



PEORIA MULTI-MODAL TRANSPORTATION PLAN

Final Report

March 22, 2011

Prepared for:



Prepared by:



Nelson\Nygaard Consulting Associates

In association with:

JACOBS Jacobs Engineering

SHERMAN GROUP INC Sherman Group, Inc.

TABLE OF CONTENTS

EXECUTIVE SUMMARYES-1

CHAPTER 1 INTRODUCTION..... 1-1

CHAPTER 2 MARKET ANALYSIS..... 2-1

 Development Patterns.....2-1

 Population And Employment.....2-1

 Transit Dependent Populations2-5

 Travel Patterns2-8

CHAPTER 3 EXISTING AND PLANNED TRANSIT SERVICES..... 3-1

 Existing Transit Facilities and Services3-1

 Planned New Services.....3-11

 Summary of Planned and Potential Services3-19

CHAPTER 4 LOCAL SERVICE ALTERNATIVES..... 4-1

 Local Circulator Options4-1

 Service Characteristics and Costs4-3

 Fixed-Route Options4-4

 Flex Service Options4-5

 Extend Valley Metro Grid into Peoria.....4-19

 Summary.....4-21

CHAPTER 5 HIGH CAPACITY TRANSIT ALTERNATIVES AND ISSUES..... 5-1

 Definition of HCT/Modes Examined5-1

 Light Rail Alternatives5-2

 BRT Options5-13

 Complementary Local Service5-26

 Ridership, Cost, and Productivity Estimates5-27

 HCT Issues and Options5-33

CHAPTER 6 OLD TOWN TRANSIT CENTER..... 6-1

 Design and Location Considerations6-1

 Site Alternatives6-1

 Facility Requirements6-6

 Preliminary Site Plan - Mid-Term.....6-6

 Preliminary Site Plan - Long-Term6-9

CHAPTER 7 BUS STOP IMPROVEMENTS 7-1

 Bus Stop Practices in Other Communities7-1

 Proposed Peoria Approach7-18

 Bus Stop Art Selection Process7-29

CHAPTER 8 RECOMMENDATIONS..... 8-1

Summary of Recommendations8-2
Short-Term Recommendations (2011 – 2015)8-2
Mid-Term Improvements (2016 - 2026)8-5
Long-Term Improvements (Beyond 2026).....8-7

EXECUTIVE SUMMARY

Peoria has grown rapidly from a small agricultural town located outside of Phoenix to a city of 154,000 residents that is now a part of the Phoenix metropolitan area. As growth continues, the city desires to grow “smarter,” to make growth more efficient and more productive, revitalize Old Town, protect natural resources and community character, and improve quality of life for the city’s residents. One important component will be the development of a much more balanced transportation system, and specifically the development of an attractive and effective transit system. This study addressed those issues and examined how to:

- Use transit to provide better links between Peoria and the rest of the Valley,
- Develop a more balanced transportation system, and
- Use transit to encourage smarter growth and improve the city’s character.

As described in detail in the full report, the study examined a number of transit issues and improvements:

- An analysis of current and future transit demand.
- A review of existing and currently programmed transit services in Peoria and its environs.
- A description of local service options with associated ridership, costs, and productivity estimates.
- An analysis of High Capacity Transit options that describes light rail and Bus Rapid Transit (BRT) alternatives, also along with associated ridership, costs, and productivity estimates, plus an analysis of issues related to the implementation of High Capacity Transit.
- A description of options for the development of an Old Town Transit Center, including a preliminary site plan for the preferred option.
- A review of bus stop facilities and practices in other communities, including the incorporation of artwork into major stops and the development of a preferred approach for Peoria.
- Recommendations for the short, mid, and long-term.

MARKET CONDITIONS

Peoria is a very large city geographically, and encompasses a planning area of approximately 233 square miles. The large majority of development is in the southern third of the city, south of Deer Valley Road. This area contains most of Peoria’s residential and commercial areas, including the Peoria Sports Complex (which is the spring training facility for the Seattle Mariners and San Diego Padres), and downtown (Old Town) Peoria. However, development is moving northward, and areas between Deer Valley Road and Happy Valley Road are rapidly

developing. North of Happy Valley Parkway, the city is still largely undeveloped, and Lake Pleasant, in the far northern part of the city, is a major recreational area.

At present, Peoria has approximately 154,000 residents. However, by 2028, it is projected that the city’s population will grow by 95% to over 300,000 residents. At present, most residents live in parts of the city south of Union Hills Drive. Over the next 20 years, most population growth is projected for areas north of there, but even with that growth, most residents will still live in the southern portions of the city.

Similarly, most employment is also located in the southern areas of Peoria (see Figure 2). At present, 72% of all jobs are located south of Union Hills Drive, and 23% are located north of there. In total, there is only one job for every 3.6 residents, which means that many Peoria residents commute to other communities for work. However, employment is projected to increase even faster than population, by 130% through 2028. With this job growth, the proportion of jobs will increase to one job for every 2.7 residents. As with population, most of the job growth will occur north of Union Hills Drive, but even so, the largest proportions of jobs will continue to be in south of there.

EXISTING AND PLANNED TRANSIT SERVICES

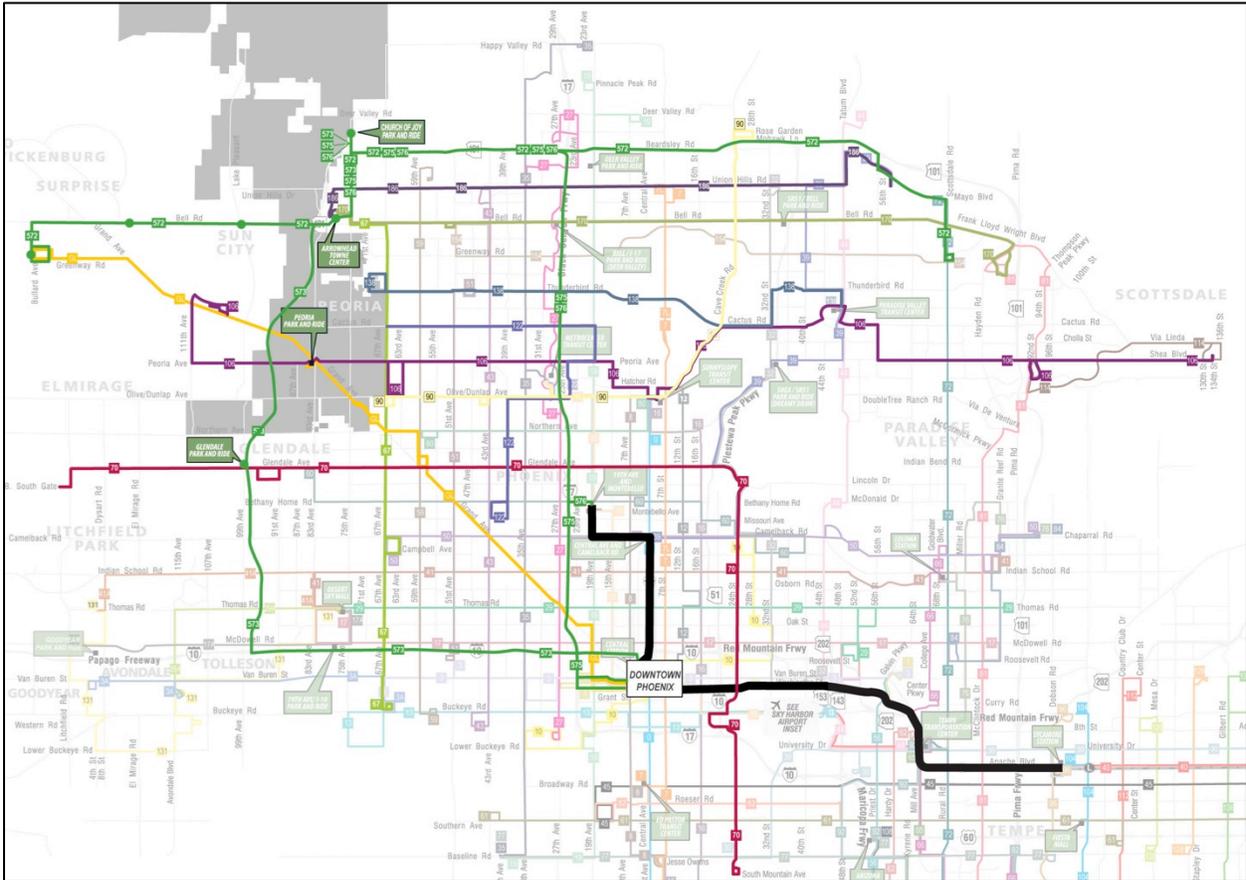
Because Peoria is located near the northwestern edge of Valley Metro’s service area and the city is one of the Phoenix metro areas “newer” communities, general public transit service is still relatively limited (see Figure 1). Today, Peoria has a single park and ride lot, and is served by one local Valley Metro route (Route 106 Peoria/Shea) and one limited stop commuter route (Grand Avenue Limited). Peoria also operates a dial-a-ride service for elderly and disabled residents.

For the future, new services are programmed as part of the region’s Prop 400 transit program, many of which would extend more Valley Metro service to Peoria, and provide new types of services. However, due to the recession, Prop 400 sales tax revenues have been significantly lower than projected, and as a result, many planned projects are now being delayed. Peoria projects include:

- The development of an **Old Town Transit Center**, in 2015.
- **Super Grid bus service** that would operate on many major arterials, including Bell Road, Thunderbird Road, Peoria Avenue, Olive Avenue, 83rd Avenue and 99th Avenue. However, most of Super Grid routes that would serve Peoria are planned for relatively far in the future, in 2023 and beyond.
- **Express service** improvements, but not until after 2026.

In addition, MAG’s Commuter Rail Systems Study and the Grand Avenue Commuter Rail Corridor Development Plan recommends that commuter rail between Wittmann and Phoenix via Peoria be pursued. There are a large number of steps that will need to be accomplished

Figure 7: Peoria Area Fixed-Route Transit Services



before commuter rail can be implemented and the earliest that commuter rail service could begin would be in the late 2010s.

LOCAL SERVICE OPTIONS

The study examined a large number of ways to improve local transit service within Peoria and to provide better connections with the rest of the Valley. These included:

1. Local bus circulator services that would be similar to those that have been implemented in a number of other Valley communities.
2. Local flex services that would be a hybrid of fixed-route and dial-a-ride service.
3. An expansion of Valley Metro's grid network into Peoria.
4. Combinations of the above.

Of the different options, the extension of the Valley Metro grid into Peoria was viewed the most favorably by project staff, stakeholders, and the public who attended the project open houses. The major reason for this was that connections to the rest of the Valley were considered to be extremely important. This view is substantiated by the market analysis that

showed that very large volumes of trips are made between Peoria and other areas, particularly Glendale and North Phoenix. The technical analysis also indicated that this approach would serve more riders and be more productive and cost-effective.

HIGH CAPACITY TRANSIT ALTERNATIVES

The study examined the feasibility of High Capacity Transit (HCT) in Peoria; specifically, six options that would either extend light rail to Peoria or develop new Bus Rapid Transit services:

- LRT from downtown Glendale via Grand Avenue
- LRT from Westgate Center via 91st Avenue
- BRT from 19th Street at Montebello Avenue via Grand Avenue
- BRT from Westgate Center via 91st Avenue
- BRT from the Northwest Extension via Dunlap Avenue
- BRT from the Northwest Extension via Peoria Avenue

All six alternatives would operate to Old Town Peoria from either a currently planned or potential LRT extension (the Northwest Extension or one of the potential Glendale extensions). From Old Town, all six alternatives would follow a common alignment to the planned Arrowhead Transit Center via 83rd Avenue and the Peoria Sports Complex.

However, the study found that none of the HCT alternatives would be feasible because projected ridership would be much too low to justify the associated costs. Ridership would be low largely because projected development patterns will not be dense enough to provide markets that would be large enough to support HCT.

