BEST PRACTICES IN EVALUATING TRANSIT PERFORMANCE

Final Report

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Florida Department of Transportation,
Freight Logistics and Passenger Operations, Transit Office

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CHAPTER 1: INTRODUCTION

To assist Florida transit agencies in improving performance evaluation, the Florida Department of Transportation, Public Transit Office researched best practices for urban fixed route systems in evaluating transit performance in the United States and made recommendations as to how these practices can be adopted and implemented by Florida transit agencies. This study identifies the most common effective performance measures and data sources so that agencies can pick and choose the most appropriate metrics for their agencies.

The implementation of the results-driven Moving Ahead for Progress in the 21st Century Act (MAP-21) accentuates the importance of evaluating transit performance and in ensuring that transit agencies remain accountable in the use and application of federal, state, and local funds. However, there is no uniformity in conducting transit performance evaluation among transit agencies. Each agency, depending on their capabilities and needs, adopt different methodologies in the collection, measurement, analysis, and assessment of transit performance data. Additionally, there is little information collected on the performance evaluation methodologies utilized by each Florida transit agency. This limits the ability to learn from the methodologies applied by other Florida agencies with similar characteristics, curbing the efficiency in conducting internal transit evaluations.

This report describes activities conducted in support of an exploration of best practices for transit performance measurement and is organized into four chapters, including this introduction:

Chapter 2: Literature Review – describes activities conducted in support of an exploration of best practices for transit performance measurement across the United States. Chapter activities are classified as follows:

- Explores best practices for transit performance measurement by reviewing existing literature that discusses the various conceptual frameworks and commonly used measures in evaluating transit performance.
- Conduct a national case study featuring the transit performance measurement programs of selected transit agencies across the United States. The case study encompasses two “large”, two “medium”, and two “small” transit agencies.
- Provide an overview of Moving Ahead for Progress in the 21st Century (MAP-21) requirements relevant to transit performance measurement.

Chapter 3: Practices and Performance Measures Used by Florida Transit Agencies – reviews the current practices of Florida urban fixed route agencies in using performance measures with emphasis on safety and asset management. Activities in this chapter include the following:

- Identification of the most commonly used performance measures reported by Florida transit agencies in their Transit Development Plans (TDPs) and online performance reports. Performance measures were classified into five functional areas: service effectiveness, service efficiency, labor utilization, safety, and asset management.
- Survey of 29 Florida urban fixed route Florida transit agencies comprising small, medium and large agencies. The survey was developed to identify the performance measures that transit agencies are reports and deem as most effective in measuring goals related to customer satisfaction, service

effectiveness, service efficiency, labor utilization, safety, and asset management. The survey also gauges transit agencies' data collection methodologies and sources. The survey results ensure that FDOT had the most up-to-date information related to how Florida transit agencies track and monitor performance measures, focusing on four areas:

(1) Performance reporting
(2) Performance indicators and measures
(3) Performance measures changes with MAP-21
(4) Transit data collection methodology

- After reviewing TDPs and online performance reports and summarizing survey results, four different-sized Florida transit agencies with notable performance measurement programs were selected as case studies. Representatives from the selected agencies were interviewed to gather in-depth information about the agencies capabilities and needs and the methodologies and technologies they use in the collection and analysis of transit data that feeds into the calculation of performance measures. The case study describes the process that transit agencies follow in setting performance measures, collecting and reporting data, and using measures. The case study also provides a discussion of the constraints and opportunities that transit agencies confront in implementing existing and planned performance measurement programs.

Chapter 4: Transit Performance Measure Toolbox Executive Summary – Based on the lessons learned from Chapters Two and Three, an Executive Summary was developed so transit agencies can pick and choose performance measures that match their reporting needs. The performance measures in the Executive Summary are categorized into five functional areas: customer satisfaction, service effectiveness, service efficiency, labor utilization, safety, and asset management, and are linked to specific sample goals. Selection of the measures were based on the following:

- An inventory of performance measures used by Florida transit agencies/the most frequently used performance measures included in the trends and peer analyses of each agency's TDP
- Survey of Florida transit agencies/the most frequently used and most effective performance measures identified by respondents
- Nationally recommended transit performance measures

Information regarding the purpose of the measure as well as ease of collecting data that feeds into each measure are also included in the Executive Summary. The measures included in the Executive Summary are not meant to be data-intensive; most are already being reported by different-sized transit agencies to the NTD.

CHAPTER 2: LITERATURE REVIEW

National Review of Best Practices for Transit Agencies

National Transit Database

The National Transit Database (NTD) was established by Congress to be the United States' primary source for data, information, and statistics on the transit systems around the nation. The data from the NTD reporting system is used in the formula allocations of federal transit funds. Transit providers, states, or metropolitan planning organizations (MPOs) that receive Urbanized Area Formula Program (Section 5307) or Rural Areas Formula Program (Section 5311) grants must report annual data to the NTD.

The NTD Annual Report consists of a series of forms and declarations submitted by agencies to provide a summary of transit characteristics for the fiscal year, including financial and non-financial operating statistics. This includes all revenues and expenditures for all public transportation services, regardless of whether the services are provided in urbanized areas or rural areas. Each reporter (transit agency) is assigned a unique four-digit NTD Identification Number to be used when submitting required forms, waivers, and declarations using the Internet Reporting system that is accessible through the NTD website. For transit agencies serving urban areas with a population greater than 200,000, the 2013 *Urban Module Reporting Manual* contains information necessary to complete the NTD Annual Report. Other relevant documents are the 2013 *Rural Module Reporting Manual* and the 2013 NTD Glossary.

NTD training is provided by the Federal Transit Administration (FTA) nationwide. However, only two states, Texas and Florida, conduct their own statewide NTD training. The Florida Department of Transportation (FDOT) sponsors free bi-annual NTD training for Florida urban transit agencies who receive Section 5307 grants. Similarly, rural transit systems receiving Section 5311 grants also receive guidance from FDOT in tracking measures and submitting transit statistics to NTD. Understanding that rural transit systems have limited resources and capacity as compared to urban systems, the transit statistics that rural systems are required to submit to NTD are not as comprehensive as those of urban systems.

TCRP Report 88

Transit Cooperative Research Program (TCRP) Report 88 (*A Guidebook for Developing a Transit Performance-Measurement System*) was developed to assist transit agencies that are looking to improve their decision-making processes in order to increase their effectiveness and efficiency. The Guidebook lays out a progressive process for transit agencies to develop a performance-measurement program. TCRP Report 88 outlines both traditional and non-traditional performance indicators that are recommended based on typical transit agency goals.

The Guidebook outlines the need for performance-measurement programs and describes in detail the characteristics of an effective performance-measurement system. According to the Guidebook, the key characteristics of an effective performance-measurement system are as follows:

1. Stakeholder acceptance
2. Linkage to agency and community goals

3. Clarity
4. Reliability and credibility
5. Variety of measures
6. Number of measures
7. Level of detail
8. Flexibility
9. Realism of goals and targets
10. Timeliness
11. Integration into agency decision-making

The Guidebook also includes 12 case study examples of successful performance-measurement programs. Successful public transit performance-measurement programs were chosen on the basis of meeting agency goals and objectives defined in the transit provider's long-range transportation plan. The results from these case studies are presented to help transit agencies implement or update their performance-measurement program by using an eight-step process.

TCRP Report 88 identifies and provides a detailed summary for over 400 transit performance measures. The performance measures are divided into 10 categories. These categories are as follows:

1. Availability
2. Service delivery
3. Community
4. Travel time
5. Safety and security
6. Maintenance and construction
7. Economic
8. Capacity
9. Paratransit
10. Comfort

These categories can be used to form an agency's goals and objectives. Based on an agency's goals and objectives, the Guidebook identifies types of performance measures that can be used, relevant data sources, and methods of reporting results. TCRP Report 88 states that it is important to consider the establishment of a performance-measurement program involves a number of trade-offs:

- **How many measures should be reported? –** Too many measures can overwhelm the users with too much data, while too few measures may not address an agency's goals and/or objectives.
- **How much detail should be included? –** More detailed measures will use a greater number of factors, while general measures will be easier to track, calculate and present.
- **Will performance measures be evaluated internally or compared with other agencies? –** Choosing measures designed to be shared or compared with other agencies may limit the amount of performance measures an agency can use and may not address an agency's objectives.
- **Who is the intended audience? –** Some audiences may or may not be familiar with transit service concepts, so selecting performance measures to be correctly displayed and interpreted is vital to the success of the performance-measurement program.

Several different types of measures exist to help Florida transit agencies address these trade-offs. To help transit agencies adopt appropriate performance measures, TCRP Report 88 includes user-friendly

menu guides that quickly identify performance measures appropriate to an agency's goals, objectives, and resources.

TCRP Report 141

TCRP Report 141 (*A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry*) defines a methodology for transportation agencies to evaluate their efficiency and effectiveness. The tools explained in this report can also be used to "identify opportunities for improvement, establish performance goals, and help guide expenditures and investments."

The methodology for evaluating performance measures in this report includes the use of peer comparisons and benchmarking. Peer comparison is used when a transit agency measures its performance against that of similar agencies. TCRP Report 141 provides guidance on how transit agencies can select peers for a peer comparison effort. This peer selection methodology has been incorporated into the Florida Transit Information System - Integrated National Transit Database Analysis System (FTIS-INTDAS). FTIS-INTDAS consolidates transit statistics reported to NTD by transit systems who receive Section 5307 and Section 5311 grants, and it also provides a feature whereby, based on certain criteria, transit agency peer groups are automatically determined.

Through peer comparison, transit agencies are encouraged to benchmark, which adds the component of an agency seeking out best practices to explore and imitate in order to achieve their performance measure goals and objectives. The report describes an eight-step process for conducting a benchmarking effort. Each of the eight steps may or may not be needed in a given analysis. These eight steps are as follows:

1. Understand the context of the benchmarking exercise.
2. Identify standardized performance measures appropriate to the performance question being asked.
3. Establish a peer group.
4. Compare performance within the peer group.
5. Contact best-practices peers in the areas where one's performance can be improved.
6. Develop a strategy for improving performance based on what one learns form the best-practices peers.
7. Implement the strategy.
8. Monitor changes in performance over time, repeating the process if the desired results are not achieved within the desired timeframe.

This report does not recommend one set or a particular number of performance measures. Rather, it presents approaches to evaluating and selecting measures. The report acknowledges that each transportation agency is going to have different performance measures based on size, goals, and resources available to the agency. Therefore, based on the methodology in this report, it is recommended that the report be used as a guide for selecting performance measures that fit with an agency's particular performance goal and objective.

NCHRP Report 446

National Cooperative Highway Research Program (NCHRP) Report 446 (*A Guidebook for Performance Based Transportation Planning*) is intended to provide transportation organizations with "guidance for considering overall system performance in the multimodal transportation planning and decision-making

process." NCHRP Report 446 is a guidebook meant to support transportation investment decisions in accordance with performance-based transportation planning initiatives. This guidebook is tailored to state departments of transportation (DOTs), MPOs, and local transportation authorities.

NCHRP Report 446 explains that "the benefits to be gained from performance-based planning could be substantial." These benefits include:

- Improved correlation between agency goals and those desired by the users and general public
- Improved internal understanding and management of programs and services
- Improved internal strategic planning and analysis
- Improved accountability and reporting on performance and results to external or higher-level entities
- More informed decision making by governing boards or bodies
- Periodic refinement of programs or services

Appendix B of the guidebook lists (but does not explain) hundreds of potential performance measures that can be adopted. These measures are for all transportation modes and are categorized under Accessibility, Mobility, Economic Development, Quality of Life, Environmental and Resource Conservation, Safety, Operational Efficiency, System Preservation, and Measures Relevant to Multiple Categories.

NCHRP Report 708

NCHRP Report 708 (*A Guidebook for Sustainability Performance Measurement for Transportation Agencies*) was designed as a guidebook that transportation agencies can use "to quickly find the information and resources needed to implement and evaluate sustainability." The guidebook describes the role that transportation agencies play in supporting sustainability. NCHRP Report 708 outlines the basic principles of sustainability as meeting human needs for the present and future while:

- preserving and restoring environmental and ecological systems,
- fostering community health and vitality,
- promoting economic development and prosperity, and
- ensuring equity between and among population groups and over generations.

NCHRP Report 708 is a reference for state DOTs and MPOs looking to incorporate sustainability into short- and long-range planning. The guidebook does not identify specific performance measures to evaluate sustainability, but rather recognizes that sustainability performance measures are those that have been selected by a transportation agency to meet sustainability goals and objectives. The guidebook does include examples of sustainability goals, their definitions and how those goals can be combined with performance measures to fulfill a transportation agency's sustainability objectives. These goals and their definitions are listed in **Table 1**.

While NCHRP Report 708 defines sample sustainability goals in **Table 1**, it is important for transportation agencies to identify which goals fit their overall principles of sustainability. The guidebook explains that, when an agency chooses it final set of goals, it is important to have the resources in place to ensure that all of the principles are well addressed.

Table 1. Sustainability Goals and Definitions

Sustainability Goal	Definition
Safety	Provide a safe transportation system for users and the general public.
Basic accessibility	Provide a transportation system that offers accessibility that allows people to fulfill at least their basic needs.
Equity/equal mobility	Provide options that allow affordable and equitable transportation opportunities for all sections of society.
System efficiency	Ensure that the transportation system's functionality and efficiency are maintained and enhanced.
Security	Ensure that the transportation system is secure from, ready for, and resilient to threats from all hazards.
Prosperity	Ensure that the transportation system's development and operation support economic development and prosperity.
Economic viability	Ensure the economic feasibility of transportation investments over time.
Ecosystems	Protect and enhance environmental and ecological systems while developing and operating transportation systems.
Waste generation	Reduce waste generated by transportation-related activities.
Resource consumption	Reduce the use of nonrenewable resources and promote the use of renewable replacements.
Emissions and air quality	Reduce transportation-related emissions of air pollutants and greenhouse gases.

Source: NCHRP Report 708

NCHRP Research Results Digest 361

The purpose of NCHRP Research Results Digest (RRD) 361 (*State DOT Public Transportation Performance Measures: State of the Practice and Future Needs*) is "to provide more information on performance measures and performance management approaches that can be used by state DOTs in relation to public transportation programs." The report declares that state DOT decision-making can be better supported if transit performance measures are used more effectively. In order to explore the use of effective transit performance measures, the researchers who prepared the report conducted a literature review, a web survey of state DOTs, and interviews with selected state DOTs. The interviews indicated that funding shortfalls have resulted in many state DOTs creating transit performance measurement programs or revising existing programs as a means of distributing funds more effectively.

The web survey was used to understand what transportation agencies are doing around the United States to improve efficiency and effectiveness of their transportation systems. The survey showed multiple state DOTs use numerous transit performance measures in order to provide clarity and help track efficiency and effectiveness of transit agencies in their state. Of the 43 state DOTs that responded to the survey (30 of which indicated they use transit performance measures), "several" say that they use 7 or more transit performance measures. Commonly used performance measure categories are ridership, availability, internal cost and efficiency, quality, asset management, and community measures. More information about these categories is as follows:

1. **Ridership measures** focus on the level of riders using a service or services within a particular transit system. Examples are the following:

   - Total ridership, or ridership by mode or service type (used by 17 states in the survey)
   - Passenger trips
   - Passenger miles
   - Ratio of ridership growth to population growth
   - Passengers per capita
   - Number of riders at park-and-ride lot

2. **Availability measures** focus on the availability of transit services provided by a transportation agency. Examples are the following:

   - Total service hours provided versus total hours needed to meet transit demand
   - Average days per week that transit service is available

3. **Internal cost and efficiency measures** focus primarily on internal utilization of resources, cost, and other measures of efficiency. Examples are the following:

   - Passengers per vehicle mile
   - Passengers per vehicle hour
   - Total operating cost per passenger
   - Operating expense per vehicle revenue mile
   - Fuel economy (miles per gallon)

4. **Quality measures** address factors that affect the quality of service experienced by transit riders, which encompasses speed, safety, reliability, and comfort. Examples are the following:

   - On-time performance by mode
   - Rate of injuries and/or fatalities involving transit vehicles
   - Ratings of public transportation system

5. **Asset management measures** address the maintenance of the physical components of the public transportation agency. Examples are the following:

   - Age of fleet by vehicle type
   - Percent of vehicle useful life remaining
   - Number of mechanical failures
   - Distance between vehicle failures

6. **Community measures** focus on impacts, both economic and environmental, to communities served by transit. The surveys conducted for NCHRP RRD 361 suggest that state DOTs do not use community measures as often as they use other categories of measures; however, commute measures can be relevant to a DOT's overall goals. Examples are the following:

   - Percent of non–single-occupant vehicle commuters
   - Number of auto vehicle trips reduced
   - Energy savings
   - Percentage of fleet vehicles transitioned to clean or alternative fuels

In order to help state DOTs select appropriate performance measures, NCHRP RRD 361 provides a list of characteristics of good performance measures. These characteristics were derived from the state DOT interviews and are as follows:

- **Trackable over Time –** Measures can be consistently used over many years.
- **Storytelling Potential –** Measures should be meaningful and convincing, particularly over the long term. They should "help weave a storyline around public transportation performance in the state."
- **Meaningful for Types of Service Measured –** The set of performance measures should include non-traditional measures (e.g., community measures) so as to represent social values and quality of life concerns.
- **Relation to Statewide Public Transportation Goals –** Measures should allow the DOT to track progress towards achieving goals.
- **Available Data –** Measures should be calculable from data that are readily available statewide.

The report identifies the following challenges for state DOT use of transit performance measures:

- Lack of data to support transit performance measurement/monitoring
- Lack of technical resources to support transit performance measurement/monitoring
- Connection between transit performance and decision-making for funding allocations
- Lack of state DOT influence over transit agency decision-making
- Accounting for variations in transit agency types and purposes

The report identifies the following best practices for state DOT use of transit performance measures:

- Choose transit performance measures that can be consistently evaluated over time.
- Select measures that are meaningful to the type of transit service being provided and the purpose of the transit service.
- Choose measures that show progress toward goals.
- Seek input from other state DOTs, transit agencies, and other partners when identifying measures. Develop data partnerships with these entities.
- Make use of national research and studies when identifying measures.
- Cooperate and coordinate with transit agencies.
- Transit performance measures can be used formally or informally. They can be used to support qualitative evaluations.
- Consider hiring a staff person to focus on performance measurement.
- Tie transit performance measurement to funding decisions.

The report concludes that several states have successfully incorporated transit performance measures into external reporting.

Summary of Literature Review

After reviewing existing literature, **it is understood that a successful performance measurement system is based on achieving the goals and objectives set by the transit agency**. For instance, NCHRP Report 446 and Report 708 include examples of sustainability goals, their definitions, and how the goals can be combined with performance measures to fulfill a transportation agency's sustainability objectives. While these two reports do not mention specific performance measures, it noted the importance of **defining an agency's goals and objectives for transit service should come first.**

The goals and objectives defined by a transit agency should be used to help categorize performance measures. TCRP Report 88 had the most comprehensive guide to finding and defining transit performance measures. TCRP Report 88 lays out a progressive process for transit agencies to develop a performance-measurement program. The report outlines both traditional and non-traditional performance indicators that are recommended based on transit agency goals. All of the annual performance measures required by NTD are found in TCRP Report 88.

After a transportation agency has identified its goals and has chosen its performance measures, TCRP Report 141 defines a methodology that helps transit agencies evaluate the efficiency and effectiveness of their performance measures. The methodology for evaluating performance measures in this report includes the use of peer comparisons and benchmarking. In addition to the TCRP Report 141, NCHRP Research Results Digest 361 also recognizes the need for more effective use of public transportation performance measures to support state DOT investment decision-making.

It is understood that a successful performance measurement system is based on achieving the goals and objectives set by the transit agency.

National Case Studies

Six national case studies are described in detail below. The case studies encompass two "large," two "medium," and two "small" transit agencies. The size categories are based on the categories FTA uses for urbanized area apportionments. These are national case studies. The Florida case studies will be discussed in *Chapter Three: Practices in Evaluating Transit Performance*. The transit agencies are as follows:

- **Large (service area population > 1 million):** Washington Metropolitan Area Transit Authority (WMATA) and Denver Regional Transportation District (RTD)
- **Medium (service area population of 200,000 to 1 million):** Capital Metro in Austin, TX, and Lane Transit District (LTD) in Eugene, OR
- **Small (service area population < 200,000):** Transfort in Fort Collins, CO, and Merced County Transit in CA

Large Transit Systems

Washington Area Metropolitan Transit Authority (Washington, D.C.)

The Washington Area Metropolitan Transit Authority (WMATA or Metro) is the transit agency serving the Washington, D.C. metropolitan region. With a service area population of 3.7 million spread over 950 square miles (according to 2012 NTD data), Metro is one of the largest transit providers in the country. **Figure 1** illustrates Metro's extensive bus route map, which provides service to and from the greater Washington, D.C. area. In 2012, Metro saw more than 400 million riders on three types of transit service: bus, rail, and MetroAccess, Metro's paratransit service. The agency offers 318 bus routes on 175 lines; 5 rail lines; and a paratransit fleet of 600 vehicles running seven days a week.

In 2010, in response to the increasing pressure for transparency and accountability, the Office of Performance was created to increase the use of performance information throughout the agency. The Office helped design a performance-based management approach that is shared throughout the organization at all levels. Each quarter, Metro produces the Vital Signs report (The Vital Signs report was produced monthly until 2013). The Vital Signs report provides an analysis of 10 key performance indicators addressing 4 major goals associated with safety, security, service reliability, and customer satisfaction. These goals reflect those in *Momentum: The Next Generation of Metro*, Metro's Strategic Business Plan. **Table 2** presents a breakdown of the *Momentum* goals and key performance indicators.

Figure 1. WMATA System Map

Source: WMATA

Table 2. Goals and Indicators- Metro's Strategic Business Plan

Goals	Performance Indicators
Build and maintain a premier safety culture and system	▪ Customer and employee injury rates ▪ On-time performance ▪ Customer satisfaction ▪ Operating expense on budget ▪ Connecting communities ▪ Crime rates ▪ Escalator availability ▪ Capital funds invested ▪ Meet board-established service criteria
Meet or exceed customer expectations by consistently delivering quality service	
Improve regional mobility and connect communities	
Ensure financial stability and invest in our people and assets	

Source: WMATA, Momentum: The Next Generation of Metro

The performance analysis presented in the Vital Signs report is intended to answer two primary questions that aid Metro in the assessment of its performance and help determine where changes in policy are required:

- Why did performance change?
- What actions are being taken to improve performance?

The performance targets associated with the performance measures are identified in the Vital Signs report. The standards and guidelines dictating targets are passed by resolutions from the WMATA board. The Vital Signs report is the only performance report made available to the general public; however, employees receive daily updates and much more detailed performance measurement reports as part of a larger performance program. These daily reports, along with the Vital Signs reports, are analyzed to determine where opportunities for improvement exist. By requiring performance-improving actions to be part of the Vital Signs report, Metro ensures it is held accountable for its performance in a transparent way.

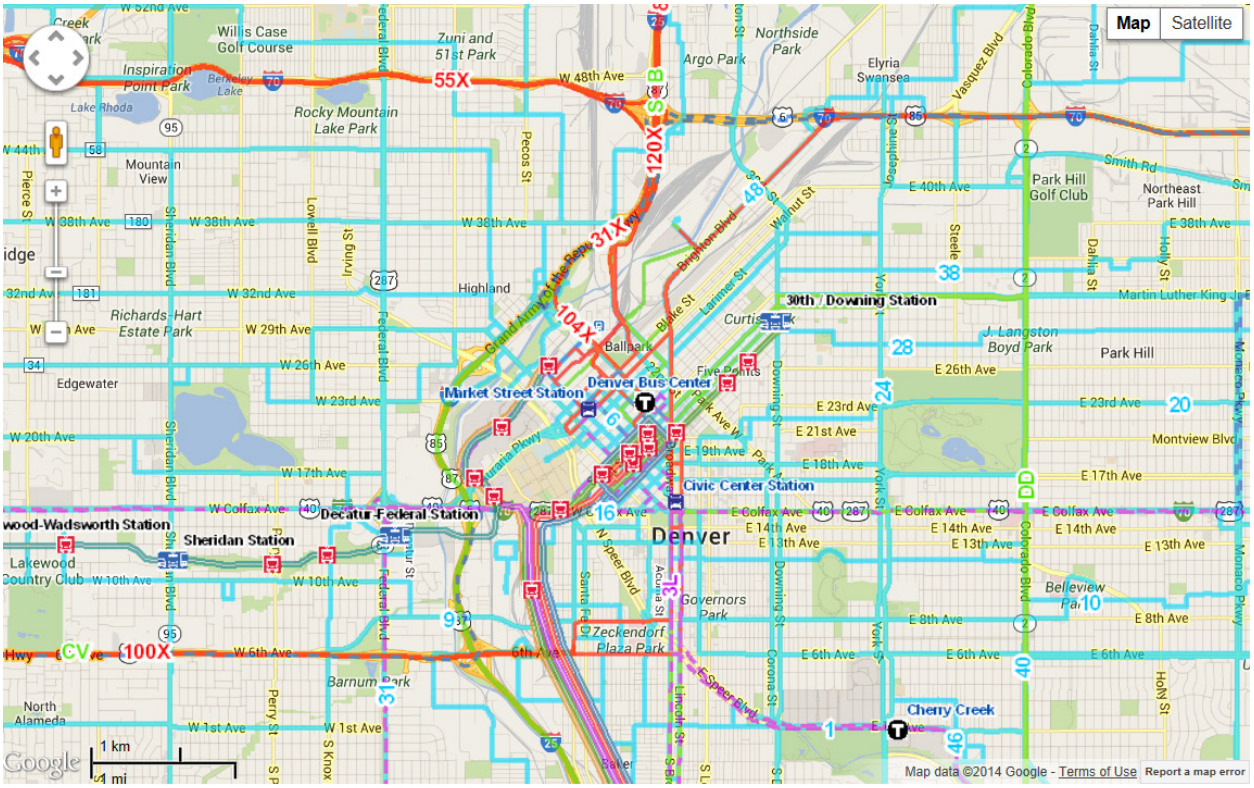
Metro's performance measurement information is one of the products used in the creation of the region's constrained long range plan (CLRP). Developed by the National Capital Region Transportation Planning Board, the region's MPO, this report includes transportation projects that are eligible for federal funding and that are reasonable expected to receive that funding. Metro is then able to use the funds provided to implement the projects identified in that report.

In conclusion, Metro has undertaken a systemwide performance measurement program that requires a continuous evaluation of the system performance, and is made publicly available each quarter. The data is compiled annually and submitted to the National Transit Database (NTD). This system provides transparency through a quarterly Vital Signs Report that presents a high level analysis and communicates if the Metro system's performance is improving, worsening, or remaining steady. By monitoring performance changes, Metro is able to pinpoint areas for improvement and consider actions to improve service.

Denver Regional Transit District (Denver, CO)

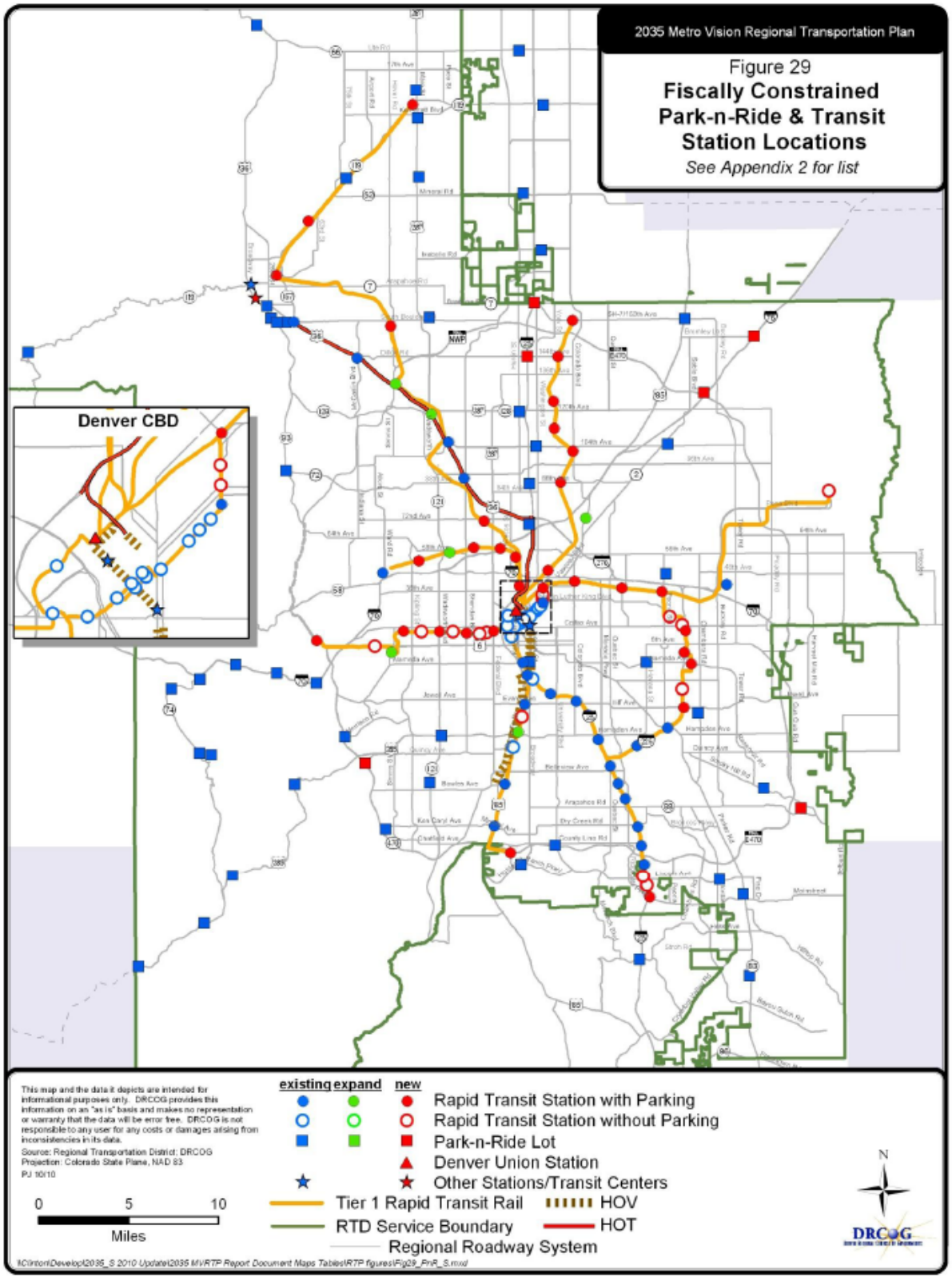
The Denver Regional Transportation District (RTD) serves a population of 2.6 million spread over 2,326 square miles, 40 municipalities, 6 counties, and 2 city/county jurisdictions (based on 2012 NTD data).The agency operates 133 fixed routes including light rail, local bus services, limited bus service, express bus service, as well as special services including paratransit, van pool, and call-and-ride. In 2012, RTD provided over 98 million passenger trips across the breadth of its services. **Figure 2** is an excerpt of RTD's interactive transit system map. This map is a Google-based map designed for passengers to find the most efficient route from their origin to destination. **Figure 3** illustrates the park-and-ride lots and transit stations from the Fiscally Constrained 2035 Regional Transportation Plan. **Figure 3** also conveys the scale of RTD services.

Figure 2. RTD's Interactive Transit Map (Excerpt)



Source: RTD

Figure 3. RTD Park-and-Ride Lots and Transit Stations



Source: Denver Regional Council of Governments, Fiscally Constrained 2035 Regional Transportation Plan

The Service Development Division of the RTD is responsible for the service planning, scheduling, runcutting[1], service monitoring, service performance evaluation, and implementation coordination of all RTD services. The major functions of the Division include:

- Exploration and development of new and improved services
- Integration of service planning with marketing, systems planning, and facilities planning
- Evaluation of service performance according to RTD service standards with recommendations for proposed changes
- Development and implementation of three systemwide service changes each year
- Development of new and restructured network, sub-regional, corridor, and community transit service plans
- Maintenance and development of tools for planning and analysis, including scheduling; runcutting; geographic information systems; ridership monitoring and analysis; and performance evaluation

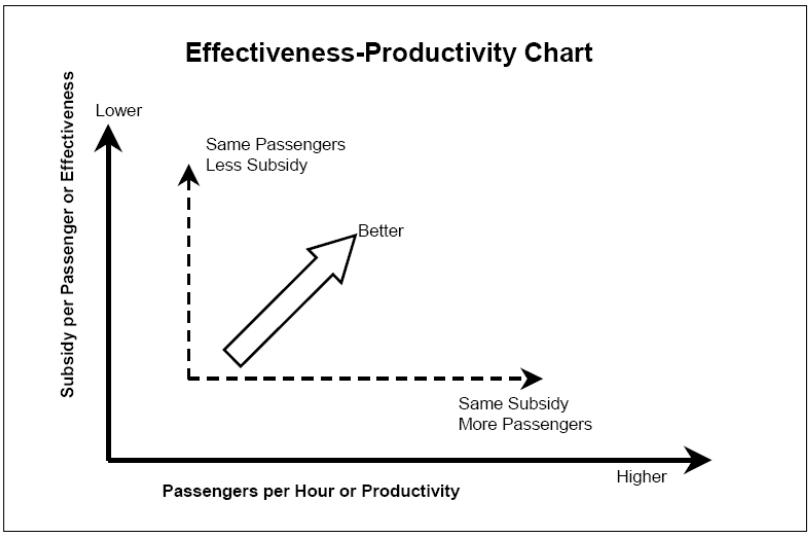
In order to perform these functions, the Service Development Division with RTD relies on a set of service standards used in a yearly performance measure evaluation. RTD's service standards are defined in their *Service Standards* document, last revised in 2002. The standards are maintained by RTD for use in the following two applications:

- The evaluation of existing services, and
- The evaluation of proposals for new service.

The purpose of the service standards is to help identify routes that are most in need of changes. However, just because a route meets the standards does not mean that changes will not be made to the route in the event that an opportunity to increase performance is presented. The service standards are reviewed on a bi-annual basis. In general, the performance of RTD routes is evaluated based on productivity (passengers per hour/passengers per trip) and on cost effectiveness (subsidy per passenger). The standards are based on the performance of the least productive 10 percent of the routes in each service class for either the ridership or economic measure, or on the least productive 25 percent of routes in both measures. They are shown together in a chart so that a true comparison of routes can take place. The *Service Standards* document, as shown in **Figure 4**, is intended to provide a comparative analysis of all classes of services by illustrating relative performance.

[1] According to the 3rd Edition of the *Transit Capacity and Quality Service Manual,* runcutting is "the process of organizing all scheduled trips into [groups] for the assignment of operating personnel and vehicles."

Figure 4. RTD's Effectiveness vs. Productivity Chart



Source: RTD, Service Standards

RTD's *Service Standards* document is extensive, and it covers a multitude of topics including service frequencies, vehicle assignment, route changes, geometric design, area coverage, systemwide cost recovery (the minimum ratio is 30%), and standards for transit-dependent travelers. **Table 3** shows the minimum service standards for buses, and **Table 4** shows the maximum service standards for rail. In both cases, frequencies can be changed to help balance out loads.

Table 3. Bus Typical Productivity by Service Frequency

Frequency	Boardings Per Hour	
	Route	Segment-Period
60 – 30 Minutes	Minimum for Class	-
15 Minutes	25 – 39	35 +
10 Minutes	40 +	45 +

Source: RTD, Service Standards

Table 4. Rail Maximum Service Standards

Route Type	Load		
	Peak	Off Peak	Special Events
Local and Limited Service	125% of Seated Load	Seated Load	-
Express, Regional, and SkyRide Service	Seated Load	Seated Load	-
Light Rail Vehicles	125 Passengers per Vehicle	Seated Load	165 Passengers per Vehicle

Source: RTD, Service Standards

RTD requires that all routes meet the applicable minimum standards. The routes not meeting the minimum standards are assessed to determine what is not working, and changes are made based on that assessment. Typically, this means some form of modification or additional marketing for the route (typically through direct mail) that is meant to help bring the route up to the minimum standards. If a route cannot be brought up to the minimum standards for some reason, it may be subject to cancellation as a last resort.

In addition to the service development reporting, RTD also releases a quarterly performance report. In this report, RTD measures performance in relation to seven goals that are supported by objectives and performance measures. The RTD performance measures are adopted yearly by the Board of Directors and are used in conjunction with the service standards discussed previously to determine service changes. The goals and performance measures, shown in **Table 5**, can be found annually in RTD's Adopted Budget report.

Table 5. RTD Denver Performance Measurement Standards

Goal	Objectives	Performance Measures
To meet the present transportation needs of the District by providing safe transportation service	▪ Reduce vehicle accident ratio ▪ Increase preventive maintenance ▪ Reduce passenger accident ratio ▪ Improve light rail safety ▪ Improve employee safety	▪ Vehicle accident involvements per 100,000 miles – preventable ▪ Percentage of preventive maintenance inspections incurred as scheduled every 6,000 miles – systemwide ▪ Passenger accident ratio per 100,000 miles – systemwide ▪ Reportable light rail/auto accidents per month ▪ Reportable light rail/auto accidents per 100,000 miles – preventable ▪ Operator or passenger assault ratio per 100,000 boardings ▪ Average response time to emergency dispatch calls
To meet the present transportation needs of the District by providing clean transportation service	▪ Prompt graffiti removal ▪ Prompt bus interior and exterior cleaning ▪ Prompt shelter cleaning	▪ Average response time to public comments ▪ Average graffiti complaints per month ▪ Average facilities maintenance complaints per month ▪ Average overdue bus interior cleanings per month
To meet the present transportation needs of the District by providing reliable transportation service	▪ Improve on-time performance ▪ Improve miles between lost service road calls ▪ Decrease number of missed trips	▪ Local on-time service – systemwide ▪ Regional and express on-time service ▪ Light rail – on-time service ▪ Light rail – service available ▪ Adherence to scheduled revenue service trip start time – systemwide ▪ Mileage between lost service maintenance road calls ▪ Hours between lost service maintenance road calls ▪ Average number of buses ▪ Average age of buses
To meet the present transportation needs of	▪ Reduce customer response time	▪ Average Telephone Information Center (TIC) call wait time

Goal	Objectives	Performance Measures
the District by providing courteous transportation service	▪ Limit customer complaints ▪ Decrease average wait time for telephone information ▪ Complete installation of shelter boards by date of service change	▪ Response time on TIC customer inquiries ▪ Average response time to customer complaints ▪ Complaints per boarding
To meet the present transportation needs of the District by providing accessible transportation support service	▪ Improve on-time performance standards ▪ Improve ADA trip availability ▪ Improve ADA courtesy	▪ Access-a-Ride on-time service ▪ Adherence to Americans with Disabilities Act (ADA) mandate to have zero denials to service requests ▪ Average ADA complaints per boarding
To meet the present transportation needs of the District by providing cost-effect and efficient transportation service	▪ Maintain cost recovery ratios ▪ Increase ridership ▪ Increase farebox and EcoPass revenue ▪ Improve route efficiency ▪ Monitor selected internal functions for efficiency ▪ Maintain cost effective and efficient transportation services ▪ Hire and train competent personnel	▪ Operating cost recovery ratio ▪ Overall ridership increase ▪ Fare revenue ▪ EcoPass revenue ▪ Total operating revenue ▪ Number of audits ▪ Bus operator – vacancies ▪ Bus operator – over headcount ▪ Bus mechanic – vacancies ▪ Bus mechanic – over headcount ▪ Stock-out level
To meet the future transportation needs of the District	▪ Deliver civic and neighborhood presentations to communicate with the public regarding service issues ▪ Maintain accurate financial analysis	▪ Number of presentations – Communications ▪ Number of presentations – General Manager ▪ Number of presentations – service changes ▪ Number of presentations – route and service planning ▪ Number of local government planning workshops ▪ Number of Community Advisory Committee meetings ▪ Number of Info Rides ▪ Receipt of Distinguished Budget Presentation Award ▪ Receipt of Certificate of Achievement for Excellence in Financial Reporting

Source: RTD, compiled from 2012 Adopted Budget

In addition to determining service changes on an annual basis, RTD also used its performance measurement to develop a 12-year comprehensive plan known as FasTracks. The plan balances transit needs in the region with the projected future population growth of almost one million people by 2025. Approved in November 2004, the project has been worked on continuously, adapting based on the

performance of the system as a whole. Currently, it has produced one new completed rail line with four other rail lines, a BRT project, and Denver Union Station is under construction.

RTD works alongside the Denver Regional Council of Governments, the region's designated Metropolitan Planning Organization; the Colorado Department of Transportation; the Colorado Department of Public Health and Environment; and the Regional Air Quality Council on the transportation planning process for the region. Most recently, this process has produced the 2035 Metro Vision Regional Transportation Plan and the 2012-2017 Transportation Improvement Program. Armed with a solid performance measurement process and the knowledge of the state of the public transportation system's needs, RTD has been able to recommend projects by considering current and future service needs and the improvements required to sustain those needs.

In conclusion, RTD has developed a multi-pronged and extensive set of performance measurement and service standards allowing the agency to assess the need for route and organizational changes on a quarterly and annual basis. The data is compiled annually and submitted to the National Transit Database (NTD). This system remains current because the service standards are established in a way that allows them to adapt each year depending on the ridership that year in comparison to previous years. Using this system, RTD has been able to meet the demand for transit in the Denver Region and will continue to expand into the future.

Medium Transit Systems

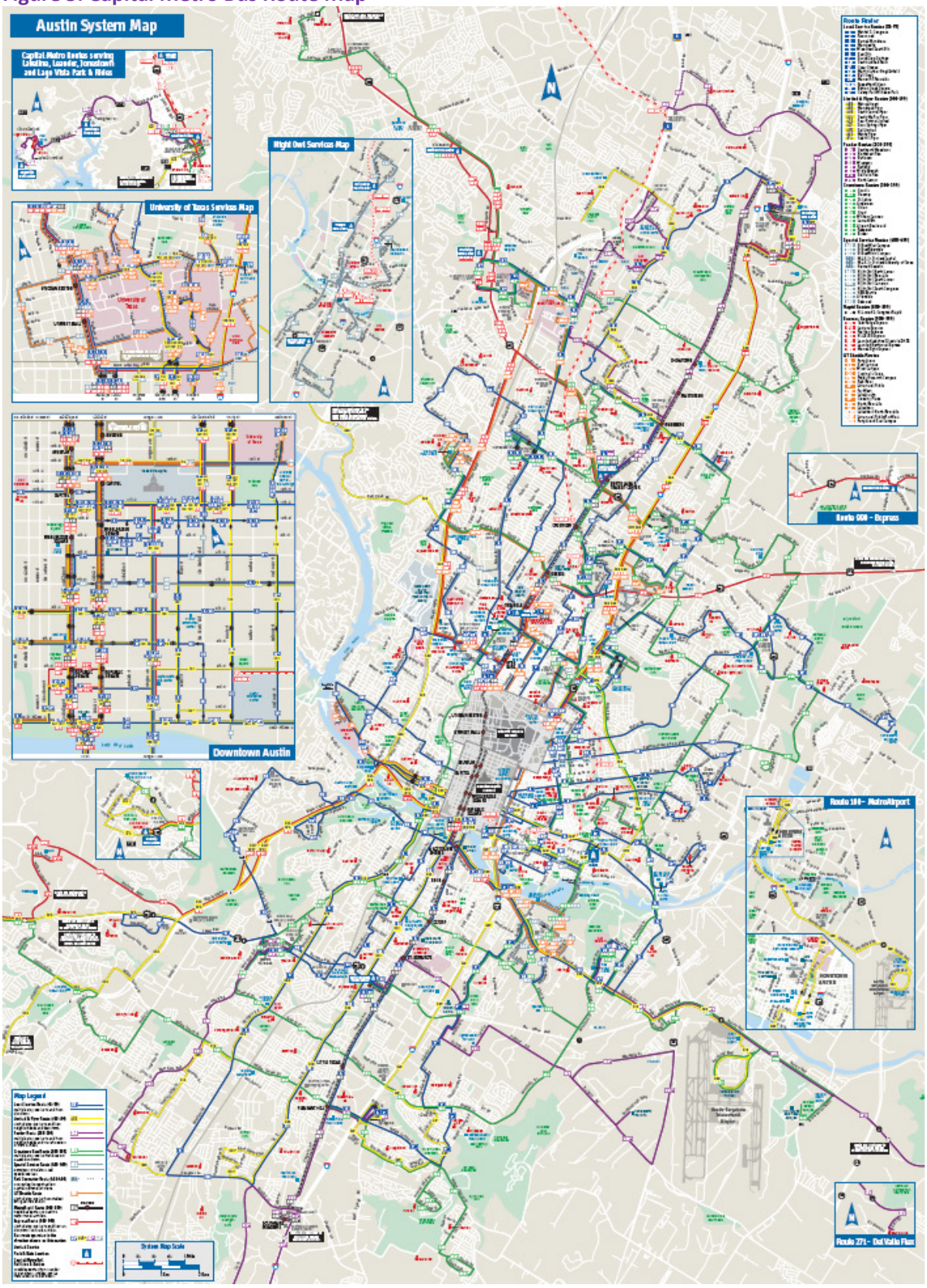
Capital Metro (Austin, TX)

Capital Metro is the public transportation provider in Austin, Texas. From 2012 NTD data, Capital Metro serves a population of 1 million (up from 936,363 in 2011) spread over 522 square miles. The agency provides over 33 million passenger trips per year on rail lines, buses, university shuttles, and other types of transit. Capital Metro operates 83 bus routes (400 buses), 32 miles of commuter rail, 127 vanpools, 14 carpools, and 138 paratransit vehicles. **Figure 5** illustrates Capital Metro's service area.

