TBEST – GUIDELINES FOR TRANSIT DEVELOPMENT PLAN RIDERSHIP ESTIMATION REVIEW AND REPORTING

Prepared for:

State of Florida Department of Transportation

Public Transit Office

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TBEST – GUIDELINES FOR TRANSIT DEVELOPMENT PLAN RIDERSHIP REVIEW AND REPORTING

Technical Memorandum

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Introduction

The Florida Department of Transportation Public Transit Office developed and maintains the Transit Boardings Estimation and Simulation Tool (TBEST) transit demand estimation software. In response to industry needs for guidance of TBEST implementation, reporting and review procedures, a TBEST Guidebook will be prepared to provide Transit Agencies and FDOT Districts with the information to effectively evaluate, implement, manage and maintain TBEST. This document addresses guidelines for submission and review of TBEST ridership estimations for Transit Development Plans (TDP's) by identifying TBEST TDP modeling scenarios, reporting guidelines, and TBEST functionally required for report implementation.

The guidance in this document is not intended to be prescriptive; adherence should be made first and foremost to the TDP rule regarding demand forecasting. Instead, the content supplements other materials such as the TDP manual and TBEST Users' Manual with some practical methods for scenario development and standardization of model output relevant to TDPs. The intent is to make it easierfor both those with expertise in TBEST and others who may be new, to create and review TBEST forecasts in a way most applicable to a TDP.

The first section provides anintroduction into the primary variables that can be controlled in TBEST scenario development with respect to TDPs. TDP scenarios should model changes that relate to other portions of the planning document. These can include; incremental or systemic future year service changes, introduction of new modes or actions to support strategic service initiatives outlined in the plan, as examples. Scenarios can be designed to isolate particular service elements to gauge the influence on ridership or network performance. Scenarios may also be crafted to model multiple changes simultaneously for assessing broader impacts on ridership, cost and transit accessibility.

The second section of the document addresses a set of performance measures that are recommended for inclusion in a future version of TBEST. These measures allow for comparison of forecasts between scenarios andagainst agency and industry standards given certain conditions as defined by the modeler. The value of performance measures can be found in quantifying the estimated access to population and employment, efficiency and productivity of a scenario. Performance measures are outputs for scenarios that are being considered in the TDP document. They also create a standard for both TDP submitters and reviewers to share an understanding of the various impacts of a given scenario. The document concludes with a new TDP Performance Measures report template, a set of requirements needed to calculate these values and the expected operation of TBEST to output the report.

This material is not all inclusive, the final TBEST Guidebook should both refine and further the direction initiated here.After this document has been adopted by FDOT, the prescribed TBEST functionality for TDP reporting will be implemented within the software and the TBEST Guidebook finalized under the TBEST Maintenance contract.

TBEST Scenario Creation for Transit Development Plans – An Overview

For the purpose of analyzing performance measures for the Transit Development Plan, it is helpful to create a variety of alternative service scenarios in TBEST. There are many different types of scenario themes that an agency can create with TBEST. Because the TDP is a mid-term planning document, looking ahead 10 years into the future, one approach would be to focus scenarios in TBEST to be more concerned with system-wide strategic planning and handle short-term individual route service planning secondarily. The examples below highlight some general types of scenario changes that can be analyzed using TBEST.

TBEST Scenario Themes

Base Scenario

The base year scenario in TBEST will include only the socio-economic changes (population and employment) that are input into the model to update demographic data from the data source year to an estimate for the base year. This scenario will be the one that all other scenarios can be compared to. See Chapter 4 of the TBEST User's Guide for more information on socio-economic data inputs.

Increase Service Frequency

One of the most common types of service planning concepts involves the increase of service frequencies in order to increase ridership. This type of scenario can provide a general idea of how much ridership can be expected to increase with the increase of service frequencies to the routes on a system-wide level. As a TDP is not generally concerned with individual route performance, it is advised that the scenario apply the service frequency increase across the entire system or sub-set of route types (i.e., all core routes, all crosstowns, all circulators, etc.).

The TDP-related performance measures to key on with this scenario type are: estimated annual ridership, boardings per service mile, and boardings per service hour. Because TBEST estimates ridership on a stop level, and providing more service results in more service provided at stops, the ridership estimates should increase with the increase of service frequencies. How much they increase will depend on the model coefficients in

TBEST. If boardings per service mile and boardings per service hour increase in addition to ridership, then it is a strong indication that the proposed service frequency increases may be advisable. If the measures remain about the same, then the user must look at the context of other variables. Should these measures decrease, then it is a strong indication that the frequency increases would result in less productive service.

For more information on how to make changes to service frequencies, also known as headways, see Section 5.13 Performing Stop Attribute Modifications and Section 5.14 Stop Attribute Values of the TBEST User's Guide.

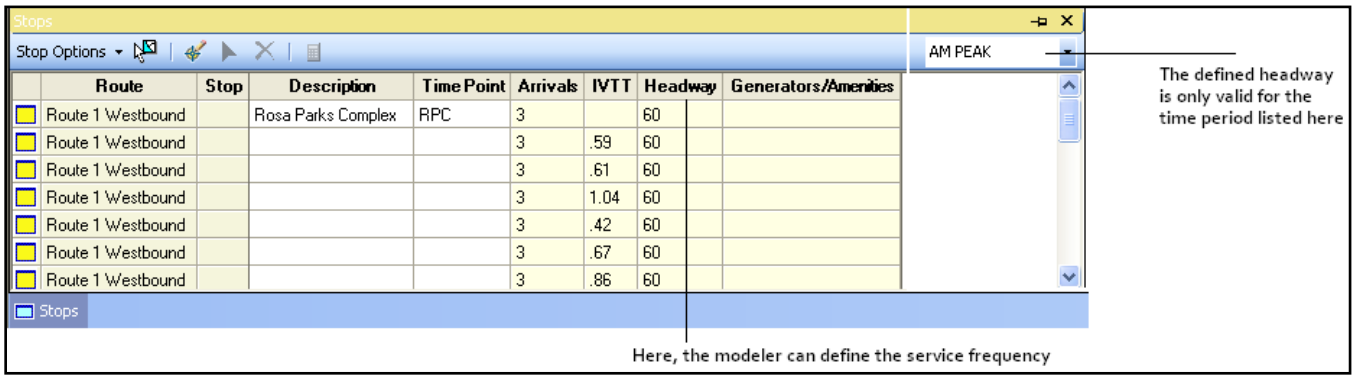


Figure 1: Service Frequency Definition

Decrease Service Frequency

Not as common as service frequency increase scenarios, another potential scenario type is a service frequency decrease. In an era of reduced budgets and the potential need to reduce service, this type of scenario can provide a guideline of what kind of ridership losses would be sustained if cuts in service are required.

