USER GUIDE

Simplified Trips-on-Project Software Version 2.52 – 2.53

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1.0 Introduction

The Simplified Trips-on-Project Software (STOPS) is a series of programs designed to quickly and accurately estimate transit project ridership using readily available census data, transit ridership and schedule information, and metropolitan planning organization forecasts of demographic growth.

This documentation covers versions 2.52 and 2.53. The only difference between these two versions is that version 2.53 now includes support for ArcGIS Pro in addition to the earlier capabilities which supported Arc Map and TransCAD GIS packages. This documentation is largely unchanged from that released for version 2.52 with the exception of a section describing how to use ArcGIS Pro with STOPS.

In its basic form, STOPS performs many of the same computations of transit level-of-service and market share found in model sets maintained by Metropolitan Planning Organizations (MPOs) throughout the United States. Like STOPS, these MPO models start by creating a zone-to-zone matrix of person trips stratified by purpose and socioeconomic class. These trips are then split into separate tables for each travel mode using a nested logit mode choice model. Each of the mode-specific tables are assigned to specific transportation facilities (e.g., transit routes, stations, or bus stops[1]) to determine traveler volumes (i.e., ridership).

Key distinctions between the STOPS approach and conventional models include the following:

- Estimates of total origin-to-destination travel are derived from Census data or transit rider surveys rather than elaborate trip generation and destination choice procedures. This avoids the need to calibrate these sub-models to the degree of accuracy required to estimate transit ridership.
- Representations of transit levels-of-service are derived from timetable information, bypassing the need to develop detailed transit networks in the planning environment. Timetable information is already available at most agencies and is much more accurate than the representations of travel time and frequencies contained in typical planning networks.
- The model adjusts itself to represent current conditions using transit count data including system-wide unlinked trips, boardings by route, and boardings by station. If available, STOPS can also use total linked transit trips by auto ownership level and trip purpose to further refine its understanding of transit markets.

Although STOPS represents a significant simplification over existing procedures, it still requires careful development of input information that describes existing transit

[1] MPO models also assign trips to roadway links. STOPS is a transit model and does not perform highway assignments.

ridership, existing transit schedules and future transit service scenarios. This document describes the process that should be followed to install STOPS, develop input data, and run the STOPS model to generate estimates of trips on transit projects.

STOPS Version 2.52 has four different operating modes that take advantage of varying levels of input information that may be available in any given metropolitan area. These operating modes are:

- **Synthetic Mode.** The synthetic mode of STOPS is most similar to typical regional models. In this mode of operation, STOPS develops a person trip table based on Census Transportation Planning Products (CTPP) Journey-to-Work (JTW) flows. STOPS then uses a conventional mode choice model to estimate the share of these trips using transit and tally up the number of transit trips using each transit station and route. In this mode, STOPS calibrates itself to match CTPP transit shares and ridership counts at the system-, route-, and station/stop-group level-of-detail.
- **Incremental Mode.** In regions where a detailed transit user survey exists, STOPS can have access to much more detailed transit travel information that are usually much better than person trip estimates developed from the CTPP. In the STOPS Incremental mode, transit trips are used to estimate calibration year person trips by dividing survey transit trips by the estimated transit share. Transit shares are obtained from a transit mode choice model calibrated to match CTPP shares. When this calibrated model is applied to the existing (calibration) transit networks, the resulting estimates of transit trips generally match the original survey closely[2]. When this model is applied to future scenarios, changes in transit ridership reflect the incremental impact of changes to future demographic assumptions and changes to transit levels-of-service related to the project.
- **Special Markets Mode.** In some cases, neither STOPS synthetic or STOPS incremental is feasible. This situation can happen in areas where 1) no suitable transit survey exists and 2).the project corridor has large special generators creating enough non-work transit trips that the CTPP JTW-based synthetic model is unable to fully represent the transit demand. The special markets version of STOPS works by combining synthetic STOPS in most portions of the area with data from a special markets survey (e.g., air passenger survey or university student survey) to develop a stronger sense of the demand for transit in specific areas. In the Special Markets Mode, TAZs are designated as special[3]

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[2] STOPS adjusts results to match counts in all application modes if count data are available and a count adjustment option is selected. If no adjustment is specified, STOPS matches the incremental trip table exactly except for zone-to-zone interchanges where no transit path is available. If count adjustments are selected, then the table is adjusted to match the input count data.

[3] STOPS identifies zones with an alphanumeric identifier instead of a simple integer zone number used in some forecasting systems. If this identifier begins with a "$" then STOPS uses survey data as

and all trips traveling to or from a "special" zones are based on survey records even if the other end of the trip is not a special markets zone.

- **Special Markets Type 2 Mode**. The Type 2 Special Markets mode is almost identical to the regular Special Markets mode, described above, except that survey data is used only for trips where both zones at the ends of a trips are labeled as "special zones". This capability is useful in situations where a comprehensive transit survey is available but that survey (or the underlying transit service) covers only a portion of the region to be modeled in STOPS. Zones covered by the transit survey can be lableled as "special" and zones that are outside of the survey/service area are not labeled as being special. With this coding only those trips occurring entirely within the "special" area (i.e., survey/transit service area) are based on survey data. Trips beginning and ending outside the survey area or trips between the survey and non-survey areas are treated as synthetic model trips.

The synthetic mode of STOPS is its simplest form and is how most new users are introduced to the software. Chapters 1.0 to 10.0 of this document describe how to use synthetic STOPS with only a brief mention of the incremental or special market options. These chapters describe how STOPS works, how to set up the software, how to assemble input data, how to run STOPS, and how to interpret results. Chapter 11.0 provides an introduction to the process used to calibrate a STOPS synthetic model for a specific project application. Chapter 12.0 describes how to use the incremental and special market versions of STOPS. Chapter 13.0 provides an example of the process used to calibrate the incremental version of STOPS.

1.1 Version Release Information

This document describes STOPS version 2.52 and 2.53. As noted previously, 2.53 adds a new linkage to the ArcGIS Pro software package. Key changes in 2.52 as compared to earlier versions of the software include:

- Added the capability to use a specially-processed version of the 2012-2016 Census Transportation Planning Products (CTPP) journey-to-work data tables. Note that the current version of the STOPS parameters were revised for v2.51 and have not been changed for v2.52. Depending on the context, this documentation may refer to these parameters as the Version 2.51 parameters or the Version 2.51/2.52 parameters. In all cases, the Version

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the foundation for demand (except when the Synthetic Mode is selected). In the Incremental Model, all zones are labeled with a "$". In the first Special Markets Mode, all trips traveling to or from a zone labeled with a "$" is treated as "special" (even if the other zone is not "special") and reads data from the survey. In the Type 2 Special Markets Mode, survey data is only used with both zones at the ends of the trip are labeled as "special"

2.51 and 2.52 parameters are identical—the only difference between Version 2.51 and 2.52 is the ability of the latter to utilize the 2012-2016 CTPP.

The prior version of STOPS (2.51) was never formally released but includes the following modifications (depending on the date of the executable):

- STOPS no longer requires a valid GTFS file name in File Set 1 for all three scenarios (existing, no-build and build). Now, the only requirement is that at least one non-blank file name be provided in any File Set (i.e., File Set 1 through File Set 20). This simplifies the coding process for cases where the existing, no-build, and build scenarios require a different calendar day. This happens most frequently when one GTFS file is used for calibration (the existing scenario) and a newer GTFS file is the basis for the no-build or build scenarios.
- New procedures and parameters for representing transit Park-and-Ride (PNR) travel were introduced. The default values of these parameters restrict the situations in which STOPS predicts large transit PNR markets to high density attraction locations with numerous transit trips made by car-owning households, transit options that are time-competitive with driving, and involve little or no backtracking.
- New procedures and parameters for controlling calibration were introduced to better handle situations with limited transit data and to be more consistent between path-building and mode choice.
- Trips that involve use of both full fixed guideway (e.g., commuter rail, heavy rail or light rail transit) and partial fixed guideway (e.g., BRT or streetcar) are, by default, now treated as the lowest mode used during the journey rather than the highest mode. The change was made to address observations by FTA that STOPS overestimated partial fixed-guideway (BRT and streetcar) ridership in situations where these modes serve as feeders to full-fixed guideway systems.
- Optionally, STOPS v2.51 allows the user to describe the regional transit fare structure and use this information to affect how shortest transit paths are found and how users choose modes of travel[4].
- STOPS now generates estimates of Transportation System User Benefits and can generate production- and attraction-zone summaries that can be used to assess the geographic distribution of mobility benefits and assist in the quality control process.

The previous version of STOPS was version 2.50. Key changes in 2.50 as compared to earlier versions of the software include:

[4] This feature was added to later versions of v2.50 that were released after the v2.50 documentation was written

- STOPS was recalibrated to match ridership for projects that have opened since STOPS was first developed. The additional information on actual transit project ridership includes an expanded the range of project types and now includes information on ridership experience with additional inexpensive "BRT-lite" projects and major heavy rail extensions.
- STOPS has been updated to use the expanded memory capabilities of 64-bit operating systems. Other programs have been updated to reduce the required memory and, therefore, operate more reliably with current versions of Windows.
- Enhanced tools have been provided to update station files with new stop_ids coded in existing, no-build, and build GTFS directories. These tools are included in Step 6, Specify Station Locations and can be used to create new station files or update existing files.
- A new GTFS editor, *GTFSed*, is now available to help users code new services in GTFS format. This program is also available from FTA and is described in a stand-alone user guide.

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2.0 Overview of STOPS and Its Application

This section describes the STOPS model and provides guidance on its application. The focus in this chapter is on the synthetic STOPS operating mode. Incremental STOPS and the special market version of STOPS are described in Chapter 12.0.

2.1 STOPS Model Structure

STOPS is designed to estimate transit trips on a project using readily available data and procedures that are calibrated to match both local and national experience related to rail, bus, and BRT ridership and is designed to forecast project ridership in a wide range of situations including:

- A fixed guideway starter line
- An extension to an existing fixed guideway line
- A new line added to an existing fixed guideway system
- A gap-filler project in which a new segment connects two previously separated fixed guideway systems

To be able to measure project ridership in all of these situations, STOPS includes the capability to represent the transit system and the project definition so that trips can be identified that benefit from the investment in new fixed guideway transit services.

In the synthetic version of STOPS, person trip tables (i.e., the results of Steps 1 and 2 of traditional four-step models) are developed from the Census Transportation Planning Products (CTPP) Journey-to-Work (JTW) flows that are available on the FTA web site. Three sets of CTPP data are available:

- The Year 2000 Census Long Form
- The 2006-2010 American Community Survey
- The 2012-2016 American Community Survey

In all cases, the person trip tables are "grown" using demographic projections representing the CTPP Year[5] (the base for the adjustment) and four different application years—the current (calibration) year, the project opening year, a 10-year horizon year and a 20-year horizon year. Demographic projections are obtained from the local Metropolitan Planning Organization using the MPO's own system of Traffic Analysis Zones (TAZs). The user is able to define the year that best fits each of these descriptions.

[5] The CTPP year for the Year 2000 Census CTPP is 2000. The CTPP year for the 2006-2010 ACS version of the CTPP JTW flows is assumed to be 2008; approximately mid-way between 2006 and 2010. The CTPP year for the 2012-2016 ACS is assumed to be 2015.

STOPS uses transit timetable data in General Transit Feed Specification (GTFS) format to develop zone-to-zone estimates of transit, access, and waiting times for three different network scenarios:

- Existing: represents current transit operations and is compared to current ridership counts to calibrate the STOPS application.
- No-build: represents transit services that will exist in the future without the project. In many cases, the transit schedules used for the existing scenario will be used without modification to represent the no-build scenario.
- Build: represents transit services that will exist in the future when the project is in operation.

A traditional nested logit mode choice model computes transit shares stratified by access mode (walk, kiss-and-ride, and park-and-ride) and sub-mode (fixed guideway-only, fixed guideway and bus, and bus-only). Trips are assigned to stations and routes based on the boarding station/stop, alighting station/stop, and routes used on each access and sub-mode path.

One unique feature of STOPS is that that each model run includes:

- A fully automated calibration run that establishes mode choice constants and other adjustments based on the current year and existing transit network.
- Two application ridership forecasts, representing the no-build and build scenarios for whatever horizon year is selected.

This multi-step aspect of STOPS is illustrated in Figure 1.

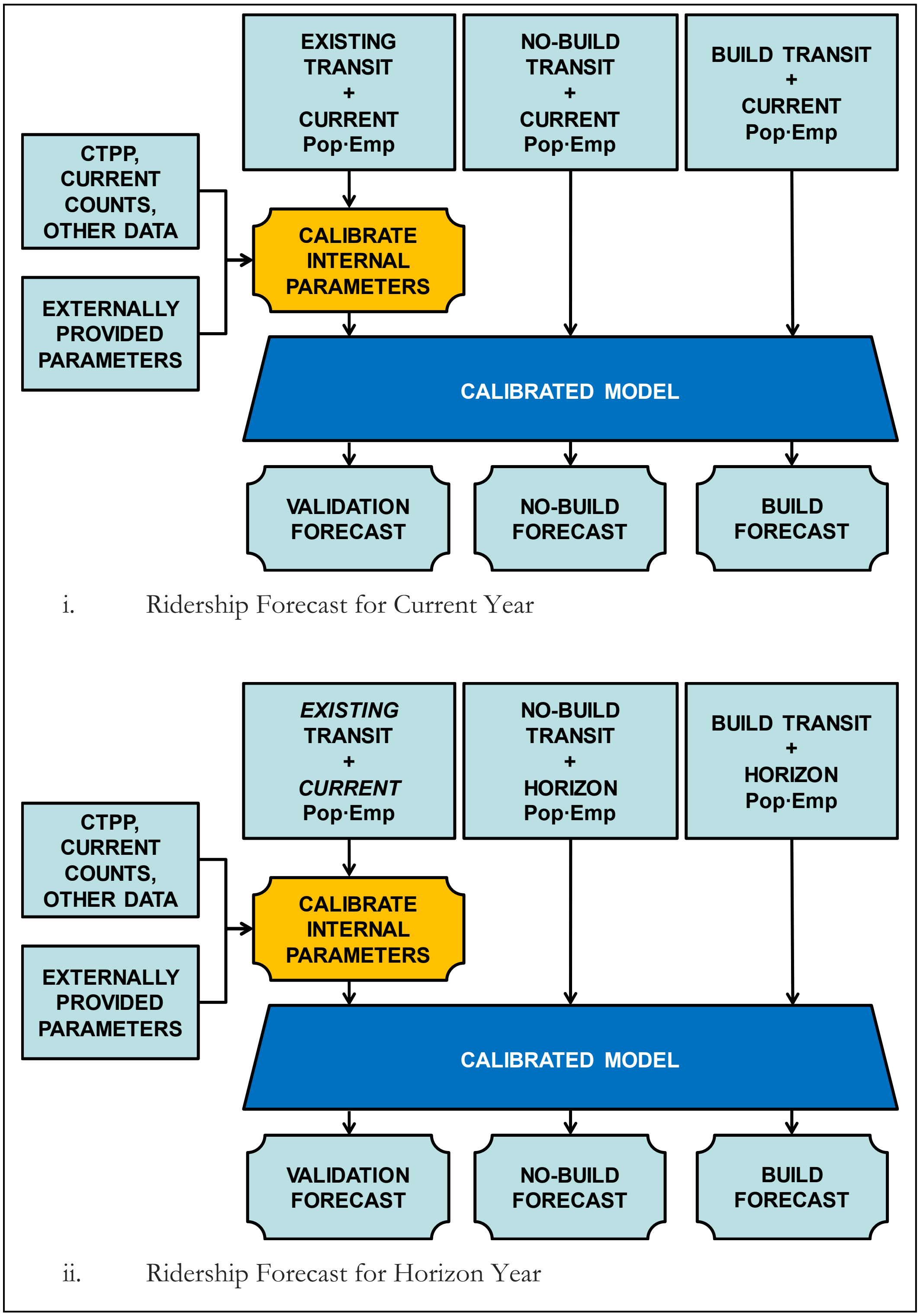


Figure 1. Overview of STOPS Application

An overview of the process used to calibrate STOPS in its simplest form (i.e., the synthetic mode) is presented in Figure 2. The key steps are as follows:

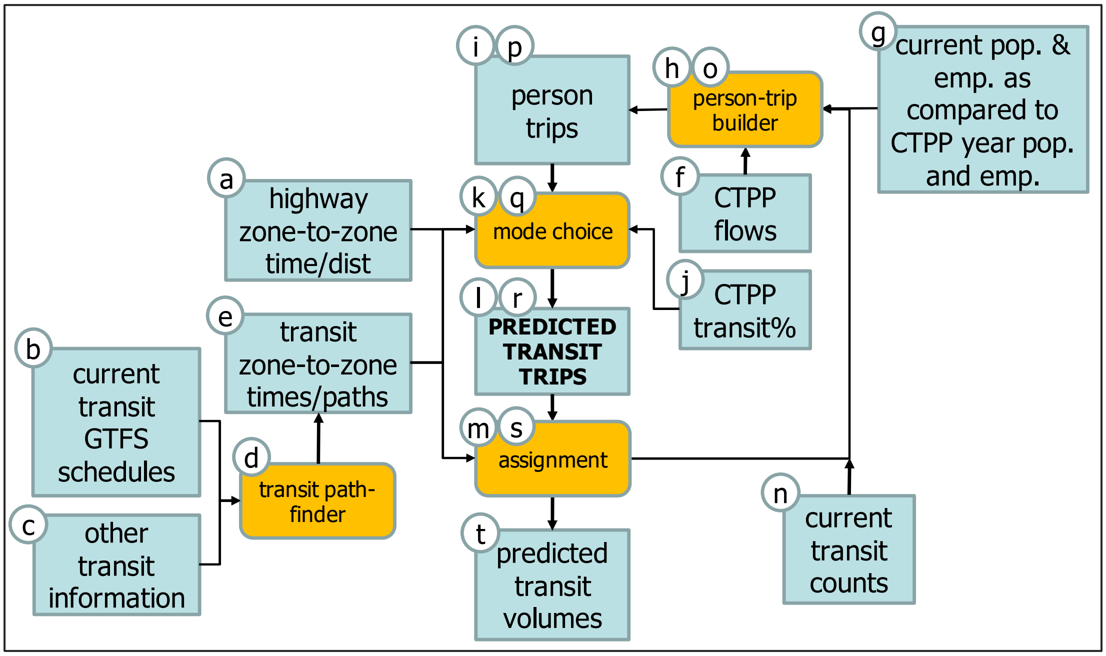


Figure 2. STOPS Synthetic Calibration

a) Highway zone-to-zone time and distance. Characteristics of the highway system are supplied to STOPS in the form of zone-to-zone matrices of highway times and distances for the current, opening year, 10-year horizon, and 20-year horizon. STOPS does not directly process information on highway attributes and instead relies on estimates of zone-to-zone highway travel times and distances obtained from regional travel forecasting model sets maintained by Metropolitan Planning Organizations (MPOs). Since MPO models might not use the same geographic (zone) system used in the CTPP, STOPS includes a procedure to convert MPO geography to CTPP geography[6].

[6] Note that STOPS allows (and requires) the user to provide separate Census and MPO zone system definitions in ESRI shape file format. STOPS builds the relationship between these files. Census and MPO boundaries may be identical, may nest within the other system or be independent of each other. All geographic files MUST be coded with longitude and latitude coordinates consistent with files prepared by the U.S. Census Bureau. Any geographic file obtained from an MPO that is specified in State Plane Coordinates must be converted to longitude and latitude coordinates prior to use with STOPS.

b) Transit schedules. Descriptions of current and future transit services are supplied in the form of bus and rail schedule files in General Transit Feed Specification (GTFS) format.

c) Other transit information. Additional transit network information including stations, park-and-ride locations, and walk networks are supplied by the user to supplement the schedule information contained in the GTFS files.

d) Transit path finder. A transit path-finder named GTFPath processes schedule and other transit information to find the shortest zone-to-zone paths for each scenario (existing, no-build and build), two time periods (AM peak and midday), three access modes (walk, kiss-and-ride, and park-and-ride) and three paths (fixed guideway only, bus only, and both bus and fixed guideway together).

e) Zone-to-zone transit times/paths. The results of the path-finding procedures are saved in a series of zone-to-zone matrices containing travel times by category (e.g., in-vehicle time, wait time, walk time) and path information (e.g., routes and transit vehicle trips used during the journey).

f) CTPP flows. The Census Transportation Planning Products (CTPP) provides zone-to-zone estimates of workers by their place of work and place of employment.

g) Current population and employment vs. CTPP year population and employment. The differences in population and employment are converted to home-end and employment-end growth factors for each zone.

h) Person-trip builder (initial pass). STOPS builds estimates of person travel by starting with CTPP journey-to-work flows aged-up to the current year based on the relative growth in population and employment between the year of the CTPP and the current year. STOPS generates person trips from the current CTPP flows for three purposes: home-based work (HBW), home-based other (HBO), and non-home-based (NHB). Trips are generated based on simple trip rates, a distance decay function for non-work purposes, and a process that scales trip productions to match attractions for NHB travel.

i) Person trips (initial pass). The results of the person trip-builder are stored in a series of zone-to-zone matrices containing trips for each scenario, purpose, and auto ownership category.

j) CTPP transit%. The CTPP also provides an estimate of transit share for each residential zone and for each employment zone. This estimate is aggregated to user-defined districts for use in model calibration.

k) Mode choice (initial pass). An initial version of the mode choice model reads the highway and transit zone-to-zone time matrices and the initial estimate of person trips to generate estimates of transit trips by purpose, auto ownership, access mode, and path type. The model is calibrated for each user-defined district using transit shares from the CTPP.

l) Predicted transit trips (initial pass). The outcome of mode choice is a zone-to-zone matrix of transit trips by purpose, auto ownership, access mode, and path type.

m) Assignment (initial pass). Path information on station/stops and transit vehicle trips used for each journey are combined with transit trips to generate an initial estimate of ridership for each station, bus stop, and route.

n) Transit count information is supplied by the user to provide additional information on transit ridership for each station, bus stop, and transit route.

o) Person-trip builder (adjusted). STOPS compares the initial-pass assignment results to transit counts to determine where the initial estimates show too much or too little demand. Since the weakest element of the proceeding process is the person-trip builder, the discrepancy between modeled and observed ridership is resolved by factoring the person trip table up or down so that modeled ridership matches observed ridership.

p) Person trips (adjusted). The results of the adjusted person-trip builder are stored as a refined estimate of zone-to-zone person trips.

q) Mode choice (adjusted). The calibrated mode choice model from the previous iteration is used with the adjusted person-trip table to generate a revised estimate of zone-to-zone transit trips by purpose, automobile ownership, access mode, and path.

r) Predicted transit trips (adjusted). The adjusted mode choice model generates a refined estimate of transit person trips that represents the information on travel demand from two sources: the CTPP and the transit count database.

s) Assignment (adjusted). The adjusted transit trip table combined with the path information from GTFPath is used to generate a refined estimate of ridership by station, bus stop, and route.

t) Predicted transit volumes. The output of the adjusted assignment is information on ridership by station, bus stop, and route for each trip purpose, auto ownership level, access mode, and path type.

In the application mode, a similar process is followed as illustrated in Figure 3. The principal distinction between the application and calibration approaches are:

- GTFS files reflecting the alternative service (e.g., the no-build, or build alternatives) are used rather than the existing service which is always used in the calibration case.

- Horizon year (current or future) population and employment are used rather than current year population and employment which are used in the calibration case.
- Modal constants that were saved during the calibration step are used in the mode choice model during application.
- Trip table adjustments (to match ridership counts) that were determined during the calibration step are used by the person trip builder during application.

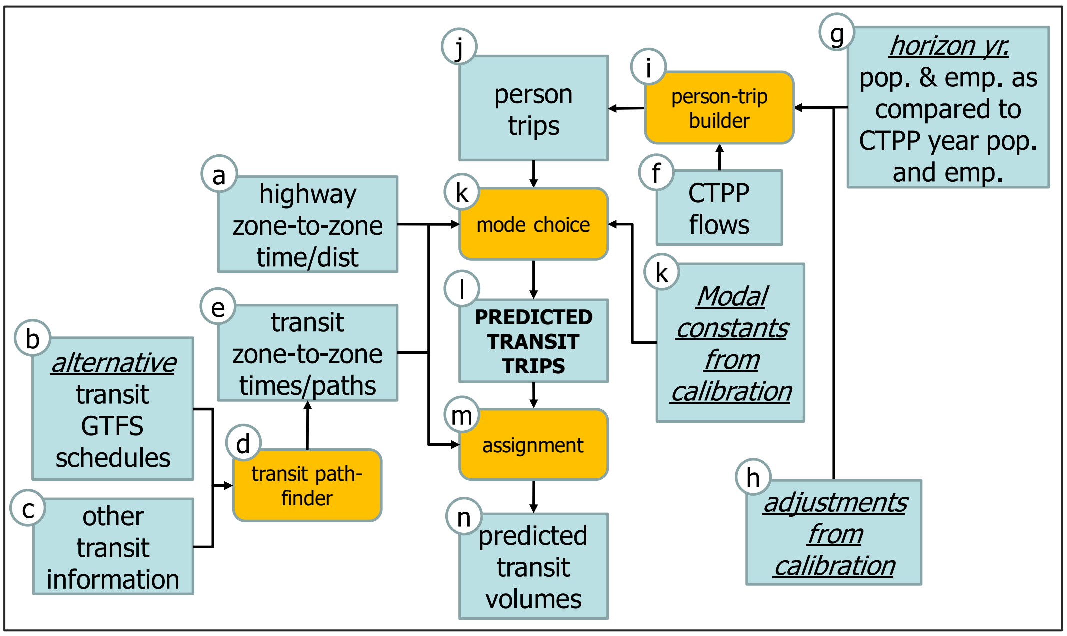


Figure 3. STOPS Synthetic Application

2.2 Default Model Parameters

This section describes some of the key model parameters.

Transit Path-Building

Transit paths are built directly from transit schedule data provided in General Transit Feed Specification (GTFS) format. For the existing scenario, this information can generally be read directly from the transit agency's GTFS database with three potential exceptions.

1. If transit rider parking is available at one or more transit stops, then park-and-ride locations must be coded in "pnr.txt," a supplemental GTFS file that provides information on parking latitude/longitude, capture area, and other park-and-ride impedances
2. If some full fixed-guideway services such as LRT are coded as route_type 0 (zero, defined in the GTFS standard as streetcar or tram) in the routes.txt file, then the user may elect to recode these routes as route_type 1 (one, defined as subway or metro) so that these services get the full benefit of being a fixed guideway transit mode.
3. If a bus rapid transit (BRT) line is coded as route type 3 (the GTFS standard defines type 3 as bus), and it has significant fixed guideway attributes, then the user may elect to recode these routes as route_type 0 (zero, defined as streetcar or tram but treated inside STOPS like a partial fixed guideway system).

Paths are built with a program named GTFPath.exe. Key path-building parameters include:

- Paths built: Separate paths are built for each combination of scenario (existing, no-build and build), time-of-day (AM peak and midday), access mode (walk, kiss-and-ride, and park-and-ride) and path type (fixed guidway-only paths, bus-only paths, and paths that can use both types of transit together).
- Path-finding criteria: Least weighted travel time required to arrive at the destination at a STOPS-selected arrival time (the "target time") between 8:00 AM and 9:00 AM for AM peak skims or between 1:00 PM and 2:00 PM for midday paths. Path weights are defined as:
    - 1.0 for bus in-vehicle time.
    - 0.8 for fixed guideway mode in-vehicle time. This weight can be adjusted by the user according to the "Full Fixed Guidway Setting" and the "Partial Fixed Guideway Setting" in the parameter file. The full fixed guideway setting applies to route_types 1, 2, 4, 5, 6, and 7. The partial fixed guideway setting applies to route_type 0. If the relevant fixed guideway setting is 1.0, then the default parameter applies (i.e., 0.8). If the setting is 1.2, then the in-vehicle time weight drops to 0.76. If the fixed guideway setting is 0.5, then the in-vehicle time weight increases to 0.9. If the fixed guideway setting is 0, then the weight is equal to 1.0.
    - Walk weight defaults to 1.5 but can be adjusted up or down by the Walk Weight setting in the parameter file. If the walk weight parameter is set to 2 (the maximum amount), then the walk path

weight is equal to 3.0. If the walk weight parameter is set to 0.5 (the minimum amount), then the walk path weight parameter is equal to 0.75.

  - Wait weight is set to 1.0 and is not adjustable except by a special override procedure that can be provided by FTA staff, if required.
  - Boarding penalty (assessed each time a new transit vehicle is boarded) is set to 5.0 minutes per boarding but can be adjusted up or down by the "Fraction of Transfer Penalty to Apply" setting in the parameter file. If the fraction is set to 1, then the default boarding penalty is applied. If the fraction is set to 2 (the maximum amount), then the boarding penalty is equal to 10.0 minutes per boarding. If the fraction is set to 0.0 (the minimum amount), then the boarding penalty is set to 0.
  - Park-and-Ride and Kiss-and-Ride weights are set to 1.5 to balance between minimizing overall travel time and finding the nearest park-and-ride or kiss-and-ride lot to use.

- Walk access link generation: Defaults to all useful walk links within 1.0 straight-line miles of the zone centroid at a speed of 3 miles per hour. Optionally, if specified in the parameter file, STOPS can read a walk link file in ESRI shape file format (WalkLink.shp) and build connectors within 1.4 miles of distance walked on these links at 3 miles per hour.
- Kiss-and-Ride access link generation. Defaults to 3 straight-line miles at 25 mph. Optionally, speeds can be adjusted to match MPO-generated auto times from the zone-to-zone auto time file.
- Park-and-Ride access link generation. Defaults to 3 to 25 straight-line miles (depending on the PNR type coded in the pnr.txt file) at 25 mph. Optionally, speeds can be adjusted to match MPO-generated auto times from the zone-to-zone auto time file.
- Transfer link generation. Set at 0.25 straight-line miles for both transit-to-transit transfers and park-and-ride lot to transit transfers. These links are traversed at 3 miles per hour.

Characteristics of the schedule-based path-builder include:

- Travel times are based on the departure and arrival time for the specific boarding and alighting locations and the specific buses/trains used for the trip.
- Transfer wait times are based on the difference between the arrival time of the incoming bus/train and the departure time of the outgoing bus/train.

- The absolute value of the difference between actual arrival time at a destination and the target arrival time is used in lieu of the initial waiting time. The traveler can arrive up to 30 minutes after the target arrival time or any amount of time before the target arrival time.
- Feasibility constrains paths—a rider cannot depart on a bus leaving a given bus stop before the traveler arrives at that stop.

Trip Table Development

In the synthetic version of STOPS, person trips are generated from the Census Transportation Planning Products datasets using the trip rates shown in Table 1. The initial estimates of home-based work (HBW) trips per journey-to-work (JTW) flow were obtained from NCHRP 716. Initial estimates of non-work trip making came from the ratio of work to non-work trips from the National Household Travel Survey. Non-work trip making was adjusted so that shorter zone-to-zone distances generate relatively more non-work trips and longer distances generate relatively fewer non-work trips based on information from NCHRP Report 365. The curve that shows the distance adjustments is shown in Figure 4. Finally, the default trip rates were adjusted to match the results of the transit survey database assembled for the STOPS development project.

The default trips rates that are used in STOPS can be revised by the user with information specific to each locality in the STOPS parameter file.

Table 1. Default Trips per JTW Flow

Household Auto Ownership	Purpose		
	Home-Based Work	Home-Based Other	Non-Home Based[7]
0 Cars	1.64	6.58	3.45
1 car	1.43	5.65	3.26

[7] Applied to an adjusted version of the JTW in which productions have been rescaled to match the original attractions for that zone.

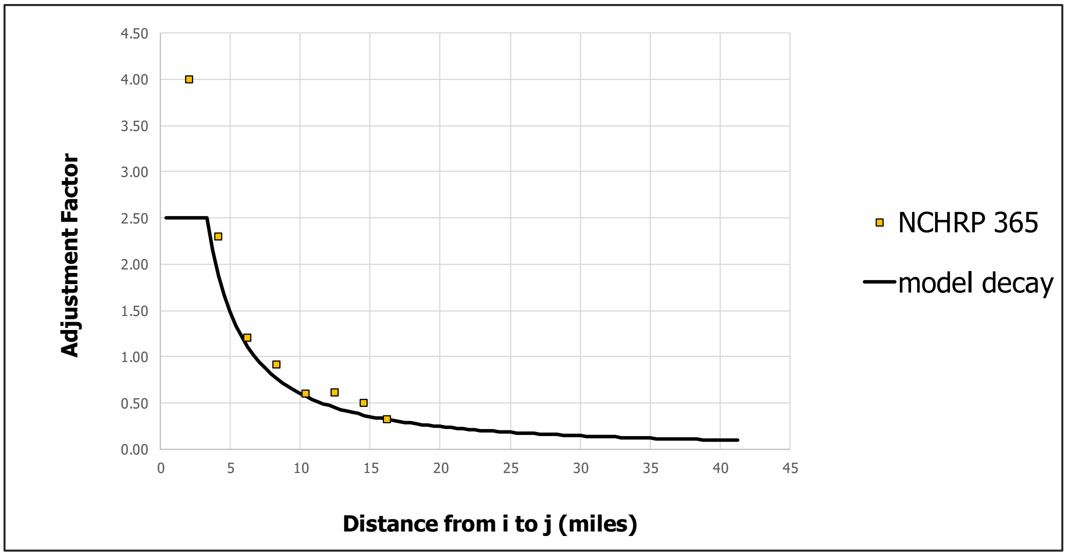


Figure 4. Non-Work Trip Rate Adjustment

Mode Choice

STOPS uses a nested logit choice model to determine the share of trips using each transit access and path-choice option. The structure of the nested choice model is shown in Figure 5 and Figure 6. Mode choice coefficient values (and calibration sources) are as follows:

- Coefficient on in-vehicle time equals -0.03 and is based on a national calibration.
- Weights on other path characteristics are aligned with path-building weights and are based on a national calibration. Walk weights are user-adjustable.
- Local HBW constants by autos-owned are calibrated vs. CTPP shares (local)
- Access-mode constants by trip purpose and autos-owned are based on a national calibration and are user-adjustable.
- Path-type constants are based on the national calibration and are scaled by the fixed guideway setting (FGS)
- Nesting coefficients are based on the national calibration and are scaled by the FGS values

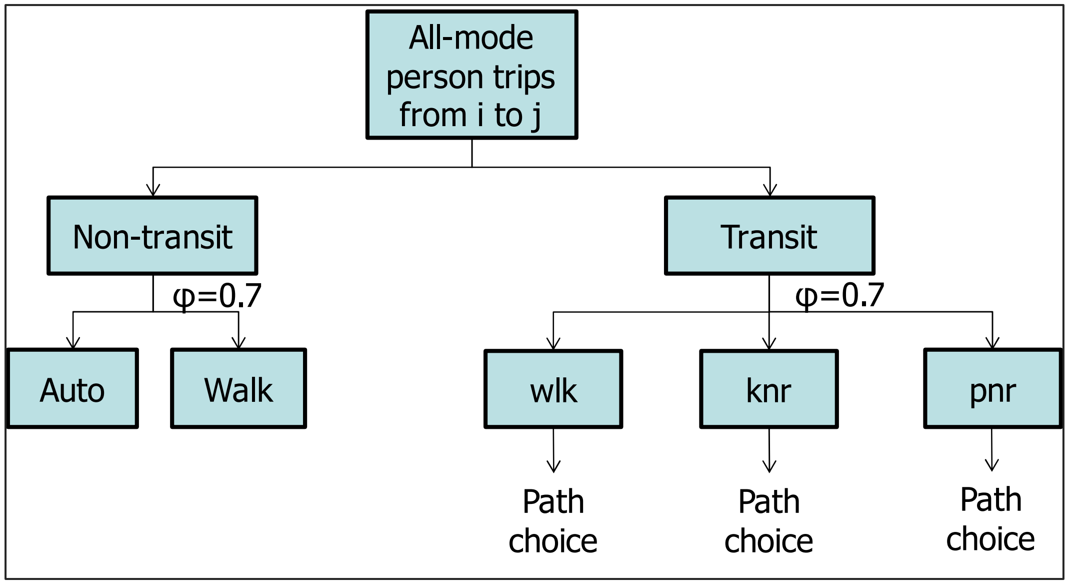


Figure 5. Mode and Access Choices (top of nesting structure)

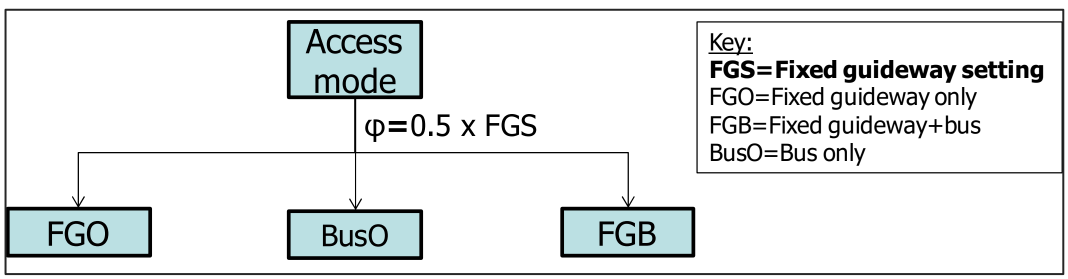


Figure 6. Path Choices (bottom of nesting structure)

STOPS includes a series of path-choice specific constants that affect traveler perceptions about each transit option above and beyond the time-related effects (in-vehicle time, waiting time, access time, egress time, and transfer time) that are outcomes of the path-finding process. Default constants for v2.52 are shown in Table 2 (Fixed Guideway Only), Table 3 (Bus Only), and Table 4 (Fixed Guideway and Bus path). These values are unchanged from v2.50 for the fixed guideway only and bus only paths. Trips using both fixed guideway and bus modes have a small correction to the constants which result in minor changes to ridership results obtained from v2.50.

Table 2. Fixed Guideway-Only Path Choice Constants (in minutes of equivalent in-vehicle time)

Access Mode	Household Auto Ownership		
	0 Car	1 Car	2+ Cars

Table 3. Bus-Only Path Choice Constants (in minutes of equivalent in-vehicle time)

Access Mode	Household Auto Ownership		
	0 Car	1 Car	2+ Cars
Kiss-and-Ride	20	20	20

Table 4. Fixed Guideway and Bus Path Choice Constants (in minutes of equivalent in-vehicle time)

Access Mode	Household Auto Ownership		
	0 Car	1 Car	2+ Cars
Walk Access	0	7.5	7.5
Kiss-and-Ride	15	15	15
Park-and-Ride	15	15	15

Notes: All constants are shown for a FG setting of 1.0. Values are adjusted up or down based on the value of the FG setting. Version 2.52 default constants are unchanged from version 2.50 (and 2.51) with the exception of a correction to a v2.50 error found with the fixed guideway and bus walk access constants which interchanged the constants for 0 car and 1 car households. Tests of the corrected constants show that this correction resulted in only small changes to model results.

Selected mode choice parameters can be adjusted by making changes to the parameter file. These include:

- Path choice constants and nesting coefficients are scaled up or down by the value of the full and partial fixed guideway settings
- Kiss-and-Ride usage can be adjusted by the "KNR Transit" parameter which scales the Kiss-and-Ride constants up or down. If the KNR Transit parameter is set to 1.0, STOPS will use the default parameter. If this parameter is greater than 1, then modeled KNR transit usage will increase. If this parameter is less than 1, then modeled KNR transit usage will decrease.
- Park-and-Ride usage can be adjusted as follows:
    - If the v2.50 parameters are retained, the PNR Transit parameter in the user interface controls the level of parking demand. If this parameter is set to 1.0, STOPS will use the default v2.50 value. If this parameter is greater than 1, then modeled PNR transit usage will increase. If this parameter is less than 1, then modeled PNR transit usage will decrease.
    - If the v2.51/v2.52 parameters are specified (the PNR screen in the user interface), then the user can adjust the impact of employment density/transit share and the quality of the PNR trip (compared to driving alone) as described later in this document.
    - In either case, the PNR penalty is an easy way to add a user-selected time penalty to all park-and-ride lots.
- The balance between park-and-ride to bus versus park-and-ride to fixed guideway can be adjusted with the "PNR Bus parameter". Increasing this parameter increases the penalty on parking and transferring to a bus (as opposed to a fixed guideway route) and therefore reduces the incidence of travelers parking and then riding a bus.

2.3 National Calibration/Validation of STOPS

STOPS was calibrated and validated using a multi-stage strategy:

1. Match survey estimates of transit ridership by purpose, access mode, path type, and household auto ownership from 8 cities with modern, high quality transit rider survey data. The purpose of this "static" calibration is to establish reasonable default parameters so that STOPS will generate reasonable results in cities without complete survey information. The cities used in the static calibration are presented in Table 5.

2. Test STOPS for a range of project applications by implementing STOPS to match transit ridership statistics available before the project was opened and then comparing STOPS estimates of project ridership against the ridership

that was actually attracted to the project. This "dynamic" validation establishes the effectiveness of STOPS in estimating the impact that building a project will have on the market for transit service. The cities used in the dynamic calibration are presented in Table 6. The comparison of modeled STOPS ridership to actual project ridership is presented in Figure 7.

3. Adjust selected parameters as part of the v2.51 update to better match park-and-ride demand patterns and BRT usage of newly opened projects

Table 5. Survey Data Sources for STOPS Static Calibration (v2.50)

Metro area	Commuter Rail	Heavy Rail	Light Rail	Streetcar	BRT	Local Bus
Atlanta		•				•
Charlotte			•			•
Denver			•			•
Kansas City						•
Norfolk			•			•
Phoenix			•			•
Salt Lake City	•		•		•	•
St. Louis			•			•

Table 6. Survey Data Sources for STOPS Dynamic Validation (v2.50)

Metro area	Commuter Rail	Heavy Rail	Light Rail	Streetcar	BRT
Norfolk			•		
Orlando	•				
Nashville					•
Denver West			•		
Phoenix NW			•		
Phoenix Mesa			•		
Grand Rapids					•
Seattle				•	
NY 2nd Ave. Subway		•			
DC Silver Line		•			
DC Streetcar				•	

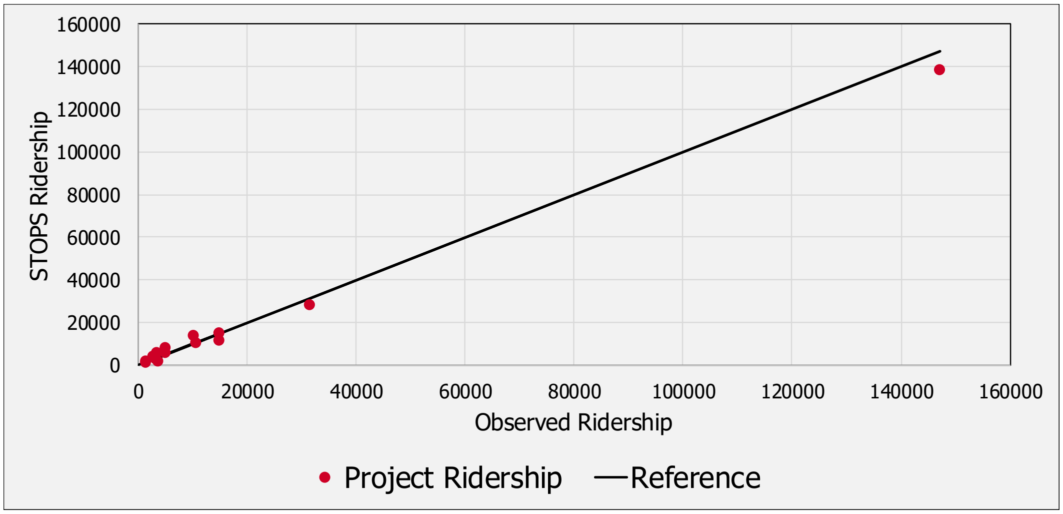


Figure 7. Comparison of STOPS Ridership to Observed Ridership for Dynamic Validation Test (v2.50 calibration)

2.4 Suggested Application Approach

STOPS is designed to simplify the process of developing and applying travel forecasting procedures while maintaining much of the internal sophistication of regional travel forecasting models. Nevertheless, there are still a number of implementation and application steps that must be followed to successfully use STOPS to estimate fixed guideway transit ridership.

In order to streamline the process of applying STOPS, the user may wish to employ a step-by-step approach that breaks the STOPS application down into a series of simple tasks including:

- Implement STOPS on the user's computer.
- Run STOPS for the current year and existing transit services and test the local model calibration. This step tests the local calibration of STOPS with existing transit services and current socioeconomic conditions in the corridor. As mentioned above, STOPS is fundamentally organized around three separate transit service scenarios — (1) the existing, (2) the no-build, and (3) the build conditions. A current year / existing transit scenario run can be created by configuring all three scenarios so that they represent the existing transit schedule.
- Determine the characteristics of transportation system if the project is not built (i.e., the no-build scenario). This scenario is used as a point of comparison for the purpose of computing incremental transportation impacts such as the change in VMT. After defining no-build schedules, STOPS can use the information in the no-build and build scenarios to confirm that the no-build is properly defined.

- Code the full project in the build network and run STOPS for the current year with all three scenarios—existing, no-build, and build. This step will generate current-year project ridership, a key input to the New Starts reporting process.
- If optional future year forecasts are desired, the user can develop future year demographic data and run STOPS for the forecast year.

2.5 Input Data

STOPS is designed to make use of pre-existing data sources on transportation supply and demand for nearly all aspects of the ridership forecasting process. The only required information that must be created specifically for a STOPS application are transit timetables (in GTFS format) representing the no-build and build scenarios.

Data are obtained from four sources:

- Federal Transit Administration: The FTA STOPS website includes copies of the CTPP data used by STOPS. Data is organized by state, and users can download one or more states to represent travel patterns in their corridor. Data in each state file include geographic files in ESRI shape file format describing Census Traffic Analysis Zones, Block Groups, or Tracts (depending on the geographic unit of analysis of CTPP data in the project corridor), Census Blocks, and Parts I, II, and III of the CTPP.
- Local Transit Agencies. Transit timetables in GTFS format are used in STOPS to represent existing service. Transit count data are used to describe actual (observed) existing transit ridership. At a minimum STOPS requires an estimate of existing region-wide unlinked trips. Route-level and stop-level boardings and linked trips by purpose and auto ownership help to improve the calibration of the model.
- Metropolitan Planning Organizations. Geographic files in ESRI shape file format are used to describe the agency's traffic analysis zone system with information on zone number and current and forecast year population and employment by zone. MPOs also provide zone-to-zone estimates of AM peak single-occupant highway time and distance for the current and forecast year.
- Project Sponsors. Project definitions used in STOPS include station locations, station grade level (i.e., at-grade or grade-separated), station presence or absence of park-and-ride, and operating plan at a sufficient level-of-detail to synthesize a transit schedule for the new service.

2.6 Computer Resources

STOPS is designed to run on a computer running a 32- or 64-bit version of Microsoft Windows Version 7 or above. At least 8 GB of installed memory is required. STOPS takes advantage of multi-core processors and large models should be run on computers with 8 or more threads (4 cores) and 16 GB of installed memory. The display should have a resolution of 1024x768 pixels but higher resolution screens are strongly recommended.

STOPS generates large tables of zone-to-zone travel times and output summary files. The size of these files is related to the number of zones contained in the metropolitan area's Census Traffic Analysis Zone (TAZ) system and the number of different forecast years that are generated. In practice, the storage required for each scenario ranges from 20 GB to 100 GB. A USB external hard drive is recommended for storing scenario results and can also be used for running STOPS.

STOPS uses ESRI Shape files to describe the geographic relationships between Census TAZs (or block groups or tracts, depending on the availability of CTPP data), MPO TAZs, and station locations. The user should have access to Geographic Information System (GIS) software to update these files to define station locations and zonal district aggregations. Any GIS software that can read ESRI Shape files can be used; however, STOPS automates the linkage to three of the most common GIS packages used in transportation analysis and modeling: TransCAD Version 5.0 or later, ArcMap Version 10.1 or later, and ArcGIS Pro Version 3.2.0 or later.

2.7 Skill Requirements

STOPS is designed for use by technical staff with a basic understanding of the principles of travel forecasting and model application. Skill requirements include:

- Experience using one or more GIS packages and the ability to create GIS layers in ESRI shape file format representing station locations and MPO zone systems.
- Understanding of the mechanics of travel forecasting including the concept of a "run", the types of data used as input to the travel forecasting process, and techniques for reviewing model outputs.
- Familiarity with the regional transit system including the different agencies providing service and the nature of the scheduled service in the region.
- Understanding of the regional transit markets. This understanding should include both traditional and non-traditional travel markets. The non-traditional transit markets will require careful additional attention with STOPS. These include commercial airports, events venues, universities and transit used for fringe parking.

2.8 Time Requirements

STOPS is designed to dramatically reduce the time required to prepare forecasts of transit trips on a project. The traditional process required to prepare a fully operational local transit forecasting model often exceeds a year if the full range of model development activities is required. These steps include a comprehensive transit passenger survey, model calibration, and refinements required to generate a reasonable representation of existing transit patterns while conforming to best practices regarding model structure and parameters.

In its most simple application mode, STOPS utilizes data from a variety of sources to represent travel flows and transit supply, bypassing the need to calibrate these challenging model elements. It utilizes relatively conventional procedures for estimating mode shares and then calibrates these results to match estimated home-to-work transit shares attracted to each zone (from the CTPP), local regional transit boardings (from the National Transit Database or other sources), and station- and route-level ridership data.

STOPS requires carefully-developed input information and this data takes time to obtain and prepare. In general, STOPS can be used in a mid-sized metropolitan area to generate estimates of project ridership within the following timeline:

- Prepare data and run model for current/existing conditions—1 to 2 weeks. In some regions, all information required to run STOPS is available on-line and 1 to 2 days are required to download the data files and reformat these data to the structure expected by STOPS. In other areas, these data must be obtained from transit agencies and MPOs and a greater amount of time will be required to request and obtain the needed input files.
- Developing data for build scenarios—1 to 2 weeks. The amount of time required to prepare a build scenario will depend on the complexity of the alternative. A new fixed guideway line that is introduced into a corridor with relatively minor changes to the local bus service can be coded in as little as a day. A more complex project in which a new fixed guideway line is integrated into an existing system with significant changes to feeder and/or competing bus lines could take up to a week to code.
- Running STOPS—3-8 hours. After the initial data preparation tasks are completed, STOPS can run unattended so the process of actually running of STOPS can occur overnight.
- Reviewing results – 1 to 2 weeks. As is true of any forecasting application, the time spent reviewing results is a critical part of the process of generating ridership forecasts. At least a day should be anticipated for reviewing every aspect of the forecasting process including the characteristics of both the transportation supply and transit demand to make sure that every aspect of the model aligns with the intended definition of the project. STOPS may need to be re-run, if changes to the transportation supply, demographic forecasts, or calibration parameters are required. This process of code, run,

and review may need to be repeated several times over the course of several weeks to generate a final estimate of trips on a transit project.

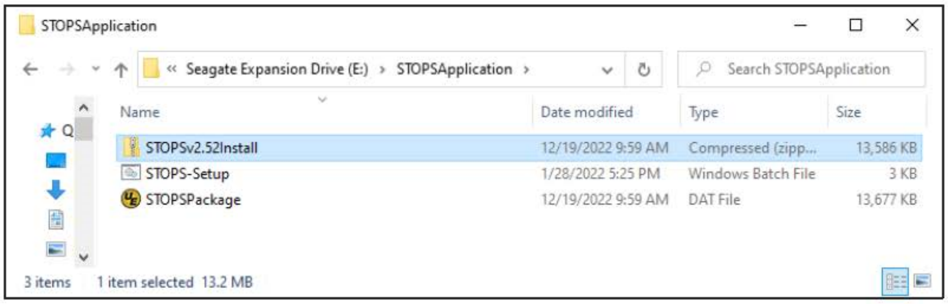
3.0 INSTALLING STOPS SOFTWARE

This section describes the steps required to install STOPS on a new computer.

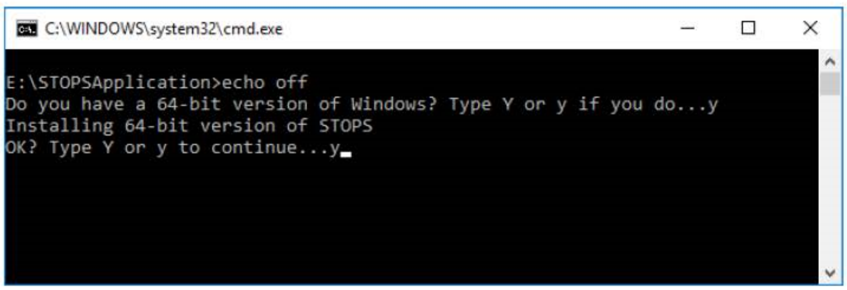
3.1 Installation Steps

STOPS can be downloaded from the FTA STOPS web page. The downloaded file is named STOPSv2.52Install.zip . To install STOPS, create a directory on the computer where STOPS is to reside and copy the distribution file to this directory. Extract the contents of this zip file (STOPS_setup.bat and STOPSPackage.dat) to this directory and then double click on STOPS__setup.bat to complete the installation. The program extraction and setup process is illustrated in Figure 8. If the program is successfully installed, the STOPS program directory should have the application (STOPSMenu.exe) and two subdirectories (STOPSComponents and datatemplates). The user may want to create a short-cut to STOPSMenu.exe and copy it to the desktop for easy access to STOPS.

1. Copy the STOPS install zip file to a user-named folder that will hold the STOPS program. Unzip the contents – STOPSPackage.dat and STOPS-Setup.bat. When this is done, your folder will look like the following:



2. Double-click on STOPS-Setup. If a security warning appears, select "Run". A command shell (window) will appear asking if you have a 64-bit operating system. Most users should answer "Y" or "y" and the "Enter" key to select the 64-bit version of STOPS. After confirming that it is OK to continue with a "Y" or "y" and then "Enter", STOPS will complete the installation process.



3. After successful implementation of STOPS, the application directory will look similar to the following folder:

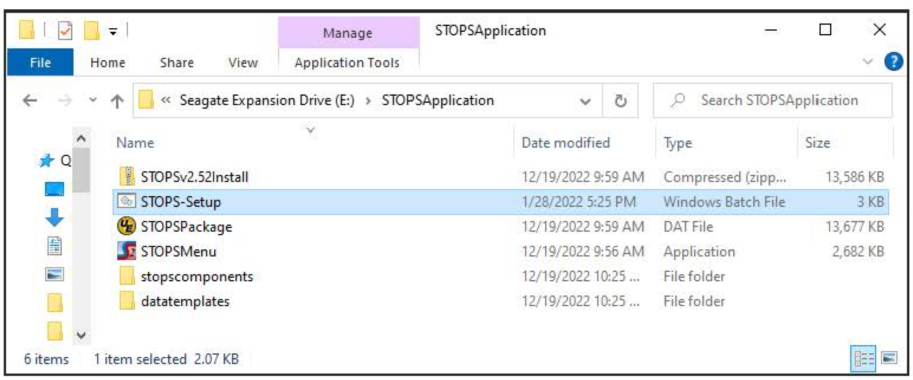


Figure 8. STOPS Program Setup Process

A zip file (KC_example252.zip) containing sample data is available on the FTA STOPS website. This zip file includes all of the information necessary to represent a real project in Kansas City, Missouri. This folder can be unzipped to a location on the user's computer (e.g., e:\STOPSRun\KC) and run to test the implementation of STOPS. The examples in this documentation are mostly based on the results of this project so the reader can run this sample set to generate many of the examples on a local computer.

3.2 Specifying Automatic GIS Linkage

After the STOPS software is installed on the computer it can be opened by double clicking on the STOPSMenu application (or the shortcut). The first time that STOPS is used after installation, the screen shown in Figure 9 appears.

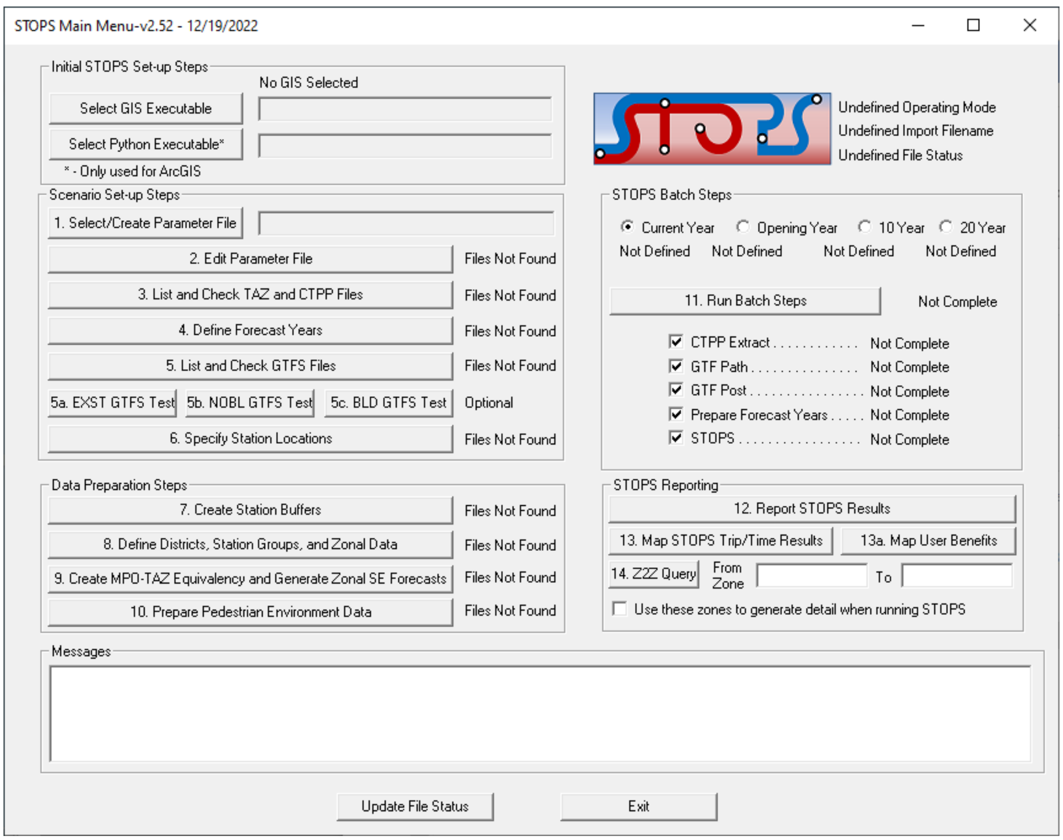


Figure 9. STOPS Main Menu When Opened the First Time

The message "No GIS Selected" appears at the top of the dialog box to remind the user that the automatic GIS linkage has not yet been defined. Until this is updated, that means that STOPS will prompt the user to manually edit station and district shape files.

To define an automatic GIS linkage, the user can click on the button "Select GIS Executable". When this is done, the standard Windows file selection box appears as shown in Figure 10.

Use the file selection dialog to identify the location of one of the two files shown below:

- TransCAD executable – TCW.exe (typically located at C:\Program files (x86)\TransCAD\tcw.exe); or
- ArcMap executable – ArcMap.exe (typically located at C:\Program files (x86)\ArcGIS10.4\bin\ArcMap.exe))
- ArcGIS Pro executable – ArcGISPro.exe (typically located at C:\Program Files\ArcGIS\Pro\Bin

After the GIS executable is selected, the message at the top of the dialog changes to indicate that STOPS has been properly associated with one of the recognized GIS packages. Figure 11 shows the appearance of the Main Menu after STOPS is successfully associated with the TransCAD GIS package.

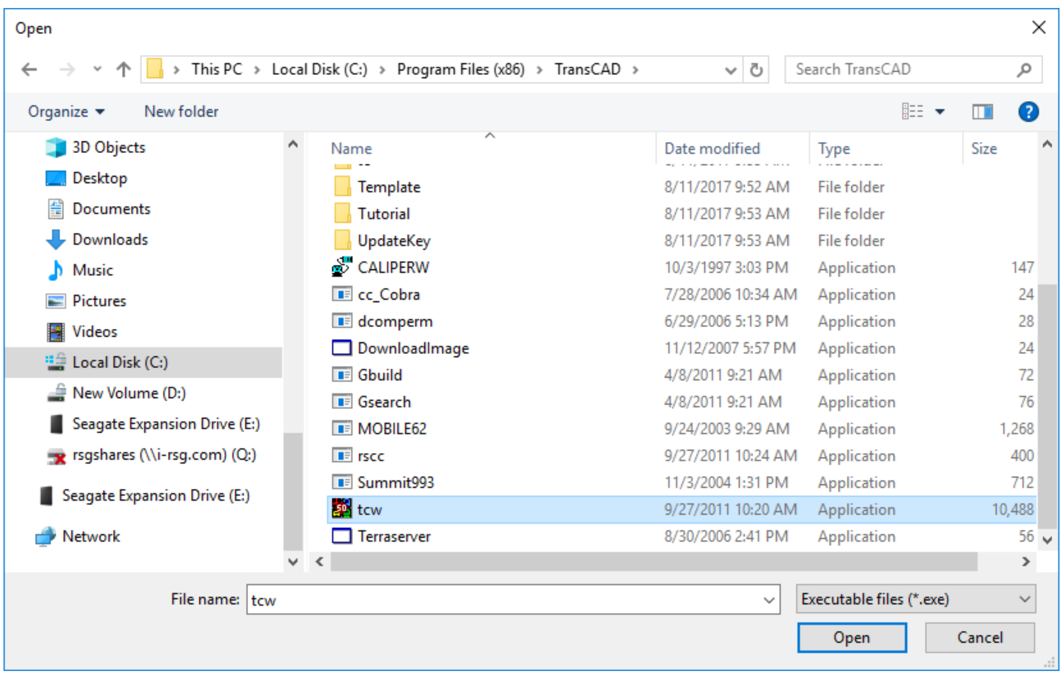


Figure 10. STOPS Dialog to Select GIS Executable

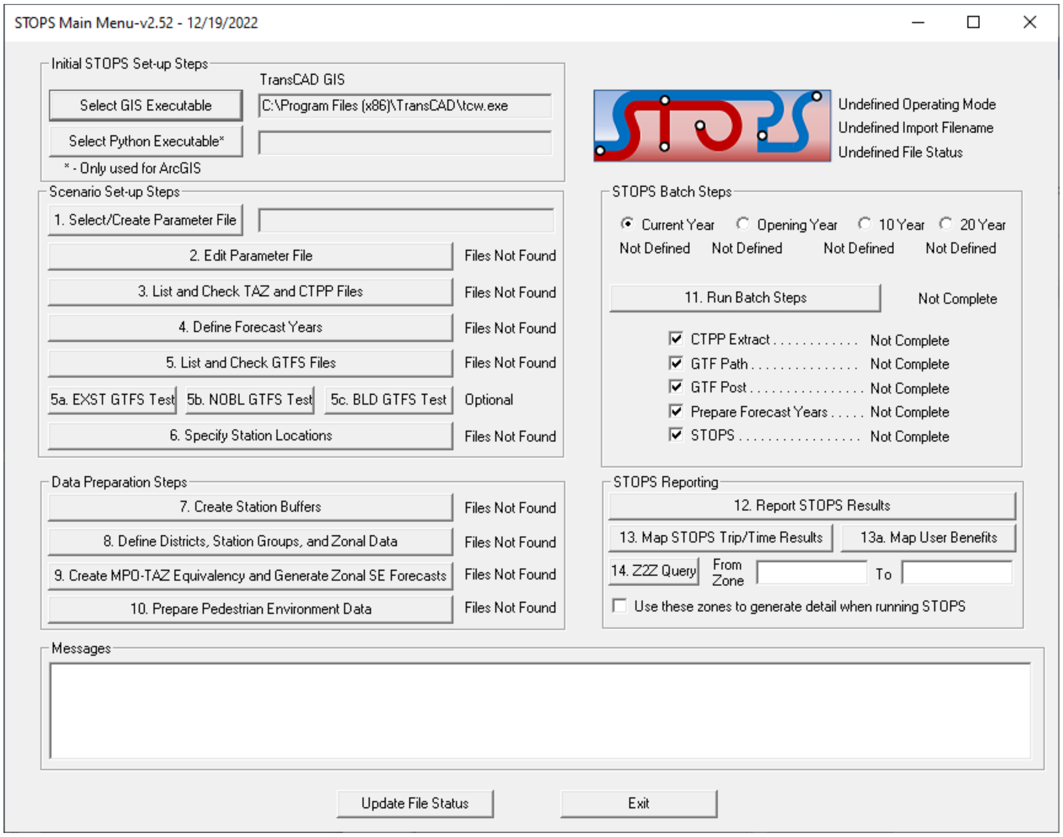
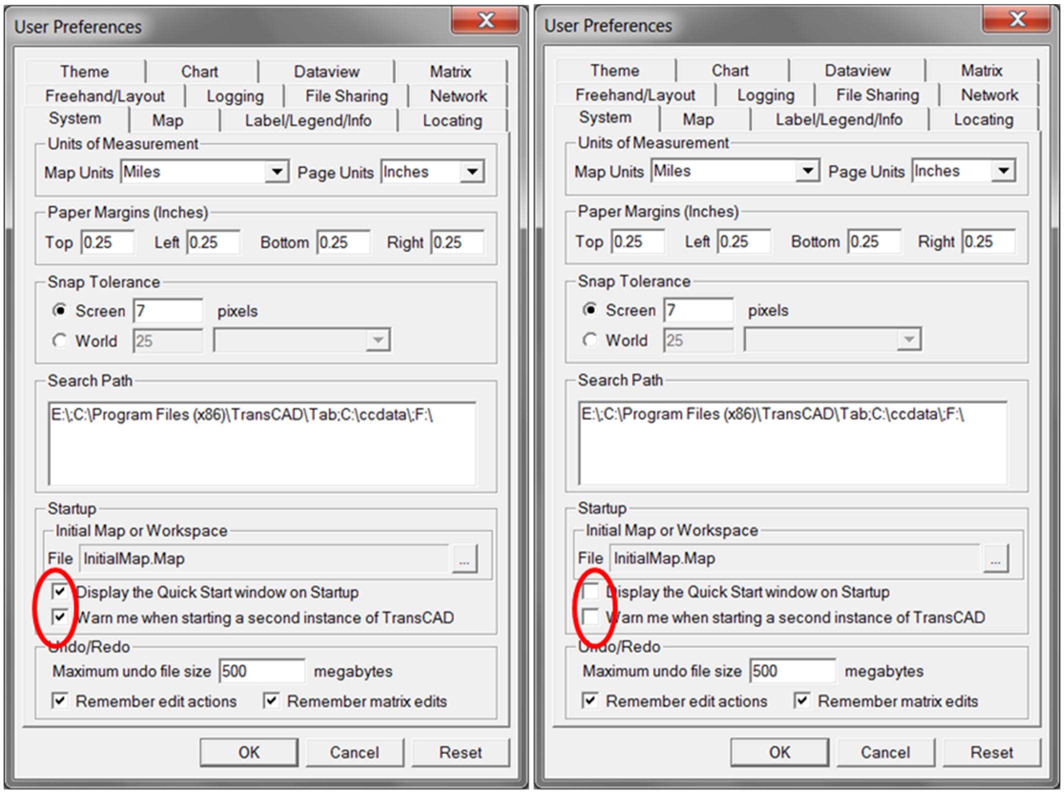


Figure 11. STOPS Main Menu After Selection of TransCAD GIS

Before TransCAD can be used in STOPS, it must be configured to allow it to open without using the quick start window and without warning the user if there is a second instance of TransCAD running. This is done by opening TransCAD and selecting the Edit > Preferences menu option. Unclick the start up and second instance warning options as shown in Figure 12.



Before After

Figure 12. Setting TransCAD Quick Start and Second Instance Warning Options

If the user selects ArcMap, then the python executable file should also be defined. This program is named pythonw.exe and is typically installed at c:\python27\ArcGIS10.4\. When ArcMap is selected the appearance of the main menu is shown in Figure 13.

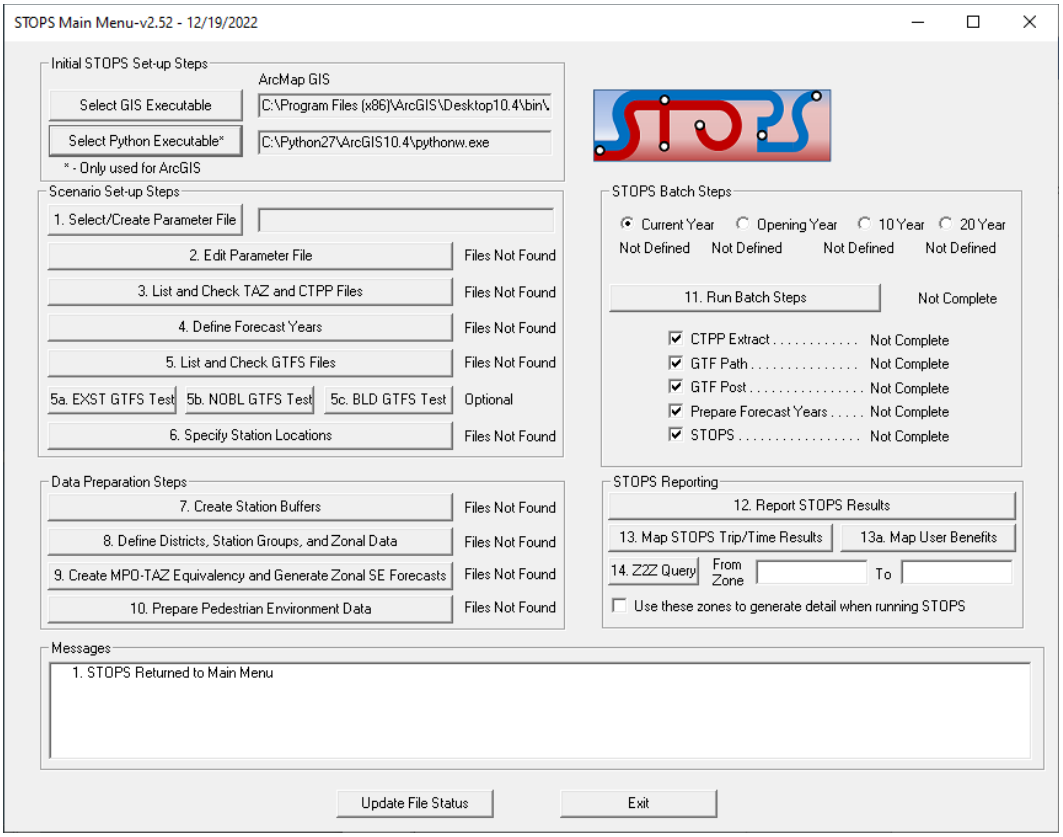


Figure 13. STOPS Main Menu After Selection of ArcMap GIS

Similarly, if the user selects ArcGIS Pro, then the ArcGIS Pro/python environment batch file should be defined. This file is names propy.bat and is typically installed at c:\Program Files\ArcGIS\Pro\bin\Python\Scripts\. When ArcGIS Pro is selected, the appearance of the main menu is shown in Figure 14. STOPS Main Menu After Selection of ArcGIS ProFigure 14.

Please note that the ArcGISPro interface is slightly different from the ArcMap interface. Two key differences are:

1. The interface brings up an initial screen of instructions that guide the user to open up a map for viewing STOPS information. A typical initial instruction screen is shown in Figure 15.
2. ArcGIS Pro will ask the user if they want to save their edits if they leave the editing screen or close the ArcGIS Pro program. Be sure to answer "Yes" unless you want to revert back to the original data values.

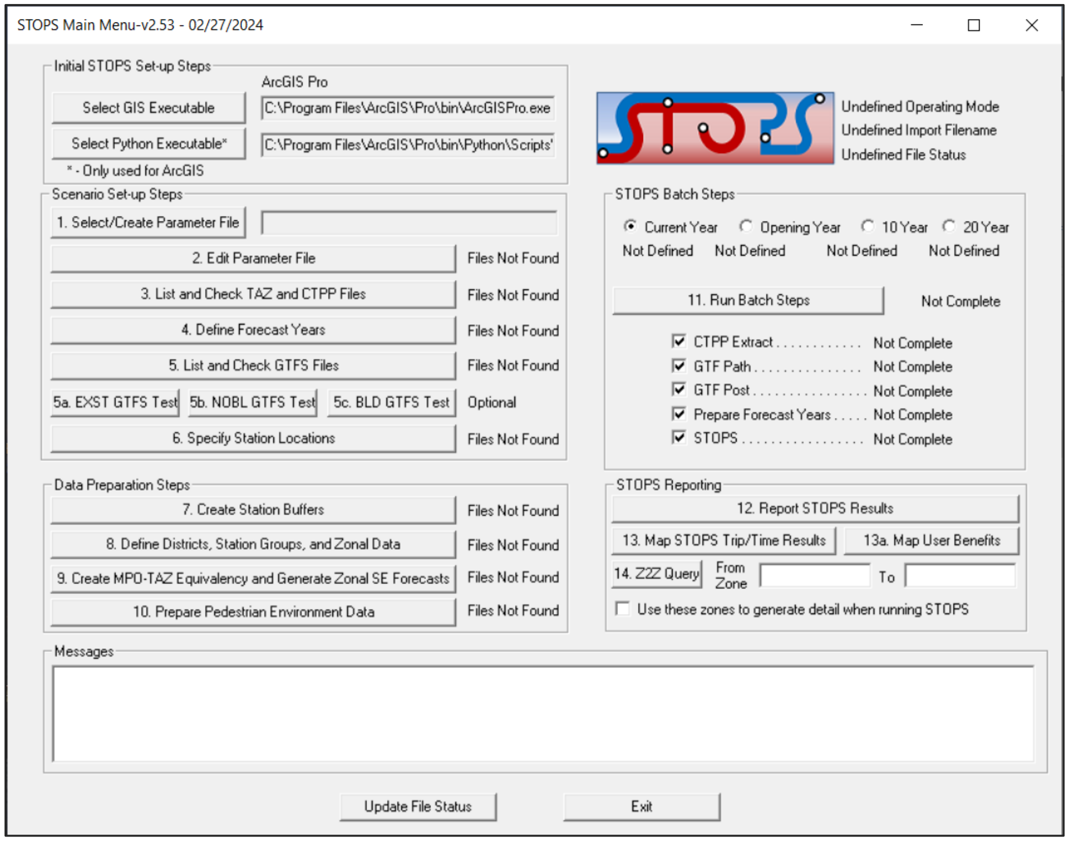


Figure 14. STOPS Main Menu After Selection of ArcGIS Pro

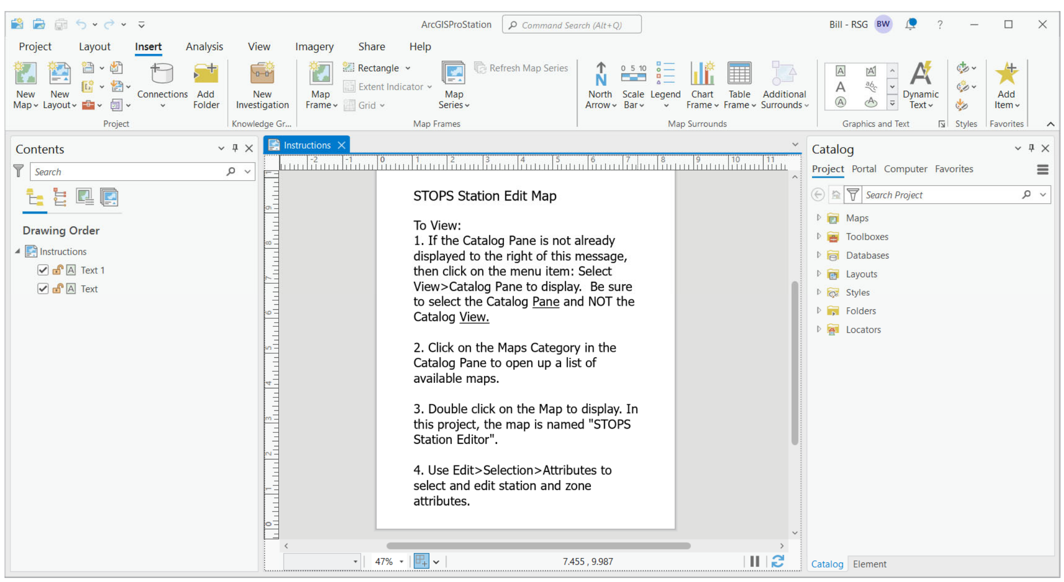


Figure 15. ArcGIS Pro Instruction Screen

For all three GIS packages, the user interface sets up the environment for the user to edit and display various data files. When editing is complete, the user must terminate the GIS using a menu command or clicking on the red "X" at the upper right hand corner of the screen. In some cases, the GIS program will ask if it is OK to save the map (See Figure 16 for an example from TransCAD) or project (in the case of ArcGIS Pro. The user should click "No" to this question since STOPS regenerates this the map/project each time it is needed. In the case of ArcGIS Pro, be sure to carefully consider the difference between the question about saving your edits (generally answer "Yes", unless you want to revert to the earlier data) and saving the changes to the ArcGIS project (answer "No").

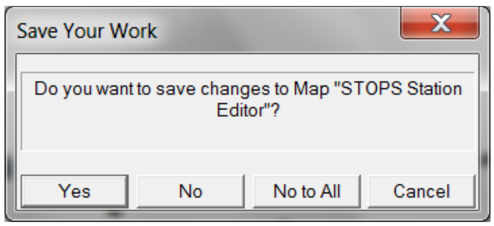


Figure 16. Click "No" in TransCAD Map Save Configuration Dialog

As noted above, the Although the map, itself does not need to be saved, some GIS packages including ArcGIS Pro may ask you if you want to save your edits. You should answer this question with a "Yes" if you intend for your changes to the database to be saved for later use.

4.0 Introduction to Kansas City Forecasting Example

The remainder of this document will illustrate the STOPS setup, calibration, and results for a forecasting scenario set in Kansas City, Missouri. It is derived from project plans for a new BRT system along Prospect Avenue to be known as the Prospect Max. The new service was coded by FTA staff using project definitions as they existed in 2017. These plans were prepared after the formal project approval by FTA and, accordingly, are not the same as the official forecasts for the project. They are also not the same as the infrastructure or service plans actually implemented for the project. As such, all input data and results presented in this document are provided to illustrate the use of the STOPS program and interpretation of its results. They should not be used to evaluate the performance of the Prospect Max Project.

The BRT project is depicted on the map provided in Figure 17. The southern terminus of the BRT system is located on Prospect Avenue at 75th Street (i.e., the Prospect Transit Center). The BRT service travels north on Prospect Avenue and then west on 12th Street to its northern terminus in downtown Kansas City. The Prospect BRT largely replaces some of the existing local bus service on Prospect Avenue (i.e., the #71 Prospect).

The BRT project includes the purchase of 12 40-foot, low-floor compressed natural gas buses with special BRT design and branding. It also includes road work; transit signal priority and queue-jumps; intersection and sidewalk improvements; construction of 30 park and ride spaces; and communications and fare collection systems. Key characteristics of the BRT service plan and the #71 Prospect Local Bus are presented in Table 7. Service characteristics are provided for:

- Existing/No-Build as it existed in 2017
- Prospect BRT Project other Kansas City bus service as envisioned in 2017 and coded by FTA technical staff for this example
- Prospect BRT and other Kansas City bus service as actually operated in December 2019

As both the map and the service characteristic table show, the 2017 plan had fewer BRT stations and more local service than the 2019 service that was actually implemented. This change appears to reduce the cases in which travelers began or ended their trips some distance away from the project and would be dependent on the local bus service. As results of the modeling show (presented later in this document), this outcome leads to greater use of the BRT and a larger number of new transit riders.

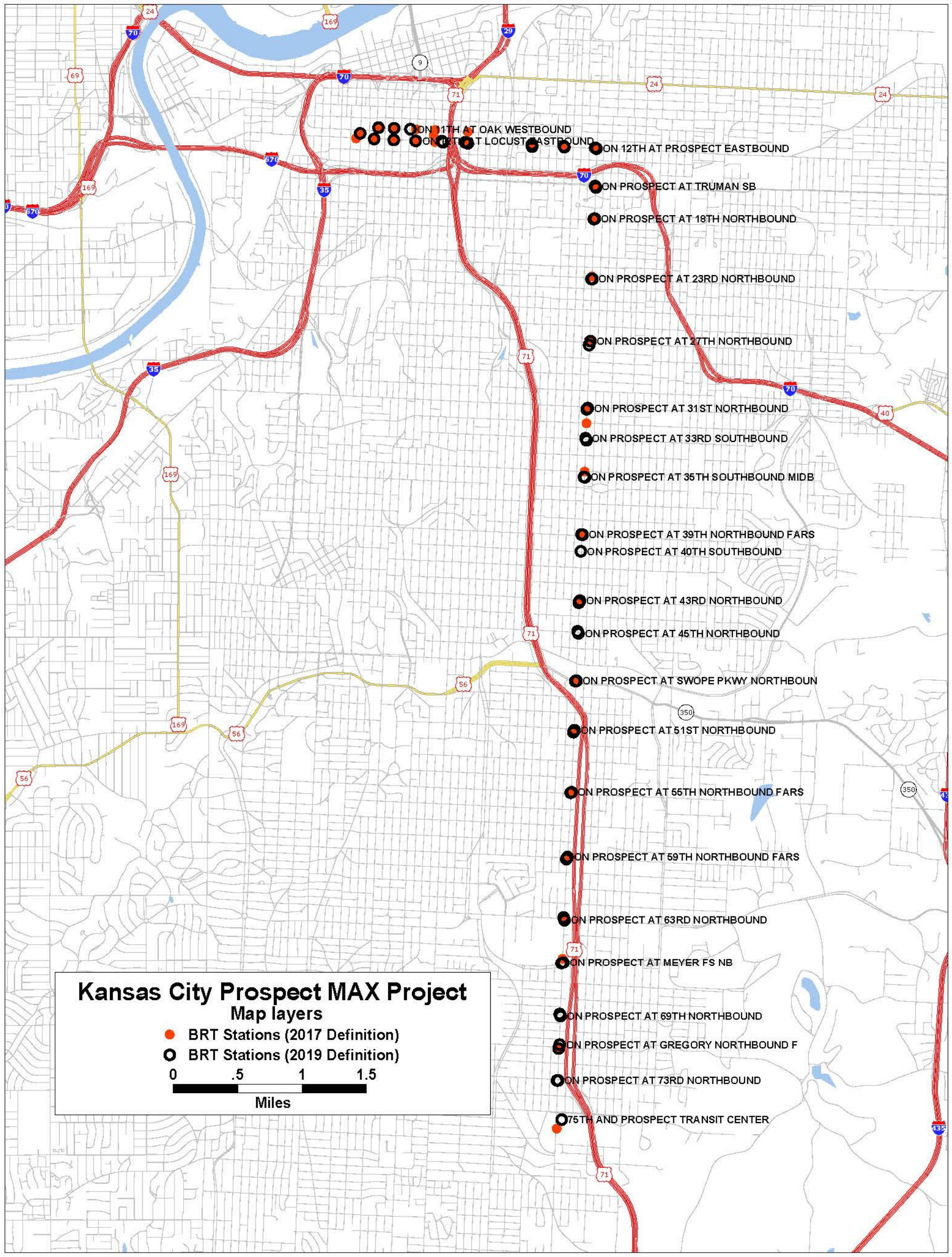


Figure 17. Prospect MAX Station Definitions

Table 7. Characteristics of Kansas City Example BRT and Local Service

Statistic	2017 No-Build Service	2017 Plan as Coded by FTA	2019 Schedule As Actually Operated
Number of BRT Stations		26 NB 26 SB	29NB 30SB
BRT AM Peak Travel Time 75th/Prospect to Wyandotte/11th-12th		40 min NB 38 min SB	44 min NB 41 Min SB
BRT Headway		10 min peak 10 min off-peak	10 min peak 10 min off-peak

71 Prospect (75th/Prospect-Downtown)	#Stops=74-76
	HW=11
	TrvTime=44-46
		#Stops=74
		HW=30
		TrvTime=42
			#Stops=62
			HW=60
			TrvTime=44

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5.0 SCENARIO SET-UP STEPS

STOPS develops predictions of transit fixed guideway ridership based on the experiences of a wide variety of rapid transit, light rail transit, commuter rail, streetcar, and bus rapid transit systems built over the last 40 years in various cities across the United States. This experience is adapted to new settings according to:

- Trip-making characteristics in the corridor as represented in Census Transportation Planning Products (CTPP) Journey-to-Work (JTW) data sets from the 2006-2010 or 2012-2016 American Community Survey or from the Year 2000 Census long form.
- Information on the density of the street grid conveyed by Census Block definitions.
- Forecasted changes in population and employment from the census year[8] to the current year and future forecast years that are prepared by local Metropolitan Planning Organizations (MPOs). MPO data are also used to characterize travel times on the regional highway system.
- Characteristics of the transit system as represented by automated schedule data and supplemental information on station characteristics, park-and-ride locations, and existing ridership.

Each source of data must be understood and, in many cases, prepared for use by STOPS. This chapter describes the various input data and the steps that must be taken to set-up a STOPS scenario and generate forecasts of transit ridership.

At this stage in the process, the user needs to organize the analysis, collect data from FTA's STOPS webpage and/or FTA staff, obtain data on highway travel times and socioeconomic forecasts from the regional MPO, collect existing schedule data in GTFS format, and prepare information related to the transit project to be studied. In some cases (station locations and district definitions), STOPS, itself, is used to prepare input data. Other data (CTPP and Census Data) are downloaded and used "as-is." In other cases (GTFS scenario definitions), the user must create the input data using a text editor or a specialized GTFS editor such as GTFSed.

Before the user begins, several key decisions must be made based on the availability of Census data and local information that will streamline the process of setting up a STOPS run. These decisions include:

- **What is the geographic scope?** STOPS reads a user-developed station file[9] and processes all CTPP zones within 25 straight-line miles of any coded station or bus stop unless user-defined exceptions are coded. In general, the station file should have one record for each station or bus stop in the region and the model

[8] Year 2012-2016, 2006-2010 or 2000, depending on which CTPP file is selected.
[9] The STOPS station file can also include bus stops to represent all locations where travelers can board and alight from transit.

will encompass the entire metropolitan area. In most parts of the country, this is the simplest approach and fits within the STOPS capacity of 9,000 zones and 70,000 transit stops. In some areas (e.g., the Northeastern United States) metropolitan areas are interconnected into mega-regions which exceed the STOPS zone or transit stop limits. In these cases, the user must define a more limited geographic scope by coding a special value in the Census geography files[10].

- **What States and MPO regions are included in the project corridor?** CTPP data are organized around states and/or MPO regions so the next step is to identify the states and MPO regions that are included in the modeled geographic region. In most cases, states and regions are obvious and this task is quite simple. If not, a state layer can be added to the GIS view showing stations and all states within 25 miles of a station or stop can be identified. MPO coverage can be determined by identifying the counties that are included in the buffer area and comparing this list to the MPO counties provided in Section 15.3.
- **What CTPP version and geography type will be used in the analysis?** STOPS supports the following CTPP versions and geography types[11]:
    - 2012-2016 CTPP from the American Community Survey (A2)
    - 2006-2010 CTPP from the American Community Survey (AC)
    - 2000 CTPP from the Year 2000 Census Long Form:
        1. Census Traffic Analysis Zones (TZ)
        2. Census Block Groups (BG)
        3. Census Tracts (TR) as the units of geographic analysis.
- **What years will be modeled?** STOPS allows the user to define up to four different application years.
    - The current year is used in the local calibration element of the model and may also be used for forecasting. The current year must be supported with information on zonal population and employment and optional information on regional transit boardings, regional linked transit trips, and fixed guideway station boarding counts.
    - Optional forecast years include: opening year, 10-year, and 20-year forecasts and (if defined) require just population and employment data for each MPO zone in the modeling area.

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[10] See the end of Section 5.3 (Optional Adjustments to the Census Data) for more information on how to limit the geographic scope of the analysis by using "XX" or "YY" in the LSAD field.

[11] Note that only one type of geography can be used in each scenario or model run. The ACS (type A2 or AC) are the most recent and have a consistent geography across the United States. In some cases, the smaller sample size of the ACS may be problematic. In areas with relatively modest growth, the greater sample associated with the Year 2000 Census may result in a stronger model. In the Year 2000 CTPP, Census Traffic Analysis Zones or Block Groups are the most detailed options but can only be used for situations where the entire corridor lies within a single MPO region and the Census Bureau collected information at the TZ or BG (either one but not both) level throughout the corridor. A county-by-county listing of MPO areas and geography types appears in Section 15.3. If all of these conditions are met, then users of the 2000 CTPP can select Census 2000 TZ or BG as the geography type. Otherwise, users of the 2000 CTPP must select TR as the geography type.

- **What are the definitions of the existing, no-build, and build scenarios?** STOPS expects the user to define 3 distinct transportation scenarios[12]:

  - **Existing scenario (EXST).** The "EXST" scenario represents the existing transit system and is used with current year socioeconomic data to calibrate the local application of STOPS to observed current year ridership. The resulting calibration parameters are applied to all other scenarios.
  - **No-build scenario (NOBL).** The no-build scenario represents the future year network that is to be used for any statistic requiring information on incremental impacts of the project as compared to what would happen if the project were not built. Incremental statistics include changes in linked transit trips or vehicle miles of travel. The no-build scenario includes the existing system together with relevant transit elements that are already committed for construction and operation.
  - **Build scenario (BLD-).** The build scenario represents conditions after the project is constructed and in operation.

- **How is automated schedule data structured in the corridor?** STOPS uses data organized in General Transit Feed Specification (GTFS) format. Nearly every large transit agency in the United States has this data available and it is possible to convert manual schedule information into this format if GTFS files are not already available. In some cities with multiple transit operators, each transit operator creates its own separate GTFS files. STOPS allows the user to combine up to twenty independent datasets to make up a regional schedule. STOPS introduces two extensions to the specification to allow the user to code Park-and-Ride (PNR) locations and to introduce simple changes to the GTFS files to represent new services.

STOPS uses a predefined directory structure that is shown in Table 8. The STOPS project root directory can have any legal Windows name and can be a subdirectory to the drive's root directory or a subdirectory of any other folder. At the beginning of a run, the STOPS directory will only have one file, a parameter file, and a series of subdirectories. Both the parameter file and the directory structure are created by the STOPS program and no manual steps are required. The user may also copy data from another folder to serve as the starting point for a new run. If this is done, the user needs only to copy the inputs\ subdirectory and the parameter file. STOPS will add the required additional directories.

[12] STOPS requires information on the service plan, station locations and station characteristics for each transportation scenario. STOPS can, however, accept the same files for each alternative if, for example, the EXST and NOBL scenarios are identical.

Table 8. STOPS Directory Structure

Directory	Example	Contents
STOPS project root	e:\STOPSRun\KC\	Parameter (control) file
Inputs	e:\STOPSRun\KC\Inputs\	Input data.
Logfiles	e:\STOPSRun\KC\Logfiles\	STOPS program logfiles that determine the completion status of each step.
GTFS subdirectories of Inputs that contain information for a particular agency and/or scenario	e:\STOPSRun\KC\Inputs\[Dir 1]\ e:\STOPSRun\KC\Inputs\[Dir 2]\ e:\STOPSRun\KC\Inputs\[Dir 3]\ Etc.	GTFS schedule data for agency and scenario defined by Directory 1, Directory 2, Directory 3, etc. Note these directories are not created by STOPS; They are created by the user when a new GTFS file set is created for each agency and/or scenario. [Dir 1], [Dir 2], [Dir 3], etc., can be any user-defined Windows-supported subdirectory name.
Districts	e:\STOPSRun\KC\Districts\	District definition
Scratch	e:\STOPSRun\KC\Scratch\	Temporary working files that can be deleted by the user after each STOPS run is complete and checked.

The directory name is not strictly limited in length. However, the user should note that Windows may limit the length of file names (drive, directory, name, and extension) to 255 characters and many STOPS displays are not wide enough to display very long filenames. STOPS maximum suggested filename lengths are as follows:

- Maximum length of the control file name (including drive letter, colon, directory names, backslashes, filename, and extension) is 80 characters and fewer than 40 characters are recommended.
- Maximum length of individual GTFS subdirectory names (excluding the root directory or “inputs\”) is 20 characters and fewer than 10 characters

are preferred. If more than 4 GTFS file sets are used, then even shorter directory names (i.e., 2-character codes) may be required.

STOPS periodically tests the lengths of key file names to confirm that the directory names will not generate file name lengths that are too long. Nevertheless, the user should keep file name lengths under these guidelines to minimize the chance of problems in later steps.

5.1 Select or Create a Parameter File for a STOPS Run

The STOPS menu screen (after the GIS software is selected) looks like the example shown in Figure 18. Each aspect of a STOPS run is labeled as "Files Not Found" or "Not Complete" at the beginning of a run. Each item on the left side of the menu (Set-up and Data Preparation Steps) will switch to "FILES FOUND!" when STOPS detects that the necessary files have been properly assembled.

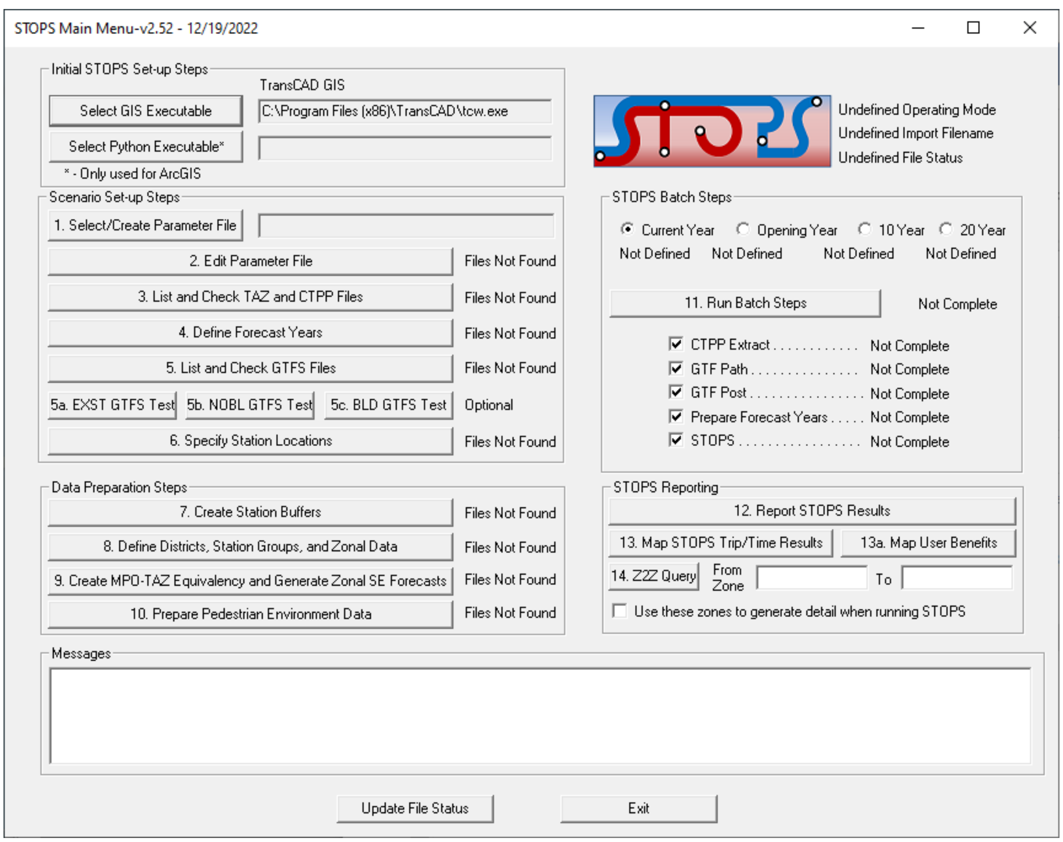


Figure 18. Initial STOPS Menu

Please note that in some cases a "FILES FOUND!" status label does not necessarily mean that the file is ready for use. In many cases a user might defer data entry for one or more elements of a data file (e.g., GTFS file parameters before the GTFS files have been constructed). STOPS does not know if the various files have been fully populated with accurate data, only that the files appear to be complete and suitable for running STOPS. The user is responsible for completing data entry for files that are only partly populated.

On the right side of the main menu (Batch Steps), the label switches to "COMPLETE!" to indicate that the batch step successfully ran to completion and generated the necessary information to proceed to the next step.

To create or select an existing parameter file (also known as a "control" file) that will control a STOPS model run, click on "1. Select/Create Parameter File". This will open a standard windows dialog for selecting a file (see Figure 19). If the parameter file has been previously created, use the dialog to select the directory and filename containing the parameter file.

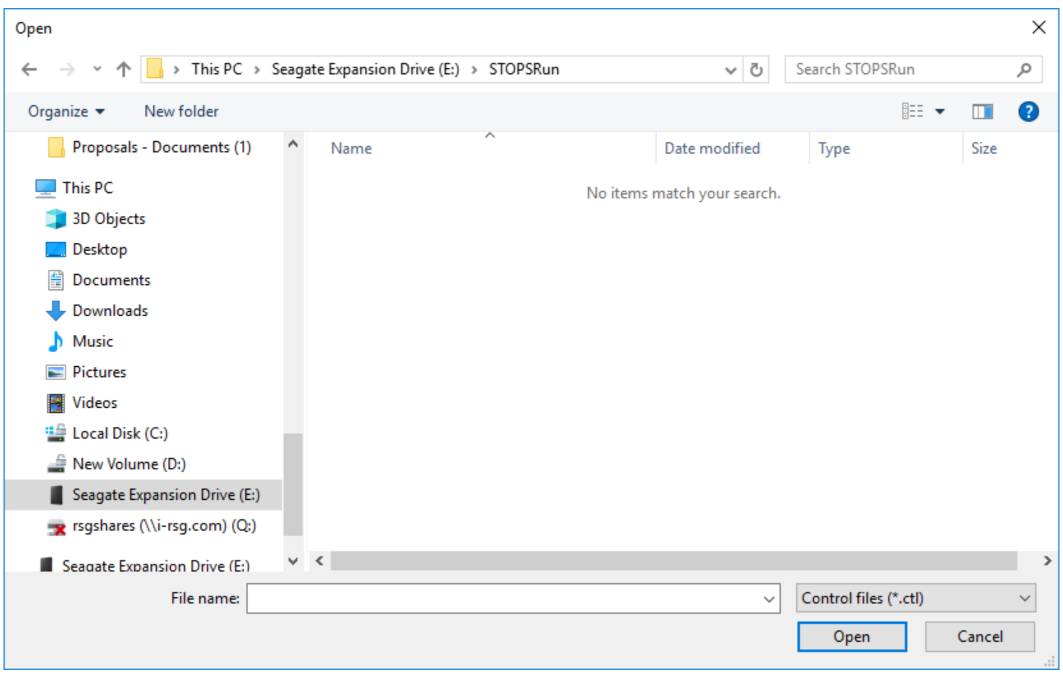


Figure 19. Standard Windows File Selection Dialog Used in STOPS

If this is the first time that you are using STOPS or if you are starting a new project, this dialog can be used to create a new folder (using the "New Folder" Button, see Figure 20) where the project will reside. Please note that just like all Windows applications, the "New Folder" Button creates the new folder at the location that is highlighted in the body of the dialog so the user should first point to the main folder where the project should reside (e.g., e:\STOPSRun in this example) before pressing the "New Folder" button. The user should rename the folder to describe the project ("KC" in the example for "Kansas City"). Double click on the new folder to open it and then type the name of the desired parameter filename in the line labeled "File name:". It is not necessary to enter the file extension (".ctl"), just the name is required (ProspectBRT in the example). If this is a new file, then STOPS will ask you to confirm that you want to create a new parameter file. Click "Yes" to proceed or "No" to select another filename.

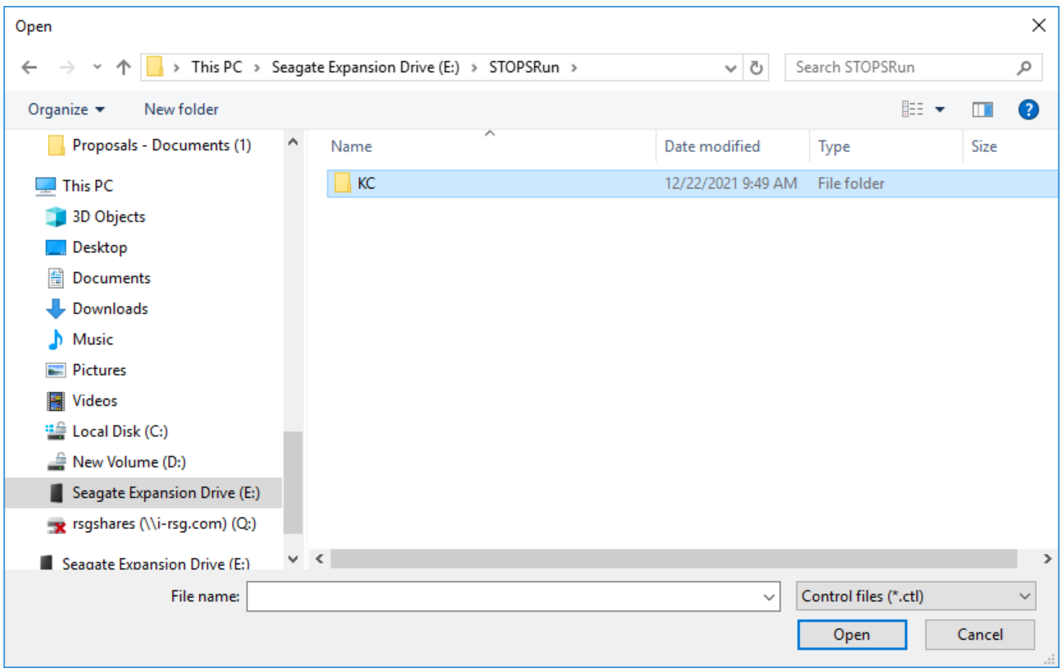
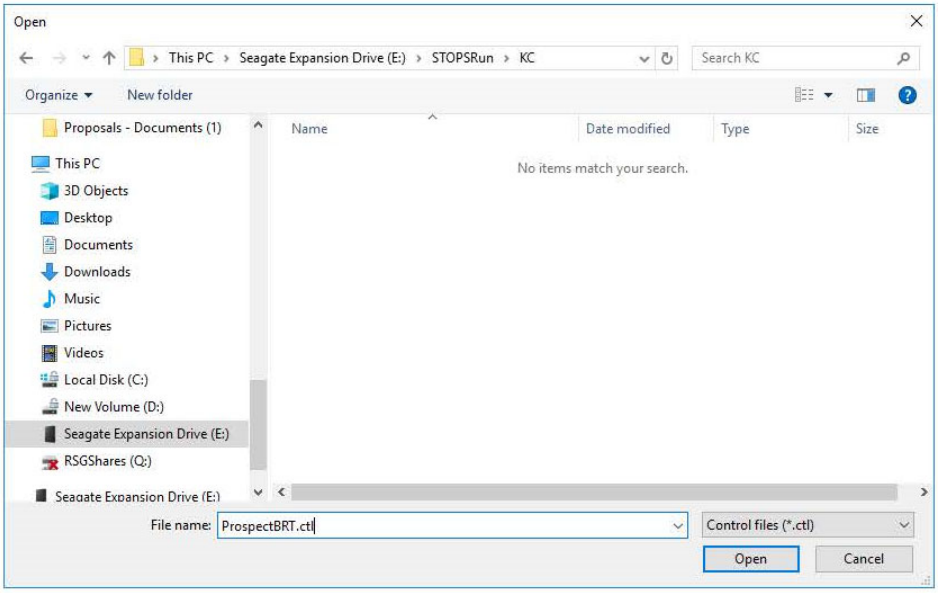


Figure 20. Creating a New Folder and Folder Name

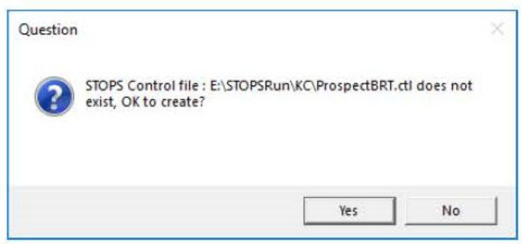
If "Yes" is clicked, STOPS will ask the user if the new scenario should be created by copying another scenario. If "Yes" is clicked in response to this question, then a dialog will open that asks the user to select the control filename of the scenario to be copied. If "No" is clicked, then STOPS will create a blank scenario. This dialog is illustrated in Figure 21.

This action will result in STOPS creating the STOPS sub-directory structure that will provide a home for the STOPS input and output data files. All directories are created except those which relate to individual GTFS file sets which are manually created by the user as those files are prepared.

1. Specify the control file name



2. If the control file does not already exist, STOPS will confirm that it should create a new file.



3. If a new file is to be created, STOPS can copy and existing model set or create a new file from scratch.

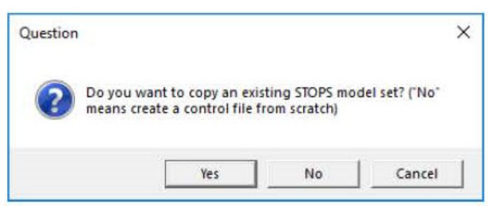


Figure 21. Creating a New Parameter file

5.2 Edit the STOPS Parameter File

In this step, the user opens the STOPS parameter file and enters the information that controls the operation of STOPS. This step begins by clicking on "2. Edit Parameter File" in the main menu. This action opens the parameter file dialog shown in Figure 22. As this figure shows, the dialog is mostly blank except for fields that have STOPS default values.

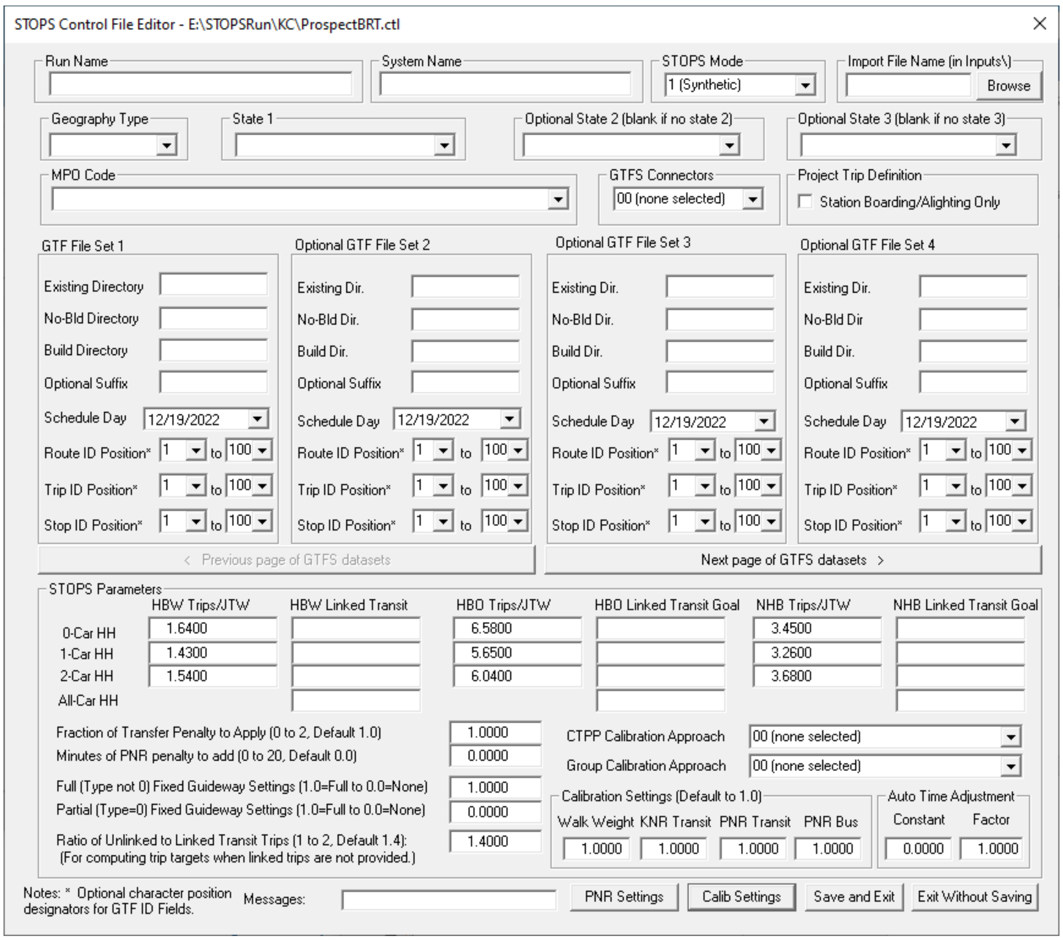


Figure 22. Edit Parameter Dialog for New Control File

Information entered into this screen includes:

- **Run Name.** A descriptive label that is included in the header of the STOPS report to help identify the model run. This parameter has no effect on STOPS processing or forecast results.
- **System Name.** A descriptive label that is included in the header of the STOPS report to help identify the transit system that is being

represented. This parameter has no effect on STOPS processing or forecast results.

- **STOPS Mode.** This parameter controls the type of model that STOPS uses to forecast transit ridership the options are:
  - 1 (Synthetic). This is the default mode and means that STOPS generates estimates of transit ridership from travel patterns contained in the CTPP, transit service characteristics from transit schedules, and transit usage obtained from count databases. This form of the model is most similar to conventional ridership forecasting procedures.
  - 2 (Special Markets). This mode is similar to the Synthetic Mode but adds travel demand estimates for special markets that are not well-represented by the CTPP JTW flows. Example special markets include air passengers and university students. When this option is selected, the user should also specify the Import File Name in the next block. The input data and processing associated with the Special Markets version of the model is described in Section 12.3.
  - 3 (Incremental). In this mode, the user provides an import file containing transit trip table information (and optionally, person travel information). STOPS uses this information to develop person trips and transit trips that closely match the input transit trips for the existing scenario. Forecasts for different years and transit scenarios represent the impact that incremental changes in population, employment, and transit levels-of-service have on transit ridership. The input data and processing associated with the incremental version of STOPS is described in Section 12.3.
  - 4 (Type 2 Special Markets). This mode is a variation of Mode 2 (Special Markets). The difference relates to the circumstances in which CTPP JTW flows or special market flows are used. In each case, TAZs which are included in the special market data base are identified with a "$" in the TAZ name. The difference occurs in cases where a trip travels between a special zone and a regular zone. If "2 (Special Markets)" is selected, then trips between a special and non-special zone must be included in the special markets trip database. If "4 (Type 2 Special Markets" is selected then trips between a special zone and a regular zone are developed from CTPP data. The former approach is most applicable in cases where a special market survey was conducted covering all origin locations traveling to or from the special activity center (e.g., an airport or university coded with a "$" in the TAZ name). The latter approach is applicable when a transit Origin-Destination survey was conducted in a portion of the region but the modeling area needs to be larger to

cover the project service area. In this case, TAZs in the transit survey area are coded with a "$" in the TAZ name and TAZs outside of the survey area are coded with a "~" (i.e., not "$") in the TAZ name. The input data and processing associated with this variation of Special Markets is described in Section 12.3.