OLD TOWN TRANSIT CENTER

With the redevelopment of Old Town, there will be an increased emphasis on transit, and to provide a focal point for local and regional transit services, a transit center will be developed in Old Town. Three alternative sites were identified and evaluated, all of which were in the vicinity of the intersections of Peoria Avenue and 83rd Avenue on the north side of Grand Avenue. These were:

- **Option A:** Peoria Avenue in front of current Zocalo Mall
- **Option B:** 83rd Avenue between Peoria and Grand Avenues.
- **Option C:** Market Street between Cotton Crossing and 83rd Avenue.

Overall, Options A (Peoria Avenue) and B (83rd Avenue) would have similar advantages and disadvantages, and both would be significantly better than Option C (Market Street). However, between Options A and B, Option B would provide better bus service through the heart of Old Town, and was determined to be the preferred location on that basis.

For the mid-term, the Old Town Transit Center would be developed to serve Route 106 Peoria/Shea, Grand Avenue Limited, a new Route 83 83rd Avenue local route, and to provide park and ride spaces for transit riders, carpoolers, and vanpoolers. Key elements of the plan include (see Figure 2):

Figure 2: Mid-Term Site Layout



- A transit center building on the west side of 83rd Avenue between Grand Avenue and Peoria Avenue.
- The conversion of 83rd Avenue between Grand Avenue and Peoria Avenue to transit-only use, with bus berths, passenger waiting areas, bicycle racks, water fountain, vending machines and public art.
- Passenger pick-up and drop-off areas behind the transit center building in the area where Taco Bell is currently located.
- Parking south of 83rd Avenue adjacent to the transit platforms with access from Peoria Avenue. Amenities would include covered parking, landscaped walkways and seating at the pedestrian way.
- Roadway improvements on Peoria Avenue that would include striping and island revisions from south of the Market Street intersection to south of the northern most Peoria Avenue/83rd Avenue intersection.

Over the longer-term, the transit center would be expanded to accommodate additional local and express bus service, and Grand Avenue commuter rail service. These increases in transit service would require that the transit center be expanded to accommodate increased transit usage, and to integrate it with Old Town as it redevelops (see Figure 3). To do this:

Figure 3: Long-Term Site Layout



- The transit platforms would be expanded to accommodate additional bus service and, as required, additional modes.
- Up to 200 commuter spaces would be needed, and to accommodate these, structured parking would be developed south of 83rd Avenue. This structure would include transit-oriented joint development along Peoria Avenue.
- The areas around the transit center would be redeveloped in a transit-oriented manner consistent with the Old Town Redevelopment Plan.

BUS STOP IMPROVEMENTS

Waiting for the bus is a significant part of nearly every bus rider's transit experience. If bus stops provide a comfortable waiting environment, people traveling to and from that area will be more likely to use transit. Conversely, if bus stops do not provide a comfortable environment, people will be less likely to use transit. In addition, well designed bus shelters can also help to provide a unifying design element for the city. Shelters created by artists can be used to create diversity and interest with designs specifically for unique locations.

Rather than determine the facilities and amenities should be developed on a stop-by-stop basis, a more systematic approach is to develop a hierarchy of stops based on relative importance. The level of amenities that would be provided would then be based upon that hierarchy. For example, basic stops that serve relatively few riders would consist simply of a bus stop sign with

bus route information, and if possible, a paved waiting area pad, lighting, and a trash receptacle. At the other end of the spectrum, major regional portals would be uniquely designed, and would include a full range of amenities including local area information and real-time passenger information.

At the present time, transit service in Peoria is limited, and thus a relatively small hierarchy would be appropriate. However, as the city, and its transit services grow, a larger hierarchy would be more apt. The recommended approach includes:

Short-Term

- **“Signature” Art Stops:** Stops in key high visibility locations where design is particularly important and/or can contribute to the vitality and character of the area. Examples would be at the Peoria Sports Complex and at the Peoria Performing Arts Center. These stops would have custom art installations.
- **“Standard” Art Stops:** Stops in prominent locations that would have artwork built into the design of the stop. These stops would be smaller in scale than the Signature Stops, with artwork incorporated into a standard design (as opposed to the custom designs for the Signature Stops).
- **Regular Stops:** Most stops—those that would not be Signature Stops, Standard Art Stops, or low volume stops. These stops would provide a basic set of amenities, including shelters. As in Tucson, artwork could be incorporated into the design of the standard shelter.
- **Low Volume Stops:** Stops that serve very few riders and that are provided largely to ensure comprehensive service coverage. These stops would have limited facilities.

Mid to Long-Term

- **Transit Centers:** Transit centers, such as the proposed Old Town Transit Center, can act as a focal point for local and regional transit services, and typically handle high volumes of passengers. These facilities would include similar elements as Signature Stops, plus additional passenger amenities.
- **HCT Stops:** High capacity transit stops would consist of specially designed “stations” that would be designed to be consistent with stations constructed for other Valley high capacity transit services such as commuter rail, and possibly light rail, BRT, and Rapid Bus.

RECOMMENDATIONS

As described above, this study examined a large number of improvements, and through this work, a number of priorities and conclusions emerged:

- Transit services in Peoria should be well integrated with the regional transit system, and to accomplish this, it is more important to extend Valley Metro services into Peoria than to develop purely local circulator services.

- For existing and new services, it is important to provide “full” rather than only limited service (at the present time, only half of existing Route 106 Peoria/Shea weekday service, and no Saturday or Sunday service, operates through Peoria).
- Peoria Dial-A-Ride service needs to be maintained, and to do this, local revenues should be used to offset cuts in state funding.
- Bus stop facilities should be improved, and artwork should be incorporated into major stops.
- An Old Town Transit Center should be developed north of Grand Avenue at the intersection of 83rd Avenue and Peoria Avenue.
- High Capacity Transit will not be feasible in the foreseeable future, as projected population and employment levels and densities will not be sufficient to support cost-effective service.

These priorities and conclusions, and available funding levels, were used to develop the project’s recommendations, which are presented for the short-term (2011 to 2015), the mid-term (2016 to 2026), and long-term (beyond 2026). Based on current funding projections, a combination of local transportation sales tax, Prop 400, and federal funding is available for the short and mid-term recommendations. Recommended long-term improvements, due to uncertainties about which areas of Peoria will develop at what rate, are more generalized. Also, because implementation of those projects will occur beyond the end of the Prop 400 program, funding for those projects will need to be identified at the time plans are being made for a successor to the Prop 400 program.

SUMMARY OF RECOMMENDATIONS

As described in more detail below, the following services and facilities are recommended:

Short-Term (2011 to 2016)

- Use local funding to maintain Peoria Dial-A-Ride service.
- Use local funding to maintain Grand Avenue Limited service.
- Improve Route 106 Peoria service.
- Improve bus stops.

Mid-Term (2016 to 2026)

- Develop Old Town Transit Center/Park and Ride.
- Extend Route 138 Thunderbird into Peoria.
- Implement new Route 83 83rd Avenue local route.
 - Continue to improve bus stops.

Long-Term (Beyond 2026)

- Extend Valley Metro’s local bus grid service into much of Peoria.
- Extend service to northern areas.
- Develop new park and ride lots.

- Support development of Grand Ave commuter rail.

**SHORT-TERM RECOMMENDATIONS
(2011 – 2015)**

The project’s short-term recommendations are aimed at using available revenues to offset cuts in state and regional funding to maintain existing services, to provide a full level of service on the city’s only existing Valley Metro local route, and improve facilities (see Figure 4 and Table 1):

1. Maintain Peoria Dial-A-Ride Service.
2. Expand Route 106 Peoria/Shea service.
3. Maintain Grand Avenue Limited service.
4. Improve bus stop facilities.

Maintain Peoria-Dial-A-Ride Service

Peoria had been using state Local Transportation Assistance Fund II (LTAF II) revenues to fund most of the costs of its Dial-A-Ride service. This funding has been eliminated, and to continue service, the city should use local sales tax revenues to maintain service. The cost to maintain service will be \$1.0 million per year.

**Figure 4: Short-Term Recommendations:
Route 106 Peoria/Shea & Grand Ave**

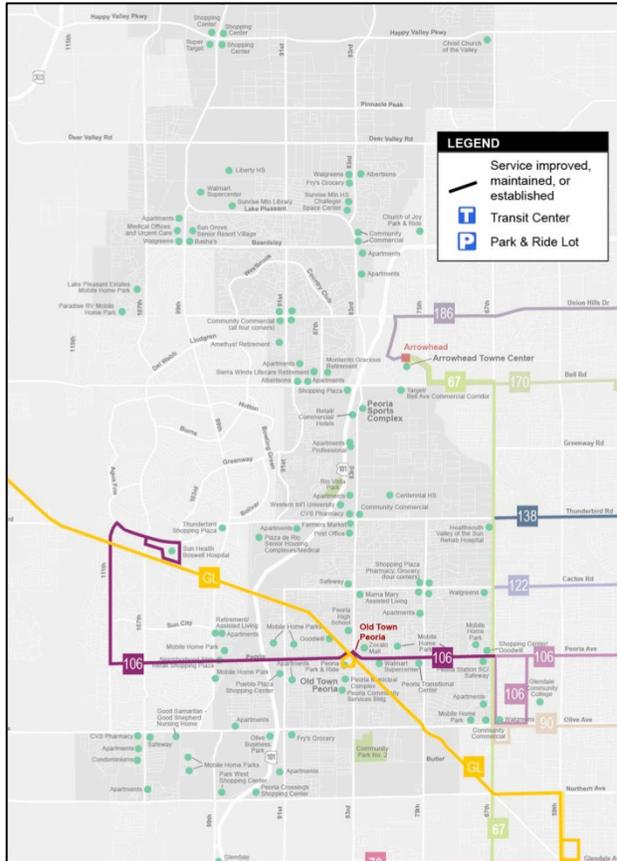


Table 1: Short-Term Recommendations: Ridership, Costs, and Funding Sources

Program	Ridership/ Month	Annual Operating Cost	Capital Cost	Funding Source
Maintain Dial-A-Ride	2,600	\$1.0 m	\$0.0	Peoria Sales Tax
Expand Route 106 Peoria Service	8,460	\$125,000	\$0.0	Prop 400
Maintain Grand Avenue Limited Service	800	\$12,500	\$0.0	Prop 400
Improve Bus Stops	--		\$100,000 - \$200,00/yr (over 2-3 yrs)	Peoria Sales Tax

Expand Route 106 Peoria/Shea Service

At the present time, approximately half of Route 106 Peoria/Shea weekday service, and all weekend service, terminates at Peoria Avenue at 67th Avenue, which means that only half of weekday service, and no weekend service, operates through Peoria. In the short-term, the city should use available Prop 400 revenues to extend all Route 106 service into Peoria. Because of recent reductions elsewhere, RPTA has available buses, and thus there will be no associated capital costs. Annual operating costs will be approximately \$125,000 per year.

Maintain Grand Avenue Limited Service

Valley Metro's Grand Avenue Limited provides limited stop commuter service between El Mirage and Phoenix, largely along Grand Avenue, with a stop in Old Town Peoria. The route is partially funded by the communities that it serves and some of that funding is being reduced. To preserve service at present levels, Peoria should allocate some of its available Prop 400 funding to maintain service at three AM inbound and three PM outbound trips. The cost to maintain this service will be approximately \$12,500 per year.

Improve Facilities at Higher Volume Bus Stops

Better bus stop facilities can make the use of transit much more comfortable, and improve the aesthetics and character of the areas in which they are located. The city should work over time to improve bus stops. It is recommended that over the next two to three years that the city spends \$100,000 to \$200,000 per year of local sales taxes revenues on bus stop improvements.

