



Regional Transit Standards and Performance Measures

Phase II Report

DECEMBER 2014



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Table of Contents

Table of Contents	iii
Executive Summary	ES-1
1.0 Introduction	1
1.1 Objectives of the Study	1
1.2 Adopted Service Provision Goals	2
2.0 Transit Service Performance Measures	4
3.0 Transit Service Thresholds.....	8
4.0 Principles for the Application of Transit Standards, Performance Measures and Performance Thresholds	10
5.0 Implementation Standards for New Services	14
5.1 Review of Other Transportation Agency Methodologies.....	14
5.2 Valley Metro Region Analysis	18
5.3 Methodology for Estimating New Service Performance Potential.....	25
5.4 Methodology Testing	28
5.5 Implementation Standards for New Transit Service.....	30
5.6 Implementation Process for New Services	34
6.0 Phase III – Next Steps.....	36



Executive Summary

The development of Valley Metro's Transit Standards and Performance Measures (TSPM) was commenced for multiple purposes, including the necessity of developing a performance-based public transportation system consistent with federal and state requirements. The Moving Ahead for Progress in the 21st Century (MAP-21) federal transportation reauthorization bill furthers several important goals, including safety, state of good repair, performance and program efficiency. The act establishes performance-based planning requirements that align federal funding with key goals and tracks progress towards these goals. From the state perspective, the application of performance-based planning and programming was emphasized in the Arizona Auditor General's performance audit. The auditor's recommendation stated that "it does not appear that performance data is considered nor is a methodical, disciplined approach using set criteria in place to guide project priority decisions and changes to projects."

Working in cooperation with representatives from member agencies, Valley Metro initiated a process to establish agency transit service and capital standards and performance measures. In addition to the collaborative participation of member cities, Valley Metro also received input from a panel of peer agencies with experience in the formation and implementation of transit service standards and performance measures.

The scope of Valley Metro's transit service standards and performance measures effort requires the completion of the process through multiple phases. The initial phase, approved by the Valley Metro Boards in November 2013, considered elements critical to the establishment of transit service standards including the identification of service provision goals, service types (including minimum operating standards for each), preliminary performance measures and the process for evaluating and recommending service changes. The second phase, which is documented in this summary, focused on the development of transit service performance measures, transit service thresholds, application principles and implementation standards for new service. The next phase will focus on transit facility and fleet standards.



Adopted Service Provision Goals

Valley Metro adopted five service provision goals in 2013 as the first step in developing regional transit service standards and performance measures. The goals, outlined below, also serve as a means to guide the operation and development of Valley Metro-funded and operated public transportation services.

1. Implement services identified in the Regional Transportation Plan (RTP) in consideration of a performance-based system.
2. Give high priority to services that focus on the transit-dependent population.
3. Provide transit service that is desirable as an alternate mode to automobile travel.
4. Improve Valley Metro's overall performance and promote the long-term financial stability of the agency.
5. Promote expansion that builds existing services to meet standards and focuses new services in key areas, including the following:
 - Higher population density
 - Limited auto availability
 - Low income
 - Major activity centers

Transit Service Measures

Transit service performance measures are intended to assess the effectiveness of transit operations in achieving the adopted service provision goals, and help identify whether performance improvement actions taken to enhance performance and productivity are effective. Working in conjunction with the Transit Standards and Performance Measures (TSPM) Technical Advisory Group (TAG) and incorporating input received from peer Western U.S.

Table ES-1: Proposed Transit Service Measures and Planning Tools

Measures	Planning Tools
• Boardings/revenue mile • Boardings/revenue hour • Boardings/revenue trip* • Farebox recovery rate • On-time performance	• Boardings by stop • Boardings by time of day • Service connectivity • Subsidy per boarding • Zero-auto households served • Low-income households served • Elderly persons served • Youth served • Persons with mobility disability served • Peak load factor • Headways/trips • Service span • Operating days • Population density • Employment density • Activity centers served

**For commuter express and limited stop peak services only*

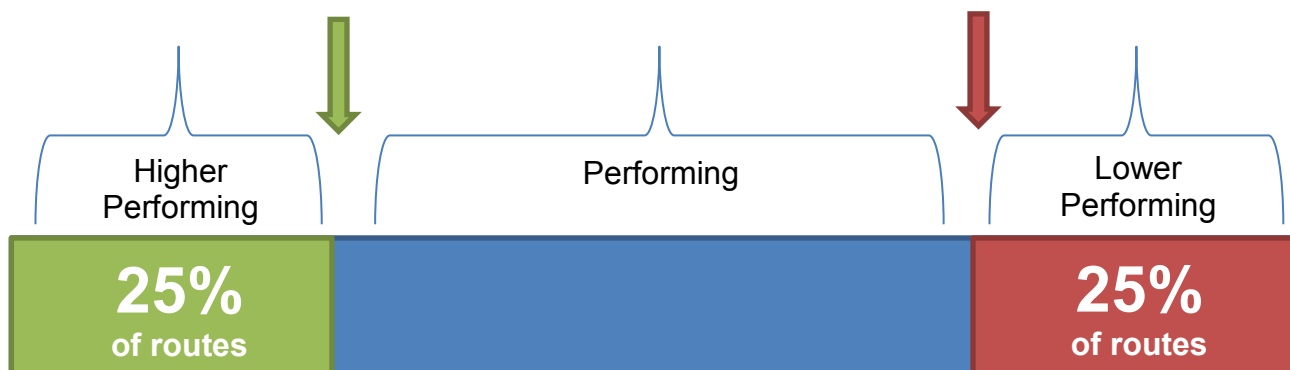
transit agencies, several transit service performance measures have been developed. The performance measures are intended to be applied separately for each transit service type

(the adopted transit service types are described in the TSPM Phase 1 Final Report and Executive Summary). In addition to the performance measures, a set of planning tools has been identified to assist with detailed evaluation of existing services or operations or to assess the potential performance of new or expanded services being contemplated. The proposed service performance measures and planning tools are listed in **Table ES-1**.

Transit Service Thresholds

Transit service thresholds serve as a tool for comparing and measuring the relative performance of individual services/operations by transit service type. The transit service performance thresholds developed by Valley Metro rely on a numerical ranking of each performance measure for each route or service within their respective service type category. Thresholds will be established at quartile breakpoints for each transit service type to identify the top 25% and bottom 25% performers. **Figure ES-1** illustrates the quartile-based performance threshold concept.

Figure ES-1: Transit Service Performance Thresholds



It is proposed that all routes or services operated within the region, regardless of operating agency or funding source, be reviewed using the five performance measures and thresholds described above. Routes or services that are operated by Valley Metro and/or funded, all or in part, by legislatively authorized Valley Metro regional transit funds (currently includes the Public Transportation Fund and State Lottery Fund) that are within the top 25% or bottom 25% (by service type) of any two of the five performance measures identified in **Table ES-1** will be further evaluated using the planning tools (also identified in Table ES-1) or other relevant qualitative or quantitative metrics (e.g. service evaluation by day of week). Based on the additional evaluation of the higher performing and lower performing routes/services, potential performance improvement actions will be identified cooperatively with all affected jurisdictions/agencies, and later, discussed with the Valley Metro Service Planning Working Group (SPWG). As applicable, performance improvement

actions will be submitted for Valley Metro Board approval through the bi-annual service change process and annual Transit Life Cycle Program (TLCP) update process. Locally operated and funded transit services will be included in the performance measurement process, but the development of local performance improvement actions and implementation of any actions will be at the sole discretion of the affected local jurisdiction. Valley Metro will provide planning assistance for locally funded/operated services if requested by the local jurisdiction.

As part of the first TSPM update, which is expected to be conducted two years after the approval of the Phase II recommendations, Valley Metro will have had the opportunity to track the performance measures over multiple years. Valley Metro will work with member agencies to prepare targets (or baselines) by service type, to identify transit services that are underperforming for each of the performance measures. By transitioning to a target based approach, routes or services will be measured against a performance standard as opposed to being measured against each other.

Principles for the Application of Transit Standards, Performance Measures and Performance Thresholds

The application of the adopted transit service standards and the performance measures and performance thresholds had previously been segregated during the TSPM development process to minimize the potential for biasing the results to produce a particular outcome. The application principles for guiding how the transit service standards and performance measures are to be applied are defined in seven categories:

1. General Application Principles

- The application of the transit service standards and performance measures will be consistent with, and adhere to, the Valley Metro Board-adopted TLCP policies.

2. Services/Operations Subject to Transit Standards and Performance Measures

- All transit services that are, or will be, funded all or in part, by legislatively authorized Valley Metro regional transit funding sources (Public Transportation Fund and State Lottery Fund).
- Local jurisdictions that fully fund and operate transit services are also encouraged to adopt the regional transit service standards and performance measures for their services.

3. Prioritization of New Services

- New transit services include routes not currently in operation or any material service change (defined in the adopted TLCP policies as a 25% or greater change in a route's service level). As concepts for new services are identified, the process for assessing performance potential will be applied to determine the recommended transit service type for implementation. The implementation of all new services will be consistent with the adopted TLCP policies, including jurisdictional equity and the TSPM application principles. New transit services identified by Valley Metro member agencies and Valley Metro staff will be considered in coordination with the regional transit service planning process, which includes the following:
 - i. annual transit service performance review initiated through the Service Planning Working Group (SPWG); and,
 - ii. annual update of the Valley Metro Five-year Short Range Transit Program, Fleet Management Plan and TLCP.
- New services are proposed to be prioritized based on three levels of evaluation. First, consistent with adopted TLCP policies, determine if there is available jurisdictional equity within the communities to be served by the proposed new service. The second level of evaluation includes determining if the proposed new service is included in the RTP (consistent with adopted TLCP policies and TSPM Service Provision Goal #1). The third level of evaluation includes an assessment of potential performance using the planning tools associated with TSPM Service Provision Goals #2 and #5. These tools include transit service connectivity, population density, employment density and activity centers served, zero-auto households, low-income population, elderly persons, youth (persons under 16) and persons with mobility disability. The performance assessment for each proposed service improvement will be conducted collaboratively with the affected local jurisdictions to be used as a decision-making aid. However, all light rail service adjustments will be subject to action by the Valley Metro Rail Board of Directors, even though the operation is funded by the local jurisdictions.
- The prioritization of regional transit fleet will be defined during Phase III of the TSPM.

4. Transit Service Standards for New and Existing Services

- New services will be expected to meet the Board-adopted transit service standards upon implementation; however, exceptions will be considered for weekend service levels. A new service may have limited weekend demand; therefore, it is proposed that weekend service standards may be relaxed until there is reasonable and sufficient demand to support weekend service above the lower performance threshold.
- A route is designated as “performing” if it has no more than one performance measure ranked in the bottom quartile by service type.
- New services or material service changes (as defined in the adopted TLCP policies) to an existing route will be expected to attain a “performing” level within three (3) years of implementation. If the service has not attained a “performing” level within the first three years of operation, performance improvement actions should be identified and applied to help improve service performance for one or more measurements (see Performance Improvement Actions below).
- If after three (3) years, the route has still not achieved “performing” status or showing improvement, Valley Metro and staff from the affected jurisdiction(s) will work together to determine if the route will be further modified, eliminated, or remain in service. If it is agreed that the route will be eliminated, Valley Metro and the affected local jurisdiction(s) staff will identify alternative uses within said jurisdiction(s) for any funding saved by eliminating the route.
- Routes that do not achieve a “performing” level after three (3) years of continuous operation, but are showing improvement in one or more performance-measurement category, will continue to be monitored and evaluated to determine if there are any additional performance improvement actions that can be implemented.
- Existing services that do not meet service standards, but are “performing”, will not be required to meet service standards.
- Consistency with adopted transit service standards is recommended for all locally funded transit services; however, this is at the discretion of the local funding agency.