- **Import File Name.** If STOPS mode 2, 3, or 4 (special markets, incremental, or Type 2 Special Markets) are selected, an import file name must be specified to indicate where the special market or transit trip tables are found. More about the nature of this file is presented in Chapter 12.0.

- **Geography Type.** The geography type options are:
  - A2 – Year 2012-2016 American Community Survey Zones
  - AC – Year 2006-2010 American Community Survey Zones
  - BG – Year 2000 Census Block Groups
  - TR – Year 2000 Census Tracts
  - TZ – Year 2000 Census CTTP Traffic Analysis Zones

- **States.** Up to three states that define the market area for the metropolitan transit system.
-
- **MPO Code.** Select the MPO code that corresponds to the main MPO covering the modeling area.

- **GTFS connectors.** This drop-down box determines how access connectors are built in the path-building steps. The default 00 (none selected) or 01 (default) uses the original STOPS approach of building all connectors according to straight-line distances. Option 02 reads a user-provided street file (described in Section 5.3, Walk Shape File) to generate walk connectors. Option 03 uses MPO skims to develop a better estimate of Kiss-and-Ride and Park-and-Ride travel times. Option 04 combines Options 02 and 03.

- **Project Trip Definition.** By default, STOPS assumes that any transit trip boarding, alighting, or traveling through a new station/stop constitutes a project rider. This approach is appropriate for the majority of transit projects and makes the assumption that even through passengers (e.g., on a BRT route) will benefit from the improved speed and reliability associated with a new section of fixed guideway. For some projects (e.g., an infill commuter rail station on an existing line), this assumption is not appropriate. In these cases, the project trip definition can be set to include new station boardings and alightings only. This change is made by clicking on the box labeled "Station Boarding/Alighting Only."

- **GTFS schedule files.** Up to 20 (4 per page) GTFS files that, together, describe the transit services available in the STOPS modeling area. Each column grouping is designed to represent a separate operator. The first three rows represent the GTFS file directory[13] for the existing, no-build, and build scenarios. Each grouping also shows information on:

  - **Suffix.** The suffix is an optional 1-character string that is used in the event that different GTFS files use duplicate stop, trip, or route IDs. STOPS adds an ampersand "&" and the character coded in the suffix end of these ID fields to create a unique identifier for each GTFS file and each stop, trip, or route.

  - **Schedule Day.** This field defines the exact day to use from the selected GTFS schedule.

  - **Route, Trips and Stop ID positions.** STOPS assumes that nearly all ID fields will be 25 characters or less[14]. If any of the GTFS IDs are longer than this limit, STOPS will truncate the ID to be 25 (including the &suffix) characters. This action may cause a duplicate ID error. The Route, Trips, and Stop ID position fields helps resolve the problem by providing the option to define a substring of the ID in which a unique 25-character ID is defined. For instance, if the Route positions are defined as 26 and 50, then STOPS will translate the route ID as follows:
    - Route ID in GTFS file: MetroTransitAuthorityRoute 17x
    - STOPS translation: 17X

[13] See Chapter 14.0 for a discussion of GTFS coding requirements. The GTFS standard uses different directories for each individual GTFS file set. For very large organizations such as the Metropolitan Transportation Authority in New York, separate directories may be used for each mode (e.g., subway, commuter rail, and bus) and each geographic area (e.g., each county or other subarea). In other cities, each independent agency will have its own GTFS dataset. At the opposite end of the spectrum, some areas have a single combined GTFS file set that includes all regional transit operators. The user is responsible for understanding how local agencies have structured their GTFS files and providing the relevant files to STOPS so that it has a comprehensive understanding of the entire regional transit system.
[14] If a suffix is specified, then the maximum ID length is 23 characters

  - **Previous and Next Page of GTFS datasets.** These buttons allow the user to scroll through the GTFS datasets in groups of four. STOPS allows users to code up to 20 GTFS file sets.

- **STOPS Parameters.** This block presents the following information:

  - **HBW, HBO, and NHB Trips/JTW by Auto Ownership.** These fields are pre-populated with STOPS defaults for the number of person trips by purpose that are generated for each Census Journey-to-Work record. These default values are based on analyses of the surveys used in the original STOPS calibration. If better local information exists, the user can enter these values on the parameter screen and STOPS will generate person trips according to this refined local information. Each time STOPS runs, it checks to see that each of these values lies within the range of 0.001 and 20. If not, then STOPS resets these trip rates back to the defaults shown in the example.

  - **HBW, HBO, and NHB Linked Transit Goals.** If a local survey is available, the user can code linked transit person trip targets by purpose or by auto ownership level for the calibration year. If this information is coded, STOPS calibrates the mode choice model for each purpose and auto ownership level to match these person-trip targets. If these values are not coded, STOPS generates its own estimate of transit linked trips based on the unlinked trip targets entered on the "Define Forecast Years" dialog. STOPS then proceeds with the calibration as above.

  - **Fraction of Transfer Penalty to Apply.** This parameter allows the user to specify how much of the nationally-calibrated boarding penalty to apply in the particular case being modeled. This value can range from 0 to 2 with a default of 1.0. When this parameter is 1, the full boarding penalty (5 minutes) is applied during path building. When the value is 0.5, only 50 percent of the penalty is applied. The first time that STOPS is run in a new area, this parameter should be set to 1.0. As initial runs are made, the modeled ratio of unlinked-to-linked trips should be compared to local information from surveys or farebox registers. The penalty should be increased if the unlinked-to-linked trip ratio is too high (i.e., too many transfers). The penalty should be decreased if this ratio is too low.

  - **Fixed Guideway Settings.** STOPS employs several mechanisms to represent the fact that fixed guideway systems can attract higher levels of ridership than would be predicted on the basis of its service characteristics alone. This higher level of ridership occurs because fixed guideway systems are often more visible to occasional travelers, may be more reliable, and may offer important amenities such as protection from the weather while waiting. Within STOPS, all of these factors are combined into a single parameter (the "setting," known in earlier versions of STOPS as the "visibility factor") that was calibrated using survey results from several cities across the United States. Two settings are available: one for full fixed guideway facilities such as LRT, commuter rail, and rail rapid transit, and a second for partial fixed guideway systems such as streetcars and some BRT lines. STOPS distinguishes partial fixed guideway systems from full fixed guideway systems based on the route_type field coded in the GTFS schedule files (in the file routes.txt). Partial fixed guideway systems are coded with route_type equal to zero. Full fixed guideway systems are coded with a route_type equal to 1, 2, 4, 5, 6, or 7. (The remaining route_type, 3, is used for bus routes, which are not considered by STOPS to be a fixed guideway mode. The value coded for the fixed guideway setting defines the proportion of the fixed guideway benefit to apply. In most regions, the following FG settings should be used:

- Full Fixed Guideway (most LRT, commuter rail and heavy rail systems): 1.0
- Partial Fixed Guideway:
  - If partial fixed guideway applies to BRT: 0.1
  - If partial fixed guideway applies to streetcar: 0.3
  - If partial fixed guideway applies to both BRT and streetcar, contact FTA staff for assistance.

In metropolitan areas with existing fixed guideway services, the Fixed Guideway settings above can be confirmed by:

1. Running STOPS with Group Calibration turned off (i.e., set the Group Calibration Approach to 0 as described below).
2. Comparing modeled fixed guideway ridership to counted fixed guideway ridership.
3. Confirming that any mismatches are not the result of large zones, data errors, or other modeling problems.
4. Adjusting fixed guideway settings to improve the correspondence between modeled and actual ridership[15].

[15] Note that the recommended fixed guideway settings have worked well in forecasting BRT, streetcar and LRT ridership in a wide range of situations. Adjustments to the default values will be closely reviewed during FTA project reviews to confirm that higher values are truly warranted rather than being a means to correct to some other problem in the STOPS application.

- **Ratio of Unlinked to Linked Transit Trips.** This parameter controls how STOPS estimates the regional linked transit trip targets if the purpose- and auto ownership-specific linked transit trips described above are not entered. This ratio must be between the values of 1.0 and 2.0 and defaults to 1.4. If linked trip targets are not specified for each purpose, then the regional number of unlinked transit trips (entered in Step 4) are divided by this ratio to generate an estimate of linked trips as part of the mode choice model calibration process in the STOPS phase of Step 11.

- **CTPP Calibration Approach.** By default, STOPS calibrates itself to match district-level transit shares from the CTPP for each attraction district. The default calibration approach does not force STOPS to match production district shares since this might unrealistically constrain STOPS in rapidly growing regions where the nature of outlying (typically more residential) areas change rapidly. Many projects, however, are in more stable areas where the nature of travel is less likely to change (except in response to the project, itself). In such cases, this field allows the user to select option 2 – Production and Attraction calibration. Otherwise, either option 0 (none selected) or option 1 (Attraction District Only) will cause STOPS to apply the default approach of calibrating to Attraction Districts only.

- **Group Calibration Approach.** STOPS has the option of reading station/stop- or route-level count data and using this information to refine the model calibration. This parameter allows the user to select the calibration approach. Options include:

  - **00 – None Selected <u>(Default and recommended for the initial STOPS run)</u>** this run does not do any group calibration.

  - **01 – No Group Calibration <u>(same as option 00)</u>**

  - **06 – Static Group Calibration <u>(Obsolete)</u>** Adjusts station group ridership outputs for each origin-destination pair in the Existing scenario and applies the same result to all scenarios based on origin and destination zone numbers.

  - **07 – District Ks-limited <u>(Obsolete)</u>** Adjusts mode choice production and attraction constants to match counts to maximum extent possible. Maximum and minimum adjustment constants are limited in scale.

- **08 – District Ks-full <u>(Obsolete)</u>** Adjusts mode choice production and attraction constants to match counts to maximum extent possible. Maximum and minimum adjustment constants are not limited in scale.

- **09 – Full Group Calibration <u>(Obsolete)</u>** Adjusts station group ridership outputs for each origin-destination pair in the Existing scenario and applies the same result to all scenarios based on station group usage.

- **10 – OD Adjustment <u>(Recommended after initial STOPS Run is complete in cases where full bus and fixed guideway stop/station count data are available)</u>** This option adjusts the person OD trip table based on a comparison of modeled and observed stop/station group ridership.

- **11 – OD Adjustment Route <u>(Recommended after initial STOPS Run is complete in cases where full bus and fixed guideway stop/station count data are NOT available)</u>** This option adjusts the person OD trip table based on a comparison of modeled and observed route-level ridership.

- **12 – OD Adjustment Route and Stop <u>(Recommended after initial STOPS Run is complete in cases where full bus and fixed guideway stop/station count data are available but route level ridership results still require adjustment)</u>** This option adjusts the person OD trip table based on a comparison of modeled and observed stop/station group ridership and route level ridership.

Note: As indicated above, the initial runs of STOPS that are precursors to the calibration process (i.e., "Pre-Calibration Runs") should disable count-based adjustment by selecting types "00" or "01". This prevents STOPS from adjusting all results to match counted values. Such an adjustment before calibration is complete can mask data errors or poor representation of traveler choices. Only after the calibration process is approaching completion, should types "10", "11", or "12" be enabled. Most of the example reports shown in Chapter 8.0 present results of the Initial / Pre-Calibration run and are similar

to the results that users would obtain when running the Kansas City example that is provided by FTA with STOPS. The process used to calibrate the Kansas City model to better represent the transit market in that region is described in Section 11.0.

- **Calibration Settings.** This section contains several adjustment parameters that define how important different components of time are to the path-finding and demand models. Each adjustment is designed as a factor between 0.0 and 2.0 (or 0.5 and 2 for some settings) that either turn up or turn down the importance of the time component to the traveler. In each case, a value of 1.0 is used to indicate that the default value of the underlying parameter should be used. The following parameters are defined:

  - **Walk Weight.** The walk weight setting is multiplied by 1.5 to generate the estimate of perceived impedance of each minute of walking as compared to time spent traveling in a transit vehicle. A walk weight setting of 1.0 (the default) results in walking being 1.5 times as onerous as riding in a bus. Setting this parameter of 0.67 means that each minute of walking is equivalent to 1.0 minutes of riding in a bus (i.e., 1.5 x 0.67). Setting this parameter to 2.0 means that each minute of walking is equivalent to 3.0 minutes of riding in a bus (i.e., 1.5 x 2.0). The resulting weight on walk time is used during both the path-finding and mode choice steps in STOPS.

  - **KNR Transit.** The KNR Transit Setting affects how much of the nationally-calibrated KNR constants are applied to KNR trips in the mode choice element of STOPS. The default for the KNR Transit Setting is 1.0 which uses the nationally-calibrated constants without adjustment. To increase KNR usage, set the KNR Transit Setting to a value greater than 1. The upper limit on this setting is 2.0, which multiplies the KNR constants by 0.25. This has the effect of reducing the absolute value of these negative constants and increasing transit KNR usage. The lower limit on this setting is 0.0, which multiples the KNR constants by 1.75. This has the effect of increasing the absolute value of these negative constants and decreasing KNR usage.

  - **PNR Density (This parameter is operational only when the more detailed PNR Settings, discussed below, are left unadjusted).** When the PNR settings developed for v2.51 are unspecified, then the PNR Density Factor scales the nationally-calibrated effect of employment density on PNR utilization up or down. This parameter affects the mode choice model only. If the PNR Density is set to 1.0, then the national-calibrated impact of density on PNR usage is applied with out modification. A value of 2 (the upper limit of this parameter) doubles the effect and a value of 0.5 (the lower limit) reduces the effect of density on PNR usage by 50 percent. Note that the PNR density applies to all types of PNR usage (i.e., fixed-guideway only, fixed-guideway and bus, and bus only).

- **PNR Bus.** The PNR Bus Penalty Setting scales the nationally-calibrated PNR-to-bus constants up or down. If a value of 1.0 is used, then the nationally-calibrated PNR-to-bus constants are used. When the PNR Bus setting is greater than zero, then the magnitude of the constants is increased. These constants are negative so the result is fewer PNR-to-bus trips. Conversely, a PNR Bus setting that is less than zero will increase PNR-to-bus trips. The PNR Bus Penalty Setting must be between 0 and 2.0.

- **Auto Time Adjustment.** This section contains an additive constant and a multiplicative factor that can be used to adjust the zone-to-zone automobile time from the MPO model to more accurately reflect observed congested highway travel times. The constant (“a”) and factor are (“b”) are typically estimated by comparing MPO and observed highway travel time and conducting a regression analysis to determine parameters that adjust the MPO times to minimize the difference. Adjusted highway times are estimated with the following equation:

  Adjusted_Highway_Time = a + b × MPO_Highway_Time

  Two parameters are defined:

  - **Auto Time Constant.** The Auto Time Constant is the additive portion of the adjustment (i.e., “a”). The Auto Time Constant defaults to 0.0 minutes (no adjustment) and must be in the range between -10.0 and +10.0 minutes).

  - **Auto Time Factor.** The Auto Time Factor is the multiplicative portion of the adjustment (i.e., “b”). The Auto Time Factor defaults to 1.0 (no adjustment) and must be in the range between 0.5 and 2.0).[16]

- **PNR Settings.** STOPS version 2.51 introduced a new array of optional parameters designed to better represent the nature of the park-and-ride (PNR) to transit market. These parameters are accessed by clicking on the "PNR Settings Button". When this button is pressed, the screen shown in Figure 23 appears. If no PNR Settings have previously been defined, all values are initialized to "-99.99". This value is used to indicate that STOPS should not make use of the new version 2.51/2.52 parameters and rely, instead, on the v2.50 parameters (including the PNR Transit Setting on the main parameter screen). Clicking the "Load Version 2.51/2.52 Parameters" button will replace all parameter values with the Version 2.51/2.52 default values of all parameters.

  The PNR settings screen has two sections. The first section (PNR Density, Backtracking and Circuity Patterns) controls how STOPS determines the best markets for PNR to transit. This process works by assessing the attraction zone's PNR potential as measured by the product of employment density and transit share for auto-owning households[17]. This product, called "DenShr" throughout this discussion, is adjusted based on whether the PNR transit trip is competitive with drive-all-the-way (i.e., Automobile) mode. For PNR trips that are circuitous in comparison to the automobile trip or involve significant backtracking, the impact of a high DenShr on PNR usage is reduced or eliminated.

  The second section, Penalty on Short PNR trips reduces the PNR utility for trips that are specified as being too short to be likely users of the PNR-to-transit mode.

  Parameters included on the PNR Setting screen include :

  - **Maximum Effective Employment Density.** This parameter sets a cap on the number of employees per square mile used in the DenShr

[16] Auto time adjustments are typically a product of a process to check a sample of current highway travel times from the MPO skim files against travel time collected from on-line mapping databases or other information on observed travel times. FTA has developed a spreadsheet that helps guide the user through the process of confirming highway travel times which can be obtained directly from FTA.

[17] The product of employment density and transit share, referred to as "DenShr" throughout this discussion is designed to represent the observation that PNR to transit is most likely for trips to attraction zones that have a relatively high employment density and high transit shares among car owning households. Central Business Districts often combine both of these attributes. Suburban employment centers may have high density but low transit shares for car-owning households. Highly urban areas outside the downtown may have high transit shares but lower densities. The two latter cases are less likely to have large PNR markets.

computation. It establishes the point at which employment density is as high as needed to identify the attraction location as a very high-density area (i.e., a Central Business District) and any density beyond that point adds little to the likelihood of using the PNR access mode. When using this capability in v2.51 or v2.52, this parameter defaults to 20,000 employees per square mile and can be coded as any value between 15,000 employees per square mile and 30,000 employees per square mile.

- **Maximum Effective Transit Share.** This parameter sets a cap on the transit share of 1 and 2+ car households that is another component of the DenShr variable. It establishes the point at which transit share by car-owning households is high enough to identify the attraction location as a very high transit use area (by car-owning households) and thus attract a significant share of PNR-to-transit trips. Any transit share beyond this point contributes little to increasing the likelihood of using the PNR access mode. When using this capability in v2.51 or v2.52, this parameter defaults to 25 percent transit and can be coded as any value between 5 and 50 percent.
- **Maximum Contribution of Circuity.** In STOPS, circuity is defined as the ratio of excess PNR time[18] to automobile drive-all-the-way. A circuity value of 0.0 means that the weighted access and transit in-vehicle time is less than or equal to automobile time. A circuity value of 1.0 means that the weighted PNR access and transit time is twice as long as the automobile time. This parameter defines the maximum effect that a high level of circuity (defined below) will have reducing the utility associated with the DenShr variable. The v2.51/2.52 default of 0.8 means that, at most, 80 percent of the utility associated with density and transit share percent are lost for highly circuitous trips (i.e., 20 percent of the density/share effect remains). This parameter can range from 0.0 (circuity has no effect on demand, needed when the auto times are not sufficiently accurate to compute circuity) to 1.0 (circuity can completely reduce density/transit share effects).
- **%Circuity Where Density Effects Start to Drop (and End).** These two parameters define the meaning of low and high levels of circuity. The default start value (0) means that the decay in PNR demand begins as soon as the weighted PNR access plus in-vehicle time exceeds the time to drive all the way. This value can range from 0 to 0.25. At the high end of the range, this parameter means that the decay in demand begins when the PNR excess time exceeds 25

[18] Excess PNR time equals weighted PNR access+in-vehicle transit time minus auto time. This quantity is constrained so that it is never less than zero.

percent of the auto time. The end parameter defines the point at which the maximum effect of circuity is reached. This value defaults to 1.0 meaning that the full effect of circuity on density and transit share is reached when the PNR Excess Time equals 100 percent of the auto time (i.e., weight PNR access and in-vehicle time is twice as long as the auto drive all the way time). The end limits can range from 0.5 (PNR excess time equals half of the auto time) to 1.5 (PNR excess time equals 1.5 times the auto time).

- **Transit Time Factor in Circuity.** This parameter affects the computation of weighted PNR access plus in-vehicle time. The default (0.8) means that 80 percent of the in-vehicle time is used for computing weighted PNR access plus in-vehicle time. Coded values can range from 0.8 to 1.0, the latter meaning that 100 percent of in-vehicle time is considered in this computation.
- **Maximum Contribution of Backtracking.** In addition to the circuity computation, STOPS also has a procedure that limits the attractiveness of a PNR trip that doesn't move towards the ultimate destination. This is done by computing a "backtracking score" based the relative locations of the production zone, the PNR lot, and the attraction zone as represented by latitude and longitude[19]. Figure 24 illustrates the backtracking values for different potential productions zones (the different colored locations) for a PNR lot located 5 miles from the attraction zone for the trip. In this case, the no-backtrack area[20] is approximately 5 miles wide for zones that are 1 mile further away from the destination zone than the PNR lot. At this distance, PNR trips can backtrack by up to 0.2 miles without being penalized by the backtrack process. The transition area[21] (a backtracking score greater than 0 but less than 1.0) is approximately 0.3 miles wide.

  The shape broadens as the distance increases. For instance, when the PNR lot is 10 miles from the destination zone, the no-backtrack area is approximately 6.5 miles wide and backtracks of up to 0.4 miles are not penalized. The transition area in this case is up to 0.7 miles wide.

[19]Circuity and Backtracking adjustments are similar measures of the likelihood of making a specific PNR trip. Circuity is dependent on accurate estimates of auto travel times which may not be available in all regions. Backtracking is independent of travel time but may prevent travelers from using an option that saves considerable travel time but involves travel away from the attraction zone. The contribution of each should be established by careful calibration against existing survey data. The ranges of allowable circuity and backtracking values is designed so that at least one of these two factors will reduce PNR utility by at least 75 percent for very indirect PNR-to-transit trips.

[20] Specifically, zones which would have a backtrack score of 0.0

[21] In this context, the transition zone represents areas with a backtrack score greater than 0.0 but less than 1.0.

The shape of backtracking area is fixed and cannot be adjusted in the user interface. The effect that the backtracking score has on PNR-to-transit demand is controlled by the "Maximum Contribution of Backtracking" parameter. This parameter defaults to 1.0 in Version 2.51/2.52. This value means that the utility associated with DenShr is reduced by 100 percent when the backtracking score reaches 1.0. The parameter value can be coded in the range of 0.75 to 1.0. At the low end of the range (0.75), 75 percent of the utility is reduced with a backtracking score of 1.0. In all cases, a backtracking score of 0 results in no adjustment to the utility. Utility impacts for backtracking scores between 0 and 1 are interpolated between these extremes.

- **Limit on sum of All PNR Constants.** This parameter is used by STOPS as a check on the combined effect of all path and mode choice constants affecting the PNR-to-transit mode. In most cases, the sum total of all constants should be less positive (or more negative) than the value of the constants assigned to the automobile mode. The default value of 0.0 applies this test and adjusts the PNR-to-transit constants to pass this test. This value can be coded as low as -1.0 utiles to reflect a situation where PNR-to-transit is viewed less favorably than the automobile model (beyond the effects of time and cost on mode choice). It can also be set as high as 1.0 utiles. This higher value could be useful in places where the cost or difficulty of parking in downtown areas is sufficiently high to generate more PNR demand than predicted by the default value. The maximum value of this parameter is equivalent to 33.3 minutes of inconvenience finding parking (and walking from the parking facility to the destination) or, alternatively, $13 per day to park[22].
- **Apply Auto Time Factor to PNR.** When checked, this option is used to add the auto time factor (main parameter screen) to the PNR access time to fully represent the time adjustments made to the highway travel time skims.
- **Apply Future Auto Times to PNR.** When checked, this option is used adjust the PNR access time by the anticipated growth in zone-to-zone highway travel times. This is only an approximation since the future and base highway times used for this adjustment are obtained from the production-to-attraction zone table and might not be fully applicable to the zone-to-PNR portion of the trip.
- **Breakpoint Density*Share Product (DenShr).** This series of parameters, in conjunction with the next item, define the utilities that

[22] At the default value of time of $12 per hour, 33.3 minutes of delay per trip is equivalent to $6.66 per trip or $13.32 per day assuming that parking service two trips—the inbound and the outbound trip.

are assigned to different levels of DenShr. Specifically, this parameter defines six different values (breakpoints) of DenShr that will be associated with seven different utilities in the next section. Breakpoint 1 represents the lowest breakpoint value of DenShr and Breakpoint 6 represents the highest value. The user interface provides the opportunity to make limited adjustments to the breakpoint values if needed to better match observed PNR usage data.

- **Utility for DenShr Breakpoints.** The utility attached to each breakpoint is coded in these seven parameter boxes. The utility assigned to breakpoint 1 is typically the lowest value and defaults to 0.5. The value assigned to trips with a DenShr greater than breakpoint 6 is the highest utility and defaults to 3.5 (equivalent to 106 minutes). The utility for DenShr values greater than breakpoint 6 can be as high as 5.5 minutes (183 minutes). Figure 25 shows the default values for the breakpoints and the associated utilities. Most destinations zones outside of an activity center or highly urbanized area[23] will have DenShr's that are less than 20 and a very low PNR utility of 0.5. Moderately urban areas may have a DenShr value of 100[24] and would have a PNR utility of 2.0. CBD areas could have a DenShr value of 5000[25]. The default utility value for these areas equals 3.5 and can be as high as 5.5. The positive contribution of utility in high density/high transit share areas overcomes the highly negative general constant assigned to the PNR Transit model (-2.5 to -5.9, depending on trip purpose and auto ownership). Together, these constant values work together to create a situation where PNR Transit is unlikely except in cases where employment density is high, car-owning transit share is high and the trip is not circuitous and does not involve backtracking. The limit on the sum of all PNR constants prevents STOPS from being overly generous in even in areas highly favorable to PNR usage.
- **Compute Short Time on the Basis of Auto Time (vs. Transit Time).** This parameter determines how short time is defined. If checked this box indicates that "short" is defined in terms of automobile time. Otherwise total transit in-vehicle time (IVTT) is used to define short trips. The advantage of automobile time is that it is independent of transit path and will not vary among transit

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[23] Such areas may have employment densities less than 1,000 employees per square mile and car-owning transit shares less than 2 percent leading to a DenShr less than 20.
[24] For instance, areas with 1,000 employees per square mile and a car-owning transit share of 10 percent.
[25] CBDs can have employment densities of 20,000 employees per square mile and a car owning transit share of 25 percent or more leading to a DenShr value of 5,000

alternatives. In particular, it will not change if two alternatives have similar overall travel times but one has more access time and another has more in-vehicle time. By contrast, using transit time may better reflect the unlikelihood of a short ride on transit following a long drive to a PNR lot. However, this measure can be very unstable particularly if an alternative features a PNR lot near to a large activity center. When the version 2.51/2.52 defaults are loaded, this parameter defaults to being checked (i.e., using automobile times for determining short PNR penalties).

- **Breakpoint Times and Utilities.** Similar to the breakpoints for DenShr, STOPS allows users to code 3 breakpoints and 4 utilities to define the effect of short trips. The version 2.51 defaults subtract 2.0 utiles (equivalent to adding 67 minutes of travel time) for auto trip times less than 10. Any trip with an auto time over 15 minutes has no short IVTT penalty. Short PNR penalties for automobile times between 10 and 15 minutes are interpolated.

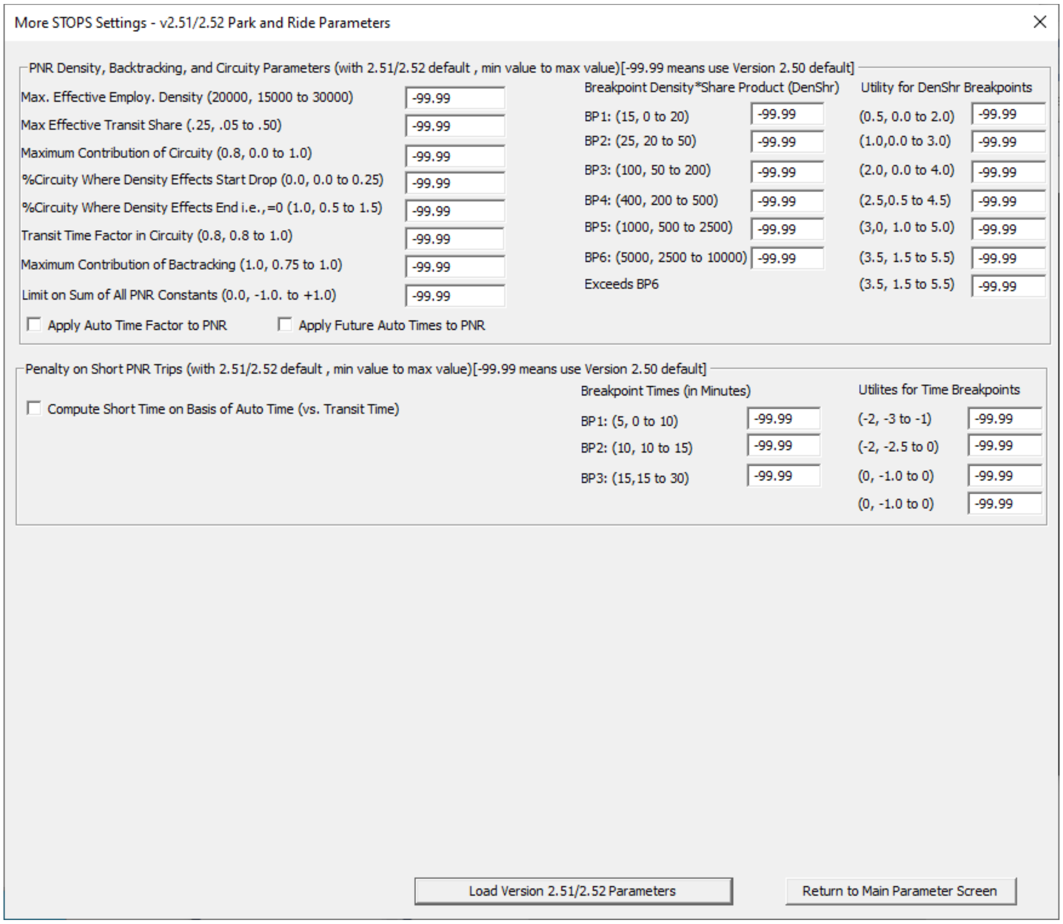


Figure 23. STOPS PNR Settings Parameter Screen Showing Default Values

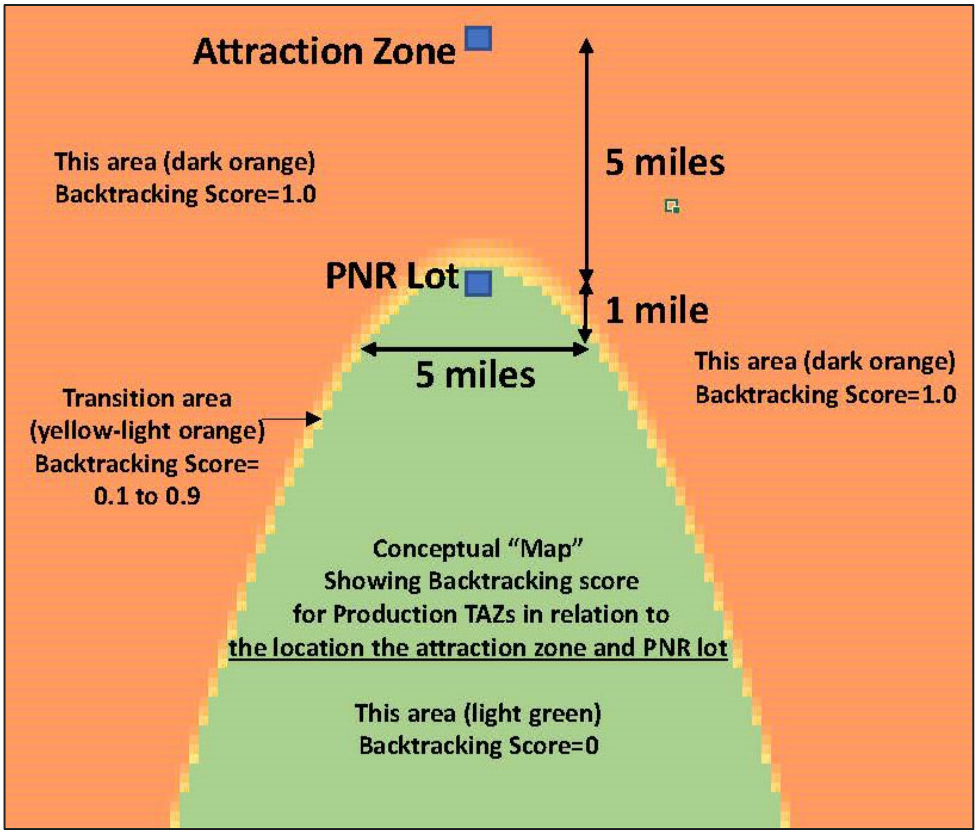
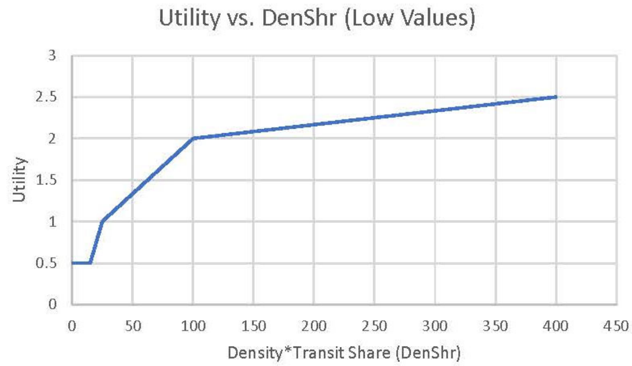


Figure 24. Illustration of PNR Backtracking Score

BP	DenShr	Utility
1	15	0.5
2	25	1
3	100	2
4	400	2.5
5	1000	3
6	5000	3.5
7		3.5



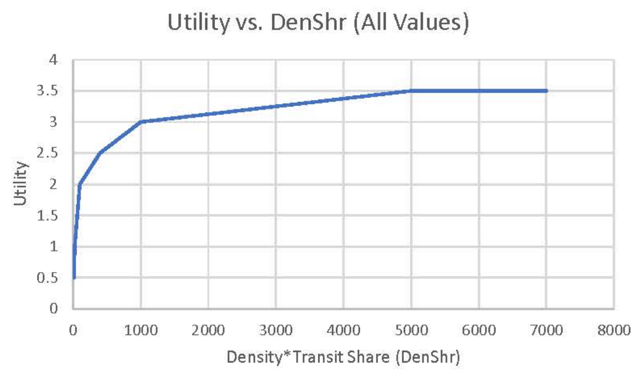


Figure 25. Default Relationship Between Utility and DenShr

- **Calib (Calibration) Settings.** This section contains new parameters for Version 2.51 (and 2.52) that control how the STOPS calibration operates and establishes limits on maximum and minimum calibrated constants. These limits are important in cases where limited transit data and services are available and the calibration process would result in extremely high or low constant values in an attempt to match ridership data given limited transit supply. These extreme values can be problematic when future transit service is introduced to these areas and lead to unrealistically high or low estimates of transit demand. This page also includes other adjustments to the model calibration and application that improve the reliability of STOPS forecasts. Figure 26 presents the Calib Settings page when it is first accessed. Most values are coded with "-99.99" which tells STOPS to apply the older version 2.50 standards. These values can be updated to the Version 2.51.2.52 defaults by clicking on the "Load Version

2.51 Parameters" button. This page includes the following parameters:

- **Full FG factor only if NO partial FG.** If checked (the Version 2.51 default), this parameter treats trips that include both full and partial fixed guideway (FG) services[26] as a partial FG trip. When unchecked, STOPS considers these trips to be full fixed guideway. In most new applications, this box should be checked as considering mixed FG trips like partial FG appears to do a much better job representing actual usage of partial FG systems in cases where they serve as a feeder to a full FG system.[27]
- **Minimum and Maximum Values of District Constants.** This section allows the user to set the minimum and maximum values of the transit constants, stratified by auto ownership levels and by trip purpose. The default values were established based on typical minimum and maximum values observed for districts with sufficient data and transit service to generate realistic constant values in the survey database used for STOPS calibration. These values can be adjusted within a limited range to improve calibration in other regions
- **Variables Defining Districts with Too Little Data to Reliably Compute Constants.** This section provides a series of controls that STOPS can use to create reasonable transit constants in places with too few existing transit trips to successfully calibrate these values. It works by developing a "typical" constant for places with enough data to compute a constant that also has a low transit share[28]. This constant can be adjusted by a multiplier to increase or decrease the generic constant. The parameters included in this section include:

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[26] In STOPS, full fixed guideway (FG) services are specified with a GTFS route_type of 1, 2, or 4 and above. These route types are typically assigned to LRT, rapid transit, commuter rail, and ferry services. Partial FG services are assigned a GTFS route_type of 0. This route type is typically assigned to streetcar or BRT services. In many cases, the official regional GTFS file assigns route_type 3 (defined as bus) to BRT routes or route_type 0 to LRT routes. When this happens, the user consider recoding route_types to be consistent with the STOPS treatment of full and partial FG services.

[27] In Version 2.51/2.52, the ability to fall back to the earlier (v2.50 or before) has been retained to reduce problems associated with changing forecasts for a project that is already underway. In cases where BRT or streetcar projects feed LRT or rapid transit projects, users should strongly consider selecting this option even if it results in changes to estimates of ridership since earlier estimates could be unrealistically high.

[28] The presumption is that districts without enough transit trips today to calibrate a transit constant are also areas with low transit shares. If the area is a high transit share district with little data, then a better remedy is to consolidate districts with similar characteristics to allow successful district calibration.

- **Largest Share for a District to be Considered Low Share.** This parameter holds the transit share that defines the boundary between being a low transit share and other areas. The v2.51.2.52 defaults for this parameter range from 0.07 (7 percent transit share) to 0.01, depending on auto ownership and whether the standard is being applied to a production or attraction zone.
- **Constant Multiplier for Low Share Application.** This parameter scales the effect of the calibrated low-share constant up or down prior to application in a district with an insufficient number of transit trips to calibrate its own constants. This is not a straight factor. Instead, positive constants are multiplied by this parameter and negative constants are divided by this multiplier. This value defaults to 1.0 (no impact on the constants). It can be as low as 0.1 (positive calibrated constants are applied at one-tenth the calibrated value, negative calibrated constants are applied at 10 times the calibrated value). It can be as high as 1.5 meaning that positive constants are applied at 1.5 times the calibrated low-share value and negative constants are applied at 0.67 times the calibrated value)
- **Least Trips to be Enough for Calibration.** This parameter defines the fewest number of transit trips necessary to calibrate a district constant. In v2.51/2.52, this value defaults to 15 and can be coded between 1 and 50.

- **Override to Bus and FG+Bus PNR Bias Constants.** These parameters allow the user to update the bus and fixed guideway-bus constants on PNR to the v2.51/2.52 default of 20 minutes for bus-only trips and 15 minutes for fixed guideway-bus trips. The user can also specify other values for these constants that range between 0 and 30 minutes.
- **Other Adjustments.** This section defines other miscellaneous adjustments to STOPS parameters. Included in this section are the following:
  - **Count Factor Limit.** This parameter controls the maximum trip adjustment made by STOPS in response to count data. In v2.50, the default was 5.0 which meant that trip adjustment factors could range from 1/5 to 5. In v2.51/2.52, the default has been reduced to 1.5 (from 1/1.5=0.67 to 1.5). In many applications, including incremental models, this tighter factor results in a model transit trip table that is closer to the original survey table while also still maintaining a good

match to counts. In cases where 1.5 is inadequate to achieve good comparisons to counts, this value can be manually adjusted up to the v2.50 standard of 5.0. Experience shows that 1.5 is often sufficient for incremental applications to work well. Synthetic applications typically require 3 to 5.

- **KNR Const Multipliers for Fixed Guideway Only (FGO) and Fixed Guideway Bus (FGB).** In some cases the v2.50 estimate of the KNR bias constant for fixed guideway trips (FGO and FGB) have needed adjustment to account for actual ridership behavior. This adjustment allows these negative constants to be adjusted to have less of a negative impact. The v2.51/2.52 default for this parameter is 0.7 and can be coded between 0.5 and 1.0.
- **Auto Time at Which Extra Impedance Begins to Accrue.** STOPS allows users to code a time at which the automobile mode (i.e., auto all-the-way) becomes perceived as being too long for efficient use of time and each minute beyond that point accrues impedance more rapidly than before that point. This factor sets the time in minutes that defines this transition point. It defaults to 20 minutes and can range from 15 to 90 minutes.
- **Weight of Auto Time Beyond the Accrual Point.** This parameter specifies how automobile travel times beyond the accrual point (set in the previous control) are weighed. It defaults to 1.25 and can range from 1.0 to 2.5). At the default values, these two parameters mean that auto time up to 20 minutes are treated as an impedance of 20 minutes. Times beyond 20 minutes are weighted by 1.25 so a 30 minute time will be treated like 20+(30-20)*1.25=32.5 minutes.
- **Minimize Path-Building and Demand Model Inconsistencies.** This check box activates procedures to minimize the inconsistencies between path-building and demand (mode choice) modeling[29]. Principal actions are to:
  - Add the minimum of the bus and fixed-guideway bus PNR biases to the path-building criteria so that the best path reflects the preferences of travelers for full fixed guideway over partial fixed guideway and for partial fixed guideway over bus as used in the mode choice model.

[29] In most cases, users will want to check this box since internal model consistency is almost always appropriate. It is checked whenever the user loads the Version 2.51/2.52 parameters but is left unchecked when earlier (2.50) parameters are selected to maintain backwards compatibility with earlier versions of STOPS.

- Consider best weighted travel times (including constants) when PNR paths are used by KNR trips.

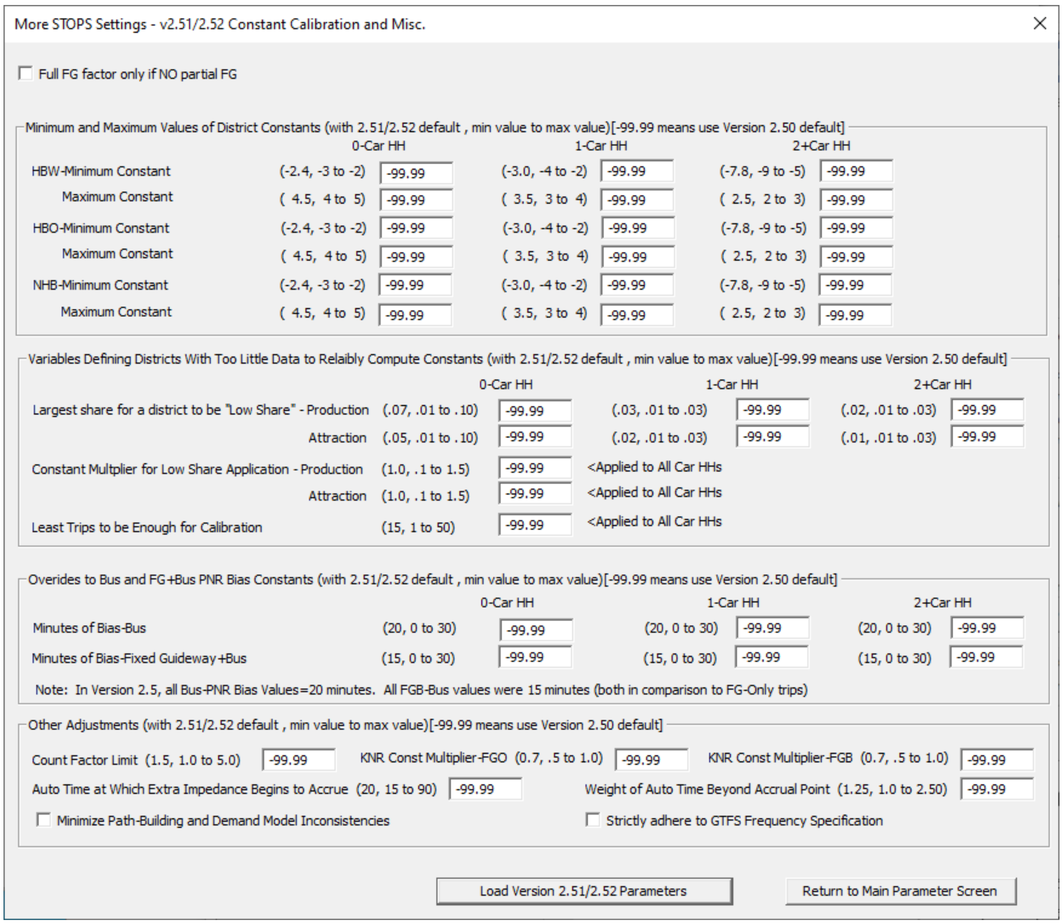


Figure 26. STOPS Calibration Settings Parameter Screen Showing Default Values

An example of the parameter dialog after control information is entered for the Kansas City example is presented in Figure 27 (main parameter screen), Figure 28 (PNR parameters), and Figure 29 (calibration parameters). After all information is entered into this screen, the user should click Save and Exit to save this information to the control file. Figure 30 shows the STOPS main menu after this step is complete. As needed, the user can return to the Edit Parameter File step to make any necessary corrections or updates.

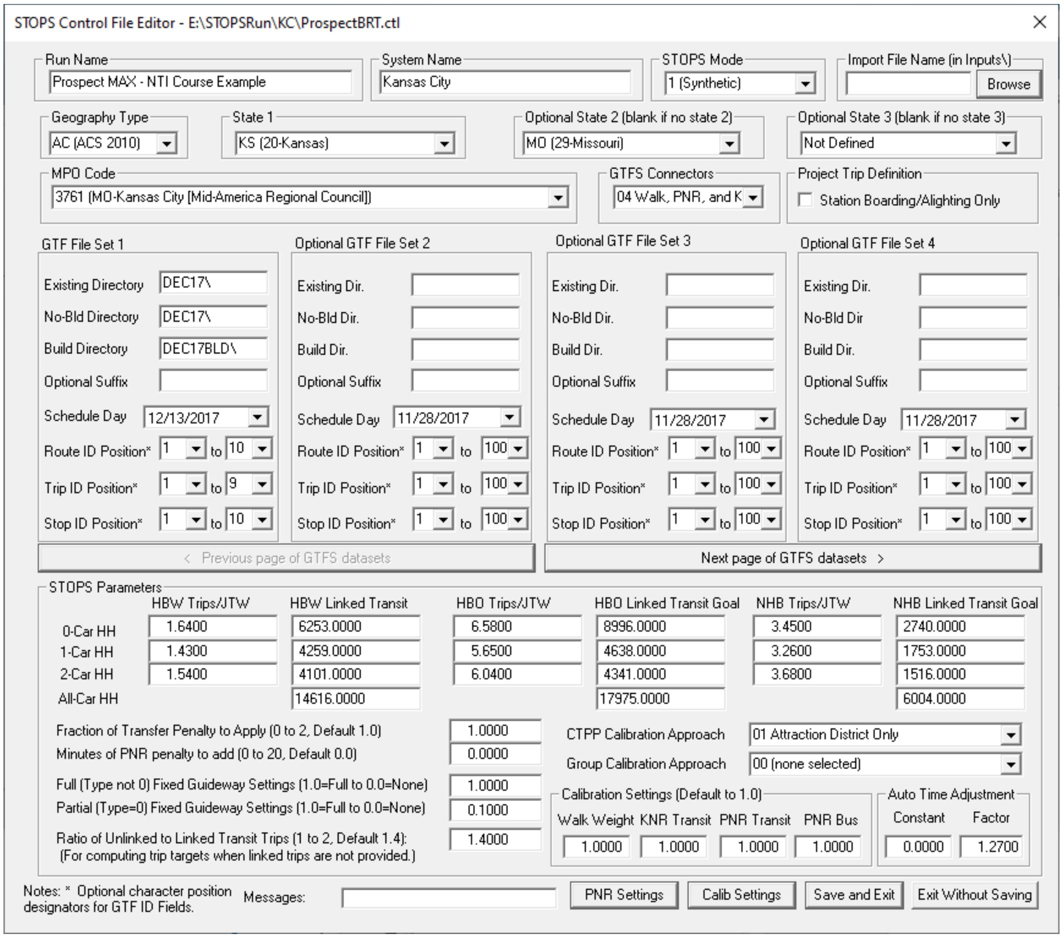


Figure 27. STOPS Main Parameter Screen After Entry of KC Example

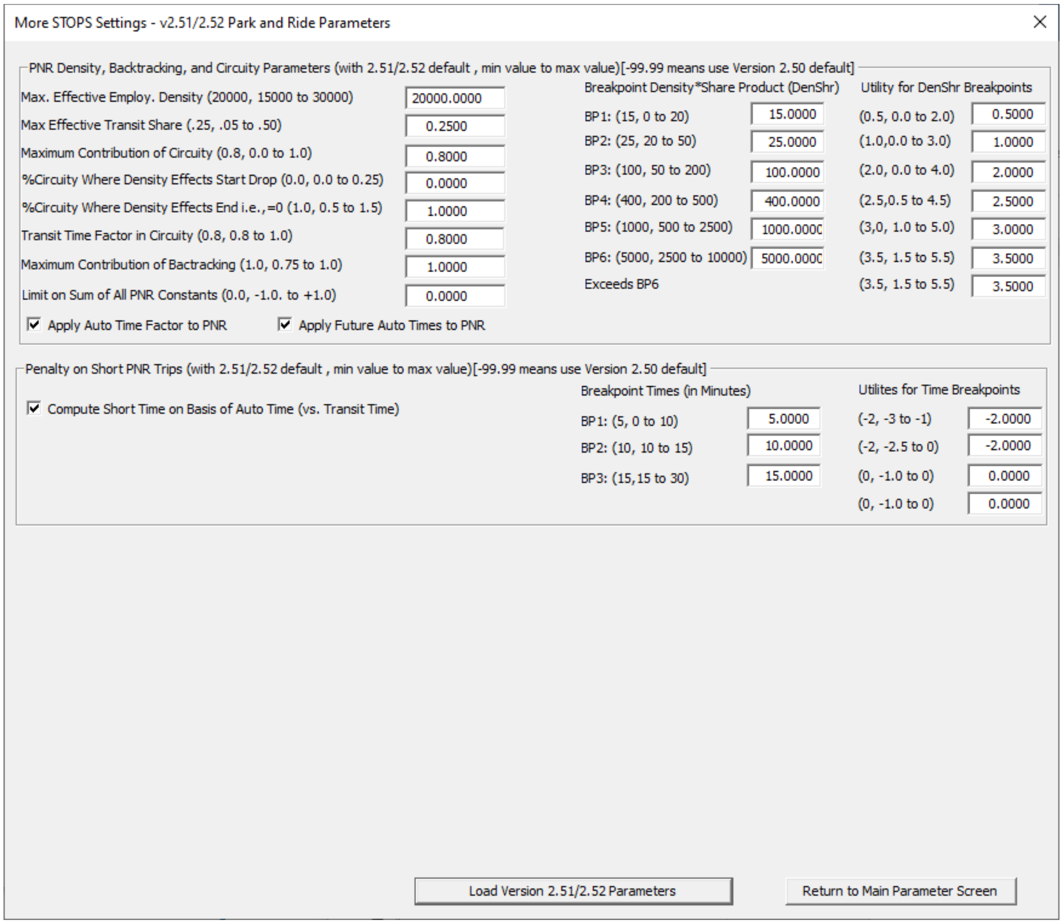


Figure 28. STOPS PNR Settings Parameter Screen After Entry of KC Example

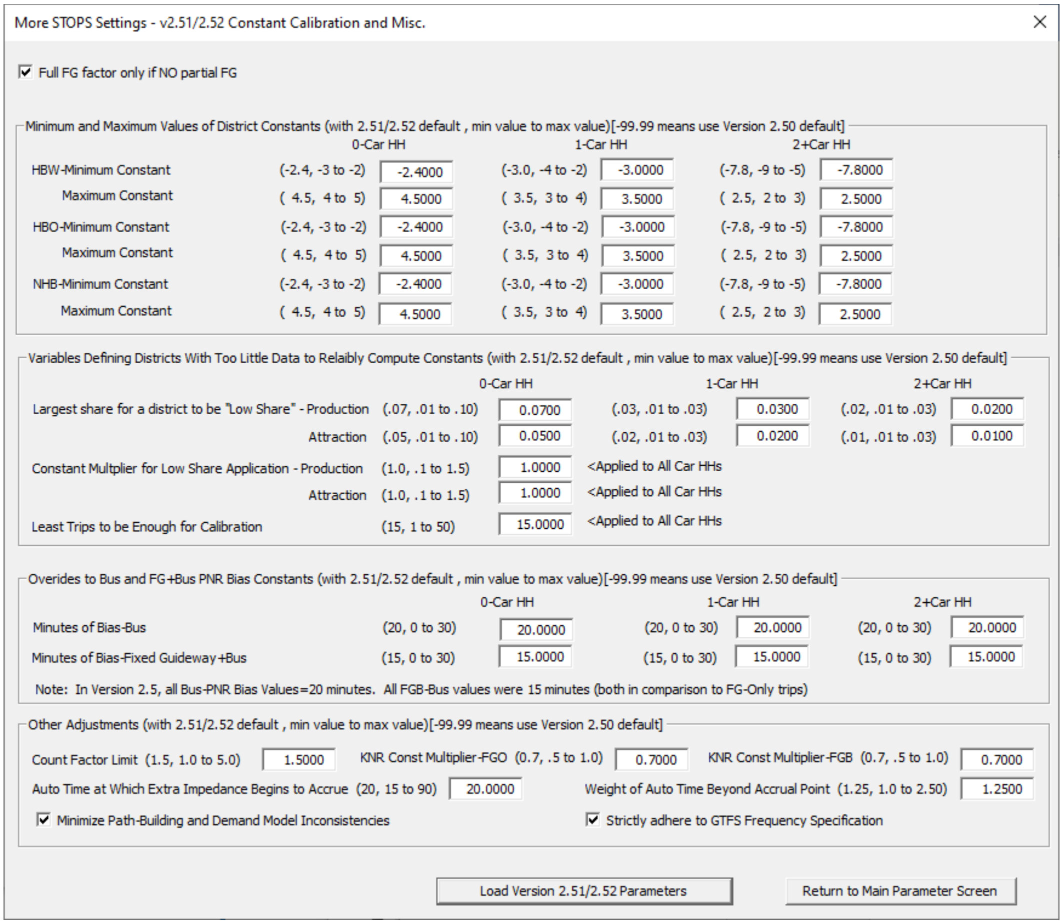


Figure 29. STOPS Calibration Settings Parameter Screen After Entry of KC Example

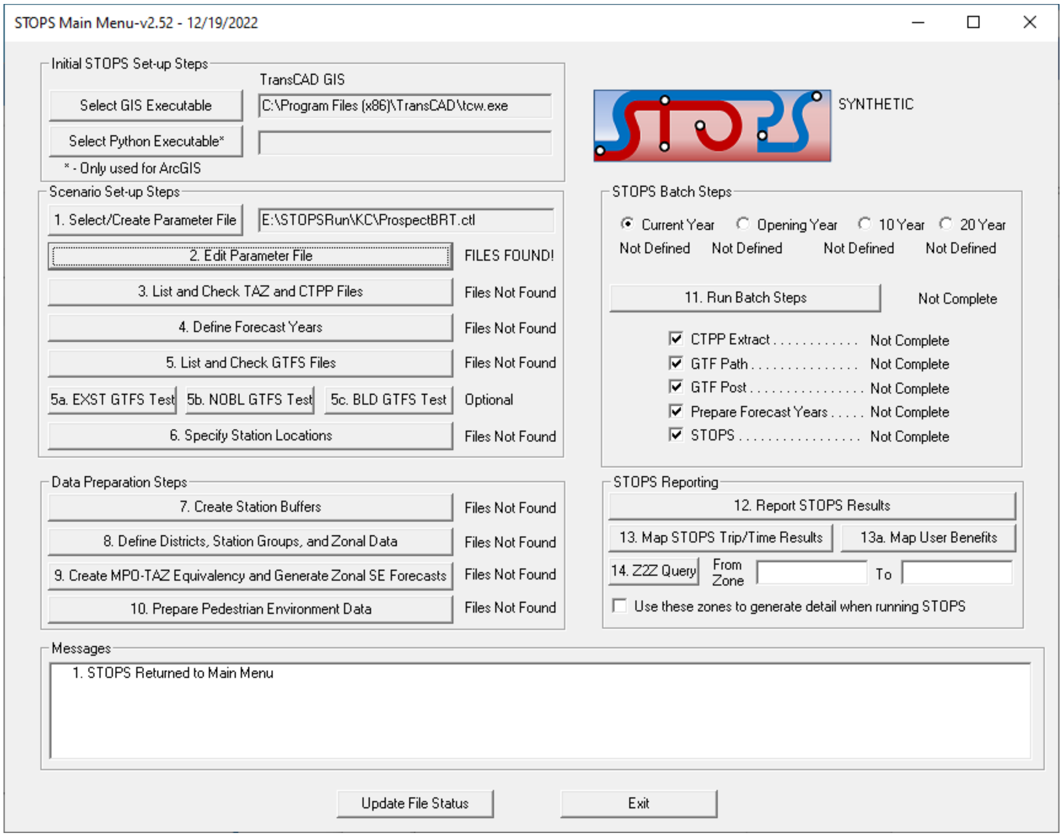


Figure 30. STOPS Main Menu After Completion of Parameter File

5.3 Assembling Input Census, MPO, and Route Counts

This section discusses the process of assembling all input census, MPO, and route count data that are used by STOPS for forecasting project transit ridership.

A listing of required and optional files that correspond to the user selections in the parameter file can be generated by clicking on “3. List and Check TAZ and CTPP files.” When this is done, the screen shown in Figure 31 appears. Each file is described in the subsections that follow.

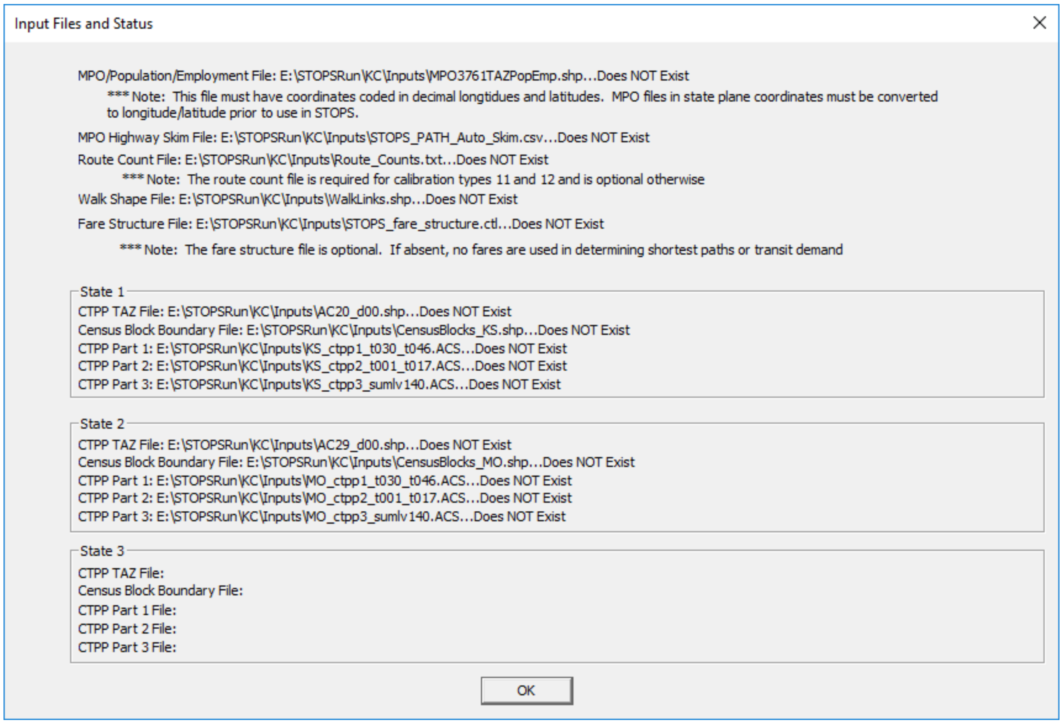


Figure 31. Dialog Showing Required and Optional Files

MPO Population/Employment File

The MPO population/employment file is an ESRI shape file that conveys information about the MPO zone geography[30] and MPO estimates of existing and future population and employment.

This file should be constructed using a GIS package (e.g., TransCAD, ArcMap, or ArcGIS Pro) and saved as an ESRI shape file. Its name must match the STOPS-generated file name specified in the "TAZ and CTPP Files" Dialog. (MPO3761TAZPopEmp.shp in the Kansas City example). Coordinates must be expressed as degrees of longitude and latitude. It must, at a minimum, include the fields described below. Other fields may exist in this file (and will be ignored) although some field names ("District") are not allowed.

- Required geographic information
  - Boundary of each zone in the MPO modeling system.

[30] STOPS uses two sets of zone geography—census zones and MPO zones. Census zones are used to understand the location of census and CTPP JTW data. These same zones are also used to develop zone-level matrices of transit impedances. All STOPS results are expressed in terms of Census zones. STOPS uses MPO zones to understand MPO-provided data such as zone-to-zone highway times and distances and zone-level projections of population and employment. STOPS overlays census and MPO zones to determine how the two different zone systems relate to one another.

- Coordinate system
  - Decimal degrees of longitude and latitude
- Required data fields
  - Model TAZ zone number (integer[31]). Any user-selected field name.
  - Census[32] Year Population (numeric[33]). Any user-selected field name.
  - Census Year Employment (numeric). Any user-selected field name.
  - Current Year Population (numeric). Any user-selected field name.
  - Current Year Employment (numeric). Any user-selected field name.
- Optional data fields
  - Opening Year Population (numeric). Any user-selected field name.
  - Opening Year Employment (numeric). Any user-selected field name.
  - 10-Year Horizon Population (numeric). Any user-selected field name.
  - 10-Year Horizon Employment (numeric). Any user-selected field name.
  - 20-Year Horizon Population (numeric). Any user-selected field name.
  - 20-Year Horizon Employment (numeric). Any user-selected field name.

In some cases, MPOs will provide a TAZ layer with a coordinate system other than longitude and latitude. This can be easily checked in either TransCAD, Arc Map, or ArcGIS Pro by opening the shape file and observing whether or not coordinates are reported in degrees of longitude and latitude. If the coordinates are reported in some other system (e.g., state plane feet or meters), then the file must be converted to use latitude and longitude.

The MPO zone file for the Kansas City example is shown in Figure 32. Fields in this file include:

- TAZ10. The zone number assigned to each area in the MPO forecasting model
- POP2015, POP2017, POP2023, etc. Population estimates for 2015, 2017 and various other years
- EMP2015, EMP2017, EMP2023, etc. Employment estimates for 2010, 2017 and various other years

[31] All integer fields must be 10 or fewer characters wide.
[32] Census Year is 2000 for the Year 2000 CTPP (Geography type BG, TR, or TZ), 2008 for the 2006 to 2010 ACS CTPP (Geography type AC), and 2015 for the 2012-2106 ACS CTPP (Geography Type A2)
[33] Numeric fields may be real or integers and must be 20 or fewer characters wide.

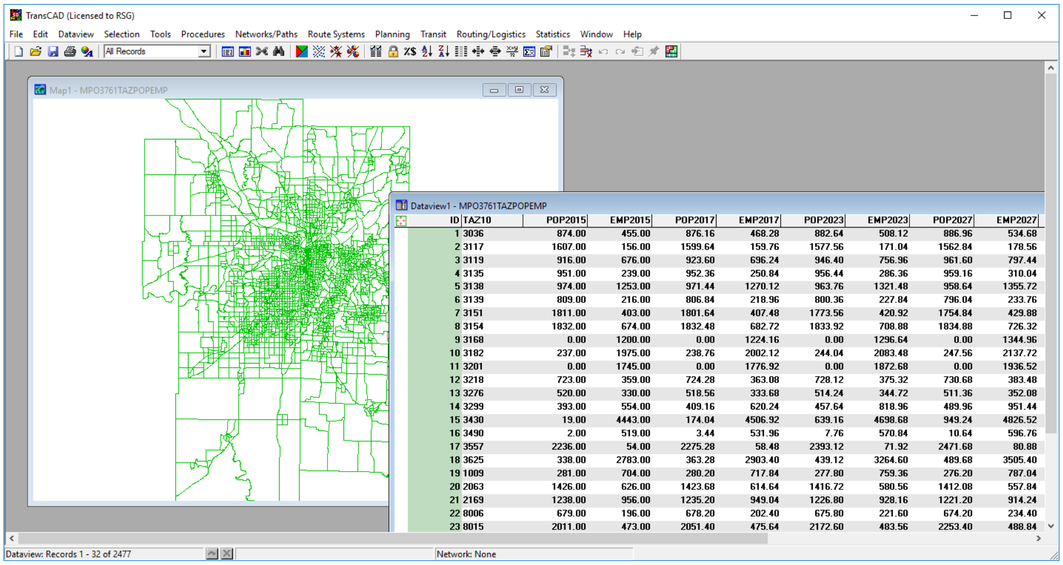


Figure 32 MPO Population Employment File for Kansas City

MPO Highway Skim File

The MPO auto time matrix is obtained by extracting zone-to-zone current year (and horizon years, if available) AM peak period automobile travel times and distances from the regional travel demand forecasting model and saving this information in a comma-separated value (.csv) file. Its name must match the STOPS-generated file name specified in the "TAZ and CTPP Files" Dialog. (STOPS_PATH_Auto_Skim.csv).

The file is organized with one line for each origin-destination zone pair containing the following fields in the order presented below:

- Integer[34] origin zone number from the travel model
- Integer destination zone number
- Real automobile distance for the current year (in miles)
- Real automobile time for the current year (in minutes)
- Real automobile distance for the opening year (in miles)
- Real automobile time for the opening year (in minutes)
- Real automobile distance for the mid-range forecast year (10-year forecast) (in miles)
- Real automobile time for the mid-range forecast year (10-year forecast) (in minutes)

[34] Integer fields must be less than 10 characters wide and real number fields must be less than 20 characters wide. Numbers in the origin and destination zone fields must match the zone numbers in the TAZ field used in the MPO population/employment file.

- Real automobile distance for the long-range forecast year (20-year forecast) (in miles)
- Real automobile time for the long-range forecast year (20-year forecast) (in minutes)

If highway travel time data for the opening or forecast years are not available, then these fields may be left empty by coding consecutive commas. Commas after the last real data field may be left off. Any times or distances that are left blank or set to zero are given the same time or distance values that were entered for the current year.

A portion of a Kansas City auto time matrix file appears in Figure 33. This example shows the format for the case in which auto highway time information is only available for the current year. The first row shows that the trip from zone 101 to zone 101 is 0.0 miles long and takes 3.26 minutes. Since future year information is not included in this file, all analysis years are assumed to use the same information.

Figure 34 shows an example automobile skim file for a case where current and 20-year horizon information are available. As this example shows, empty fields (two consecutive commas) appear for distances and times for the opening year and 10-year horizon slots. In the first row, travel time in the base year is 3.26 minutes and in the 20-year forecast, the travel time is 3.27 minutes.

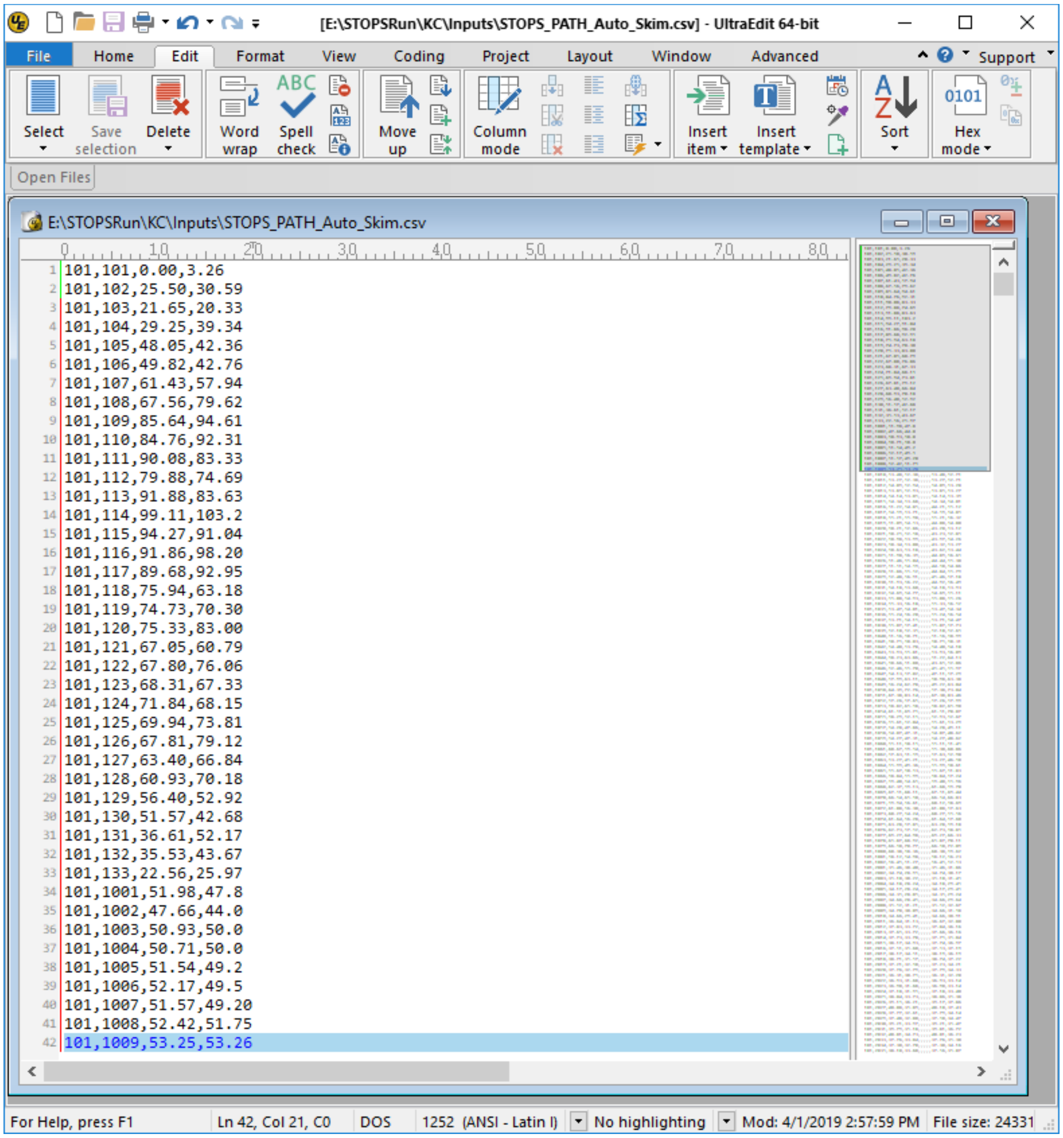


Figure 33. Sample Auto Skim File for Kansas City

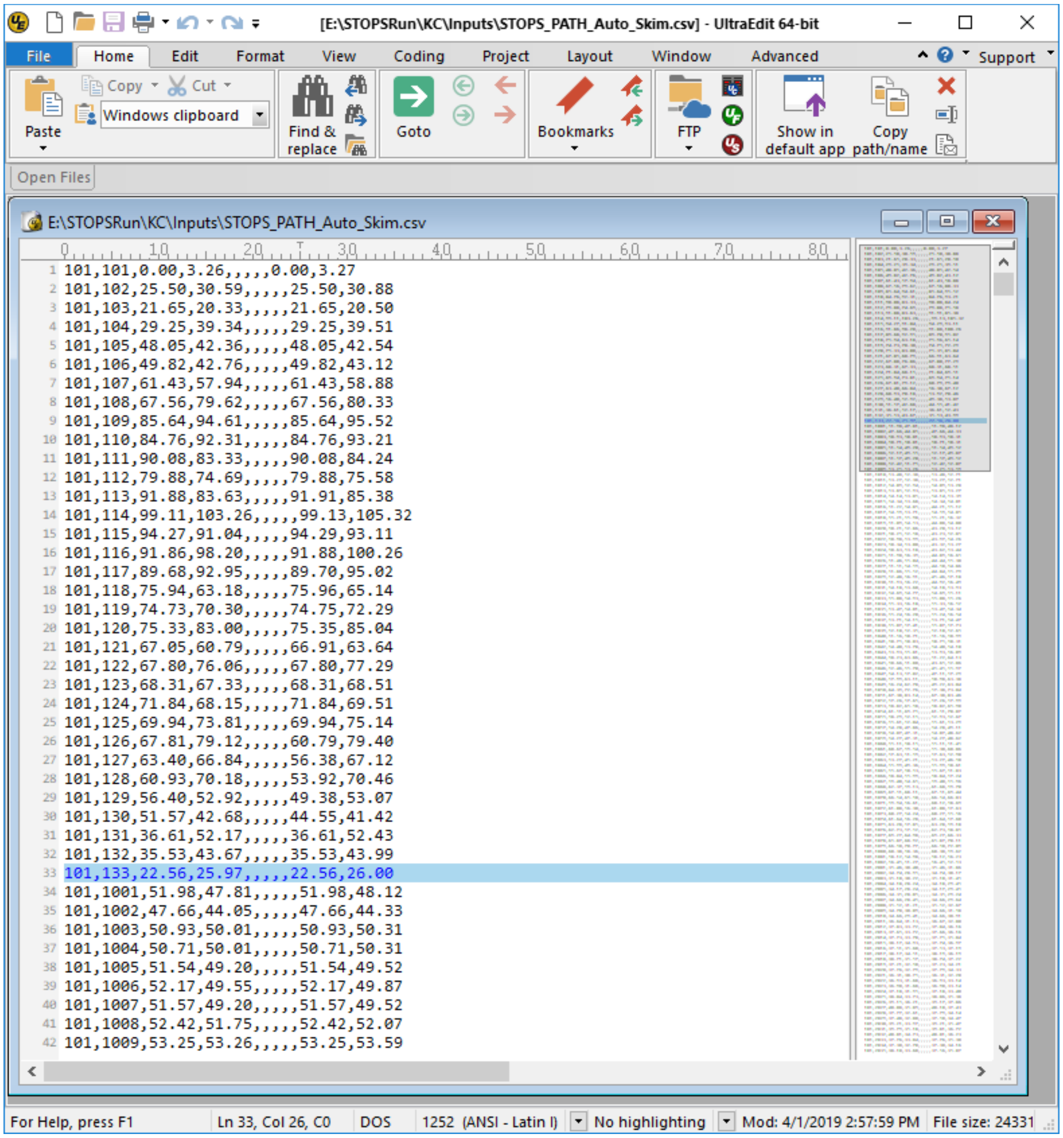


Figure 34. Sample Auto Skim File with Current and 20-Year Distance and Time

Route Count File (Required for Calibration Types 11 and 12, Optional Otherwise)

The route count file is used for Calibration Types 11 and 12 to adjust the STOPS model so that it replicates ridership on a route-by-route basis. The file is named route_counts.txt and is organized as a text file with a header row showing the defined fields separated by commas. Data records follow the header record. Fields that must appear in this file include:

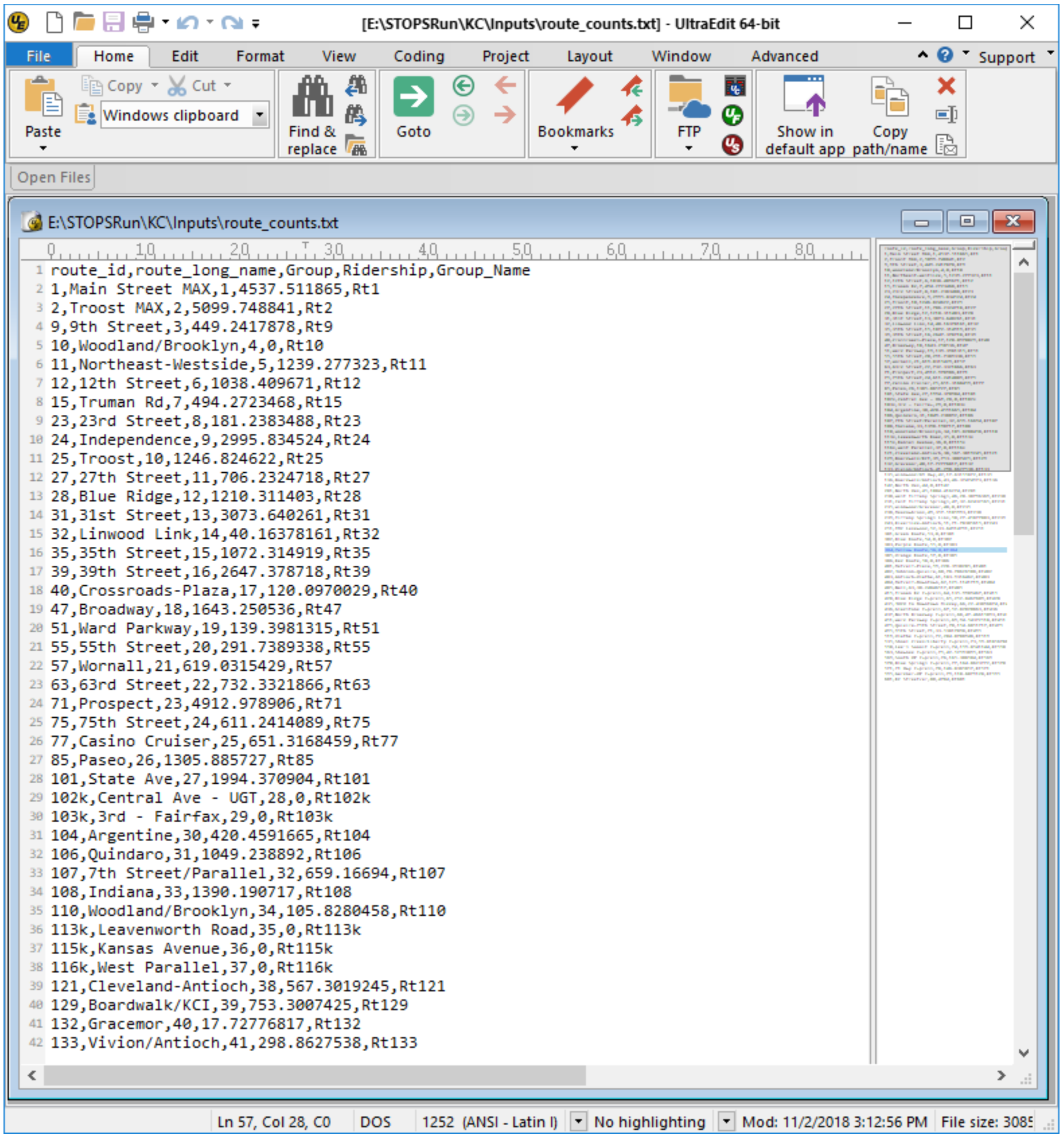
- Route_id. The first 25 characters of the GTFS route_id. If a GTFS suffix was specified in the parameter file, then the last 2 characters of the route_id are an ampersand (“&”) followed by the suffix. If the route_id is longer than 23 characters, the &suffix appears in character positions 24 and 25 even if it overwrites portions of the original route_id.

- Group. A user-defined integer between 1 and 999 indicating how the routes should be summarized. In most cases, each route will be assigned its own route group unless two routes share a market and should be calibrated together.
- Ridership. The average daily ridership for the route.

The file can also have two optional fields:

- Route_long_name. This field shows the full name of the route associated with each route_id.
- Group_name. This field shows the name that will be assigned to each route group in the STOPS report.

Figure 35 presents an example route count file for Kansas City. Since the control file doesn't specify any suffixes for GTFS files used in the STOPS run, the ampersand and suffix are not required. If the control file assigned the suffix "K" to the KCATA GTFS files, then "&K" would have been added to all route_ids. For instance, the first data record would have been coded as "1&K" so that STOPS could properly associate the daily ridership on this route (4,357.51) with KCATA Route 1.




```
route_id,route_long_name,Group,Ridership,Group_Name
1,Main Street MAX,1,4537.511865,Rt1
2,Troost MAX,2,5099.748841,Rt2
9,9th Street,3,449.2417878,Rt9
10,Woodland/Brooklyn,4,0,Rt10
11,Northeast-Westside,5,1239.277323,Rt11
12,12th Street,6,1038.409671,Rt12
15,Truman Rd,7,494.2723468,Rt15
23,23rd Street,8,181.2383488,Rt23
24,Independence,9,2995.834524,Rt24
25,Troost,10,1246.824622,Rt25
27,27th Street,11,706.2324718,Rt27
28,Blue Ridge,12,1210.311403,Rt28
31,31st Street,13,3073.640261,Rt31
32,Linwood Link,14,40.16378161,Rt32
35,35th Street,15,1072.314919,Rt35
39,39th Street,16,2647.378718,Rt39
40,Crossroads-Plaza,17,120.0970029,Rt40
47,Broadway,18,1643.250536,Rt47
51,Ward Parkway,19,139.3981315,Rt51
55,55th Street,20,291.7389338,Rt55
57,Wornall,21,619.0315429,Rt57
63,63rd Street,22,732.3321866,Rt63
71,Prospect,23,4912.978906,Rt71
75,75th Street,24,611.2414089,Rt75
77,Casino Cruiser,25,651.3168459,Rt77
85,Paseo,26,1305.885727,Rt85
101,State Ave,27,1994.370904,Rt101
102k,Central Ave - UGT,28,0,Rt102k
103k,3rd - Fairfax,29,0,Rt103k
104,Argentine,30,420.4591665,Rt104
106,Quindaro,31,1049.238892,Rt106
107,7th Street/Parallel,32,659.16694,Rt107
108,Indiana,33,1390.190717,Rt108
110,Woodland/Brooklyn,34,105.8280458,Rt110
113k,Leavenworth Road,35,0,Rt113k
115k,Kansas Avenue,36,0,Rt115k
116k,West Parallel,37,0,Rt116k
121,Cleveland-Antioch,38,567.3019245,Rt121
129,Boardwalk/KCI,39,753.3007425,Rt129
132,Gracemor,40,17.72776817,Rt132
133,Vivion/Antioch,41,298.8627538,Rt133
```

Figure 35. Example Route Count File for Kansas City

Walk Shape File (Required for GTFS Connector Types 02 and 04, Not Used Otherwise)

The path building component of STOPS (GTF Path) is able to generate zone-to-walk connector links using two different techniques—straight line distances (the default) or by walking along links defined in a street database. In some cases, straight-line connectors are sufficiently precise to generate good estimates of walk access to the transit system. In many other cases, the presence of waterways, highways, or other barriers mean that straight-line connectors would not be a realistic representation of access to the transit system. In such cases, the user can provide a ESRI shape file with all street and other walkway links that can be used for walk access to transit. This file is required if GTFS Connector Option 02 or 04 is selected. When used, this file is named WalkLinks.shp.

A field named "LENGTH" must be present in the walk link database associated with the shape file and must contain the link distance in miles. This value is used by STOPS to estimate the walk time required to traverse the link assuming an average walk speed of 3 miles per hour. If an integer "DIR" field appears in the file, the following codes are used:

- 0 (default) = travelers can walk along this link in both directions
- 1 = one-way walk link in the direction that the link is coded
- 2 = travelers can walk along this link in both directions (same as 0)
- -1 = one-way walk link in the direction opposite to the direction that the link is coded.

This file can be prepared by the user from locally-available street databases. The file must be saved in ESRI shape file format with latitude and longitude coordinates.

Census Data for Each State

Census data to support the STOPS analysis are identified in the TAZ and CTPP file listing. The exact file names depend on which version of the Census is being used (2006-2010 ACS or 2000 long form) and on the selected Geography Type. All Year 2000 files are in the original Census format. The ACS files (files that begin with "AC" or "A2") have been specially prepared by FTA for STOPS and are only available from FTA. File names are as follows:

- CTPP boundary files in ESRI shape file format. These filenames begin with a prefix of AC or A2 (2006-2010 or 2012-2016 ACS, respectively), TZ (TAZ from 2000 CTPP), BG (Block Group from 2000 Census) or TR (Tract from the 2000 Census) followed by the two-digit numeric FIPS state code (see Section 15.1 for definitions) and a name denoting a CTPP boundary file. For the Kansas City example, Missouri ACS zones are in the file named: AC29_d00.shp
- CTPP Part I files begin with the Alpha FIPS state code following by a string that defines the file type. ACS files have a ".ACS" or ".AC2" extension (2006-2010 or 2012-2016 ACS, respectively). The Year 2000 Census files have a ".DAT" extension. For the Kansas City example, Missouri CTPP Part I data are in the file named: MO_ctpp1_t030_t046.ACS.
- CTPP Part II files begin with the Alpha FIPS state code following by a string that defines the file type. ACS files have a ".ACS" or ".AC2" extension (2006-2010 or 2012-2016 ACS, respectively). The Year 2000 Census files have a ".DAT" extension. For the Kansas City example,

Missouri CTPP Part II data are in the file named: MO_ctpp2_t030_t046.ACS.

- CTPP Part III files are organized differently depending on the CTPP version and geography type. Options are:
  - ACS: Name is structured as the Alpha state code followed by "_ctpp3_sumlv140.ACS" or "_ctpp3_sumlv140.AC2" (2006-2010 or 2012-2016 ACS, respectively)
  - Tracts from CTPP 2000: Name is structured as the Alpha state code followed by "_ctpp3_sumlv140.DAT"
  - TAZs or Block Groups: MPO designation (MPO3761 in Kansas City) following by "_ctpp3_sumlv944.DAT". Note in this case, only the first state has a Part III file identified since the MPO file includes all trips within its area regardless of the state of residence of the traveler.

Optional Adjustments to the Census Data

In most situations, the Census data obtained from the FTA STOPS website can be used without alteration. In some cases, however, the user may wish to adjust these files to improve the performance of STOPS. These changes are made using a GIS package to make adjustments to the census block or TAZ boundary files in ESRI shape file format. Potential adjustments include:

- **Edit the state block boundary files to exclude all blocks outside of the STOPS analysis area.** The state-level block files are often quite large and include detailed block data for areas of the state outside of the metropolitan area being modeled. STOPS processing speeds may be noticeably improved by updating the block shape file to delete these blocks. This editing step is optional and users should take care to delete only those blocks that are well beyond the limits of the regional transit service area. If there is any doubt whether a block is or is not part of a metropolitan area, then the blocks should be left in the data set.
- **Providing a User-Name to Zones in the CTPP Geographic Files.** The CTPP Zone Shape files include an empty field named LSAD_TRANS which can be filled with a user-defined name up to 6 characters long. This name, in conjunction with the FIPS state and county codes, is used in all subsequent processing. This capability may be used to give one or more zones a more easily remembered name for use in the zone or path query options. In two cases, a user name is required in LSAD_TRANS:
  - When zones are split (see below), an alternate name must be specified so that each zone is uniquely identified.

  - When import trip table data is used (Incremental and Special Generator STOPS modes), some or all zones must be given a special name that controls how the trips are to be used. If the first character of the zone name in LSAD_TRANS is coded as a "$", the zone is identified as being a special zone and trips to and from this location are obtained from the imported trip table rather than the CTPP. A tilde ("~") in the first character position means that the zone uses CTPP records but the import file can use a shorter version of the zone identification. See Section 12.1 for more detail[35].

- **Splitting CTPP Geography.** In some cases, the CTPP geography will be too coarse to support detailed analysis of transit ridership potential. To improve (to some degree) the geographic precision of the model, STOPS allows users to split Census geography. This is done by using a GIS package to edit the census boundary files in ESRI shape file format (i.e., split large zones into several smaller zones). The user must take care to ensure that the original FIPS state, county, and TAZ (or tract or block group) designations appear in each split zone. That way, STOPS knows to associate the proper CTPP Journey-to-Work records with each of the split zones. CTPP Journey-to-Work flows are allocated to split zones based on:
  - The relative population and employment of underlying MPO zones (if the MPO zone system has detail comparable to the split zones); or
  - The relative area of each split zone

  The user is responsible for assigning a new and unique zone identifier (up to 6 characters) for each split zone and coding this identifier in the LSAD_TRANS field.

- **Controlling the Geographic Extent of the Analysis.** Special coding can also be used to control the geographic extent of the analysis. By default, STOPS processes all CTPP zones within 25 miles of a coded station/bus stop in the station file. In some cases, this rule extends the STOPS analysis into nearby regions that are not served by the modeled transit agency. To limit STOPS to a specific service area for the modeled transit agencies, STOPS allows users to enter special codes in the LSAD field of the Census geographic files. These codes are defined as follows:

[35] Travel between a "$" zone and a "~" zone may come from either the CTPP or the import file depending on the STOPS mode. For Mode 2-Special markets, these trips originate from the import file. For 4-Type 2 Special Markets, these trips originate from the CTPP. For 3-Incremental, no travel is assumed to occur.

- <blank>: The default value which tells STOPS to include the zone and trips as long as the zone centroid is within 25 miles of an active station or stop.
- YY: Include this zone in the STOPS analysis area but only process CTPP Journey-to-Work trips that travel to/or from a zone coded with a blank in LSAD. If both ends have "YY" in LSAD, then do not process any CTPP trips for this zone-to-zone interchange[36] .
- XX : Exclude this zone from the STOPS analysis

Fare Structure File (Optional, But Highly Recommended)

STOPS allows users to code a simplified representation of a region's transit fare system. This file must be located in the inputs\ directory and is named "STOPS_fare_structure.ctl." Figure 36 presents the STOPS_fare_structure.ctl for the Kansas City example. The first 26 rows of this table are comments (noted by "!" in the first character of each line) and are shown here and in the example file to illustrate the range of available fare structure controls. Fare structure parameters and syntax are as follows:

- **Value-of-Time.** The value-of-time (VOT) control sets the value-of-time in dollars per hour. Typically the VOT ranges between $6 and $18/hour with $12/hour being most common. In cases where a region has a range of fares, the VOT can be calibrated by starting with the default estimate (e.g., $12/hour) and comparing modeled ridership (before count-based adjustment) to counted ridership. If higher-fare routes are systematically over-predicted then the VOT should be updated to a lower value. If higher-fare routes are systematically under-predicted then the VOT should be higher. STOPS can be run iteratively with adjustments to VOT until modeled and observed ridership match. Syntax is as follows:

  VOT=xxxx.xx

  Where:

[36] This capability is most useful when modeling a suburban carrier that serves a local market in the suburbs and also carries commuters into the central city. The suburban zones would have a blank in LSAD and the central city zones would be coded with "YY" in LSAD. This tells STOPS to estimate transit trips for suburb-suburb, suburb-city, and city-suburb trips but not city-city. GTFS files should be provided for both the suburban carrier and for urban transit system since suburban commuters may transfer to the urban system to reach their final destination. The number of coded unlinked trips for calibration would be set to the ridership on the suburban carrier plus an allowance for the estimated number of boardings that suburban customers will make when transferring to or from the urban transit system.

xxxx.xx is the value-of-time in dollars per hour

- **Default Boarding Fare.** The default boarding fare specifies the boarding fare in dollars for all GTFS route_types and routes, in dollars. This specification should appear at or near the beginning of the file so that subsequent commands (i.e., the TypeBoardFare and the RouteBoardFare command) can be used to override this default for specific route_types and routes. If the default boarding fare is not specified, then any service not covered by a later boarding fare command is assumed to be free to board. Syntax is as follows

  DefaultBoardFare= xxxx.xx

  Where xxxx.xx=default boarding fare in dollars

- **Boarding Fare for Specific Route_Types.** The TypeBoardFare command specifies the boarding fare for specific combinations of GTFS route_type and GTFS file. Syntax is as follows:

  TypeBoardFare= t,ss,xxxx.xx

  Where:

  t=GTFS route_type that is affected by this control. If a legal GTFS route_type appears, the fare coded on this control applies only to routes coded with that route_type (one digit number between 0 and 7[37]). If this field is left blank, then this control applies to all route_types.

  ss=STOPS suffix for the GTFS file specified with an ampersand followed by a letter. If no ampersand or suffix is coded, this control applies to all GTFS files. If an ampersand appears without another character, (e.g., "&") this control applies only to those GTFS files with a blank suffix. An ampersand followed by a letter (e.g., "&A") means that this control applies only to GTFS files specified with that letter as its suffix.

  xxxx.xx is the boarding fare in dollars

- **Boarding Fare for Specific Routes.** The TypeBoardFare command specifies the boarding fare for specific combinations of GTFS route_id and GTFS file. Syntax is as follows:

  RouteBoardFare= r,ss,xxxx.xx

  Where:

  r=GTFS route_id that is affected by this control. If a GTFS route_id appears, the fare coded on this control applies only to routes

[37] At present, STOPS recognizes only the original route_type specifications.

coded with that route_id. If this field is left blank, then this control applies to all route_ids. Unlike many other STOPS commands, route_ids in the fare structure file are coded just as they appear in the routes.txt GTFS file (i.e., without any "&" and suffix). Any suffixes that apply to the control are applied in the next field.

ss=STOPS suffix for the GTFS file specified with an ampersand followed by a letter. If no ampersand or suffix is coded, this control applies to all GTFS files. If an ampersand appears without another character, (e.g., "&") this control applies only to those GTFS files with a blank suffix. An ampersand followed by a letter (e.g., "&A") means that this control applies only to GTFS files specified with that letter as its suffix.

xxxx.xx is the boarding fare in dollars

- **Transfer Fares.** Two types of transfer fares can be coded: 1) Absolute ("ABS") transfer fares are always 0 or positive and represent the cost to make the transfer. A coded value of 0.00 means that there is no cost to board the second vehicle. A coded value of 0.50 means that there is a flat $0.50 charge to board the second vehicle. 2) Incremental ("INC") transfers are always 0 or negative and represent the discount from the normal boarding fare for the service. A value of -1.00 means that the user saves $1.00 off of the normal boarding cost.

  Syntax:

  XferFareABS= t1,ss1,t2,ss2,qqqqq.qq (Absolute)

  XferFareINC= t1,ss1,t2,ss2,qqqqq.qq (Incremental)

  Where:

  t1=route_type for the service from which the trip transfers[38]

  ss1=suffix for the service from which the trip transfers

  t2=route_type for the service from which the trip transfers

  ss2=suffix for the service to which the trip transfers

  qqqq.qq=coded transfer charge in dollars

- **Zone Fares.** Control allows specification of zone fare surcharges that are applied in addition to any boarding fare that applies to the service. Zone fares are not affected by transfer fares so it may be necessary to code published fare tables in two parts. The first board could be the base cost of the service which is coded as a boarding fare and the extra cost above the

[38] From and to route_types and suffixes are coded according to the same rules as apply to boarding fares. As above, when these fields are left blank, they apply to all services.

base fare can be coded using the zone fare command. Zone fares can be developed separately for each GTFS file or applied to all GTFS files (like the other commands described above). Zone fares refer to the fare zone field in the STOPS station file (described later in this chapter). Syntax is as follows:

ZoneFare= ss,yy,zz,xxxx.xx

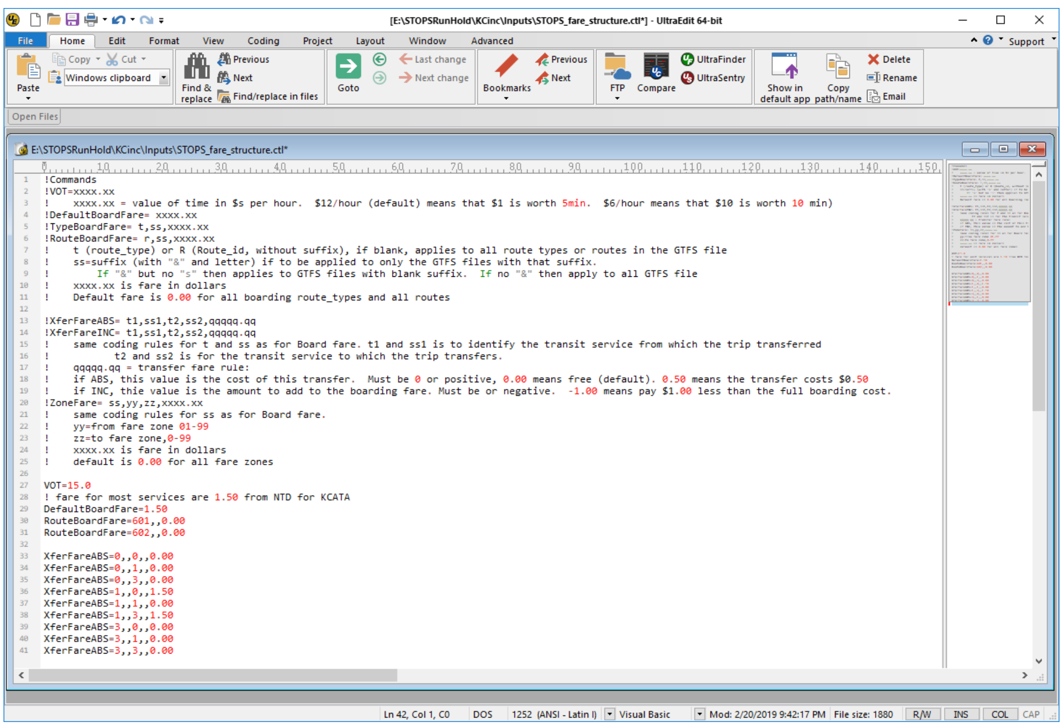
Where:

ss=STOPS suffix following the same rules that apply to boarding fares

yy=fare zone, 01-99, for the station where the boarding occurred

zz=fare zone, 01-99, for the station where the trip alights

xxxx.xx is the fare zone-to-fare zone charge in dollars



```
!Commands
!VOT=xxxx.xx
!    xxxx.xx = value of time in $s per hour.  $12/hour (default) means that $1 is worth 5min.  $6/hour means that $10 is worth 10 min)
!DefaultBoardFare= xxxx.xx
!TypeBoardFare= t,ss,xxxx.xx
!RouteBoardFare= r,ss,xxxx.xx
!    t (route_type) or R (Route_id, without suffix), if blank, applies to all route types or routes in the GTFS file
!    ss=suffix (with "&" and letter) if to be applied to only the GTFS files with that suffix.
!        If "&" but no "s" then applies to GTFS files with blank suffix.  If no "&" then apply to all GTFS file
!    xxxx.xx is fare in dollars
!    Default fare is 0.00 for all boarding route_types and all routes

!XferFareABS= t1,ss1,t2,ss2,qqqqq.qq
!XferFareINC= t1,ss1,t2,ss2,qqqqq.qq
!    same coding rules for t and ss as for Board fare. t1 and ss1 is to identify the transit service from which the trip transferred
!           t2 and ss2 is for the transit service to which the trip transfers.
!    qqqqq.qq = transfer fare rule:
!    if ABS, this value is the cost of this transfer.  Must be 0 or positive, 0.00 means free (default). 0.50 means the transfer costs $0.50
!    if INC, thie value is the amount to add to the boarding fare. Must be or negative.  -1.00 means pay $1.00 less than the full boarding cost.
!ZoneFare= ss,yy,zz,xxxx.xx
!    same coding rules for ss as for Board fare.
!    yy=from fare zone 01-99
!    zz=to fare zone,0-99
!    xxxx.xx is fare in dollars
!    default is 0.00 for all fare zones

VOT=15.0
! fare for most services are 1.50 from NTD for KCATA
DefaultBoardFare=1.50
RouteBoardFare=601,,0.00
RouteBoardFare=602,,0.00

XferFareABS=0,,0,,0.00
XferFareABS=0,,1,,0.00
XferFareABS=0,,3,,0.00
XferFareABS=1,,0,,1.50
XferFareABS=1,,1,,0.00
XferFareABS=1,,3,,1.50
XferFareABS=3,,0,,0.00
XferFareABS=3,,1,,0.00
XferFareABS=3,,3,,0.00
```

Figure 36 Example STOPS Fare Structure File

5.4 Define the Forecast Year

When all files containing the census, TAZ and other related information have been defined, the status for Step 3 "List and Check TAZ and CTPP Files" changes to "FILES FOUND!" as shown in Figure 37.

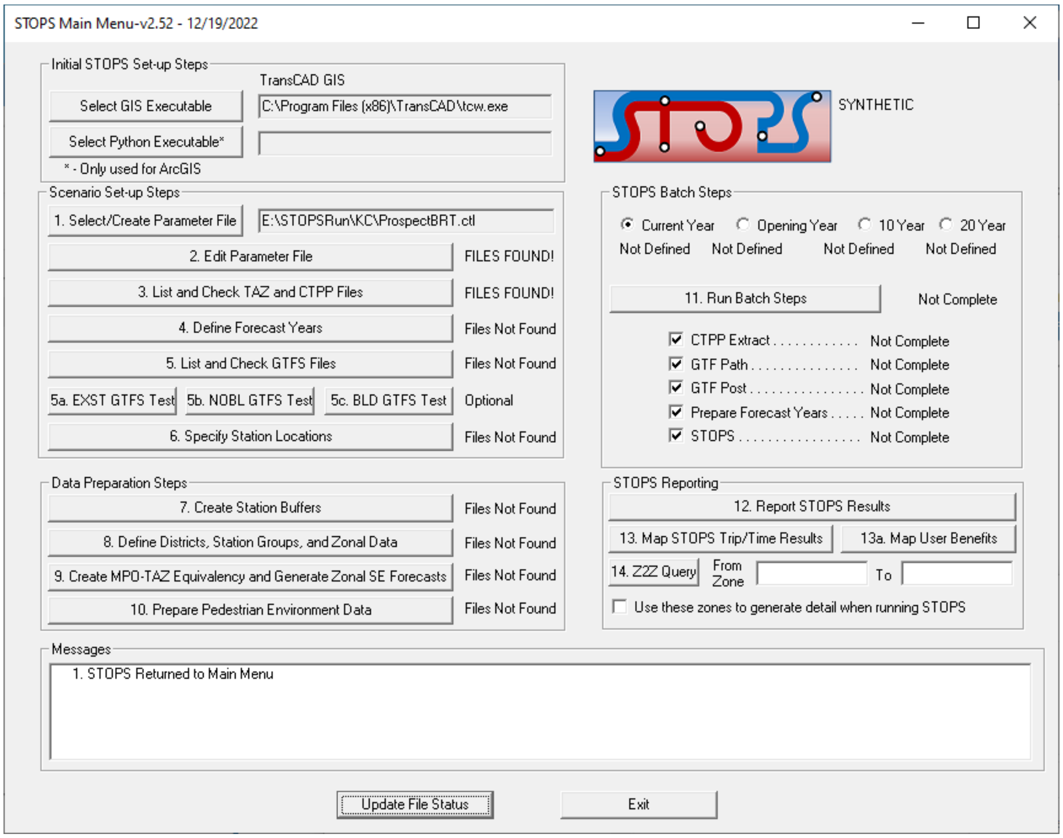


Figure 37 STOPS Menu After All TAZ and CTPP Files Have Been Found

The next step is to define the Forecast Years. This is done by clicking on "4. Define Forecast Years". If this is the first time you have clicked on this option, STOPS will ask if it can create a new year definition control file. If the user answers "Yes", then the screen shown in Figure 38 appears.

This dialog defines each of the analysis years, variables in the MPO zone layer file, and other related ridership information. Most items relate to the MPO zone layer file described in Section 5.3 – MPO Population/Employment File. The user must identify the field names in this file that correspond to the different data items used by STOPS to adjust CTPP trips to represent future years. Field names are selected using drop down lists containing the available field names in the MPO zone data file. Year fields are character strings that should contain the year numbers that are used in reports and file names to identify the year being modeled. The unlinked trip field is a numeric quantity that is entered by the user and read by STOPS as part of its self-calibration routine. The following data are entered in this dialog:

- Numeric TAZ Field Name (required). The field in the MPO zone layer file containing the numeric MPO TAZ number used to identify origins and destinations in the auto skim file. Note that this field must be coded as an integer in the database file that is part of the ESRI shape file.

- CTPP Year (2015, 2008 or 2000 depending on the CTPP version selected in the Parameter File) Population Field Name (required). The field in the TAZ layer file containing the MPO estimate of CTPP Year population.

- CTPP Year (2015, 2008 or 2000) Employment Field Name (required). The field in the TAZ layer file containing the MPO estimate of CTPP Year employment.

- Current Year (required). A four-digit number identifying the current year for the model calibration and application.

- Current Population Field Name (required). The field in the TAZ layer file containing the MPO estimate of current year population.

- Current Employment Field Name (required). The field in the TAZ layer file containing the MPO estimate of current year employment.

- Current Year Regional Transit Unlinked Transit Trips (weekday transit boardings, optional in STOPS but required by FTA for Capital Investment Grant (CIG) reporting). If this number is entered, then STOPS will self-calibrate to match the number of regional transit boardings. STOPS will adjust the modeled number of unlinked trips traveling within the 25-mile corridor and using the coded GTFS services to match this entry. It is very important that the coded number reflect both the geographic corridor definition and the GTFS systems included in the model run. If a significant portion of transit operations included in the GTFS inputs serve areas outside of the 25-mile corridor radius then any trips occurring in whole or in part outside of the corridor should be excluded from the unlinked trip estimate. Likewise, travel on smaller operators that are not represented by the GTFS files should be excluded from the estimate of regional ridership.

- Optional Years and Field Names for Opening Year, 10-Year, and 20-Year Forecasts. STOPS allows definition of up to 3 additional years that represent the project opening year, a medium-term horizon year, and a long-term horizon year. These entries are optional.

- Growth Factor Geography. This radio button selection indicates whether STOPS will factor trips on a zone-by-zone basis or on a district-by-district basis. Generally, zone-level factoring is preferred unless the estimates of zone-level population and employment are not consistent between years and should not be used for updating the CTPP. District-level factoring will generate much more consistent growth between the zones in the corridor while zone-level factoring will show greater differences in growth among zones. The decision of which to use depends on the nature of the MPO forecasts. If the MPO estimates of zone-specific growth assumptions are thought to be representative of future plans, then zone factoring should be used. If the zonal variation is thought to represent spurious differences in data sources then district factoring should be used.

- Skip smoothing of future year special market trips. If checked, this box indicates that STOPS should not attempt to smooth trips in the survey trip database to be consistent with population and employment estimates in the MPO file. Instead, the survey trip table will be factored according to the relative number of base and forecast year residents and employees, without any checks to confirm that the trips per resident/employment are consistent. Checking this box means that the user has high confidence with the survey trip inputs to STOPS and does not wish for them to be smoothed to match socioeconomic projections.

Figure 39 shows the Year Definition Dialog after information for the Kansas City example is entered.

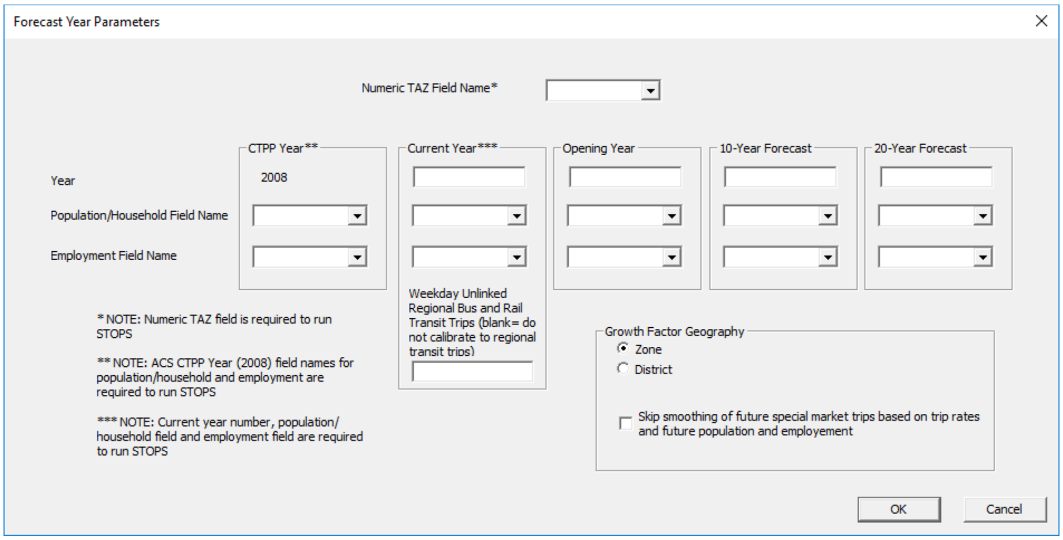


Figure 38. Year Definition File Dialog Before User Entries

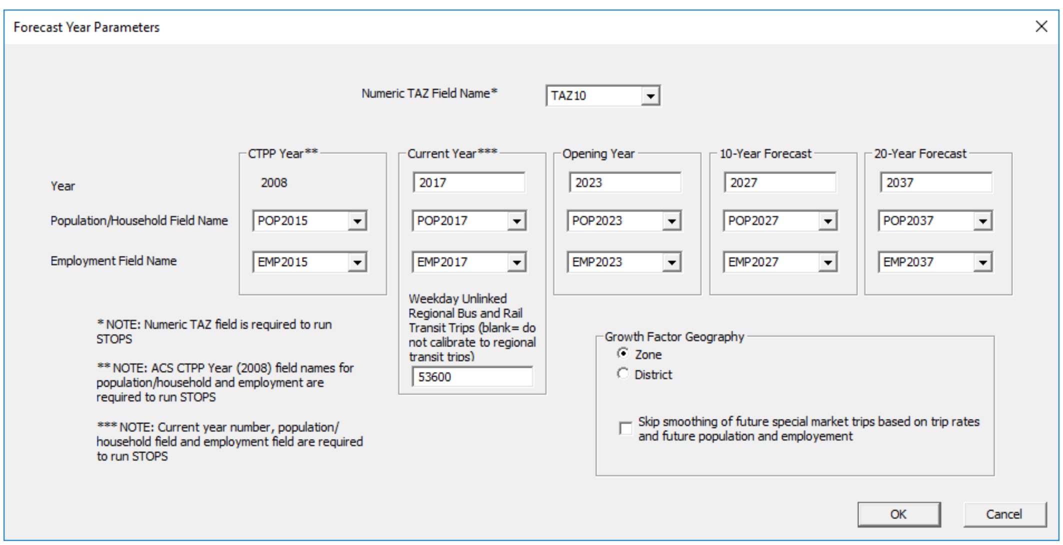


Figure 39. Year Definition File After User Entries for Kansas City Example

5.5 List and Check GTFS Files

The next step in the scenario set-up process is to place the required transit schedule files in General Transit Feed Specification (GTFS) format in the proper folders. At the beginning of this step, the main menu appears as shown in Figure 40. The user can click on "5. List and Check GTFS Files" to obtain a complete list of GTFS file names and locations. STOPS shows the GTFS file names separately for the Existing, No-Build, and Build scenarios as shown in Figure 41, Figure 42, and Figure 43. If a scenario has more than 4 GTFS file sets, STOPS will show additional screens so that all GTFS file names are identified to the user.