The TDP-related performance measures to key on with this scenario are: estimated annual ridership, estimated scenario operating cost, operating cost per service mile, and operating cost per passenger trip. If the costs saved by reducing service are proportionally greater than the estimated loss of ridership, service productivity would increase. As one would typically reduce the poorest performaing service, productivity increases are likely.

The same methods of making changes to service frequencies apply for decreases as for increases. See sections 5.13 and 5.14 of the TBEST User's Guide.

Increase Service Span

Another common service change is to expand the hours of service that routes operate by either adding hours of service in the morning or adding hours of service at night. Work commute patterns that fall outside of the standard 9am to 5pm (second and third shift workers), are typically the users during these increased spans. A span increase might be worth considering if the current span appears inadequate for ridership demand or if new demand has been created that is not being met. Of course, adding additional hours of service will result in higher operating costs.

Key performance measures are estimated annual ridership and boardings per service hour. If the boardings per service hour are forecasted to improve then that means that the new service is operating at a higher level than the average boardings per service hour of the entire system. This would indicate that the new hours of service are likely warranted. However, should boardings per service hour decrease, then the new service is operating at a lower level than the system average and the span increase would have to be warranted for other reasons. Often service span increases are provided to improve the safety net availability of transportation for citizens and not necessarily to improve overall productivity.

Service span is easily changed in TBEST by accessing the route service span window. For more information, see Section 5.9 of the TBEST User's Guide.