MID-TERM IMPROVEMENTS (2016 - 2026)

Over the mid-term, transit demand will grow, and mid-term recommendations are aimed at maintaining the short-term services, extending Valley Metro's Route 138 Thunderbird into Peoria, implementing new local service on 83rd Avenue, and developing a new Old Town Transit Center, and continuing the bus stop improvement program (see Figure 5 and Table 2).

Extend Route 138 Thunderbird through Peoria

Route 138 Thunderbird, which now operates between the Paradise Valley Mall and the Peoria/Glendale border at 67th Avenue, should be extended through Peoria along Thunderbird Road. Because of recent reductions elsewhere, RPTA has available buses, and there will be no associated capital costs. Annual operating costs will be approximately \$250,000 per year.

Develop New Route 83 83rd Avenue Route

The expansion and extension of Routes 106 Peoria/Shea and 138 Thunderbird will improve east-west service in Peoria and connections to the rest of the Valley. The development of a

new Route 83 83rd Avenue route will provide north-south service through the core of Peoria from Arrowhead Mall to Phoenix via the Peoria Sports Center, Old Town, and Glendale. Annual operating costs will be approximately \$1.0 million per year for the Peoria portion of the route, and will be funded with programmed Prop 400 funds.

Develop Old Town Transit Center/Park and Ride Lot

To provide a focus for transit services in Peoria, to provide parking for carpoolers and vanpoolers, and to serve future Grand Avenue commuter rail service, a transit center should be developed in Old Town on 83rd Avenue. This transit center would be integrated with and support the city’s Old Town redevelopment plans, and should be located north of Grand Avenue at the intersection of 83rd Avenue and Peoria Avenue. The Old Town Transit Center would cost \$8.0 million to construct and would be funded with programmed Prop 400 funds and federal funds. Annual operating cost would be approximately \$70,000 and would be funded with local sales tax revenues.

Figure 5: Mid-Term Recommendations: Routes 83 & 138 and Old Town Transit

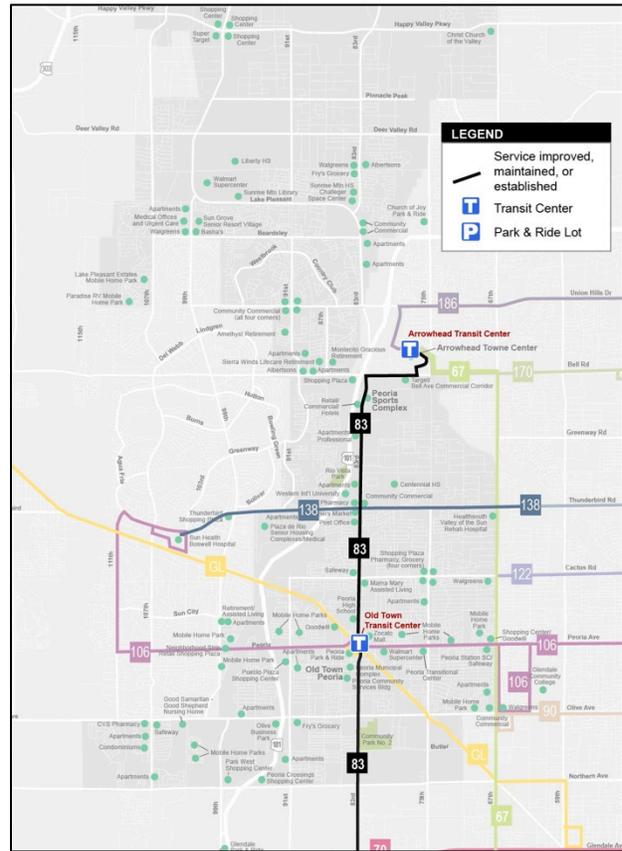


Table 2: Mid-Term Recommendations: Ridership, Costs, and Funding Sources

Program	Ridership/ Month	Annual Operating Cost	Capital Cost	Funding Source
Extend Route 138 Thunderbird through Peoria	6,200	\$250,000	\$0.0	Prop 400
Develop New Route 83 83 rd Ave Route	27,200	\$1,000,000 (Peoria service)	\$0.0	Prop 400
Old Town Transit Center	TBD	\$70,000	\$8.0 million	Prop 400 and federal funds
Continue to Improve Bus Stops	--		\$80,000/yr (average)	Peoria Sales Tax

Improve Bus Stop Facilities

As in the short term, the city should continue to improve bus stops. It is recommended that between 2016 and 2026 the city spend an average of \$80,000 per year of local sales taxes revenues to improve bus stops. Part of this spending will be for the development of new bus stops for the extension of Route 138 Thunderbird through Peoria and for the new Route 83 83rd Avenue.

LONG-TERM IMPROVEMENTS (BEYOND 2026)

Beyond 2026, as Peoria continues to develop and as development moves northward, transit services and facilities should also be extended northward. Given the uncertainties involved in how this development will occur—in terms of which areas will develop first and more intensely and potential funding availability—recommendations for beyond 2026 are necessarily more general than those through 2026. However, the following types of improvements will be desirable:

- Additional local bus service improvements to extend Valley Metro’s grid system into much of Peoria, including northern areas.
- New express routes from northern areas, with specific routes determined based on future growth patterns.
- New park and ride lots, at locations to be determined based on growth.
- Grand Avenue commuter rail between Wittmann and downtown Phoenix via Peoria in the Grand Avenue corridor.

Operating and capital costs would depend upon the specific services and facilities that would be developed, and funding will need to be identified for these services as they are developed.

CHAPTER 1 INTRODUCTION

Peoria has grown rapidly from a small agricultural town located outside of Phoenix to a city of 154,000 residents that is now a part of the Phoenix metropolitan area. Its development patterns have been similar to those throughout the Valley, but due to its location at the edge of the metropolitan area, there has been a significant amount of “leapfrog” development, which has left many low density residential enclaves. Newer commercial growth has also been built along major arterials and in big box centers to serve the new locations, and that led to an associated decline in Peoria’s Old Town, which was its traditional commercial center.

While recent development patterns have produced many benefits, they have also produced traffic congestion and negative air quality impacts, and have increased the costs to provide services and develop infrastructure. For the future, Peoria desires to grow “smarter,” to make growth more efficient and more productive, revitalize Old Town, establish an entertainment district, protect natural resources and community character, and improve quality of life for the city’s residents. As described in Peoria’s adopted 2010 General Plan, a number of efforts will be needed to achieve this future. One important component will be the development of a much more balanced transportation system, and specifically the development of an attractive and effective transit system. This study addresses those issues and examined how to:

- Use transit to provide better links between Peoria and the rest of the Valley,
- Develop a more balanced transportation system, and
- Use transit to encourage smarter growth and improve the city’s character.

This report provides a summary of the study’s major tasks, and includes:

- An analysis of current and future transit demand.
- A review of existing and currently programmed transit services in Peoria and its environs.
- A description of local service options with associated ridership, costs, and productivity estimates.
- An analysis of High Capacity Transit options that describes light rail and Bus Rapid Transit (BRT) alternatives, also along with associated ridership, costs, and productivity estimates, plus an analysis of issues related to the implementation of High Capacity Transit.
- A description of options for the development of an Old Town Transit Center, including a preliminary site plan for the preferred option.
- A review of bus stop facilities and practices in other communities, including the incorporation of artwork into major stops and the development of a preferred approach for Peoria.
- Recommendations for the short, mid, and long-term.

In addition to this report, the study also produced a standalone document that presents new bus stop standards for the improvement of bus stops in Peoria, as well as a process for the incorporation of artwork at major stops. That document is entitled, “City of Peoria, Bus Stop Design Standards,” and is dated June 2010.

CHAPTER 2 MARKET ANALYSIS

This chapter summarizes existing and projected socio-economic, travel, and development characteristics of Peoria as they relate to the provision of transit service. This market analysis addresses:

- Development Patterns
- Population and Employment
- Socio-Economic Characteristics
- Travel Patterns

DEVELOPMENT PATTERNS

Located in the northwest valley, Peoria is a very large city geographically, and encompasses approximately 233 square miles. However, the large majority of development is in the southern third of the city, south of Deer Valley Road. This area contains most of Peoria's residential and commercial areas, including the Peoria Sports Complex (which is the spring training facility for the Seattle Mariners and San Diego Padres), and downtown (Old Town) Peoria.

At present, Peoria is largely residential, and has nearly four times as many residents as jobs. The city, including its school district, is the largest employer, with a total of 5,000 employees (most of whom work for the school district). Other large employers include Plaza del Rio Campus (700 employees) and large retail stores, including Walmart, Fry's, Target, and Safeway. Today, most activity centers are located in the southern portion of the city (see Figure 2-1).

However, development is spreading northward, and is now beginning to occur between Deer Valley Road and Happy Valley Parkway. North of Happy Valley Parkway, the city is still largely undeveloped, and Lake Pleasant, in the far northern part of the city, is a major recreational area.

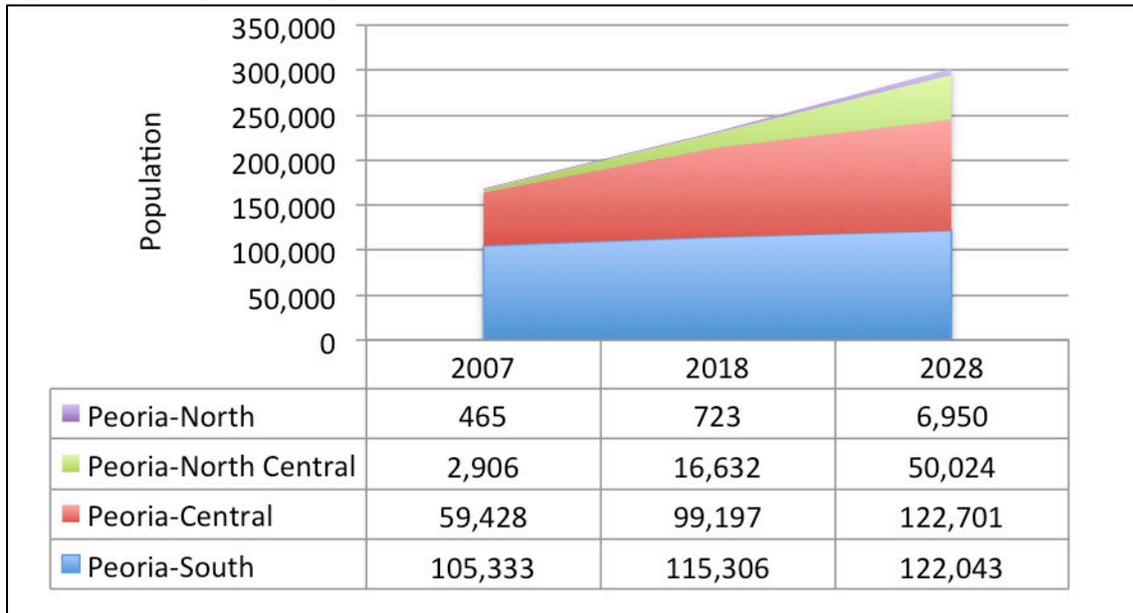
POPULATION AND EMPLOYMENT

At present, Peoria has approximately 154,000 residents. However, the city is growing rapidly, and by 2018, it is projected that Peoria's population will grow by 48% to over 230,000 residents, and by 2028, by 80% to over 300,000 residents. At present, most residents live in parts of the city south of Deer Valley Road (Peoria-South and Peoria-Central).¹ Over the next 20 years, most

¹ For the purpose of this analysis, the Peoria planning area was subdivided into four districts: (1) Peoria-South, (2) Peoria-Central, (3) Peoria-North Central, and (4) Peoria North, and the boundaries of these areas are included on the corresponding maps.

population growth is projected for Peoria-Central and Peoria-North Central, but even with that growth, most residents will still live in the southern portions of the city (see Figure 2-2).