In 2010, Capital Metro was struggling financially. In response to this, the Sunset Advisory Commission (made up of state legislators and identifying waste, duplication, and inefficiencies in services) released recommendations for Capital Metro with changes to be made. The report recommended an overhaul of Capital Metro's labor structure and addressed the funding issues the agency was experiencing. One of the recommendations required Capital Metro to adopt a five-year capital improvement plan, a balanced budget each year, and a five-year strategic plan that drives the budget.

Due largely to the new requirements, Capital Metro works closely with the Capital Metro Board of Directors and conducts an extensive public participation process to develop a yearly strategic plan, known as the *Capital Metro Strategic Plan*. The strategic plan evaluates previous year performance and sets the performance standards for the upcoming year. The plan reflects the near-and long-term plans of the Capital Metro Board of Directors, and helps the agency determine where efficiencies can be gained and changes can be made. In this strategic plan, Capital Metro measures performance in relation to four goals supported by objectives and performance measures. The goals, objectives, and performance measurement standards can be seen in **Table 6**.

Figure 5. Capital Metro Bus Route Map



Source: Capital Metro

Table 6. Capital Metro Performance Measurement Standards

Goal	Objectives	Performance Measures
Provide a great customer experience	▪ Increase user friendliness ▪ Make riding safe, reliable, and accessible	▪ Customer satisfaction survey ▪ % of trips booked on Interactive Voice Response (IVR) ▪ % of trips booked on WebRes site ▪ Call center responsiveness (by service level, in both call centers) ▪ Increased Wi-Fi use ▪ Decrease customer complaint process time ▪ Service delivery index (includes on time performance, vehicle accident rate, passenger accident rate, miles between road calls, and customer comments ▪ % of bus stop connectivity / accessibility upgraded to meet Capital Metro's standard
Improve business practices	▪ Strengthen the financial health of the agency ▪ Increase accountability ▪ Enhance organizational development	▪ Two-month operating revenue reserves ▪ Return on assets (includes right of way revenue, transit advertising, and fares) ▪ Audit findings key performance indicator (KPI) ▪ State of Good Repair KPI ▪ Operating budget adherence ▪ Employee survey results ▪ Percent of designated leadership team beginning participation in the leadership development program
Demonstrate the value of public transportation in an active community	▪ Increase ridership in target markets ▪ Develop and innovatively deliver our message ▪ Strengthen community relationships	▪ Riders per hour ▪ Website average visits/day ▪ Website returning traffic ▪ Website new traffic ▪ Website average bounce rate ▪ Ridership increase in target markets ▪ Ridership increase in University of Texas students on mainline service ▪ Establish baseline for sale of student summer ridership pass ▪ Customer satisfaction survey ▪ Number of positive media pitches ▪ Attitudinal poll ▪ DBE goal ▪ Increase number of employers who buy passes for their employees ▪ Increase the number of speakers bureau presentations
Be a regional leader	▪ Lead public transportation planning and innovation ▪ Grow the service area and customer base ▪ Play a key role in sustainable development	▪ Attitudinal poll ▪ Advance the project Connect High Capacity Transit System Plan ▪ Develop and upgrade plan for MetroRail ▪ BRT measures (schedule and budget for project) ▪ Funding for transit initiatives grant funding ▪ Urban rail development project ▪ Project Connect System Plan ▪ Initiate North Central corridor alternatives analysis

Source: Capital Metro, Capital Metro Strategic Plan

In addition to helping Capital Metro determine service needs, the performance measures are used in a variety of new ways that require Capital Metro to coordinate with many different entities. For example, the agency is now spearheading Project Connect, a regional transportation plan that includes urban commuter rail and bus-rapid transit. The Capital Area Metropolitan Planning Organization created the Transit Working Group that meets frequently throughout the year to provide input on regional high-capacity transit plans in Central Texas. Capital Metro is a key member along with the City of Austin and the Lone Star Rail District.

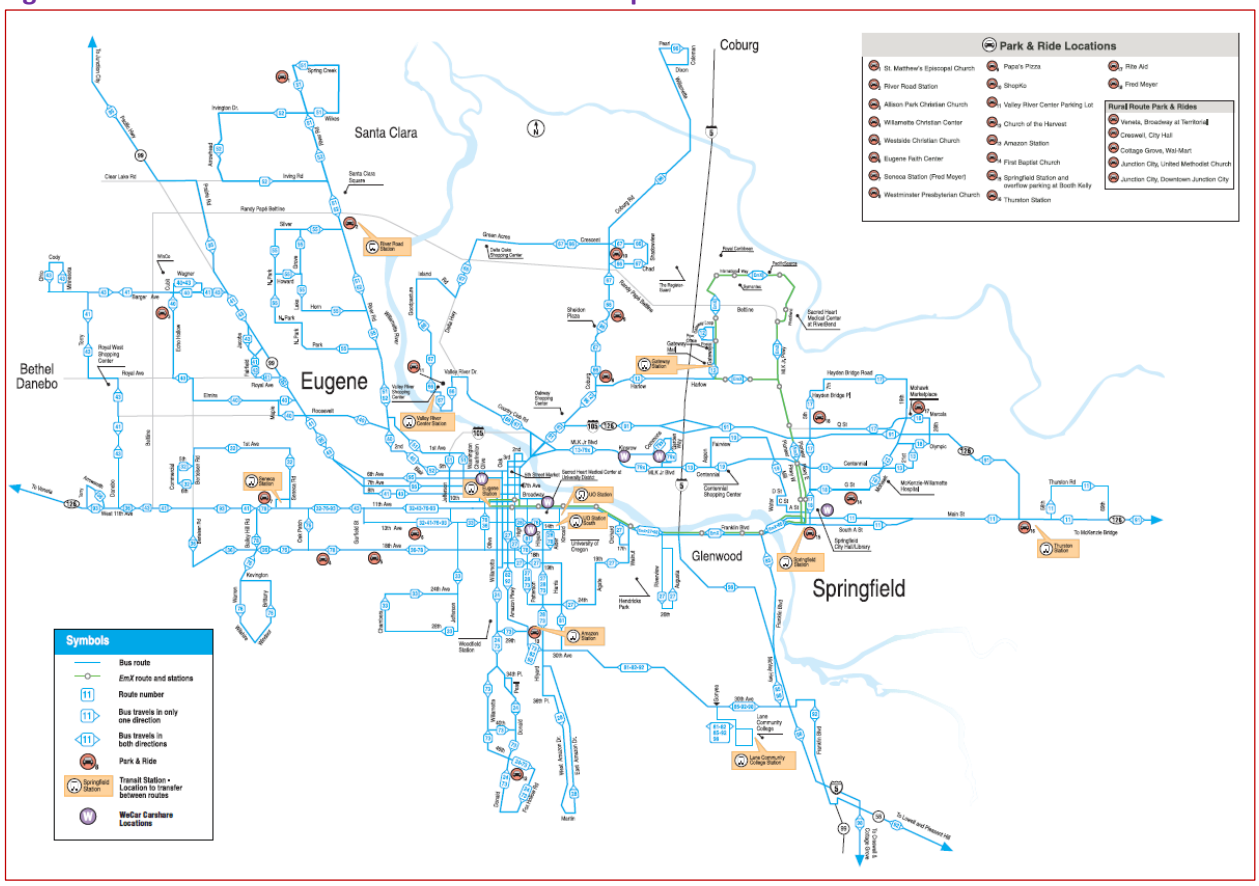
The performance measures provide a base level of understanding used to determine opportunities for increased service and where funding for those opportunities can be gained. Additionally, the use of performance measures helps the agency track its progress towards its goals and allows Capital Metro to hold itself accountable for meeting those goals.

In conclusion, Capital Metro implemented a series of changes in response to a troubled financial scenario in 2010. These measures included the implementation of yearly performance measurement and evaluation, the privatization of many services, a more intense public participation and review process. Since then, the agency has seen continuous ridership increases, service increases, and revenue increases. The performance measurement system allows the agency to determine where opportunities for improvement exist and help pinpoint changes to continuously improve operations. Capital Metro is now able to plan for both the short- and long-term needs of the Austin area based on a realistic picture of where the agency stands each year.

Lane Transit District (Eugene, OR)

Lane Transit District (LTD) is the public transportation provider for the Eugene and Springfield, Oregon metro area. The agency has a service area of 298,000 people across 482 square miles, and provides approximately 11.5 million annual passenger trips (based on 2012 NTD data). LTD currently operates 35 fixed routes, two bus rapid transit routes (known as EmX), paratransit (EZ Access and Ride Source), and an event shuttle service. **Figure 6** illustrates the service area map of LTD and each of the bus lines servicing the Eugene-Springfield metropolitan area. The map also includes park and ride locations for transit riders looking to drive to the closest bus stop servicing their origin and destination.

Figure 6. Lane Transit District's Bus Service Area Map



Source: LTD

In 2013, the draft Lane Transit District Long-Range Transit Plan (LRTP) was developed in coordination with the long-term transportation system plans of the cities in the region and the Central Lane MPO's long-term regional transportation system plan. LTD's 2013 LRTP covers a 20-year planning horizon. Within this LRTP, LTD delineates a set of policies, projects, and performance measures to serve as a basis for the transit elements required in order to assure consistency with other adopted local, regional, and state plans, policies, and rules throughout Oregon.

The LRTP delineates a series of six goals supported by various policies and strategies based on an assessment of the strategic issues facing LTD. In order to ensure the goals are met, LTD developed a set of 11 performance measures designed to create a connection between long-range planning and day-to-day actions. The performance measures are not exhaustive, but instead are meant to serve as a starting point to monitor change in the LRTP's goals and policies and will evolve as necessary to remain current and relevant to the community. LTD analyzes its performance monthly in order to continuously improve on its service and monitor how the LRTP performs over time. **Table 7** lists the six goals and performance measures for each goal.

Table 7. LTD's Goals and Performance Measures as Outlined in the 2013 LRTP

Goal	Performance Measure										
	On-time departures as a % of total departures	Frequency of transit service	Passenger miles per vehicle revenue hour	Passenger miles per capita	% of households with access to transit	% of employers with access to transit	Preventable vehicle collisions as a % of total vehicle collisions	Sense of safety while riding with other passengers	Operating costs per vehicle revenue mile	Operating cost per boarding	General rider satisfaction
Provide attractive travel options to improve ease of connectivity throughout LTD's service area	X	X	X	X	X	X		X			X
Sustain and enhance economic prosperity, environmental health, and quality of life through investment in transit service and infrastructure	X	X	X	X	X	X			X	X	X
Ensure equitable and accessible transit service	X	X		X	X	X					X
Maintain and enhance safety and security of LTD's services							X	X			
Use LTD's resources sustainably in adapting to future conditions	X	X	X	X	X	X			X	X	X
Engage the regional community in LET's short- and long-term planning process								X			X

Source: LTD. Draft 2013 LRTP

In addition to performance measures outlined in LTD's LRTP, the Central Lane MPO is currently developing a 3-5 year Transportation Improvement Program designed to help prioritize projects outlined in LTD's LRTP. The Transportation Improvement Program will incorporate LTD's LRTP goals, objectives, and performance measures in order to channel federal funding for future transportation projects and programs throughout the Eugene-Springfield metropolitan area.

In conclusion, LTD has created the first major update of its performance measures since 2001. These performance measures were crafted with the support of the communities, as well as the MPO to support the region's transportation system in a way that is sensitive to the needs of the communities and the region alike. The performance measures are both context-sensitive and adaptable, paving the

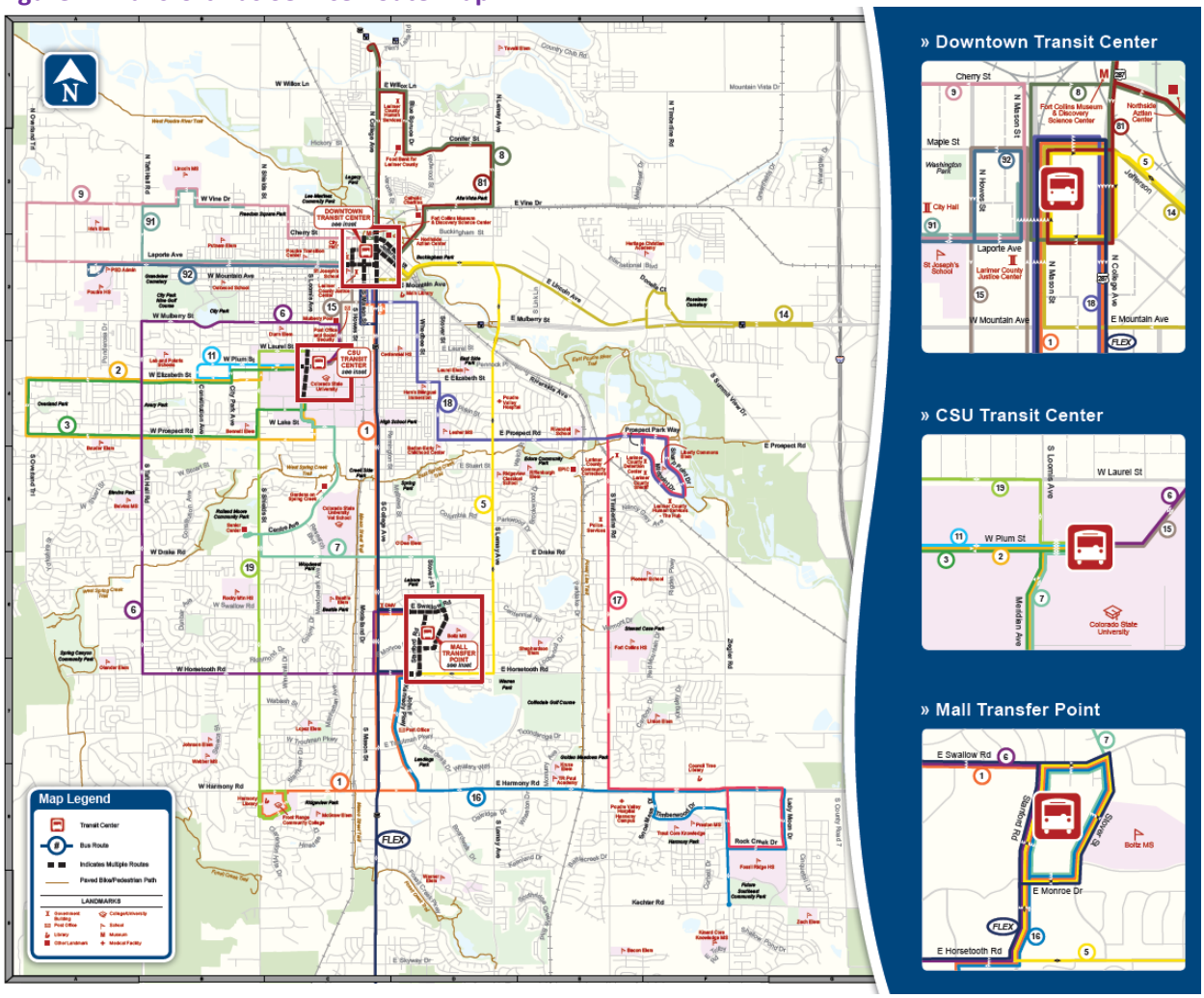
path for a system that can plan for the short- and long-term future in a way that is informed, current, and relevant.

Small Transit Systems

Transfort (Fort Collins, CO)

Transfort is the public transportation provider for the metro area of Fort Collins, Colorado, located north of the Denver metropolitan area. Transfort's service area includes a population of 144,000 and covers 54 square miles (based on 2012 NTD data). Transfort offers 20 fixed routes, with 14 of those routes providing service Monday through Saturday. **Figure 7** illustrates the Transfort service area. In addition to fixed route service, Transfort provides intercity service, three campus routes that serve students and faculty at Colorado State University, and dial-a-ride service for the disabled and elderly in the area. Transfort provided just over 2.2 million passenger trips in 2012.

Figure 7. Transfort Bus Service Route Map



Source: City of Fort Collins

In order to address requests for changes to existing service and new service in the growing areas of Fort Collins, Transfort maintains a set of standards in its *Service Standards and Policies* document. These standards are used to "ensure that the service being provided represents the most cost-effective use of

the City's resources." That is, the service standards help identify the Transfort routes most in need of revision or elimination.

Transfort's service standards were developed and implemented to support the goals and objectives of the City of Fort Collins. The service standards are reviewed on a bi-annual basis. During the bi-annual assessment period, Transfort works with the City to review the service standards over the previous time period and determine whether any standards should be added or revised based on any changes in the City's goals and objectives. Performance measures are updated each year and reported to NTD. The updating procedure compares the values of the performance measures with those from the previous year.

Transfort aggregates performance measures into eight categories, which are evaluated for each of the five transit service types, distinguished by area type and land use designations. **Table 8** shows the eight categories and their corresponding performance measures.

Based on annual performance reviews, Transfort identifies possible new route extensions or deviations to existing routes. The agency reviews performance by comparing minimum and target goals for each of the measures within the identified categories. In addition, these standards are also used to evaluate proposals for new routes to serve the Fort Collins metropolitan area. The measures have thresholds that are used to determine if a route is operating at an "E" (Exceeds), "S" (Satisfactory), "M" (Marginal), or "U" (Unsatisfactory) level.

In conclusion, Transfort has developed its own method for evaluating and assessing its transit services. Transfort evaluates performance measures and reports these measures to NTD on a yearly basis. On a bi-annual basis, the City of Fort Collins and Transfort meet to review the efficiency and effectiveness of their transit system based on the results of their performance assessment. The results are used in conjunction with the City's transportation goals and objectives to determine if route changes or modifications need to be made and/or if performance measures should be added or eliminated in order to reach the City's transit goals.

Table 8. Transfort's Current Transit Performance Measures

Category	Performance Measures
Ridership and Economic	▪ Passengers/hour ▪ Passengers/mile ▪ Passengers/revenue hour ▪ Passenger/revenue mile
Vehicle Load	▪ Seated capacity ▪ Passenger load
Vehicle Headway	▪ Service frequency ▪ Headway
Service Availability	▪ Availability ▪ Population density ▪ Employment density ▪ Service area demographics ▪ Enhancements of timed transfers ▪ Destinations ▪ Route directness
Vehicle Assignment Targets	▪ Average age of fleet vehicles ▪ Fleet composition
On Time Performance	▪ On-time performance ▪ Percent of routes scheduled to clock headways ▪ Delay ratio
Distribution of Transit Amenities	▪ Percentage of stops with shelter and benches ▪ Fleet cleaning ▪ Passenger environment
Transit Security	▪ Passenger safety ▪ Ratio of police officers to transit vehicles ▪ Number of vehicles with specified safety devices

Source: Transfort, Service Standards and Policies

Merced County Transit (Merced County, California)

Merced County Transit, also known as The Bus, serves 120,000 people and 30 square miles (based on 2012 NTD data) throughout Merced County in California's Central Valley. The Bus provided more than 800,000 passenger trips in 2012. Merced's downtown transportation center serves as the hub for The Bus's fixed route and dial-a-ride services. The downtown transportation center offers multimodal connections to the Bay Area, Los Angeles, Sacramento, and Yosemite National Park.

The Bus offers a public transportation network which includes a mix of local fixed routes, inter-community fixed routes that connect communities throughout Merced County, and dial-a-ride services, in both urban and rural areas. A system map illustrating all routes is not available, but the agency's web

site offers a map of each route and its weekday and weekend schedule, as well as a real-time bus tracking map.

In June 2012, the Transit Joint Powers Authority for Merced County produced the *Short Range Transit Plan* (SRTP) for 2012-2017. The SRTP reviews the existing services within Merced County, lays out a 10-year vision for an enhanced transit network, and proposes a stepwise approach to pursuing the 10-year vision by identifying current and previous performance standards to achieve goals and objectives. The Merced County Association of Government (MCAG), serving as the MPO for Merced County, wrote the *2011 Regional Transportation Plan for Merced County* (RTP) that identifies countywide transportation goals and objectives and provides performance measures for reaching systemwide goals.

Merced County Transit's SRTP identifies performance measures based on ridership goals, economic viability of the transit system, and requirements by the California Department of Transportation (Caltrans) for fixed route and dial-a-ride services. These performance measures are grouped into two categories: base statistics and performance measures. The measures are assessed annually for each of the four service types. This evaluation has an emphasis on farebox recovery because of the Transportation Development Act requirement, stating that urbanized areas achieve 20 percent farebox recovery for fixed routes and rural fixed routes and demand-response services must achieve a 10 percent farebox recovery. **Table 9** shows The Bus's performance measures.

Table 9. The Bus's Current Performance Measures

Service Types	Base Statistics	Performance Measures
▪ Urban Fixed Route ▪ Urban Dial-A-Ride ▪ Rural Fixed Route ▪ Rural Dial-A-Ride	▪ Passengers ▪ Revenue Hours ▪ Revenue Miles ▪ Fare Revenues ▪ Operating Costs	▪ Passengers/revenue hour ▪ Passengers/revenue mile ▪ Cost/revenue hour ▪ Cost/revenue mile ▪ Cost/passenger trip ▪ Subsidy/passenger ▪ Average fare ▪ Farebox recovery

Source: Transit Joint Powers Authority for Merced County Short Range Transit Plan

The 2012 version of the SRTP recommended new goals and objectives and identified performance measures in order to achieve the new goals. The new performance measures will be evaluated in future SRTP updates. The three new goals for The Bus are:

1. Provide increased mobility in Merced County,
2. Provide safe and high quality service, and
3. Provide cost-effective and efficient services.

The new performance measures accompanying the three new goals are shown in **Table 10**. Minimum and target thresholds are provided for each measure.

Table 10. Merced County Transit New Performance Measures- 2012 SRTP

Performance Measure	Minimum	Target
Miles Between Preventable Accidents	100,000	500,000
Miles Between Road Calls	10,000	15,000
Percentage of Trips No Later Than 5 Minutes after Scheduled Timepoint	95%	99%

Source: Transit Joint Powers Authority for Merced County Short Range Transit Plan

In conclusion, The Bus assesses and evaluates performance measures on an annual basis, and submits to the NTD. In addition to adding three performance measures, a target standard of 25 percent farebox recovery in urbanized areas for fixed route services was set in the 2012 SRTP. Based on the yearly assessment of The Bus's performance measures, adjustments are made by the agency in order to grow and continue to provide efficient and effective transit service throughout Merced County.

Summary of Case Studies

Consideration of the six case studies as a whole suggests the following observations:

- Larger transit agencies do not necessarily have more extensive performance measurement programs (in terms of the number of measures used) than smaller agencies, as shown below in **Table 11**.
  - This is in spite of larger transit agencies tending to provide more transit service, more types of transit service, and/or more complex transit services.
  - This is in spite of larger transit agencies tending to have more resources available (in terms of funding options and partner data) to support more extensive performance measurement programs and more rigorous FTA reporting requirements.
- All case study agencies use performance measures related to on-time performance. More than half use performance measures related to safety/accidents, customer satisfaction, the amount/type of transit service provided, and cost-effectiveness.
- All case study agencies link transit performance measures to agency goals. Some link transit performance measures to a vision as well.
- General long-range planning influences the development of a transit performance measurement program, and performance measures can inform updates of long-range plans (e.g., LRTPs in Florida). In general, long-range plans are closely tied to performance measurement programs.
- Transit performance data are shared with other agencies and with the public for coordination, oversight, and/or transparency purposes. Capital Metro uses performance measurement data to seek out new funding sources.
- Transit performance measurement activities typically occur within the transit agency (as opposed to within a partner agency such as an MPO or state DOT). Transit agencies with adequate resources may have staff or a department dedicated to performance measurement and monitoring.
- Some performance management programs define feedback loops that account for service improvements and inform future updates of measures and targets.
- The case study agencies review their performance standards periodically. This occurs on an annual or bi-annual basis.
- Most of the case study agencies conduct formal performance measurement evaluations on an annual basis. WMATA conducts such evaluations quarterly and LTD conducts them monthly. Prior to 2013, WMATA conducted formal performance measure evaluations monthly.

- Transit agency board involvement in performance measurement is typically focused on developing/updating performance measures and targets.
- Performance can be assessed with respect to minimum standards for a route/service or by comparing one route/service to others. In the case of the former, the agency considers revising or eliminating routes/services that do not meet minimum standards. In the case of the latter, the agency considers revising or eliminating routes/services that do not perform as well as other routes/services. Revisions might include reallocating marketing funds in addition to or in place of service improvements.

It should be noted that six case studies can serve only as a snapshot of U.S. transit agencies, so the above observations should be updated if additional transit agencies are studied.

Table 11. Number of Performance Measures Used by Case Study Agencies

Statistic	WMATA	LTD	The Bus	Transfort	Capital Metro	RTD
Number of Measures	9	11	11	26	37	47
2012 Passenger Trips	416,197,000	11,480,000	838,000	2,269,000	20,138,000	70,963,000
2012 Service Area Population	3,720,000	297,500	120,000	144,000	1,023,000	2,619,000
2012 Service Area Size (sq. mi.)	950	482	30	54	522	2,326

Sources: NTD and case studies

MAP-21 Guidelines and Transit Performance Evaluation

Transit-Related Requirements of MAP-21

The Moving Ahead for Progress in the 21st Century Act (MAP-21) is the surface transportation funding authorization that took effect in October 2012 and is in effect through FY 2014. Division B of the MAP-21 act contains language about federal goals for public transportation systems, which will be used in the development of transit performance measures for safety and state of good repair. It also contains language that requires the use of transit-related performance measures and performance targets in statewide and metropolitan transportation planning (i.e., a "performance-based planning process"). This requirement applies to long-range transportation plans (LRTPs) and Transportation Improvement Programs (TIPs). States must also establish transit performance measures for non-urban areas as part of a long-range transportation planning process. These measures are to be developed by the MPOs in coordination with area transit providers. Excerpts of the act can be found in **Attachment A**.

National Public Transportation Safety Program

MAP-21 authorized the creation of the National Public Transportation Safety Program (NPTSP), which comprises the National Public Transportation Safety Plan, individual Public Transit Agency Safety Plans (PTASPs), the Public Transportation Safety Certification Training Program, and the State Safety Oversight Program. FTA solicited public comments related to the first three components of the NPTSP via an Advance Notice of Proposed Rulemaking (ANPRM) contained in Docket Number FTA-2013-0030 at regulations.gov. The public comment period for the ANPRM closed on January 2, 2014.

According to the ANPRM, the National Public Transportation Safety Plan is intended to establish public transportation safety performance criteria, define "State of Good Repair," describe the Public Transportation Safety Certification Training Program, and provide minimum safety standards for transit vehicles that are not already subject to safety regulation by other federal agencies. The safety performance criteria are intended to provide guidance to individual transit agencies as the agencies develop performance measures and standards for their individual PTASPs. The minimum safety standards are expected to rely on "best practices" of the National Transportation Safety Board and the transit industry.

As stated in the ANPRM, the PTASPs are to be developed and certified within one year after FTA issues its final rule on PTASPs. FTA is seeking comment specifically on the States' role in the development and certification of PTASPs. Minimum requirements for PTASPs include the following:

- "Methods for identifying and evaluating safety risks throughout all elements of the recipient's public transportation system"
- "Strategies to minimize the exposure of the public, personnel, and property to hazards and unsafe conditions
- "A process and timeline for conducting an annual review and update of the plan"
- "Performance targets based on the safety performance criteria and [State of Good Repair (SGR)] standards set out in the National [Public Transportation] Safety Plan"

The ANPRM states that the FTA "is considering a Safety Management System (SMS) approach to developing and implementing the National Safety Program." SMS is more proactive than implementing safety improvements only after crashes or other safety-related incidents have occurred. SMS requires

"setting safety goals and objectives, defining clear levels of accountability for safety, establishing proactive approaches to managing risks and hazards, .risk-based resource allocation, monitoring and evaluating performance, and continuous learning and improvements." SMS also makes safety a part of all transit agency functions (e.g., from planning to maintenance).

FTA has not yet established any specific safety performance measures or performance standards.

National Transit Asset Management System

The National Public Transportation Safety ANPRM also requires transit agencies to set safety performance targets based on SGR standards under a to-be-developed National Transit Asset Management System (NTAMS). NTAMS includes five components:

- Definition of SGR
- FTA-established performance *measures* for SGR and transit agency–established performance *targets*
- Transit agency asset management plans or TAMPs (including safety investment priorities)
- Agency reporting to FTA (including inventories, assessments, and performance targets)
- FTA technical assistance (including tools to assist with the prioritization of safety investments)

The safety investment priorities are to be adopted into the local LRTP, TIP, and STIP. Use of federal funds to implement the safety investments will require consideration of SGR and safety performance.

FTA has not yet established SGR performance measures, but the ANPRM indicates that agencies must establish targets within three months of FTA establishing SGR performance measures. Agencies must also submit annual reports to FTA. TAMPs are to include inventories of assets, assessment of the condition of each asset, and prioritization of investments to improve the condition of assets (where needed).

Enhanced Mobility of Seniors and Individuals with Disabilities

MAP-21 also requires paratransit operators receiving Federal Transit Administration (FTA) 5310 grant to report measures used to evaluate agency's performance in improving mobility of seniors and individuals with disabilities. Funds are apportioned based on each State's share of the targeted populations and are now apportioned to both States (for all areas under 200,000) and large urbanized areas (over 200,000). The former New Freedom program (5317) is folded into this program under MAP-21.

This study effort focuses on urban fixed route transit agencies and does not include discussion of the FTA 5310 performance reporting requirement. Some large agencies in Florida may need to report under these requirements.

Candidate Transit Performance Measures for MAP-21 Reporting

Based upon what is currently known about the reporting requirements tied to MAP-21 and the NPTSP, candidate transit performance measures for MAP-21 safety and state of good repair reporting have been identified and are listed and described in **Table 12**. This set of candidate performance measures has the following characteristics:

- Facilitate the U.S. Secretary of Transportation's MAP-21 report to Congress. Such measures can be calculated uniformly and objectively nationwide, using data sources that are available to MPOs and transit agencies nationwide.
- Address safety, funding, SGR, efficiency, cost-effectiveness, energy usage, and security.

- Can be linked to intermodal connectivity, economic vitality, quality of life, livability, accessibility, and mobility.
- Can influence project prioritization.
- Reflect both passenger experience and operator experience.
- Includes measures that are normalized to facilitate comparisons between agencies, where possible.
- Where possible, calculated from existing NTD data to minimize the data collection burden.
- Include outcome measure where possible.

As identified in previous sections of this study, these measures are essential for a "good" performance measurement system. Additional measures may be included to address a region's or MPOs goals. Transit agencies may be asked to participate in the establishment and measurement of regional and MPOs goals and objectives. **Table 12** summarizes the performance measures that can be used by an agency, a MPO, or both for MAP-21 reporting.

Table 12. Candidate Transit Performance Measures for MAP-21 Reporting

Category	Performance Measure	Comments	Suggested for Transit Agency Use	Suggested for MPO Use	Suggested for Use by Both
Economic vitality	Payroll per capita	Reflects how much money goes back into the local economy		X	
Safety	Preventable crashes per 100,000 revenue miles	Reflects operator training	X		
	Total crashes per 100,000 revenue miles	Reflects exposure (e.g., lack of bus lanes)	X		
	Total passenger injuries per 100,000 boardings	Reflects the passenger experience	X		
	Total employee injuries per 100,000 revenue miles	Reflects the employee experience	X		
	Total fatalities (excluding suicides)	Should be zero in a given year for any system, but worth tracking statewide. Also used for gauging roadway infrastructure, if appropriate.			X
Security	Reported crimes per 100,000 boardings	Reflects the passenger experience	X		
	Operator assaults per 100,000 boardings	Reflects the employee experience	X		
Access and mobility	Revenue miles per square mile	Spatial access. Also used to evaluate access to transit service			X
	Revenue miles per revenue hour	Average system speed	X		

Category	Performance Measure	Comments	Suggested for Transit Agency Use	Suggested for MPO Use	Suggested for Use by Both
	Average (peak) headway	Temporal access; peak headway can be determined from NTD data, while average headway would require a definition and new data collection for agencies not already using it	X		
	Annual boardings per capita	Reflects how well transit service is used to provide mobility		X	
Environment	Vehicle miles per gallon	Included for its familiarity, but only applies to diesel- and gasoline-powered vehicles	X		
	Energy consumption per vehicle mile	Accounts for alternative fuel use, but units (BTUs) are not intuitive	X		
	Tons of emissions per 100,000 vehicle miles	Should rely on one or two types of emissions of interest; many will show identical trends due to the calculation method; requires new data collection		X	
Integration and connectivity	Number of locations where transfers can be made to other modes and transit operators	For example: intercity bus, Amtrak, airport, cruise ship terminal, neighboring transit systems; measure is difficult to normalize; requires initial data collection, followed by annual tracking		X	
	Percent of stops meeting ADA accessibility standards	Requires initial data collection, followed by annual tracking. Also used regionally for tracking accessibility within a community			X
System management and operations	Boardings per revenue hour	Productivity	X		
	Farebox recovery ratio	Amount of trip cost directly paid by passengers	X		
	Operating ratio	Reflects % of trip cost covered by agency revenue (e.g., includes ad revenue and right-of-way usage revenue)			X
	Operating expense per boarding	Cost-effectiveness	X		

Category	Performance Measure	Comments	Suggested for Transit Agency Use	Suggested for MPO Use	Suggested for Use by Both
	Operating expense per revenue hour	Cost-efficiency; sensitive to labor costs	X		
	Operating expense per revenue mile	Cost-efficiency; sensitive to fuel costs and speed	X		
	Revenue hours per FTE employee	Labor efficiency	X		
	Spare ratio	Asset usage efficiency	X		
System preservation	Average fleet age	Useful for monitoring trends, also applicable to infrastructure			X
	Percent of fleet exceeding FTA-defined lifespan	Reflects immediate needs, also applicable to infrastructure			X
	Percent preventative maintenance performed on schedule	Reflects ability to properly maintain assets	X		
	SGR backlog as percent of annual budget	Reflects the size of the deferred maintenance problem; will require FTA to define SGR for various asset types; will require agencies to establish replacement costs for assets; requires new data collection	X		
	Revenue miles between failures	Reflects maintenance quality and asset condition; tracks major problems; "failures" must be consistently defined	X		
	Revenue miles between road calls	Reflects maintenance quality and asset condition; reflects passenger experience; "road calls" must be consistently defined	X		

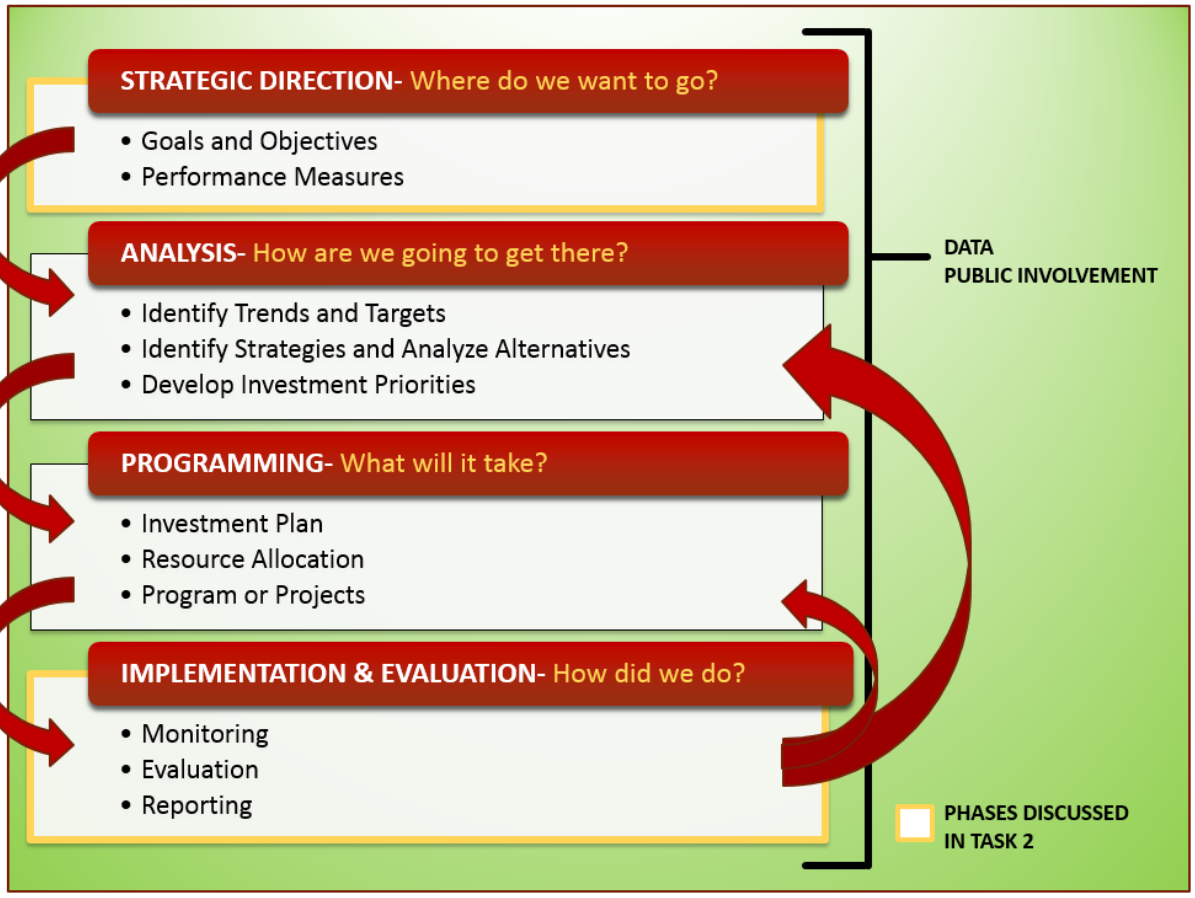
CHAPTER 3: PRACTICES AND PERFORMANCE MEASURES USED BY FLORIDA TRANSIT AGENCIES

Performance-Based Planning

What is Performance-Based Planning?

Performance-based planning includes the adoption of a strategic approach linking performance evaluation with policy and investment decisions. **Figure 8** illustrates the performance-based planning and programming framework in the Federal Highway Administration's (FHWA) Performance Based Planning and Programming (PBPP) Guidebook, which provides the state, transit agencies, metropolitan planning organizations, local governments and partners direction for implementing programs and preparing planning documents that incorporates performance management and transportation planning principles. The framework used in the PBPP Guidebook is especially useful for transit agencies preparing strategic plans and transit development plans.

Figure 8. Performance-Based Planning and Programming



Source: Performance Based Planning and Programming Guidebook, FHWA, September 2013.

The framework is divided into four main phases:

1. **Strategic Direction:** used to shape decisions about policies and investments
   - **Goals and Objectives:** goals address key desired outcomes, and supporting objectives (specific, measurable statements that support achievement of goals) play a key role in shaping planning priorities.
   - **Performance Measures:** support objectives and serve as a basis for comparing alternative improvement strategies (investment and policy approaches) and for tracking performance over time
2. **Analysis:** driven by data on performance, along with public involvement and policy considerations. Agencies conduct analysis in order to develop investment and policy priorities.
   - **Identify Trends and Targets:** Preferred trends (direction of results) or targets (specific levels of performance desired to be achieved within a certain timeframe) are established for each measure to provide a basis for comparing alternative packages of strategies**.**
   - **Identify Strategies and Analyze Alternatives:** Performance measures are used to assess strategies and to prioritize options. Scenario analysis may be used to compare alternative packages of strategies, to consider alternative funding levels, or to explore what level of funding would be required to achieve a certain level of performance.
   - **Develop Investment Priorities:** Packages of strategies for the Long Range Transportation Plan (LRTP) are selected that support attainment of targets, considering tradeoffs between different goal areas, as well as policy priorities.
3. **Implementation and Evaluation**
   - **Monitoring:** Gathering information on actual conditions.
   - **Evaluation:** Conducting analysis to understand to what extent implemented strategies have been effective.
   - **Reporting:** Communicating information about system performance and the effectiveness of plans and programs to policymakers, stakeholders, and the public.
4. **Programming:** decisions are made based on their ability to support attainment of performance targets or contribute to desired trends, and account for a range of factors.
   - **Investment Plan:** In order to connect the LRTP, which has an outlook of at least 20 years, to a selection of projects in a state Transportation Improvement Program (TIP/STIP), some areas develop a mid-range (e.g., 10 year) investment plan or investment program.
   - **Resource Allocation/Program of Projects:** Project prioritization or selection criteria are used to identify specific investments or strategies for a capital plan or TIP/STIP.

Transit agencies closely coordinate with the state and MPOs to ensure their goals and activities are consistent with the LRTP and TIP/ STIP. Transit agencies' performance is evaluated in its larger role in achieving regional and statewide planning goals.

The public's vision for the transportation system and their community plays a key role in determining goals, performance measures, and investment priorities.

This study focuses on two main phases:

- Strategic direction, and
- Implementation and evaluation, specifically the selection of performance measures for tracking goals and objectives and for service performance monitoring, evaluation, and reporting.

Florida Transit Performance Measures

The Florida Department of Transportation (FDOT) has been a leader in promoting the use of performance measures for the evaluation of transit systems and identifying future transit needs. In the 1979 study entitled "Florida Transit System Performance Measures and Standards", the FDOT first defined and enumerated a set of performance measures and standards that transit agencies could adopt to comply with Federal Transit Administration Section 15 requirements. The initial set of performance measures generated in the 1979 study was used as the basis for the development of the Florida Standard Performance Variables (FSV), which is used and recognized across the United States today.

Florida Standard Performance Variables

The FSV transit performance indicators and measures are utilized by FDOT in evaluating the annual performance of transit agencies in the state and were developed for transit agencies to address several key areas of transit agency performance. Due to the fact that safety, security, and state of good repair data were not made available to the public until recently, the FSV list, although comprehensive, does not include any safety and security measures, required under MAP-21. The FSV has multiple measures and is divided into three main categories, as shown in **Table 13**:

- general performance indicators,
- effectiveness measures, and
- efficiency measures.

Table 13. Florida Standard Performance Variables

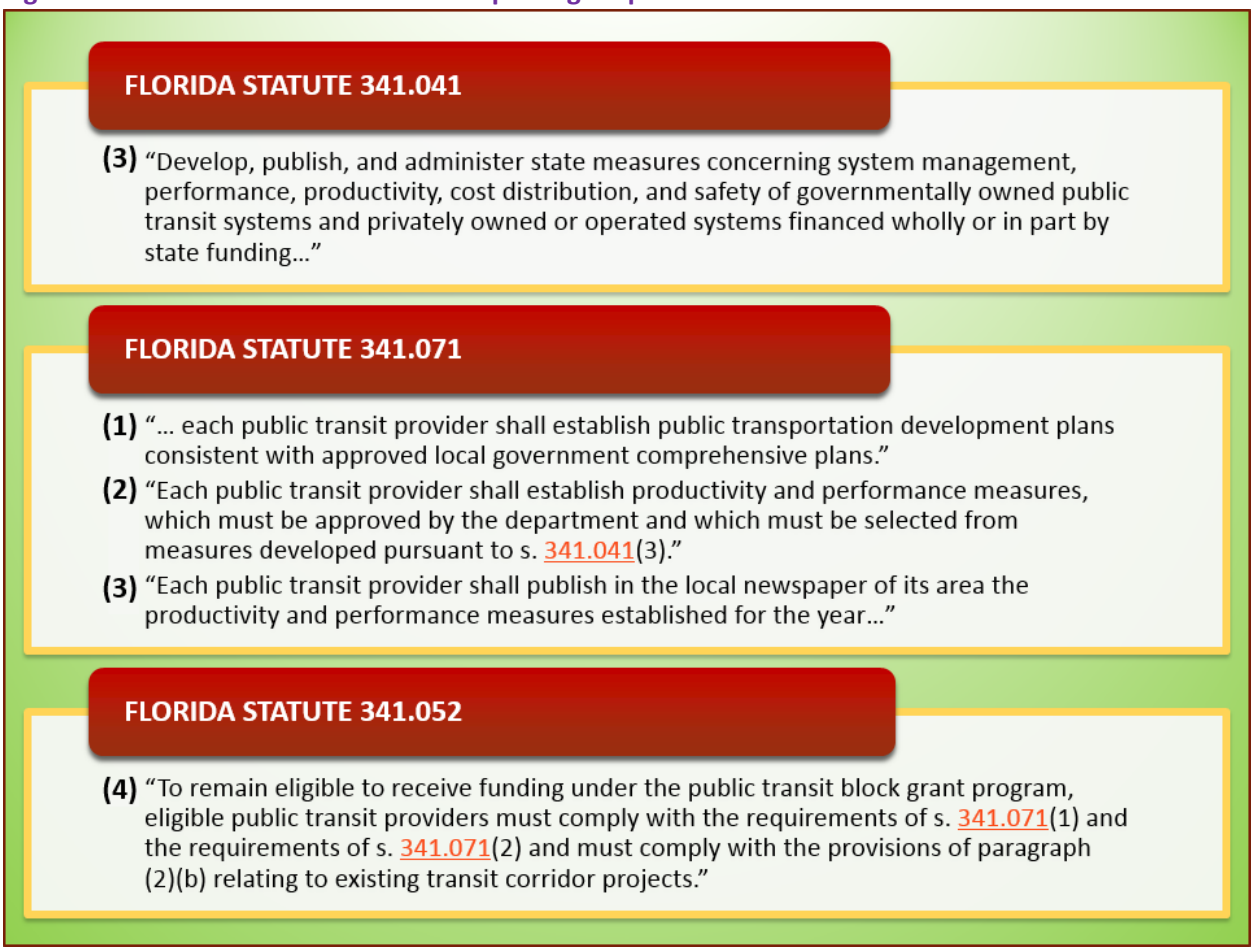
General Performance Indicators	Effectiveness Measures	Efficiency Measures
▪ Service area population ▪ Service area size ▪ Passenger trips ▪ Passenger miles ▪ Vehicle miles ▪ Revenue miles ▪ Vehicle hours ▪ Revenue hours ▪ Route miles ▪ Total operating expense ▪ Total maintenance expense	***Service Supply*** ▪ Vehicle miles per capita ***Service Consumption*** ▪ Passenger trips per capita ▪ Passenger trips per mile ▪ Passenger trips per revenue hour ▪ Average trip length ***Quality of Service*** ▪ Average speed ▪ Average headway	***Cost Efficiency*** ▪ Operating expense per capita ▪ Operating expense per peak vehicle ▪ Operating expense per passenger trip ▪ Operating expense per passenger mile ▪ Operating expense per revenue mile ▪ Operating expense per revenue hour ▪ Maintenance expense per revenue mile ▪ Maintenance expense per operating expense ***Operating Ratios*** ▪ Farebox recovery

General Performance Indicators	Effectiveness Measures	Efficiency Measures
▪ Total capital expense ▪ Federal revenue ▪ State revenue ▪ Local revenue ▪ Total employees ▪ Transportation operating employee ▪ Administrative employees ▪ Vehicle available in maximum service ▪ Vehicle operated in maximum service ▪ Spare ratio ▪ Total gallons consumed ▪ Total energy consumed	▪ Average age of fleet ▪ Number of incidents ▪ Number of vehicle system failures ▪ Revenue miles between failures ***Availability*** ▪ Revenue miles per route miles ▪ Weekday span of service ▪ Route miles per square mile of service area	▪ Local revenue per operating expense ▪ Operating revenue per operating expense ***Vehicle Utilization*** ▪ Vehicle miles per peak vehicle ▪ Vehicle hours per peak vehicle ▪ Revenue miles per vehicle mile ▪ Revenue miles per (total) vehicle ▪ Revenue hours per (total) vehicle ***Labor Productivity*** ▪ Revenue hours per employee ▪ Passenger trips per employee ***Energy Utilization*** ▪ Vehicle miles per gallon ▪ Vehicle miles per kilowatt-hour ***Fare*** ▪ Average fare

Source: Florida Transit Information System – Integrated National Transit Database Analysis System.

