

Evaluation of First-Year Florida MPO Transit Capacity and Quality of Service Reports

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ABSTRACT

As an application of the transit quality of service framework presented in the first edition of the *Transit Capacity and Quality of Service Manual* (TCQSM), the Florida Department of Transportation required all Metropolitan Planning Organizations (MPOs) in the state where fixed-route transit service operates to analyze those services based on the six measures identified in the TCQSM: service frequency, hours of service, service coverage, passenger loading, reliability (on-time performance/headway adherence), and transit versus auto travel time. This first-year evaluation compiles the analyses provided by the participating MPOs and provides an assessment of the aggregate performance of the transit systems. A larger part of the study focused on the examination of the actual process used by the MPOs and transit systems to evaluate their services. Recommended changes to improve and refine the process for future years are presented based on the first-time experiences of the MPOs. This evaluation serves as a model for other areas in the country interested in applying the customer-oriented assessment of transit based on the TCQSM.

Key words: performance—public transit—quality of service—transit capacity

INTRODUCTION

The Florida Department of Transportation (FDOT) is interested in the application of the new transit quality of service framework presented in the first edition of the *Transit Capacity and Quality of Service Manual* (TCQSM). This framework is seen as a tool to augment systematic evaluation of transit systems performed by FDOT. The goal is to provide a benchmark evaluation of transit systems within a specific time period such that the performance of the systems can be assessed from the transit users' point of view. FDOT required that the Florida Metropolitan Planning Organizations (MPOs) where fixed-route transit service operates coordinate an effort to evaluate those services within their regions with respect to the six measures identified in the TCQSM.

This study involved the collection, compilation, and analysis of these reports as gathered from the MPOs. The reports were examined to make preliminary assessments of the overall performance of the transit systems in the state in terms of these new measures. While individual system results are not presented, the six transit capacity and quality of service (TQOS) measures are presented in aggregate form for the state as a whole.

More than a general analysis and presentation of the results is contained herein; this study also sought to evaluate the *process* undertaken by the transit systems and MPOs in completing this effort. It is understood that the results from this first-time endeavor might not be as meaningful as results obtained in future attempts. This process is new for all involved and several issues arose which impeded the achievement of optimal results for most agencies. It was FDOT's intention to discover and implement the data collection and reporting methodologies that will lead to the most valid TCQS results with minimum effort by the participants. Possible remedies and improvements to the process, based on the experiences of this first year, are provided in the form of a series of recommendations.

The purpose of the TCQS measures is to establish a means of evaluating the quality of transit service, from the users' perspective, that can be comparable to the level of service measures used for roadways, which are also designed from the perspective of the user (i.e., level of congestion). It is the hope of FDOT that the routine implementation of this procedure in the future will lead to increased investment in transit services throughout the state by prompting the allocation of resources toward the improvement of transit services with poor TCQS measures, similar to the response when roadways are deemed to perform poorly. This study represents the first known statewide use of this new customer-oriented transit performance evaluation procedure, and the results of this project will be beneficial to other DOTs, MPOs, and transit systems throughout the country that may be interested in the application of the performance measures found in the TCQSM.

FDOT TRANSIT QUALITY OF SERVICE INITIATIVE

In 2001, FDOT required that Florida MPOs where fixed-route transit exists organize an effort to evaluate those fixed-route services in terms of the six transit quality of service measures in the TCQSM (1). The six TQOS measures evaluated are:

1. service coverage
2. service frequency
3. hours of service
4. transit travel time versus auto travel time
5. passenger loading
6. reliability (on-time performance or headway adherence)

The TQOS framework, as presented in the First Edition of the TCQSM (1), focuses on transit service availability, comfort, and convenience from the users' point of view and culminates in these six measures. The first three measures, service coverage, service frequency, and hours of service, relate to the availability of transit service to the user. The measures of travel time (transit versus auto), passenger loading, and reliability are associated with the comfort and convenience to the transit user. Each measure is expressed on a scale from "A" to "F," similar to roadway level of service measures, with "A" denoting the best quality of service and "F" representing the worst quality of service.