Figure 2-2: Projected Population Growth

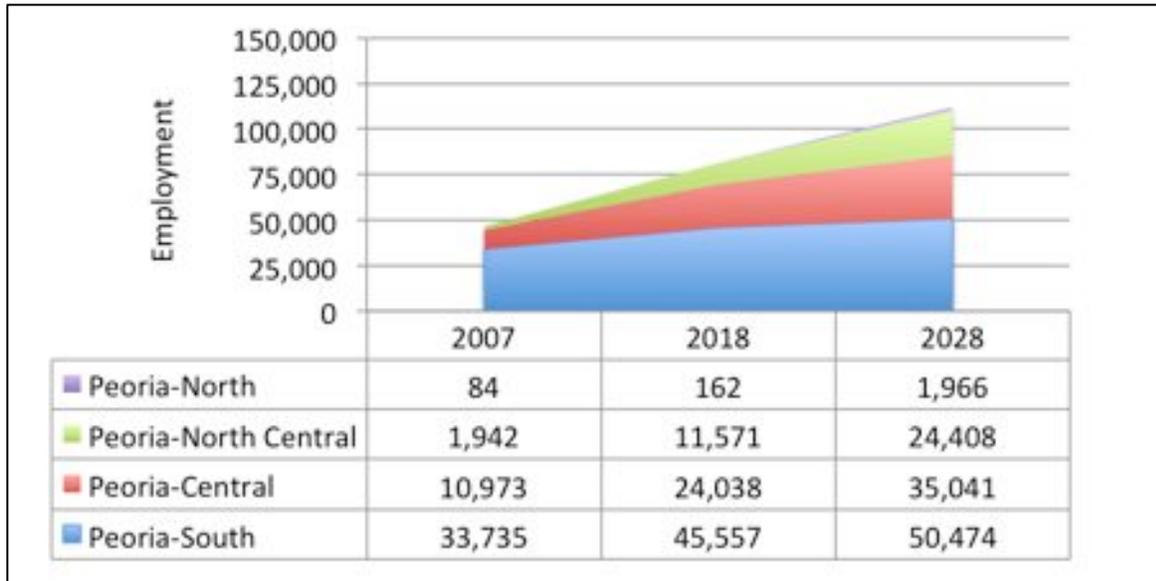


Similarly, most employment is also located in the southern areas of Peoria. At present, 72% of all jobs are located in Peoria-South, and 23% are located in Peoria-Central. In total, there is only one job for every 3.6 residents, which means that many Peoria residents commute to other communities for work. However, employment is projected to increase even faster than population, by 74% through 2018 and by 130% through 2028 (see Figure 2-3). With this job growth, the proportion of jobs will increase to one job for every 2.7 residents. As with population, most of the job growth will occur in Peoria-Central and Peoria-North Central, but even so, the largest proportions of jobs will continue to be in Peoria-South and Peoria-Central.

More than any other factor, the nature of an area’s development will determine whether this will be possible:

- The reach of transit is generally limited to within ¼ to ½ mile of the transit line or station, and thus the size of the travel market is directly related to the density of development in that area.
- Bigger markets support more frequent service, while smaller markets can support only less frequent service.

Figure 2-3: Projected Employment Growth



- To attract travelers who have other options, such as automobiles, transit must be relatively frequent—at least every 30 minutes, and preferably every 10 to 15 minutes. With less frequent service, transit can be expected to serve only those who do not drive or cannot drive.

Population and employment densities are among the best indicators of the types of service that would be feasible. As shown in Table 2-1, as a general rule, approximately 320 residents per

Table 2-1: Population and Employment Densities and Transit Service

Transit Mode/ Service Frequencies	Population/ Square Mile	Jobs/ Square Mile
Flex Bus	320	
Community Circulator	1,300	
Local Bus		
60 minutes	5,000-10,000	2,500-5,000
30 minutes	10,000-20,000	5,000-10,000
15 minutes	20,000-30,000	10,000-15,000
10 minutes	30,000-60,000	15,000-30,000
<=5 minutes	>60,000	>30,000
Bus Rapid Transit	17,000-33,000	>8,500
Light Rail Transit	20,000-50,000	>10,000
Commuter Rail ²	1,600-3,200	

² Note that most transit modes draw riders from ¼ to ½ mile of the station or line. However, commuter rail typically draws park and ride riders from much larger distances (MAG has estimated eight miles for the Phoenix area), and because of this commuter rail can be effective with lower surrounding densities.

square mile are typically needed to support Flex Service, 1,300 to support Community Circulator services (such as Glendale’s GUS services), and 5,000 or more are needed to support fixed-route bus service.

In Peoria, most residential development consists of low density single family housing. Currently, and as shown in Figure 2-4, population densities throughout most of the city are below 5,000 residents per square mile. Only a few areas, which are north and south of Peoria Avenue, and between Bell Road and Union Hills Drive, have 5,000 to 10,000 residents per square mile. Population projections through 2028 indicate only small increases in densities throughout the city, and the highest populations densities will continue to be in the 5,000 to 10,000 residents per square mile range (see Figure 2-6). This indicates that without significant changes to development patterns, there would be demand for Flex Bus, community circulators, and local bus services, but not higher capacity services such as BRT or light rail. For BRT or light rail to be practical, the city will need to take steps to develop a more transit supportive environment (as described in Chapter 5).

The situation is similar for employment. As shown in Figure 2-6, 2008 employment densities in most of the city are below 3,000 jobs per square mile, and the highest densities are in the 3,000 to 5,000 jobs per square mile range. Through 2028, and as shown in Figure 2-8, employment densities will intensify to between 5,000 and 10,000 jobs per square miles in a few areas. However, throughout most of the city, employment densities will remain low. As with population densities, employment densities also indicate that there would be demand for Flex Bus, community circulators, and local bus services, but not higher capacity services such as BRT or light rail unless the city takes steps to develop a more transit supportive environment.

TRANSIT DEPENDENT POPULATIONS

Many groups, such as the elderly, young teenagers, persons from low income households, households without automobiles, those with mobility limitation, and many minority groups use transit to a greater extent than other groups. There is a large degree of overlap between many of these groups, and three of the most important indicators of high transit demand from these populations are the proportion of residents aged 65 and older, those with mobility limitations, and those living in poverty.

Compared to Maricopa County as a whole, Peoria has more seniors, an average proportion of residents with mobility limitations, and a much lower than average proportion of residents living in poverty (see Figure 2-8). Compared to the state as a whole, Peoria has only a slightly higher than average proportion of seniors, more residents with mobility limitations, and far fewer residents living in poverty. Overall, these figures indicate that demand from transit dependents will be slightly higher than average among seniors and those with mobility limitations, but much lower from residents with lower incomes.