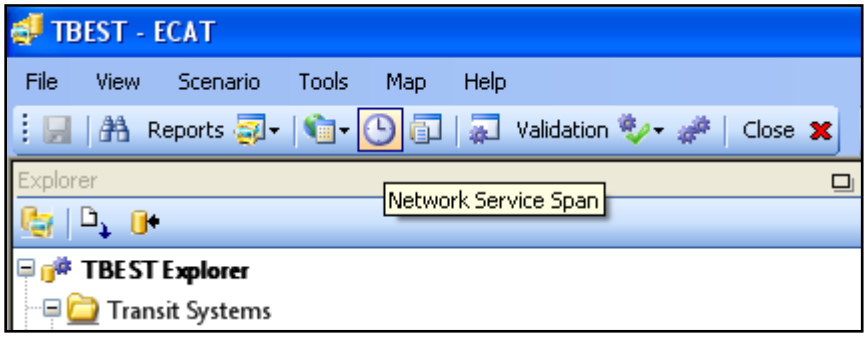


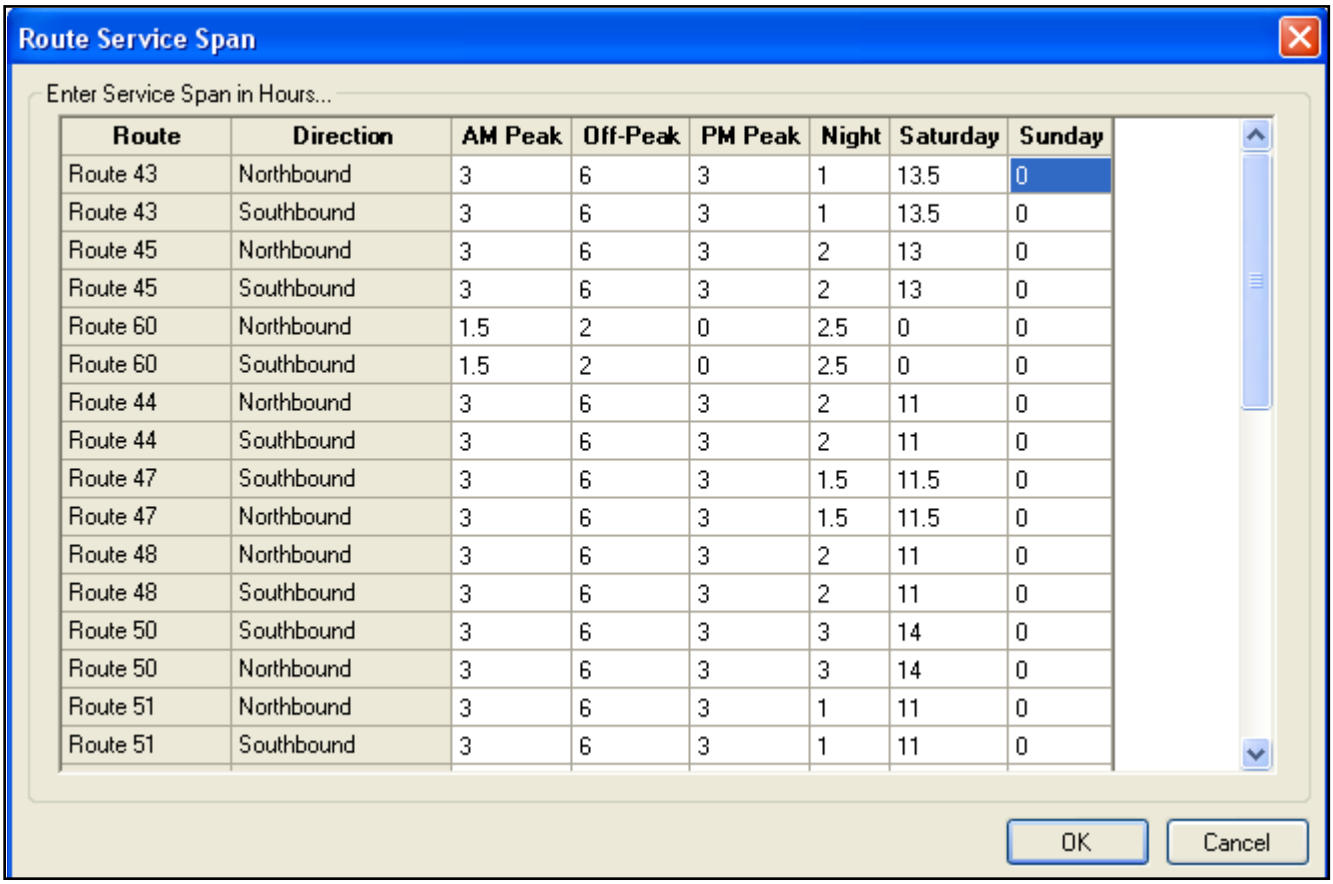
Figure 2: Service Span Menu Selection

Decrease Service Span

As an inverse to a service span increase scenario, this type of scenario looks at decreasing the service span of routes in an attempt to improve performance. Should time of day ridership analysis (done via ride checks or automatic passenger counters) reveal certain hours of service that are far less productive than the system average, a system may decide that reducing the service span is a better alternative than cutting service

frequency or eliminated routes altogether. Using TBEST, those resources can be reallocated to other service and modeled for estimated benefits. Key performance measures to consider are estimated annual ridership and boardings per service hour.

Service span is easily changed in TBEST by accessing the route service span window. For more information, see Section 5.9 of the TBEST User's Guide.



Route	Direction	AM Peak	Off-Peak	PM Peak	Night	Saturday	Sunday
Route 43	Northbound	3	6	3	1	13.5	0
Route 43	Southbound	3	6	3	1	13.5	0
Route 45	Northbound	3	6	3	2	13	0
Route 45	Southbound	3	6	3	2	13	0
Route 60	Northbound	1.5	2	0	2.5	0	0
Route 60	Southbound	1.5	2	0	2.5	0	0
Route 44	Northbound	3	6	3	2	11	0
Route 44	Southbound	3	6	3	2	11	0
Route 47	Southbound	3	6	3	1.5	11.5	0
Route 47	Northbound	3	6	3	1.5	11.5	0
Route 48	Northbound	3	6	3	2	11	0
Route 48	Southbound	3	6	3	2	11	0
Route 50	Southbound	3	6	3	3	14	0
Route 50	Northbound	3	6	3	3	14	0
Route 51	Northbound	3	6	3	1	11	0
Route 51	Southbound	3	6	3	1	11	0

Figure 3: Route Service Span Window

Introduction or Elimination of Saturday/Sunday Service

The addition or subtraction of service on the weekends is another option for agencies looking to grow their system. Weekend service has the potential to serve new trip types such as shopping, religious services, tourism and entertainment that may not be as prevalent during the weekdays. However, as a rule of thumb, Saturday service is always less productive than weekday service, and Sunday service is even less productive than Saturday. These types of scenarios should be considered only if a system can afford to reduce its overall

efficiency. Underperforming weekend service could be reallocated to other areas; however the risk of eliminating entire service days has impacts beyond what can be modeled.

Therefore, the key performance measures to examine are estimated annual ridership and boardings per service hour and service mile as compared to ridership and boarding data for weekday service.

Add New Service

The addition of new routes to the system is another major consideration in TDPs. Typically, systems will want to add service to areas that are growing in population or as employment centers and where there is not currently any service already operating nearby.

The key performance measures to examine for this scenario type are service area population, percent population served of total population, passenger trips per population served, total employment, total employment served, and percent employment served of total employment. In addition, the productivity measures and efficiency measures (operating costs) should also be examined and compared to similar routes in the current system in order to make a determination if new service is warranted.

Chapter 5 of the User's Guide is about network development and provides a step by step guide of how to add new service to a system in TBEST and includes information on how to digitize route structure, add service span, input in-vehicle travel times, input headways and/or arrivals, etc.

Increase or Decrease Passenger Fares

Agencies may want to look at the effects of a system wide fare change (whether it is an increase or decrease) to ridership as well the effect it has on farebox recovery.

In TBEST, fare is used as measure of network impedance which means that the higher the fare, the less accessibility you have to employment or other destination attractions on the transit network and will impact performance measures accordingly. Fare is also highly dependent on the Mean Annual Person Wage, which reflects the value of money in the service area. The lower the wage, the more impact fare will have and therefore changes to the fare will have.

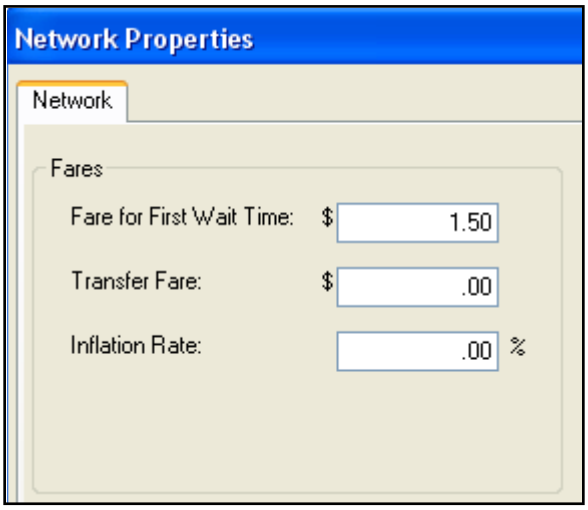


Figure 4: Fare Definition Window

New Technologies – Alternative Modes

Another capability in TBEST is to classify routes as different modes other than fixed route bus. Other options built into the model include: rail, streetcar, BRT, LRT, and people mover. Model coefficients for these modes are not provided and would have to be developed by the agency in order to utilize this feature. Therefore a scenario based on the introduction of a new mode or a change of an existing service (for example the conversion of fixed route bus to BRT) would require additional inputs from the user.