Each measure, except service coverage, was to be applied on a typical weekday p.m. peak period. Service coverage was evaluated for the typical weekday. A typical weekday was defined as Tuesday, Wednesday, or Thursday, and the p.m. peak period was defined from 4:00 p.m. to 6:00 p.m. The p.m. peak was chosen to mirror the p.m. peak period analysis procedures identified in FDOT's *Level of Service Handbook* for highways. The TCQS evaluations were to be conducted in March 2001, with a final report from each MPO area due to FDOT by July 1, 2001.

The evaluation process began with the selection of major activity centers in each study area. Large areas with populations of 200,000 or more were to select at least 10 activity centers, while smaller areas were to select at least 6 activity centers. The objective was to choose activity centers where demand is high for people in the community to travel to and travel from. Guidelines were provided for the areas to aid in the selection of the activity centers. Once the activity centers were chosen, trip pairs were developed from each activity center to all the other activity centers. From the local travel demand model, total trip demand (auto and transit), measured in trips per hour, was generated for each O-D pair.

The measures for service frequency quality of service (QOS), hours of service QOS, and transit travel times (for use in the travel time QOS measure) were developed using existing transit route maps and schedules produced by the individual transit systems for the public. Auto travel times, necessary to complete the process for calculating the Travel Time QOS measure, were derived from the local travel demand model.

Passenger loading and reliability data were required to be measured for only the 15 O-D pairs with the highest travel demands based on the model results. Measurements on these trip pairs were to be made at the maximum load point for trips departing the origin between 4:00 p.m. and 6:00 p.m. If a passenger would need to transfer from one transit route to another to complete the trip, data were collected for only the first segment of the trip. Reliability information was to be recorded using the arrival time of the vehicle at the maximum load point. Passenger loading QOS was calculated using automatic passenger counter (APC) data for two transit systems, while all others used field measurements. Reliability QOS could be calculated using automatic vehicle location (AVL) data, but all participating systems, except two, used field measurements. For both passenger loading and reliability, either 10 observations or three days of peak observations should have been made, whichever is greater.

Service coverage QOS most easily could be determined by using geographic information systems (GIS) technology. However, if GIS software was not available in an area, a manual method, described in the *Agency Reporting Guide* (2), could be applied. Two of the participants in this evaluation utilized the manual technique for measuring service coverage. Data on population, households, and employment was needed by geographical unit such as traffic analysis zone (TAZ) or census block group. While the reporting agencies were to indicate the type of data used and the year that the data represented, there was no specification as to exactly which data or which year should be used. This makes sense, since various areas around the state may have different types of data more easily available or more recent than others. However, the various data used by the participating agencies did not facilitate a consistent aggregation of the service coverage QOS for the state as a whole.

EVALUATION OF FIRST-YEAR TCQS REPORTS

This section addresses the process undertaken by the participating agencies and also analyzes the resulting TQOS measures. Each of the MPO's reports was collected and reviewed to provide an overall assessment of how well the MPOs and transit systems conducted the evaluation.

Review of the Process

All but one of Florida's MPOs that were required to participate in this effort did so and submitted a report to FDOT. This resulted in 17 MPO reports representing 18 fixed-route transit systems. While a few participants submitted only the completed evaluation spreadsheets, others prepared additional written materials ranging from a simple memorandum to detailed reports. The transit agencies represented in this evaluation are listed below.

- Broward County Transit
- Escambia County Area Transit
- Gainesville Regional Transit System
- Hillsborough Area Regional Transit Authority
- Jacksonville Transportation Authority
- Lakeland Area Mass Transit District
- Lee County Transit
- Lynx (Central Florida Regional Transit Authority)
- Manatee County Area Transit
- Miami-Dade Transit
- Ocala/Marion MPO (SunTran)
- Palm Beach County Transportation Agency
- Pasco County Public Transportation
- Sarasota County Area Transit
- Space Coast Area Transit
- Tallahassee Transit
- Volusia County dba VOTRAN
- Winter Haven Area Transit

All of the participating agencies selected at least the minimum number of activity centers. Several participants indicated that the auto travel times derived from the local models were suspect. The issue of comparability between the theoretically estimated auto travel times and the transit travel times recorded from actual transit schedules was a contentious one.