All GTFS files are organized as subfolders to the inputs\ folder in the STOPS run directory. Each GTFS file set (e.g., each agency or each operating division) appears in a separate subfolder. In each of these subfolders the following files must be defined:

- Agency.txt. Information on the agency operating the GTFS file set.
- Calendar.txt or calendar_dates.txt. At least one of these files must exist (both files are also allowed). Together, these files define a series of "service_id" records. Each service_id is given a starting and ending date and the days-of-the-week that the service operates. Calendar_dates is used to override the standard definitions to account for service changes on holidays or other special cases.
- Routes.txt defines the different routes operated by the agency. From the perspective of STOPS, one of the most important pieces of information in the routes.txt file is the route_type. STOPS uses this field to distinguish bus routes (type 3) from streetcar or other fixed guideway systems operating in mixed traffic (type 0) and all other fixed guideway routes (types 1, 2, 4, 5, 6, and 7).
- Trips.txt. Defines a series of transit vehicle trips. Information in the trips.txt file includes the trip_id that identifies the trip, the route_id that identifies the route name and route type, and the service_id that identifies the days that this trip operates.
- Stops.txt. Defines all bus stops and transit stations in the system. This file defines the stop_id and the name, and the latitude and longitude of each bus stop or rail station.
- Stop_times.txt. Defines the time at which each trip arrives and departs from each stop. This file, optionally, can include information on whether boardings or alightings are prohibited at the stop.
- Freqencies.txt. Instead of defining separate trips and stop_time records for each bus trip, GTFS allows agencies to create an optional frequencies.txt file the describes how user-selected trips are repeated over the course of the day. This capability is most helpful for services which are operated on a set frequency or headway over a period of time.

The GTFS directories may also include two optional files which are extensions to the GTFS standard:

- PNR.txt. This file is an extension to the original GTFS specification and defines locations with park-and-ride facilities. PNR records include the latitude and longitude of the facility, the ability of the facility to attract users from a large or small area, and the generalized cost of using the facility (both dollar and time costs) expressed in terms of minutes.
- Editlist.txt. Another extension of the original GTFS specification that gives a series of programmatic overrides to simplify the process of coding alternatives.

A more complete description of the GTFS standard and its usage in STOPS is presented in Section 14.0.

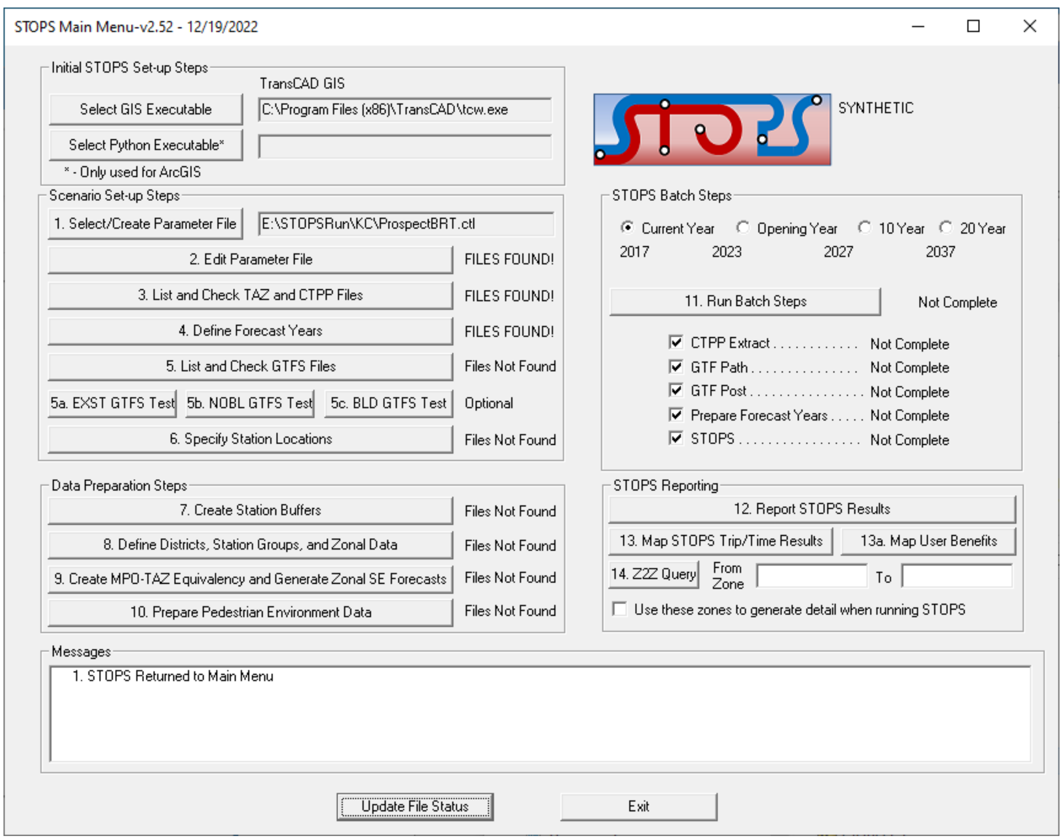
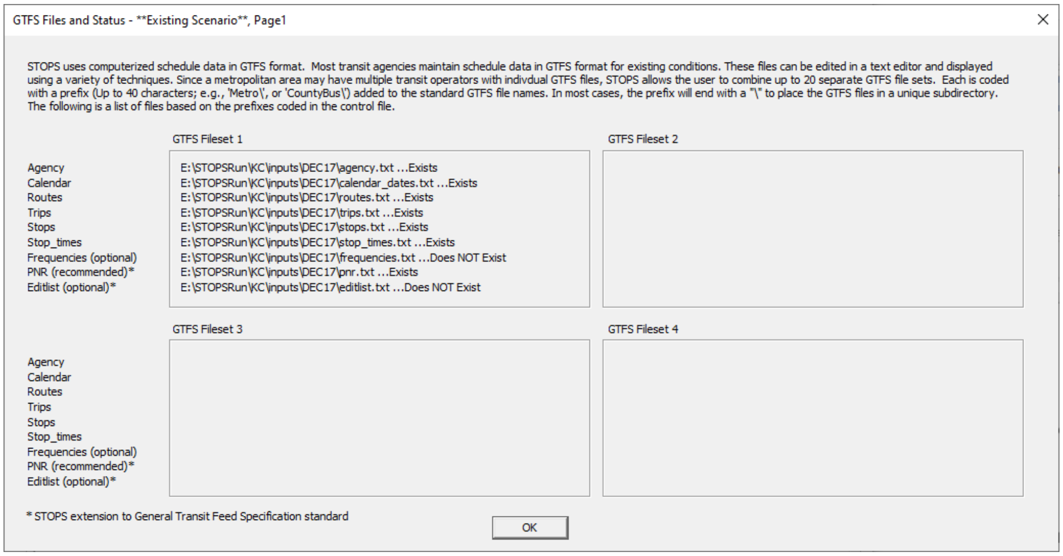
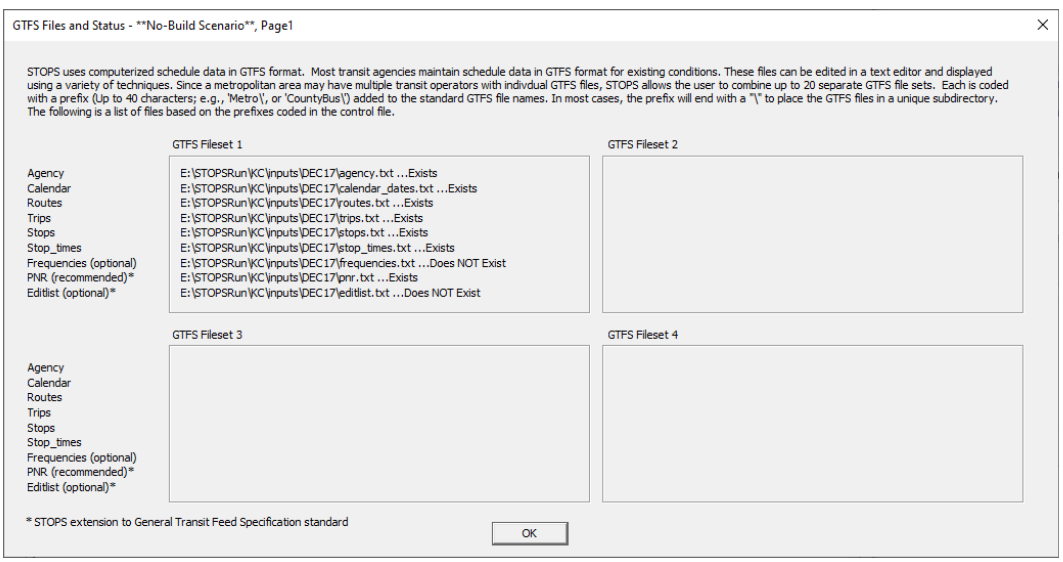


Figure 40. STOPS Main Menu Before GTFS Files Are Provided in the Proper Folders



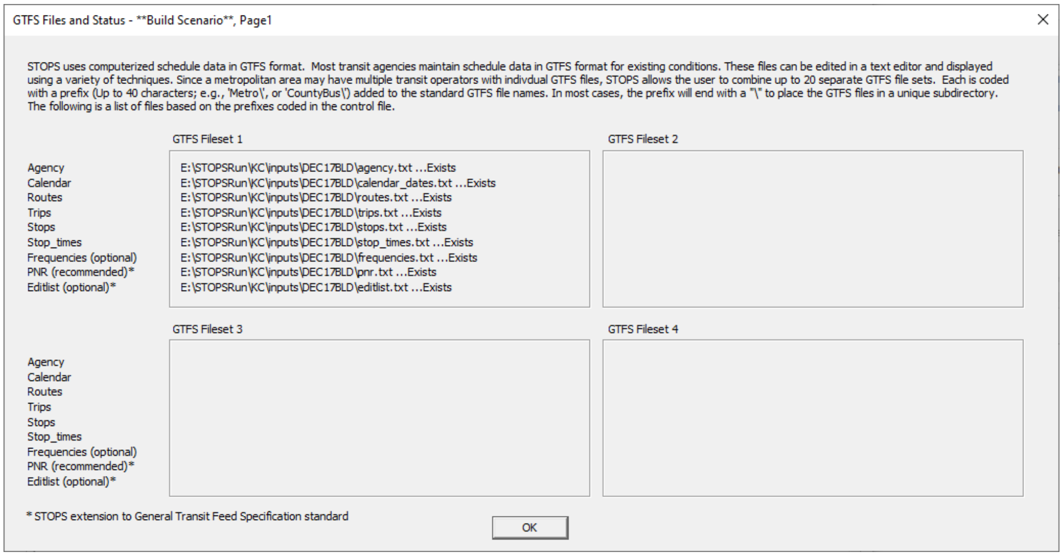
Note: shows display after files are present in the proper folder

Figure 41. GTFS File Names and Locations for Existing Scenario



Note: shows display after files are present in the proper folder

Figure 42. GTFS File Names and Locations for No-Build Scenario



Note: shows display after files are present in the proper folder

Figure 43. GTFS File Names and Locations for Build Scenario

5.6 Testing GTFS Files and Preparing Station Inputs

When all GTFS files are copied to the proper directories, the screen appears as shown in Figure 44.

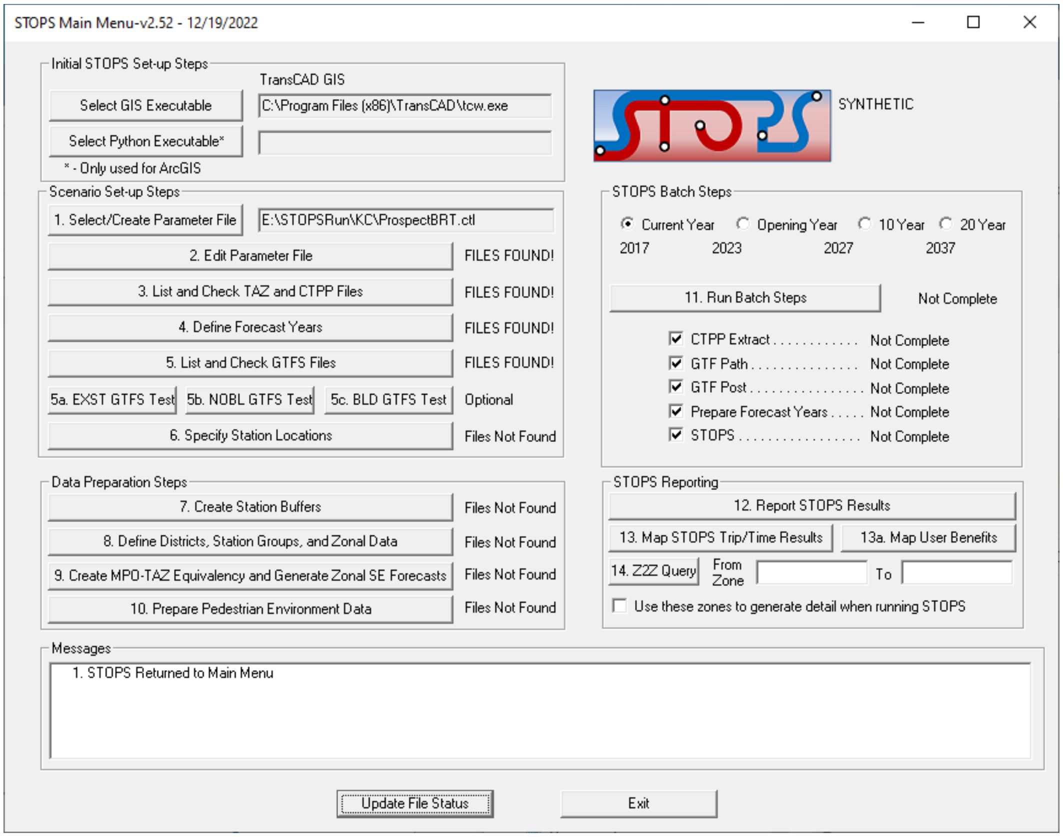


Figure 44. Main Menu After All GTFS Files Loaded into Proper Folders

The next step is to test these files to:

- Confirm that the GTFS files can be successfully read by STOPS and contain no errors such as duplicate ID fields, unreadable numeric information, or other coding that violates the GTFS standard.
- Provide a listing of stations and stops that can be helpful in the next step, preparing a station file.
- Generate an output GTFS directory combining all of the input GTFS files in one location.

This step is accomplished by clicking:

- "5a. EXST GTFS Test" – all GTFS files for the Existing Scenario
- "5b. NOBL GTFS Test" – all GTFS files for the No-Build Scenario
- "5c. BLD GTFS Test" – all GTFS files for the Build Scenario

If you are planning on using the GTFS files to prepare the starting station file, then all three GTFS test steps should be run. It is always possible to add stations later if the build stations have not been defined or if the build alternative test is not run.

When each test step is run, STOPS will confirm that the user wants to run the operation with the dialogs shown in Figure 45 and Figure 46[39]. To run the test, click "Yes" in response to both confirmation questions. Next, a dialog box appears that asks the user to confirm the scenarios to run. The user should accept STOPS's defaults and click "OK."

Each test step generates a complete output GTFS file in the GTFSOutput folder. This folder has 6 sub folders for the peak and off-peak periods, and for the existing, no-build, and build GTFS schedules.

This step also gives the user the option to see all stop_ids used in each run as shown in Figure 47. If the user clicks Yes, then STOPS opens the report shown in Figure 48. The information in this report can be used by STOPS to develop the initial version of the station file as described in the next step.

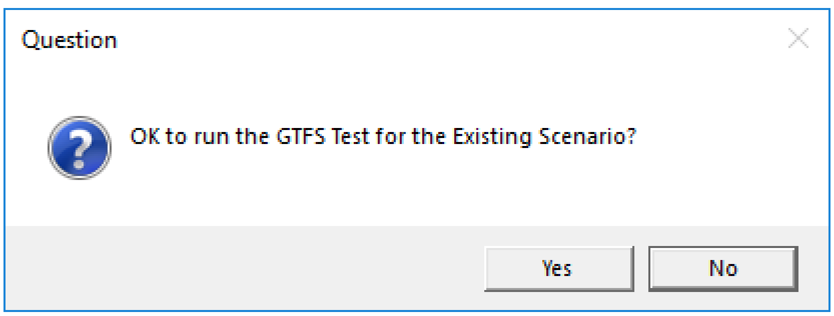


Figure 45. First Confirmation of Test Step

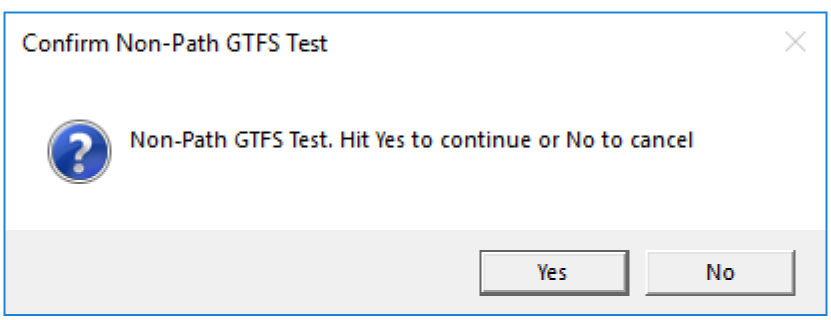


Figure 46. Second Confirmation of Test Step

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[39] Later in the STOPS setup process when enough information is available to generate a test path, the second confirmation will change to ask if the user wishes to build a test path. See Section 6.5 for more information.

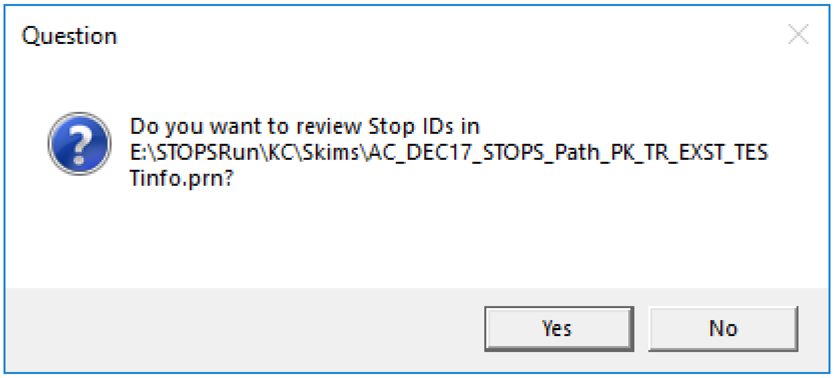
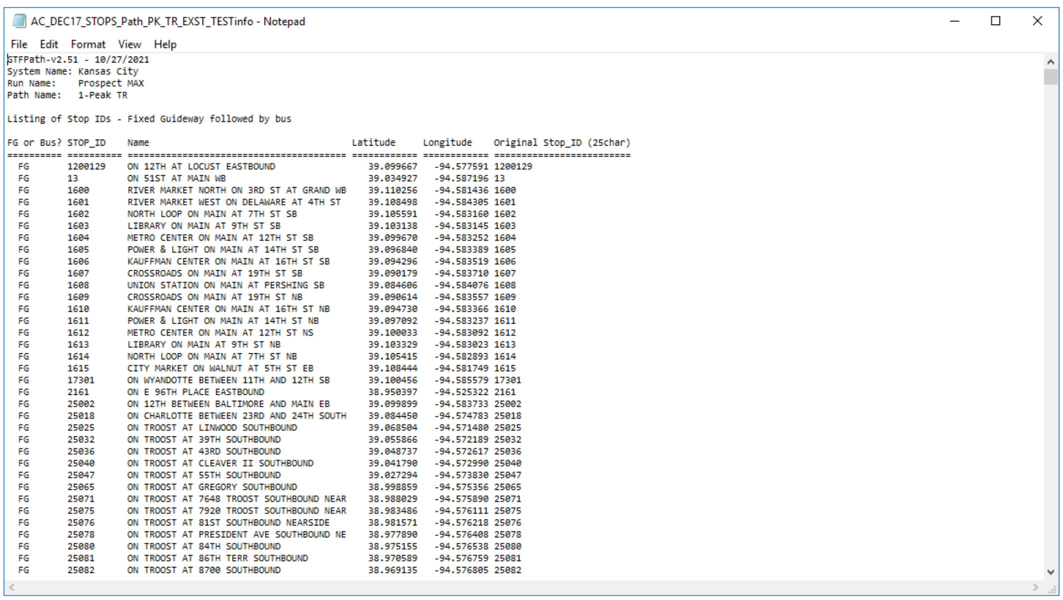


Figure 47. Option to Review Stop IDs




```
GTFPath-v2.51 - 10/27/2021
System Name: Kansas City
Run Name:    Prospect MAX
Path Name:   1-Peak TR

Listing of Stop IDs - Fixed Guideway followed by bus

FG or Bus? STOP_ID    Name                                      Latitude     Longitude    Original Stop_ID (25char)
========== ========== ========================================= ============ ============ =========================
  FG       1200129    ON 12TH AT LOCUST EASTBOUND                  39.099667   -94.577591 1200129
  FG       13         ON 51ST AT MAIN WB                           39.034927   -94.587196 13
  FG       1600       RIVER MARKET NORTH ON 3RD ST AT GRAND WB     39.110256   -94.581436 1600
  FG       1601       RIVER MARKET WEST ON DELAWARE AT 4TH ST      39.108498   -94.584305 1601
  FG       1602       NORTH LOOP ON MAIN AT 7TH ST SB              39.105591   -94.583160 1602
  FG       1603       LIBRARY ON MAIN AT 9TH ST SB                 39.103138   -94.583145 1603
  FG       1604       METRO CENTER ON MAIN AT 12TH ST SB           39.099670   -94.583252 1604
  FG       1605       POWER & LIGHT ON MAIN AT 14TH ST SB          39.096840   -94.583389 1605
  FG       1606       KAUFFMAN CENTER ON MAIN AT 16TH ST SB        39.094296   -94.583519 1606
  FG       1607       CROSSROADS ON MAIN AT 19TH ST SB             39.090179   -94.583710 1607
  FG       1608       UNION STATION ON MAIN AT PERSHING SB         39.084606   -94.584076 1608
  FG       1609       CROSSROADS ON MAIN AT 19TH ST NB             39.090614   -94.583557 1609
  FG       1610       KAUFFMAN CENTER ON MAIN AT 16TH ST NB        39.094730   -94.583366 1610
  FG       1611       POWER & LIGHT ON MAIN AT 14TH ST NB          39.097092   -94.583237 1611
  FG       1612       METRO CENTER ON MAIN AT 12TH ST NS           39.100033   -94.583092 1612
  FG       1613       LIBRARY ON MAIN AT 9TH ST NB                 39.103329   -94.583023 1613
  FG       1614       NORTH LOOP ON MAIN AT 7TH ST NB              39.105415   -94.582893 1614
  FG       1615       CITY MARKET ON WALNUT AT 5TH ST EB           39.108444   -94.581749 1615
  FG       17301      ON WYANDOTTE BETWEEN 11TH AND 12TH SB        39.100456   -94.585579 17301
  FG       2161       ON E 96TH PLACE EASTBOUND                    38.950397   -94.525322 2161
  FG       25002      ON 12TH BETWEEN BALTIMORE AND MAIN EB        39.099899   -94.583733 25002
  FG       25018      ON CHARLOTTE BETWEEN 23RD AND 24TH SOUTH     39.084450   -94.574783 25018
  FG       25025      ON TROOST AT LINWOOD SOUTHBOUND              39.068504   -94.571480 25025
  FG       25032      ON TROOST AT 39TH SOUTHBOUND                 39.055866   -94.572189 25032
  FG       25036      ON TROOST AT 43RD SOUTHBOUND                 39.048737   -94.572617 25036
  FG       25040      ON TROOST AT CLEAVER II SOUTHBOUND           39.041790   -94.572990 25040
  FG       25047      ON TROOST AT 55TH SOUTHBOUND                 39.027294   -94.573830 25047
  FG       25065      ON TROOST AT GREGORY SOUTHBOUND              38.998859   -94.575356 25065
  FG       25071      ON TROOST AT 7648 TROOST SOUTHBOUND NEAR     38.988029   -94.575890 25071
  FG       25075      ON TROOST AT 7920 TROOST SOUTHBOUND NEAR     38.983486   -94.576111 25075
  FG       25076      ON TROOST AT 81ST SOUTHBOUND NEARSIDE        38.981571   -94.576218 25076
  FG       25078      ON TROOST AT PRESIDENT AVE SOUTHBOUND NE     38.977890   -94.576408 25078
  FG       25080      ON TROOST AT 84TH SOUTHBOUND                 38.975155   -94.576538 25080
  FG       25081      ON TROOST AT 86TH TERR SOUTHBOUND            38.970589   -94.576759 25081
  FG       25082      ON TROOST AT 8700 SOUTHBOUND                 38.969135   -94.576805 25082
```

Figure 48. Sample Stop_ID Listing from GTFS Test

5.7 Specify Station Locations

The last step in the scenario set-up process is to create a station location file. This file is an ESRI shape file and must, at a minimum, have one point for each existing or future fixed guideway station in the regional transit system. Ideally, this file will also include a record for each bus stop in the system since these additional records will allow the demand models to use bus stop-level ridership count information during the calibration phase, resulting in a stronger model.

The station file can be developed in one of four ways:

1. Manually copy a station file from another setup and edit in a GIS package to represent the current scenarios.
2. Prepare an input station data text file with a text editor and then import this table into the station file.
3. Use the GTFS tests (run in the previous step) to generate a starting station file. This file is then edited in a GIS package to add additional information for each stop.
4. Use STOPS to generate a partially-populated table of rail stations and then complete the table in a GIS package.

No matter which of these options is selected, the STOPS station file must include the following fields:

Table 9. Required Fields in Station File

Field Name	Data Type	Width	Description
STATIONSEQ	Integer	6	A sequence number used to sort the stations for reporting in STOPS.
STATION	Character	35	Station name.
STAT_CODE	Character	9	A shorter code used for some reporting.
STAT_GRP	Integer	8	A number group number (generally 1 to 50, but may be as high as 250) used for aggregating stops for calibration purposes.
GRP_NAME	Character	6	The name of the station group. Only one station in each group needs to be named. If more than one station in a group is given a non-blank name, then STOPS will use the last grp_name to label the group in reports. To avoid confusion, users should ensure that either 1) only one station in a group is given a group name or 2) all stations in a group are given the same group name.
DAILYBOARD	Integer	8	Number of daily boardings counted at this station or stop. If no riders use this stop in the count period, code a zero. If ridership is unknown for this station or stop and is also unknown for every other station in this group, code a 0. For special

Field Name	Data Type	Width	Description
			cases where ridership is known for other stations in the group but not this particular station, code a number less than 0 (e.g., -1). A negative number flags STOPS to add its own estimate of ridership at this station prior to performing station group calibration.
STOP_ID1	Character	25	Up to 4 GTFS STOP_IDs that represent this station or stop. Up to 25 characters can be used. If the GTFS file uses a GTFS suffix, then an ampersand and the suffix is added to the end of the GTFS STOPS_ID. The total length, including the suffix, is limited to 25 characters.
STOP_ID2	Character	25	
STOP_ID3	Character	25	
STOP_ID4	Character	25	
STOPSTYPE	Integer	6	Code to indicate usage of this station: 0 = not used in this STOPS run 1= At grade station/ no PNR 2= At-grade station/ PNR 3= One grade level up or down/ no PNR. Adds 0.5 minutes of access/egress time 4= One grade level up or down/ PNR. Adds 0.5 minutes of access/egress time 5= Two grade levels up or down/ no PNR. Adds 1.0 minutes of access/egress time 6= Two grade levels up or down/ PNR. Adds 1.0 minutes of access/egress time 7= Three grade levels up or down/ no PNR. Adds 1.5 minutes of access/egress time 8= Three grade levels up or down/ PNR. Adds 1.5 minutes of access/egress time
NEWSTATION	Integer	8	Code to identify stations/stops associated with a project. Codes are: 0=Not a project station 1=New (project) station

Field Name	Data Type	Width	Description
			2=[Rarely Used] Indicates stations on one side of a project to represent run-through trips[40]. STOPS now does this computation automatically. 3=[Rarely Used] Indicates stations on the other side of a project to represent run-through trips. STOPS now does this computation automatically. 4=Station that is not a project station but should still be reported in station-to-station matrices
WALK_PEN	Real Number	10.2	Additional (penalty) time (in minutes) to add to all centroid-to-station walk access/egress links. This penalty is added to the times already computed from horizontal separation (latitude and longitude) and vertical separation (STOPSTYPE). This penalty may represent actual walking times or other contributors to impedance (e.g., fare or perceptions of the service).
KNR_PEN	Real Number	10.2	Similar to WALK_PEN but applied to centroid-to-station kiss-and-ride access/egress connections
PNR_PEN	Real Number	10.2	Similar to WALK_PEN but applied to centroid-to-station park-and-ride access/egress connections
SAMEGTFX	Real Number	10.2	Similar to WALK_PEN but applied to stop-to-stop transfer links generated by STOPS when the stops appear in the same GTFS file[41].

[40] Earlier versions of STOPS used New Station type 3 and 4 for any case where a project bridges a gap between two existing transit services. In this case, project trips may include travelers who do not board or alight at a project station but just pass through. Starting with STOPS v1.50, STOPS automatically detects person trips that cross a gap as long as the train or bus makes a station stop at one or more stations coded as type 1. If a train or bus does not stop at a new station, the user could code a dummy station on the new segment and set the GTFS pickup and dropoff code to 1 to prevent passengers from boarding or alighting at that station. Alternatively, the user could use Newstation codes 3 and 4 on either side of the gap.

[41]Note that if a transfer link connects two stops with a non-zero value of SAMEGTFX, then both SAMEGTFS time values are added to the link. Transfers made at a single stop_id location do not require a connecting link and SAMEGTFX times are not added to the transfer. Transfer links obtained from the optional GTFS transfers.txt file are presumed to represent a realistic estimate of the transfer time and are not further adjusted by adding SAMEGTFX or grade-separation times.

Field Name	Data Type	Width	Description
DIFFGTFX	Real Number	10.2	Similar to WALK_PEN but applied to stop-to-stop transfer links when the stops appear in the different GTFS files.
FAREZONE	Integer	2	Mandatory if fare structure file contains zone fares. Optional otherwise. Contains a fare zone designation between 0 and 99. (0 used to indicate that zone fares do not apply to this station/stop).

The details regarding each option for preparing the station file are described below.

Station File Preparation Option 1: Copy the Station File from Another Scenario

In cases where a region is creating a new STOPS setup from a pre-existing STOPS run, then it is often easiest to copy the STOPSSTATIONS shape files[42] from the old inputs\ directory to the new inputs\directory. If this option is desired, the user should copy the station file into the new directory prior to running Step 6, Specify Station Locations. As long as a STOPSSTATIONS.SHP file exists in the inputs\ subdirectory, Step 6 will open the existing the station shape file and use the selected GIS executable to create a map with the station file. The user can then use GIS editing tools to add, delete and modify the stations and stops required for the new STOPS run.

Station File Preparation Option 2: Import Station Text File

If the STOPSSTATIONS.SHP file is not in the inputs directory when Step 6 is clicked, STOPS looks to see if the inputs\ directory has a file named "STOPSStationInputs.txt." If so, the user is asked if STOPS should read this file and use it to create a new STOPSTATIONS.SHP file.

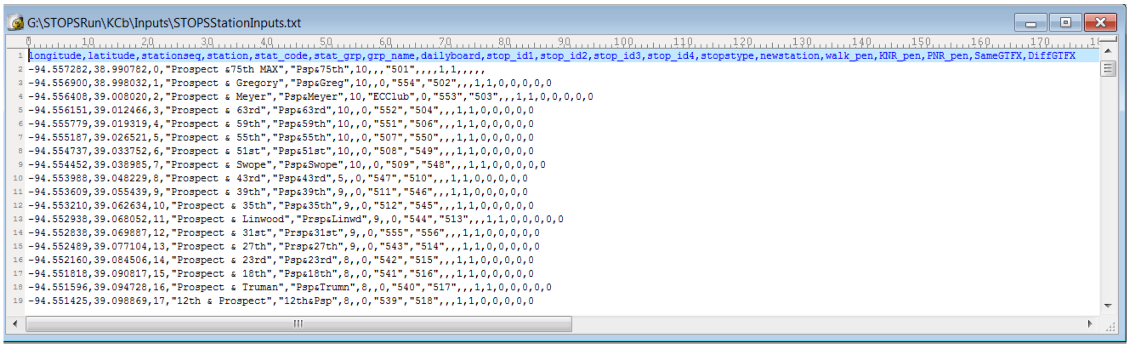
A sample of the import station text file is shown in Figure 49.

This file begins with a header record describing the fields that appear in the file, followed by one record for each station to be added to the station file. The fields can be in any order as long as the header and the data records are consistent. The latitude and longitude fields are required and must appear in the file. Other fields are optional and if they are omitted from the header or left blank in the data records, the

[42] Shape files are contained in a set of windows files with the same file name but different extensions. At a minimum, those extensions are .shp, .shx, and .dbf. Other extensions may also be present. All files with the STOPSSTATIONS name must be copied.

shape file field will be created but these data items will be left blank for later editing with a GIS.

Data fields have the same names and contents as described for the ESRI shape file. The names are not case sensitive and will be converted to all capitals as part of the process that creates the shape file.


G:\STOPSRun\KCb\Inputs\STOPSStationInputs.txt

```
longitude,latitude,stationseq,station,stat_code,stat_grp,grp_name,dailyboard,stop_id1,stop_id2,stop_id3,stop_id4,stopstype,newstation,walk_pen,KNR_pen,PNR_pen,SameGTFX,DiffGTFX
-94.557282,38.990782,0,"Prospect &75th MAX","Psp&75th",10,,,"501",,,,1,1,,,,,
-94.556900,38.998032,1,"Prospect & Gregory","Psp&Greg",10,,0,"554","502",,,1,1,0,0,0,0,0
-94.556408,39.008020,2,"Prospect & Meyer","Psp&Meyer",10,"ECClub",0,"553","503",,,1,1,0,0,0,0,0
-94.556151,39.012466,3,"Prospect & 63rd","Psp&63rd",10,,0,"552","504",,,1,1,0,0,0,0,0
-94.555779,39.019319,4,"Prospect & 59th","Psp&59th",10,,0,"551","506",,,1,1,0,0,0,0,0
-94.555187,39.026521,5,"Prospect & 55th","Psp&55th",10,,0,"507","550",,,1,1,0,0,0,0,0
-94.554737,39.033752,6,"Prospect & 51st","Psp&51st",10,,0,"508","549",,,1,1,0,0,0,0,0
-94.554452,39.038985,7,"Prospect & Swope","Psp&Swope",10,,0,"509","548",,,1,1,0,0,0,0,0
-94.553988,39.048229,8,"Prospect & 43rd","Psp&43rd",5,,0,"547","510",,,1,1,0,0,0,0,0
-94.553609,39.055439,9,"Prospect & 39th","Psp&39th",9,,0,"511","546",,,1,1,0,0,0,0,0
-94.553210,39.062634,10,"Prospect & 35th","Psp&35th",9,,0,"512","545",,,1,1,0,0,0,0,0
-94.552938,39.068052,11,"Prospect & Linwood","Prsp&Linwd",9,,0,"544","513",,,1,1,0,0,0,0,0
-94.552838,39.069887,12,"Prospect & 31st","Prsp&31st",9,,0,"555","556",,,1,1,0,0,0,0,0
-94.552489,39.077104,13,"Prospect & 27th","Prsp&27th",9,,0,"543","514",,,1,1,0,0,0,0,0
-94.552160,39.084506,14,"Prospect & 23rd","Psp&23rd",8,,0,"542","515",,,1,1,0,0,0,0,0
-94.551818,39.090817,15,"Prospect & 18th","Psp&18th",8,,0,"541","516",,,1,1,0,0,0,0,0
-94.551596,39.094728,16,"Prospect & Truman","Psp&Trumn",8,,0,"540","517",,,1,1,0,0,0,0,0
-94.551425,39.098869,17,"12th & Prospect","12th&Psp",8,,0,"539","518",,,1,1,0,0,0,0,0
```

Figure 49. Sample STOPSStationInputs.txt File

Station File Preparation Option 3: Create Station File from GTFS

If Step 6, doesn't find the STOPSSTATIONS file in the inputs directory and if the import file does not exist, the GTFS files identified in the parameter file can be used to generate an initial version of the station file. This can only be done after the GTFS files have been identified in the parameter file and tested with Steps 5a, 5b, and 5c. These testing steps generate a special file that contains sufficient information for STOPS to generate a shape file representing all transit stops and stations with information on location, station name and stop_id. After this station file is created, the user must use a GIS package to enter the required information for all other fields.

Station File Preparation Option 4: Generate a Partial Rail Station File and Manually Add Stations and Stops

If Step 6, doesn't find the STOPSSTATIONS file in the inputs directory and if no other option was selected, then STOPS can create a blank station file using a national database of rail stations. The user can then supplement the data in this file using the selected GIS executable.

Station File Editing For All Options

After the file has been created, STOPS will ask the user the following question each time Step 6 is clicked:

> StationFile <directory>\Inputs\STOPSStations.shp already exists. Do you want to check output of steps 5a/5b/5c to see if new stations should be added?

If the answer to this question is "Yes" then STOPS will keep all records in the existing STOPSStation file as long as the sequence number is greater than -99. Then, STOPS will look in all of the GTFPath test runs to identify any new STOP_IDs that should be added. All newly added STOPS IDs will be given a sequence of -1 to make the new records easy to find for final editing in a GIS package.

> ***Since STOPS does not copy records coded with a sequence number of -99 or less, this is an easy way to remove unused station ids from the station file (as long as the stop_id does not appear in any of the GTFS files).***

If the answer is "No", then STOPS goes straight to the GIS package to allow manual editing of the file. No matter which option is selected, STOPS uses the selected GIS executable to open the shape file and allows users to add, delete, or modify stations. An example of the station map and underlying database are shown in Figure 50.

Depending on which technique was used to create the station file, the user may have to populate any field that is empty or has obsolete information. The station file is a critical input to STOPS and must be carefully completed with data that describe:

- The station and stop names that are to be reported in the summary report.
- The grouping of stations and stops for purposes of calibration and reporting.
- The GTFS stop_ids (up to 4) that, together, should be treated as a station.
- Boarding counts to indicate the ridership (boardings) attracted to each station or bus stop.
- The STOPS_type and newstation values to indicate whether the station is to be used, the degree of grade separation and whether the station is new to the project.
- Any additional time penalties that are required to represent impedances associated with the station.

If you are using TransCAD to edit stations, then STOPS created an editable TransCAD geographic database from the ESRI shape file that is used as the input to STOPS. After the user closes TransCAD, STOPS asks if it is OK to copy this file back to the ESRI shape file format. Click "Yes" to copy this data back to ESRI

Shape File format or "No" to skip this step and lose the changes entered into TransCAD. This dialog is shown in Figure 51.

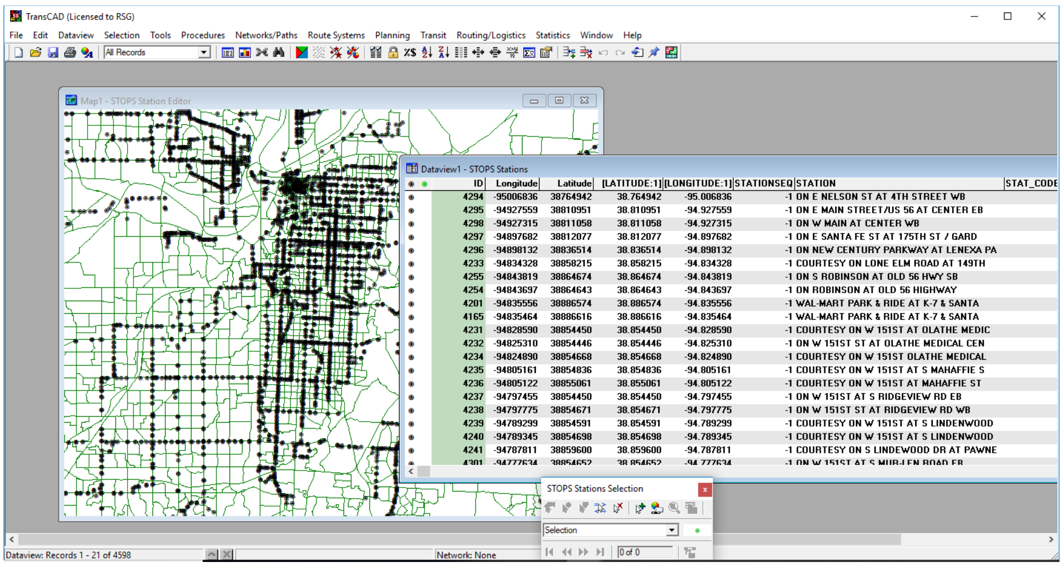


Figure 50. Sample Station file in GIS

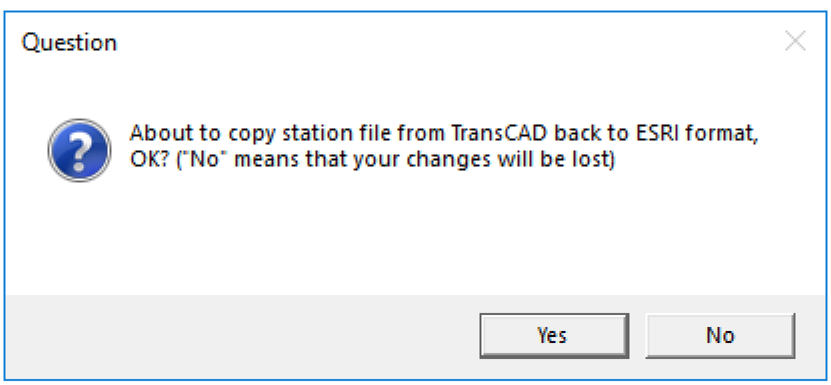


Figure 51. TransCAD Confirmation After Station Editing

5.8 Specify Special Parameters (Rarely Used)

The STOPS user interface provides a mechanism for users to adjust standard STOPS parameters to improve the representation of transit service and demand in a metropolitan area beyond those provided in the User Interface and discussed in Section 5.2. Additional controls affecting development of shortest transit paths and the STOPS demand model can be specified using a series of override files. In most cases, no overrides are necessary and these files will not be created[43]. these files will be updated based on guidance from FTA regarding the resolution of a modeling issue. In these cases, FTA will supply all required information regarding the syntax and meaning of the command. In limited cases, the user may recognize a problem with the STOPS defaults and propose a solution.

Special Parameters for GTFPath (Rarely Used)

Special Parameters for GTFPath are coded in a series of files located in the inputs\ directory and named "GTFPathOverride01.ctl", "GTFPathOverride02.ctl" through "GTFPathOverride18.ctl". The two digit file numbers (at the end of the body of the filename and before the ".ctl") relate to the scenario, path type, and time period as shown in Table 10.

Table 10. GTFPathOverride File Numbers

Path Type	Existing		No-Build		Build	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
General Transit (Bus + Fixed Guideway)	01	02	07	08	13	14
Fixed Guideway Only	03	04	09	10	15	16
Bus Only	05	06	11	12	17	18

These files are optional. If any of the 18 possible GTFPath override files does not exist, then no overrides for that combination of path, time period, and scenario are applied.

[43] The override files described in this section are optional. When they exist they are given specific names described later in this chapter and appear in the inputs\ subdirectory. The contents of each file are appended to the end of the control files developed by the STOPS user interface. When reading STOPS control files, the last record in the file with a particular parmater name is the one that affects the operation of the program. As a result appending the override file resets parameter values to those specified in that file. If no override file is provided, then the parameters specified in the STOPS user interface are the ones used in the operation of the program.

GTFPathOverride commands are usually not needed and should be reviewed by FTA staff. The most common suggested parameter relates to the need to adjust the assumed peak or midday arrival times to better coincide with the most common times of travel. If the peak arrival time needed to be changed from the default of 8:00 am to 7:30 am, then GTFPathOverride01.ctl could be created using the as shown in Figure 52.

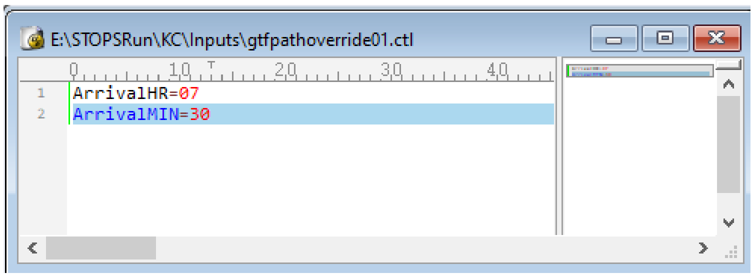


Figure 52. Sample GTFPathOverride01.ctl File

Since this change would likely apply to all peak period files, GTFPath Override files similar to this example would be created for all odd file numbers between 01 and 17.

GTFPath Override commands that are occassionally coded include:

- ArrivalHR and ArrivalMIN. Set the desired base time (coded in 24-hour or military time format). Default is 08:00 for peak paths and 13:00 for offpeak paths. For example to reset the arrive time to 07:30, code the following:

  ArrivalHR=07

  ArrivalMIN=30

- nTimeSamples and SampleTimeRange. By default, STOPS builds 7 paths at different times over a range of 51 minutes and then selects which path to use for any particular zone-to-zone interchange based on the zone sequence numbers. This mimics a random selection of time for each interchange while always using the same selection for all model runs using that zone system. The nTimeSamples command can be used to change the number of time samples from the default value of 7 to any value greater than 1. Please note that the running time of the pathbuilder is proportional to this value so any number of time samples greater than 7 could significantly increase the running time of the model. The time range default of 51 can be reset using the SampleTimeRange command. To increase the number of sample to 13 over a 111 minute time range, code the following commands:

  nTimeSamples=13

  SampleTimeRange=111

- MaxTripMIN. By default, STOPS paths as long as 180 minutes of weighted travel time. This limit can be increased with the MaxTripMIN command. For example, to increase the maximum weighted travel time to 250 minutes, code:

  MaxTripMIN=250

- Walk Speed. By default, STOPS assumes that travelers can walk at 3 miles per hour. The Walk Speed command can change this assumption. For example, to change the walk speed to 2.5 miles per hours, code:

  WalkSpeed=2.5

- XferLimit. By default, STOPS builds stop-to-stop transfer links between all stops located within 0.25 miles of one another. These connections are made between stops located in any GTFS fileset and do not require walk network links[44]. Transfer links are also built between PNR lots and transit stops (in this case transferring from car to transit) and are controlled by the same distance limit. Occasionally, this standard must be reduced to prevent particularly egregious cases of STOPS creating impossible transfer links (i.e., across a small river or it must be increased to represent places where a large PNR lot is more than 0.25 miles from its associated transit station. For example, to change th XferLimit to 0.33, code:

  XferLimit=0.33

Other GTFPath commands may be suggested by FTA in response to specific problems but are not advised for use without guidance from FTA.

Special Parameters for STOPS Demand Model (Rarely Used)

Special parameters for the STOPS demand model are coded in an optional override file located in the inputs directory and named STOPSoverride.ctl. If this file does not exist, no overrides are applied. If the file does exist, then the contents of the override file are appended to the default control file, overriding previously coded values (in STOPS, if commands are duplicated, the last command read is the operative command). An example STOPSoverride.ctl file

[44] Walk links are typically built from block-level street files which are generally too coarse to represent walk opportunities between bus stops.

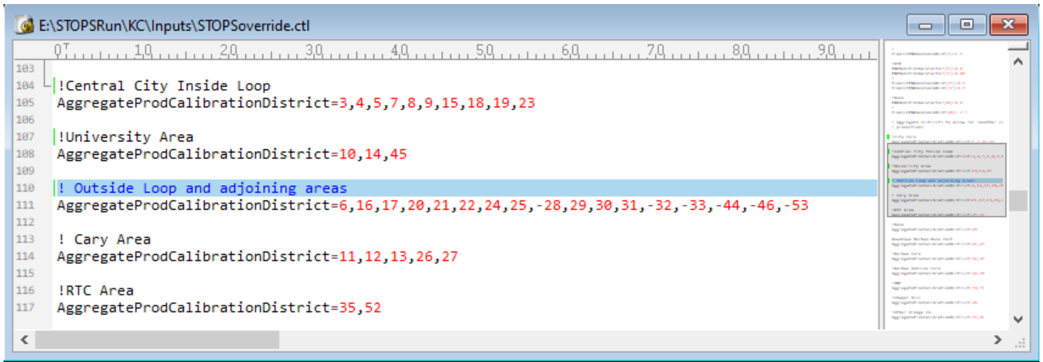


Figure 53. Sample STOPSOverride.ctl File

Generally, users should not use the STOPSOverride.ctl file without guidance from FTA staff concerning a particular problem with the standard application. Several of the more commonplace commands include:

- Aggregate Districts for Calibration. As will be discussed later in this document, STOPS allows users to define up to 99 districts (numbered 1 to 99). These districts are used for reporting of district-to-district trip tables and as the aggregation basis for calibrating mode choice constants. Occasionally, a user needs more detailed districts for reporting (e.g., districts that respect jurisdictional boundaries) that are too fine for calibrating the model (e.g., have too few transit trips and/or person trips to reliably estimate transit shares and constants). When this happens, districts can be aggregated for calibration purposes using the AggregateProdCalibrationDistrict (aggregations used for constants related to trip productions) and AggregateAttrCalibrationDistrict (aggregations used for constants related to trip attractions). Each command includes the keyword given above followed by a list of districts to sum into a single aggregate district. The new aggregate district is saved to the district number for the first listed district. For example, to aggregate production districts 10, 14, and 45 and save in district 10 (and cause districts 14 and 45 to be empty for calibration purposes) the user can code:

  AggregateProdCalibrationDistrict=10,14,45

  If the user wishes the same aggregations for Attractions, then the following line would be added (along with the previous line):

  AggregateAttrCalibrationDistrict=10,14,45

Other commands are available for handling special issues but require guidance from FTA regarding their proper use.

6.0 Data Preparation Steps

In the previous chapter, the user defined the STOPS run and prepared input information that will be used to estimate project ridership. If every initial set-up step was successfully completed, then the STOPS Main Menu should show the status as being "FILES FOUND!" through Step 6 as shown in Figure 54.

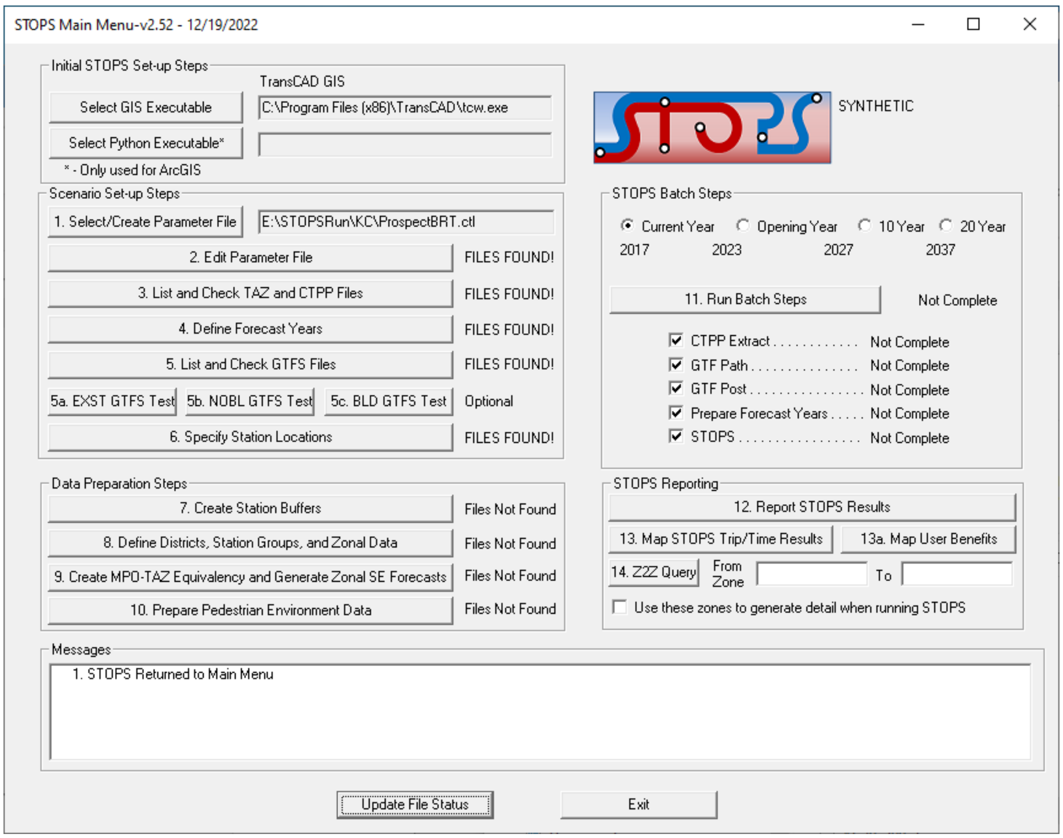


Figure 54. STOPS Main Menu at the Beginning of Data Preparation

This chapter describes the next round of STOPS preparation steps, focusing on additional data that is required to generate estimates of project boardings. Four steps must be accomplished to complete data preparation and are described in the remainder of this chapter.

These steps are different from the steps in Chapter 5.0 (Scenario Set-up) in a very important way. In the previous Chapter, the steps involve setting up the model run and the steps need not be accomplished sequentially[45]. The user may go back and forth between editing stations, specifying parameters, and coding GTFS scenarios until all files are fully defined.

[45] Unless GTFS stop_ids are used to create the station file. In that case, GTFS files must be created and identified in the parameter file and steps 5a, 5b, and 5c must be run before Step 6 is run.

Beginning with this section, STOPS steps are sequential. Any change to an earlier step may affect downstream steps. If it becomes necessary to recode a data item in an earlier step (including Scenario Setup), then all later elements of Data Preparation generally should be re-run to ensure that all data is properly updated throughout STOPS. Some key exceptions to this general rule are as follows:

1. If the station file is updated but without changing the station time penalties), the user only needs to re-run the STOPS step (last option in Step 11) as long as the station file revisions do not affect the geographic scope of the project. This may happen if the user updates station groups, group names, or ridership. If the user adds a new station within the geographic range of existing stations, the user need only re-run the STOPS step.

2. Likewise, if the District file is updated, then the user need only re-run the STOPS step.

6.1 Create Station Buffers

This step is a completely automated process that builds a series of buffers around the stations that were specified in the station shape file and compares them to the CTPP geography file(s) selected in the parameter file. The principal result is a file containing a listing of each CTPP zone (AC, TZ, BG, or TR) to be included in the modeling file. This program also creates a blank district file in ESRI shape format that is pre-populated with district=99 (i.e., unknown district) or whatever districts were assigned after an earlier run of this program. The next section has more information about the process of defining districts.

The step is initiated by clicking on "7. Create Station Buffers". This command will call the program "StatBuffZone" which runs for several minutes without any need for user intervention. When done, the program will return to the STOPS Main Menu.

It is possible that you will receive an error message that says:

> "Error: Duplicate zone names found. Split Zones (or duplicate zones form the original census files) must have alternate name specified in LSAD_TRANS field of CTPP Zone File.

A follow-up message will direct you to a file that contains a list of duplicate names.

When this happens, open up your census geography file and code a unique override zone label in the LSAD_TRANS field. (see the discussion on split zones in Section 5.3, Optional Adjustments to the Census Data, for a more complete discussion of this process). As long as the LSAD_TRANS value is unique, it can be any 6-

character string. When all necessary changes have been made, re-run the Create Stations Buffer step. Once all duplicates have been resolved, the error message will not be generated and this step will be labeled with "FILES FOUND!"

6.2 Define Districts, Station Groups, and Zonal Data

In this step, users define a series of zone and station aggregations that STOPS uses for calibration and reporting. Optionally, the user can also define additional zonal information that helps STOPS understand "greenfield" development areas and "brownfield" redevelopment sites. The information defined in this step includes:

- Districts, which are groups of one or more zones[46] that are used by STOPS to aggregate travel data to a level suitable for model calibration and reporting. Depending on the type of growth factoring selected by the user, districts also define the unit of geographic analysis used to update the base year CTPP to represent current and forecast year population and employment. Districts should be defined that represent groups of similar geographic areas along the project and other key transit markets. Districts should represent areas with levels of walk and drive accessibility to stations that are relatively close to one-another and share similar levels of transit service.
- Station groups, which are aggregations of stations or bus stops used for calibration. In most cases, station groups are defined according to the geographic district in which the station is located.
- Optional zone-related inputs include information on whether the zone should be cloned from another nearby location to reflect the fact that the area is expected to change substantially in the coming years.

Figure 55 shows the District and Station Group screen for the Kansas City example before any districts or station groups are defined[47].

[46] In this section, the word "zone" will be used to describe any of the geography types (A2, AC, TZ, BG, or TR)
[47] The Kansas City example provided by FTA has districts and station groups pre-populated so the initial screen looks like the example provided in Figure 56 when running the FTA example.

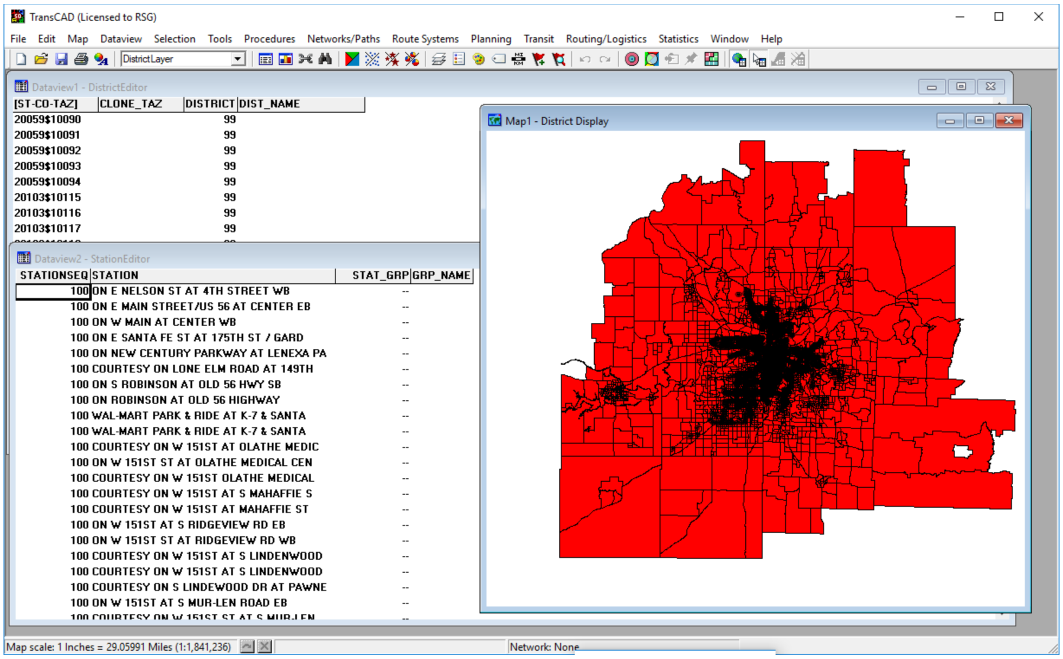


Figure 55. Sample District System in Kansas City, KS (Before Districts Defined by User)

This process begins when the user clicks on "8. Define Districts, Station Groups, and Zonal Data." This causes STOPS to open a map with:

- District and Zonal Characteristics File
- Station File

The adjustments that the user must make to each of these files is described in the sections that follow.

District and Zonal Characteristics File

Districts and zonal characteristics are defined in an ESRI shape file located in the Districts\ folder. This file is named AC_DistrictZone.shp[48] and contains one record for each zone in the modeling area. This file is created in Step 7, Create Station Buffers. The first time Step 7 is run, STOPS generates a "starter" district file with all districts set to "99" (defined as the "Other" district). If Step 7 is re-run, then it copies all previously defined districts over the new DistrictZone file

The user is responsible for updating all elements of this file except for the zone name found in the first field. The contents of the file are as follows:

[48] This is the name when the ACS version of the CTPP is used. When the Year 2000 CTPP is the basis for the zone file, the first two letters for the district file will be "TZ", "TR", or "BG" depending on which geography type was specified in the parameter file.

- **ST-CO-TAZ – the full name of the TAZ (or block group or tract).** This field is the full name of each zone as is prepopulated in the data file and should not be changed. This name is used by STOPS in all subsequent steps to describe the zone. Any user interactions that require a zone number will use this number. These interactions include: the imported trip table (see special rules for zones beginning with "$" or "~" in Section 12.1); the path trace options in Steps 5a, 5b, and 5c; and the Z2Z query option.
- **DISTRICT – District number (required and entered for every zone).** This integer must be between 1 and 98 and is used to identify the geographic district used for data summarization and mapping. District 99 is a special value used by STOPS to identify zones that have not been assigned to any district. This is the initial value of the district field before the user has defined districts. After the user has established district definitions, no zones should be left in district 99.

  Typical districts might include the CBD and a system of wedge-shaped districts that relate to key transportation corridors radiating outward from the CBD. The wedges may also be segmented by the characteristics of the area (e.g., urban, suburban, and exurban).

- **DIST_NAME - Description (required but entered only once for each district—most zones left blank).** This district name field serves two purposes:
  - **Assigns a name to each district.** This field is used to assign a short name to each District. The names can have as many as 18 characters. However, the district-to-district reports in STOPS only show the first 6 characters in the district headings so it is generally preferred to limit the district name to 6 characters.
  - **Identifies the middle of each district for path reporting purposes.** The most representative zone in each district should be the only zone with a non-blank DIST_NAME. STOPS automatically generates trace messages for any zone (up to a preset limit) with a non-blank DIST_NAME. ***Users should take care to only provide DIST_NAME for one zone per district. Otherwise, the path reporting feature is disabled.***

- **CLONE_TAZ - CloneTAZ (optional and only coded in cases where a zone completely changes its character).** When forecasting the CTPP JTW into the future, STOPS grows demand according the relative size of base year[49] and forecast year population and employment in each zone or district. In areas with existing development and growth that reflects "more of the same", this is sufficient to generate a reasonable estimate of future travel. This approach is less successful in areas that are projected to change

[49] 2008 or 2000 depending on which version of the CTPP (2006-2010 ACS or Year 2000 Long Form, respectively) is being used in STOPS

their character dramatically (e.g., from farm land to suburban activity center). The zone cloning process is a mechanism for overcoming this problem by allowing the user to tell STOPS that an undeveloped or re-developing zone will become more like another nearby zone (that already had development at the time of the CTPP). The process for specifying clones is as follows:

- **Step 1.** Define and name a clone group. A clone group is a series of one or more "donor" zones that establish the travel patterns that existed at the time of the CTPP that should be transferred to one or more "recipient" zones. In regions with multiple redevelopment areas, multiple clone groups can be defined. Each should be given a 4-character name (e.g., GRPA, GRPB, or GRPC)
- **Step 2.** For each zone in the DistrictZone file that is either a donor or recipient, enter a code into the CLONE_TAZ field that is defined as follows: <group that this zone contributes to as a donor>,<group that the zone borrows from as a recipient>. In some cases, the zone only contributes to a clone group. In that case, CLONE_TAZ is blank after the comma. In other cases, the zone only receives from a clone group. In this case, CLONE_TAZ is blank before the comma. When a zone contributes to and borrows from a group, then CLONE_TAZ is non-blank before and after the comma. When the zone is not involved with the cloning process, the entire CLONE_TAZ field is left blank.

Example: assume that zone "08012 1201" "the borrower zone" had an employment of 10 in 2008 but is expected to have 2,000 employees in 2015. Assume another "borrower zone" is Zone "08012 1204, which had no employment in 2008. Also assume that zones "08012 1202" and "08012 1203" (the "contributor" zones) are nearby and together had a Year 2008 employment of 10,000. In that case, the user might define clone Clone Group A in which zones "08012 1201" and "08012 1204" borrow the characteristics of clone zones "08012 1201", "08012 1202" and "08012 1203". The coding of Clone_TAZ for this situation is shown in Table 11.

Table 11. Clone_TAZ Coding in DistrictZone File

ST-CO-TAZ	CLONE_TAZ
08012 1201	GRPA,GRPA
08012 1202	GRPA,
08012 1203	GRPA,
08012 1204	,GRPA

Hint: Clone "donor" zones should be selected that had development patterns in the CTPP Year similar to what the "borrower" zone will have in the forecast years. If the borrower zone will have dense employment and no population then the donor zones should be a set of nearby zone(s) that had significant employment levels in the CTPP Year. If the borrower zone will have little employment but significant population in the future then the donor zones should be a set of nearby zone(s) with significant population in the CTPP Year but little employment. If the borrower zone will have significant levels of population and employment in the future, then the clone group should have donor zones with significant levels of population and employment in the CTPP Year. It is also important that the borrower and donor zones be near to one another since the trip patterns (including the other end of each trip) will be copied from the donor zones to the borrower zones.

The total population or employment of the donor zones need not match those values for the borrower zones. After cloning, STOPS will adjust the trips to and from each borrower zone to match the future year population and employment.

Station Group Information

Station groups are the other principal aggregation used in STOPS for controlling the calibration process. The initial definition of station groups should be consistent with the geographic districts that contain each stop. Step 8 can be used to update station group definitions since both the station and DistrictZone layers are present in the same GIS map. GIS tools such as posting an area attribute to a point attribute can be used to ensure that all station groups are defined according to the district that contains them.

Depending on the particular needs of the application, different station group coding schemes can also be employed. Station groups can be any value up to 250 (as compared to district values of up to 98) so that more detailed station groups can be defined if needed to refine the calibration of STOPS.

Completed District and Station Groups

Figure 56 shows the appearance of the district and station group coding after the user defines these items.

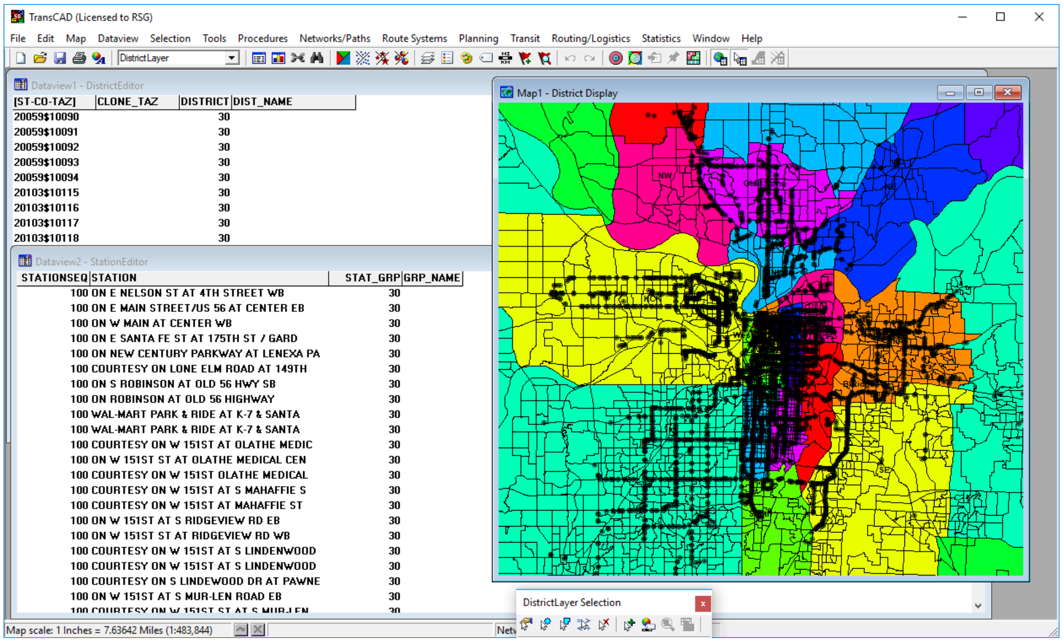


Figure 56. Districts and Station Groups After User Definition

6.3 Create MPO-TAZ Equivalency and File and Generate Zonal Socioeconomic Forecasts

This is a fully automated step that (1) creates an equivalency file between the CTPP geography and the MPO zone system and (2) generates a file with one record for each unit of CTPP geography containing MPO forecasts of population and employment for each year defined in the forecast year parameter file. ***It is important that this program be re-run any time the MPO zone file or the forecast year definitions are changed.***

This step is initiated by clicking on "9. Create MPO-TAZ Equivalency and Generate Zonal SE Forecasts". This procedure will start a program that will run for several minutes and return to the STOPS Main Menu. No user actions are required during this process.

6.4 Prepare Pedestrian Environment Data

This is a fully automated step that generates an estimate of the number of Census blocks contained in each unit of CTPP geography. This statistic is used to provide an indication of the completeness of the street grid in a zone which is often indicative of the walkability of an area. This step is initiated by clicking on "10. Prepare Pedestrian Environment Data". This action will start a program that will run for several minutes and return to the STOPS Main Menu.

6.5 Print Transit Path Trace for Selected Origin-Destination Zones (Optional)

When all of the data preparation tasks are complete, STOPS can generate transit paths for a user-selected origin and destination zone pair. This capability can be helpful prior to a STOPS run to confirm that the GTFS coding for each alternative is working as intended. This step can also be used after the run is complete to investigate specific paths that are of interest.

The path tracing option is invoked by clicking on Step 5a, 5b, or 5c (existing, no-build and build scenarios, respectively). These steps were previously described in Section 5.5 before the setup and data preparation steps were complete. At that time in the process, STOPS just checks the transit networks to confirm that the GTFS schedules are coded properly. Once all of the data preparation steps are complete, centroids and station penalties have been defined and, with this information, STOPS can generate full transit paths and a path trace report.

When path tracing is possible, the GTFS tests in steps (5a, 5b, and 5c) will open the dialog box shown Figure 57. If the user leaves one or both zone fields blank, STOPS will only test the GTFS schedules, just like the earlier process. If the user codes an entry in both zones, as shown in Figure 58, STOPS will generate a path trace for the selected zone pair. Note that the zone identifications must be the full STOPS zone name, which is structured as state code+county code+TAZ.

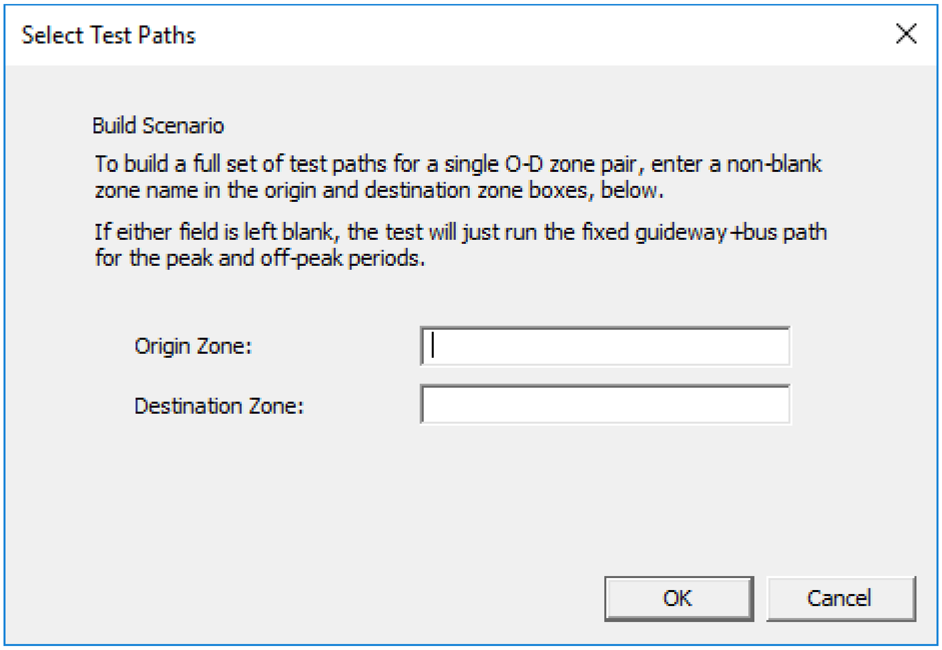


Figure 57. Dialog to Select Origin and Destination Zones for Path Trace Printing

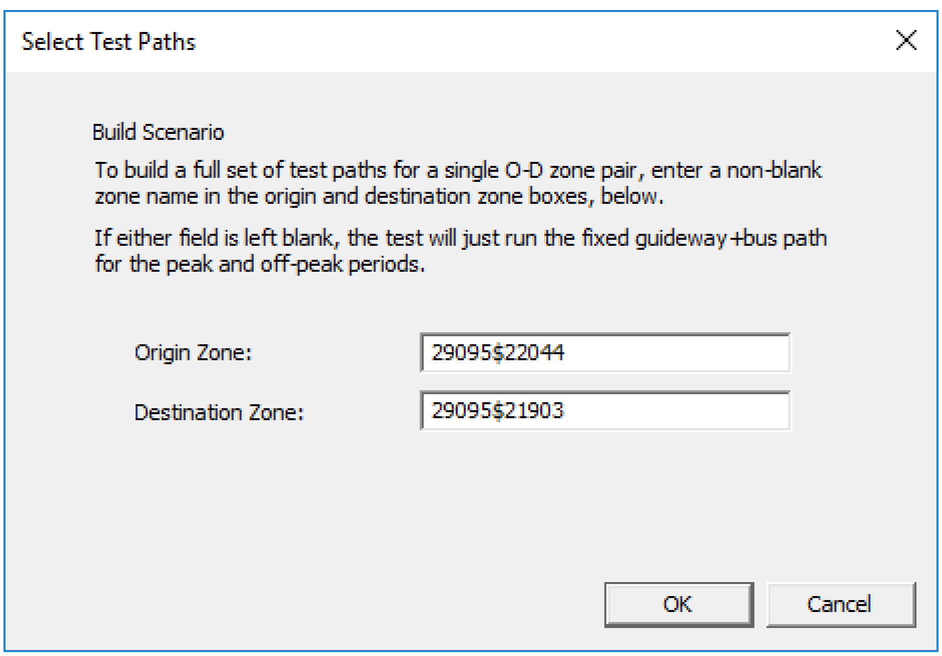
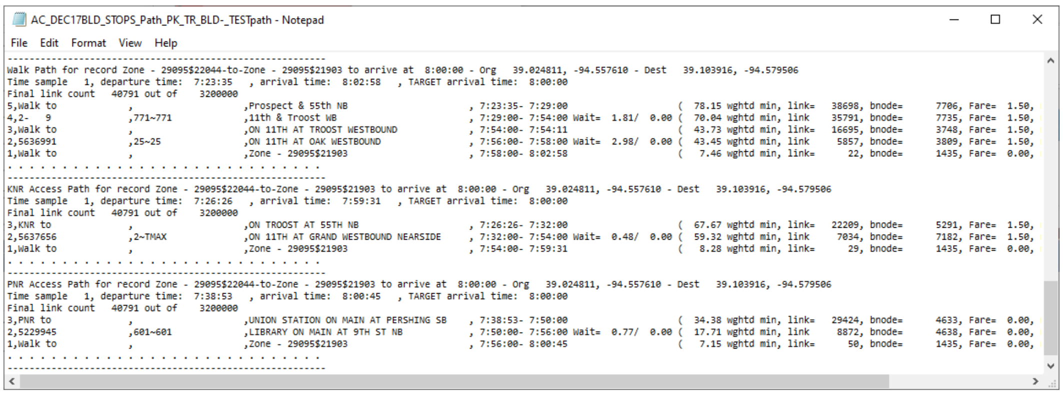


Figure 58. Path Trace Dialog with Origin and Destination Zones Entered

After a confirmation screen, STOPS runs the transit path-builder and generates six path files:

- 2 time periods--PK or OP (peak/off peak)
- 3 path type—TR, FG or BS (best transit, Fixed Guideway Only and Bus only)

STOPS will ask the user if it should open each of these files for review. If the user answers “Yes”, the path file will be opened in Notepad for display. A snapshot of one of these files appears in Figure 59.


AC_DEC17BLD_STOPS_Path_PK_TR_BLD-_TESTpath - Notepad

File Edit Format View Help

```
------------------------------------------------------
Walk Path for record Zone - 29095$22044-to-Zone - 29095$21903 to arrive at  8:00:00 - Org   39.024811, -94.557610 - Dest   39.103916, -94.579506
Time sample   1, departure time:  7:23:35   , arrival time:  8:02:58   , TARGET arrival time:  8:00:00
Final link count   40791 out of    3200000
5,Walk to            ,                 ,Prospect & 55th NB                    , 7:23:35- 7:29:00                 (  78.15 wghtd min, link=   38698, bnode=      7706, Fare=  1.50,
4,2-   9             ,771~771          ,11th & Troost WB                      , 7:29:00- 7:54:00 Wait=  1.81/  0.00 (  70.04 wghtd min, link    35791, bnode=      7735, Fare=  1.50,
3,Walk to            ,                 ,ON 11TH AT TROOST WESTBOUND           , 7:54:00- 7:54:11                 (  43.73 wghtd min, link=   16695, bnode=      3748, Fare=  1.50,
2,5636991            ,25~25            ,ON 11TH AT OAK WESTBOUND              , 7:56:00- 7:58:00 Wait=  2.98/  0.00 (  43.45 wghtd min, link     5857, bnode=      3809, Fare=  1.50,
1,Walk to            ,                 ,Zone - 29095$21903                    , 7:58:00- 8:02:58                 (   7.46 wghtd min, link=      22, bnode=      1435, Fare=  0.00,
. . . . . . . . . . . . . . . . . . . . . . . . . . . . .
------------------------------------------------------
KNR Access Path for record Zone - 29095$22044-to-Zone - 29095$21903 to arrive at  8:00:00 - Org   39.024811, -94.557610 - Dest   39.103916, -94.579506
Time sample   1, departure time:  7:26:26   , arrival time:  7:59:31   , TARGET arrival time:  8:00:00
Final link count   40791 out of    3200000
3,KNR to             ,                 ,ON TROOST AT 55TH NB                  , 7:26:26- 7:32:00                 (  67.67 wghtd min, link=   22209, bnode=      5291, Fare=  1.50,
2,5637656            ,2~TMAX           ,ON 11TH AT GRAND WESTBOUND NEARSIDE   , 7:32:00- 7:54:00 Wait=  0.48/  0.00 (  59.32 wghtd min, link     7034, bnode=      7182, Fare=  1.50,
1,Walk to            ,                 ,Zone - 29095$21903                    , 7:54:00- 7:59:31                 (   8.28 wghtd min, link=      29, bnode=      1435, Fare=  0.00,
. . . . . . . . . . . . . . . . . . . . . . . . . . . . .
------------------------------------------------------
PNR Access Path for record Zone - 29095$22044-to-Zone - 29095$21903 to arrive at  8:00:00 - Org   39.024811, -94.557610 - Dest   39.103916, -94.579506
Time sample   1, departure time:  7:38:53   , arrival time:  8:00:45   , TARGET arrival time:  8:00:00
Final link count   40791 out of    3200000
3,PNR to             ,                 ,UNION STATION ON MAIN AT PERSHING SB  , 7:38:53- 7:50:00                 (  34.38 wghtd min, link=   29424, bnode=      4633, Fare=  0.00,
2,5229945            ,601~601          ,LIBRARY ON MAIN AT 9TH ST NB          , 7:50:00- 7:56:00 Wait=  0.77/  0.00 (  17.71 wghtd min, link     8872, bnode=      4638, Fare=  0.00,
1,Walk to            ,                 ,Zone - 29095$21903                    , 7:56:00- 8:00:45                 (   7.15 wghtd min, link=      50, bnode=      1435, Fare=  0.00,
. . . . . . . . . . . . . . . . . . . . . . . . . . . . .
------------------------------------------------------
```

Figure 59. Sample Path Trace Report

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7.0 Run STOPS Batch Steps

After all set-up and data preparation steps are finished, the STOPS Main Menu should indicate "FILES FOUND!" for all steps in the left hand column (see Figure 60). The next step is to run the batch steps. This part of the STOPS process may take between one and twelve hours depending on the speed of the computer, the number of regional zones, and the complexity of the regional transit system.

This step is performed by:

1. Selecting a year to model (any of the previously defined years: Current, Opening Year, 10-Year Forecast or 20-Year Forecast)

2. Clicking on "11. Run Batch Steps"

The user can optionally select which batch steps are run using the check boxes. STOPS defaults to running all of the following steps:

1. CTPP Extract. This step calls the *CTPPExtract* program which reads the CTPP files and prepares an output dataset with one record for each zone-to-zone pair containing the number of CTPP JTW flows. This file also contains space for later posting of zone-to-zone travel times and other data. A separate zone-to-zone file is created for each scenario (existing, no-build, and build). Until travel time data is posted (in GTF Post, below), these three files are identical to one-another. If STOPS is configured for special markets or as an incremental transit model, CTPP Extract also prepares these files for later processing.

> ***Hint: This step can be skipped if CTPP Extract has already been run and nothing in the parameter file, special market/transit trip table, or station ESRI shape file[50] has changed. The advantage of not re-running CTPP Extract is that if the GTF Path file can be skipped, the GTF Post step can also be skipped, saving considerably on STOPS execution times. This will frequently occur when the user wishes to re-run STOPS with a different forecast year or if the user wishes to change clone zones or other socioeconomic data.***

[50] If the only changes to the station file are updates to the station group, group name, or number of boardings, CTPP Extract can still be skipped. If new stations are added to the station file, CTPP Extract can be skipped as long as the location of any new stations are close enough to existing stations that the geographic extent of the analysis is not changed.

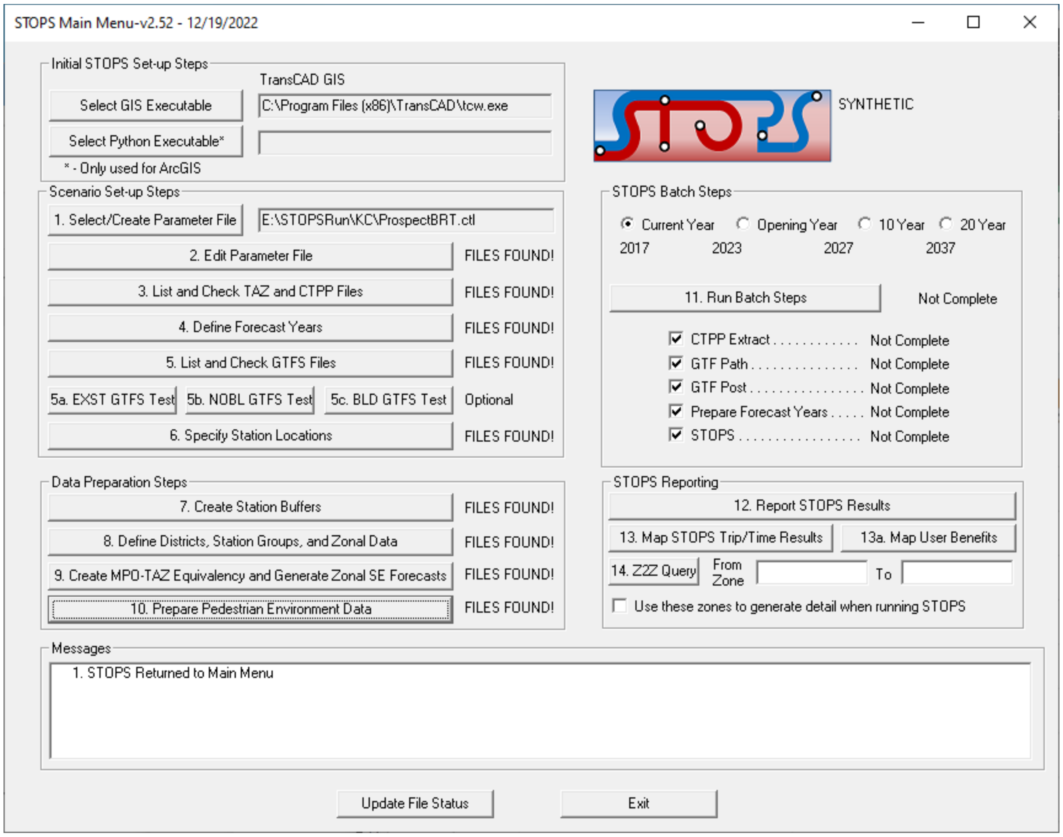


Figure 60. STOPS Main Menu Before Batch Steps

2. GTF Path. This step calls the *GTFPath* program which reads the GTFS files and generates estimates of zone-to-zone transit travel times. This program is called 18 times—once for each combination of:

    i. Peak (PK) and off-peak (OP) times-of-day
    ii. All transit (TR), fixed guideway transit only (FG), and bus transit only (BS) service type combinations
    iii. Existing (EXST), no-build (NOBL), and build (BLD-) scenarios

> ***Hint: The GTF Path step can be skipped if GTF Path has already been run for the current zone system, the current definition of GTFS subdirectories, and if the contents of the GTFS subdirectories have not been changed since GTF Path was originally run. This could save considerable processing time and is most useful if the user wishes to re-run STOPS with a different forecast year or for a different set of clone zones or SE data.***

3. GTF Post. This step calls *GTFPost* which reads each zone-to-zone JTW flow file and posts the appropriate travel times to each record.

> ***Hint: The GTF Post step can be skipped if GTF Post has already been run for the current set of skims and CTPP Extract tables. Skipping this step will save considerable time. It needs to be re-run only after CTPP Extract is re-run (since that program clears the posting) and any time the GTF Path skims are updated.***

4. Prepare Forecast Years. This step calls the program that reads each zone-to-zone JTW flow file (with posted time estimates) and grows the file to represent the user-selected forecast year.

5. Run STOPS. This step calls *STOPS*, the program that generates estimates of fixed guideway ridership for each scenario for the year specified at the beginning of this phase.

After the user selects the steps to run, STOPS will ask for confirmation that it is OK to run Batch steps. If the user clicks "OK", STOPS gives the user the opportunity to de-select the current, no-build, or build elements of CTPP Extract, GTF Path, GTF Post, and preparing forecast years (see Figure 61). The option to de-select these steps is only active if STOPS detects the presence of the appropriate files generated by an earlier run. It is the responsibility of the user to confirm that these earlier results are still correct for the intended run. The de-select option is provided since in many analyses, the existing and no-build runs are unchanged from earlier runs and skipping these steps can save considerable time.

No user action is required during the remainder of the process. A series of similar windows will open that describe the progress of each step. When all steps are done, the program returns to the main menu.

STOPS can be re-run for each of the defined years by selecting each one of the radio buttons (Current, Opening Year, 10 Year and 20 Year) and re-running the batch processes. As suggested in the hints above, after the first run is complete, the user can save considerable processing time by unchecking "CTPP Extract", "GTFPath", and GTFPost". Unless the user changes the GTFS directories or edits the GTFS files, the only steps that differ from year-to-year are the steps associated with "Prepare Forecast Years" and "STOPS".

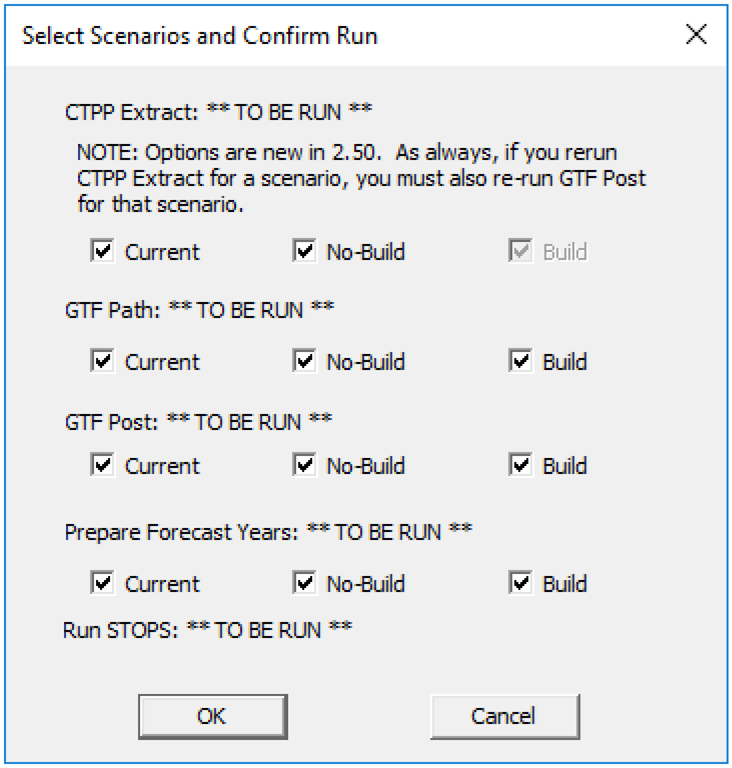
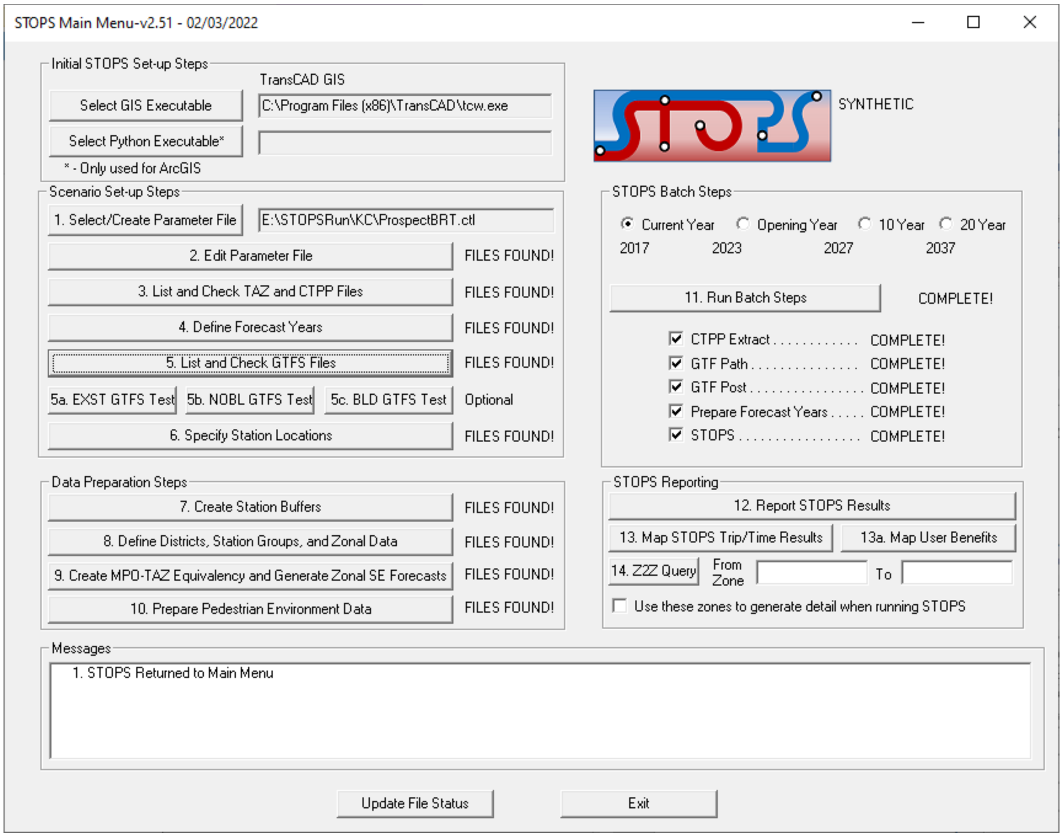


Figure 61. Dialog to Select Batch Steps to Run

8.0 Reporting Results

When STOPS is finished with the batch processing steps, the STOPS Main Menu will show that all steps are complete as shown in Figure 62. Once this milestone has been achieved, the user can open the a report describing STOPS results. This chapter describes the contents of the STOPS results report. Most of the examples shown here are results of the initial run generated by the initial (pre-calibration) parameter file described in Section 5.2. Some reports are dependent on data or later calibration steps that are different from the conditions represented in the pre-calibration Kansas City example. These examples are identified in the caption as "Not from Pre-Calibration Run."


STOPS Main Menu-v2.51 - 02/03/2022
Initial STOPS Set-up Steps
TransCAD GIS
Select GIS Executable
C:\Program Files (x86)\TransCAD\tcw.exe
Select Python Executable*
* - Only used for ArcGIS
SYNTHETIC
Scenario Set-up Steps
1. Select/Create Parameter File
E:\STOPSRun\KC\ProspectBRT.ctl
2. Edit Parameter File
FILES FOUND!
3. List and Check TAZ and CTPP Files
FILES FOUND!
4. Define Forecast Years
FILES FOUND!
5. List and Check GTFS Files
FILES FOUND!
5a. EXST GTFS Test
5b. NOBL GTFS Test
5c. BLD GTFS Test
Optional
6. Specify Station Locations
FILES FOUND!
STOPS Batch Steps
Current Year
Opening Year
10 Year
20 Year
2017
2023
2027
2037
11. Run Batch Steps
COMPLETE!
CTPP Extract .... COMPLETE!
GTF Path .... COMPLETE!
GTF Post .... COMPLETE!
Prepare Forecast Years ..... COMPLETE!
STOPS .... COMPLETE!
Data Preparation Steps
7. Create Station Buffers
FILES FOUND!
8. Define Districts, Station Groups, and Zonal Data
FILES FOUND!
9. Create MPO-TAZ Equivalency and Generate Zonal SE Forecasts
FILES FOUND!
10. Prepare Pedestrian Environment Data
FILES FOUND!
STOPS Reporting
12. Report STOPS Results
13. Map STOPS Trip/Time Results
13a. Map User Benefits
14. Z2Z Query
From Zone
To
Use these zones to generate detail when running STOPS
Messages
1. STOPS Returned to Main Menu
Update File Status
Exit

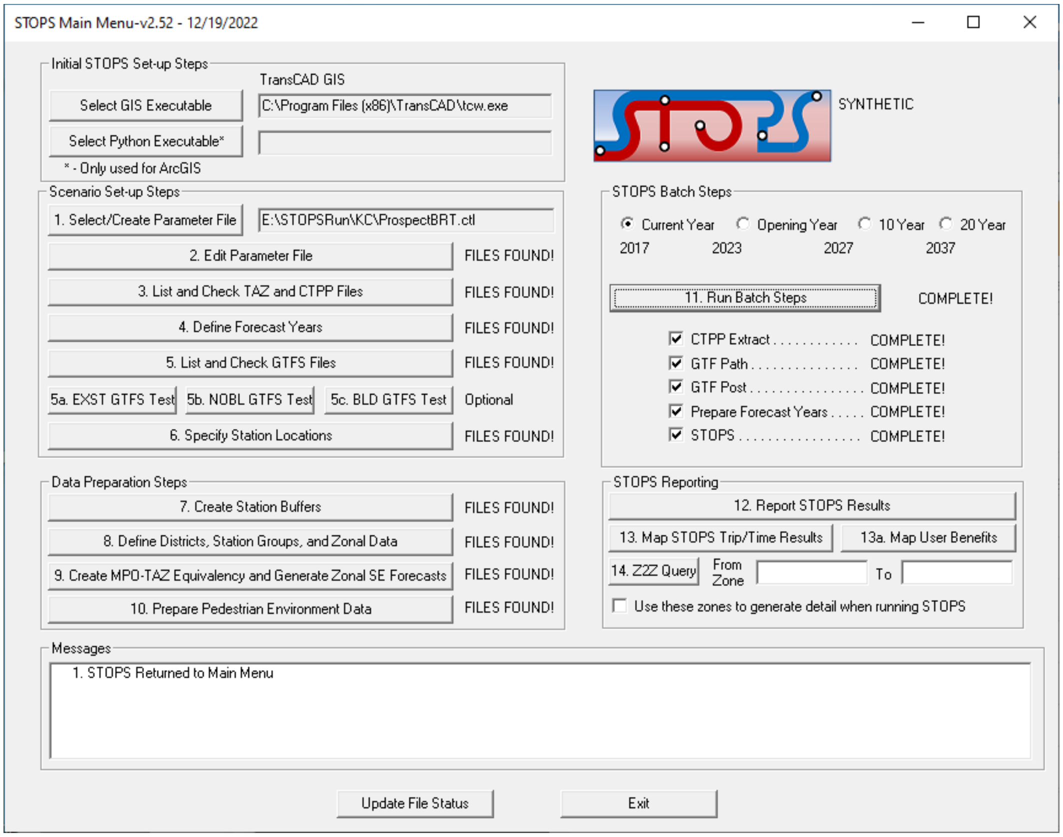


Figure 62. STOPS Main Menu After Completion of Batch Steps

The STOPS results are found in the "reports\" subdirectory in a text file with a name that indicates the nature of the run represented in the report. In the Kansas City example, this file is named:

AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results.PRN

This filename has the following components:

- Whether the analysis was conducted at the 2012-2016 ACS TAZ, 2006-2010 ACS TAZ, Census 2000 TAZ, Block Group, or Tract Level ("A2", "AC", "TZ", "BG", "TR"). *"AC" in the Kansas City example denoting use of the 2006-2010 ACS TAZ system.*
- Underscore ("_") as a separator.

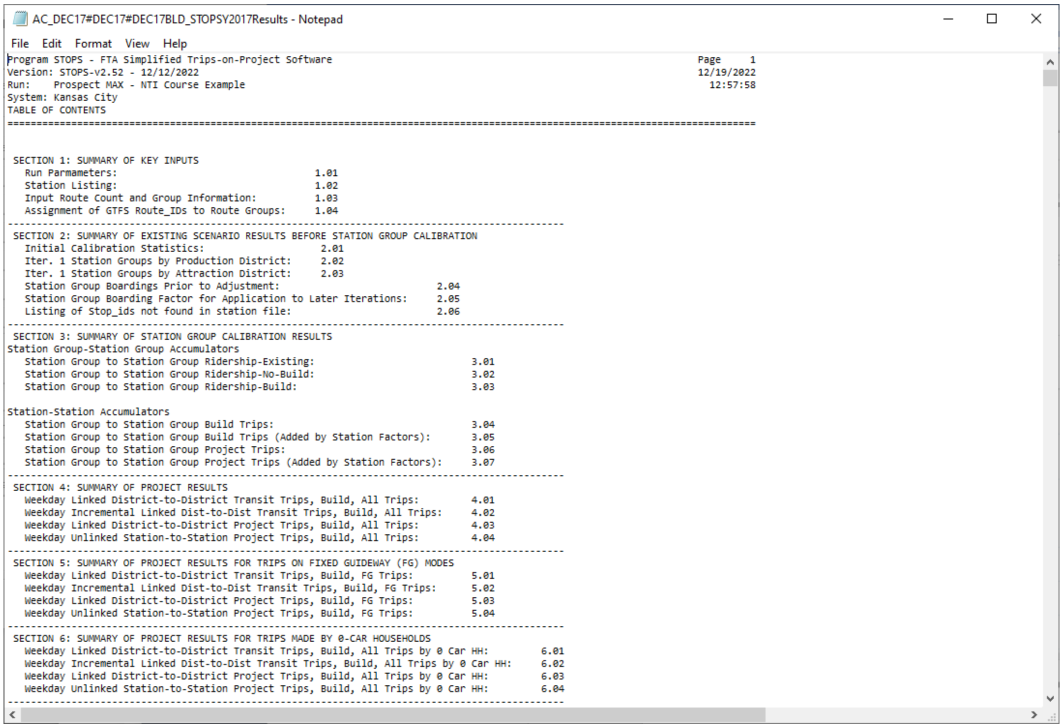
- The GTFS subdirectory name (or names separated by a hyphen) that make up the Existing Scenario. *"DEC17"* in the Kansas City example[51].
- "#" as a separator.
- The GTFS subdirectory name (or names separated by a hyphen) that make up the No-Build Scenario. *"DEC17"* in the Kansas City example.
- "#" as a separator.
- The GTFS subdirectory name (or names separated by a hyphen) that make up the Build Scenario. *"DEC17BLD"* in the Kansas City example Underscore "_" as a separator.
- "STOPS".
- The Analysis Year. *Y2017*.
- Results.prn".

The report can be opened by clicking on "12. Report STOPS Results". STOPS will open up a notepad window and display the report for the selected year. The beginning of this report is shown in Figure 63, Figure 64, Figure 65, and Figure 66. These four figures show the STOPS report table of contents that describe the 18 sections of the report and the tables that are provided in each section. In Sections 1 to 14, the table title and table number are provided. This allows the user to find the table name of interest and then search for the table in the body of the report. The easiest way to find the proper table is to use a search string that begins with a blank followed by the table number that is desired. To find table "2.04", search on " 2.04".

The index in Section 15 also shows table numbers. Every report in listed Section 15 is a matrix of either district-to-district or station-to-station trips in production-attraction format. The index, itself, is a matrix. Each column represents the type of trip that is being reported:

- Transit Trips
    - Transit Path Type
        - FGO – Fixed guideway only
        - FGB – Fixed guideway and bus on the same path
        - BUS – Bus only
        - TRN – Any transit (sum of FGO, FGB, and Bus)
        - FG – Any fixed guideway (sum of FGO and FGB)
    - Access Mode
        - WLK – Walk
        - KNR – Kiss-and-ride
        - PNR – Park-and-ride

[51] In 2014, KCATA and Johnson County transit GTFS schedules were contained in separate files located in directories named "*KCATAoct14" and "JOEXIST." In this case, the existing GTFS portion of the file name would contain "KCATAoct14-JOEXIST"*.



AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

File Edit Format View Help

```
Program STOPS - FTA Simplified Trips-on-Project Software                                                        Page     1
Version: STOPS-v2.52 - 12/12/2022                                                                               12/19/2022
Run:    Prospect MAX - NTI Course Example                                                                         12:57:58
System: Kansas City
TABLE OF CONTENTS
==================================================================================================================================


 SECTION 1: SUMMARY OF KEY INPUTS
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   Station Listing:                                 1.02
   Input Route Count and Group Information:         1.03
   Assignment of GTFS Route_IDs to Route Groups:    1.04
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   Iter. 1 Station Groups by Attraction District:    2.03
   Station Group Boardings Prior to Adjustment:                          2.04
   Station Group Boarding Factor for Application to Later Iterations:    2.05
   Listing of Stop_ids not found in station file:                        2.06
-------------------------------------------------------------------------------------------------
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   Station Group to Station Group Ridership-No-Build:                          3.02
   Station Group to Station Group Ridership-Build:                             3.03

Station-Station Accumulators
   Station Group to Station Group Build Trips:                                 3.04
   Station Group to Station Group Build Trips (Added by Station Factors):      3.05
   Station Group to Station Group Project Trips:                               3.06
   Station Group to Station Group Project Trips (Added by Station Factors):    3.07
-------------------------------------------------------------------------------------------------
 SECTION 4: SUMMARY OF PROJECT RESULTS
   Weekday Linked District-to-District Transit Trips, Build, All Trips:        4.01
   Weekday Incremental Linked Dist-to-Dist Transit Trips, Build, All Trips:    4.02
   Weekday Linked District-to-District Project Trips, Build, All Trips:        4.03
   Weekday Unlinked Station-to-Station Project Trips, Build, All Trips:        4.04
-------------------------------------------------------------------------------------------------
 SECTION 5: SUMMARY OF PROJECT RESULTS FOR TRIPS ON FIXED GUIDEWAY (FG) MODES
   Weekday Linked District-to-District Transit Trips, Build, FG Trips:         5.01
   Weekday Incremental Linked Dist-to-Dist Transit Trips, Build, FG Trips:     5.02
   Weekday Linked District-to-District Project Trips, Build, FG Trips:         5.03
   Weekday Unlinked Station-to-Station Project Trips, Build, FG Trips:         5.04
-------------------------------------------------------------------------------------------------
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   Weekday Linked District-to-District Project Trips, Build, All Trips by 0 Car HH:        6.03
   Weekday Unlinked Station-to-Station Project Trips, Build, All Trips by 0 Car HH:        6.04
-------------------------------------------------------------------------------------------------
```
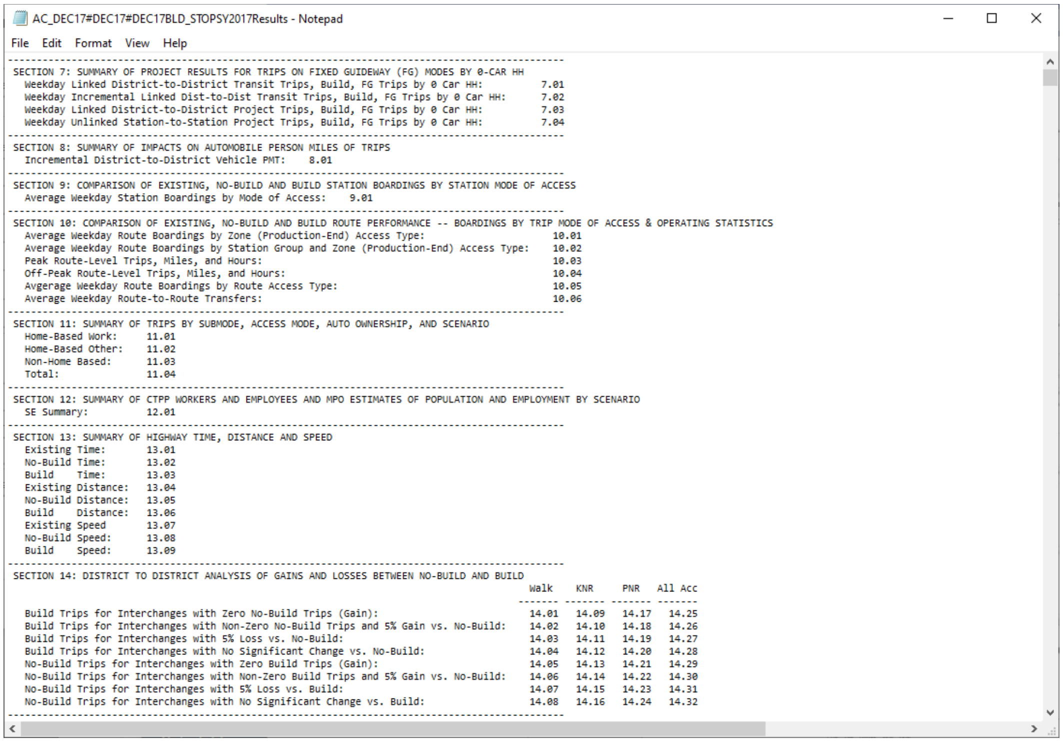

Figure 63. Example Report File and Index (Part 1)


AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

File Edit Format View Help

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-----------------------------------------------------------------------------------------------
SECTION 7: SUMMARY OF PROJECT RESULTS FOR TRIPS ON FIXED GUIDEWAY (FG) MODES BY 0-CAR HH
  Weekday Linked District-to-District Transit Trips, Build, FG Trips by 0 Car HH:         7.01
  Weekday Incremental Linked Dist-to-Dist Transit Trips, Build, FG Trips by 0 Car HH:     7.02
  Weekday Linked District-to-District Project Trips, Build, FG Trips by 0 Car HH:         7.03
  Weekday Unlinked Station-to-Station Project Trips, Build, FG Trips by 0 Car HH:         7.04
-----------------------------------------------------------------------------------------------
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-----------------------------------------------------------------------------------------------
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  Home-Based Other:    11.02
  Non-Home Based:      11.03
  Total:               11.04
-----------------------------------------------------------------------------------------------
SECTION 12: SUMMARY OF CTPP WORKERS AND EMPLOYEES AND MPO ESTIMATES OF POPULATION AND EMPLOYMENT BY SCENARIO
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-----------------------------------------------------------------------------------------------
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  Build    Time:       13.03
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  No-Build Distance:   13.05
  Build    Distance:   13.06
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  No-Build Speed:      13.08
  Build    Speed:      13.09
-----------------------------------------------------------------------------------------------
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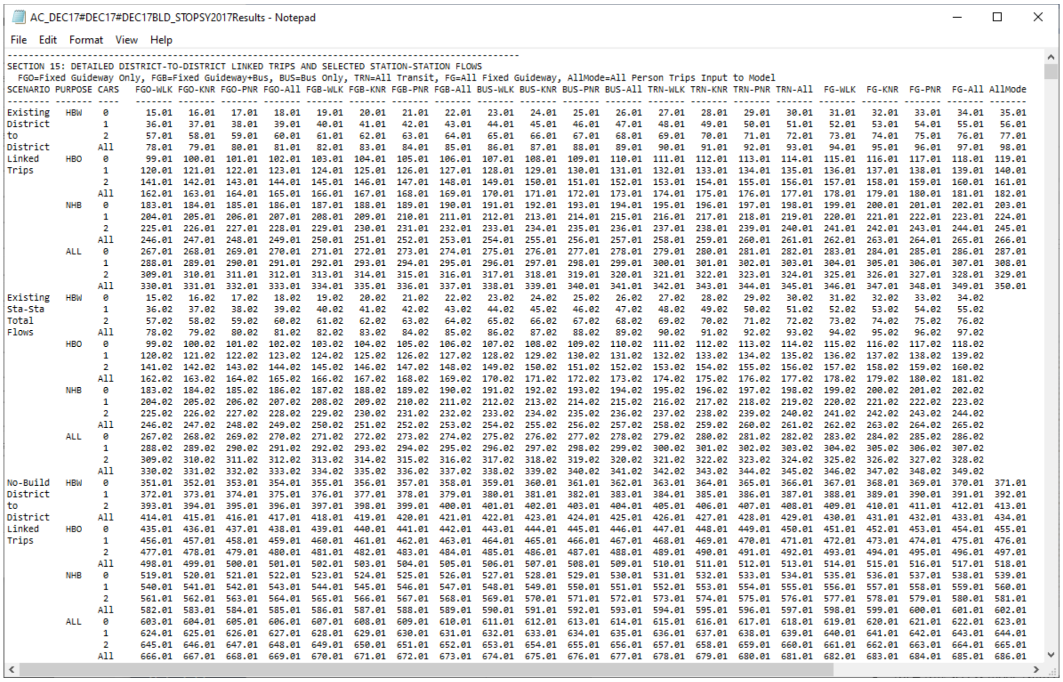
                                                                                -------  ------- ------- -------
  Build Trips for Interchanges with Zero No-Build Trips (Gain):                   14.01   14.09   14.17   14.25
  Build Trips for Interchanges with Non-Zero No-Build Trips and 5% Gain vs. No-Build:   14.02   14.10   14.18   14.26
  Build Trips for Interchanges with 5% Loss vs. No-Build:                         14.03   14.11   14.19   14.27
  Build Trips for Interchanges with No Significant Change vs. No-Build:           14.04   14.12   14.20   14.28
  No-Build Trips for Interchanges with Zero Build Trips (Gain):                   14.05   14.13   14.21   14.29
  No-Build Trips for Interchanges with Non-Zero Build Trips and 5% Gain vs. No-Build:   14.06   14.14   14.22   14.30
  No-Build Trips for Interchanges with 5% Loss vs. Build:                         14.07   14.15   14.23   14.31
  No-Build Trips for Interchanges with No Significant Change vs. Build:           14.08   14.16   14.24   14.32
-----------------------------------------------------------------------------------------------
```

Figure 64. Example Report File and Index (Part 2)


AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

File Edit Format View Help

SECTION 15: DETAILED DISTRICT-TO-DISTRICT LINKED TRIPS AND SELECTED STATION-STATION FLOWS

FGO=Fixed Guideway Only, FGB=Fixed Guideway+Bus, BUS=Bus Only, TRN=All Transit, FG=All Fixed Guideway, AllMode=All Person Trips Input to Model

SCENARIO	PURPOSE	CARS	FGO-WLK	FGO-KNR	FGO-PNR	FGO-All	FGB-WLK	FGB-KNR	FGB-PNR	FGB-All	BUS-WLK	BUS-KNR	BUS-PNR	BUS-All	TRN-WLK	TRN-KNR	TRN-PNR	TRN-All	FG-WLK	FG-KNR	FG-PNR	FG-All	AllMode
Existing	HBW	0	15.01	16.01	17.01	18.01	19.01	20.01	21.01	22.01	23.01	24.01	25.01	26.01	27.01	28.01	29.01	30.01	31.01	32.01	33.01	34.01	35.01
District		1	36.01	37.01	38.01	39.01	40.01	41.01	42.01	43.01	44.01	45.01	46.01	47.01	48.01	49.01	50.01	51.01	52.01	53.01	54.01	55.01	56.01
to		2	57.01	58.01	59.01	60.01	61.01	62.01	63.01	64.01	65.01	66.01	67.01	68.01	69.01	70.01	71.01	72.01	73.01	74.01	75.01	76.01	77.01
District		All	78.01	79.01	80.01	81.01	82.01	83.01	84.01	85.01	86.01	87.01	88.01	89.01	90.01	91.01	92.01	93.01	94.01	95.01	96.01	97.01	98.01
Linked	HBO	0	99.01	100.01	101.01	102.01	103.01	104.01	105.01	106.01	107.01	108.01	109.01	110.01	111.01	112.01	113.01	114.01	115.01	116.01	117.01	118.01	119.01
Trips		1	120.01	121.01	122.01	123.01	124.01	125.01	126.01	127.01	128.01	129.01	130.01	131.01	132.01	133.01	134.01	135.01	136.01	137.01	138.01	139.01	140.01
		2	141.01	142.01	143.01	144.01	145.01	146.01	147.01	148.01	149.01	150.01	151.01	152.01	153.01	154.01	155.01	156.01	157.01	158.01	159.01	160.01	161.01
		All	162.01	163.01	164.01	165.01	166.01	167.01	168.01	169.01	170.01	171.01	172.01	173.01	174.01	175.01	176.01	177.01	178.01	179.01	180.01	181.01	182.01
	NHB	0	183.01	184.01	185.01	186.01	187.01	188.01	189.01	190.01	191.01	192.01	193.01	194.01	195.01	196.01	197.01	198.01	199.01	200.01	201.01	202.01	203.01
		1	204.01	205.01	206.01	207.01	208.01	209.01	210.01	211.01	212.01	213.01	214.01	215.01	216.01	217.01	218.01	219.01	220.01	221.01	222.01	223.01	224.01
		2	225.01	226.01	227.01	228.01	229.01	230.01	231.01	232.01	233.01	234.01	235.01	236.01	237.01	238.01	239.01	240.01	241.01	242.01	243.01	244.01	245.01
		All	246.01	247.01	248.01	249.01	250.01	251.01	252.01	253.01	254.01	255.01	256.01	257.01	258.01	259.01	260.01	261.01	262.01	263.01	264.01	265.01	266.01
	ALL	0	267.01	268.01	269.01	270.01	271.01	272.01	273.01	274.01	275.01	276.01	277.01	278.01	279.01	280.01	281.01	282.01	283.01	284.01	285.01	286.01	287.01
		1	288.01	289.01	290.01	291.01	292.01	293.01	294.01	295.01	296.01	297.01	298.01	299.01	300.01	301.01	302.01	303.01	304.01	305.01	306.01	307.01	308.01
		2	309.01	310.01	311.01	312.01	313.01	314.01	315.01	316.01	317.01	318.01	319.01	320.01	321.01	322.01	323.01	324.01	325.01	326.01	327.01	328.01	329.01
		All	330.01	331.01	332.01	333.01	334.01	335.01	336.01	337.01	338.01	339.01	340.01	341.01	342.01	343.01	344.01	345.01	346.01	347.01	348.01	349.01	350.01
Existing	HBW	0	15.02	16.02	17.02	18.02	19.02	20.02	21.02	22.02	23.02	24.02	25.02	26.02	27.02	28.02	29.02	30.02	31.02	32.02	33.02	34.02	
Sta-Sta		1	36.02	37.02	38.02	39.02	40.02	41.02	42.02	43.02	44.02	45.02	46.02	47.02	48.02	49.02	50.02	51.02	52.02	53.02	54.02	55.02	
Total		2	57.02	58.02	59.02	60.02	61.02	62.02	63.02	64.02	65.02	66.02	67.02	68.02	69.02	70.02	71.02	72.02	73.02	74.02	75.02	76.02	
Flows		All	78.02	79.02	80.02	81.02	82.02	83.02	84.02	85.02	86.02	87.02	88.02	89.02	90.02	91.02	92.02	93.02	94.02	95.02	96.02	97.02	
	HBO	0	99.02	100.02	101.02	102.02	103.02	104.02	105.02	106.02	107.02	108.02	109.02	110.02	111.02	112.02	113.02	114.02	115.02	116.02	117.02	118.02	
		1	120.02	121.02	122.02	123.02	124.02	125.02	126.02	127.02	128.02	129.02	130.02	131.02	132.02	133.02	134.02	135.02	136.02	137.02	138.02	139.02	
		2	141.02	142.02	143.02	144.02	145.02	146.02	147.02	148.02	149.02	150.02	151.02	152.02	153.02	154.02	155.02	156.02	157.02	158.02	159.02	160.02	
		All	162.02	163.02	164.02	165.02	166.02	167.02	168.02	169.02	170.02	171.02	172.02	173.02	174.02	175.02	176.02	177.02	178.02	179.02	180.02	181.02	
	NHB	0	183.02	184.02	185.02	186.02	187.02	188.02	189.02	190.02	191.02	192.02	193.02	194.02	195.02	196.02	197.02	198.02	199.02	200.02	201.02	202.02	
		1	204.02	205.02	206.02	207.02	208.02	209.02	210.02	211.02	212.02	213.02	214.02	215.02	216.02	217.02	218.02	219.02	220.02	221.02	222.02	223.02	
		2	225.02	226.02	227.02	228.02	229.02	230.02	231.02	232.02	233.02	234.02	235.02	236.02	237.02	238.02	239.02	240.02	241.02	242.02	243.02	244.02	
		All	246.02	247.02	248.02	249.02	250.02	251.02	252.02	253.02	254.02	255.02	256.02	257.02	258.02	259.02	260.02	261.02	262.02	263.02	264.02	265.02	
	ALL	0	267.02	268.02	269.02	270.02	271.02	272.02	273.02	274.02	275.02	276.02	277.02	278.02	279.02	280.02	281.02	282.02	283.02	284.02	285.02	286.02	
		1	288.02	289.02	290.02	291.02	292.02	293.02	294.02	295.02	296.02	297.02	298.02	299.02	300.02	301.02	302.02	303.02	304.02	305.02	306.02	307.02	
		2	309.02	310.02	311.02	312.02	313.02	314.02	315.02	316.02	317.02	318.02	319.02	320.02	321.02	322.02	323.02	324.02	325.02	326.02	327.02	328.02	
		All	330.02	331.02	332.02	333.02	334.02	335.02	336.02	337.02	338.02	339.02	340.02	341.02	342.02	343.02	344.02	345.02	346.02	347.02	348.02	349.02	
No-Build	HBW	0	351.01	352.01	353.01	354.01	355.01	356.01	357.01	358.01	359.01	360.01	361.01	362.01	363.01	364.01	365.01	366.01	367.01	368.01	369.01	370.01	371.01
District		1	372.01	373.01	374.01	375.01	376.01	377.01	378.01	379.01	380.01	381.01	382.01	383.01	384.01	385.01	386.01	387.01	388.01	389.01	390.01	391.01	392.01
to		2	393.01	394.01	395.01	396.01	397.01	398.01	399.01	400.01	401.01	402.01	403.01	404.01	405.01	406.01	407.01	408.01	409.01	410.01	411.01	412.01	413.01
District		All	414.01	415.01	416.01	417.01	418.01	419.01	420.01	421.01	422.01	423.01	424.01	425.01	426.01	427.01	428.01	429.01	430.01	431.01	432.01	433.01	434.01
Linked	HBO	0	435.01	436.01	437.01	438.01	439.01	440.01	441.01	442.01	443.01	444.01	445.01	446.01	447.01	448.01	449.01	450.01	451.01	452.01	453.01	454.01	455.01
Trips		1	456.01	457.01	458.01	459.01	460.01	461.01	462.01	463.01	464.01	465.01	466.01	467.01	468.01	469.01	470.01	471.01	472.01	473.01	474.01	475.01	476.01
		2	477.01	478.01	479.01	480.01	481.01	482.01	483.01	484.01	485.01	486.01	487.01	488.01	489.01	490.01	491.01	492.01	493.01	494.01	495.01	496.01	497.01
		All	498.01	499.01	500.01	501.01	502.01	503.01	504.01	505.01	506.01	507.01	508.01	509.01	510.01	511.01	512.01	513.01	514.01	515.01	516.01	517.01	518.01
	NHB	0	519.01	520.01	521.01	522.01	523.01	524.01	525.01	526.01	527.01	528.01	529.01	530.01	531.01	532.01	533.01	534.01	535.01	536.01	537.01	538.01	539.01
		1	540.01	541.01	542.01	543.01	544.01	545.01	546.01	547.01	548.01	549.01	550.01	551.01	552.01	553.01	554.01	555.01	556.01	557.01	558.01	559.01	560.01
		2	561.01	562.01	563.01	564.01	565.01	566.01	567.01	568.01	569.01	570.01	571.01	572.01	573.01	574.01	575.01	576.01	577.01	578.01	579.01	580.01	581.01
		All	582.01	583.01	584.01	585.01	586.01	587.01	588.01	589.01	590.01	591.01	592.01	593.01	594.01	595.01	596.01	597.01	598.01	599.01	600.01	601.01	602.01
	ALL	0	603.01	604.01	605.01	606.01	607.01	608.01	609.01	610.01	611.01	612.01	613.01	614.01	615.01	616.01	617.01	618.01	619.01	620.01	621.01	622.01	623.01
		1	624.01	625.01	626.01	627.01	628.01	629.01	630.01	631.01	632.01	633.01	634.01	635.01	636.01	637.01	638.01	639.01	640.01	641.01	642.01	643.01	644.01
		2	645.01	646.01	647.01	648.01	649.01	650.01	651.01	652.01	653.01	654.01	655.01	656.01	657.01	658.01	659.01	660.01	661.01	662.01	663.01	664.01	665.01
		All	666.01	667.01	668.01	669.01	670.01	671.01	672.01	673.01	674.01	675.01	676.01	677.01	678.01	679.01	680.01	681.01	682.01	683.01	684.01	685.01	686.01

Figure 65. Example Report File and Index (Part 3)

- ▪ All – Any access mode (sum of WLK, KNR, and PNR)
- Total Person Trips
  - All Mode – The estimate of person trips used to generate the estimate of transit trips.

The rows in the Section 15 index represent the statistic, trip purpose, and auto ownership levels that are included in each table:

- Statistic
  - Scenario
    - Existing
    - No-build
    - Build
  - Matrix Type
    - District-to-district linked trips
    - Station-to-station total flows
  - Other
    - Incrmtl. – Incremental (Build-No-Build) district-to-district linked trips
    - Linked Trips on project – district-to-district table of linked trips that use the project

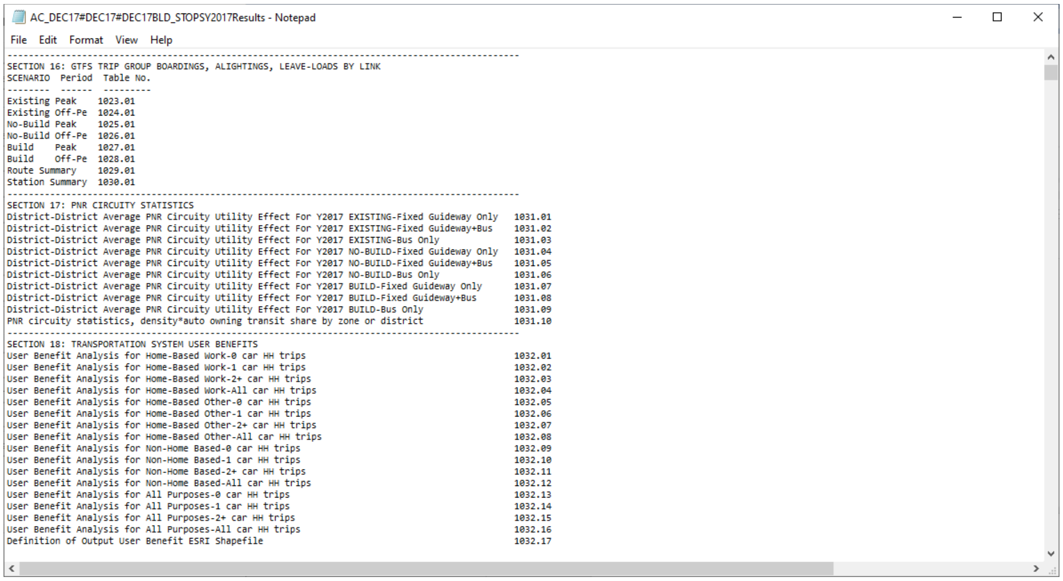
        - Station-to-station project flows. Station usage by project trips
- Trip Purpose
    - HBW – Home-based work
    - HBO – Home-based other
    - NHB – Non-home based
    - ALL – All trip purposes (sum of HBW, HBO, and NHB)
- Household Auto Ownership
    - 0 – 0 cars in the household
    - 1 – 1 car in the household
    - 2 – 2 or more cars in the household
    - All - All households (sum of 0, 1, and 2)

Section 16 contains a series of reports showing assigned transit ridership on each trip group[52] in the GTFS. Information reported for each trip group includes boardings, alightings, leave load (i.e., riders on board the vehicle as it leave each stop). Separate reports are presented for the peak and off-peak periods for the existing, no-build, and build scenarios.

Section 17 presents statistics describing the outcomes of the PNR circuity process. These results can be useful in tailoring the PNR circuity computations to the region.

Section 18 presents information on the mobility benefits of the project as measured by Transportation System User Benefits. This capability equivalent to running FTA's *Summit* program, providing both district-to-district estimates of user-benefits and data files that can be used to map benefits at the TAZ level-of-detail.

[52] Trip groups are a STOPS term used to describe groups of GTFS trips that serve identical series of stop_ids in exactly the same order. This structure allows reporting that is more aggregate than individual trips without the loss of information that would result from reporting ridership by route.



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SECTION 16: GTFS TRIP GROUP BOARDINGS, ALIGHTINGS, LEAVE-LOADS BY LINK
SCENARIO  Period  Table No.
--------  ------  ---------
Existing Peak    1023.01
Existing Off-Pe  1024.01
No-Build Peak    1025.01
No-Build Off-Pe  1026.01
Build    Peak    1027.01
Build    Off-Pe  1028.01
Route Summary    1029.01
Station Summary  1030.01
----------------------------------------------------------------------------------------
SECTION 17: PNR CIRCUITY STATISTICS
District-District Average PNR Circuity Utility Effect For Y2017 EXISTING-Fixed Guideway Only   1031.01
District-District Average PNR Circuity Utility Effect For Y2017 EXISTING-Fixed Guideway+Bus    1031.02
District-District Average PNR Circuity Utility Effect For Y2017 EXISTING-Bus Only              1031.03
District-District Average PNR Circuity Utility Effect For Y2017 NO-BUILD-Fixed Guideway Only   1031.04
District-District Average PNR Circuity Utility Effect For Y2017 NO-BUILD-Fixed Guideway+Bus    1031.05
District-District Average PNR Circuity Utility Effect For Y2017 NO-BUILD-Bus Only              1031.06
District-District Average PNR Circuity Utility Effect For Y2017 BUILD-Fixed Guideway Only      1031.07
District-District Average PNR Circuity Utility Effect For Y2017 BUILD-Fixed Guideway+Bus       1031.08
District-District Average PNR Circuity Utility Effect For Y2017 BUILD-Bus Only                 1031.09
PNR circuity statistics, density*auto owning transit share by zone or district                 1031.10
----------------------------------------------------------------------------------------
SECTION 18: TRANSPORTATION SYSTEM USER BENEFITS
User Benefit Analysis for Home-Based Work-0 car HH trips                                       1032.01
User Benefit Analysis for Home-Based Work-1 car HH trips                                       1032.02
User Benefit Analysis for Home-Based Work-2+ car HH trips                                      1032.03
User Benefit Analysis for Home-Based Work-All car HH trips                                     1032.04
User Benefit Analysis for Home-Based Other-0 car HH trips                                      1032.05
User Benefit Analysis for Home-Based Other-1 car HH trips                                      1032.06
User Benefit Analysis for Home-Based Other-2+ car HH trips                                     1032.07
User Benefit Analysis for Home-Based Other-All car HH trips                                    1032.08
User Benefit Analysis for Non-Home Based-0 car HH trips                                        1032.09
User Benefit Analysis for Non-Home Based-1 car HH trips                                        1032.10
User Benefit Analysis for Non-Home Based-2+ car HH trips                                       1032.11
User Benefit Analysis for Non-Home Based-All car HH trips                                      1032.12
User Benefit Analysis for All Purposes-0 car HH trips                                          1032.13
User Benefit Analysis for All Purposes-1 car HH trips                                          1032.14
User Benefit Analysis for All Purposes-2+ car HH trips                                         1032.15
User Benefit Analysis for All Purposes-All car HH trips                                        1032.16
Definition of Output User Benefit ESRI Shapefile                                               1032.17
```

Figure 66. Example Report File and Index (Part 4)

Each report section is described in the paragraphs below.

8.1 Report Section 1 – Summary of Key Inputs

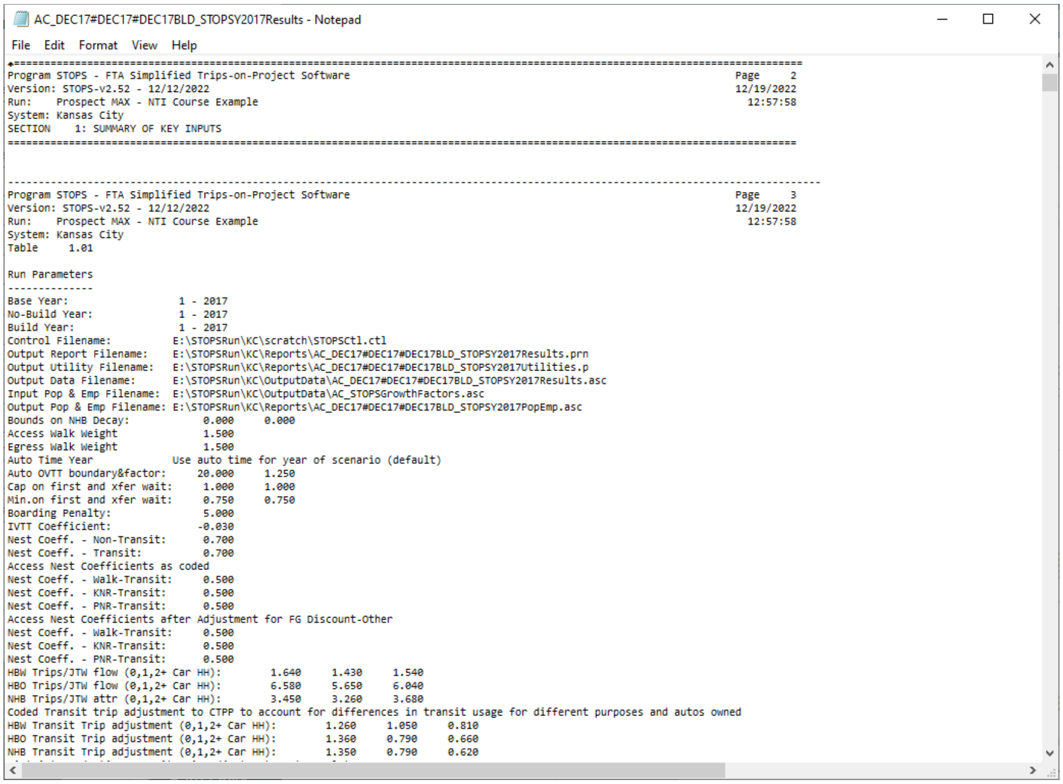
Section 1 of the STOPS report file presents a summary of key inputs that were used in this STOPS run.

Report Table 1.01 – Model Inputs and Parameters

Table 1.01 provides a summary of key model and run parameters including:

- Years for the demand matrices that are associated with the base, no-build, and build scenarios
- Key STOPS model coefficients
- Key parameters associated with each scenario
- Overview of input base-year transit trip tables (if incremental version of STOPS is used)
- Overview of input special market trip table (if special market trips were provided)

A sample of the run parameters in Section 1 is shown in Figure 67.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==========================================================================================================================
Program STOPS - FTA Simplified Trips-on-Project Software                                                     Page     2
Version: STOPS-v2.52 - 12/12/2022                                                                            12/19/2022
Run:    Prospect MAX - NTI Course Example                                                                     12:57:58
System: Kansas City
SECTION    1: SUMMARY OF KEY INPUTS
=========================================================================================================================


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Program STOPS - FTA Simplified Trips-on-Project Software                                                     Page     3
Version: STOPS-v2.52 - 12/12/2022                                                                            12/19/2022
Run:    Prospect MAX - NTI Course Example                                                                     12:57:58
System: Kansas City
Table     1.01

Run Parameters
--------------
Base Year:                   1 - 2017
No-Build Year:               1 - 2017
Build Year:                  1 - 2017
Control Filename:           E:\STOPSRun\KC\scratch\STOPSCtl.ctl
Output Report Filename:     E:\STOPSRun\KC\Reports\AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results.prn
Output Utility Filename:    E:\STOPSRun\KC\Reports\AC_DEC17#DEC17#DEC17BLD_STOPSY2017Utilities.p
Output Data Filename:       E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results.asc
Input Pop & Emp Filename:   E:\STOPSRun\KC\OutputData\AC_STOPSGrowthFactors.asc
Output Pop & Emp Filename: E:\STOPSRun\KC\Reports\AC_DEC17#DEC17#DEC17BLD_STOPSY2017PopEmp.asc
Bounds on NHB Decay:            0.000     0.000
Access Walk Weight              1.500
Egress Walk Weight              1.500
Auto Time Year              Use auto time for year of scenario (default)
Auto OVTT boundary&factor:     20.000     1.250
Cap on first and xfer wait:     1.000     1.000
Min.on first and xfer wait:     0.750     0.750
Boarding Penalty:               5.000
IVTT Coefficient:              -0.030
Nest Coeff. - Non-Transit:      0.700
Nest Coeff. - Transit:          0.700
Access Nest Coefficients as coded
Nest Coeff. - Walk-Transit:     0.500
Nest Coeff. - KNR-Transit:      0.500
Nest Coeff. - PNR-Transit:      0.500
Access Nest Coefficients after Adjustment for FG Discount-Other
Nest Coeff. - Walk-Transit:     0.500
Nest Coeff. - KNR-Transit:      0.500
Nest Coeff. - PNR-Transit:      0.500
HBW Trips/JTW flow (0,1,2+ Car HH):        1.640     1.430     1.540
HBO Trips/JTW flow (0,1,2+ Car HH):        6.580     5.650     6.040
NHB Trips/JTW attr (0,1,2+ Car HH):        3.450     3.260     3.680
Coded Transit trip adjustment to CTPP to account for differences in transit usage for different purposes and autos owned
HBW Transit Trip adjustment (0,1,2+ Car HH):        1.260     1.050     0.810
HBO Transit Trip adjustment (0,1,2+ Car HH):        1.360     0.790     0.660
NHB Transit Trip adjustment (0,1,2+ Car HH):        1.350     0.790     0.620
```

Figure 67. Report Table 1.01 – Run Parameters

Report Table 1.02 – Station Listing

Table 1.02 contains a summary of the input station information that was used in this this model run (example shown in Figure 68). This table reports the name, station group, counted ridership, station time penalties, and stop_ids for each station in the input station shape file.

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Program STOPS - FTA Simplified Trips-on-Project Software                                     Page     4
Version: STOPS-v2.52 - 12/12/2022                                                            12/19/2022
Run:     Prospect MAX - NTI Course Example                                                    12:57:58
System: Kansas City
Table     1.02

Station Listing for Scenario  3: Y2017 BUILD
 S2S#  Sequence  Station Name          Code      Group      Type New/Exist BoardCount  WalkPen  KNRPen   PNRPen  SameGTFS DiffGTFS  GTF STOP1                GTF STOP2
====== ======== ==================== ========= ============ ==== ========= ========== ======== ======== ======== ======== ========= ======================== ========================
   1         0  Prospect &75th MAX   Psp&75th   10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99501
   2         1  RIVER MARKET NORTH O 3rd&Grand   2-NCBD      2    3              424     0.00     0.00     0.00     0.00      0.00  1600
   3         1  Prospect & Gregory   Psp&Greg   10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99554                    99502
   4         2  RIVER MARKET WEST ON Delw&4th    2-NCBD      1    3              383     0.00     0.00     0.00     0.00      0.00  1601
   5         2  Prospect & Meyer     Psp&Meyer  10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99553                    99503
   6         3  NORTH LOOP ON MAIN A MN&7thSB    1-CBD       1    3               80     0.00     0.00     0.00     0.00      0.00  1602
   7         3  Prospect & 63rd      Psp&63rd   10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99552                    99504
   8         4  LIBRARY ON MAIN AT 9 MN&9thSB    1-CBD       1    3              274     0.00     0.00     0.00     0.00      0.00  1603
   9         4  Prospect & 59th      Psp&59th   10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99551                    99506
  10         5  METRO CENTER ON MAIN MN&12thSB   1-CBD       1    3              261     0.00     0.00     0.00     0.00      0.00  1604
  11         5  Prospect & 55th      Psp&55th   10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99507                    99550
  12         6  POWER & LIGHT ON MAI MN&14thSB   1-CBD       1    3              361     0.00     0.00     0.00     0.00      0.00  1605
  13         6  Prospect & 51st      Psp&51st   10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99508                    99549
  14         7  KAUFFMAN CENTER ON M MN&16thSB   3-CrwnCt    1    3               81     0.00     0.00     0.00     0.00      0.00  1606
  15         7  Prospect & Swope     Psp&Swope  10-ECClub    1    N                0     0.00     0.00     0.00     0.00      0.00  99509                    99548
  16         8  CROSSROADS ON MAIN A MN&19thSB   3-CrwnCt    1    3              184     0.00     0.00     0.00     0.00      0.00  1607
  17         8  Prospect & 43rd      Psp&43rd    5-Plaza     1    N                0     0.00     0.00     0.00     0.00      0.00  99547                    99510
  18         9  Prospect & 39th      Psp&39th    9-Emidtw    1    N                0     0.00     0.00     0.00     0.00      0.00  99511                    99546
  19         9  UNION STATION ON MAI UNSTATION   3-CrwnCt    2    3             1311     0.00     0.00     0.00     0.00      0.00  1608
  52        -1  Pershing & Grand                 3-CrwnCt    1    E                0     0.00     0.00     0.00     0.00      0.00  place_prgr
  20        10  CROSSROADS ON MAIN A MN&19thNB   3-CrwnCt    1    3              356     0.00     0.00     0.00     0.00      0.00  1609
  21        10  Prospect & 35th      Psp&35th    9-Emidtw    1    N                0     0.00     0.00     0.00     0.00      0.00  99512                    99545
  22        11  KAUFFMAN CENTER ON M MN&16thNB   3-CrwnCt    1    3              171     0.00     0.00     0.00     0.00      0.00  1610
  23        11  Prospect & Linwood   Prsp&Linw   9-Emidtw    1    N                0     0.00     0.00     0.00     0.00      0.00  99544                    99513
  24        12  POWER & LIGHT ON MAI MN&14thNB   1-CBD       1    3              226     0.00     0.00     0.00     0.00      0.00  1611
  25        12  Prospect & 31st      Prsp&31st   9-Emidtw    1    N                0     0.00     0.00     0.00     0.00      0.00  99555                    99556
  26        13  METRO CENTER ON MAIN MN&12thNB   1-CBD       1    3              292     0.00     0.00     0.00     0.00      0.00  1612
  27        13  Prospect & 27th      Prsp&27th   9-Emidtw    1    N                0     0.00     0.00     0.00     0.00      0.00  99543                    99514
  28        14  LIBRARY ON MAIN AT 9 MN&9thNB    1-CBD       1    3              160     0.00     0.00     0.00     0.00      0.00  1613
  29        14  Prospect & 23rd      Psp&23rd    8-ECBD      1    N                0     0.00     0.00     0.00     0.00      0.00  99542                    99515
  30        15  NORTH LOOP ON MAIN A MN&7thNB    1-CBD       1    3               37     0.00     0.00     0.00     0.00      0.00  1614
  31        15  Prospect & 18th      Psp&18th    8-ECBD      1    N                0     0.00     0.00     0.00     0.00      0.00  99541                    99516
  32        16  Prospect & Truman    Psp&Trumn   8-ECBD      1    N                0     0.00     0.00     0.00     0.00      0.00  99540                    99517
  33        16  CITY MARKET ON WALNU WAL&5thEB   2-NCBD      1    3              384     0.00     0.00     0.00     0.00      0.00  1615
  34        17  12th & Prospect      12th&Psp    8-ECBD      1    N                0     0.00     0.00     0.00     0.00      0.00  99539                    99518
  52        17  Union Station NB     UnStatNB    3-CrwnCt    2    E                0     0.00     0.00     0.00     0.00      0.00  199
  35        18  12th & Brooklyn      12th&Brkl   8-ECBD      1    N                0     0.00     0.00     0.00     0.00      0.00  99519                    99538
  52        18  27th & Main NB       MN&27thNB   3-CrwnCt    1    E                0     0.00     0.00     0.00     0.00      0.00  200
  52        19  27th & Main SB       MN&27thSB   3-CrwnCt    1    E                0     0.00     0.00     0.00     0.00      0.00  201
  36        19  12th & Woodland      Psp&Woodl   8-ECBD      1    N                0     0.00     0.00     0.00     0.00      0.00  99520                    99537
  37        20  12th & Troost        12th&Troo   1-CBD       1    N                0     0.00     0.00     0.00     0.00      0.00  99535
  52        20  31st & Main SB       MN&31stSB   4-Midtow    1    E                0     0.00     0.00     0.00     0.00      0.00  204
  38        21  11th & Troost        11th&Troo   1-CBD       1    N                0     0.00     0.00     0.00     0.00      0.00  99522
  52        21  31st & Main NB       MN&31stNB   4-Midtow    1    E                0     0.00     0.00     0.00     0.00      0.00  205
```

Figure 68. Report Table 1.02 – Station Listing

Report Table 1.03 – Route Count and Group Information

If the user provided information on counted route ridership, STOPS summarizes these inputs in Table 1.03. An example is presented in Figure 69. Information provided in this report includes the GTFS route_id, the route_name, the group that was assigned to this route for calibration, and the route ridership.

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Program STOPS - FTA Simplified Trips-on-Project Software                                                  Page     5
Version: STOPS-v2.52 - 12/12/2022                                                                         12/19/2022
Run:    Prospect MAX - NTI Course Example                                                                   12:57:58
System: Kansas City
Table     1.03


Input Route Count and Group Information
RouteID                              Route Name                      Group  Rider Count
========================= ======================================== ===== ============
1                         Main Street MAX                              1      4537.51
2                         Troost MAX                                   2      5099.75
9                         9th Street                                   3       449.24
10                        Woodland/Brooklyn                            4         0.00
11                        Northeast-Westside                           5      1239.28
12                        12th Street                                  6      1038.41
15                        Truman Rd                                    7       494.27
23                        23rd Street                                  8       181.24
24                        Independence                                 9      2995.83
25                        Troost                                      10      1246.82
27                        27th Street                                 11       706.23
28                        Blue Ridge                                  12      1210.31
31                        31st Street                                 13      3073.64
32                        Linwood Link                                14        40.16
35                        35th Street                                 15      1072.31
39                        39th Street                                 16      2647.38
40                        Crossroads-Plaza                            17       120.10
47                        Broadway                                    18      1643.25
51                        Ward Parkway                                19       139.40
55                        55th Street                                 20       291.74
57                        Wornall                                     21       619.03
63                        63rd Street                                 22       732.33
71                        Prospect                                    23      4912.98
75                        75th Street                                 24       611.24
77                        Casino Cruiser                              25       651.32
85                        Paseo                                       26      1305.89
```

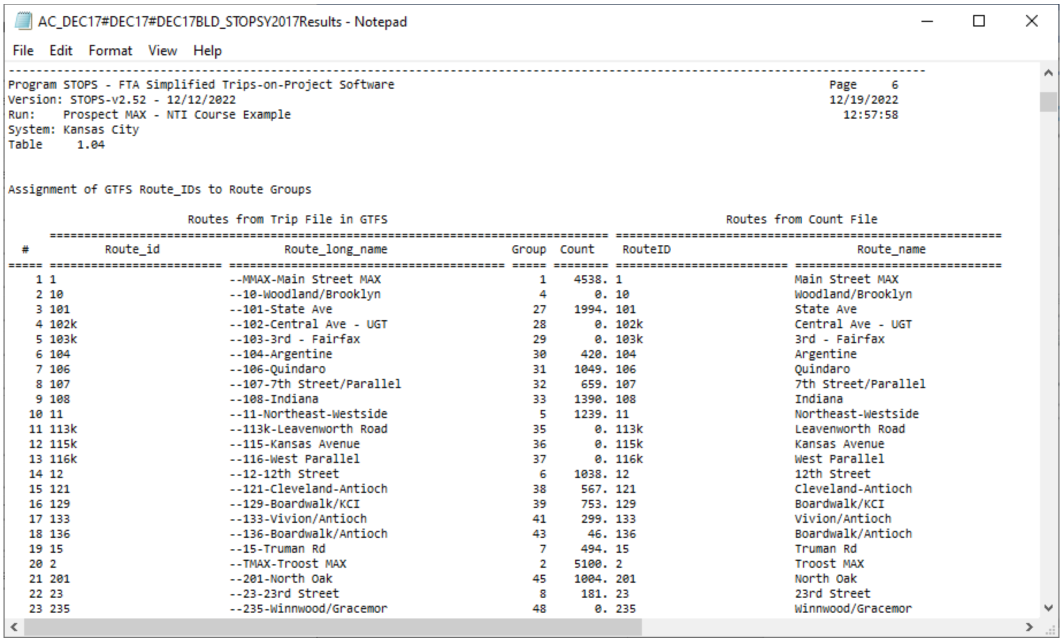
Figure 69. Report Table 1.03 – Route Count and Group Information

Report Table 1.04 – Assignment of GTFS Route_IDs to Route Groups

If input route information was provided, then Report Table 1.04 summarizes the linkage that STOPS makes between the two input files with route information:

- GTFS trip file. These are the actual routes operated on the calendar day selected for the STOPS analysis. These trips are reported in the transit impedance files used by STOPS to estimate ridership.
- Route count file. This is the information provided by the user and previously summarized in Report Table 1.03.

An example of Report Table 1.04 is shown in Figure 70. When the GTFS Trip File and the Route Count File use consistent route_ids, each route from the trip file is linked to a route from the count file and the sum of the counted ridership matches the number provided in Table 1.03.



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Program STOPS - FTA Simplified Trips-on-Project Software          Page     6
Version: STOPS-v2.52 - 12/12/2022                                 12/19/2022
Run:     Prospect MAX - NTI Course Example                          12:57:58
System: Kansas City
Table     1.04

Assignment of GTFS Route_IDs to Route Groups
```

	Routes from Trip File in GTFS				Routes from Count File	
#	Route_id	Route_long_name	Group	Count	RouteID	Route_name
1	1	--MMAX-Main Street MAX	1	4538.	1	Main Street MAX
2	10	--10-Woodland/Brooklyn	4	0.	10	Woodland/Brooklyn
3	101	--101-State Ave	27	1994.	101	State Ave
4	102k	--102-Central Ave - UGT	28	0.	102k	Central Ave - UGT
5	103k	--103-3rd - Fairfax	29	0.	103k	3rd - Fairfax
6	104	--104-Argentine	30	420.	104	Argentine
7	106	--106-Quindaro	31	1049.	106	Quindaro
8	107	--107-7th Street/Parallel	32	659.	107	7th Street/Parallel
9	108	--108-Indiana	33	1390.	108	Indiana
10	11	--11-Northeast-Westside	5	1239.	11	Northeast-Westside
11	113k	--113k-Leavenworth Road	35	0.	113k	Leavenworth Road
12	115k	--115-Kansas Avenue	36	0.	115k	Kansas Avenue
13	116k	--116-West Parallel	37	0.	116k	West Parallel
14	12	--12-12th Street	6	1038.	12	12th Street
15	121	--121-Cleveland-Antioch	38	567.	121	Cleveland-Antioch
16	129	--129-Boardwalk/KCI	39	753.	129	Boardwalk/KCI
17	133	--133-Vivion/Antioch	41	299.	133	Vivion/Antioch
18	136	--136-Boardwalk/Antioch	43	46.	136	Boardwalk/Antioch
19	15	--15-Truman Rd	7	494.	15	Truman Rd
20	2	--TMAX-Troost MAX	2	5100.	2	Troost MAX
21	201	--201-North Oak	45	1004.	201	North Oak
22	23	--23-23rd Street	8	181.	23	23rd Street
23	235	--235-Winnwood/Gracemor	48	0.	235	Winnwood/Gracemor

Figure 70. Report Table 1.04 – Assignment of GTFS Route_IDs to Route Groups

8.2 Report Section 2 – Summary of Existing Scenario Results Before Station Group Calibration

Section 2 summarizes STOPS results for the existing scenario before the station group calibration process begins. The information in this section provides an indication of how well STOPS can calibrate itself to local conditions using just CTPP estimates of attraction district transit share, regional unlinked trips, and linked trips by purpose (if provided). This information can be helpful in determining how well STOPS understands the particular markets being modeled and may provide an indication that additional refinement to the inputs are required before STOPS is used to forecast project ridership.

Report Table 2.01 – Initial Calibration Statistics

Table 2.01 (see Figure 71) provides a summary of the user-provided HBW linked transit trip targets as compared to estimated CTPP person trip tables (as adjusted by special market/transit trip table inputs). In the event that the user did not provide any estimate of HBW linked trips, STOPS infers the linked HBW trips from total unlinked transit trips using CTPP estimates of the HBW transit mode share.

Next, Table 2.01 presents a district summary of HBW transit and total trip targets for each production and attraction district (bottom section of Figure 71) followed by the results of the district calibration in Figure 72. District calibration results include computed district-level trips and the resulting mode-specific constants.

Trip targets and calibration results for HBO and NHB purposes are also provided.

Since the district level calibration is only one of several calibration steps, these results are preliminary and are only useful for understanding the degree to which the district-level calibration achieved the trip goals.

The information in these tables are used to confirm that:

1. The calibration process worked properly and that sufficient data exists to calibrate mode-specific constants in places with significant numbers of transit trips; and
2. Areas with few transit trips were assigned a transit constant that is consistent with the characteristics of the place.

If problems are found in the Section 2 reports, adjustments can be made in Step 2. This is done by clicking on the button "2. Edit Parameter File" on the STOPS main menu and then clicking the "Calib Settings" button to change parameters related to identifying districts with too few trips to perform calibration. Changes can also be made by defining aggregate calibration districts as discussed in the section on the STOPS override file capability.

When districts are aggregated, Table 2.01 shows trip statistics for both the original and aggregate districts. Constants are shown for aggregate districts only.

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Program STOPS - FTA Simplified Trips-on-Project Software                                      Page     8
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Run:     Prospect MAX - NTI Course Example                                                      12:57:58
System: Kansas City
Table     2.01

 Maximum zonal density in database:        41091.47
 Maximum work transit share used for PNR computations 0.433
 Initial Calibration Statistics - PURPOSE Home-Based Work
 Regional CTPP all-mode trips (converted to trips):          1292740.29
 Regional CTPP transit trips (converted to trips):    14613.00
 Transit boarding target    53600.00
 Home-Based Work      Linked trip target                 14616.00 (Input, if entered by user. Otherwise inferred from unlinked trips)
 Home-Based Work      Adj CTPP linked transit trips      14613.00 (CTPP adjusted by special market/transit trip inputs, if any)
 Auto ownership: 0 car HH
 Home-Based Work      Input linked trip target      6253.00 (Input, if entered by user. Otherwise zero)
 Home-Based Work      CTPP linked transit trips     6253.00 (CTPP adjusted by special market/transit trip inputs, if any)
 Auto ownership: 1 car HH
 Home-Based Work      Input linked trip target      4259.00 (Input, if entered by user. Otherwise zero)
 Home-Based Work      CTPP linked transit trips     4259.00 (CTPP adjusted by special market/transit trip inputs, if any)
 Auto ownership: 2+ car HH
 Home-Based Work      Input linked trip target      4101.00 (Input, if entered by user. Otherwise zero)
 Home-Based Work      CTPP linked transit trips     4101.00 (CTPP adjusted by special market/transit trip inputs, if any)
 CTPP adjustment factor       1.0002

 District-Level Calibration Targets Home-Based Work     (adjustments by cars owned:  1.000  1.000  1.000)
```

	Transit Production Goals			Transit Attraction Goals			All-Mode Est. Productions			Production Share			All-Mode Est. Attractions			Attraction Share		
District	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car
Original Districts																		
1 CBD	40.3	11.4	7.5	1068.4	815.7	1587.6	588.1	1240.7	1329.3	0.069	0.009	0.006	7535.8	8531.1	37978.4	0.142	0.096	0.042
2 NCBD	13.9	82.8	5.0	100.7	18.0	6.0	358.2	1201.6	612.6	0.039	0.069	0.008	771.8	823.4	2858.3	0.130	0.022	0.002
3 CrwnC	112.9	16.7	0.6	543.3	419.5	423.7	338.3	862.1	625.9	0.334	0.019	0.001	7177.5	8812.8	36221.0	0.076	0.048	0.012
4 Midto	727.8	377.5	88.9	470.8	376.2	111.1	2560.3	3730.3	5293.2	0.284	0.101	0.017	3263.8	4390.5	13952.0	0.144	0.086	0.008
5 Plaza	244.2	271.1	0.0	160.4	273.5	141.8	1165.3	2260.3	1929.7	0.210	0.120	0.000	3808.4	4599.7	18841.4	0.042	0.059	0.008
6 UMKC	13.8	62.5	5.3	40.3	146.0	38.3	507.1	630.8	1145.4	0.027	0.099	0.005	1291.8	1691.0	5220.1	0.031	0.086	0.007
7 CClub	224.2	273.3	236.0	592.4	147.0	107.6	4642.5	5542.1	22937.1	0.048	0.049	0.010	4556.6	5040.8	21767.1	0.130	0.029	0.005
8 ECBD	820.1	335.0	75.8	381.9	182.3	85.1	1586.6	1694.8	3610.2	0.517	0.198	0.021	2079.3	2627.1	7580.6	0.184	0.069	0.011
9 Emidt	502.9	428.7	105.1	163.6	43.5	33.4	1389.0	3016.2	3017.0	0.362	0.142	0.035	555.8	682.9	1994.0	0.294	0.064	0.017
10 SPrsp	806.7	464.2	264.4	371.8	117.5	41.0	2511.5	4480.4	7577.8	0.321	0.104	0.035	2044.6	2451.5	8461.8	0.182	0.048	0.005
11 EInd	367.3	237.2	188.9	182.1	67.5	122.2	2396.1	2963.8	8220.2	0.153	0.080	0.023	3398.8	4164.1	17234.5	0.054	0.016	0.007
12 EastS	246.5	198.1	41.8	64.9	89.7	17.9	1187.5	2448.7	3325.6	0.208	0.081	0.013	1285.2	1659.3	5465.7	0.050	0.054	0.003
13 Swope	17.1	14.0	68.4	145.6	188.7	67.3	395.0	541.8	1284.7	0.043	0.026	0.053	1132.0	1625.1	5769.4	0.129	0.116	0.012
14 BlRid	137.2	20.7	209.1	14.2	0.0	65.1	1794.1	2199.3	8683.7	0.076	0.009	0.024	1314.4	1074.9	6851.6	0.011	0.000	0.010

Figure 71. Report Table 2.01 – Initial Calibration Statistics (beginning)

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```
Above inputs by district includes an overall factor that corrects region-wide estimated trips to control totals.
These factors are (with underlying target transit trips, Z2Z estimate of transit trips, CTPP estimated transit trips, and special transit trips) are as follows:
  0-car:    1.0000(   6253.00,   6253.00,   6253.00,      0.00)
  1-car:    1.0000(   4259.00,   4259.00,   4259.00,      0.00)
  2-car:    1.0000(   4101.00,   4101.00,   4101.00,      0.00)

 District-Level Calibration Results and Transit Constants for Home-Based Work     (adjustments by cars owned:  1.000  1.000  1.000)
 Note: Final constants for districts with fewer than  15.0 trips use the average constant for districts with less than a 0.000 share** and more than  15.0 trips
       Low data constants are adjusted* by   1.00 for productions and   1.00 for attractions when applied to specific districts
       *adjusted in this context means multiplying positive constants and dividing negative constants by this factor to reduce transit trips
       ** this share may be overridden for specific ownership categories as follows
          O-car productions, low share districts capped at   0.070
          1-car productions, low share districts capped at   0.030
          2-car productions, low share districts capped at   0.020
          O-car attractions, low share districts capped at   0.050
          1-car attractions, low share districts capped at   0.020
          2-car attractions, low share districts capped at   0.010
  Average Low-Share Production Constants: 0-car=   0.00000, 1-car=   0.00000, 2+car=   0.00000
  Average Low-Share Attraction Constants: 0-car=  -0.25484, 1-car=  -1.43771, 2+car=  -2.29403
  Minimum District Constants (P or A):    0-car=  -2.40000, 1-car=  -3.00000, 2+car=  -7.80000
  Maximum District Constants (P or A):    0-car=   4.50000, 1-car=   3.50000, 2+car=   2.50000
```

	Transit Production Goals			Transit Attraction Goals			Transit Productions Modeled			Transit Attractions Modeled		
District	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car
1 CBD	40.3	11.4	7.5	1068.4	815.7	1587.6	94.6	102.2	33.1	1068.4	815.7	1587.6
2 NCBD	13.9	82.8	5.0	100.7	18.0	6.0	42.7	69.3	7.7	100.7	18.0	28.6
3 CrwnC	112.9	16.7	0.6	543.3	419.5	423.7	47.0	40.9	9.8	543.3	419.5	423.7
4 Midto	727.8	377.5	88.9	470.8	376.2	111.1	403.6	292.1	83.1	470.8	376.2	111.1
5 Plaza	244.2	271.1	0.0	160.4	273.5	141.8	161.0	137.5	34.6	160.4	273.5	141.8
6 UMKC	13.8	62.5	5.3	40.3	146.0	38.3	28.5	31.0	9.7	40.3	146.0	38.3
7 CClub	224.2	273.3	236.0	592.4	147.0	107.6	525.3	337.8	444.7	592.4	147.0	107.6
8 ECBD	820.1	335.0	75.8	381.9	182.3	85.1	253.2	114.4	51.1	381.9	182.3	85.1
9 Emidt	502.9	428.7	105.1	163.6	43.5	33.4	248.7	193.5	46.0	163.6	43.5	33.4
10 SPrsp	806.7	464.2	264.4	371.8	117.5	41.0	392.1	256.2	100.1	371.8	117.5	41.0
11 EInd	367.3	237.2	188.9	182.1	67.5	122.2	304.9	148.9	112.2	182.1	67.5	122.2
12 EastS	246.5	198.1	41.8	64.9	89.7	17.9	129.6	139.9	37.9	64.9	89.7	17.9
13 Swope	17.1	14.0	68.4	145.6	188.7	67.3	31.5	29.4	12.7	145.6	188.7	67.3
14 BlRid	137.2	20.7	209.1	14.2	0.0	65.1	135.6	90.7	88.4	43.4	15.0	65.1
15 SE	278.6	166.5	290.7	111.1	33.2	55.2	371.4	215.5	320.6	111.1	33.2	55.2
16 South	121.7	50.9	196.0	67.7	80.0	46.2	163.2	125.1	92.6	67.7	80.0	46.2
17 FarSo	55.0	10.5	230.9	38.6	6.2	158.8	15.2	12.2	54.1	0.0	0.0	0.0
18 FarEa	68.9	38.1	289.1	35.3	47.3	128.5	67.3	56.7	181.1	2.4	1.9	128.5
19 NKC	95.5	122.6	54.8	197.0	105.5	41.0	162.2	129.7	80.4	197.0	105.5	41.0
20 NE	21.3	47.0	53.4	82.1	91.5	11.4	73.2	44.4	57.9	82.1	91.5	11.8
21 FarNE	6.9	0.0	31.7	0.0	0.0	0.0	0.2	0.0	0.6	0.0	0.0	0.0
22 GladS	162.3	240.2	215.8	58.0	51.7	11.1	486.3	343.2	370.9	58.0	51.7	101.3
23 NW	17.9	35.2	57.1	79.3	30.1	19.8	111.0	70.0	132.7	79.3	30.1	19.8
24 KCI	0.0	0.0	0.0	57.4	72.1	10.1	0.4	0.0	1.6	57.4	72.1	43.2
25 Far N	26.7	0.0	26.9	7.7	0.0	0.0	1.4	0.8	4.4	0.0	0.0	0.0
26 Ind	89.1	107.0	153.9	85.6	176.1	88.5	235.9	238.0	273.2	85.6	176.1	88.5
27 KCK	419.7	369.3	383.1	535.5	428.2	262.2	535.5	401.2	275.8	535.5	428.2	262.2
28 WestC	106.1	35.6	4.3	141.8	83.0	66.0	112.8	120.6	51.6	141.8	83.0	66.0
29 FarNW	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.8	12.3	0.0	0.0	0.0
30 Kansa	497.7	242.7	766.9	441.6	169.2	324.6	991.0	450.6	984.9	441.6	169.2	324.6

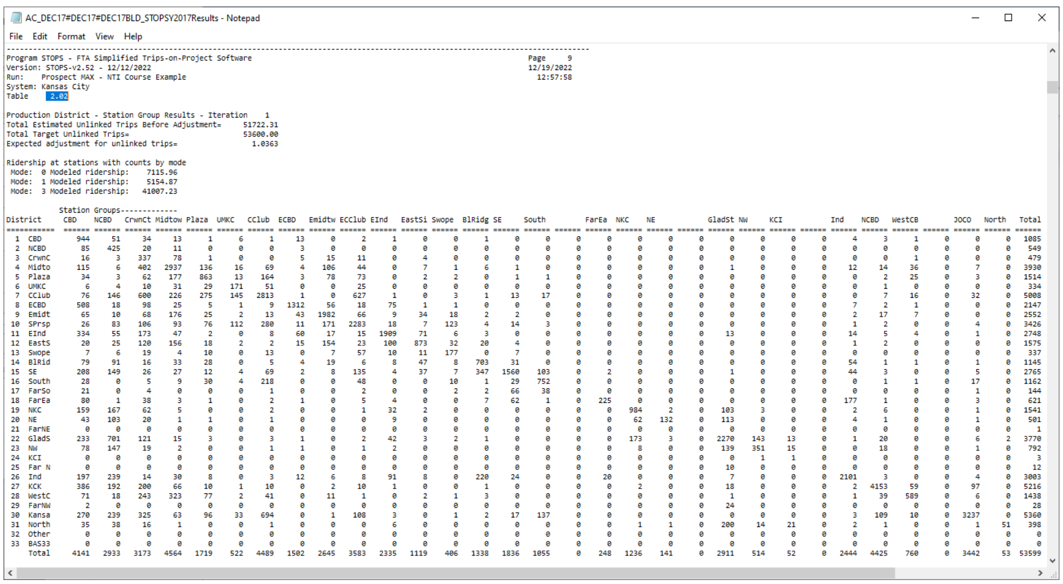
	-Raw-Production Constants--			-Raw Attraction Constants--			-Final Production Constants-			-Final Attraction Constants-		
District	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car	0-car	1-car	2+car
1 CBD	0.000000	0.000000	0.000000	0.294408	-0.738921	-1.702680	0.000000	0.000000	0.000000	0.294408	-0.738921	-1.702680
2 NCBD	0.000000	0.000000	0.000000	0.158900	-2.128485	-3.863459	0.000000	0.000000	0.000000	0.158900	-2.128485	-2.294030
3 CrwnC	0.000000	0.000000	0.000000	-0.231177	-1.179709	-2.474577	0.000000	0.000000	0.000000	-0.231177	-1.179709	-2.474577
4 Midto	0.000000	0.000000	0.000000	0.516049	-0.439842	-2.701714	0.000000	0.000000	0.000000	0.516049	-0.439842	-2.701714
5 Plaza	0.000000	0.000000	0.000000	-0.694552	-0.846826	-2.724118	0.000000	0.000000	0.000000	-0.694552	-0.846826	-2.724118
6 UMKC	0.000000	0.000000	0.000000	-0.984414	-0.386585	-2.977934	0.000000	0.000000	0.000000	-0.984414	-0.386585	-2.977934
7 CClub	0.000000	0.000000	0.000000	0.751159	-1.192258	-2.744521	0.000000	0.000000	0.000000	0.751159	-1.192258	-2.744521
8 ECBD	0.000000	0.000000	0.000000	0.732186	-0.541617	-2.113778	0.000000	0.000000	0.000000	0.732186	-0.541617	-2.113778
9 Emidt	0.000000	0.000000	0.000000	1.607467	-0.850590	-1.635174	0.000000	0.000000	0.000000	1.607467	-0.850590	-1.635174
10 SPrsp	0.000000	0.000000	0.000000	1.303911	-0.668470	-2.498996	0.000000	0.000000	0.000000	1.303911	-0.668470	-2.498996
11 EInd	0.000000	0.000000	0.000000	0.285629	-1.368467	-1.886724	0.000000	0.000000	0.000000	0.285629	-1.368467	-1.886724
12 EastS	0.000000	0.000000	0.000000	-0.007625	-0.185371	-2.872275	0.000000	0.000000	0.000000	-0.007625	-0.185371	-2.872275
13 Swope	0.000000	0.000000	0.000000	1.342132	0.630477	-1.252126	0.000000	0.000000	0.000000	1.342132	0.630477	-1.252126
14 BlRid	0.000000	0.000000	0.000000	-1.396496	-1.438141	-1.642400	0.000000	0.000000	0.000000	-0.254840	-1.437712	-1.642400
15 SE	0.000000	0.000000	0.000000	0.194511	-1.409880	-2.394536	0.000000	0.000000	0.000000	0.194511	-1.409880	-2.394536
16 South	0.000000	0.000000	0.000000	-0.207317	-0.382577	-2.442439	0.000000	0.000000	0.000000	-0.207317	-0.382577	-2.442439
17 FarSo	0.000000	0.000000	0.000000	-0.254872	-1.438141	-2.293205	0.000000	0.000000	0.000000	-0.254840	-1.437712	-2.294030
18 FarEa	0.000000	0.000000	0.000000	2.427713	1.805843	1.968631	0.000000	0.000000	0.000000	-0.254840	-1.437712	1.968631
19 NKC	0.000000	0.000000	0.000000	0.184328	-0.928465	-3.298983	0.000000	0.000000	0.000000	0.184328	-0.928465	-3.298983
20 NE	0.000000	0.000000	0.000000	1.442046	1.441083	-2.330714	0.000000	0.000000	0.000000	1.442046	1.441083	-2.294030
21 FarNE	0.000000	0.000000	0.000000	-0.254872	-1.438141	-2.293205	0.000000	0.000000	0.000000	-0.254840	-1.437712	-2.294030
22 GladS	0.000000	0.000000	0.000000	-1.009327	-1.462891	-4.505273	0.000000	0.000000	0.000000	-1.009327	-1.462891	-2.294030
23 NW	0.000000	0.000000	0.000000	0.818609	-0.879708	-2.504332	0.000000	0.000000	0.000000	0.818609	-0.879708	-2.504332
24 KCI	0.000000	0.000000	0.000000	0.004170	-0.444874	-3.753020	0.000000	0.000000	0.000000	0.004170	-0.444874	-2.294030
25 Far N	0.000000	0.000000	0.000000	-0.254872	-1.438141	-2.293205	0.000000	0.000000	0.000000	-0.254840	-1.437712	-2.294030
26 Ind	0.000000	0.000000	0.000000	-0.573132	-0.343505	-2.341546	0.000000	0.000000	0.000000	-0.573132	-0.343505	-2.341546
27 KCK	0.000000	0.000000	0.000000	0.027560	-0.697638	-2.430737	0.000000	0.000000	0.000000	0.027560	-0.697638	-2.430737
28 WestC	0.000000	0.000000	0.000000	-0.093436	-1.185802	-2.502536	0.000000	0.000000	0.000000	-0.093436	-1.185802	-2.502536
29 FarNW	0.000000	0.000000	0.000000	-0.254872	-1.438141	-2.293205	0.000000	0.000000	0.000000	-0.254840	-1.437712	-2.294030
30 Kansa	0.000000	0.000000	0.000000	-1.067939	-2.378420	-3.306688	0.000000	0.000000	0.000000	-1.067939	-2.378420	-3.306688

Figure 72. Report Table 2.01 – Initial Calibration Statistics (Continuation)

Report Tables 2.02 and 2.03 – District - Station Group Results

Table 2.02 (Figure 73), provides a listing of trips by production district and station group. Table 2.03 provides a similar table for trips by attraction district. Together, these two tables can be useful in determining the relationship between districts and station groups. If stations and districts are coded with similar geographic definitions, then the majority of trips will appear on the diagonal where the district sequence number equals the station group sequence. If significant numbers of trips are off of this diagonal and if the distance between the districts and groups is large, then either a different district/station group coding convention was used or there is a problem with one or more district or station codes.

Note*: *If calibration Types 7 or 8 are selected, Tables 2.02 and 2.03 are repeated 5 more times for each iteration of the district calibration process.



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Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:    Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     2.02

Production District - Station Group Results - Iteration    1
Total Estimated Unlinked Trips Before Adjustment=     51722.31
Total Target Unlinked Trips=                          53600.00
Expected adjustment for unlinked trips=                 1.0363

Ridership at stations with counts by mode
 Mode:  0 Modeled ridership:    7115.96
 Mode:  1 Modeled ridership:    5154.87
 Mode:  3 Modeled ridership:   41007.23

            Station Groups-------------
```

District	CBD	NCBD	CrwnCt	Midtow	Plaza	UMKC	CClub	ECBD	Emidtw	ECClub	EInd	EastSi	Swope	BlRidg	SE	South		FarEa	NKC	NE		GladSt	NW	KCI		Ind	NCBD	WestCB		JOCO	North	Total
1 CBD	944	51	34	13	1	6	1	13	0	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	3	1	0	0	0	1085
2 NCBD	85	425	20	11	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	549
3 CrwnC	16	3	337	78	1	0	0	5	15	11	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	479
4 Midto	115	6	402	2937	136	16	69	4	106	44	0	7	1	6	1	0	0	0	0	0	0	1	0	0	0	12	14	36	0	7	0	3930
5 Plaza	34	3	62	177	863	13	164	3	78	73	0	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	2	25	0	3	0	1514
6 UMKC	6	4	10	31	29	171	51	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	334
7 CClub	76	146	600	226	275	145	2813	1	0	627	1	0	3	1	13	17	0	0	0	0	0	0	0	0	0	0	7	16	0	32	0	5008
8 ECBD	508	18	98	25	5	1	9	1312	56	18	75	1	1	0	0	0	0	0	0	0	0	0	0	0	0	7	2	1	0	0	0	2147
9 Emidt	65	10	68	176	25	2	13	43	1982	66	9	34	18	2	2	0	0	0	0	0	0	0	0	0	0	2	17	7	0	0	0	2552
10 SPrsp	26	83	106	93	76	112	280	11	171	2283	18	7	123	4	14	3	0	0	0	0	0	0	0	0	0	1	2	0	0	4	0	3426
11 EInd	334	55	173	47	2	0	8	60	17	15	1909	71	6	3	0	0	0	0	0	0	0	13	0	0	0	14	5	4	0	1	0	2748
12 EastS	20	25	120	156	18	2	2	15	154	23	100	873	32	20	4	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1575
13 Swope	7	6	19	4	10	0	13	0	7	57	10	11	177	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337
14 BlRid	79	91	16	33	28	0	5	4	19	6	8	47	8	703	31	0	0	0	0	0	0	0	0	0	0	54	1	1	0	1	0	1145
15 SE	208	149	26	27	12	4	69	2	8	135	4	37	7	347	1560	103	0	2	0	0	0	1	0	0	0	44	3	0	0	5	0	2765
16 South	28	0	5	9	30	4	218	0	0	48	0	0	10	1	29	752	0	0	0	0	0	0	0	0	0	0	1	1	0	17	0	1162
17 FarSo	21	0	4	0	0	0	1	0	0	2	0	0	2	2	66	38	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	144
18 FarEa	80	1	38	3	1	0	2	1	0	5	4	0	0	7	62	1	0	225	0	0	0	0	0	0	0	177	1	0	0	3	0	621
19 NKC	159	167	62	5	0	0	2	0	0	1	32	2	0	0	0	0	0	0	984	2	0	103	3	0	0	2	6	0	0	1	0	1541
20 NE	43	103	20	1	1	0	1	0	0	0	9	0	0	0	0	0	0	0	62	132	0	113	0	0	0	4	1	0	0	1	0	501
21 FarNE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
22 GladS	233	701	121	15	3	0	3	1	0	2	42	3	2	1	0	0	0	0	173	3	0	2270	143	13	0	1	20	0	0	6	2	3770
23 NW	78	147	19	2	0	0	1	1	0	1	2	0	0	0	0	0	0	0	8	0	0	139	351	15	0	0	18	0	0	1	0	792
24 KCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	3
25 Far N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	12
26 Ind	197	239	14	30	8	0	3	12	6	8	91	8	0	220	24	0	0	20	0	0	0	7	0	0	0	2101	3	0	0	4	0	3003
27 KCK	386	192	200	66	10	1	10	0	2	10	1	0	0	1	0	0	0	0	2	0	0	18	0	0	0	2	4153	59	0	97	0	5216
28 WestC	71	18	243	323	77	2	41	0	11	1	0	2	1	3	0	0	0	0	0	0	0	1	0	0	0	1	39	589	0	6	0	1438
29 FarNW	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	28
30 Kansa	270	239	325	63	96	33	694	0	1	108	3	0	1	2	17	137	0	0	0	0	0	0	0	0	0	3	109	10	0	3237	0	5360
31 North	35	38	16	1	0	0	1	0	0	0	6	0	0	0	0	0	0	0	1	1	0	200	14	21	0	2	1	0	0	1	51	398
32 Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33 BAS33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4141	2933	3173	4564	1719	522	4489	1502	2645	3583	2335	1119	406	1338	1836	1055	0	248	1236	141	0	2911	514	52	0	2444	4425	760	0	3442	53	53599

Figure 73. Report Table 2.02 – Production District - Station Group Results

Report Table 2.04 – Station Group Boardings Prior to Adjustment

Table 2.04[53] is shown in Figure 74 and presents the station group-to-station group ridership for the existing scenario and current year prior to group calibration. The table should be carefully reviewed by the user to confirm that STOPS has a good initial understanding of the ridership market for the project corridor and to confirm that there are no obvious errors in the input information supplied to STOPS.

[53] The station group-to-station group ridership tables before station calibration appears as Tables 2.04 except for Group Calibration Types 07 and 08. This table appears as Tables 2.16 for Group Calibration Types 07 and 08.

This table shows station group-to-station group ridership and sums the STOPS estimate in the row and column labeled "TOTAL". For use in assessing the reasonableness of this total, the total counted station group ridership (coded by the user in the station file) is shown in the row and column labeled "COUNT". STOPS also shows the calibration target for the station group calibration in the row and column labeled "GOAL". Generally, the count and the goal are equal except in cases where a station has a missing count denoted in the station file with a ridership value less than zero. When this happens, STOPS increases the ridership for this station group by the amount of pre-calibration ridership for that station so that the remaining stations will calibrate to the correct values.

One important use of Table 2.04 is to compare the initial pre-station group calibration results shown in the "TOTAL" row of Table 2.04 to the user-provided counts shown in the "COUNTS" and "GOAL" rows to confirm that the model appears to reflect the same patterns as the counts. This review should focus on big picture observations (i.e., does the largest modeled ridership occur in the same groups that have the largest counts) rather than a strict review of percentage differences.

As shown in the Kansas City example, the model properly represents the fact that the CBD is, by far, the most important attraction location and other major attraction locations include Midtown, Crown Center, and Country Club. The East Midtown attraction group is lower than is desirable and might deserve additional review. Nevertheless, all areas have sufficient numbers of transit trips so that the last calibration step can correct volumes to match route and/or station group counts.

Another important use of this table is to establish that the regional ridership estimated by STOPS is relatively close to the expected value before region-wide adjustment factors are applied. This is determined by reviewing the number labeled as "Regional Calibration" (1.04 in this example). In general, when this number is lower than 0.9 or higher than 1.1, it is likely that there is a problem with the STOPS setup that must be addressed. Potential problems include:

- Problems with the specification of regional geography
- Incorrect regional unlinked trips control total (entered in "4. Define Forecast Years")
- Problem with GTFS files including improper selection of the GTFS Day for one or more of GTFS file sets used for the existing scenario
- Need for supplemental special markets data when the modeling area includes universities, airports, or other non-standard land-uses that attract a substantial number of transit trips

In this case, the factor is well within the range of 0.9 to 1.1. In this case, the model appears to be working reasonably well but requires additional tuning. The process of updating model parameters to fully match demand (i.e., calibration) is discussed in Section 11.0 (synthetic models) and Section 13.0 (incremental models).

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Program STOPS - FTA Simplified Trips-on-Project Software                    Page    11
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     2.04

Station Group Boardings Prior to Adjustment
Scenario  1: Y2017 EXISTING
Raw linked transit trips:           39270.55
Raw unlinked transit trips:         51722.31
Target unlinked transit trips:      53600.00
Regional calibration:                   1.04
          Destination Group-----------------------------------
```

Origin Group	1 CBD	2 NCBD	3 CrwnCt	4 Midtow	5 Plaza	6 UMKC	7 CClub	8 ECBD	9 Emidtw	10 ECClub	11 EInd	12 EastSi	13 Swope	14 BlRidg	15 SE	16 South	17	18 FarEa	19 NKC	20 NE	21	22 GladSt	23 NW	24 KCI	25	26 Ind	27 NCBD	28 WestCB	29	30 JOCO	31 North	TOTAL	GOAL	COUNT
1-CBD :	782	900	1218	473	125	37	253	510	209	224	470	63	29	189	218	80	0	48	355	55	0	305	153	35	0	161	379	123	0	474	14	7882	10553	10553
2-NCBD :	900	17	498	36	40	5	26	5	14	5	30	0	1	0	0	0	0	0	63	20	0	48	0	0	0	4	61	17	0	0	0	1788	1680	1680
3-CrwnCt:	1218	498	533	524	181	26	150	29	86	94	38	73	10	32	32	40	0	24	41	10	0	97	12	0	0	0	14	41	0	150	8	3962	4353	4353
4-Midtow:	473	36	524	1274	422	158	465	32	363	163	3	172	26	37	7	18	0	0	4	2	0	4	0	0	0	0	45	304	0	0	0	4530	6801	6801
5-Plaza :	125	40	181	422	272	61	340	3	19	133	1	34	32	53	3	40	0	0	0	0	0	0	0	0	0	0	0	134	0	70	0	1963	1887	1887
6-UMKC :	37	5	26	158	61	100	69	1	0	80	0	0	24	3	7	10	0	0	0	0	0	0	0	0	0	0	0	10	0	29	0	618	540	540
7-CClub :	253	26	150	465	340	69	1659	0	0	438	0	0	81	0	79	275	0	0	0	0	0	0	0	0	0	0	2	16	0	191	0	4043	1664	1664
8-ECBD :	510	5	29	32	3	1	0	481	190	56	286	30	9	0	0	0	0	0	0	1	0	0	0	0	0	27	0	32	0	0	0	1693	2336	2336
9-Emidtw:	209	14	86	363	19	0	0	190	639	237	14	127	99	31	0	0	0	0	3	0	0	4	0	0	0	0	16	53	0	0	0	2104	4317	4317
10-ECClub:	224	5	94	163	133	80	438	56	237	1222	42	41	171	12	210	49	0	0	2	0	0	2	0	0	0	0	0	2	0	62	0	3243	4051	4051
11-EInd :	470	30	38	3	1	0	0	286	14	42	631	121	19	0	0	0	0	0	40	85	0	52	0	0	0	68	0	34	0	0	0	1934	2117	2117
12-EastSi:	63	0	73	172	34	0	0	30	127	41	121	129	20	98	19	0	0	0	2	1	0	1	0	0	0	0	1	17	0	0	0	952	1661	1661
13-Swope :	29	1	10	26	32	24	81	9	99	171	19	20	116	33	30	6	0	0	1	0	0	4	0	0	0	0	0	0	0	2	0	710	574	574
14-BlRidg:	189	0	32	37	53	3	0	0	31	12	0	98	33	263	169	1	0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	1054	1330	1330
15-SE :	218	0	32	7	3	7	79	0	0	210	0	19	30	169	585	56	0	0	0	0	0	0	0	0	0	21	0	0	0	8	0	1445	1169	1169
16-South :	80	0	40	18	40	10	275	0	0	49	0	0	6	1	56	197	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0	778	419	419
17- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
18-FarEa :	48	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	91	0	0	0	0	0	212	79	79
19-NKC :	355	63	41	4	0	0	0	0	3	2	40	2	1	0	0	0	0	0	329	26	0	462	8	0	0	0	0	0	0	0	0	1334	530	530
20-NE :	55	20	10	2	0	0	0	1	0	0	85	1	0	0	0	0	0	0	26	29	0	12	0	0	0	0	0	0	0	0	0	242	161	161
21- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
22-GladSt:	305	48	97	4	0	0	0	0	4	2	52	1	4	0	0	0	0	0	462	12	0	884	91	144	0	0	0	0	0	0	4	2113	1022	1022
23-NW :	153	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	91	98	33	0	0	0	0	0	0	0	397	151	151
24-KCI :	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144	33	15	0	0	0	0	0	0	1	227	182	182
25- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
26-Ind :	161	4	0	0	0	0	0	27	0	0	68	0	0	135	21	0	0	91	0	0	0	0	0	0	0	1696	0	0	0	0	0	2204	455	455
27-NCBD :	379	61	14	45	0	0	2	0	16	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3589	12	0	165	0	4285	3650	3650
28-WestCB:	123	17	41	304	134	10	16	32	53	2	34	17	0	0	0	1	0	0	0	0	0	0	0	0	0	0	12	110	0	6	0	913	412	412
29- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
30-JOCO :	474	0	150	0	70	29	191	0	0	62	0	0	2	0	8	5	0	0	0	0	0	0	0	0	0	0	165	6	0	1782	0	2944	1263	1263
31-North :	14	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	27	5	5
TOTAL :	7882	1788	3962	4530	1963	618	4043	1693	2104	3243	1934	952	710	1054	1445	778	0	212	1334	242	0	2113	397	227	0	2204	4285	913	0	2944	27	53599	-	-
GOAL :	10553	1680	4353	6801	1887	540	1664	2336	4317	4051	2117	1661	574	1330	1169	419	-	79	530	161	-	1022	151	182	-	455	3650	412	-	1263	5	-	53362	-
COUNT :	10553	1680	4353	6801	1887	540	1664	2336	4317	4051	2117	1661	574	1330	1169	419	-	79	530	161	-	1022	151	182	-	455	3650	412	-	1263	5	-	-	53362

Figure 74. Report Table 2.04 – Station Group Boardings Prior to Station or Route Adjustment

Report Table 2.05 – Station Group Factors

Table 2.05 shows the station group-to-station group adjustment factors that are computed during the station group calibration process. These factors show the results of an Iterative Proportional Fitting (IPF) process in which the station group-to-station group table shown in Table 2.04 are balanced to the station group goals. Table 2.05 presents the ratio of the factored estimate of ridership to the original values of station group ridership presented in Table 2.04.

An example of Table 2.05 is presented in Figure 75. These ratios show whether the initial estimates of ridership are or are not close to the counted ridership. Factors close to 1.0 indicate that the station group calibration process is relatively modest. Factors greater than 2.0 or less than 0.5 indicate that more significant adjustments are required. Users should review these cases to determine whether all input information is being properly interpreted by STOPS and whether additional adjustments are required.

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Program STOPS - FTA Simplified Trips-on-Project Software                Page    12
Version: STOPS-v2.52 - 12/12/2022                                       12/19/2022
Run:     Prospect MAX - NTI Course Example                                12:57:58
System: Kansas City
Table     2.05

Station Group Boarding Factor for Application to Later Iterations
                 Destination Group-----------------------------------
```

Origin Group	1 CBD	2 NCBD	3 CrwnCt	4 Midtow	5 Plaza	6 UMKC	7 CClub	8 ECBD	9 Emidtw	10 ECClub	11 EInd	12 EastSi	13 Swope	14 BlRidg	15 SE
1-CBD :	2.02	1.14	1.41	1.93	1.41	1.23	0.71	1.60	2.24	1.68	1.43	2.01	1.09	1.67	1.17
2-NCBD :	1.14	0.64	0.80	1.09	0.80	0.69	0.40	0.90	1.26	0.95	0.81	1.00	0.61	1.00	1.00
3-CrwnCt:	1.41	0.80	0.99	1.34	0.98	0.86	0.50	1.12	1.56	1.17	1.00	1.40	0.76	1.17	0.81
4-Midtow:	1.93	1.09	1.34	1.83	1.34	1.17	0.68	1.52	2.13	1.60	1.36	1.92	1.03	1.59	1.11
5-Plaza :	1.41	0.80	0.98	1.34	0.98	0.86	0.50	1.12	1.56	1.17	1.00	1.40	0.76	1.17	0.81
6-UMKC :	1.23	0.69	0.86	1.17	0.86	0.74	0.43	0.97	1.00	1.02	1.00	1.22	0.66	1.02	0.71
7-CClub :	0.71	0.40	0.50	0.68	0.50	0.43	0.25	1.00	1.00	0.59	1.00	1.00	0.38	1.00	0.41
8-ECBD :	1.60	0.90	1.12	1.52	1.12	0.97	1.00	1.27	1.77	1.33	1.14	1.59	0.86	1.00	1.00
9-Emidtw:	2.24	1.26	1.56	2.13	1.56	1.00	1.00	1.77	2.47	1.86	1.58	2.22	1.20	1.85	1.00
10-ECClub:	1.68	0.95	1.17	1.60	1.17	1.02	0.59	1.33	1.86	1.40	1.19	1.67	0.90	1.39	0.97
11-EInd :	1.43	0.81	1.00	1.36	1.00	1.00	1.00	1.14	1.58	1.19	1.02	1.43	0.77	1.00	1.00
12-EastSi:	2.01	1.00	1.40	1.92	1.40	1.22	1.00	1.59	2.22	1.67	1.43	2.00	1.08	1.67	1.16
13-Swope :	1.09	0.61	0.76	1.03	0.76	0.66	0.38	0.86	1.20	0.90	0.77	1.08	0.58	0.90	0.63
14-BlRidg:	1.67	1.00	1.17	1.59	1.17	1.02	1.00	1.00	1.85	1.39	1.00	1.67	0.90	1.38	0.96
15-SE :	1.17	1.00	0.81	1.11	0.81	0.71	0.41	1.00	1.00	0.97	1.00	1.16	0.63	0.96	0.67
16-South :	0.97	1.00	0.68	0.93	0.68	0.59	0.34	1.00	1.00	0.81	1.00	1.00	0.52	0.81	0.56
17- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18-FarEa :	0.74	1.00	0.52	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
19-NKC :	0.67	0.38	0.47	0.64	1.00	1.00	1.00	1.00	0.74	0.56	0.48	0.67	0.36	1.00	1.00
20-NE :	0.97	0.55	0.68	0.92	1.00	1.00	1.00	0.77	1.00	1.00	0.69	0.97	1.00	1.00	1.00
21- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22-GladSt:	0.90	0.51	0.63	0.86	1.00	1.00	1.00	1.00	0.99	0.75	0.64	0.89	0.48	1.00	1.00
23-NW :	0.58	1.00	0.41	0.55	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24-KCI :	1.52	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26-Ind :	0.54	0.30	0.38	1.00	1.00	1.00	1.00	0.43	1.00	1.00	0.38	1.00	1.00	0.45	0.31
27-NCBD :	1.28	0.72	0.90	1.22	1.00	1.00	0.45	1.00	1.42	1.00	1.00	1.28	1.00	1.00	1.00
28-WestCB:	0.57	0.32	0.40	0.54	0.40	0.35	0.20	0.45	0.63	0.47	0.40	0.57	1.00	1.00	1.00
29- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30-JOCO :	0.80	1.00	0.56	1.00	0.56	0.48	0.28	1.00	1.00	0.66	1.00	1.00	0.43	1.00	0.46
31-North :	0.23	1.00	0.16	1.00	1.00	1.00	1.00	0.18	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Origin Group	16 South	17	18 FarEa	19 NKC	20 NE	21	22 GladSt	23 NW	24 KCI	25	26 Ind	27 NCBD	28 WestCB	29	30 JOCO	31 North
1-CBD :	0.97	1.00	0.74	0.67	0.97	1.00	0.90	0.58	1.52	1.00	0.54	1.28	0.57	1.00	0.80	0.23
2-NCBD :	1.00	1.00	1.00	0.38	0.55	1.00	0.51	1.00	1.00	1.00	0.30	0.72	0.32	1.00	1.00	1.00
3-CrwnCt:	0.68	1.00	0.52	0.47	0.68	1.00	0.63	0.41	1.00	1.00	0.38	0.90	0.40	1.00	0.56	0.16
4-Midtow:	0.93	1.00	1.00	0.64	0.92	1.00	0.86	0.55	1.00	1.00	1.00	1.22	0.54	1.00	1.00	1.00
5-Plaza :	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.40	1.00	0.56	1.00
6-UMKC :	0.59	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.35	1.00	0.48	1.00
7-CClub :	0.34	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.45	0.20	1.00	0.28	1.00
8-ECBD :	1.00	1.00	1.00	1.00	0.77	1.00	1.00	1.00	1.00	1.00	0.43	1.00	0.45	1.00	1.00	0.18
9-Emidtw:	1.00	1.00	1.00	0.74	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.42	0.63	1.00	1.00	1.00
10-ECClub:	0.81	1.00	1.00	0.56	1.00	1.00	0.75	1.00	1.00	1.00	1.00	1.00	0.47	1.00	0.66	1.00
11-EInd :	1.00	1.00	1.00	0.48	0.69	1.00	0.64	1.00	1.00	1.00	0.38	1.00	0.40	1.00	1.00	1.00
12-EastSi:	1.00	1.00	1.00	0.67	0.97	1.00	0.89	1.00	1.00	1.00	1.00	1.28	0.57	1.00	1.00	1.00
13-Swope :	0.52	1.00	1.00	0.36	1.00	1.00	0.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.43	1.00
14-BlRidg:	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.45	1.00	1.00	1.00	1.00	1.00
15-SE :	0.56	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.31	1.00	1.00	1.00	0.46	1.00
16-South :	0.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.27	1.00	0.38	1.00
17- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18-FarEa :	1.00	1.00	0.27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.20	1.00	1.00	1.00	1.00	1.00
19-NKC :	1.00	1.00	1.00	0.22	0.32	1.00	0.30	0.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20-NE :	1.00	1.00	1.00	0.32	0.47	1.00	0.43	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.11
21- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22-GladSt:	1.00	1.00	1.00	0.30	0.43	1.00	0.40	0.26	0.68	1.00	1.00	1.00	1.00	1.00	1.00	0.10
23-NW :	1.00	1.00	1.00	0.19	1.00	1.00	0.26	0.17	0.44	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24-KCI :	1.00	1.00	1.00	1.00	1.00	1.00	0.68	0.44	1.15	1.00	1.00	1.00	1.00	1.00	1.00	0.17
25- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26-Ind :	1.00	1.00	0.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.14	1.00	1.00	1.00	1.00	1.00
27-NCBD :	0.62	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.36	1.00	0.51	1.00
28-WestCB:	0.27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.36	0.16	1.00	0.22	1.00
29- :	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30-JOCO :	0.38	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.51	0.22	1.00	0.31	1.00
31-North :	1.00	1.00	1.00	1.00	0.11	1.00	0.10	1.00	0.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Figure 75. Report Table 2.05 – Station Group Boarding Factors

Two calibration methodologies (Type 6 and 9) also use these factors in adjusting all STOPS outputs.

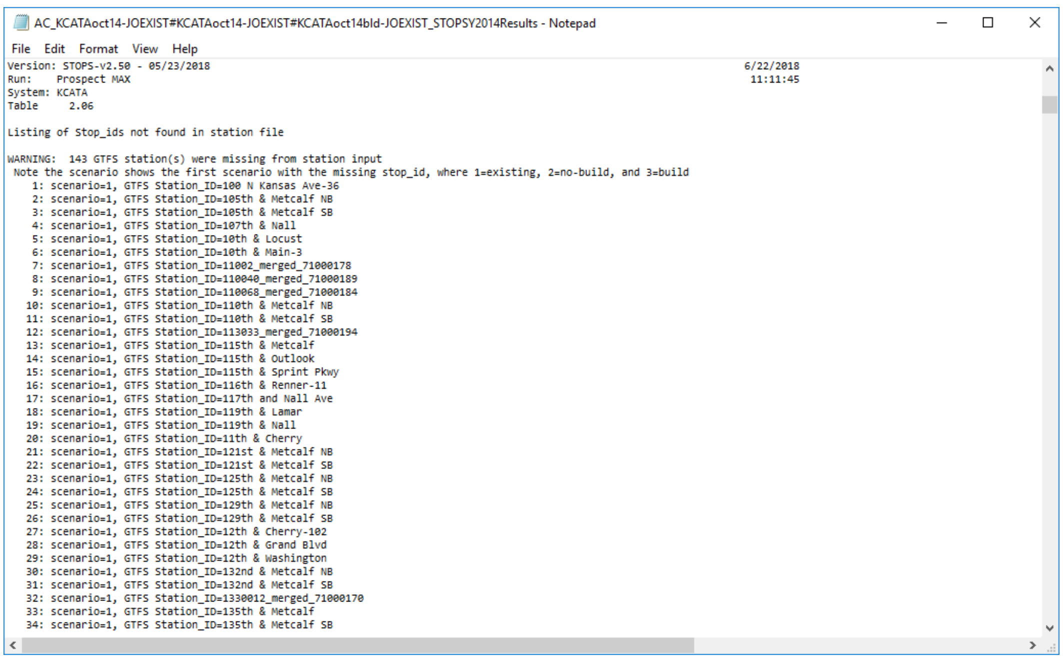
Calibration Type 6, computes station group-to-station group factors for each zone-to-zone interchange for each access mode (walk, KNR, and PNR) and each transit path type (fixed guideway only, bus only and all transit). These factors are fixed as constant and used to adjust all output transit trip estimates for the existing, no-build, and build case. This calibration technique is currently obsolete and should only be used to maintain consistency with prior STOPS runs.

Calibration Type 9 is similar in operation to Type 6 except that the factors are not fixed for each zone-to-zone interchange and, instead, change for the no-build and build alternatives depending on the station groups used in each scenario. Calibration Type 9 is also obsolete and should only be used to maintain consistency with prior STOPS runs.

If calibration types 10, 11, or 12 are used, then the station calibration process is discussed below in Report Tables 2.07 and 2.08.

Report Table 2.06 – Listing of Stop_IDs Not Found in Station File

Table 2.06 presents a list of all stop_ids that are present in the GTFS schedule files and appear in the transit paths that are read by STOPS, but were *not* found in the station file[54]. Figure 76 presents a sample report for an earlier version of the Kansas City run. In this example, APC counts were not available for The Jo, so many of the missing stop_ids are bus stops for that system (any stop with the "&J" suffix). A few KCATA stop_ids are also shown. These are stops which KCATA counted as individual stations but later consolidated into a single bus stop. An example of a consolidated bus stop is "11002_merged_71000178". The list presented in Table 2.06 should be carefully reviewed and any station for which APC counts are available should be added to the station file. If the station file is updated to add missing stop_ids and no other changes are made, then the STOPS step can be re-run without running any other data preparation or batch step.



```
AC_KCATAoct14-JOEXIST#KCATAoct14-JOEXIST#KCATAoct14bld-JOEXIST_STOPSY2014Results - Notepad
File  Edit  Format  View  Help
Version: STOPS-v2.50 - 05/23/2018                                                    6/22/2018
Run:     Prospect MAX                                                                 11:11:45
System: KCATA
Table     2.06

Listing of Stop_ids not found in station file

WARNING:  143 GTFS station(s) were missing from station input
 Note the scenario shows the first scenario with the missing stop_id, where 1=existing, 2=no-build, and 3=build
    1: scenario=1, GTFS Station_ID=100 N Kansas Ave-36
    2: scenario=1, GTFS Station_ID=105th & Metcalf NB
    3: scenario=1, GTFS Station_ID=105th & Metcalf SB
    4: scenario=1, GTFS Station_ID=107th & Nall
    5: scenario=1, GTFS Station_ID=10th & Locust
    6: scenario=1, GTFS Station_ID=10th & Main-3
    7: scenario=1, GTFS Station_ID=11002_merged_71000178
    8: scenario=1, GTFS Station_ID=110040_merged_71000189
    9: scenario=1, GTFS Station_ID=110068_merged_71000184
   10: scenario=1, GTFS Station_ID=110th & Metcalf NB
   11: scenario=1, GTFS Station_ID=110th & Metcalf SB
   12: scenario=1, GTFS Station_ID=113033_merged_71000194
   13: scenario=1, GTFS Station_ID=115th & Metcalf
   14: scenario=1, GTFS Station_ID=115th & Outlook
   15: scenario=1, GTFS Station_ID=115th & Sprint Pkwy
   16: scenario=1, GTFS Station_ID=116th & Renner-11
   17: scenario=1, GTFS Station_ID=117th and Nall Ave
   18: scenario=1, GTFS Station_ID=119th & Lamar
   19: scenario=1, GTFS Station_ID=119th & Nall
   20: scenario=1, GTFS Station_ID=11th & Cherry
   21: scenario=1, GTFS Station_ID=121st & Metcalf NB
   22: scenario=1, GTFS Station_ID=121st & Metcalf SB
   23: scenario=1, GTFS Station_ID=125th & Metcalf NB
   24: scenario=1, GTFS Station_ID=125th & Metcalf SB
   25: scenario=1, GTFS Station_ID=129th & Metcalf NB
   26: scenario=1, GTFS Station_ID=129th & Metcalf SB
   27: scenario=1, GTFS Station_ID=12th & Cherry-102
   28: scenario=1, GTFS Station_ID=12th & Grand Blvd
   29: scenario=1, GTFS Station_ID=12th & Washington
   30: scenario=1, GTFS Station_ID=132nd & Metcalf NB
   31: scenario=1, GTFS Station_ID=132nd & Metcalf SB
   32: scenario=1, GTFS Station_ID=1330012_merged_71000170
   33: scenario=1, GTFS Station_ID=135th & Metcalf
   34: scenario=1, GTFS Station_ID=135th & Metcalf SB
```

Note: this example was from an earlier implementation of the Kansas City example. The current example includes all GTFS stops in the station database and the current version of 2.06 shows no missing stations.

Figure 76. Report Table 2.06 – Listing of Stop_IDs Not Found in Station File (Not From Pre-Calibration Run)

[54] The station file can and should include bus stops if automated passenger count data is available.

Report Table 2.07 – Type 10/12 Group-Level Calibration Summary – Stations/Stops

When calibration type 10 or 12 is selected, Report Table 2.07 presents a summary of the process that adjusts person trips so that modeled stop group ridership matches counted stop group ridership. Figure 77 presents an example of Table 2.07 that shows the initial STOPS estimate of pre-group calibration ridership, the station/stop group counts, the target ridership for the group[55], and the resulting post-group calibration estimate of ridership. This example report is not from the pre-calibration run shown elsewhere in this chapter. As discussed in Section 5.2, pre-calibration runs of STOPS should select group calibration types of 0 or 1 ("none selected" or "No Group Calibration") so that model results clearly show how well the model is representing the market for transit. As calibration is finalized, count adjustment can be enabled (types 11, 12, or 13) to finalize the development of the STOPS application. More on the calibration approach is discussed in Section 11.0.

.

AC_KCATAoct14-JOEXIST#KCATAoct14-JOEXIST#KCATAoct14bld-JOEXIST_STOPSY2015Results - Notepad

File Edit Format View Help

```
-------------------------------------------------------------------------------------------------------------------
Program STOPS - FTA Simplified Trips-on-Project Software                                           Page    14
Version: STOPS-v2.51 - 10/30/2021                                                                  12/23/2021
Run:     Prospect MAX                                                                                 9:53:04
System: KCATA
Table      2.07


Type 10/12 Group-Level Calibration Summary-Stations/Stops
         Pre-Group                                Post-Group
Station/   Calib.     Station/   Station/    Calib.
 Stop      Model       Stop       Stop       Model
 GRP     Boardings    Count      Target    Boardings
======== ========== ========== ========== ==========
      1   10506.01   11103.00   11103.00    9560.16
      2     360.41     363.00     363.00     339.86
      3    3471.95    2393.00    2393.00    3138.07
      4    6356.68    8820.00    8820.00    6473.14
      5    2353.33    2373.00    2373.00    2035.07
      6     799.12     741.00     741.00     843.04
      7    4757.35    2104.00    2104.00    3437.74
      8    3161.98    3077.00    3077.00    2950.92
      9    2527.55    5647.00    5647.00    2782.17
     10    4921.60    5200.00    5200.00    4344.71
     11    2739.97    2432.00    2432.00    2514.07
     12     912.64    1950.00    1950.00     997.38
     13     917.54     666.00     666.00     755.89
     14    1011.97    1431.00    1431.00     973.09
     15    2602.81    1724.00    1724.00    1802.56
     16    1265.51     576.00     576.00     811.59
     17       0.00       0.00       0.00       0.00
     18     162.79     105.00     105.00     112.23
     19    1465.58     549.00     549.00    1024.80
     20     260.94     193.00     193.00     246.77
     21       0.00       0.00       0.00       0.00
     22    1173.69    1093.00    1093.00     873.40
     23     451.65     234.00     234.00     300.07
     24     151.11     171.00     171.00     150.10
     25       0.00       0.00       0.00       0.00
     26     756.98     524.00     524.00     832.60
     27    4823.08    4443.00    4443.00    4809.67
     28    1280.77     651.00     651.00    1131.33
     29       0.00       0.00       0.00       0.00
     30    1224.63     107.00     244.93     781.06
     31      25.83      13.00      13.00      17.44
```

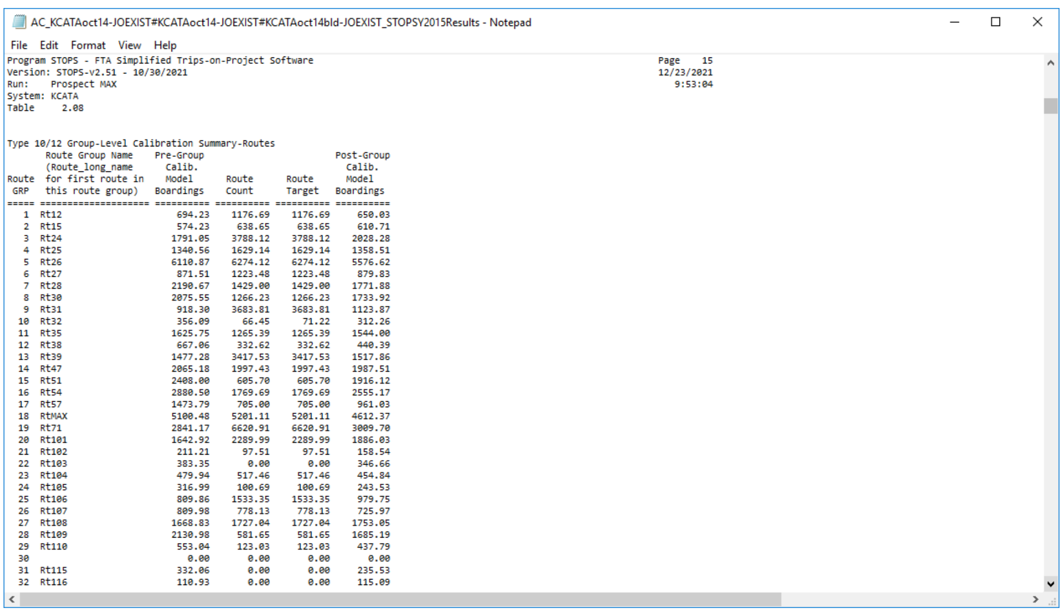
Figure 77. Report Table 2.07 – Group Calibration Summary-Stations/Stops (Not From Pre-Calibration Run)

[55] Counted ridership plus any adjustment for stations with unknown ridership.

Report Table 2.08 – Type 10/12 Group-Level Calibration Summary – Routes

When calibration type 11 or 12 is selected, Report Table 2.08 presents a summary of the process that adjusts person trips so that modeled route group ridership matches counted route group ridership. Figure 78 presents an example of Table 2.08 that shows the initial estimate of pre-group calibration ridership, the route group counts, the target ridership for the route group, and the resulting post-group calibration estimate of ridership.

This report summarizes the initial boardings, the count, the target and the resulting calibrated estimate of ridership by route. Like Table 2.07, this example is not from the pre-calibration run shown elsewhere in this chapter. As discussed in Section 5.2, pre-calibration runs of STOPS should select group calibration types of 0 or 1 (“none selected” or “No Group Calibration”) so that model results clearly show how well the model is representing the market for transit. As calibration is finalized, count adjustment can be enabled (types 11, 12, or 13) so that modeled and counted ridership match closely while also minimizing the adjustments introduced by the count-based factoring approach. More detail on the calibration process is discussed in Section 11.0.


AC_KCATAoct14-JOEXIST#KCATAoct14-JOEXIST#KCATAoct14bld-JOEXIST_STOPSY2015Results - Notepad

File Edit Format View Help

```
Program STOPS - FTA Simplified Trips-on-Project Software                          Page    15
Version: STOPS-v2.51 - 10/30/2021                                                 12/23/2021
Run:    Prospect MAX                                                                 9:53:04
System: KCATA
Table     2.08


Type 10/12 Group-Level Calibration Summary-Routes
       Route Group Name    Pre-Group                                Post-Group
       (Route_long_name      Calib.                                   Calib.
Route  for first route in    Model      Route      Route      Model
 GRP   this route group)   Boardings    Count      Target    Boardings
===== ==================== ========== ========== ========== ==========
   1  Rt12                     694.23    1176.69    1176.69     650.03
   2  Rt15                     574.23     638.65     638.65     610.71
   3  Rt24                    1791.05    3788.12    3788.12    2028.28
   4  Rt25                    1340.56    1629.14    1629.14    1358.51
   5  Rt26                    6110.87    6274.12    6274.12    5576.62
   6  Rt27                     871.51    1223.48    1223.48     879.83
   7  Rt28                    2190.67    1429.00    1429.00    1771.88
   8  Rt30                    2075.55    1266.23    1266.23    1733.92
   9  Rt31                     918.30    3683.81    3683.81    1123.87
  10  Rt32                     356.09      66.45      71.22     312.26
  11  Rt35                    1625.75    1265.39    1265.39    1544.00
  12  Rt38                     667.06     332.62     332.62     440.39
  13  Rt39                    1477.28    3417.53    3417.53    1517.86
  14  Rt47                    2065.18    1997.43    1997.43    1987.51
  15  Rt51                    2408.00     605.70     605.70    1916.12
  16  Rt54                    2880.50    1769.69    1769.69    2555.17
  17  Rt57                    1473.79     705.00     705.00     961.03
  18  RtMAX                   5100.48    5201.11    5201.11    4612.37
  19  Rt71                    2841.17    6620.91    6620.91    3009.70
  20  Rt101                   1642.92    2289.99    2289.99    1886.03
  21  Rt102                    211.21      97.51      97.51     158.54
  22  Rt103                    383.35       0.00       0.00     346.66
  23  Rt104                    479.94     517.46     517.46     454.84
  24  Rt105                    316.99     100.69     100.69     243.53
  25  Rt106                    809.86    1533.35    1533.35     979.75
  26  Rt107                    809.98     778.13     778.13     725.97
  27  Rt108                   1668.83    1727.04    1727.04    1753.05
  28  Rt109                   2130.98     581.65     581.65    1685.19
  29  Rt110                    553.04     123.03     123.03     437.79
  30                             0.00       0.00       0.00       0.00
  31  Rt115                    332.06       0.00       0.00     235.53
  32  Rt116                    110.93       0.00       0.00     115.09
```

Figure 78. Report Table 2.08 – Group Calibration Summary-Routes (Not From Pre-Calibration Run)

8.3 Report Section 3 – Summary of Station Group Calibration Results

Section 3 summarizes the results of the station group calibration process and its effects on the final estimate of ridership for three cases: the existing, no-build, and build scenarios.

Report Tables 3.01, 3.02, and 3.03 – Linked Trips and Group-to-Group Ridership for Each Scenario

Tables 3.01, 3.02, and 3.03 (Figure 79, Figure 80, and Figure 81) show the final[56] estimate of regional linked trips, unlinked trips, and group-to-group ridership for the existing, no-build, and build scenarios, respectively. In the Kansas City example, the regional transit system serves 40,696 daily linked transit trips in both the existing and no-build cases (i.e., shown both Figure 79 (existing) and Figure 80 (no-build). These trips result in 53,600 daily transit boardings (unlinked trips) in both scenarios.

The linked and unlinked trip estimates are the same for the existing and no-build scenarios because:

1. This particular report shows results for the current year for all alternatives. A different forecast year can be selected with the year radio buttons on the main menu. If the year is changed, the user need only re-run the last two batch steps (Prepare Forecast Years and STOPS) to generate a revised forecast. If this is done, then the no-build will reflect the new forecast year. The existing scenario is always linked to the current year.

2. In the Kansas City example, the no-build scenario is identical to the existing scenario (i.e., has the same set of GTFS files describing no-build services as were used to describe existing services).

The build scenario shows that according to the as-yet uncalibrated model, the project will increase daily linked transit trips to 40,742 (46 incremental linked trips) and increase unlinked transit trips to 53,682 (82 incremental unlinked trips). As will be shown in Chapter 11.0, the calibration process will adjust the model to more completely represent the market for transit in Kansas City. These same tables in the

[56] In this context, final means after any count-based factoring is complete. In this test case, count based factoring was not enabled so the final estimate matches earlier estimates of ridership. Later in the calibration process, count-based factoring will be enabled and the final results will differ from earlier estimates of ridership.

calibrated version of the model show a greater increase in Build linked and unlinked trips as compared to the existing or no-build cases.

AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

File Edit Format View Help

Program STOPS - FTA Simplified Trips-on-Project Software — Page 15
Version: STOPS-v2.52 - 12/12/2022 — 12/19/2022
Run: Prospect MAX - NTI Course Example — 12:57:58
System: Kansas City
Table 3.01

Station Group Boardings After Adjustment
Scenario 1: Y2017 EXISTING
Modeled linked transit trips: 40696.21
Modeled unlinked transit trips: 53600.00

Destination Group

Origin Group	1 CBD	2 NCBD	3 CrwnCt	4 Midtow	5 Plaza	6 UMKC	7 CClub	8 ECBD	9 Emidtw	10 ECClub	11 EInd	12 EastSi	13 Swope	14 BlRidg	15 SE	16 South
1-CBD :	782	900	1218	473	125	37	253	510	209	224	470	63	29	189	218	80
2-NCBD :	900	17	498	36	40	5	26	5	14	5	30	0	1	0	0	0
3-CrwnCt:	1218	498	533	524	181	26	150	29	86	94	38	73	10	32	32	40
4-Midtow:	473	36	524	1274	422	158	465	32	363	163	3	172	26	37	7	18
5-Plaza :	125	40	181	422	272	61	340	3	19	133	1	34	32	53	3	40
6-UMKC :	37	5	26	158	61	100	69	1	0	80	0	0	24	3	7	10
7-CClub :	253	26	150	465	340	69	1659	0	0	438	0	0	81	0	79	275
8-ECBD :	510	5	29	32	3	1	0	481	190	56	286	30	9	0	0	0
9-Emidtw:	209	14	86	363	19	0	0	190	639	237	14	127	99	31	0	0
10-ECClub:	224	5	94	163	133	80	438	56	237	1222	42	41	171	12	210	49
11-EInd :	470	30	38	3	1	0	0	286	14	42	631	121	19	0	0	0
12-EastSi:	63	0	73	172	34	0	0	30	127	41	121	129	20	98	19	0
13-Swope :	29	1	10	26	32	24	81	9	99	171	19	20	116	33	30	6
14-BlRidg:	189	0	32	37	53	3	0	0	31	12	0	98	33	263	169	1
15-SE :	218	0	32	7	3	7	79	0	0	210	0	19	30	169	585	56
16-South :	80	0	40	18	40	10	275	0	0	49	0	0	6	1	56	197
17- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-FarEa :	48	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0
19-NKC :	355	63	41	4	0	0	0	0	3	2	40	2	1	0	0	0
20-NE :	55	20	10	2	0	0	0	1	0	0	85	1	0	0	0	0
21- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-GladSt:	305	48	97	4	0	0	0	0	4	2	52	1	4	0	0	0
23-NW :	153	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
24-KCI :	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Ind :	161	4	0	0	0	0	0	27	0	0	68	0	0	135	21	0
27-NCBD :	379	61	14	45	0	0	2	0	16	0	0	1	0	0	0	1
28-WestCB:	123	17	41	304	134	10	16	32	53	2	34	17	0	0	0	1
29- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-JOCO :	474	0	150	0	70	29	191	0	0	62	0	0	2	0	8	5
31-North :	14	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL :	7882	1788	3962	4530	1963	618	4043	1693	2104	3243	1934	952	710	1054	1445	778
GOAL :	10553	1680	4353	6801	1887	540	1664	2336	4317	4051	2117	1661	574	1330	1169	419
COUNT :	10553	1680	4353	6801	1887	540	1664	2336	4317	4051	2117	1661	574	1330	1169	419

Origin Group	17	18 FarEa	19 NKC	20 NE	21	22 GladSt	23 NW	24 KCI	25	26 Ind	27 NCBD	28 WestCB	29	30 JOCO	31 North	TOTAL	GOAL	COUNT
1-CBD :	0	48	355	55	0	305	153	35	0	161	379	123	0	474	14	7882	10553	10553
2-NCBD :	0	0	63	20	0	48	0	0	0	4	61	17	0	0	0	1788	1680	1680
3-CrwnCt:	0	24	41	10	0	97	12	0	0	0	14	41	0	150	8	3962	4353	4353
4-Midtow:	0	0	4	2	0	4	0	0	0	0	45	304	0	0	0	4530	6801	6801
5-Plaza :	0	0	0	0	0	0	0	0	0	0	0	134	0	70	0	1963	1887	1887
6-UMKC :	0	0	0	0	0	0	0	0	0	0	0	10	0	29	0	618	540	540
7-CClub :	0	0	0	0	0	0	0	0	0	0	2	16	0	191	0	4043	1664	1664
8-ECBD :	0	0	0	1	0	0	0	0	0	27	0	32	0	0	0	1693	2336	2336
9-Emidtw:	0	0	3	0	0	4	0	0	0	0	16	53	0	0	0	2104	4317	4317
10-ECClub:	0	0	2	0	0	2	0	0	0	0	0	2	0	62	0	3243	4051	4051
11-EInd :	0	0	40	85	0	52	0	0	0	68	0	34	0	0	0	1934	2117	2117
12-EastSi:	0	0	2	1	0	1	0	0	0	0	1	17	0	0	0	952	1661	1661
13-Swope :	0	0	1	0	0	4	0	0	0	0	0	0	0	2	0	710	574	574
14-BlRidg:	0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	1054	1330	1330
15-SE :	0	0	0	0	0	0	0	0	0	21	0	0	0	8	0	1445	1169	1169
16-South :	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0	778	419	419
17- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
18-FarEa :	0	50	0	0	0	0	0	0	0	91	0	0	0	0	0	212	79	79
19-NKC :	0	0	329	26	0	462	8	0	0	0	0	0	0	0	0	1334	530	530
20-NE :	0	0	26	29	0	12	0	0	0	0	0	0	0	0	0	242	161	161
21- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
22-GladSt:	0	0	462	12	0	884	91	144	0	0	0	0	0	0	4	2113	1022	1022
23-NW :	0	0	8	0	0	91	98	33	0	0	0	0	0	0	0	397	151	151
24-KCI :	0	0	0	0	0	144	33	15	0	0	0	0	0	0	1	227	182	182
25- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
26-Ind :	0	91	0	0	0	0	0	0	0	1696	0	0	0	0	0	2204	455	455
27-NCBD :	0	0	0	0	0	0	0	0	0	0	3589	12	0	165	0	4285	3650	3650
28-WestCB:	0	0	0	0	0	0	0	0	0	0	12	110	0	6	0	913	412	412
29- :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
30-JOCO :	0	0	0	0	0	0	0	0	0	0	165	6	0	1782	0	2944	1263	1263
31-North :	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	27	5	5
TOTAL :	0	212	1334	242	0	2113	397	227	0	2204	4285	913	0	2944	27	53599	-	-
GOAL :	-	79	530	161	-	1022	151	182	-	455	3650	412	-	1263	5	-	53362	-
COUNT :	-	79	530	161	-	1022	151	182	-	455	3650	412	-	1263	5	-	-	53362

Figure 79. Report Table 3.01 – Station Group Boardings (Final, After Adjustment) - Existing Scenario

Note: In the reported model run, count-based adjustment was not enabled resulting in final, after adjustment results matching pre-adjustment results

AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

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COUNT : 10553 1680 4353 6801 1887 540 1664 2336 4317 4051 2117 1661 574 1330 1169 419 - 79 530 161 - 1022 151 182 - 455 3650 412 - 1263 5 -

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Version: STOPS-v2.52 - 12/12/2022 — 12/19/2022
Run: Prospect MAX - NTI Course Example — 12:57:58
System: Kansas City
Table 3.02

Station Group Boardings After Adjustment
Scenario 2: Y2017 NO-BUILD
Modeled linked transit trips: 40696.21
Modeled unlinked transit trips: 53600.00

Destination Group

Origin Group	1 CBD	2 NCBD	3 CrwnCt	4 Midtow	5 Plaza	6 UMKC	7 CClub	8 ECBD	9 Emidtw	10 ECClub	11 EInd	12 EastSi	13 Swope	14 BlRidg	15 SE	16 South	17	18 FarEa	19 NKC	20 NE	21	22 GladSt	23 NW	24 KCI	25	26 Ind	27 NCBD	28 WestCB	29	30 JOCO	31 North	TOTAL
1-CBD	782	900	1218	473	125	37	253	510	209	224	470	63	29	189	218	80	0	48	355	55	0	305	153	35	0	161	379	123	0	474	14	7882
2-NCBD	900	17	498	36	40	5	26	5	14	5	30	0	1	0	0	0	0	0	63	20	0	48	0	0	0	4	61	17	0	0	0	1788
3-CrwnCt	1218	498	533	524	181	26	150	29	86	94	38	73	10	32	32	40	0	24	41	10	0	97	12	0	0	0	14	41	0	150	8	3962
4-Midtow	473	36	524	1274	422	158	465	32	363	163	3	172	26	37	7	18	0	0	4	2	0	4	0	0	0	0	45	304	0	0	0	4530
5-Plaza	125	40	181	422	272	61	340	3	19	133	1	34	32	53	3	40	0	0	0	0	0	0	0	0	0	0	0	134	0	70	0	1963
6-UMKC	37	5	26	158	61	100	69	1	0	80	0	0	24	3	7	10	0	0	0	0	0	0	0	0	0	0	0	10	0	29	0	618
7-CClub	253	26	150	465	340	69	1659	0	0	438	0	0	81	0	79	275	0	0	0	0	0	0	0	0	0	0	2	16	0	191	0	4043
8-ECBD	510	5	29	32	3	1	0	481	190	56	286	30	9	0	0	0	0	0	0	1	0	0	0	0	0	27	0	32	0	0	0	1693
9-Emidtw	209	14	86	363	19	0	0	190	639	237	14	127	99	31	0	0	0	0	3	0	0	4	0	0	0	0	16	53	0	0	0	2104
10-ECClub	224	5	94	163	133	80	438	56	237	1222	42	41	171	12	210	49	0	0	2	0	0	2	0	0	0	0	0	2	0	62	0	3243
11-EInd	470	30	38	3	1	0	0	286	14	42	631	121	19	0	0	0	0	0	40	85	0	52	0	0	0	68	0	34	0	0	0	1934
12-EastSi	63	0	73	172	34	0	0	30	127	41	121	129	20	98	19	0	0	0	2	1	0	1	0	0	0	0	1	17	0	0	0	952
13-Swope	29	1	10	26	32	24	81	9	99	171	19	20	116	33	30	6	0	0	1	0	0	4	0	0	0	0	0	0	0	2	0	710
14-BlRidg	189	0	32	37	53	3	0	0	31	12	0	98	33	263	169	1	0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	1054
15-SE	218	0	32	7	3	7	79	0	0	210	0	19	30	169	585	56	0	0	0	0	0	0	0	0	0	21	0	0	0	8	0	1445
16-South	80	0	40	18	40	10	275	0	0	49	0	0	6	1	56	197	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0	778
17-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-FarEa	48	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	91	0	0	0	0	0	212
19-NKC	355	63	41	4	0	0	0	0	3	2	40	2	1	0	0	0	0	0	329	26	0	462	8	0	0	0	0	0	0	0	0	1334
20-NE	55	20	10	2	0	0	0	1	0	0	85	1	0	0	0	0	0	0	26	29	0	12	0	0	0	0	0	0	0	0	0	242
21-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-GladSt	305	48	97	4	0	0	0	0	4	2	52	1	4	0	0	0	0	0	462	12	0	884	91	144	0	0	0	0	0	0	4	2113
23-NW	153	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	91	98	33	0	0	0	0	0	0	0	397
24-KCI	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144	33	15	0	0	0	0	0	0	1	227
25-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Ind	161	4	0	0	0	0	0	27	0	0	68	0	0	135	21	0	0	91	0	0	0	0	0	0	0	1696	0	0	0	0	0	2204
27-NCBD	379	61	14	45	0	0	2	0	16	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3589	12	0	165	0	4285
28-WestCB	123	17	41	304	134	10	16	32	53	2	34	17	0	0	0	1	0	0	0	0	0	0	0	0	0	0	12	110	0	6	0	913
29-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-JOCO	474	0	150	0	70	29	191	0	0	62	0	0	2	0	8	5	0	0	0	0	0	0	0	0	0	0	165	6	0	1782	0	2944
31-North	14	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	27
TOTAL	7882	1788	3962	4530	1963	618	4043	1693	2104	3243	1934	952	710	1054	1445	778	0	212	1334	242	0	2113	397	227	0	2204	4285	913	0	2944	27	53599

Figure 80. Report Table 3.02 – Station Group Boardings (Final, After Adjustment) - No-Build Scenario

Note: In the reported model run, count-based adjustment was not enabled resulting in final, after adjustment results matching pre-adjustment results

AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

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Program STOPS - FTA Simplified Trips-on-Project Software — Page 17
Version: STOPS-v2.52 - 12/12/2022 — 12/19/2022
Run: Prospect MAX - NTI Course Example — 12:57:58
System: Kansas City
Table 3.03

Station Group Boardings After Adjustment
Scenario 3: Y2017 BUILD
Modeled linked transit trips: 40741.60
Modeled unlinked transit trips: 53681.76

Destination Group

Origin Group	1 CBD	2 NCBD	3 CrwnCt	4 Midtow	5 Plaza	6 UMKC	7 CClub	8 ECBD	9 Emidtw	10 ECClub	11 EInd	12 EastSi	13 Swope	14 BlRidg	15 SE	16 South	17	18 FarEa	19 NKC	20 NE	21	22 GladSt	23 NW	24 KCI	25	26 Ind	27 NCBD	28 WestCB	29	30 JOCO	31 North	TOTAL
1-CBD	772	890	1208	474	130	36	245	503	199	251	467	62	22	188	215	80	0	48	357	56	0	308	153	35	0	162	379	122	0	477	14	7854
2-NCBD	890	17	502	36	40	5	25	5	14	4	30	0	1	0	0	0	0	0	63	19	0	48	0	0	0	4	60	17	0	0	0	1780
3-CrwnCt	1208	502	533	517	179	25	147	33	100	89	38	73	10	31	32	40	0	24	41	10	0	95	12	0	0	0	14	41	0	149	8	3951
4-Midtow	474	36	517	1246	418	159	451	30	362	170	3	169	25	36	7	18	0	0	4	2	0	4	0	0	0	0	44	303	0	0	0	4478
5-Plaza	130	40	179	418	279	61	336	9	22	140	1	34	32	52	3	40	0	0	0	0	0	0	0	0	0	0	0	134	0	70	0	1979
6-UMKC	36	5	25	159	61	100	68	1	0	76	0	0	23	3	7	10	0	0	0	0	0	0	0	0	0	0	0	10	0	29	0	611
7-CClub	245	25	147	451	336	68	1667	0	0	442	0	0	81	0	79	275	0	0	0	0	0	0	0	0	0	0	2	16	0	191	0	4025
8-ECBD	503	5	33	30	9	1	0	496	199	85	299	29	9	0	0	0	0	0	0	1	0	0	0	0	0	26	0	31	0	0	0	1756
9-Emidtw	199	14	100	362	22	0	0	199	574	257	13	131	97	36	0	0	0	0	2	0	0	4	0	0	0	0	17	54	0	0	0	2081
10-ECClub	251	4	89	170	140	76	442	85	257	1286	40	43	187	11	212	50	0	0	1	0	0	2	0	0	0	0	0	3	0	62	0	3411
11-EInd	467	30	38	3	1	0	0	299	13	40	623	118	18	0	0	0	0	0	39	84	0	52	0	0	0	68	0	32	0	0	0	1926
12-EastSi	62	0	73	169	34	0	0	29	131	43	118	127	19	98	19	0	0	0	2	1	0	1	0	0	0	0	1	17	0	0	0	946
13-Swope	22	1	10	25	32	23	81	9	97	187	18	19	115	32	30	6	0	0	1	0	0	4	0	0	0	0	0	0	0	2	0	713
14-BlRidg	188	0	31	36	52	3	0	0	36	11	0	98	32	263	168	1	0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	1054
15-SE	215	0	32	7	3	7	79	0	0	212	0	19	30	168	585	56	0	0	0	0	0	0	0	0	0	21	0	0	0	8	0	1441
16-South	80	0	40	18	40	10	275	0	0	50	0	0	6	1	56	197	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0	779
17-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-FarEa	48	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	91	0	0	0	0	0	212
19-NKC	357	63	41	4	0	0	0	0	2	1	39	2	1	0	0	0	0	0	329	26	0	462	8	0	0	0	0	0	0	0	0	1335
20-NE	56	19	10	2	0	0	0	1	0	0	84	1	0	0	0	0	0	0	26	29	0	12	0	0	0	0	0	0	0	0	0	242
21-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-GladSt	308	48	95	4	0	0	0	0	4	2	52	1	4	0	0	0	0	0	462	12	0	884	91	144	0	0	0	0	0	0	4	2113
23-NW	153	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	91	98	33	0	0	0	0	0	0	0	396
24-KCI	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144	33	15	0	0	0	0	0	0	1	227
25-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26-Ind	162	4	0	0	0	0	0	26	0	0	68	0	0	135	21	0	0	91	0	0	0	0	0	0	0	1696	0	0	0	0	0	2205
27-NCBD	379	60	14	44	0	0	2	0	17	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3587	12	0	165	0	4281
28-WestCB	122	17	41	303	134	10	16	31	54	3	32	17	0	0	0	1	0	0	0	0	0	0	0	0	0	0	12	109	0	6	0	908
29-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30-JOCO	477	0	149	0	70	29	191	0	0	62	0	0	2	0	8	5	0	0	0	0	0	0	0	0	0	0	165	6	0	1782	0	2947
31-North	14	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	27
TOTAL	7854	1780	3951	4478	1979	611	4025	1756	2081	3411	1926	946	713	1054	1441	779	0	212	1335	242	0	2113	396	227	0	2205	4281	908	0	2947	27	53681

Figure 81. Report Table 3.03 – Station Group Boardings (Final, After Adjustment) - Build Scenario

Note: In the reported model run, count-based adjustment was not enabled resulting in final, after adjustment results matching pre-adjustment results

Report Tables 3.04, 3.05, 3.06 and 3.07 – Review of Impact of Station Group Factoring on Build Scenario Trips and Project Linked Trips

This section presents a series of 4 reports that, together, illustrate the impact that station group factoring had on build scenario and project ridership[57]. The following tables are presented:

- Table 3.04 – Group-to-Group Unlinked Transit Trips for Build Scenario. Example shown in Figure 82 and Figure 83 (left and right side of the table, respectively). This table shows the same statistic as Table 3.03 (unlinked transit trips for the build scenario) but formatted and aggregated like the following tables (3.05, 3.06, and 3.07) for easier comparison.
- Table 3.05 – Group-to-Group Build Unlinked Transit Trips (Trips added by Group Factors). Example shown in Figure 84 and Figure 85 (left and right side of the table, respectively).
- Table 3.06 – Group-to-Group Project Unlinked Transit Trips. Example shown in Figure 86 and Figure 87 (left and right side of the table, respectively).
- Table 3.07 – Station-to-Station Project Unlinked Transit Trips (Trips added by Group Factors). Example shown in Figure 88 and Figure 89 (left and right side of the table, respectively).

Together these tables show that in the build scenario in 2015, transit stop_ids included in the station database will attract a total of 53,464 transit boardings (Table 3.04). None of these trips are the result of station or route count factoring as shown in Table 3.05[58].

Of greater interest is the fact that project trips will account for 2,535 transit boardings on all services[59] as shown in Table 3.06. None of these trips are the result of station and route factors as shown in Table 3.07. As will be discussed in Chapter 11.0, when count-based adjustment is enabled near the conclusion of the calibration process, Table 3.07 will show non-zero trip adjustments. When these adjustments are a relatively small proportion of total project riders (i.e., less than 10 to 20 percent), the model is well-calibrated and the count-based adjustment is having a

[57] In the reported model run, group factoring was not enabled and as a result all reported numbers of trips added by group factoring are equal to zero.
[58] Table 3.05 will always be zero when the run is made with count-based factoring type 00 or 01 (neither option results in count-based factoring). If factoring type 10, 11, or 12 were selected (as would happen later in the calibration process) this table would have many non-zero entries. Ideally, the number of trips generated by count-based factoring is under 10 to 20 percent of all transit trips for the model to be considered well calibrated.
[59] Unlinked trips (boardings) by made project trips at any station or stop. This number will always be higher than linked trips on the project since the unlinked trip number includes trips boarding and alighting on the project and, for any of these trips that transfer to or from the project, trips on connecting transit routes. It can also include trips transferring between project routes in cases where a transfer is required within the project system to complete a trip.

modest effect. Larger percentages indicate that the count-based adjustment is having a material effect and further research is warranted to determine whether the forecasts are or are not plausible.

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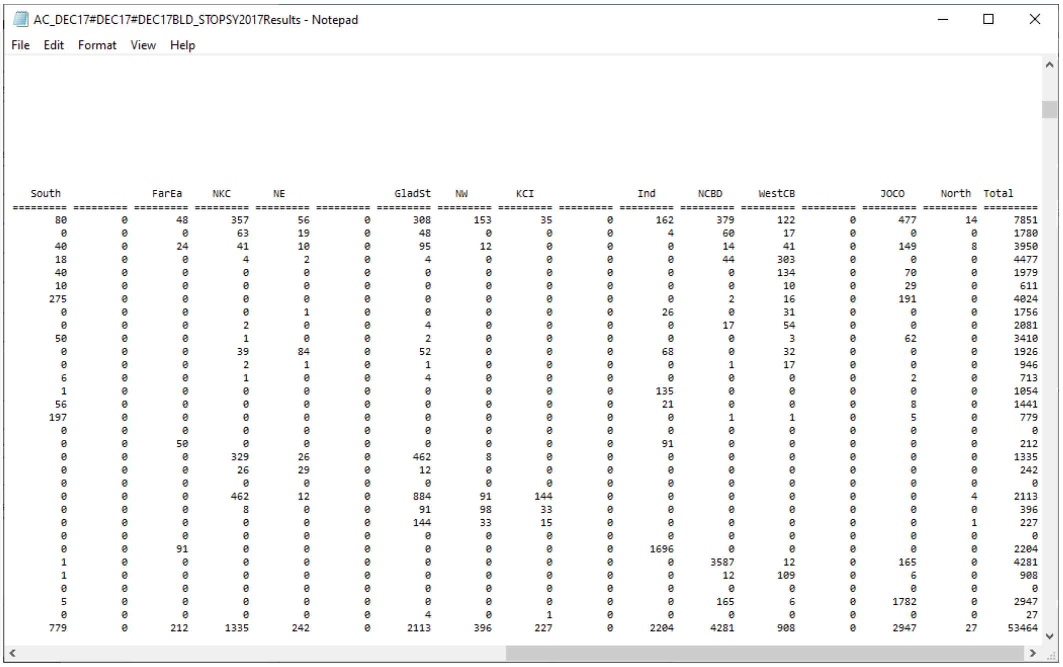
Program STOPS - FTA Simplified Trips-on-Project Software                    Page    18
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     3.04

***** AVG WEEKDAY GROUP UTILIZATION BY BUILD TRANSIT TRIPS (Transit trips) ************
Station to Station MODEL Summary for Scenario  3: Y2017 BUILD
All Purposes All Transit All Access All car HH
```