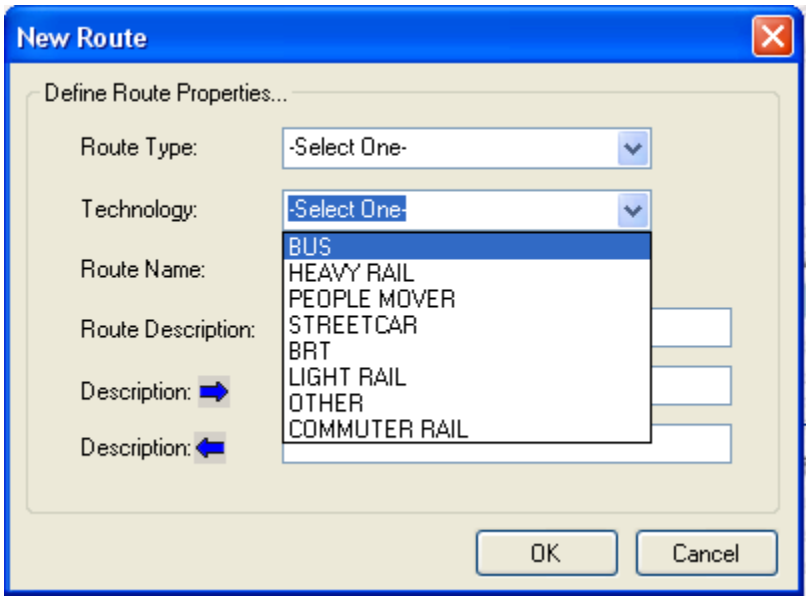


Figure 5: Technology Selection in TBEST

Existing Service Reconstruction

Another option for a scenario would be to restructure portions of or the entire route network. These are the types of activities where TBEST excels, due to the otherwise difficult task of having an understanding of such changes without a prior implementation to review. A complete service overhaul is rare, but not unheard of. For example, StarMetro's Nova 2010 plan restructured the 50 bus routes in their hub and spoke system.

In the case of this type of scenario, it is worth looking at all of the TDP performance measures and comparing them to the base scenario, due to the drastic nature of such a change.

TDP Related Performance Measures from TBEST

TBEST scenarios can be built to forecast the impacts of systemic change, designed to estimate potential transit demand in a number of environments. Scenarios are comprised of a series of data building blocks and processes that result in a model that can be queried for user feedback to envision how a service might perform. The value of the model for a user can be amplified by how well the reporting output can be applied to its intended use.

A Transit Development Plan (TDP), required of state block grant fund recipients and submitted to FDOT, should contain certain elements to support its vision for transit service for a 10 year horizon. Where TBEST can produce statistics and reports that supply TDPs with information that is relevant is the topic of this section.

One way to apply outputs from TBEST to TDPs would be through the use of performance measures. Performance measures provide a way to standardize a set of values that are associated with transit network design and service delivery. One methodcould be to compare an estimate of service performance produced from a scenario against an agency standard. In this way, the performance measure could represent a level of competence of where the agency would like to be, or a goal. Performance measures may also be used to compare a scenario against another transit agency's performance. In a TDP, an example of this can be found in a section sometimes called a *Peer and Trend* analysis, which compares past performance against similar agencies utilizing the National Transit Database.

The performance measures provided in Figure 1 below were derived from practice, found utilized in Florida TDPs and other U.S. short range transit plans. Recently published research has also described the usefulness of other measures included in Figure 1 that are well suited for the planning stages of transit network design. Excluded from the list below are some measures used in the transit industry (on time performance, for example) that are more operationally oriented in favor of some more common planning metrics (population and employment access to transit).

Finally, it should be noted that these measures are also a product of what TBEST is capable of producing, recognizing several excluded operations and maintenance based performance measures rely on data TBEST does not possess.

LIST OF TDP PERFORMANCE MEASURES

POPULATION ACCESS
- Total Population
- Service Area Population
- Percent Population Served of Total Population
- Passenger Trips per Population Served

EMPLOYMENT ACCESS
- Total Employment
- Total Employment Served
- Percent Employment Served of Total Employment

SERVICE CHARACTERISTICS
- Estimated Annual Service Miles
- Average System Speed
- Average System Headway

PRODUCTIVITY
- Estimated Annual Ridership
- Boardings per Service Mile
- Boardings per Service Hour

EFFICIENCY
- Estimated Scenario Operating Cost
- Operating Cost per Service Mile
- Operating Cost per Passenger Trip

Total Population

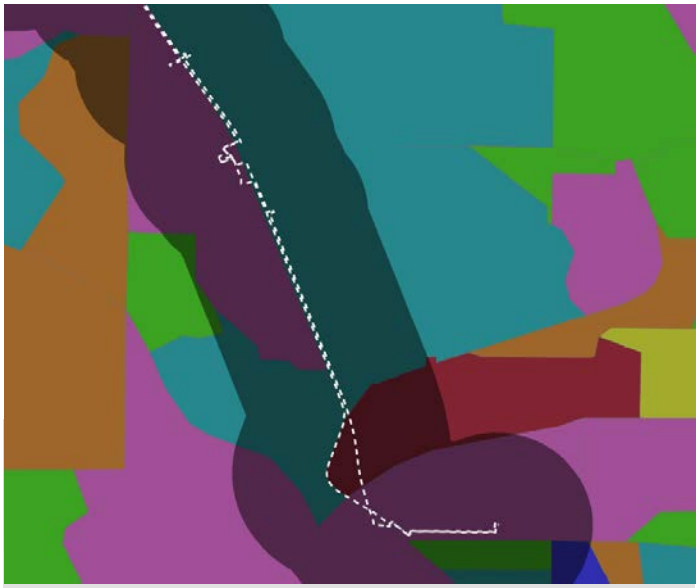
This is the first of several data elements that are provided to illustrate the characteristics of the existing or potential transit service area. Total population is used to show the number of people living in the greater urban area regardless of whether they are served by transit within a reasonable proximity. In this case, the reporting of total population is to indicate the population of the jurisdiction(s) that the transit system operates within. By doing this, the potential for increasing transit access through service reconfiguration or expansion is better understood.

Initially, this will be reported as the population of the county that the service operates in. Many transit agencies are either municipally or county based. Others serve populations within a transit district. With the release of the TBEST parcel model, the definition of Total Population could be updated to the preferred geography, the US Census *urbanized area*.