5. Transit Performance Measures and Thresholds

- All routes or services operated within the region, regardless of operating agency or funding source, will be reviewed annually using the five proposed performance measures and performance thresholds.
- Locally operated and funded transit services will be included in the performance measurement process, but the development of local performance improvement

actions and implementation of any actions will be at the sole discretion of the associated local jurisdiction. However, all light rail service adjustments will be subject to action by the Valley Metro Rail Board of Directors, even though the operation is funded by the local jurisdictions.

- Routes or services that are operated by Valley Metro and/or funded in full or in part by legislatively authorized Valley Metro regional transit funds that are within the top 25% or bottom 25% (by service type) of any two of the five performance measures will be further evaluated using the proposed planning tools or other relevant qualitative or quantitative metrics (e.g., service evaluation by day of week).
- Prior to conducting additional performance evaluation of the top 25% or bottom 25% (by service type) routes, the performance data will be reviewed for accuracy. If further review of the data identifies that it is inaccurate and the route is in fact “performing,” then no additional evaluation will be conducted for that service. Valley Metro and the City of Phoenix are actively working together to improve the reliability of data collection to assure inaccuracies are minimized in the future.
- Based on the additional evaluation of the higher performing and lower performing routes/services, performance improvement actions will be identified cooperatively with all affected jurisdictions/agencies, and later, with the Service Planning Working Group (SPWG).
- Valley Metro will provide planning assistance for locally funded/operated services if requested by the local jurisdiction.

6. Performance Improvement Actions

- Performance improvement actions will be identified collaboratively between Valley Metro and the affected jurisdictions. Performance improvement actions may include targeted marketing, schedule adjustments, frequency, service span and days of operation adjustments and rerouting (including route extensions and route segment terminations).
- If performance improvement actions prove to be unsuccessful (did not improve performance in one or more performance measurement category), potential reinvestment of resources into other services within the same jurisdiction(s) will be collaboratively explored with the affected jurisdiction(s) to maintain jurisdictional equity as defined by the adopted TLCP policies, and if agreed to, will be submitted to the Valley Metro Rail Board of Directors (if applicable) and/or the Valley Metro RPTA Board of Directors for possible action.



- Performance improvement actions will be developed collaboratively with affected jurisdictions, and if agreed to, will be coordinated with the SPWG prior to submitting to the Valley Metro Rail Board of Directors (if applicable) or Valley Metro RPTA Board of Directors for possible action as part of the bi-annual service change process and annual TLCP update.

7. Implementation of Transit Service Standards and Performance Measures

- It is intended that the proposed transit service performance measures, performance measure thresholds, thresholds for determining potential service types for proposed new services and application principles be adopted by the Valley Metro Boards by fall 2014 and implemented for planning service adjustments scheduled to take effect in fall 2015.
- The policies and procedures associated with the TSPM, including the application principles, will be reviewed and updated, as needed, through the SPWG or other collaborative Valley Metro member agency working groups.

Implementation Standards for New Service

Based upon a review of peer transit agency methodologies and an analysis of transit service performance in the Valley Metro region, service implementation standards for new services were identified for each of the fixed-route service types identified in Phase I of this project. The implementation standards define thresholds for new services, which include any new proposed transit service or major service change as defined by the adopted TLCP policies. These thresholds will be used to classify the type of service appropriate for any proposed new transit service using performance-based quantitative and qualitative measures. The thresholds are recommended for classifying services proposed to be implemented within five years from the date proposed. Thresholds for long-term service concepts (beyond five years) have not been developed yet. Summary descriptions of the recommended criteria for each service type are summarized in **Table ES-2**. A complete description of the implementation standards for new services are included the full Phase II report.

Table ES-2. Recommended Thresholds for New Services

Service Type	Thresholds for New Services
Key Local	• Projected Boardings/Revenue Mile > 90% of Bottom Quartile Threshold
Local	• Projected Boardings/Revenue Mile > 90% of Bottom Quartile Threshold
Light Rail	• Determined through the completion of corridor-specific transit planning studies and through incorporation into the Regional Transportation Plan (RTP)

Service Type	Thresholds for New Services
Limited Stop All Day	- Key local service operating in corridor has boardings/revenue mile $\geq$ Top Quartile Threshold - Demand exceeding capacity on existing services in corridor
Limited Stop Peak	- Key local service operating in corridor has boardings/revenue mile $\geq$ Top Quartile Threshold - Demand exceeding capacity on existing services in corridor OR - Existing commuter-based market on a non-freeway corridor - Estimated 6,400 person trips in market - Corridor greater than 8 miles in length - Serve top 10 regional employment center
Commuter Express	- Must serve a top 10 employment district - Existing commuter-based market on a freeway corridor - Estimated 6,400 person trips in market - Corridor greater than 8 miles in length
Community Circulator	- Based on market demand - Routing structure connects neighborhoods to local or regional activity centers and resources - Proposed new routes that are generally less than 10 miles in length that fall below the projected boardings per revenue mile for local service would be a candidate for community circulator standard of service, to help build a future market for transit use
Rural Connector	- Connect a rural community into the regional transit network - Based on market demand
Demand Response/Flex Route	- Serves low-density (4 DU/Acre or lower) areas without fixed-route transit service or other available transit service options - Can help build future demand for local transit market
Vanpool	- Serves groups of 6 to 15 persons with a common destination - Provides a commuter express-type option for limited-demand worksites not necessarily located within one of the top 10 regional employment centers

Next Steps

The process for the Transit Service Standards and Performance Measures study was divided into multiple phases. Board approval of the elements discussed and recommended in this report will conclude Phase II of the process. Phase III will focus on the development of regional standards and performance measures for capital facilities and transit fleet. These items will be evaluated and analyzed in coordination with the TAG and are projected to be complete in FY16. The transit service standards and performance measures will be updated regularly as appropriate to assure they are consistent with Valley Metro's evolving goals.

1.0 Introduction

The development of Valley Metro's Transit Standards and Performance Measures (TSPM) was commenced for multiple purposes, including the necessity of developing a performance-based public transportation system consistent with federal and state requirements. The Moving Ahead for Progress in the 21st Century (MAP-21) federal transportation reauthorization bill furthers several important goals, including safety, state of good repair, performance and program efficiency. The act establishes performance-based planning requirements that align federal funding with key goals and tracks progress towards these goals. From the state perspective, the application of performance-based planning and programming was emphasized in the Arizona Auditor General's performance audit. The auditor's recommendation stated that "it does not appear that performance data is considered nor is a methodical, disciplined approach using set criteria in place to guide project priority decisions and changes to projects."

In a movement towards a regional performance-based approach, the Valley Metro Regional Public Transportation Authority (RPTA) Board of Directors and Valley Metro Rail Board of Directors adopted new transit service provision goals and service standards for Valley Metro-funded transit operations in 2013. The adopted transit service provision goals and service standards are documented in the TSPM Phase 1 Final Report and Executive Summary. Since the adoption of these goals and standards, Valley Metro has undertaken efforts to develop transit service measures, transit service thresholds and implementation standards for new services as a part of Phase II of the TSPM study. It is these efforts that are summarized herein. The application of the transit service standards and performance measures will be consistent with, and adhere to, the Valley Metro Board-adopted Transit Life Cycle Program (TLCP) policies.

1.1 Objectives of the Study

The objectives of the TSPM study are as follows:

- To develop a series of transit service standards that guides the development of existing and future transit service operations.
- To develop measures that can be utilized to assess the performance of existing and future transit services.
- To develop regional processes for implementing, modifying and constructing transit services and facilities.



- To provide transit system performance information to policy makers, member agencies, and the public in an integrated format.

To assist in this effort, a Technical Advisory Group (TAG) was formed with representatives from Valley Metro partner organizations and member jurisdictions, the Maricopa Association of Governments (MAG), and the Arizona Department of Transportation. The TAG generally met monthly to provide guidance and input on the study process. Due to the complexity of the project, the TAG determined that a multi-phased approach to the study was appropriate. In Phase I, completed in 2013, the TAG focused on the operational characteristics of selected transit modes, which culminated in the adoption of transit service provision goals and service standards. Phase II of the TSPM study, the efforts of which are summarized herein, focused on the development of transit service measures, transit service thresholds, and implementation standards for new service. Finally, upon completion of Phase II, Phase III will be undertaken and focus primarily on facility, fleet, and urban design standards with an expected completion date in FY16.

Valley Metro staff engaged member agencies individually and collectively through the TSPM TAG throughout the entire TSPM development process. Input received from member agencies has been taken into consideration and helped shape the recommendations for both the previous and current phase of work. During Phase II, member agency input was received on a wide range of elements ranging from reiterating the purpose of the regional TSPM effort to availability of quality data. The primary input/comments submitted by member agencies and the associated responses and/or actions taken based on the input received are summarized in Appendix A.

1.2 Adopted Service Provision Goals

Valley Metro adopted five service provision goals in 2013 as the first step in developing regional transit service standards and performance measures. The goals, outlined below, also serve as a means to guide the operation and development of Valley Metro-funded and operated public transportation services.

1. Implement services identified in the RTP in consideration of a performance-based system.
2. Give high priority to services that focus on the transit-dependent population.
3. Provide transit service that is desirable as an alternate mode to automobile travel.
4. Improve Valley Metro's overall performance and promote the long-term financial stability of the agency.
5. Promote expansion that builds existing services to meet standards and focuses new services in key areas, including the following:



- Higher population density
- Limited auto availability
- Low income
- Major activity centers

2.0 Transit Service Performance Measures

Transit service performance measures are intended to assess the effectiveness of transit operations in achieving the adopted system goals, and help identify whether performance improvement actions taken to enhance performance and productivity are effective. Working in conjunction with the TSPM TAG and incorporating input received from peer Western U.S. transit agencies, several transit service performance measures have been developed. The performance measures are intended to be applied separately for each transit service type (the adopted transit service types are described in the TSPM Phase 1 Final Report and Executive Summary). In addition to the performance measures, a set of planning tools has been identified to assist with a more detailed service evaluation of existing services or operations or to assess the potential future performance of new or expanded services or operations being contemplated. A detailed summary of the adopted service provision goals, objectives, and measures is provided in **Table 1** below.

Table 1. Adopted Service Provision Goals and Transit Service Measures and Planning Tools

Adopted Service Provision Goals	Objectives	Applicable Service Types	Measures / Planning Tools (measures in bold text)	Level of Analysis	Frequency of Reporting	Primary Data Source	Thresholds ¹
Implement services in the Regional Transportation Plan (RTP) in consideration of a performance-based system	Meet or exceed ridership levels as determined by ridership thresholds established by applicable service mode	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Normalized Boardings</u> Boardings/revenue mile Boardings/revenue hour Boardings/trip - Boardings by stop - Time of day	Route, Route Segment	Quarterly	VM Monthly Ridership Report	TBD
	Meet or exceed farebox recovery levels as determined by Valley Metro's adopted target for farebox recovery by applicable service mode	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Fare Recovery Percentage and Subsidy</u> Farebox Recovery Rate (Fares collected/operating cost) - Subsidy per Boarding (Net cost/boarding)	Route	Quarterly	VM Monthly Ridership Report & Transit Provider	TBD
Give high priority to services that focus on the transit-dependent population	Serve low-income, zero-auto households, elderly, youth, and persons with mobility disabilities (as determined by the established thresholds for service area by route type measures)	Rural Connector Community/Circulator Local Bus Key Local Bus Light Rail Transit	<u>Transit-Dependent Population Served – Composite Score</u> - Composite score derived from comparing population served for each individual route to the average population characteristics by service type - Zero-auto Households Served - Low-income Population Served - Elderly Persons Served - Youth [persons under 16] - Persons with Mobility Disability Served	Service Type, Route	Annually	US Census	TBD
			<u>Elderly, Youth, and Persons with Disabilities</u> Reduced fare paid compared to full fare	Route Segment	Quarterly	VM Monthly Ridership Report	TBD
As a secondary priority, provide transit service that is desirable as an alternate mode to automobile travel	Provide transit services that offer reliable travel times and transfer connections (<i>Definition: Reliability is determined by the current established threshold for on-time performance</i>)	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>On-time Performance</u> Percent of scheduled trips on-time	Service Type, Route, Route Segment	Quarterly	VMS & Transit Provider	TBD
	Provide transit service options that offer travel times (bus stop to destination) competitive with single occupied vehicle travel ¹	Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Travel Time Difference (SOV : transit)</u> Total minutes	Service Type, Route, Route Segment	Quarterly	Transit Provider	TBD