The compilation and reporting of the service frequency, hours of service, and transit travel time data for the O-D trip pairs were relatively straightforward, with the relevant information being readily available from published transit schedules. Complications tended to arise with the collection of the loading and reliability data for the top 15 O-D pairs, and stemmed from both the determination of the top 15 pairs and the methods applied to collect the pertinent information.

Review of the Statewide Results

To provide a benchmark evaluation of Florida transit systems, performance was analyzed using the six TQOS measures. As stated previously, these measures represent the passengers' point of view and are

denoted by a scale of “A” through “F,” with “A” representing the best service from the passenger’s perspective, and “F” representing the worst service.

Service Frequency QOS

This measure is one of the most relied upon when determining customer satisfaction, and improving frequency is often considered when transit systems wish to strengthen core ridership and attract new riders. While transit-dependent riders often must adjust to prevailing schedules, it is very difficult to attract choice riders with infrequent service. As Table 1 shows, nearly half of the trip pairs in the evaluation (48.4 percent) received a Service Frequency QOS E, meaning that service was available only once during the hour.

Hours of Service QOS

For those passengers who depend on transit service, inconvenient hours of operation require adjustments of activities and schedules to utilize the service. Those with alternative means of travel may simply opt not to use transit when the hours of service are limited. As Table 1 indicates, most of the trips in the evaluation (28.9 percent) represent systems in which daytime service is typical (QOS D). Nearly 40 percent of the total trips evaluated represent systems that provide some type of evening or night service on at least some routes (QOS A, B, or C).

Transit vs. Auto Travel Time

This measure compares the travel time between selected origins and destinations using both transit schedules and model-derived estimates for automobile travel. As mentioned previously, many participants expressed concern over the model estimates being used to calculate auto travel time. Some indicated that the only valid technique would be to determine auto travel times by actually test-driving an auto on the trip on the same day(s) transit measurements are taken. As identified in Table 1, nearly 30 percent of the trips evaluated for travel time would be considered QOS F. However, nearly five percent of trips evaluated were determined to be as fast or faster by transit than by auto (QOS A).

TABLE 1. Summary of All O-D Pairs: Service Frequency, Hours of Service, and Travel Time QOS

QOS	Service Frequency QOS			Hours of Service QOS			Travel Time QOS		
	State	Small	Large	State	Small	Large	State	Small	Large
A	1.1%	0.0%	2.6%	6.3%	0.7%	14.1%	4.9%	7.2%	1.7%
B	1.2%	0.4%	2.4%	11.3%	0.2%	27.0%	20.0%	25.6%	12.0%
C	12.7%	5.8%	22.5%	21.1%	17.2%	26.6%	17.1%	18.9%	14.4%
D	25.7%	24.4%	27.7%	28.9%	35.1%	20.3%	14.4%	13.0%	16.5%
E	48.4%	59.5%	32.8%	19.8%	29.6%	5.8%	13.7%	12.4%	15.6%
F	10.8%	10.0%	12.0%	12.6%	17.1%	6.2%	29.9%	22.9%	39.7%

Note: “State” denotes total pairs; “Small” is < 50 peak vehicle systems; “Large” is > 50 peak vehicles.

Passenger Loading QOS

While a crowded bus signals high ridership, in the case of this evaluation a crowded bus represents an undesirable situation for the transit passenger. For many participants, it was inconceivable that mostly empty transit vehicles warranted the better QOS. However, loading from the perspectives of the transit rider and transit provider represent two very different views. Since this evaluation represents the perspective of the passenger, QOS A indicates that there are so many seats available that passengers can choose where to sit and do not need to sit next to any other passenger(s). This condition exists until the vehicle is half full. At the other end of the spectrum, QOS F represents those situations where all seats are occupied and there are at least half that many more passengers standing in the transit vehicle.