Figure 2-4: 2008 Population Density

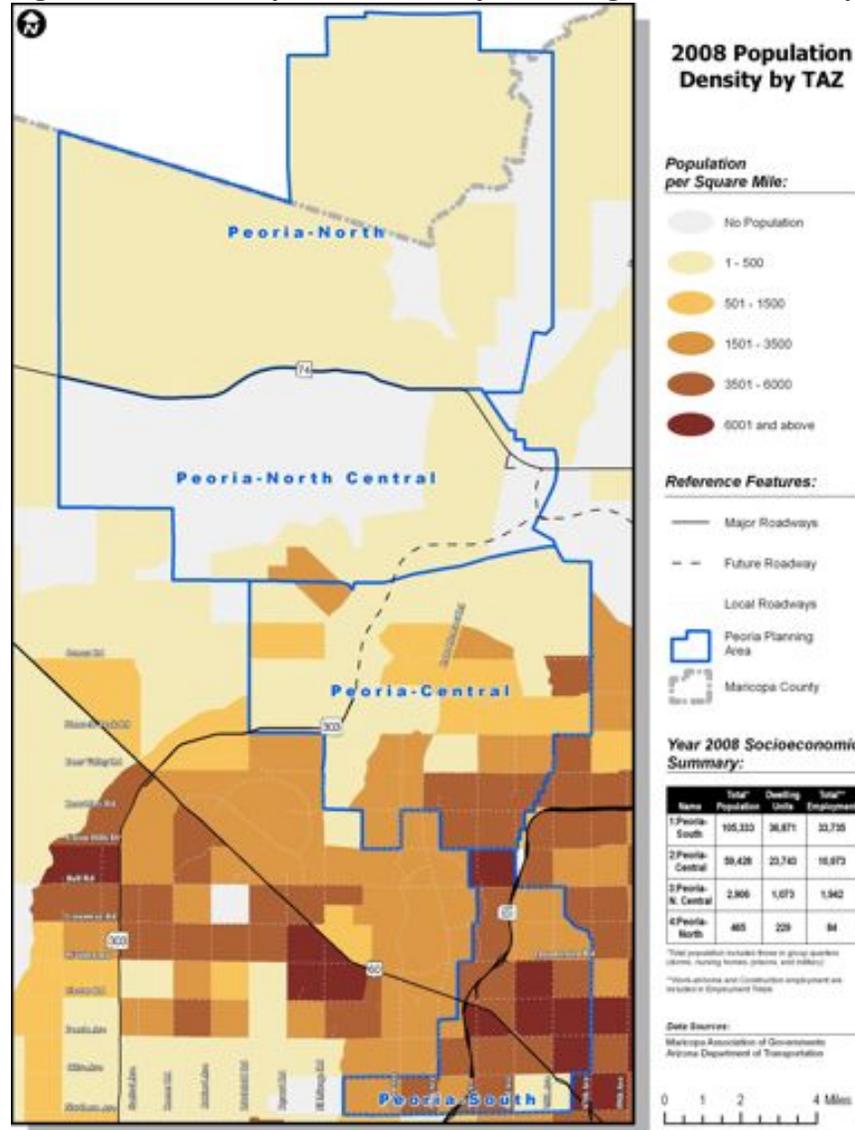


Figure 2-5: 2028 Population Density

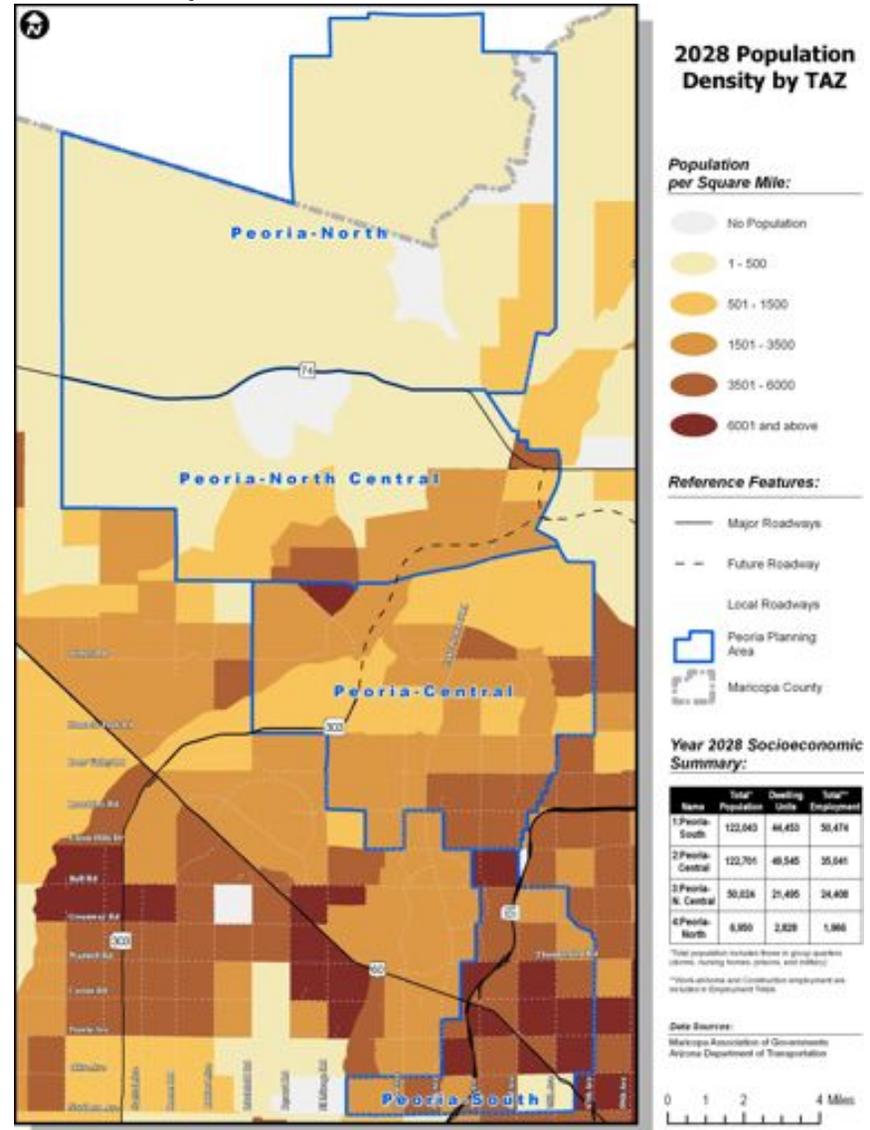


Figure 2-6: 2008 Peoria Employment Density

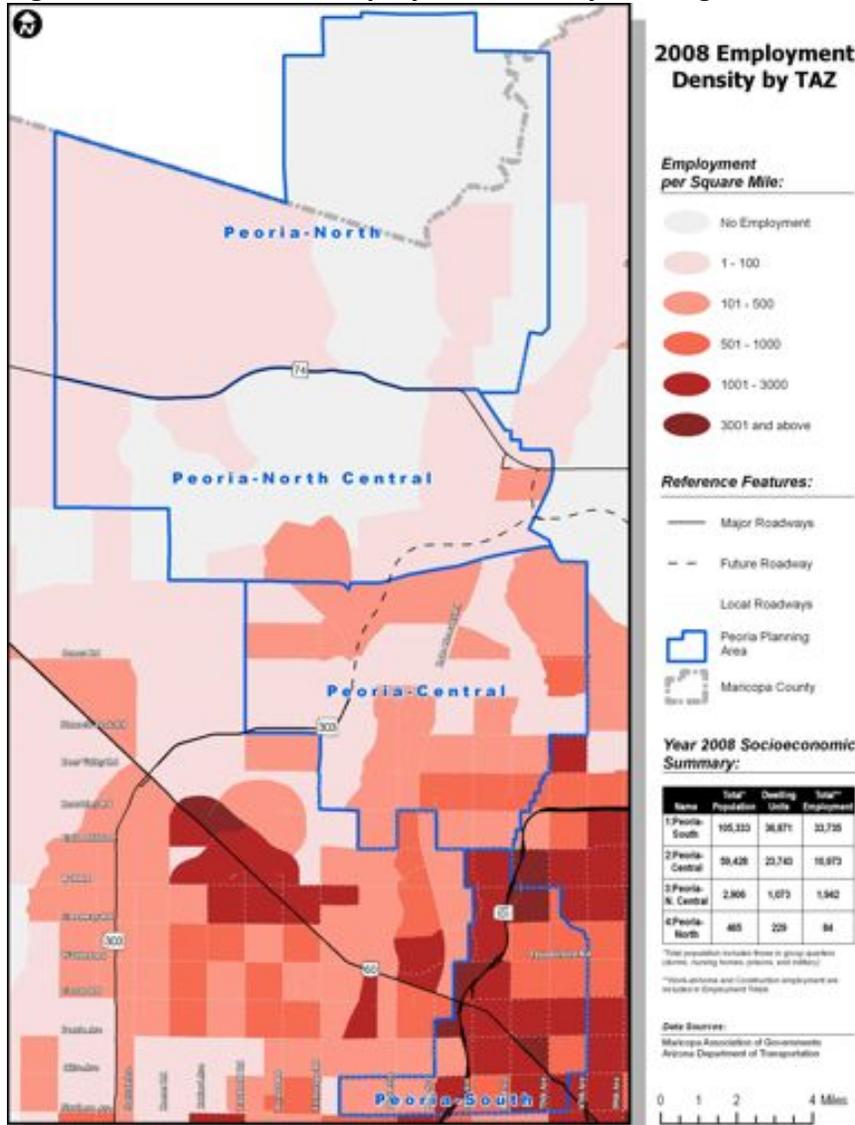


Figure 2-7: 2028 Peoria Employment Density

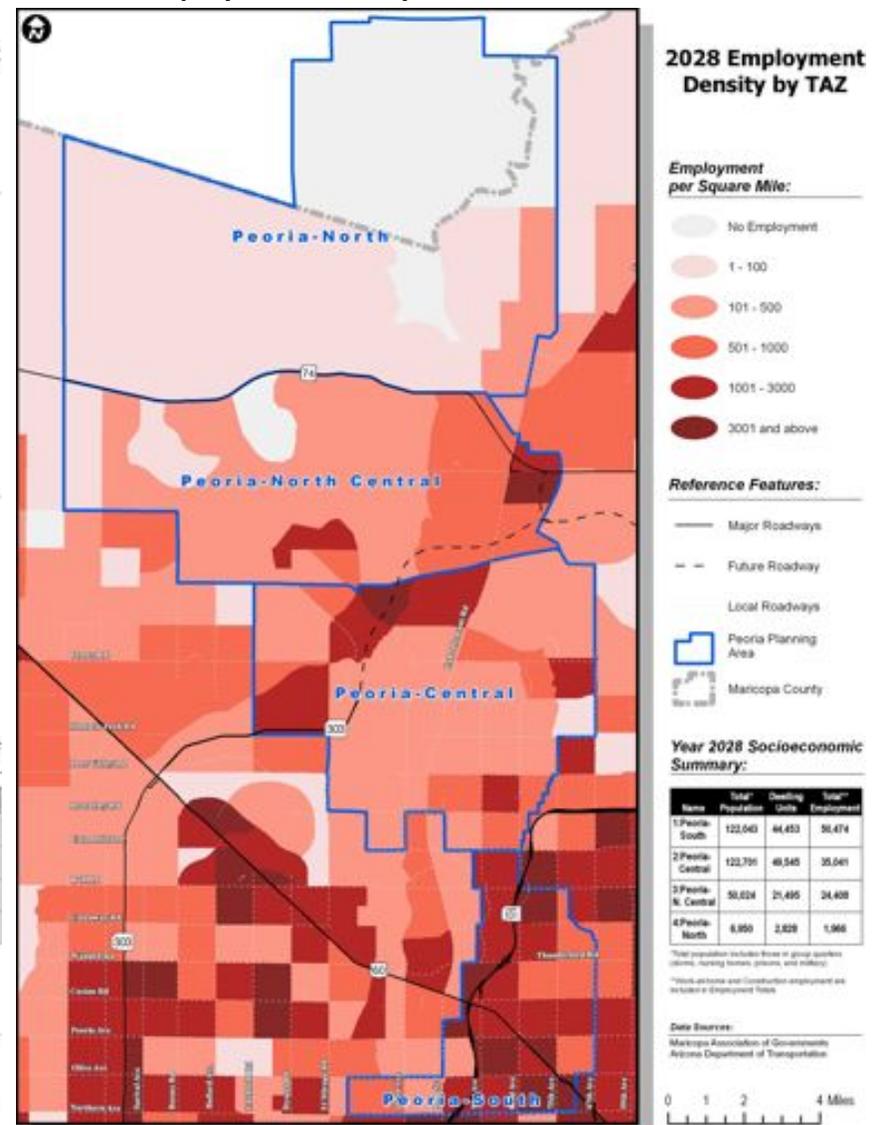
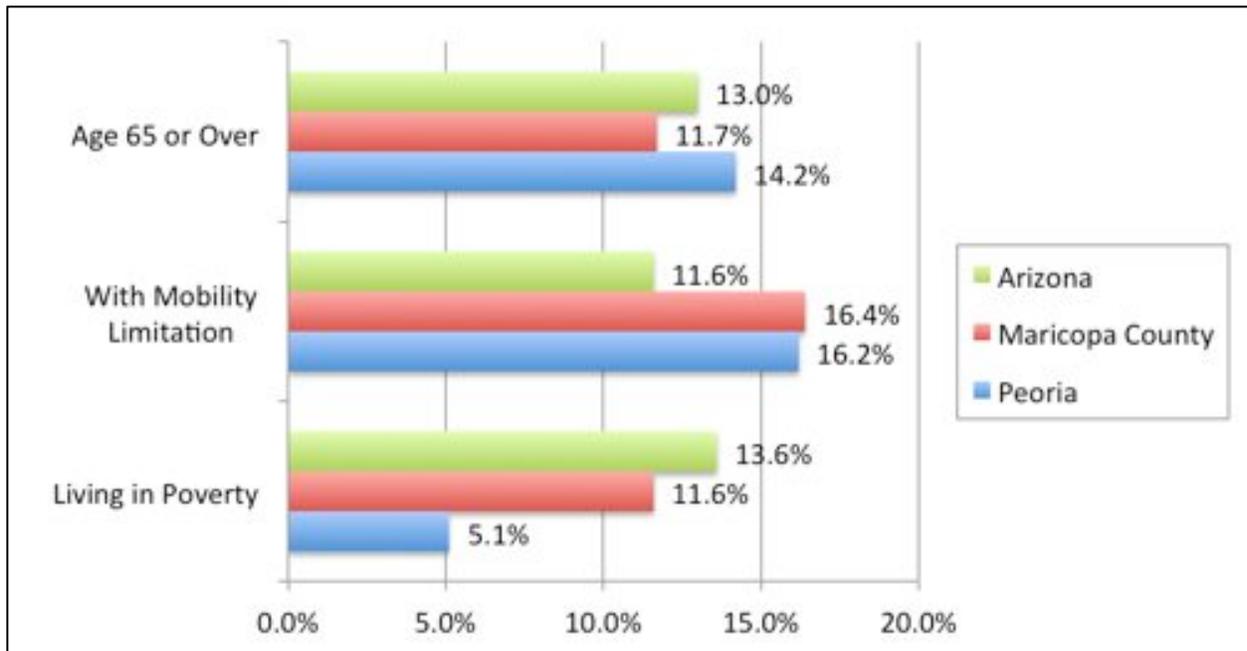


Figure 2-8: Percentages of Population More Likely to Be Transit Dependent



Source: Census 2000

TRAVEL PATTERNS

A third key component of transit demand consists of travel patterns. For transit to be effective, it must take people where they want to go. For Peoria, the greatest travel flows are currently to and from Glendale and Phoenix-North. For the future, these will continue to be the most important flows, but there will also be relatively high volumes to and from other areas as well.

WORK TRIPS

Typically, a high proportion of transit trips are made to and from work—for example, in Phoenix, work trips comprise 55% of all transit trips. As described earlier, Peoria has many more residents than jobs, and as a result, work trips could also be expected to comprise a large proportion of all transit trips in Peoria.

Trips within Peoria

At present, the numbers of work trips that are made within Peoria are relatively low. The areas with the highest volumes of trips are within Peoria-South (11,600), within Peoria-Central (4,400), and from Peoria-Central to Peoria-North Central (5,600) and Peoria-Central (see Table 2-2).

Table 2-2: 2008 Home-Based Work Trips within Peoria

From/To	Peoria-South	Peoria-Central	Peoria-North Central	Peoria-North
Peoria-South	11,578	1,109	87	4
Peoria-Central	3,407	4,362	5607	16
Peoria-North Central	115	249	370	2
Peoria-North	14	21.	19	10

As with population and employment growth, through 2028, the largest amount of growth is expected to occur in Peoria-Central and Peoria-North Central (see Table 2-3). However, even with this growth, volumes will remain largest in Peoria-South, but closely followed by Peoria-Central. These work trip flows indicate that both today and in the future, Peoria-South and Peoria-Central will be the most important markets for local travel, but that there will also be longer term needs in Peoria-North Central.