Adopted Service Provision Goals	Objectives	Applicable Service Types	Measures / Planning Tools (measures in bold text)	Level of Analysis	Frequency of Reporting	Primary Data Source	Thresholds ¹
	Provide secure transit services (Definition: Security is determined by the current established threshold for the number of public safety incidents per 100,000 miles of revenue service)	Paratransit Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Transit Security and Police Incidents</u> Number of security incidents/year	Route	Quarterly	Transit provider	TBD
	Provide comfortable passenger trips through adequate seating availability (Definition: Comfort is determined by the current established threshold for peak load factor)	Commuter Express	<u>Peak Load Factor</u> Passengers/seats	Route	Quarterly	Transit provider	TBD
Improve Valley Metro's overall performance and promote the long-term financial stability of the agency	Meet or exceed ridership levels as determined by ridership thresholds established by applicable service mode	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Normalized Boardings</u> - Boardings/revenue mile - Boardings/revenue hour - Boardings/trip	Service Type, System	Monthly, Annually	VM Monthly Ridership Report	TBD
	Meet or exceed Valley Metro's adopted target for farebox recovery	Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Normalized Operating Cost</u> - Net cost/revenue mile - Net cost/revenue hour	Service Type, System	Monthly, Annually	VM Monthly Ridership Report & Transit Provider	TBD
			<u>Fare Recovery Percentage and Subsidy</u> - Farebox Recovery Rate (Fares collected/operating cost) - Subsidy per Boarding (Net cost/boarding)	Service Type, System	Monthly, Annually	VM Monthly Ridership Report & Transit Provider	TBD
Promote expansion that builds existing services to meet standards and focuses new services in key areas - Higher population density - Limited auto availability - Low income - Major activity centers	Meet Phase 1 regional transit service standards as adopted by Valley Metro Boards	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Service Standards</u> - Minimum headways or trips - Service span - Operating days	Route, Route Segment	Annually	Transit provider	TBD
	Serve low-income or zero-auto households	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Low-income Population Served</u> Percentage of route length serving above average low-income household census tracts	Route, Route Segment	Prior to service change or new service implementation	US Census	TBD
			<u>Zero-auto Households Served</u> Percentage of route length serving above average zero-auto household census tracts	Route, Route Segment	Prior to service change or new service implementation	US Census	TBD



Adopted Service Provision Goals	Objectives	Applicable Service Types	Measures / Planning Tools (measures in bold text)	Level of Analysis	Frequency of Reporting	Primary Data Source	Thresholds ¹
	Provide regional connectivity	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Transit Route Connectivity</u> Number of direct transit route connections	Route	Prior to service change or new service implementation	Valley Metro	TBD
	Serve population and employment areas (transit service demand)	Rural Connector Community/Circulator Local Bus Key Local Bus Limited Stop Peak Limited Stop All-Day Commuter Express Light Rail Transit	<u>Population Density</u> Population/sq mi	Route, Route Segment	Prior to service change or new service implementation	MAG	TBD
			<u>Employment Density</u> Jobs/sq mi	Route, Route Segment	Prior to service change or new service implementation	MAG	TBD
			<u>Activity centers served²</u> Number and size of activity centers	Route, Route Segment	Prior to service change or new service implementation	MAG	TBD

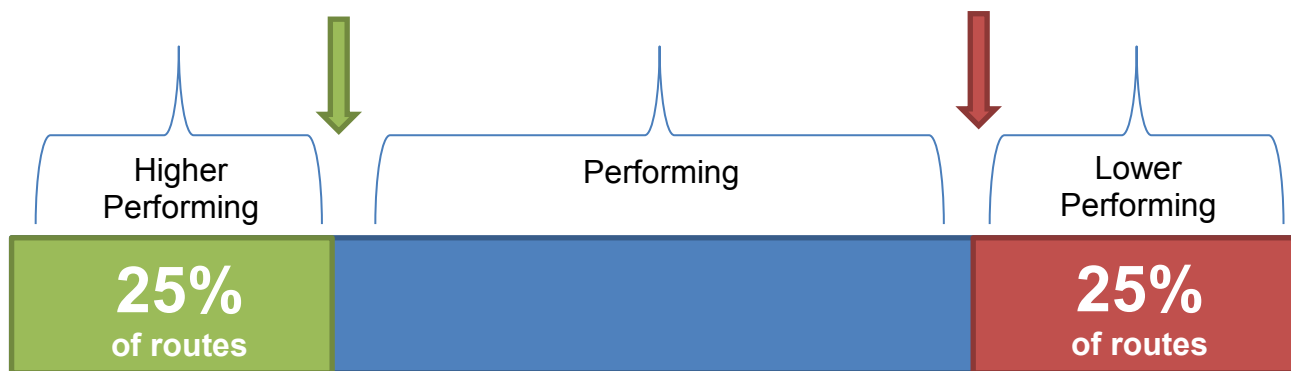
¹ Thresholds to be determined by range of actual data values (see Section 3.0 – Transit Service Thresholds).

3.0 Transit Service Thresholds

Transit service thresholds serve as a tool for comparing and measuring the relative performance of individual services/operations by transit service type. The transit service types adopted by the Valley Metro Board as part of TSPM Phase 1 include: rural connector, community/circulator, local bus, key local bus, limited stop peak period, limited stop all-day, commuter express and light rail transit. Dial-a-Ride performance measures and thresholds will be identified through the upcoming Paratransit Plan Update.

The Valley Metro transit service performance thresholds rely on a numerical ranking of each performance measure for each route or service within their respective service type category. Thresholds will be established at quartile breakpoints for each transit service type to identify the top 25% and bottom 25% performers. **Figure 1** illustrates the quartile-based performance threshold concept.

Figure 1: Transit Service Performance Thresholds



It is proposed that all routes or services operated within the region, regardless of operating agency or funding source, be reviewed using the five performance measures and thresholds described above. Routes or services that are operated by Valley Metro and/or funded, in part, by legislatively authorized Valley Metro regional transit funds (currently includes the Public Transportation Fund and State Lottery Fund) that are within the top 25% or bottom 25% (by service type) of any two of the five performance measures identified in **Table 1** will be further evaluated using the planning tools (also identified in Table 1) or other relevant qualitative or quantitative metrics (e.g. service evaluation by day of week). Based on the additional evaluation of the higher performing and lower performing routes/services, potential performance improvement actions will be identified cooperatively with all affected jurisdictions/agencies, and later, discussed with the Valley Metro SPWG. Locally operated and funded transit services will



be included in the performance measurement process, but the development of local performance improvement actions and implementation of any actions will be at the sole discretion of the affected local jurisdiction. Valley Metro will provide planning assistance for locally funded/operated services if requested by the local jurisdiction.

As part of the first TSPM update, which is expected to be conducted two years after the approval of the Phase II recommendations, Valley Metro will have had the opportunity to track the performance measures over multiple years. Valley Metro will work with member agencies to prepare targets (or baselines) by service type, to identify transit services that are underperforming for each of the performance measures. By transiting to a target based approach, routes or services will be measured against a performance standard as opposed to being measured against each other.

4.0 Principles for the Application of Transit Standards, Performance Measures and Performance Thresholds

The application of the adopted transit service standards and the performance measures and performance thresholds had previously been segregated during the TSPM development process to minimize the potential for biasing the results to produce a particular outcome. The application principles for guiding how the transit service standards and performance measures are envisioned to be applied are outlined in this section. The application principles are categorized as follows:

- General Application Principles
- Services/Operations Subject to Transit Standards and Performance Measures
- Prioritization of New Services
- Transit Service Standards for New and Existing Services
- Transit Performance Measures and Thresholds
- Performance Improvement Actions
- Implementation of Transit Service Standards and Performance Measures

These categories and their respective application principles are summarized below.

General Application Principles

8. The application of the transit service standards and performance measures will be consistent with, and adhere to, the Valley Metro Board-adopted TLCP policies.

Services/Operations Subject to Transit Standards and Performance Measures

- All transit services that are, or will be, funded all or in part, by legislatively authorized Valley Metro regional transit funding sources (Public Transportation Fund and State Lottery Fund).
- Local jurisdictions that fully fund and operate transit services are also encouraged to adopt the regional transit service standards and performance measures for their services.

Prioritization of New Services

- New transit services include routes not currently in operation or any material service change (defined in the adopted TLCP policies as a 25% or greater change in a route's service level). As concepts for new services are identified, the process for assessing performance potential will be applied to determine the recommended transit service type for implementation. The implementation of all new services will be consistent with the adopted TLCP policies, including jurisdictional equity, and the TSPM application

principles. New transit services identified by Valley Metro member agencies and Valley Metro staff will be considered in coordination with the regional transit service planning process, which includes the following:

- annual transit service performance review initiated through the SPWG; and,
 - annual update of the Valley Metro Five-year Short Range Transit Program, Fleet Management Plan and TLCP.
- New services are proposed to be prioritized based on three levels of evaluation. First, consistent with adopted TLCP policies, determine if there is available jurisdictional equity within the communities to be served by the proposed new service. The second level of evaluation includes determining if the proposed new service is included in the RTP (consistent with adopted TLCP policies and TSPM Service Provision Goal #1). The third level of evaluation includes an assessment of potential performance using the planning tools associated with TSPM Service Provision Goals #2 and #5. These tools include transit service connectivity, population density, employment density and activity centers served, zero-auto households, low-income population, elderly persons, youth (persons under 16) and persons with mobility disability. The performance assessment for each proposed service improvement will be conducted collaboratively with the affected local jurisdictions used as a decision-making aid. However, all light rail service adjustments will be subject to action by the Valley Metro Rail Board of Directors, even though the operation is funded by the local jurisdictions.
- The prioritization of regional transit fleet will be defined during Phase III of the TSPM.

Transit Service Standards for New and Existing Services

- New services will be expected to meet the Board-adopted transit service standards upon implementation; however, exceptions will be considered for weekend service levels. A new service may have limited weekend demand; therefore, it is proposed that weekend service standards may be relaxed until there is reasonable and sufficient demand to support weekend service above the lower performance threshold.
- A route is designated as “performing” if it has no more than one performance measure ranked in the bottom quartile by service type.
- New services or material service changes (as defined in the adopted TLCP policies) to an existing route will be expected to attain a “performing” level within three (3) years of implementation. If the service has not attained a “performing” level within the first three years of operation, performance improvement actions should be identified and applied to help improve service performance for one or more measurements (see Performance Improvement Actions below).
- If after three (3) years, the route has still not achieved “performing” status or showing improvement, Valley Metro and staff from the affected jurisdiction(s) will work together to

determine if the route will be further modified, eliminated, or remain in service. If it is agreed that the route will be eliminated, Valley Metro and the affected local jurisdiction(s) staff will identify alternative uses within said jurisdiction(s) for any funding saved by eliminating the route.

- Routes that do not achieve a “performing” level after three (3) years of continuous operation, but are showing improvement in one or more performance-measurement category, will continue to be monitored and evaluated to determine if there are any additional performance improvement actions that can be implemented.
- Existing services that do not meet service standards, but are “performing”, will not be required to meet service standards.
- Consistency with adopted transit service standards is recommended for all locally funded transit services; however, this is at the discretion of the local funding agency.