As presented in Table 2, QOS A far exceeded the other levels of service with 83.9 percent of the observed trips. Very few of the agencies’ top trips were crowded such that QOS F was earned. In fact, the seven trips with QOS F came from one transit agency.

TABLE 2. Summary of Top 15 O-D Pairs: Passenger Loading and Reliability QOS

QOS	Passenger Loading QOS			Reliability QOS		
	State	Small	Large	State	Small	Large
A	83.9%	94.6%	67.1%	20.4%	24.8%	13.4%
B	9.0%	3.9%	17.1%	0.5%	0.0%	1.2%
C	1.4%	0.0%	3.7%	10.4%	10.9%	9.8%
D	0.0%	0.0%	0.0%	1.4%	0.0%	3.7%
E	2.4%	1.6%	3.7%	11.8%	13.2%	9.8%
F	3.3%	0.0%	8.5%	55.5%	51.2%	62.2%

Note: “State” denotes total pairs; “Small” is < 50 peak vehicle systems; “Large” is > 50 peak vehicles.

Reliability QOS

The reliability measure reflects a comparison of actual versus scheduled arrival times of transit vehicles at stops/stations that reflect the maximum load point of the first segment required to take the trip via transit. On-time performance is a critical factor when evaluating transit service, as it is indicative of the degree to which passengers can depend on the system. On-time performance is defined as the arrival of the transit vehicle within five minutes of the printed time on the schedule. The distribution of statewide Reliability QOS results in Table 2 reveals that, while the majority of the top trips made reflect poor reliability (55.5 percent received QOS F), there are several trips for which the agencies have been able to maintain a high level of on-time performance (20.4 percent received QOS A).

Service Coverage QOS

The final measure is indicative of passengers’ satisfaction related to whether the system provides service to the areas they want to go. The QOS measure for service coverage is the percent of the transit-supportive area served for each transit system. For this evaluation, an area is considered transit-supportive if it has a minimum population and/or employment density to support at least hourly service. A density of three housing units per acre or four employees per acre is required, and the area must be within walking

distance (within one-quarter mile of a bus stop or one-half mile of a rail or busway station) to transit service.

Table 3 shows that 5 of the 17 participating agencies (29.4 percent) represent QOS F, i.e., have coverage of less than 50 percent of the transit-supportive area. While this suggests that several agencies are not providing access to areas having sufficient population or employment activity, Table 3 also indicates that nearly 65 percent have coverage in at least 60 percent of their transit-supportive areas (at least QOS D).

TABLE 3. Summary of Service Coverage QOS Results

QOS	Statewide	Small Systems (< 50 Peak vehs.)	Large Systems (> 50 vehs.)
A	4 systems (23.5%)	2 systems (20.0%)	2 systems (28.6%)
B	0 systems (0.0%)	0 systems (0.0%)	0 systems (0.0%)
C	4 systems (23.5%)	3 systems (30.0%)	1 system (14.3%)
D	3 systems (17.6%)	1 system (10.0%)	2 systems (28.6%)
E	1 system (5.9%)	1 system (10.0%)	0 systems (0.0%)
F	5 systems (29.4%)	3 systems (20.0%)	2 systems (28.6%)
<i>Total</i>	<i>17 systems (100.0%)</i>	<i>10 systems (100.0%)</i>	<i>7 systems (100.0%)</i>

Note: “State” denotes total pairs; “Small” is < 50 peak vehicle systems; “Large” is > 50 peak vehicles.

CONCLUSIONS AND RECOMMENDATIONS

The first-year Transit Capacity and Quality of Service Evaluation proved to be a valuable learning experience for everyone involved: participating MPOs and transit systems, FDOT, and consultants and researchers who assisted in this effort. Undoubtedly, the developers of this evaluation process can also learn from this first statewide application of their work. While a summary of the statewide Florida TQOS results is included in this paper, significant emphasis is placed on the process of the evaluation itself. Exhaustive interviews were conducted with representatives of each participating agency (MPOs, transit systems, and consultants) to obtain insight as to how the process unfolded in each area and to identify obstacles, problems, and issues that arose. This section summarizes the major issues that surfaced during the course of the evaluation and presents a series of recommendations that will help ensure the most valid results from this process in the future.