Table 2-3: 2028 Home-Based Work Trips within Peoria

From/To	Peoria-South	Peoria-Central	Peoria-North Central	Peoria-North
Peoria-South	14,417	1,615	500	29
Peoria-Central	5,503	12,895	4,600	251
Peoria-North Central	1,108	4,734	7,322	278
Peoria-North	124	355	638	296

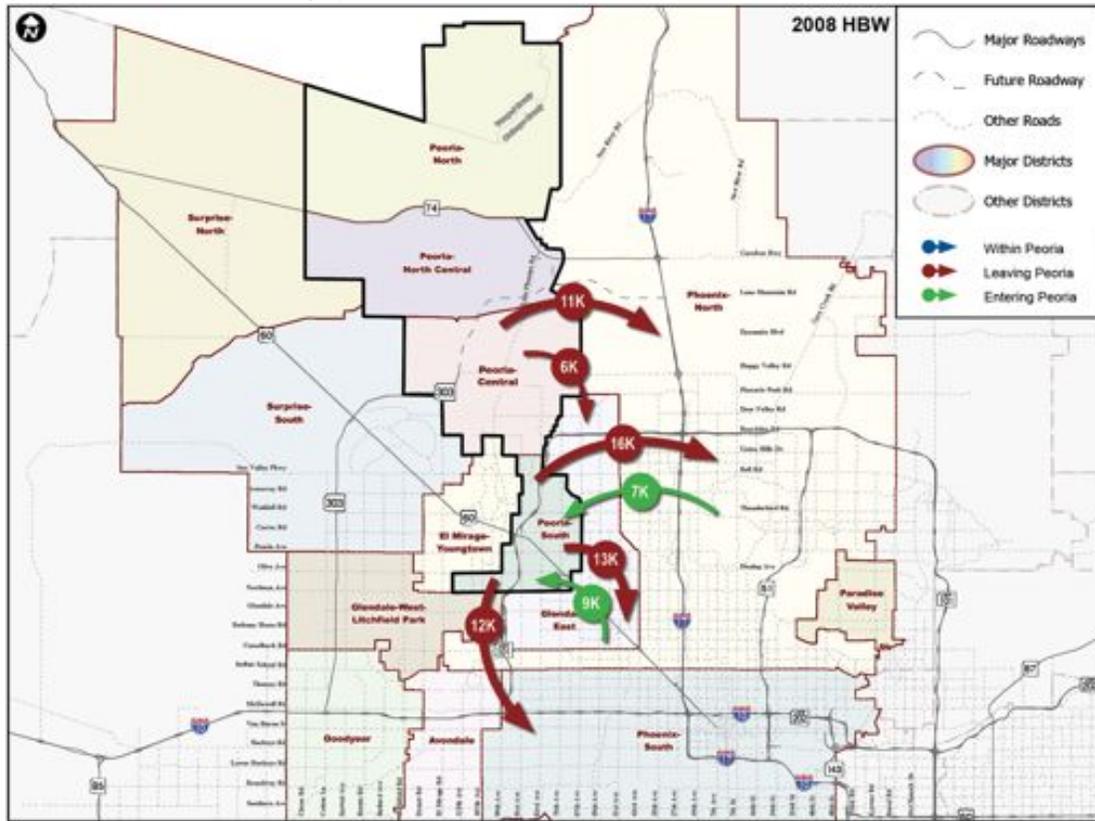
Travel to and from Locations Outside of Peoria

Because most work trips are made to locations outside of Peoria, work trip travel volumes are higher to locations outside of Peoria than they are to locations within Peoria. As shown in Table 2-4 and Figure 2-9, the highest volumes are currently from Peoria to Phoenix-North, Glendale-East, and Phoenix-South. Work trip travel flows into Peoria are much lower, with the only significantly high work trip flows into Peoria-South from Glendale-East and Phoenix-North.

Through 2028, work trip flows will increase significantly. The largest bi-directional flows will be between Peoria and Phoenix-North and Glendale-East (see Figure 2-10). Notable changes are that relatively large work trip flows will develop between Peoria-Central and El Mirage/Youngtown, and between Surprise-South and Peoria.

Note that, in total, work travel flows to locations outside of Peoria are much larger than work trip flows within Peoria. This indicates that, for transit, connections to the rest of the Valley, and in particular, to other communities close to Peoria, represent a larger market than trips within Peoria.

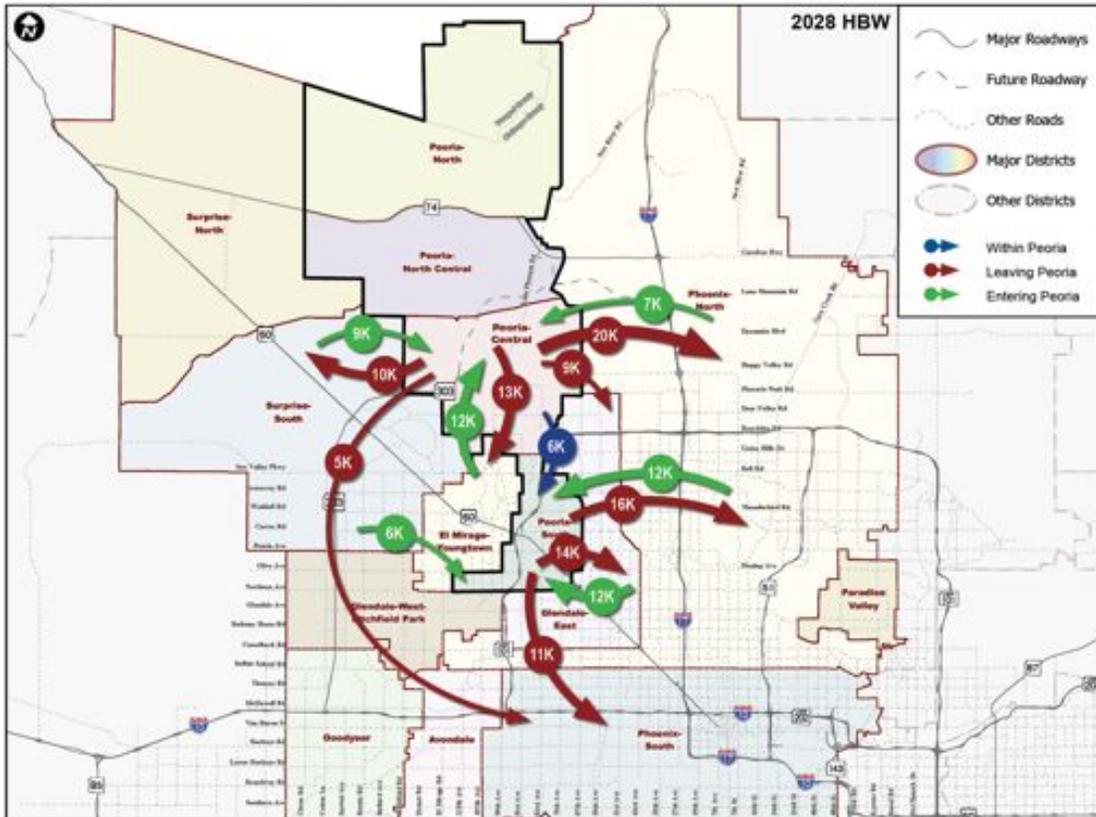
**Figure 2-9: 2008 Inter-District Trip Flows for Home-Based Work Trips
(Greater than 5,000 Trips)**



**Table 2-4: 2008 and 2028 Inter-District Work Trip Travel Flows
(Greater than 5,000 Trips)**

From	To	2008	2028
Peoria-South	Phoenix-North	16,000	16,000
	Glendale-East	13,000	14,000
	Phoenix-South	12,000	11,000
Peoria-Central	Phoenix-North	11,000	20,000
	Glendale-East	6,000	9,000
	El Mirage/Youngtown		13,000
	Peoria-South		6,000
	Phoenix-South		5,000
Glendale-East	Peoria-South	9,000	12,000
Phoenix-North	Peoria-South	7,000	12,000
	Peoria-Central		7,000
El Mirage/Youngtown	Peoria-Central		12,000
Surprise-South	Peoria-Central		9,000
	Peoria-South		6,000

Figure 2-10: 2028 Inter-District Trip Flows for Home-Based Work Trips (Greater than 5,000 Trips)



Also notable is that there will not be a significant amount of work trip travel between Peoria and Glendale-West, which could be the terminal of a potential light rail extension to Glendale via I-10 and Loop 101. This indicates that demand for a further extension of light rail from that area into Peoria would likely be much lower than from downtown Glendale.

ALL TRIPS

For all trip purposes, the largest numbers of trips are currently made within Peoria-South. However, in the future, as development spreads northward, even more will be made in Peoria-Central. The numbers of trips that are made to and from locations outside of Peoria are smaller than those made within the city, but are still significant.

Trips within Peoria

At present, as with work trips, the largest volumes of trips are within Peoria-South (133,700) and within Peoria-Central (67,100) (see Table 2-5). Trips within and between other areas of Peoria are all much lower, and in absolute terms, relatively low.

Table 2-5: 2008 Trips within Peoria: All Trip Purposes

From/To	Peoria-South	Peoria-Central	Peoria-North Central	Peoria-North
Peoria-South	133,688	8,518	243	24
Peoria-Central	16,825	67,054	3,394	110
Peoria-North Central	330	2,007	4,539	59
Peoria-North	38	91	156	515

However, through 2028, there will be only moderate growth in trips within Peoria-South (from 133,400 to 156,900) and much higher growth rates in the rest of Peoria (see Table 2-6). Within Peoria-Central, the number of trips will grow from 67,100 to 169,100, and within Peoria-North Central they will grow from 4,500 to 86,700. The high growth rates in these areas will be the result of high rates of development in those areas.

Table 2-6: 2028 Trips within Peoria: All Trip Purposes

From/To	Peoria-South	Peoria-Central	Peoria-North Central	Peoria-North
Peoria-South	156,884	10,591	1,460	126
Peoria-Central	20,647	169,146	28,276	1,292
Peoria-North Central	1,958	23,829	86,715	2,055
Peoria-North	192	878	2,528	6,770

Travel to and from Locations Outside of Peoria

In terms of overall patterns, trip flows for all trip types are similar to those for work trips, but with much higher overall volumes, typically around 11 times as high. In general, higher trip flows occur to and from areas east of Peoria, such as Glendale-East and Phoenix-North. As shown in Figure 2-11, at present, the largest trip flows occur between:

- Peoria-South and Glendale-East: 131,000 trips
- Peoria-South and Phoenix-North: 68,000 trips
- Peoria-South and El Mirage-Youngtown: 63,000 trips

As Peoria grows, it is projected that increases in travel patterns for all trip types will be similar to those for work trips, and that the highest volumes will occur to and from areas east of the Peoria, such as Glendale-East and Phoenix-North. In terms of bi-directional travel flows, the largest flows in 2028 will be between (see also **Error! Reference source not found.**Figure 2-12):

- Peoria-South and Glendale-East: 158,000 trips
- Peoria-South and Phoenix-North: 78,000 trips
- Peoria-Central and Phoenix-North: 76,000 trips

Figure 2-11: 2008 Inter-District Trip Flows for All Trips (Greater than 10,000 Trips)