FSV measures are collected from the National Transit Database (NTD) and are calculated from the Florida Transit Information System – Integrated National Transit Database Analysis System (FTIS-INTDAS) online application used by transit agencies. NTD reporting is required for all transit agencies receiving FTA 5307 grant funds. Statewide performance measures reporting took effect in the 1990s when the Florida legislature amended sections of the Florida Statutes requiring the FDOT under Florida Statutes (F.S.) 341.041 to administer the development, publication, and administration of state transit measures. As a result of these statutes, the FDOT publishes the Florida Transit Handbook annually, which provides a snapshot of Florida's transit system performance over one fiscal year. Florida transit agencies receiving state block grants, Florida Transit Administration's (FTA) 5307, and 5311 grants, are required to publish performance measures in local newspapers using selected FSV measures. Transit Development Plans (TDPs) are required as part of F.S. 341.052 , which mandates block grant recipients to comply with F.S. 341.071 (1) in establishing a public Transportation Development Plan . **Figure 9** presents excerpts from the Florida Statutes that provide guidance for the reporting of transit performance in the state.

Figure 9. Florida Transit Performance Reporting Requirements



Source: 2012 Florida Statutes

Categorization of Performance Measures

The performance measures identified in this study refer to traditional internal transit measures that illustrate the relationship between service outputs/outcomes and inputs, particularly those used to track agency goals. Indicators, on the other hand, refer to service outputs/outcomes or inputs that indicate agency performance but by themselves are not useful in explaining the agency's performance and in evaluating the agency progress in achieving its goals. However, there are exemptions wherein indicators may also be used as a measure. For instance, the number of incidents and number of safety-related complaints are service outcome indicators, but some agencies use these indicators to assess improvement of transit safety.

Chapter Two: Literature Review used the Transit Cooperative Research Program (TCRP) Report 88's performance measures categorization (10 categories) to select best practices across the country for collecting and analyzing performance measures at transit agencies. The TCRP categories are:

1. Availability
2. Service delivery
3. Community
4. Travel time
5. Safety and security
6. Maintenance and construction
7. Economic
8. Capacity
9. Paratransit
10. Comfort

The FDOT performance measure FSV process described above is recognized across the United States as a leading tool available for local transit agencies, in addition to monitoring transit agencies at the state level. For consistency with the FSV planning process AND utilizing the above nationally-recognized best practices, the following five FSV categories were used in selecting performance measures for this project.

1. Service Effectiveness
2. Vehicle Utilization and Asset Management
3. Labor Productivity
4. Service Efficiency
5. Safety and Security

The above categorizations have similarities, with the TCRP measures having more detailed information. The FSV measures are broadly related to the TCRP measures, but are tailored towards the needs of Florida transit agencies. **Table 14** provides a comparison between the FSV-based categories and the TCRP measures. As shown in the table, the TCRP categories are aggregated into the five identified FSV performance measure categories and will be used throughout *Chapter 3* and discussed among the Florida transit agency case studies.

Table 14. TCRP Report 88 Categories in Comparison to FSV Categories

FSV-based Categories	TCRP 88 Categories
Service Effectiveness	Comfort Capacity Paratransit Availability Travel Time Community Service Delivery
Vehicle Utilization and Asset Management	Maintenance and Construction
Labor Productivity	Administrative
Service Efficiency	Economic Availability Service Delivery Travel Time Community Maintenance and Construction

FSV-based Categories	TCRP 88 Categories
Safety and Security*	Safety and Security

*Safety and security measures are not included in the current FSV process.

Review of Transit Development Plans and Online Performance Reports

Florida transit agencies report performance indicators and measures in various publications primarily for statutory, funding, and policy-making reasons. The audience for these publications ranges from the agency's policy board to federal agencies. Many of the publications, such as the Transit Development Plan (TDP) and other agency performance reports, are available to the public.

In April 2014, Transit Development Plans and online performance reports of Florida transit agencies were reviewed to identify the performance measures. The following discussion relates to TDP and online performance measures commonly used by transit agencies.

Transit Development Plan

Section 341.052, Florida Statutes, mandates all state block grants recipients to submit a Transit Development Plan (TDP) as a prerequisite to receiving funds. Thirty-one Florida transit agencies receive block grants. For this review, only 28 TDPs are evaluated due to the fact that some agencies consolidate efforts when their TDPs are completed. These agencies include

- Martin County with St. Lucie, and
- Polk County/ Winter Haven Area Transit (WHAT) with Citrus Connection.

Note that consolidation of TDPs is provisional. For the next round of TDP updates, Martin and St. Lucie counties will report separately.

This *chapter* focuses on transit agencies operating a fixed route service in small, medium, and large urban areas. The analyses for this report do not include Charlotte County Transit, which provides deviated fixed route and paratransit services, and Key West Transit, which only provides services in rural areas.

The TDP is a 10-year horizon plan that provides information regarding the current status and needs of transit agencies and serves as a guiding document that is consistent with local, regional, and state comprehensive plans on planning, development, and operations. The TDP is a multifunctional document that satisfies statutory and funding requirements, while also identifying transit agencies' long-term planning priorities.

Transit agencies are required to complete major updates to the TDP every five years. In addition, an Annual Update is required to assess the changes in the performance, needs, and goals of the agencies. The transit agencies are not required to change annual performance measures, but they ARE required to regularly track these performance measures to better assess operational and financial status, making changes accordingly, to either maintain or improve the quality of service provided. More information

regarding the TDP development and update is provided in the FDOT Guidance for Producing a Transit Development Plan.

In the TDP, measures are primarily used to conduct performance evaluation of the agency's existing transit services and are reported in the "Situation Appraisal" chapter. Performance measures and analyses are also cross-referenced in the following TDP chapters:

- Public Involvement Process,
- Goals and Objectives,
- Development of Alternative Service Plans,
- Forecasting Ridership,
- Plan Development, and
- Annual Update

The following summary text includes specific performance measure references to chapters within agency TDPs.

TDP Situation Appraisal Chapter

In the TDP Situation Appraisal Chapter, performance evaluation of the agency's existing transit services is conducted through peer review analysis and trends analysis. Peer review analysis involves the comparison of the agency's performance to other agencies across the nation with similar characteristics. The trends analysis tracks the performance of the agency over a specified period of time. Similar set of performance measures are used to conduct both peer review and trends analyses.

The National Transit Database (NTD) and Florida Transit Information System – Integrated National Transit Database Analysis System (FTIS-INTDAS), which contains NTD data, are the primary sources of data for the performance measures within the Situation Appraisal chapter. Most of the performance measures reported in this chapter are from the FSV as contained within the FTIS-INTDAS. Transit agencies, however, have the flexibility to add performance measures outside the FSV or exclude some of the measures in the FSV for conducting performance analyses. **Table 15** presents a summary of performance measures that are commonly used in the TDP peer review and trend analyses. The percentage shown following the performance measure indicates the current number of Florida agencies using that measure within their TDP planning process.

Table 15. Performance Measures Commonly Used in TDP Peer Review and Trend Analysis

Category	Top Performance Measures
Service Effectiveness	Passenger trips per revenue hour (93%) Passenger trips per revenue mile (93%) Passenger trips per capita (86%)
Vehicle Utilization and Asset Management	Average age of fleet (72%) Number of system failures (59%) Revenue miles (distance) between failures (59%) Vehicles operated in maximum service (59%)
Labor Productivity	Revenue hours per employee (45%)

Category	Top Performance Measures
	Passenger trips per employee (31%)
Service Efficiency	Operating expense per passenger trip (93%) Farebox recovery (ratio) (90%) Operating expense per revenue mile (79%)
Safety and Security	Accident/Collisions per 100,000 revenue miles or Incident/Accident rate (10%) Revenue miles (distance) between incidents (7%)

Sources: Compiled from Transit Development Plan of Florida urban fixed-route transit agencies.

The following are performance measures commonly used in TDP trend analysis, but are not included in the above FSV list:

- Revenue miles per vehicle operated in maximum service (28%),
- Passenger trips per vehicle operated in maximum service (34%),
- Accident/Collisions per 100,000 revenue miles or Incident/Accident rate (10%),
- Revenue miles (distance) between incidents (7%).

TDP Goals and Objectives Chapter

As mentioned in *Chapter Two,* successful public transit performance measurement programs are linked to agency goals and objectives. In the TDP "Goals and Objectives" chapter, transit agencies provide a list of their long-term goals and objectives, including performance measures used to track the progress of achieving each goal and objective. Transit agencies also specify strategies, initiatives and policies describing activities and actions to be implemented and achieve established goals. **Table 16** is an excerpt from Miami-Dade Transit's (MDT) goals and objectives.

Table 16. Miami-Dade Transit's TDP Major Update Goals, Objectives, and Measures (Excerpt)

Goal 2: Improve Customer Convenience, Comfort and Safety on Transit Service and Within Facilities	
Objective	Measure
2.1 Improve safety on vehicle service operations	▪ Level of investment in safety projects ▪ Level of accident ratio ▪ Level of compliance with MDT's System Safety Program Plan
Strategy: Continue to conduct regularly scheduled safety audits to determine level of compliance with MDT's System Safety Program Plan	

Source: Miami-Dade County Transit Development Plan FY 2010-2019.

Different-sized transit agencies serve areas with varying characteristics and diverse resources; thus each agency has goals customized to their unique needs and capacity. Nevertheless, commonalities exist among the agencies and can be categorized into the following criteria:

- Operational Goals
  - Safety and security,
  - Service effectiveness,

  - Vehicle utilization and asset management.
- Financial Goals
  - Expense and revenue,
  - Service cost-efficiency.

Table 17 lists the goals, related service performance indicators, and measures specified by the agencies in their TDPs. Labor utilization indicators and measures were not used in the TDPs to assess goals and objectives.

Most performance indicators and measures were linked to the goal of maintaining or improving service delivery and effectiveness. The TDPs also identified seven performance measures to evaluate transit safety and security. However, five of these measures are tracked only by Miami-Dade Transit:

- level of accident ratio,
- number of accidents and/or incidents per 100,000 miles,
- number of passenger complaints,
- number of safety related accidents and incidences on-board and in stations/ transit facilities, and
- number of criminal incidents on-board transit and in stations/ transit facilities.

The top two performance measures that most, if not all, of the agencies use to evaluate goals and objectives are:

- ridership (passenger trips),
- operating cost per trip.

Table 17. TDP Goals with Corresponding Performance Indicators and Measures

Operational Goals	
Goals	**Performance Indicators and Measures**
Safety and security	▪ Level of accident ratio ▪ Number of accidents and/or incidents per 100,000 miles ▪ Number of criminal incidents on –board transit and in stations/ transit facilities ▪ Number of incidents ▪ Number of passenger complaints (safety-related) ▪ Number of safety related accidents and incidences on-board and in stations/ transit facilities ▪ Revenue miles between incidents (annual revenue miles divided by total incidents)
Service effectiveness	▪ Average transit time savings ▪ Average travel time ▪ Frequency ▪ Headway ▪ On-time performance ▪ Passengers per revenue mile ▪ Passenger trips per revenue hour ▪ Peak period directional load factor ▪ Peak period directional travel time ▪ Percent of transit-supportive areas with bus service within ¼ mile

Operational Goals	
Goals	**Performance Indicators and Measures**
	▪ Ridership ▪ Route miles ▪ Span of service ▪ Transfer time
Vehicle utilization and asset management	▪ Average age of fleet ▪ Number of vehicle and facility safety inspections performed annually ▪ Number of hybrid buses in the fleet ▪ Number of reported failures ▪ Revenue miles between failures (annual revenue miles divided by total failures) ▪ Vehicle miles per gallon
Expense and revenue	▪ Cost of fixed route services ▪ Local revenue ▪ Number of grant opportunities ▪ Number of grant submissions per year ▪ Revenue from donations ▪ Success rate on state and federal applications
Service cost efficiency	▪ Farebox recovery ratio ▪ Operating cost per trip

Source: Compiled from Transit Development Plans (Martin-St. Lucie, Indian River, PalmTran, and MDT).

Performance Standards for Evaluating Goals

Some transit agencies also include performance standards and benchmarks in their TDPs. Performance standards for evaluating goals should be pragmatic. Thus, consideration of the agency's size and resources are salient in establishing effective performance standards. TCRP Report 88 discusses the methods agencies use to develop standards for performance measures.

- **Comparison to the annual average:** average value for each measure is determined annually, and the routes that fall into the lowest groups for each measure are identified for further action
- **Comparison to a baseline:** value for each measure is compared to the average value for the measure in the first year that the performance-measurement system was implemented
- **Trend analysis:** set the standard based on the previous year's performance measure value
  - **Self-identified standards:** transit agency management in consultation with the agency's governing body, sets targets based on a combination of current agency performance, professional judgment, and agency goals
  - **Comparison to typical industry standards:** standards are pulled out from other agencies
- **Comparison to peer systems:** agency identifies other agencies with similar conditions and determines how well those agencies are performing in the measurement categories

Bay County Trolley, Escambia County Area Transit, and Okaloosa County Transit are part of the West Florida Planning Regional Council and share the same goals, consistent with that of the region. For each of these goals, the agencies also follow to some extent, similar objectives and strategies. In addition, each of these agencies has established benchmarks to evaluate the success of their goals and objectives, as well as capturing the effectiveness and efficiency of their service operations and financial status.

Table 18 summarizes the peer system performance standards used by Bay, Escambia, and Okaloosa counties and how it corresponds with their goals, and objectives. All three agencies have set peer system benchmark for farebox recovery. Both Bay County Trolley and Escambia County Area Transit set peer system benchmarks for cost per passenger trip, passengers per revenue hour, and passengers per revenue mile. Only Escambia County Area Transit established a peer system benchmark for subsidy per passenger trip.

Table 18. Summary of Peer System Performance Standards Used by Bay, Escambia, and Okaloosa Counties

Bay County Transit		
Goals	**Objectives**	**Standards and Measures**
Expand service delivery for existing and potential customers to meet rising demand for transit in Bay County	Establish performance benchmarks for all service improvements and monitor performance to ensure minimum performance levels are met	Utilize peer report to establish benchmarks for: ▪ Cost per passenger trip ▪ Farebox recovery ▪ Passengers per revenue hour ▪ Passengers per revenue mile
Ensure prudent public stewardship of financial resources and secure additional funding for system maintenance and improvements	Maintain an equitable fare policy and establish a farebox recovery standard	Utilize peer report to establish farebox recovery standard
Escambia County Area Transit		
Goals	**Objectives**	**Strategy**
Expand service delivery for existing and potential customers to meet demand for transit services in Escambia County	Develop benchmarks for performance at the system and route level	Use modified peer mean benchmarks including: ▪ Cost per passenger trip ▪ Farebox recovery ▪ Passengers per revenue hour ▪ Passengers per revenue mile ▪ Subsidy per passenger trip
Okaloosa County Transit		
Goals	**Objectives**	**Strategy**
Ensure prudent public stewardship of financial resources and secure additional funding for system maintenance and improvements	Maintain an equitable fare policy and establish a farebox recovery standard	Maintain a farebox recovery standard equal to the peer mean

Sources: Compiled from Transit Development Plans (Bay Town Trolley, Escambia County Area Transit, and Okaloosa County Transit).

Table 19 presents a summary of performance standards used by other Florida transit agencies in their TDPs. These performance standards are incorporated within the objectives, initiatives, strategies, and policies for each of the goals specified in the agency's TDP. Various methods were used by these agencies to set their performance standards. Some of the transit agencies utilize self-identified standards, while others use either annual average comparison or comparison to a baseline.

Table 19. Summary of Non-Peer Performance Standards Used by Florida Transit Agencies

Criteria	Measure	Standard	Transit Agency
Service Effectiveness	Passengers per revenue hour	15 passengers per hour on fixed-routes in operation more than 5 years	Citrus Connection, Polk County Transit Services/ WHAT
		10 passengers per hour on fixed-routes in operation less than 5 years	
		Passengers per revenue hour should be greater than or equal to 20.5	Hillsborough Area Regional Transit
		Maintain operating standards of 14 passengers per revenue vehicle hour	LeeTran
	Passenger trips	Average increase of 5% annually	Indian River Transit
			LeeTran
			Manatee County Area Transit
		10% increase in passenger trips within 10 years	Gainesville Regional Transit System
		50% increase in the span of 10 years	Port St. Lucie
			SunTran
			The Hernando Express Bus
	Passenger trips per revenue mile	Attract a minimum of 0.25 one-way passenger trips per revenue mile	Indian River Transit
	Passengers per revenue vehicle mile	Maintain operating standards of 1.3 passengers per revenue vehicle mile	LeeTran
	Passengers per hour	Increase passengers per hour each year by 1%	Gainesville Regional Transit System
	Passengers per mile	Increase passengers per mile each year by 1%	Gainesville Regional Transit System
	On-time performance	Achieve and "on-time" performance rating of 90% at the route and system level	Citrus Connection, Polk County Transit Services/ WHAT
			Gainesville Regional Transit System
		Improve run-time and on-time performance by 25% by 2024	Manatee County Area Transit
		1 minute early to 5 minutes late at scheduled time points should be greater than 69%	Hillsborough Area Regional Transit
	Frequency	Standards for 30 minute frequency on strong performers only	Escambia County Area Transit
			Indian River Transit
		Expand the frequency of service to 30 minutes or better on all existing East Gainesville routes by 2016 and future by 2019	Gainesville Regional Transit System
		Increase the frequency of peak weekday service to 40 minutes or better on all existing routes and future routes by 2019	Gainesville Regional Transit System
		Increase average frequency to at least one bus every 30 minutes in core area services and 60 minutes in other services	SunTran
		Improve service headways to 60 minutes on existing routes by 2015	The Hernando Express Bus
	Span of service	Saturday service at 100% of weekday service and Sunday at 50% of weekday service	Bay County Trolley
		Establish a span of service for fixed routes to operate from 6:00am to 8:00pm	Indian River Transit
		Expand service hours by 4,000 hours each year	Gainesville Regional Transit System
	Quality of service	>75% composite score = strong performer, >50% and <75% = average performer, and <50% = poor performer	Escambia County Area Transit
		Maintain or exceed the overall quality of service rating of 4.5 on a scale of 5.0 as measured by the Transit Capacity and Quality of Service Report	Indian River Transit

Criteria	Measure	Standard	Transit Agency
Service Effectiveness	Number of complaints	Complaints per 100,000 passengers should be less than or equal to 9.0	Hillsborough Area Regional Transit
		Reduce the number of complaints by 1% annually	Manatee County Area Transit
		Reduce the number of complaints by 1% to 3% annually	Gainesville Regional Transit System
	Service coverage	Provide fixed route bus service to all multi-family dwelling projects exceeding 500 units and all commercial areas exceeding 200,000 square feet	Indian River Transit
		Maintain fixed-route service coverage for areas of Manatee County that have a population density of 2,000 people per square mile	Manatee County Area Transit
		Increase the fixed-route service area by 25% by 2017	SunTran
	Fixed-route access time	Decrease passenger fixed-route access time by 25% by 2017	SunTran
Service Efficiency	Administrative cost	Hold administrative cost to less than 20% of total operating cost	Citrus Connection, Polk County Transit Services/ WHAT
	Maintenance cost	Hold maintenance cost to less than 20% of total operating cost	Citrus Connection, Polk County Transit Services/ WHAT
	Cost per passenger trip	Limit any annual cost per passenger trip increase to no more than 5%	Indian River Transit
	Operating cost per passenger trip	Maintain an annual operating cost per passenger trip of less than $8.00	Port St. Lucie
	Gross cost per revenue mile	Gross cost per revenue mile should be less than or equal to $7.02	Hillsborough Area Regional Transit
	Operating cost per revenue mile	Reduce annual operating cost per revenue mile by 15%	SunTran
		Achieve and maintain an annual operating cost per on-way passenger trip to within the Consumer Price Index (CPI) or less	Gainesville Regional Transit System
	Operating ratio	Achieve an operating ratio of at least 20%	Citrus Connection, Polk County Transit Services/ WHAT
			LeeTran
			Manatee County Area Transit (2024 target)
		Achieve an operating ratio of at least 25%	Gainesville Regional Transit System
Safety and Security	Revenue miles between incidents	Maintain a minimum of 75,000 revenue miles between incidents including security incidents and reportable incidents as defined in the National Transit Database Annual Reporting Manual	Indian River Transit
	Collisions per 100,000 revenue miles	Collisions per 100,000 revenue miles should be less than or equal to 4.5	Hillsborough Area Regional Transit
	Accidents per 100, 000 miles	Less than 2 accidents per 100, 000 miles of revenue service	Citrus Connection, Polk County Transit Services/ WHAT
	Preventable accidents	Reduce preventable accidents by 3% each year	Gainesville Regional Transit System
Economic	Local support	Increase local support for fixed-route transit services by 100 percent by 2019 to support increases in ridership	Port St. Lucie
	Advertising revenue	Increase advertising revenue by 2% each year	Gainesville Regional Transit System
	Partnership revenue	Increase revenue from other partnerships by 2% each year	Gainesville Regional Transit System
	Bus pass sale	Increase bus pass sale by 100% by 2020	SunTran

Criteria	Measure	Standard	Transit Agency
Vehicle Utilization and Asset Management	Spare ratio	Maintain a spare ratio of 20% for fixed-route service	Citrus Connection, Polk County Transit Services/ WHAT
	Age of fleet	Operate a fleet of vehicles with an average age of less than 7 years by 2015	Port St. Lucie
		Operate a fleet of vehicles with an average age of between 5 to 7 years each year through 2024	Manatee County Area Transit
		Operate a fleet of fixed-route vehicles with an average age of less than 6 years by 2019	Gainesville Regional Transit System
		Operate a fleet of fixed-route vehicles with an average age of less than 6 years by 2019	The Hernando Express Bus
	Energy savings	Convert 50% of the existing vehicle fleet to “green”, environmentally-friendly propulsion technologies by 2021	LeeTran
		Reduce fuel consumption by 1% each year	Gainesville Regional Transit System
	Number of bus shelters and stops	Install shelters at the top 50% most active stops and benches at 75% of the most active stops by 2024	Manatee County Area Transit
		Enhance bus stops by strategic placement of 10 landing pads per year and 5 shelters per year	Gainesville Regional Transit System
	Revenue miles between system failures	Maintain a minimum of 50,000 revenue miles between system failures including those based on agency policy and those due to major mechanical failure as defined in the National Transit Database Annual Reporting Manual	Indian River Transit
	Distance between vehicle failures	Mean distance between vehicle failures should be greater than or equal to 7,500	Hillsborough Area Regional Transit
	Service interruptions	Reduce service interruptions by 3% per year	Gainesville Regional Transit System

***Source**: Compiled from Transit Development Plan of Florida urban fixed-route transit agencies.*

Measures Used In Monitoring Goals and Overall Service Performance

Florida transit agencies have monitoring programs for goals, objectives, and overall service performance. The following are the top six performance measures tracked by Florida transit agencies as part of their monitoring programs:

- Farebox recovery
- Farebox revenue
- Operating cost per passenger trip
- Passenger trips
- Passenger trips per revenue hour
- Passenger trips per revenue mile

Most agencies are collecting data and evaluating these performance measures on an ongoing basis, while others do it quarterly. Evaluation of these measures are conducted either through comparison of historical performance or by comparative analysis of route performance measures and are reported to entities, including to the Metropolitan Planning Organization and agency policy board.

Online Performance Reports

Nine out of the twenty-nine Florida urban fixed route transit agencies publish operational and financial reports on their websites. Pinellas Suncoast Transportation Authority (PSTA) presents numerous performance measures on its website. MDT provides a comprehensive historical record of various performance reports, including annual financial reports, business plans, FTA quarterly report, and ridership technical reports. The top three measures reported by transit agencies on their websites can both be categorized under vehicle utilization and asset management:

- Ridership (passenger trips and boardings)
- On-time performance
- Passenger trips per hour

State of good repair and safety and security measures are also reported by agencies online, including the following:

- Accidents per 100,000 miles
- Complaints per 100,000 passenger trips
- Preventable accidents per 100,000 miles
- Number of vehicle failures
- Average vehicle age
- Miles per road call
- Miles per service interruption

Below is a description of performance reports posted by transit agencies on their websites:

Ridership Report

A ridership report provides a snapshot of the transit agency's monthly or annual performance trends using various measures. The public is the main audience for the ridership report and hence, as compared to other performance reports, ridership reports do not contain technical text, but rather communicates the agency's service performance through visually comprehensible graphs and tables.

The comprehensiveness of each ridership report, however, varies by agency. Some agencies classify performance reports by mode and route, others simply presents an aggregate system performance trend. Lakeland Area Mass Transit Distict (LAMTD), Gainesville Regional Transit System (RTS), Broward County Transit (BCT), Miami-Dade Transit (MDT), and Pinellas Suncoast Authority (PSTA) publish monthly or annual ridership reports (in PDF format) on their websites.

Annual Report

An annual report is a comprehensive document that includes a summary of the agency's operational and financial performance throughout the year and provides information regarding systemwide characteristics, mission – vision and board of directors. The public and local governments are the main recipients of the annual report and hence, similar to the ridership report, performance trends in the annual report are presented in graphical and tabular format and the text are kept simple, avoiding technical jargons. Jacksonville Transportation Authority (JTA), LYNX, and MDT publish a copy of annual reports on their websites.

Operations Report

Operations report provides a summary of the transit agency's monthly operational performance. Aside from ridership data, which is the main focus of ridership reports, operations reports provide month-to-month information on system wide and route measures: operating days, vehicles operated in maximum service, revenue hours, total hours, revenue miles, total miles, vehicle failures, and fare revenue. Operations reports are mostly used internally by the agency. Nevertheless, transit agencies such as The Hernando Bus (THE Bus) provide a condensed summary of its operational performance for public review.

Business Plan

The development of a two-year business plan is a requirement for all Miami-Dade county departments. Performance targets are set in the business plan to evaluate the success of each initiatives and strategies in achieving the goals in the County's Strategic Plan. Business plans are submitted to the county government but is also available to the public online. MDT's business plan is available on Miami-Dade County's Office of Management and Budget website.

Ridership Survey

Ridership surveys are not necessarily considered as performance reports. However, they serve as important resource for collecting data that are used for assessing customer satisfaction. A summary of survey result also provides an overview of ridership characteristics, behavior, and perspective. Space Coast Area Transit (SCAT) publishes a summary of their 2008 Rider Survey on their website.

Summary of Transit Development Plans and Online Performance Reports Review

From the thorough review of TDPs and online performance reports, a general summary was prepared of lessons learned about Florida urban fixed route transit agencies current performance measures practices:

- Florida agencies use performance measures to track, evaluate, and monitor achievement of their goals and objectives.

- TDPs serve as a regularly-updated, performance-based planning tool to guide transit agencies in prioritizing policies and activities to meet future transit needs across the state. Performance analysis serves as a key component of the TDP, from understanding the current status of transit services to forecasting future demands, both at the system and route level. The TDP planning process provides an excellent tool to assist transit agencies to monitor operational and financial performance annually. Some Florida transit agencies are already collecting safety and asset management data and tracking measures to comply with MAP-21 regulations, particularly pertaining to the development of Safety Management System (SMS). For instance, some Florida transit agencies have already linked measures to goals and strategies (see **Table 4** and **5**) and a few have established safety and asset management performance targets (see **Table 6** and **7**).
- Many data elements needed to calculate the performance measures in TDPs are similar to those required for NTD reporting. Thus, data collection for performance measures included in the TDP does not necessarily have to be intensive for different-sized agencies. Notably, these measures are also traditionally used nationwide in assessing the achievement of transit service goals and objectives.
- Similar to findings in *Chapter Two: Literature Review,* larger transit agencies do not necessarily report more measures than smaller agencies. The number of performance measures reported by agency are:
  - Large transit agencies range from 17 to 50,
  - Medium-sized agencies report 19 to 39, and
  - Small agencies report 19 to 32.
- The classification of Florida transit agencies by size will be discussed later in Chapter 4: Florida Case Studies of Transit Performance Evaluation.
- Florida transit agencies abide by mandated performance reporting, such as the TDP, reporting to NTD, and publication of measures in the local newspaper. However, improvement is needed for non-mandated performance reporting, such as publishing annual performance measures on agency websites, or developing online performance dashboards. Reporting performance measures online allows for more transparency and public accountability.
- Performance measures are commonly used to evaluate transit service effectiveness and efficiency, highlighting an agencies' priority to improve quality of service and optimize existing resources. The measures help an agency make route/system changes with the goal of increasing ridership, revenue, and cost-savings. The top three most frequently used performance measures by transit agencies are listed below.
  - Passenger trips per revenue hour
  - Passenger trips per revenue mile
  - Operating expense per passenger trip

Survey Results

Overview of the Survey

Florida transit agencies were surveyed in December 2013 regarding their practices in evaluating transit performance. The transit agency survey was developed to ensure that FDOT had the most up-to-date information related to how Florida transit agencies track and monitor performance measures. The survey focused on four areas:

- performance reporting,
- performance indicators and measures,
- performance measure changes with MAP-21, and
- transit data collection methodology.

The surveys were sent to all 29 Florida urban fixed route transit agencies. The purpose of the survey was to conduct an inventory of all the existing measures reported by the agencies for evaluating transit performance, as well as gauge the agency's data collection methodologies and sources. **Attachment B** illustrates the transit agency survey.

The survey was available online via www.surveygizmo.com. Transit agencies were also provided a printable copy of the survey with the option to scan and send the completed survey through e-mail. Sixteen transit agencies completed the survey, which resulted in an overall response rate of 56 percent. From the responses submitted, at least two transit agencies from each FDOT District completed the survey. There were also at least two responses from different sized urban transit agencies (small, medium and large), encompassing a good geographic and agency size representation. **Attachment C** provides a list of respondent agencies categorized by size.

Summary Results

The following section discusses the results of the questions from the "Best Practices for Performance Measures" transit agency survey. Graphics also depict the survey responses.

Q1. Contact Information

Each transit agency completed the most current contact information, which was used for follow up questions and interviews, as needed. Information such as Name, Position, Agency, Email and phone number were provided by the respondents.

Performance Reporting

Florida transit agencies report performance measures in various publications primarily for statutory, funding, and policy-making reasons. Audiences for these publications range from the agency's policy board to federal agencies. Questions 2 through Question 7 gathered information regarding Florida transit agency's performance reporting process – where they report performance measures, reasons for reporting, how frequent they update each report, the recipient of the report, and who prepares the report.

Q2. Does your agency report performance measures?

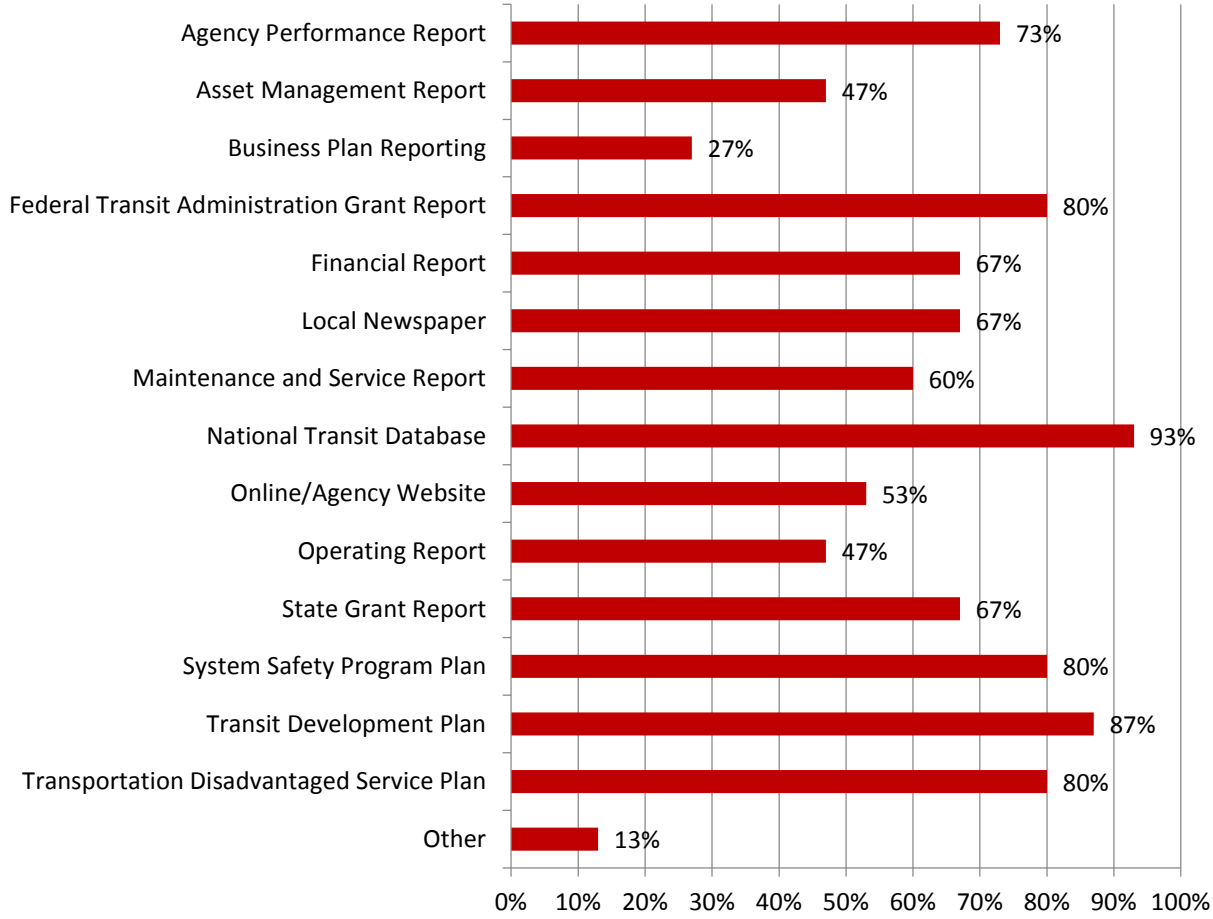
Of the 16 transit agencies that completed the surveys, all stated they do report performance measures. The statistical tables and graphics below reflect information for each of the transit agencies.

Q3. Reports and Publications

Figure 10 shows the top six performance reports and publications published by Florida transit agencies.

- **National Transit Database:** Under Title 49 U.S.C. 5335 (a), 5307 and 5311 grant recipients are required to provide monthly and annual report of financial and operating information to the National Transit Database
- **Transit Development Plan:** As previously mentioned in this *chapter*, the TDP is a 10-year horizon plan that provides information regarding the current status and needs of transit agencies and serves as a guiding document that is consistent with local, regional, and state comprehensive plans on planning, development, and operations.
- **Transportation Disadvantaged Service Plan:** Planning document that serves as a framework for evaluating performance of agency's paratransit services. It provides information regarding compliance with the American Disability Act and tracks agency's progress in providing adequate services to transportation disadvantaged groups (Note that this study focuses on fixed route services)
- **Federal Transit Administration Grant Report:** Triennial Review's Milestone Progress Report (MPR) is an example of a FTA grant report and is a requirement for all FTA 5307 grant recipients. The review aims to examine grantees performance and compliance with current FTA requirements and policies.
- **System Safety Program Plan:** The System Safety Program Plan provides information on the safety procedures and standards followed by transit agencies. The plan include a list of indicators and measures tracked by the agency to identify safety risks and develop a program to reduce these risks.
- **Agency Performance Report:** The agency performance report provides an overview of the current status of various service operations and finances. The measures and information that are included in the agency performance report are selected by the agency itself, if not required by the local government. Mostly the information in this report is used internally by the agency or is presented to the local government.

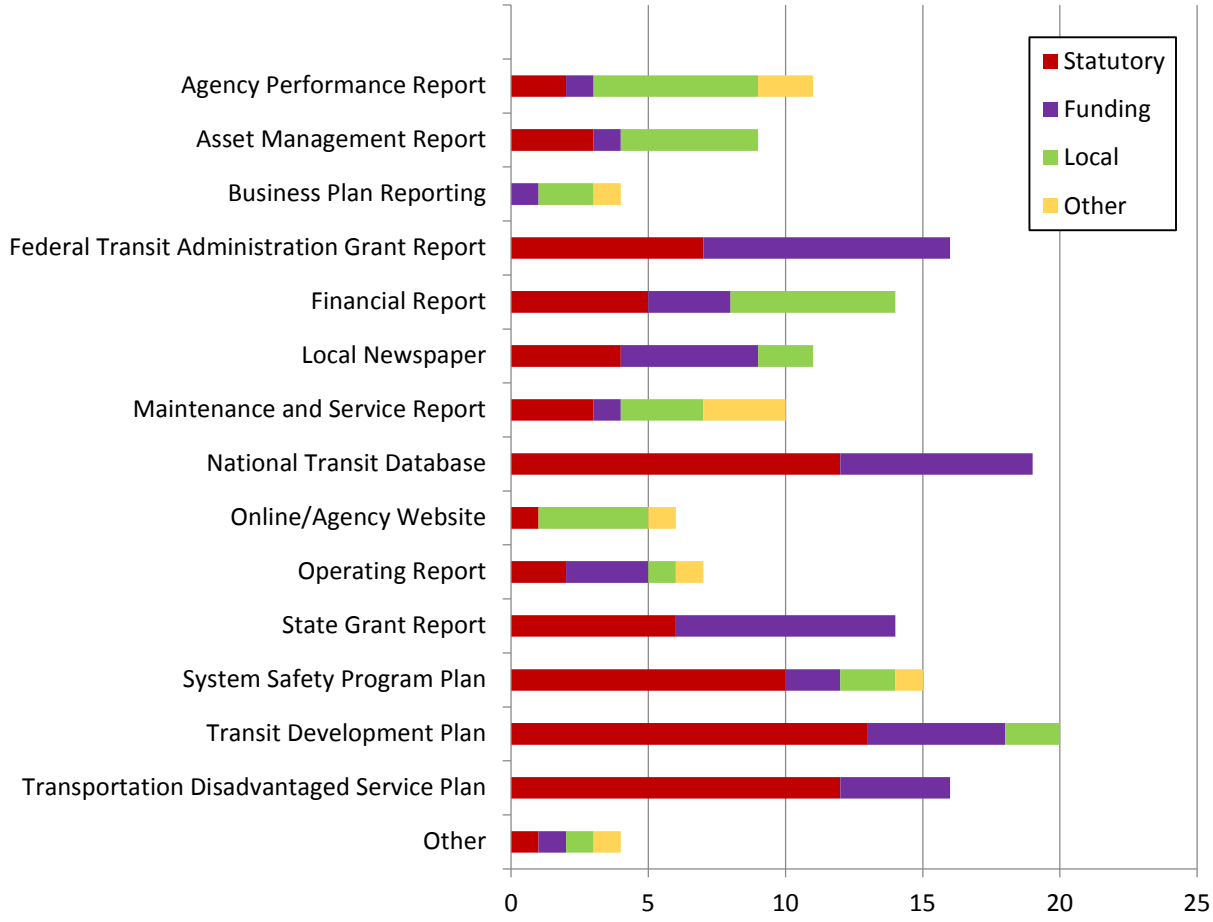
Figure 10. Reports and Publications Used by Transit Agencies



Q4. Statutory Requirements

Transit agencies indicated the top reasons for reporting performance measures are due to statutory and funding requirements, as shown in **Figure 11**. The agencies must be in compliance in order to receive funds and obtain project approvals.

Figure 11. Reasons for Reporting Performance Measures



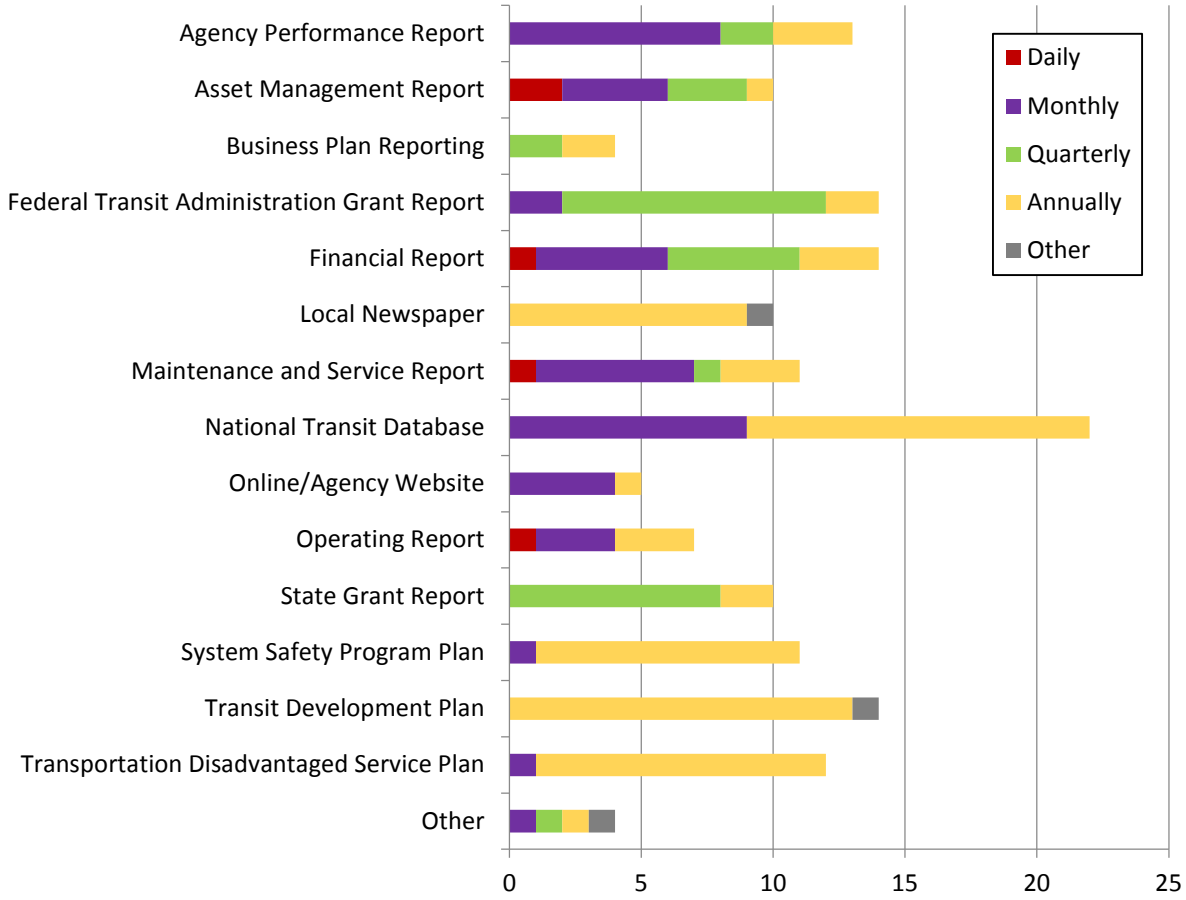
Q5. Reporting Frequency

Florida transit agencies responded that most reporting is conducted annually, as shown in **Figure 12**, with monthly reporting closely behind. There were no agencies reporting weekly or bi-weekly data. The most popular annual reports are:

- Transportation Disadvantaged Service Plan,
- Transit Development Plan – Annual Updates
- National Transit Database,
- System Safety Program Plan, and
- Local Newspapers.