Transit Performance Measures and Thresholds

- All routes or services operated within the region, regardless of operating agency or funding source, will be reviewed annually using the five proposed performance measures and performance thresholds.
- Locally operated and funded transit services will be included in the performance measurement process, but the development of local performance improvement actions and implementation of any actions will be at the sole discretion of the associated local jurisdiction. However, all light rail service adjustments will be subject to action by the Valley Metro Rail Board of Directors, even though the operation is funded by the local jurisdictions.
- Routes or services that are operated by Valley Metro and/or funded in full or in part by legislatively authorized Valley Metro regional transit funds that are within the top 25% or bottom 25% (by service type) of any two of the five performance measures will be further evaluated using the proposed planning tools or other relevant qualitative or quantitative metrics (e.g., service evaluation by day of week).
- Prior to conducting additional performance evaluations of the top 25% or bottom 25% (by service type) routes, the performance data will be reviewed for accuracy. If further review of the data identifies that it is inaccurate and the route is, in fact, “performing,” then no additional evaluation will be conducted for that service. Valley Metro and the City of Phoenix are actively working together to improve the reliability of data collection to assure inaccuracies are minimized in the future.
- Based on the additional evaluation of the higher performing and lower performing routes/services, performance improvement actions will be identified cooperatively with all affected jurisdictions/agencies, and later, with the SPWG.

- Valley Metro will provide planning assistance for locally funded/operated services if requested by the local jurisdiction.

Performance Improvement Actions

- Performance improvement actions will be identified collaboratively between Valley Metro and the affected jurisdictions. Performance improvement actions may include targeted marketing, schedule adjustments, frequency, service span and days of operation adjustments and rerouting (including route extensions and route segment terminations).
- If performance improvement actions prove to be unsuccessful (did not improve performance in one or more performance measurement category), potential reinvestment of resources into other services within the same jurisdiction(s) will be collaboratively explored with the affected jurisdiction(s) to maintain jurisdictional equity as defined by the adopted TLCP policies, and if agreed to, will be submitted to the Valley Metro Rail Board of Directors (if applicable) and/or the Valley Metro RPTA Board of Directors for possible action.
- Performance improvement actions will be developed collaboratively with affected jurisdictions, and if agreed to, will be coordinated with the SPWG prior to submitting to the Valley Metro Rail Board of Directors (if applicable) or Valley Metro RPTA Board of Directors for possible action as part of the bi-annual service change process and annual TLCP update.

Implementation of Transit Service Standards and Performance Measures

1. It is intended that the proposed transit service performance measures, performance measure thresholds, thresholds for determining potential service types for proposed new services and application principles be adopted by the Valley Metro Boards by fall 2014 and implemented for planning service adjustments scheduled to take effect in fall 2015.
2. The policies and procedures associated with the TSPM, including the application principles, will be reviewed and updated, as needed, through the SPWG or other collaborative Valley Metro member agency working groups.

5.0 Implementation Standards for New Services

Service implementation standards are represented as thresholds or various criteria needed to support the implementation of a particular type of transit service. To assist in the development of these standards, a review of other agency service implementation methodologies was first conducted. Given that development patterns among these cities vary, a separate analysis was conducted to determine the applicability of these methodologies to the Phoenix metropolitan region. Upon completion of the transportation agency methodology review and subsequent regional analysis, new service implementation standards were identified for each of Valley Metro's service types. Each step in the process of developing service implementation standards is explored in greater detail in the sections below.

5.1 Review of Other Transportation Agency Methodologies

To identify the common themes and variables most often utilized to aid in the implementation of new transit service, a review of other transit agency/professional organization methodologies was conducted. The essential findings from each agency/organization are summarized briefly below.

Institute of Transportation Engineers

The Institute of Transportation Engineers (ITE) bases the provision of new transit service on a series of population and density thresholds. Through an analysis based on extensive research, ITE has identified specific thresholds for several common transit service types, summarized in **Table 2** below. Intuitively, as density for both population and employment increases, so does the capacity and frequency of the transit service prescribed. For example, on the low end of the density spectrum (4-5 Dwelling Units (DU)/Acre and 5-8 million (M) square feet (sq. ft.) of non-residential floor space), a minimum level of local bus service (defined as 20 daily bi-directional bus trips with one per hour) is recommended. On the opposite end of the density spectrum (9-12 DU/Acre and 35M to 50M sq. ft. of non-residential floor space), population and employment densities are at a level high enough to support light rail service.

Table 2. ITE Density Thresholds and Transit Service Types

Density Metric	Service Type					
	Local (Minimum) - 20 Trips per Day	Local (Intermediate) - 40 Trips per Day	Local (Frequent) - 120 Trips per Day	Express	Light Rail	Commuter Rail
Population	4-5 DU/Acre (3-4K people/SqMi)	7 DU/Acre (5-6K people/SqMi)	15 DU/Acre (8-10K people/SqMi)	-	9-12 DU/Acre	-
Employment	5M to 8M SqFt floor space	8M to 20M SqFt floor space	20M to 50M SqFt floor space	7 Employees/acre	35M to 50M SqFt floor space	100M SqFt floor space (or more)

Source: Institute of Transportation Engineers: A Toolbox for Alleviating Traffic Congestion (1989)

Denver Regional Transportation District

Similar to ITE, the Denver Regional Transportation District (RTD) also bases the provision of new transit service on population and employment densities; however, the employment-density metric used is slightly different. Whereas ITE assigns employment densities on the basis of square footage of non-residential floor space (with the exception of express service), RTD uses total employees per acre. Furthermore, RTD combines population and employment together to form a population/employment index. Based on this index, minimum and maximum service levels are defined for two density thresholds as summarized in **Table 3** below.

Table 3. RTD Service Thresholds

Service Levels	Density Thresholds	
	3-12 Residents and Employees/Acre	> 12 Residents and Employees/Acre
Minimum	Peak park-and-ride service if travel time to Denver CBD exceeds 20 minutes.	Local service on major arterials. Peak period, Limited, Express, or Regional service from park-and-rides if travel time to Denver CBD exceeds 20 minutes.
Maximum	Local service along major arterials with pedestrian access within 1/4 mile. Peak period, Limited, Express, or Regional service from park-and-rides if travel time to Denver CBD exceeds 20 minutes.	Local service with ½ mile route spacing. Limited, Express, or Regional service if travel time to Denver CBD exceeds 20 minutes.

Source: Regional Transportation District: Service Standards (2002)

Metro Transit

In an effort to maximize transit service productivity, Metro Transit of the Minneapolis-St. Paul region has developed a formula to identify and guide new service investments. Known as the Transit Market Index (TMI), this tool analyzes transit market potential for a given geographic unit (i.e., TAZ or Census unit) and helps identify the appropriate service type and level of service to meet current or future demand. As with the previous approaches to transit service implementation outlined above, the most influential determinant for projecting transit productivity is population and employment densities; however, Metro Transit also includes a third variable—a combined transit dependency metric. Using the formula below, Metro Transit assesses the potential of new transit service and assigns a service type accordingly.

$$TMI = \frac{(Total\ Population) + (Total\ Employment/3) + (Population\ Over\ 16 - Available\ Automobiles)}{Acreage\ of\ Populated\ Land\ Uses}$$

The product of the TMI calculation determines the most appropriate service type in a new corridor or geographic area. An analysis of the TMI scores for the Minneapolis-St. Paul region led to the identification of five market areas. A description of these market areas and the service types deemed appropriate for each are summarized in **Tables 4 & 5** below.

Table 4. Metro Transit – Market Area Scores and Definitions

Area	TMI Score	Definition
Area 1	≥ 20	Primary emphasis on regular route service. Crosstown routes and limited stop services are appropriate to link major destinations. Downtown area circulators possible.
Area 2	10-20	Primary emphasis on regular route service. Crosstown routes and limited stop services are appropriate to link major destinations.
Area 3	5-10	A mix of regular route and community circulator service complemented by dial-a-ride service in specific cases. Community circulators should tie into regular route regional service at a transfer point.
Area 4	1-5	Peak period express service, if potential demand for service is sufficient to support at least three peak-period trips. General public dial-a-ride services are appropriate.
Area 5	< 1	Primary emphasis on general public (GP) dial-a-ride services.

Source: Metropolitan Council - Regional 2030 Transportation Policy Plan Appendix G (2010)

Table 5. Metro Transit – Service Type by Market Area

Service Type	Area 1	Area 2	Area 3	Area 4	Area 5
Express	Yes	Yes	Yes	Yes	No
Urban Radial	Yes	Yes	Yes	No	No
Urban Crosstown	Yes	Yes	No	No	No
Suburban Local/Circulator	Yes	Yes	Yes	No	No
GP Dial-A-Ride	No	No	Specific	Yes	Yes

Source: Metropolitan Council - Regional 2030 Transportation Policy Plan Appendix G (2010)

Dallas Area Rapid Transit

When considering implementation of new transit service in the Dallas region, the Dallas Area Rapid Transit (DART) agency conducts a market analysis to assess the performance potential of a planned service investment. As with the previous methodologies, DART's assessment is largely focused on population and employment densities. The results of the market analysis are used to determine the appropriate level of service investment to correspond to performance potential.

DART maintains that operating successful transit service involves some flexibility in service standards to tailor service to the level of demand. When implementing new services, DART focuses on connecting routes to the regional rail system or other major transfer stations, particularly those routes on the urban fringe. The provision of flex routes also allows for greater understanding of demand in a given corridor and can serve as a mechanism to build demand for more traditional fixed-route services. Recently, DART began reanalyzing their flex routes to determine whether they should remain flex or be converted to feeder routes serving passenger terminals or other facilities with an increased level of service.

DART expects that a new service may underperform immediately following implementation, but allows for an incubation period to adjust service according to demand. The incubation period is typically 24 months and provides sufficient time for a new route to reach applicable performance standards. During this period, service is evaluated every six months with expectations for incremental performance improvements.

Maricopa Association of Governments (MAG)

As a part of the Sustainable Transportation – Land Use Integration Study (ST-LUIS), the Maricopa Association of Governments (MAG) developed several transit supportive “Place

Types,” which identified appropriate transit modes based on density thresholds and development patterns. As the study focused primarily on creating more compact walkable places throughout the region, the place types generally represent areas that are already supportive of varying modes of transit service. The identified place types range from “Compact Walkable” to “High Capacity Transit (HCT) Oriented”. The density and development thresholds associated with each place type are summarized in **Table 6** below.

Table 6. MAG ST-LUIS Place Types

	Place Type		
	Compact/Walkable	Transit Served	HCT Oriented
Density	15-30 persons/acre	30-45 persons/acre	45+ persons/acre
Land Use	Neighborhood land uses with mix of local serving employment	Neighborhood land uses with mix of employment	Mixed use, employment/office, regional uses (universities, centers)
Transit Type	Local bus, Commute services (RAPID & Express), Dial-a-Ride	LINK bus, Local bus, Commute services (RAPID & Express), Dial-a-Ride, Commuter Rail	LRT, Streetcar, LINK bus, Local bus, Commute services (RAPID & Express), Dial-a-Ride, Commuter Rail
Employment	Low	Moderate	High

Source: MAG Sustainable Transportation & Land Use Integration Study, 2013

5.2 Valley Metro Region Analysis

In consideration of the new service implementation methodologies outlined above, a comprehensive analysis was conducted to determine their relative applicability to the Phoenix metropolitan region. The primary purpose of this analysis was to develop a quantitative methodology for evaluating and implementing new transit services in the Valley Metro Region. The Census Bureau’s American Community Survey (ACS) five-year estimates for the years 2008-2012 were utilized to collect data for the most commonly used variables in the methodologies reviewed previously. These include:

- Total Population
- Population Below Poverty
- Zero-Auto Households

Additionally, employment data was derived from the MAG 2013 Employment Database, which provides information on all Maricopa County employers with five or more employees. Using this data, a GIS-based analysis was conducted to determine route-level totals for each variable within one-half mile of the corridor (Note: as the Census data was summarized at the tract level, the values for these criteria represent the totals for the entire tract, not just the portion that falls within one-half mile of a corridor. Conversely, since the MAG employment database is location-specific, the employment totals reflect the true employment within one-half mile of a corridor.) The results were summarized by service type and compared to determine if a defined range of values existed for each service type. While the analysis indicated some variation in the range of values, it was not substantial. Therefore, further analysis of the variables was required.