1. The minimum number of activity centers seemed adequate. Regarding the selection process, some participants indicated that they looked at this task as a useful exercise to determine where people are coming from and going to, and to see how well transit serves those centers. However, some indicated that the temptation would be strong to select centers of activity already well served by the existing transit system so as to demonstrate better QOS measures. While FDOT is aware that QOS measures are not expected to be very strong statewide, at the local level, some individual agencies felt the need to look after their own interests and present their transit system in the most positive light for fear of local media gaining access to and misinterpreting the purpose and results of the evaluation. As a result, **it is recommended that activity centers be reselected for each evaluation, as appropriate, to reflect new growth and travel patterns. Also, it might be best for transit systems to have less involvement in the selection; the MPO or an objective party**

should oversee the selection process. A balance between origins and destinations should also be achieved.

2. From the O-D pairs derived according to the activity centers, the local travel demand model provides estimates of total travel demand (auto and transit) for each trip, which are then ranked. Passenger loading and reliability QOS measures are then applied to the 15 O-D pairs with the highest travel demands. While this seems straightforward, most of the participants in this evaluation experienced moderate to extreme difficulty in determining the travel times between the activity centers (models will measure between the centers of TAZs, not point-to-point) and expressed discontent that theoretically-estimated travel demands and travel times were being compared to actual transit loads and travel times. Some participants believe that, although it would be labor-intensive, the best way to do the comparisons would be to take field observations on auto travel between the activity centers, i.e., drive the trip in an auto on the same day(s) the transit observation(s) are made. The travel demand models in each individual area often use different years' data, are updated on different schedules, and provide results in varying forms. **Individual areas need to be aware of exactly what information the local model is providing, and must be sure that any peak and seasonal factors are applied as appropriate. Since this evaluation is primarily the MPOs' responsibility, MPO staff should take the lead in working with the model.**

3. Another issue deals with selection of the top 15 trips and the occurrence of both directions of movement between two activity centers in the top 15 trips. Movement between residential areas and employment centers is different between other pairs of destinations such as between an airport and a CBD, for example. Nonetheless, participants were to rank all of their O-D pairs and select the 15 pairs with the highest travel demands for further measurements. Passenger Loading and Reliability QOS results in this study represent only the top 15 trips. However, several participants analyzed the resulting top 15 O-D pairs and tweaked them to either remove one pair's direction of movement if both were included or to be sure that all activity centers were represented. The latter reason may deal more with the initial selection of activity centers if trips between some were not recognized in the top 15 pairs. **Otherwise, if the top 15 trips include both directions of movement between one or more pairs, and the travel demand results are not identical, then both trips should be included in the final analysis. To ensure consistency across agencies in the state, all participants should analyze their top 15 O-D pairs according to the model results. Further exploration is needed on this issue, and should be addressed in any future update of the *Agency Reporting Guide*.**

4. The time frame for the QOS measurements is the p.m. peak period as defined from 4:00 p.m. to 6:00 p.m. This ensures consistency with roadway traffic measurements. However, if one of the trips among an agency's top 15 is from a residential area to a center of employment, such as an industrial park or CBD, it is logical to assume that this trip has the highest travel demands in the a.m. peak. In such a case, the travel demand model is forecasting all-day demands without accounting for time period. One participant, which had such a trip, measured the reverse direction in the p.m. peak. This makes intuitive sense, but this problem would be eliminated if measurements could be taken in the a.m. peak, as well. Several agencies suggested the idea of including the a.m. peak. **It is recommended that participants analyze the resulting top 15 O-D pairs and determine the time period (a.m. versus p.m. peak) during which the individual trips would be expected to have the higher travel demands. Then, the trip could be measured during the appropriate time period. If no valid determination can be made, then the measurement should default to the p.m. peak period.**