The most popular monthly reports are the National Transit Database, Agency Performance Reports, Maintenance and Service Reports, and Financial Reporting.

Figure 12. How Often Performance Measures are Updated and Reported



Q6. Report Recipients

The FTA, FDOT, public, and local government are the primary recipients of transit agency performance reports. The transit agencies also produce performance measure reports for internal use. **Table 20** and **21** illustrate the types of reports generated by transit agency and the reporting agencies. The green highlighted areas in the table represent the highest number of transit agencies responding to the survey question for the type of report and report recipients. The FTA, FDOT, public, and local government are the primary recipients of transit agency performance reports. The transit agencies also produce performance measure reports for internal use.

Table 20. Primary Recipients of Reports and Publications

	FTA	FDOT	Public	Grant Sponsor	Internal Use	Local Govt	Peers	Agency Board	Other
Agency Performance Report	3	4	3	1	7	8	1	5	1
Asset Management Report	3	2	0	1	6	4	0	1	0
Business Plan Reporting	0	0	0	0	3	4	1	1	1
Federal Transit Administration Grant Report	12	2	1	3	3	3	1	1	0
Financial Report	3	5	4	1	7	1	4	0	0
Local Newspaper	1	4	7	0	0	2	0	0	0
Maintenance and Service Report	3	2	0	1	5	3	0	1	0
National Transit Database	14	7	5	1	5	5	4	1	1
Online/Agency Website	1	0	6	0	1	1	1	0	0
Operating Report	2	3	3	1	5	4	0	1	1
State Grant Report	0	10	2	2	4	4	1	0	0
System Safety Program Plan	6	10	1	1	7	5	1	3	0
Transit Development Plan	4	12	8	1	7	9	5	6	1

	FTA	FDOT	Public	Grant Sponsor	Internal Use	Local Govt	Peers	Agency Board	Other
Transportation Disadvantaged Service Plan	2	11	7	1	6	9	2	4	4
Other	1	0	0	0	1	2	1	1	0

Note: Highlighted areas denote the areas with highest number or most popular responses from transit agencies.

Table 21. Names of Reports and Publications of Primary Report Recipients

Primary Report Recipients	Reports and Publications
FTA	National Transit Database FTA Grant Report
FDOT	State grant report System Safety Program Plan Transit Development Plan Transportation Disadvantaged Service Plan
Public	Local newspaper and Online/ agency website
Internal Use	Asset Management Report Financial Report Maintenance and Service Report Operating Report
Local Government	Agency Performance Report Business Plan Reporting Other

Q7. Report Preparation

Based on the survey responses, most transit agencies prepare reports and publications for performance measure reporting in-house with internal staff. **Table 22** illustrates the survey responses. The table also indicates the top two reports and publications, the Transit Development Plan and the Transportation Disadvantaged Service Plan, are prepared by a third-party (consultant).

Table 22. Who Prepares Reports and Publications for Transit Agencies

	INTERNAL STAFF	THIRD-PARTY	MPO/TPO	FDOT	LOCAL GOVT.	OTHER
Agency Performance Report	11	0	0	0	0	0
Asset Management Report	7	0	0	0	0	0
Business Plan Reporting	4	0	0	0	0	0
Federal Transit Administration Grant Report	11	0	0	0	1	0
Financial Report	10	1	0	0	1	0
Local Newspaper	8	0	0	0	0	0
Maintenance and Service Report	8	0	0	0	0	0
National Transit Database	12	0	0	0	1	0
Online/Agency Website	7	0	0	0	0	0
Operating Report	7	0	0	0	0	0
State Grant Report	9	0	0	0	1	0
System Safety Program Plan	11	1	0	0	0	0
Transit Development Plan	11	11	3	2	1	0
Transportation Disadvantaged Service Plan	10	6	6	0	1	0
Other	2	0	0	0	1	0

Note: Highlighted areas denote the areas with highest number or most popular responses from transit agencies.

Performance Indicators and Measures

Question 8 through Question 12 inquire about the existing performance measures used by Florida transit agencies to evaluate goals and objectives pertaining to customer satisfaction, service effectiveness, service efficiency, and labor utilization. Questions 13 and 14 determine if transit agencies customize performance measures based on the type of service and mode being evaluated. Responses to these questions supplement information gathered in reviewing TDPs and online performance reports.

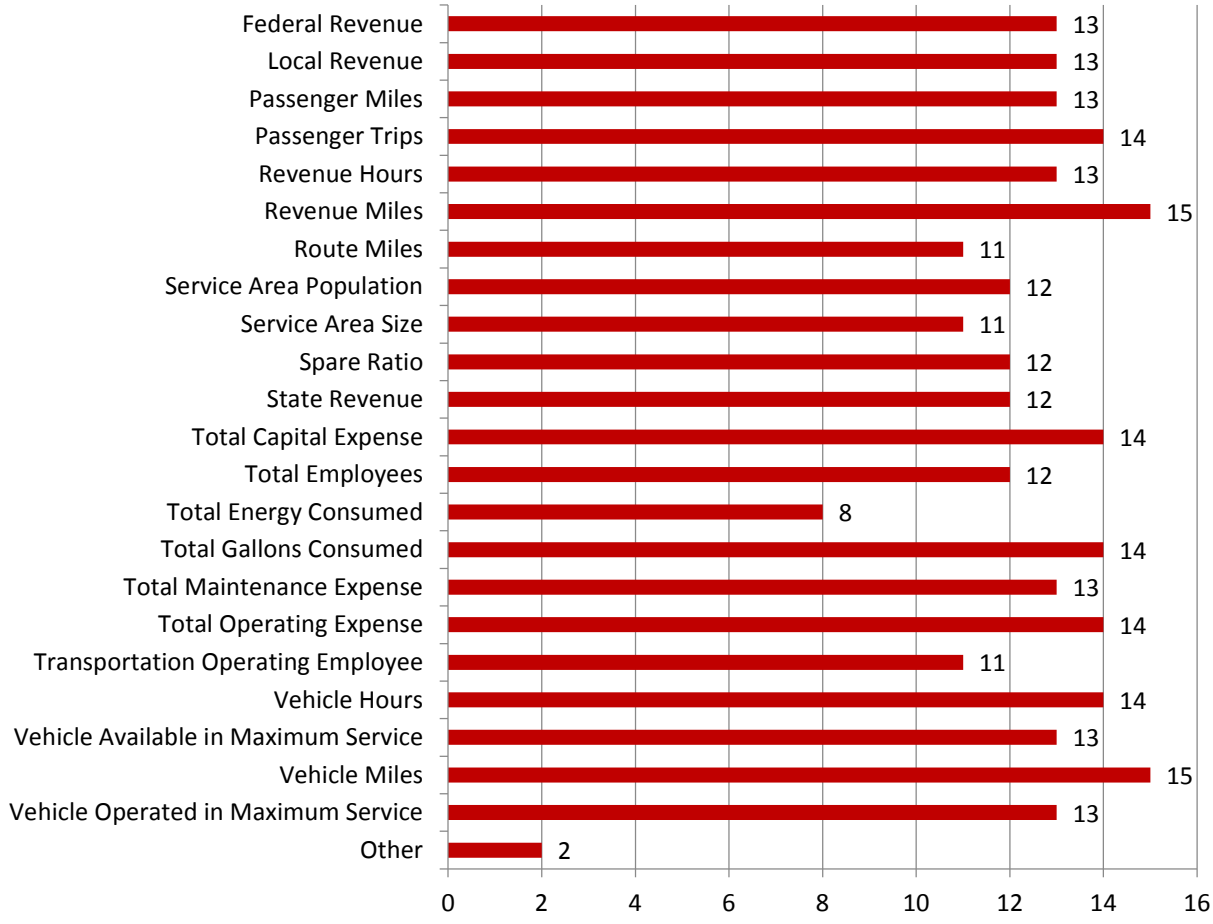
Q8. Service Performance Indicators

The top seven service performance indicators reported in the survey and shown in **Figure 13** are:

- Revenue Miles,
- Vehicle Miles,
- Passenger Trips,
- Total Capital Expense,
- Total Gallons Consumed,
- Total Operating Expense; and
- Vehicle Hours.

The lowest reported service performance indicators were: Total Energy Consumed, Route Miles, Service Area Size, and Transportation Operating Employee or employee involved in transit operations.

Figure 13. Service Performance Indicators Typically Reported by Transit Agencies



Q9. Customer Satisfaction Measures

The top four performance indicators used to evaluate Customer Satisfaction as reported in the survey by transit agencies are shown in **Table 23.**

- Hours of service during weekdays.
- Accessibility of trains/buses to persons with disabilities.
- Frequency of delays for breakdowns/emergencies.
- Reliable trains/buses that come on schedule.

The most effective performance indicator reported by transit agencies to evaluate Customer Satisfaction based on responses from the survey is "Cost-effectiveness, Affordability, and Value". The least reported performance indicators reported by transit agencies to evaluate Customer Satisfaction are:

- Availability of handrails or grab bars on trains/buses.
- Station/stop names visible from train/bus.

Q10. Service Effectiveness Measures

Transit agency survey respondents indicated the top performance measures used to evaluate Service Effectiveness are shown below and in **Table 24**.

- Passenger trips per revenue mile.
- Passenger trips per revenue hour.
- Service frequency.

Transit agencies responded that passenger trips per revenue hour and on-time performance were the most effective indicators for measuring Service Effectiveness, as shown in the table.

Q11. Service Efficiency Measures

Table 25 illustrates the top performance measures used to evaluate Service Efficiency. They are:

- Operating Expenses per Passenger Trip
- Farebox Recovery
- Operating Expense per Revenue Mile, and
- Operating Expense per Revenue Hour.

Transit agencies responded that Operating Expenses per Passenger Trip is the most effective measure. Vehicle Hour per Peak Vehicle and Vehicle Miles per Kilowatt-hour were listed as the least effective indicators when measuring Service Efficiency.

Table 23. Measures Typically Reported by Transit Agencies to Evaluate Customer Satisfaction

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Accessibility of trains/buses to persons with disabilities	10	4	11
Availability of handrails or grab bars on trains/buses	1	0	1
Availability of monthly discount passes	4	3	5
Availability of schedule information by phone/mail	5	3	6
Availability of schedules/maps at stations/stops	4	1	4
Availability of seats on train/bus	5	1	5
Availability of shelter and benches at stations/stops	8	3	10
Cleanliness of interior, seats, windows	5	1	6
Cleanliness of stations/stops	4	0	4
Cleanliness of train/bus exterior	4	0	4
Comfort of seats on train/bus	2	0	2
Connecting bus service to stations/main bus stops	6	3	8
Cost-effectiveness, affordability, and value	9	8	11
Displaying of customer service/complaint number	8	2	8
Frequency of delays for breakdowns/emergencies	10	5	10
Frequency of service on Saturdays/Sundays	8	4	9
Frequent service so that wait times are short	6	2	6
Friendly, courteous, quick service from personnel	8	1	8
Having station/stop near destination	6	2	6
Having station/stop near my home	5	2	5
Hours of service during weekdays	11	3	13
Number of transfer points outside downtown	2	0	2
Physical condition of stations/stops	5	2	5
Physical condition of vehicles and infrastructure	6	1	6
Reliable trains/buses that come on schedule	10	4	10
Safe and competent drivers/conductors	9	4	9
Safety from crime at stations/stops	3	1	3
Safety from crime on trains/buses	4	2	4
Short wait time for transfers	3	2	4
Signs/information in Spanish as well as English	6	3	7
Station/stop names visible from train/bus	1	0	1
The train/bus traveling at a safe speed	4	0	4
Trains/buses that are not overcrowded	5	1	5
Other	1	1	2

Table 24. Measures Typically Reported by Transit Agencies to Evaluate Service Effectiveness

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Vehicle miles per capita	6	0	6
Passenger trips per capita	6	0	6
Passenger trips per revenue mile	13	3	14
Passenger trips per revenue hour	13	9	14
Average trip length	11	2	12
Average Speed	9	0	9
Average headway (in minutes)	11	1	11
Revenue miles per route miles	6	0	6
Weekend span of service	10	1	10
Weekday span of service	11	1	11
Route miles per square mile of service area	2	0	2
Percentage of population within ¼ mile of a route	8	0	8
Service frequency	12	4	13
On-time performance	11	9	12
Other	1	0	1

Table 25. Measures Typically Reported by Transit Agencies to Evaluate Service Efficiency

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Operating Expense per Capita	5	1	5
Operating Expense per Peak Vehicle	2	1	2
Operating Expenses per Passenger Trip	12	8	13
Operating Expense per Passenger Mile	9	3	11
Operating Expense per Revenue Mile	12	3	12
Operating Expense per Revenue Hour	12	4	12
Maintenance Expense per Revenue Mile	5	1	5
Maintenance Expense per Operating Expense	6	2	6
Farebox Recovery	13	7	13
Local Revenue per Operating Expense	5	1	5
Operating Revenue per Operating Expense	5	1	6
Vehicle Miles per Peak Vehicle	3	1	3
Vehicle Hour per Peak Vehicle	3	0	3
Revenue Miles per Vehicle Mile	9	2	9
Revenue Miles per (total) Vehicle	7	2	8
Revenue Hours per (total) Vehicle	8	1	8

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Vehicle Miles per Gallon	8	4	8
Vehicle Miles per Kilowatt-hour	2	0	2
Average Fare	11	5	11
Other	1	1	1

Q12. Labor Utilization Measures

The most effective measure used to evaluate Labor Utilization is Passenger Trips per Employee, as shown in **Table 26**.

Table 26. Measures Typically Reported by Transit Agencies to Evaluate Labor Utilization

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Revenue Hours per Employee	7	2	8
Passenger Trips per Employee	6	3	7
Vehicle Miles per Employee	3	0	3
Other	4	2	5

Q13. Route- and System-Level Measures

When the transit agencies were asked if they use different measures to evaluate performance at both the route-level and system-level, 50 percent of the respondents indicated they use different measures.

Q14. Measures for each Mode

Fifty-seven percent of the transit agencies surveyed stated they report measures of performance evaluation for various modes (e.g. bus, rail, trolley, etc.) of service.

Performance Measure Changes with MAP-21

The Federal Transit Administration began the 2013 fiscal year in October with the new transportation bill, *Moving Ahead for Progress in the 21st Century (MAP-21).* A few changes were made within the transit section of the bill, compared to the previous bill SAFETEA-LU. MAP-21 consolidated the overall number of programs by two-thirds to improve efficiency. Several unknowns regarding the policy provisions will be clarified over the coming year. The new bill:

- Increases funding for improving the state of good repair;
- Includes new reporting requirements; and
- Requires agency plans and performance measures for state of good repair, and safety.

The federal guidelines have not been released pertaining to specific performance measures required. However, FDOT continues to monitor progress. Responses to Questions 15 to 19 provide insight on Florida transit agencies' awareness of MAP-21 changes affecting performance reporting, as well as identify existing measures that agencies use in evaluating goals and objectives pertaining to safety and asset management.

Q15. MAP-21 Performance Measure Requirements

All transit agencies that completed the survey stated they are aware of the MAP-21 requirements for an agency safety and asset management plan and performance measures. **Figure 14** provides a summary of the MAP-21 transit performance requirements.

Figure 14. MAP-21 Transit Performance Requirements

Source: FHWA

Q16. Tracking Safety Measures

Transit agencies were asked if they were currently tracking safety performance measures. Ninety-three percent of the agencies stated they are tracking safety performance measures.

Q17. Safety Measures

Transit agencies reported the measures below to be the most effective when evaluating safety within the agency:

- Number of Accidents
- Number of Fatalities
- Number of Incidents

Table 27 illustrates the information. The measures least used by agencies include property-damage only/per passenger miles traveled and property-damage only accidents/per vehicle miles traveled.

Table 27. Measures Typically Reported by Transit Agencies to Evaluate Safety

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Accidents per 100,000 Revenue Miles	10	2	10
Collisions per 100,000 Revenue Miles	9	2	9
Crimes per 1,000 Passengers	6	0	6
Customer Accidents	9	2	10
Fatal Accidents per Passenger Miles Traveled	7	1	8
Fatal Accidents per Vehicle Miles Traveled	6	1	7
Injury Accidents per Passenger Miles Traveled	7	1	8
Injury Accidents per Vehicle Miles Traveled	5	2	6
Number of Accidents	12	5	13
Number of Collisions	10	1	10
Number of Fatalities	12	0	12
Number of Incidents	12	3	13
Number of Injuries	10	1	11
Number of Safety-related Complaints	8	2	9
Number of Safety-related Improvements	5	2	6
Property-damage only accidents per vehicle miles traveled	3	0	3
Property-damage only per passenger miles traveled	4	0	4
Revenue Miles (Distance) Between Incidents	7	2	7
Other	2	1	2

Q18. Asset Management Measures

Over three quarters (79%) of survey respondents reported their agency is currently tracking performance measures for asset management.

Q19. State of Good Repair Measures

The top five measures, as shown in **Table 28**, reported by transit agencies to be most effective for the evaluation of State of Good Repair are:

- Average Age of Fleet,
- Number of System Failures,
- Percent of Stops with Shelters and Benches,
- Revenue Miles between Road Calls, and
- Total Road Calls.

The least used performance measures are Loading Area Capacity and Maintenance Labor Cost/per Vehicle.

Table 28. Measures Typically Reported by Transit Agencies to Evaluate State of Good Repair

Measure	# of Agencies Use Measure	# of Agencies Stating Most Effective	Total # of Agency Responses
Average Age of Fleet (in years)	11	3	11
Loading Area Capacity	2	0	2
Maintenance Labor Cost per Mile	4	1	4
Maintenance Labor Cost per Vehicle	2	1	2
Mechanics per 1,000 Revenue Miles	4	0	4
Missed Trips due to Operation Failures	8	2	8
Number of Repeat Breakdowns per Month	8	1	8
Number of Repeat Repairs per Month	5	0	5
Number of System Failures	9	1	9
Percent of Stops with Shelters and Benches	9	1	9
Revenue Miles between Road Calls	9	0	9
Revenue Miles between Incidents	8	1	8
Total Road Calls	10	1	10
Other	3	1	3

Transit Data Collection and Technology

Question 20 provides information regarding the data collection source and technology used by transit agencies.

Q20. Technology Used by Agencies to Collect Transit Performance Data

Figures 15 through 31 show the different technologies being used for each of the transit performance measures. As shown in **Figure 15**, a majority of respondents use fleet data, such as vehicle records, to collect age of fleet.

Figure 15. Age of Fleet (Years)

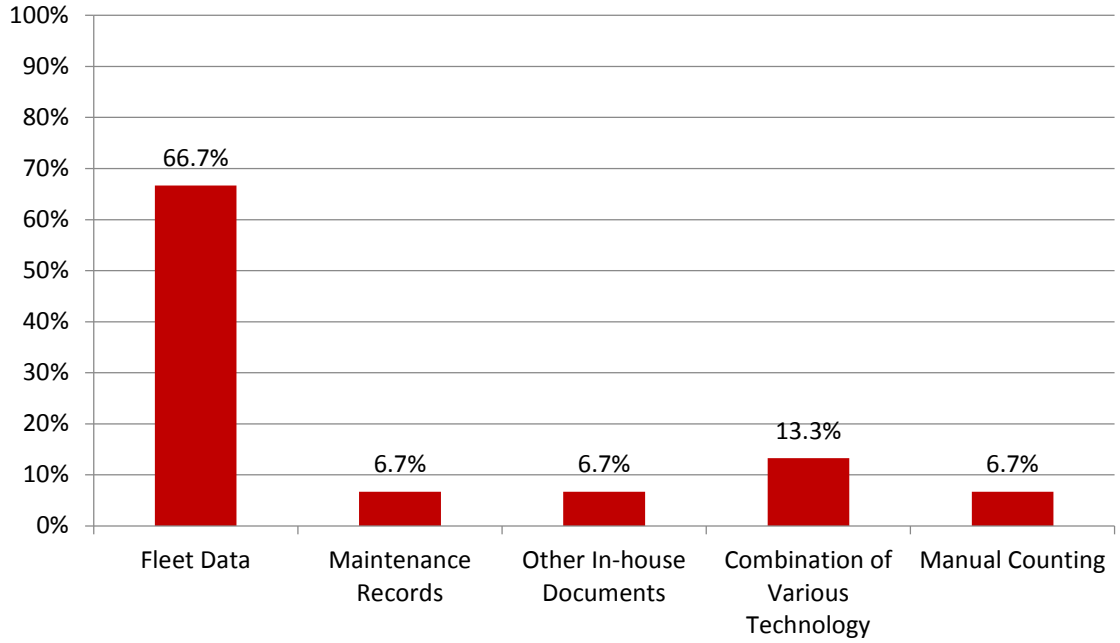


Figure 16 illustrates that electronic fareboxes are used by the majority of respondents in collecting farebox revenue data. Note however that some medium-sized transit agencies such as Volusia County Transit (VOTRAN) and Space Coast Area Transit (SCAT) along with small transit agencies such as Martin County Board of County Commissioners (Martin County) and Council on Aging of St. Lucie (COASL) use either manual counting or other in-house documents in collecting farebox revenue data.

Figure 16. Farebox Revenue

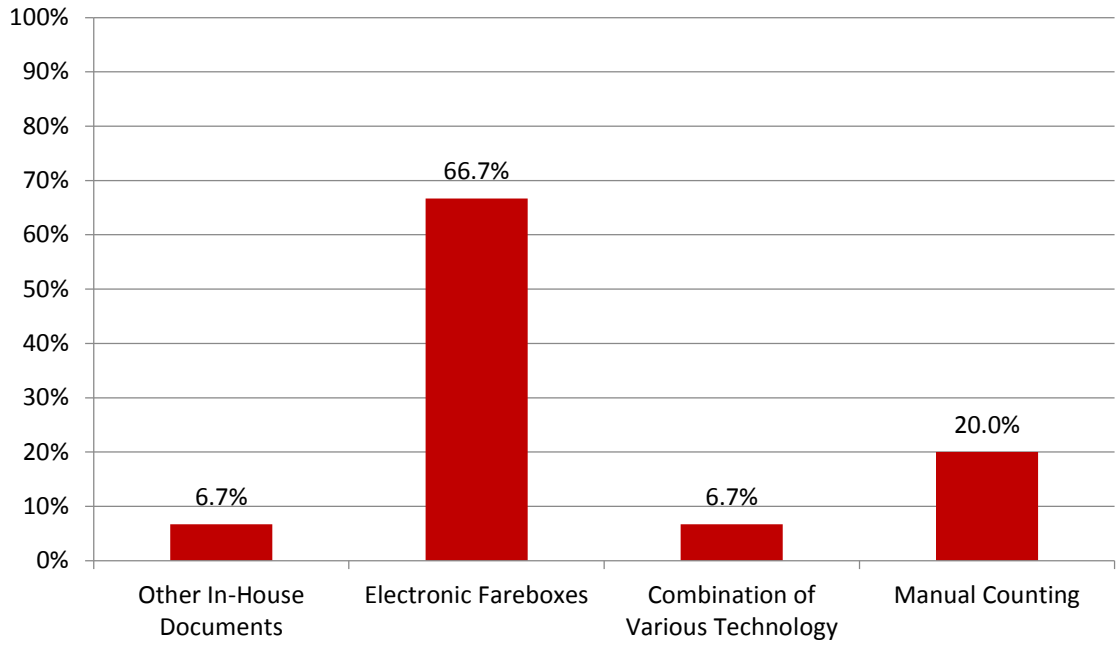
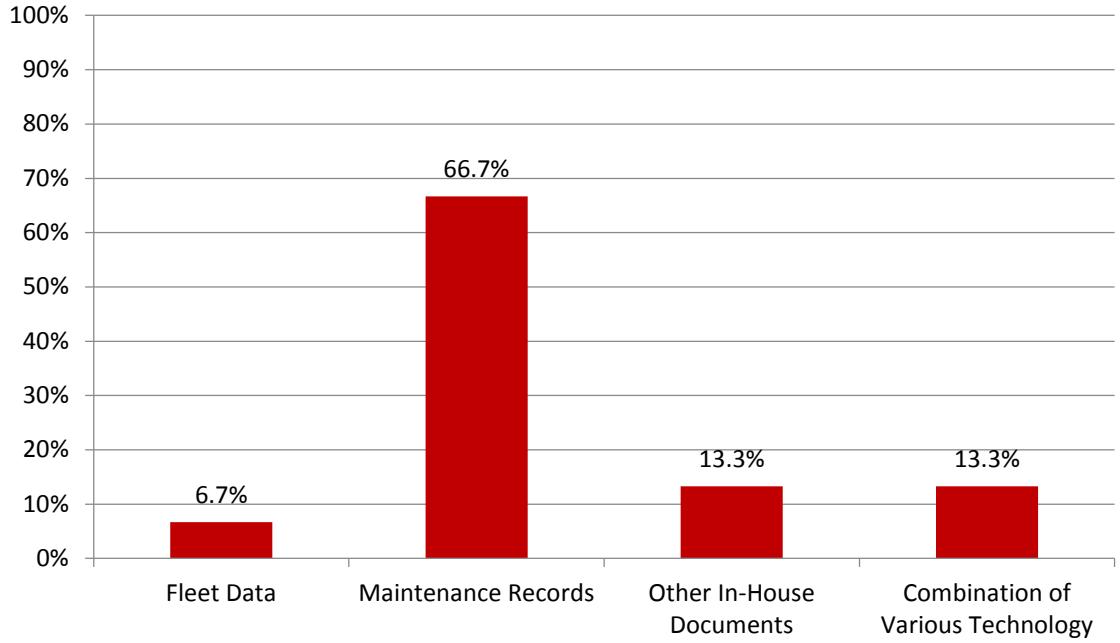


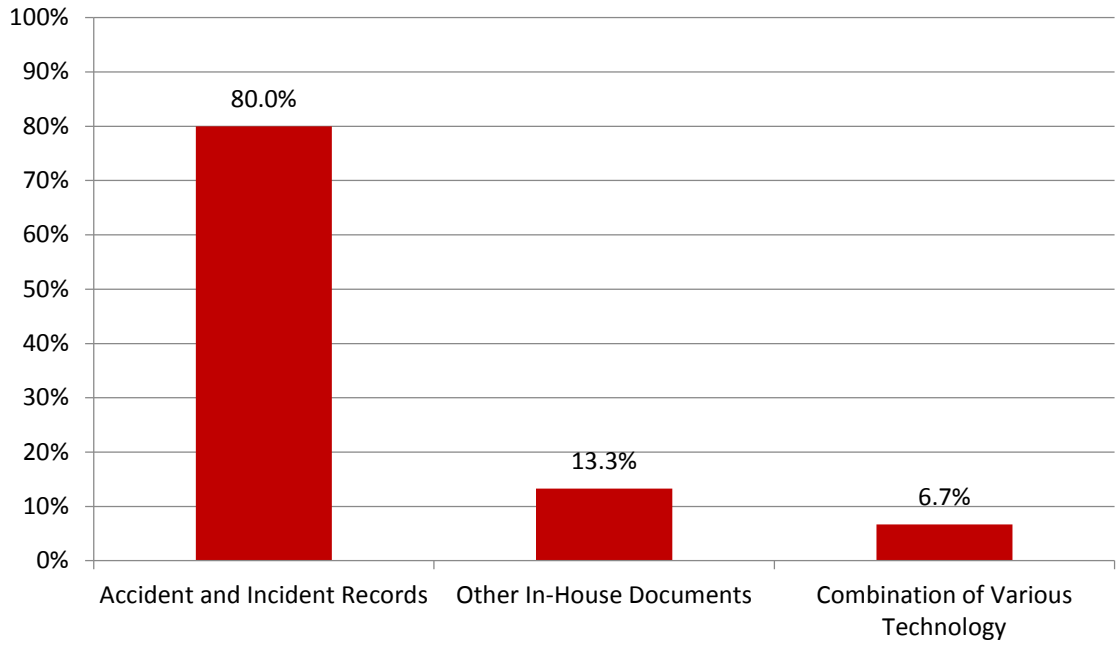
Figure 17 indicates that maintenance records are the most commonly used source by transit agency respondents in gathering maintenance expense data.

Figure 17. Maintenance Expenses



The majority of the transit agencies use accident and incident records when compiling the number of accidents/incidents/collisions. **Figure 18** illustrates these data.

Figure 18. Number of Accidents/Incidents/Collisions



Electronic fareboxes, automatic passenger counters (APC), and manual counting are most commonly used by the responding agencies to track the number of boardings, as shown in **Figure 19**. Some medium-sized and smaller agencies use manual counting and other manual data collection methodology to collect number of boardings data.

Figure 19. Number of Boardings

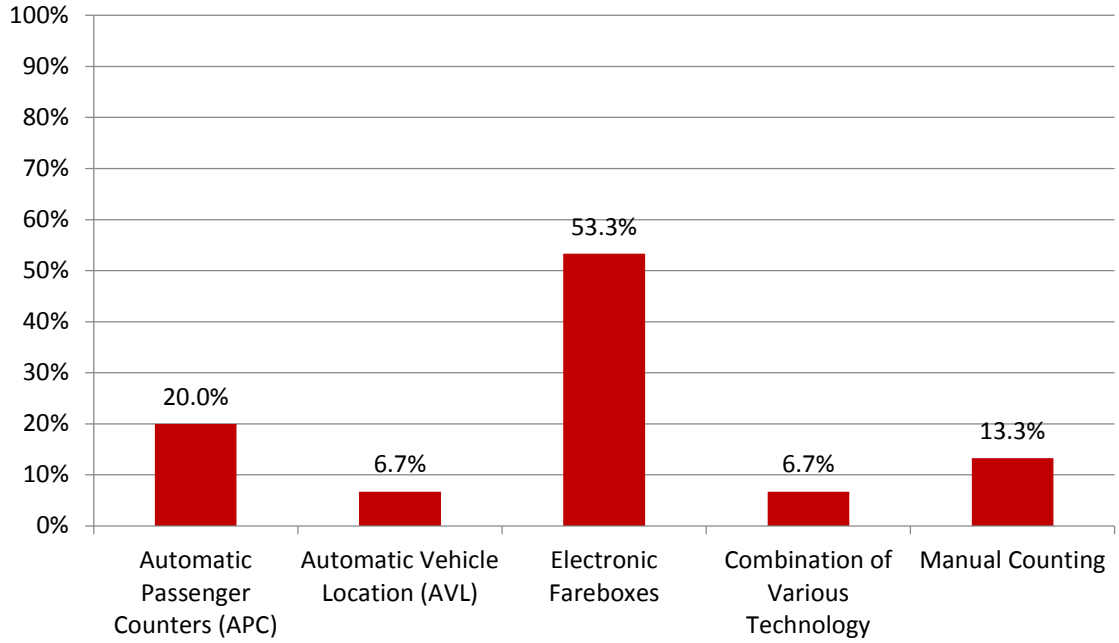


Figure 20 shows the majority of the transit agency respondents use maintenance records to compile number of system failures data.

Figure 20. Number of System Failures

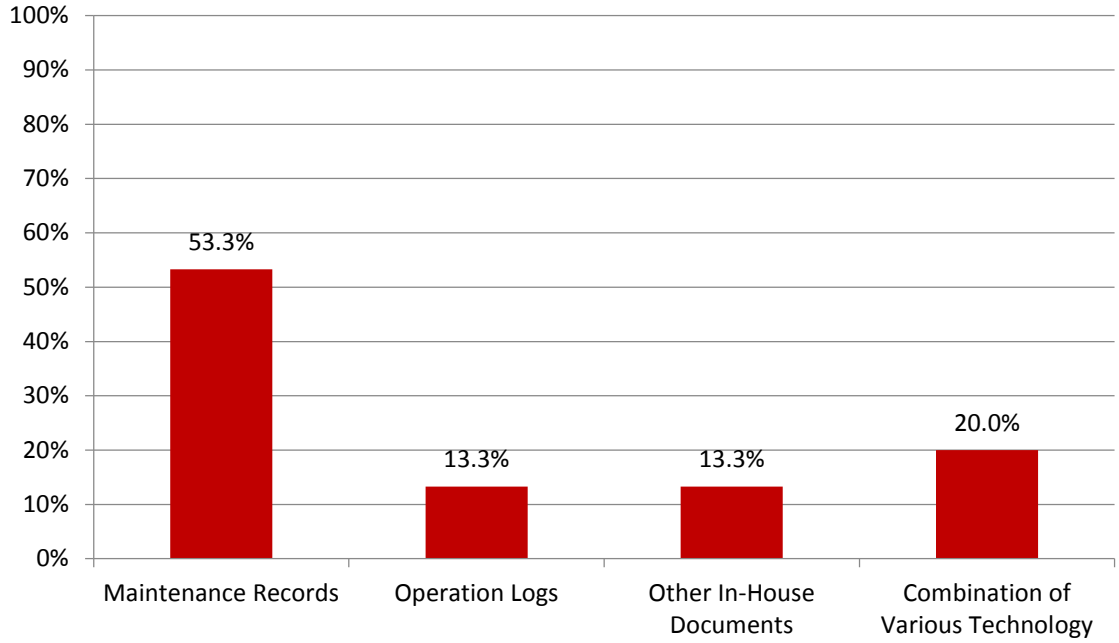


Figure 21 illustrates survey respondents use a combination of various technology and other in-house documents as the primary source for operational expense data.

Figure 21. Operation Expenses

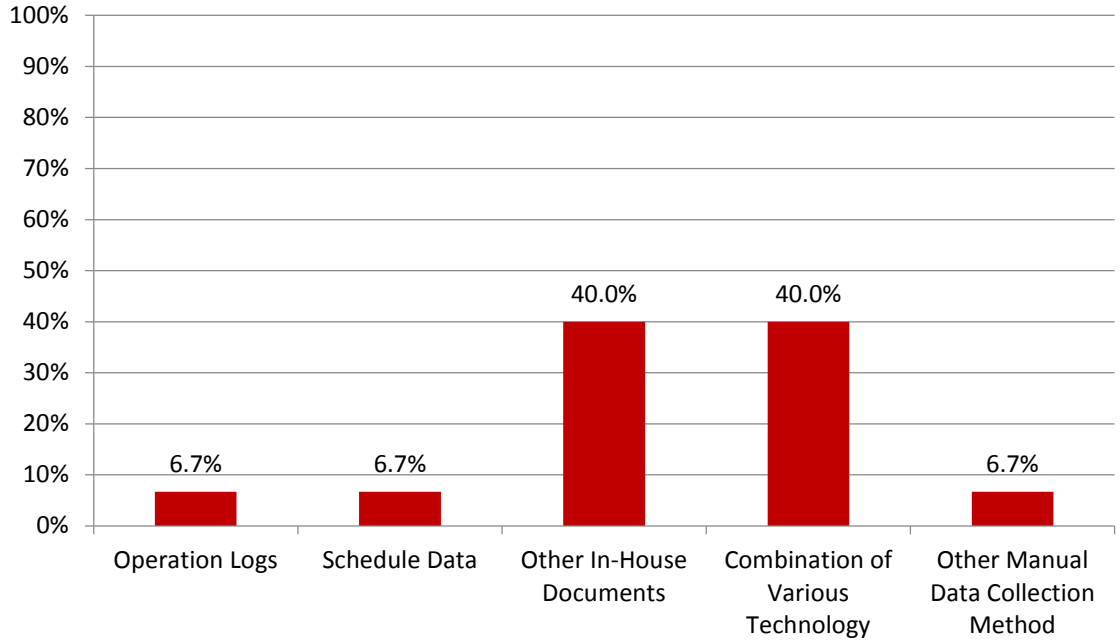
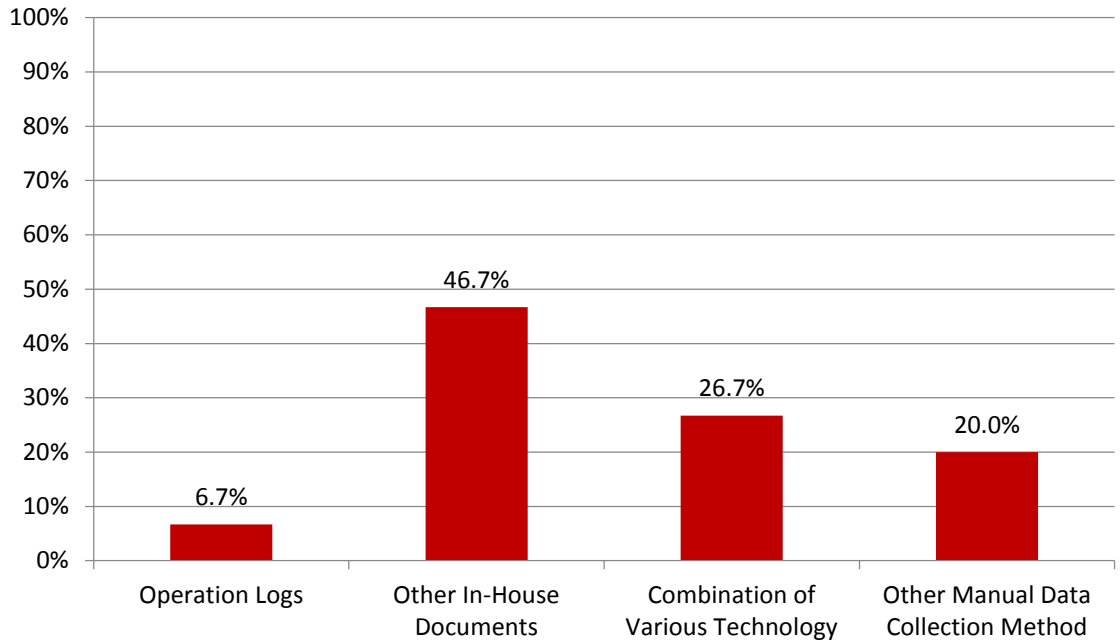


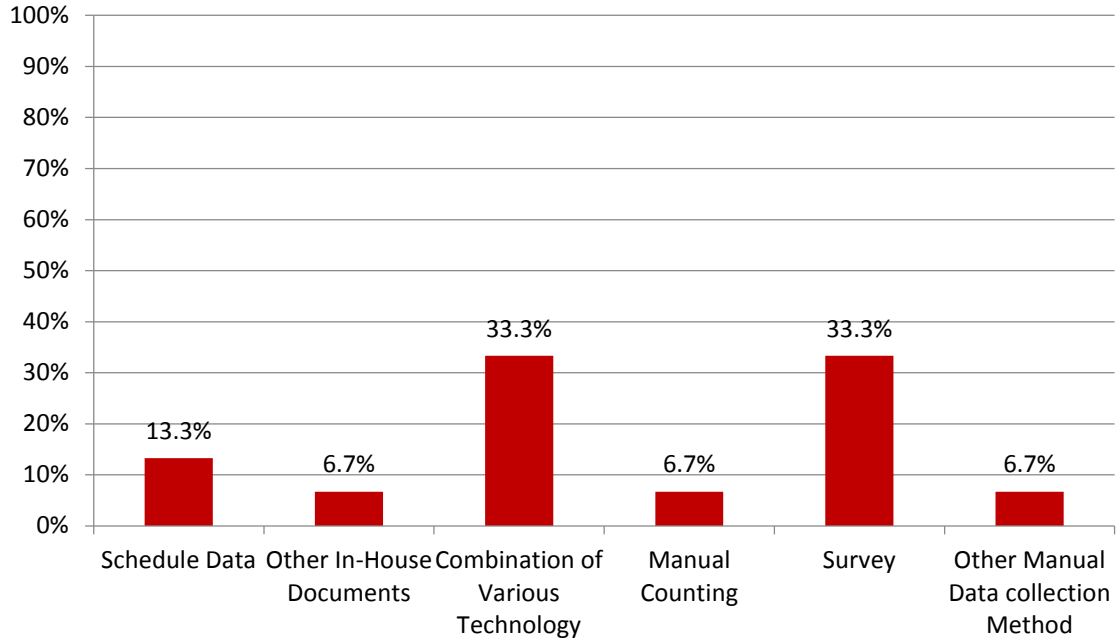
Figure 22 shows that transit agencies use other in-house documents and a combination of various technologies in gathering other non-fare revenue data.

Figure 22. Other Non-Fare Revenue



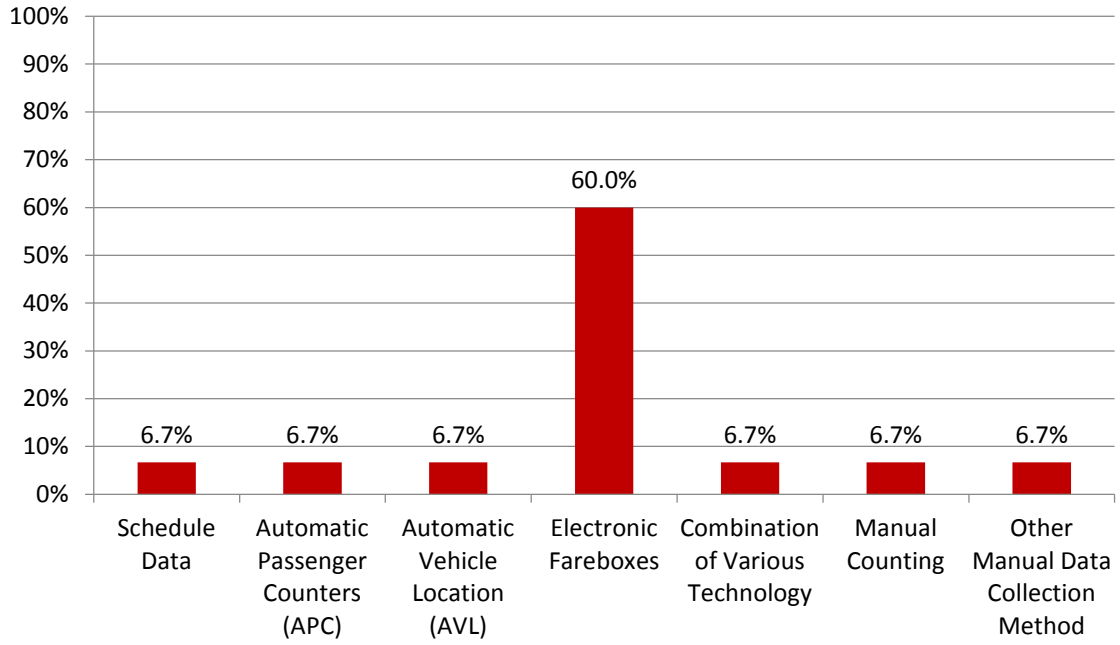
A combination of various technologies and surveys are the top two methodologies used by transit agencies when collecting passenger miles data, as shown in **Figure 23**.

Figure 23. Passenger Miles



The majority of the transit agencies use electronic fareboxes in collecting passenger trips data, as shown in **Figure 24**. Some medium-sized and small agencies use manual counting and other manual data collection method to collect passenger trips data.

Figure 24. Passenger Trips



A combination of various technologies, schedule data, and automatic vehicle location (AVL) are the top three sources/technology used by transit agencies for collecting revenue hours. **Figure 25** shows the responses.

Figure 25. Revenue Hours

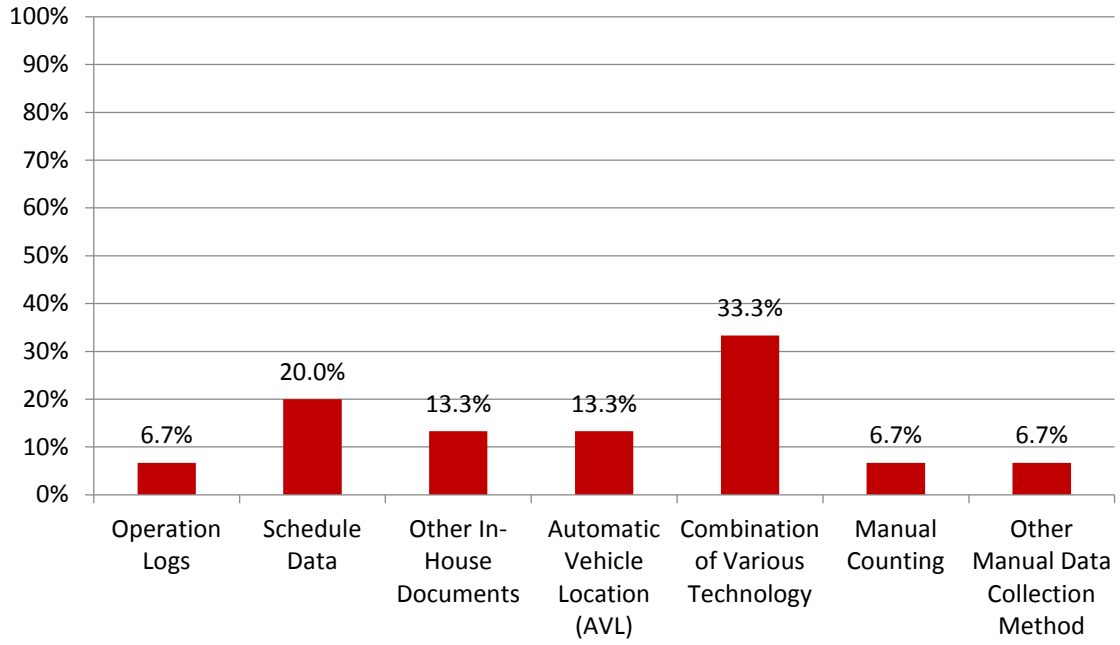


Figure 26 indicates transit agencies use the same sources/technology when collecting data for both revenue hours and revenue miles.