As summarized previously, Metro Transit in the Minneapolis/St. Paul region utilizes a market area approach based on a transit market index tool they developed, with specific service types prescribed for each market area. With this methodology in mind, an analysis was conducted to determine if a similar approach could be adopted in the Phoenix metropolitan region. First, population and employment densities were overlaid to determine areas with the highest combined densities. Market area boundaries were then defined based on the patterns of density. Analysis of the established market areas revealed minimal variation in densities, largely attributed to the homogenous nature of development patterns in the region relative to other metropolitan regions. These patterns are reflected in **Figures 2-5**, which depict region-wide densities for population and employment and percentage of totals for population below poverty and zero-auto households. The range in each of the figures below represents values below the county average for the given variable, values from the county average up to twice the county average and values greater than twice the county average. Due to the minimal variation in market areas, this approach to implementing new service was determined to be an insufficient methodology for the Valley Metro region.

Figure 2. Population Density

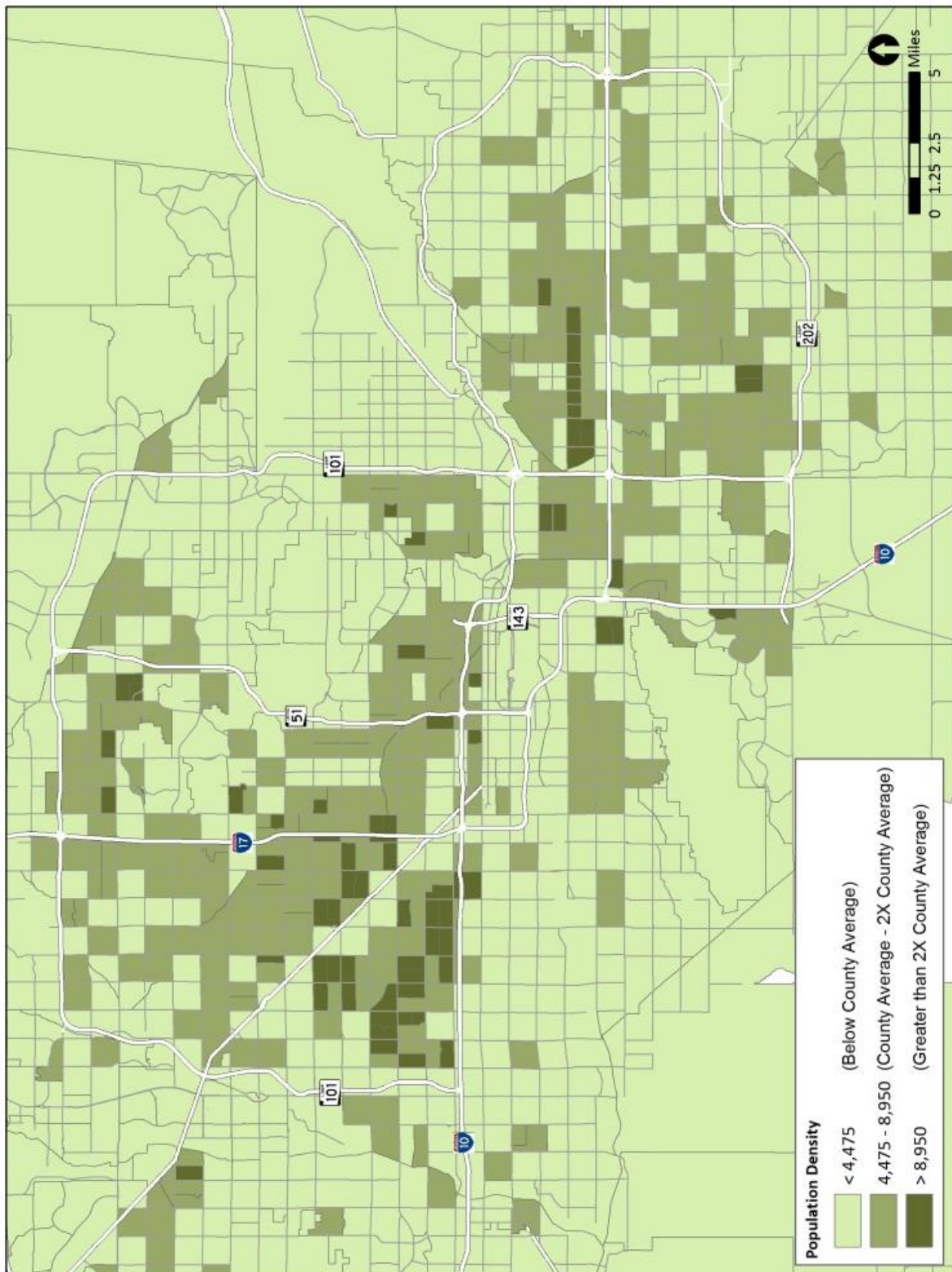


Figure 3. Employment Density

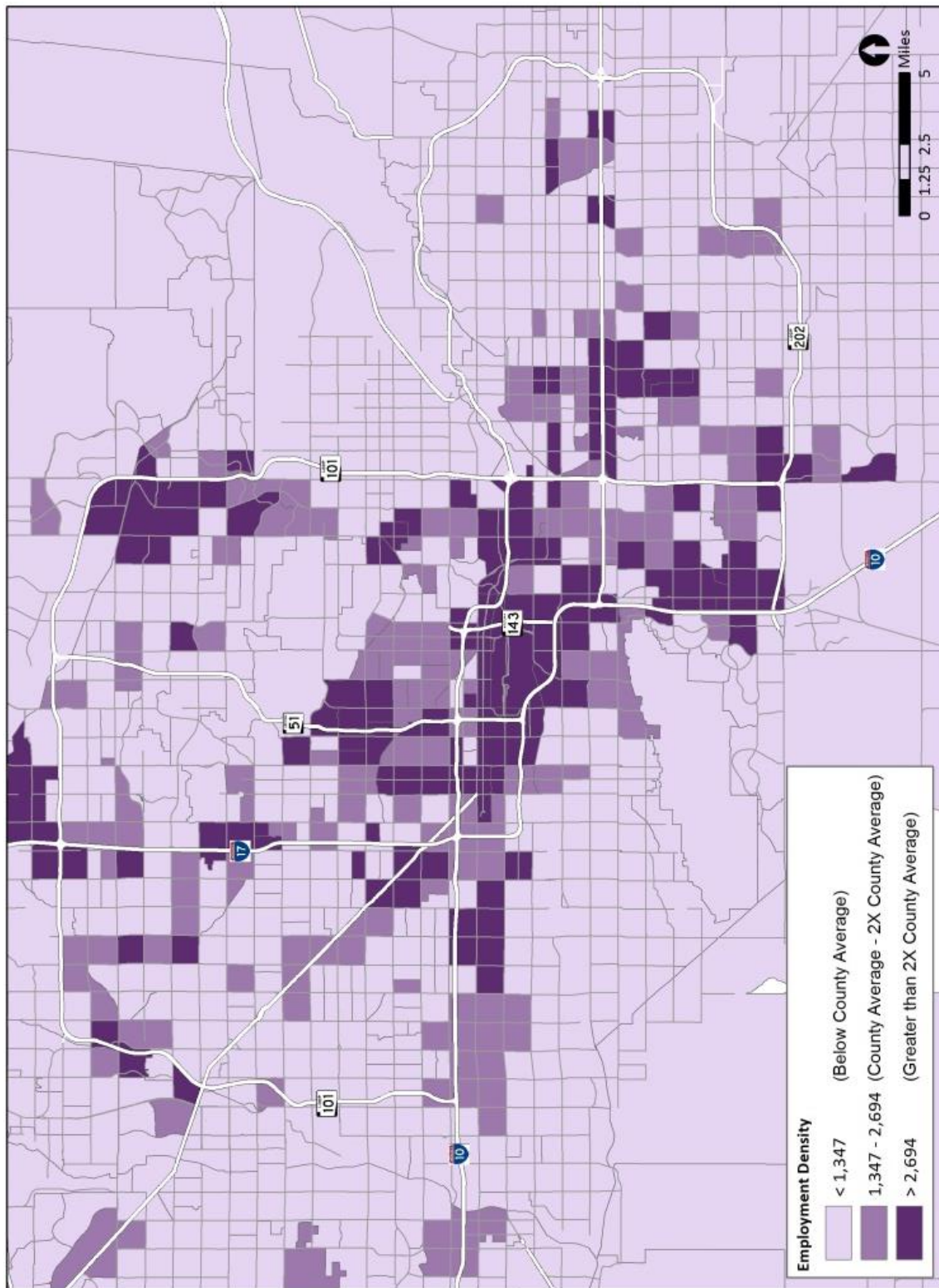


Figure 4. Percent of Population below Poverty

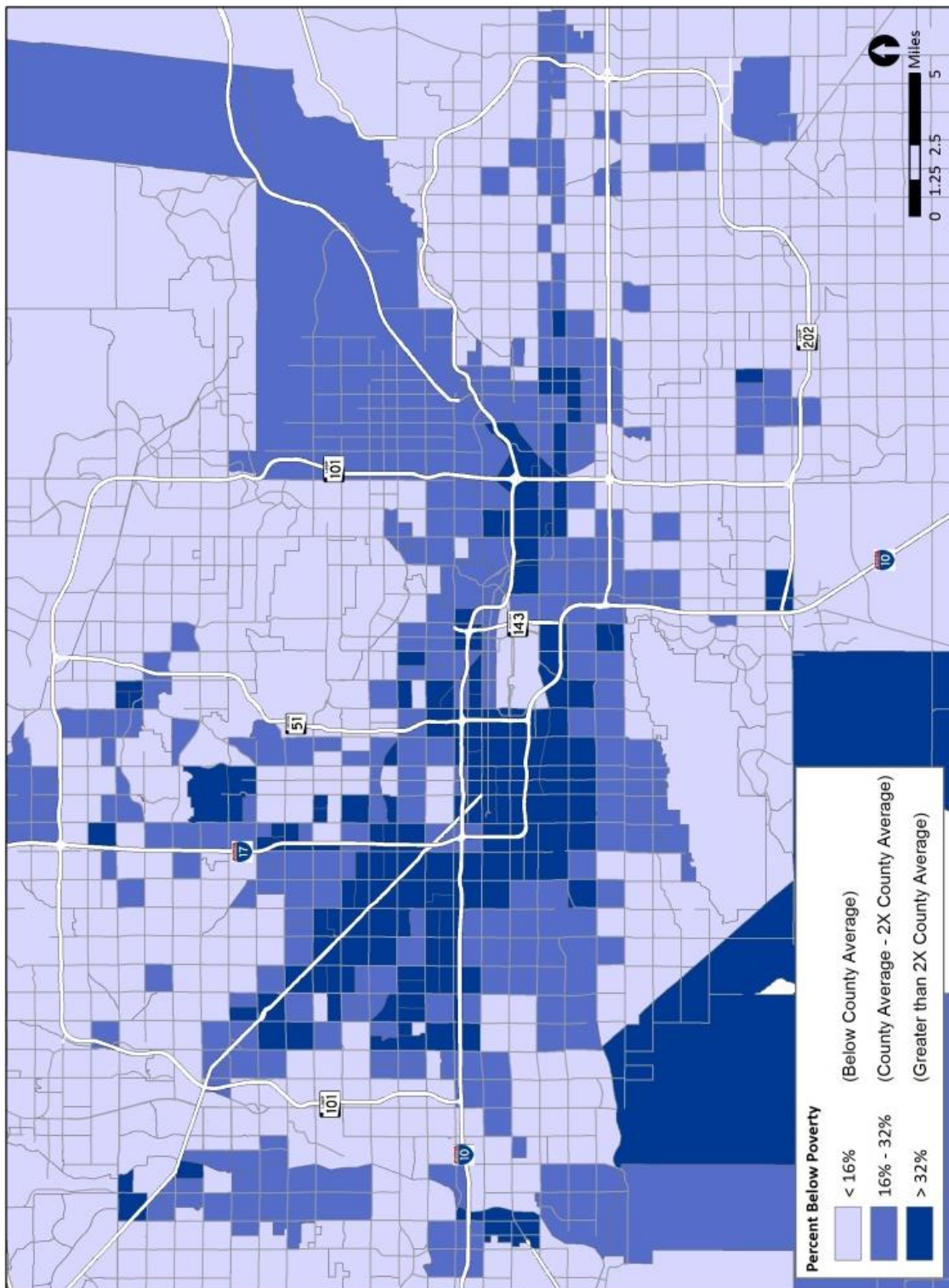
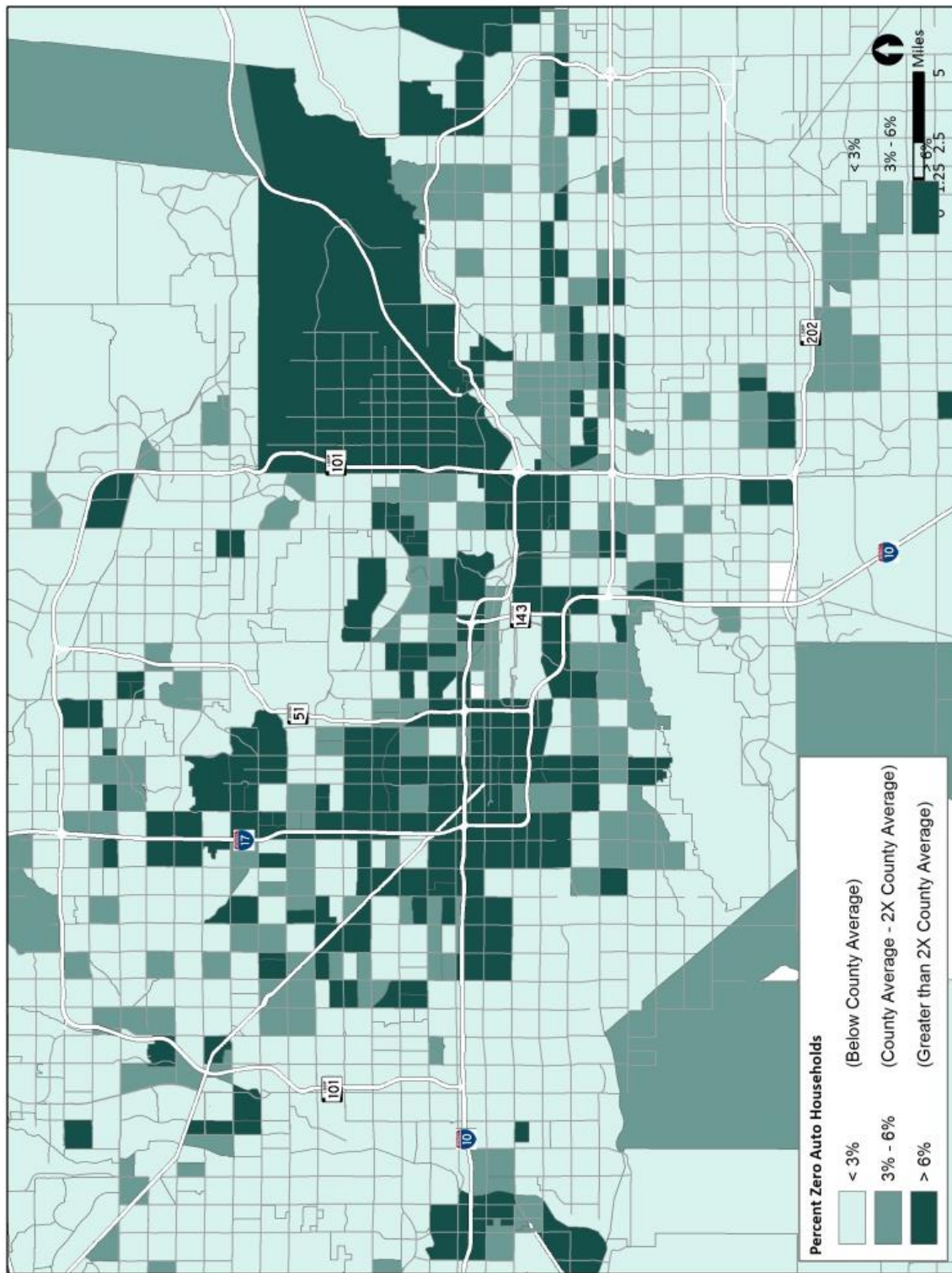


Figure 5. Percent of Households with Zero Autos



In an effort to better understand the relationship between several key variables and existing transit ridership, a series of regression analyses was conducted for local and key local services. Totals for each variable within one-half mile of the corridor for each route were determined and compared with ridership statistics from the 2013 Valley Metro Transit Performance Report (TPR). The coefficient of determination or “R squared (R^2)” value in a regression analysis indicates how well observed data “fits” a straight line when compared to one another. The closer the R^2 value is to 1.0, the greater the proportion of total variation of outcomes can be explained by the model.

In addition to the R^2 value, other statistical values were calculated for the regression analyses including F-statistic, t-statistic and P-value. The greater the value of the observed F-statistic, the more evidence there is against the null hypothesis. The t-statistic is a measure of the probability of a particular event occurring. If a t-statistic is greater than 2.0 (absolute value) for large sample sizes, it is possible to conclude that the dependent variable is impacted by the independent variable. The P-value tests the null hypothesis (no relationship between variables) to help determine the probability that the independent variable influences the dependent variable. A P-value of .05 (expressed as a percentage is 5%) suggests there is a 95% confidence level (100% - 5%) in the relationship tested by the positive hypothesis. The values computed for each of the regression analyses are summarized in **Table 7**.

The regression analyses indicate that three of the tested variables have a greater relationship to ridership (average daily boardings) than the other variables tested. These include:

- population below poverty
- total zero-auto households
- total population

After extensive analysis of the predictive qualities of each variable and subsequent testing and refining, a methodology was developed for applying these variables to new service corridors to estimate performance potential.

Table 7. R² Values for Chosen Variables

Ridership Variable (dependent)	Demographic Variable (independent)	R²	F-stat	t-stat	P-value
Boardings per Revenue Mile (bivariate)	Population Density	0.36	27.35	5.23	0.00
	Employment Density	0.03	1.73	1.31	0.19
	Population/Employment Index	0.09	6.29	2.51	0.02
Average Daily Boardings (bivariate)	Total Population	0.59¹	78.14	8.84	0.00
	Total Employment	0.24	17.12	4.14	0.00
	Total Zero-Auto Households	0.74	158.17	12.58	0.00
	Total Single- and Zero-Auto Households	0.65	101.96	10.01	0.00
	Percent Zero-Auto Households	0.05	3.00	1.73	0.09
	Total Population Below Poverty	0.75	165.61	12.87	0.00
	Percent Population below Poverty	0.1	6.16	2.48	0.02
Average Daily Boardings (multivariate)	Total Population	0.79	66.32	1.06	0.29
	Total Zero-Auto Households			2.62	0.01
	Total Population Below Poverty			2.58	0.01

¹When removing two routes from the analysis that represent statistical outliers, the R² value increased to 0.64.

5.3 Methodology for Estimating New Service Performance Potential

The process for estimating the performance potential of a new service and identifying whether the appropriate service (local or key local fixed routes) is feasible for implementation consists of four distinct steps. Each of these is explained in detail below. This process is intended for new services contemplated for implementation within a near-term time period and not applicable to services contemplated for implementation beyond two years from applying the process.