BACKGROUND

Total Population is not a term defined by the FTA within the National Transit Database. Therefore, there isn't a standard by which all transit agencies calculate and report this value. It is however a useful measure to define the potential for increasing access to public transportation for a service provider.

Service Area Population

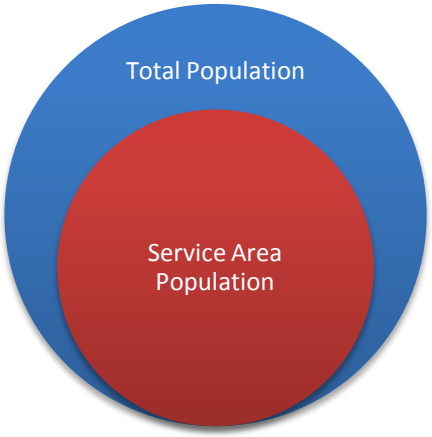


This is a measure of access to transit service in terms of population served within a width of three-fourths of a mile on each side of each fixed route. Typically, the transit agency determines the service area boundaries and population for most transit services using the definitions contained in the Americans with Disabilities Act of 1990 (ADA). TBEST reports service area population by the above method as research has found that many agencies report the entire urban area or transit district to NTD, rather than ¾ mile access from fixed routes.

Traditionally, this has been a difficult value to determine due to the nature of how census data is presented. With the TBEST parcel model, land uses derived from parcel data will provide a more accurate approximation of population counts by using a smaller geography than census block groups.

Percent Population Served of Total Population

The percent of population served by transit out of the total population, is service area population (Measure 2) divided by the total population (Measure 1). This will allow for comparisons of how well the transit system is designed to provide access both against a baseline service standard (if one exists) and between TBEST scenarios. This does not take into account, measures of service quality, such as headway orreliability.



DISTINCTION

- **SERVICE AVAILABILITY**
  Here, service availability is determined by geographic coverage related to jurisdictional boundaries and fixed transit routes.
- **NOT SERVICE QUALITY**
  This measure does not take into account service quality measures such as operating span of service and vehicle frequency.

Passenger Trips per Population Served

This measure, also described as *Boardings per Service Area Capita*, is an annualized ratio of unlinked passenger trips taken to population within a ¾ mile distance of fixed bus routes. The higher number of passenger trips per service area population, the more effective the service quality and design is in maximizing ridership potential.

The figure below is a method of presenting this information within a TDP. Here, Pierce Transit demonstrates via this trend chart that boardings per capita have fluctuated over time while overall boarding counts generally increased.

Annual Passenger Trips

Service Area Population

DISTINCTION

In this measure, *passenger trips* are used to determine service effectiveness. When *vehicle tripsper service population* are used as a measure, it then becomes one of service utilization.

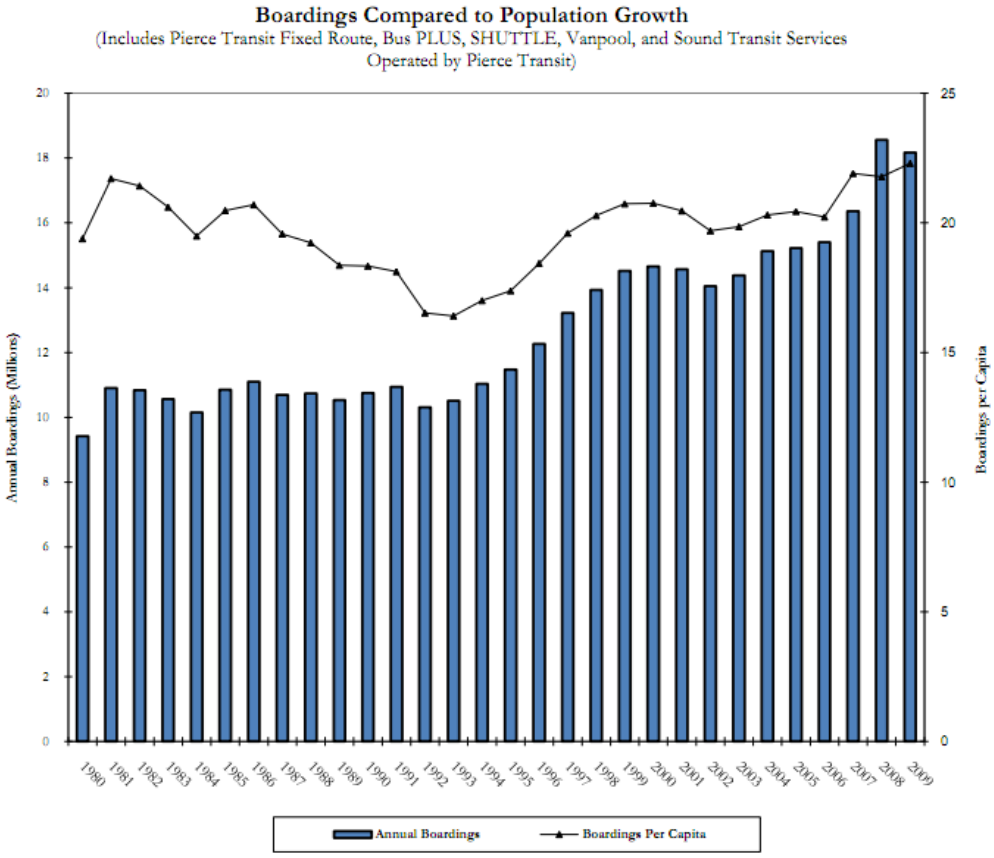


Figure 6: Pierce Transit TDP Chart – Boardings per Capita

Total Employment

Total employment is a count of all of the employees within the same geography as the *Total Population* measure. It is intended to define the potential for work trips that transit could serve in the greater urban area, in this case, countywide.

With the release of the TBEST parcel model, the definition of Total Employment could be updated to the preferred geography, the US Census *urbanized area*.

DATA SOURCE

InfoUSA is a privately furnished dataset that contains the number of employers and employees in a GIS point layer format. Because of frequent changes in numbers of both of these data elements, it is important to load the most recently available file (Year 2010 or newer). This also negates the need to use growth factors that must account for the years prior to current.