Figure 26. Revenue Miles

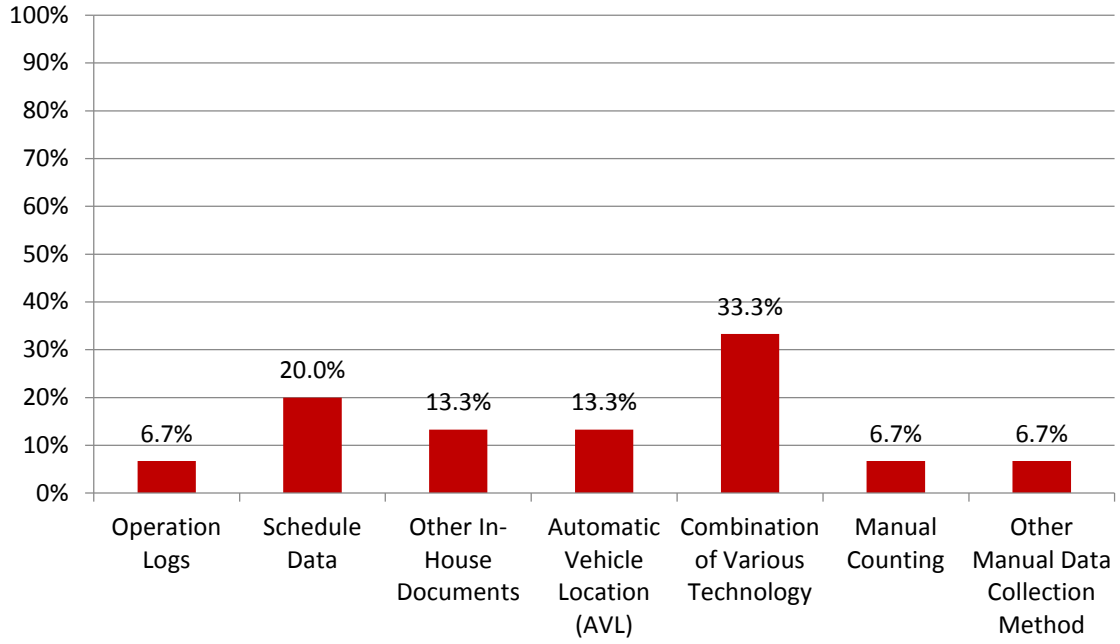


Figure 27 illustrates the top three sources/technology used by transit agencies when collecting route miles data are: other in-house documents, combination of various technology, and schedule data.

Figure 27. Route Miles

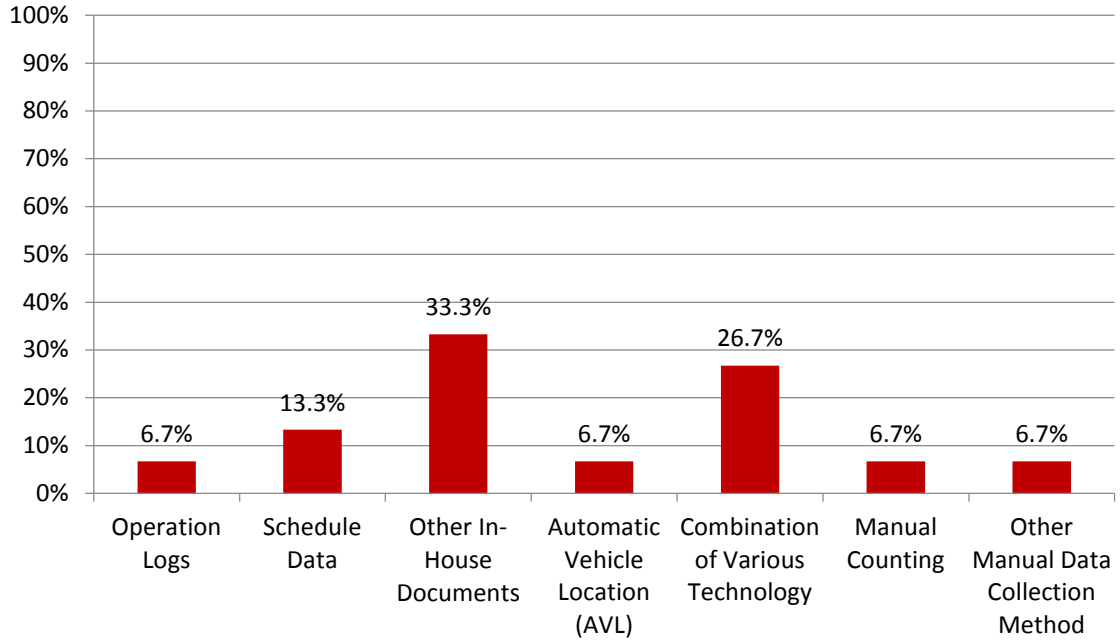
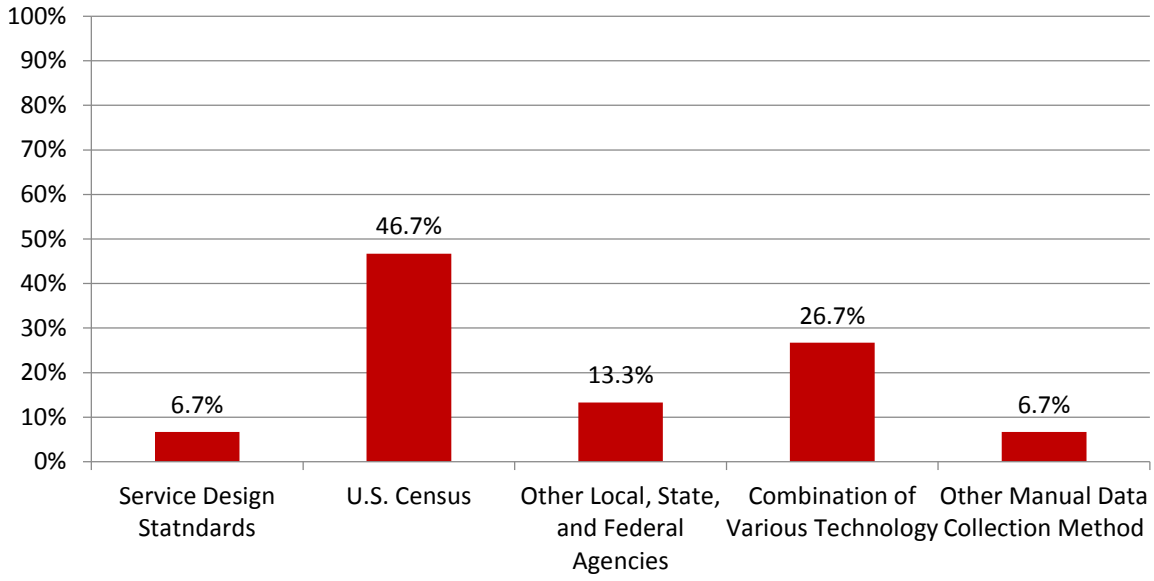


Figure 28 shows that 50 percent of transit agencies use a secondary source, the U.S. Census, when gathering service area population data. Other methods include coordination with other local, state, and federal agencies, a combination of various technologies, and other manual data collection methods.

Figure 28. Service Area Population



Employee records and other in-house documents are the two sources used most by transit agency respondents in gathering total employee data, as shown in **Figure 29**.

Figure 29. Total Employees

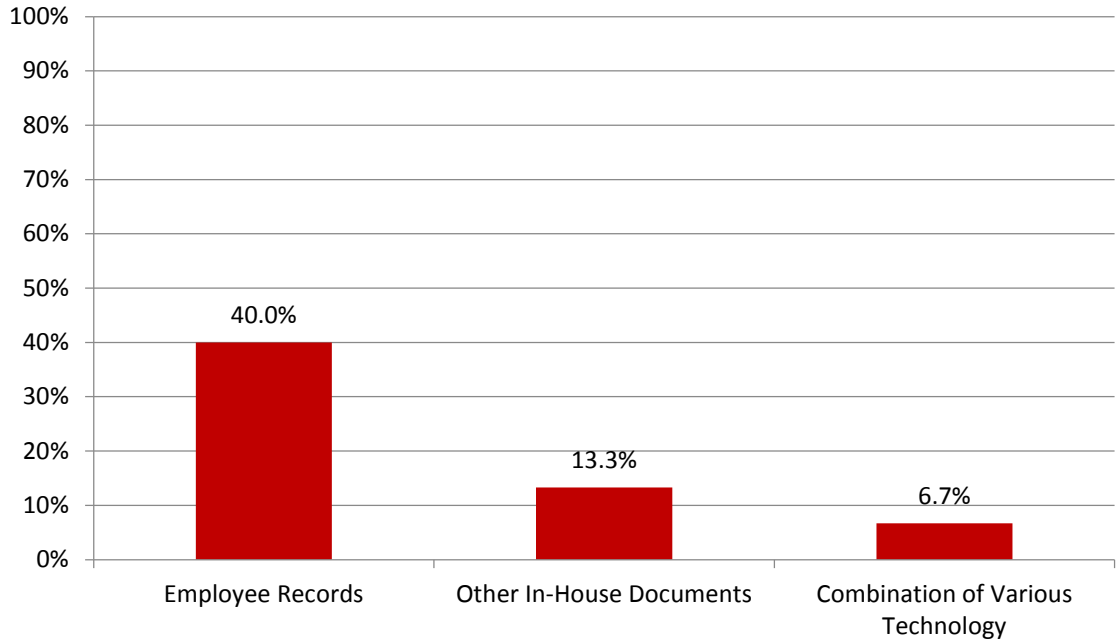
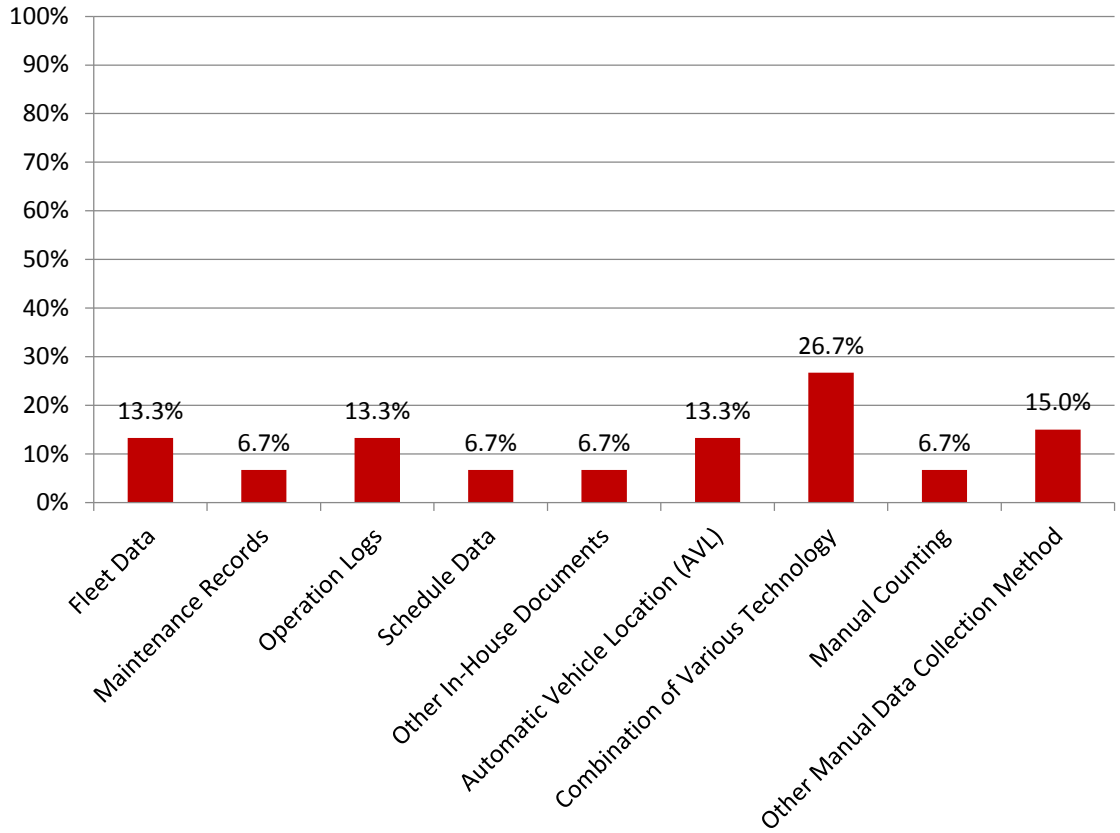


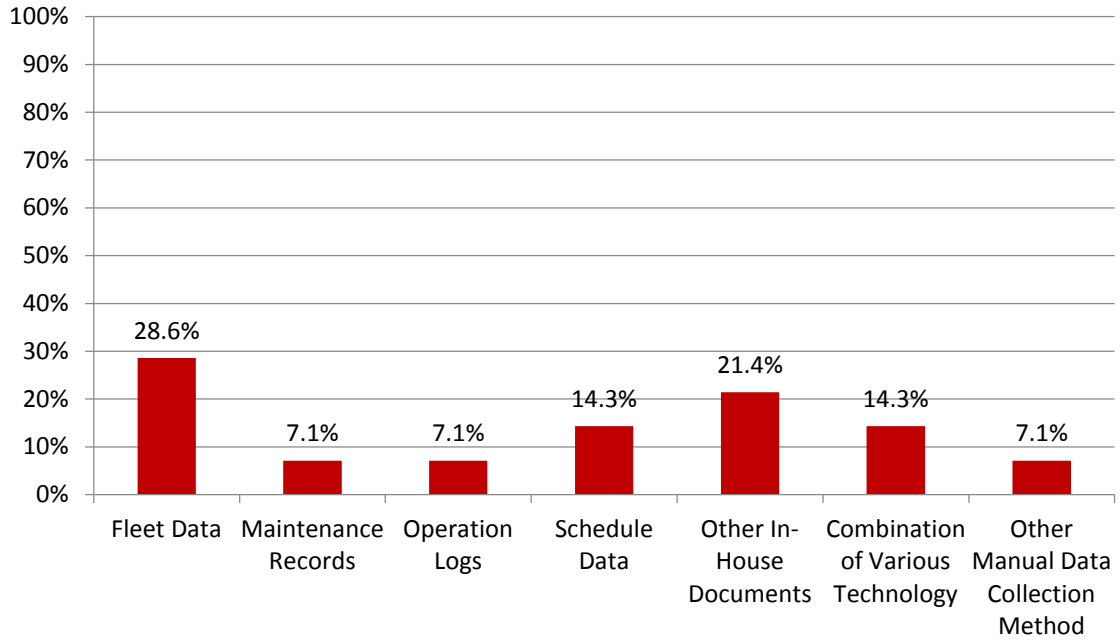
Figure 30 indicates a combination of various technologies, automatic vehicle location (AVL) counters, operational logs, fleet data, and manual data collection and the top sources/technology used by transit agencies to record vehicle miles data.

Figure 30. Vehicle Miles



The most commonly used sources/technology by transit agencies to determine the number of vehicles available during maximum service is fleet data and other in-house documents. **Figure 31** presents the information.

Figure 31. Vehicles Available in Maximum Service



Florida Case Studies

This section presents four case studies encompassing one "small", two "medium", and one "large" Florida fixed route urban transit agencies. These agencies incorporate unique and successful methodologies in collecting data as well as in tracking, monitoring, and reporting performance measures:

- Large: Miami Dade Transit (MDT)
- Medium: Jacksonville Transportation Authority (JTA) and Lee County Transit (LeeTran)
- Small: Council on Aging of St. Lucie, Inc. (COASL)

The size category was based on three factors: service area population, ridership, and fleet size. **Table 29** shows a categorization of agencies by size. Service area population is one of the categories that FTA uses for urbanized apportionments. Size categories are broken into the following:

- **Large:** service area population >1 million
- **Medium:** service area population of 200,000 to 1 million
- **Small:** service area population < 200,000

The Florida case study also considers the intensity of transit service reflected by the agency's ridership and fleet size. StarMetro, Gainesville RTS, Indian River, and Lakeland Area Mass Transit District (LAMTD) have service area population less than 200,000. For this study effort, they were considered as mid-size agencies because their ridership is close to or greater than 1 million and have a fleet size (peak vehicles) of equal or greater than 15. St. Lucie, on the other hand, has a service area population greater than

200,000 but is categorized as a small agency because its ridership is less than 1 million and its fleet size (peak vehicles) is less than 10.

Table 29. Florida Transit Agencies Categorized by Size

Size	Transit Agency	Service Area Pop.	Ridership	Fleet Size
Large	SFRTA	5,502,379	4,491,886	65
	LYNX	1,837,359	28,384,884	302
	Broward County Transit	1,780,172	40,288,678	320
	Miami Dade Transit	1,496,435	106,215,326	1,022
	Palm Tran	1,268,782	11,579,046	126
Medium	Pinellas Suncost Transit Authority	922,616	13,713,027	170
	Jacksonville Transportation Authority	838,815	12,318,052	145
	HART	822,404	14,620,857	156
	Space Coast Area Transit	554,354	2,202,373	72
	Voltran	468,670	3,598,032	57
	Pasco County Public Transportation (PCPT)	464,697	956,591	18
	LeeTran	459,381	3,793,542	57
	Sarasota County Area Transit	388,474	2,795,526	45
	Escambia County Area Transit	341,765	1,473,412	31
	Collier Area Transit	323,785	1,207,866	16
	Manatee County Area Transit	322,833	1,767,086	19
	StarMetro	162,310	4,585,634	58
	Gainesville RTS	160,000	10,652,169	97
	Senior Resource Association (Indian River)	143,696	1,104,769	22
Small	Council on Aging of St. Lucie, Inc./ Community Transit	280,379	152,561	8
	St. Johns County	195,823	237,132	7
	Okaloosa County Transit	180,822	179,921	14
	Polk County Transit Services/ Winter Haven Area Transit	153,924	525,711	11
	Martin County Board of County Commissioners	146,000	67,173	4
	Sun Tran	115,000	422,547	6
	Bay Town Trolley	105,192	774,384	14
	Lake County Transit	97,497	296,969	7
	Hernando County	86,848	72,406	4

Source: 2013 Florida Transit Handbook.
Note: Fleet size is Peak Vehicles or Vehicles Operated in Maximum Service

Miami Dade Transit

Miami Dade Transit (MDT) is the 17th largest public transit system in the nation and the largest in Florida, serving 2.6 million residents of Miami-Dade County, including connections to South Broward County and North Monroe County. MDT employs 3,235 full-time employees and operates a total of 997 vehicles daily via three fixed route modes: bus (Metrobus), heavy rail (Metrorail), and monorail (Metromover)**. Figure 32** illustrates MDT's downtown transit map.

In 2005, Miami Dade County adopted the Active Strategy Enterprise (ASE) online performance management system, which allows government departments across the county to align their activities to the County Strategic Plan and to make performance information readily available. The ASE system allows the county's Office of Performance Management (OPM) to efficiently communicate the progress and outcomes of publicly funded countywide initiatives. Through the ASE system, each department can generate a Scorecard that matches goals and objectives to specific performance measures, effectively tracking performance over time and conducting performance appraisals. The Scorecard is also used to feed into each department's quarterly business plan.

In the following section, 'department' refers to MDT, while 'division' refers to the various offices within MDT, including safety, maintenance, operations, finance, and so on.

Performance Measure Setting

Strategic planning directs the identification of performance measures that are aligned with both MDT's and the county's goals and objectives, as specified in the Miami-Dade County Strategic Plan. MDT considers five perspectives in developing objectives and corresponding performance measures:

- **Customer:** provide quality service to customers.
- **Financial:** optimize the use of resources and reduce costs.
- **Internal:** improve overall agency efficiency.
- **Learning and growth:** develop skills and promote career growth of employees.
- **Sustainability:** ensure long-term viability of services.

Meetings with division heads are held annually and on an as needed basis regarding the establishment of new goals to be added in the Scorecard. The meetings ensure any proposed goals are consistent with the county's strategic plan and that the goals can be easily translated into performance measures/initiatives, which are then reflected and tracked in the Scorecard.

As an example, if MDT's safety division proposes a new goal of improving transit safety education, the MDT's scorecard liaison coordinates with the safety division director and key staff to define and establish the new goal, as well as identify ways of capturing data that can be used to create measure, set targets, and track the progress in achieving the goal. In the event there is no measurable data an initiative (narrative) is developed to track the progress toward the goal. Once consensus is reached for implementing the new goal, it will then be added to the Scorecard along with the measure and/or initiative.

The objectives and performance measures tracked in the Scorecard are dynamic rather than static. Objectives and performance measures are adaptable and adjusted accordingly based on the changing transit demand. Michelle Davis Hines, MDT's Special Projects Coordinator, states, the Scorecard is a "living document, it is formatted based on the needs of the department/agency."

Figure 32. MDT's County Downtown Transit Map

Source: Miami-Dade Transit

Data Collection and Reporting

A reliable data collection and reporting process is necessary to support the ever changing objectives and performance measures in the Scorecard. Collected data must be translated in a narrative form that focuses on both process and outcome. MDT has a clear vision on where to allocate and how to optimize resources for gathering and reporting data by ensuring all collected data are relevant to measurement, benchmarking, and making improvements. The ASE system assists MDT in compiling, administering, and archiving purposeful data across different divisions with ease. Each division can enter data into the ASE system, which then is populated into Scorecards for conducting performance analysis. MDT's Special Projects Administrator manages the department's Scorecard and oversees the data and information entered by each division in the ASE system.

A designated staff from each division is trained to correctly input data into the ASE system and provide a narrative status report for initiatives linked to a specific goal. Both the data and initiative narratives are due at the end of each month and are automatically populated in the Scorecard. The Scorecard can be generated for both system and route-level analysis and for each performance measure. **Table 30** illustrates a snapshot of a route-level Scorecard for the *On-time Bus performance/Schedule adherence – weekday bus* measure. MDT defines on-time performance as the actual bus arrival 2 minutes prior to scheduled time and within 5 minutes after scheduled departure time. The green upward arrow shown in the table signifies routes that attained the 78% on-time performance target while the red downward arrow signifies routes that missed the target.

Table 30. Route-level On-Time Performance Scorecard

Name	Period	Actual	Target	Variance
Ontime Performance/Schedule Adherence – Bus (2)	Mar '14	83.72% (1,352/1,615)	78.00%	5.72%
Ontime Performance/Schedule Adherence – Bus (3)	Mar '14	76.34% (4,645/6,085)	78.00%	-1.66
Ontime Performance/Schedule Adherence – Bus (9)	Mar '14	78.73% (3,005/3,817)	78.00%	0.73
Ontime Performance/Schedule Adherence – Bus (10)	Mar '14	79.26% (1,754/2,213)	78.00%	1.26

The route-level Scorecard for each performance measure also provides information regarding the methodology used in calculating the performance measure, which includes details on the following:

- Data source/technology.
- Definition and/or parameters of performance measure.
- Formula for calculating performance measure.
- Current and historical performance measure target.
- Other data cleaning technique.

MDT uses a combination of Computer Aid Dispatch (CAD) and Automatic Vehicle Location (AVL) in collecting data to calculate on-time performance statistics. Other transit data are collected using a combination of various technology and sources include the following: operating expenses, other non-fare revenue, passenger miles, revenue hours, revenue miles, and vehicle miles. **Table 31** lists the technology and sources used by MDT in collecting specified transit data.

Table 31. MDT's Data Collection Sources and Technology

Transit Data	MDT
Age of Fleet (yrs.)	Fleet Data
Farebox Revenue	Electronic fareboxes
Maintenance Expenses	Maintenance records
Number of accidents/ incidents/ collisions	Accident and incident records
Number of boardings	Electronic fareboxes
Number of system failures	Maintenance records
Operating Expenses	Combination of various technology
Other Non-Fare Revenue	Combination of various technology
Passenger Miles	Combination of various technology
Passenger Trips	Automatic passenger counters (APC)
Revenue Hours	Combination of various technology
Revenue Miles	Combination of various technology
Route Miles	Other in-house documents
Service Area Population	Service design standards
Total Employee	Other in-house documents
Vehicle Miles	Combination of various technology
Vehicles Available in Maximum Service	Maintenance records

Source: Best Practices in Transit Performance Measures Survey, March 2014.

Uses of Performance Measures

- Accountability

The Scorecard is used internally across the MDT divisions, but it is also developed for the county's Office of Management and Budget (OMB), and for the advisory board to whom Scorecard results are presented. The Scorecard provides evidence of where public funds are used, specifically illustrating the outcome of public funding by tracking achievement of goals and completion of initiatives.

MDT's annual Scorecard is published on both the MDT and OMB websites. More comprehensive Scorecards, detailing the route-level performance for each measure is not publicly available because the public may not have access to the software necessary for detailed scorecard data. However, since this is a transparent system, data and performance results contained in these more-detailed Scorecards can be used to provide further information and clarification to the public regarding specific service concerns.

Furthermore, the ASE Scorecard system is utilized in presenting quarterly performance data to the Citizens Independent Transportation Trust (CITT) oversight board. MDT has an oversight board for the half penny sales tax, CITT, which was approved by voters in 2002 to improve transportation systems in Miami-Dade County.

- Meet funding requirements

MDT is a recipient of the FTA 5307 grant and is therefore required to report data to the National Transit Database (NTD). Since MDT utilizes the ASE system which provides a reliable means for each division to report and archive data, MDT can easily gather data to report to NTD. Additionally, the Scorecards generated through the ASE System can serve as supporting documents for auditors, showing the performance of routes and the entire system, as monitored throughout the year for all modes.

As part of Miami-Dade County's budgeting process, MDT is required to prepare a two-year business plan, which highlights department projects and initiatives that support the goals in the Miami-Dade County Strategic Plan and reflect funding allocations. Also reported in the business plan is the department's Scorecard for the fiscal year, which tracks the progress and contributions of MDT activities in achieving the county's goals and serves as a basis for setting performance targets for the next fiscal year.

- Improve performance

In the sample submitted for the case study "Bus On-Time Performance" (OTP) in **Table 30**, the performance measure identified overall on time weekday performance for bus. MDT has a bus fleet of 817 active buses. The Scorecard identifies if the entire system or specific routes are on course in meeting performance targets. For instance, in February 2014, MDT's overall system did not reach its 78 percent on-time performance target and attained 75 percent OTP due to road construction, detours, traffic or other factors. By generating route-level Scorecards for on-time performance, MDT is able to identify which routes are encountering service delays and causing deficiencies. This information is crucial in advising the public regarding potential road bottlenecks and identifying needs to temporarily provide detour routes or even consider redesigning routes to improve performance.

- Evaluate Progress in Meeting Goals

Performance measures are useful in evaluating the progress of MDT in achieving the County's Strategic Plan. **Table 32** lists the customer perspective objectives and performance targets included in MDT's Scorecard. The specified objectives and targets are consistent with the Miami Dade County Strategic Plan for Transportation. In the Scorecard, MDT's actual monthly and year-to-date performance are compared to the fiscal year-to-date target.

Table 32. MDT's Customer Perspective – Objectives and Performance Targets (Excerpt from Scorecard)

Customer		
Objective	**Measure**	**Fiscal Year-To-Date Target**
Minimize traffic congestion	Percentage completion a design project	n/a
Provide reliable transit service	Peak vehicle requirement – weekday	100%
	On-time performance (Metrorail)	95%
	On-time performance/ schedule adherence – weekday – bus (Overall system)	78%
	Mean distance between failures (Bus)	4,000
	Mean distance between disruptions (Rail)	39,000
	Mean distance between disruptions (Mover)	1,500
Expand and improve public transportation – operations	Average daily boardings – Rail	295,000
	Average daily boardings – Bus	1,205,000
	Average daily boardings – Mover	150,000
	Total monthly boardings – Bus	n/a
Improve mobility of low income individuals, the elderly and the disabled	On-time performance (STS)	80%
	Total Monthly boardings (STS)	n/a
Ensure security at public transit facilities	Security post inspections	3,000
Ensure excellent customer service for passengers	All complaints per 100K boardings for bus, rail, mover	12
	All complaints per boardings for paratransit – monthly	n/a

Source: MDT Department Scorecard FY 13-14.

Performance Measure Constraints and Future Development

The support of the entire department is crucial in implementing a successful performance measures program. For instance, the ASE system at MDT is only useful and reliable if all divisions are reporting data regularly and if all designated users in each division are correctly inputting data. To emphasize the usefulness of the Scorecard and gain support from each department, it is important to customize the Scorecards based on the need of each division, having the option to only populate data relevant to the division's evaluation.

MDT is prepared to comply with the new MAP-21 requirements pertaining to safety and asset management/state of good repair performance measures. The agency has a comprehensive list of safety measures they monitor, including the following:

- level of accident ratio,
- number of accidents and/or incidents per 100,000 miles,
- number of passenger complaints,
- number of safety related accidents and incidences on-board and in stations/transit facilities, and
- number of criminal incidents on-board transit and in stations/transit facilities

With the new requirements, a meeting to discuss changes in the asset management performance reporting was held for MDT division heads. Currently, a Scorecard containing a materials management component can be generated through the ASE system. This component provides an inventory of MDT assets, including procurements, bus engine parts, contracts, etc. Information provided in the materials management component can be tweaked and utilized to match any additional MAP-21 requirements.

The Scorecard concept can be adopted by smaller transit agencies by developing a similar tool within the agency's means. Smaller transit agencies may not have substantial capital funding for purchasing performance measure software, such as the ASE system, but they can manually replicate the methodologies applied in the ASE system, or research other similar effective software programs. Manual replication of the ASE system may be initially time-intensive, but it is feasible. Smaller agencies, for example, can set up/program an Excel or Access document where the agency can easily populate data fields and calculate performance measures.

Jacksonville Transportation Authority

In 1955, the Jacksonville Expressway Authority was founded to build bridges and expressways in Duval County funded by toll revenues. A merger in 1971 of the original Expressway Authority and several private bus companies paved the way for the Jacksonville Transportation Authority (JTA), as it is known today.

The Jacksonville Transportation Authority provides high quality regional transit services and roadway infrastructure connecting Northeast Florida, providing public transit services to over 880,000 persons in Duval County and northern Clay County. The service area covers 432 of the 747 square miles in the City of Jacksonville. The City is one of the largest in terms of land area in the United States and is traversed by the longest river in the state of Florida (the St. Johns River) with seven bridges crossing it to provide linkages within Jacksonville. **Figure 33** illustrates the JTA downtown service area.

Performance Measure Setting

The majority of performance metrics utilized by JTA are required by the NTD, Florida Transportation Commission (FTC), FDOT or some other outside organization. The remaining performance metrics reported by JTA are reported to the Board of Directors or used internally by managers and analysts.

Figure 33. JTA Downtown System Map

Source: JTA

The JTA team is in the process of updating the organizations strategic plan and creating a comprehensive reporting system which will align with the Authority's Strategic Vision, Mission, Goals and Objectives. Recently, JTA revised their Five Year Plan which will be incorporated into the organization strategic plan, "Blueprint for Transportation Excellence," and will be published in the annual FTC "Transportation Authority Monitoring and Oversight Report." The Five Year Plan links the Authority's objectives to performance metrics and will be used to determine if goals and objectives are being achieved.

When selecting performance measures, JTA defines the goals and objectives of the organization which are specific, achievable, realistic, and time bound. Then measurable performance metrics are selected which help the team determine if these goals and objectives are being achieved.

JTA uses the following resources as references for selecting performance measures:

- The Performance Management Process.
- Systems for Transit Performance Analysis Using the National Transit Database.
- Armstrong's Handbook for Performance Management.
- The Certified Quality Engineer Handbook.

Performance measures are revised when the goals and objectives of the organization change, or when new technologies become available to collect data and may be more useful in measuring the objectives.

Data Collection and Reporting

JTA categorizes monthly key performance indicators (KPIs) by mode of transportation. The KPIs are categorized by the Organization's goals. The metrics listed in **Table 33**, are used by JTA to review service performance of the fixed route service. Operational measures are categorized by service, vehicle employee or effectiveness measures, totaling 21 measures for JTA's fixed route service. Nine financial measures are grouped into expenses and revenue, and efficiency.

JTA currently uses Sungard Fleet Management Software to track vehicle expenses. JTA will be moving to Oracle Enterprise Asset Management to track Maintenance Expenses in the near future. No manual calculation is required with this software. All maintenance expenses are recorded and reported using the software. JTA reports Maintenance Expenses annually to NTD.

Operating Expenses are recorded in JTA's current operating system, AS-400 software, through normal accounting processes, such as, payroll disbursements, General Ledger entries, Accounts Payable disbursements, Accounts Receivable receipts and billings, etc. Operating Expenses are recorded as various employees make entries in the accounting system. JTA reports Operating Expenses annually to NTD and FTC. Operating Expenses are also reported to the JTA Board of Directors monthly.

Table 33. Fixed Route - Selected Performance Review Measures

Operational Measures	Financial Measures
Service Service Area Population Service Area Population Density Passenger Trips Passenger Miles Average Passenger Trip Length Revenue Miles Revenue Hours Directional Route Miles **Vehicle** Vehicles Available in Maximum Service Vehicles Operated in Maximum Service Revenue Miles Per Vehicle in Maximum Service Average Age of Fleet (in years) Average Speed **Employee** Total Employee FTEs (full-time equivalents) Revenue Hours Per Employee FTE Passenger Trips Per Employee FTE **Effectiveness** Vehicle Miles Per Capita Passenger Trips per Capita Passenger Trips per Vehicles in Maximum Service Passenger Trips per Revenue Mile Passenger Trips per Revenue Hour	**Expenses and Revenue** Operating Expenses Maintenance Expenses Fare Revenue **Efficiency** Operating Expenses per Capita Operating Expenses per Passenger Trip Operating Expenses per Revenue Mile Operating Expenses per Revenue Hour Fare Revenue per Passenger Farebox Recovery Rate

Source: JTA Transit Development Plan.

Passenger miles are collected from tracking the number of passengers and the average trip length by route. Passenger counts are collected through the farebox report and average trip lengths are collected through the APC system. The Planning department reports Passenger Miles and the Performance Management Coordinator compiles the performance measures for the agency. Passenger Miles equals passenger counts multiplied by average trip length. JTA reports Passenger Miles by route monthly for internal use and annually to the NTD.

JTA collects Revenue Hours through HASTUS transit scheduling software. The Planning department reports Revenue Hours and the Performance Management Coordinator compiles the performance measures for the agency. Revenue Hours are calculated using HASTUS software. Revenue Hours equals the sum of scheduled hours for all trips, not including the dead-head time or the time it takes to go to/from the route line. JTA reports Revenue Hours by route monthly for internal use and annually to the NTD.

Revenue Miles are also collected using the HASTUS software. Revenue Miles equal the length of each trip multiplied by the number of trips. JTA reports Revenue Miles by route monthly for internal use and annually to the NTD.

Data for Route Miles is collected using GIS software. The Planning Department reports Route Miles and the Performance Management Coordinator compiles the performance measures for the agency. Route Miles are calculated per NTD standards. Route Miles equal the length of the route lines including both directions (inbound and outbound), removing any overlap. JTA reports Route Miles annually to the NTD.

JTA uses Oracle software to track the number of employees in the organization. There is a headcount report that is generated when the data is needed. JTA reports Total Employees annually to NTD and internally as needed.

To collect data for Vehicles Operated in Maximum Service (VOMS) for Fixed Route Service, JTA uses HASTUS scheduling software. The program tracks the number of buses out of the garage in service (have pulled out, but not back in). The software program updates the maximum number of vehicles in service each time the number changes. The "vehicles operated in annual maximum service" is the maximum number reported at any time of day.

Uses of Performance Measures

- Accountability

JTA uses several different measures to evaluate Customer Satisfaction, Service Effectiveness, and Service Efficiency. The Authority stated the most effective measure for Customer Satisfaction is "the Availability of seats on train/bus." The most effective measure for Service Effectiveness is "On-time Performance," and the most effective measure for Service Efficiency is "Farebox Recovery."

- Meet funding requirements

As a recipient of the FTA 5307 grant, JTA is required to report data to the NTD. As a recipient of federal and state block grants, JTA reports performance measures in their TDP and submit performance reports to the FTA including triennial review's Milestone Progress Report (MPR), respectively.

- Improve performance

Trends and Transit Service Implications analysis have been performed to identify issues, needs, opportunities, and trends that affect JTA. The analyses should also be considered when developing and expanding new and improved services in the future. The implications identified in this section should serve to guide the development of goals and objectives for JTA in the development and evaluation of services and capital program alternatives.

With the contributions of on-going JTA community outreach activities and TDP public outreach activities, JTA developed a long-term vision for its transit services. This long-term vision is the basis for JTA's 10-year implementation plan described in the TDP (November 2009). The TDP is currently undergoing a major update and is scheduled to be submitted to the FDOT in September 2014.

JTA's long term vision for transit service consists of an interconnected transit system with the following characteristics:

- Serves multimodal and neighborhood hubs, park and ride lots and transit stations;
- Includes high frequency transit (HFT) corridors featuring very frequent fixed route bus service; bus rapid transit (BRT) and light rail transit (LRT) routes to and from the downtown area, with dedicated lanes and special treatment given to transit vehicles at signalized intersections (signal priority);
- Features downtown streetcars, waterborne transportation along the St. Johns River, commuter rail; and
- Convenient bus service throughout JTA's service area.

The future Jacksonville Regional Transportation Center (JRTC), will be located in Downtown Jacksonville at the convergence of interstate highways and rail networks, will be a major multimodal and intermodal transportation hub, connecting JTA customers, with Intercity rail, Intercity bus and Regional Transit Services. The Center will also house the planning and operations offices of local, regional and state transportation agencies and is intended to serve as the information clearing house and management center for the Northeast Florida region. Currently, the information at the center is limited to JTA and Greyhound.

- Evaluate Progress in Meeting Goals

JTA recognizes that understanding the current and future customer needs is the key to providing multimodal transportation services successfully and fulfilling its responsibility as the public agency to the citizens of Duval County. The agency's public involvement activities are continuously conducted with this purpose in mind. Performance measures are useful in evaluating the progress of JTA in achieving the Mission and Vision of the agency. **Table 34** provides an excerpt of the Goals, Objectives, and Strategies undertaken by JTA in order to evaluate their progress.

Table 34. JTA's Goals and Objectives

Goal	Objectives	Measures
Excellence in Customer Service	Improve Overall Customer Satisfaction	Overall Customer Satisfaction with Fixed Route Services (CSS)
		Overall Customer Satisfaction with Connexion Services (CSS)
		System-wide Customer Complaint Ratio (Comments & Concerns/Ridership)
		Connexion Customer Complaint Ratio (Complaints/Ridership)
	Deliver high quality Fixed Route and Community Shuttle services by providing reliable and timely service	On-time Performance Fixed Route
		Frequency Fixed Route
		On-time Performance Community Shuttle
		Frequency Community Shuttle
	Deliver high quality Skyway services by maintaining a timely and reliable Skyway system	On-time Performance Skyway
		Schedule Availability Skyway
	Deliver high quality Connexion services by	On-time Performance Connexion
		Percent of Connexion No-shows

Goal	Objectives	Measures
	providing reliable and timely services	
	Ensure JTA buses, Skyway and facilities are comfortable and clean	Fixed Route Load Factor (Access to a seat)
		Community Shuttle Load Factor (Access to seat)
		Average Percentage of JTA Bus Fleet Cleaned Daily
		Bus Cleanliness (CSS)
		Bus Stop Cleanliness (CSS)
	Improve operator courtesy	Driver Courtesy (CSS)
	Provide responsive and clear communications to customers concerns and questions	Concern Resolution (CSS)
		Customer Service Call Center – Average Speed to Answer (Hold Time)
		Customer Service Call Center - Abandon Rate
		Connexion Call Center – Average Speed to Answer (Hold Time)
		Connexion Call Center – Abandon Rate

Goal	Objectives	Measures
Enhance Overall Effectiveness and Efficiency	Maximize transit service effectiveness	Fixed Route Ridership
		Average Fixed Route Weekday Ridership
		Fixed Route Farebox Recovery Ratio
		Fixed Route Customers per Revenue Hour
		Community Shuttle Ridership
		Average Community Shuttle Weekday Ridership
		Community Shuttle Customers per Revenue Hour
		Connexion Customers per Revenue Hour
		Skyway Ridership
		Average Weekday Skyway Ridership
		Skyway Customers per Revenue Hour
	Maximize transit service efficiency and minimize operational costs (to the extent possible without degrading service)	Fixed Route Operating Expense per Revenue Mile
		Fixed Route Operating Expense per Passenger Trip
		Community Shuttle Operating Expense per Revenue Mile
		Community Shuttle Operating Expense per Passenger Trip
		Connexion Operating Expenses per Revenue Mile
		Connexion Operating Expenses per Passenger Trip
		Skyway Operating Expense per Revenue Mile
		Skyway Operating Expense per Passenger Trip
	Deliver high quality projects on schedule and within budget	Percentage of Projects Completed on Schedule
		Percentage of Projects Completed within Budget
	Minimize transportation related environmental impacts	Emissions per Revenue Mile
	Maintain compliance with regulatory requirements	Critical Action Plans Implemented/Critical Action Plans Recommended
		Disadvantaged Business Enterprise (DBE) Percentage
Solidify Long-Term Financial Sustainability	Operate within budget	Actual versus Budgeted Revenue and Expenses Variance
	Increase income recovery from collected fares	Fixed Route Farebox Recovery Ratio
	Maximize transit financial efficiency	Operating Ratio
	Increase revenue from grant applications	Number of Discretionary Grants Awarded
		Number of Grants Lapsed
	Increase ancillary revenue	Ancillary Revenue

Goal	Objectives	Measures
Increase Mobility within our Community	Minimize travel time throughout our community	Fixed Route Average Frequency
		Fixed Route Average Trip Length
		Community Shuttle Average Frequency
		Community Shuttle Average Trip Length
		Connexion Late Pick-ups
	Improve accessibility to JTA transit services	Service Area Population Coverage as Percentage of Total Population
		Fixed Route Major Mechanical Failures
		Fixed Route Minor Mechanical Failures
		Community Shuttle Major Mechanical Failures
		Community Shuttle Minor Mechanical Failures
		Skyway Major Mechanical Failures
		Skyway Minor Mechanical Failures
		Connexion Major Mechanical Failures
		Connexion Minor Mechanical Failures
		Skyway Escalators and Elevators Percentage of Time Operational
	Develop regional partnerships	Completion of Transportal Website
Enhance Knowledge and Skills of Employees	Develop exceptional JTA employees	Percentage of Administrative Staff to Complete Mandatory Training
		Percentage of Union Staff to Complete Mandatory Training
		Percentage of Employee Satisfaction with Training Opportunities
	Retain exceptional JTA employees	Percentage of New Hire First Year Turnover

Goal	Objectives	Measures
Provide a Safe and Secure Environment	Eliminate transit fatalities	Number of Fatalities (as defined by NTD definition)
	Reduce transit injuries	Number of Injuries (as defined by NTD definition)
	Reduce transit related collisions	Fixed Route Preventable Collisions per 100,000 Miles
		Fixed Route Non-Preventable Collisions per 100,000 Miles
		Community Shuttle Preventable Collisions per 100,000 Miles
		Community Shuttle Non-Preventable Collisions per 100,000 Miles
		Connexion Preventable Collisions per 100,000 Miles
		Connexion Non-Preventable Collisions per 100,000 Miles
	Reduce transit related incidents	Fixed Route Preventable Incidents per 100,000 Miles
		Fixed Route Non-Preventable Incidents per 100,000 Miles
		Community Shuttle Preventable Incidents per 100,000 Miles
		Community Shuttle Non-Preventable Incidents per 100,000 Miles
		Connexion Preventable Incidents per 100,000 Miles
		Connexion Non-Preventable Incidents per 100,000 Miles
		Skyway Total Number of Incidents
	Reduce risk of injuries in workplace	Employee Work Days Lost to Injuries
		Number of Workers Compensation Claims
	Ensure customers feel safe while using JTA services	Driver Capability (CSS)
		Bus Stop Safety (CSS)
		Safety on Bus (CSS)
	Increase passenger security	Number of Crimes Committed Against Customer or Staff on Transit Property
	Strengthen our culture of safety	Number of Employees Successfully Completing a Safety or Security Class or Seminar

Source: BluePrint for Transportation Excellence – 5 Year Plan.

Performance Measure Constraints and Future Development

JTA is in the process of developing a performance management program that is aligned with the Vision, Mission, goals and objectives of the Authority and creating a tool that assists the Authority's management staff with the process of identifying whether key goals and objectives are being met. Thus far, the most challenging aspects are:

- Obtaining agreement on which KPIs should be used to measure objectives.
- Alignment of strategy development with budget and operational planning.