5. Thresholds for passenger loading are determined using the square footage available per passenger or the number of passengers per seat. This accounts for standee loads and, understandably from the riders' perspective, the more crowded the vehicle, the lower the QOS. However, one's level of comfort with a crowded vehicle or even a standee load is usually inversely proportional to the length of the trip. To be certain, there are some individuals who would never be comfortable standing for any length of time. However, for many, standing for a shorter length of time can be acceptable. **Further exploration is needed to determine whether the length of the relevant trip or segment can be incorporated into measurements for Passenger Loading QOS.**

6. For the purposes of obtaining passenger loading and reliability information, if a transit trip between activity centers necessitated a transfer, measurements were to be taken at the maximum load point of the first segment required for the trip. Many participants believe that this methodology did not result in a meaningful representation of the entire trip. **For transit trips that include one or more transfers, it is recommended that service frequency and hours of service information be averaged over the routes required to accomplish the trips. The maximum load point along the entire trip should be determined, and then measurements for passenger loading and reliability taken on the segment that represents that maximum load point.**

7. Each agency was to collect field observations for passenger loading and reliability during March 2001. Several participants believe that this window of time is too short. For some, especially those with less service frequency, it was difficult to obtain the minimum number of observations within the time frame due to staffing issues. Systems with less frequent service could collect fewer observations per day and thus needed staff in the field for more days than the systems with higher peak frequencies. In addition, if trip observations were missed or collected incorrectly, there were often little or no other opportunities to collect the information as required. Some participants faced with this situation collected data after March 2001, while others substituted other O-D pairs outside the top 15 or simply completed the evaluation using the fewer number of observations. While the need to resample trips due to data collection error will undoubtedly decline as the TCQS process is refined and familiarity among the participants improves, **it is recommended that the time frame for collecting passenger loading and reliability data be increased from the current four-week time period to a six- or eight-week period.**

8. Yet another issue to consider regarding the time frame for collecting the data pertains to the varying peak months experienced by agencies in various geographic locations throughout the state. While locations in central and south Florida tend to experience peak travel demands and ridership between February and April, locations in northern Florida tend to experience spikes during the summer. It is understood that one of the intentions of this first-year effort was to examine a "snapshot" of transit performance across Florida. However, it was also the intention to measure typical weekday transit performance in the p.m. peak of the peak travel time. **If it is indeed the case that FDOT wishes to measure the performance of its transit systems during peak ridership months, then participants should be able to choose the time frame based upon individual agency ridership variations. Participating agencies would need to provide evidence that the selected time frame represents the ridership peak. In this case, the statewide results would be presented in terms of how well Florida's transit systems perform, overall, during their peak periods. The statewide results could be compiled at the end of a calendar or fiscal year to allow time for each participant to complete the evaluation.**

9. **If the recommendation to widen the window of time for the collection of field data is implemented to allow for a six- or eight-week time frame, then the requirement to collect the information only on Tuesdays, Wednesdays, or Thursdays should stand.** These three days are representative of the "typical" weekday and are the days used for collecting traffic information.

However, given the shorter four-week time period, it may be feasible to allow some systems to collect data on Mondays, as well. Several of the participants representing smaller areas indicated that their weekday ridership is flat, and that there is no statistical variation Mondays through Thursdays. These smaller areas also tend to have the less frequent transit services, necessitating additional data collection days to acquire the minimum number of observations. **It is recommended that, if a participating agency can show valid data to prove that Monday ridership is not statistically different from ridership on Tuesdays, Wednesdays, or Thursdays, then that participant should be able to use Mondays to collect field data. Data collection on Fridays would not be allowable.**