	CBD	NCBD	CrwnCt	Midtow	Plaza	UMKC	CClub	ECBD	Emidtw	ECClub	EInd	EastSi	Swope	BlRidg	SE	South
CBD	772	890	1208	474	130	36	245	503	199	251	467	62	22	188	215	80
NCBD	890	17	502	36	40	5	25	5	14	4	30	0	1	0	0	0
CrwnCt	1208	502	533	517	179	25	147	33	100	89	38	73	10	31	32	40
Midtow	474	36	517	1246	418	159	451	30	362	170	3	169	25	36	7	18
Plaza	130	40	179	418	279	61	336	9	22	140	1	34	32	52	3	40
UMKC	36	5	25	159	61	100	68	1	0	76	0	0	23	3	7	10
CClub	245	25	147	451	336	68	1667	0	0	442	0	0	81	0	79	275
ECBD	503	5	33	30	9	1	0	496	199	85	299	29	9	0	0	0
Emidtw	199	14	100	362	22	0	0	199	574	257	13	131	97	36	0	0
ECClub	251	4	89	170	140	76	442	85	257	1286	40	43	187	11	212	50
EInd	467	30	38	3	1	0	0	299	13	40	623	118	18	0	0	0
EastSi	62	0	73	169	34	0	0	29	131	43	118	127	19	98	19	0
Swope	22	1	10	25	32	23	81	9	97	187	18	19	115	32	30	6
BlRidg	188	0	31	36	52	3	0	0	36	11	0	98	32	263	168	1
SE	215	0	32	7	3	7	79	0	0	212	0	19	30	168	585	56
South	80	0	40	18	40	10	275	0	0	50	0	0	6	1	56	197
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FarEa	48	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0
NKC	357	63	41	4	0	0	0	0	2	1	39	2	1	0	0	0
NE	56	19	10	2	0	0	0	1	0	0	84	1	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladSt	308	48	95	4	0	0	0	0	4	2	52	1	4	0	0	0
NW	153	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0
KCI	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	162	4	0	0	0	0	0	26	0	0	68	0	0	135	21	0
NCBD	379	60	14	44	0	0	2	0	17	0	0	1	0	0	0	1
WestCB	122	17	41	303	134	10	16	31	54	3	32	17	0	0	0	1
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JOCO	477	0	149	0	70	29	191	0	0	62	0	0	2	0	8	5
North	14	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	7851	1780	3950	4477	1979	611	4024	1756	2081	3410	1926	946	713	1054	1441	779

Figure 82. Report Table 3.04 – Station Group Utilization for Build Scenario (Left Side)



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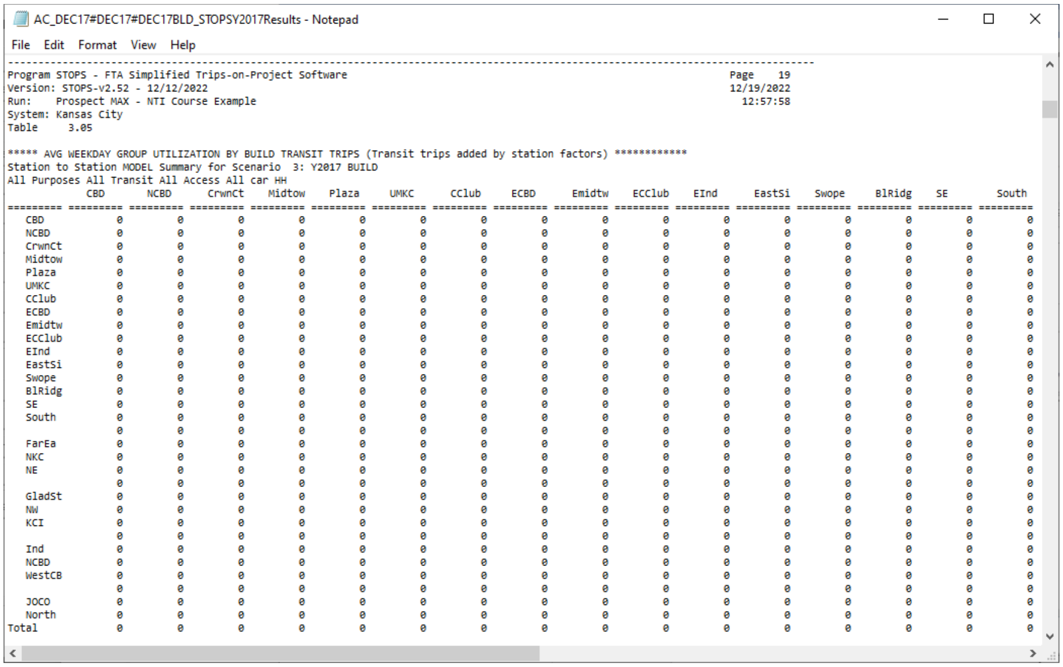
South		FarEa	NKC	NE		GladSt	NW	KCI		Ind	NCBD	WestCB		JOCO	North	Total
80	0	48	357	56	0	308	153	35	0	162	379	122	0	477	14	7851
0	0	0	63	19	0	48	0	0	0	4	60	17	0	0	0	1780
40	0	24	41	10	0	95	12	0	0	0	14	41	0	149	8	3950
18	0	0	4	2	0	4	0	0	0	0	44	303	0	0	0	4477
40	0	0	0	0	0	0	0	0	0	0	0	134	0	70	0	1979
10	0	0	0	0	0	0	0	0	0	0	0	10	0	29	0	611
275	0	0	0	0	0	0	0	0	0	0	2	16	0	191	0	4024
0	0	0	0	1	0	0	0	0	0	26	0	31	0	0	0	1756
0	0	0	2	0	0	4	0	0	0	0	17	54	0	0	0	2081
50	0	0	1	0	0	2	0	0	0	0	0	3	0	62	0	3410
0	0	0	39	84	0	52	0	0	0	68	0	32	0	0	0	1926
0	0	0	2	1	0	1	0	0	0	0	1	17	0	0	0	946
6	0	0	1	0	0	4	0	0	0	0	0	0	0	2	0	713
1	0	0	0	0	0	0	0	0	0	135	0	0	0	0	0	1054
56	0	0	0	0	0	0	0	0	0	21	0	0	0	8	0	1441
197	0	0	0	0	0	0	0	0	0	0	1	1	0	5	0	779
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	50	0	0	0	0	0	0	0	91	0	0	0	0	0	212
0	0	0	329	26	0	462	8	0	0	0	0	0	0	0	0	1335
0	0	0	26	29	0	12	0	0	0	0	0	0	0	0	0	242
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	462	12	0	884	91	144	0	0	0	0	0	0	4	2113
0	0	0	8	0	0	91	98	33	0	0	0	0	0	0	0	396
0	0	0	0	0	0	144	33	15	0	0	0	0	0	0	1	227
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	91	0	0	0	0	0	0	0	1696	0	0	0	0	0	2204
1	0	0	0	0	0	0	0	0	0	0	3587	12	0	165	0	4281
1	0	0	0	0	0	0	0	0	0	0	12	109	0	6	0	908
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	165	6	0	1782	0	2947
0	0	0	0	0	0	4	0	1	0	0	0	0	0	0	0	27
779	0	212	1335	242	0	2113	396	227	0	2204	4281	908	0	2947	27	53464

Figure 83. Report Table 3.04 – Station Group Utilization for Build Scenario (Right Side)

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Program STOPS - FTA Simplified Trips-on-Project Software                    Page    19
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     3.05

***** AVG WEEKDAY GROUP UTILIZATION BY BUILD TRANSIT TRIPS (Transit trips added by station factors) ************
Station to Station MODEL Summary for Scenario  3: Y2017 BUILD
All Purposes All Transit All Access All car HH
```
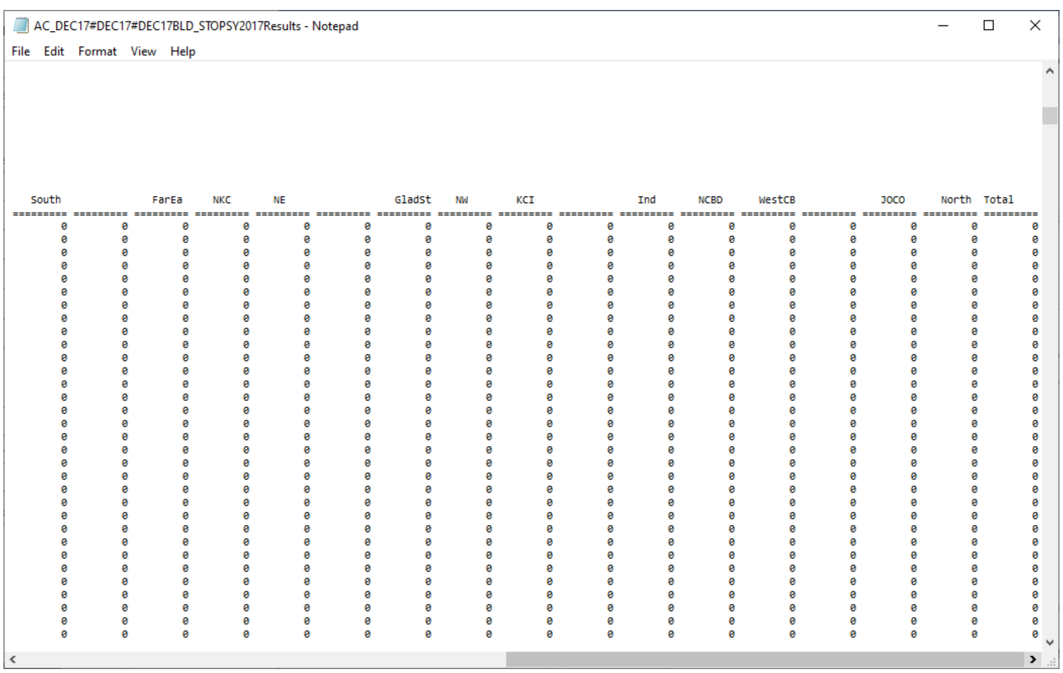

	CBD	NCBD	CrwnCt	Midtow	Plaza	UMKC	CClub	ECBD	Emidtw	ECClub	EInd	EastSi	Swope	BlRidg	SE	South
CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CrwnCt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Midtow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plaza	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMKC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CClub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Emidtw	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECClub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EInd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EastSi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BlRidg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FarEa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NKC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladSt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WestCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JOCO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 84. Report Table 3.05 – Station Group Utilization Added by Station Group Factors for Build Scenario (Left Side)



South		FarEa	NKC	NE		GladSt	NW	KCI		Ind	NCBD	WestCB		JOCO	North	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 85. Report Table 3.05 – Station Group Utilization Added by Station Group Factors for Build Scenario (Right Side)

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Program STOPS - FTA Simplified Trips-on-Project Software                                                  Page    20
Version: STOPS-v2.52 - 12/12/2022                                                                         12/19/2022
Run:    Prospect MAX - NTI Course Example                                                                   12:57:58
System: Kansas City
Table     3.06

***** AVG WEEKDAY GROUP UTILIZATION BY PROJECT TRIPS (Project trips) ************
Station to Station MODEL Summary for Scenario  3: Y2017 BUILD
All Purposes All Transit All Access All car HH
             CBD      NCBD    CrwnCt    Midtow     Plaza      UMKC     CClub      ECBD    Emidtw    ECClub      EInd    EastSi     Swope    BlRidg        SE     South
========= ========= ========= ========= ========= ========= ========= ========= ========= ========= ========= ========= ========= ========= ========= ========= =========
   CBD            34         6         8         8        13         0         3        83        84        78        11         0         0         2         7         1
   NCBD            6         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   CrwnCt          8         0         0         0         0         0         0         2         7         0         0         0         0         0         0         0
   Midtow          8         0         0         1         0         0         2         1        79         4         0         0         0         0         0         0
   Plaza          13         0         0         0         0         0         0         7        11        33         0         0         0         0         0         0
   UMKC            0         0         0         0         0         0         0         0         0         2         0         0         0         0         0         0
   CClub           3         0         0         2         0         0        12         0         0        37         0         0         0         0         0         4
   ECBD           83         0         2         1         7         0         0        45        99        55        35         0         0         0         0         0
   Emidtw         84         0         7        79        11         0         0        99       102       105         1        36         0        16         0         0
   ECClub         78         0         0         4        33         2        37        55       105       326         0         1        40         6        10         0
   EInd           11         0         0         0         0         0         0        35         1         0         0         0         0         0         0         0
   EastSi          0         0         0         0         0         0         0         0        36         1         0         0         0         2         0         0
   Swope           0         0         0         0         0         0         0         0         0        40         0         0         0         0         0         0
   BlRidg          2         0         0         0         0         0         0         0        16         6         0         2         0         1         1         0
   SE              7         0         0         0         0         0         0         0         0        10         0         0         0         1         7         0
   South           1         0         0         0         0         0         4         0         0         0         0         0         0         0         0         0
                   0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   FarEa           1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   NKC            12         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   NE              3         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
                   0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   GladSt         10         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   NW              2         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   KCI             1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
                   0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   Ind             5         0         0         0         0         0         0         5         0         0         0         0         0         1         0         0
   NCBD           14         1         0         0         0         0         0         0         4         0         0         0         0         0         0         0
   WestCB          4         0         0         0         0         0         0         1        10         2         0         0         0         0         0         0
                   0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
   JOCO            6         0         0         0         0         0         1         0         0        14         0         0         0         0         0         0
   North           1         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0
Total            396         7        17        95        65         3        59       333       552       714        46        39        41        30        26         5
```

Figure 86. Report Table 3.06 – Group Utilization by Project Trips (Left Side)

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South		FarEa	NKC	NE		GladSt	NW	KCI		Ind	NCBD	WestCB		JOCO	North	Total
1	0	1	12	3	0	10	2	1	0	5	14	4	0	6	1	396
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	59
0	0	0	0	0	0	0	0	0	0	5	0	1	0	0	0	333
0	0	0	0	0	0	0	0	0	0	0	4	10	0	0	0	552
0	0	0	0	0	0	0	0	0	0	0	0	2	0	14	0	714
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	30
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	12
0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	26
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	21
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5	0	1	12	3	0	11	2	1	0	12	26	18	0	21	1	2535

Figure 87. Report Table 3.06 – Group Utilization by Project Trips (Right Side)

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Program STOPS - FTA Simplified Trips-on-Project Software Page 21
Version: STOPS-v2.52 - 12/12/2022 12/19/2022
Run: Prospect MAX - NTI Course Example 12:57:58
System: Kansas City
Table 3.07

***** AVG WEEKDAY GROUP UTILIZATION BY PROJECT TRIPS (Project trips added by station factors) ************
Station to Station MODEL Summary for Scenario 3: Y2017 BUILD
All Purposes All Transit All Access All car HH

	CBD	NCBD	CrwnCt	Midtow	Plaza	UMKC	CClub	ECBD	Emidtw	ECClub	EInd	EastSi	Swope	BlRidg	SE	South
CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CrwnCt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Midtow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plaza	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMKC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CClub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Emidtw	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ECClub	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EInd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EastSi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BlRidg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FarEa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NKC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladSt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WestCB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JOCO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 88. Report Table 3.07 – Group Utilization by Project Trips Added By Station Factors (Left Side)

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South		FarEa	NKC	NE		GladSt	NW	KCI		Ind	NCBD	WestCB		JOCO	North	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 89. Report Table 3.07 – Group Utilization by Project Trips Added By Station Factors (Right Side)

8.4 Report Section 4 – Summary of Project Results for All Trip Types

Section 4 of the report presents ridership statistics for the build scenario for trips made by members from all household types using all modes of transit. Table 4.01 (Figure 90 and Figure 91) presents district-to-district linked transit trip flows (in production/attraction format) for all transit trips in the Build scenario in the forecast year. In this example, the Kansas City Transit system will attract 40,741 daily linked transit trips in the build alternative. This total is the same (within the limits of rounding) as reported at the top of Table 3.03[60].

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Version: STOPS-v2.52 - 12/12/2022 — 12/19/2022
Run: Prospect MAX - NTI Course Example — 12:57:58
System: Kansas City
Table 4.01

*** WEEKDAY LINKED TRANSIT TRIPS (All Transit/All car HH) ***
District to District MODEL Summary for Scenario 3: Y2017 BUILD
All Purposes All Transit All Access All car HH

Idist	CBD	NCBD	CrwnC	Midto	Plaza	UMKC	CClub	ECBD	Emidt	SPrsp	EInd	EastS	Swope	BlRid	SE	South	FarSo	FarEa
CBD	583	41	178	38	11	2	7	28	13	1	0	0	18	1	1	2	0	0
NCBD	147	18	114	28	7	23	20	40	0	0	2	0	0	1	0	0	0	0
CrwnC	152	3	108	24	26	0	5	7	41	9	13	0	0	0	6	0	0	0
Midto	470	55	475	625	288	112	128	199	91	177	22	48	100	7	3	5	0	8
Plaza	105	44	217	202	105	65	111	35	0	62	13	22	94	1	1	6	0	0
UMKC	14	0	20	50	9	73	47	13	7	18	1	5	1	0	1	1	0	0
CClub	974	64	411	495	318	180	656	25	25	232	27	28	77	10	55	140	0	0
ECBD	288	20	74	204	27	6	56	543	23	18	63	32	40	4	4	0	0	0
Emidt	279	55	131	279	34	13	37	172	335	97	30	84	177	12	8	10	0	1
SPrsp	370	7	145	267	129	44	312	79	155	703	22	42	146	19	46	46	0	0
EInd	362	62	230	96	25	2	75	410	52	39	280	22	12	9	11	8	0	0
EastS	232	5	109	106	109	38	19	90	42	38	74	35	34	39	12	2	0	0
Swope	28	14	8	28	4	0	12	15	0	13	24	8	88	0	4	2	0	0
BlRid	115	4	61	49	43	6	23	36	17	23	24	41	51	76	71	5	0	14
SE	425	10	140	76	42	20	140	57	26	193	24	36	142	97	231	48	0	15
South	81	1	75	53	35	41	162	7	0	98	5	2	48	4	42	166	0	0
FarSo	45	0	8	2	2	1	6	2	1	2	2	1	3	1	3	3	0	0
FarEa	102	2	33	9	8	2	10	12	2	5	14	7	7	10	11	3	0	99
NKC	333	11	86	40	11	4	6	25	2	8	72	7	3	2	0	1	0	0
NE	87	2	47	13	4	0	5	12	1	5	14	1	1	0	1	1	0	0
FarNE	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladS	766	17	182	87	43	8	20	40	5	14	77	10	11	3	3	3	0	0
NW	215	2	57	15	7	1	6	6	5	5	17	4	8	1	1	0	0	0
KCI	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Far N	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	246	8	136	38	23	4	27	32	5	17	68	30	18	82	103	4	0	403
KCK	349	9	207	72	48	7	33	100	21	13	20	15	17	2	2	4	0	2
WestC	258	0	123	165	153	25	43	33	4	38	29	4	9	0	7	1	0	0
FarNW	12	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kansa	1038	13	362	143	221	33	275	41	6	96	27	15	47	5	35	60	0	3
North	108	1	24	7	5	1	2	5	2	3	10	1	2	1	1	1	0	1
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	8190	468	3763	3213	1737	710	2243	2067	882	1926	975	503	1155	388	662	524	0	547

Figure 90. Report Table 4.01 – Linked Transit Trips (All Auto Ownership Levels) For Build Scenario (Left Side)

[60] Note that the remainder of Table 3.03 shows unlinked trips. The matrix component of that table shows station group-to-station group unlinked trips while this table (Table 4.01) shows district-to-district linked transit trips.

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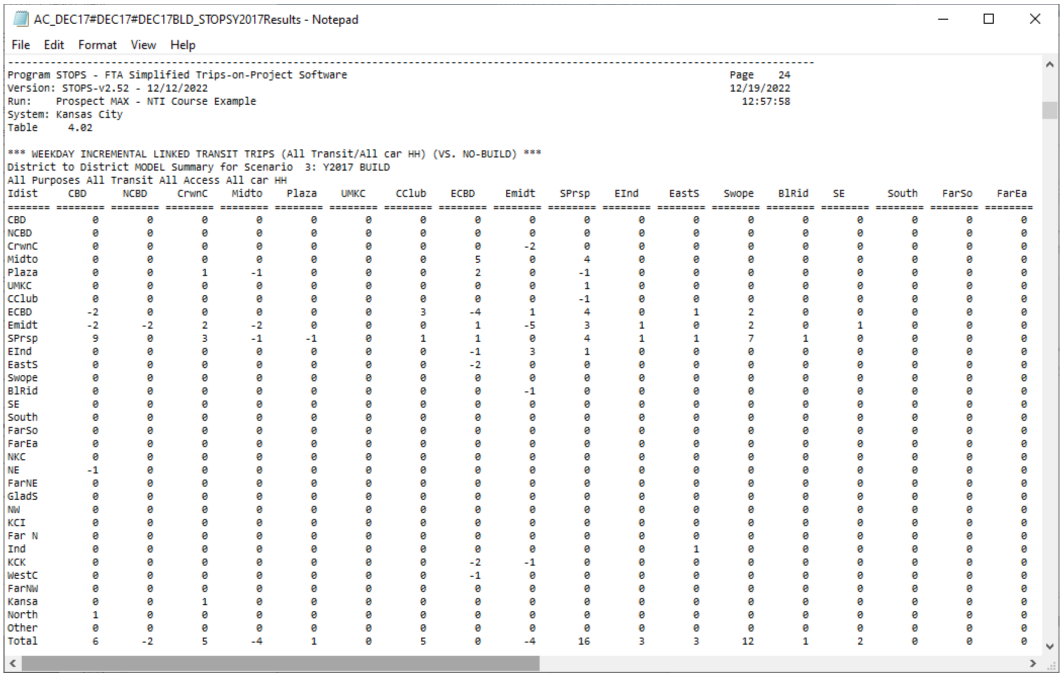
FarEa	NKC	NE	FarNE	GladS	NW	KCI	Far N	Ind	KCK	WestC	FarNW	Kansa	North	Other	Total
0	38	0	0	0	2	4	0	11	16	19	0	13	0	0	1027
0	26	0	0	0	0	0	0	1	10	28	0	4	0	0	470
0	2	0	0	2	0	0	0	0	9	0	0	9	0	0	416
8	23	8	0	2	0	1	0	5	137	201	0	31	0	0	3222
0	4	0	0	2	4	0	0	0	8	129	0	33	0	0	1264
0	0	0	0	0	0	1	0	0	2	8	0	1	0	0	271
0	15	4	0	4	3	2	0	2	101	75	0	153	0	0	4075
0	31	16	0	4	3	6	0	18	19	84	0	10	0	0	1594
1	16	5	0	1	0	0	0	1	108	33	0	4	0	0	1923
0	5	7	0	0	0	2	0	3	38	14	0	48	0	0	2650
0	61	97	0	6	0	5	0	28	30	62	0	5	0	0	1990
0	7	20	0	1	0	0	0	8	31	12	0	7	0	0	1073
0	3	0	0	0	0	0	0	1	5	1	0	1	0	0	260
14	13	7	0	1	0	2	0	72	18	13	0	7	0	0	793
15	14	5	0	3	0	3	0	48	25	17	0	23	0	0	1860
0	8	0	0	0	0	0	0	1	9	11	0	28	0	0	877
0	1	0	0	1	1	1	0	0	1	3	0	2	0	0	93
99	4	2	0	2	0	1	0	67	7	4	0	6	0	0	431
0	270	69	0	114	12	18	0	5	25	27	0	9	0	0	1159
0	65	32	0	33	2	8	0	4	11	4	0	4	0	0	358
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	415	67	0	531	151	190	0	10	61	44	0	20	0	0	2778
0	35	6	0	48	87	88	0	1	28	4	0	6	0	0	652
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
0	0	0	0	2	0	4	0	0	0	0	0	0	0	0	10
403	28	34	0	4	1	1	0	779	18	33	0	11	0	0	2154
2	38	2	0	6	4	20	0	1	2540	50	0	238	0	0	3820
0	18	6	0	2	0	2	0	7	82	61	0	23	0	0	1092
0	1	0	0	1	1	6	0	0	0	0	0	0	0	0	24
3	21	7	0	4	4	5	0	9	224	46	0	1347	0	0	4087
1	33	5	0	41	16	29	0	2	6	3	0	3	0	0	315
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547	1196	399	0	814	292	402	0	1086	3566	987	0	2047	0	0	40741

Figure 91. Report Table 4.01 – Linked Transit Trips (All Auto Ownership Levels) For Build Scenario (Right Side)

Table 4.02 presents the number of incremental linked transit trips (build – no-build). As shown in Figure 92 and Figure 93 the project results in 45 more linked transit trips than existed for the no-build scenario[61]

[61] This outcome is from the pre-calibration model run and should not be reported outside of the technical review process. This value represents both the increases in ridership resulting from the project and decreases in ridership that may result from a reduction in local bus service.



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Program STOPS - FTA Simplified Trips-on-Project Software                    Page    24
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     4.02

*** WEEKDAY INCREMENTAL LINKED TRANSIT TRIPS (All Transit/All car HH) (VS. NO-BUILD) ***
District to District MODEL Summary for Scenario  3: Y2017 BUILD
All Purposes All Transit All Access All car HH
```
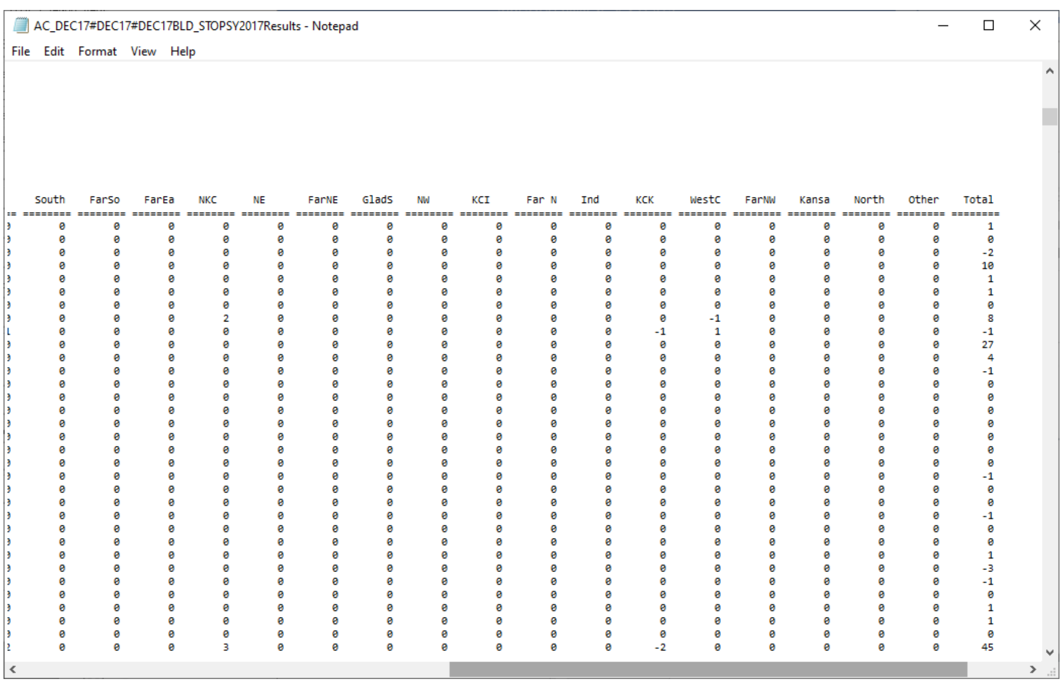

Idist	CBD	NCBD	CrwnC	Midto	Plaza	UMKC	CClub	ECBD	Emidt	SPrsp	EInd	EastS	Swope	BlRid	SE	South	FarSo	FarEa
CBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CrwnC	0	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0
Midto	0	0	0	0	0	0	0	5	0	4	0	0	0	0	0	0	0	0
Plaza	0	0	1	-1	0	0	0	2	0	-1	0	0	0	0	0	0	0	0
UMKC	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
CClub	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0
ECBD	-2	0	0	0	0	0	3	-4	1	4	0	1	2	0	0	0	0	0
Emidt	-2	-2	2	-2	0	0	0	1	-5	3	1	0	2	0	1	0	0	0
SPrsp	9	0	3	-1	-1	0	1	1	0	4	1	1	7	1	0	0	0	0
EInd	0	0	0	0	0	0	0	-1	3	1	0	0	0	0	0	0	0	0
EastS	0	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0
Swope	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BlRid	0	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FarSo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FarEa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NKC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NE	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FarNE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Far N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
KCK	0	0	0	0	0	0	0	-2	-1	0	0	0	0	0	0	0	0	0
WestC	0	0	0	0	0	0	0	-1	0	0	0	0	0	0	0	0	0	0
FarNW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kansa	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	-2	5	-4	1	0	5	0	-4	16	3	3	12	1	2	0	0	0

Figure 92. Report Table 4.02 – Incremental Linked Transit Trips (All Auto Ownership Levels) For Build Scenario (Left Side)



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South	FarSo	FarEa	NKC	NE	FarNE	GladS	NW	KCI	Far N	Ind	KCK	WestC	FarNW	Kansa	North	Other	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	2	0	0	0	0	0	0	0	0	-1	0	0	0	0	8
0	0	0	0	0	0	0	0	0	0	0	-1	1	0	0	0	0	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	3	0	0	0	0	0	0	0	-2	0	0	0	0	0	45

Figure 93. Report Table 4.02 – Incremental Linked Transit Trips (All Auto Ownership Levels) For Build Scenario (Right Side)

Table 4.03 presents the district-to-district linked transit flows for just those trips that use the project at some point during the journey. As shown in the example in Figure 94 and Figure 95, the Kansas City BRT is expected to attract 1,511 linked project trips[62]. Major attraction locations include the Kansas City CBD (District 1), and other districts near the CBD such as Midtown, the East CBD, East Midtown, and South Prospect. Note that the number reported in Table 4.03 is "linked trips on project," which is a key measure of mobility and cost-effectiveness in the FTA project evaluation process once the model calibration process is complete.

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Program STOPS - FTA Simplified Trips-on-Project Software                    Page    25
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     4.03

*** WEEKDAY LINKED TRANSIT TRIPS ON PROJECT (All Transit/All car HH)***
District to District MODEL Summary for Scenario  3: Y2017 BUILD
All Purposes All Transit All Access All car HH
```

Idist	CBD	NCBD	CrwnC	Midto	Plaza	UMKC	CClub	ECBD	Emidt	SPrsp	EInd	EastS	Swope	BlRid	SE	South	FarSo	FarEa
CBD	0	0	0	0	0	0	0	2	2	1	0	0	5	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
CrwnC	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0
Midto	0	0	0	0	1	0	0	52	0	21	2	0	1	2	0	0	0	0
Plaza	13	0	2	3	0	0	0	14	0	9	1	3	2	0	0	0	0	0
UMKC	0	0	0	0	0	0	0	2	0	5	0	0	0	0	0	0	0	0
CClub	0	0	0	0	0	0	0	2	6	6	0	0	1	0	0	0	0	0
ECBD	38	0	5	32	4	0	25	16	15	17	1	5	17	1	2	0	0	0
Emidt	106	5	4	61	3	0	13	50	18	55	12	7	14	2	4	3	0	0
SPrsp	87	1	6	26	23	2	31	22	42	135	3	16	30	9	4	1	0	0
EInd	0	0	1	0	1	0	1	9	28	17	0	4	1	0	1	2	0	0
EastS	8	0	0	0	0	0	0	17	1	4	0	0	1	0	0	0	0	0
Swope	1	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	0
BlRid	1	0	0	0	0	0	1	8	1	11	6	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	0	11	7	7	2	0	0	0	0	0	0	0
South	0	0	0	0	0	0	0	1	0	3	0	0	1	0	0	0	0	0
FarSo	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
FarEa	1	0	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	0
NKC	0	0	0	0	0	0	0	8	0	3	0	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0
FarNE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladS	0	0	0	1	0	0	0	7	1	4	0	0	0	0	0	0	0	0
NW	1	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	0	0
KCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Far N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	0	0	3	0	0	0	0	2	0	8	0	7	0	0	0	0	0	0
KCK	0	0	1	0	0	0	0	2	5	4	0	0	3	0	0	0	0	0
WestC	3	0	0	0	0	0	0	11	4	1	0	0	0	0	0	0	0	0
FarNW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kansa	0	0	1	0	0	0	0	5	1	6	0	0	1	0	0	0	0	0
North	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	263	6	23	124	34	3	73	250	137	327	28	43	77	15	12	6	0	0

Figure 94. Report Table 4.03 – Linked District-to-District Project Trips (All Auto Ownership Levels) (Left Side)

[62] The model results reported in this section are for the initial or pre-calibration run. Project ridership will be substantially affected by the improvements introduced by the model calibration process and should not be reported outside of the technical review process until model calibration is complete.

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South	FarSo	FarEa	NKC	NE	FarNE	GladS	NW	KCI	Far N	Ind	KCK	WestC	FarNW	Kansa	North	Other	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78
0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	49
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
0	0	0	9	1	0	1	0	1	0	0	8	4	0	0	0	0	203
3	0	0	4	0	0	0	0	0	0	0	14	6	0	1	0	0	383
1	0	0	1	0	0	0	0	1	0	1	6	5	0	18	0	0	469
2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	66
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	34
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	29
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	17
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	14	1	0	1	0	2	0	2	33	16	0	21	0	0	1511

Figure 95. Report Table 4.03 – Linked District-to-District Project Trips (All Auto Ownership Levels) (Right Side)

The next table, (Table 4.04 shown in Figure 96) shows the origin (boarding) and destination (alighting) station for project trips. This report includes just stations for which Newstation is set to 1 or above. In the Kansas City example, all project stations were set with a Newstation of 1. All other stations are set with a New Station of 0. This coding, which is typical practice, results in a table which sums to 1,524 station-to-station project unlinked trips. This is slightly higher than the project linked trips due to a small number of project-to-project transfers as riders navigate the end-of-line loop in downtown Kansas City.

In some cases, users may wish to see how project riders connect to other transit stations in the system. This can be accomplished by setting Newstation equal to 4 for those other stops in the station file. When this is done, the sum of all boardings and alightings in this table will equal project linked trips, plus all transfers made by project riders to the other transit stops included in the list.

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Version: STOPS-v2.52 - 12/12/2022 12/19/2022
Run: Prospect MAX - NTI Course Example 12:57:58
System: Kansas City
Table 4.04

***** AVG WEEKDAY STATION UTILIZATION BY PROJECT TRIPS (All Transit/All car HH) ************
Origin Station to Destination Station MODEL Summary for Scenario 3: Y2017 BUILD
All Purposes All Transit All Access All car HH

	Psp&75th	3rd&Grand	Psp&Greg	Delw&4th	Psp&Meyer	MN&7thSB	Psp&63rd	MN&9thSB	Psp&59th	MN&12thSB	Psp&55th	MN&14thSB	Psp&51st	MN&16thSB	Psp&Swope	MN&19thSB
Psp&75th	0	0	1	0	14	0	10	0	9	0	24	0	1	0	1	0
3rd&Grand	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Psp&Greg	1	0	0	0	0	0	6	0	1	0	4	0	1	0	1	0
Delw&4th	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&Meyer	14	0	0	0	0	0	1	0	0	0	3	0	0	0	1	0
MN&7thSB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&63rd	10	0	6	0	1	0	0	0	3	0	10	0	44	0	8	0
MN&9thSB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&59th	9	0	1	0	0	0	3	0	0	0	3	0	0	0	2	0
MN&12thSB	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Psp&55th	24	0	4	0	3	0	10	0	3	0	0	0	0	0	0	0
MN&14thSB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&51st	1	0	1	0	0	0	44	0	0	0	0	0	0	0	0	0
MN&16thSB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&Swope	1	0	1	0	1	0	8	0	2	0	0	0	0	0	0	0
MN&19thSB	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Psp&43rd	1	0	1	0	1	0	8	0	2	0	0	0	4	0	1	0
Psp&39th	2	0	3	0	1	0	8	0	6	0	3	0	1	0	0	0
UNSTATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MN&19thNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&35th	3	0	2	0	1	0	8	0	3	0	5	0	6	0	3	0
MN&16thNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prsp&Linw	1	0	1	0	1	0	8	0	0	0	1	0	1	0	5	0
MN&14thNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prsp&31st	3	0	1	0	0	0	5	0	6	0	5	0	3	0	2	0
MN&12thNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Prsp&27th	1	0	0	0	0	0	1	0	2	0	0	0	1	0	0	0
MN&9thNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&23rd	1	0	0	0	1	0	2	0	1	0	0	0	0	0	1	0
MN&7thNB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Psp&18th	1	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0
Psp&Trumn	1	0	1	0	0	0	9	0	0	0	0	0	1	0	2	0
WAL&5thEB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 96. Report Table 4.04 – Origin Station to Destination Station Project Trips

8.5 Report Section 5 – Summary of Project Results for Fixed Guideway Trips

Section 5 repeats the tables in Section 4 but includes just those trips that are attracted to the fixed guideway portion of the system.

8.6 Report Section 6 – Summary of Project Results for Members of 0-Car Households

Section 6 repeats the tables in Section 4 but includes just those that are made by members of 0-car households only.

8.7 Report Section 7 – Summary of Project Results for Fixed Guideway Trips Made by Members of 0-Car Households

Section 7 repeats the tables in Section 4 but includes just those that are made on fixed guideway modes by members of 0-car households only.

8.8 Section 8 – Summary of Impacts on Automobile Person Miles of Travel

Section 8 summarizes the impact of the transit project on automobile person miles of travel. This section has just one table, 8.01 (see Figure 97), which presents the incremental (build minus no-build) estimate of automobile person miles of travel that are a result of the project. Negative numbers in this table mean that the no-build automobile person miles are greater than the build person miles (i.e., that the project reduces person-miles of automobile travel). The information reported here includes the change in automobile miles of travel for both the automobile mode (i.e., auto drive-all-the-way) and for driving portion of park-and-ride and kiss-and-ride transit trips.

Results are displayed on a district-to-district (production/attraction) basis. This statistic can be converted to vehicle miles of travel saved by the project by using locally-derived estimates of vehicle occupancy to convert person miles to vehicle miles.

Once the model is fully calibrated, this table provides information on automobile person- (and after conversion, vehicle-) miles of travel which is used as part of the environmental benefits portion of the FTA project evaluation process.

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Program STOPS - FTA Simplified Trips-on-Project Software                    Page    43
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table     8.01

District to District Incremental WEEKDAY AUTOMOBILE PMT Summary for Scenario  3: Y2017 BUILD
All Purposes All Transit All Access All car HH
```

Idist	CBD	NCBD	CrwnC	Midto	Plaza	UMKC	CClub	ECBD	Emidt	SPrsp	EInd	EastS	Swope	BlRid	SE	South	FarSo	FarEa
CBD	0	0	0	0	0	0	0	0	-1	-1	0	0	-3	0	0	0	0	0
NCBD	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
CrwnC	0	0	0	0	0	0	0	0	3	0	0	0	0	0	-1	0	0	0
Midto	0	0	0	0	0	0	0	-22	0	-18	-4	0	0	-1	0	0	0	0
Plaza	-1	0	-3	2	0	0	0	-12	0	1	0	0	0	0	0	0	0	0
UMKC	0	0	0	0	0	0	0	-3	0	-2	0	0	0	0	0	0	0	0
CClub	0	0	0	0	0	0	0	-3	-1	5	-1	0	3	0	0	0	0	0
ECBD	0	0	1	1	-2	0	-30	0	-5	-37	0	-3	-32	-1	-4	0	0	0
Emidt	6	6	-4	6	-1	0	-4	-7	7	-14	-11	0	-10	0	-6	-3	0	0
SPrsp	-77	3	-21	3	2	-2	-6	-20	-3	-11	-8	-6	-22	-12	-3	0	0	0
EInd	0	0	1	0	-2	0	-2	-6	-14	-7	0	-2	-1	0	-2	-2	0	0
EastS	-2	0	0	0	0	0	-1	11	-1	-2	0	0	0	0	0	0	0	0
Swope	-1	0	0	0	0	0	-1	-1	0	1	0	0	0	0	0	0	0	0
BlRid	3	0	0	0	-2	0	0	4	6	-2	-3	0	0	0	0	0	0	0
SE	-1	0	0	0	0	0	-1	-9	1	-1	-3	0	0	0	0	0	0	0
South	0	0	0	0	0	0	0	-2	0	3	0	0	0	0	0	0	0	0
FarSo	1	0	0	0	0	0	0	-2	0	0	0	0	0	0	0	0	0	0
FarEa	2	0	2	0	0	0	0	-5	-2	0	0	0	0	0	0	0	0	0
NKC	0	0	0	0	0	0	0	-3	0	1	0	0	1	0	0	0	0	0
NE	11	0	0	0	0	0	0	-3	0	-2	0	0	0	0	0	0	0	0
FarNE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GladS	0	0	0	0	-1	0	0	-3	1	-3	0	0	0	0	0	0	0	0
NW	-1	0	0	0	0	0	0	1	7	0	0	0	3	0	0	0	0	0
KCI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Far N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ind	2	0	0	0	0	0	0	0	-1	-3	0	-11	1	0	0	0	0	0
KCK	0	0	2	0	0	0	0	6	5	-1	0	-1	-2	0	0	0	0	0
WestC	0	0	0	0	0	0	0	6	-1	1	-1	0	0	0	0	0	0	0
FarNW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kansa	0	0	-8	0	0	0	0	-9	0	-6	-1	0	0	0	0	0	0	0
North	-5	0	0	0	0	0	0	2	0	-3	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	-63	10	-31	11	-5	-2	-43	-79	2	-102	-31	-23	-64	-14	-17	-5	0	0

Figure 97. Report Table 8.01 – Incremental Automobile PMT

8.9 Report Section 9 – Comparison of Existing, No-Build and Build Station Boardings by Station Mode of Access

Section 9 of the report presents a side-by-side comparison of station boardings stratified by mode of access. This section has one table, 9.01 (shown in Figure 98), which shows the station boardings by mode of access for each station in the station database. Boardings are shown for the existing, no-build, and build scenarios.

This table represents the mode-of-access for trips boarding at each particular station[63]. A similar number of trips will alight at each station over the course of a day and use a similar mode-of-egress to reach their destination. Because this table represents boardings, the estimates of PNR trips are similar to the number of vehicles entering the station complex each day seeking a parking place. This estimate needs only to be adjusted for vehicle occupancy and parking turnover to estimate the necessary number of spaces required at the station to meet the parking demand.

[63] As distinguished from a production-attraction mode-of-access report which show the number of production-end trips using a station stratified by the mode choice mode-of-access.

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System: Kansas City
Table     9.01

***** AVG WEEKDAY STATION UTILIZATION (All Transit/All car HH) ************
Comparison of Station Boardings by Scenario for      4684 Stations
All Purposes All Transit  All car HH
```

		Y2017 EXISTING					Y2017 NO-BUILD					Y2017 BUILD				
Stop_id1	Station Name	WLK	KNR	PNR	XFR	ALL	WLK	KNR	PNR	XFR	ALL	WLK	KNR	PNR	XFR	ALL
99501	Prospect &75th MAX	0	0	0	0	0	0	0	0	0	0	19	3	0	68	91
1600	RIVER MARKET NORTH O	143	922	53	26	1144	143	922	53	26	1144	143	921	53	26	1143
99554	Prospect & Gregory	0	0	0	0	0	0	0	0	0	0	30	1	0	0	32
1601	RIVER MARKET WEST ON	16	8	0	14	38	16	8	0	14	38	16	8	0	14	37
99553	Prospect & Meyer	0	0	0	0	0	0	0	0	0	0	28	1	0	0	29
1602	NORTH LOOP ON MAIN A	120	1	0	8	129	120	1	0	8	129	119	1	0	8	129
99552	Prospect & 63rd	0	0	0	0	0	0	0	0	0	0	130	1	0	33	163
1603	LIBRARY ON MAIN AT 9	334	1	0	81	417	334	1	0	81	417	332	1	0	76	410
99551	Prospect & 59th	0	0	0	0	0	0	0	0	0	0	47	1	0	0	48
1604	METRO CENTER ON MAIN	315	1	0	44	360	315	1	0	44	360	313	1	0	46	360
99507	Prospect & 55th	0	0	0	0	0	0	0	0	0	0	58	1	0	16	75
1605	POWER & LIGHT ON MAI	298	1	0	0	299	298	1	0	0	299	297	1	0	0	299
99508	Prospect & 51st	0	0	0	0	0	0	0	0	0	0	70	0	0	1	71
1606	KAUFFMAN CENTER ON M	114	0	0	1	115	114	0	0	1	115	111	0	0	1	113
99509	Prospect & Swope	0	0	0	0	0	0	0	0	0	0	13	1	0	28	41
1607	CROSSROADS ON MAIN A	198	3	0	8	209	198	3	0	8	209	198	3	0	8	209
99547	Prospect & 43rd	0	0	0	0	0	0	0	0	0	0	42	2	0	0	44
99511	Prospect & 39th	0	0	0	0	0	0	0	0	0	0	47	3	0	55	105
1608	UNION STATION ON MAI	424	606	196	88	1313	424	606	196	88	1313	422	603	196	94	1314
place_prgr	Pershing & Grand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1609	CROSSROADS ON MAIN A	157	2	0	12	172	157	2	0	12	172	158	2	0	11	171
99512	Prospect & 35th	0	0	0	0	0	0	0	0	0	0	49	1	0	41	91
1610	KAUFFMAN CENTER ON M	112	1	0	3	115	112	1	0	3	115	112	1	0	3	116
99544	Prospect & Linwood	0	0	0	0	0	0	0	0	0	0	49	1	0	0	50
1611	POWER & LIGHT ON MAI	178	0	0	0	178	178	0	0	0	178	178	0	0	0	178
99555	Prospect & 31st	0	0	0	0	0	0	0	0	0	0	21	0	0	55	76
1612	METRO CENTER ON MAIN	367	1	0	30	397	367	1	0	30	397	365	1	0	19	384
99543	Prospect & 27th	0	0	0	0	0	0	0	0	0	0	38	0	0	13	52
1613	LIBRARY ON MAIN AT 9	214	0	0	27	241	214	0	0	27	241	213	0	0	25	238
99542	Prospect & 23rd	0	0	0	0	0	0	0	0	0	0	30	1	0	10	40
1614	NORTH LOOP ON MAIN A	25	0	0	0	26	25	0	0	0	26	25	0	0	0	25
99541	Prospect & 18th	0	0	0	0	0	0	0	0	0	0	36	1	0	2	39

Figure 98. Report Table 9.01 – Station Boardings by Mode of Access for Existing, No-Build, and Build Scenarios

8.10 Report Section 10 – Comparison of Existing, No-Build and Build Route Boardings by Route Mode of Access

Section 10 begins with two tables (10.01 and 10.02) which shows usage of each route by production-end mode of access.[64] Table 10.01 (shown in Figure 99) presents a condensed table with one line in the report for each route. Table 10.02 presents an expanded table with routes broken out by station groups so that the contribution of each station group to each route can be understood. Table 10.01 and 10.02 break out mode-of-access according to the access mode used to leave the production-end of the trip (i.e., walk, kiss-and-ride, or park-and-ride).

Tables 10.03 and 10.04 summarize route-level operating statistics (revenue vehicle miles and vehicle hours) by alternative and analysis time period.

Table 10.05 (shown in Figure 100) presents route-level ridership by scenario and for project trips stratified by mode-of-access at the time the route was boarded (i.e., walk, kiss-and-ride, park-and-ride and transfer). This structure separates the trips

[64]Production-end mode-of-access is the access mode used to connect home to the first transit station/stop used during the trip and consists of walk, kiss-and-ride, and park-and-ride modes. Since production-end mode-of-access represents just the first transit mode, it does not include transfers. To see the route ridership stratified by the access mode used at that particular route, (i.e., including transfers), see report table 10.05.

that arrive at the stop/station directly from the production zone (i.e., walk, kiss-and-ride, and park-and-ride) from those that had previously ridden another transit service (transfers).

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Table 10.01

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***** AVG WEEKDAY ROUTE UTILIZATION ZONE BY (PRODUCTION-END) ACCESS TYPE ************
Comparison of Route Boardings by Scenario and Zone (Production-End) Mode-of-Access
Total Transit Trips

			Y2017 EXISTING				Y2017 NO-BUILD				Y2017 BUILD			
Route_ID	--Route Name	Count	WLK	KNR	PNR	ALL	WLK	KNR	PNR	ALL	WLK	KNR	PNR	ALL
1	--MMAX-Main Street MAX	4537	3434	440	181	4055	3434	440	181	4055	3401	437	180	4019
10	--10-Woodland/Brooklyn	0	169	9	2	180	169	9	2	180	170	9	2	181
101	--101-State Ave	1994	1387	143	24	1555	1387	143	24	1555	1387	143	24	1555
102k	--102-Central Ave - UGT	0	258	16	2	275	258	16	2	275	257	16	2	275
103k	--103-3rd - Fairfax	0	220	42	5	267	220	42	5	267	219	42	5	266
104	--104-Argentine	420	496	26	1	523	496	26	1	523	493	26	1	521
106	--106-Quindaro	1049	523	22	2	547	523	22	2	547	522	22	2	546
107	--107-7th Street/Parallel	659	918	60	7	985	918	60	7	985	918	60	7	986
108	--108-Indiana	1390	1253	44	3	1301	1253	44	3	1301	1251	43	4	1298
11	--11-Northeast-Westside	1239	1332	70	16	1417	1332	70	16	1417	1325	69	16	1410
113k	--113k-Leavenworth Road	0	154	12	1	167	154	12	1	167	154	12	1	167
115k	--115-Kansas Avenue	0	173	43	4	220	173	43	4	220	173	43	4	220
116k	--116-West Parallel	0	156	13	1	169	156	13	1	169	156	13	1	169
12	--12-12th Street	1038	538	14	3	555	538	14	3	555	513	13	3	529
121	--121-Cleveland-Antioch	567	1226	98	13	1337	1226	98	13	1337	1222	97	13	1332
129	--129-Boardwalk/KCI	753	868	214	168	1250	868	214	168	1250	865	213	168	1246
133	--133-Vivion/Antioch	298	578	98	26	701	578	98	26	701	578	98	26	702
136	--136-Boardwalk/Antioch	46	185	10	2	197	185	10	2	197	185	10	2	197
15	--15-Truman Rd	494	435	17	2	455	435	17	2	455	486	17	2	505
2	--TMAX-Troost MAX	5099	2554	365	143	3062	2554	365	143	3062	2480	359	142	2981
201	--201-North Oak	1004	1197	141	23	1362	1197	141	23	1362	1198	141	23	1362
23	--23-23rd Street	181	148	13	2	163	148	13	2	163	165	13	2	179
235	--235-Winnwood/Gracemor	0	73	0	0	73	73	0	0	73	73	0	0	73
238	--238-Meadowbrook	357	723	77	11	811	723	77	11	811	724	77	11	812
24	--24-Independence	2995	939	54	15	1008	939	54	15	1008	918	53	15	987
243	--243-Riverside-Antioch	71	203	32	3	237	203	32	3	237	203	32	3	237
25	--25-Troost	1246	624	23	40	686	624	23	40	686	613	22	40	675
251	--251-TMC Lakewood	33	76	11	0	88	76	11	0	88	76	11	0	88
27	--27-27th Street	706	316	14	3	334	316	14	3	334	358	14	4	376
28	--28-Blue Ridge	1210	1065	204	136	1405	1065	204	136	1405	1061	204	136	1402
301	--301-Green Route	0	328	37	2	368	328	37	2	368	328	37	2	368
302	--302-Blue Route	0	413	39	6	458	413	39	6	458	414	39	6	459

Figure 99. Report Table 10.01 – Comparison of Route Ridership by Scenario and Production-End Mode of Access

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***** AVG WEEKDAY ROUTE UTILIZATION BY ROUTE ACCESS TYPE************
Comparison of Route Boardings by Scenario by Route-Specific Mode-of-Access
Total Transit Trips

			Y2017 EXISTING					Y2017 NO-BUILD					Y2017 BUILD		
Route_ID	--Route Name	Count	WLK	KNR	PNR	XFR	ALL	WLK	KNR	PNR	XFR	ALL	WLK	KNR	PNR
1	--MMAX-Main Street MAX	4537	2470	401	151	1034	4055	2470	401	151	1034	4055	2474	398	150
10	--10-Woodland/Brooklyn	0	129	8	1	41	180	129	8	1	41	180	128	8	2
101	--101-State Ave	1994	971	126	22	436	1555	971	126	22	436	1555	970	126	22
102k	--102-Central Ave - UGT	0	208	15	2	50	275	208	15	2	50	275	208	15	2
103k	--103-3rd - Fairfax	0	55	27	3	182	267	55	27	3	182	267	55	27	3
104	--104-Argentine	420	418	16	0	89	523	418	16	0	89	523	416	16	0
106	--106-Quindaro	1049	395	12	1	140	547	395	12	1	140	547	395	12	1
107	--107-7th Street/Parallel	659	790	55	6	134	985	790	55	6	134	985	790	55	6
108	--108-Indiana	1390	1031	26	0	244	1301	1031	26	0	244	1301	1011	25	0
11	--11-Northeast-Westside	1239	1032	20	0	366	1417	1032	20	0	366	1417	1035	20	0
113k	--113k-Leavenworth Road	0	138	11	1	16	167	138	11	1	16	167	138	11	1
115k	--115-Kansas Avenue	0	61	40	3	116	220	61	40	3	116	220	61	40	3
116k	--116-West Parallel	0	133	13	1	23	169	133	13	1	23	169	133	13	1
12	--12-12th Street	1038	489	4	0	62	555	489	4	0	62	555	474	4	0
121	--121-Cleveland-Antioch	567	923	84	10	320	1337	923	84	10	320	1337	902	84	10
129	--129-Boardwalk/KCI	753	645	201	160	244	1250	645	201	160	244	1250	644	200	160
133	--133-Vivion/Antioch	298	351	85	24	241	701	351	85	24	241	701	351	85	24
136	--136-Boardwalk/Antioch	46	170	10	2	15	197	170	10	2	15	197	171	10	2
15	--15-Truman Rd	494	304	5	0	146	455	304	5	0	146	455	335	5	0
2	--TMAX-Troost MAX	5099	1751	311	110	890	3062	1751	311	110	890	3062	1738	307	110
201	--201-North Oak	1004	998	132	21	210	1362	998	132	21	210	1362	998	132	21
23	--23-23rd Street	181	130	11	1	21	163	130	11	1	21	163	143	10	1
235	--235-Winnwood/Gracemor	0	73	0	0	0	73	73	0	0	0	73	73	0	0
238	--238-Meadowbrook	357	563	66	10	171	811	563	66	10	171	811	563	67	10

Figure 100. Report Table 10.05 – Comparison of Route Ridership by Scenario and Production-End Mode of Access

8.11 Report Section 11 – Summary of Trips by Submode, Access Mode, Auto Ownership, and Scenario

Section 11 presents a summary of linked transit trips by submode, access mode and auto ownership for each scenario (existing, no-build, and build) and for build trips that are identified as linked trips using the project. Four tables are provided:

- Table 11.01: home-based work trips (sample shown in Figure 101)
- Table 11.02: home-based other trips
- Table 11.03: non-home based trips
- Table 11.04: all-purpose trips

All model results (including access mode) are presented in production/attraction format.

Linked trips are reported in separate columns for the existing, no-build, and build scenarios. The last column group reports project trips which are defined as any build trips boarding, alighting, or passing through[65] a new station.

[65] Trips passing through a new station are included as project trips unless the parameter file box labeled "Project Trip Definition – Station Boarding/Alighting Only" is checked. In that case, project trips include just those trips boarding or alighting at a new station at some point during the trip.

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Run:     Prospect MAX - NTI Course Example                                                                  12:57:58
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Table    11.01

SUMMARY OF TRIPS BY SUBMODE, ACCESS MODE, AUTO OWNERSHIP, AND SCENARIO
Purpose Home-Based Work
 STOPS Model Application Model Application AFTER Station Boarding Calibration
                                          | Y2017 EXISTING | Y2017 NO-BUILD | Y2017 BUILD    | Y2017 BUILD    |
 HH Cars Sub-mode           Access mode   |  Model  Survey |  Model  Survey |  Model  Survey | Project Survey |
======= ================== =============| ======= =======| ======= =======| ======= =======| ======= =======|
 0 car H Fixed Guideway Only Walk Access |     576       0|     576       0|     674       0|      99       0|
 0 car H Fixed Guideway Only KNR Access  |     352       0|     352       0|     355       0|       4       0|
 0 car H Fixed Guideway Only PNR Access  |       6       0|       6       0|       6       0|       0       0|
 0 car H Fixed Guideway Only All Access  |     934       0|     934       0|    1035       0|     102       0|

 0 car H Fixed Guideway+Bus  Walk Access |     808       0|     808       0|     935       0|     173       0|
 0 car H Fixed Guideway+Bus  KNR Access  |      79       0|      79       0|      83       0|       7       0|
 0 car H Fixed Guideway+Bus  PNR Access  |       2       0|       2       0|       2       0|       0       0|
 0 car H Fixed Guideway+Bus  All Access  |     890       0|     890       0|    1020       0|     180       0|

 0 car H Bus Only            Walk Access |    4274       0|    4274       0|    4055       0|       0       0|
 0 car H Bus Only            KNR Access  |     293       0|     293       0|     286       0|       0       0|
 0 car H Bus Only            PNR Access  |      22       0|      22       0|      22       0|       0       0|
 0 car H Bus Only            All Access  |    4590       0|    4590       0|    4364       0|       0       0|

 0 car H All Transit         Walk Access |    5658       0|    5658       0|    5664       0|     272       0|
 0 car H All Transit         KNR Access  |     725       0|     725       0|     724       0|      10       0|
 0 car H All Transit         PNR Access  |      31       0|      31       0|      31       0|       0       0|
 0 car H All Transit         All Access  |    6414       0|    6414       0|    6419       0|     282       0|

 0 car H All Fixed Guideway  Walk Access |    1384       0|    1384       0|    1609       0|     272       0|
 0 car H All Fixed Guideway  KNR Access  |     431       0|     431       0|     438       0|      10       0|
 0 car H All Fixed Guideway  PNR Access  |       8       0|       8       0|       8       0|       0       0|
 0 car H All Fixed Guideway  All Access  |    1824       0|    1824       0|    2055       0|     282       0|
------- ------------------ -------------| ------- -------| ------- -------| ------- -------| ------- -------|
 1 car H Fixed Guideway Only Walk Access |     401       0|     401       0|     450       0|      50       0|
 1 car H Fixed Guideway Only KNR Access  |     401       0|     401       0|     404       0|       4       0|
 1 car H Fixed Guideway Only PNR Access  |     122       0|     122       0|     122       0|       0       0|
 1 car H Fixed Guideway Only All Access  |     924       0|     924       0|     976       0|      54       0|

 1 car H Fixed Guideway+Bus  Walk Access |     378       0|     378       0|     457       0|      92       0|
 1 car H Fixed Guideway+Bus  KNR Access  |      56       0|      56       0|      57       0|       2       0|
```

Figure 101. Report Table 11.01 – Summary of Home-Based Work Linked Transit Trips by Submode, Access Mode, Auto Ownership, and Scenario

8.12 Report Section 12 – Summary of CTPP Workers and Employees and MPO Estimates of Population and Employment by Scenario

Section 12 has one table, 12.01 (shown in Figure 102), which presents a district-level summary of the CTPP and the population and employment projections that were used to grow the CTPP to represent current and horizon years. The CTPP columns report the workers (the number of employed persons living in each district) and employment (employed persons working in each district). The MPO columns report the CTPP year (2015, 2008, or 2000, depending on CTPP version) estimates of population and employment and also show the estimates/forecasts for the existing, no-build, and build scenarios that were used to create the demand tables for each scenario.

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Run:     Prospect MAX - NTI Course Example                                                                              12:57:58
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Table    12.01

SUMMARY OF DISTRICT LEVEL CTPP, POPULATION, AND EMPLOYMENT
 STOPS Model Application Model Application AFTER Station Boarding Calibration

             Y2008     CTPP               MPO POPULATION                     MPO EMPLOYMENT
         ================= =================================== ===================================
                             CTPP   Existing No-Build    Build     CTPP   Existing No-Build    Build
District  Workers Emplymnt  Y2008     2017     2017     2017    Y2008     2017     2017     2017
======== ======== ======== ======== ======== ======== ======== ======== ======== ======== ========
 1-CBD       2566    28060     5382     6196     6196     6196    37533    37916    37916    37916
 2-NCBD      1604     2661     3354     3777     3777     3777     2102     2167     2167     2167
 3-CrwnC     1471    26370     3890     4649     4649     4649    31667    32262    32262    32262
 4-Midto     8752    12771    19013    19279    19279    19279    17617    17598    17598    17598
 5-Plaza     4350    13069     7770     7808     7808     7808    24150    24266    24266    24266
 6-UMKC      1403     5084     3959     3954     3954     3954     6385     6397     6397     6397
 7-CClub    23101    15880    40686    40924    40924    40924    19234    19287    19287    19287
 8-ECBD      5246     7878    16727    16730    16730    16730     9207     9190     9190     9190
 9-Emidt     5914     2120    17587    17125    17125    17125     1809     1804     1804     1804
10-SPrsp    11221     7786    31449    30647    30647    30647     9980    10016    10016    10016
11-EInd     10125    16202    28815    28352    28352    28352    17640    17586    17586    17586
12-EastS     5445     5405    14099    13854    13854    13854     7934     7911     7911     7911
13-Swope     1661     4755     4046     4006     4006     4006     4817     5352     5352     5352
14-BlRid     8816     6424    21765    21878    21878    21878    10347    10285    10285    10285
15-SE       67975    46573   156346   157504   157504   157504    54523    56481    56481    56481
16-South    19580    21915    41539    41689    41689    41689    30476    30339    30339    30339
17-FarSo    63641    35476   123654   125905   125905   125905    32784    33899    33899    33899
18-FarEa    74632    40289   137423   139353   139353   139353    37344    37754    37754    37754
19-NKC      13100    25071    28032    28395    28395    28395    29946    30488    30488    30488
20-NE       19116    24622    44336    44558    44558    44558    31921    32633    32633    32633
21-FarNE    23959    12896    26322    27056    27056    27056     8233     8584     8584     8584
22-GladS    49398    19791   100561   102468   102468   102468    23444    24656    24656    24656
23-NW       19368    11495    40969    41949    41949    41949    14957    15337    15337    15337
24-KCI        281    12271      733      883      883      883    12867    13429    13429    13429
25-Far N    16778     5471    19302    20724    20724    20724     3363     3700     3700     3700
26-Ind      39736    27943    97948    98326    98326    98326    33385    33460    33460    33460
27-KCK      62110    53164   156382   157952   157952   157952    88161    90836    90836    90836
28-WestC     6304     7964    11432    11708    11708    11708    10664    10817    10817    10817
29-FarNW     6790     4501    14321    14762    14762    14762     4361     4539     4539     4539
30-Kansa   401951   333980   699066   716066   716066   716066   348054   359195   359195   359195
31-North    24503     6527    56857    60672    60672    60672     7942     8793     8793     8793
32-Other        0        0        0        0        0        0        0        0        0        0
Total     1000897   844414  1973778  2009167  2009167  2009167   972863   996991   996991   996991
Total of zonal database including unassigned districts
DB Total  1000897   844414  1973778  2009167  2009167  2009167   972863   996992   996992   996992
```

Figure 102. Report Table 12.01 – Summary of District Level CTPP, Population, and Employment

8.13 Report Section 13 – Summary of Highway Time, Distance and Speed

Section 13 reports highway times, distances and speeds for each district-to-district pair. The following tables are provided:

- Table 13.01 – Existing scenario, district-to-district highway time (in minutes)

- Table 13.02 – No-build scenario, district-to-district highway time (in minutes)
- Table 13.03 – Build scenario, district-to-district highway time (in minutes)
- Table 13.04 – Existing scenario, district-to-district highway distance (miles)
- Table 13.05 – No-Build scenario, district-to-district highway distance (miles)
- Table 13.06 – Build scenario, district-to-district highway distance (miles)
- Table 13.07 – Existing scenario, district-to-district highway speed (mph)
- Table 13.08 – No-Build scenario, district-to-district highway speed (mph)
- Table 13.09 – Build scenario, district-to-district highway speed (mph)

A sample report (existing scenario highway time) is shown in Figure 103.

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Program STOPS - FTA Simplified Trips-on-Project Software                    Page    61
Version: STOPS-v2.52 - 12/12/2022                                           12/19/2022
Run:     Prospect MAX - NTI Course Example                                    12:57:58
System: Kansas City
Table    13.01

*** UNWEIGHTED AVERAGE HIGHWAY TIME (MINUTES) FOR ZONE-TO-ZONE RECORDS WITH CTPP TRIPS ***
District to District Highway Impedance Summary for Scenario  1: Y2017 EXISTING
```

Idist	CBD	NCBD	CrwnC	Midto	Plaza	UMKC	CClub	ECBD	Emidt	SPrsp	EInd	EastS	Swope	BlRid
CBD	1.1	1.5	4.8	8.4	12.7	11.4	22.2	3.8	12.8	13.0	0.0	0.0	15.4	12.1
NCBD	3.6	1.0	6.1	8.9	13.5	14.0	21.5	6.5	0.0	0.0	7.7	0.0	0.0	14.2
CrwnC	5.8	7.2	1.2	8.1	10.3	0.0	14.9	5.0	5.3	12.4	13.9	0.0	0.0	0.0
Midto	9.0	10.6	6.5	2.3	5.6	6.1	13.9	9.2	8.7	9.7	15.4	10.7	10.9	16.5
Plaza	9.9	13.1	8.2	5.3	2.2	3.3	7.4	10.8	0.0	7.2	15.3	11.2	9.1	18.0
UMKC	11.9	0.0	11.2	8.7	4.1	1.3	9.3	12.1	6.6	6.6	18.1	11.0	9.1	17.7
CClub	18.1	19.6	17.5	11.9	8.4	7.7	4.2	19.4	16.2	8.6	27.7	19.6	14.2	23.0
ECBD	7.1	6.5	9.1	10.9	13.1	17.7	19.7	2.4	10.2	15.8	10.1	8.8	17.1	14.0
Emidt	9.1	9.1	8.8	7.3	9.9	11.1	20.0	8.6	2.3	11.8	14.0	7.4	10.8	12.3
SPrsp	15.5	14.9	14.1	12.8	12.3	9.9	9.1	15.3	11.1	4.0	21.6	16.2	7.6	18.4
EInd	11.2	11.1	12.7	16.6	19.6	20.8	27.3	7.6	12.3	21.8	4.4	13.5	19.8	15.6
EastS	11.9	13.6	11.1	11.0	13.3	12.8	19.9	10.4	6.6	11.1	12.5	2.2	5.7	8.6
Swope	12.0	12.8	11.3	14.0	8.9	0.0	15.4	15.2	0.0	6.1	15.5	7.9	1.6	13.6
BlRid	17.0	19.7	17.7	21.9	23.8	19.6	27.0	14.8	13.8	20.1	17.3	12.3	14.8	3.7
SE	25.8	26.9	26.3	28.4	26.8	25.9	25.1	23.2	23.4	18.6	24.7	19.5	16.6	14.3
South	27.4	28.5	26.5	25.6	24.6	22.6	16.7	26.5	25.3	16.7	29.0	22.0	15.4	19.8
FarSo	45.6	51.8	45.1	44.0	43.4	39.3	43.3	47.4	30.4	39.1	44.1	37.2	35.2	34.4
FarEa	29.8	30.2	31.8	31.9	37.0	36.7	37.2	25.9	27.9	30.4	29.8	25.9	26.0	20.5
NKC	10.1	9.3	13.9	16.5	20.4	18.0	25.6	10.8	15.2	21.1	12.6	19.5	22.6	20.8
NE	21.0	18.7	23.5	24.7	27.9	35.3	40.4	22.3	20.0	32.8	18.3	22.9	29.3	26.1
FarNE	15.3	8.2	10.8	23.4	15.7	18.1	10.2	19.5	16.1	7.8	14.1	13.2	9.4	13.4
GladS	18.0	16.9	21.5	23.8	27.2	27.6	35.3	19.7	25.3	27.7	19.5	25.0	31.1	27.7
NW	20.2	17.6	22.6	26.4	28.9	26.2	35.6	21.1	26.1	30.4	23.2	26.9	32.8	33.8
KCI	23.1	0.0	33.4	34.3	0.0	0.0	0.0	32.3	0.0	0.0	0.0	0.0	0.0	0.0
Far N	17.6	39.3	34.0	30.9	32.8	0.0	33.6	21.8	0.0	20.1	20.1	16.0	18.7	0.0
Ind	24.0	24.1	25.2	29.0	30.8	32.0	35.0	20.2	23.3	30.9	19.5	18.1	23.6	12.5
KCK	16.4	20.6	17.3	18.7	19.2	20.8	28.2	18.6	17.0	28.6	23.3	23.2	29.0	26.8
WestC	9.7	0.0	7.9	4.4	4.7	7.8	9.3	9.0	13.4	15.0	16.3	16.0	14.9	0.0
FarNW	35.7	39.6	37.4	39.5	43.0	41.4	60.6	37.2	0.0	61.6	38.7	0.0	23.5	48.9
Kansa	27.8	24.6	27.8	28.2	28.7	30.4	23.9	29.0	37.2	29.8	37.0	32.5	32.7	36.4
North	25.4	21.7	27.7	29.0	36.1	33.1	39.2	26.8	30.1	36.6	23.9	29.6	31.6	32.9
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	21.1	18.9	21.1	18.1	20.0	17.3	18.0	17.4	12.0	15.1	22.9	20.0	19.8	18.3

Figure 103. Report Table 13.01 – Average District-to-District Highway Time for Existing Scenario

8.14 Report Section 14 – District-to-District Analysis of Gains and Losses Between No-Build and Build

Section 14 provides a number of tables that help the user understand the degree to which the project appears to change the level of transit coverage or reduce service to existing customers. Each table shows linked transit trips on a district-to-district basis. The following tables are provided:

- Table 14.01. Build Walk Access Transit Trips on Interchanges with Significant Transit Gain (>5%) and Zero No-Build trips. This table shows the number of build transit trips occurring in situations where no one uses transit in the no-build (presumably because no transit is provided). The presence of trips in this category suggests a change in transit service coverage has occurred.
- Table 14.02. Build Walk Linked Transit Trips on Interchanges with Significant Transit Gain (>5%) and Non-Zero No-Build trips. This table is the shows cases where transit grows significantly off of a non-zero base. Generally, trips in this table will be located in geographic proximity to the project or other service enhancements. If not, this table may help the user understand where unintended changes were made to the transit system.
- Table 14.03 Build Walk Access Linked Transit Trips on Interchanges with Significant Transit Loss (>5%). This table shows the number of build trips occurring in places where the number of transit linked trips declines between the no-build and build scenarios.
- Table 14.04 Build Walk Access Linked Transit Trips on Interchanges with no-significant change in transit. This table shows the remaining linked transit trips in the build alternative for cases where the project had little impact on ridership.
- Tables 14.05 through 14.08 repeat Tables 14.01-14.04 but shows no-build trips in the same categories.

These eight tables are repeated in Tables 14.09-14.16 for KNR trips, in Tables 14.17-14.24 for PNR trips, and 14.25-14.32 for All Access Mode trips.

8.15 Report Section 15 – Detailed District-to-District Linked Trips and Selected Station-to-Station Flows

Section 15 provides a complete set of district-to-district linked trips for each combination of scenario, access mode, auto ownership, trip purpose, and submode. The index provided at the top of the report provides the table number for each condition. For some cases, station-to-station or project trips are also reported.

8.16 Report Section 16 – GTFS Trip Group Boardings, Alightings, and Leave-Loads by Link

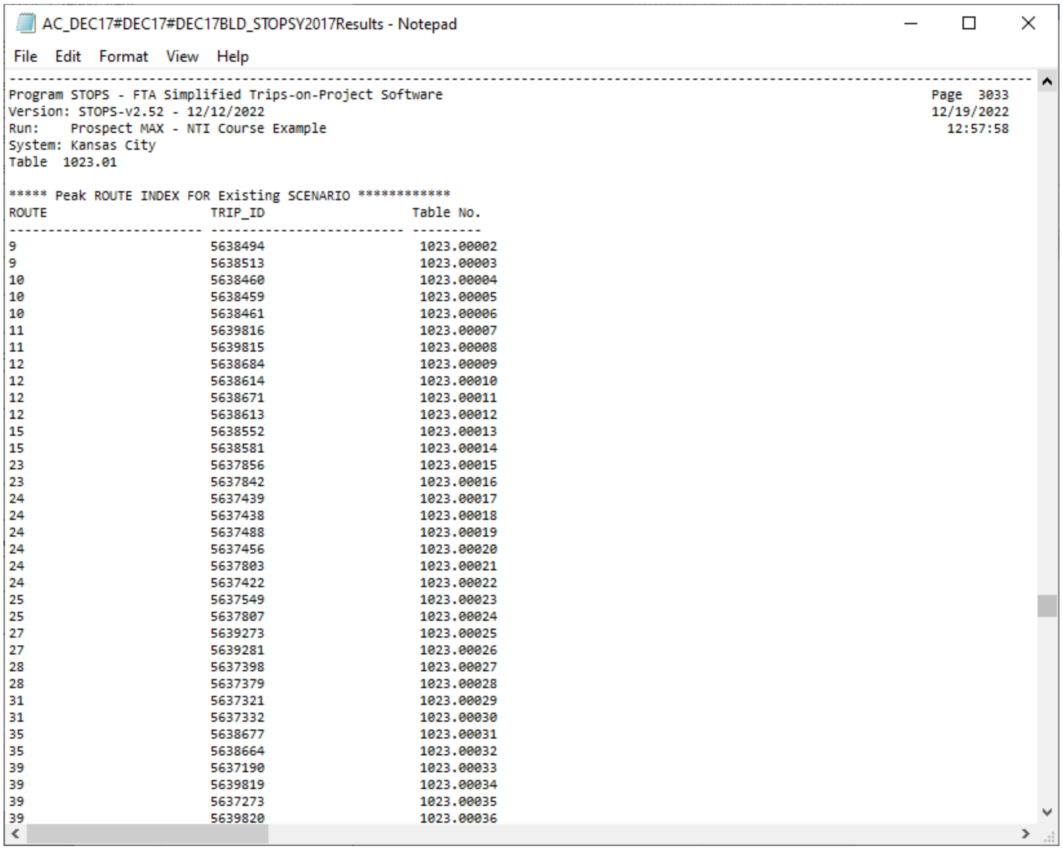
Section 16 presets transit trip assignment information for each GTFS Trip Group[66] active in each scenario (Existing, No-Build, and Build) and each time period (peak and off-peak). Assignment results for each combination of scenario and time period begin with an index of trip groups. These index tables are:

- Existing Scenario, Peak Period: Table 1023.01
- Existing Scenario, Off-Peak Period: Table 1024.01
- No-Build Scenario, Peak Period: Table 1025.01
- No-Build Scenario, Off-Peak Period: Table 1026.01
- Build Scenario, Peak Period: Table 1027.01
- Build Scenario, Off-Peak Period: Table 1028.01

Figure 104 shows the beginning of the index for existing, peak assignment results. It includes route (GTFS route_id), the trip_id for a representative trip that is a member of the trip group, and the table number where assignment results can be found.

Figure 105 shows a sample route assignment report for a trip group that is part of Route 9-9th Street. The report shows each station served by the representative trip that is a member of the trip group (trip_id 5638494), passenger boarding, alighting, and leave-load volumes, and cumulative ridership. The report also shows through passengers already on board the vehicle as the trip begins (labeled as "Thru trips from previous trips, this block") and through passengers who remain on the vehicle after the trip ends (labeled as "Thru Trips to next trip, this block"). These values are equal to 0 unless the GTFS trip file contains the optional block_id field which is used to define continued trips where passengers may remain on board a transit vehicle (without making a transfer) and as the vehicle changes over to the next GTFS-defined vehicle trip.

[66] GTFS Trip Groups are aggregations of individual GTFS trips in which all trips included in a trip group serve the same set of stops in the same order.



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Program STOPS - FTA Simplified Trips-on-Project Software                                                                  Page  3033
Version: STOPS-v2.52 - 12/12/2022                                                                                        12/19/2022
Run:    Prospect MAX - NTI Course Example                                                                                  12:57:58
System: Kansas City
Table  1023.01

***** Peak ROUTE INDEX FOR Existing SCENARIO ************
ROUTE                     TRIP_ID                   Table No.
------------------------- ------------------------- ---------
9                          5638494                   1023.00002
9                          5638513                   1023.00003
10                         5638460                   1023.00004
10                         5638459                   1023.00005
10                         5638461                   1023.00006
11                         5639816                   1023.00007
11                         5639815                   1023.00008
12                         5638684                   1023.00009
12                         5638614                   1023.00010
12                         5638671                   1023.00011
12                         5638613                   1023.00012
15                         5638552                   1023.00013
15                         5638581                   1023.00014
23                         5637856                   1023.00015
23                         5637842                   1023.00016
24                         5637439                   1023.00017
24                         5637438                   1023.00018
24                         5637488                   1023.00019
24                         5637456                   1023.00020
24                         5637803                   1023.00021
24                         5637422                   1023.00022
25                         5637549                   1023.00023
25                         5637807                   1023.00024
27                         5639273                   1023.00025
27                         5639281                   1023.00026
28                         5637398                   1023.00027
28                         5637379                   1023.00028
31                         5637321                   1023.00029
31                         5637332                   1023.00030
35                         5638677                   1023.00031
35                         5638664                   1023.00032
39                         5637190                   1023.00033
39                         5639819                   1023.00034
39                         5637273                   1023.00035
39                         5639820                   1023.00036
```

Figure 104. Report Table 1023.01 –Index for Existing Peak Assignment Results for Trip Groups

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Program STOPS - FTA Simplified Trips-on-Project Software                                                                Page  3034
Version: STOPS-v2.52 - 12/12/2022                                                                                     12/19/2022
Run:     Prospect MAX - NTI Course Example                                                                              12:57:58
System: Kansas City
Table  1023.00002

GTFS Trip Group Ridership Report for Trip Group     1
Route No:    3--9                        ----9-9th Street
Trip: 5638494

 Stop_seq Stop_No Stop_ID                 Stop_Name                                Boards    Alights    Leave-Load  Cumulative
 -------- ------- ----------------------- ---------------------------------------- --------- ---------- ----------- ----------
 *** Thru trips from previous trip, this block                                                              0.01
      1      4043      1200002            ON TRUMAN AT EWING WESTBOUND                  32.19       0.00      32.20      32.19
      2      7627      9177               ON EWING AT 12TH NORTHBOUND                    7.34       0.00      39.54      39.53
      3      3731      1090004            ON 12TH AT BENNINGTON WESTBOUND                0.00       0.01      39.53      39.53
      4      3732      1090006            ON 12TH AT BELMONT WESTBOUND                  12.25       0.00      51.78      51.78
      5      3733      1090009            ON 12TH AT TOPPING WESTBOUND FARSIDE           0.00       0.00      51.78      51.78
      6      3734      1090010            ON 12TH AT OAKLEY WESTBOUND                    0.00       0.00      51.79      51.79
      7      3735      1090012            ON HARDESTY AT WINNER NORTHBOUND               0.00       0.00      51.79      51.79
      8      3736      1090014            ON 9TH AT DENVER WESTBOUND                    16.21       2.61      65.38      67.99
      9      3737      1090016            ON 9TH AT VAN BRUNT WESTBOUND                  0.98       8.26      58.09      68.97
     10      4137      1210120            ON 9TH AT ELMWOOD WESTBOUND                    5.10       0.00      63.19      74.07
     11      3738      1090020            ON 9TH AT JACKSON WESTBOUND                    6.90       1.29      68.80      80.97
     12      3739      1090023            ON 9TH AT CLEVELAND WESTBOUND                  3.96       0.00      72.76      84.93
     13      3740      1090024            ON 9TH AT BALES WESTBOUND                     45.35       0.65     117.46     130.28
     14      3741      1090026            ON 9TH AT BENTON WESTBOUND FARSIDE             2.65       0.72     119.39     132.93
     15      3742      1090027            ON 9TH AT BELLEFONTAINE WESTBOUND              6.37       2.33     123.43     139.30
     16      3743      1090029            ON 9TH AT PROSPECT WESTBOUND FARSIDE           0.00       0.00     123.43     139.30
     17      3744      1090030            ON 9TH AT OLIVE WESTBOUND                      4.11       0.00     127.54     143.41
     18      3745      1090031            ON 9TH AT BROOKLYN WESTBOUND                   2.78       4.53     125.79     146.19
     19      3746      1090032            ON 9TH AT EUCLID WESTBOUND                     0.00       0.00     125.79     146.19
     20      3747      1090033            ON 9TH AT WOODLAND WESTBOUND                   3.34       0.88     128.25     149.53
     21      5939      3000045            ON 9TH AT PASEO WB                             0.05      12.04     116.25     149.58
     22      5940      3000048            ON 9TH AT TROOST WESTBOUND                     0.00       1.93     114.33     149.58
     23      3748      1090039            ON 11TH AT TROOST WESTBOUND                    4.08      27.85      90.55     153.66
     24      3749      1090041            ON 11TH BETWEEN CHARLOTTE AND HOLMES WES       0.06       0.16      90.46     153.72
     25      3750      1090042            ON 11TH AT CHERRY WESTBOUND                    0.00      23.76      66.70     153.72
     26      3809      110046             ON 11TH AT OAK WESTBOUND                       0.74      18.31      49.13     154.46
     27      7182      5811               ON 11TH AT GRAND WESTBOUND NEARSIDE            3.52       7.65      44.99     157.98
     28      5257      25225              ON 11TH/PETTICOAT LANE AT MAIN WB              0.00      11.18      33.81     157.98
     29      3101      1010004            ON 11TH AT CENTRAL WESTBOUND                   0.00      16.01      17.80     157.98
     30      7691      D25779             ON BROADWAY AT 12TH ST SB                      0.00       0.00      17.80     157.98
     31      3140      1010200            ON 12TH AT WASHINGTON WESTBOUND                0.21       4.81      13.20     158.19
     32      4074      1200083            ON 12TH AT JEFFERSON WESTBOUND                 0.00       0.00      13.21     158.20
     33      4075      1200084            ON 12TH BTWN WYOMING & GENESSEE WESTBOUN       0.00       6.23       6.97     158.20
     34      7626      9171               ON 14TH AT GENESSEE ST EASTBOUND FARSIDE       0.00       0.00       6.97     158.20
     35      4081      1200102            ON WYOMING AT 12TH NORTHBOUND                  0.00       0.00       6.97     158.20
 *** Thru trips to next trip, this block                                                                    6.97
```

Figure 105. Report Table 1023.00002 –Existing Peak Assignment Results for Trip Group 5638494 (Route 9-9th Street)

This section concludes with two summary results tables:

- Table 1029.01. Daily trip group ridership for the existing, no-build, and build scenarios
- Table 1030.01. Daily stop boarding summary for existing no-build and build scenarios.

Examples of each table are presented in Figure 106 and Figure 107.

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Program STOPS - FTA Simplified Trips-on-Project Software                                                                  Page  3956
Version: STOPS-v2.52 - 12/12/2022                                                                                         12/19/2022
Run:     Prospect MAX - NTI Course Example                                                                                  12:57:58
System: Kansas City
Table  1029.01

GTFS Trip Group Route Summary Report

Daily Riders by Route Recorded in Trip Group Summary
Route No Route_id                  Route_name                 Existing    No-Build      Build
======== ========================= ========================= ========== =========== ===========
       1  1                         --MMAX-Main Street MAX       3913.00     3913.00     3878.08
       2  10                        --10-Woodland/Brooklyn        173.92      173.92      174.73
       3  101                       --101-State Ave              1500.38     1500.38     1500.40
       4  102k                      --102-Central Ave - UGT       265.29      265.29      265.19
       5  103k                      --103-3rd - Fairfax           257.54      257.54      256.70
       6  104                       --104-Argentine               505.16      505.16      502.78
       7  106                       --106-Quindaro                527.97      527.97      526.91
       8  107                       --107-7th Street/Parallel     950.91      950.91      951.09
       9  108                       --108-Indiana                1255.38     1255.38     1252.95
      10  11                        --11-Northeast-Westside      1367.40     1367.40     1360.77
      11  113k                      --113k-Leavenworth Road       160.94      160.94      160.91
      12  115k                      --115-Kansas Avenue           212.20      212.20      212.16
      13  116k                      --116-West Parallel           163.50      163.50      163.49
      14  12                        --12-12th Street              535.43      535.43      510.34
      15  121                       --121-Cleveland-Antioch      1290.11     1290.11     1285.03
      16  129                       --129-Boardwalk/KCI          1205.99     1205.99     1202.65
      17  133                       --133-Vivion/Antioch          676.62      676.62      677.40
      18  136                       --136-Boardwalk/Antioch       190.35      190.35      190.58
      19  15                        --15-Truman Rd                438.60      438.60      487.23
      20  2                         --TMAX-Troost MAX            2954.90     2954.90     2876.75
      21  201                       --201-North Oak              1314.14     1314.14     1314.71
      22  23                        --23-23rd Street              157.18      157.18      173.14
      23  235                       --235-Winnwood/Gracemor        70.31       70.31       70.27
      24  238                       --238-Meadowbrook             782.34      782.34      783.25
      25  24                        --24-Independence             972.79      972.79      951.97
      26  243                       --243-Riverside-Antioch       229.05      229.05      229.02
      27  25                        --25-Troost                   662.26      662.26      651.17
      28  251                       --251-TMC Lakewood             85.18       85.18       85.27
      29  27                        --27-27th Street              322.22      322.22      362.85
      30  28                        --28-Blue Ridge              1355.76     1355.76     1353.06
      31  301                       --301-Green Route             355.21      355.21      355.23
      32  302                       --302-Blue Route              442.29      442.29      442.78
      33  303                       --303-Purple Route            325.59      325.59      325.41
      34  304                       --304-Yellow Route            287.78      287.78      287.79
      35  305                       --305-Orange Route            207.25      207.25      207.26
      36  306                       --306-Red Route               370.41      370.41      370.47
      37  31                        --31-31st Street              999.79      999.79      995.22
      38  35                        --35-35th Street             1615.75     1615.75     1608.08
```

Figure 106. Report Table 1029.01 – Trip Group Route-Level Ridership Summary

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Program STOPS - FTA Simplified Trips-on-Project Software                                                          Page  3957
Version: STOPS-v2.52 - 12/12/2022                                                                                 12/19/2022
Run:     Prospect MAX - NTI Course Example                                                                          12:57:58
System: Kansas City
Table  1030.01

GTFS Trip Group Stop Summary Report

Daily Riders by Stop Recorded in Trip Group Summary
Scenario Stop No  Stop_id                   Stop_name                     Ons        Offs    (Ons+Offs)/2
======== ======== ========================= ========================= =========== =========== ===========
Existing    3098  1                         10TH & MAIN METROCENTER D       33.48       63.46       48.47
Existing    3099  10                        10TH & MAIN METRO CENTER       227.73      381.58      304.66
Existing    3100  100                       ON 10TH AT MAIN EASTBOUND       22.23      318.06      170.15
Existing    3101  1010004                   ON 11TH AT CENTRAL WESTBO       59.30      215.48      137.39
Existing    3103  1010017                   ON 6TH AT ANN SOUTHBOUND         7.85        3.92        5.88
Existing    3104  101002                    ON MINNESOTA AVE AT 7TH S       18.27       53.82       36.04
Existing    3105  1010023                   ON MINNESOTA AT 10TH WEST       41.11        0.01       20.56
Existing    3106  1010024                   ON MINNESOTA AT 11TH WEST        1.22        0.07        0.65
Existing    3107  1010040                   ON STATE AT 38TH WESTBOUN        2.54       42.80       22.67
Existing    3108  1010041                   ON STATE AT 41ST TERRACE         8.65        7.37        8.01
Existing    3109  1010042                   ON 47TH AT MINNESOTA SOUT       33.30      130.62       81.96
Existing    3110  1010065                   ON LEAVENWORTH RD AT N 51        1.87        0.61        1.24
Existing    3112  1010067                   ON LEAVENWORTH RD AT N 53        0.61        0.26        0.44
Existing    3114  1010069                   ON LEAVENWORTH RD AT N 56        0.00        0.02        0.01
Existing    3115  101007                    ON STATE AVE AT 32ND STRE        1.07        0.00        0.54
Existing    3116  1010070                   ON LEAVENWORTH RD AT N 57        0.02        4.52        2.27
Existing    3118  1010072                   ON LEAVENWORTH RD AT N 60        1.92        0.00        0.96
Existing    3119  1010073                   ON LEAVENWORTH RD AT N 60        1.53        0.00        0.77
Existing    3120  1010074                   ON LEAVENWORTH RD AT N 58        0.15        0.00        0.08
Existing    3121  1010075                   ON LEAVENWORTH RD AT N 57        1.73        0.51        1.12
Existing    3122  1010076                   ON LEAVENWORTH RD AT N 56        4.94        0.00        2.47
Existing    3123  1010077                   ON LEAVENWORTH RD AT N 55        0.00        0.06        0.03
Existing    3124  1010078                   ON LEAVENWORTH RD AT N 53        1.13        0.13        0.63
Existing    3125  1010079                   ON LEAVENWORTH RD AT N 51        2.56        0.19        1.37
Existing    3126  10101                     ON MINNESOTA AVE AT 7TH S        3.83       32.21       18.02
Existing    3127  1010101                   ON STATE AT 38TH EASTBOUN       34.40        1.52       17.96
Existing    3128  1010118                   ON MINNESOTA AT 10TH EAST        2.58       51.31       26.94
Existing    3129  1010119                   ON MINNESOTA AT 9TH EASTB       27.90       56.43       42.16
Existing    3130  1010120                   ON MINNESOTA AT 8TH EASTB       76.64      168.02      122.33
Existing    3131  1010124                   ON ANN AT 6TH EASTBOUND         20.92        5.67       13.29
Existing    3132  1010125                   ON 6TH AT MINNESOTA NORTH        2.22        2.99        2.60
Existing    3134  1010130                   ON 4TH AT WASHINGTON NORT        1.60        0.38        0.99
Existing    3135  1010133                   ON BROADWAY AT 8TH SOUTHB        4.75       21.68       13.21
Existing    3136  1010138                   ON 4TH AT STATE AVE. SOUT        0.00        6.44        3.22
Existing    3137  1010139                   ON 5TH AT STATE AVE NB           8.48       26.83       17.66
Existing    3139  1010141                   ON WOODSWETHER AT LIBERTY        0.00       40.61       20.30
Existing    3140  1010200                   ON 12TH AT WASHINGTON WES        0.31       14.22        7.26
Existing    3141  1010211                   ON PARALLEL AT VILLAGE WE        1.27        0.00        0.64
```

Figure 107. Report Table 1030.01 – Trip Group Stop-Level Ridership Summary

8.17 Report Section 17 – PNR Circuity Statistics

This section provides information on computation of PNR Circuity and its effect on the density computation that is a key determinant of park-and-ride (PNR) demand. This section includes the following tables:

- Tables 1031.01-1031.09. District-to-District average utility effect for each scenario (existing, no-build, and build) and each path type (fixed guideway only, fixed guideway and bus, and bus only)
- Table 1031.10. PNR Circuity Statistics by District. This table presents a listing of each district in the STOPS modeling system showing the DenShr statistic (labeled to show its composition: “Density * 1&2 cr%TRN”) which is a key part of the PNR demand computation. This table also shows the input data that create this statistic (i.e., density in employees per square mile

and transit share for car-owning households)[67]. A sample of this report is presented in Figure 108. It shows that the CBD has a very high DenShr score (equal to 1,053.11) which would lead to the highest probability of making a PNR-transit trip. Other more urbanized areas surrounding downtown have DenShr scores between 100 and 400 which would lead to a moderate level of PNR demand. Other areas have DenShr scores well under 100 which would lead to few PNR-to-transit trips.

AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad

File Edit Format View Help

```
--------------------------------------------------------------------------------------------------------------------------------------
Program STOPS - FTA Simplified Trips-on-Project Software                                                                  Page  3968
Version: STOPS-v2.52 - 12/12/2022                                                                                         12/19/2022
Run:     Prospect MAX - NTI Course Example                                                                                  12:57:58
System: Kansas City
Table  1031.10

 PNR circuity statistics, density*auto owning transit share by zone or district
--- number of zones=      3054
```

DISTRICT	NAME	DENSITY * 1&2 car%TRN	DENSITY	1&2CAR%TRN	TARG FACT
1	CBD	1053.11	29350.71	0.05	1.00021
2	NCBD	9.71	9212.29	0.00	1.00021
3	CrwnC	279.11	20037.18	0.02	1.00021
4	Midto	163.36	7198.33	0.02	1.00021
5	Plaza	183.50	14180.66	0.01	1.00021
6	UMKC	396.67	6037.07	0.07	1.00021
7	CClub	20.40	2403.32	0.01	1.00021
8	ECBD	71.14	3011.82	0.03	1.00021
9	Emidt	15.91	670.21	0.02	1.00021
10	SPrsp	30.23	2087.93	0.01	1.00021
11	EInd	22.47	2083.71	0.01	1.00021
12	EastS	12.51	992.83	0.02	1.00021
13	Swope	2.38	950.62	0.00	1.00021
14	BlRid	1.60	813.33	0.00	1.00021
15	SE	1.63	1387.57	0.00	1.00021
16	South	1.62	1572.55	0.00	1.00021
17	FarSo	4.79	584.06	0.01	1.00021
18	FarEa	2.04	859.70	0.00	1.00021
19	NKC	17.78	4371.42	0.00	1.00021
20	NE	3.70	1382.97	0.00	1.00021
21	FarNE	0.00	486.40	0.00	1.00021
22	GladS	2.32	936.25	0.00	1.00021
23	NW	4.44	902.59	0.01	1.00021
24	KCI	31.13	2419.23	0.01	1.00021
25	Far N	0.00	176.21	0.00	1.00021
26	Ind	9.49	1464.36	0.01	1.00021
27	KCK	16.79	2557.00	0.01	1.00021
28	WestC	50.92	4284.78	0.01	1.00021
29	FarNW	0.00	640.54	0.00	1.00021
30	Kansa	3.76	3002.97	0.00	1.00020
31	North	3.64	391.11	0.01	1.00021
32	Other	0.00	0.00	0.00	0.00000

Figure 108. Report Table 1031.10 – PNR Circuity Statistics

8.18 Report Section 18 – Transportation System User Benefits

This section presents the results of the user benefit computations for the build scenario as compared to the no-build scenario. It provides district-to-district summaries of trips and user benefits (measured in person-minutes of equivalent

[67] The table also presents a column lableled "Targ Fact", which is an adjustment factor that accounts for the difference between transit shares contained in the CTPP and actual reported transit ridership. This factor is usually between 0.9 and 1.1.

travel time savings) similar to results obtained from FTA's *Summit* program but without the need for an interface file or a separate program step.

Results are summarized in Tables 1032.01 to 1032.16 which show the results of the user benefit computation process for each purpose (home-based work, home-based other, non-home based, and all purposes) and each auto ownership class (0 car, 1 car, 2+ cars, and all car ownership categories). In each table, district-to-district statistics are reported for:

- Base (no-build) linked transit trips
- Build linked transit trips
- User Benefits as measured in change in person-minutes

The user benefits process also creates an output ESRI shape file that contains production and attraction end summaries of trips and user benefits. The details of this file are presented in Table 1032.17 as shown in Figure 109. This report shows the name of the ESRI shape files, the included data fields and the definitions of the production and attraction user benefit classes that can be used for thematic mapping.