JTA wants to ensure their compliance with all State and Federal RequirementsAs more details regarding MAP-21 requirements are released, JTA will update the strategic plan accordingly.

The KPIs that satisfy the Map-21 Safety Goal requirement include tracking Fatalities, Injuries, Collisions and Incidents. JTA will coordinate with regional MPOs in achieving the system reliability goal, measured

by on-time performance for all modes of transportation and other state of good repair/asset management measures. The Environmental Sustainability goal will be considered by measuring Emissions per Revenue Mile. These metrics are included and linked to Authority goals and objectives in the Five Year Plan which is being submitted to FTC this year.

Lee County Transit

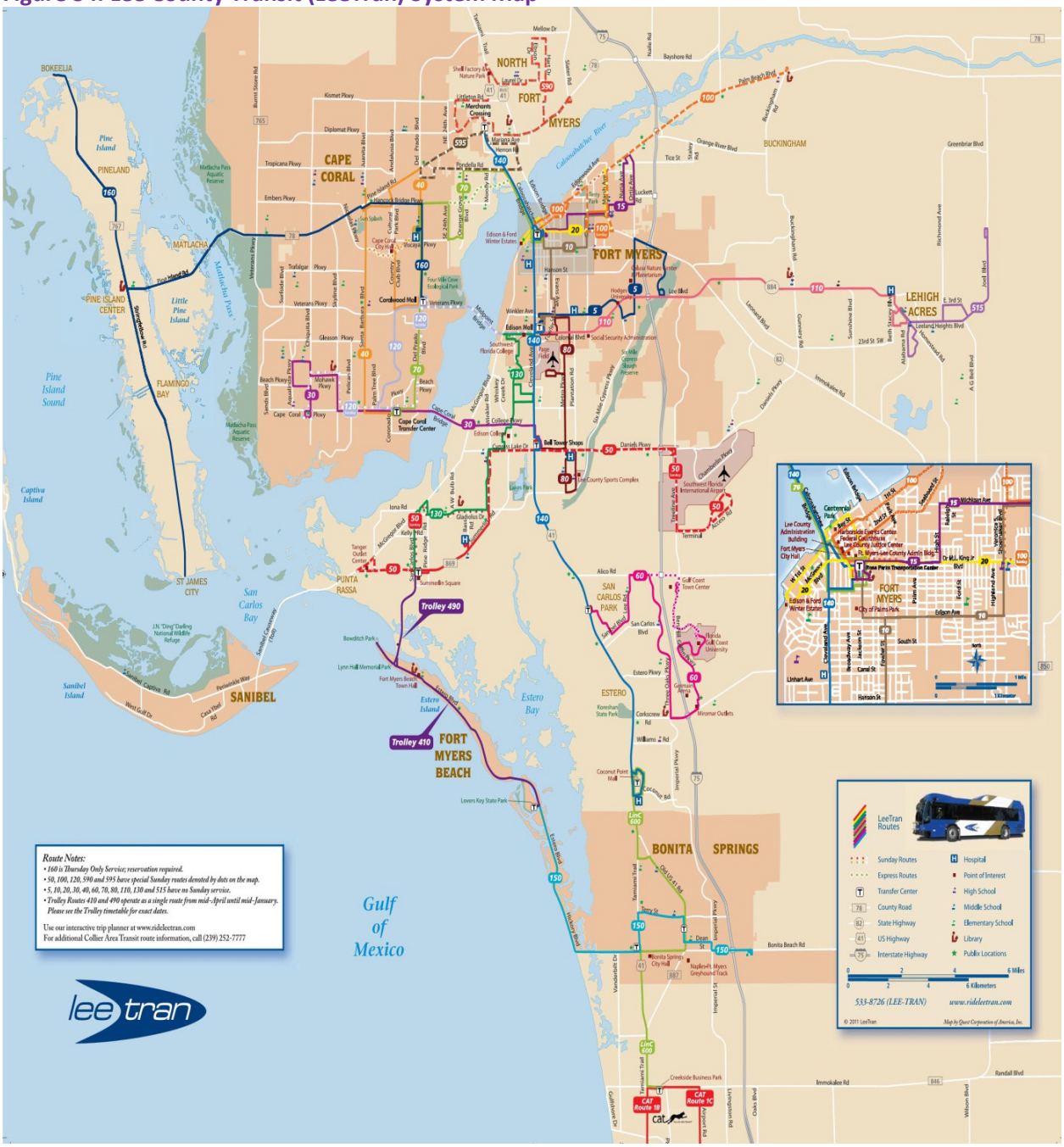
Transit service in Lee County was started in 1974 by a private operator running one route from Cape Coral to downtown Fort Myers. Lee County took over the transit service in 1977. Today Lee County Transit (LeeTran) provides over 4 million passenger trips on over 400 miles of roadway in Lee County, including North Fort Myers, Lehigh Acres, Pine Island, Estero and the municipalities of Fort Myers, Cape Coral, Fort Myers Beach, and Bonita Springs. The agency also has connecting service to Collier County. LeeTran employs approximately 240 persons to run its fleet of 50 buses, 10 trolleys, and 42 ADA vans. The agency has 30 hybrid-electric, full-sized vehicles. **Figure 34** illustrates LeeTran's System Map.

Performance Measure Setting

Goals and objectives are an integral part of any transportation plan because they provide the policy direction to achieve the community's vision. The goals and objectives adopted by LeeTran were prepared based on the review and assessment of existing conditions, feedback received during the public involvement process, and the review of local transportation planning documents. They are consistent with the goals and objectives found in the 2035 MPO Long Range Transportation Plan for Collier and Lee Counties and the Transportation Element of the Lee County Comprehensive Plan. Below are the goals adopted by LeeTran:

- Increase the Market Share for Transit
- Provide high Quality Service
- Build Meaningful Community Partnerships
- Ensure the Long-Term Viability and Stability of the Service

Figure 34. Lee County Transit (LeeTran) System Map



Source: LeeTran

LeeTran utilizes a performance monitoring program to track the performance and efficiency of the transit system. This tool is used to ensure the provision of the most efficient and effective transit service. It assists LeeTran in identifying routes in need of improvement or modification. The LeeTran monitoring program consists of a comparative analysis of route performance. The methodology utilizes specific route-level data and compares each route's performance with all other regular local service

routes. The following fixed route performance indicators and measures are monitored by LeeTran on a quarterly basis, as part of the recommended performance monitoring program:

- **Passenger Trips –** Annual number of passenger boarding on the transit vehicles.
- **Revenue Miles –** Number of annual miles of vehicle operation while in active service (available to pick up revenue passengers)
- **Revenue Hours –** Total hours of operation by revenue service in active revenue service.
- **Total (Fare) Revenue –** Revenue generated annually from carrying passengers in regularly scheduled service.
- **Operating Cost –** Reported total spending on operations, including administration, maintenance, and operation of service vehicles.
- **Passenger Trips per Revenue Mile –** The ratio of passenger trips to revenue miles of service. This is the key indicator of service effectiveness that is influenced by the levels of demand and the supply of service provided.
- **Passenger Trips per Revenue Hour –** The ratio of passenger trips to revenue hours of operation.
- **Revenue per Revenue Mile –** The ratio of fare revenue to revenue miles of operation.
- **Revenue per Revenue Hour –** The ratio of fare revenue to revenue hours of operation.
- **Operating Ratio (Fare Recovery) –** Ratio of fare revenues to total operating cost; an indicator of the share of total operating cost that is covered by total passenger fares.
- **Cost per Passenger Trip –** Operating cost divided by total annual ridership; a measure of the efficiency of transporting riders.

LeeTran uses an Evaluation Form created in Excel spreadsheets to calculate and evaluate the above listed performance measures.

Data Collection and Reporting

LeeTran collects data using different sources and technology as identified in **Table 35**. System failure data is collected from Transman Fleet Management (TMT) software, while ridership data is collected using automatic passenger counters (APC) for the number of boardings, and electronic fareboxes for passenger trips. The data is maintained by the agency's maintenance department and reported to the NTD by the planning department. This information is also used in the Annual Report for the agency and other internal reports.

Table 35. LeeTran's Data Collection Sources and Technology

Transit Data	MDT
Age of Fleet (yrs.)	Fleet Data
Farebox Revenue	Electronic fareboxes
Maintenance Expenses	Maintenance records
Number of accidents/ incidents/ collisions	Accident and incident records
Number of boardings	Automatic Passenger Counters (APC)
Number of system failures	Transman Fleet Management Software
Operating Expenses	Combination of various technology (excel and specialized finance software package)
Other Non-Fare Revenue	Combination of various technology(excel, QuickBooks, and specialized finance software package)
Passenger Miles	Survey

Passenger Trips	Electronic Fareboxes
Revenue Hours	Combination of various technology (excel)
Revenue Miles	Combination of various technology (excel and GIS)
Route Miles	Combination of various technology (excel and GIS)
Service Area Population	Combination of various technology (excel and GIS)
Total Employee	Employee Records
Vehicle Miles	Combination of various technology (excel and GIS)
Vehicles Available in Maximum Service	Fleet Data

Source: Best Practices in Transit Performance Measures Survey, March 2014.

The operating expenses of the agency are established annually based on a compilation of LeeTran expenses, which include costs such as personnel, fuel, operations, maintenance/repairs, etc. From the analysis of expenses, the cost of running a bus on an hourly basis is made, which is currently approximately $104/hour. Operating expenses are compiled by the finance department.

The Lee County MPO provides LeeTran with its Service Area Population based on the County's urbanized area maps. This data is collected from the U.S. Census population data and then a service area buffer is established with GIS to get population counts within the service area. Service Area Population is updated as needed. On-board surveys are also another way for LeeTran to collect data on ridership characteristics and perspectives. **Figure 35** is an example of an on-board transit survey question that gauges customer satisfaction.

Figure 35. Sample Question from LeeTran's On-Board Survey

23. How satisfied are you with each of the following? Circle a score for each characteristic.

Please indicate	Very Satisfied		Neutral		Very Unsatisfied
How often the buses run on this route	5	4	3	2	1
How courteous the Bus Operator was during your trip	5	4	3	2	1
How directly this route goes to your destination	5	4	3	2	1
The length of time your trip takes	5	4	3	2	1
How on-time this bus is running today	5	4	3	2	1
The number of times you have to transfer	5	4	3	2	1
How the shade or shelter was where you waited	5	4	3	2	1
How clean the buses and bus stops are	5	4	3	2	1
How easy it is to use bus schedule information	5	4	3	2	1
Safety on the bus and at bus stops	5	4	3	2	1
Your overall satisfaction with LeeTran	5	4	3	2	1

THANK YOU FOR COMPLETING THE SURVEY!

Source: Lee County Transit TDP, September 2011.

Uses of Performance Measures

- Accountability

LeeTran reviews performance measures monthly through Evaluation Forms. LeeTran follows a model ensuring proper data collection for evaluating transit service, such as revenue hours, revenue miles, vehicle hours and miles, etc. The planning department reviews the performance measures monthly to make sure that goals and objectives are met.

- Meet funding requirements

LeeTran is a recipient of the FTA 5307 grant and is required to report data to the National Transit Database (NTD). Since LeeTran completes monthly Evaluation Forms to review the performance of the transit system, LeeTran can easily gather data to report to NTD. Additionally, the Evaluation Forms generated can serve as supporting documents for auditors, showing the performance of routes and the entire system as monitored throughout the year.

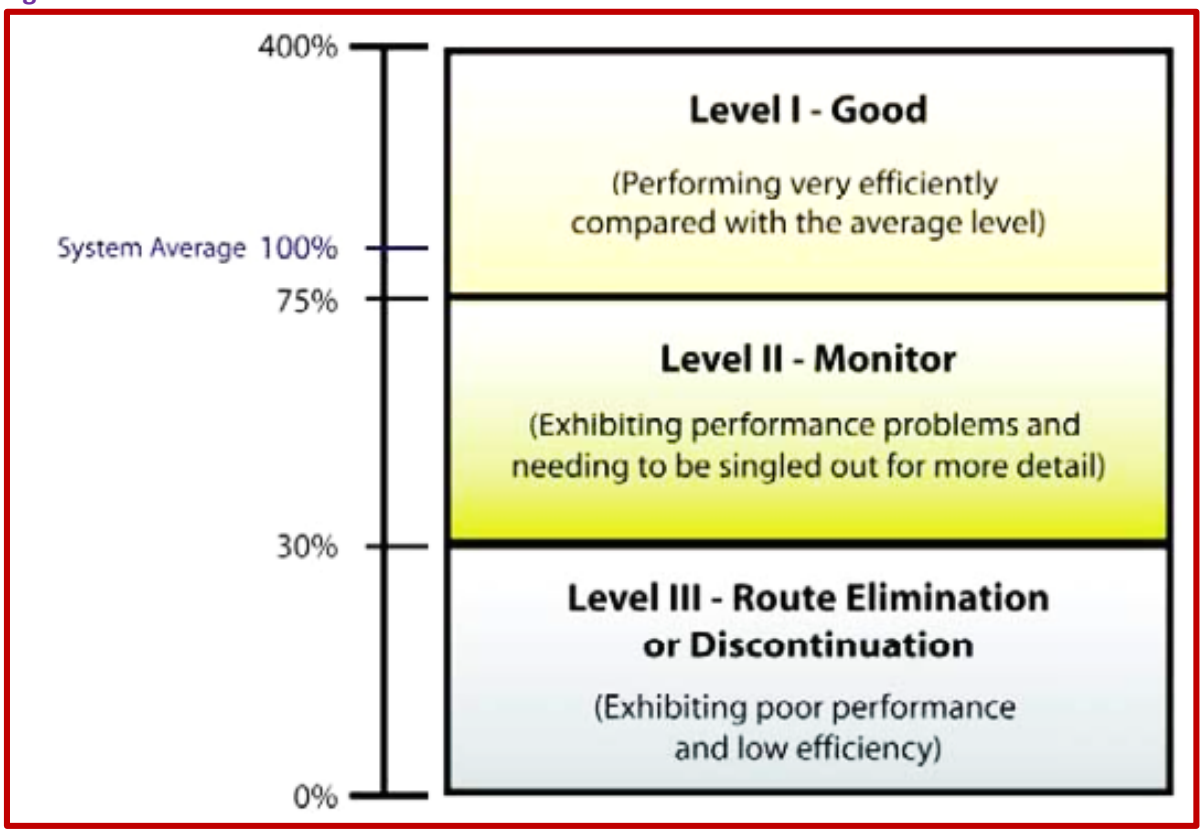
- Improve performance

A scoring evaluation process has been developed to present the specific route-level data for LeeTran's regular local service routes for a full fiscal year of operation. This process is based on six measures (trips per mile, trips per hour, revenue per mile, revenue per hour, operating ratio, and cost per trip) weighted equally to derive an overall route score. A route's score for a particular measure is based on a comparison of the measure as a percentage of the system average for that particular measure. These individual measure scores are added together and divided by six to get a final aggregate score. This final composite performance score is an indication of a route's performance for all six measures, when compared to the system average for those measures. A higher score represents better overall performance when compared to other routes.

The above comparative performance evaluation can be beneficial, but care should be taken when using the final scores and rankings because these figures are comparing routes to one another and may not reflect the specific goals established for a particular route (i.e.: geographic coverage vs. ridership performance). The process is particularly useful, however, in highlighting those routes that may have performance-related issues. These routes can then be singled out for closer observation in future years to determine specific changes that may help mitigate any performance issues.

The rankings are a useful proxy to determine the comparative performance of any route, as well as to highlight changes in performance over time. **Figure 36** illustrates the baseline for each route, with a score for the corresponding route over a subsequent analysis, which will be used for trend comparison purposes. In order to track the performance variation over time, three performance levels have been developed.

Figure 36. Evaluation Levels



Source: Lee County Transit TDP, September 2011.

Routes that operate at Level I, are performing efficiently compared with the average level of all agency routes. Routes operating at a Level II, may be candidates for minor operational changes. Prior to implementing any operational changes, LeeTran assess' factors affecting the operation of the route. Factors that are reviewed and assessed are:

- **Data Collection –** Verify that data is being reported correctly.
- **Seasonal fluctuations –** Compare changes in system performance with seasonal travel factors.
- **Operating conditions –** Determine whether any changes to the operating conditions of the route have affected its performance (i.e., new development, roadway improvements, etc.).
- **Survey bus operators –** Contact bus operators to gather insight on any on-road problems. This can be completed by initially speaking to shift supervisors.
- **Cost –** Determine whether there are any unique circumstances affecting the cost of providing the individual routes services. The performance monitoring program is designed to proportionally balance system-wide cost increases.
- **Ridecheck –** Conduct a ridecheck to determine potential bus stop eliminations, bus stop consolidations, and/or other minor route adjustments.
- **Marketing –** Increase marketing efforts along the route.

Routes that consistently fall in the Level II category and the score very low within the Level II scoring range (e.g. less than 40%), should be considered for the Level III decision process. Routes falling into the Level III performance category require a major modification.

LeeTran first conducts an operational assessment to determine what type of operational change should occur. Unlike the assessment tasks outlined for the Level II performance category, tasks for Level III consist of possible route improvements. Improvements to routes are only considered after an examination of the scores obtained for each of the performance monitoring program's scoring components (i.e., passenger trips per revenue mile, operating cost per passenger trip, etc.). Examination of those scores assists in determining what the potential cause(s) of the routes inefficiency is. In addition to the assessment tasks for Level II, the following options should be considered for routes falling into Level III:

- **Passenger Loading –** Determine whether any stops along the route need frequency improvements or that can be eliminated based on ridecheck data and on driver input.
- **Service area –** Assess whether the route can be realigned to serve nearby transit supportive areas. Transit supportive areas include commercial and retail development and areas with high residential densities.
- **Route truncation –** Assess the cost and ridership implications of reductions in route miles and/or revenue miles.
- **Frequency –** Evaluate the need for headway improvements in the peak hour or all-day.
- **Transfers –** Identify opportunities for increasing the productivity of the route by linking it to other existing routes.
- **Schedule adjustment –** Consider the need to adjust the route's service span.
- **Other Operational Improvements –** Other operational improvements, such as short-turning, route branching and through-routing should be considered as options for poorly performing routes.

Public notice must be given before implementing any changes to a route. LeeTran follows its established policy for notifying and implementing major route modifications.

- Evaluate Progress in Meeting Goals

Performance measures are useful in evaluating the progress of LeeTran in achieving the County's Vision for transit. **Table 36** lists an excerpt the Goals, Objectives, and Initiatives undertaken by LeeTran in order to evaluate their progress.

The Goal is the long-term end toward which programs or activities are ultimately directed. The Objective is the specific, measurable, intermediate end that is achievable and allows measurement of progress toward a goal. Finally, the Initiative is the course of action or way in which programs and activities are conducted to achieve an identified objective.

Table 36. LeeTran's Goals, Objectives, and Initiatives

Goal	Objective	Initiative
1. Increase the Market Share for Transit	1.1 Increase the number of one-way fixed-route passenger trips by an average of five percent annually, from 3 million in FY 2008/09 to 5 million in FY 2020/21	1.1 Continue to maintain existing LeeTran Service levels.
	1.2 Meet the fixed-route performance measures included in Objective 43.1 and Policy 43.3.1 in the Lee Comprehensive Plan, which states that the County will	1.2 Implement new and expanded services prioritized in the Lee MPO LRTP, the LeeTran TDP, and Vision Plan

Goal	Objective	Initiative
	maintain operating standards of 14 passengers per revenue vehicle hour, 1.3 passengers per revenue vehicle mile, and farebox revenues at a minimum of 20% of operating expenses.	
		1.3 Implement the performance monitoring program that addresses performance standards for fixed-route service.
		1.4 Develop a Marketing and Education Program by March 2012.
		1.5 Expand marketing and educational efforts to local universities and colleges.
		1.6 Explore opportunities for marketing hybrid vehicles and other environmentally-friendly transit technologies.
		1.7 Develop and distribute marketing materials that integrate the opinion and transit needs of community business leaders.

Goal	Objective	Initiative
2. Provide a High Quality Service	2.1 Develop/implement two high-quality premium transit lines, such as express or BRT service by 2021.	2.1 Continue to explore and pursue funding opportunities for implementing BRT services along high-density corridors in Lee County.
	2.2 Expend a minimum of $150,000 on ADA compliant bus shelters and transit infrastructure each year through 2021.	2.2 Expand opportunities for multi-modal travel, including express bus service, park-and-ride facilities, and improved bicycle and pedestrian access by implementing the TDP capital improvement plan.
	2.3 Convert 50% of the existing vehicle fleet to “green”, environmentally-friendly propulsion technologies by 2021.	2.3 Complete a park-and-ride study that integrates and supports MPO LRTP, TDP 10-Year, and Vision Plan premium transit services.
		2.4 Operate a fixed-route fleet of vehicles with an average age of less than seven and a half years.
		2.5 Complete an inventory, assessment, and prioritization of ADA compliant bus stop infrastructure and incorporate into a Passenger Amenities Program by December 2012.
		2.6 Continue to implement bus stop shelter prioritization program.
3. Build Meaningful Community Partnerships	3.1 Support and participate in local and regional economic development and transportation planning efforts.	3.1 Work with the Lee Transit Task Force to ensure long-term viability of public transportation options in Lee County.
	3.2 Conduct a minimum of 50 public outreach and community involvement events each year through 2021.	3.2 Coordinate with the County Planning Department, the Transportation Planning Department, the Sustainability Department, and other appropriate agencies/departments in developing transit-friendly land development regulations.
		3.3 Establish a Citizen Transit Advisory/Guidance Committee that meets regularly and provides feedback to LeeTran staff regarding every day, on-the-ground operational issues.
		3.4 Continue to coordinate with other transportation planning agencies in the county and region in regard to improving transportation system connectivity and implementation of premium transit services, including commuter rail service

Goal	Objective	Initiative
4. Ensure the Long-Term Viability and Stability of the Service	4.1 Maintain local support for the fixed-route bus service consistent with the financial plan in the 2012 TDP Update.	4.1 Submit grant applications/requests for funding available through federal, state, and local sources.
	4.2 Expand revenue base in order to fund TDP 10-Year and Vision Plan service enhancements.	4.2 Request financial support from municipalities in Lee County on an annual basis.
		4.3 Work with the Lee Transit Task Force to ensure long-term viability of public transportation options in Lee County.
		4.4 Establish service implementation guidelines that address the coordination of new service within incorporated areas of Lee County.

Source: Lee County Transit TDP, September 2011

Performance Measure Constraints and Future Development

LeeTran staff stated that they would like to focus on improving bus frequency, better vehicle mileage, and max load factor collection performance measures to improve future service efficiency. Since there is a funding shortage for transit service, LeeTran formed a Transit Task Force to look at ways to increase funding in order to initiate the above performance measures.

The Transit Task Force was broken up into two phases. The first phase the task force members addressed short-term budget and planning issues facing Lee County's public transit department. In Phase Two, the members will make recommendations on the future role and sustainability of funding for transit in Lee County. The Task Force is still on-going at this time.

LeeTran also collects the following performance measures to comply with the new MAP-21 requirements pertaining to safety and asset management/state of good repair:

- Customer Accidents
- Number of Accidents
- Number of Collisions
- Number of Fatalities
- Number of Incidents
- Number of Injuries
- Average Age of Fleet (in years)
- Mechanics per 1,000 revenue miles
- Missed trips due to operation failures
- Number of repeat breakdowns per month
- Number of repeat repairs per month
- Percent of stops with shelters and benches
- Revenue miles between roadcalls
- Revenue miles between incidents
- Total roadcalls

Council on Aging of St. Lucie, Inc.

The Council on Aging of St. Lucie, Inc. (COASL) operates the Treasure Coast Connector, a regional fixed-route system connecting St. Lucie and Martin Counties. The transit agency serves an area with 280,379 people. COASL has eight peak vehicles serving six routes. **Figure 37** illustrates COASL Treasure Coast Connector South Fort Pierce Business Transit Line Route.

Figure 37. COASL's Treasure Coast Connector South Fort Pierce Business Transit Line Route

Source: Treasure Coast Connector Plus

Performance Measure Setting

COASL aligns its performance measures to the goals established by the Local Coordinating Board (LCB). The most effective performance measures are those that can effectively track the progress of COASL in achieving the goals set by the Local Coordinating Board. In setting performance measures, the COASL Transit Director meets with the COASL president to discuss the purpose, definition and parameters of each performance measure, including how and which data to collect to capture each measure.

Data Collection and Reporting

COASL primarily uses NTD data to calculate measures used in monitoring and evaluating its overall operational and financial performance. Marianne Arbore, Transit Director of COASL, reported that collecting and recording basic transit data is crucial for smaller agencies as it is the basis of calculating performance measures used in the annual operating report for various recipients, including the Transportation Disadvantaged Commission. In particular, COASL emphasizes the collection of data that feeds into performance measures used in assessing the operational cost of running a system. These basic operational data includes the following:

- Number of passenger trips
- Times of service
- Vehicle miles per trip

COASL also tracks data for each fleet, manually logging key vehicle information such as fleet age and life expectancy in an Excel file. Farebox revenue is also calculated manually by tracking boarding passes that are purchased daily. COASL, however, is in the process of transitioning into an automated system and getting closer to the agency's goal of developing a formal route-level data monitoring and analysis program. In early April 2014, the agency received proposals for an automated system. The automated system will provide an easier and less time-intensive means to collect data for each individual stop and vehicles, making it manageable to track performance measures for each route and in identifying routes in need of improvement.

Uses of Performance Measures

- Accountability

COASL summarizes performance and outcome of operational activities in various reports and publications to make transparent where public money is spent. COASL also tracks a comprehensive list of measures used to evaluate customer satisfaction, ensuring the system provides quality service within the standards of the community. **Table 37** identifies the customer satisfaction measures tracked by COASL. Availability of schedule information by phone/mail and cost-effectiveness, affordability, and value are deemed as two measures that are most effective in evaluating customer satisfaction.

Table 37: COASL's Customer Satisfaction Measures)

Performance Measure	Tracked Measure	Most Effective
Accessibility of trains/buses to persons with disabilities	X	
Availability of handrails or grab bars on trains/buses		
Availability of monthly discount passes	X	
Availability of schedule information by phone/mail	X	X
Availability of schedules/maps at stations/stops		
Availability of seats on train/bus	X	
Availability of shelter and benches at stations/stops	X	
Cleanliness of interior, seats, windows	X	
Cleanliness of stations/stops	X	
Cleanliness of train/bus exterior	X	
Comfort of seats on train/bus	X	
Connecting bus service to stations/main bus stops	X	
Cost-effectiveness, affordability, and value	X	X
Displaying of customer service/complaint number	X	
Frequency of delays for breakdowns/emergencies	X	
Frequency of service on Saturdays/Sundays		

Performance Measure	Tracked Measure	Most Effective
Frequent service so that wait times are short	X	
Friendly, courteous, quick service from personnel	X	
Having station/stop near destination	X	
Having station/stop near my home	X	
Hours of service during weekdays	X	
Number of transfer points outside downtown		
Physical condition of stations/stops	X	
Physical condition of vehicles and infrastructure	X	
Reliable trains/buses that come on schedule	X	
Safe and competent drivers/conductors	X	
Safety from crime at stations/stops		
Safety from crime on trains/buses		
Short wait time for transfers	X	
Signs/information in Spanish as well as English	X	
Station/stop names visible from train/bus		
The train/bus traveling at a safe speed	X	
Trains/buses that are not overcrowded		
Other	X	

Source: Best Practices in Transit Performance Measures Survey, March 2014
X: measures that are tracked

- Meet funding requirements

COASL is also a recipient of the FTA 5307 grant and is required to report data to the National Transit Database (NTD). As mentioned earlier, COASL uses NTD data to calculate selected operational performance measures. To comply with funding requirements, COASL reports performance measures in the following publications:

  - Asset management report (monthly)
  - FTA Grant report (quarterly)
  - Local newspaper (annually)
  - State grant report (quarterly)

COASL manually monitors performance of each individual route, collecting and logging data for each vehicle in every route. Doing so allows the agency to find solutions to improve services in underperforming routes by first identifying bottlenecks encountered in these routes. For example, currently the LCB set an annual goal of increasing overall ridership by 10 percent. If the 10 percent goal is not reached, COASL will adjust the routes and conduct public hearing to better understand the community's transit needs. If the goal is still not achieved after all the efforts, then the route will be ceased and another route that better accommodates the needs of the community will be identified.

- Evaluate Progress in Meeting Goals

Performance measures are not only used by COASL to assess their performance in meeting the goals set by the LCB but also to evaluate the achievement of internally established goals. **Table 38** enumerates COASL's goals and objectives with corresponding performance measures from the 2010-2019 Regional Transit Development Plan for the Port St. Lucie Urbanized Area.

Operational and financial measures used by COASL in evaluating goals include the following:

– Percent increase in fixed route ridership
– Operating cost per passenger trip
– Fleet average age

Table 38: COASL Goals and Objectives with Corresponding Performance Measure

Goals and Objectives		Unit of Measure
Goal 1	**Develop an effective regional public transportation system that will move people throughout the region.**	
Objective 1.1	By December 2009, adopt an action plan that will provide guidance in regard to coordinated regional public transportation service delivery.	Action Plan adoption
Objective 1.2	Establish one system identity for public transportation services in the region consistent with the action plan for coordinated regional public transportation service delivery.	Establishment of system identity/branding
Objective 1.3	Develop a Communications and Marketing Program for public transportation services in the region consistent with the action plan for coordinated regional public transportation service delivery.	Completion of Communications and Marketing Plan
Objective 1.4	Conduct a fare policy study and transfer analysis for fixed-route services in support of the action plan for coordinated regional public transportation service delivery.	Completion of Fare Policy Study and Transfer Analysis
Objective 1.5	Develop and implement interconnecting regional transit routes consistent with the transfer centers and service areas identified in the regional TDP.	Number of regional transit routes implemented
Objective 1.6	Develop and implement regional transit routes that are effective in serving regional travel needs including travel to and from surrounding counties.	Number of regional transit routes implemented

Goals and Objectives		Unit of Measure
Goal 2	Increase the availability and use of public transportation services through mobility enhancements, expanded fixed route service, and more inter-country fixed bus routes.	
Objective 2.1	Increase the number of fixed-route passenger trips by 50% between FY 2010 and FY 2019.	Percent increase in fixed route rider
Objective 2.2	Increase the number of inter-county bus routes from one to three by 2019.	Number of inter-county bus routes
Objective 2.3	Add at least one vanpool to the commuter services program each year through the 2019 TDP planning horizon.	Number of new vanpools
Objective 2.4	By 2019, reduce demand for paratransit by 25 % as fixed route services are improved for customers to utilize.	Percent decrease in paratransit trips
Goal 3	Provide an efficient, high quality service that will meet the transportation needs of existing users and that will attract new users.	
Objective 3.1	Maintain an annual operating cost per passenger trip of less than $8.00 (the 2009 peer mean).	Operating cost per passenger trip
Objective 3.2	Develop a performance monitoring program that addresses performance standards for fixed route, paratransit, and commuter services by 2010.	Completion of Performance Monitoring Program
Objective 3.3	Operate a fleet of vehicles with an average age of less than seven years by 2015.	Fleet average age
Objective 3.4	Develop a Bus Stop Infrastructure Plan by 2012.	Completion of Bus Stop Infrastructure Plan
Goal 4	Build meaningful and cooperative partnerships between government, private, and community entities that provide transportation planning and services in the region.	
Objective 4.1	Employ transportation demand management strategies that advance the distribution and/or presentation of commuter services program and transit service benefits to the largest employers each year through the 2019 TDP planning horizon.	Number of presentations
Objective 4.2	Continue to conduct coordinated public outreach effort to potential and current transit system users each year through the planning horizon of the Regional TDP.	Number of public outreach efforts
Objective 4.3	Conduct activities that will support local jurisdictions adopt transit supportive comprehensive plan amendments.	Number of activities conducted
Objective 4.4	Continue to convene quarterly county, transit agency, and CTC coordination meetings.	Number of meetings
Goal 5	Ensure the long-term viability and stability of transit services throughout the region.	
Objective 5.1	Maintain local support for fixed route bus service consistent with the 2010-2019 TDP financial plan.	Amount of local revenue
Objective 5.2	Increase local support for fixed route transit services by 100% by 2019 to support increases in ridership.	Increase in local revenue
Objective 5.3	Conduct activities that will support local jurisdictions adopt transit supportive comprehensive plan amendments.	Number of activities conducted
Objective 5.4	By December 2009, adopt an action plan that will provide guidance in regard to coordinated regional public transportation service delivery.	Action Plan adoption

Source: Regional Transit Development Plan for the Port St. Lucie Urbanized Area 2010-2019, p. 5-5

Performance Measure Constraints and Future Development

Currently, COASL conducts data collection and performance analysis manually, which is time-intensive and allows for more frequent errors for data input. COASL recognizes this issue and is now ready to upgrade into a more efficient, automated system. Despite the lack of existing automated system, COASL has done a tremendous job in tracking and monitoring measures used in evaluating the status of vehicles, routes, and the entire system. The agency does not only collect transit data and report performance measures because they are required to do so. COASL does it because performance measures guide them in determining if the current system is working based on their internal specifications in addition to the standards set by funding sources.

COASL is prepared and working towards compliance with the new MAP-21 rule pertaining to safety and asset management/ state of good repair. The agency puts together a solid safety plan and also maintains a comprehensive record for each vehicle for asset management, practices which are crucial in continuing the agency's efficient daily operations. The safety plan and extensive asset inventory provide COASL the necessary components for meeting MAP-21 requirements.

COASL currently collects data and monitors the safety and asset management/state of good repair performance measures shown in **Table 39**. The number of accidents and incidents are identified as the most effective measure of safety and security, while average age of fleet and maintenance labor cost per vehicle are identified as most effective in assessing the state of good repair of assets and vehicles.

Table 39: COASL Safety and Asset Management/ State of Good Repair Measures

Criteria	Performance Measure	Currently Monitors	Most Effective
Safety and security	Accidents per 100,000 Revenue Miles	x	
	Collisions per 100,000 revenue miles	x	
	Crimes per 1,000 passengers	x	
	Customer accidents	x	
	Fatal accidents per passenger miles traveled	x	
	Fatal accidents per vehicle miles traveled	x	
	Injury accidents per passenger miles traveled	x	
	Injury accidents per vehicle miles traveled	x	
	Number of accidents	x	x
	Number of collisions	x	
	Number of fatalities	x	
	Number of incidents	x	x
	Number of injuries	x	
	Number of safety-related complaints	x	
	Number of safety-related improvements	x	
	Property-damage-only accidents per vehicle miles traveled	x	
	Property-damage-only per passenger miles traveled	x	
	Revenue Miles (Distance) Between Incidents	x	

Criteria	Performance Measure	Currently Monitors	Most Effective
Asset Management/ State of Good Repair	Average Age of Fleet (in years)	x	x
	Loading area capacity	x	
	Maintenance labor cost per mile		
	Maintenance labor cost per vehicle	x	x
	Mechanics per 1,000 revenue miles		
	Missed trips due to operation failures		
	Number of repeat breakdowns per month	x	
	Number of repeat repairs per month	x	
	Number of system failures	x	
	Percent of stops with shelters and benches	x	
	Revenue miles between roadcalls	x	
	Revenue miles between incidents		
	Total roadcalls	x	

Source: Best Practices in Transit Performance Measures Survey, March 2014

Summary of Case Studies

Below is a general summary of notable practices from Florida transit agencies considered for the case studies:

- Transit agencies provide linkage of performance measures to goals and objectives that are consistent with county and local strategic transportation plans.
- Large and medium-sized agencies use technological software to facilitate an organized and simple data collection process. Although small transit agencies like COASL do not have the technology in place as MDT, JTA, and LeeTran has, they still efficiently collect data that feeds into performance measures by focusing on basic data needed to calculate key measures for service performance.
- Transit agencies have a designated office or staff that consolidate collected data and report performance measures from each agency division (safety, maintenance, finance, and so on). For example, MDT's Office of Performance Management deals with the compilation and review of performance reports from different divisions. Similarly, JTA' s Performance Management Coordinator deals with the performance measure program of JTA, from coordinating measures from various departments to the incorporation of performance analyses in planning.
- The use of performance measures and standards is tailored by mode (rail, bus, etc.) and service level (route vs. system).
- Transit agencies report performance measures primarily to comply with statutory and funding requirements. Nevertheless, they also use performance measures to promote transparency of transit operations, establish service standards to evaluate goals, and identify underperforming routes or service matters lagging and needing improvement.
- Transit agencies are currently collecting data and reporting measures related to safety and asset management used to comply with MAP-21 changes. The transit agency representative for the case studies were all confident their agency could quickly adopt to the MAP-21 performance reporting changes once the final ruling comes out.

- Large transit agencies do not necessarily use more performance measures than medium-sized and small transit agencies, as **Table 40** illustrates. The focus is not on the quantity of performance measures, but rather on the usefulness of each performance measure in evaluating agency goals and objectives and in the availability of data resources to measure the outputs and outcomes.

Table 40: Number of Performance Measures Used by Florida Case Study Agencies

Statistic	Transit Agency Name			
	MDT	JTA	LeeTran	St. Lucie
Number of Measures Used	17	32	25	32
2012 Passenger Trips	106,215,326	12,318,052	3,793,542	152,561
2012 Service Area Population	1,496,435	838,815	459,381	280,379
Peak Vehicles	1,022	145	57	8

Source: 2013 Florida Transit Handbook, March 2014 Best Practices in Transit Performance Measures Survey, Transit Development Plans of MDT, JTA, LeeTran, and COASL.

Recommendations

In conclusion, Florida agencies use a variety of performance measures to track, evaluate, and monitor achievement of their goals and objectives. In order to help transit agencies choose, calculate, and report performance measures effectively, a toolbox was developed based on the findings from *Chapter Two: Literature Review*, and the results discussed within *Chapter Three: Practices and Performance Measures Used by Florida Transit Agencies*. Recommended components of best practices toolbox are as follows:

- Sample Goals

Sample goals based on the goals identified by Florida transit agencies in their respective Transit Development Plans (TDPs). Each agency adopts their own set of goals that guides their policies, initiatives, and funding prioritization. However, their goals often have the same underlying theme, which makes it easier to incorporate several actual goals into one sample goal.

- Functional Areas

Goals identified by Florida transit agencies in their TDPs can be categorized into five functional areas. These functional areas are based on the FSV categories which are:

- **Service Effectiveness**: ability to meet the demand for transit services given existing resources (TCRP 88)
- **Service Efficiency**: ability to provide service outputs such as passenger trips within the constraints of service inputs such as revenue hours and revenue miles (TCRP 88)
- **Labor Utilization**: how well agency resources are used, specifically human resources (TCRP 88)
- **Vehicle Utilization and Asset Management**: ability to maintain physical conditions of vehicles and other agency assets in a state of good repair (FTA)
- **Safety and Security**: ability to provide the highest practical level of safety and security for all modes of transit to protect passengers, employees , revenues and property (FTA)

- Performance Measures

Selection of measures based on:

- An inventory of performance measures used by Florida transit agencies/the most frequently used performance measures Survey of Florida transit agencies/the most frequently used and most effective performance measures identified by respondents
- Nationally recommended transit performance measures from *Chapter Two: Literature Review*

- Data Collection

Data elements needed to calculate each measure provided, including any applicable formulas. Potential data sources and data collection technology also identified.

- Purpose of Measure

Explains what each measure captures and how each measure can be useful in tracking the achievement of the sample goal. The purpose of measure is related to both the sample goals and the functional areas.

- Ease of Data Collection by Transit Agency Size

The measures included in the toolbox require data not difficult to collect or are already being reported to NTD. Ease of data collection will give transit agencies an at-a-glance summary of how difficult a measure may be to collect based on size.

Small transit agencies often do not have expansive access to data collection resources and technology as compared to mid-sized and large transit agencies so they are expected to experience more difficulty in collecting some data that is used in calculating the performance measures. Not intended to consider the accuracy of data collection using a particular source or technology.

See **Attachment D and E** for acronyms and measures/data elements definitions, respectively.

JULY 2014

TRANSIT PERFORMANCE MEASURE TOOLBOX

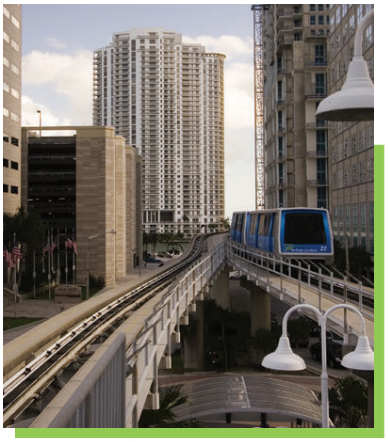
EXECUTIVE SUMMARY

FOR URBAN FIXED ROUTE SYSTEMS

Florida Department of Transportation, Freight Logistics and Passenger Operations, Transit Office

INTRODUCTION

To assist Florida transit agencies in improving performance evaluation, the Florida Department of Transportation, Public Transit Office researched best practices for urban fixed route systems in evaluating transit performance in the United States and made recommendations as to how these practices can be adopted and implemented by Florida transit agencies. This study identifies the most common effective performance measures and data sources so that agencies can pick and choose the most appropriate metrics for their agencies.



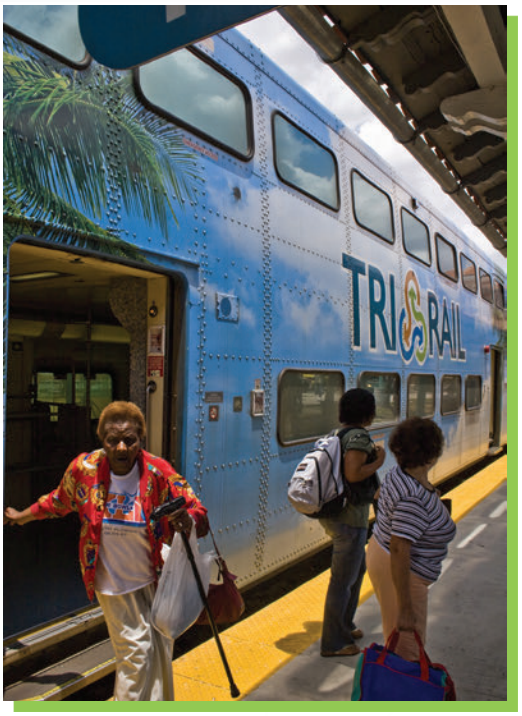
The implementation of the results-driven Moving Ahead for Progress in the 21st Century Act (MAP-21) accentuates the importance of evaluating transit performance and in ensuring that transit agencies remain accountable in the use and application of federal, state, and local funds. However, there is no uniformity in conducting transit performance evaluation among transit agencies. Each agency, depending on their capabilities and needs, adopt different methodologies in the collection, measurement, analysis, and assessment of transit performance data. Additionally, there is little information collected on the performance evaluation methodologies utilized by each Florida transit agency. This limits the ability to learn from the methodologies applied by other Florida agencies with similar characteristics, curbing the efficiency in conducting internal transit evaluations.

It is the Quality of the measure, not the Quantity

For the full study, please visit http://www.dot.state.fl.us/transit/.

WHY IS THIS TOOLBOX USEFUL FOR YOUR TRANSIT AGENCY?

The performance measure toolbox presents candidate performance measures that Florida transit agencies can utilize in tracking the progress of achieving their goals. These measures were recommended based on a review of selected national and state performance management systems and national studies, and represent best practices in evaluating transit performance.



For simplicity, performance measures are grouped into the following categories:

- Service effectiveness
- Service efficiency
- Labor utilization
- Safety and security, and
- Vehicle utilization, asset management, and state of good repair

The last two categories include suggested performance measures to meet new MAP-21 requirements.

In addition, the toolbox includes sample goals that can be incorporated into the Transit Development Plan (TDP) process.