Step 1: Calculate Projected Boardings Using Coefficients

The initial step in estimating the potential of a new service is to develop two coefficients—one for local service and one for key local service—for each variable. This is accomplished by first collecting total population, population below poverty, and total zero-auto households within one-half mile of each existing local and key local route. These figures are then summed for the local and key local networks, as are the average daily boardings figures from the most recent Valley Metro TPR. The resulting figures are used to develop average population per boarding factors for each variable. **Table 8** below provides a summary of these factors for FY13. The data used for developing the total population, population below poverty and zero-auto household

coefficients shall be derived from the most current US Census Data from the American Community Survey (ACS).

Table 8. Coefficients for Primary Variables (2013)¹

Variable	Coefficients	
	Key Local	Local
Total Population	0.027	0.013
Population Below Poverty	0.104	0.067
Zero-Auto Households	1.104	0.687

¹ Coefficients updated annually to reflect the most recent data available.

Once the coefficients have been developed, the next step is to multiply each by its respective variable's corridor total (i.e., total population within one-half mile x total population coefficient). These calculations produce a projected daily boardings figure for each variable. **Please note that the boardings estimate derived through this formula is not considered to be an official estimate of ridership.** Its purpose is solely for determining the potential performance of a new service. As each variable is weighted equally in the analysis, their respective projected daily boardings figures are then averaged to establish a projected average daily boardings figure. This two-step process is outlined in **Figure 6** below for local routes. The methodology for estimating performance for key local routes is the same except the key local specific coefficients identified previously in Table 8 would be used.

Figure 6. Methodology for Projecting Average Daily Boardings

A)

Total population within ½ mile of corridor	x	0.013	=	Projected Daily Boardings 1 (population)
Population below poverty within ½ mile of corridor	x	0.067	=	Projected Daily Boardings 2 (poverty)
Total zero-auto households within ½ mile of corridor	x	0.687	=	Projected Daily Boardings 3 (zero-auto households)

B)

Projected Daily Boardings 1 (population)	+	Projected Daily Boardings 2 (poverty)	+	Projected Daily Boardings 3 (zero-auto HH)	=	Projected Average Daily Boardings
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3

Step 2: Calculate Projected Revenue Miles

The second step in estimating new service potential is to calculate the projected revenue miles. This is achieved by performing the following calculation:

$$\text{Trip Mileage} \times \text{Service Span} \times \text{Trips per Hour} = \text{Daily Revenue Miles}$$

The service span and trips per hour for a new service are derived from the service standards that were developed as a part of Phase I of the TSPM study. The service standards for key local and local services are summarized in **Table 9** below.

Table 9. Service Standards for Key Local and Local Routes

Service Type	Service Span	Peak Period Frequency	Off Peak Frequency
Key Local	16 hours	15 minutes	30 minutes
Local	16 hours	30 minutes	30 minutes

Step 3: Calculate Boardings per Revenue Mile

Once the daily revenue miles for the new service have been established, boardings per revenue mile can be determined by dividing the projected average daily boardings (Step 1) by the daily revenue miles (Step 2). It is this metric that will be used to determine the potential service type (key local, local, or some other type service) for a proposed new service.

Step 4: Compare Boardings per Revenue Mile to Bottom Quartile Thresholds

The final step in the process is to compare the projected boardings per revenue mile figure to the bottom quartile thresholds for existing key local and local routes as identified in the most recent Valley Metro TPR. For the new service to be implemented as a local or key local service, it is recommended that its projected boardings per revenue mile value be greater than the respective thresholds identified in **Table 10** below. The thresholds would be updated annually to reflect the most recent data available.

Table 10. Bottom Quartile Thresholds (2013)¹

Service Type	Boardings per Revenue Mile
Key Local	2.3
Local	1.2

¹Thresholds updated annually to reflect the most recent data available.

5.4 Methodology Testing

In order to evaluate the accuracy of the methodology summarized above, the process was tested on several existing key local and local routes. The resulting figures were then compared to each route's actual performance to ensure the estimates were reasonable. Results of this analysis are summarized in **Table 11** below.