10. The reliability measurements caused problems for many. Reasons for the generally poor Reliability QOS results offered by participating agencies were numerous. Most indicated that transit schedules are not written for the peak periods and that “everyone” is always late during the peaks. Some observed that poor roadway LOS resulted in poor Reliability QOS since transit vehicles must negotiate the congested traffic conditions. Also, it is often the case that a maximum load point, where measurements should be taken, occurs at a transfer center, where several buses may meet for timed transfers. Often the transit vehicles wait for each other so if one runs late they all will be late. Another issue is when recovery time is built into a schedule so that a vehicle may arrive at a transfer center that represents a maximum load point more than five minutes early (designating it as not on-time according to many participants’ interpretation of the guidelines), but will leave on schedule. Finally, participants noted that, for example, being 30 minutes late is counted the same as being 6 minutes late. **The results of the reliability QOS measures should lead to a closer look at a system’s schedules to be sure they are realistic for peak conditions. Closer examination is needed of the threshold definitions of the reliability QOS measure. A sliding scale may be appropriate so that a worse QOS level is associated with a greater number of minutes late.**

11. Some participants in this evaluation speculated that the application of the TCQS measures to route segments between activity centers is not a complete representation of the transit service. Some believe that, by using the TCQS measures to evaluate whole routes, the results would be easier to understand and would render a more accurate portrayal of system performance. However, other participants realize that, to best evaluate how well transit serves the trips with the highest travel demands, it is necessary to evaluate the trip itself. As such, **this report recommends that the evaluation of the transit trips between major O-D pairs continue in subsequent evaluations.**

12. Results from the service coverage QOS analysis were difficult to interpret on a statewide level due to the fact that different methodologies and data representing various years were used by the participants. **Participating agencies should all use data representing the same year in calculating service coverage, if possible.**

13. Training courses and materials were provided to the participating agencies in advance of this first-time effort. Many participants had little trouble with the process and/or were pleased with the support provided. The training courses were, by all accounts, extremely helpful. However, some areas were unable to send representatives to the training, and they tended to encounter more difficulties during the evaluation. **It is recommended that, with the experience gained by all involved with this first-time effort, additional training be held in the future. Also, the Agency Reporting Guide should be updated to include new or modified procedures and a clarification of other issues.**

14. Strong opinions were voiced by participants regarding the fact that no additional funds were provided to the agencies to conduct this required evaluation, particularly by transit systems that had to shoulder a larger portion of the work involved in completing this effort. Perhaps a few of the

MPOs, realizing there were no new funds for this project, expected the transit systems to take on more of the tasks, resulting in the notion of “passing the buck,” as expressed by one participant. Costs to conduct this evaluation ranged from “negligible” to \$50,000, with an average of \$4,500. **Clearly, in some areas, a much higher level of resources was expended on this evaluation than should have been necessary. With proper advance planning and by taking advantage of less expensive local labor options if needed (e.g., college students, senior groups, volunteer organizations, etc.), costs should be kept at a minimum. It is anticipated that future efforts will cost less as participants prepare earlier and become more familiar with the process.**

15. The evaluation was originally intended to be an annual effort. However, given the fact that local travel demand models are not updated annually and the fact that transit services do not typically experience significant changes from year to year, the **benefits (i.e., useful information) from annual evaluations may outweigh the costs. Therefore, it is recommended that the TCQS Evaluation be conducted in full as part of the Long Range Transportation Plan Update process. Each agency that is expected to participate should be sure to plan appropriately for the proper collection and reporting of the TQOS measures.**

The items and recommendations presented herein are intended to provide an overall assessment of Florida transit performance in terms of the six TQOS measures included in the First Edition of the Transit Capacity and Quality of Service Manual. More importantly, this paper evaluates the process of the first-year statewide implementation of these measures and summarizes the experiences of those involved. It was the objective of this study to provide FDOT and other interested parties guidance on refining the process to extract meaningful and valid results in the future, with minimum effort. Overall, further research is needed in areas regarding the selection of O-D pairs, data collection for passenger loading and reliability, and the thresholds for the TQOS measures, particularly reliability and overall on-time performance issues. With better, consistent results, the aim of evaluating statewide transit service on an “A” through “F” scale, similar to roadway LOS, can move Florida closer to the ultimate goal of increasing investment in public transit services and can serve as a model for other states with the same objectives.

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