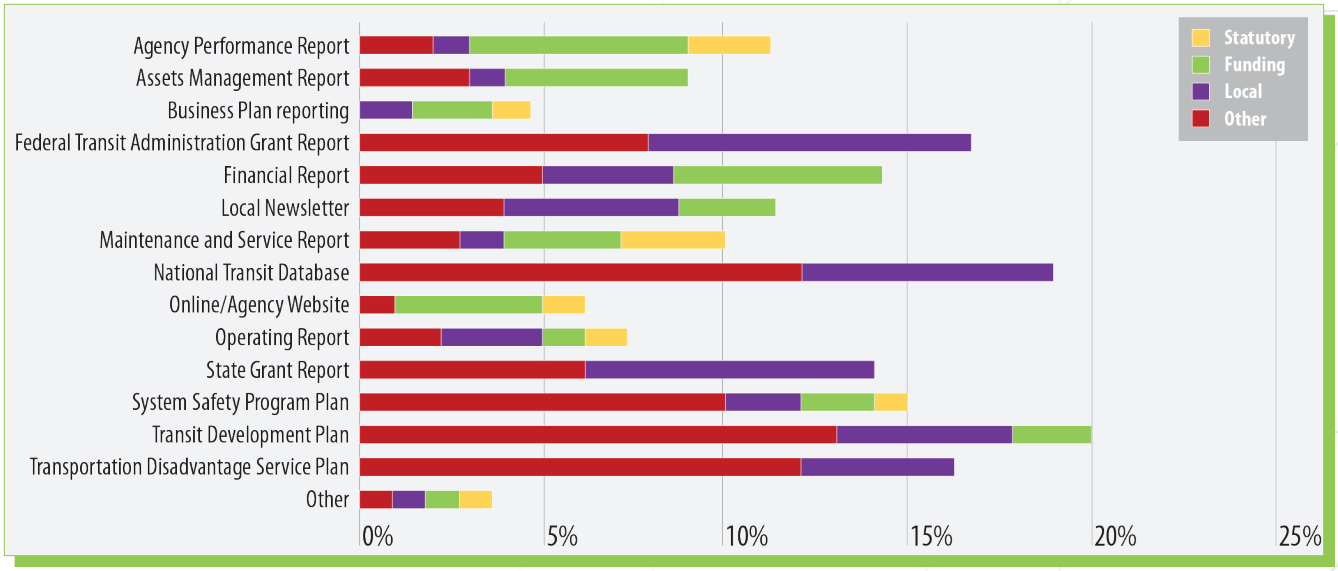
COMMON REPORTS

A transit agency survey was conducted for the study which focused on four areas: performance reporting, performance indicators and measures, performance measure change with MAP-21, and transit data collection methodology. Survey questions aimed to gather information regarding Florida transit agencies' performance reporting process – where they report performance measures, reasons for reporting, how frequently they update each report, the recipient of the report, and who prepares the report. 29 urban fixed route agencies were surveyed. Of the 16 transit agencies that completed the surveys, all stated that they do report performance measures. Survey results showed the top six reports and publications used by Florida transit agencies are:

- National Transit Database,
- Transit Development Plan,
- Transportation Disadvantaged Service Plan,
- Federal Transit Administration Grant Report, and
- System Safety Program Plan,
- Agency Performance Report

Florida transit agencies report performance measures in various publications primarily for statutory, funding, and policy-making reasons. Florida transit agencies responded that most reporting is conducted annually, with monthly reporting closely behind. There were no agencies reporting weekly or biweekly data. The recipient for these publications ranges from the agency's policy board to federal agencies.

Reasons for Reporting Performance Measures



Primary Report Recipients

Primary Report Recipients	Reports and Publications
FTA	National Transit Database FTA Grant Report
FDOT	State grant report System Safety Program Plan Transit Development Plan Transportation Disadvantaged Service Plan
Public	Local newspaper and Online/ agency website
Internal Use	Asset Management Report Financial Report Maintenance and Service Report Operating Report
Local Government	Agency Performance Report Business Plan Reporting Other

CASE STUDY 1: MIAMI DADE TRANSIT (MDT)

Miami Dade Transit (MDT) is the 17th largest public transit system in the nation and the largest in Florida. MDT operates a total of 997 vehicles daily via three modes: bus (Metrobus), heavy rail (Metrorail), and monorail (Metromover).

In 2005, Miami Dade County adopted the Active Strategy Enterprise (ASE) online performance management system, which allows government departments across the county to align their activities to the County Strategic Plan. The ASE system allows the county's Office of Performance Management (OPM) to efficiently communicate the progress and outcomes of publicly funded countywide initiatives.

Through the ASE system, each department can generate a Scorecard that matches goals and objectives to specific performance measures, effectively tracking performance over time and conducting performance appraisals. The Scorecard is also used to feed into each department's quarterly business plan. MDT is already prepared to comply with the new MAP-21 requirements pertaining to safety and asset management/state of good repair performance measures.

Example Route-Level On-Time Performance Scorecard

	Name	Period	Actual	Target	Variance
▼	Online Performance Schedule Adherence- Bus (3)	March '14	76.34%	78.00%	-1.66%
▲	Online Performance Schedule Adherence- Bus (9)	March '14	78.73%	78.00%	1.26%

CASE STUDY 2: JACKSONVILLE TRANSPORTATION AUTHORITY (JTA)

The Jacksonville Transportation Authority provides high quality regional transit services and roadway infrastructure connecting Northeast Florida, providing public transit service to a population of over 880,000 in Duval County and northern Clay County. The JTA team is in the process of updating the organizations strategic plan and creating a comprehensive reporting system which is aligned with the Authority's Strategic Vision, Mission, goals and objectives.

JTA uses a variety of measures to review service performance of the fixed route service. Operational measures are categorized by service, vehicle employee or effectiveness measures, and financial measures are grouped into expenses and revenue, and efficiency. The Authority has stated that the most effective measure for Customer Satisfaction is "the Availability of seats on train/bus". The most effective measure for Service Effectiveness is "On-time Performance" and the most effective measure for Service Efficiency is "Farebox Recovery".

Trends and Transit Service Implications analysis have been performed to identify issues, needs, opportunities and trends that are now affecting JTA. Performance measures are also useful in evaluating the progress of JTA in achieving the Mission and Vision of the agency. JTA has incorporated goals and objectives that satisfy the MAP-21 requirements currently identified on the Federal Highway website.

CASE STUDY 3: LEE COUNTY TRANSIT (LEETRAN)

Lee County Transit (LeeTran) serves over 4 million riders annually on over 400 miles of roadway in Lee County, and employs approximately 240 persons to run its fleet of 50 buses; 10 trolleys; and 42 Americans with Disabilities Act (ADA) compliant vans. The agency goals and objectives adopted by LeeTran were prepared based on the review and assessment of existing conditions, feedback received during the public involvement process, and the review of local transportation planning documents. They are consistent with the goals and objectives found in the 2035 MPO Long Range Transportation Plan for Collier and Lee Counties and the Transportation Element of the Lee County Comprehensive Plan.

LeeTran utilizes a performance monitoring program to track the efficiency of the transit system. The monitoring program utilizes specific route-level data and compares each route's performance with all other regular local service routes. LeeTran uses an Evaluation Form created in excel spreadsheets to calculate and evaluate performance measures.

LeeTran collects data using different sources, such as Transman Fleet Management (TMT) software to collect data on the number of system failures. LeeTran collects a variety of performance measures to comply with the new MAP-21 requirements pertaining to safety and asset management/state of good repair.

Safety and Asset Management/State of Good Repair Performance Measures
Customer Accidents
Number of Accidents
Number of Collisions
Number of Fatalities
Number of Incidents
Number of Injuries
Average Age of Fleet (in years)
Mechanics per 1,000 revenue miles
Missed trips due to operation failures
Number of repeat breakdowns per month
Number of repeat repairs per month
Percent of stops with shelters and benches
Revenue miles between roadcalls
Revenue miles between incidents
Total roadcalls

CASE STUDY 4: COUNCIL ON AGING OF ST. LUCIE (COASL)

Uses of Performance Measures
Accountability
Meet funding requirements
Improve performance
Evaluate progress in meeting goals

The Council on Aging of St. Lucie, Inc. (COASL) operates the Treasure Coast Connector, a regional fixed route system connecting St. Lucie and Martin Counties.

COASL aligns performance measures to the agency goals established by the local Coordinating Board. They define the most effective performance measures as those that can effectively track the progress of COASL in achieving the goals. COASL primarily uses the National Transit Database (NTD) data to calculate measures used in monitoring and evaluating its overall operational and financial performance. In particular, COASL emphasizes performance measures used in assessing the operating cost of running a system.

COASL tracks data for its fleet, manually logging key vehicle information, such as fleet age and life expectancy. Farebox revenue is also calculated manually by tracking boarding passes that are purchased daily and cash fares. Despite the lack of an automated system, COASL has done a tremendous job in tracking and monitoring measures used in evaluating the status of vehicles, routes, and the entire system. In April 2014, the agency received proposals for an automated system to track farebox revenue and vehicles.

A previously completed safety plan and extensive asset inventory will provide COASL the necessary components for meeting new MAP-21 requirements pertaining to safety and asset management/state of good repair.

PERFORMANCE MEASURE (PM) CATEGORY- LABOR UTILIZATION

The performance measure toolbox presents candidate performance measures that Florida transit agencies can utilize in tracking the progress of achieving their goals. The performance measures were selected based on the following:

- The most frequently used and most effective performance measures identified in a national literature review
- The most frequently used and most effective performance measures identified in the survey of Florida transit agencies
- Potenial performance measures for MAP-21 reporting

Sample Goals	Criteria	Measure	Data Data Elements Needed
Support economic vitality	Labor Utilization	Payroll per capita	Payroll
			Service area population
Increase labor utilization		Passenger trips per FTE employee	Passenger trips
			Total number of Full time employees
		Revenue hours per FTE employee	Revenue hours
			Total number of Full time employees
		Vehicle miles per employee FTE	Vehicle miles
			Total number of Full time employees

The sample goals in the toolbox are based on the goals identified by Florida transit agencies in their Transit Development Plans (TDPs). Each agency adopts their own set of goals that guides their policies, initiatives, and funding prioritization. These goals represent the underlying themes common among most agencies.

Collection Possible Data Source/ Technology	Formula	Purpose of Measure	Ease of Data Collection by Size of Agency		
In house documents, including financial data U.S. Census, other secondary sources	Total payroll/ Total FTE employees	Measures labor utilization in relations to the number of riders			
Electronic farebox, Smartcards, Manual counting In house documents, including financial data and employee records	Passenger trips/ Total FTE employees	Measures labor utilization in relations to the number of riders			
Schedule data, CAD, AVL In house documents, including financial data and employee records	Revenue hours/ Total FTE employees	Measures labor utilization in relations to the hours of service provided			
Fleet data, Operation logs, Schedule data, Manual counting In house documents, including financial data and employee records	Vehicle miles/ Total FTE employees	Measures labor utilization in relations to the distance of services covered			

The Formula column shows how to use the data elements to calculate each performance measure.

The Purpose of Measure column explains what each measure captures and how each measure can be useful in tracking the achievement of the sample goal.

The Ease of Data Collection is based on the availability of sources and technology that facilitate a faster, more accurate, and more efficient data collection process. It is divided into categories representing the sizes of transit agencies to capture the different access to resources and technology.

Each color denotes the difficulty of collecting data that feeds into each performance measure: red = challenging, yellow = fair, green = easy.

PM CATEGORY- SERVICE EFFICIENCY

Sample Goals	Criteria	Measure	Data Data Elements Needed
Increase service while enhancing fiscal stability	Service Efficiency	Revenue miles per square mile	Revenue miles
			Service area size
Ensure the long-term viability and stability of the service		Farebox recovery ratio	Fare revenue
			Total operating expenses
		Operating expense per capita	Total Operating expenses (Operating budget)
			Service area population
		Operating expense per passenger mile	Total operating expenses
			Passenger miles
		Operating expense per passenger trip	Total operating expenses
			Passenger trips
		Operating expense per revenue hour	Total operating expenses
			Revenue hours
		Operating expense per revenue mile	Total operating expenses
			Revenue miles
Preserve environment and promote energy conservation		Energy consumption per vehicle mile	Consumption of electricity (for electric or hybrid electric vehicles)
			Vehicle miles
		Tons of emission per 100,000 vehicle miles	Emission factor
			Vehicle miles
		Vehicle miles per gallon	Vehicle miles
			Fuel consumption

Collection Possible Data Source/ Technology	Formula	Purpose of Measure	Ease of Data Collection by Size of Agency		
Schedule data, CAD, AVL U.S. Census, other secondary sources	Revenue miles/ Service area size	Coverage of revenue service			
Electronic farebox, Smartcards, Manual counting In-house documents, including financial data, operations logs, schedule data, etc.	Fare revenue/ total operating expenses	Percentage of direct operating costs that are recovered through the fares paid by the riders			
In-house documents, including financial data, operations logs, schedule data, etc. U.S. Census, other secondary sources	Operating expense/ Service area population	Resource commitment to transit by the community			
In-house documents, including financial data, operations logs, schedule data, etc. Survey, APC	Operating expense/ Passenger miles	Impact of trip length on performance			
In-house documents, including financial data, operations logs, schedule data, etc. Electronic farebox, APC, manual counting	Operating expense/ Passenger trips	Efficiency of transporting riders, both on how service is delivered and the market demands for the service			
In-house documents, including financial data, operations logs, schedule data, etc. Schedule data, CAD, AVL	Operating expense/ Revenue hours	Efficiency of transporting riders, factoring vehicle speed			
In-house documents, including financial data, operations logs, schedule data, etc. Schedule data, CAD, AVL	Operating expense/ Revenue miles	How efficiently service is delivered			
In-house documents, including financial data, operations logs, schedule data, etc. Fleet data, operation logs, schedule data, manual counting	Energy consumption/ vehicle miles	Efficiency of alternative fuel use, but units (BTUs) are not intuitive			
Vehicle specification, default emission factos by vehicle type based on vehicle technology Fleet data, Operation logs, Schedule data, Manual counting	Fuel consumed x emission factor/1,000,000)/ vehicle miles For CO2: (Fuel consumed x emission factor/1,000)/ vehicle miles)	Vehicle efficiency, particularly relating to its environmental impact			
Fleet data, operation logs, schedule data, manual counting In-house documents, including operation logs and maintenance logs	Vehicle miles/ Total fuel consumption (in gallons)	Fuel efficiency, only applies to diesel- and gasoline-powered vehicles. Ratio between fuel consumed and distance traveled			

PM CATEGORY- SERVICE EFFECTIVENESS

Sample Goals	Criteria	Measure	Data Data Elements Needed
Improve quality of service and customer satisfaction	Service Effectiveness	Average headway (in minutes)	Directional route miles
			Revenue miles
			Revenue hours
			Vehicles operated in maximum service
		Average trip length	Passenger miles
			Passenger trips
		On-time performance	On-time samplings
			Total samplings
		Revenue miles per revenue hour	Revenue miles
			Revenue hours
Increase market share of transit		Passenger trips per capita	Passenger trips
			Service area population
		Passenger trips revenue hour	Passenger trips
			Revenue hours
		Passenger trips per revenue mile	Passenger trips
			Revenue miles
		Passenger trips per VOMS	Passenger trips
			Vehicles operated in maximum service
		Vehicle miles per capita	Vehicle miles
			Service area population

Collection Possible Data Source/ Tech	Formula	Purpose of Measure	Ease of Data Collection by Size of Agency		
Schedule data, CAD, AVL	[(Directional route miles/ (Revenue miles/ Revenue hours))/ (Vehicles operated in maximum service)] *60	Temporal access- how frequently transit service is provided			
Schedule data, CAD, AVL					
Schedule data, CAD, AVL					
Schedule data, fleet data, CAD, AVL					
Survey, APC	Passenger miles/ Passenger trips	Service mobility			
Electronic farebox, APC, manual counting					
Survey, CAD, AVL	On-time samplings/ Total samplings	Reliability of service			
Survey, CAD, AVL					
Schedule data, CAD, AVL	Revenue miles/ Revenue hours	Service mobility, average system speed			
Schedule data, CAD, AVL					
Electronic farebox, APC, manual counting	Transit boardings/ Service area population	Transit utilization within the service area			
U.S. Census, other secondary sources					
Electronic farebox, APC, manual counting	Transit boardings / Revenue hours	Resource consumed in providing service			
Schedule data, CAD, AVL					
Electronic farebox, APC, manual counting	Transit boardings / Revenue miles	Supply of revenue service provided based on the level of demand			
Schedule data, CAD, AVL					
Electronic farebox, APC, manual counting	Transit boardings / Annual vehicles operated in maximum service	Supply of service provided based on the level of demand during peak hours			
Schedule data, fleet data, CAD, AVL					
Fleet data, Operation logs, Schedule data, manual counting	Vehicle miles/ Service area population	Supply of service provided based on the demand within the service area			
U.S. Census, other secondary sources					

PM CATEGORY- SAFETY AND SECURITY

Sample Goals	Criteria	Measure	Data Data Elements Needed
Improve safety on transit service and with facilities	Safety and Security	Accidents per 100,000 revenue miles	Total injuries
			Total fatalities
			Revenue miles
		Revenue miles between incidents	Revenue miles
			Total incidents
		Preventable crashes per 100,000 revenue miles	Total perventable collision
			Revenue miles
		Total crashes per 100,000 revenue miles	Total collision
			Revenue miles
		Total passenger injuries per 100,000 boardings	Total passenger injuries
			Passenger trips
		Total employee injuries per 100,000 revenue miles	Total employee injuries
			Revenue miles
		Total incidents	Total incidents
		Total accidents	Total injuries
			Total fatalities
		Total fatalities (excluding suicides)	Total fatalities (excluding suicides)
Increase security of transit vehicles and facilities		Reported crimes per 100,000 boardings	Total reported security incidents
			Passenger trips
		Operator assaults per 100,000 boardings	Total operator assaults
			Passenger trips

Collection Possible Data Source/ Technology	Formula	Purpose of Measure	Ease of Data Collection by Size of Agency		
In house documents, including accident and incident records	((Total injuries + Total fatalities)/ 100,000 revenue miles) *100	Measures accident rate, determines overall safety of the system			
In house documents, including accident and incident records					
Schedule data, CAD, AVL					
Schedule data, CAD, AVL	Revenue miles/ total incidents	Measures distance between incidents			
In house documents, including accident and incident records					
In house documents, including accident and incident records	Total preventable crashes/ 100,000 revenue miles	Reflects operator training			
Schedule data, CAD, AVL					
In house documents, including accident and incident records	Total collision/ 100,000 revenue miles	Reflects exposure to crash-prone factors (e.g. lack of bus lanes)			
Schedule data, CAD, AVL					
In house documents, including accident and incident records	Total passenger injuries/ 100,000 revenue miles	Measures passenger safety			
Electronic farebox, APC, Manual counting					
In house documents, including accident and incident records	Total employee injuries/ 100,000 revenue miles	Measures employee safety			
Schedule data, CAD, AVL					
In house documents, including accident and incident records	Total incidents	Indicator for minor safety occurences			
In house documents, including accident and incident records	Total injuries + Total fatalities	Indicator for impact of incidence, reflects both minor and major injuries, requiring immediate medical attention			
In house documents, including accident and incident records					
In house documents, including accident and incident records	Total fatalities	Indicator for impact of incidence, resulting to death (both on-the spot or within 30 days of occurrence)			
In house documents, including accident and incident records	Reported crimes/ 100,000 boardings	Measures security of passengers			
Electronic farebox, APC, Manual counting					
In house documents, including accident and incident records	Operator assaults/ 100,000 boardings	Measures security of employees operating the transit vehicle			
Electronic farebox, APC, Manual counting					

PM CATEGORY- VEHICLE UTILIZATION, ASSET MANAGEMENT AND STA

Sample Goals	Criteria	Measure	Data Data Elements Needed
Maximize and preserve the existing transportation system	Vehicle Utilization, Asset Management and State of Good Repair	Average age of fleet (in years)	Age of each vehicle in the fleet (year of manufacture)
		Percent of fleet exceeding design lifespan	Fleet size
			Design lifespan of each vehicle in the fleet
		Percent preventative maintenance performed on schedule	Ontime preventative maintenance
			Total preventative maintenance
		SGR backlog as percent of annual budget	SGR backlog amount
			Annual budget
Ensure the long-term viability and stability of the service		Missed trips due to operation failures	Missed trips due to operation failures
		Number of repeat breakdowns per month	Number of repeat breakdowns per month
		Number of system failures	Number of system failures
		Revenue miles between failures	Revenue miles
			Total number of failures
		Revenue miles between road calls	Revenue miles
			Total road calls
		Spare ratio	Fleet size
			Vehicles operated in maximum service
		Total road calls	Total road calls
Enhance multimodal connectivity and improve regional public transportation system		Number of locations where transfers can be made to other modes and transit operators	Number of locations where transfers can be made to other modes and transit operators
		Percent of stops meeting ADA accessibility standards	Total number of stops
			Stops that meet ADA accessible standards
		Percent of stops with shelters and benches	Total number of stops
			Stops with shelter and benches

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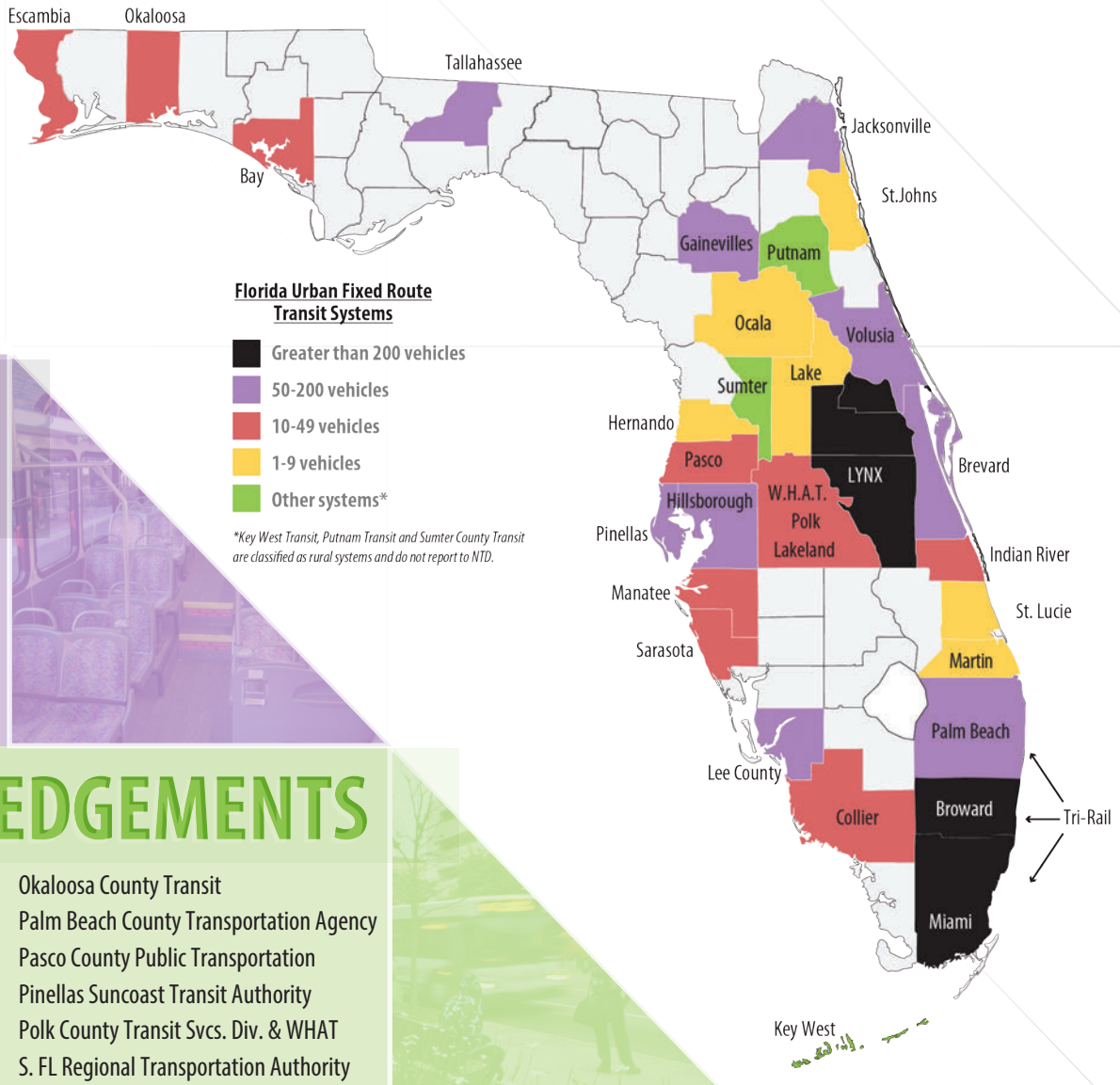
Collection / Possible Data Source/ Technology	Formula	Purpose of Measure	Ease of Data Collection by Size of Agency
Manual counting, In-house documents, including fleet data	Summation of fleet age/ fleet size	Measures reliability/ condition of fleet	
Manual counting, In-house documents, including fleet data	(Fleet size exceeding design lifespan/ fleet size)*100	Reflects immediate needs such as for maintenance of existing vehicles or acquisition of new vehicles	
Set by FDOT based on FTA guidelines			
Manual counting, In-house documents, including fleet data, maintenance logs	(Preventative maintenance performed on schedule/ (preventative maintenance performed early + on-time+ late))*100	Reflects regularity and ability to properly maintain assets	
Manual counting, In-house documents, including fleet data, maintenance logs			
Manual counting, In-house documents, including fleet data, maintenance logs	(SGR backlog amount/ Annual budget)*100	Reflects the size of the deferred maintenance problem	
Inhouse documents, including financial data			
Schedule data, Manual counting, In-house documents, including fleet data, maintenance logs	Number of missed trips due to operation failures	Reflects maintenance quality as well as loss in revenue and service shortage due to operation failures	
Manual counting, In-house documents, including fleet data, maintenance logs	Number of repeat breakdowns per month	Reflects maintenance quality	
Manual counting, In-house documents, including fleet data, maintenance logs	Number of system failures	Reflects immediate needs such as for maintenance	
Manual counting, In-house documents, including fleet data, maintenance logs	Revenue miles/ Total road calls	Reflects maintenance quality and asset condition; reflects passenger experience	
Schedule data, CAD, AVL			
Schedule data, CAD, AVL	Revenue miles/ Total road calls	Reflects maintenance quality and asset condition; reflects passenger experience	
Manual counting, In-house documents, including fleet data, maintenance logs			
Manual counting, In-house documents, including fleet data	(Fleet size – Vehicles operating in maximum service)/ fleet size	Reflects service reliability, ensuring adequate service supply	
Schedule data, fleet data, CAD, AVL			
Manual counting, In-house documents, including fleet data, maintenance logs	Total road calls	Reflects service monitoring and maintenance quality	
Manual counting, survey, ATSIM	Number of locations where transfers can be made to other modes and transit operators	Reflects availability of transit infrastructure that provides better intermodal and regional connectivity	
Manual counting, survey, ATSIM	(Number of stops meeting ADA accessibility standards/ Total number of stops) * 100	Reflects compliance of transit stops and infrastructure with ADA	
Manual counting, survey, ATSIM			
Manual counting, survey, ATSIM	(Number of stops with shelters and benches/ Total number of stops) * 100	Reflects availaility of transit stop facilities and their amenities	
Manual counting, survey, ATSIM			



CONTACT INFORMATION

Diane Quigley, FDOT Transit Planning Administrator
Diane.Quigley@dot.state.fl.us
850-414-4520

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Bay Town Trolley
Broward County Transit
Collier Area Transit
Escambia County Area Transit
Gainesville Regional Transit System
GoLine Transit
Hillsborough Area Regional Transit System
Jacksonville Transportation Authority
Lake City Public Transportation/Lake Xpress
Lakeland Area Mass Transit District
Lee County Transit
Lynx Transit
Manatee County Area Transit
Martin County
Miami Dade Transit
Okaloosa County Transit
Palm Beach County Transportation Agency
Pasco County Public Transportation
Pinellas Suncoast Transit Authority
Polk County Transit Svcs. Div. & WHAT
S. FL Regional Transportation Authority
Sarasota County Area Transit
Space Coast Area Transit
St. Lucie Council On Aging, Inc.
StarMetro
Sun Tran
Sunshine Bus Company
TransHernando Express
Votran

FDOT

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ATTACHMENT A: MAP-21 ACT EXCERPTS RELEVANT TO TRANSIT PERFORMANCE MEASUREMENT PROGRAMS

§ 5301. Policies and purposes

(a) DECLARATION OF POLICY.—It is in the interest of the United States, including the economic interest of the United States, to foster the development and revitalization of public transportation systems with the cooperation of both public transportation companies and private companies engaged in public transportation.
(b) GENERAL PURPOSES.—The purposes of this chapter are to—
  (1) provide funding to support public transportation;
  (2) improve the development and delivery of capital projects;
  (3) establish standards for the state of good repair of public transportation infrastructure and vehicles;
  (4) promote continuing, cooperative, and comprehensive planning that improves the performance of the transportation network;
  (5) establish a technical assistance program to assist recipients under this chapter to more effectively and efficiently provide public transportation service;
  (6) continue Federal support for public transportation providers to deliver high quality service to all users, including individuals with disabilities, seniors, and individuals who depend on public transportation;
  (7) support research, development, demonstration, and deployment projects dedicated to assisting in the delivery of efficient and effective public transportation service; and
  (8) promote the development of the public transportation workforce.

§ 5303. Metropolitan transportation planning

(a) POLICY.—It is in the national interest—
  (1) to encourage and promote the safe and efficient management, operation, and development of surface transportation systems that will serve the mobility needs of people and freight and foster economic growth and development within and between States and urbanized areas, while minimizing transportation-related fuel consumption and air pollution through metropolitan and statewide transportation planning processes identified in this chapter; and
  (2) to encourage the continued improvement and evolution of the metropolitan and statewide transportation planning processes by metropolitan planning organizations, State departments of transportation, and public transit operators as guided by the planning factors identified in subsection (h) and section 5304(d).
(b) DEFINITIONS.—In this section and section 5304, the following definitions apply:
  (1) METROPOLITAN PLANNING AREA.—The term 'metropolitan planning area' means the geographic area determined by agreement between the metropolitan planning organization for the area and the Governor under subsection (e).
  (2) METROPOLITAN PLANNING ORGANIZATION.—The term 'metropolitan planning organization' means the policy board of an organization established as a result of the designation process under subsection (d).

(3) NONMETROPOLITAN AREA.—The term 'nonmetropolitan area' means a geographic area outside designated metropolitan planning areas.
(4) NONMETROPOLITAN LOCAL OFFICIAL.—The term 'nonmetropolitan local official' means elected and appointed officials of general purpose local government in a onmetropolitan area with responsibility for transportation.
(5) REGIONAL TRANSPORTATION PLANNING ORGANIZATION.—The term 'regional transportation planning organization' means a policy board of an organization established as the result of a designation under section 5304(l).
(6) TIP.—The term 'TIP' means a transportation improvement program developed by a metropolitan planning organization under subsection (j).
(7) URBANIZED AREA.—The term 'urbanized area' means a geographic area with a population of 50,000 or more, as determined by the Bureau of the Census.

(c) GENERAL REQUIREMENTS.—
(1) DEVELOPMENT OF LONG-RANGE PLANS AND TIPS.—To accomplish the objectives in subsection (a), metropolitan planning organizations designated under subsection (d), in cooperation with the State and public transportation operators, shall develop long-range transportation plans and transportation improvement programs through a performance-driven, outcome-based approach to planning for metropolitan areas of the State.
(2) CONTENTS.—The plans and TIPs for each metropolitan area shall provide for the development and integrated management and operation of transportation systems and facilities (including accessible pedestrian walkways and bicycle transportation facilities) that will function as an intermodal transportation system for the metropolitan planning area and as an integral part of an intermodal transportation system for the State and the United States.
(3) PROCESS OF DEVELOPMENT.—The process for developing the plans and TIPs shall provide for consideration of all modes of transportation and shall be continuing, cooperative, and comprehensive to the degree appropriate, based on the complexity of the transportation problems to be addressed.

[text omitted]

(h) SCOPE OF PLANNING PROCESS.—
(1) IN GENERAL.—The metropolitan planning process for a metropolitan planning area under this section shall provide for consideration of projects and strategies that will—
(A) support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
(B) increase the safety of the transportation system for motorized and nonmotorized users;
(C) increase the security of the transportation system for motorized and nonmotorized users;
(D) increase the accessibility and mobility of people and for freight;
(E) protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
(F) enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
(G) promote efficient system management and operation; and
(H) emphasize the preservation of the existing transportation system.
(2) PERFORMANCE-BASED APPROACH.—
(A) IN GENERAL.—The metropolitan transportation planning process shall provide for the establishment and use of a performance-based approach to transportation decisionmaking to support the national goals described in section 150(b) of title 23 and the general purposes described in section 5301.
(B) PERFORMANCE TARGETS.—
(i) SURFACE TRANSPORTATION PERFORMANCE TARGETS.—

(I) IN GENERAL.—Each metropolitan planning organization shall establish performance targets that address the performance measures described use in tracking progress towards attainment of critical outcomes for the region of the metropolitan planning organization.

(II) COORDINATION.—Selection of performance targets by a metropolitan planning organization shall be coordinated with the relevant State to ensure consistency, to the maximum extent practicable.

(ii) PUBLIC TRANSPORTATION PERFORMANCE TARGETS.—Selection of performance targets by a metropolitan planning organization shall be coordinated, to the maximum extent practicable, with providers of public transportation to ensure consistency with sections 5326(c) and 5329(d).

(C) TIMING.—Each metropolitan planning organization shall establish the performance targets under subparagraph (B) not later than 180 days after the date on which the relevant State or provider of public transportation establishes the performance targets.

(D) INTEGRATION OF OTHER PERFORMANCE-BASED PLANS.—A metropolitan planning organization shall integrate in the metropolitan transportation planning process, directly or by reference the goals, objectives, performance measures, and targets described in other State transportation plans and transportation processes, as well as any plans developed by recipients of assistance under this chapter, required as part of a performance-based program.

(3) FAILURE TO CONSIDER FACTORS.—The failure to consider any factor specified in paragraphs (1) and (2) shall not be reviewable by any court under this chapter, title 23, subchapter II of chapter 5 of title 5, or chapter 7 of title 5 in any matter affecting a transportation plan, a TIP, a project or strategy, or the certification of a planning process.

(i) DEVELOPMENT OF TRANSPORTATION PLAN.—

(1) REQUIREMENTS.—

(A) IN GENERAL.—Each metropolitan planning organization shall prepare and update a transportation plan for its metropolitan planning area in accordance with the requirements of this subsection.

(B) FREQUENCY.—

(i) IN GENERAL.—The metropolitan planning organization shall prepare and update such plan every 4 years (or more frequently, if the metropolitan planning organization elects to update more frequently) in the case of each of the following:

(I) Any area designated as nonattainment, as defined in section 107(d) of the Clean Air Act (42 U.S.C. 7407(d)).

(II) Any area that was nonattainment and subsequently designated to attainment in accordance with section 107(d)(3) of that Act (42 U.S.C. 7407(d)(3)) and that is subject to a maintenance plan under section 175A of that Act (42 U.S.C. 7505a).

(ii) OTHER AREAS.—In the case of any other area required to have a transportation plan in accordance with the requirements of this subsection, the metropolitan planning organization shall prepare and update such plan every 5 years unless the metropolitan planning organization elects to update more frequently.

(2) TRANSPORTATION PLAN.—A transportation plan under this section shall be in a form that the Secretary determines to be appropriate and shall contain, at a minimum, the following:

(A) IDENTIFICATION OF TRANSPORTATION FACILITIES.—

(i) IN GENERAL.—An identification of transportation facilities (including major roadways, transit, multimodal and intermodal facilities, nonmotorized transportation facilities, and intermodal connectors) that should function as an integrated metropolitan transportation system, giving emphasis to those facilities that serve important national and regional transportation functions.

(ii) FACTORS.—In formulating the transportation plan, the metropolitan planning organization shall consider factors described in subsection (h) as the factors relate to a 20-year forecast period.

(B) PERFORMANCE MEASURES AND TARGETS.—A description of the performance measures and performance targets used in assessing the performance of the transportation system in accordance with subsection (h)(2).

(C) SYSTEM PERFORMANCE REPORT.—A system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets described in subsection (h)(2), including—

(i) progress achieved by the metropolitan planning organization in meeting the performance targets in comparison with system performance recorded in previous reports; and

(ii) for metropolitan planning organizations that voluntarily elect to develop multiple scenarios, an analysis of how the preferred scenario has improved the conditions and performance of the transportation system and how changes in local policies and investments have impacted the costs necessary to achieve the identified performance targets.

(D) MITIGATION ACTIVITIES.—

(i) IN GENERAL.—A long-range transportation plan shall include a discussion of types of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.

(ii) CONSULTATION.—The discussion shall be developed in consultation with Federal, State, and tribal wildlife, land management, and regulatory agencies.

(E) FINANCIAL PLAN.—

(i) IN GENERAL.—A financial plan that—

(I) demonstrates how the adopted transportation plan can be implemented;

(II) indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan; and

(III) recommends any additional financing strategies for needed projects and programs.

(ii) INCLUSIONS.—The financial plan may include, for illustrative purposes, additional projects that would be included in the adopted transportation plan if reasonable additional resources beyond those identified in the financial plan were available.

(iii) COOPERATIVE DEVELOPMENT.—For the purpose of developing the transportation plan, the metropolitan planning organization, transit operator, and State shall cooperatively develop estimates of funds that will be available to support plan implementation.

(F) OPERATIONAL AND MANAGEMENT STRATEGIES.—Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods.

(G) CAPITAL INVESTMENT AND OTHER STRATEGIES.— Capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure and provide for multimodal capacity increases based on regional priorities and needs.

(H) TRANSPORTATION AND TRANSIT ENHANCEMENT ACTIVITIES.—Proposed transportation and transit enhancement activities.

(j) METROPOLITAN TIP.—

(1) DEVELOPMENT.—

(A) IN GENERAL.—In cooperation with the State and any affected public transportation operator, the metropolitan planning organization designated for a metropolitan area shall develop a TIP for the metropolitan planning area that—
  (i) contains projects consistent with the current metropolitan transportation plan;
  (ii) reflects the investment priorities established in the current metropolitan transportation plan; and
  (iii) once implemented, is designed to make progress toward achieving the performance targets established under subsection (h)(2).

(B) OPPORTUNITY FOR COMMENT.—In developing the TIP, the metropolitan planning organization, in cooperation with the State and any affected public transportation operator, shall provide an opportunity for participation by interested parties in the development of the program, in accordance with subsection (i)(5).

(C) FUNDING ESTIMATES.—For the purpose of developing the TIP, the metropolitan planning organization, public transportation agency, and State shall cooperatively develop estimates of funds that are reasonably expected to be available to support program implementation.

(D) UPDATING AND APPROVAL.—The TIP shall be—
  (i) updated at least once every 4 years; and
  (ii) approved by the metropolitan planning organization and the Governor.

(2) CONTENTS.—

(A) PRIORITY LIST.—The TIP shall include a priority list of proposed Federally supported projects and strategies to be carried out within each 4-year period after the initial adoption of the TIP.

(B) FINANCIAL PLAN.—The TIP shall include a financial plan that—
  (i) demonstrates how the TIP can be implemented;
  (ii) indicates resources from public and private sources that are reasonably expected to be available to carry out the program;
  (iii) identifies innovative financing techniques to finance projects, programs, and strategies; and
  (iv) may include, for illustrative purposes, additional projects that would be included in the approved TIP if reasonable additional resources beyond those identified in the financial plan were available.

(C) DESCRIPTIONS.—Each project in the TIP shall include sufficient descriptive material (such as type of work, termini, length, and other similar factors) to identify the project or phase of the project.

(D) PERFORMANCE TARGET ACHIEVEMENT.—The transportation improvement program shall include, to the maximum extent practicable, a description of the anticipated effect of the transportation improvement program toward achieving the performance targets established in the metropolitan transportation plan, linking investment priorities to those performance targets.

(3) INCLUDED PROJECTS.—

(A) PROJECTS UNDER THIS CHAPTER AND TITLE 23.—A TIP developed under this subsection for a metropolitan area shall include the projects within the area that are proposed for funding under this chapter and chapter 1 of title 23.

(B) PROJECTS UNDER CHAPTER 2 OF TITLE 23.—
  (i) REGIONALLY SIGNIFICANT PROJECTS.—Regionally significant projects proposed for funding under chapter 2 of title 23 shall be identified individually in the transportation improvement program.

(ii) OTHER PROJECTS.—Projects proposed for funding under chapter 2 of title 23 that are not determined to be regionally significant shall be grouped in 1 line item or identified individually in the transportation improvement program.

(C) CONSISTENCY WITH LONG-RANGE TRANSPORTATION PLAN.—Each project shall be consistent with the long-range transportation plan developed under subsection (i) for the area.

(D) REQUIREMENT OF ANTICIPATED FULL FUNDING.—The program shall include a project, or an identified phase of a project, only if full funding can reasonably be anticipated to be available for the project or the identified phase within the time period contemplated for completion of the project or the identified phase.

(4) NOTICE AND COMMENT.—Before approving a TIP, a metropolitan planning organization, in cooperation with the State and any affected public transportation operator, shall provide an opportunity for participation by interested parties in the development of the program, in accordance with subsection (i)(5).

(5) SELECTION OF PROJECTS.—

(A) IN GENERAL.—Except as otherwise provided in subsection (k)(4) and in addition to the TIP development required under paragraph (1), the selection of Federally funded projects in metropolitan areas shall be carried out, from the approved TIP—

(i) by—

(I) in the case of projects under title 23, the State; and

(II) in the case of projects under this chapter, the designated recipients of public transportation funding; and

(ii) in cooperation with the metropolitan planning organization.

(B) MODIFICATIONS TO PROJECT PRIORITY.—Notwithstanding any other provision of law, action by the Secretary shall not be required to advance a project included in the approved TIP in place of another project in the program.

(6) SELECTION OF PROJECTS FROM ILLUSTRATIVE LIST.—

(A) NO REQUIRED SELECTION.—Notwithstanding paragraph (2)(B)(iv), a State or metropolitan planning organization shall not be required to select any project from the illustrative list of additional projects included in the financial plan under paragraph (2)(B)(iv).

(B) REQUIRED ACTION BY THE SECRETARY.—Action by the Secretary shall be required for a State or metropolitan planning organization to select any project from the illustrative list of additional projects included in the financial plan under paragraph (2)(B)(iv) for inclusion in an approved TIP.

(7) PUBLICATION.—

(A) PUBLICATION OF TIPS.—A TIP involving Federal participation shall be published or otherwise made readily available by the metropolitan planning organization for public review.

(B) PUBLICATION OF ANNUAL LISTINGS OF PROJECTS.—

(i) IN GENERAL.—An annual listing of projects, including investments in pedestrian walkways and bicycle transportation facilities, for which Federal funds have been obligated in the preceding year shall be published or otherwise made available by the cooperative effort of the State, transit operator, and metropolitan planning organization for public review.

(ii) REQUIREMENT.—The listing shall be consistent with the categories identified in the TIP.

[text omitted]

(l) REPORT ON PERFORMANCE-BASED PLANNING PROCESSES.—

(1) IN GENERAL.—The Secretary shall submit to Congress a report on the effectiveness of the performance-based planning processes of metropolitan planning organizations under this section, taking into consideration the requirements of this subsection.

(2) REPORT.—Not later than 5 years after the date of enactment of the Federal Public Transportation Act of 2012, the Secretary shall submit to Congress a report evaluating—

(A) the overall effectiveness of performance-based planning as a tool for guiding transportation investments;

(B) the effectiveness of the performance-based planning process of each metropolitan planning organization under this section;

(C) the extent to which metropolitan planning organizations have achieved, or are currently making substantial progress toward achieving, the performance targets specified under this section and whether metropolitan planning organizations are developing meaningful performance targets; and

(D) the technical capacity of metropolitan planning organizations that operate within a metropolitan planning area of less than 200,000 and their ability to carry out the requirements of this section.

(3) PUBLICATION.—The report under paragraph (2) shall be published or otherwise made available in electronically accessible formats and means, including on the Internet.

§ 5304. Statewide and nonmetropolitan transportation planning

(a) GENERAL REQUIREMENTS.—

(1) DEVELOPMENT OF PLANS AND PROGRAMS.—Subject to section 5303, to accomplish the objectives stated in section 5303(a), each State shall develop a statewide transportation plan and a statewide transportation improvement program for all areas of the State.

(2) CONTENTS.—The statewide transportation plan and the transportation improvement program developed for each State shall provide for the development and integrated management and operation of transportation systems and facilities (including accessible pedestrian walkways and bicycle transportation facilities) that will function as an intermodal transportation system for the State and an integral part of an intermodal transportation system for the United States.

(3) PROCESS OF DEVELOPMENT.—The process for developing the statewide plan and the transportation improvement program shall provide for consideration of all modes of transportation and the policies stated in section 5303(a) and shall be continuing, cooperative, and comprehensive to the degree appropriate, based on the complexity of the transportation problems to be addressed.

(b) COORDINATION WITH METROPOLITAN PLANNING; STATE IMPLEMENTATION PLAN.—A State shall—

(1) coordinate planning carried out under this section with the transportation planning activities carried out under section 5303 for metropolitan areas of the State and with statewide trade and economic development planning activities and related multistate planning efforts; and

(2) develop the transportation portion of the State implementation plan as required by the Clean Air Act (42 U.S.C. 7401 et seq.).

(c) INTERSTATE AGREEMENTS.—

(1) IN GENERAL.—Two or more States may enter into agreements or compacts, not in conflict with any law of the United States, for cooperative efforts and mutual assistance in support of activities authorized under this section related to interstate areas and localities in the States and establishing authorities the States consider desirable for making the agreements and compacts effective.

(2) RESERVATION OF RIGHTS.—The right to alter, amend, or repeal interstate compacts entered into under this subsection is expressly reserved.