```
AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad
File  Edit  Format  View  Help
-------------------------------------------------------------------------------------------------------------------
Program STOPS - FTA Simplified Trips-on-Project Software                                              Page  3986
Version: STOPS-v2.51 - 02/25/2022                                                                     2/25/2022
Run:    Prospect MAX                                                                                   17:17:50
System: Kansas City
Table  1032.17

Definition of Output User Benefit ESRI Shapefile

Zonal Total production-end and attractions-end User Benefits are mapped in the ESRI shape file named:
 E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017ResultsZONEMAP.shp

Variables in this file include:
   1.  ST-CO-TAZ   - Full zone name composed of the FIPS state and county code plus the TAZ identifier
   2.  DISTRICT    - District number assigned to this zone
   3.  DIST_NAME   - District name assigned to this zone
   4.  NOB_TRAN_P  - No-Build Transit Trip Ends (Productions)
   5.  BLD_TRAN_P  - Build Transit Trip Ends (Productions)
   6.  DEL_TRAN_P  - Delta (Build - No-Build) Transit Trip Ends (Productions)
   7.  USERBEN_P   - User Benefits in Person-Minutes (Production Trip Ends)
   8.  UBCLASS_P   - User Benefit numeric classification (-3 to +3) (Production Trip Ends)
   9.  UBCLASS2_P  - User Benefit classification (descriptive name) (Production Trip Ends)
  10.  NOB_TRAN_A  - No-Build Transit Trip Ends (Attractions)
  11.  BLD_TRAN_A  - Build Transit Trip Ends (Attractions)
  12.  DEL_TRAN_A  - Delta (Build - No-Build) Transit Trip Ends (Attractions)
  13.  USERBEN_A   - User Benefits in Person-Minutes (Attraction Trip Ends)
  14.  UBCLASS_A   - User Benefit numeric classification (-3 to +3) (Attraction Trip Ends)
  15.  UBCLASS2_A  - User Benefit classification (descriptive name) (Attraction Trip Ends)

Definition of User Benefit Classes Included in Zone Map Shape File
 UBClass Production-End Definition              Attraction-End Definition
 ======= ====================================== =====================================
   -3    -3: <     -41.63 minutes                -3: <     -51.25 minutes
   -2    -2:      -41.63 to      -13.01 minutes  -2:      -51.25 to      -21.35 minutes
   -1    -1:      -13.01 to       -3.90 minutes  -1:      -21.35 to       -4.27 minutes
    0     0:       -3.90 to        3.90 minutes   0:       -4.27 to        4.27 minutes
    1     1:        3.90 to       13.01 minutes   1:        4.27 to       21.35 minutes
    2     2:       13.01 to       41.63 minutes   2:       21.35 to       51.25 minutes
    3     3: >      41.63 minutes                 3: >      51.25 minutes
   Note: Breakpoints defined so that class 3 includes 40% of positive benefits, class 2 includes the next 30% of benefits and class 1 include next 20% of benefits
         Breakpoints for negative benefits mirror those of the positive benefits
```

```
AC_DEC17#DEC17#DEC17BLD_STOPSY2017Results - Notepad
File  Edit  Format  View  Help
-------------------------------------------------------------------------------------------------------------------
Program STOPS - FTA Simplified Trips-on-Project Software                                              Page  3986
Version: STOPS-v2.52 - 12/12/2022                                                                    12/19/2022
Run:    Prospect MAX - NTI Course Example                                                              12:57:58
System: Kansas City
Table  1032.17

Definition of Output User Benefit ESRI Shapefile

Zonal Total production-end and attractions-end User Benefits are mapped in the ESRI shape file named:
 E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017ResultsZONEMAP.shp

Variables in this file include:
   1.  ST-CO-TAZ   - Full zone name composed of the FIPS state and county code plus the TAZ identifier
   2.  DISTRICT    - District number assigned to this zone
   3.  DIST_NAME   - District name assigned to this zone
   4.  NOB_TRAN_P  - No-Build Transit Trip Ends (Productions)
   5.  BLD_TRAN_P  - Build Transit Trip Ends (Productions)
   6.  DEL_TRAN_P  - Delta (Build - No-Build) Transit Trip Ends (Productions)
   7.  USERBEN_P   - User Benefits in Person-Minutes (Production Trip Ends)
   8.  UBCLASS_P   - User Benefit numeric classification (-3 to +3) (Production Trip Ends)
   9.  UBCLASS2_P  - User Benefit classification (descriptive name) (Production Trip Ends)
  10.  NOB_TRAN_A  - No-Build Transit Trip Ends (Attractions)
  11.  BLD_TRAN_A  - Build Transit Trip Ends (Attractions)
  12.  DEL_TRAN_A  - Delta (Build - No-Build) Transit Trip Ends (Attractions)
  13.  USERBEN_A   - User Benefits in Person-Minutes (Attraction Trip Ends)
  14.  UBCLASS_A   - User Benefit numeric classification (-3 to +3) (Attraction Trip Ends)
  15.  UBCLASS2_A  - User Benefit classification (descriptive name) (Attraction Trip Ends)

Definition of User Benefit Classes Included in Zone Map Shape File
 UBClass Production-End Definition              Attraction-End Definition
 ======= ====================================== =====================================
   -3    -3: <     -49.58 minutes                -3: <     -45.67 minutes
   -2    -2:      -49.58 to      -17.42 minutes  -2:      -45.67 to      -20.30 minutes
   -1    -1:      -17.42 to       -4.02 minutes  -1:      -20.30 to       -5.07 minutes
    0     0:       -4.02 to        4.02 minutes   0:       -5.07 to        5.07 minutes
    1     1:        4.02 to       17.42 minutes   1:        5.07 to       20.30 minutes
    2     2:       17.42 to       49.58 minutes   2:       20.30 to       45.67 minutes
    3     3: >      49.58 minutes                 3: >      45.67 minutes
   Note: Breakpoints defined so that class 3 includes 40% of positive benefits, class 2 includes the next 30% of benefits and class
         Breakpoints for negative benefits mirror those of the positive benefits
```

Figure 109. Table 1032.17 – User Benefit ESRI Output Shape File Specification

Zone-level estimates of production-end or attraction-end user benefits can be automatically mapped by STOPS. The maps show positive and negative user benefits as red and green areas that can be used to determine how well the service plans improve in different portions of the region. The procedures to develop these maps are described in Section 9.2.

9.0 Mapping Results

STOPS includes two options for mapping many of the results generated by the demand and path-finding models:

- Map STOPS Trip/Time Results (called Map STOPS Results in version 2.50 and earlier)
- Map User Benefits

Both options are discussed in this chapter

9.1 Mapping STOPS Trip and Time Results

This option is selected by clicking on "13. Map STOPS Trip/Time Results". When this is done, the dialog shown in Figure 110 appears. The program allows the user to select what types of trips to map including:

- Transit sub-modes. Fixed guideway only, fixed guideway and bus, bus only and all (default).
- Transit access modes. Walk, kiss-and-ride, park-and-ride, and all (default).
- Trip purpose: Home-based work, home-based other, non-home based, and all (default).
- Household auto ownership: 0 car, 1 car, 2+ car and all (default).
- Production (home) location of trips (default) or attraction (non-home) location.
- Destination district (for Production Plots) or origin district (for attraction plots): Any one district or all (drop down list with the default of blank meaning all districts).
- Scenario: existing, no-build, build (map all transit trips associated with the project scenario), project (map project trips, default), trip gains (increases in linked trips for build vs. no-build), or trip losses (decreases in linked trips for build vs. no-build).
- Travel times to plot:
    - Fixed Guideway Time (default)
    - Bus Time
    - All In-Vehicle time
    - Out-of-Vehicle time
    - Total time
- Incremental time (default) or time for the selected scenario.

When the defaults are selected, a GIS screen appears showing the origin location for all trips using the project (shown as black dots in Figure 111). For reference, the map also includes all stations defined in the station file. GIS tools can be used to hide this layer or highlight project stations. This example shows a manual adjustment made to project stations so that they appear as medium-large red circles and other stations as very small green circles. No times are plotted with the default parameters since no specific origin or destination location was selected.

When a district, a submode, and an access mode are selected, STOPS also displays the travel times to a specific zone in the destination district (the zone in the district definition file where the district label is coded).

A sample map showing project walk access trips to the CBD is shown in Figure 112. This map also shows the incremental in-vehicle travel time (Build vs. No-Build) for each production zone to the destination zone. A small black square marks the destination zone for the travel time estimates. Blue, green and gray shading is used to denote travel times that increased from the no-build to the build scenario. Orange, yellow and red are used to denote travel times that decreased (improved) from the no-build to the build scenario. The user can adjust the thematic mapping of the time variable as needed to clearly indicate the impact of the project on the transit service quality.

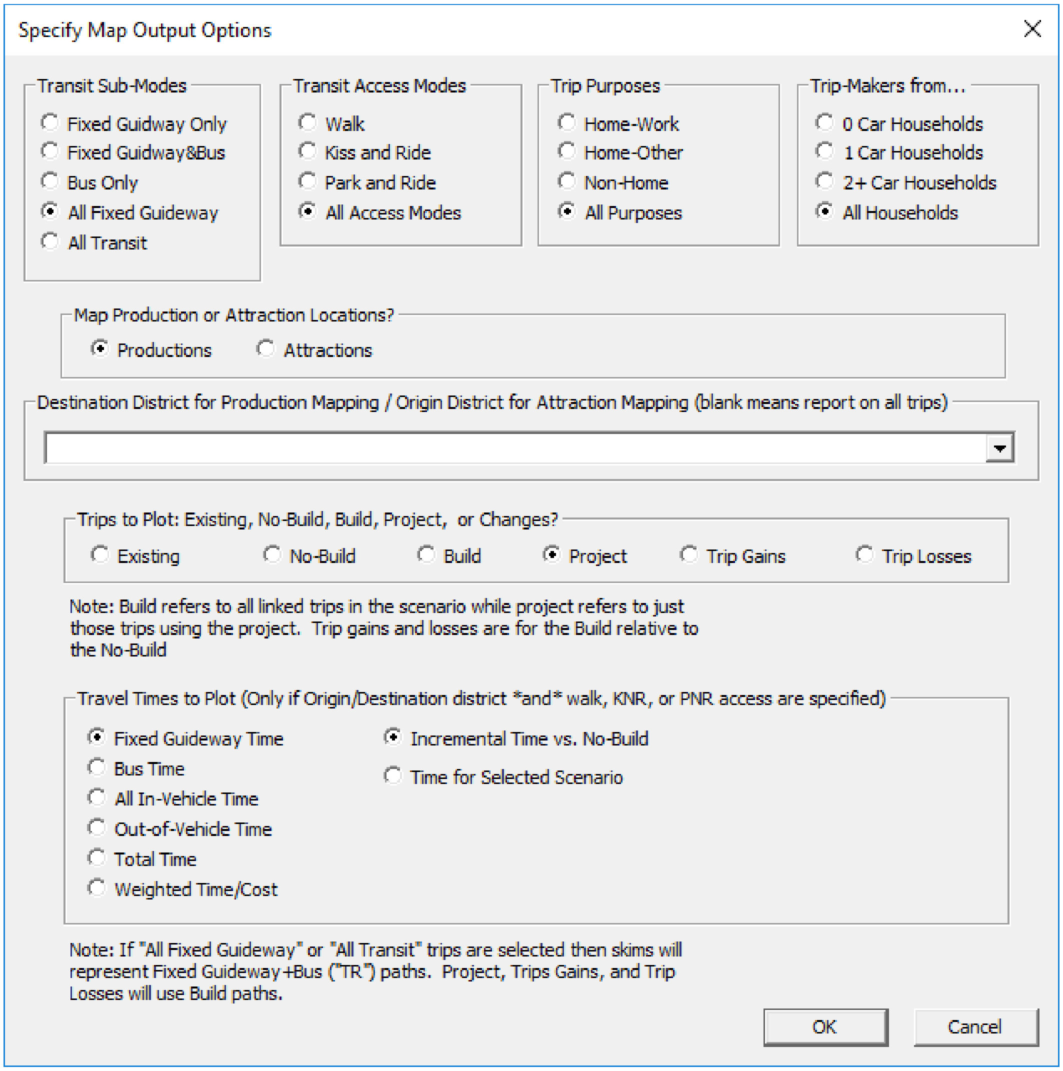


Figure 110. Dialog for Selecting Mapping Options

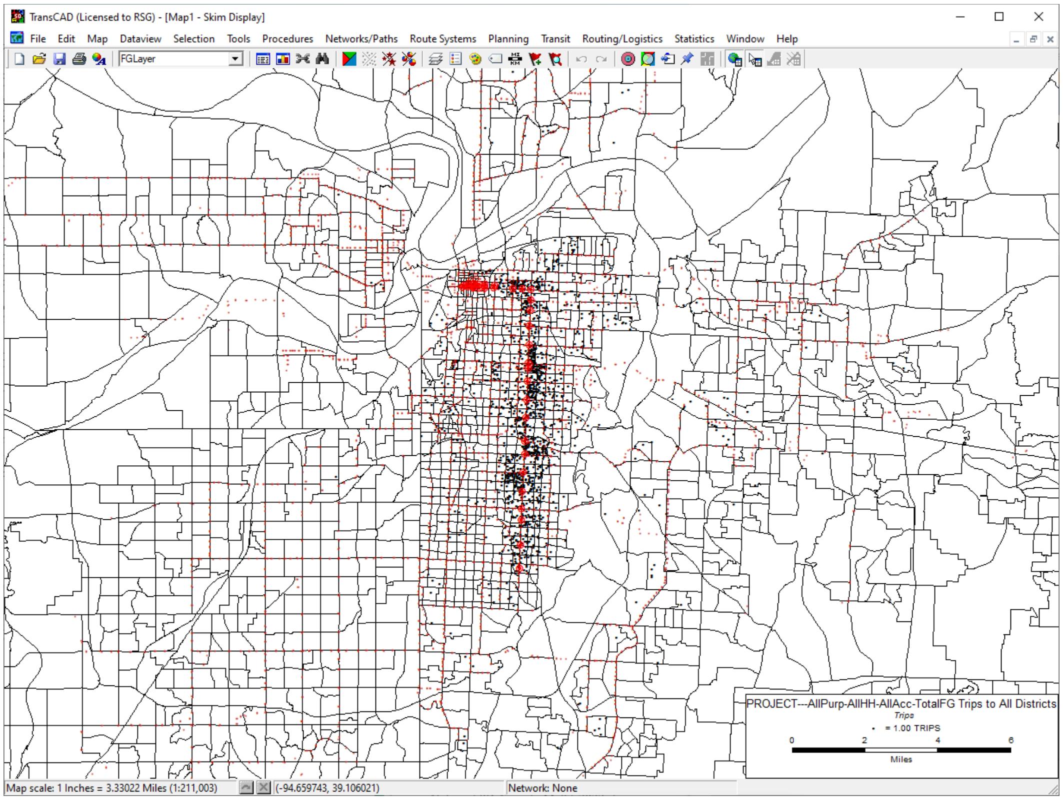


Figure 111. Map of Project Trips to All Destinations

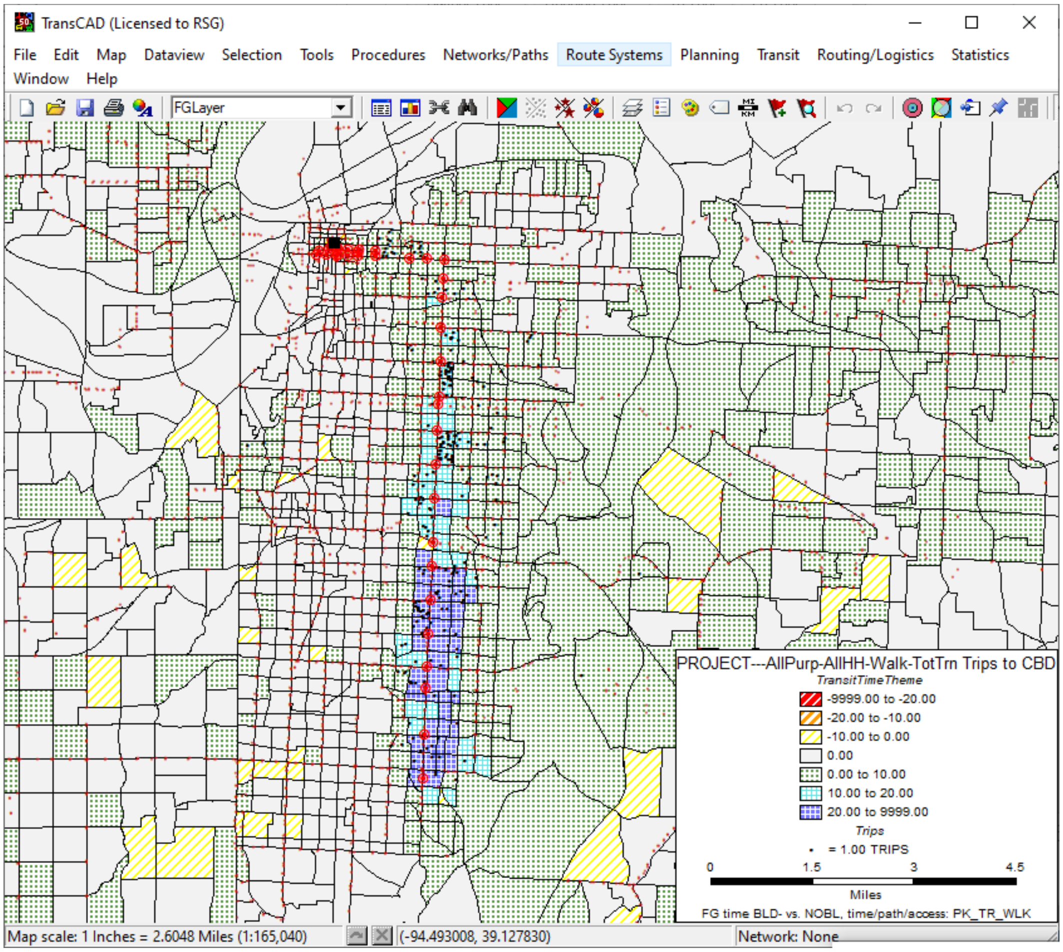


Figure 112. Map of Walk Access Project Trips to the CBD

9.2 Map User Benefits

STOPS can prepare maps showing total production- or attraction-end Transportation System User Benefits by zone. This option is selected by clicking on "13a. Map User Benefit Results". When this is done, a dialog appears asking the user whether to map a production-end summary or an attraction end summary as shown in Figure 113.

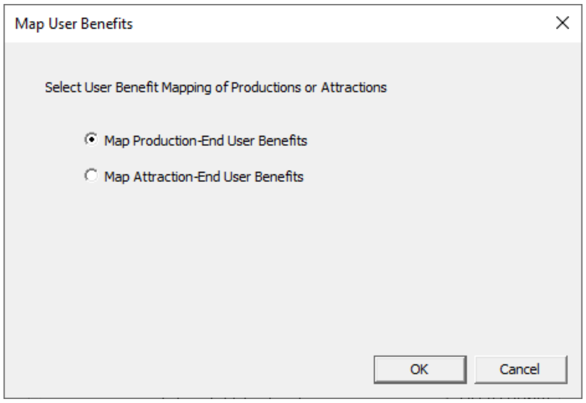


Figure 113. Dialog to Select Production or Attraction User Benefits Map

The map generated by this process is shown in Figure 114. The areas colored with the darkest green color, together, account for 40 percent of the positive project benefits and the medium and light green areas account for an additional 30 and 20 percent of the benefits, respectively. Areas colored red represent disbenefit areas and the scale for dark, medium and light red are set at the same magnitude but opposite sign (i.e., disbenefits) as the green scale. Ideally, the map is mostly green with only occasional areas of red.

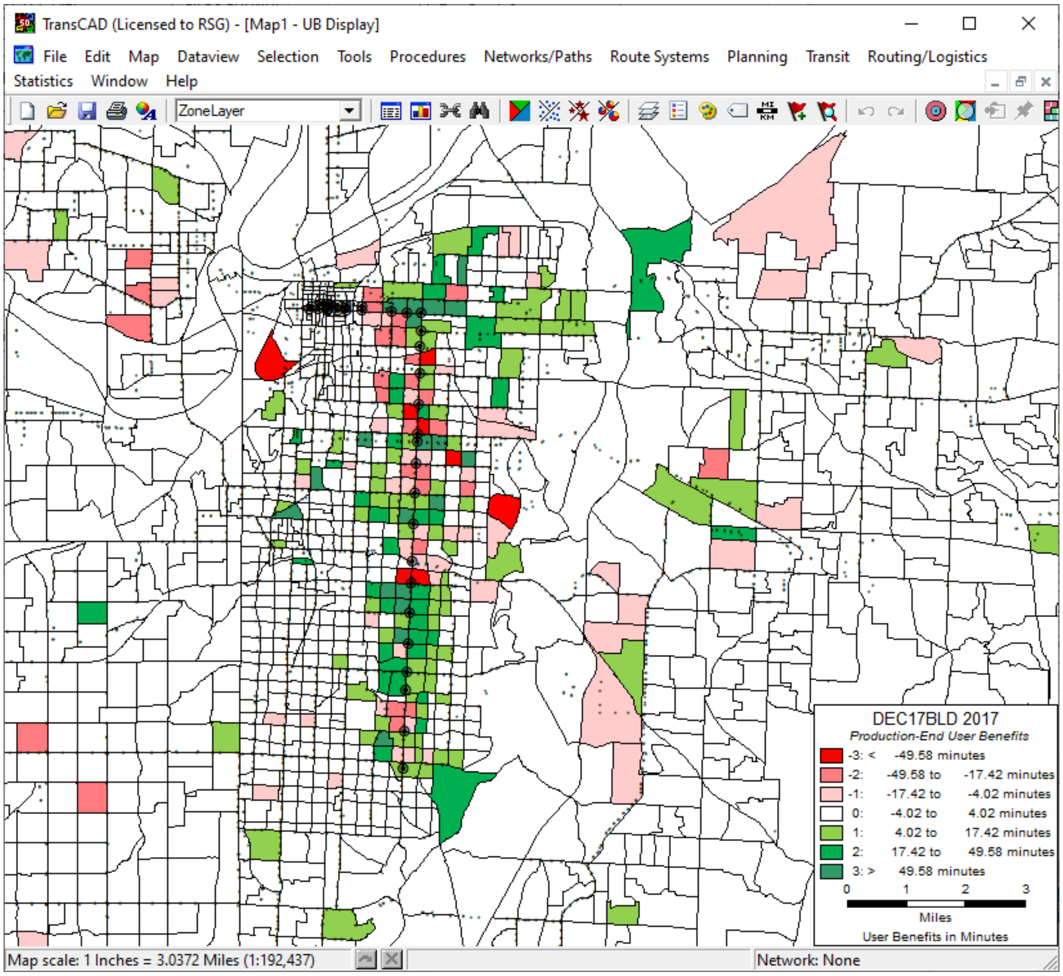


Figure 114. Sample User Benefits Map

This map shows areas of red and light red in the corridor which is related to the trade-off between faster speeds for riders boarding at BRT stations versus longer access times or less frequent service for riders beginning their trip in areas located between the BRT stations.

10.0 Querying Zone-to-Zone Impedances and Trips

Option 14 ("Z2Z Query") allows the user to prepare a report summarizing travel times and trips by mode for a specific zone-to-zone interchange.

To use the query function, the user must type a valid zone name in both the "From Zone" and "To" text boxes and then click "14. Z2Z Query." When typing a zone name, remember to enter the full STOPS zone identification as it appears in the ST-CO-TAZ field in the District file.

When the Z2Z Query button is clicked, STOPS will read the datasets that were prepared by the most recent run and report on impedances and times for each combination of:

- Scenario (no-build, build, and build)
- Access mode (walk, kiss-and-ride, and park-and-ride)
- Path (fixed guideway+bus [all transit path], fixed guideway only, and bus-only)

An illustration of the Main Menu is shown in Figure 115 with zones 29095$22044 to 29095$21903 selected for query. To generate the query report, click "14. Z2Z Query". This process will run for several minutes as STOPS assembles the requested information. When complete, STOPS will open a report in Notepad summarizing the results. This report is shown in Figure 116.

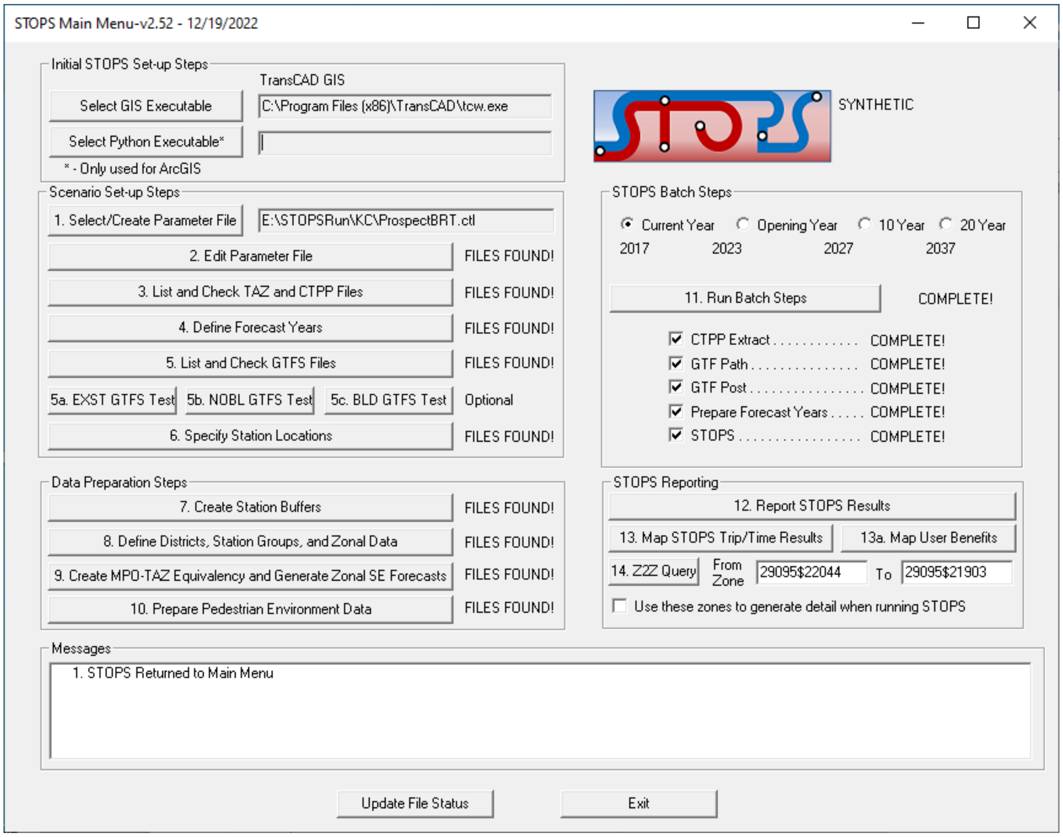


Figure 115. Using the Z2Z Query Function

AC_DEC17#DEC17#DEC17BLD_STOPSY2017Query - Notepad

File Edit Format View Help

```
STOPS Query File - Year2017

-------------------------------------------------------------------------------------------

Z2Z information-- Existing

. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
File: E:\STOPSRun\KC\OutputData\AC_DEC17_Zone2ZoneY2017EXST.bin
Production zone      29095$22044
Attraction zone      29095$21903

CTPP JTW -  1 Car:        11.72
CTPP JTW -  2 Car:         0.00
CTPP JTW -  3 Car:        54.15


Auto distance              7.60
Auto time                 10.04

Peak transit skims       WLK-TRN    WLK-FG   WLK-BUS   KNR-TRN    KNR-FG   KNR-BUS   PNR-TRN    PNR-FG   PNR-BUS
Access time                 2.72     20.19      2.72      5.57      5.57      2.49     11.11     11.11      8.78
Xfer Walk                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
Egress Walk                 4.97      5.52      4.97      5.52      5.52      2.11      4.77      4.77      4.97
Wait 1                      2.98      0.48      2.98      0.48      0.48      4.11      0.77      0.77      2.98
Wait xfer                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
FG ivtt                     0.00     22.00      0.00     22.00     22.00      0.00      6.00      6.00      0.00
Bus ivtt                   30.01      0.00     30.01      0.00      0.00     28.00      0.00      0.00     12.01
Boardings                   1.00      1.00      1.00      1.00      1.00      1.00      1.00      1.00      1.00
Fare                        1.50      1.50      1.50      1.50      1.50      1.50      0.00      0.00      1.50

Off-peak transit skims   WLK-TRN    WLK-FG   WLK-BUS   KNR-TRN    KNR-FG   KNR-BUS   PNR-TRN    PNR-FG   PNR-BUS
Access time                 2.72     20.19      2.72      2.49      5.57      2.49     11.11     11.11      8.78
Xfer Walk                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
Egress Walk                 4.97      5.52      4.97      2.11      5.52      2.11      4.77      4.77      4.97
Wait 1                      5.02      0.48      5.02      4.11      0.48      4.11      0.77      0.77      1.98
Wait xfer                   0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00      0.00
FG ivtt                     0.00     26.00      0.00      0.00     26.00      0.00      8.00      8.00      0.00
Bus ivtt                   32.01      0.00     32.01     26.00      0.00     26.00      0.00      0.00     11.01
Boardings                   1.00      1.00      1.00      1.00      1.00      1.00      1.00      1.00      1.00
Fare                        1.50      1.50      1.50      1.50      1.50      1.50      0.00      0.00      1.50

. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
Trip file: E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017ResultsHBWEXST.asc

Person trips by mode for purpose: HBW
Auto Ownership   WLK-TRN    WLK-FG   WLK-BUS   KNR-TRN    KNR-FG   KNR-BUS   PNR-TRN    PNR-FG   PNR-BUS PersTrips
0 cars             0.000     0.000     2.992     0.000     0.580     0.004     0.000     0.000     0.002    13.608
1 cars             0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
2+ cars            0.000     0.000     3.069     0.000     1.657     0.017     0.000     0.065     0.283    97.119
All HHs            0.000     0.000     6.060     0.000     2.236     0.020     0.000     0.065     0.285   110.727
Trip file: E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017ResultsHBOEXST.asc

Person trips by mode for purpose: HBO
Auto Ownership   WLK-TRN    WLK-FG   WLK-BUS   KNR-TRN    KNR-FG   KNR-BUS   PNR-TRN    PNR-FG   PNR-BUS PersTrips
0 cars             0.000     0.000     3.075     0.000     1.045     0.014     0.000     0.000     0.005   102.193
1 cars             0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
2+ cars            0.000     0.000     4.059     0.000     2.992     0.049     0.000     0.018     0.168   433.567
All HHs            0.000     0.000     7.133     0.000     4.037     0.063     0.000     0.019     0.172   535.760
Trip file: E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017ResultsNHBEXST.asc

Person trips by mode for purpose: NHB
Auto Ownership   WLK-TRN    WLK-FG   WLK-BUS   KNR-TRN    KNR-FG   KNR-BUS   PNR-TRN    PNR-FG   PNR-BUS PersTrips
0 cars             0.000     0.000     0.862     0.000     0.424     0.008     0.000     0.000     0.002    53.581
1 cars             0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000     0.000
2+ cars            0.000     0.000     1.233     0.000     1.072     0.020     0.000     0.010     0.091   264.160
All HHs            0.000     0.000     2.095     0.000     1.496     0.028     0.000     0.010     0.093   317.741
Trip file: E:\STOPSRun\KC\OutputData\AC_DEC17#DEC17#DEC17BLD_STOPSY2017ResultsTOTEXST.asc
```

Figure 116. Example Z2Z Query Report

11.0 Calibration of Synthetic STOPS Model Applications

The discussion of model inputs and application steps in the previous chapters have focused on the mechanical aspects of making STOPS work. The reports and GIS visualizations generated to this point represent a significant milestone in the process of generating meaningful project forecasts. However, much work still remains to tailor the STOPS application to properly understand the nature of transit demand in a given metropolitan area. The process of adjusting STOPS (or any transportation demand model) to match the relevant demand patterns in a region is known as model calibration.

This chapter discusses the general approach that can be followed to calibrate a STOPS application. The steps described in this chapter represent a fairly basic level of calibration that is broadly applicable to many settings. However, the user is responsible for understanding the key issues that may affect their particular project and adapt this calibration approach so that the resulting STOPS application meets these needs.

11.1 Overview of Calibration Process

Calibration begins with an "base" model run that represents all that is known about regional demand and service but with none of the STOPS calibration processes enabled at this time. In particular, a good base run features:

- GTFS files for all relevant transit operators in the corridor and/or region. For calibration, only the existing year GTFS files are required. If no-build and build scenarios are not yet defined, the existing GTFS files can be used in all three "slots" (i.e., existing, no-build, and build).
- Full coding of all park-and-ride (PNR) lots serving those operators.
- Representation of regional fare structures in cases where fares may vary among agencies or services.
- Development of a STOPS station file with all stop_ids from the GTFS sets included in the application. All stops and stations should have ridership count data for the existing scenario.
- Development of a route count file containing existing scenario counted ridership for all routes. Counts supporting the station and route counts

should be reconciled so that total station and total route counted ridership are consistent[68].

- Specification of appropriate districts and station groups for aggregating results. In most areas, the best district system will include 30 to 40 districts that identify major activity centers (e.g., Central Business Districts, major employment locations, and other major generators). For other areas, the metropolitan area should be divided into a system of corridors (eight is often a good number) and rings (e.g., urban, inner suburban, outer suburban, exurban)
- STOPS parameter file set so that minimal automatic calibration is employed:
    - CTPP calibration set to Attractions Only
    - Count-based adjustment set to "None"

The results of this run (identical to the Kansas City application described in earlier chapters) represent a solid foundation for the calibration work to be employed in this chapter.

11.2 Calibration Metrics

Calibration metrics are the statistics that are tracked in order to monitor how well the STOPS application matches transit demand conditions in a specific metropolitan area. The list of statistics discussed in this section represents a typical list of statistics that are used for model calibration. However, each area is different in terms of the data that are available to describe actual ridership patterns and each project is different in terms of the characteristics that are important to represent well. Accordingly, this list is just a starting point for the calibration metrics to be used for a new STOPS application.

Typical calibration metrics, sources of observed data, and the location (i.e., table number) of the corresponding modeled results in the STOPS report are shown in Table 12.

[68] If all routes and station/stops are included in the route and station file, then the sums of the counts from each source should be equal. In cases where ridership is not known for all stops but is known for all routes (or vice versa), then the sums will not be equal. In these cases, the subset of stops and routes which are included in both sources of count data should be compared and adjusted to be consistent.

Table 12. Summary Calibration Metrics

Calibration Metric	Typical Source of Observed Data	Location of Corresponding STOPS Results
System-wide Adjustment Factor[69]	Should be between 0.99 and 1.01	Table 2.04
Unlinked Trips	Sum of counts[70]	Sum of existing route ridership in Table 10.01. (other tables also provide this statistic)
Linked Transit Trips by Trip Purpose	Comprehensive regional transit user survey	Tables 11.01 (HBW), 11.02 (HBO), and 11.03 (NHB)
Linked Transit Trips by Auto Ownership	Comprehensive regional transit user survey	Tables 11.01 (HBW), 11.02 (HBO), and 11.03 (NHB)
Linked Transit Trips by Production and/or Attraction District	Comprehensive regional transit user survey	Table 345.01
Production-end linked trips by access mode	Comprehensive regional transit user survey or estimated from PNR vehicle counts	Table 11.04
Share of transit unlinked trips using fixed guideway	Route-level ridership counts	Table 10.01
Stop Boardings by Group	Stop-level ridership counts	Table 3.01
Route Boardings by Route Group	Route-level ridership counts summarized by user-defined route groups	Table 10.01 summarized by user-defined route groups
Route Boardings by Route	Route level ridership counts	Table 10.01

[69] The system-wide adjustment factor is related to the ratio of unlinked to linked trips. Wherever possible, users should provide estimates of linked and unlinked trips to STOPS (using the parameter file). Where data on linked trips is not available, STOPS estimates this relationship with a user-coded ratio which defaults to 1.4.
[70] In most cases, total counted ridership is known for all services included in the STOPS application. In rare cases, counts are not known for some services. This can happen if transit services are provided by another agency and that service extends outside of the modeling region. In these cases, total boardings are equal to the counted ridership plus and estimate of the ridership on the missing routes that would occur within the modeling area.

11.3 Calibration Process and Record Keeping

The calibration process involves identifying the most significant disconnects between observed and modeled ridership, addressing these problems by adjusting parameters, and repeating until the model generates results that match the major transit travel patterns present in the region. This process begins with major system-wide issues first and as each issue is resolved, focuses on more detailed concerns as the calibration progresses.

Parameter adjustments should be applied with a view to developing a plausible explanation of key transit patterns in the region. In general, the allowable ranges for STOPS parameters have been designed so that they represent the ranges of experiences for different aspects of transit demand in the United States. Nevertheless, it is just as important that the modifications to the default parameters be grounded in explainable characteristics of the area and not just be an adjustment that forces the model to match reality.

One of the ***last*** steps in the calibration process should involve enabling count-based adjustment. The count-based adjustment process in STOPS is quite powerful and even models that differ substantially from observed conditions can be forced, superficially, to match route- and stop-level counts. However, these adjustments may conceal the fact that the natural model mis-represents the true nature of the transit demand including errors related to transit trip purpose, auto ownership, fixed guideway usage, etc. It is best to correct these aspects of transit ridership before using count-based adjustment to force STOPS results to match observed ridership.

Calibration results should be tracked by a "scorecard" that shows key model results for each stage of the calibration process. A streamlined version of the calibration scorecard for Kansas City is shown in Table 13, Table 14, and Table 15. Key features of the scorecard are as follows:

- The top of the scorecard shows key parameter settings for each step of the calibration process. Changes from one step to the next are highlighted in yellow. Typically, only one parameter is changed at a time. The only exception to this rule occurred in Step 3 where the transfer rate, KNR, and PNR settings were adjusted simultaneously since each setting had an impact on the other calibration results.
- Many of the numeric parameters (e.g., transfer setting, KNR adjustment, and PNR adjustment) were set by iterative testing with different values of each parameter, determining the impact on the calibration statistic, adjusting the parameter value and repeating. Intermediate results are not shown in this

summary but users should record all steps to assist in finding the optimal values more quickly.

- The scorecard shows the STOPS batch steps that were re-run for each model step. When the parameter change has no effect on path-building, then steps prior to the demand model (i.e., the STOPS step) can be skipped.
- Run 4 (second from the last run) invokes count-based factoring for the first time. Count-based factoring is not enabled in earlier steps to better see how well the underlying model is performing. At this stage, count based adjustment is enabled to serve as a final tune-up to the model.
- Run 5 (last run) is a clean run from the beginning that is used to confirm that skipping all but the STOPS step in earlier runs did not change the results.
- The progress of runs are as follows:
  - Run 0 is the same as the base run described in earlier chapters. This run shows a serious deficiency in transit productions in key locations in the corridor.
  - Run 1 begins to address this deficiency by enabling Production and Attraction CTPP calibration. This action helps to reduce the problem with a deficiency of transit trips in the corridor although the modeled number is still less than the survey results. The next key problem is that the systemwide adjustment factor is significantly different from 1.0
  - Run 2 begins the process of addressing the systemwide adjustment issue by revising the transfer penalty parameter to 0.75 of the default amount (i.e., reduces the boarding penalty from 5 minutes to 3 minutes). This brings the systemwide adjustment parameter to 1.02. This is a better result but also suggests that a bigger change to this parameter is required to fully represent actual transfer rates.
  - Run 3 completes the process of addressing the systemwide adjustment process by revising the transfer penalty parameter to 0.65. This change drops the system wide adjustment factor to 1.0 (the desired outcome). At this point most system-wide results (e.g., ridership by access mode, purpose, and geographic location of productions and attractions) match observed values fairly well. The key remaining problem is that ridership in the project corridor (Prospect family of routes and the Prospect route in particular) understates actual ridership..
  - Since all other aspects of the model appear to be correct, count-based adjustment was applied in Run 4 to balance results to counts. When this change is applied, the model results match stop and route counts.

However, linked trips by district no longer match observed values as well as before. This illustrates the fact that while count-based adjustment is a powerful tool, it does not necessarily adjust the model to perfectly match all characteristics of transit travel. Since the count data are generally more accurate than survey-derived estimates of transit flows, this adjustment is preferred to ignoring the count mismatch. A better approach, when data are available, is to apply an incremental model which uses survey data to start with a closer fit between observed and modeled ridership.

- Run 5 is a clean re-run of all steps of the model to confirm that the model is completely up-to-date and ready for application. The fact that Run 5 matches Run 4 in all results means that the decisions on which batch steps to re-run were correct and that when applied, the existing scenario from the calibrated model should match the results shown in the calibration scorecard.

Figure 117, Figure 118, and Figure 119 show the parameter screens following the conclusion the synthetic calibration process.

Table 13. Kansas City Synthetic Calibration Scorecard Part 1

KC Scorecard (Synthetic Part 1)	Targets	Run 0	Run 1	Run 2	Run 3	Run 4	Run 5
CTPP Calibration Methodology		A's	A and Ps	A and Ps	A and Ps	A and Ps	A and Ps
AutoTime Adjustment		1.27	1.27	1.27	1.27	1.27	1.27
FGS, Full-Streetcar		1	1	1	1	1	1
FGS, Partial-BRT		0.1	0.1	0.1	0.1	0.1	0.1
Xfer Penalty		1.00	1.00	0.75	0.65	0.65	0.65
PNR Density		1.0	1.0	1.0	1.0	1.0	1.0
Adjust to Counts/Max. Adjustment		no	no	no	no	yes/5	yes/5
Rerun							
CTPP Extract		yes	no	no	no	no	yes
GTF Path		yes	no	yes	yes	no	yes
Prepare Forecast Year		yes	no	yes	yes	no	yes
STOPS		yes	yes	yes	yes	yes	yes
Systemwide adjustment factor	1.00	1.04	1.05	1.02	1.00	1.00	1.00
Final unlinked trips	53,600	53,600	53,600	53,600	53,600	53,826	53,826
Purposes: linked trips by purpose							
TOTAL	38,595	40,696	40,065	38,785	38,174	39,905	39,905
HBW %	38%	37%	38%	38%	38%	37%	37%
HBO %	47%	47%	47%	47%	47%	47%	47%
NHB %	16%	17%	16%	16%	16%	16%	16%
0-car: linked trips by 0-car hholds							
HBW 0-car % of all transit trips	16%	16%	16%	16%	16%	16%	16%
HBO 0-car % of all transit trips	23%	23%	24%	24%	24%	23%	23%
NHB 0-car % of all transit trips	7%	8%	7%	7%	7%	7%	7%
All 0-car % of all transit trips	47%	47%	47%	47%	47%	46%	46%

Table 14. Kansas City Synthetic Calibration Scorecard Part 2

KC Scorecard (Synthetic Part 2)	Targets	Run 0	Run 1	Run 2	Run 3	Run 4	Run 5
Transit flows: Totals	Survey						
Prods from E CBD	1,978	1,586	3,881	3,757	3,697	4,307	4,307
Prods from E Midtown	3,317	1,924	3,251	3,146	3,096	3,918	3,918
Prods from S Prospect	3,584	2,623	4,744	4,591	4,518	5,266	5,266
Attrs to CBD	7,495	8,185	8,316	8,051	7,924	11,240	11,240
Attrs to E CBD	1,681	2,067	2,105	2,038	2,006	1,261	1,261
Attrs to E Midtown	1,733	885	897	868	855	1,100	1,100
Trips to CBD from E CBD	374	290	726	697	682	1,222	1,222
Trips to CBD from E Midtown	431	281	552	532	522	868	868
Trips to CBD from S Prospect	441	361	860	832	817	2,068	2,068
TOTAL flows	38,595	40,696	40,065	38,785	38,174	39,905	39,905
Access: linked trips by P MOA							
Walk	33,895	31,868	35,561	33,920	34,017	35,867	34,811
KNR	2,200	6,705	2,622	2,470	2,470	2,447	2,378
PNR	2,500	2,123	1,760	1,647	1,694	1,628	1,536
TOTAL	38,595	40,696	39,943	38,036	38,181	39,942	38,725
Transfers: unlinked/linked trips	1.39	1.32	1.34	1.38	1.40	1.35	1.35
FG share: BRT	18%	13%	13%	13%	13%	18%	18%
FG share: Streetcar	9%	10%	8%	8%	8%	9%	9%
BRT share on Troost	80%	82%	81%	81%	81%	80%	80%
Groups: stop boardings by group							
01- CBD	10,553	9,794	9,760	9,610	9,652	10,600	10,603
08- E CBD	2,336	2,040	2,042	2,070	2,009	2,359	2,361
09- E Midtown (N Prospect)	4,317	3,816	3,759	3,729	3,676	4,337	4,341
10- E CClub (S Prospect)	4,051	4,033	3,968	3,988	3,949	4,054	4,056
TOTAL (inc. other groups)	53,600	53,600	53,600	53,600	53,600	53,512	53,542

Table 15. Kansas City Synthetic Calibration Scorecard Part 3

KC Scorecard (Synthetic Part 3)	Targets	Run 0	Run 1	Run 2	Run 3	Run 4	Run 5
Routes: Families in Southtown							
Total North-South	19,347	14,762	16,539	16,559	16,555	19,447	19,447
Main/Wornall Family	5,295	6,177	5,346	5,402	5,435	5,264	5,264
Troost Family	7,650	5,100	5,982	5,990	5,984	7,631	7,631
Prospect Family	6,402	3,485	5,211	5,167	5,136	6,552	6,552
Total East-West	17,142	13,430	15,685	15,848	15,943	17,037	17,037
Routes: Individual							
#71 Prospect	4,912	2,004	3,113	3,121	3,115	4,877	4,877
#108 Indiana	1,390	1,301	1,828	1,781	1,760	1,382	1,382
#10 Woodland/Brooklyn	100	180	270	265	261	293	293
KC Streetcar	4,784	5,156	4,297	4,279	4,286	4,833	4,833
MAX--Main	4,537	4,055	3,577	3,632	3,667	4,508	4,508
MAX--Troost	5,099	3,062	3,424	3,457	3,459	5,085	5,085
#31--31st St.	3,073	1,036	1,251	1,268	1,273	3,071	3,071
#35--35th St.	1,072	1,674	1,719	1,727	1,731	1,069	1,069
#39--39th St.	1,760	1,470	2,013	2,099	2,142	2,631	2,631

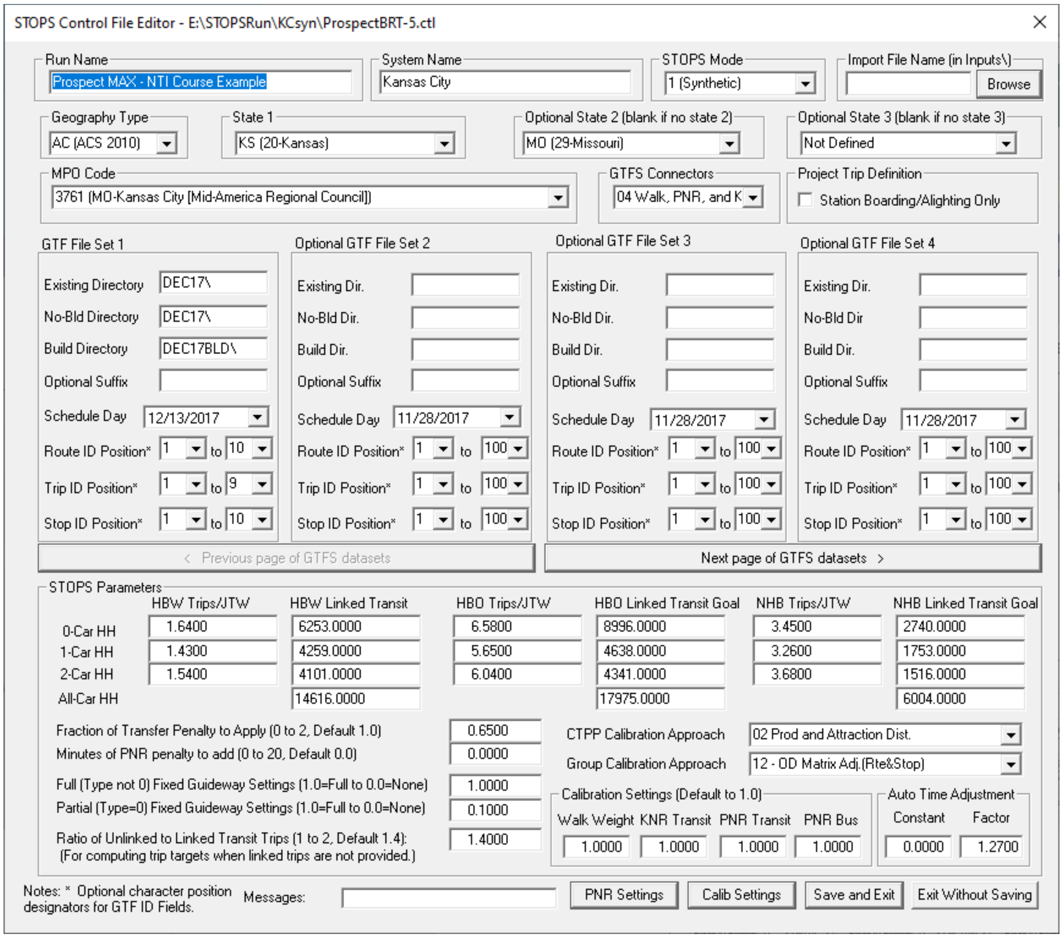


Figure 117. Main Parameter Screen After Synthetic Calibration

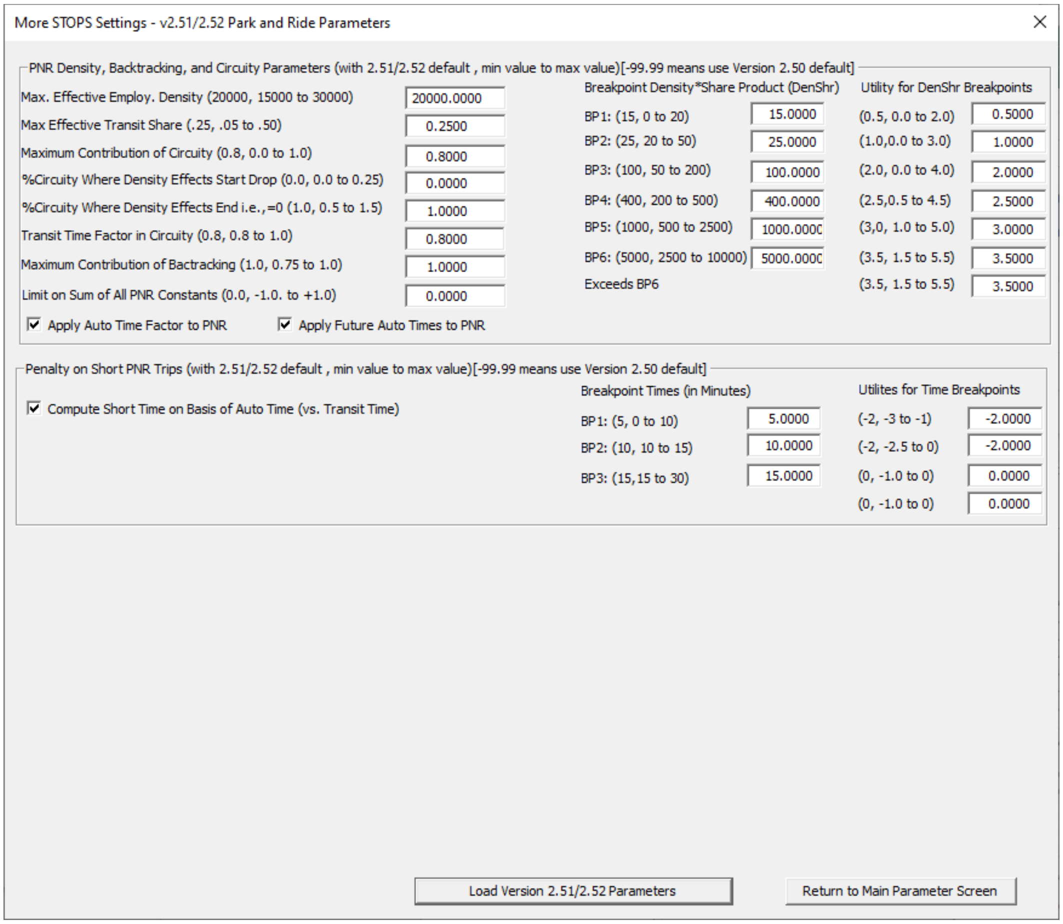


Figure 118. PNR Parameter Screen After Synthetic Calibration

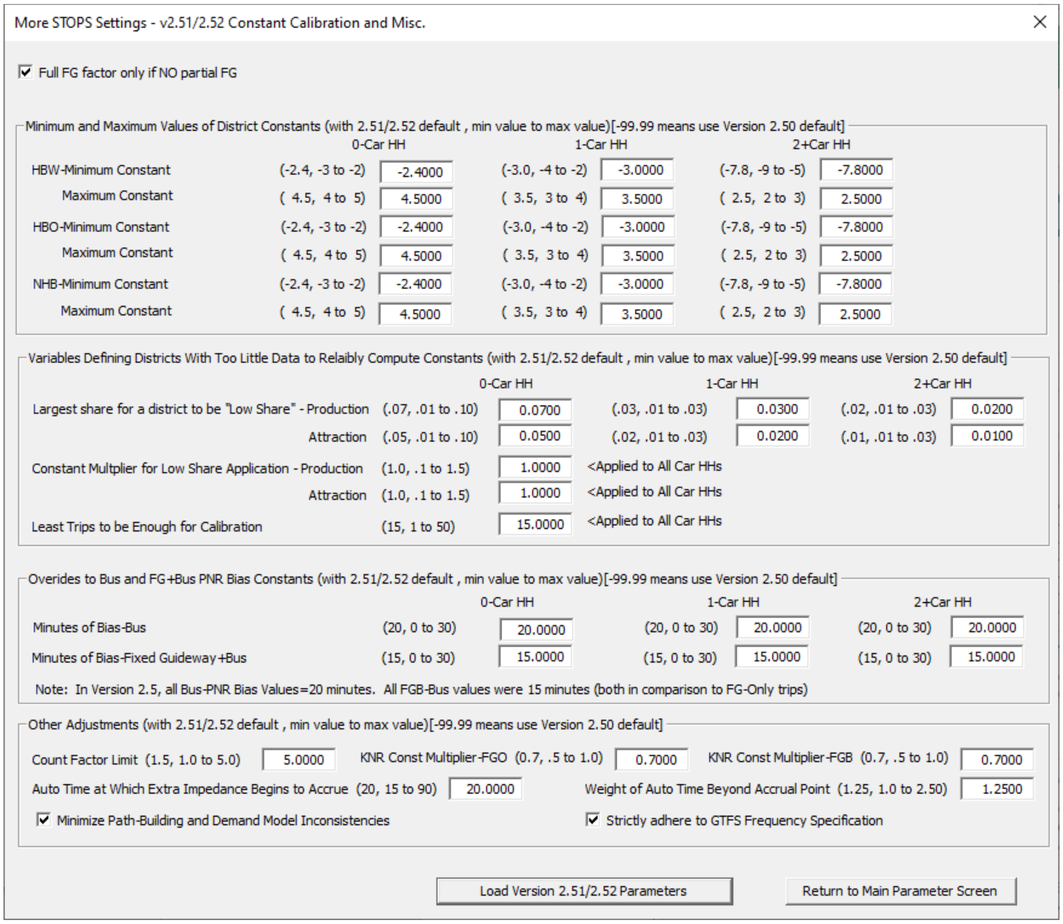


Figure 119. Other Settings Parameter Screen After Synthetic Calibration

12.0 Advanced STOPS Application Methods

Up to this point, the traditional (synthetic) method for running STOPS has been described with brief references to additional capabilities such as importing trip tables or different operating modes. This chapter discusses in greater detail the nature of the imported person trip table and how this table can be used in conjunction with three advanced STOPS operating modes—incremental mode and two different special markets modes.

12.1 Introduction to the Trip Table Import Function

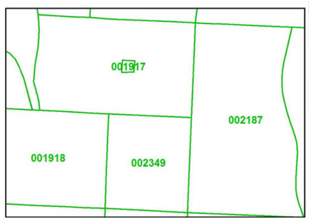
The trip table import function is key to all three advanced STOPS operating modes. This function reads a user-supplied person trip table text file that contains information on the production zone, attraction zone, and trips by various categories.

The usage of imported trip table information is controlled by user names for each zone in the CTPP boundary layer (e.g., AC29_d00.shp for the Missouri portion of the Kansas City example). As described in Section 5.3 – Optional Adjustments to the Census Data, the first character of the user-coded zone name in LSAD_TRANS is used to control how STOPS integrates imported trips with trips synthesized from the CTPP. The exact rules are controlled by the STOPS Mode as follows:

1. If STOPS Mode is set to 1 (Synthetic) then all trips are synthesized from the CTPP and the first character in the zone name has no impact on processing.
2. If STOPS Mode is set to 2 (Special Markets) then trips are controlled by the first character in the user-coded zone name in LSAD_TRANS. If the first character in a zone name is a "$", then the trips will be read from imported trip table for all trips to and from that zone (even if the other zone is not coded with a "$"). If neither the production nor attraction zone begins with a "$", then trips are obtained from the CTPP using the same procedures as synthetic STOPS.
3. If STOPS Mode is set to 3 (Incremental) then trips are controlled by the first character in the user-coded zone name in LSAD_TRANS. If the first character in a zone name is a "$", then the trips will be read from imported trip table for all trips to and from that zone (even if the other zone is not coded with a "$"). If neither the production nor attraction zone begins with a "$", then no transit trips are assumed to occur on the interchange..
4. If STOPS Mode is set to 4 (Type 2 Special Markets), then trips are controlled by the first character in the user-coded zone name in LSAD_TRANS but in a different way from STOPS Mode 2. If the first character in both the production and attraction zone name is a "$", then the trips will be read from imported trip table. Otherwise (i.e., only one zone name begins with "$" or neither zone name begins with a "$"), then trips are obtained from the CTPP using the same procedures as synthetic STOPS.

The full STOPS zone name is comprised of the 2-character state numeric FIPS code plus the 3-character state county FIPS code plus a 6-character zone[71] name. Since this name would be awkward to code in an imported trip table, zone numbers are shortened when the first character in LSAD_TRANS is a "$" or a "~". In such cases, the zone name coded in the imported trip table is just that part of the zone name that was coded in LSAD_TRANS.

The effect of the LSAD_TRANS field on the both of these concepts (zone names and the source of trip information) illustrated in Figure 120.



Zone Names
-------------- Census Boundary File---------------- ---District File--- ---Imported Table---

State	County	CTPP Zone*	LSAD_Trans	District File Zone Name	Imported Trip Table Zone Name
29	095	001917	$1100	29095$1100	$1100
29	095	002187	~913	29095~913	~913
29	095	001918	ZoneB	29095ZoneB	29095ZoneB
29	095	002439		29095002439	29095002439

STOPS Modes In Which the Imported Trip Table is Used**
----------------------------------Attraction Zone----------------------------------

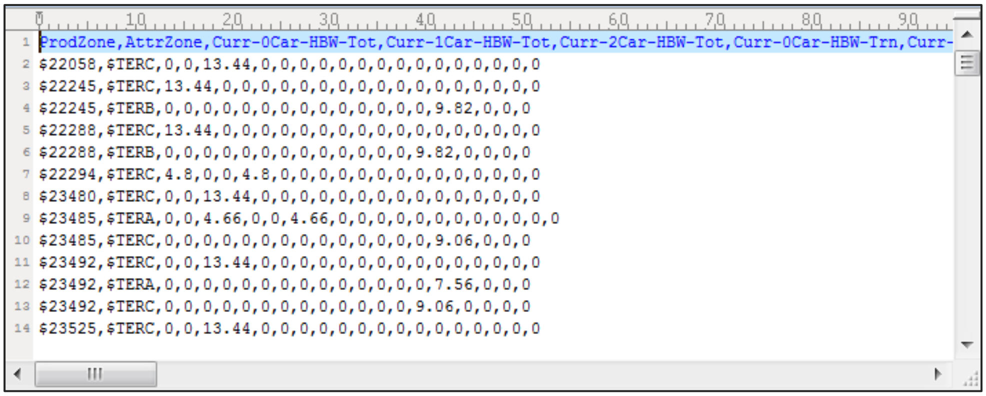
Production Zone	$1100	~913	ZoneB	002439
$1100	2,3,4	2,3	2,3	2,3
~913	2,3			
ZoneB	2,3			
002439	2,3			

*The CTPP zone refers to the Zone, Tract, or Block Group, depending on the Geography Type selected for the analysis
** STOPS Modes: 1=Synthetic, 2=Special Markets, 3=Incremental, 4=Type 2 Incremental. STOPS Modes not using Imported Trip Table use CTPP data. Blank means that the zones use CTPP data for all STOPS Modes

Figure 120. Zone Naming Convention and Impact on Trip Table Source

The imported trip table file a comma separated value file with a ".csv" extension. The actual name of the file is selected by the user and set in the parameter file as described in Section 5.1. A sample imported trip table file is presented in Figure 121.

[71] The 6 character "zone" name is short hand for the zone, tract or block group depending on the Geography Type. The CTPP zone is overridden by the contents of the LSAD_TRANS field if a non-blank value is coded.



```
ProdZone,AttrZone,Curr-0Car-HBW-Tot,Curr-1Car-HBW-Tot,Curr-2Car-HBW-Tot,Curr-0Car-HBW-Trn,Curr-
$22058,$TERC,0,0,13.44,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
$22245,$TERC,13.44,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
$22245,$TERB,0,0,0,0,0,0,0,0,0,0,0,0,0,0,9.82,0,0,0
$22288,$TERC,13.44,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
$22288,$TERB,0,0,0,0,0,0,0,0,0,0,0,0,0,0,9.82,0,0,0,0
$22294,$TERC,4.8,0,0,4.8,0,0,0,0,0,0,0,0,0,0,0,0,0,0
$23480,$TERC,0,0,13.44,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
$23485,$TERA,0,0,4.66,0,0,4.66,0,0,0,0,0,0,0,0,0,0,0,0
$23485,$TERC,0,0,0,0,0,0,0,0,0,0,0,0,0,0,9.06,0,0,0
$23492,$TERC,0,0,13.44,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
$23492,$TERA,0,0,0,0,0,0,0,0,0,0,0,0,0,0,7.56,0,0,0
$23492,$TERC,0,0,0,0,0,0,0,0,0,0,0,0,0,0,9.06,0,0,0,0
$23525,$TERC,0,0,13.44,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

Figure 121. Example Imported Trip Table File

The first line of the file must be a header record. The fields described in the header record may be in any order as long as the header and the data contents are consistent. The header record has two required fields (ProdZone and AttrZone). All other fields are optional. Any fields that are not present are treated as missing values.

Fields are defined as follows:

- ProdZone. (Required) The production zone identification code, as described earlier in this section. If the zone identification starts with "$" or "~", this identification is identical to the contents of the LSAD_TRANS field in the Census boundary file. Otherwise it is a concatenated string consisting of the FIPS Numeric State Code, FIPS Numeric County Code, and CTPP TAZ/Tract/BlockGroup code.
- AttrZone. (Required) The attraction zone identification code, as described above.
- A series of one or more trip codes built-up as follows:
    - Year: ("Curr", "OpYr", "10yr", "20yr")[72]
    - Hyphen ("-")
    - Auto Ownership ("0car", "1car", "2car")
    - Hyphen ("-")
    - Trip Purpose ("HBW", "HBO", or "NHB")
    - Hyphen ("-")
    - Transit trips or total person trips ("Trn" or "Tot")

[72] Represents current year, opening year, 10-year horizon, and 20-year horizon

As an example: opening year, 1-car household, home-based other total person trips would have a field named "OpYr-1car-HBO-Tot".

The specific application of the imported trip tables in the incremental version of STOPS and the special generator version of STOPS is described in the next two sections.

12.2 Incremental Application of STOPS

In the incremental version of STOPS, the imported trip table function is used to load a transit trip table derived from a recent, properly controlled transit user survey. This survey should be processed to convert individual records into a weighted representation of production zone-to-attraction zone transit linked trips stratified by trip purpose (home-based work, home-based other, and non-home based) and household auto ownership (0 car, 1 car, and 2+ cars). The survey should be geo-coded to the CTPP zone system and all CTPP zones should have a unique zone identification coded in the in the LSAD_TRANS field. All zone identifications start with "$". The label following the "$" can be any character string that is unique and consistent with the coding in in imported trip file.

An example of the Kansas City CTPP geography file is shown in Figure 122.

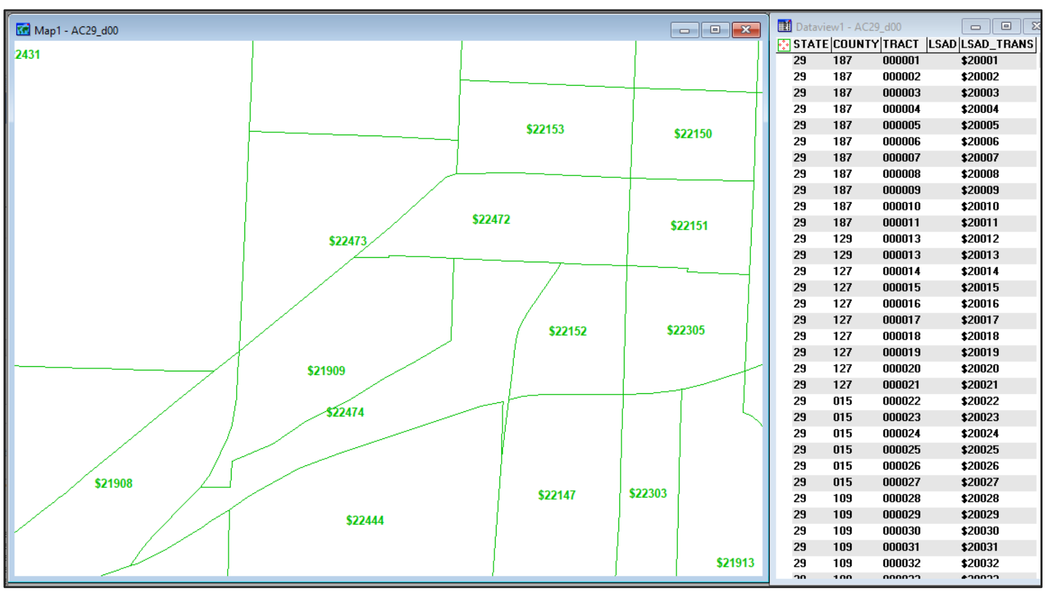


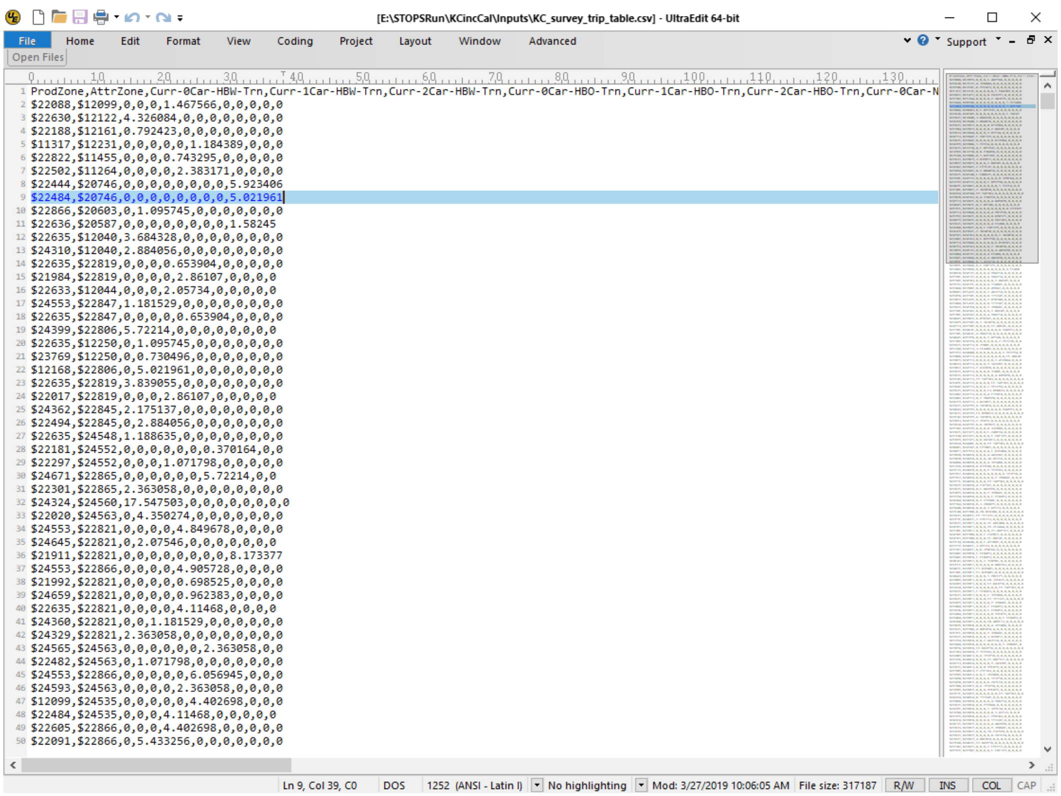
Figure 122. CTPP Geography File LSAD_TRANS Coding for Incremental Mode

The imported trip file is typically coded with the following fields:

- Curr-0car-HBW-Trn

- Curr-1car-HBW-Trn
- Curr-2car-HBW-Trn
- Curr-0car-HBO-Trn
- Curr-1car-HBO-Trn
- Curr-2car-HBO-Trn
- Curr-0car-NHB-Trn
- Curr-1car-NHB-Trn
- Curr-2car-NHB-Trn

An example of the input trip table file for Kansas City is shown in Figure 123.


```
[E:\STOPSRun\KCincCal\Inputs\KC_survey_trip_table.csv] - UltraEdit 64-bit
ProdZone,AttrZone,Curr-0Car-HBW-Trn,Curr-1Car-HBW-Trn,Curr-2Car-HBW-Trn,Curr-0Car-HBO-Trn,Curr-1Car-HBO-Trn,Curr-2Car-HBO-Trn,Curr-0Car-N
$22088,$12099,0,0,0,1.467566,0,0,0,0,0
$22630,$12122,4.326084,0,0,0,0,0,0,0,0
$22188,$12161,0.792423,0,0,0,0,0,0,0,0
$11317,$12231,0,0,0,0,0,1.184389,0,0,0
$22822,$11455,0,0,0,0.743295,0,0,0,0,0
$22502,$11264,0,0,0,0,2.383171,0,0,0,0
$22444,$20746,0,0,0,0,0,0,0,5.923406
$22484,$20746,0,0,0,0,0,0,0,5.021961
$22866,$20603,0,1.095745,0,0,0,0,0,0,0
$22636,$20587,0,0,0,0,0,0,0,1.58245
$22635,$12040,3.684328,0,0,0,0,0,0,0,0
$24310,$12040,2.884056,0,0,0,0,0,0,0,0
$22635,$22819,0,0,0,0.653904,0,0,0,0,0
$21984,$22819,0,0,0,0,2.86107,0,0,0,0
$22633,$12044,0,0,0,2.05734,0,0,0,0,0
$24553,$22847,1.181529,0,0,0,0,0,0,0,0
$22635,$22847,0,0,0,0,0.653904,0,0,0,0
$24399,$22806,5.72214,0,0,0,0,0,0,0,0
$22635,$12250,0,1.095745,0,0,0,0,0,0,0
$23769,$12250,0,0.730496,0,0,0,0,0,0,0
$12168,$22806,0,5.021961,0,0,0,0,0,0,0
$22635,$22819,3.839055,0,0,0,0,0,0,0,0
$22017,$22819,0,0,0,2.86107,0,0,0,0,0
$24362,$22845,2.175137,0,0,0,0,0,0,0,0
$22494,$22845,0,2.884056,0,0,0,0,0,0,0
$22635,$24548,1.188635,0,0,0,0,0,0,0,0
$22181,$24552,0,0,0,0,0,0,0.370164,0,0
$22297,$24552,0,0,0,1.071798,0,0,0,0,0
$24671,$22865,0,0,0,0,0,0,5.72214,0,0
$22301,$22865,2.363058,0,0,0,0,0,0,0,0
$24324,$24560,17.547503,0,0,0,0,0,0,0,0
$22020,$24563,0,4.350274,0,0,0,0,0,0,0
$24553,$22821,0,0,0,0,4.849678,0,0,0,0
$24645,$22821,0,2.07546,0,0,0,0,0,0,0
$21911,$22821,0,0,0,0,0,0,0,8.173377
$24553,$22866,0,0,0,0,4.905728,0,0,0,0
$21992,$22821,0,0,0,0,0.698525,0,0,0,0
$24659,$22821,0,0,0,0,0.962383,0,0,0,0
$22635,$22821,0,0,0,0,4.11468,0,0,0,0
$24360,$22821,0,0,1.181529,0,0,0,0,0,0
$24329,$22821,2.363058,0,0,0,0,0,0,0,0
$24565,$24563,0,0,0,0,0,0,2.363058,0,0
$22482,$24563,0,1.071798,0,0,0,0,0,0,0
$24553,$22866,0,0,0,0,0,6.056945,0,0,0
$24593,$24563,0,0,0,0,2.363058,0,0,0,0
$12099,$24535,0,0,0,0,0,4.402698,0,0,0
$22484,$24535,0,0,0,4.11468,0,0,0,0,0
$22605,$22866,0,0,0,4.402698,0,0,0,0,0
$22091,$22866,0,5.433256,0,0,0,0,0,0,0
```

Note: The full header role is as follows:

ProdZone,AttrZone,Curr-0Car-HBW-Trn,Curr-1Car-HBW-Trn,Curr-2Car-HBW-Trn,Curr-0Car-HBO-Trn,Curr-1Car-HBO-Trn,Curr-2Car-HBO-Trn,Curr-0Car-NHB-Trn,Curr-1Car-NHB-Trn,Curr-2Car-NHB-Trn

Figure 123. Sample Import Trip Table File for Incremental STOPS

At the user's option, fields for future transit trips can also be entered. If future year fields are provided (OpYr, 10yr and 20yr), then these estimates of future transit trips are used to represent the future year transit ridership that would exist if the existing service plan is operated in those years. If future year fields are not provided, then STOPS uses its normal "Prepare Forecast Year" procedures to adjust current year trip tables so that they represent future year demographics.

If consistent data on total person trip making exists (e.g., from a very large home interview survey similar to data collected in Toronto, Ottawa, and Montreal in Canada), then that information can be entered using the "Tot" fields. If these data are not available (the most common condition in the United States), then STOPS will infer total trip making using the following logic:

- Total transit trips by purpose (from the transit user survey) are the most reliable set of data available.
- Work trip mode shares from the CTPP are the next most reliable source of information.
- A properly calibrated home-based work mode choice model can be calibrated that match CTPP shares on a district-to-district basis. The non-work shares can be calibrated using conventional STOPS procedures. This estimate is less reliable than the HBW shares but is still better than other generally available data on non-work transit shares.
- Person trips can be estimated by dividing survey transit trips by computed mode share.

In application mode, the person trips from the last step are scaled to represent the desired forecast year and multiplied by computed mode shares. For the current year with the existing transit network, inputs are identical to the calibration case and the model reproduces the input transit trip table closely. For future years, the estimates of total person trips are factored using the same process as in "Prepare Forecast Years" portion of "Step 11. Run Batch Steps". New mode choice values are computed using level-of-service matrices from the no-build and build alternatives.

This approach is mathematically equivalent to an incremental mode choice model at the transit vs. auto choice level. Access mode (walk, KNR, and PNR) and path type (fixed guideway only, fixed guideway and bus, and bus only) choices are still made using a synthetic process. Likewise, all options to calibrate to route and station ridership counts are available.

12.3 Synthetic STOPS Supplemented by Special Generators (Type 1)

Another use of imported trip tables is to supplement the standard STOPS synthetic model with information on special generators. This capability is particularly useful in cases where:

- A transit user survey is not available and, as a consequence, the incremental version of STOPS is not an option; and
- One or more major transit demand production or attraction sites exist in the project corridor that are not well captured by the CTPP. Examples of major transit production / attraction sites might include:
    - Students traveling to and from a major university
    - Patients traveling to and from a major hospital complex
    - Air passengers traveling to and from an airport
    - Visitors to large entertainment complexes
    - Foreign residents entering the United States on a daily basis and traveling to employment or other locations

Note that workers at universities, hospitals, airports, and entertainment locations are, for the most part included in the CTPP. The user can opt to provide all travel information to these sites for all purposes or just for non-work purposes.

No foreign residents are included in the CTPP, so a representation of cross-border flows should be developed for all trip purposes.

The first major decision to make when doing a special market analysis is whether or not to use the CTPP for the work purpose. This decision can be made separately for each zone in which special market activity occurs. For example, if a full establishment survey was conducted at a hospital, then a full representation of all transit and total trip making (i.e., all purposes) can be added to the import trip table file. If the hospital occupies the entire zone (i.e., there is no other employment or residential activity in the zone) then LSAD_TRANS for that zone should be given a zone name starting with "$" to denote a special generator where all trips are replaced by the contents of the import trip file.

If, on the other hand, the survey scope included just hospital visitors, then the zone should be split into two parts as shown in Figure 124. One zone (shaded red) is given a LSAD_TRANS value that begins with a "$" to indicate that all trips to and from this zone are to be obtained from the import trip file. The remainder of the zone (the majority) is given a zone name starting with "~". This indicates that trips should be obtained from the regular CTPP process (unless the other zone begins with "$").

The relative size of $1102 and ~953 is relevant. In this case, ~953 (the CTPP portion of the zone) occupies the vast majority of the original zone and over 99.8% of the CTPP trips would be retained. Zone $1102 occupies 0.22% of the original zone. This share of the CTPP trips (0.22%) would be replaced by the contents of the import trip file. In essence, the relatively small zone size tells STOPS to keep nearly all CTPP trips and add the special market trips to this quantity. This might be an appropriate when the special generator is located in a large, diverse zone with normal travel activity occurring around it.

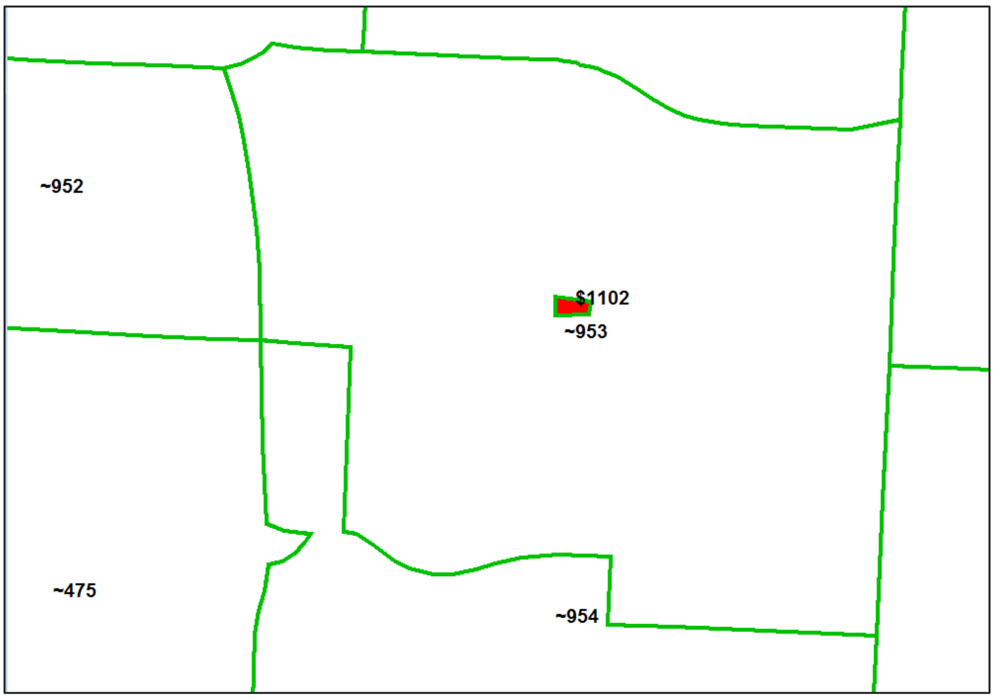
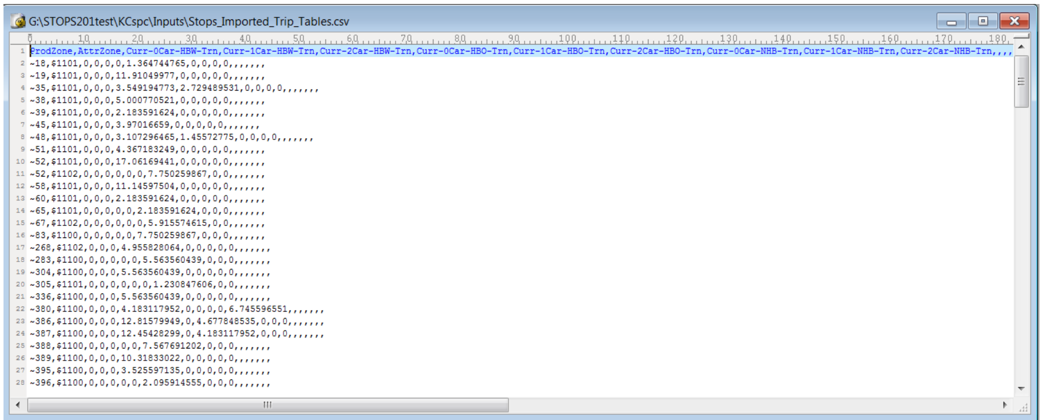


Figure 124. Split Zone to Separate Special Market Area From CTPP Area

The same trip table field options exist for the special market analysis as for the incremental model. Current year transit trips should be provided—otherwise STOPS will conclude that there is no transit activity in the special zones. If available, the user can also provide total person trips or trip tables for future years. If these variables are not provided, then STOPS will infer both quantities using the same process that is used for the regular version of STOPS.

An example of the special markets trip file is provided in Figure 125 and includes a mix of zones beginning with a "~" (regular zones) and a "$" (special zones).



G:\STOPS201test\KCspc\Inputs\Stops_Imported_Trip_Tables.csv

```
ProdZone,AttrZone,Curr-0Car-HBW-Trn,Curr-1Car-HBW-Trn,Curr-2Car-HBW-Trn,Curr-0Car-HBO-Trn,Curr-1Car-HBO-Trn,Curr-2Car-HBO-Trn,Curr-0Car-NHB-Trn,Curr-1Car-NHB-Trn,Curr-2Car-NHB-Trn,,,
~18,$1101,0,0,0,0,1.364744765,0,0,0,0,,,,,,,
~19,$1101,0,0,0,11.91049977,0,0,0,0,0,,,,,,,
~35,$1101,0,0,0,3.549194773,2.729489531,0,0,0,0,,,,,,,
~38,$1101,0,0,0,5.000770521,0,0,0,0,0,,,,,,,
~39,$1101,0,0,0,2.183591624,0,0,0,0,0,,,,,,,
~45,$1101,0,0,0,3.97016659,0,0,0,0,0,,,,,,,
~48,$1101,0,0,0,3.107296465,1.45572775,0,0,0,0,,,,,,,
~51,$1101,0,0,0,4.367183249,0,0,0,0,0,,,,,,,
~52,$1101,0,0,0,17.06169441,0,0,0,0,0,,,,,,,
~52,$1102,0,0,0,0,0,0,7.750259867,0,0,,,,,,,
~58,$1101,0,0,0,11.14597504,0,0,0,0,0,,,,,,,
~60,$1101,0,0,0,2.183591624,0,0,0,0,0,,,,,,,
~65,$1101,0,0,0,0,0,2.183591624,0,0,0,,,,,,,
~67,$1102,0,0,0,0,0,0,5.915574615,0,0,,,,,,,
~83,$1100,0,0,0,0,0,7.750259867,0,0,0,,,,,,,
~268,$1102,0,0,0,4.955828064,0,0,0,0,0,,,,,,,
~283,$1100,0,0,0,0,0,5.563560439,0,0,0,,,,,,,
~304,$1100,0,0,0,5.563560439,0,0,0,0,0,,,,,,,
~305,$1101,0,0,0,0,0,0,1.230847606,0,0,,,,,,,
~336,$1100,0,0,0,5.563560439,0,0,0,0,0,,,,,,,
~380,$1100,0,0,0,4.183117952,0,0,0,0,6.745596551,,,,,,,
~386,$1100,0,0,0,12.81579949,0,4.677848535,0,0,0,,,,,,,
~387,$1100,0,0,0,12.45428299,0,4.183117952,0,0,0,,,,,,,
~388,$1100,0,0,0,0,0,7.567691202,0,0,0,,,,,,,
~389,$1100,0,0,0,10.31833022,0,0,0,0,0,,,,,,,
~395,$1100,0,0,0,3.525597135,0,0,0,0,0,,,,,,,
~396,$1100,0,0,0,0,0,2.095914555,0,0,0,,,,,,,
```

Figure 125. Sample Import Trip Table File for STOPS with Special Generators

12.4 Synthetic STOPS Supplemented by Special Generators (Type 2 Special Markets)

The other possibility for combining imported (special market) trips and synthetic STOPS estimates occurs when a good regional transit survey exists but it only covers a portion of the region that is relevant to the project being modeled. This could happen when:

1. Only a portion of the regional transit operators are included in the transit survey; or
2. The regional transit service only includes a portion of the corridor to be served by the new project

In either case, it may be desirable to use the incremental form of STOPS in places with existing transit services and survey data while using the synthetic form of STOPS in the remaining areas. This is done by selecting STOPSMode 4 (Type 2 Special Markets) in the parameter file and defining regional zones as follows:

- Zones in the portion of the region served by existing transit services <u>and</u> included in the regional transit survey should be coded with a name in the LSAD_TRANS field that has a "$" as the first character.
- Zones outside the portion of the region served by existing transit services or not included in the regional travel survey should be coded with a name in the LSAD_TRANS field that has a "~" as the first character.

When STOPS encounters this situation, the Type 2 Special Markets rules handle trips as follows:

1. Trip interchanges where both the projection and attraction zone names (from LSAD_TRANS) begin with a "$" are obtained from the imported trip file.
2. All other trip interchanges (i.e., one or both zone names begin with a "~") are developed from the CTPP.

The import trip table, in this case, will consist entirely of production and attraction zone names beginning with a "$".

The STOPS processing that occurs is similar, but not identical, to the incremental form of the model. Several key things to note:

1. The distinction between survey and non-survey areas is seldom a bright line. Areas defined with a "$" in STOPS should represent areas where the survey is useful in understanding transit usage. Areas defined with a "~" are areas where the survey is less useful even if there are a few long-access trips that begin or end in those zones. It is common for up to 10 percent of the survey records to be excluded by traveling to or from zones coded with a "~".
2. In Type 2 Special Markets, STOPS calibrates itself using synthetic procedures rather than the incremental process. The incremental process calibrates mode-specific constants for each district-to-district combination[73]. By contrast, the Synthetic Mode (used in Type 2 Special Markets) uses constants calibrated to each attraction district and optionally for each production district, resulting in many fewer constants[74]. Areas with relatively small sample size surveys or low transit shares (and thus little data) may elect to use this mode of STOPS to take advantage of better ability to deal with small data sample sizes during calibration. If this is done, all zones can be coded with a "$" in LSAD_TRANS.

[73] If 50 districts are defined, STOPS would calibrate 2,500 constants. This is only workable in areas in which the survey data is robust enough to generate good estimates of travel by transit. In other words, places in the 50x50 matrix which have no transit trips must really be cases where little to no transit travel occurs. Otherwise, STOPS will infer the lack of a transit market in a place where the transit market exists but the sample gathering process failed to collect records.
[74] With the same 50 district system, STOPS would generate 50 attraction constants and, optionally, 50 production constants. At most 100 constants are generated with the synthetic calibration approach. In this case that is 1/25th of the number of constants developed in the incremental approach.

13.0 Calibration of Incremental STOPS Model Applications

This chapter demonstrates the use of the incremental version of STOPS for the same transit project in Kansas City, Missouri. The implementation of incremental STOPS starts with the base synthetic calibration described in Chapter 11.0. The only differences in the parameter file are:

1. The STOPS Mode was set to "3 Incremental"
2. The "Import File Name" parameter was set to KC_survey_trip_table

The initial (base) incremental parameter file for the incremental calibration process is shown in Figure 126.

The other step that may be required to convert a synthetic model to an incremental model is renaming of the TAZ name in LSAD-TRANS so that the name begins with a "$". In this case it was not necessary since the zones used in the synthetic model were already named with a "$"[75].

The overall calibration process is similar to that of the synthetic model. The key difference is that the CTPP calibration methodology for the incremental model is not relevant since CTPP calibration for incremental models is always performed at the production district-to-attraction district level-of-detail. The last model run (Run 5) uses STOPS Mode 4- type 2 special markets. This STOPS Mode is similar to the incremental model except for the way that CTPP calibration is done. In Mode 4, calibration is done at the attraction end (default) or the production and attraction end depending on the user selection in the parameter file. As a result the mode choice calibration process is more similar to the synthetic model than the incremental model. In most cases, this distinction is not important. In cases with relatively few transit trips per district, STOPS Mode 4 may generate more stable results.

The calibration scorecard for the incremental process is presented in Table 16, Table 17, and Table 18.

[75] When the STOPS Mode is set to "1-Synthetic" the name in LSAD_TRANS is not used to distinguish between "special zones" (i.e., those that use trips read from the Import File) and regular zones. The Kansas City example was developed to support both Synthetic and Incremental applications and, accordingly, all zones were named with a beginning "$".

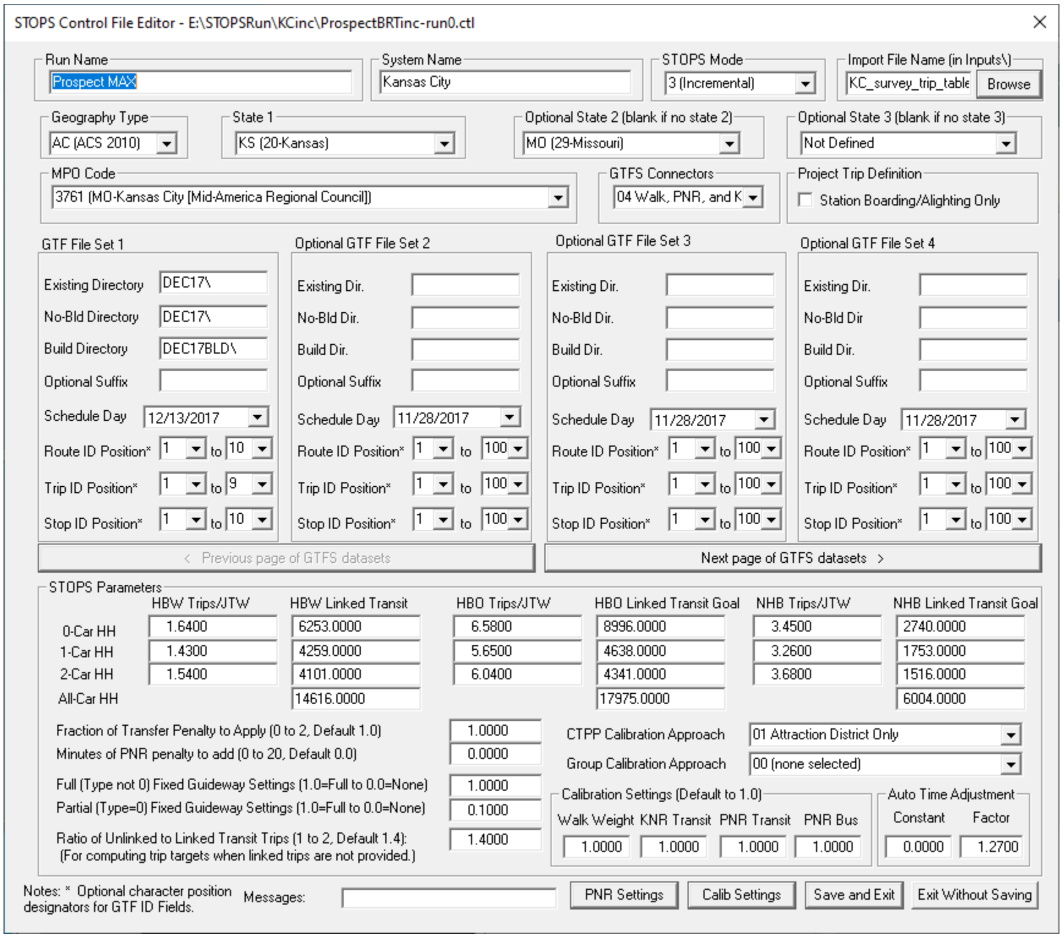


Figure 126. Parameter File for Base Incremental STOPS Run

Table 16. Kansas City Incremental Calibration Scorecard Part 1

KC Scorecard (Incremental Part 1)	Targets	Run 0	Run 1	Run 2	Run 3	Run 4	Run 5
STOPS Mode		Incre-mental	Incre-mental	Incre-mental	Incre-mental	Incre-mental	Type 2 Special
CTPP Calibration Methodology		N/A	N/A	N/A	N/A	N/A	A and P
AutoTime Adjustment		1.27	1.27	1.27	1.27	1.27	1.27
FGS, Full-Streetcar		1	1	1	1	1	1
FGS, Partial-BRT		0.1	0.1	0.1	0.1	0.1	0.2
Xfer Penalty		1.00	0.35	0.35	0.425	0.425	0.50
KNR Transit		1.0	1.0	0.50	0.62	0.62	0.62
PNR Density		1.0	1.0	1.2	1.2	1.2	1.2
Adjust to Counts/Max. Adjustment		no	no	no	no	yes/2.5	yes/2.5
Rerun							
CTPP Extract		yes	no	no	no	no	yes
GTF Path		yes	yes	no	yes	no	yes
Prepare Forecast Year		yes	yes	no	yes	no	yes
STOPS		yes	yes	yes	yes	yes	yes
Systemwide adjustment factor	1.00	1.09	1.00	0.98	1.00	1.00	1.00
Final unlinked trips	53,600	53,600	53,600	53,600	53,600	52,150	52,459
Purposes: linked trips by purpose							
TOTAL	38,595	40,140	36,624	35,985	36,580	36,656	37,104
HBW %	38%	39%	39%	39%	39%	39%	40%
HBO %	47%	48%	48%	48%	48%	48%	48%
NHB %	16%	13%	13%	13%	13%	13%	13%
0-car: linked trips by 0-car hholds							
HBW 0-car % of all transit trips	16%	17%	17%	17%	17%	16%	16%
HBO 0-car % of all transit trips	23%	24%	24%	24%	24%	25%	25%
NHB 0-car % of all transit trips	7%	7%	7%	7%	7%	7%	7%
All 0-car % of all transit trips	47%	48%	48%	48%	48%	48%	48%

Note: Run5 uses STOPS Mode 4-Type 2 Special, which when all zones are coded with a leading "$" in LSAD_TRANS, is a variation of the incremental model

Table 17. Kansas City Incremental Calibration Scorecard Part 2

KC Scorecard (Synthetic Part 2)	Targets	Run 0	Run 1	Run 2	Run 3	Run 4	Run 5
Transit flows: Totals	Survey						
Prods from E CBD	1,978	2,144	1,956	1,932	1,959	2,180	2,195
Prods from E Midtown	3,317	3,546	3,237	3,190	3,235	3,367	3,581
Prods from S Prospect	3,584	3,791	3,467	3,415	3,462	3,756	3,870
Attrs to CBD	7,495	8,163	7,458	7,342	7,447	7,335	7,539
Attrs to E CBD	1,681	1,736	1,587	1,560	1,583	2,169	2,307
Attrs to E Midtown	1,733	1,777	1,625	1,597	1,620	2,156	2,199
Trips to CBD from E CBD	374	415	379	373	378	366	385
Trips to CBD from E Midtown	431	486	443	437	443	409	464
Trips to CBD from S Prospect	441	491	448	442	448	552	555
TOTAL flows	38,595	40,140	36,624	35,985	36,580	36,656	37,104
Access: linked trips by P MOA							
Walk	33,895	34,442	31,669	32,603	32,806	32,772	33,101
KNR	2,200	4,366	3,768	1,816	2,204	2,102	2,136
PNR	2,500	1,331	1,187	1,566	1,569	1,782	1,867
TOTAL	38,595	40,139	36,624	35,985	36,579	36,656	37,104
Transfers: unlinked/linked trips	1.39	1.34	1.46	1.49	1.47	1.42	1.41
FG share: BRT	18%	16%	16%	16%	16%	18%	18%
FG share: Streetcar	9%	13%	13%	12%	12%	9%	9%
BRT share on Troost	80%	82%	81%	81%	81%	80%	80%
Groups: stop boardings by group							
01- CBD	10,553	9,904	9,978	10,089	10,054	10,266	10,306
08- E CBD	2,336	1,987	1,991	2,006	2,012	2,351	2,353
09- E Midtown (N Prospect)	4,317	3,613	3,613	3,631	3,660	4,345	4,344
10- E CClub (S Prospect)	4,051	3,787	3,816	3,875	3,846	3,938	3,946
TOTAL (inc. other groups)	53,600	53,601	53,601	53,601	53,601	52,161	52,248

Note: Run5 uses STOPS Mode 4-Type 2 Special, which when all zones are coded with a leading "$" in LSAD_TRANS, is a variation of the incremental model

Table 18. Kansas City Incremental Calibration Scorecard Part 3

KC Scorecard (Synthetic Part 3)	Targets	Run 0	Run 1	Run 2	Run 3	Run 4	Run 5
Routes: Families in Southtown							
Total North-South	19,347	17,684	17,950	18,090	18,001	19,005	19,286
Main/Wornall Family	5,295	4,864	5,022	4,977	4,964	5,052	5,246
Troost Family	7,650	7,509	7,569	7,660	7,583	7,486	7,629
Prospect Family	6,402	5,311	5,359	5,453	5,454	6,467	6,411
Total East-West	17,142	15,831	16,039	16,286	16,174	16,255	16,210
Routes: Individual							
#71 Prospect	4,912	3,333	3,420	3,480	3,481	4,814	4,803
#108 Indiana	1,390	1,760	1,702	1,741	1,739	1,397	1,390
#10 Woodland/Brooklyn	100	218	237	232	234	256	218
KC Streetcar	4,784	7,120	6,879	6,166	6,305	4,534	4,619
MAX--Main	4,537	3,947	4,074	4,034	4,018	4,291	4,474
MAX--Troost	5,099	4,508	4,506	4,535	4,514	4,886	5,054
#31--31st St.	3,073	2,084	2,118	2,120	2,108	3,036	3,035
#35--35th St.	1,072	1,294	1,425	1,414	1,404	1,098	1,092
#39--39th St.	1,760	1,687	1,745	1,765	1,752	2,575	2,578

Note: Run5 uses STOPS Mode 4-Type 2 Special, which when all zones are coded with a leading "$" in LSAD_TRANS, is a variation of the incremental model

13.2 Impact of Calibration Approach and Service Assumptions on Estimates of Project Ridership

Table 19 presents an assessment of how the ridership forecasting approach and service assumptions can affect estimates of project ridership. This table compares modeled project results for the three models discussed in the chapters on calibration with a service plan developed by FTA staff in consultation with the project sponsors. The last column presents ridership estimates using the actual service plan for all Kansas City area services (including the Prospect BRT) in December 2019.

Ridership for Different STOPS Model Modes (2017 Service Plan)

As this table shows, the overall estimates of project ridership are generally consistent among the different STOPS modes, with daily ridership ranging from 3,700 to just over 4,700. Ridership for the different STOPS modes is distributed similarly among the different sections of the lines. The most notable difference is that the incremental variants of the model have twice as many boardings in the East CBD area as the synthetic model. Given the fact that the data foundation for the incremental models is a full transit user survey covering all trips purposes, the higher number of BRT riders is likely to be a better reflection of demand. The synthetic model is based on the CTPP Journey-to-Work (JTW) table. STOPS attempts to represent both work and non-work travel from the JTW data but, as the dataset names suggest, the foundation is less strong for non-work travel. This outcome suggests that when the distribution of ridership among stations or bus stops is important, users should collect transit rider survey data and use it with the STOPS incremental method.

In all cases, incremental daily linked transit trips are small (under 300 daily trips). This is likely due to the fact that this service plan (coded by FTA based on guidance from KCATA mid-way during project development) offers a combination of modest time improvements for the BRT coupled with a significant loss of service frequency for the local service in the corridor. The decline in local service means that travelers located near to bus stop only served by the local bus must either wait longer for a bus or walk further to the BRT. This situation means that travelers near a BRT stop benefit and are more likely to ride transit while those not near to a BRT stop will be less likely to ride. The net positives and negatives nearly balance, leading to a small, near zero, number of incremental transit riders.

Ridership for the Actual 2018 Service Plan

The last column of Table 19 shows the daily ridership for the Prospect BRT project using actual schedule data for December 2019. The fact that the Prospect BRT includes more stations than the 2017 coded schedule has helped to reduce the situations in which mobility is reduced. Daily project ridership increases to over 4,900 riders per day (an increase of 16 percent over the corresponding ridership for the 2017 service plan. Incremental ridership increases to over 1,200 new linked trips per day.

Table 19. Comparison of Year 2017 Weekday Project Ridership Estimates by STOPS Mode and Service Plan

Ridership Statistic	Synthetic STOPS	Incre-mental STOPS	Mode 4 (Type 2 Special)	Mode 4 (Type 2 Special)
Build Network	As coded by FTA based on 2017 plans	As coded by FTA based on 2017 plans	As coded by FTA based on 2017 plans	As actually run in Dec. 2019
Incremental Weekday Linked Trips	79	59	286	1,207
Weekday Prospect BRT Ridership	3,744	3,642	4,649	4,924
Boardings by section				
CBD	913	824	1,102	1,060
Plaza	85	120	158	112
East CBD	538	735	921	836
East Midtown	1,007	1,045	1,289	1,592
East Country Club	1,201	918	1,178	1,325
Total Boardings	3,744	3,642	4,649	4,924

14.0 Overview of GTFS Coding

This chapter provides an introduction to transit schedules coded in GTFS format. Full documentation of GTFS is provided at:

https://developers.google.com/transit/gtfs/reference.

This discussion illustrates examples of GTFS files in the Kansas City area that are older than the schedules used in the previous sections illustrating STOPS development and calibration. These older versions of the GTFS data help illustrate the interaction of multiple GTFS file sets that are not used in more recent GTFS schedules in Kansas City.

Transit schedules in GTFS format are coded in a set of files that, together, represent the stops, routes, and scheduled operation of a transit system. These files always have the same name (e.g., stops.txt or trips.txt) and are distinguished by the file folder (directory) in which they reside. In the Kansas City example, two operators provided transit service in the region in the 2014 calibration year (KCATA and The Jo). Furthermore, two KCATA scenarios are provided: (1) the existing/no-build system and (2) the build scenario. The GTFS files needed to represent The Jo, KCATA existing/no-build and KCATA build scenarios are located in three subdirectories. These subdirectories are located in the inputs\ directory and are named: JOEXIST\, KCATAoct14\, and KCATAoct14BLD.

As the Kansas City example shows, it is important for the user to know exactly which services are included in each file so that STOPS has an accurate representation of all transit services in the project corridor. The user must also be aware of the possibility that protocols may shift over time in a region. For example, since 2014, KCATA and The Jo services have been integrated into a single operation and the current KCATA GTFS file sets include both services in a single GTFS file. If the current GTFS file were used as the basis for the no-build and build alternatives, then the user would need to edit the parameter file and remove JOEXIST from the no-build and build scenario specification in STOPS.

Sometimes it is possible for a user to learn about the scope of each GTFS file (and changes over time) by talking to transit agency staff. In other cases, the user may have to explore each GTFS file to make sure that the files include all relevant transit services. Section 14.4 describes a publicly-available visualization tool that can help the user to understand the services coded in a GTFS file set. *GTFSed*, mentioned previously, can also be used to visualize GTFS schedules.

STOPS uses just a sub-set of the GTFS file structure as is briefly described, below. The full documentation (referenced above) provides a more comprehensive description of the full capabilities of GTFS. STOPS processes GTFS data using a program called *GTFPath*. This program reads GTFS data and a set of zone centroids and creates a matrix of zone-to-zone transit times that is similar in concept to transit skim files generated by conventional travel forecasting models.

GTFS uses a fully relational data model that depends on a series of ID fields to store key aspects of the schedule. These ID fields include:

- **Service_id** uniquely identifies a set of dates when service is available for one or more routes. A GTFS file can include routes that operate on Saturdays, Sundays, weekdays or any combination. GTFS files can also include different schedule "picks" so one file might include bus schedules for the spring, summer, and fall. The service_id is used to select just that portion of the schedule that operates on a given day. The "calendar.txt" (if provided) file defines the beginning and ending dates and days of the week that apply to each service_id. The calendar_dates.txt (if provided) can add or subtract service on specific dates. The GTFS file set must include either the calendar.txt or the calendar_dates.txt file. Optionally, it may include both files.

- **Stop_id** uniquely identifies each stop or station boarding location. Multiple routes may use the same stop. Many agencies separately code stops on each side of the street or each platform at a rail station. Stop_IDs are defined in the "stops.txt" file.

- **Route_id** uniquely identifies the route and is defined in the file "routes.txt." A route is a collection of [bus or rail] "trips" that generally follow the same alignment. All "trips" identified as a single "route" must share the same name, description, and type (e.g., bus, rail, light rail, etc.). Different trips within a route may serve a different series of stops allowing one route to include short-turn trips, route deviations and branches. The route information includes one data item of critical importance to STOPS—the route_type. A Route_type of "3" indicates "bus". All other route_types are considered by STOPS to be a fixed guideway option. ***Users should carefully consider the most appropriate way to code a BRT project. BRT lines that are operating in a fully grade-separated right-of-way may be perceived as being fixed guideway and might be coded as as route_type=0 (streetcar or tram). BRT routes that represent enhancements to bus service but operate in mixed traffic may be perceived like other bus routed and should probably be coded as route_type=3.***

- **Trip_id** uniquely identifies a [bus or rail] trip. A trip is equivalent to each row [or column] in a typical time table and represents the departure of one bus or train from the originating or turn-back point of the route through to that vehicle's arrival at the destination terminal for the route (or turn-back point).

In STOPS and GTFPath, the service_id is a string variable that can be up to 100 characters wide. The other ID fields (stop_id, route_id, and trip_id) are character strings of up to 25 characters for processing with STOPS and GTFPath. In some cities, the ID fields are much longer than 25 characters but most of these characters duplicate the service ID or another non-relevant character string. STOPS includes the capability to define a subset of the ID character string that can uniquely identify an ID within the 25-character limit.

Figure 127 presents a portion of the trip file from a GTFS file that represents service operated in the Charlotte, NC area in 2010. The highlighted section of the file shows the trip_ids. Characters 1 to 8 represent the unique part of the trip_id and the remaining characters duplicate the service_id and are not needed to uniquely identify each trip.

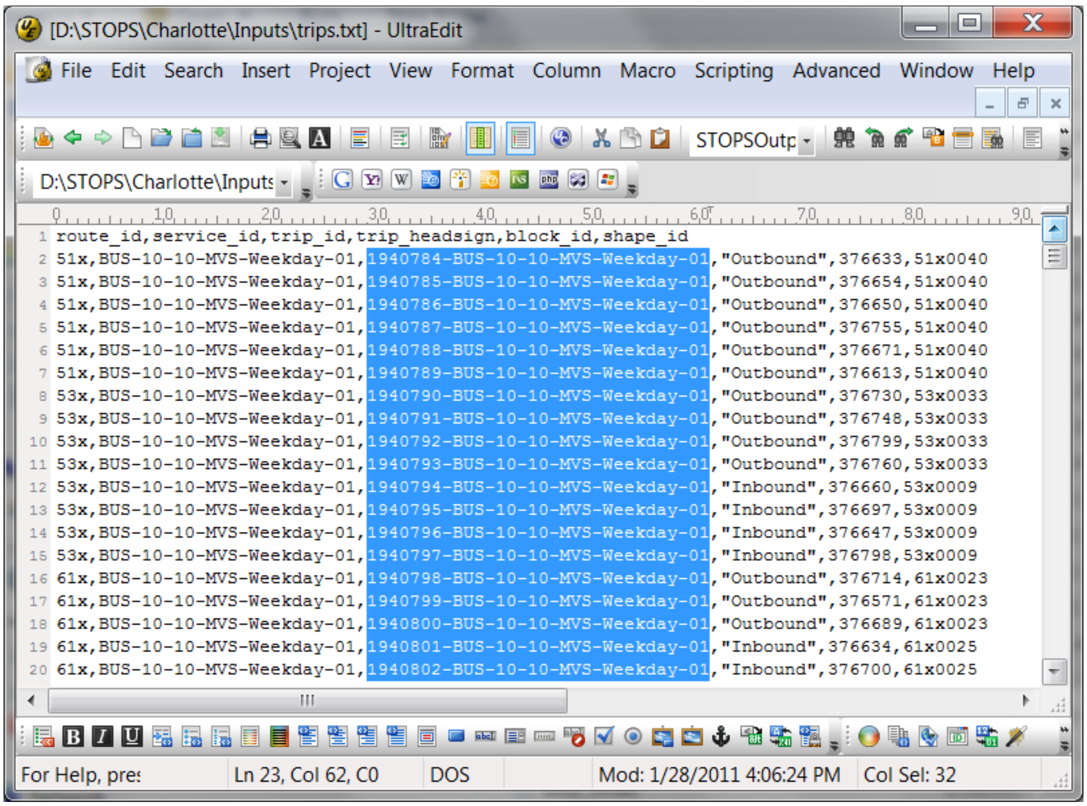


Figure 127. Sample Trip File with Long Trip IDs

In this example, the user could identify a unique 25-character trip_id by limiting the trip_id field to characters 1 to 8. Similar character ranges can also be defined for route_ids and stop_ids if that helps to identify a short, yet unique, string within each ID field.

Figure 127 also illustrates another GTFS concept – GTFS files are structured as comma separated text files (with a .txt extension) that can include data in any order on a record. The contents of each file are defined in a header record. STOPS and GTFPath reads the header record and use this information to determine where in each record the relevant data is found. STOPS and GTFPath can process the required data in any order as long as it is properly identified in the header record. Extra fields can be included in the file and STOPS will ignore this extra information.

14.1 GTFS File Specifications

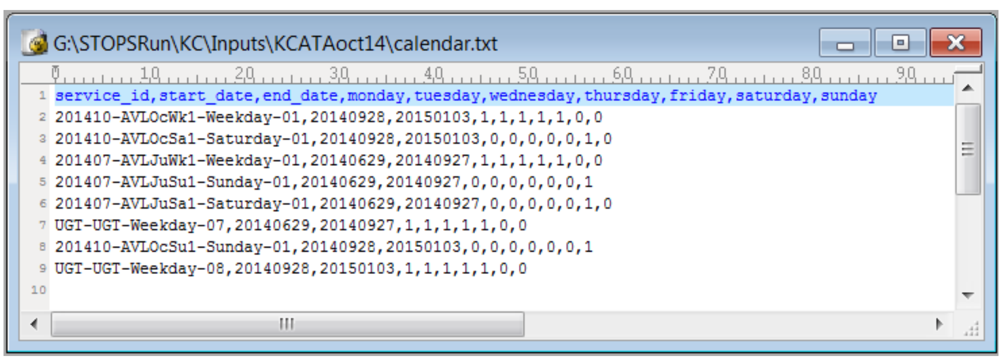
This section describes the individual GTFS files read by STOPS and GTFPath and used to prepare the level-of-service matrices.

Calendar.txt (Required unless the calendar_dates file is provided)

This file contains a listing of valid dates and days-of-week for each "Service_ID." Calendar.txt is a comma separated file with a header displaying the structure of the file followed by one record for each service_id. Each record includes:

- Service_ID: a character ID that uniquely identifies a set of dates that appears at most once in the calendar file.
- Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday: A series of binary fields that if set to 1 indicates that the service is operated that day. A 0 (zero) is used to indicate that this service is not operated.
- Start_date and end_date. The starting and ending dates for the service in YYYYMMDD format.

A simple calendar file is shown in Figure 128.


G:\STOPSRun\KC\Inputs\KCATAoct14\calendar.txt

```
service_id,start_date,end_date,monday,tuesday,wednesday,thursday,friday,saturday,sunday
201410-AVLOcWk1-Weekday-01,20140928,20150103,1,1,1,1,1,0,0
201410-AVLOcSa1-Saturday-01,20140928,20150103,0,0,0,0,0,1,0
201407-AVLJuWk1-Weekday-01,20140629,20140927,1,1,1,1,1,0,0
201407-AVLJuSu1-Sunday-01,20140629,20140927,0,0,0,0,0,0,1
201407-AVLJuSa1-Saturday-01,20140629,20140927,0,0,0,0,0,1,0
UGT-UGT-Weekday-07,20140629,20140927,1,1,1,1,1,0,0
201410-AVLOcSu1-Sunday-01,20140928,20150103,0,0,0,0,0,0,1
UGT-UGT-Weekday-08,20140928,20150103,1,1,1,1,1,0,0
```

Figure 128. Sample GTFS Calendar File

Calendar_dates.txt (Optional unless the calendar.txt file is not provided then calendar_dates is required)

This file contains a listing of dates and exceptions to the schedule previously defined in the calendar.txt file. If the calendar.txt file is not provided, then each day of operation is an exception to the schedule and all dates and service_IDs must be coded. Calendar_dates.txt is a comma separated file with a header displaying the structure of the file followed by one record for each combination of day and service_ID for which an exception record is required. Each record includes:

- Service_ID: a character ID that is coded on the trip record to indicate the type of service operated (e.g., weekday, Sunday, holidays).
- Date. The day that this exception applies to
- Exception_type. Equals 1 if the service_ID is to be operated on that day. Equals 2 if the service_ID is not to be operated on that day.

A sample calendar_dates file is presented in Figure 129.

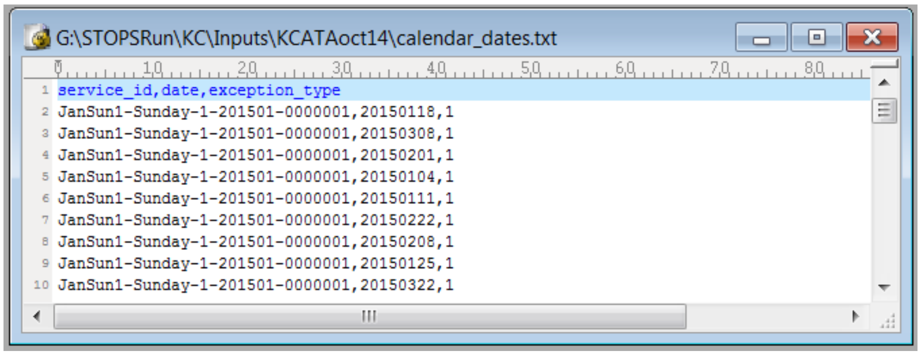


Figure 129. Sample Calendar_Dates File

Stops.txt (required)

This file contains a list of stop_ids, stop locations, and names to define stops and stations where passengers can board and alight from transit. The file has a header record followed by one record for each station or stop in the system. The following fields are required:

- Stop_id: a unique identifier no more than 25 characters long[76] that identifies the stop or station.
- Stop_name. A character string that names the stop.
- Stop_lat. A real number containing the latitude of the stop.
- Stop_lon. A real number containing the longitude of the stop.

A sample stops.txt file is shown in Figure 130.

[76] 23 characters if this GTFS file is given a suffix in the STOPS parameter file.

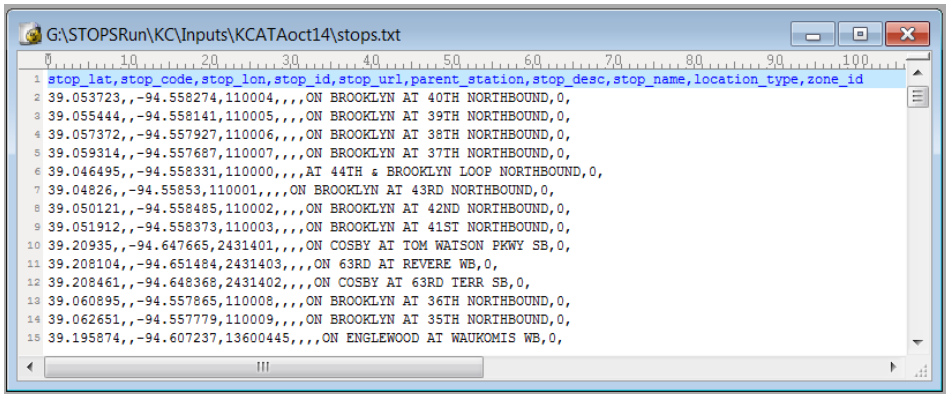


Figure 130. Sample GTFS Stops File

Routes.txt (required)

This file contains a list of route_ids, route descriptions and route types (transit modes). The file has a header record followed by one record for each route in the system. Each record includes a unique route_id, one or more name fields, and a route_type code.