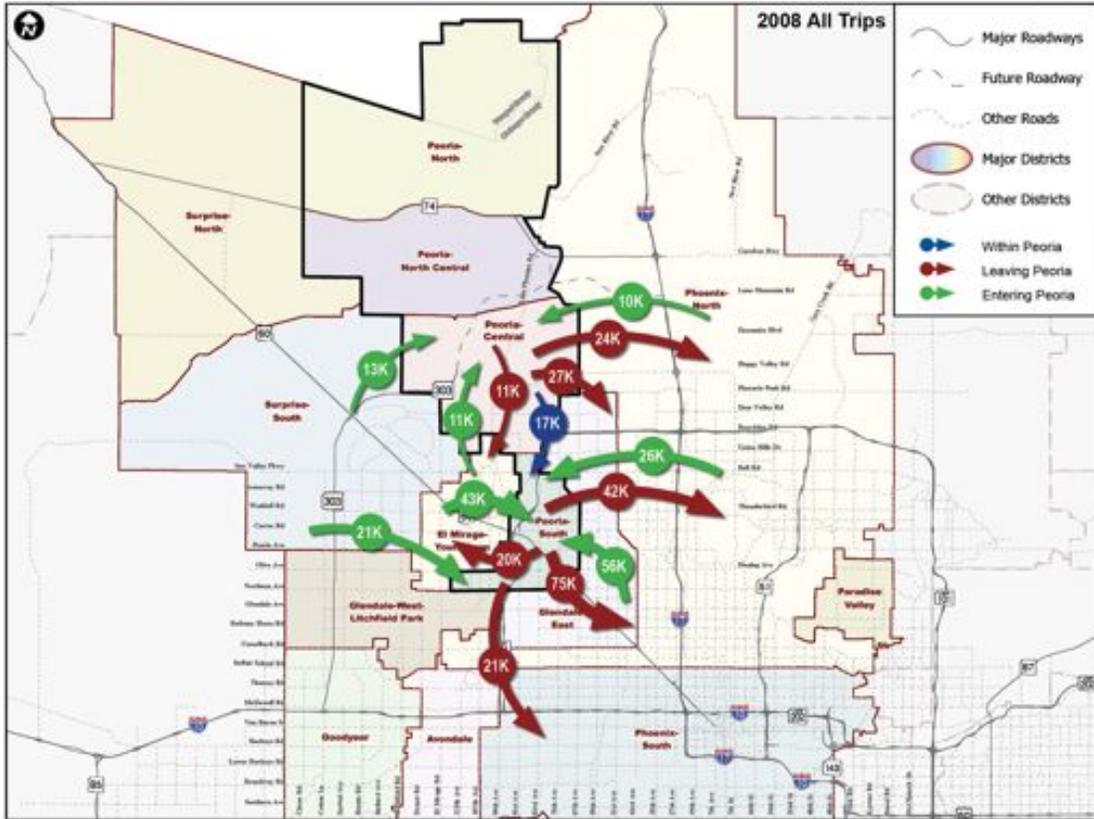
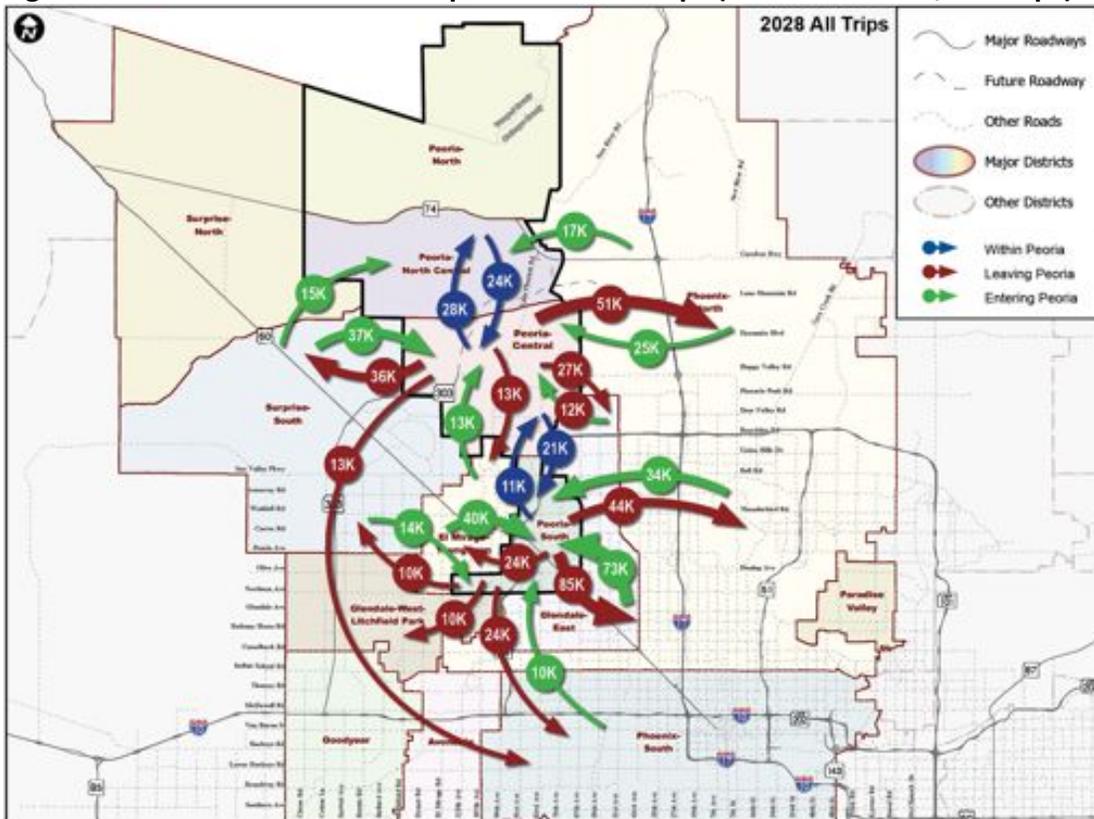


Figure 2-12: 2028 Inter-District Trip Flows for All Trips (Greater than 10,000 Trips)



- Peoria-Central and Surprise-South: 73,000 trips
- Peoria-South and El Mirage-Youngtown: 64,000 trips

As with work trip travel, travel flows between Peoria and Glendale-East and Phoenix-North will continue to be among the most important. However, travel to neighboring areas to the west, such as Surprise, El Mirage, and Youngtown, will become increasingly important.

CHAPTER 3 EXISTING AND PLANNED TRANSIT SERVICES

Peoria is located near the northwestern edges of Valley Metro’s service area. As such, and because it is one of the Phoenix metro areas “newer” communities, general public transit service is still relatively limited. Today, Peoria has a single park and ride lot, and is served by two Valley Metro routes. Peoria also operates a dial-a-ride service for elderly and disabled residents. In addition, many Peoria residents are within relatively short driving distances to transit centers and park and ride lots in Glendale that provide an expanded array of transit services.

This chapter describes those existing services, plus new services that are programmed as part of the region’s Prop 400 transit program, and other potential links that are currently being planned and/or evaluated. These existing and potential new services will then form the foundation for additional transit improvements that will be assessed as part of this study.

EXISTING TRANSIT FACILITIES AND SERVICES

MAJOR TRANSIT FACILITIES

At the present time, the only major transit facility in Peoria is the Peoria Park and Ride Lot, which is located in Old Town. In addition, there are three transit facilities in Glendale that are located just outside of Peoria and that are very convenient for many Peoria residents. These are the Arrowhead Transit Center, the Church of Joy Park and Ride Lot, and the Glendale Park and Ride Lot (see also Figure 3-1 and Table 3-1).

Peoria Park and Ride Lot

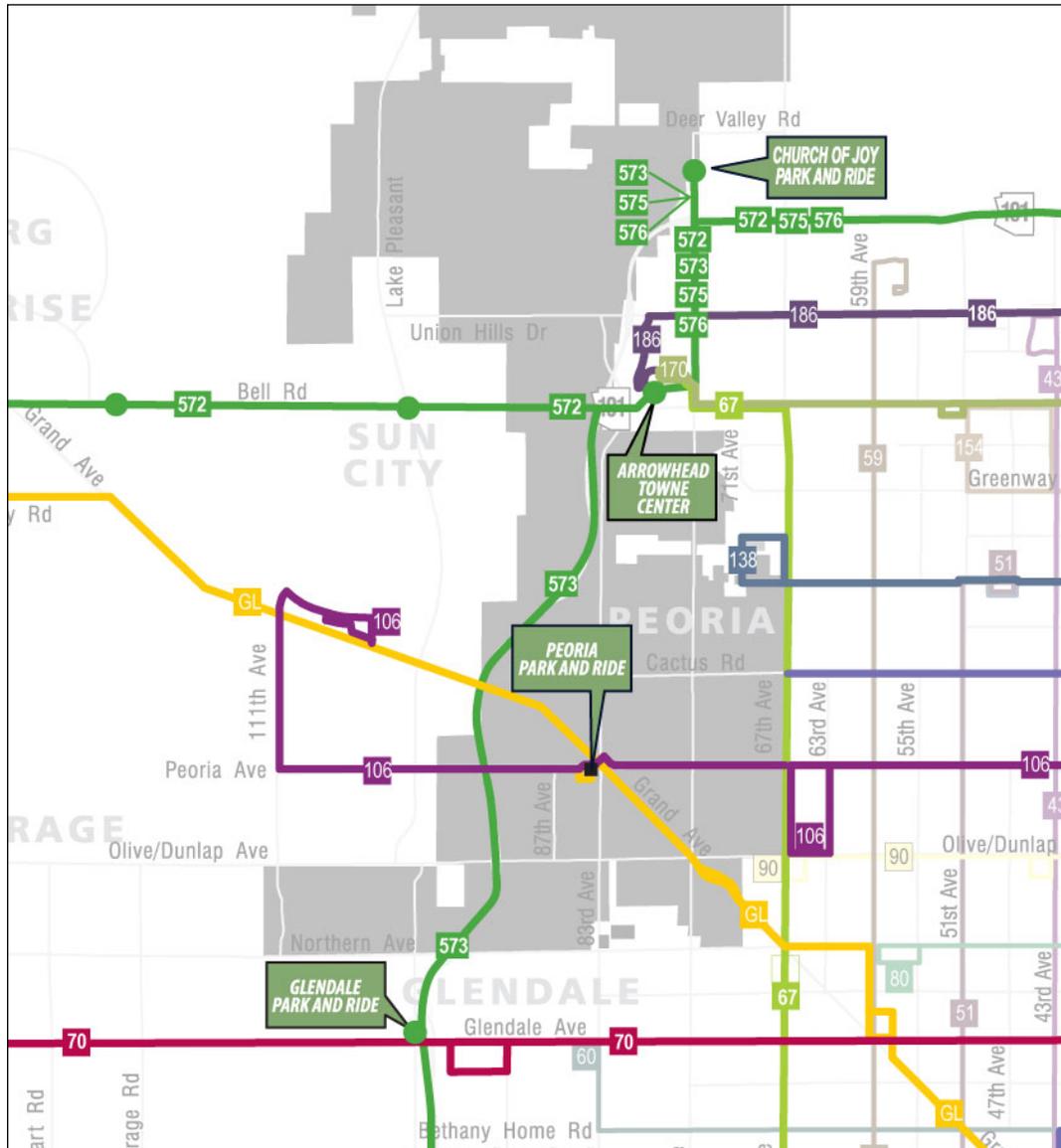
The Peoria Park and Ride consists of two lots (East and West) that are located in Old Town on 84th Avenue between Jefferson Street and Washington Street. These lots, which offer free parking, provide a total of 74 spaces, and are served by Valley Metro’s Route GL Grand Avenue Limited, which has peak period commuter service to and from downtown Phoenix (see next section for more detail on bus services).

Arrowhead Transit Center

The Arrowhead Transit Center is located at Arrowhead Towne Center in Glendale, just to the east of the Peoria city line, and is a major hub for Valley Metro services in the Northwest Valley. The transit center provides parking and is served by three local routes, four express routes, one

regional connector route, and three local circulator routes (which are described in the following section):

Figure 3-1: Peoria Area Transit Centers and Park and Ride Lots



Note: Route 572 service between Surprise and Scottsdale and Route 576 service in Glendale were discontinued in July 2010.

This transit center provides, by far, the highest concentration of transit service options in or near Peoria, and is most convenient for Peoria residents who live in the vicinity of Bell Road and to the northwest.