Total Employment Served

Somewhat similar to Service Area Population, this is a measure of access to transit service in terms of employment served within a width of three-fourths of a mile on each side of each fixed route. Within TBEST, counts are derived from the InfoUSA data which contains the number of employees assigned to an employer's physical address.

This measure is useful in estimating total numbers of employee work trips that are possible given the network design contained within a scenario. Work trips are usually the predominant trip type observed in fixed route transit use.

Percent Employment Served of Total Employment

This measure is used to determine the degree to which a network design within a TBEST scenario captures the most or least amount of potential work trips. The higher the percentage of employment served of total employment, the greater maximization of resources to serve commuters out of the potential for the area.

TIP

Using TBEST scenarios, a modeler can isolate certain performance measures for improvement. For example, a performance measure goal for percent employment served may be 75%. Scenarios may be copied to save time and redesigned with only maximizing employment access in mind. Routes can be reconfigured along different corridors to produce a scenario that achieves a 75% goal.

Estimated Annual Service Miles

This measure is a representation of the service/revenue mileage for a given scenario, annualized. It is calculated from inputs to TBEST which include; span of service, vehicle frequency and route mileage.

Average System Speed

This measure is a representation of the average vehicle travel speed across the transit system network in a scenario. This is calculated from the number vehicles operating on a transit route and one way travel time needed to perform revenue service. The Route Miles performance measure will be incorporated as the distance variable in the calculation.

Average System Headway

Vehicle frequencies on transit routes are a required input in building a scenario. When multiple scenarios are constructed with a variety of operating frequencies, this measure can be helpful to compare headways between scenarios. Knowing and reporting vehicle headways as an average system-wide can be helpful in developing and monitoring standards for quality of service.

	LEAVE				LEAVE		ARRIVE
A.M.	4:05	4:10	4:14	4:18	4:33	4:42	5:00
A.M.	4:25	4:30	4:34	4:38	4:53	5:02	5:20
A.M.	4:40	4:45	4:49	4:53	5:08	5:17	5:35
A.M.	5:00	5:05	5:09	5:13	5:28	5:37	5:55
A.M.	5:20	5:25	5:29	5:33	5:48	5:57	6:15
A.M.	5:40	5:45	5:49	5:53	6:08	6:17	6:35

Figure 7: Sample Headway Schedule

Estimated Annual Ridership

Forecast demand is presented in terms of ridership within the TBEST model. Ridership is defined as unlinked passenger trips taken annually. Additionally, estimated passenger transfers are determined by TBEST but are not distinct within the ridership value.

Boardings per Service Hour

*Boardings per service hour*is equal to the total number of forecast passenger boardings divided by the total number of service/revenue hours for a given scenario. This figure is annualized and can be compared to a value that's been adopted as a minimum or optimum number of boardings per service hour as an agency performance measure, or against other scenario outputs for this value.

It is intended to reflect system productivity, meaning to produce the highest amount of ridership for a given number of hours spent operating transit in revenue service.

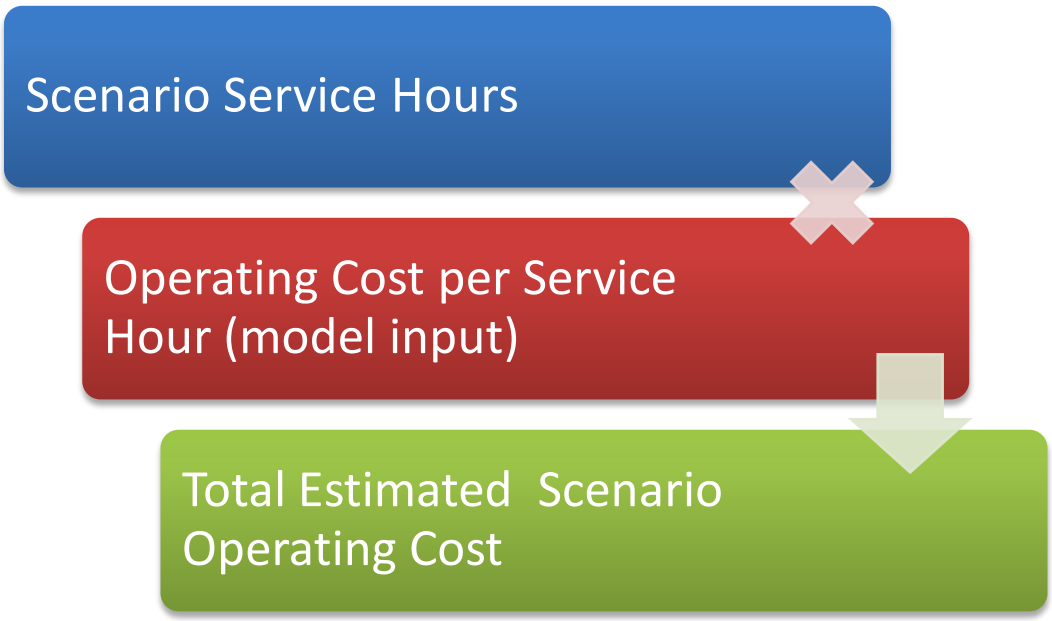
Boardings per Service Mile

*Boardings per service mile*is equal to the total number of forecast passenger boardings divided by the total number of service/revenue miles for a given scenario. This figure is annualized and can be compared to a value that's been adopted as a minimum or optimum number of boardings per service mile as an agency performance measure, or against other scenario outputs for this value.

It is intended to reflect system productivity; meaning to produce the highest amount of ridership for a given number of miles spent operating transit in revenue service.

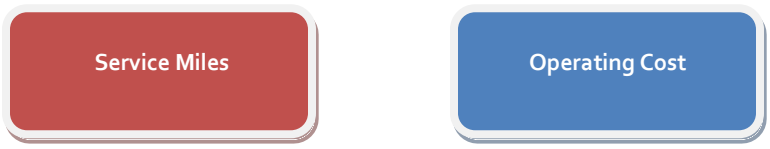
Estimated Scenario Operating Cost

Where transit agency operating costs are available, they could be input into the model to estimate the total cost for operating each TBEST scenario. This may be useful for determining service levels that can be provided in a cost-constrained environment.