Routes.txt has the following fields:

- Route_id. A unique id up to 25 characters long[77] used to identify the route.
- Route_short_name. A short description such as the route number which describes the route but not the destination.
- Route_long_name. The full name of the route.
- Route_type: A one-digit integer that best describes the type of transit. The value of 3 is used to denote non-fixed guideway bus routes. All other types are considered to be fixed guideway services. Projects can be comprised of any route type[78]. The full list of potential route-types are:
  - 0 - Tram, streetcar, LRT, (and some high-end BRT services in STOPS)
  - 1 – Subway, Metro
  - 2 – Rail (intercity and long-distance)
  - 3 – Bus
  - 4 – Ferry
  - 5 – Cable car
  - 6 – Gondola or suspended cable car
  - 7 – Funicular

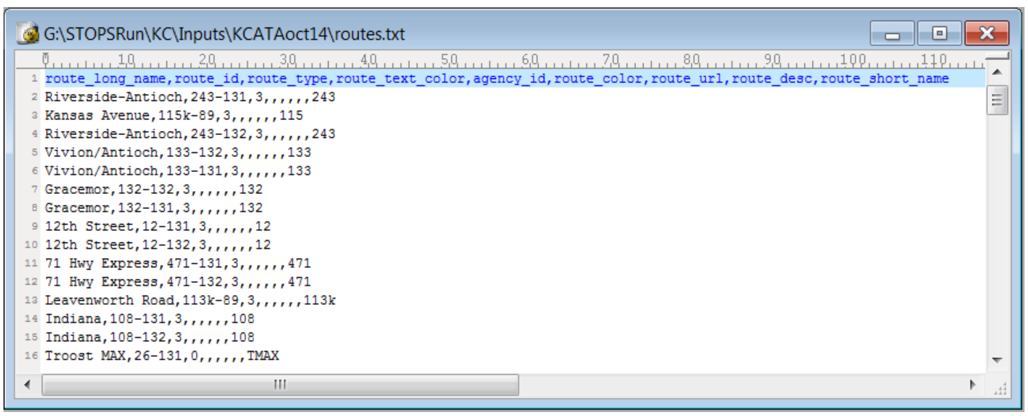
[77] 23 characters if this GTFS file is given a suffix in the STOPS parameter file.
[78] The stops that comprise a project are identified in the station file. It is necessary to identify all stop_ids must be associated with a "station" in the station file that has a NewStation Code of "1".

The route_type codes are critically important to STOPS since this code is how STOPS distinguishes between regular bus routes (route type 3), partial fixed guideway systems (route type 0) and full fixed guideway services (all other route types).

In most cases the route_type should be coded according to their standard GTFS definitions as described above. Two common exceptions to this rule are:

1. BRT routes operating in an exclusive right-of-way that could be perceived as a partial fixed guideway service might be coded as type 0 (tram or streetcar).
2. LRT routes that operate in an exclusive right-of-way that could be perceived like a full subway or metro system rather than a streetcar line might be coded as type 1 (subway, metro)

A sample route file appears in Figure 131. Note that in this example, the Troost MAX route (a BRT) has been coded with a route_type of 0.


G:\STOPSRun\KC\Inputs\KCATAoct14\routes.txt

```
route_long_name,route_id,route_type,route_text_color,agency_id,route_color,route_url,route_desc,route_short_name
Riverside-Antioch,243-131,3,,,,,,243
Kansas Avenue,115k-89,3,,,,,,115
Riverside-Antioch,243-132,3,,,,,,243
Vivion/Antioch,133-132,3,,,,,,133
Vivion/Antioch,133-131,3,,,,,,133
Gracemor,132-132,3,,,,,,132
Gracemor,132-131,3,,,,,,132
12th Street,12-131,3,,,,,,12
12th Street,12-132,3,,,,,,12
71 Hwy Express,471-131,3,,,,,,471
71 Hwy Express,471-132,3,,,,,,471
Leavenworth Road,113k-89,3,,,,,,113k
Indiana,108-131,3,,,,,,108
Indiana,108-132,3,,,,,,108
Troost MAX,26-131,0,,,,,,TMAX
```

Figure 131. Sample GTFS Routes File

Trips.txt (required)

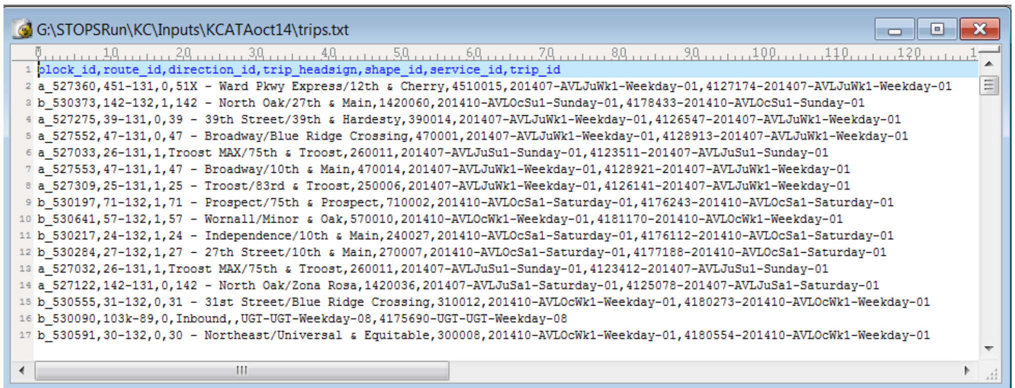
This file contains a header record followed by one record for each [bus or rail] trip. A trip in this context refers to a transit vehicle [bus or rail] trip that occurs when a bus or train departs from the route beginning point (or a turnback point) and lasts until it arrives at the destination terminal or turnback. Required fields are as follows:

- Trip_id. A unique ID up to 25 characters long[79] identifying the trip.
- Route_id. The ID of the route that describes this trip.
- Service_id. The ID that describes the days this trip operates in the calendar.txt file.

[79] 23 characters if this GTFS file is given a suffix in the STOPS parameter file.

GTFS trip files can also include an optional block_id field. This field is used to indicate groups of trips that are served by the same vehicle. Passengers are allowed to remain on the bus between trips when the trips share the same block_id. This is particularly important in systems that interline routes. For example, route "A" on the north side of town may continue as route "B" on the south side. In this case, as long as two trips have the same block_id, through passengers have a no-transfer trip even though the route and trip have changed during the course of the journey.

A sample trip file is shown in Figure 132.



G:\STOPSRun\KC\Inputs\KCATAoct14\trips.txt

```
block_id,route_id,direction_id,trip_headsign,shape_id,service_id,trip_id
a_527360,451-131,0,51X - Ward Pkwy Express/12th & Cherry,4510015,201407-AVLJuWk1-Weekday-01,4127174-201407-AVLJuWk1-Weekday-01
b_530373,142-132,1,142 - North Oak/27th & Main,1420060,201410-AVLOcSu1-Sunday-01,4178433-201410-AVLOcSu1-Sunday-01
a_527275,39-131,0,39 - 39th Street/39th & Hardesty,390014,201407-AVLJuWk1-Weekday-01,4126547-201407-AVLJuWk1-Weekday-01
a_527552,47-131,0,47 - Broadway/Blue Ridge Crossing,470001,201407-AVLJuWk1-Weekday-01,4128913-201407-AVLJuWk1-Weekday-01
a_527033,26-131,1,Troost MAX/75th & Troost,260011,201407-AVLJuSu1-Sunday-01,4123511-201407-AVLJuSu1-Sunday-01
a_527553,47-131,1,47 - Broadway/10th & Main,470014,201407-AVLJuWk1-Weekday-01,4128921-201407-AVLJuWk1-Weekday-01
a_527309,25-131,1,25 - Troost/83rd & Troost,250006,201407-AVLJuWk1-Weekday-01,4126141-201407-AVLJuWk1-Weekday-01
b_530197,71-132,1,71 - Prospect/75th & Prospect,710002,201410-AVLOcSa1-Saturday-01,4176243-201410-AVLOcSa1-Saturday-01
b_530641,57-132,1,57 - Wornall/Minor & Oak,570010,201410-AVLOcWk1-Weekday-01,4181170-201410-AVLOcWk1-Weekday-01
b_530217,24-132,1,24 - Independence/10th & Main,240027,201410-AVLOcSa1-Saturday-01,4176112-201410-AVLOcSa1-Saturday-01
b_530284,27-132,1,27 - 27th Street/10th & Main,270007,201410-AVLOcSa1-Saturday-01,4177188-201410-AVLOcSa1-Saturday-01
a_527032,26-131,1,Troost MAX/75th & Troost,260011,201407-AVLJuSu1-Sunday-01,4123412-201407-AVLJuSu1-Sunday-01
a_527122,142-131,0,142 - North Oak/Zona Rosa,1420036,201407-AVLJuSa1-Saturday-01,4125078-201407-AVLJuSa1-Saturday-01
b_530555,31-132,0,31 - 31st Street/Blue Ridge Crossing,310012,201410-AVLOcWk1-Weekday-01,4180273-201410-AVLOcWk1-Weekday-01
b_530090,103k-89,0,Inbound,,UGT-UGT-Weekday-08,4175690-UGT-UGT-Weekday-08
b_530591,30-132,0,30 - Northeast/Universal & Equitable,300008,201410-AVLOcWk1-Weekday-01,4180554-201410-AVLOcWk1-Weekday-01
```

Figure 132. Sample GTFS Trip File

Stop_times.txt (required)

This file contains one record for each stop served by each trip and defines the times that the trip serves that stop. This file corresponds to each time value in a printed schedule. The key difference between the stop_times.txt file and printed schedules is that each stop on the route has a time record in the stop_times file[80] as compared to most printed time tables in which time values are present for selected stops only (known as time points). The following fields are required:

- Trip_id. The ID of the trip represented by this record.
- Stop_id. The ID of the stop represented by this record.
- Arrival_time. The time that the trip arrives at the stop. This value is left blank if the time is not known and the time is to be interpolated based on preceding and following time points.

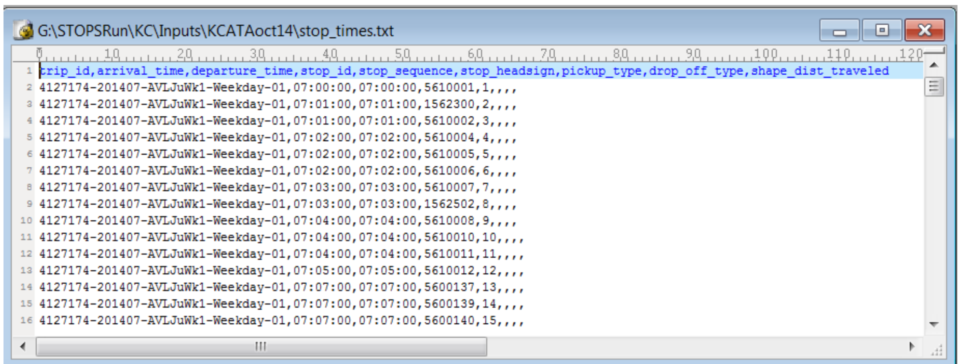
[80] In cases where the time is not known (i.e., the stop is not a time point and the agency does not estimate times for non-time points), then times may be left blank. In this case, STOPS interpolates the time based on the preceding and following time points and the relative straight line distance between stops. Note that 0:00:00 is considered to be midnight at the beginning of the schedule day. It is not the same as a blank value which is treated as a non-time point to be interpolated.

- Departure_time. The time that the trip departs from the stop.[81] This value is left blank if the time is not known and the time is to be interpolated based on preceding and following time points.
- Stop_sequence. A sequential number that indicates whether this record is the first, second, third, etc. stop that this trip makes.

Optionally, the stop_times file may include two other fields:

- Pickup_type. A "1" denotes that passengers may not board the vehicle at this stop[82]
- Drop_off_type. A "1" denotes that passengers may not alight the vehicle at this stop

A sample stop_times file appears in Figure 133.


G:\STOPSRun\KC\Inputs\KCATAoct14\stop_times.txt

```
trip_id,arrival_time,departure_time,stop_id,stop_sequence,stop_headsign,pickup_type,drop_off_type,shape_dist_traveled
4127174-201407-AVLJuWk1-Weekday-01,07:00:00,07:00:00,5610001,1,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:01:00,07:01:00,1562300,2,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:01:00,07:01:00,5610002,3,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:02:00,07:02:00,5610004,4,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:02:00,07:02:00,5610005,5,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:02:00,07:02:00,5610006,6,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:03:00,07:03:00,5610007,7,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:03:00,07:03:00,1562502,8,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:04:00,07:04:00,5610008,9,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:04:00,07:04:00,5610010,10,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:04:00,07:04:00,5610011,11,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:05:00,07:05:00,5610012,12,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:07:00,07:07:00,5600137,13,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:07:00,07:07:00,5600139,14,,,,
4127174-201407-AVLJuWk1-Weekday-01,07:07:00,07:07:00,5600140,15,,,,
```

Figure 133. Sample Stop_Times File

Frequencies.txt (optional)

This is an optional file that, if present, describes how a trip defined in the trips.txt file is repeated over the course of a day. The frequencies file includes a series of records that indicate the trip_id, a start- and end- time interval, and the headway (in seconds) that the trip is repeated during the coded time interval. The frequencies file includes the following fields:

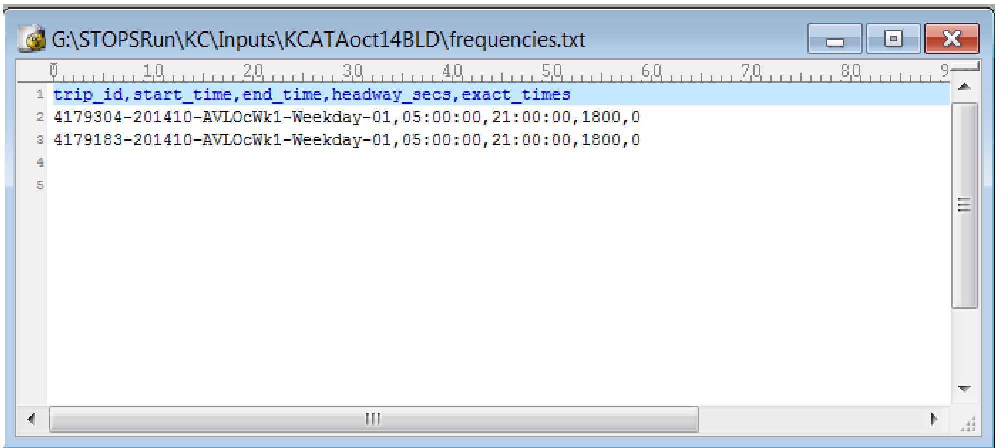
- Trip_id. The ID of the trip to be repeated.
- Start_time. The first departure time from the first stop on the trip.
- End_time. The latest departure time from the first stop on the trip.

---

[81] In most cases arrival and departure times are the same. They are different when the bus or train is scheduled to wait at the stop for more time than is necessary to receive and discharge passengers.
[82] GTFS uses codes "0" (the default) to indicate that passengers may board and alight at the stop. Codes"2" and "3" to identify stops that may be used by special arrangement with the driver or agency. STOPS treats codes 0, 2, or 3 as indicating that the pickup or drop-off can occur.

- Headway_secs. The headway ***in seconds*** between successive departures[83].

A sample frequencies file appears in Figure 134.


G:\STOPSRun\KC\Inputs\KCATAoct14BLD\frequencies.txt

```
trip_id,start_time,end_time,headway_secs,exact_times
4179304-201410-AVLOcWk1-Weekday-01,05:00:00,21:00:00,1800,0
4179183-201410-AVLOcWk1-Weekday-01,05:00:00,21:00:00,1800,0
```

Figure 134. Sample GTFS Frequencies File

Transfers.txt (optional)

The transfers.txt file contains information on the amount of time required to complete a transfer. If this file is not provided or if a transfer is not coded in this file, then STOPS automatically generates transfers between stops located within 0.25 miles of each other and computes the transfer time based on the straight line distance between the two stops traversed at a speed of 3 miles per hour. Any station grade separation time (0.5 minutes per level) and any transfer penalty time coded in the station file are added[84] to this time estimate. The GTFS station file provides the opportunity to override this estimate in cases where the actual transfer time is known. This file has the following fields

- From_stop_id. The stop_id used to define the stop where the transfer begins
- To_stop_id. The stop_id used to define the stop where the transfer ends
- Transfer_type. A code defined as follows
    - 0 – recommended transfer point (ignored by STOPS)
    - 1 – timed transfer point where the to bus will wait for passengers (ignored by STOPS)
    - 2 – requires a time specified in min_transfer_time to make the connection
    - 3 – transfers not allowed at this location

[83] If a trip has different headways over the course of the day, a series of frequency records can be used, one corresponding to each time period and headway.
[84] Grade separation and penalty times for both the "from" station and the "to" station are added to the computed transfer time.

- Min_transfer_time. (Optional) The number of ***seconds*** required to complete this transfer for transfer_type = 2. If this field is not available, the min_transfer_time is assumed to be zero[85].

PNR.txt (optional STOPS extension to GTFS standard)

The PNR file is a STOPS-extension to the GTFS standard and allows the user to specify locations where travelers can park their cars prior to making a transit trip. One record is specified for each potential parking location which is defined in terms of latitude and longitude. STOPS and GTFPath compare this location to stops identified in the stops.txt file and all stops within 0.25 miles are connected to the PNR lot. The PNR.txt file has the following required fields:

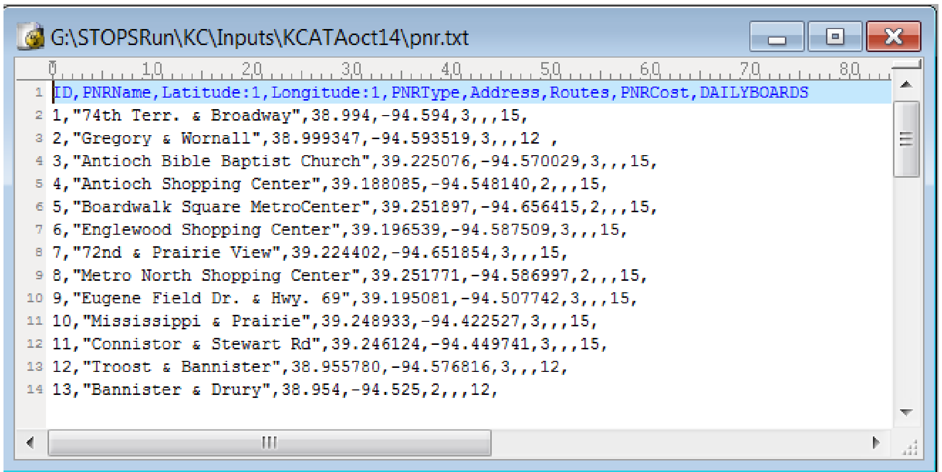
- Pnrname A character string with the PNR lot name.
- Latitude. A real number with the latitude in degrees.
- Longitude. A real number with the longitude in degrees.
- Pnrtype. An integer that is used to define the scale of the PNR and its likely catchment area. In STOPS, these values are defined as follows:
    - 1 – End-of-line fixed guideway station – attracts trips up to 25 miles away. Also used when a major highway intersects the fixed guideway facility and the station effectively serves as an end-of-line station for these travelers.
    - 2- Formal fixed guideway or bus PNR lot-attracts trips up to 10 miles away.
    - 3 – Officially designated PNR lot in a shared facility – attracts trips up to 6 miles away. This designation is applied to lots in churches, shopping centers and similar settings with posted signage permitting transit PNR.
    - 4 – Unofficial PNR lots. Lots where parking for transit occurs but is not identified by the transit operator as a officially-designated PNR lot. This could include cases where private land owners make their property available for a fee and other cases where parking occurs without permission. Because this usage is dependent on driver knowledge of the local situation, this type of parking is limited to access distances of less than 3 miles.

The pnr.txt file also has an optional field, called "PNRCost" that, if present, contains the amount of additional impedance (in equivalent minutes of travel time) that should be added to the connection between the parking lot and nearby transit stops. PNRCost can be used to represent additional time required for vertical circulation in a parking structure or to represent a shadow price for purposes of constraining modeled parking utilization to parking capacity.

---

[85] Note that when transfer times are provided in transfers.txt, STOPS does not apply transfer time adjustments specified in the station ESRI shape file. Transfers.txt is presumed to supersede the station file adjustments.

A sample PNR file is presented in Figure 135.


G:\STOPSRun\KC\Inputs\KCATAoct14\pnr.txt

```
ID,PNRName,Latitude:1,Longitude:1,PNRType,Address,Routes,PNRCost,DAILYBOARDS
1,"74th Terr. & Broadway",38.994,-94.594,3,,,15,
2,"Gregory & Wornall",38.999347,-94.593519,3,,,12 ,
3,"Antioch Bible Baptist Church",39.225076,-94.570029,3,,,15,
4,"Antioch Shopping Center",39.188085,-94.548140,2,,,15,
5,"Boardwalk Square MetroCenter",39.251897,-94.656415,2,,,15,
6,"Englewood Shopping Center",39.196539,-94.587509,3,,,15,
7,"72nd & Prairie View",39.224402,-94.651854,3,,,15,
8,"Metro North Shopping Center",39.251771,-94.586997,2,,,15,
9,"Eugene Field Dr. & Hwy. 69",39.195081,-94.507742,3,,,15,
10,"Mississippi & Prairie",39.248933,-94.422527,3,,,15,
11,"Connistor & Stewart Rd",39.246124,-94.449741,3,,,15,
12,"Troost & Bannister",38.955780,-94.576816,3,,,12,
13,"Bannister & Drury",38.954,-94.525,2,,,12,
```

Figure 135. Sample PNR File

14.2 Managing GTFS Files and Creating Project Scenarios in STOPS

The GTFS file format provides a flexible structure for defining an individual transit operating agency's schedule of service. This is an important foundation for generating estimates of trips on a project but is only the beginning. STOPS must read multiple sets of GTFS files to represent:

- Corridors where transit service is provided by multiple agencies and schedule data is coded into independent GTFS file sets.
- Multiple scenarios representing existing service, future year no-build and project-related service.

This section introduces several of the concepts that make it possible to read multiple GTFS files to cover both circumstances.

Separate Sub-Directories for Representing Multiple GTFS Files

In GTFS, simple file names such as calendar.txt, trips.txt, and stops.txt are used to define a set of schedules for one agency. With this structure, GTFS file sets for multiple agencies or different scenarios must be stored in different sub-directories.

This requirement is satisfied in STOPS through the concept of a "Subdirectory Prefix" ("Directory" or "Dir") in the parameter file. The Subdirectory Prefix is a character string that is added to the beginning of each GTFS file name to differentiate subdirectory locations. This capability can be used to do the following:

- Identify a set of subdirectories where each transit operator's files may reside. In San Diego, two GTFS files are used (Metropolitan Transit System and North County Transit District). In this case, two subdirectories might be used to represent existing schedules:
    - MTS2013\
    - NCTD2013\[86]

- Identify different scenarios. Continuing the San Diego example, assume that NCTD is constructing a project and that both MTS and NCTD have future year no-build scenarios. In that case, the following subdirectories might also be defined
    - MTSNoBuild\
    - NCTDNoBuild\
    - NCTDBuild\

These names are sub-directories of the inputs\ folder which is a subdirectory of the project folder where the control file is located. If the project control file is d:\STOPS\SD\sandiego.ctl, then the GTFS folders described above would be:

- D:\STOPS\SD\Inputs\MTS2013\
- D:\STOPS\SD\Inputs\NCTD2013\
- D:\STOPS\SD\Inputs\MTSNoBuild\
- D:\STOPS\SD\Inputs\NCTDNoBuild\
- D:\STOPS\SD\Inputs\MTSBuild\

The combination of root directory name and the sum of all of the GTFS subdirectory names may have as many as 200 characters. Much shorter name lengths are recommended for readability of reports and screens.

Simultaneous Processing of Multiple GTFS Files

As discussed in the previous section, transit service in some metropolitan areas is provided by multiple agencies and, in some cases, these agencies each generate their own GTFS files. STOPS provides the capability to read multiple GTFS files and generate a single set of paths that considers routes operated by all agencies. The STOPS parameter file editing dialog requires users code at least one non-blank subdirectory name for all scenarios (e.g., existing, no-build, and build). Up to nineteen additional GTFS files with non-blank subdirectory names may also be provided for each scenario to represent multiple operators.

Although a non-blank subdirectory prefix is required for each scenario, it is important to note that the same subdirectory prefix can be used for multiple

[86] In a STOPS subdirectory prefix, a subdirectory is indicated when the prefix ends with a "\" character. If no "\" is present at the end of the subdirectory prefix, then STOPS will treat the prefix as a character string to insert at the beginning of each GTFS file name. This approach works in STOPS. However, the prefix + file name without an intervening "\" will not work with the GTFS data validation or visualization tools and are, therefore, not recommended.

scenarios. This could happen if the no-build and existing scenarios are the same or if the user wishes to test STOPS to determine "project" ridership for an existing rail line. In such cases, the user might type "MTS2013\" and "NCTD2013\" as the subdirectory prefix for the "Existing", "No-Build", and "Build" scenarios.

In many cases, this is all the user needs to do—specify all of the subdirectories that together should be read to generate a complete set of origin to destination paths for the modeling region. In some cases, however, this strategy will lead to an error caused by different agencies using the same stop, route, or trip designation to refer to different things. When this happens, the user can define a 1-character suffix in the parameter file. When this is done, all identification fields (e.g., stop_id, trip_id, or route_id) have an ampersand and the suffix appended to the end of the field.

Example of Suffix and Its Effect on ID fields

If the user defines the suffix for a GTFS file as "A", then:

- Trip 121 would be renamed as "121&A"
- Stop "65112" would be renamed "65112&A"
- Route "17X" would be renamed "17X&A"

The user does not need to add the suffix to any of contents of the GTFS file set; STOPS does that automatically. The only places where the suffix needs to be hand-coded by the user are:

1. In the parameter file where other GTFS information is identified.
2. In the station file (see Section 5.7) in which the user must add the ampersand and suffix to the GTFS stop_id fields.
3. In the optional route count file (See Section 5.3-Route Count File) in which the user specifies the ridership on each route for purposes of calibration. Here, too, the ampersand and suffix is added to the route_id.

14.3 Using STOPS to Automatically Edit GTFS Files to Create Alternative Scenarios (Editlist.txt file)

GTFS files are highly detailed representations of a transit operator's service that are designed to allow on-line mapping software to provide directions to potential transit users. In most transit agencies, these files are prepared by the scheduling department using their timetable/run-cutting software systems. The GTFS files are the final product of a complex process to prepare efficient, accurate schedules to be used by drivers, dispatchers, and the traveling public.

STOPS takes advantage of this detailed information to calibrate the model to represent current year conditions. However, STOPS must also read GTFS files representing future year conditions with and without the project.

The simplest approach (for the forecasters) to generate the future no-build and build GTFS files is to engage the agency's service planning staff to build a future time table using their timetable/run-cutting software systems. This approach has the advantage that the resulting schedules will be based on the experience gained by the scheduling staff over many years and may result in a schedule that is more accurate and more likely to be implemented. Often, however, these staff are too busy to perform this task and it falls to the forecasters to adjust the GTFS files to prepare alternative scenarios.

One alternative for developing a set of future year GTFS files is to use a software packages designed for GTFS editing (e.g., *GTFSed*, available from FTA).

Another option is for the user to construct GTFS files by hand by editing the underlying text files to represent future scenarios. Since GTFS files are extremely complex with many inter-relationships, the resulting files should be carefully checked to confirm that the GTFS files are accurate representations of each scenario. This approach could be practical in cases where the schedule changes are relative simple between the existing GTFS files and the proposed future services.

The final option is to use the STOPS capability to modify a GTFS file set based on a series of editing commands. These commands are stored in a file called "editlist.txt" (located in the same subdirectory as the GTFS files to be edited). This capability is another STOPS extension to the GTFS standard.

Using Editlist

Even with the editlist function, the user is still responsible for manually editing the relatively simple files in the GTFS standard (stops.txt, routes.txt, trips.txt, and frequencies.txt). Editlist.txt is used to simplify the process of making routing changes to existing services in the stop_times.txt file. An important concept is that the stop_times.txt file contains the service that is offered to the traveling public. The other files (stops.txt, routes.txt, trips.txt, and frequencies.txt file) play a supporting role. If a route or trip exists, but there is no stop_time record, then no transit service is available for a traveler to use.

This means that if the user wishes to discontinue a route, it is sufficient to remove all of the route's stop_time records. There is no reason to eliminate the route from the route file or trips from the trip file and, depending on how these tools are used, deleting these records could cause errors. It is helpful to bear the following principle in mind:

> GTFS files are extremely complex and many opportunities exist to introduce serious errors. ***Therefore, the user should make as few changes as possible to represent potential service changes.*** Nearly always that means adding necessary stops, routes, trips, and stop_times but seldom, if ever, deleting anything directly from the files. Existing services are best modified or deleted using the editlist.txt capability.

The following process can be followed to create a new GTFS file to represent a new scenario.

1. Copy an existing GTFS file set to a new directory.

2. Open the calendar.txt file in a simple text editor and make a note of the service_ids that can be used to represent weekday services (often Wednesday offers the most typical representation of a weekday) on a date that is consistent with other routes represented in the GTFS file. In most cases an existing service_id can be used although it is also possible to create a new service_id.

3. Open the stops.txt file in a simple text editor and add any new bus or fixed guideway stops. In most cases, the user should not delete or move an existing stop since these physical points still exist. Even though the user may delete service in later steps, STOPS still checks the integrity of all routes and stopping patterns and will generate an error if these stop locations do not exist. When adding new points, search the existing stop database to make sure that duplicate stop_ids are not defined. STOPS will flag a duplicate stop_id as an error.

4. Open the routes.txt file in a simple text editor and add any completely new routes to the route database taking care not to re-use any existing route_id. New routes could include a new fixed guideway line or new feeder bus routes. Do not delete any existing route_ids unless the user also deletes all references to the route in the trips.txt, stop_times.txt, and frequencies.txt files. It is not necessary to change existing routes that are truncated or modified unless the user wants to modify the route description fields to reflect the new name.

5. Open the trips.txt file in a simple text editor and add a new trip for each new route in each direction. It is only necessary to add one new trip for each new route and direction since the frequencies.txt file can be used to generate the entire schedule over the course of a day. If trips are to be added to existing routes, then the user can either code one new trip for every added trip or to create one new trip and use the frequencies.txt file to add additional runs. The user should not delete trips from the trips.txt file unless all references to the trip in the stop_times.txt and frequencies.txt files are also removed using a text editor.

6. Open the stop_times.txt file and add all stop_time entries for the new trips. Existing routes that are modified need not be edited here since the editlist.txt command can be used to change existing routes more easily. If the user does modify stop_time entries for existing routes in this file, make sure to change all of the relevant entries since each route can have one record for each trip and each stop unless the frequencies.txt file is used.

7. Open (or create) the frequencies.txt file and add frequency records for each new trip to specify the peak and off peak frequency of service. STOPS considers waiting times for two periods of the day: Peak (7:00 AM to 8:59 AM) and Off-peak (12:00 noon to 1:59 AM). Since scheduled trips serving these time periods may begin before and extend beyond these time periods, the user should create schedule information for a broader period (e.g., 6-9 AM and 11 AM- 3 PM to make sure that all trips operating in the modeled periods are properly represented.

8. Open or create the editlist.txt file. This extension to the GTFS standard allows users to update existing services using a series of editing commands that are designed to apply to multiple trips and/or routes and facilitate consistent modification to trip routing.

An example editlist.txt file is shown in Figure 136. This file shows includes the following modifications to an existing GTFS file:

- Two comment lines (begin with an "!"). The remainder of the line (a discarded command) is ignored.
- Delete routes 501, 42-44, 55-58, and 60 in their entirety
- Reroute all routes that serve stops 29380 and 46443 (in that order, but with possible intermediate stops). The new routing will be 29380, 29320, 29310, 29290, 29270, 29250, 25280, and 45075. Since this replacement never ties back to the original line, 45075 is the new terminus of the line.
- Reroute all routes that serve stops 46443 and 29260 (in that order, but with possible intermediate stops). The new routing will be 29380, 29320, 29310, 45047, 25270, and 29260. Since this replacement starts at a different stop from the original line, 45075 is the new origin of the line.

```
command,parameter1,parameter2,parameter3,parameter4

!Re-RouteBetwnStopsonTrip,8011,8010,*,8013,4.0,8012,5.0,8011,3.0,8010
!Re-RouteBetwnStopsonTrip,8010,8011,*,8010,3.0,8011,5.0,8012,4.0,8013
ExcludeRoute,501
ExcludeRoute,42
ExcludeRoute,43
ExcludeRoute,44
ExcludeRoute,55
ExcludeRoute,56
ExcludeRoute,57
ExcludeRoute,58
ExcludeRoute,60
Re-RouteBetwnStopsonRoute,29380,46443,12,29380,1.,29320,1.,29310,1.,29290,.5,29270,.5,29250,3.,25280,1.,45075
Re-RouteBetwnStopsonRoute,46443,29260,12,45047,1.,25270,3.,29260
```

Figure 136. Sample GTFS Editlist file

The format of the editlist file is described in the paragraphs below.

The editlist file begins with a header line that must contain the exact string of characters shown in the example. The first non-blank line following the header begins with a "!" that indicates that this line contains a comment which is skipped by STOPS when processing the editlist file.

All non-comments consist of a command followed by one or more parameters. Each command type can apply to a route, trip, stop or combination that exists in the stop_time file. The command only affects the stop_time file—the stop, route, and trip definitions contained in those files continue to exist without change even after the editlist commands are applied. The editlist commands that are applicable to STOPS are as follows:

- ***ExcludeRoute,[route_id].*** Directs STOPS to exclude all stop_time records for all trips operating with the route indicated by "route_id". This command is generally used in cases where a route no longer operates in a scenario. This might happen if a parallel route is eliminated when a new fixed guideway system is implemented. If "*" is coded as the route_id, then all routes are excluded but this wildcard should only be used if a later "include route" reinstates some of this service. Otherwise all routes are excluded and no transit paths can be built. In the sample file, route_id 501 (the LRT line) and several bus routes are removed from the schedule.

- ***ExcludeTrip,[trip_id].*** Directs STOPS to exclude all stop_time records for the trip specified by "trip_id". This command is used when a new fixed guideway service results in a loss of some trips on an existing route. If "*" is coded then all trips are excluded but this wildcard should only be used if a later "include trip" record reinstates some of this service.

- ***Re-RouteBetwnStopsonRoute,[stop_id-1],[stop_id-2],[route_id],[replacement string]. Re-RouteBetwnStopsonTrip,[stop_id-1],[stop_id-2],[trip_id],[replacement string].*** These commands instruct STOPS to look for cases where a route or trip travels between stop_id-1 and stop_id-2 (with or without intermediate points) and then replaces the sequence of nodes in the original stop_time file with the nodes and travel times contained in the replacement string. This command can be used to code a short turn-back on a route or to define a new deviation off of an existing alignment. In the sample file, Route 12 between 46443 and 29260 is replaced with a new beginning that involves traveling from 45047 to 25270 in one minute and then continuing to 29260 for another 3 minutes of travel time. Re-route commands are subject to the following rules:

    - Both stop_id-1 and stop_id-2 must exist in the stop_time file with stop_id-1 being before stop_id-2 in the order sequence for the trip being modified. Two re-reroute commands are required for 2-way routes to cover each direction of travel.

    - The replacement string consists of a series of stop_ids representing the new sequence of stops. Between each pair of stop_ids, the user must code the transit running time required to travel between the stops.

    - The replacement string must be anchored to the existing stop_id sequence at one or both ends. This means that the first stop_id in the replacement string must match stop_id-1 and/or the last stop_id in the replacement string must match stop_id-2. There are 3 kinds of replacements possible.

        - The first stop ID in the replacement string matches stop_id-1 and the last stop ID in the replacement string matches stop_id-2.
            - Example 1 (new routing between existing stops):

              Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

              Re-routeBetwnStopsonRoute, stopB,stopE,Rte1,stopB,2,stopF,3,stopE

              Revised Route: Rte1,stopA,stopB,stopF,stopE

              Times. Original route up to B. Then, 2 minutes B-F, 3 minutes F-E

            - The first stop ID in the replacement string matches stop_id-1 and the last stop ID in the replacement string *does not* match stop_id-2.

            - Example 2 (extension to the end of the line):

              Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

              Re-routeBetwnStopsonRoute, stopD,stopE,Rte1,stopD,2,stopE,3,stopF

Revised Route: Rte1,stopA,stopB,stopC,stopD,stopE,stopF

Times. Original route up to D. Then, 2 minutes D-E, 3 minutes E-F

- Example 3 (replacement to the end of the line):

  Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

  Re-routeBetwnStopsonRoute, stopC,stopE,Rte1,stopC,2,stopF,3,stopG

  Revised Route: Rte1,stopA,stopB,stopC,stopF,stopG

  Times. Original route up to C. Then, 2 minutes C-F, 3 minutes F-G

- Example 4 (short turn back at end of line):

  Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

  Re-routeBetwnStopsonRoute, stopC,stopE,Rte1,stopC,2,stopD

  Revised Route: Rte1,stopA,stopB,stopC,stopD

  Times. Original route up to C. Then, 2 minutes C-D

- The first stop ID in the replacement string *does not* match stop_id-1 and the last stop ID in the replacement string matches stop_id-2.

- Example 5 (extension to the beginning of the line):

  Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

  Re-routeBetwnStopsonRoute, stopA,stopB,Rte1,stopQ,2,stopA,3,stopB

  Revised Route: Rte1,stopQ,stopA,stopB,stopC,stopD,stopE

  Times. Original route after B. Prior to B times are computed backwards using 3 minutes A-B, 2 minutes Q-A

- Example 6 (replacement to the beginning of the line):

  Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

  Re-routeBetwnStopsonRoute, stopB,stopC,Rte1,stopQ,2,stopR,3,stopC

  Revised Route: Rte1,stopQ,stopR,stopC,stopD,stopE

  Times. Original route after C. Prior to C times are computed backwards using 3 minutes R-C, 2 minutes Q-R

- Example 7 (short turn at beginning of the line):

  Original Route: Rte1,stopA,stopB,stopC,stopD,stopE

  Re-routeBetwnStopsonRoute, stopA,stopC,Rte1,stopB,2,stopC

  Revised Route: Rte1,stopB,stopC,stopD,stopE

  Times. Original route after C. Prior to C times are computed backwards using 2 minutes B-C

- Except in the case of a new beginning to the route, the arrival/departure times in the stop_times file are retained for the section of route prior to the change. Travel times following the insertion of the new stops are updated based on the stop-to-stop travel times contained in the replacement string. When a new beginning is coded, then the stop_times arrival/departure times for the existing route after the insertion point are retained and the arrival/departure times for the new beginning sequence are estimated from the stop-to-stop running times contained in the replacement string.

14.4 Visualizing GTFS Data

GTFS data are very complex and must be carefully checked before using this data as an input to STOPS. Review is particularly important when new files are created to represent proposed services such as a new rail line and the related bus service changes. The Google developers web site includes two tools that can be used to verify and to visualize a GTFS feed.

The following steps are required to use the feed validator and feed visualization tools:

1. Download the latest version of transitfeed-windows-binary-v.v.vv.zip (v is version information) and extract the contents to a directory on your hard drive. The zip file can be downloaded from https://github.com/google/transitfeed/wiki/FeedValidator. Select the "Windows Standalone Version" link and download and extract the transitfeed binary.

2. Locate the subdirectories containing GTFS data to be tested and viewed. These subdirectories may be one of the input directories described in Section 14.2 or an output GTFS file generated by STOPS[87]. The end of this section describes the advantages of reviewing output files rather than the input files.

3. Drag the directory identified in Step 2 to the feedvalidator application located in the directory created in Step 1. The program will open a browser and display the results of the analysis as shown in Figure 137.

[87] STOPS Step 5a can be used to generate two sets (peak and off-peak) of output GTFS files for the Existing (EXST) scenario for use with feedvalidator and ScheduleViewer. These files appear in the GTFOUTPUT\PK_TR_EXST\ and GTFOUTPUT\OP_TR_EXST\ subdirectories. Steps 5b and 5c generate similar GTFS outputs for the no-build (NOBL) and project (BLD-) scenarios. These output files include the effects of the multiple GTFS files, the editlist commands, the frequency specification, and hand-entered edits to the GTFS file set.

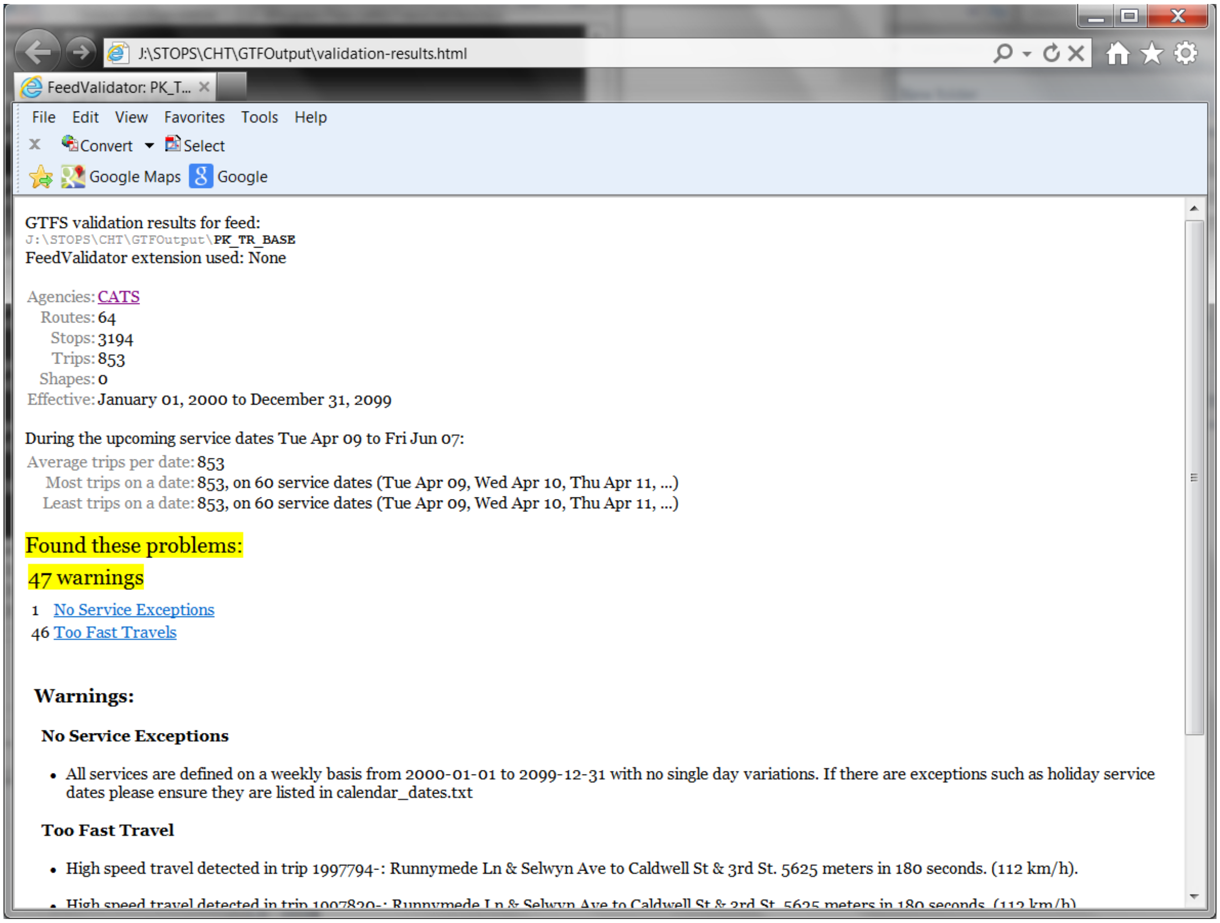


Figure 137. Output from GTFS Feed Validator

4. Drag the directory identified in Step2 to the schedule_viewer application located in the directory created in Step 1. The program will open a console window as shown in Figure 138 which (after a few minutes) directs the user to open a browser window and type a localhost http: address. After this is done, the window shown in Figure 139 appears. Select a route and a trip time to view that route's coding. As shown in this example, the re-routing of some trips on Route 12 (using the STOPS editlist capability) was mis-coded leading to an unintended route diversion. When the mis-coded stop was corrected, the route returned to the intended alignment.

Although scheduler_viewer is a powerful tool, the user should be aware of several limitations. First, it is not programmed to handle PNR or editlist files (STOPS extensions to the GTFS standard) so these changes are not displayed. Second, it does not combine GTFS files from multiple agencies, and third, it does not process the frequencies.txt file so the route and trip listing may not be complete.

To work around these limitations, STOPS and the GTFPath program can be used to generate an output GTFS file that includes the capability to combine GTFS from multiple agencies and apply frequency and editlist commands. The use of this command is described in Section 5.5.

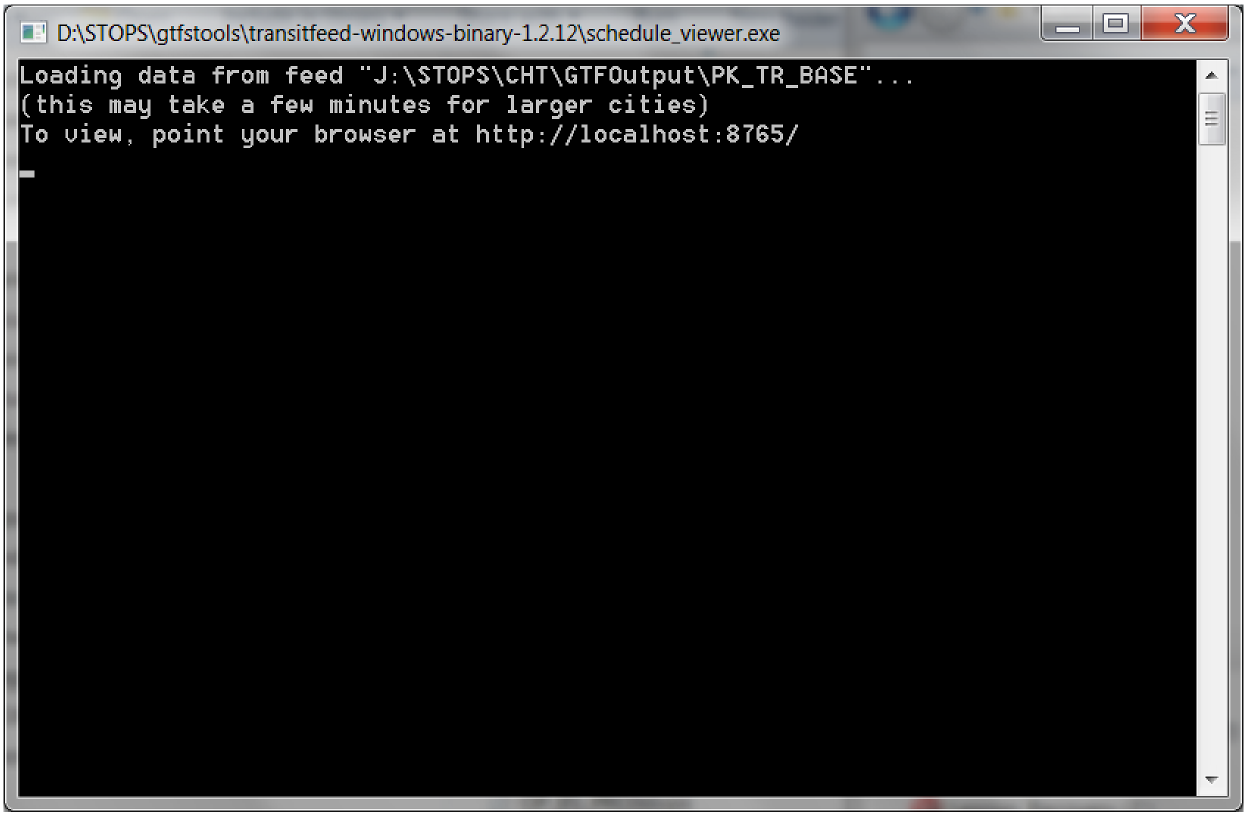


Figure 138. GTFS Schedule Viewer Console Window

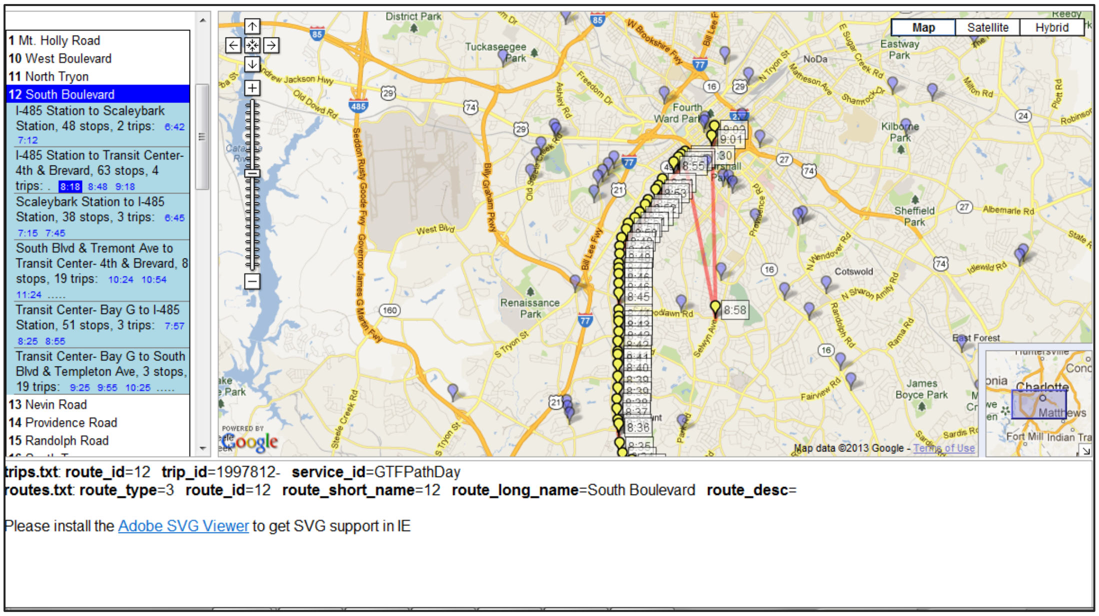


Figure 139. GTFS Schedule Viewer Window Showing Error in Route 12 Re-Routing

14.5 Obtaining GTFS Files

In many cities, GTFS files for the current (and past) transit schedule(s) are available on-line for public use. A good source of publicly-available GTFS files (including feeds from past time periods) is found at:

https://transitfeeds.com

Many agencies that do not make their feeds public still create these files so that on-line mapping tools can help customers plan trips. One good way of determining whether an agency generates this data is to go to Google Maps, select "Get Directions" and choose the transit option. Try to build a path between an origin and destination in the corridor to see if the agency has provided Google Maps with a transit feed.

In cases where the transit feed is not publicly available, it might be obtained from the agency's scheduling department. Even if the agency does not generate a feed, the agency's scheduling software may be able to generate a GTFS file set for use in STOPS.

15.0 Appendices

15.1 State FIPS Codes

State Name	Numeric FIPS Code	Alpha FIPS Code
Alabama	1	AL
Alaska	2	AK
Arizona	4	AZ
Arkansas	5	AR
California	6	CA
Colorado	8	CO
Connecticut	9	CT
Delaware	10	DE
District of Columbia	11	DC
Florida	12	FL
Georgia	13	GA
Hawaii	15	HI
Idaho	16	ID
Illinois	17	IL
Indiana	18	IN
Iowa	19	IA
Kansas	20	KS

State Name	Numeric FIPS Code	Alpha FIPS Code
Missouri	29	MO
Montana	30	MT
Nebraska	31	NE
Nevada	32	NV
New Hampshire	33	NH
New Jersey	34	NJ
New Mexico	35	NM
New York	36	NY
North Carolina	37	NC
North Dakota	38	ND
Ohio	39	OH
Oklahoma	40	OK
Oregon	41	OR
Pennsylvania	42	PA
Rhode Island	44	RI
South Carolina	45	SC
South Dakota	46	SD

Louisiana	22	LA
Maine	23	ME
Maryland	24	MD
Massachusetts	25	MA
Michigan	26	MI
Minnesota	27	MN
Mississippi	28	MS

State Name	Numeric FIPS Code	Alpha FIPS Code
Tennessee	47	TN
Texas	48	TX
Utah	49	UT
Vermont	50	VT
Virginia	51	VA
Washington	53	WA
West Virginia	54	WV
Wisconsin	55	WI
Wyoming	56	WY

15.2 Census MPO Codes

MPO Code	MPO Name	Area Name
0581	Auburn-Opelika	Auburn-Opelika, AL
1001	Birmingham RPC	Birmingham, AL
0451	Calhoun Area MPO	Anniston, AL
2881	Gadsden-Etowah MPO	Gadsden, AL
3441	Huntsville MPO	Huntsville, AL
5241	Montgomery Division of Planning	Montgomery, AL
2031	North-Central Alabama Regional COG	Decatur, AL
2651	Northwest Alabama COG	Florence, AL
5161	South Alabama RPC	Mobile, AL
2181	Southeast Wiregrass MPO	Dothan, AL
8601	West Alabama PDC	Tuscaloosa, AL
0381	Anchorage MATS	Anchorage, AK
2461	Fairbanks MATS	Fairbanks, AK
2621	Flagstaff MPO	Flagstaff, AZ
6201	Maricopa Association of Governments	Phoenix-Mesa, AZ
8521	Pima Association of Governments	Tucson, AZ
9361	Yuma MPO	Yuma, AZ
3341	Hot Springs MPO	Hot Springs, AR
3701	Jonesboro MPO	Jonesboro, AR
4401	Metroplan	Little Rock-North Little Rock, AR
2581	Northwest AR Regional Planning Commission	Fayetteville-Springdale-Rogers, AR
6241	Southeast AR Regional Planning Commission	Pine Bluff, AR
8951	West Memphis Area Transportation Study	West Memphis, AR
2721	Western Arkansas PDD	Fort Smith, AR-OK
7121	Association of Monterey Bay Area Governments	Salinas, CA
1621	Butte County Association of Governments	Chico-Paradise, CA
2841	Council of Fresno County Governments	Fresno, CA
0681	Kern County Council of Governments	Bakersfield, CA
4941	Merced County Association of Governments	Merced, CA
7361	Metropolitan Transportation Commission-Oakland	San Francisco-Oakland-San Jose, CA

MPO Code	MPO Name	Area Name
6921	Sacramento Area COG	Sacramento-Yolo, CA
7321	San Diego Association of Governments	San Diego, CA
8121	San Joaquin County COG	Stockton-Lodi, CA
7461	San Luis Obispo Council of Governments	San Luis Obispo-Atascadero-Paso Robles, CA
7481	Santa Barbara County Association of Governments	Santa Barbara-Santa Maria-Lompoc, CA
6691	Shasta County RTPA	Redding, CA
4471	Southern CA Association of Governments	Los Angeles-Riverside-Orange County, CA
5171	Stanislaus council of Governments	Modesto, CA
8781	Tulare County Association of Governments	Visalia-Tulare-Porterville, CA
2081	Denver Regional COG	Denver-Boulder-Greeley, CO
2996	Grand Valley MPO	Grand Junction, CO
2671	North Front Range MPO	Fort Collins-Loveland, CO
1721	Pikes Peak Area COG	Colorado Springs, CO
6561	Pueblo Area Council of Governments	Pueblo, CO
0910	Capitol Region COG	Hartford, CT
0909	Central Connecticut RPA	Brisol, CT
0905	Central Naugatuck Valley COG	Waterbury, CT
0912	Connecticut River Estuary RPA	Old Saybrook, CT
0907	Greater Bridgeport / Valley MPO	Bridgeport, CT
0902	Housatonic Valley Council of Elected Officials	Danbury, CT
0904	Litchfield Hills Council of Elected Officials	Torrington, CT
0911	Midstate Regional Planning Agency	Middletown, CT
0915	Northeastern Connecticut COG	Putnam, CT
0903	Northwestern Connecticut COG	Warren, CT
0908	South Central Region COG	New Haven, CT
0901	South Western Regional Planning Agency	Stamford-Norwalk, CT
0913	Southeastern Connecticut COG	New London-Norwich, CT
0906	Valley Regional Planning Agency	Derby-Shelton, CT
0914	Windham Regional Planning Agency	Willimantic, CT
2191	Dover/Kent County MPO	Dover, DE
9161	Wilmington Area Planning Council	Wilmington-Newark, DE-MD

MPO Code	MPO Name	Area Name
8841	Metropolitan Washington COG	Washington, DC-MD-VA
4901	Brevard County MPO	Melbourne-Titusville-Palm Bay, FL
2681	Broward County MPO	Fort Lauderdale, FL
6581	Charlotte County - Punta Gorda MPO	Punta Gorda, FL
5346	Collier County MPO	Naples, FL
8281	District 7 FDOT	Tampa-St. Petersburg-Clearwater, FL
3601	First Coast MPO	Jacksonville, FL
2751	Okaloosa-Walton TPO	Fort Walton Beach, FL
2901	Gainesville Urbanized Area MPO	Gainesville, FL
8701	Indian River County MPO	Vero Beach, FL
2701	Lee County MPO	Fort Myers-Cape Coral, FL
8131	Martin County MPO	Stuart, FL
5961	Metroplan Orlando	Orlando, FL
5001	Miami-Dade Metropolitan Planning Organization	Miami, FL
5791	Ocala-Marion County MPO	Ocala, FL
8961	Palm Beach County MPO	West Palm Beach-Boca Raton, FL
6016	Panama City MPO	Panama City, FL
6081	Pensacola MPO	Pensacola, FL
3981	Polk Transportation Planning Organization	Lakeland-Winter Haven, FL
7511	Sarasota-Manatee MPO	Sarasota-Bradenton, FL
2711	St. Lucie MPO	Fort Pierce-Port St. Lucie, FL
8241	Tallahassee-Leon County MPO	Tallahassee, FL
2021	Volusia County MPO	Daytona Beach, FL
0121	Albany Dougherty County Planning Commission	Albany, GA
0501	Athens-Clarke County MPO	Athens, GA
0521	Atlanta Regional Commission	Atlanta, GA
0601	Augusta Richmond County PC	Augusta-Aiken, GA-SC
7521	Chatham County-Savannah Metropolitan Planning Comm.	Savannah, GA
1801	Columbus-Phenix City Transportation Study	Columbus, GA-AL
1251	Brunswick Area Transportation Study	Brunswick GA
4681	Macon Area Transportation Study	Macon, GA

MPO Code	MPO Name	Area Name
6911	Rome-Floyd County Planning Commission	Rome, GA
8821	Warner Robins MPO	Warner Robins, GA
3321	Oahu Metropolitan Planning Organization	Honolulu, HI
6341	Bannock Planning Organization	Pocatello, ID
3461	Bonneville MPO	Idaho Falls,ID
1081	Community Planning Association of Southwest Idaho	Boise City, ID
1961	Bi-State Regional Commission	Davenport-Moline-Rock Island, IA-IL
1401	Champaign County RPC	Champaign-Urbana, IL
1601	Chicago Area Transportation Study	Chicago, IL
3741	Kankakee County RPC	Kankakee, IL
2041	Macon County RPC	Decatur, IL
1041	McLean County RPC	Bloomington-Normal, IL
6881	Rockford Area Transportation Study	Rockford, IL
7881	Springfield-Sangamon County RPC	Springfield, IL
6121	Tri-County Regional Planning Commission--IL	Peoria-Pekin, IL
3921	Tippecanoe County Area Planning Commission	Lafayette, IN
1021	Bloomington Area Transportation Study	Bloomington-Normal, IN
5281	Delaware-Muncie MPC	Muncie, IN
2441	Evansville Urban Transportation Study	Evansville-Henderson, IN-KY
3481	Indianapolis MPO	Indianapolis, IN
3851	Kokomo-Howard County Governmental Coordinating Council	Kokomo, IN
0401	Madison County COG	Anderson, IN
7801	Michiana Area Council of Governments	South Bend, IN
2761	Northeastern Indiana Reg. Coordinating Council	Fort Wayne, IN
2961	Northwestern Indiana RPC	Gary, IN
8321	West Central Indiana Economic Development District	Terre Haute, IN
8921	Black Hawk Metropolitan Area Transportation Policy Board	Waterloo-Cedar Falls, IA
2121	Des Moines Area MPO	Des Moines, IA

MPO Code	MPO Name	Area Name
2201	Dubuque Metropolitan Area Transportation Study	Dubuque, IA
3501	Johnson County COG	Iowa City, IA
1361	Linn County Reg. Planning Commission	Cedar Rapids, IA
7721	Siouxland Interstate Metropolitan Planning Council	Sioux City, IA-NE
4151	Lawrence-Douglas MPO	Lawrence, KS
8441	Topeka-Shawnee County MPO	Topeka, KS
9041	Wichita-Sedgewick County MPO	Wichita, KS
1141	Bowling Green-Warren County	Bowling Green, KY
3411	Ashland Urbanized Area	Ashland, KY
5991	Green River Area Development District	Owensboro, KY
4521	Kentuckiana Reg. Planning and Development Agency	Louisville, KY-IN
4281	Lexington-Fayette Urban County Government	Lexington, KY
0761	Capital Region Planning Commission	Baton Rouge, LA
3961	Imperial Calcasieu Regional Planning & Dev. Commission	Lake Charles, LA
3881	Lafayette City - Parish Consolidated Government	Lafayette, LA
5561	New Orleans RPC	New Orleans, LA
7681	Northwest Louisiana COG	Shreveport-Bossier City, LA
5201	Ouachita Council of Governments	Monroe, LA
0221	Rapides Area Planning Commission	Alexandria, LA
3351	Houma-Thibodaux MPO	Houma, LA
4241	Androscoggin Transportation Resource Center	Lewiston-Auburn, ME
0731	Bangor Area Comprehensive Transportation System	Bangor, ME
6401	Greater Portland COG	Portland, ME
7471	Southern Maine RPC	Sanford, ME
0721	Baltimore Metropolitan Council	Baltimore, MD
1901	Cumberland Urbanized Area	Cumberland, MD-WV
3181	Hagerstown-Eastern Panhandle MPO	Hagerstown, MD
6321	Berkshire County Regional Planning Commission	Pittsfield, MA

MPO Code	MPO Name	Area Name
1121	Boston MPO	Boston, MA
0741	Cape Cod Commission	Barnstable-Yarmouth, MA
9241	Central Massachusetts RPC	Worcester, MA
1126	Central Transportation Planning	Boston metro, MA
3101	Franklin Regional COG	Greenfield, MA
4861	Marthas Vineyard Commission	Martha's Vineyard, MA
4161	Merrimack Valley Planning Commission	Lawrence, MA
2601	Montachusett RPC	Fitchburg-Leominster, MA
5301	Nantucket Planning and Economic Devp. Commission	Nantucket, MA
4561	Northern Middlesex COG	Lowell, MA
1201	Old Colony Planning Council	Brockton, MA
8001	Pioneer Valley Planning Commission	Springfield, MA
2481	Southeastern Regional Planning and Economic Dev.	Fall River, MA
0781	Battle Creek Area Transportation Study	Battle Creek, MI
0801	Bay City Area Transportation Study	Bay City, MI
2641	Genesse County MPO	Flint, MI
3001	Grand Valley Metropolitan Council	Grand Rapids, MI
3721	Kalamazoo Area Transportation Study	Kalamazoo, MI
3311	Macatawa Area Coordinating Council	Holland, MI
3521	Region 2 Planning Commission	Jackson, MI
6961	Saginaw Co Metro Planning Commission	Saginaw-Bay City-Midland, MI
2161	Southeast Michigan COG	Detroit-Ann Arbor, MI
0871	Southwestern Michigan Commission	Benton Harbor, MI
4041	Tri-County RPC--MI	Lansing-East Lansing, MI
5291	West Michigan Shoreline RDC	Muskegon, MI
2241	Arrowhead Regional Development Commission	Duluth-Superior, MN-WI
5121	Metropolitan Council of the Twin Cities Area	Minneapolis-St. Paul, MN-WI
6821	Rochester-Olmsted COG	Rochester, MN
6981	St. Cloud Area Planning Organization	St. Cloud, MN
3561	Central Mississippi Planning and Development District	Jackson, MS
0921	Gulf Regional Planning Commission	Biloxi-Gulfport-Pascagoula, MS

MPO Code	MPO Name	Area Name
3286	Hattiesburg-Petal-Forrest-Lamar MPO	Hattiesburg, MS
1741	Columbia Area Transportation Study	Columbia, MO
7041	East-West Gateway Coordinating Council	St. Louis, MO-IL
3711	Joplin Area Transportation Study Organization	Joplin, MO
3761	Mid-America Regional Council	Kansas City, MO-KS
7921	Springfield Area Transportation Study Org.	Springfield, MO
7001	St. Joseph Area Transportation Study Organization	St. Joseph, MO
3041	Great Falls City-County Planning Board	Great Falls, MT
5141	Missoula Transportation Policy Coordinating Commit	Missoula, MT
0881	Yellowstone County Board of Planning	Billings, MT
4361	Lincoln-Lancaster MPO	Lincoln, NE
5921	Omaha-Council Bluffs Metro Area Planning Agency	Omaha, NE-IA
4121	Southern Nevada RTC	Las Vegas, NV-AZ
9371	Tahoe MPO	Zephyr Cove, NV
6721	Washoe County RTC	Reno, NV
5351	Nashua Regional Planning Commission	Nashua, NH
7061	Salem/Plaistow MPO	Salem, NH
6451	Sea Coast MPO	Portsmouth-Rochester, NH-ME
4761	Southern NH Planning Commission	Manchester, NH
5641	North Jersey Transportation Planning Authority	Newark, NJ
0561	South Jersey Transportation Planning Organization	Atlantic-Cape May, NJ
4101	Las Cruces MPO	Las Cruces, NM
0201	Mid Region MPO	Albuquerque, NM
7491	Santa Fe MPO	Santa Fe, NM
2976	Adirondack-Glens Falls Transportation Council	Glens Falls, NY
0961	Binghamton Metropolitan Transportation Study	Binghamton, NY
0161	Capital District Transportation Committee	Albany-Schenectady-Troy, NY
2336	Elmira-Chemung Transportation Committee	Elmira, NY

MPO Code	MPO Name	Area Name
6841	Genesee Transportation Council	Rochester, NY
1281	Greater Buffalo Niagara Transportation Commission	Buffalo-Niagara Falls, NY
8681	Herkimer-Oneida Counties Transportation Study	Utica-Rome, NY
3511	Ithaca-Tompkins County Transportation Council	Ithaca, NY
3836	Kingston MPO	Kingston, NY
5601	New York Metropolitan Transportation Council	New York, NY
5661	Newburgh/Orange County Transportation Council	Newburgh, NY-PA
2281	Poughkeepsie-Dutchess County Transportation Council	Dutchess County, NY
8161	Syracuse Metropolitan Transportation Council	Syracuse, NY
0481	Asheville Urban Area MPO	Asheville, NC
3111	Burlington-Graham MPO	Burlington, NC
1861	Cabarrus-South Rowan MPO	Concord, NC
6641	Capital Area MPO	Raleigh, NC
3606	City of Jacksonville	Jacksonville, NC
2261	Durham-Chapel Hill-Carrboro MPO	Durham-Chapel Hill, NC
2561	Fayetteville Area Metropolitan Planning Organization	Fayetteville, NC
2966	Gaston Urban Area MPO	Gastonia, NC
2981	Goldsboro Urbanized Area MPO	Goldsboro, NC
3121	Greensboro Urban Area MPO	Greensboro, NC
3151	Greenville Urban Area MPO	Greenville, NC
3291	Hickory-Newton-Conover MPO	Hickory-Morganton-Lenoir, NC
1521	Mecklenburg-Union MPO	Charlotte, NC
6896	Rocky Mount Urban Area MPO	Rocky Mount, NC
3301	High Point Urban Area MPO	High Point, NC
9181	Wilmington Urban Area MPO	Wilmington, NC
9201	Winston Salem/Forsyth County MPO	Winston-Salem, NC
1011	Bismarck-Mandan MPO	Bismarck, ND
2521	Fargo-Moorhead Metropolitan COG	Fargo-Moorhead, ND-MN

MPO Code	MPO Name	Area Name
2986	Grand Forks-East Grand Forks MPO	Grand Forks, ND-MN
0081	Akron Metropolitan Area Transportation Study	Akron, OH
8081	Brooke-Hancock-Jefferson Metropolitan Planning Com	Steubenville-Weirton, OH-WV
8011	Clark County-Springfield Transportation Coordinating Committee	Springfield, OH
9321	Eastgate Regional COG	Youngstown-Warren, OH
5651	Licking County Area Transportation Study	Newark, OH
4321	Lima-Allen County RPC	Lima, OH
2001	Miami Valley Regional Planning Commission	Dayton, OH
1841	Mid-Ohio RPC	Columbus, OH
1681	Northeast Ohio Areawide Coordinating Agency	Cleveland, OH
1641	Ohio-Kentucky-Indiana Regional COG	Cincinnati-Hamilton, OH-KY-IN
4801	Richland County RPC	Mansfield, OH
1321	Stark County Area Transportation Study	Canton-Massillon, OH
8401	Toledo Metropolitan Area COG	Toledo, OH
5881	Association of Central Oklahoma Governments	Oklahoma City, OK
8561	Indian Nations COG	Tulsa, OK
4201	Lawton Metropolitan Area PC	Lawton, OK
2401	Lane Council of Governments	Eugene-Springfield, OR
6441	Metro	Portland, OR
7081	Salem Keizer Area Transportation Study	Salem, OR
4991	Rogue Valley COG	Medford-Ashland, OR
0281	Blair County Planning Commission	Altoona, PA
3681	Cambria County Planning Commission	Johnstown, PA
8051	Centre Region MPO	State College, PA
6161	Delaware Valley Regional Planning Commission	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD
2361	Erie MPO	Erie, PA
7561	Lackawanna-Luzerne Transportation Study	Scranton--Wilkes-Barre--Hazleton, PA
4001	Lancaster County Transportation Coordinating Committee	Lancaster, PA
5401	Lawrence County Planning Department	New Castle, PA

MPO Code	MPO Name	Area Name
0241	Lehigh Valley Transportation Study	Allentown-Bethlehem-Easton, PA
9141	Lycoming County Planning Commission	Williamsport, PA
7611	Shenango Valley Area Transportation Study	Sharon, PA
6681	Reading Area Transportation Study	Reading, PA
6281	Southwestern Pennsylvania Commission	Pittsburgh, PA
3241	Harrisburg Area Transportation Study	Harrisburg-Lebanon-Carlisle, PA
9281	York County Planning Commission	York, PA
6481	RI Statewide Planning Program	Providence, RI
0406	Anderson MPO	Anderson, SC
1761	Central Midlands COG	Columbia, SC
1441	Charleston Area Transportation Study	Charleston, SC
2656	Florence Area Transportation Study	Florence, SC
3161	Greenville Area Transportation Study	Greenville, SC
6861	Rock Hill-Fort Mill Area Trans. Study Policy	Rock Hill, SC
7821	Spartanburg Area Transportation Study	Spartanburg, SC
8141	Sumter Area Transportation Study	Sumter, SC
2971	Waccamaw RPC	Georgetown, SC
6661	Rapid City Area MPO	Rapid City, SD
7761	Sioux Falls MPO	Sioux Falls, SD
1161	Bristol Urban Area MPO	Bristol, TN
1561	Chattanooga Urban Area MPO	Chattanooga, TN-GA
1661	Clarksville Urban Area MPO	Clarksville-Hopkinsville, TN-KY
3581	Jackson MPO	Jackson, TN
3661	Johnson City MPO	Johnson City, TN
3831	Kingsport Urban Area MPO	Kingsport, TN
3841	Knoxville MPO	Knoxville, TN
4921	Memphis MPO	Memphis, TN-AR-MS
5361	Nashville Area MPO	Nashville, TN
0041	Abilene MPO	Abilene, TX
0321	Amarillo MPO	Amarillo, TX
1241	Brownsville MPO	Brownsville, TX
1261	Bryan-College Station MPO	Bryan-College Station, TX
0641	Capital Area MPO	Austin-San Marcos, TX

MPO Code	MPO Name	Area Name
1881	Corpus Christi MPO	Corpus Christi, TX
2321	El Paso MPO	El Paso, TX
3201	Harlingen-San Benito MPO	Harlingen-San Benito, TX
4881	Hidalgo County MPO	McAllen-Edinburg-Mission, TX
3361	Houston-Galveston Area Council	Houston-Galveston, TX
3811	Killeen-Temple Urban Transportation Study	Killeen-Temple, TX
4081	Laredo Urban Transportation Study	Laredo, TX
4421	Longview MPO	Longview-Marshall, TX
4601	Lubbock MPO	Lubbock, TX
1921	North Central Texas COG	Dallas-Fort Worth, TX
5801	Permian Basin RPC	Odessa-Midland, TX
7201	San Angelo MPO	San Angelo, TX
7241	San Antonio-Bexar County MPO	San Antonio, TX
0841	South East Texas Regional Planning Commission	Beaumont-Port Arthur, TX
7641	Sherman Denison MPO	Sherman-Denison, TX
8641	Tyler MPO	Tyler, TX
8751	Victoria MPO	Victoria, TX
8801	Waco MPO	Waco, TX
9081	Wichita Falls MPO	Wichita Falls, TX
8361	Texarkana MPO	Texarkana, TX-Texarkana, AR
4411	Cache MPO	Logan, UT
6971	Dixie MPO	St George, UT
6521	Mountainland Association of Governments	Provo-Orem, UT
7161	Wasatch Front Regional Council	Salt Lake City-Ogden, UT
1306	Chittenden County MPO	Burlington, VT
6141	Crater Planning District Commission	Petersburg, VA
5721	Hampton Roads Planning District Commission	Norfolk-Virginia Beach-Newport News, VA-NC
2801	Fredericksburg Area MPO	Fredericksburg, VA
4641	Central Virginia MPO	Lynchburg, VA
6761	Richmond Regional Planning District Commission	Richmond, VA
6801	Roanoke Valley Area MPO	Roanoke, VA

MPO Code	MPO Name	Area Name
1541	Thomas Jefferson Planning District Commission	Charlottesville, VA
1951	West Piedmont Planning District Commission	Danville, VA
6741	Benton-Franklin COG	Richland-Kennewick-Pasco, WA
4416	Longview-Kelso-Rainier MPO	Longview, WA
7601	Puget Sound Regional Council	Seattle-Tacoma-Bremerton, WA
5261	Skagit COG	Mount Vernon, WA
8691	Southwest Washington Regional Transportation Council	Vancouver, WA
7841	Spokane Regional Transportation Council	Spokane, WA
5911	Thurston Regional Planning Council	Olympia, WA
8946	Wenatchee Valley Transportation Council	Wenatchee, WA
0861	Whatcom COG	Bellingham, WA
9261	Yakima Valley COG	Yakima, WA
9001	Bel-O-Mar Regional Council	Wheeling, WV-OH
3401	KYOVA Interstate Planning Commission	Huntington, WV
5251	Morgantown, WV MPO	Morgantown, WV
1481	Regional Intergovernmental Council	Charleston, WV
6021	WWW Interstate Planning Commission	Parkersburg-Marietta, WV-OH
3081	Bay-Lake Regional Planning Commission	Sheboygan, WI
3086	Brown County Planning Commission	Green Bay, WI
0461	East Central Wisconsin Regional Planning Commission	Appleton-Oshkosh-Neenah, WI
3621	Janesville Area Transportation Study	Janesville, WI
3871	La Crosse Area Planning Committee	La Crosse, WI-MN
4721	Madison Area MPO	Madison, WI
8941	Marathon County Metro Planning Commission	Wausau, WI
5081	South East Wisconsin Regional Planning Commission	Milwaukee-Racine, WI
0866	Stateline Area Transportation Study	Beloit, WI
2291	West Central Wisconsin RPC	Eau Claire, WI
1351	Casper Area Transportation Planning Process	Casper, WY
1581	Cheyenne Area Transportation Planning Process	Cheyenne, WY

15.3 CTPP 2000 Geography Types by MPO County

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Lee County, AL	01081	Auburn-Opelika	0581	TAZ
Jefferson County, AL	01073	Birmingham RPC	1001	TAZ
Shelby County, AL	01117	Birmingham RPC	1001	TAZ
Calhoun County, AL	01015	Calhoun Area MPO	0451	TAZ
Talladega County, AL	01121	Calhoun Area MPO	0451	TAZ
Lee County, AL	01081	Columbus-Phenix City Transportation Study	1801	TAZ
Russell County, AL	01113	Columbus-Phenix City Transportation Study	1801	TAZ
Calhoun County, AL	01015	Gadsen-Etowah MPO	2881	BG
Etowah County, AL	01055	Gadsen-Etowah MPO	2881	BG
Limestone County, AL	01083	Huntsville MPO	3441	BG
Madison County, AL	01089	Huntsville MPO	3441	TAZ
Autauga County, AL	01001	Montgomery Division of Planning	5241	BG
Elmore County, AL	01051	Montgomery Division of Planning	5241	BG
Montgomery County, AL	01101	Montgomery Division of Planning	5241	BG
Cullman County, AL	01043	North Central Alabama Regional COG	2031	BG
Lawrence County, AL	01079	North Central Alabama Regional COG	2031	BG
Limestone County, AL	01083	North Central Alabama Regional COG	2031	TAZ
Morgan County, AL	01103	North Central Alabama Regional COG	2031	TAZ
Colbert County, AL	01033	Northwest Alabama COG	2651	TAZ
Lauderdale County, AL	01077	Northwest Alabama COG	2651	TAZ
Mobile County, AL	01097	South Alabama RPC	5161	TAZ
Dale County, AL	01045	Southeast Wiregrass Area MPO	2181	TAZ
Henry County, AL	01067	Southeast Wiregrass Area MPO	2181	TAZ
Houston County, AL	01069	Southeast Wiregrass Area MPO	2181	TAZ
Tuscaloosa County, AL	01125	West Alabama PDC	8601	TAZ
Anchorage Municipality, AK	02020	Anchorage MATS	0381	TAZ
Fairbanks North Star Borough, AK	02090	Fairbanks MATS	2461	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Coconino County, AZ	04005	Flagstaff MPO	2621	BG
Maricopa County, AZ	04013	Maricopa Assn. Of Gov.	6201	TAZ
Pinal County, AZ	04021	Maricopa Assn. Of Gov.	6201	TAZ
Yavapai County, AZ	04025	Maricopa Assn. Of Gov.	6201	TAZ
Pima County, AZ	04019	Pima Assn. Of Gov.	8521	TAZ
Pinal County, AZ	04021	Pima Assn. Of Gov.	8521	TAZ
Yuma County, AZ	04027	Yuma MPO	9361	Tract
Garland County, AR	05051	Hot Springs MPO	3341	BG
Hot Spring County, AR	05059	Hot Springs MPO	3341	BG
Craighead County, AR	05031	Jonesboro MPO	3701	BG
Cleburne County, AR	05023	Metroplan	4401	BG
Conway County, AR	05029	Metroplan	4401	BG
Faulkner County, AR	05045	Metroplan	4401	BG
Grant County, AR	05053	Metroplan	4401	BG
Hot Spring County, AR	05059	Metroplan	4401	BG
Lonoke County, AR	05085	Metroplan	4401	BG
Perry County, AR	05105	Metroplan	4401	BG
Prairie County, AR	05117	Metroplan	4401	BG
Pulaski County, AR	05119	Metroplan	4401	BG
Saline County, AR	05125	Metroplan	4401	BG
Van Buren County, AR	05141	Metroplan	4401	BG
White County, AR	05145	Metroplan	4401	BG
Benton County, AR	05007	Northwest Arkansas RPC	2581	BG
Carroll County, AR	05015	Northwest Arkansas RPC	2581	BG
Madison County, AR	05087	Northwest Arkansas RPC	2581	BG
Washington County, AR	05143	Northwest Arkansas RPC	2581	BG
Cleveland County, AR	05025	Southeast Arkansas RPC	6241	BG
Jefferson County, AR	05069	Southeast Arkansas RPC	6241	BG
Miller County, AR	05091	Texarkana MPO	8361	TAZ
Crittenden County, AR	05035	West Memphis MPO	8951	BG
Crawford County, AR	05033	Western Arkansas PDD	2721	TAZ
Sebastian County, AR	05131	Western Arkansas PDD	2721	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Alameda County, CA	06001	Association of Monterey Bay Area Governments	7121	BG
Merced County, CA	06047	Association of Monterey Bay Area Governments	7121	BG
Monterey County, CA	06053	Association of Monterey Bay Area Governments	7121	BG
San Benito County, CA	06069	Association of Monterey Bay Area Governments	7121	BG
San Luis Obispo County, CA	06079	Association of Monterey Bay Area Governments	7121	BG
San Mateo County, CA	06081	Association of Monterey Bay Area Governments	7121	BG
Santa Clara County, CA	06085	Association of Monterey Bay Area Governments	7121	BG
Santa Cruz County, CA	06087	Association of Monterey Bay Area Governments	7121	BG
Butte County, CA	06007	Butte County Association of Governments	1621	TAZ
Fresno County, CA	06019	Council of Fresno County Governments	2841	TAZ
Kern County, CA	06029	Kern County Council of Governments	0681	TAZ
Merced County, CA	06047	Merced County Association of Governments	4941	TAZ
Alameda County, CA	06001	Metropolitan Transportation Commission-Oakland	7361	TAZ
Contra Costa County, CA	06013	Metropolitan Transportation Commission-Oakland	7361	TAZ
Marin County, CA	06041	Metropolitan Transportation Commission-Oakland	7361	TAZ
Napa County, CA	06055	Metropolitan Transportation Commission-Oakland	7361	TAZ
San Francisco County, CA	06075	Metropolitan Transportation Commission-Oakland	7361	TAZ
San Mateo County, CA	06081	Metropolitan Transportation Commission-Oakland	7361	TAZ
Santa Clara County, CA	06085	Metropolitan Transportation Commission-Oakland	7361	TAZ
Solano County, CA	06095	Metropolitan Transportation Commission-Oakland	7361	TAZ
Sonoma County, CA	06097	Metropolitan Transportation Commission-Oakland	7361	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
El Dorado County, CA	06017	Sacramento Area COG	6921	TAZ
Placer County, CA	06061	Sacramento Area COG	6921	TAZ
Sacramento County, CA	06067	Sacramento Area COG	6921	TAZ
Sutter County, CA	06101	Sacramento Area COG	6921	TAZ
Yolo County, CA	06113	Sacramento Area COG	6921	TAZ
Yuba County, CA	06115	Sacramento Area COG	6921	TAZ
San Diego County, CA	06073	San Diego Association of Governments	7321	TAZ
San Joaquin County, CA	06077	San Joaquin County COG	8121	TAZ
San Luis Obispo County, CA	06079	San Luis Obispo COG	7461	TAZ
Santa Barbara County, CA	06083	Santa Barbara County Association of Governments	7481	TAZ
Shasta County, CA	06089	Shasta County RTPA	6691	BG
Imperial County, CA	06025	Southern CA Association of Governments	4471	BG
Los Angeles County, CA	06037	Southern CA Association of Governments	4471	BG
Orange County, CA	06059	Southern CA Association of Governments	4471	BG
Riverside County, CA	06065	Southern CA Association of Governments	4471	BG
San Bernardino County, CA	06071	Southern CA Association of Governments	4471	BG
Ventura County, CA	06111	Southern CA Association of Governments	4471	BG
Stanislaus County, CA	06099	Stanislaus COG	5171	TAZ
El Dorado County, CA	06017	Tahoe MPO	9371	BG
Placer County, CA	06061	Tahoe MPO	9371	BG
Fresno County, CA	06019	Tulare County Association of Governments	8781	BG
Kern County, CA	06029	Tulare County Association of Governments	8781	BG
Kings County, CA	06031	Tulare County Association of Governments	8781	BG
Tulare County, CA	06107	Tulare County Association of Governments	8781	BG
Adams County, CO	08001	Denver Regional COG	2081	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Arapahoe County, CO	08005	Denver Regional COG	2081	TAZ
Boulder County, CO	08013	Denver Regional COG	2081	TAZ
Clear Creek County, CO	08019	Denver Regional COG	2081	TAZ
Denver County, CO	08031	Denver Regional COG	2081	TAZ
Douglas County, CO	08035	Denver Regional COG	2081	TAZ
Elbert County, CO	08039	Denver Regional COG	2081	TAZ
Gilpin County, CO	08047	Denver Regional COG	2081	TAZ
Jefferson County, CO	08059	Denver Regional COG	2081	TAZ
Park County, CO	08093	Denver Regional COG	2081	BG
Weld County, CO	08123	Denver Regional COG	2081	TAZ
Mesa County, CO	08077	Grand Valley MPO	2996	TAZ
Boulder County, CO	08013	North Front Range MPO	2671	BG
Larimer County, CO	08069	North Front Range MPO	2671	BG
Weld County, CO	08123	North Front Range MPO	2671	BG
El Paso County, CO	08041	Pikes Peak Area COG	1721	TAZ
Park County, CO	08093	Pikes Peak Area COG	1721	BG
Teller County, CO	08119	Pikes Peak Area COG	1721	BG
Pueblo County, CO	08101	Pueblo Area Council of Governments	6561	TAZ
Connecticut	**New England states are shown at the end of this file**			
New Castle County, DE	10003	Delaware Valley RPC	6161	Tract
Kent County, DE	10001	Dover/Kent Co MPO	2191	BG
Sussex County, DE	10005	Dover/Kent Co MPO	2191	BG
New Castle County, DE	10003	Wilmington Planning Council	9161	BG
District of Columbia, DC	11001	Metropolitan Washington COG	8841	TAZ
District of Columbia, DC	11001	Baltimore Metropolitan Council	0721	Tract
Brevard County, FL	12009	Brevard MPO	4901	TAZ
Broward County, FL	12011	Broward County MPO	2681	TAZ
Charlotte County, FL	12015	Charlotte County-Punta Gorda MPO	6581	TAZ
DeSoto County, FL	12027	Charlotte County-Punta Gorda MPO	6581	Tract
Lee County, FL	12071	Charlotte County-Punta Gorda MPO	6581	TAZ
Sarasota County, FL	12115	Charlotte County-Punta Gorda MPO	6581	TAZ
Collier County, FL	12021	Collier County MPO	5346	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Citrus County, FL	12017	District 7 FDOT	8281	TAZ
Hernando County, FL	12053	District 7 FDOT	8281	TAZ
Hillsborough County, FL	12057	District 7 FDOT	8281	TAZ
Manatee County, FL	12081	District 7 FDOT	8281	TAZ
Marion County, FL	12083	District 7 FDOT	8281	TAZ
Pasco County, FL	12101	District 7 FDOT	8281	TAZ
Pinellas County, FL	12103	District 7 FDOT	8281	TAZ
Polk County, FL	12105	District 7 FDOT	8281	TAZ
Duval County, FL	12031	First Coast MPO	3601	TAZ
Alachua County, FL	12001	Gainesville Urbanized Area MPO	2901	TAZ
Indian River County, FL	12061	Indian River County MPO	8701	TAZ
Charlotte County, FL	12015	Lee County MPO	2701	TAZ
Collier County, FL	12021	Lee County MPO	2701	TAZ
Lee County, FL	12071	Lee County MPO	2701	TAZ
Martin County, FL	12085	Martin County MPO	8131	BG
St. Lucie County, FL	12111	Martin County MPO	8131	BG
Orange County, FL	12095	Metroplan Orlando	5961	BG
Osceola County, FL	12097	Metroplan Orlando	5961	BG
Seminole County, FL	12117	Metroplan Orlando	5961	BG
Miami-Dade County, FL	12086	Miami-Dade MPO	5001	BG
Marion County, FL	12083	Ocala-Marion County MPO	5791	TAZ
Okaloosa County, FL	12091	Okaloosa-Walton TPO	2751	TAZ
Walton County, FL	12131	Okaloosa-Walton TPO	2751	TAZ
Palm Beach County, FL	12099	Palm Beach County MPO	8961	TAZ
Bay County, FL	12005	Panama City MPO	6016	TAZ
Escambia County, FL	12033	Pensacola MPO	6081	TAZ
Santa Rosa County, FL	12113	Pensacola MPO	6081	TAZ
Polk County, FL	12105	Polk TPO	3981	BG
Manatee County, FL	12081	Sarasota-Manatee MPO	7511	TAZ
Sarasota County, FL	12115	Sarasota-Manatee MPO	7511	TAZ
St. Lucie County, FL	12111	St. Lucie MPO	2711	BG
Leon County, FL	12073	Tallahassee-Leon County MPO	8241	TAZ
Flagler County, FL	12035	Volusia County MPO	2021	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Volusia County, FL	12127	Volusia County MPO	2021	BG
Dougherty County, GA	13095	Albany Dougherty Regional Transportation Study	0121	TAZ
Lee County, GA	13177	Albany Dougherty Regional Transportation Study	0121	TAZ
Clarke County, GA	13059	Athens Clarke Oconee Regional Transportation Study	0501	TAZ
Madison County, GA	13195	Athens Clarke Oconee Regional Transportation Study	0501	Tract
Oconee County, GA	13219	Athens Clarke Oconee Regional Transportation Study	0501	TAZ
Barrow County, GA	13013	Atlanta Regional Commission	0521	BG
Bartow County, GA	13015	Atlanta Regional Commission	0521	TAZ
Butts County, GA	13035	Atlanta Regional Commission	0521	BG
Carroll County, GA	13045	Atlanta Regional Commission	0521	BG
Cherokee County, GA	13057	Atlanta Regional Commission	0521	TAZ
Clayton County, GA	13063	Atlanta Regional Commission	0521	TAZ
Cobb County, GA	13067	Atlanta Regional Commission	0521	TAZ
Coweta County, GA	13077	Atlanta Regional Commission	0521	TAZ
Dawson County, GA	13085	Atlanta Regional Commission	0521	BG
DeKalb County, GA	13089	Atlanta Regional Commission	0521	TAZ
Douglas County, GA	13097	Atlanta Regional Commission	0521	TAZ
Fayette County, GA	13113	Atlanta Regional Commission	0521	TAZ
Forsyth County, GA	13117	Atlanta Regional Commission	0521	TAZ
Fulton County, GA	13121	Atlanta Regional Commission	0521	TAZ
Gwinnett County, GA	13135	Atlanta Regional Commission	0521	TAZ
Hall County, GA	13139	Atlanta Regional Commission	0521	BG
Haralson County, GA	13143	Atlanta Regional Commission	0521	Tract
Heard County, GA	13149	Atlanta Regional Commission	0521	Tract
Henry County, GA	13151	Atlanta Regional Commission	0521	TAZ
Jackson County, GA	13157	Atlanta Regional Commission	0521	BG
Jasper County, GA	13159	Atlanta Regional Commission	0521	Tract
Lamar County, GA	13171	Atlanta Regional Commission	0521	Tract
Meriwether County, GA	13199	Atlanta Regional Commission	0521	Tract
Newton County, GA	13217	Atlanta Regional Commission	0521	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Paulding County, GA	13223	Atlanta Regional Commission	0521	TAZ
Pickens County, GA	13227	Atlanta Regional Commission	0521	BG
Pike County, GA	13231	Atlanta Regional Commission	0521	Tract
Polk County, GA	13233	Atlanta Regional Commission	0521	Tract
Rockdale County, GA	13247	Atlanta Regional Commission	0521	TAZ
Spalding County, GA	13255	Atlanta Regional Commission	0521	BG
Troup County, GA	13285	Atlanta Regional Commission	0521	Tract
Upson County, GA	13293	Atlanta Regional Commission	0521	Tract
Walton County, GA	13297	Atlanta Regional Commission	0521	BG
Columbia County, GA	13073	Augusta Richmond County PC	0601	TAZ
Richmond County, GA	13245	Augusta Richmond County PC	0601	TAZ
Glynn County, GA	13127	Brunswick Area Transportation Study	1251	BG
Bryan County, GA	13029	Chatham County-Savannah MPC	7521	BG
Chatham County, GA	13051	Chatham County-Savannah MPC	7521	TAZ
Effingham County, GA	13103	Chatham County-Savannah MPC	7521	BG
Catoosa County, GA	13047	Chattanooga Urban Area MPO	1561	BG
Dade County, GA	13083	Chattanooga Urban Area MPO	1561	BG
Walker County, GA	13295	Chattanooga Urban Area MPO	1561	BG
Muscogee County, GA	13215	Columbus-Phenix City Transportation Study	1801	TAZ
Bibb County, GA	13021	Macon Area Transportation Study	4681	TAZ
Jones County, GA	13169	Macon Area Transportation Study	4681	TAZ
Floyd County, GA	13115	Rome-Floyd County PC	6911	BG
Houston County, GA	13153	Warner Robins MPO	8821	TAZ
Peach County, GA	13225	Warner Robins MPO	8821	TAZ
Honolulu County, HI	15003	Oahu MPO	3321	BG
Bannock County, ID	16005	Bannock Planning Organization	6341	BG
Power County, ID	16077	Bannock Planning Organization	6341	BG
Bonneville County, ID	16019	Bonneville MPO	3461	TAZ
Ada County, ID	16001	Community Planning Assoc. of Southwest Idaho	1081	TAZ
Boise County, ID	16015	Community Planning Assoc. of Southwest Idaho	1081	Tract