(d) SCOPE OF PLANNING PROCESS.—
(1) IN GENERAL.—Each State shall carry out a statewide transportation planning process that provides for consideration and implementation of projects, strategies, and services that will—
(A) support the economic vitality of the United States, the States, nonmetropolitan areas, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency;
(B) increase the safety of the transportation system for motorized and nonmotorized users;
(C) increase the security of the transportation system for motorized and nonmotorized users;
(D) increase the accessibility and mobility of people and freight;
(E) protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
(F) enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;
(G) promote efficient system management and operation; and
(H) emphasize the preservation of the existing transportation system.
(2) PERFORMANCE-BASED APPROACH.—
(A) IN GENERAL.—The statewide transportation planning process shall provide for the establishment and use of a performance-based approach to transportation decisionmaking to support the national goals described in section 150(b) of title 23 and the general purposes described in section 5301.
(B) PERFORMANCE TARGETS.—
(i) SURFACE TRANSPORTATION PERFORMANCE TARGETS.—
(I) IN GENERAL.—Each State shall establish performance targets that address the performance measures described in section 150(c) of title 23, where applicable, to use in tracking progress towards attainment of critical outcomes for the State.
(II) COORDINATION.—Selection of performance targets by a State shall be coordinated with the relevant metropolitan planning organizations to ensure consistency, to the maximum extent practicable.
(ii) PUBLIC TRANSPORTATION PERFORMANCE TARGETS.—In urbanized areas with a population of fewer than 200,000 individuals, as calculated according to the most recent decennial census, and not represented by a metropolitan planning organization, selection of performance targets by a State shall be coordinated, to the maximum extent practicable, with providers of public transportation to ensure consistency with sections 5326(c) and 5329(d).
(C) INTEGRATION OF OTHER PERFORMANCE-BASED PLANS.—A State shall integrate into the statewide transportation planning process, directly or by reference, the goals, objectives, performance measures, and targets described in this paragraph, in other State transportation plans and transportation processes, as well as any plans developed pursuant to title 23 by providers of public transportation in urbanized areas with a population of fewer than 200,000 individuals, as calculated according to the most recent decennial census, and not represented by a metropolitan planning organization, required as part of a performance-based program.
(D) USE OF PERFORMANCE MEASURES AND TARGETS.—The performance measures and targets established under this paragraph shall be considered by a State when developing policies, programs, and investment priorities reflected in the statewide transportation plan and statewide transportation improvement program.
(3) FAILURE TO CONSIDER FACTORS.—The failure to take into consideration the factors specified in paragraphs (1) and (2) shall not be subject to review by any court under this

chapter, title 23, subchapter II of chapter 5 of title 5, or chapter 7 of title 5 in any matter affecting a statewide transportation plan, a statewide transportation improvement program, a project or strategy, or the certification of a planning process.

(f) LONG-RANGE STATEWIDE TRANSPORTATION PLAN.—

(1) DEVELOPMENT.—Each State shall develop a long-range statewide transportation plan, with a minimum 20-year forecast period for all areas of the State, that provides for the development and implementation of the intermodal transportation system of the State.

(2) CONSULTATION WITH GOVERNMENTS.—

(A) METROPOLITAN AREAS.—The statewide transportation plan shall be developed for each metropolitan area in the State in cooperation with the metropolitan planning organization designated for the metropolitan area under section 5303.

(B) NONMETROPOLITAN AREAS.—

(i) IN GENERAL.—With respect to nonmetropolitan areas, the statewide transportation plan shall be developed in cooperation with affected nonmetropolitan officials with responsibility for transportation or, if applicable, through regional transportation planning organizations described in subsection (l).

(ii) ROLE OF SECRETARY.—The Secretary shall not review or approve the consultation process in each State.

(C) INDIAN TRIBAL AREAS.—With respect to each area of the State under the jurisdiction of an Indian tribal government, the statewide transportation plan shall be developed in consultation with the tribal government and the Secretary of the Interior.

(D) CONSULTATION, COMPARISON, AND CONSIDERATION.—

(i) IN GENERAL.—The long-range transportation plan shall be developed, as appropriate, in consultation with State, tribal, and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation.

(ii) COMPARISON AND CONSIDERATION.—Consultation under clause (i) shall involve comparison of transportation plans to State and tribal conservation plans or maps, if available, and comparison of transportation plans to inventories of natural or historic resources, if available.

(3) PARTICIPATION BY INTERESTED PARTIES.—

(A) IN GENERAL.—In developing the statewide transportation plan, the State shall provide to—

(i) nonmetropolitan local elected officials, or, if applicable, through regional transportation planning organizations described in subsection (l), an opportunity to participate in accordance with subparagraph (B)(i); and

(ii) citizens, affected public agencies, representatives of public transportation employees, freight shippers, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, providers of freight transportation services, and other interested parties a reasonable opportunity to comment on the proposed plan.

(B) METHODS.—In carrying out subparagraph (A), the State shall, to the maximum extent practicable—

(i) develop and document a consultative process to carry out subparagraph (A)(i) that is separate and discrete from the public involvement process developed under clause (ii);

(ii) hold any public meetings at convenient and accessible locations and times;

(iii) employ visualization techniques to describe plans; and

(iv) make public information available in electronically accessible format and means, such as the World Wide Web, as appropriate to afford reasonable opportunity for consideration of public information under subparagraph (A).

(4) MITIGATION ACTIVITIES.—

(A) IN GENERAL.—A long-range transportation plan shall include a discussion of potential environmental mitigation activities and potential areas to carry out these activities, including activities that may have the greatest potential to restore and maintain the environmental functions affected by the plan.

(B) CONSULTATION.—The discussion shall be developed in consultation with Federal, State, and tribal wildlife, land management, and regulatory agencies.

(5) FINANCIAL PLAN.—The statewide transportation plan may include—

(A) a financial plan that—

(i) demonstrates how the adopted statewide transportation plan can be implemented;

(ii) indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan; and

(iii) recommends any additional financing strategies for needed projects and programs; and

(B) for illustrative purposes, additional projects that would be included in the adopted statewide transportation plan if reasonable additional resources beyond those identified in the financial plan were available.

(6) SELECTION OF PROJECTS FROM ILLUSTRATIVE LIST.—A State shall not be required to select any project from the illustrative list of additional projects included in the financial plan described in paragraph (5).

(7) PERFORMANCE-BASED APPROACH.—The statewide transportation plan should include—

(A) a description of the performance measures and performance targets used in assessing the performance of the transportation system in accordance with subsection (d)(2); and

(B) a system performance report and subsequent updates evaluating the condition and performance of the transportation system with respect to the performance targets described in subsection (d)(2), including progress achieved by the metropolitan planning organization in meeting the performance targets in comparison with system performance recorded in previous reports;

(8) EXISTING SYSTEM.—The statewide transportation plan should include capital, operations and management strategies, investments, procedures, and other measures to ensure the preservation and most efficient use of the existing transportation system.

(9) PUBLICATION OF LONG-RANGE TRANSPORTATION PLANS.—Each long-range transportation plan prepared by a State shall be published or otherwise made available, including (to the maximum extent practicable) in electronically accessible formats and means, such as the World Wide Web.

(g) STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM.—

(1) DEVELOPMENT.—

(A) IN GENERAL.—Each State shall develop a statewide transportation improvement program for all areas of the State.

(B) DURATION AND UPDATING OF PROGRAM.—Each program developed under subparagraph (A) shall cover a period of 4 years and shall be updated every 4 years or more frequently if the Governor of the State elects to update more frequently.

(2) CONSULTATION WITH GOVERNMENTS.—

(A) METROPOLITAN AREAS.—With respect to each metropolitan area in the State, the program shall be developed in cooperation with the metropolitan planning organization designated for the metropolitan area under section 5303.

(B) NONMETROPOLITAN AREAS.—

(i) IN GENERAL.—With respect to each nonmetropolitan area in the State, the program shall be developed in cooperation with affected nonmetropolitan local officials with responsibility for transportation or, if applicable, through regional transportation planning organizations described in subsection (l).

(ii) ROLE OF SECRETARY.—The Secretary shall not review or approve the specific consultation process in the State.

(C) INDIAN TRIBAL AREAS.—With respect to each area of the State under the jurisdiction of an Indian tribal government, the program shall be developed in consultation with the tribal government and the Secretary of the Interior.

(3) PARTICIPATION BY INTERESTED PARTIES.—In developing the program, the State shall provide citizens, affected public agencies, representatives of public transportation employees, freight shippers, private providers of transportation, providers of freight transportation services, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties with a reasonable opportunity to comment on the proposed program.

(4) PERFORMANCE TARGET ACHIEVEMENT.—A statewide transportation improvement program shall include, to the maximum extent practicable, a discussion of the anticipated effect of the statewide transportation improvement program toward achieving the performance targets established in the statewide transportation plan, linking investment priorities to those performance targets.

(5) INCLUDED PROJECTS.—

(A) IN GENERAL.—A transportation improvement program developed under this subsection for a State shall include Federally supported surface transportation expenditures within the boundaries of the State.

(B) LISTING OF PROJECTS.—

(i) IN GENERAL.—An annual listing of projects for which funds have been obligated for the preceding year in each metropolitan planning area shall be published or otherwise made available by the cooperative effort of the State, transit operator, and the metropolitan planning organization for public review.

(ii) FUNDING CATEGORIES.—The listing described in clause (i) shall be consistent with the funding categories identified in each metropolitan transportation improvement program.

(C) PROJECTS UNDER CHAPTER 2.—

(i) REGIONALLY SIGNIFICANT PROJECTS.—Regionally significant projects proposed for funding under chapter 2 of title 23 shall be identified individually in the transportation improvement program.

(ii) OTHER PROJECTS.—Projects proposed for funding under chapter 2 of title 23 that are not determined to be regionally significant shall be grouped in 1 line item or identified individually in the transportation improvement program.

(D) CONSISTENCY WITH STATEWIDE TRANSPORTATION PLAN.—Each project shall be—

(i) consistent with the statewide transportation plan developed under this section for the State;

(ii) identical to the project or phase of the project as described in an approved

metropolitan transportation plan; and

(iii) in conformance with the applicable State air quality implementation plan developed under the Clean Air Act (42 U.S.C. 7401 et seq.), if the project is carried out in an area designated as a nonattainment area for ozone, particulate matter, or carbon monoxide under part D of title I of that Act (42 U.S.C. 7501 et seq.).

(E) REQUIREMENT OF ANTICIPATED FULL FUNDING.—The transportation improvement program shall include a project, or an identified phase of a project, only if full funding can reasonably be anticipated to be available for the project within the time period contemplated for completion of the project.

(F) FINANCIAL PLAN.—

(i) IN GENERAL.—The transportation improvement program may include a financial plan that demonstrates how the approved transportation improvement program can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the transportation improvement program, and recommends any additional financing strategies for needed projects and programs.

(ii) ADDITIONAL PROJECTS.—The financial plan may include, for illustrative purposes, additional projects that would be included in the adopted transportation plan if reasonable additional resources beyond those identified in the financial plan were available.

(G) SELECTION OF PROJECTS FROM ILLUSTRATIVE LIST.—

(i) NO REQUIRED SELECTION.—Notwithstanding subparagraph (F), a State shall not be required to select any project from the illustrative list of additional projects included in the financial plan under subparagraph (F).

(ii) REQUIRED ACTION BY THE SECRETARY.—Action by the Secretary shall be required for a State to select any project from the illustrative list of additional projects included in the financial plan under subparagraph (F) for inclusion in an approved transportation improvement program.

(H) PRIORITIES.—The transportation improvement program shall reflect the priorities for programming and expenditures of funds, including transportation enhancement activities, required by this chapter and title 23.

(6) PROJECT SELECTION FOR AREAS OF LESS THAN 50,000 POPULATION.—

(A) IN GENERAL.—Projects carried out in areas with populations of less than 50,000 individuals shall be selected, from the approved transportation improvement program (excluding projects carried out on the National Highway System and projects carried out under the bridge program or the Interstate maintenance program under title 23 or under sections 5310 and 5311 of this chapter), by the State in cooperation with the affected nonmetropolitan local officials with responsibility for transportation or, if applicable, through regional transportation planning organizations described in subsection (l).

(B) OTHER PROJECTS.—Projects carried out in areas with populations of less than 50,000 individuals on the National Highway System or under the bridge program or the Interstate maintenance program under title 23 or under sections 5310 and 5311 of this chapter shall be selected, from the approved statewide transportation improvement program, by the State in consultation with the affected nonmetropolitan local officials with responsibility for transportation.

(7) TRANSPORTATION IMPROVEMENT PROGRAM APPROVAL.—Every 4 years, a transportation improvement program developed under this subsection shall be reviewed and approved by the Secretary if based on a current planning finding.

(8) PLANNING FINDING.—A finding shall be made by the Secretary at least every 4 years that the transportation planning process through which statewide transportation plans and programs

are developed is consistent with this section and section 5303.

(9) MODIFICATIONS TO PROJECT PRIORITY.—Notwithstanding any other provision of law, action by the Secretary shall not be required to advance a project included in the approved transportation improvement program in place of another project in the program.

(h) PERFORMANCE-BASED PLANNING PROCESSES EVALUATION.—

(1) IN GENERAL.—The Secretary shall establish criteria to evaluate the effectiveness of the performance-based planning processes of States, taking into consideration the following:
  (A) The extent to which the State is making progress toward achieving, the performance targets described in subsection (d)(2), taking into account whether the State developed appropriate performance targets.
  (B) The extent to which the State has made transportation investments that are efficient and cost-effective.
  (C) The extent to which the State—
    (i) has developed an investment process that relies on public input and awareness to ensure that investments are transparent and accountable; and
    (ii) provides reports allowing the public to access the information being collected in a format that allows the public to meaningfully assess the performance of the State.
(2) REPORT.—
  (A) IN GENERAL.—Not later than 5 years after the date of enactment of the Federal Public Transportation Act of 2012, the Secretary shall submit to Congress a report evaluating—
    (i) the overall effectiveness of performance-based planning as a tool for guiding transportation investments; and
    (ii) the effectiveness of the performance-based planning process of each State.
  (B) PUBLICATION.—The report under subparagraph (A) shall be published or otherwise made available in electronically accessible formats and means, including on the Internet.

ATTACHMENT B: BEST PRACTICES IN EVALUATING TRANSIT PERFORMANCE SURVEY

Florida transit agencies were surveyed in December 2013 regarding their practices in evaluating transit performance. The transit agency survey was developed to ensure that FDOT had the most up-to-date information related to how Florida transit agencies track and monitor performance measures. The survey focused on four areas:

- performance reporting,
- performance indicators and measures,
- performance measure changes with MAP-21, and
- transit data collection methodology.

The surveys were sent to all 29 Florida urban fixed route transit agencies. The following screenshots document the online survey transit agencies completed.

FDOT

Introduction

The Florida Department of Transportation (FDOT), Public Transit Office has contracted with CDM Smith and Kittelson and Associates to explore best practices in evaluating transit performance nationwide and on the state level, in Florida. The purpose of the study is to recommend the most effective measures for Florida transit agencies and to identify data collection techniques adopted by the 29 Florida urban transit agencies.

The attached survey will identify the existing performance measures reported by the agencies – including measures that pertain to safety and asset management. Additionally, the survey will gauge data collection methodologies and sources.

Once the study is completed, FDOT will share the results to ensure that your agency is well-informed regarding these measures utilized by other agencies in evaluating transit performance, which you may find useful in improving the efficiency of assessing your agency's system and route performance.

Please submit survey responses by March 7, 2014. If you have any questions and comments regarding the survey and the study, please feel free to contact us. Thank you for your assistance with this study and we look forward to hearing back from you soon.

Sincerely,

Nina Verzosa
verzosanb@cdmsmith.com
(850) 414-4217

Meghan Marion
marionm@cdmsmith.com
(239) 938-9614

1. Please provide us with your contact info:

Name

Position

Transit Agency

Email Address

Phone Number

Performance Reporting

2. Does your agency report performance measures? *

- ○ Yes
- ○ No

3. In what reports and publications does your agency provide performance measures? Please select all that apply. *

- ☐ Agency Performance Report
- ☐ Asset Management Report
- ☐ Business Plan Reporting
- ☐ Federal Transit Administration Grant Report
- ☐ Financial Report
- ☐ Local Newspaper
- ☐ Maintenance and Service Report
- ☐ National Transit Database Report
- ☐ Online/ Agency Website
- ☐ Operating Report
- ☐ State Grant Report
- ☐ System Safety Program Plan
- ☐ Transit Development Plan
- ☐ Transportation Disadvantaged Service Plan
- ☐ Other

4. Please indicate the reports that are required:

- **by statute (federal and/or state)**
- **by local agency/ policy board**
- **to receive funding for service operations and capital investments**

Please select all that apply.

Note that the reports shown below are based on your response in the previous question. Comments box is also provided if you would like to add a detailed response on why your agency provide performance measures for each report.

	Statutory	Funding	Local Policy	Other
Agency Performance Report	☐	☐	☐	☐
Asset Management Report	☐	☐	☐	☐
Business Plan Reporting	☐	☐	☐	☐
Federal Transit Administration Grant Report	☐	☐	☐	☐
Financial Report	☐	☐	☐	☐
Local Newspaper	☐	☐	☐	☐
Maintenance and Service Report	☐	☐	☐	☐
National Transit Database Report	☐	☐	☐	☐
Online/ Agency Website	☐	☐	☐	☐
Operating Report	☐	☐	☐	☐
State Grant Report	☐	☐	☐	☐
System Safety Program Plan	☐	☐	☐	☐
Transit Development Plan	☐	☐	☐	☐
Transportation Disadvantaged Service Plan	☐	☐	☐	☐
Other	☐	☐	☐	☐

Comments

5. How often do you update and report the performance measures for the following reports and publications? Please select all that apply.

	Daily	Weekly	Bi-weekly	Monthly	Quarterly	Annually	Other
Agency Performance Report	☐	☐	☐	☐	☐	☐	☐
Asset Management Report	☐	☐	☐	☐	☐	☐	☐
Business Plan Reporting	☐	☐	☐	☐	☐	☐	☐
Federal Transit Administration Grant Report	☐	☐	☐	☐	☐	☐	☐
Financial Report	☐	☐	☐	☐	☐	☐	☐
Local Newspaper	☐	☐	☐	☐	☐	☐	☐
Maintenance and Service Report	☐	☐	☐	☐	☐	☐	☐
National Transit Database Report	☐	☐	☐	☐	☐	☐	☐
Online/ Agency Website	☐	☐	☐	☐	☐	☐	☐
Operating Report	☐	☐	☐	☐	☐	☐	☐
State Grant Report	☐	☐	☐	☐	☐	☐	☐
System Safety Program Plan	☐	☐	☐	☐	☐	☐	☐
Transit Development Plan	☐	☐	☐	☐	☐	☐	☐
Transportation Disadvantaged Service Plan	☐	☐	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐	☐

6. Who are the primary recipients of these reports and publications? Please select all that apply.

	Federal Transit Administration	Florida Department of Transportation	General Public	Grant Sponsor	Internal use - department within the agency (safety, operations, management, and so on)	Local City/ County Government	Peers	Transit Agency Policy Board	Other
Agency Performance Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
Asset Management Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
Business Plan Reporting	☐	☐	☐	☐	☐	☐	☐	☐	☐
Federal Transit Administration Grant Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
Financial Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
Local Newspaper	☐	☐	☐	☐	☐	☐	☐	☐	☐
Maintenance and Service Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
National Transit Database Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
Online/ Agency Website	☐	☐	☐	☐	☐	☐	☐	☐	☐
Operating Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
State Grant Report	☐	☐	☐	☐	☐	☐	☐	☐	☐
System Safety Program Plan	☐	☐	☐	☐	☐	☐	☐	☐	☐
Transit Development Plan	☐	☐	☐	☐	☐	☐	☐	☐	☐
Transportation Disadvantaged Service Plan	☐	☐	☐	☐	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐	☐	☐	☐

7. Who prepares the following reports and publications for your agency?

	Agency (internal staff)	Third-party (consultants)	Metropolitan/ Transportation Planning Organization	Florida Department of Transportation	Local Government	Other
Agency Performance Report	☐	☐	☐	☐	☐	☐
Asset Management Report	☐	☐	☐	☐	☐	☐
Business Plan Reporting	☐	☐	☐	☐	☐	☐
Federal Transit Administration Grant Report	☐	☐	☐	☐	☐	☐
Financial Report	☐	☐	☐	☐	☐	☐
Local Newspaper	☐	☐	☐	☐	☐	☐
Maintenance and Service Report	☐	☐	☐	☐	☐	☐
National Transit Database Report	☐	☐	☐	☐	☐	☐
Online/ Agency Website	☐	☐	☐	☐	☐	☐
Operating Report	☐	☐	☐	☐	☐	☐
State Grant Report	☐	☐	☐	☐	☐	☐
System Safety Program Plan	☐	☐	☐	☐	☐	☐
Transit Development Plan	☐	☐	☐	☐	☐	☐
Transportation Disadvantaged Service Plan	☐	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐	☐

Performance Indicators and Measures

8. What service performance indicators does your agency typically report?

- ☐ Service area population
- ☐ Service area size
- ☐ Passenger trips
- ☐ Passenger miles
- ☐ Vehicle miles
- ☐ Revenue miles
- ☐ Vehicle hours
- ☐ Revenue hours
- ☐ Route miles
- ☐ Total operating expense
- ☐ Total maintenance expense
- ☐ Total capital expense
- ☐ Federal revenue
- ☐ State revenue
- ☐ Local revenue
- ☐ Total employees
- ☐ Transportation operating employee
- ☐ Vehicle available in maximum service
- ☐ Vehicle operated in maximum service
- ☐ Spare ratio
- ☐ Total gallons consumed
- ☐ Total energy consumed
- ☐ Other

9. What measures does your agency typically report for evaluating customer satisfaction? Please select all that apply.

Please also indicate the which measure(s) you feel are the most effective in evaluating your agency's goals and objectives pertaining to customer satisfaction.

	Agency reports	Most effective
Accessibility of trains/buses to persons with disabilities	☐	☐
Availability of handrails or grab bars on trains/buses	☐	☐
Availability of monthly discount passes	☐	☐
Availability of schedule information by phone/mail	☐	☐
Availability of schedules/maps at stations/stops	☐	☐
Availability of seats on train/bus	☐	☐
Availability of shelter and benches at stations/stops	☐	☐
Cleanliness of interior, seats, windows	☐	☐
Cleanliness of stations/stops	☐	☐
Cleanliness of train/bus exterior	☐	☐
Comfort of seats on train/bus	☐	☐
Connecting bus service to stations/main bus stops	☐	☐
Cost-effectiveness, affordability, and value	☐	☐
Displaying of customer service/complaint number	☐	☐
Frequency of delays for breakdowns/emergencies	☐	☐
Frequency of service on Saturdays/Sundays	☐	☐
Frequent service so that wait times are short	☐	☐
Friendly, courteous, quick service from personnel	☐	☐
Having station/stop near destination	☐	☐
Having station/stop near my home	☐	☐
Hours of service during weekdays	☐	☐
Number of transfer points outside downtown	☐	☐
Physical condition of stations/stops	☐	☐
Physical condition of vehicles and infrastructure	☐	☐
Reliable trains/buses that come on schedule	☐	☐
Safe and competent drivers/conductors	☐	☐
Safety from crime at stations/stops	☐	☐
Safety from crime on trains/buses	☐	☐
Short wait time for transfers	☐	☐
Signs/information in Spanish as well as English	☐	☐
Station/stop names visible from train/bus	☐	☐
The train/bus traveling at a safe speed	☐	☐
Trains/buses that are not overcrowded	☐	☐
Other	☐	☐

10. What measures does your agency typically report for evaluating service effectiveness? Please select all that apply.

Please also indicate which measure(s) you feel are the most effective in evaluating your agency's goals and objectives pertaining to the improvement of service effectiveness.

	Agency reports	Most effective
Vehicle miles per capita	☐	☐
Passenger trips per capita	☐	☐
Passenger trips per revenue mile	☐	☐
Passenger trips per revenue hour	☐	☐
Average trip length	☐	☐
Average speed	☐	☐
Average headway (in minutes)	☐	☐
Revenue miles per route miles	☐	☐
Weekend span of service	☐	☐
Weekday span of service	☐	☐
Route miles per square mile of service area	☐	☐
Percentage of population within 1/4 mile of a route	☐	☐
Service frequency	☐	☐
On-time performance	☐	☐
Other	☐	☐

11. What measures does your agency typically report for evaluating service efficiency? Please select all that apply.

Please also indicate what measure(s) you feel are most effective in evaluating your agency's goals and objectives pertaining to the improvement of service efficiency.

	Agency reports	Most effective
Operating expense per capita	☐	☐
Operating expense per peak vehicle	☐	☐
Operating expense per passenger trip	☐	☐
Operating expense per passenger mile	☐	☐
Operating expense per revenue mile	☐	☐
Operating expense per revenue hour	☐	☐
Maintenance expense per revenue mile	☐	☐
Maintenance expense per operating expense	☐	☐
Farebox recovery	☐	☐
Local revenue per operating expense	☐	☐
Operating revenue per operating expense	☐	☐
Vehicle miles per peak vehicle	☐	☐
Vehicle hours per peak vehicle	☐	☐
Revenue miles per vehicle mile	☐	☐
Revenue miles per (total) vehicle	☐	☐
Revenue hours per (total) vehicle	☐	☐
Vehicle miles per gallon	☐	☐
Vehicle miles per kilowatt-hour	☐	☐
Average fare	☐	☐
Other	☐	☐

12. What measures does your agency typically report for evaluating labor utilization? Please select all that apply.

Please also indicate which measure(s) you feel are most effective in evaluating your agency's goals and objectives pertaining to optimizing labor utilization.

	Agency reports	Most effective
Revenue hours per employee	☐	☐
Passenger trips per employee	☐	☐
Vehicle miles per employee	☐	☐
Other	☐	☐

13. Does your agency use different measures to evaluate performance at both the route-level and system-level?

- ○ Yes
- ○ No

14. Does your agency report measures to evaluate performance for various modes (e.g. bus, rail, trolley, etc.)?

- Yes
- No

Performance Measure Changes with MAP-21

The Federal Transit Administration began the 2013 fiscal year in October with the new transportation bill, Moving Ahead for Progress in the 21st Century (MAP-21). Several new requirements were added for safety and state of good repair (asset management). The new bill:

- Increases funding for improving the state of good repair;
- Includes new reporting requirements; and
- Requires performance measures for state of good repair, planning, and safety.

The federal guidelines have not been released pertaining to specific performance measures required. However, FDOT continues to monitor the progress. In light of these new federal requirements, please respond to the following questions.

15. Is your agency aware of the MAP-21 requirements for an agency safety and asset management plan and performance measures?

- Yes
- No

16. Is your agency currently tracking safety performance measures? *

- Yes
- No

17. What measures does your agency typically report for evaluating safety ? Please select all that apply.

Please also indicate which measure(s) you feel are most effective in evaluating your agency's goals and objectives pertaining to safety.

	Agency reports	Most effective
Accidents per 100,000 Revenue Miles	☐	☐
Collisions per 100,000 revenue miles	☐	☐
Crimes per 1,000 passengers	☐	☐
Customer accidents	☐	☐
Fatal accidents per passenger miles traveled	☐	☐
Fatal accidents per vehicle miles traveled	☐	☐
Injury accidents per passenger miles traveled	☐	☐
Injury accidents per vehicle miles traveled	☐	☐
Number of accidents	☐	☐
Number of collisions	☐	☐
Number of fatalities	☐	☐
Number of incidents	☐	☐
Number of injuries	☐	☐
Number of safety-related complaints	☐	☐
Number of safety-related improvements	☐	☐
Property-damage-only accidents per vehicle miles traveled	☐	☐
Property-damage-only per passenger miles traveled	☐	☐
Revenue Miles (Distance) Between Incidents	☐	☐
Other	☐	☐

18. Is your agency currently tracking performance measures in asset management? *

- ○ Yes
- ○ No

19. What measures does your agency typically report for evaluating state of good repair (asset management)? Please select all that apply.

Please also indicate which measure(s) you feel are most effective in evaluating your agency's goals and objectives pertaining to state of good repair (of vehicles, facilities, etc.).

	Agency reports	Most effective
Average Age of Fleet (in years)	☐	☐
Loading area capacity	☐	☐
Maintenance labor cost per mile	☐	☐
Maintenance labor cost per vehicle	☐	☐
Mechanics per 1,000 revenue miles	☐	☐
Missed trips due to operation failures	☐	☐
Number of repeat breakdowns per month	☐	☐
Number of repeat repairs per month	☐	☐
Number of system failures	☐	☐
Percent of stops with shelters and benches	☐	☐
Revenue miles between roadcalls	☐	☐
Revenue miles between incidents	☐	☐
Total roadcalls	☐	☐
Other	☐	☐

20. What sources and technology does your agency use in collecting transit performance data? Please click on arrow to access pull down menu.

	Data sources and technology
Age of Fleet (yrs.)	
Farebox Revenue	
Maintenance Expenses	
Number of accidents/ incidents/ collisions	
Number of boardings	
Number of system failures	
Operating Expenses	
Other Non-Fare Revenue	
Passenger Miles	
Passenger Trips	
Revenue Hours	
Revenue Miles	
Route Miles	
Service Area Population	
Total Employee	
Vehicle Miles	
Vehicles Available in Maximum Service	

Dropdown options for Question #21:

-- Please Select --
---IN HOUSE---
Accident and incident records
Complaint records
Employee records
Fleet data
Maintenance records
Operation logs
Schedule data
Service design standards
System maps
Other in-house documents

---SECONDARY DATA---
Florida Transit Information System - Integrated National Transit Database Analysis System (FTIS-INTDAS)
National Transit Database (NTD)
U.S Census
Other local, state, and federal agencies

---TECHNOLOGY---
Automatic Passenger Counters (APC)
Automatic Vehicle Location (AVL)
Electronic Fareboxes
Smart Card
Train Control Systems
Combination of various technology

---MANUAL DATA COLLECTION---
Manual Counting
Survey
Workshops
Other manual data collection method

Thank you for your assistance with this study!

OFFICE OF FREIGHT, LOGISTICS & PASSENGER OPERATIONS

ATTACHMENT C: FLORIDA TRANSIT AGENCIES WHO RESPONDED TO THE SURVEY BY SIZE

The size category was based on three factors: service area population, ridership, and fleet size.

Transit Agency	Service Area Population	Ridership	Fleet Size (Peak Vehicles)	Size
SFRTA	5,502,379	4,941,886	65	Large
Broward County Transit	1,780,172	40,288,678	320	Large
Miami Dade Transit	1,496,435	106,215,326	1,022	Large
Jacksonville Transportation Authority	838,815	12,318,052	145	Medium
HART	822,404	14,620,857	156	Medium
Space Coast Area Transit	554,354	2,202,373	72	Medium
Votran	468,670	3,598,032	57	Medium
Pasco County Public Transportation (PCPT)	464,697	956,591	18	Medium
LeeTran	459,381	3,793,542	57	Medium
Sarasota County Area Transit	388,474	2,795,526	45	Medium
Manatee County Area Transit	322,833	1,767,086	19	Medium
StarMetro	162,310	4,585,634	58	Medium
Gainesville RTS	160,000	10,652,169	97	Medium
Council on Aging of St. Lucie, Inc./Community Transit	280,379	152,561	8	Small
Okaloosa County Transit	180,822	179,921	14	Small
Martin County Board of County Commissioners	146,000	67,173	4	Small

ATTACHMENT D: ACRONYMS

ADA	Americans with Disability Act
ASE	Active Strategy Enterprise
Bay Town Trolley	Bay Town Trolley
BCT	Broward County Transit
BRT	Bus Rapid Transit
CAT	Collier Area Transit
CFRTA/ LYNX	LYNX/ Central Florida Regional Transportation Authority
COASL	St. Lucie Council on Aging, Inc.
ECAT	Escambia County Area Transit
FDOT	Florida Department of Transportation
FHWA	Federal Highway Administration
FSV	Florida Standard Performance Variables
FTA	Federal Transit Administration
FTC	Florida Transportation Commission
FTIS-INTDAS	Florida Transit Information System – Integrated National Transit Database Analysis System
HART	Hillsborough Area Regional Transit
HFT	High frequency transit
Indian River	Senior Resource Association
JRTC	Jacksonville Regional Transportation Center
JTA	Jacksonville Transportation Authority
KPI	Key Performance Indicators
LAMTD/ Citrus Connection	Lakeland Area Mass Transit District
LeeTran	Lee County Transit
LRT	Light Rail Transit
LRTP	Long Range Transportation Plans
MAP-21	Moving Ahead for Progress in the 21st Century
Martin County	Council on Aging of Martin County, Inc.
MCAT	Manatee County Area Transit
MDT	Miami-Dade County Transit
MPO	Metropolitan Planning Organization
NTD	National Transit Database
OMB	Office of Management and Budget
OPM	Office of Performance Management
PalmTran	Palm Beach County Transportation Agency
PCPT	Pasco County Public Transportation
PSTA	Pinellas Suncoast Transit Authority
RTS	Gainesville Regional Transit System
SCAT (Sarasota)	Sarasota County Area Transit
SCAT (Space Coast)	Space Coast Area Transit
SFRTA/ Tri-Rail	South Florida Regional Transportation Authority

SGR	State of Good Repair
SMS	Safety Management System
StarMetro	StarMetro
STIP	State Transportation Improvement Program
Sunshine Bus	St. Johns County
SunTran	Ocala/ Marion Transit
TCRP	Transit Cooperative Research Program
TDP	Transit Development Plan
THE Bus	Hernando County
TheWave	Okaloosa County Transit
TIP	Transportation Improvement Program
TMT	Transman Fleet Management
VOTRAN	Volusia County Public Transit System
WHAT	Winter Haven Area Transit

ATTACHMENT E: SELECTED MEASURES AND DATA ELEMENTS DEFINITIONS

Measures

Average headway- This measure is computed in minutes for the system as a whole using the following data: directional route miles, revenue miles, revenue hours, and the number of vehicles operated in maximum service (peak vehicles). The route mileage figure is divided by the system's calculated average speed (revenue miles per revenue hour) to produce an estimate of the time it would take, in hours, to traverse all the system's total route miles. Finally, this time figure is divided by the system's number of peak vehicles (then multiplied by 60 to convert time in hours to minutes) to determine the number of minutes it takes for a vehicle to complete its portion of the total route miles one time (FTH)

Average trip length- Annual passenger miles divided by annual passenger trips (FTH)

On-time performance- A transit vehicle is considered "on time" if it departs a location within a certain number of minutes after and/or before the scheduled time (TCRP 88). Miami-Dade Transit considers a bus on-time if it arrives to minutes prior to and within 5 minutes after scheduled departure time (MDT Scorecard). New York City Transit, on the other hand, defines on-time as the percentage of trips departing from all scheduled time points between 0 and 5 min after their scheduled departing time (Nakanishi, 1997)

Passenger trips per capita- Average number of transit boardings per person per year. This number is larger in areas where public transportation is emphasized and in areas where there are more transit dependent persons, and is a measure of the extent to which the public utilizes transit in a given service area (FTH)

Passenger trips per revenue hour- The ratio of annual passenger trips to total annual revenue hours of operation; reports on the effectiveness of the service because hours are generally a better representation of the resources consumed in providing service (FTH)

Passenger trips per revenue mile- The ratio of annual passenger trips to total annual revenue miles of service; a key indicator of service effectiveness that is influenced by the levels of demand and the supply of service provided (FTH)

Passenger trips per VOMS- The ratio of annual passenger trips to total annual vehicles operated in maximum service (during peak hours) (FTH)

Revenue miles per revenue hour- The ratio of annual revenue miles to total annual revenue hours. Measures average system speed (FTH)

Vehicle miles per capita- Total number of annual vehicle miles divided by the service area population (CUTR, 2000)

Revenue miles per square mile- Total annual revenue miles divided by the service area size

Farebox recovery ratio- The percentage of direct operating costs for a route that are recovered through the fares paid by the ridership (CUTR, 2009). It is equal to fare revenue divided by total expenses.

Operating expense per capita- Annual operating budget divided by the service area population; a measure of the resource commitment to transit by the community (FTH)

Operating expense per passenger mile- Operating expense divided by the number of passenger miles; takes into account the impact of trip length on performance because some operators provide lengthy trips while others provide mainly shorter trips. (FTH)

Operating expense per passenger trip- Operating expenditures divided by the total annual ridership; a measure of the efficiency of transporting riders; one of the key indicators of comparative performance of transit properties since it reflects both the efficiency with which service is delivered and the market demands for the service (FTH)

Operating expense per revenue hour- Operating expense divided by total annual revenue hours; a key comparative measure which factors out vehicle speed. This is often important because vehicle speed is strongly influenced by local traffic conditions (FTH)

Operating expense per revenue mile- Operating expense divided by total annual revenue miles; a measure of the efficiency with which service is delivered and is another key comparative indicator (FTH)

Energy consumption per vehicle mile- Amount of energy used per unit distance

Tons of emission per 100,000 vehicle miles- This primarily measures vehicle efficiency and will be sensitive to efforts to purchase lower-emission vehicles or to switch to lower-carbon fuels (APTA, 2009)

Vehicle miles per gallon- Distance travelled per unit volume of fuel used

Payroll per capita- Average salary per employee

Passenger trip per FTE employee- Ratio of total passenger trips to system total full-time equivalents. Another measure of overall labor productivity (FTH)

Revenue hours per full time employee- Ratio of total revenue hours to total number of full time employees.

Vehicle miles per employee FTE- Ratio of total vehicle miles to total number of full time employees.

Accidents per 100,000 revenue miles- Measures accident rate

Revenue miles between incidents- Number of total annual revenue miles divided by the number of incidents; reports the average interval, in miles, between incidents (FTH)

Preventable crashes per 100,000 revenue miles- Frequency of preventable crashes

Total collisions per 100,000 revenue miles- Frequency of total collision

Total passenger injuries per 100,000 boardings- Measures rate of passenger injuries

Total employee injuries per 100,000 revenue miles- Measures rate of employee injuries

Total incidents- Total number of any physical damage or harm to persons as a result of an incident that requires immediate medical attention away from the scene (NTD)

Total accidents- Total number of occurrences associated with the operation of a mass transit vehicle in which an individual dies, an individual suffers a bodily injury and immediately receives medical treatment away from the scene of an accident (FTA). Sum of the number of fatalities and injuries.

Total fatalities (excluding suicides)- A death confirmed within 30 days of a reported incident. Does not include deaths in or on transit property that are a result of illness or other natural causes (NTD). Note that NTD includes suicide in the number of total fatalities.

Reported crimes per 100,000 boardings- Rate of reported crimes

Operator assaults per 100,000 boardings- Rate of operator assaults

Average age of fleet (in years)- Average age of the transit fleet

Percent of fleet exceeding design lifespan- Reflects agency's state of good repair backlog

Percent preventative maintenance performed on schedule- Measures regularity of assets upkeep

SGR backlog as percent of annual budget- Measures the agency's unmet reinvestment needs

Missed trips due to operation failures- Total number of trips removed from the daily schedule due to mechanical breakdowns

Number of repeat breakdowns per month- Total number of repeat mechanical failure per month requiring maintenance

Number of system failures- Total number of some mechanical element of the revenue vehicle that prevents the vehicle from completing a scheduled revenue trip or from starting the next scheduled revenue trip because actual movement is limited or because of safety concerns (NTD)

Revenue miles between failures- Number of total annual revenue miles divided by the number of revenue vehicle system failures; an indicator of the average frequency of delays because of a problem with the equipment (NTD)

Revenue miles between road calls- Distance between the number of unplanned tows and assists that maintenance vehicles provide revenue vehicles while it is in service (TCRP 88)

Spare ratio- The percentage of the fleet available to substitute for other vehicles (TCRP 88)

Total road calls- Total number of unplanned tows and assists that maintenance vehicles provide revenue vehicles while it is in service (TCRP 88)

Number of locations where transfers can be made to other modes and transit operators- Reflects availability of transit infrastructure that provides better intermodal and regional connectivity

Percent of stops meeting ADA accessibility standards- Reflects availability of transit infrastructure that provides better intermodal and regional connectivity

Percent of stops with shelters and benches- Reflects availability of transit infrastructure that provides better intermodal and regional connectivity

Data Elements

Directional route miles- The mileage in each direction over which public transportation vehicles travel while in revenue service (NTD)

Revenue miles- The miles that passenger cars travel while in revenue service (NTD)

Revenue hours- The hours that vehicles are scheduled to or actually travel while in revenue service (NTD)

Vehicles operated in maximum service- The number of revenue vehicles operated to meet the annual maximum service requirement (NTD)

Passenger miles- The cumulative sum of the distances ridden by each passenger (NTD)

Passenger trips- The number of passengers who board public transportation vehicles (NTD)

On-time samplings- Sampling of buses that falls within the on-time parameters (based from the MDT ScoreCard)

Total samplings- Sampling of buses that are on-time, late, and early (based from the MDT ScoreCard)

Revenue miles- The miles that passenger cars travel while in revenue service (NTD)

Revenue hours- The hours that vehicles are scheduled to or actually travel while in revenue service (NTD)

Service area population- A measure of access to transit service in terms of population served (NTD). In Florida, transit agencies commonly use county population as the service area population

Vehicle miles- The miles that vehicles travel while in revenue service (actual vehicle revenue miles (VRM)) plus deadhead miles (NTD)

Service area size- The hours that vehicles are scheduled to or actually travel while in revenue service (NTD)

Fare revenue- All income received directly from passengers, paid either in cash or through pre-paid tickets, passes, etc. (NTD)

Operating cost/ expense - The expenses associated with the operation of the transit agency, and classified by function or activity, and the goods and services purchased (NTD)

Operating budget - Budget for supporting the system's operations costs

Consumption of electricity- Amount of electricity used annually

Emission level/ factor- This category accounts for the —debit side of net transit emissions. The major element is mobile combustion — i.e., tailpipe emissions from transit vehicles, or electricity use for rail agencies. It also includes stationary combustion, such as on-site furnaces and indirect emissions from electricity generation. These debits are calculated at the agency level (APTA, 2009)

Fuel consumption- Amount of fuel used annually

Payroll- Total amount paid to employees

Total number of full time employees- Total number of the transit agency meeting the local definition of full time hours (NTD)

Total accidents- Total number of occurrences associated with the operation of a mass transit vehicle in which an individual dies, an individual suffers a bodily injury and immediately receives medical treatment away from the scene of an accident (FTA). Sum of the number of fatalities and injuries.

Total incidents- Total number of incidents such as slips, trips, falls, electric shock, yard derailments, smoke or the odor of smoke/ chemicals noticed in a transit vehicle or facility, or other safety events not specifically listed as a reportable incident but which meet a reportable incident threshold (NTD)

Total preventable collision- Total number of preventable vehicle accidents in which there is an impact of a transit vehicle with another transit vehicle, a non-transit vehicle, an object, a person(s) excluding suicide, an animal, a rail vehicle, a vessel, or a dock (NTD)

Total collision - Total number of vehicle accidents in which there is an impact of a transit vehicle with another transit vehicle, a non-transit vehicle, an object, a person(s) excluding suicide, an animal, a rail vehicle, a vessel, or a dock (NTD)

Total passenger injuries- Total number of any physical damage or harm to passengers as a result of an incident that requires immediate medical attention away from the scene (NTD)

Total employee injuries- Total number of any physical damage or harm to employees as a result of an incident that requires immediate medical attention away from the scene (NTD)

Total fatalities (excluding suicides)- A death confirmed within 30 days of a reported incident. Does not include deaths in or on transit property that are a result of illness or other natural causes (NTD). Note that NTD includes suicide in the number of total fatalities.

Security incidents- Total number of security incidence: an occurrence of a bomb threat, bombing, arson, hijacking, sabotage, cyber security event, assault, robbery, rape, burglary, suicide, attempted suicide, larceny, theft, vandalism, homicide, nonviolent civil disturbance, or CBR (chemical/biological/radiological) or nuclear release (NTD)

Operator assaults - An unlawful attack by one person upon an operator (NTD)

Age of each vehicle in the fleet- Age of fleet = Current Year - Manufacturing Year

Fleet size- Total number of fleet

Design lifespan of each vehicle in the fleet- Set by the state DOT based on FTA guidelines

On-time preventative maintenance- Number of preventative maintenance conducted on time

Total preventative maintenance- Total number of preventative maintenance conducted

SGR backlog amount- Amount of investment on immediate replacement of all assets exceeding their useful life and immediate completion of all major station rehabilitation that are currently past due (FTA, 2010)

Annual budget- Estimate of funds needed to support agency operations

Missed trips - Total number of trips removed from the daily schedule

System failures - Total number of some mechanical element of the revenue vehicle that prevents the vehicle from completing a scheduled revenue trip or from starting the next scheduled revenue trip because actual movement is limited or because of safety concerns (NTD)

Road calls- Occurs when a maintenance vehicle is required to tow or assist a revenue vehicle while it is in service. It is assumed that these incidents are unplanned occurrences (TCRP 88)

Locations where transfers can be made to other modes and transit operators- Intermodal and regional stations

Stops meeting ADA accessibility standards- Stops that meet ADA accessibility standards

Stops with shelters and benches - Stops with shelters and benches

**Note: Definitions are based on system-level annual reporting.*
FTH: 2013 Florida Transit Handbook
TCRP 88: Transit Cooperative Research Program Report 88 – A Guidebook for Developing a Transit Performance Measurement System
NTD: National Transit Database Glossary (http://www.ntdprogram.gov/ntdprogram/Glossary.htm)
MDT Scorecard: Miami-Dade Transit Scorecard (http://www.miamidade.gov/managementandbudget/transportation.asp)
Nakanishi, 1997: Transportation Research Board - Bus Performance Indicators: On-time Performance and Service Regularity.
FTA: Florida Transit Administration (http://transit-safety.fta.dot.gov/DrugAndAlcohol/Newsletters/Issue20/html/pg4.htm)
CUTR 2009: Center for Urban Transportation Research Report – Best Practices in Transit Service Planning
CUTR 2000: Center for Urban Transportation Research Report – 1998 Performance Evaluation of Florida's Transit System
APTA 2009: Recommended Practice for Quantifying Greenhouse Gas Emissions for Transit


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