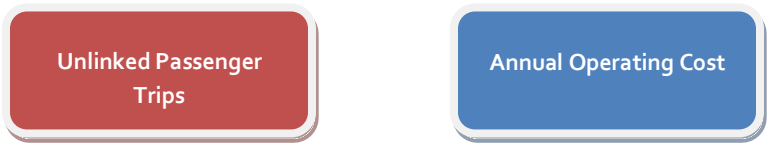
Operating Cost per Service Mile

This measure allows for costs to be understood in terms of distance traveled in revenue service. The operating cost value typically originates from a transit agency and may be fully loaded with certain maintenance and administrative expenditures in addition to basic vehicle operating labor and fuel.



Operating Cost per Passenger Trip

This measure provides a ratio for operating cost expended by the transit provider for each unlinked passenger trip taken on its service. Higher operating costs per passenger trip could be indicative of a less efficient transit network design. This can be offset to some degree by passenger fares.



RELATED MEASURES

When farebox receipts are subtracted from operating costs, another performance measure can be calculated. *Subsidy per Passenger Trip* is the dollar amount of difference between total operating cost per trip and average fare paid by transit riders. It can be useful in determining a fare structure to recover a portion of the total operating cost per unlinked trip.

Reporting TDP Performance Measures from Within TBEST

In the preceding section, a background has been provided to describe the select performance measures TBEST could report in order to standardize a minimum set of data for TDP submission and review. Rationale for performance measure selection and ways to apply that data can help an agency or reviewer compare and contrast scenarios to help support certain strategic initiatives, for example.

TBEST TDP Summary Reporting Template

Based on feedback from FDOT and research on TDP reporting both within the state of Florida and nationally, a TDP Summary Report template was developed as a target for organizing and summarizing key performance indicators by TDP Goal Area across multiple TBEST scenarios. This report will streamline the TDP ridership estimation reporting process by providing Agencies and FDOT with a single data view that represents the TBEST TDP modeling results. If further modeling results are required to segment results by Route, Route Type or other grouping, those reports can be added either as support to narratives or as an Appendix. At a minimum, the TDP Summary Report should be included in the TDP document. The agency should provide a narrative description of the general model inputs for each scenario including but not limited to; fare changes, new service, service adjustments, projected socio-economic growth, major generators or land use changes.

Goal Area	Performance Measure	Scenario 1 Description/Title Scenario 1	Scenario 2 Description/Title Scenario 2	Scenario 3 Description/Title Scenario 3	Scenario 4 Description/Title Scenario 4
Population Access	Total Population				
	Service Area Population				
	Percent Population Served of Total Population				
	Passenger Trips Per Population Served				
Employment Access	Total Employment				
	Total Employment Served				
	Percent Employment Served of Total Employment				
Service Characteristics	Estimated Annual Service Miles				
	Average System Speed				
	Average System Headway				
Productivity	Estimated Annual Ridership				
	Boardings per Service Mile				
	Boardings Per Service Hour				
Efficiency	Estimated Scenario Operating Cost				
	Operating Cost per Service Mile				
	Operating Cost per Passenger Trip				

Figure8: TBEST TDP Summary Report Template

Implementing the TBEST TDP Summary Report

The TBEST Scenario Summary Tool will be updated to include an option for generating the TBEST TDP Summary report. Report generation will be customized to match the performance measures and formatting within the TDP Summary Report template. The table below lists the performance measures within the report and the expected TBEST modifications necessary to calculate the value.

TDP Summary Report Implementation Requirements	
Performance Measures	Implementation Requirements
Total Population	New TBEST functionality will be required for the user to define the service area based on county, urbanized area, or other logical area definitions.
Service Area Population	TBEST functionality will be required to calculate the total population within ¾ mile of each fixed route.
Percent Population Served of Total Population	No new functionality will be required to implement this performance measure.
Passenger Trips per Population Served	No new functionality will be required to implement this performance measure.
Total Employment	TBEST functionality to implement this performance measure will be the same as Total Population.
Total Employment Served	TBEST functionality to implement this performance measure will be the same as Total Population Served.
Percent Employment Served of Total Employment	No new functionality will be required to implement this performance measure.
Estimated Annual Service Miles	No new functionality will be required to implement this performance measure.
Average System Speed	New performance measure within TBEST. It can be calculated from existing vehicle travel times and route mileage data.
Average System Headway	No new functionality will be required to implement this performance measure.
Estimated Annual Ridership	No new functionality will be required to implement this performance measure.
Boardings Per Service Mile	No new functionality will be required to implement this performance measure.
Boardings Per Service Hour	No new functionality will be required to implement this performance measure.
Estimated Scenario Operating Cost	While the current TBEST Scenario Summary Tool does provide the ability to calculate the Scenario Operating Cost, the cost is not specific to a particular scenario. When comparing two scenarios, the tool applies a single operating cost across both scenarios. To apply individual operating costs per scenario will require new functionality within TBEST. Operating costs could be defined as a scenario property within TBEST, or an operating cost could be entered for each scenario when developing performance measure reports.
Operating Cost per Service Mile	Outside of the requirements for Estimated Scenario Operating Costs, no new functionality will be required to implement this performance measure.
Operating Cost per Passenger Trip	Outside of the requirements for Estimated Scenario Operating Costs, no new functionality will be required to implement this performance measure.

Figure9: TDP Summary Report Implementation Requirements

After report generation, it will be possible to customize the report to view specific variables. The report Summary Variables will be listed in a TBEST Scenario Summary tool Scenario Report interface similar to Figure 3 below. The 14 performance measures will be listed under the TDP Performance Measures sub-heading. Checking variables on or off in this interface will toggle their visibility in the report. Filtering variables in this manner could segment reports into specific goal areas or target only critical variables.