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Canyon County, ID	16027	Community Planning Assoc. of Southwest Idaho	1081	TAZ
Elmore County, ID	16039	Community Planning Assoc. of Southwest Idaho	1081	Tract
Gem County, ID	16045	Community Planning Assoc. of Southwest Idaho	1081	Tract
Owyhee County, ID	16073	Community Planning Assoc. of Southwest Idaho	1081	Tract
Payette County, ID	16075	Community Planning Assoc. of Southwest Idaho	1081	Tract
Kootenai County, ID	16055	Spokane RTC	7841	BG
Henry County, IL	17073	Bi-State Regional Commission	1961	TAZ
Mercer County, IL	17131	Bi-State Regional Commission	1961	TAZ
Rock Island County, IL	17161	Bi-State Regional Commission	1961	TAZ
Champaign County, IL	17019	Champaign County RPC	1401	TAZ
Boone County, IL	17007	Chicago Area Transportation Study	1601	TAZ
Cook County, IL	17031	Chicago Area Transportation Study	1601	TAZ
DeKalb County, IL	17037	Chicago Area Transportation Study	1601	Tract
DuPage County, IL	17043	Chicago Area Transportation Study	1601	TAZ
Grundy County, IL	17063	Chicago Area Transportation Study	1601	TAZ
Kane County, IL	17089	Chicago Area Transportation Study	1601	TAZ
Kankakee County, IL	17091	Chicago Area Transportation Study	1601	TAZ
Kendall County, IL	17093	Chicago Area Transportation Study	1601	TAZ
Lake County, IL	17097	Chicago Area Transportation Study	1601	TAZ
LaSalle County, IL	17099	Chicago Area Transportation Study	1601	Tract
McHenry County, IL	17111	Chicago Area Transportation Study	1601	TAZ
Will County, IL	17197	Chicago Area Transportation Study	1601	TAZ
Winnebago County, IL	17201	Chicago Area Transportation Study	1601	TAZ
Jo Daviess County, IL	17085	Dubuque MATS	2201	TAZ
Madison County, IL	17119	East-West Gateway Coordinating Council	7041	TAZ
Monroe County, IL	17133	East-West Gateway Coordinating Council	7041	TAZ
St. Clair County, IL	17163	East-West Gateway Coordinating Council	7041	TAZ
Kankakee County, IL	17091	Kankakee County RPC	3741	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Macon County, IL	17115	Macon County RPC	2041	BG
McLean County, IL	17113	McLean County RPC	1041	TAZ
Cook County, IL	17031	Northwestern Indiana RPC	2961	TAZ
DeKalb County, IL	17037	Northwestern Indiana RPC	2961	TAZ
DuPage County, IL	17043	Northwestern Indiana RPC	2961	TAZ
Grundy County, IL	17063	Northwestern Indiana RPC	2961	TAZ
Kane County, IL	17089	Northwestern Indiana RPC	2961	TAZ
Kankakee County, IL	17091	Northwestern Indiana RPC	2961	TAZ
Kendall County, IL	17093	Northwestern Indiana RPC	2961	TAZ
Lake County, IL	17097	Northwestern Indiana RPC	2961	TAZ
McHenry County, IL	17111	Northwestern Indiana RPC	2961	TAZ
Will County, IL	17197	Northwestern Indiana RPC	2961	TAZ
Boone County, IL	17007	Rockford Area Transportation Study	6881	TAZ
DeKalb County, IL	17037	Rockford Area Transportation Study	6881	BG
Ogle County, IL	17141	Rockford Area Transportation Study	6881	BG
Stephenson County, IL	17177	Rockford Area Transportation Study	6881	BG
Winnebago County, IL	17201	Rockford Area Transportation Study	6881	TAZ
Sangamon County, IL	17167	Springfield-Sangamon County RPC	7881	TAZ
Winnebago County, IL	17201	Stateline Area Transportation Study	0866	TAZ
Peoria County, IL	17143	Tri-County Regional Planning Commission	6121	TAZ
Tazewell County, IL	17179	Tri-County Regional Planning Commission	6121	TAZ
Woodford County, IL	17203	Tri-County Regional Planning Commission	6121	TAZ
Monroe County, IN	18105	Bloomington Area Transportation Study	1021	BG
Lake County, IN	18089	Chicago Area Transportation Study	1601	TAZ
Porter County, IN	18127	Chicago Area Transportation Study	1601	TAZ
Delaware County, IN	18035	Delaware-Muncie MPC	5281	TAZ
Randolph County, IN	18135	Delaware-Muncie MPC	5281	BG
Gibson County, IN	18051	Evansville Urban Transportation Study	2441	TAZ
Posey County, IN	18129	Evansville Urban Transportation Study	2441	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Vanderburgh County, IN	18163	Evansville Urban Transportation Study	2441	TAZ
Warrick County, IN	18173	Evansville Urban Transportation Study	2441	TAZ
Boone County, IN	18011	Indianapolis MPO	3481	TAZ
Hamilton County, IN	18057	Indianapolis MPO	3481	TAZ
Hancock County, IN	18059	Indianapolis MPO	3481	TAZ
Hendricks County, IN	18063	Indianapolis MPO	3481	TAZ
Johnson County, IN	18081	Indianapolis MPO	3481	TAZ
Marion County, IN	18097	Indianapolis MPO	3481	TAZ
Morgan County, IN	18109	Indianapolis MPO	3481	TAZ
Shelby County, IN	18145	Indianapolis MPO	3481	TAZ
Clark County, IN	18019	Kentuckiana Regional Planning and Development Agency	4521	TAZ
Floyd County, IN	18043	Kentuckiana Regional Planning and Development Agency	4521	TAZ
Howard County, IN	18067	Kokomo-Howard County Governmental Coordinating Council	3851	TAZ
Madison County, IN	18095	Madison County COG	0401	BG
Elkhart County, IN	18039	Michiana Area COG	7801	TAZ
Fulton County, IN	18049	Michiana Area COG	7801	BG
Kosciusko County, IN	18085	Michiana Area COG	7801	TAZ
LaGrange County, IN	18087	Michiana Area COG	7801	BG
LaPorte County, IN	18091	Michiana Area COG	7801	TAZ
Marshall County, IN	18099	Michiana Area COG	7801	TAZ
Noble County, IN	18113	Michiana Area COG	7801	TAZ
Pulaski County, IN	18131	Michiana Area COG	7801	BG
St. Joseph County, IN	18141	Michiana Area COG	7801	TAZ
Starke County, IN	18149	Michiana Area COG	7801	BG
Wabash County, IN	18169	Michiana Area COG	7801	BG
Whitley County, IN	18183	Michiana Area COG	7801	TAZ
Adams County, IN	18001	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Allen County, IN	18003	Northeastern Indiana Reg. Coordinating Council	2761	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
DeKalb County, IN	18033	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Huntington County, IN	18069	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Noble County, IN	18113	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Steuben County, IN	18151	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Wells County, IN	18179	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Whitley County, IN	18183	Northeastern Indiana Reg. Coordinating Council	2761	TAZ
Lake County, IN	18089	Northwestern Indiana RPC	2961	TAZ
LaPorte County, IN	18091	Northwestern Indiana RPC	2961	TAZ
Porter County, IN	18127	Northwestern Indiana RPC	2961	TAZ
Dearborn County, IN	18029	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Ohio County, IN	18115	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Benton County, IN	18007	Tippecanoe County Area Planning Commission	3921	Tract
Carroll County, IN	18015	Tippecanoe County Area Planning Commission	3921	Tract
Clinton County, IN	18023	Tippecanoe County Area Planning Commission	3921	Tract
Fountain County, IN	18045	Tippecanoe County Area Planning Commission	3921	Tract
Montgomery County, IN	18107	Tippecanoe County Area Planning Commission	3921	Tract
Tippecanoe County, IN	18157	Tippecanoe County Area Planning Commission	3921	TAZ
Warren County, IN	18171	Tippecanoe County Area Planning Commission	3921	Tract
White County, IN	18181	Tippecanoe County Area Planning Commission	3921	Tract
Vigo County, IN	18167	West Central Indiana Economic Development District	8321	BG
Muscatine County, IA	19139	Bi-State Regional Commission	1961	TAZ
Scott County, IA	19163	Bi-State Regional Commission	1961	TAZ
Black Hawk County, IA	19013	Black Hawk Metropolitan Area Transp. Policy Board	8921	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Bremer County, IA	19017	Black Hawk Metropolitan Area Transp. Policy Board	8921	TAZ
Buchanan County, IA	19019	Black Hawk Metropolitan Area Transp. Policy Board	8921	TAZ
Butler County, IA	19023	Black Hawk Metropolitan Area Transp. Policy Board	8921	TAZ
Chickasaw County, IA	19037	Black Hawk Metropolitan Area Transp. Policy Board	8921	TAZ
Grundy County, IA	19075	Black Hawk Metropolitan Area Transp. Policy Board	8921	TAZ
Boone County, IA	19015	Des Moines Area MPO	2121	BG
Dallas County, IA	19049	Des Moines Area MPO	2121	TAZ
Jasper County, IA	19099	Des Moines Area MPO	2121	BG
Madison County, IA	19121	Des Moines Area MPO	2121	BG
Marion County, IA	19125	Des Moines Area MPO	2121	BG
Marshall County, IA	19127	Des Moines Area MPO	2121	BG
Polk County, IA	19153	Des Moines Area MPO	2121	TAZ
Story County, IA	19169	Des Moines Area MPO	2121	BG
Warren County, IA	19181	Des Moines Area MPO	2121	TAZ
Clinton County, IA	19045	Dubuque MATS	2201	TAZ
Delaware County, IA	19055	Dubuque MATS	2201	TAZ
Dubuque County, IA	19061	Dubuque MATS	2201	TAZ
Jackson County, IA	19097	Dubuque MATS	2201	TAZ
Johnson County, IA	19103	Johnson County COG	3501	TAZ
Johnson County, IA	19103	Linn County RPC	1361	TAZ
Linn County, IA	19113	Linn County RPC	1361	TAZ
Mills County, IA	19129	Omaha-Council Bluffs Metro Area Planning Agency	5921	BG
Pottawattamie County, IA	19155	Omaha-Council Bluffs Metro Area Planning Agency	5921	TAZ
Plymouth County, IA	19149	Siouxland Interstate MPC	7721	TAZ
Woodbury County, IA	19193	Siouxland Interstate MPC	7721	TAZ
Douglas County, KS	20045	Lawrence/Douglas County MPO	4151	TAZ
Douglas County, KS	20045	Mid-America Regional Council	3761	TAZ
Johnson County, KS	20091	Mid-America Regional Council	3761	TAZ
Leavenworth County, KS	20103	Mid-America Regional Council	3761	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Miami County, KS	20121	Mid-America Regional Council	3761	TAZ
Wyandotte County, KS	20209	Mid-America Regional Council	3761	TAZ
Doniphan County, KS	20043	St. Joseph Area Transportation Study	7001	TAZ
Shawnee County, KS	20177	Topeka-Shawnee County MPO	8441	BG
Butler County, KS	20015	Wichita-Sedgwick County MPO	9041	BG
Cowley County, KS	20035	Wichita-Sedgwick County MPO	9041	BG
Harvey County, KS	20079	Wichita-Sedgwick County MPO	9041	BG
Kingman County, KS	20095	Wichita-Sedgwick County MPO	9041	BG
Reno County, KS	20155	Wichita-Sedgwick County MPO	9041	BG
Sedgwick County, KS	20173	Wichita-Sedgwick County MPO	9041	BG
Sumner County, KS	20191	Wichita-Sedgwick County MPO	9041	BG
Boyd County, KY	21019	Ashland Urbanized Area	3411	BG
Greenup County, KY	21089	Ashland Urbanized Area	3411	BG
Warren County, KY	21227	Bowling Green-Warren County	1141	TAZ
Christian County, KY	21047	Clarksville Urban Area MPO	1661	BG
Henderson County, KY	21101	Evansville Urban Transportation Study	2441	TAZ
Daviess County, KY	21059	Green River Area Development District	5991	TAZ
Bullitt County, KY	21029	Kentuckiana Regional Planning and Development Agency	4521	TAZ
Jefferson County, KY	21111	Kentuckiana Regional Planning and Development Agency	4521	TAZ
Oldham County, KY	21185	Kentuckiana Regional Planning and Development Agency	4521	TAZ
Fayette County, KY	21067	Lexington Area MPO	4281	TAZ
Jessamine County, KY	21113	Lexington Area MPO	4281	TAZ
Boone County, KY	21015	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Campbell County, KY	21037	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Gallatin County, KY	21077	Ohio-Kentucky-Indiana Regional COG	1641	BG
Grant County, KY	21081	Ohio-Kentucky-Indiana Regional COG	1641	BG
Kenton County, KY	21117	Ohio-Kentucky-Indiana Regional COG	1641	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Pendleton County, KY	21191	Ohio-Kentucky-Indiana Regional COG	1641	BG
Ascension Parish, LA	22005	Capital Region PC	0761	TAZ
East Baton Rouge Parish, LA	22033	Capital Region PC	0761	TAZ
Iberville Parish, LA	22047	Capital Region PC	0761	BG
Livingston Parish, LA	22063	Capital Region PC	0761	TAZ
West Baton Rouge Parish, LA	22121	Capital Region PC	0761	TAZ
Assumption Parish, LA	22007	Houma-Thibodaux MPO	3351	BG
Jefferson Parish, LA	22051	Houma-Thibodaux MPO	3351	TAZ
Lafourche Parish, LA	22057	Houma-Thibodaux MPO	3351	BG
St. Charles Parish, LA	22089	Houma-Thibodaux MPO	3351	BG
St. James Parish, LA	22093	Houma-Thibodaux MPO	3351	BG
St. John the Baptist Parish, LA	22095	Houma-Thibodaux MPO	3351	BG
St. Mary Parish, LA	22101	Houma-Thibodaux MPO	3351	BG
Terrebonne Parish, LA	22109	Houma-Thibodaux MPO	3351	TAZ
Calcasieu Parish, LA	22019	Imperial Calcasieu Regional Planning & Dev. Comm.	3961	TAZ
Acadia Parish, LA	22001	Lafayette Consolidated Government	3881	BG
Iberia Parish, LA	22045	Lafayette Consolidated Government	3881	BG
Lafayette Parish, LA	22055	Lafayette Consolidated Government	3881	TAZ
St. Landry Parish, LA	22097	Lafayette Consolidated Government	3881	BG
St. Martin Parish, LA	22099	Lafayette Consolidated Government	3881	BG
Vermilion Parish, LA	22113	Lafayette Consolidated Government	3881	BG
Jefferson Parish, LA	22051	New Orleans RPC	5561	TAZ
Orleans Parish, LA	22071	New Orleans RPC	5561	TAZ
Plaquemines Parish, LA	22075	New Orleans RPC	5561	TAZ
St. Bernard Parish, LA	22087	New Orleans RPC	5561	TAZ
St. Charles Parish, LA	22089	New Orleans RPC	5561	TAZ
St. James Parish, LA	22093	New Orleans RPC	5561	BG
St. John the Baptist Parish, LA	22095	New Orleans RPC	5561	BG
St. Tammany Parish, LA	22103	New Orleans RPC	5561	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Bossier Parish, LA	22015	Northwest Louisiana COG	7681	TAZ
Caddo Parish, LA	22017	Northwest Louisiana COG	7681	TAZ
Ouachita Parish, LA	22073	Ouachita COG	5201	TAZ
Rapides Parish, LA	22079	Rapides Area PC	0221	TAZ
Maine	**New England states are shown at the end of this file**			
Anne Arundel County, MD	24003	Baltimore Metropolitan Council	0721	TAZ
Baltimore County, MD	24005	Baltimore Metropolitan Council	0721	TAZ
Carroll County, MD	24013	Baltimore Metropolitan Council	0721	TAZ
Cecil County, MD	24015	Baltimore Metropolitan Council	0721	Tract
Charles County, MD	24017	Baltimore Metropolitan Council	0721	Tract
Frederick County, MD	24021	Baltimore Metropolitan Council	0721	Tract
Harford County, MD	24025	Baltimore Metropolitan Council	0721	TAZ
Howard County, MD	24027	Baltimore Metropolitan Council	0721	TAZ
Montgomery County, MD	24031	Baltimore Metropolitan Council	0721	Tract
Prince George's County, MD	24033	Baltimore Metropolitan Council	0721	Tract
Queen Anne's County, MD	24035	Baltimore Metropolitan Council	0721	Tract
Baltimore city, MD	24510	Baltimore Metropolitan Council	0721	TAZ
Allegany County, MD	24001	Cumberland Urbanized Area	1901	BG
Cecil County, MD	24015	Delaware Valley RPC	6161	Tract
Washington County, MD	24043	Hagerstown-Eastern Panhandle MPO	3181	TAZ
Anne Arundel County, MD	24003	Metropolitan Washington COG	8841	TAZ
Baltimore County, MD	24005	Metropolitan Washington COG	8841	TAZ
Calvert County, MD	24009	Metropolitan Washington COG	8841	TAZ
Carroll County, MD	24013	Metropolitan Washington COG	8841	TAZ
Charles County, MD	24017	Metropolitan Washington COG	8841	TAZ
Frederick County, MD	24021	Metropolitan Washington COG	8841	TAZ
Harford County, MD	24025	Metropolitan Washington COG	8841	TAZ
Howard County, MD	24027	Metropolitan Washington COG	8841	TAZ
Montgomery County, MD	24031	Metropolitan Washington COG	8841	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Prince George's County, MD	24033	Metropolitan Washington COG	8841	TAZ
Queen Anne's County, MD	24035	Metropolitan Washington COG	8841	TAZ
St. Mary's County, MD	24037	Metropolitan Washington COG	8841	TAZ
Washington County, MD	24043	Metropolitan Washington COG	8841	TAZ
Baltimore city, MD	24510	Metropolitan Washington COG	8841	TAZ
Cecil County, MD	24015	Wilmington Planning Council	9161	BG
Massachusetts	**New England states are shown at the end of this file**			
Calhoun County, MI	26025	Battle Creek Area Transportation Study	0781	TAZ
Bay County, MI	26017	Bay City Area Transportation Study	0801	TAZ
Genesee County, MI	26049	Genesee County MPO	2641	TAZ
Lapeer County, MI	26087	Genesee County MPO	2641	TAZ
Livingston County, MI	26093	Genesee County MPO	2641	TAZ
Oakland County, MI	26125	Genesee County MPO	2641	TAZ
Saginaw County, MI	26145	Genesee County MPO	2641	TAZ
Shiawassee County, MI	26155	Genesee County MPO	2641	TAZ
Tuscola County, MI	26157	Genesee County MPO	2641	TAZ
Kent County, MI	26081	Grand Valley Metro Council	3001	TAZ
Ottawa County, MI	26139	Grand Valley Metro Council	3001	TAZ
Allegan County, MI	26005	Kalamazoo Area Transportation Study	3721	TAZ
Barry County, MI	26015	Kalamazoo Area Transportation Study	3721	TAZ
Calhoun County, MI	26025	Kalamazoo Area Transportation Study	3721	TAZ
Kalamazoo County, MI	26077	Kalamazoo Area Transportation Study	3721	TAZ
Kent County, MI	26081	Kalamazoo Area Transportation Study	3721	TAZ
Van Buren County, MI	26159	Kalamazoo Area Transportation Study	3721	TAZ
Allegan County, MI	26005	Macatawa Area Coordinating Council	3311	TAZ
Kent County, MI	26081	Macatawa Area Coordinating Council	3311	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Muskegon County, MI	26121	Macatawa Area Coordinating Council	3311	TAZ
Ottawa County, MI	26139	Macatawa Area Coordinating Council	3311	TAZ
Berrien County, MI	26021	Michiana Area COG	7801	TAZ
Cass County, MI	26027	Michiana Area COG	7801	TAZ
Hillsdale County, MI	26059	Region 2 Planning Commission	3521	BG
Jackson County, MI	26075	Region 2 Planning Commission	3521	TAZ
Lenawee County, MI	26091	Region 2 Planning Commission	3521	BG
Bay County, MI	26017	Saginaw Metropolitan Area Transportation Study	6961	BG
Genesee County, MI	26049	Saginaw Metropolitan Area Transportation Study	6961	BG
Gratiot County, MI	26057	Saginaw Metropolitan Area Transportation Study	6961	BG
Midland County, MI	26111	Saginaw Metropolitan Area Transportation Study	6961	BG
Saginaw County, MI	26145	Saginaw Metropolitan Area Transportation Study	6961	TAZ
Shiawassee County, MI	26155	Saginaw Metropolitan Area Transportation Study	6961	BG
Tuscola County, MI	26157	Saginaw Metropolitan Area Transportation Study	6961	BG
Livingston County, MI	26093	Southeast Michigan COG	2161	TAZ
Macomb County, MI	26099	Southeast Michigan COG	2161	TAZ
Monroe County, MI	26115	Southeast Michigan COG	2161	TAZ
Oakland County, MI	26125	Southeast Michigan COG	2161	TAZ
St. Clair County, MI	26147	Southeast Michigan COG	2161	TAZ
Washtenaw County, MI	26161	Southeast Michigan COG	2161	TAZ
Wayne County, MI	26163	Southeast Michigan COG	2161	TAZ
Berrien County, MI	26021	Southwestern Michigan Commission	0871	BG
Cass County, MI	26027	Southwestern Michigan Commission	0871	BG
Van Buren County, MI	26159	Southwestern Michigan Commission	0871	BG
Monroe County, MI	26115	Toledo Metropolitan Area COG	8401	TAZ
Clinton County, MI	26037	Tri-County RPC	4041	TAZ
Eaton County, MI	26045	Tri-County RPC	4041	TAZ
Ingham County, MI	26065	Tri-County RPC	4041	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Muskegon County, MI	26121	West Michigan Shoreline RDC	5291	TAZ
Ottawa County, MI	26139	West Michigan Shoreline RDC	5291	TAZ
St. Louis County, MN	27137	Arrowhead RDC	2241	TAZ
Clay County, MN	27027	Fargo-Moorhead Metropolitan COG	2521	TAZ
Polk County, MN	27119	Grand Forks-East Grand Forks MPO	2986	TAZ
Houston County, MN	27055	La Crosse Area Planning Committee	3871	TAZ
Winona County, MN	27169	La Crosse Area Planning Committee	3871	TAZ
Anoka County, MN	27003	Metropolitan Council of the Twin Cities Area	5121	TAZ
Carver County, MN	27019	Metropolitan Council of the Twin Cities Area	5121	TAZ
Chisago County, MN	27025	Metropolitan Council of the Twin Cities Area	5121	TAZ
Dakota County, MN	27037	Metropolitan Council of the Twin Cities Area	5121	TAZ
Goodhue County, MN	27049	Metropolitan Council of the Twin Cities Area	5121	TAZ
Hennepin County, MN	27053	Metropolitan Council of the Twin Cities Area	5121	TAZ
Isanti County, MN	27059	Metropolitan Council of the Twin Cities Area	5121	TAZ
Le Sueur County, MN	27079	Metropolitan Council of the Twin Cities Area	5121	TAZ
McLeod County, MN	27085	Metropolitan Council of the Twin Cities Area	5121	TAZ
Mille Lacs County, MN	27095	Metropolitan Council of the Twin Cities Area	5121	TAZ
Ramsey County, MN	27123	Metropolitan Council of the Twin Cities Area	5121	TAZ
Rice County, MN	27131	Metropolitan Council of the Twin Cities Area	5121	TAZ
Scott County, MN	27139	Metropolitan Council of the Twin Cities Area	5121	TAZ
Sherburne County, MN	27141	Metropolitan Council of the Twin Cities Area	5121	TAZ
Sibley County, MN	27143	Metropolitan Council of the Twin Cities Area	5121	TAZ
Washington County, MN	27163	Metropolitan Council of the Twin Cities Area	5121	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Wright County, MN	27171	Metropolitan Council of the Twin Cities Area	5121	TAZ
Olmsted County, MN	27109	Rochester-Olmsted COG	6821	TAZ
Benton County, MN	27009	St. Cloud Area Planning Organization	6981	BG
Sherburne County, MN	27141	St. Cloud Area Planning Organization	6981	BG
Stearns County, MN	27145	St. Cloud Area Planning Organization	6981	BG
Hinds County, MS	28049	Central Mississippi Planning & Development District	3561	BG
Madison County, MS	28089	Central Mississippi Planning & Development District	3561	BG
Rankin County, MS	28121	Central Mississippi Planning & Development District	3561	BG
Hancock County, MS	28045	Gulf RPC	0921	BG
Harrison County, MS	28047	Gulf RPC	0921	BG
Jackson County, MS	28059	Gulf RPC	0921	BG
Forrest County, MS	28035	Hattiesburg-Petal-Forrest-Lamar MPO	3286	TAZ
Lamar County, MS	28073	Hattiesburg-Petal-Forrest-Lamar MPO	3286	TAZ
DeSoto County, MS	28033	Memphis MPO	4921	BG
Boone County, MO	29019	Columbia Area Transportation Study	1741	TAZ
Franklin County, MO	29071	East-West Gateway Coordinating Council	7041	TAZ
Jefferson County, MO	29099	East-West Gateway Coordinating Council	7041	TAZ
St. Charles County, MO	29183	East-West Gateway Coordinating Council	7041	TAZ
St. Louis County, MO	29189	East-West Gateway Coordinating Council	7041	TAZ
St. Louis city, MO	29510	East-West Gateway Coordinating Council	7041	TAZ
Jasper County, MO	29097	Joplin Area Transportation Study Organization	3711	BG
Newton County, MO	29145	Joplin Area Transportation Study Organization	3711	BG
Cass County, MO	29037	Mid-America Regional Council	3761	TAZ
Clay County, MO	29047	Mid-America Regional Council	3761	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Clinton County, MO	29049	Mid-America Regional Council	3761	TAZ
Jackson County, MO	29095	Mid-America Regional Council	3761	TAZ
Lafayette County, MO	29107	Mid-America Regional Council	3761	TAZ
Platte County, MO	29165	Mid-America Regional Council	3761	TAZ
Ray County, MO	29177	Mid-America Regional Council	3761	TAZ
Christian County, MO	29043	Springfield Area Transportation Study Organization	7921	TAZ
Greene County, MO	29077	Springfield Area Transportation Study Organization	7921	TAZ
Andrew County, MO	29003	St. Joseph Area Transportation Study	7001	TAZ
Buchanan County, MO	29021	St. Joseph Area Transportation Study	7001	TAZ
Cascade County, MT	30013	Great Falls City-County Planning Board	3041	BG
Missoula County, MT	30063	Missoula Transportation Policy Coordinating Committee	5141	BG
Yellowstone County, MT	30111	Yellowstone County Board of Planning	0881	Tract
Lancaster County, NE	31109	Lincoln-Lancaster MPO	4361	TAZ
Douglas County, NE	31055	Omaha-Council Bluffs Metro Area Planning Agency	5921	TAZ
Sarpy County, NE	31153	Omaha-Council Bluffs Metro Area Planning Agency	5921	TAZ
Washington County, NE	31177	Omaha-Council Bluffs Metro Area Planning Agency	5921	TAZ
Dakota County, NE	31043	Siouxland Interstate MPC	7721	TAZ
Clark County, NV	32003	Southern Nevada RTC	4121	Tract
Douglas County, NV	32005	Tahoe MPO	9371	BG
Washoe County, NV	32031	Tahoe MPO	9371	BG
Carson City, NV	32510	Tahoe MPO	9371	BG
Washoe County, NV	32031	Washoe County RTC	6721	TAZ
New Hampshire	**New England states are shown at the end of this file**			
Atlantic County, NJ	34001	Delaware Valley RPC	6161	TAZ
Burlington County, NJ	34005	Delaware Valley RPC	6161	TAZ
Camden County, NJ	34007	Delaware Valley RPC	6161	TAZ
Cumberland County, NJ	34011	Delaware Valley RPC	6161	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Gloucester County, NJ	34015	Delaware Valley RPC	6161	TAZ
Hunterdon County, NJ	34019	Delaware Valley RPC	6161	Tract
Mercer County, NJ	34021	Delaware Valley RPC	6161	TAZ
Middlesex County, NJ	34023	Delaware Valley RPC	6161	Tract
Monmouth County, NJ	34025	Delaware Valley RPC	6161	Tract
Ocean County, NJ	34029	Delaware Valley RPC	6161	Tract
Salem County, NJ	34033	Delaware Valley RPC	6161	TAZ
Somerset County, NJ	34035	Delaware Valley RPC	6161	Tract
Bergen County, NJ	34003	New York MTC	5601	BG
Essex County, NJ	34013	New York MTC	5601	BG
Hudson County, NJ	34017	New York MTC	5601	BG
Hunterdon County, NJ	34019	New York MTC	5601	BG
Mercer County, NJ	34021	New York MTC	5601	BG
Middlesex County, NJ	34023	New York MTC	5601	BG
Monmouth County, NJ	34025	New York MTC	5601	BG
Morris County, NJ	34027	New York MTC	5601	BG
Ocean County, NJ	34029	New York MTC	5601	BG
Passaic County, NJ	34031	New York MTC	5601	BG
Somerset County, NJ	34035	New York MTC	5601	BG
Sussex County, NJ	34037	New York MTC	5601	BG
Union County, NJ	34039	New York MTC	5601	BG
Warren County, NJ	34041	New York MTC	5601	BG
Bergen County, NJ	34003	North Jersey Transportation Planning Authority	5641	BG
Essex County, NJ	34013	North Jersey Transportation Planning Authority	5641	BG
Hudson County, NJ	34017	North Jersey Transportation Planning Authority	5641	BG
Hunterdon County, NJ	34019	North Jersey Transportation Planning Authority	5641	BG
Middlesex County, NJ	34023	North Jersey Transportation Planning Authority	5641	BG
Monmouth County, NJ	34025	North Jersey Transportation Planning Authority	5641	BG
Morris County, NJ	34027	North Jersey Transportation Planning Authority	5641	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Ocean County, NJ	34029	North Jersey Transportation Planning Authority	5641	BG
Passaic County, NJ	34031	North Jersey Transportation Planning Authority	5641	BG
Somerset County, NJ	34035	North Jersey Transportation Planning Authority	5641	BG
Sussex County, NJ	34037	North Jersey Transportation Planning Authority	5641	BG
Union County, NJ	34039	North Jersey Transportation Planning Authority	5641	BG
Warren County, NJ	34041	North Jersey Transportation Planning Authority	5641	BG
Atlantic County, NJ	34001	South Jersey Transportation Planning Organization	0561	Tract
Cape May County, NJ	34009	South Jersey Transportation Planning Organization	0561	Tract
Cumberland County, NJ	34011	South Jersey Transportation Planning Organization	0561	Tract
Salem County, NJ	34033	South Jersey Transportation Planning Organization	0561	Tract
Doña Ana County, NM	35013	El Paso MPO	2321	TAZ
Doña Ana County, NM	35013	Las Cruces MPO	4101	TAZ
Bernalillo County, NM	35001	Mid Region COG	0201	TAZ
Sandoval County, NM	35043	Mid Region COG	0201	TAZ
Torrance County, NM	35057	Mid Region COG	0201	TAZ
Valencia County, NM	35061	Mid Region COG	0201	TAZ
Santa Fe County, NM	35049	Santa Fe MPO	7491	BG
Saratoga County, NY	36091	Adirondack-Glens Falls Transportation Council	2976	TAZ
Warren County, NY	36113	Adirondack-Glens Falls Transportation Council	2976	TAZ
Washington County, NY	36115	Adirondack-Glens Falls Transportation Council	2976	TAZ
Broome County, NY	36007	Binghamton Metropolitan Transportation Study	0961	TAZ
Tioga County, NY	36107	Binghamton Metropolitan Transportation Study	0961	TAZ
Albany County, NY	36001	Capital District Transportation Committee	0161	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Rensselaer County, NY	36083	Capital District Transportation Committee	0161	TAZ
Saratoga County, NY	36091	Capital District Transportation Committee	0161	TAZ
Schenectady County, NY	36093	Capital District Transportation Committee	0161	TAZ
Chemung County, NY	36015	Elmira-Chemung Transportation Council	2336	TAZ
Genesee County, NY	36037	Genesee Transportation Council	6841	Tract
Livingston County, NY	36051	Genesee Transportation Council	6841	TAZ
Monroe County, NY	36055	Genesee Transportation Council	6841	TAZ
Ontario County, NY	36069	Genesee Transportation Council	6841	TAZ
Orleans County, NY	36073	Genesee Transportation Council	6841	Tract
Seneca County, NY	36099	Genesee Transportation Council	6841	Tract
Wayne County, NY	36117	Genesee Transportation Council	6841	TAZ
Wyoming County, NY	36121	Genesee Transportation Council	6841	Tract
Yates County, NY	36123	Genesee Transportation Council	6841	Tract
Erie County, NY	36029	Greater Buffalo Niagara Transportation Commission	1281	TAZ
Niagara County, NY	36063	Greater Buffalo Niagara Transportation Commission	1281	TAZ
Herkimer County, NY	36043	Herkimer-Oneida Counties Transportation Study	8681	TAZ
Oneida County, NY	36065	Herkimer-Oneida Counties Transportation Study	8681	TAZ
Tompkins County, NY	36109	Ithaca-Tompkins County Transportation Council	3511	TAZ
Ulster County, NY	36111	Kingston MPO	3836	BG
Bronx County, NY	36005	New York MTC	5601	BG
Dutchess County, NY	36027	New York MTC	5601	BG
Kings County, NY	36047	New York MTC	5601	BG
Nassau County, NY	36059	New York MTC	5601	BG
New York County, NY	36061	New York MTC	5601	BG
Orange County, NY	36071	New York MTC	5601	BG
Putnam County, NY	36079	New York MTC	5601	BG
Queens County, NY	36081	New York MTC	5601	BG
Richmond County, NY	36085	New York MTC	5601	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Rockland County, NY	36087	New York MTC	5601	BG
Suffolk County, NY	36103	New York MTC	5601	BG
Sullivan County, NY	36105	New York MTC	5601	BG
Ulster County, NY	36111	New York MTC	5601	BG
Westchester County, NY	36119	New York MTC	5601	BG
Orange County, NY	36071	Newburgh-Orange County Transportation Council	5661	TAZ
Columbia County, NY	36021	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Dutchess County, NY	36027	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Orange County, NY	36071	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Putnam County, NY	36079	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Rockland County, NY	36087	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Ulster County, NY	36111	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Westchester County, NY	36119	Poughkeepsie-Dutchess County Transportation Council	2281	BG
Madison County, NY	36053	Syracuse Metropolitan Transportation Council	8161	BG
Onondaga County, NY	36067	Syracuse Metropolitan Transportation Council	8161	TAZ
Oswego County, NY	36075	Syracuse Metropolitan Transportation Council	8161	BG
Buncombe County, NC	37021	Asheville Urban Area MPO	0481	BG
Haywood County, NC	37087	Asheville Urban Area MPO	0481	BG
Henderson County, NC	37089	Asheville Urban Area MPO	0481	BG
Madison County, NC	37115	Asheville Urban Area MPO	0481	BG
Transylvania County, NC	37175	Asheville Urban Area MPO	0481	BG
Alamance County, NC	37001	Burlington-Graham MPO	3111	BG
Guilford County, NC	37081	Burlington-Graham MPO	3111	BG
Orange County, NC	37135	Burlington-Graham MPO	3111	BG
Cabarrus County, NC	37025	Cabarrus-South Rowan MPO	1861	TAZ
Rowan County, NC	37159	Cabarrus-South Rowan MPO	1861	TAZ
Chatham County, NC	37037	Capital Area MPO	6641	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Franklin County, NC	37069	Capital Area MPO	6641	TAZ
Harnett County, NC	37085	Capital Area MPO	6641	TAZ
Johnston County, NC	37101	Capital Area MPO	6641	TAZ
Wake County, NC	37183	Capital Area MPO	6641	TAZ
Onslow County, NC	37133	City of Jacksonville	3606	TAZ
Alamance County, NC	37001	Durham-Chapel Hill-Carrboro MPO	2261	BG
Chatham County, NC	37037	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Durham County, NC	37063	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Franklin County, NC	37069	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Granville County, NC	37077	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Harnett County, NC	37085	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Johnston County, NC	37101	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Orange County, NC	37135	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Person County, NC	37145	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Wake County, NC	37183	Durham-Chapel Hill-Carrboro MPO	2261	TAZ
Cumberland County, NC	37051	Fayetteville Area MPO	2561	TAZ
Harnett County, NC	37085	Fayetteville Area MPO	2561	TAZ
Hoke County, NC	37093	Fayetteville Area MPO	2561	BG
Gaston County, NC	37071	Gaston Urban Area MPO	2966	TAZ
Wayne County, NC	37191	Goldsboro Urbanized Area MPO	2981	TAZ
Guilford County, NC	37081	Greensboro Urban Area MPO	3121	BG
Pitt County, NC	37147	Greenville Urban Area MPO	3151	TAZ
Alexander County, NC	37003	Hickory-Newton-Conover MPO	3291	TAZ
Burke County, NC	37023	Hickory-Newton-Conover MPO	3291	TAZ
Caldwell County, NC	37027	Hickory-Newton-Conover MPO	3291	TAZ
Catawba County, NC	37035	Hickory-Newton-Conover MPO	3291	TAZ
Davidson County, NC	37057	High Point Urban Area MPO	3301	BG
Forsyth County, NC	37067	High Point Urban Area MPO	3301	BG
Guilford County, NC	37081	High Point Urban Area MPO	3301	BG
Randolph County, NC	37151	High Point Urban Area MPO	3301	BG
Mecklenburg County, NC	37119	Mecklenburg-Union MPO	1521	TAZ
Union County, NC	37179	Mecklenburg-Union MPO	1521	TAZ
Edgecombe County, NC	37065	Rocky Mount Urban Area MPO	6896	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Nash County, NC	37127	Rocky Mount Urban Area MPO	6896	BG
Brunswick County, NC	37019	Wilmington Urban Area MPO	9181	BG
New Hanover County, NC	37129	Wilmington Urban Area MPO	9181	TAZ
Pender County, NC	37141	Wilmington Urban Area MPO	9181	Tract
Davidson County, NC	37057	Winston Salem/Forsyth County MPO	9201	BG
Davie County, NC	37059	Winston Salem/Forsyth County MPO	9201	BG
Forsyth County, NC	37067	Winston Salem/Forsyth County MPO	9201	TAZ
Stokes County, NC	37169	Winston Salem/Forsyth County MPO	9201	BG
Burleigh County, ND	38015	Bismarck-Mandan MPO	1011	BG
Morton County, ND	38059	Bismarck-Mandan MPO	1011	BG
Cass County, ND	38017	Fargo-Moorhead Metropolitan COG	2521	TAZ
Grand Forks County, ND	38035	Grand Forks-East Grand Forks MPO	2986	TAZ
Ashtabula County, OH	39007	Akron Metropolitan Area Transportation Study	0081	TAZ
Carroll County, OH	39019	Akron Metropolitan Area Transportation Study	0081	Tract
Columbiana County, OH	39029	Akron Metropolitan Area Transportation Study	0081	Tract
Cuyahoga County, OH	39035	Akron Metropolitan Area Transportation Study	0081	TAZ
Geauga County, OH	39055	Akron Metropolitan Area Transportation Study	0081	TAZ
Lake County, OH	39085	Akron Metropolitan Area Transportation Study	0081	TAZ
Lorain County, OH	39093	Akron Metropolitan Area Transportation Study	0081	TAZ
Mahoning County, OH	39099	Akron Metropolitan Area Transportation Study	0081	TAZ
Medina County, OH	39103	Akron Metropolitan Area Transportation Study	0081	TAZ
Portage County, OH	39133	Akron Metropolitan Area Transportation Study	0081	TAZ
Stark County, OH	39151	Akron Metropolitan Area Transportation Study	0081	TAZ
Summit County, OH	39153	Akron Metropolitan Area Transportation Study	0081	TAZ
Trumbull County, OH	39155	Akron Metropolitan Area Transportation Study	0081	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Wayne County, OH	39169	Akron Metropolitan Area Transportation Study	0081	TAZ
Belmont County, OH	39013	Bel-O-Mar Regional Council	9001	TAZ
Jefferson County, OH	39081	Brooke-Hancock-Jefferson MPC	8081	TAZ
Clark County, OH	39023	Clark County-Springfield Transportation Coord. Committee	8011	TAZ
Mahoning County, OH	39099	Eastgate Regional COG	9321	TAZ
Trumbull County, OH	39155	Eastgate Regional COG	9321	TAZ
Lawrence County, OH	39087	KYOVA Interstate Planning Commission	3401	TAZ
Fairfield County, OH	39045	Licking County Area Transportation Study	5651	BG
Licking County, OH	39089	Licking County Area Transportation Study	5651	TAZ
Perry County, OH	39127	Licking County Area Transportation Study	5651	BG
Allen County, OH	39003	Lima-Allen County RPC	4321	TAZ
Greene County, OH	39057	Miami Valley RPC	2001	TAZ
Miami County, OH	39109	Miami Valley RPC	2001	TAZ
Montgomery County, OH	39113	Miami Valley RPC	2001	TAZ
Delaware County, OH	39041	Mid-Ohio RPC	1841	BG
Fairfield County, OH	39045	Mid-Ohio RPC	1841	BG
Franklin County, OH	39049	Mid-Ohio RPC	1841	BG
Licking County, OH	39089	Mid-Ohio RPC	1841	BG
Madison County, OH	39097	Mid-Ohio RPC	1841	BG
Pickaway County, OH	39129	Mid-Ohio RPC	1841	BG
Union County, OH	39159	Mid-Ohio RPC	1841	BG
Ashtabula County, OH	39007	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Cuyahoga County, OH	39035	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Geauga County, OH	39055	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Lake County, OH	39085	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Lorain County, OH	39093	Northeast Ohio Areawide Coordinating Agency	1681	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Medina County, OH	39103	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Portage County, OH	39133	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Stark County, OH	39151	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Summit County, OH	39153	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Trumbull County, OH	39155	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Wayne County, OH	39169	Northeast Ohio Areawide Coordinating Agency	1681	TAZ
Brown County, OH	39015	Ohio-Kentucky-Indiana Regional COG	1641	BG
Butler County, OH	39017	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Clermont County, OH	39025	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Greene County, OH	39057	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Hamilton County, OH	39061	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Miami County, OH	39109	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Montgomery County, OH	39113	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Warren County, OH	39165	Ohio-Kentucky-Indiana Regional COG	1641	TAZ
Richland County, OH	39139	Richland County RPC	4801	BG
Carroll County, OH	39019	Stark County Area Transportation Study	1321	Tract
Stark County, OH	39151	Stark County Area Transportation Study	1321	TAZ
Fulton County, OH	39051	Toledo Metropolitan Area COG	8401	BG
Lucas County, OH	39095	Toledo Metropolitan Area COG	8401	TAZ
Ottawa County, OH	39123	Toledo Metropolitan Area COG	8401	TAZ
Sandusky County, OH	39143	Toledo Metropolitan Area COG	8401	TAZ
Wood County, OH	39173	Toledo Metropolitan Area COG	8401	TAZ
Washington County, OH	39167	WWW Interstate Planning Commission	6021	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Canadian County, OK	40017	Association of Central Oklahoma Governments	5881	TAZ
Cleveland County, OK	40027	Association of Central Oklahoma Governments	5881	TAZ
Grady County, OK	40051	Association of Central Oklahoma Governments	5881	TAZ
Logan County, OK	40083	Association of Central Oklahoma Governments	5881	TAZ
McClain County, OK	40087	Association of Central Oklahoma Governments	5881	TAZ
Oklahoma County, OK	40109	Association of Central Oklahoma Governments	5881	TAZ
Pottawatomie County, OK	40125	Association of Central Oklahoma Governments	5881	TAZ
Creek County, OK	40037	Indian Nations COG	8561	TAZ
Mayes County, OK	40097	Indian Nations COG	8561	Tract
Muskogee County, OK	40101	Indian Nations COG	8561	Tract
Okmulgee County, OK	40111	Indian Nations COG	8561	Tract
Osage County, OK	40113	Indian Nations COG	8561	TAZ
Pawnee County, OK	40117	Indian Nations COG	8561	Tract
Rogers County, OK	40131	Indian Nations COG	8561	BG
Tulsa County, OK	40143	Indian Nations COG	8561	TAZ
Wagoner County, OK	40145	Indian Nations COG	8561	TAZ
Washington County, OK	40147	Indian Nations COG	8561	Tract
Comanche County, OK	40031	Lawton Metropolitan Area PC	4201	TAZ
Le Flore County, OK	40079	Western Arkansas PDD	2721	BG
Sequoyah County, OK	40135	Western Arkansas PDD	2721	TAZ
Malheur County, OR	41045	Community Planning Assoc. of Southwest Idaho	1081	Tract
Lane County, OR	41039	Lane Council of Governments	2401	TAZ
Clackamas County, OR	41005	Metro	6441	BG
Multnomah County, OR	41051	Metro	6441	BG
Washington County, OR	41067	Metro	6441	BG
Jackson County, OR	41029	Rogue Valley MPO	4991	BG
Marion County, OR	41047	Salem Keizer Area Transportation Study	7081	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Polk County, OR	41053	Salem Keizer Area Transportation Study	7081	BG
Adams County, PA	42001	Baltimore Metropolitan Council	0721	Tract
York County, PA	42133	Baltimore Metropolitan Council	0721	Tract
Susquehanna County, PA	42115	Binghamton Metropolitan Transportation Study	0961	BG
Blair County, PA	42013	Blair County Planning Commission	0281	Tract
Cambria County, PA	42021	Cambria County Planning Commission	3681	BG
Centre County, PA	42027	Centre Region MPO	8051	TAZ
Berks County, PA	42011	Delaware Valley RPC	6161	TAZ
Bucks County, PA	42017	Delaware Valley RPC	6161	TAZ
Chester County, PA	42029	Delaware Valley RPC	6161	TAZ
Delaware County, PA	42045	Delaware Valley RPC	6161	TAZ
Lancaster County, PA	42071	Delaware Valley RPC	6161	TAZ
Lehigh County, PA	42077	Delaware Valley RPC	6161	TAZ
Montgomery County, PA	42091	Delaware Valley RPC	6161	TAZ
Northampton County, PA	42095	Delaware Valley RPC	6161	TAZ
Philadelphia County, PA	42101	Delaware Valley RPC	6161	TAZ
Erie County, PA	42049	Erie MPO	2361	BG
Franklin County, PA	42055	Hagerstown-Eastern Panhandle MPO	3181	TAZ
Cumberland County, PA	42041	Harrisburg Area Transportation Study	3241	TAZ
Dauphin County, PA	42043	Harrisburg Area Transportation Study	3241	TAZ
Lancaster, PA	42071	Harrisburg Area Transportation Study	3241	TAZ
Lebanon County, PA	42075	Harrisburg Area Transportation Study	3241	BG
Perry County, PA	42099	Harrisburg Area Transportation Study	3241	TAZ
York County, PA	42133	Harrisburg Area Transportation Study	3241	TAZ
Lackawanna County, PA	42069	Lackawanna-Luzerne Transportation Study	7561	BG
Luzerne County, PA	42079	Lackawanna-Luzerne Transportation Study	7561	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Lancaster County, PA	42071	Lancaster County Transp. Coordinating Committee	4001	BG
Lawrence County, PA	42073	Lawrence County Planning Department	5401	BG
Carbon County, PA	42025	Lehigh Valley Transportation Study	0241	Tract
Lehigh County, PA	42077	Lehigh Valley Transportation Study	0241	TAZ
Northampton County, PA	42095	Lehigh Valley Transportation Study	0241	TAZ
Lycoming County, PA	42081	Lycoming County Planning Commission	9141	BG
Adams County, PA	42001	Metopolitan Washington COG	8841	Tract
Franklin County, PA	42055	Metopolitan Washington COG	8841	Tract
York County, PA	42133	Metopolitan Washington COG	8841	Tract
Berks County, PA	42011	Reading Area Transportation Study	6681	TAZ
Mercer County, PA	42085	Shenango Valley Area Transportation Study	7611	Tract
Allegheny County, PA	42003	Southwestern Pennsylvania Commission	6281	BG
Armstrong County, PA	42005	Southwestern Pennsylvania Commission	6281	BG
Beaver County, PA	42007	Southwestern Pennsylvania Commission	6281	BG
Butler County, PA	42019	Southwestern Pennsylvania Commission	6281	BG
Fayette County, PA	42051	Southwestern Pennsylvania Commission	6281	BG
Greene County, PA	42059	Southwestern Pennsylvania Commission	6281	BG
Indiana County, PA	42063	Southwestern Pennsylvania Commission	6281	BG
Washington County, PA	42125	Southwestern Pennsylvania Commission	6281	BG
Westmoreland County, PA	42129	Southwestern Pennsylvania Commission	6281	BG
York County, PA	42133	York County PC	9281	TAZ
Rhode Island	**New England states are shown at the end of this file**			
Anderson County, SI	45007	Anderson Area Transportation Study	0406	TAZ
Aiken County, SI	45003	Augusta Richmond County PC	0601	TAZ
Lexington County, SI	45063	Central Midlands COG	1761	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Richland County, SI	45079	Central Midlands COG	1761	TAZ
Berkeley County, SI	45015	Charleston Area Transportation Study	1441	TAZ
Charleston County, SI	45019	Charleston Area Transportation Study	1441	TAZ
Dorchester County, SI	45035	Charleston Area Transportation Study	1441	TAZ
Darlington County, SI	45031	Florence Area Transportation Study	2656	TAZ
Florence County, SI	45041	Florence Area Transportation Study	2656	TAZ
Anderson County, SI	45007	Greenville Area Transportation Study	3161	TAZ
Greenville County, SI	45045	Greenville Area Transportation Study	3161	TAZ
Laurens County, SI	45059	Greenville Area Transportation Study	3161	TAZ
Pickens County, SI	45077	Greenville Area Transportation Study	3161	TAZ
Spartanburg County, SI	45083	Greenville Area Transportation Study	3161	TAZ
York County, SI	45091	Rock Hill-Fort Mill Area Transportation Study	6861	TAZ
Spartanburg County, SI	45083	Spartanburg Area Transportation Study	7821	TAZ
Sumter County, SI	45085	Sumter Area Transportation Study	8141	TAZ
Georgetown County, SI	45043	Waccamaw RPC	2971	TAZ
Horry County, SI	45051	Waccamaw RPC	2971	TAZ
Meade County, SD	46093	Rapid City Area MPO	6661	BG
Pennington County, SD	46103	Rapid City Area MPO	6661	BG
Lincoln County, SD	46083	Sioux Falls MPO	7761	TAZ
Minnehaha County, SD	46099	Sioux Falls MPO	7761	TAZ
Union County, SD	46127	Siouxland Interstate MPC	7721	TAZ
Sullivan County, TN	47163	Bristol Urban Area MPO	1161	TAZ
Hamilton County, TN	47065	Chattanooga Urban Area MPO	1561	BG
Marion County, TN	47115	Chattanooga Urban Area MPO	1561	BG
Montgomery County, TN	47125	Clarksville Urban Area MPO	1661	BG
Madison County, TN	47113	Jackson MPO	3581	TAZ
Carter County, TN	47019	Johnson City MPO	3661	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Unicoi County, TN	47171	Johnson City MPO	3661	Tract
Washington County, TN	47179	Johnson City MPO	3661	TAZ
Hawkins County, TN	47073	Kingsport Urban Area MPO	3831	BG
Sullivan County, TN	47163	Kingsport Urban Area MPO	3831	BG
Washington County, TN	47179	Kingsport Urban Area MPO	3831	BG
Anderson County, TN	47001	Knoxville MPO	3841	BG
Blount County, TN	47009	Knoxville MPO	3841	TAZ
Knox County, TN	47093	Knoxville MPO	3841	TAZ
Loudon County, TN	47105	Knoxville MPO	3841	BG
Sevier County, TN	47155	Knoxville MPO	3841	BG
Union County, TN	47173	Knoxville MPO	3841	BG
Fayette County, TN	47047	Memphis MPO	4921	BG
Shelby County, TN	47157	Memphis MPO	4921	TAZ
Cheatham County, TN	47021	Nashville Area MPO	5361	BG
Davidson County, TN	47037	Nashville Area MPO	5361	BG
Dickson County, TN	47043	Nashville Area MPO	5361	BG
Maury County, TN	47119	Nashville Area MPO	5361	BG
Montgomery County, TN	47125	Nashville Area MPO	5361	BG
Robertson County, TN	47147	Nashville Area MPO	5361	BG
Rutherford County, TN	47149	Nashville Area MPO	5361	BG
Sumner County, TN	47165	Nashville Area MPO	5361	BG
Williamson County, TN	47187	Nashville Area MPO	5361	BG
Wilson County, TN	47189	Nashville Area MPO	5361	TAZ
Jones County, TX	48253	Abilene MPO	0041	TAZ
Taylor County, TX	48441	Abilene MPO	0041	TAZ
Potter County, TX	48375	Amarillo MPO	0321	TAZ
Randall County, TX	48381	Amarillo MPO	0321	TAZ
Cameron County, TX	48061	Brownsville MPO	1241	TAZ
Brazos County, TX	48041	Bryan-College Station MPO	1261	TAZ
Bastrop County, TX	48021	Capital Area MPO	0641	TAZ
Caldwell County, TX	48055	Capital Area MPO	0641	TAZ
Hays County, TX	48209	Capital Area MPO	0641	TAZ
Travis County, TX	48453	Capital Area MPO	0641	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Williamson County, TX	48491	Capital Area MPO	0641	TAZ
Nueces County, TX	48355	Corpus Christi MPO	1881	TAZ
San Patricio County, TX	48409	Corpus Christi MPO	1881	TAZ
El Paso County, TX	48141	El Paso MPO	2321	TAZ
Cameron County, TX	48061	Harlingen-San Benito MPO	3201	TAZ
Hidalgo County, TX	48215	Hidalgo County MPO	4881	TAZ
Brazoria County, TX	48039	Houston-Galveston Area Council	3361	TAZ
Chambers County, TX	48071	Houston-Galveston Area Council	3361	TAZ
Fort Bend County, TX	48157	Houston-Galveston Area Council	3361	TAZ
Galveston County, TX	48167	Houston-Galveston Area Council	3361	TAZ
Harris County, TX	48201	Houston-Galveston Area Council	3361	TAZ
Liberty County, TX	48291	Houston-Galveston Area Council	3361	TAZ
Montgomery County, TX	48339	Houston-Galveston Area Council	3361	TAZ
Waller County, TX	48473	Houston-Galveston Area Council	3361	TAZ
Bell County, TX	48027	Killeen-Temple Urban Transportation Study	3811	TAZ
Coryell County, TX	48099	Killeen-Temple Urban Transportation Study	3811	TAZ
Lampasas County, TX	48281	Killeen-Temple Urban Transportation Study	3811	TAZ
Webb County, TX	48479	Laredo Urban Transportation Study	4081	TAZ
Gregg County, TX	48183	Longview MPO	4421	TAZ
Harrison County, TX	48203	Longview MPO	4421	TAZ
Rusk County, TX	48401	Longview MPO	4421	TAZ
Smith County, TX	48423	Longview MPO	4421	TAZ
Upshur County, TX	48459	Longview MPO	4421	TAZ
Lubbock County, TX	48303	Lubbock MPO	4601	TAZ
Collin County, TX	48085	North Central Texas COG	1921	TAZ
Dallas County, TX	48113	North Central Texas COG	1921	TAZ
Denton County, TX	48121	North Central Texas COG	1921	TAZ
Ellis County, TX	48139	North Central Texas COG	1921	TAZ
Johnson County, TX	48251	North Central Texas COG	1921	TAZ
Kaufman County, TX	48257	North Central Texas COG	1921	TAZ
Navarro County, TX	48349	North Central Texas COG	1921	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Palo Pinto County, TX	48363	North Central Texas COG	1921	TAZ
Parker County, TX	48367	North Central Texas COG	1921	TAZ
Rockwall County, TX	48397	North Central Texas COG	1921	TAZ
Tarrant County, TX	48439	North Central Texas COG	1921	TAZ
Wise County, TX	48497	North Central Texas COG	1921	TAZ
Ector County, TX	48135	Permian Basin RPC	5801	Tract
Midland County, TX	48329	Permian Basin RPC	5801	Tract
Tom Green County, TX	48451	San Angelo MPO	7201	TAZ
Bexar County, TX	48029	San Antonio-Bexar County MPO	7241	TAZ
Comal County, TX	48091	San Antonio-Bexar County MPO	7241	TAZ
Guadalupe County, TX	48187	San Antonio-Bexar County MPO	7241	TAZ
Wilson County, TX	48493	San Antonio-Bexar County MPO	7241	TAZ
Grayson County, TX	48181	Sherman-Denison MPO	7641	TAZ
Hardin County, TX	48199	South East Texas RPC	0841	TAZ
Jefferson County, TX	48245	South East Texas RPC	0841	TAZ
Orange County, TX	48361	South East Texas RPC	0841	TAZ
Bowie County, TX	48037	Texarkana MPO	8361	TAZ
Smith County, TX	48423	Tyler MPO	8641	TAZ
Victoria County, TX	48469	Victoria MPO	8751	TAZ
McLennan County, TX	48309	Waco MPO	8801	TAZ
Archer County, TX	48009	Wichita Falls MPO	9081	TAZ
Clay County, TX	48077	Wichita Falls MPO	9081	TAZ
Wichita County, TX	48485	Wichita Falls MPO	9081	TAZ
Cache County, UT	49005	Cache MPO	4411	TAZ
Washington County, UT	49053	Dixie MPO	6971	BG
Summit County, UT	49043	Mountainland Association of Governments	6521	BG
Utah County, UT	49049	Mountainland Association of Governments	6521	TAZ
Wasatch County, UT	49051	Mountainland Association of Governments	6521	BG
Davis County, UT	49011	Wasatch Front Regional Council	7161	TAZ
Morgan County, UT	49029	Wasatch Front Regional Council	7161	TAZ
Salt Lake County, UT	49035	Wasatch Front Regional Council	7161	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Tooele County, UT	49045	Wasatch Front Regional Council	7161	TAZ
Utah County, UT	49049	Wasatch Front Regional Council	7161	TAZ
Weber County, UT	49057	Wasatch Front Regional Council	7161	TAZ
Vermont	**New England states are shown at the end of this file**			
Arlington County, VA	51013	Baltimore Metropolitan Council	0721	Tract
Fairfax County, VA	51059	Baltimore Metropolitan Council	0721	Tract
Loudoun County, VA	51107	Baltimore Metropolitan Council	0721	Tract
Prince William County, VA	51153	Baltimore Metropolitan Council	0721	Tract
Alexandria city, VA	51510	Baltimore Metropolitan Council	0721	Tract
Fairfax city, VA	51600	Baltimore Metropolitan Council	0721	Tract
Falls Church city, VA	51610	Baltimore Metropolitan Council	0721	Tract
Manassas city, VA	51683	Baltimore Metropolitan Council	0721	Tract
Manassas Park city, VA	51685	Baltimore Metropolitan Council	0721	Tract
Washington County, VA	51191	Bristol Urban Area MPO	1161	TAZ
Bristol city, VA	51520	Bristol Urban Area MPO	1161	TAZ
Amherst County, VA	51009	Central Virginia MPO	4641	BG
Bedford County, VA	51019	Central Virginia MPO	4641	BG
Campbell County, VA	51031	Central Virginia MPO	4641	BG
Lynchburg city, VA	51680	Central Virginia MPO	4641	BG
Chesterfield County, VA	51041	Crater Planning District Commission	6141	TAZ
Dinwiddie County, VA	51053	Crater Planning District Commission	6141	TAZ
Prince George County, VA	51149	Crater Planning District Commission	6141	TAZ
Colonial Heights city, VA	51570	Crater Planning District Commission	6141	TAZ
Hopewell city, VA	51670	Crater Planning District Commission	6141	TAZ
Petersburg city, VA	51730	Crater Planning District Commission	6141	TAZ
Caroline County, VA	51033	Fredericksburg Area MPO	2801	BG
King George County, VA	51099	Fredericksburg Area MPO	2801	TAZ
Spotsylvania County, VA	51177	Fredericksburg Area MPO	2801	TAZ
Stafford County, VA	51179	Fredericksburg Area MPO	2801	TAZ
Fredericksburg city, VA	51630	Fredericksburg Area MPO	2801	TAZ
Gloucester County, VA	51073	Hampton Roads PDC	5721	TAZ
Isle of Wight County, VA	51093	Hampton Roads PDC	5721	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
James City County, VA	51095	Hampton Roads PDC	5721	TAZ
York County, VA	51199	Hampton Roads PDC	5721	TAZ
Chesapeake city, VA	51550	Hampton Roads PDC	5721	TAZ
Hampton city, VA	51650	Hampton Roads PDC	5721	TAZ
Newport News city, VA	51700	Hampton Roads PDC	5721	TAZ
Norfolk city, VA	51710	Hampton Roads PDC	5721	TAZ
Poquoson city, VA	51735	Hampton Roads PDC	5721	TAZ
Portsmouth city, VA	51740	Hampton Roads PDC	5721	TAZ
Suffolk city, VA	51800	Hampton Roads PDC	5721	TAZ
Virginia Beach city, VA	51810	Hampton Roads PDC	5721	TAZ
Williamsburg city, VA	51830	Hampton Roads PDC	5721	TAZ
Scott County, VA	51169	Kingsport Urban Area MPO	3831	BG
Arlington County, VA	51013	Metropolitan Washington COG	8841	TAZ
Caroline County, VA	51033	Metropolitan Washington COG	8841	Tract
Clarke County, VA	51043	Metropolitan Washington COG	8841	TAZ
Culpeper County, VA	51047	Metropolitan Washington COG	8841	TAZ
Essex County, VA	51057	Metropolitan Washington COG	8841	Tract
Fairfax County, VA	51059	Metropolitan Washington COG	8841	TAZ
Fauquier County, VA	51061	Metropolitan Washington COG	8841	TAZ
Frederick County, VA	51069	Metropolitan Washington COG	8841	Tract
King George County, VA	51099	Metropolitan Washington COG	8841	TAZ
Loudoun County, VA	51107	Metropolitan Washington COG	8841	TAZ
Orange County, VA	51137	Metropolitan Washington COG	8841	Tract
Prince William County, VA	51153	Metropolitan Washington COG	8841	TAZ
Rappahannock County, VA	51157	Metropolitan Washington COG	8841	Tract
Spotsylvania County, VA	51177	Metropolitan Washington COG	8841	TAZ
Stafford County, VA	51179	Metropolitan Washington COG	8841	TAZ
Warren County, VA	51187	Metropolitan Washington COG	8841	TAZ
Westmoreland County, VA	51193	Metropolitan Washington COG	8841	Tract
Alexandria city, VA	51510	Metropolitan Washington COG	8841	TAZ
Fairfax city, VA	51600	Metropolitan Washington COG	8841	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Falls Church city, VA	51610	Metropolitan Washington COG	8841	TAZ
Fredericksburg city, VA	51630	Metropolitan Washington COG	8841	TAZ
Manassas city, VA	51683	Metropolitan Washington COG	8841	TAZ
Manassas Park city, VA	51685	Metropolitan Washington COG	8841	TAZ
Winchester city, VA	51840	Metropolitan Washington COG	8841	Tract
Charles City County, VA	51036	Richmond Regional PDC	6761	TAZ
Chesterfield County, VA	51041	Richmond Regional PDC	6761	TAZ
Goochland County, VA	51075	Richmond Regional PDC	6761	TAZ
Hanover County, VA	51085	Richmond Regional PDC	6761	TAZ
Henrico County, VA	51087	Richmond Regional PDC	6761	TAZ
New Kent County, VA	51127	Richmond Regional PDC	6761	TAZ
Powhatan County, VA	51145	Richmond Regional PDC	6761	TAZ
Richmond city, VA	51760	Richmond Regional PDC	6761	TAZ
Bedford County, VA	51019	Roanoke Valley Area MPO	6801	BG
Botetourt County, VA	51023	Roanoke Valley Area MPO	6801	TAZ
Roanoke County, VA	51161	Roanoke Valley Area MPO	6801	TAZ
Roanoke city, VA	51770	Roanoke Valley Area MPO	6801	TAZ
Salem city, VA	51775	Roanoke Valley Area MPO	6801	TAZ
Albemarle County, VA	51003	Thomas Jefferson PDC	1541	TAZ
Augusta County, VA	51015	Thomas Jefferson PDC	1541	Tract
Fluvanna County, VA	51065	Thomas Jefferson PDC	1541	Tract
Greene County, VA	51079	Thomas Jefferson PDC	1541	Tract
Louisa County, VA	51109	Thomas Jefferson PDC	1541	Tract
Nelson County, VA	51125	Thomas Jefferson PDC	1541	Tract
Orange County, VA	51137	Thomas Jefferson PDC	1541	Tract
Charlottesville city, VA	51540	Thomas Jefferson PDC	1541	TAZ
Pittsylvania County, VA	51143	West Piedmont RPC	1951	TAZ
Danville city, VA	51590	West Piedmont RPC	1951	TAZ
Benton County, WA	53005	Benton-Franklin COG	6741	TAZ
Franklin County, WA	53021	Benton-Franklin COG	6741	TAZ
Walla Walla County, WA	53071	Benton-Franklin COG	6741	TAZ
Cowlitz County, WA	53015	Longview-Kelso-Rainier MPO	4416	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Grays Harbor County, WA	53027	Longview-Kelso-Rainier MPO	4416	BG
Lewis County, WA	53041	Longview-Kelso-Rainier MPO	4416	BG
Pacific County, WA	53049	Longview-Kelso-Rainier MPO	4416	BG
Wahkiakum County, WA	53069	Longview-Kelso-Rainier MPO	4416	BG
Clallam County, WA	53009	Puget Sound Regional Council	7601	Tract
Island County, WA	53029	Puget Sound Regional Council	7601	BG
Jefferson County, WA	53031	Puget Sound Regional Council	7601	Tract
King County, WA	53033	Puget Sound Regional Council	7601	TAZ
Kitsap County, WA	53035	Puget Sound Regional Council	7601	TAZ
Mason County, WA	53045	Puget Sound Regional Council	7601	Tract
Pierce County, WA	53053	Puget Sound Regional Council	7601	TAZ
Skagit County, WA	53057	Puget Sound Regional Council	7601	TAZ
Snohomish County, WA	53061	Puget Sound Regional Council	7601	TAZ
Thurston County, WA	53067	Puget Sound Regional Council	7601	BG
Island County, WA	53029	Skagit COG	5261	BG
San Juan County, WA	53055	Skagit COG	5261	BG
Skagit County, WA	53057	Skagit COG	5261	TAZ
Snohomish County, WA	53061	Skagit COG	5261	BG
Whatcom County, WA	53073	Skagit COG	5261	TAZ
Clark County, WA	53011	Southwest Washington Regional Transp. Council	8691	BG
Spokane County, WA	53063	Spokane RTC	7841	TAZ
Grays Harbor County, WA	53027	Thurston RPC	5911	Tract
Lewis County, WA	53041	Thurston RPC	5911	Tract
Mason County, WA	53045	Thurston RPC	5911	Tract
Pierce County, WA	53053	Thurston RPC	5911	Tract
Thurston County, WA	53067	Thurston RPC	5911	TAZ
Chelan County, WA	53007	Wenatchee Valley Transportation Council	8946	BG
Douglas County, WA	53017	Wenatchee Valley Transportation Council	8946	BG
Okanogan County, WA	53047	Wenatchee Valley Transportation Council	8946	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Island County, WA	53029	Whatcom COG	0861	BG
San Juan County, WA	53055	Whatcom COG	0861	BG
Skagit County, WA	53057	Whatcom COG	0861	TAZ
Snohomish County, WA	53061	Whatcom COG	0861	Tract
Whatcom County, WA	53073	Whatcom COG	0861	TAZ
Yakima County, WA	53077	Yakima Valley COG	9261	TAZ
Marshall County, WV	54051	Bel-O-Mar Regional Council	9001	TAZ
Ohio County, WV	54069	Bel-O-Mar Regional Council	9001	TAZ
Brooke County, WV	54009	Brooke-Hancock-Jefferson MPC	8081	TAZ
Hancock County, WV	54029	Brooke-Hancock-Jefferson MPC	8081	TAZ
Mineral County, WV	54057	Cumberland Urbanized Area	1901	Tract
Berkeley County, WV	54003	Hagerstown-Eastern Panhandle MPO	3181	TAZ
Jefferson County, WV	54037	Hagerstown-Eastern Panhandle MPO	3181	TAZ
Cabell County, WV	54011	KYOVA Interstate Planning Commission	3401	TAZ
Wayne County, WV	54099	KYOVA Interstate Planning Commission	3401	TAZ
Berkeley County, WV	54003	Metropolitan Washington COG	8841	TAZ
Hampshire County, WV	54027	Metropolitan Washington COG	8841	Tract
Jefferson County, WV	54037	Metropolitan Washington COG	8841	TAZ
Monongalia County, WV	54061	Morgantown, WV MPO	5251	TAZ
Boone County, WV	54005	Regional Intergovernmental Council	1481	TAZ
Clay County, WV	54015	Regional Intergovernmental Council	1481	TAZ
Kanawha County, WV	54039	Regional Intergovernmental Council	1481	TAZ
Putnam County, WV	54079	Regional Intergovernmental Council	1481	TAZ
Wood County, WV	54107	WWW Interstate Planning Commission	6021	TAZ
Douglas County, WI	55031	Arrowhead RDC	2241	TAZ
Sheboygan County, WI	55117	Bay-Lake RPC	3081	TAZ
Brown County, WI	55009	Brown County Planning Commission	3086	TAZ
Kenosha County, WI	55059	Chicago Area Transportation Study	1601	TAZ
Racine County, WI	55101	Chicago Area Transportation Study	1601	TAZ
Rock County, WI	55105	Chicago Area Transportation Study	1601	TAZ

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Walworth County, WI	55127	Chicago Area Transportation Study	1601	TAZ
Grant County, WI	55043	Dubuque MATS	2201	TAZ
Calumet County, WI	55015	East Central Wisconsin RPC	0461	TAZ
Fond du Lac County, WI	55039	East Central Wisconsin RPC	0461	TAZ
Outagamie County, WI	55087	East Central Wisconsin RPC	0461	TAZ
Winnebago County, WI	55139	East Central Wisconsin RPC	0461	TAZ
Rock County, WI	55105	Janesville Area Transportation Study	3621	TAZ
La Crosse County, WI	55063	La Crosse Area Planning Committee	3871	TAZ
Monroe County, WI	55081	La Crosse Area Planning Committee	3871	Tract
Trempealeau County, WI	55121	La Crosse Area Planning Committee	3871	Tract
Vernon County, WI	55123	La Crosse Area Planning Committee	3871	Tract
Dane County, WI	55025	Madison Area MPO	4721	TAZ
Marathon County, WI	55073	Marathon County Metro Planning Commission	8941	TAZ
Dunn County, WI	55033	Metropolitan Council of the Twin Cities Area	5121	Tract
Pierce County, WI	55093	Metropolitan Council of the Twin Cities Area	5121	TAZ
Polk County, WI	55095	Metropolitan Council of the Twin Cities Area	5121	TAZ
St. Croix County, WI	55109	Metropolitan Council of the Twin Cities Area	5121	TAZ
Rock County, WI	55105	Rockford Area Transportation Study	6881	TAZ
Kenosha County, WI	55059	South East Wisconsin RPC	5081	BG
Milwaukee County, WI	55079	South East Wisconsin RPC	5081	BG
Ozaukee County, WI	55089	South East Wisconsin RPC	5081	BG
Racine County, WI	55101	South East Wisconsin RPC	5081	BG
Walworth County, WI	55127	South East Wisconsin RPC	5081	BG
Washington County, WI	55131	South East Wisconsin RPC	5081	BG
Waukesha County, WI	55133	South East Wisconsin RPC	5081	BG
Rock County, WI	55105	Stateline Area Transportation Study	0866	TAZ
Chippewa County, WI	55017	West Central Wisconsin RPC	2291	TAZ
Eau Claire County, WI	55035	West Central Wisconsin RPC	2291	TAZ
Natrona County, WY	56025	Casper Area Transportation Planning Process	1351	BG

County	FIPS STCOU	MPO Name	MPO Code	2000 CTPP Geography
Laramie County, WY	56021	Cheyenne Area Transportation Planning Process	1581	BG

					2000 CTPP Geography
Hartford County, CT	09003	02060	CAPITOL	0910	
Hartford County, CT	09003	05910	CAPITOL	0910	TAZ
Hartford County, CT	09003	12270	CAPITOL	0910	TAZ
Hartford County, CT	09003	22070	CAPITOL	0910	TAZ
Hartford County, CT	09003	22630	CAPITOL	0910	TAZ
Hartford County, CT	09003	24800	CAPITOL	0910	TAZ
Hartford County, CT	09003	25990	CAPITOL	0910	TAZ
Hartford County, CT	09003	27600	CAPITOL	0910	TAZ
Hartford County, CT	09003	31240	CAPITOL	0910	TAZ
Hartford County, CT	09003	32640	CAPITOL	0910	TAZ
Hartford County, CT	09003	37070	CAPITOL	0910	TAZ
Hartford County, CT	09003	44700	CAPITOL	0910	TAZ
Hartford County, CT	09003	45820	CAPITOL	0910	TAZ
Hartford County, CT	09003	52140	CAPITOL	0910	TAZ
Hartford County, CT	09003	65370	CAPITOL	0910	TAZ
Hartford County, CT	09003	68940	CAPITOL	0910	TAZ
Hartford County, CT	09003	71390	CAPITOL	0910	TAZ
Hartford County, CT	09003	74540	CAPITOL	0910	TAZ
Hartford County, CT	09003	82590	CAPITOL	0910	TAZ
Hartford County, CT	09003	84900	CAPITOL	0910	TAZ
Hartford County, CT	09003	87000	CAPITOL	0910	TAZ
Hartford County, CT	09003	87070	CAPITOL	0910	TAZ
Tolland County, CT	09013	01080	CAPITOL	0910	TAZ
Tolland County, CT	09013	06260	CAPITOL	0910	TAZ
Tolland County, CT	09013	25360	CAPITOL	0910	TAZ
Tolland County, CT	09013	37910	CAPITOL	0910	TAZ
Tolland County, CT	09013	69220	CAPITOL	0910	TAZ
Tolland County, CT	09013	76290	CAPITOL	0910	TAZ
Tolland County, CT	09013	78250	CAPITOL	0910	TAZ
Hartford County, CT	09003	04300	CENTRAL CONNECTICUT	0909	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Hartford County, CT	09003	08490	CENTRAL CONNECTICUT	0909	TAZ
Hartford County, CT	09003	10100	CENTRAL CONNECTICUT	0909	TAZ
Hartford County, CT	09003	50440	CENTRAL CONNECTICUT	0909	TAZ
Hartford County, CT	09003	60120	CENTRAL CONNECTICUT	0909	TAZ
Hartford County, CT	09003	70550	CENTRAL CONNECTICUT	0909	TAZ
Litchfield County, CT	09005	60750	CENTRAL CONNECTICUT	0909	TAZ
Litchfield County, CT	09005	04930	CENTRAL NAUGATUCK VALLEY	0905	TAZ
Litchfield County, CT	09005	75730	CENTRAL NAUGATUCK VALLEY	0905	TAZ
Litchfield County, CT	09005	80490	CENTRAL NAUGATUCK VALLEY	0905	TAZ
Litchfield County, CT	09005	87910	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	03250	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	14160	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	46940	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	49950	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	58300	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	62290	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	69640	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	80070	CENTRAL NAUGATUCK VALLEY	0905	TAZ
New Haven County, CT	09009	87560	CENTRAL NAUGATUCK VALLEY	0905	TAZ
Windham County, CT	09015	all	Central Transportation Planning	1126	TAZ
Middlesex County, CT	09007	14300	CONNECTICUT RIVER ESTUARY	0912	TAZ
Middlesex County, CT	09007	15350	CONNECTICUT RIVER ESTUARY	0912	TAZ
Middlesex County, CT	09007	19130	CONNECTICUT RIVER ESTUARY	0912	TAZ

			CONNECTICUT RIVER ESTUARY	0912	TAZ
Middlesex County, CT	09007	40710	CONNECTICUT RIVER ESTUARY	0912	TAZ
			ESTUARY		
Middlesex County, CT	09007	81680	CONNECTICUT RIVER ESTUARY	0912	TAZ
New London County, CT	09011	44210	CONNECTICUT RIVER ESTUARY	0912	TAZ
New London County, CT	09011	57040	CONNECTICUT RIVER ESTUARY	0912	TAZ
Fairfield County, CT	09001	23890	GREATER BRIDGEPORT	0907	TAZ
Fairfield County, CT	09001	48620	GREATER BRIDGEPORT	0907	TAZ
Fairfield County, CT	09001	77200	GREATER BRIDGEPORT	0907	TAZ
Fairfield County, CT	09001	08980	HOUSATONIC VALLEY	0902	TAZ
Fairfield County, CT	09001	50860	HOUSATONIC VALLEY	0902	TAZ
Fairfield County, CT	09001	63480	HOUSATONIC VALLEY	0902	TAZ
Fairfield County, CT	09001	68310	HOUSATONIC VALLEY	0902	TAZ
Litchfield County, CT	09005	52630	HOUSATONIC VALLEY	0902	TAZ
Litchfield County, CT	09005	02760	LITCHFIELD HILLS	0904	TAZ
Litchfield County, CT	09005	32290	LITCHFIELD HILLS	0904	
Litchfield County, CT	09005	37280	LITCHFIELD HILLS	0904	TAZ
Litchfield County, CT	09005	43370	LITCHFIELD HILLS	0904	TAZ
Litchfield County, CT	09005	49460	LITCHFIELD HILLS	0904	TAZ
Litchfield County, CT	09005	51350	LITCHFIELD HILLS	0904	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Litchfield County, CT	09005	53470	LITCHFIELD HILLS	0904	TAZ
Litchfield County, CT	09005	76570	LITCHFIELD HILLS	0904	TAZ
Litchfield County, CT	09005	86440	LITCHFIELD HILLS	0904	TAZ
Middlesex County, CT	09007	18080	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	20810	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	22280	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	22490	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	35230	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	47080	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	47360	MIDSTATE	0911	TAZ
Middlesex County, CT	09007	61800	MIDSTATE	0911	TAZ
Fairfield County, CT	09001	all	New York MTC	5601	BG
Litchfield County, CT	09005	all	New York MTC	5601	BG
New Haven County, CT	09009	all	New York MTC	5601	BG
Tolland County, CT	09013	77830	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	09190	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	12130	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	21860	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	40500	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	59980	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	61030	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	62710	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	73420	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	75870	NORTHEASTERN CONN	0915	TAZ
Windham County, CT	09015	88190	NORTHEASTERN CONN	0915	TAZ
Litchfield County, CT	09005	10940	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	17240	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	40290	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	54030	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	65930	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	66420	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	67960	NORTHWESTERN CONN	0903	TAZ
Litchfield County, CT	09005	79510	NORTHWESTERN CONN	0903	TAZ

Litchfield County, CT	09005				
New Haven County, CT	09009				
New Haven County, CT	09009				
New Haven County, CT	09009				
New Haven County, CT	09009				
New Haven County, CT	09009				
New Haven County, CT	09009				
New Haven County, CT	09009				
Fairfield County, CT	09001				
Fairfield County, CT	09001				
Fairfield County, CT	09001				
Fairfield County, CT	09001				
New London County, CT	09011				
New London County, CT	09011	23400			TAZ
New London County, CT	09011	29910	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	33900	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	34250	SOUTHEASTERN	0913	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
New London County, CT	09011	42600	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	43230	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	48900	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	52350	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	55500	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	56270	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	62150	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	66210	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	71670	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	73770	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	78600	SOUTHEASTERN	0913	TAZ
New London County, CT	09011	80280	SOUTHEASTERN	0913	TAZ
Tolland County, CT	09013	72090	UNDEFINED TOWNS	0916	TAZ
Fairfield County, CT	09001	68170	VALLEY	0906	TAZ
New Haven County, CT	09009	01220	VALLEY	0906	TAZ
New Haven County, CT	09009	19550	VALLEY	0906	TAZ
New Haven County, CT	09009	67610	VALLEY	0906	TAZ
New London County, CT	09011	42390	WINDHAM	0914	TAZ
Tolland County, CT	09013	16400	WINDHAM	0914	TAZ
Tolland County, CT	09013	17800	WINDHAM	0914	TAZ
Tolland County, CT	09013	44910	WINDHAM	0914	TAZ
Tolland County, CT	09013	85950	WINDHAM	0914	TAZ
Windham County, CT	09015	01430	WINDHAM	0914	TAZ
Windham County, CT	09015	13810	WINDHAM	0914	TAZ
Windham County, CT	09015	36000	WINDHAM	0914	TAZ
Windham County, CT	09015	67400	WINDHAM	0914	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Windham County, CT	09015	86790	WINDHAM	0914	TAZ
Androscoggin County, ME	23001	02060	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	19105	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	29255	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	38565	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	38740	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	40035	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	40665	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	40770	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	44585	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	46160	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	60020	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	64570	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	77800	Androscoggin Transportation Resource Center	4241	TAZ
Androscoggin County, ME	23001	79585	Androscoggin Transportation Resource Center	4241	TAZ
Cumberland County, ME	23005	08430	Androscoggin Transportation Resource Center	4241	TAZ
Cumberland County, ME	23005	26525	Androscoggin Transportation Resource Center	4241	TAZ
Cumberland County, ME	23005	48820	Androscoggin Transportation Resource Center	4241	TAZ
Cumberland County, ME	23005	60685	Androscoggin Transportation Resource Center	4241	TAZ
Kennebec County, ME	23011	40175	Androscoggin Transportation Resource Center	4241	TAZ
Kennebec County, ME	23011	46405	Androscoggin Transportation Resource Center	4241	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Kennebec County, ME	23011	80880	Androscoggin Transportation Resource Center	4241	TAZ
Kennebec County, ME	23011	86970	Androscoggin Transportation Resource Center	4241	TAZ
Sagadahoc County, ME	23023	03355	Androscoggin Transportation Resource Center	4241	TAZ
Sagadahoc County, ME	23023	06260	Androscoggin Transportation Resource Center	4241	TAZ
Sagadahoc County, ME	23023	76960	Androscoggin Transportation Resource Center	4241	TAZ
Sagadahoc County, ME	23023	81930	Androscoggin Transportation Resource Center	4241	TAZ
Penobscot County, ME	23019	02795	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	06680	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	06925	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	22535	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	27645	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	30795	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	32510	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	33490	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	45670	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	55225	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	55565	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	55680	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	57937	Bangor Area Comprehensive Transportation Study	0731	TAZ
Penobscot County, ME	23019	78780	Bangor Area Comprehensive Transportation Study	0731	TAZ
York County, ME	23031	00275	Central Transportation Planning	1126	TAZ
York County, ME	23031	00730	Central Transportation Planning	1126	TAZ

York County, ME	23031				
York County, ME	23031				
York County, ME	23031				
York County, ME	23031				
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York County, ME	23031				
York County, ME	23031				
York County, ME	23031				
York County, ME	23031				
Androscoggin County, ME	23001				
Cumberland County, ME	23005	10180	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	15430	Greater Portland COG	6401	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Cumberland County, ME	23005	24495	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	26525	Greater Portland COG	6401	BG
Cumberland County, ME	23005	28240	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	28870	Greater Portland COG	6401	Tract
Cumberland County, ME	23005	31390	Greater Portland COG	6401	Tract
Cumberland County, ME	23005	41067	Greater Portland COG	6401	Tract
Cumberland County, ME	23005	48820	Greater Portland COG	6401	Tract
Cumberland County, ME	23005	53860	Greater Portland COG	6401	BG
Cumberland County, ME	23005	60545	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	60685	Greater Portland COG	6401	Tract
Cumberland County, ME	23005	61945	Greater Portland COG	6401	Tract
Cumberland County, ME	23005	66145	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	71990	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	73670	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	82105	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	86025	Greater Portland COG	6401	TAZ
Cumberland County, ME	23005	87845	Greater Portland COG	6401	TAZ
Sagadahoc County, ME	23023	03355	Greater Portland COG	6401	Tract
Sagadahoc County, ME	23023	76960	Greater Portland COG	6401	Tract
Sagadahoc County, ME	23023	81930	Greater Portland COG	6401	Tract
York County, ME	23031	00730	Greater Portland COG	6401	Tract
York County, ME	23031	01605	Greater Portland COG	6401	Tract
York County, ME	23031	04860	Greater Portland COG	6401	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
York County, ME	23031	09410	Greater Portland COG	6401	TAZ
York County, ME	23031	16725	Greater Portland COG	6401	Tract
York County, ME	23031	33665	Greater Portland COG	6401	TAZ
York County, ME	23031	36535	Greater Portland COG	6401	Tract
York County, ME	23031	36745	Greater Portland COG	6401	Tract
York County, ME	23031	41750	Greater Portland COG	6401	TAZ
York County, ME	23031	55085	Greater Portland COG	6401	BG
York County, ME	23031	64675	Greater Portland COG	6401	BG
York County, ME	23031	65760	Greater Portland COG	6401	Tract
York County, ME	23031	00275	Sea Coast MPO	6451	TAZ
York County, ME	23031	00730	Sea Coast MPO	6451	TAZ
York County, ME	23031	01605	Sea Coast MPO	6451	TAZ
York County, ME	23031	04720	Sea Coast MPO	6451	TAZ
York County, ME	23031	04860	Sea Coast MPO	6451	TAZ
York County, ME	23031	09410	Sea Coast MPO	6451	TAZ
York County, ME	23031	14485	Sea Coast MPO	6451	TAZ
York County, ME	23031	16725	Sea Coast MPO	6451	TAZ
York County, ME	23031	22955	Sea Coast MPO	6451	TAZ
York County, ME	23031	33665	Sea Coast MPO	6451	TAZ
York County, ME	23031	36535	Sea Coast MPO	6451	TAZ
York County, ME	23031	36745	Sea Coast MPO	6451	TAZ
York County, ME	23031	37270	Sea Coast MPO	6451	TAZ
York County, ME	23031	38425	Sea Coast MPO	6451	TAZ
York County, ME	23031	39195	Sea Coast MPO	6451	TAZ
York County, ME	23031	39405	Sea Coast MPO	6451	TAZ
York County, ME	23031	41750	Sea Coast MPO	6451	TAZ
York County, ME	23031	48750	Sea Coast MPO	6451	TAZ
York County, ME	23031	50325	Sea Coast MPO	6451	TAZ
York County, ME	23031	54980	Sea Coast MPO	6451	TAZ
York County, ME	23031	55085	Sea Coast MPO	6451	TAZ
York County, ME	23031	56870	Sea Coast MPO	6451	TAZ
York County, ME	23031	64675	Sea Coast MPO	6451	TAZ
York County, ME	23031	65760	Sea Coast MPO	6451	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
York County, ME	23031	67475	Sea Coast MPO	6451	TAZ
York County, ME	23031	70030	Sea Coast MPO	6451	TAZ
York County, ME	23031	80530	Sea Coast MPO	6451	TAZ
York County, ME	23031	81475	Sea Coast MPO	6451	TAZ
York County, ME	23031	87985	Sea Coast MPO	6451	TAZ
Cumberland County, ME	23005	02655	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	08150	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	17250	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	26910	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	33315	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	41365	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	60405	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	74510	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	74685	Southern Maine RPC	7471	TAZ
Oxford County, ME	23017	75595	Southern Maine RPC	7471	TAZ
York County, ME	23031	00275	Southern Maine RPC	7471	TAZ
York County, ME	23031	00730	Southern Maine RPC	7471	TAZ
York County, ME	23031	01605	Southern Maine RPC	7471	TAZ
York County, ME	23031	04720	Southern Maine RPC	7471	TAZ
York County, ME	23031	04860	Southern Maine RPC	7471	TAZ
York County, ME	23031	09410	Southern Maine RPC	7471	TAZ
York County, ME	23031	14485	Southern Maine RPC	7471	TAZ
York County, ME	23031	16725	Southern Maine RPC	7471	TAZ
York County, ME	23031	22955	Southern Maine RPC	7471	TAZ
York County, ME	23031	33665	Southern Maine RPC	7471	TAZ
York County, ME	23031	36535	Southern Maine RPC	7471	TAZ
York County, ME	23031	36745	Southern Maine RPC	7471	TAZ
York County, ME	23031	37270	Southern Maine RPC	7471	TAZ
York County, ME	23031	38425	Southern Maine RPC	7471	TAZ
York County, ME	23031	39195	Southern Maine RPC	7471	TAZ
York County, ME	23031	39405	Southern Maine RPC	7471	TAZ
York County, ME	23031	41750	Southern Maine RPC	7471	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
York County, ME	23031	48750	Southern Maine RPC	7471	TAZ
York County, ME	23031	50325	Southern Maine RPC	7471	TAZ
York County, ME	23031	54980	Southern Maine RPC	7471	TAZ
York County, ME	23031	55085	Southern Maine RPC	7471	TAZ
York County, ME	23031	56870	Southern Maine RPC	7471	TAZ
York County, ME	23031	64675	Southern Maine RPC	7471	TAZ
York County, ME	23031	65760	Southern Maine RPC	7471	TAZ
York County, ME	23031	67475	Southern Maine RPC	7471	TAZ
York County, ME	23031	70030	Southern Maine RPC	7471	TAZ
York County, ME	23031	80530	Southern Maine RPC	7471	TAZ
York County, ME	23031	81475	Southern Maine RPC	7471	TAZ
York County, ME	23031	87985	Southern Maine RPC	7471	TAZ
Berkshire County, MA	25003	00555	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	00975	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	04545	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	13345	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	14010	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	16180	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	21360	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	24120	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	26815	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	28180	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	30315	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	34340	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	34655	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	34970	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	42460	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	43300	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	44385	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	45420	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	46225	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	51580	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	53050	Berkshire County RPC	6321	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Berkshire County, MA	25003	53960	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	56795	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	59665	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	60225	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	61065	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	67595	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	71095	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	73335	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	77990	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	79985	Berkshire County RPC	6321	TAZ
Berkshire County, MA	25003	80685	Berkshire County RPC	6321	TAZ
Essex County, MA	25009	05595	Boston MPO	1121	BG
Essex County, MA	25009	16250	Boston MPO	1121	BG
Essex County, MA	25009	21850	Boston MPO	1121	BG
Essex County, MA	25009	26150	Boston MPO	1121	BG
Essex County, MA	25009	27900	Boston MPO	1121	BG
Essex County, MA	25009	32310	Boston MPO	1121	BG
Essex County, MA	25009	37490	Boston MPO	1121	BG
Essex County, MA	25009	37560	Boston MPO	1121	BG
Essex County, MA	25009	37995	Boston MPO	1121	BG
Essex County, MA	25009	38400	Boston MPO	1121	BG
Essex County, MA	25009	41095	Boston MPO	1121	BG
Essex County, MA	25009	43580	Boston MPO	1121	BG
Essex County, MA	25009	52490	Boston MPO	1121	BG
Essex County, MA	25009	57880	Boston MPO	1121	BG
Essex County, MA	25009	59105	Boston MPO	1121	BG
Essex County, MA	25009	60015	Boston MPO	1121	BG
Essex County, MA	25009	68645	Boston MPO	1121	BG
Essex County, MA	25009	70150	Boston MPO	1121	BG
Essex County, MA	25009	74595	Boston MPO	1121	BG
Middlesex County, MA	25017	00380	Boston MPO	1121	BG
Middlesex County, MA	25017	01605	Boston MPO	1121	BG
Middlesex County, MA	25017	02130	Boston MPO	1121	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Middlesex County, MA	25017	04615	Boston MPO	1121	BG
Middlesex County, MA	25017	05070	Boston MPO	1121	BG
Middlesex County, MA	25017	07350	Boston MPO	1121	BG
Middlesex County, MA	25017	09840	Boston MPO	1121	BG
Middlesex County, MA	25017	11000	Boston MPO	1121	BG
Middlesex County, MA	25017	11525	Boston MPO	1121	BG
Middlesex County, MA	25017	15060	Boston MPO	1121	BG
Middlesex County, MA	25017	21990	Boston MPO	1121	BG
Middlesex County, MA	25017	24925	Boston MPO	1121	BG
Middlesex County, MA	25017	30700	Boston MPO	1121	BG
Middlesex County, MA	25017	31085	Boston MPO	1121	BG
Middlesex County, MA	25017	31540	Boston MPO	1121	BG
Middlesex County, MA	25017	35215	Boston MPO	1121	BG
Middlesex County, MA	25017	35425	Boston MPO	1121	BG
Middlesex County, MA	25017	35950	Boston MPO	1121	BG
Middlesex County, MA	25017	37875	Boston MPO	1121	BG
Middlesex County, MA	25017	38715	Boston MPO	1121	BG
Middlesex County, MA	25017	39625	Boston MPO	1121	BG
Middlesex County, MA	25017	39835	Boston MPO	1121	BG
Middlesex County, MA	25017	40115	Boston MPO	1121	BG
Middlesex County, MA	25017	43895	Boston MPO	1121	BG
Middlesex County, MA	25017	45560	Boston MPO	1121	BG
Middlesex County, MA	25017	48955	Boston MPO	1121	BG
Middlesex County, MA	25017	56130	Boston MPO	1121	BG
Middlesex County, MA	25017	61380	Boston MPO	1121	BG
Middlesex County, MA	25017	62535	Boston MPO	1121	BG
Middlesex County, MA	25017	67665	Boston MPO	1121	BG
Middlesex County, MA	25017	68050	Boston MPO	1121	BG
Middlesex County, MA	25017	68260	Boston MPO	1121	BG
Middlesex County, MA	25017	72215	Boston MPO	1121	BG
Middlesex County, MA	25017	72600	Boston MPO	1121	BG
Middlesex County, MA	25017	73440	Boston MPO	1121	BG
Middlesex County, MA	25017	73790	Boston MPO	1121	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Middlesex County, MA	25017	77255	Boston MPO	1121	BG
Middlesex County, MA	25017	80230	Boston MPO	1121	BG
Middlesex County, MA	25017	80510	Boston MPO	1121	BG
Middlesex County, MA	25017	81035	Boston MPO	1121	BG
Norfolk County, MA	25021	04930	Boston MPO	1121	BG
Norfolk County, MA	25021	07665	Boston MPO	1121	BG
Norfolk County, MA	25021	09175	Boston MPO	1121	BG
Norfolk County, MA	25021	11315	Boston MPO	1121	BG
Norfolk County, MA	25021	14640	Boston MPO	1121	BG
Norfolk County, MA	25021	16495	Boston MPO	1121	BG
Norfolk County, MA	25021	17405	Boston MPO	1121	BG
Norfolk County, MA	25021	24820	Boston MPO	1121	BG
Norfolk County, MA	25021	25100	Boston MPO	1121	BG
Norfolk County, MA	25021	30455	Boston MPO	1121	BG
Norfolk County, MA	25021	39765	Boston MPO	1121	BG
Norfolk County, MA	25021	39975	Boston MPO	1121	BG
Norfolk County, MA	25021	41515	Boston MPO	1121	BG
Norfolk County, MA	25021	41690	Boston MPO	1121	BG
Norfolk County, MA	25021	44105	Boston MPO	1121	BG
Norfolk County, MA	25021	46050	Boston MPO	1121	BG
Norfolk County, MA	25021	50250	Boston MPO	1121	BG
Norfolk County, MA	25021	55745	Boston MPO	1121	BG
Norfolk County, MA	25021	55955	Boston MPO	1121	BG
Norfolk County, MA	25021	60785	Boston MPO	1121	BG
Norfolk County, MA	25021	67945	Boston MPO	1121	BG
Norfolk County, MA	25021	72495	Boston MPO	1121	BG
Norfolk County, MA	25021	74175	Boston MPO	1121	BG
Norfolk County, MA	25021	78690	Boston MPO	1121	BG
Norfolk County, MA	25021	78865	Boston MPO	1121	BG
Norfolk County, MA	25021	82315	Boston MPO	1121	BG
Plymouth County, MA	25023	17895	Boston MPO	1121	BG
Plymouth County, MA	25023	28285	Boston MPO	1121	BG
Plymouth County, MA	25023	30210	Boston MPO	1121	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Plymouth County, MA	25023	31645	Boston MPO	1121	BG
Plymouth County, MA	25023	38855	Boston MPO	1121	BG
Plymouth County, MA	25023	50145	Boston MPO	1121	BG
Plymouth County, MA	25023	57775	Boston MPO	1121	BG
Plymouth County, MA	25023	60330	Boston MPO	1121	BG
Suffolk County, MA	25025	07000	Boston MPO	1121	BG
Suffolk County, MA	25025	13205	Boston MPO	1121	BG
Suffolk County, MA	25025	56585	Boston MPO	1121	BG
Suffolk County, MA	25025	80930	Boston MPO	1121	BG
Worcester County, MA	25027	06365	Boston MPO	1121	BG
Worcester County, MA	25027	41165	Boston MPO	1121	BG
Worcester County, MA	25027	63165	Boston MPO	1121	BG
Barnstable County, MA	25001	03600	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	07175	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	07980	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	12995	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	16775	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	19295	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	23105	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	29020	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	39100	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	51440	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	55500	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	59735	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	70605	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	74385	Cape Cod Commission	0741	BG
Barnstable County, MA	25001	82525	Cape Cod Commission	0741	BG
Worcester County, MA	25027	02760	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	03740	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	05490	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	06015	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	07525	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	09105	Central Massachusetts RPC	9241	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Worcester County, MA	25027	12715	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	17300	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	17685	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	18560	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	26430	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	28740	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	30560	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	30945	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	34795	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	40255	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	41340	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	41585	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	45105	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	46820	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	46925	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	47135	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	50670	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	51825	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	52420	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	55395	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	58825	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	61800	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	63270	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	66105	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	68155	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	68610	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	71480	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	71620	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	73090	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	73895	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	75015	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	75155	Central Massachusetts RPC	9241	BG
Worcester County, MA	25027	75400	Central Massachusetts RPC	9241	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Worcester County, MA	25027	82000	Central Massachusetts RPC	9241	BG
Barnstable County, MA	25001	03600	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	07175	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	07980	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	12995	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	16775	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	19295	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	23105	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	29020	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	39100	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	51440	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	55500	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	59735	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	70605	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	74385	Central Transportation Planning	1126	BG
Barnstable County, MA	25001	82525	Central Transportation Planning	1126	BG
Bristol County, MA	25005	00520	Central Transportation Planning	1126	BG
Bristol County, MA	25005	02690	Central Transportation Planning	1126	BG
Bristol County, MA	25005	05280	Central Transportation Planning	1126	BG
Bristol County, MA	25005	16425	Central Transportation Planning	1126	BG
Bristol County, MA	25005	16950	Central Transportation Planning	1126	BG
Bristol County, MA	25005	20100	Central Transportation Planning	1126	BG
Bristol County, MA	25005	22130	Central Transportation Planning	1126	BG
Bristol County, MA	25005	23000	Central Transportation Planning	1126	BG
Bristol County, MA	25005	25240	Central Transportation Planning	1126	BG
Bristol County, MA	25005	38225	Central Transportation Planning	1126	BG
Bristol County, MA	25005	45000	Central Transportation Planning	1126	BG
Bristol County, MA	25005	46575	Central Transportation Planning	1126	BG
Bristol County, MA	25005	49970	Central Transportation Planning	1126	BG
Bristol County, MA	25005	56060	Central Transportation Planning	1126	BG
Bristol County, MA	25005	56375	Central Transportation Planning	1126	BG
Bristol County, MA	25005	60645	Central Transportation Planning	1126	BG
Bristol County, MA	25005	62430	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Bristol County, MA	25005	68750	Central Transportation Planning	1126	BG
Bristol County, MA	25005	69170	Central Transportation Planning	1126	BG
Bristol County, MA	25005	77570	Central Transportation Planning	1126	BG
Dukes County, MA	25007	01585	Central Transportation Planning	1126	BG
Dukes County, MA	25007	13800	Central Transportation Planning	1126	BG
Dukes County, MA	25007	21150	Central Transportation Planning	1126	BG
Dukes County, MA	25007	26325	Central Transportation Planning	1126	BG
Dukes County, MA	25007	50390	Central Transportation Planning	1126	BG
Dukes County, MA	25007	69940	Central Transportation Planning	1126	BG
Dukes County, MA	25007	78235	Central Transportation Planning	1126	BG
Essex County, MA	25009	01185	Central Transportation Planning	1126	BG
Essex County, MA	25009	01465	Central Transportation Planning	1126	BG
Essex County, MA	25009	05595	Central Transportation Planning	1126	BG
Essex County, MA	25009	07420	Central Transportation Planning	1126	BG
Essex County, MA	25009	16250	Central Transportation Planning	1126	BG
Essex County, MA	25009	21850	Central Transportation Planning	1126	BG
Essex County, MA	25009	25625	Central Transportation Planning	1126	BG
Essex County, MA	25009	26150	Central Transportation Planning	1126	BG
Essex County, MA	25009	27620	Central Transportation Planning	1126	BG
Essex County, MA	25009	27900	Central Transportation Planning	1126	BG
Essex County, MA	25009	29405	Central Transportation Planning	1126	BG
Essex County, MA	25009	32310	Central Transportation Planning	1126	BG
Essex County, MA	25009	34550	Central Transportation Planning	1126	BG
Essex County, MA	25009	37490	Central Transportation Planning	1126	BG
Essex County, MA	25009	37560	Central Transportation Planning	1126	BG
Essex County, MA	25009	37995	Central Transportation Planning	1126	BG
Essex County, MA	25009	38400	Central Transportation Planning	1126	BG
Essex County, MA	25009	40430	Central Transportation Planning	1126	BG
Essex County, MA	25009	40710	Central Transportation Planning	1126	BG
Essex County, MA	25009	41095	Central Transportation Planning	1126	BG
Essex County, MA	25009	43580	Central Transportation Planning	1126	BG
Essex County, MA	25009	45175	Central Transportation Planning	1126	BG
Essex County, MA	25009	45245	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Essex County, MA	25009	46365	Central Transportation Planning	1126	BG
Essex County, MA	25009	52490	Central Transportation Planning	1126	BG
Essex County, MA	25009	57880	Central Transportation Planning	1126	BG
Essex County, MA	25009	58405	Central Transportation Planning	1126	BG
Essex County, MA	25009	59105	Central Transportation Planning	1126	BG
Essex County, MA	25009	59245	Central Transportation Planning	1126	BG
Essex County, MA	25009	60015	Central Transportation Planning	1126	BG
Essex County, MA	25009	68645	Central Transportation Planning	1126	BG
Essex County, MA	25009	70150	Central Transportation Planning	1126	BG
Essex County, MA	25009	74595	Central Transportation Planning	1126	BG
Essex County, MA	25009	77150	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	00380	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	01605	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	01955	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	02130	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	03005	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	04615	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	05070	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	05805	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	07350	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	09840	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	11000	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	11525	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	13135	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	15060	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	17475	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	17825	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	21990	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	24925	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	27480	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	30360	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	30700	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	31085	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Middlesex County, MA	25017	31540	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	35215	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	35425	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	35950	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	37000	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	37875	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	38715	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	39625	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	39835	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	40115	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	43895	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	45560	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	48955	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	52805	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	56130	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	61380	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	61590	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	62535	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	67665	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	68050	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	68260	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	69415	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	71025	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	72215	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	72600	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	73440	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	73790	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	76135	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	77255	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	80230	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	80510	Central Transportation Planning	1126	BG
Middlesex County, MA	25017	81035	Central Transportation Planning	1126	BG
Nantucket County, MA	25019	43790	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Norfolk County, MA	25021	02935	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	04930	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	07665	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	09175	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	11315	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	14640	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	16495	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	17405	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	24820	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	25100	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	30455	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	39765	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	39975	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	41515	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	41690	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	44105	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	46050	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	50250	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	54100	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	55745	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	55955	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	60785	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	67945	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	72495	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	74175	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	78690	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	78865	Central Transportation Planning	1126	BG
Norfolk County, MA	25021	82315	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	00170	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	08085	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	09000	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	11665	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	17895	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Plymouth County, MA	25023	18455	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	27795	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	28285	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	28495	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	30210	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	31645	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	33220	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	33920	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	38540	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	38855	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	39450	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	40850	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	50145	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	52630	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	54310	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	54415	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	57600	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	57775	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	60330	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	27985	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	75260	Central Transportation Planning	1126	BG
Plymouth County, MA	25023	79530	Central Transportation Planning	1126	BG
Suffolk County, MA	25025	07000	Central Transportation Planning	1126	BG
Suffolk County, MA	25025	13205	Central Transportation Planning	1126	BG
Suffolk County, MA	25025	56585	Central Transportation Planning	1126	BG
Suffolk County, MA	25025	80930	Central Transportation Planning	1126	BG
Worcester County, MA	25027	01885	Central Transportation Planning	1126	BG
Worcester County, MA	25027	02480	Central Transportation Planning	1126	BG
Worcester County, MA	25027	02760	Central Transportation Planning	1126	BG
Worcester County, MA	25027	03740	Central Transportation Planning	1126	BG
Worcester County, MA	25027	05490	Central Transportation Planning	1126	BG
Worcester County, MA	25027	06015	Central Transportation Planning	1126	BG
Worcester County, MA	25027	06365	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Worcester County, MA	25027	07525	Central Transportation Planning	1126	BG
Worcester County, MA	25027	09105	Central Transportation Planning	1126	BG
Worcester County, MA	25027	12715	Central Transportation Planning	1126	BG
Worcester County, MA	25027	14395	Central Transportation Planning	1126	BG
Worcester County, MA	25027	17300	Central Transportation Planning	1126	BG
Worcester County, MA	25027	17685	Central Transportation Planning	1126	BG
Worcester County, MA	25027	18560	Central Transportation Planning	1126	BG
Worcester County, MA	25027	23875	Central Transportation Planning	1126	BG
Worcester County, MA	25027	25485	Central Transportation Planning	1126	BG
Worcester County, MA	25027	26430	Central Transportation Planning	1126	BG
Worcester County, MA	25027	28740	Central Transportation Planning	1126	BG
Worcester County, MA	25027	28950	Central Transportation Planning	1126	BG
Worcester County, MA	25027	30560	Central Transportation Planning	1126	BG
Worcester County, MA	25027	30945	Central Transportation Planning	1126	BG
Worcester County, MA	25027	31435	Central Transportation Planning	1126	BG
Worcester County, MA	25027	34165	Central Transportation Planning	1126	BG
Worcester County, MA	25027	34795	Central Transportation Planning	1126	BG
Worcester County, MA	25027	35075	Central Transportation Planning	1126	BG
Worcester County, MA	25027	37420	Central Transportation Planning	1126	BG
Worcester County, MA	25027	40255	Central Transportation Planning	1126	BG
Worcester County, MA	25027	41165	Central Transportation Planning	1126	BG
Worcester County, MA	25027	41340	Central Transportation Planning	1126	BG
Worcester County, MA	25027	41585	Central Transportation Planning	1126	BG
Worcester County, MA	25027	45105	Central Transportation Planning	1126	BG
Worcester County, MA	25027	46820	Central Transportation Planning	1126	BG
Worcester County, MA	25027	46925	Central Transportation Planning	1126	BG
Worcester County, MA	25027	47135	Central Transportation Planning	1126	BG
Worcester County, MA	25027	50670	Central Transportation Planning	1126	BG
Worcester County, MA	25027	51825	Central Transportation Planning	1126	BG
Worcester County, MA	25027	52420	Central Transportation Planning	1126	BG
Worcester County, MA	25027	53120	Central Transportation Planning	1126	BG
Worcester County, MA	25027	53225	Central Transportation Planning	1126	BG
Worcester County, MA	25027	55395	Central Transportation Planning	1126	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Worcester County, MA	25027	58580	Central Transportation Planning	1126	BG
Worcester County, MA	25027	58825	Central Transportation Planning	1126	BG
Worcester County, MA	25027	61800	Central Transportation Planning	1126	BG
Worcester County, MA	25027	63165	Central Transportation Planning	1126	BG
Worcester County, MA	25027	63270	Central Transportation Planning	1126	BG
Worcester County, MA	25027	66105	Central Transportation Planning	1126	BG
Worcester County, MA	25027	67385	Central Transportation Planning	1126	BG
Worcester County, MA	25027	68155	Central Transportation Planning	1126	BG
Worcester County, MA	25027	68610	Central Transportation Planning	1126	BG
Worcester County, MA	25027	69275	Central Transportation Planning	1126	BG
Worcester County, MA	25027	71480	Central Transportation Planning	1126	BG
Worcester County, MA	25027	71620	Central Transportation Planning	1126	BG
Worcester County, MA	25027	73090	Central Transportation Planning	1126	BG
Worcester County, MA	25027	73895	Central Transportation Planning	1126	BG
Worcester County, MA	25027	75015	Central Transportation Planning	1126	BG
Worcester County, MA	25027	75155	Central Transportation Planning	1126	BG
Worcester County, MA	25027	75400	Central Transportation Planning	1126	BG
Worcester County, MA	25027	77010	Central Transportation Planning	1126	BG
Worcester County, MA	25027	80405	Central Transportation Planning	1126	BG
Worcester County, MA	25027	82000	Central Transportation Planning	1126	BG
Franklin County, MA	25011	02095	Franklin Regional COG	3101	BG
Franklin County, MA	25011	05560	Franklin Regional COG	3101	BG
Franklin County, MA	25011	09595	Franklin Regional COG	3101	BG
Franklin County, MA	25011	12505	Franklin Regional COG	3101	BG
Franklin County, MA	25011	14885	Franklin Regional COG	3101	BG
Franklin County, MA	25011	15200	Franklin Regional COG	3101	BG
Franklin County, MA	25011	16670	Franklin Regional COG	3101	BG
Franklin County, MA	25011	21780	Franklin Regional COG	3101	BG
Franklin County, MA	25011	25730	Franklin Regional COG	3101	BG
Franklin County, MA	25011	27025	Franklin Regional COG	3101	BG
Franklin County, MA	25011	29475	Franklin Regional COG	3101	BG
Franklin County, MA	25011	29650	Franklin Regional COG	3101	BG
Franklin County, MA	25011	35180	Franklin Regional COG	3101	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Franklin County, MA	25011	35285	Franklin Regional COG	3101	BG
Franklin County, MA	25011	42040	Franklin Regional COG	3101	BG
Franklin County, MA	25011	42285	Franklin Regional COG	3101	BG
Franklin County, MA	25011	45490	Franklin Regional COG	3101	BG
Franklin County, MA	25011	47835	Franklin Regional COG	3101	BG
Franklin County, MA	25011	51265	Franklin Regional COG	3101	BG
Franklin County, MA	25011	58335	Franklin Regional COG	3101	BG
Franklin County, MA	25011	61135	Franklin Regional COG	3101	BG
Franklin County, MA	25011	61905	Franklin Regional COG	3101	BG
Franklin County, MA	25011	68400	Franklin Regional COG	3101	BG
Franklin County, MA	25011	73265	Franklin Regional COG	3101	BG
Franklin County, MA	25011	74525	Franklin Regional COG	3101	BG
Franklin County, MA	25011	79110	Franklin Regional COG	3101	BG
Dukes County, MA	25007	01585	Marthas Vineyard Commission	4861	BG
Dukes County, MA	25007	13800	Marthas Vineyard Commission	4861	BG
Dukes County, MA	25007	21150	Marthas Vineyard Commission	4861	BG
Dukes County, MA	25007	26325	Marthas Vineyard Commission	4861	BG
Dukes County, MA	25007	50390	Marthas Vineyard Commission	4861	BG
Dukes County, MA	25007	69940	Marthas Vineyard Commission	4861	BG
Dukes County, MA	25007	78235	Marthas Vineyard Commission	4861	BG
Essex County, MA	25009	01185	Merrimack Valley PC	4161	BG
Essex County, MA	25009	01465	Merrimack Valley PC	4161	BG
Essex County, MA	25009	07420	Merrimack Valley PC	4161	BG
Essex County, MA	25009	25625	Merrimack Valley PC	4161	BG
Essex County, MA	25009	27620	Merrimack Valley PC	4161	BG
Essex County, MA	25009	29405	Merrimack Valley PC	4161	BG
Essex County, MA	25009	34550	Merrimack Valley PC	4161	BG
Essex County, MA	25009	40430	Merrimack Valley PC	4161	BG
Essex County, MA	25009	40710	Merrimack Valley PC	4161	BG
Essex County, MA	25009	45175	Merrimack Valley PC	4161	BG
Essex County, MA	25009	45245	Merrimack Valley PC	4161	BG
Essex County, MA	25009	46365	Merrimack Valley PC	4161	BG
Essex County, MA	25009	58405	Merrimack Valley PC	4161	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Essex County, MA	25009	59245	Merrimack Valley PC	4161	BG
Essex County, MA	25009	77150	Merrimack Valley PC	4161	BG
Middlesex County, MA	25017	01955	Montachusett RPC	2601	BG
Middlesex County, MA	25017	03005	Montachusett RPC	2601	BG
Middlesex County, MA	25017	27480	Montachusett RPC	2601	BG
Middlesex County, MA	25017	61590	Montachusett RPC	2601	BG
Middlesex County, MA	25017	70360	Montachusett RPC	2601	BG
Worcester County, MA	25027	01885	Montachusett RPC	2601	BG
Worcester County, MA	25027	02480	Montachusett RPC	2601	BG
Worcester County, MA	25027	14395	Montachusett RPC	2601	BG
Worcester County, MA	25027	23875	Montachusett RPC	2601	BG
Worcester County, MA	25027	25485	Montachusett RPC	2601	BG
Worcester County, MA	25027	28950	Montachusett RPC	2601	BG
Worcester County, MA	25027	31435	Montachusett RPC	2601	BG
Worcester County, MA	25027	34165	Montachusett RPC	2601	BG
Worcester County, MA	25027	35075	Montachusett RPC	2601	BG
Worcester County, MA	25027	37420	Montachusett RPC	2601	BG
Worcester County, MA	25027	53120	Montachusett RPC	2601	BG
Worcester County, MA	25027	53225	Montachusett RPC	2601	BG
Worcester County, MA	25027	58580	Montachusett RPC	2601	BG
Worcester County, MA	25027	67385	Montachusett RPC	2601	BG
Worcester County, MA	25027	69275	Montachusett RPC	2601	BG
Worcester County, MA	25027	77010	Montachusett RPC	2601	BG
Worcester County, MA	25027	80405	Montachusett RPC	2601	BG
Nantucket County, MA	25019	43790	Nantucket Planning & EDC	5301	BG
Middlesex County, MA	25017	05805	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	13135	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	17475	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	17825	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	37000	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	52805	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	69415	Northern Middlesex COG	4561	BG
Middlesex County, MA	25017	71025	Northern Middlesex COG	4561	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Middlesex County, MA	25017	76135	Northern Middlesex COG	4561	BG
Bristol County, MA	25005	20100	Old Colony Planning Council	1201	BG
Norfolk County, MA	25021	02935	Old Colony Planning Council	1201	BG
Norfolk County, MA	25021	67945	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	00170	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	08085	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	09000	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	18455	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	27795	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	28495	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	33220	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	52630	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	54310	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	54415	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	75260	Old Colony Planning Council	1201	BG
Plymouth County, MA	25023	79530	Old Colony Planning Council	1201	BG
Hampden County, MA	25013	00765	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	06085	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	08470	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	13485	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	13660	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	19645	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	26675	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	28075	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	30665	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	30840	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	36300	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	37175	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	42145	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	42530	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	52105	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	58650	Pioneer Valley PC	8001	BG
Hampden County, MA	25013	65825	Pioneer Valley PC	8001	BG

Hampden County, MA	25013				
Hampden County, MA	25013				
Hampden County, MA	25013				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Hampshire County, MA	25015				
Bristol County, MA	25005	02690	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	05280	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	16425	Southeastern Reg. Plan. & Econ. Dev.	2481	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Bristol County, MA	25005	16950	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	22130	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	23000	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	25240	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	38225	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	45000	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	46575	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	49970	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	56060	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	56375	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	60645	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	62430	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	68750	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	69170	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Bristol County, MA	25005	77570	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Norfolk County, MA	25021	54100	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Plymouth County, MA	25023	11665	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Plymouth County, MA	25023	33920	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Plymouth County, MA	25023	38540	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Plymouth County, MA	25023	39450	Southeastern Reg. Plan. & Econ. Dev.	2481	BG
Plymouth County, MA	25023	40850	Southeastern Reg. Plan. & Econ. Dev.	2481	BG

Plymouth County, MA	25023				
Merrimack County, NH	33013	37300	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	00820	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	12260	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	19140	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	26500	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	29220	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	34420	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	36660	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	38500	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	39300	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	45460	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	45700	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	50580	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	64420	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	64580	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	65700	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	73700	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	74900	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	75300	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	75700	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	77380	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	78420	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	82660	Central Transportation Planning	1126	TAZ
Cheshire County, NH	33005	85540	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	01300	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	08100	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	37140	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	37940	Central Transportation Planning	1126	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Hillsborough County, NH	33011	42260	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	44580	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	47540	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	48020	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	49140	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	50260	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	59940	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	85220	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	04500	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	29860	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	45140	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	50740	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	79780	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	01700	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	04900	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	17780	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	27140	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	31540	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	31940	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	33700	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	36180	Central Transportation Planning	1126	TAZ

	STCOU	MCD	MPO Name	MPO Code	2000 CTPP Geography
Hillsborough County, NH	33011	46260	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	51940	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	68820	Central Transportation Planning	1126	TAZ
				1126	TAZ
Hillsborough County, NH	33011	85940	Central Transportation Planning	1126	TAZ
Merrimack County, NH	33013	01460	Central Transportation Planning	1126	
Merrimack County, NH	33013	06500	Central Transportation Planning	1126	
Merrimack County, NH	33013	09860	Central Transportation Planning	1126	
Merrimack County, NH	33013	14200	Central Transportation Planning	1126	
Merrimack County, NH	33013	19460	Central Transportation Planning	1126	
Merrimack County, NH	33013	27380	Central Transportation Planning	1126	
Merrimack County, NH	33013	35860	Central Transportation Planning	1126	
Merrimack County, NH	33013	43380	Central Transportation Planning	1126	
Merrimack County, NH	33013	52100	Central Transportation Planning	1126	
Merrimack County, NH	33013	60020	Central Transportation Planning	1126	
Merrimack County, NH	33013	61940	Central Transportation Planning	1126	TAZ
Merrimack County, NH	33013	66980	Central Transportation Planning	1126	TAZ
Merrimack County, NH	33013	75460	Central Transportation Planning	1126	TAZ
Merrimack County, NH	33013	78580	Central Transportation Planning	1126	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Merrimack County, NH	33013	80020	Central Transportation Planning	1126	TAZ
Merrimack County, NH	33013	84900	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	02340	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	17140	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	32900	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	40100	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	52900	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	62500	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	66660	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	67620	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	85780	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	07220	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	21380	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	24660	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	25380	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	27940	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	31700	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	33060	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	33460	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	39780	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	50980	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	51380	Central Transportation Planning	1126	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Rockingham County, NH	33015	51620	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	52340	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	54580	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	56820	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	57460	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	62900	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	66180	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	68260	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	71140	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	74340	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	02820	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	09300	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	12100	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	17460	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	17940	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	43220	Central Transportation Planning	1126	TAZ
Rockingham County, NH	33015	64020	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	03460	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	18820	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	19700	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	26020	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	41460	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	44820	Central Transportation Planning	1126	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Strafford County, NH	33017	47700	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	48660	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	51220	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	65140	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	65540	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	69940	Central Transportation Planning	1126	TAZ
Strafford County, NH	33017	73860	Central Transportation Planning	1126	TAZ
Hillsborough County, NH	33011	01300	Nashua RPC	5351	BG
Hillsborough County, NH	33011	08100	Nashua RPC	5351	BG
Hillsborough County, NH	33011	37140	Nashua RPC	5351	BG
Hillsborough County, NH	33011	37940	Nashua RPC	5351	BG
Hillsborough County, NH	33011	42260	Nashua RPC	5351	BG
Hillsborough County, NH	33011	44580	Nashua RPC	5351	BG
Hillsborough County, NH	33011	47540	Nashua RPC	5351	BG
Hillsborough County, NH	33011	48020	Nashua RPC	5351	BG
Hillsborough County, NH	33011	49140	Nashua RPC	5351	BG
Hillsborough County, NH	33011	50260	Nashua RPC	5351	BG
Hillsborough County, NH	33011	59940	Nashua RPC	5351	BG
Hillsborough County, NH	33011	85220	Nashua RPC	5351	BG
Rockingham County, NH	33015	02340	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	17140	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	32900	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	40100	Salem Plaistow Windham MPO	7061	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Rockingham County, NH	33015	52900	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	62500	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	66660	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	67620	Salem Plaistow Windham MPO	7061	TAZ
Rockingham County, NH	33015	85780	Salem Plaistow Windham MPO	7061	TAZ
Carroll County, NH	33003	07940	Sea Coast MPO	6451	TAZ
Carroll County, NH	33003	78180	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	07220	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	21380	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	24660	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	25380	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	27940	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	31700	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	33060	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	33460	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	39780	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	50980	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	51380	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	51620	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	52340	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	54580	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	56820	Sea Coast MPO	6451	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Rockingham County, NH	33015	57460	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	62900	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	66180	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	68260	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	71140	Sea Coast MPO	6451	TAZ
Rockingham County, NH	33015	74340	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	03460	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	18820	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	19700	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	26020	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	41460	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	44820	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	47700	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	48660	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	51220	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	65140	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	65540	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	69940	Sea Coast MPO	6451	TAZ
Strafford County, NH	33017	73860	Sea Coast MPO	6451	TAZ
Hillsborough County, NH	33011	04500	Southern New Hampshire PC	4761	TAZ
Hillsborough County, NH	33011	29860	Southern New Hampshire PC	4761	TAZ
Hillsborough County, NH	33011	45140	Southern New Hampshire PC	4761	TAZ
Hillsborough County, NH	33011	50740	Southern New Hampshire PC	4761	TAZ
Hillsborough County, NH	33011	79780	Southern New Hampshire PC	4761	TAZ
Merrimack County, NH	33013	37300	Southern New Hampshire PC	4761	TAZ
Rockingham County, NH	33015	02820	Southern New Hampshire PC	4761	TAZ

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Rockingham County, NH	33015	09300	Southern New Hampshire PC	4761	TAZ
Rockingham County, NH	33015	12100	Southern New Hampshire PC	4761	TAZ
Rockingham County, NH	33015	17460	Southern New Hampshire PC	4761	TAZ
Rockingham County, NH	33015	17940	Southern New Hampshire PC	4761	TAZ
Rockingham County, NH	33015	43220	Southern New Hampshire PC	4761	TAZ
Rockingham County, NH	33015	64020	Southern New Hampshire PC	4761	TAZ
Bristol County, RI	44001	all	Central Transportation Planning	1126	TAZ
Kent County, RI	44003	all	Central Transportation Planning	1126	TAZ
Newport County, RI	44005	all	Central Transportation Planning	1126	TAZ
Providence County, RI	44007	all	Central Transportation Planning	1126	TAZ
Washington County, RI	44009	all	Central Transportation Planning	1126	TAZ
Bristol County, RI	44001	all	Rhode Island Statewide Planning Program	6481	TAZ
Kent County, RI	44003	all	Rhode Island Statewide Planning Program	6481	TAZ
Newport County, RI	44005	all	Rhode Island Statewide Planning Program	6481	TAZ
Providence County, RI	44007	all	Rhode Island Statewide Planning Program	6481	TAZ
Washington County, RI	44009	all	Rhode Island Statewide Planning Program	6481	TAZ
Addison County, VT	50001	00325	Chittenden County MPO	1306	BG
Addison County, VT	50001	08575	Chittenden County MPO	1306	BG
Addison County, VT	50001	09025	Chittenden County MPO	1306	BG
Addison County, VT	50001	16000	Chittenden County MPO	1306	BG
Addison County, VT	50001	26275	Chittenden County MPO	1306	BG
Addison County, VT	50001	28600	Chittenden County MPO	1306	BG
Addison County, VT	50001	29575	Chittenden County MPO	1306	BG
Addison County, VT	50001	31525	Chittenden County MPO	1306	BG
Addison County, VT	50001	39325	Chittenden County MPO	1306	BG
Addison County, VT	50001	40075	Chittenden County MPO	1306	BG
Addison County, VT	50001	44350	Chittenden County MPO	1306	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Addison County, VT	50001	45550	Chittenden County MPO	1306	BG
Addison County, VT	50001	48700	Chittenden County MPO	1306	BG
Addison County, VT	50001	53725	Chittenden County MPO	1306	BG
Addison County, VT	50001	53950	Chittenden County MPO	1306	BG
Addison County, VT	50001	59650	Chittenden County MPO	1306	BG
Addison County, VT	50001	62575	Chittenden County MPO	1306	BG
Addison County, VT	50001	65050	Chittenden County MPO	1306	BG
Addison County, VT	50001	70075	Chittenden County MPO	1306	BG
Addison County, VT	50001	74650	Chittenden County MPO	1306	BG
Addison County, VT	50001	76075	Chittenden County MPO	1306	BG
Addison County, VT	50001	83275	Chittenden County MPO	1306	BG
Addison County, VT	50001	83800	Chittenden County MPO	1306	BG
Chittenden County, VT	50007	06550	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	10300	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	10675	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	13300	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	14875	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	24175	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	33475	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	34600	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	36700	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	45250	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	59275	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	62050	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	64300	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	66175	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	73975	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	80350	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	84475	Chittenden County MPO	1306	TAZ
Chittenden County, VT	50007	85150	Chittenden County MPO	1306	TAZ
Franklin County, VT	50011	02500	Chittenden County MPO	1306	BG
Franklin County, VT	50011	05425	Chittenden County MPO	1306	BG
Franklin County, VT	50011	23875	Chittenden County MPO	1306	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Franklin County, VT	50011	24925	Chittenden County MPO	1306	BG
Franklin County, VT	50011	25225	Chittenden County MPO	1306	BG
Franklin County, VT	50011	26500	Chittenden County MPO	1306	BG
Franklin County, VT	50011	27100	Chittenden County MPO	1306	BG
Franklin County, VT	50011	27700	Chittenden County MPO	1306	BG
Franklin County, VT	50011	33025	Chittenden County MPO	1306	BG
Franklin County, VT	50011	45850	Chittenden County MPO	1306	BG
Franklin County, VT	50011	59125	Chittenden County MPO	1306	BG
Franklin County, VT	50011	61675	Chittenden County MPO	1306	BG
Franklin County, VT	50011	61750	Chittenden County MPO	1306	BG
Franklin County, VT	50011	64600	Chittenden County MPO	1306	BG
Franklin County, VT	50011	71725	Chittenden County MPO	1306	BG
Grand Isle County, VT	50013	00700	Chittenden County MPO	1306	BG
Grand Isle County, VT	50013	29275	Chittenden County MPO	1306	BG
Grand Isle County, VT	50013	35875	Chittenden County MPO	1306	BG
Grand Isle County, VT	50013	50650	Chittenden County MPO	1306	BG
Grand Isle County, VT	50013	67000	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	04375	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	11500	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	23500	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	23725	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	35050	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	37075	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	46675	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	70525	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	77425	Chittenden County MPO	1306	BG
Lamoille County, VT	50015	85375	Chittenden County MPO	1306	BG
Washington County, VT	50023	03175	Chittenden County MPO	1306	BG
Washington County, VT	50023	03250	Chittenden County MPO	1306	BG
Washington County, VT	50023	05650	Chittenden County MPO	1306	BG
Washington County, VT	50023	11125	Chittenden County MPO	1306	BG
Washington County, VT	50023	11350	Chittenden County MPO	1306	BG
Washington County, VT	50023	18550	Chittenden County MPO	1306	BG

County	FIPS STCOU	FIPS MCD	MPO Name	MPO Code	2000 CTPP Geography
Washington County, VT	50023	21925	Chittenden County MPO	1306	BG
Washington County, VT	50023	25825	Chittenden County MPO	1306	BG
Washington County, VT	50023	43600	Chittenden County MPO	1306	BG
Washington County, VT	50023	44500	Chittenden County MPO	1306	BG
Washington County, VT	50023	46000	Chittenden County MPO	1306	BG
Washington County, VT	50023	46225	Chittenden County MPO	1306	BG
Washington County, VT	50023	50275	Chittenden County MPO	1306	BG
Washington County, VT	50023	55825	Chittenden County MPO	1306	BG
Washington County, VT	50023	60625	Chittenden County MPO	1306	BG
Washington County, VT	50023	75325	Chittenden County MPO	1306	BG
Washington County, VT	50023	76525	Chittenden County MPO	1306	BG
Washington County, VT	50023	76975	Chittenden County MPO	1306	BG
Washington County, VT	50023	85525	Chittenden County MPO	1306	BG
Washington County, VT	50023	86125	Chittenden County MPO	1306	BG