Table 11. Comparison of Actual and Projected Route Performance/Classification

Route	Actual Performance/Classification			Projected Performance/Classification		
	Average Daily Boardings	Boardings per Revenue Mile	Classification	Average Daily Boardings	Boardings per Revenue Mile	Classification
3	5,652	2.9	Key Local	5,021	2.0	Local
7	5,151	2.6	Key Local	5,848	2.9	Key Local
29	10,299	4.3	Key Local	6,613	3.6	Key Local
35	6,748	3.0	Key Local	6,967	3.0	Key Local
41	9,861	3.9	Key Local	8,349	3.6	Key Local
50	6,503	3.2	Key Local	6,749	2.9	Key Local
61	6,730	2.3	Key Local	6,870	2.9	Key Local
70	7,161	2.7	Key Local	6,824	2.5	Key Local
8	2,313	2.1	Local	3,083	3.0	Local
59	3,210	2.9	Local	2,381	2.2	Local
67	2,680	2.5	Local	2,692	1.3	Local
77	3,569	2.3	Local	2,124	1.5	Local
81	3,131	1.5	Local	2,691	1.6	Local
104	1,430	1.7	Local	1,941	2.3	Local
112	1,978	2.6	Local	1,891	2.3	Local
154	1,311	1.2	Local	1,700	1.6	Local
170	2,747	1.9	Local	2,194	1.6	Local
184	506	0.5	Local	877	0.8	Local
186	1,720	1.6	Local	1,856	1.5	Local

A comparison of actual performance versus projected performance, as presented in **Table 11** above, illustrates that the methodology provides reasonable results. To further test the performance projection methodology, several new service corridors/areas were evaluated to estimate their potential and identify the most appropriate service type (local or key local) for implementation. The results of this analysis are provided in **Table 12** below. Potential routes classified as "other" are simply corridors where service is projected to perform below the local

service threshold. In these instances, it is recommended that a community circulator, rural connector, or some other cost-effective service type be utilized to build demand in the corridor before a more traditional, fixed-route service is implemented.

Table 12. Projected Route Performance/Classification for New Service Corridors

Route	Existing Boardings per Revenue Mile	Projected Boardings per Revenue Mile (Full Route)	Projected Boardings per Revenue Mile (New Service Segment)
Greenfield Rd – Option A (McKellips St to Chandler Heights Blvd)	N/A	0.7	N/A
Greenfield Rd – Option B (Brown Rd to Warner Rd)	N/A	1.3	N/A
Ray Rd (40 th St to Power Rd)	N/A	1.1	N/A
83rd Ave (Van Buren St to Bell Rd)	N/A	1.8	N/A
Gilbert Rd (Germann Rd to Riggs Rd & Val Vista)	1.2	1.0	0.9
Arizona Ave (Pecos Rd to Alma School Rd)	2.6	1.7	1.6
Alma School Rd (Frye Rd to Alma School/Ocotillo)	1.7	1.9	1.9
Dysart Rd (same as ZOOM route)	N/A	0.9	N/A
Queen Creek Rd (Price Rd to Power Rd)	N/A	0.6	N/A
99th Ave (Buckeye Rd to Bell Rd)	N/A	0.8	N/A
Camelback Rd (107 th Ave to Litchfield Rd)	3.2	2.1	1.4
Thunderbird Rd/Waddell Rd (43 rd Ave to Litchfield Rd)	1.4	1.5	1.5
Litchfield Rd (Lower Buckeye Rd to 128 th Ave & R.H. Johnson Blvd)	N/A	0.9	N/A
McDowell Rd/McKellips Rd (Granite Reef Rd to Power Rd)	3.0	2.0	1.0
Buckeye Rd (75 th Ave to Litchfield Rd)	1.5	1.1	1.4
Hayden Rd/McClintock Dr (existing route)	1.5	1.4	N/A
Bell Rd (75 th Ave to Loop 303)	1.9	1.3	1.1
Peoria Ave/Shea Blvd (136 th St to Fountain Hills Blvd)	3.0	1.2	0.8
Dunlap Ave (67 th Ave to Litchfield Rd)	2.5	1.8	0.7

5.5 Implementation Standards for New Transit Service

Based upon the review of peer transit agencies and the methodology outlined above, service implementation standards were developed for each of the fixed-route service types identified in Phase I of this project. As key local and local services account for a majority of the routes in Valley Metro's transit system, much of the effort was focused on developing a quantitative process to help identify the potential performance and appropriate classification of these services. Implementation standards for the remaining service types involve both quantitative and qualitative elements. The implementation standards are recommended for classifying services proposed to be implemented within five years from the date proposed. Implementation standards for long-term service concepts (beyond five years) have not been developed yet. Detailed descriptions of the recommended criteria for each service type are provided below and summarized in **Table 13**.

Local

Local service is defined as traditional fixed-route bus service that generally operates on arterial roadways. To implement a new local service, a proposed route's projected boardings per revenue mile should be no lower than 90% of the bottom quartile threshold for local service. Currently, this value is 1.08 (1.2 boardings per mile – 10%), but it will be updated annually based on the actual performance of all local routes operating in the region. The 10% variance from the calculated bottom quartile threshold is recommended to provide a limited range associated with the proposed threshold for implementing a new local route.

Key Local

Similar to local service, key local bus service generally operates on arterial roadways but is located in corridors that are expected to meet a higher level of performance based on proximity to transit-dependent populations (low-income and low-auto ownership) and demonstrated performance. To implement a new key local service, a proposed route's projected boardings per revenue mile must be no lower than 90% of the bottom quartile threshold for key local service. Currently this value is 2.07 (2.3 boardings per mile – 10%), but it will be updated annually based on the actual performance of all key local routes operating in the region.

Light Rail

Light rail transit is a high-capacity rail transit technology that operates on a fixed or semi-exclusive guideway. Light rail transit generally serves moderate to high-density urban/suburban areas and provides connections to regional employment and major activity centers. Light rail is considered an option in corridors with high existing transit usage. Light rail service warrants are determined through the completion of corridor-specific transit planning studies and incorporation into the Regional Transportation Plan (RTP).

Table 13. Recommendations for New Service Thresholds

Service Type	New Service Thresholds
Key Local	Projected Boardings/Revenue Mile > 90% of Bottom Quartile Threshold
Local	Projected Boardings/Revenue Mile > 90% of Bottom Quartile Threshold
Light Rail	Determined through the completion of corridor-specific transit planning studies and through incorporation into the Regional Transportation Plan (RTP)
Limited Stop All Day	- Key local service operating in corridor has boardings/revenue mile $\geq$ Top Quartile Threshold - Demand exceeding capacity on existing services in corridor
Limited Stop Peak	- Key local service operating in corridor has boardings/revenue mile $\geq$ Top Quartile Threshold - Demand exceeding capacity on existing services in corridor OR - Existing commuter-based market on a non-freeway corridor - Estimated 6,400 person trips in market - Corridor greater than 8 miles in length - Serve top 10 regional employment center
Commuter Express	- Must serve a top 10 employment district - Existing commuter-based market on a freeway corridor - Estimated 6,400 person trips in market - Corridor greater than 8 miles in length
Community Circulator	- Based on market demand - Routing structure connects neighborhoods to local or regional activity centers and resources - Proposed new routes that are generally less than 10 miles in length that fall below the projected boardings per revenue mile for local service would be a candidate for community circulator standard of service, to help build a future market for transit use.
Rural Connector	- Connect a rural community into the regional transit network - Based on market demand
Demand Response/Flex Route	- Serves low-density (4 DU/Acre or lower) areas without fixed-route transit service or other available transit service options - Can help build future demand for local transit market
Vanpool	- Serves groups of 6 to 15 persons with a common destination - Provides a commuter express type option for limited-demand worksites not necessarily located within one of the top 10 regional employment centers

Limited Stop All Day Service

Limited stop all day service is prescribed in corridors with high transit demand and generally operates on arterial roadways with a limited or infrequent number of passenger stops. This service can be operated as an overlay service within a corridor or roadway that is served by one or more other service types as demonstrated by service-demand studies. Implementation of limited-stop all-day service requires existing key local service in the corridor to have a boardings per revenue mile metric in the top quartile (currently ≥ 3.2) and for demand in the corridor to exceed current capacity.

Limited Stop Peak

Limited-stop peak service is prescribed to either augment existing key local service in a high-demand corridor **OR** to serve a commuter-based market on a non-freeway corridor. If a new service is proposed to augment existing key local service, it is necessary that the existing key local service in the corridor be performing in the top quartile of key local routes (currently ≥ 3.2). If a new service is proposed to serve a commuter-based market, three criteria are recommended:

1. The need for commuter service must be demonstrated through regional commute pattern data. Data to support the need can be obtained from the US Census Transportation Planning Products (CTPP), US Census Longitudinal Employer-Household Dynamics database, Maricopa County Trip Reduction Program (TRP), or other data source. A need would be determined based on a minimum of 6,400 persons directly served in the target market (origin to destination). This level of demand would produce 128 transit passengers at an assumed 2% transit mode-split, which is sufficient to reasonably fill four in-bound transit trips (minimum service standard).
2. The corridor/route served must be equal to or greater than eight miles in length, to provide sufficient time savings to attract and sustain riders.
3. The corridor must serve one of the region's top 10 employment centers (based on total jobs in area served). The list below shows the top 10 employment centers as defined in MAG's 2013 Sustainable Transportation & Land Use Integration Study.
 - West Tempe Industrial
 - Downtown Phoenix
 - North Central Avenue
 - Scottsdale Airpark
 - ASU Research Park/Silicon Highway
 - Deer Valley



- I-10 West Corridor
- Sky Harbor Airport
- Downtown Tempe/ASU
- North I-17 Corridor

Commuter Express

Commuter express service is designed to serve commuter markets using the region's freeway infrastructure and thus provides peak period, limited-stop service from residential areas or suburbs/cities to regional employment centers. If a new service is proposed to serve a commuter-based market, three criteria are recommended:

1. The need for commuter service must be demonstrated through regional commute pattern data. Data to support the need can be obtained from the US Census Transportation Planning Products (CTPP), US Census Longitudinal Employer-Household Dynamics database, Maricopa County Trip Reduction Program (TRP), or other data source. A need would be determined based on a minimum of 6,400 persons directly served in the target market (origin to destination). This level of demand would produce 128 transit passengers at an assumed 2% transit mode-split, which is sufficient to reasonably fill four in-bound transit trips (minimum service standard).
2. The corridor/route served must be equal to or greater than eight miles in length, to provide sufficient time savings to attract and sustain riders.
3. The corridor must serve one of the region's top 10 employment centers (based on total jobs in area served). See the list of current top 10 employment centers in limited stop peak section.

Community Circulator

Community circulator services connect neighborhoods with local and regional services and activity centers. These routes typically operate in areas with limited, existing, local fixed-route transit services and serve as either feeder or relief service within the regional transit network. Implementation of community circulators is based on an assessment of market need and can serve as a mechanism to build demand in a corridor or community where traditional fixed-route service is not yet feasible. Routing structure should either feed into the regional transit network or provide service to a local or regional activity center. Proposed new routes that are generally less than 10 miles in length that fall below the projected boardings per revenue mile for local service would be a candidate for community circulator standard of service, to help build a future market for transit use. A proposed community circulator route that is greater than 10 miles in

length that either serves an area at the fringe of the fixed-route transit network, is within a fixed-route service coverage gap, or directly serves multiple activity centers would be warranted.

Rural Connector

Rural connector services operate in low-density areas and provide service to an important market but are expected to have lower demand than services operating in higher-density urban areas. These routes usually serve a limited population base and often cover large distances of undeveloped land. As such, implementation of such services is entirely dependent on market need, and the routing structure is expected to connect a rural community into the regional transit network. A rural community is characterized as being outside of a defined federal urbanized area (UZA).

Demand Response/Flex Route

Demand response/flex route serves low-density (four DU/Acre or lower) and low-demand areas not currently capable of sustaining fixed-route transit service or other available basic mobility options. These service types may be more cost-effective than traditional fixed-route transit service based on total cost to operate and may be implemented to connect community members to essential local destinations including, but not limited to, grocery stores/pharmacies, medical facilities, education campuses and work sites.

Vanpool

Vanpools serve groups of 6 to 15 persons that travel to a common destination. This service provides a commuter express-type option for limited-demand worksites not necessarily located within one of the top 10 regional employment centers.