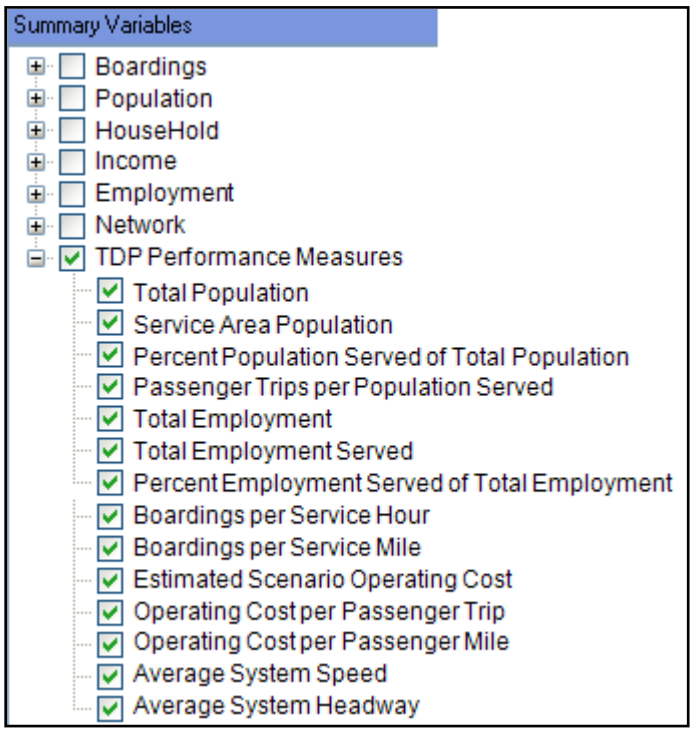


Figure10: Report Summary Variables Window

In addition to the report, the TBEST Scenario Summary Tool provides an interactive charting environment based on the report results. Charts produced from this environment will show performance measure trends for the scenarios listed in the report. Figure 4 below depicts a possible scenario charting output that compares Total Population for two scenarios.

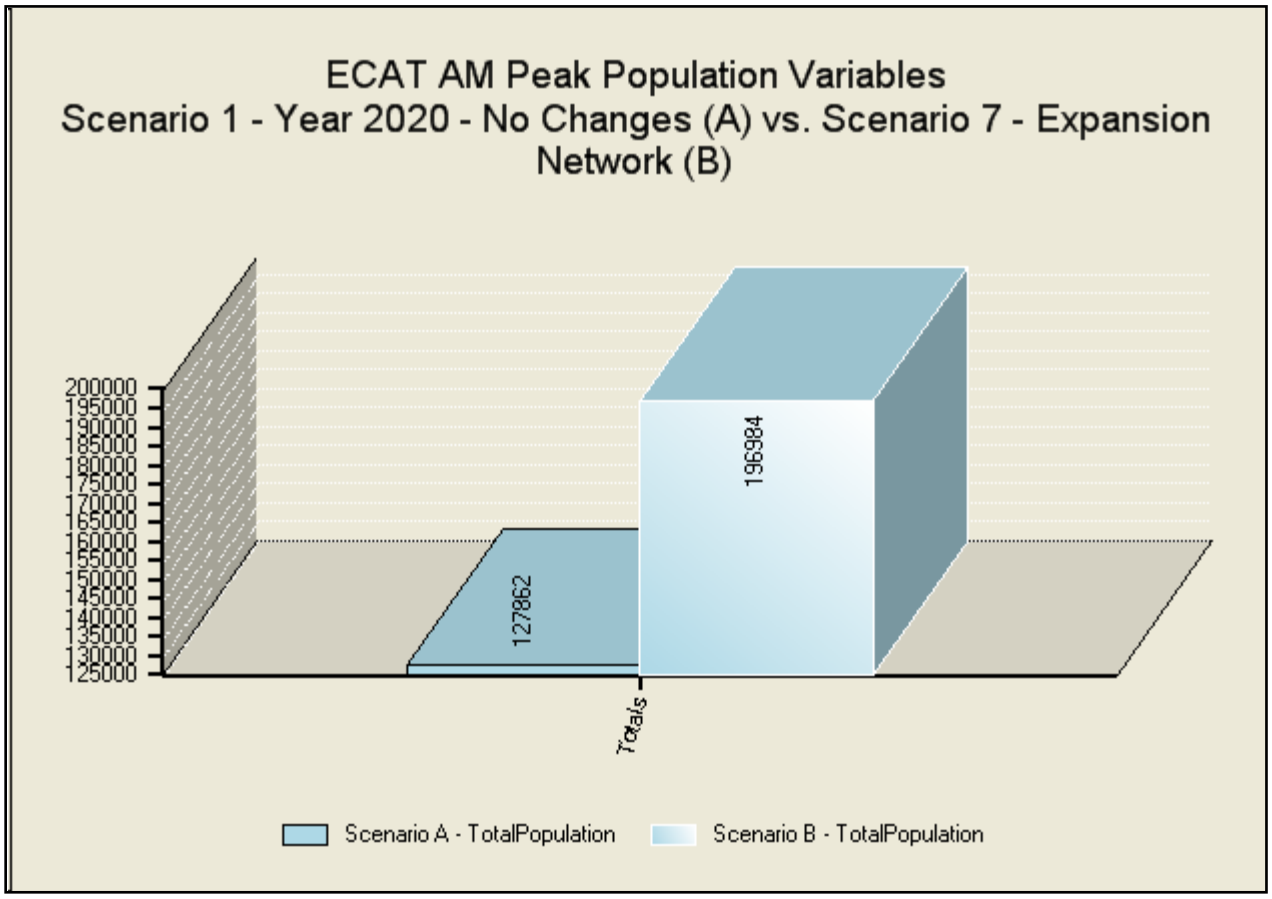


Figure 11: Scenario Variable Chart

Conclusion

This document details the guidelines for TDP model development, performance measures, and software update criteria. The final guidance to the TBEST end-user will be derived from this document and implemented within the TBEST Guidebook. After this document has been adopted by FDOT, the prescribed TBEST functionality for TDP reporting will be implemented within the software and the TBEST Guidebook finalized under the TBEST Maintenance contract. The TBEST Guidebook will also include procedural steps for utilizing the TDP reporting functionality. The final TBEST Guidebook will be made available for public download on the TBEST website.