5.6 Implementation Process for New Services

As new transit service concepts are identified, the process outlined in this report for assessing performance potential will be applied to determine the recommended transit service type for implementation. The implementation of all new services will be consistent with the adopted TLCP policies, including jurisdictional equity, and the TSPM application principles. New transit services identified by Valley Metro member agencies and Valley Metro staff will be considered in coordination with the regional transit service planning process, which include the following:

- annual transit service performance review initiated through the Service Planning Working Group (SPWG)
- annual update of the Valley Metro Five-year Short Range Transit Program, Fleet Management Plan, and Transit Life Cycle (TLCP) program.



In the event that the number of requests for new service exceeds the amount of regional funding and/or capital support infrastructure (revenue vehicles) available, implementation of services will be prioritized as follows:

1. First, consistent with adopted TLCP policies, determine if there is available jurisdictional equity within the communities to be served by the proposed new service.
2. The second level of evaluation includes determining if the proposed new service is included in the RTP (consistent with adopted TLCP policies and TSPM Service Provision Goal #1).
3. The third level of evaluation includes an assessment of potential performance using the planning tools associated with TSPM Service Provision Goals #2 and #5. These tools include transit service connectivity, population density, employment density and activity centers served, zero-auto households, low-income population, elderly persons, youth (persons under 16), and persons with mobility disability. The performance potential assessment for each proposed service improvement will be conducted collaboratively with the affected local jurisdictions to be used as a decision-making aid.

The prioritization of regional transit fleet will be defined during Phase III of the TSPM.



6.0 Phase III – Next Steps

The process for the Transit Service Standards and Performance Measures study was divided into multiple phases. Board approval of the elements discussed and recommended in this report will conclude Phase II of the process. Phase III will focus on the development of regional standards and performance measures for capital facilities and transit fleet. These items will be evaluated and analyzed in coordination with the TAG and are projected to be complete in FY16.

The transit service standards and performance measures will be updated regularly as appropriate to assure they are consistent with Valley Metro's evolving goals. As part of the first TSPM update, which is expected to be conducted two years after the approval of the Phase II recommendations, Valley Metro will have had the opportunity to track the performance measures over multiple years. Valley Metro will work with member agencies to prepare targets (or baselines) by service type, to identify transit services that are underperforming for each of the performance measures.



APPENDIX A

To: Transit Standards and Performance Measures Technical Advisory Group

From: Valley Metro Planning and Development

Date: November 3, 2014

Re: Transit Standards and Performance Measures Phase 2: Member Agency Collaboration

Valley Metro initiated the development of Regional Transit Standards and Performance Measures (TSPM) in late 2012 with a goal of developing standards and measures for regional transit services, capital facilities and fleet. The comprehensive scope of the effort has resulted in the need to proceed with developing the TSPM in multiple phases. Phase I was concluded in November 2013, with both Valley Metro Boards approving the recommendations for transit service types, transit service standards and an interim performance measurement system based on a continuation of the recommendations associated with the previously completed Valley Metro Service Efficiency and Effectiveness Study (SEES). Phase 2, which is currently scheduled to be presented to both Valley Metro Boards on December 18, 2014, includes recommendations for transit service measures and thresholds, TSPM application principles and implementation standards for new services.

Valley Metro staff has engaged member agencies individually and collectively through the TSPM Technical Advisory Group (TAG) throughout the entire TSPM development process. Input received from member agencies has been taken into consideration and helped shape the recommendations for both the previous and current phase of work. During Phase 2, member agency input was received on a wide range of elements ranging from reiterating the purpose of the regional TSPM effort to availability of quality data. This memorandum consolidates the primary input/comments submitted by member agencies and summarizes the response and/or actions taken based on the input received.

Table 1: Phase 2 Member Agency Input

ID	Input / Comment	Response / Action
1	Why is Valley Metro developing regional transit standards and performance measures and why now?	The development of Valley Metro's Transit Standards and Performance Measures (TSPM) was commenced for multiple purposes including the necessity of developing a performance-based public transportation system consistent with federal and state requirements. The Moving Ahead for Progress in the 21st Century (MAP-21) federal transportation reauthorization bill furthers several important goals, including safety, state of good repair, performance and program efficiency. The act establishes performance-based planning requirements that align federal funding with key goals and tracks progress towards these goals. From the state perspective, the application of performance-based planning and programming was emphasized in the Arizona Auditor

ID	Input / Comment	Response / Action
		General's performance audit. The auditor's recommendation stated that <i>"it does not appear that performance data is considered nor is a methodical, disciplined approach using set criteria in place to guide project priority decisions and changes to projects."</i> Development of the regional transit standards and performance measures is currently underway in an effort to address the auditor's finding prior to the next state audit, scheduled to be completed in 2015. In addition to federal and state requirements, Valley Metro has initiated the TSPM process to establish performance measures and standards for assisting with the annual TLCP update. The adopted Transit Life Cycle Policies support the application of performance measures and standards as indicated in Guiding Principle 4 of the Transit Life Cycle Policies. Paragraph "a" of Guiding Principle 4 states that <i>"performance and cost control measures will be established, maintained, and reported for the transit system and for Public Transportation Fund funded projects. Project Agreements will identify performance measures and standards for each project."</i>
2	The principles for how transit standards and performance measures will be applied need to be documented for member agencies.	Through input received from Valley Metro member agencies, detailed application principles covering the following seven categories were prepared: - General Application Principles - Services/Operations Subject to Transit Standards and Performance Measures - Prioritization of New Services - Transit Service Standards for New and Existing Services - Transit Performance Measures and Thresholds - Performance Improvement Actions - Implementation of Transit Service Standards and Performance Measures The initial draft application principles were documented in a memorandum addressed to the TSPM TAG on May 29, 2014. Based on input received from TAG members via written correspondence and one-on-one meetings between Valley Metro and member agency staffs, the application principles were updated and distributed again on August 13, 2014. Finally, a third version of the memorandum was updated and distributed on October 1, 2014. Each version of the memorandum was updated to incorporate input provided by Valley Metro member agencies.
3	Jurisdictional equity needs to be maintained as part of the TSPM application principles.	Jurisdictional equity as well as other policies and principles associated with the Transit Life Cycle Program (TLCP) were indirectly addressed in the original version of the TSPM application principles memorandum. However, the memorandum has since been updated to directly reference the adopted TLCP guiding principles and policies. The recommended application principles include the following text: <i>"The application of the transit service standards and performance measures will be consistent with, and adhere to, the Valley Metro Board-adopted Transit Life Cycle Program (TLCP) policies."</i> Additional direct references to the adopted TLCP policies have been incorporated throughout the application principles where appropriate.

Transit Standards and Performance Measures Phase 2

Member Agency Collaboration

November 3, 2014

Page 3

ID	Input / Comment	Response / Action
4	Distribution method of Arizona state lottery funds should not be modified by the regional TSPM.	The Phase 2 TSPM recommendations do not include any changes to the distribution of state lottery funds. However, the TSPM defines the state lottery funds as a regional transit funding source under the "Services/Operations Subject to Transit Standards and Performance Measures" application principles category.
5	Local jurisdictions should have decision-making roles in developing and advancing performance improvement actions for top and bottom performing services.	Assignment of responsibility for performance improvement actions are defined in the application principles as follows: <i>"Based on the additional evaluation of the higher performing and lower performing routes/services, potential performance improvement actions will be identified cooperatively with all affected jurisdictions/agencies, and later, discussed with the Valley Metro Service Planning Working Group (SPWG). Locally operated and funded transit services will be included in the performance measurement process, but the development of local performance improvement actions and implementation of any actions will be at the sole discretion of the affected local jurisdiction. Valley Metro will provide planning assistance for locally funded/operated services if requested by the local jurisdiction."</i>
6	Increasing existing service levels on weekends to meet the adopted transit service standards may take too many resources and may result in low productivity.	Board-approved Phase I TSPM principles define service standards for weekend fixed-route transit service; however, many existing routes do not meet the weekend service standard. Significant financial resources will be necessary to bring existing routes in compliance with the standard. In response to input received from member agencies and an analysis of the number of routes not meeting the weekend service standard, an exception to meeting the standard is recommended as part of Phase 2 as follows: <i>"New services will be expected to meet the Board-adopted transit service standards upon implementation; however, exceptions will be considered for weekend service levels. A new service may have limited weekend demand; therefore, it is proposed that weekend service standards may be relaxed until there is reasonable and sufficient demand to support weekend service above the lower performance threshold."</i>
7	Define what a "performing" and "underperforming" route or service is.	The following definition has been added to the application principles to explain what qualifies for "performing" status: <i>"A route is designated as "performing" if it has no more than one performance measure ranked in the bottom quartile by service type."</i>
8	Include a "pilot" period for all new routes/services.	The incorporation of a "pilot" period or program has not been added to the TSPM as the purpose of evaluating the routes, new or existing, against performance measures is to determine if the service is operating effectively and if it can be improved to better serve the community. While the term "pilot" is not used in the Phase 2 TSPM recommendations, the recommended three-year initial operating period is essentially a default "pilot". However, it is Valley Metro's intent that if a new service is implemented, it is implemented based on a community need, and not as a test or trial to determine a market. When asked about pilot services, our peer transit agencies stated that they don't classify a service as a pilot because this can give the public an impression that the service is a temporary trial.

Transit Standards and Performance Measures Phase 2

Member Agency Collaboration

November 3, 2014

Page 4

ID	Input / Comment	Response / Action
9	The performance of “suburban” routes or services should not be compared with “urban” routes or services.	During Phase I of the TSPM program, nine (9) transit service types were defined for the region. There are a total of seven (7) bus service types, including two (2) local bus service types: local bus and key local bus. Local bus routes generally operate in suburban areas or areas with typical (typical for Phoenix region) suburban development patterns. Key local bus routes are the higher utilized services (currently defined as having greater than 1,000,000 annual passenger boardings) in the region and generally serve the most densely populated areas of the region or one or more major trip generators.
10	Define how new services or service improvements will be prioritized should the number of requests exceed available funding resources.	New services, which include material service changes (defined in the adopted TLCP policies as a 25% or greater change in a route's service level), are proposed to be prioritized based on three levels of evaluation. First, consistent with adopted TLCP policies, determine if there is available jurisdictional equity within the communities to be served by the proposed new service. The second level of evaluation includes determining if the proposed new service is included in the RTP (consistent with adopted TLCP policies and TSPM Service Provision Goal #1). The third level of evaluation includes an assessment of potential performance using the planning tools associated with TSPM Service Provision Goals #2 and #5. These tools include transit service connectivity, population density, employment density and activity centers served, zero-auto households, low-income population, elderly persons, youth (persons under 16) and persons with mobility disability. The performance assessment for each proposed service improvement will be conducted collaboratively with the affected local jurisdictions to be used as a decision-making aid. However, all light rail service adjustments will be subject to action by the Valley Metro Rail Board of Directors, even though the operation is funded by the local jurisdictions. The prioritization of regional transit fleet will be defined during Phase III of the TSPM.
11	The regional fare collection system data quality is perceived as being questionable.	Valley Metro recognizes that route-level data available through the existing fare collection system may have some data quality issues associated with passenger boarding assignment by route. It is understood that this issue is largely due to interlining routes and the lack of an automated method for changing route designations in the fare collection system as a bus completes a trip on one route and commences operating along a different route. The City of Phoenix has coordinated with Scheidt & Bachman (fare collection system vendor) and Xerox (vehicle management system vendor) to develop a software patch to improve interlining route assignment reliability. Based on a successful test of applying the software patch on a limited number of buses, the patch has been expanded to the entire regional fixed-route fleet on October 27, 2014. It is expected that the deployment of the software patch will address the data quality issue associated with the improper assignment of route number on some interlined blocks. Until the fare collection data has been collected and analyzed, the effect of the software patch will not be fully known. In the interim, it is

ID	Input / Comment	Response / Action
		recommended that all under-performing routes (ranked in the bottom quartile of 2 or more performance measures by service type) be reviewed in more detail using the “raw” output data from the fare collection system. This will allow Valley Metro staff to identify any misassignment of routes and correct the data if necessary. This second but more detailed review of performance data provides an enhanced quality control and quality assurance procedure for any routes that are identified as underperforming.