Table 3-1: Transit Centers and Park and Ride Lots

Transit Center/ Park and Ride Lot	Location	Parking Spaces	Routes Served
Peoria			
Peoria Park and Ride	Jefferson St @ 84th Ave and Washington St @ 84 th Ave	74	<ul style="list-style-type: none"> ▪ 106 Peoria/Shea ▪ GL Grand Avenue Limited
Glendale			
Arrowhead Transit Center	Arrowhead Mall		<ul style="list-style-type: none"> ▪ 67 67th Avenue ▪ 170 Bell ▪ 186 Union Hills ▪ 573 NW Valley/Downtown Express ▪ 575 NW Valley/Downtown Express ▪ 660 Wickenburg Connector
Church of Joy Park and Ride Lot	75th Ave @ Rose Garden Ln		<ul style="list-style-type: none"> ▪ 573 NW Valley/Downtown Express ▪ 575 NW Valley/Downtown Express
Glendale Park and Ride Lot	W. Glendale Ave @ 99th Ave	388 (shaded)	<ul style="list-style-type: none"> ▪ 70 Glendale/24th Street ▪ 573 NW Valley/Downtown Express

Church of Joy Park and Ride Lot

The Church of Joy Park and Ride Lot is located in Glendale on 75th Avenue at Rose Garden Lane, north of Loop 101 and just east of the Peoria city line. This lot provides parking, and is served by three express routes (all of which operate to and from the Arrowhead Transit Center), two of which operate to downtown Phoenix and one that operates to the northern terminus of the Metro Rail light rail line.

This lot is served by fewer routes than the Arrowhead Transit Center, but is more convenient to residents of newly developed northern areas of Peoria.

Glendale Park and Ride Lot

The Glendale Park and Ride Lot, located approximately one mile south of the Peoria city line on Glendale Avenue at 99th Avenue is served by one local route and one express route.

VALLEY METRO TRANSIT SERVICES

Currently, only two Valley Metro routes provide service within Peoria (see also Figure 3-2 and Table 3-2):

Figure 3-2: Peoria Area Fixed-Route Transit Services

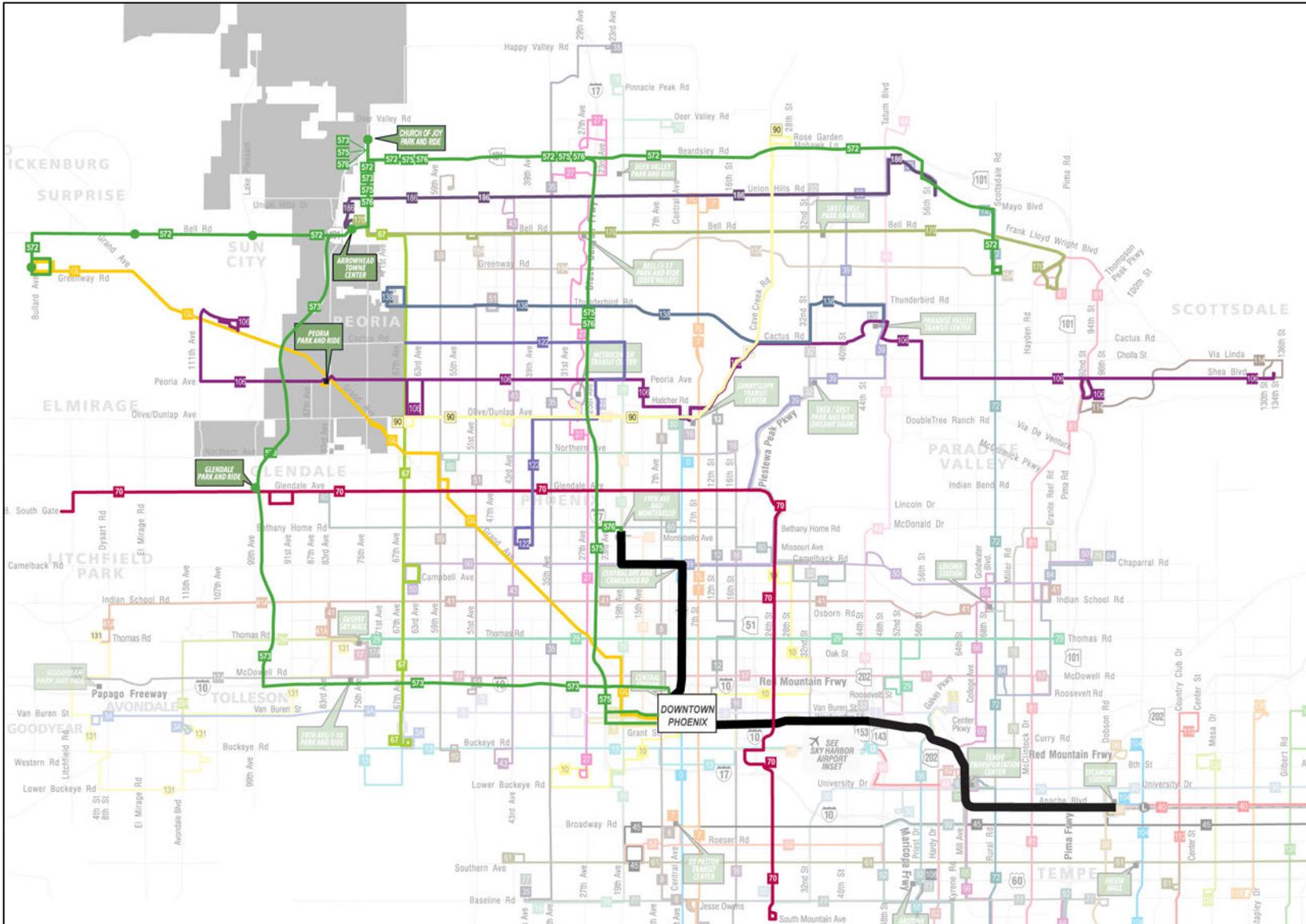


Table 3-2: Valley Metro Services: Service Spans and Frequencies

	Span of Service	Service Frequencies (minutes)	
		Peak	Off-Peak
Peoria Routes			
106 Peoria/Shea			
Weekdays	4:25a-10:32p	24-30	30-42
Saturdays	5:57a-9:35p	30	30-40
Sundays	6:16a-9:22p	30	30-40
GL Grand Limited			
Weekdays: AM Peak	4 inb trips	35,53,30	--
Weekdays: PM Peak	4 outb trips	50,30,30	--
Nearby Glendale Routes			
67 67th Avenue			
Weekdays	5:45a-10:16p	30	30
Saturdays & Sundays	5:50a-8:51p	30	30
70 Glendale/24th Street			
Weekdays	4:40a-11:13p	15	30
Saturdays	4:37a-10:01p	30	30
Sundays	5:37a-9:31p	30	30
90 Dunlop/Cave Creek			
Weekdays	5:12a-9:52p	30	30
Saturdays & Sundays	5:51a-9:24p	30	30
122 Cactus/39th Ave			
Weekdays	5:29a-9:42p	60	60
Saturdays & Sundays	6:18a-8:15p	60	60
138 Thunderbird			
Weekdays	5:00a-9:55p	30	30
Saturdays & Sundays	6:00a-8:54p	60	60
170 Bell			
Weekdays	4:57a-10:43p	30	30
Saturdays	5:29a-9:13p	30	30
Sundays	5:43a-9:11p	30	30
186 Union Hills			
Weekdays	4:47a-10:19p	30	30
Saturdays & Sundays	5:50a-8:51p	60	60
573 NW Valley/Downtown Express			
Weekdays: AM Peak inbound	4 inb, 2 outb trips	30, 30, 29	30 outb
Weekdays: PM Peak outbound	2 inb, 4 outb trips	30,35,28	35 inb
575 NW Valley/Downtown Express			
Weekdays: AM Peak inbound	3 inb trips	15, 40	
Weekdays: PM Peak outbound	3 outb trips	30	--

Table 3-2 (Cont.): Valley Metro Services: Service Spans and Frequencies

	Span of Service	Service Frequencies (minutes)	
		Peak	Off-Peak
660 Wickenburg Connector			
Weekdays	5:45a-8:00p	220	220
Saturdays	7:10a-6:35p	2 round trips	
Other			
571 Surprise Express			
Weekdays: AM Peak	3 inb trips	20, 25	--
Weekdays: PM Peak	3 outb trips	30	--

- **Route 106 Peoria/Shea**, which provides local service between Sun City and north Scottsdale via Peoria Avenue through Peoria, and also via the Metrocenter, Sunnyslope, and Paradise Valley Transit Centers.
- **Grand Avenue Limited**, which provides limited stop commuter service between Surprise and downtown Phoenix via the Peoria Park and Ride Lot.

In addition, Peoria residents are also indirectly served by routes that operate to and from Glendale. As described above, the Arrowhead Transit Center is served by 9 local, express, and local circulator routes. The Church of Joy Park and Ride Lot is served by two express routes, and the Glendale Park and Ride Lot is served by two routes.

Arrowhead Transit Center

- **Route 67 67th Avenue**, that operates between the Arrowhead Transit Center and 67th Avenue at Buckeye Road in Phoenix.
- **Route 138 Thunderbird**, that provides service between the eastern edge of Peoria at 67th Avenue and the Paradise Valley Mall/Transit Center via Thunderbird Road.
- **Route 170 Bell** that operates between the Arrowhead Transit Center and Scottsdale via Bell Road.
- **Route 186 Union Hills** that operates between the Arrowhead Transit Center and Scottsdale via Union Hills Drive.
- **Route 573 Northwest Valley/Downtown Express**, which provides express service between the Arrowhead Transit Center and downtown Phoenix via the Glendale Park and Ride Lot. This route operates through Peoria along Loop 101.
- **Route 575 Northwest Valley/Downtown Express**, which provides express service between the Arrowhead Transit Center and downtown Phoenix via the Church of Joy Park and Ride Lot, Loop 101 and I-17.
- **Route 660 Wickenburg Connector**, which provides service between Wickenburg and the Arrowhead Transit Center.
- **Glendale Urban Circulator (GUS) 1, 2, and 3** that provide circulator service in the Arrowhead area.

Church of Joy Park and Ride Lot

- **Routes 573 and 575**, as described above.

Glendale Park and Ride Lot

- **Route 70 Glendale/24th Street** operates between Luke AFB and 24th Street at Baseline Road via Glendale Avenue and 24th Street.
- **Route 573**, as described above.

Finally, one route—Route 571 Surprise Express—provides express service between Surprise and downtown Phoenix through Peoria along Grand Avenue, but does not provide any stops in or near Peoria. However, with the development of an Old Town Peoria Transit Center and additional services at that location, there would be the potential to add a Peoria stop to this route.

Route 67 67th Avenue

Route 67 67th Avenue operates between Arrowhead Towne Center at its north end and Buckeye Road at its south end. The route travels from Arrowhead Towne Center via 75th Avenue and Bell Road to 67th Avenue, on which it travels south to Buckeye Road and loops on 65th Avenue and Grant Street. The route operates on weekdays on regular 30 minute intervals between 5:45 am and 10:16 pm. On Saturdays and Sundays, the service operates between 5:50 am and 8:51 pm on regular 30 minute intervals.

Route 70 Glendale/24th Street

Route 70 Glendale/24th Street connects Litchfield Park and Glendale with the downtown Phoenix area primarily via Glendale Avenue and 24th Street. The route begins at Luke Air Force Base (on Litchfield Road) and continues on Glendale Avenue (with a loop to serve the University of Phoenix stadium at 91st Street and Maryland Avenue), until Lincoln Drive and 24th Street. The route then travels south via 24th Street, then east on Grant Street (near Phoenix Sky Harbor Airport) and returns to 24th Street via East Sky Harbor Circle. It then continues on 24th Street until looping at South Mountain Avenue, 25th Street, and Francisco Avenue. Some weekday AM and PM peak trips also serve the Glendale Park and Ride on 99th Avenue and Glendale Avenue, and terminate their service at that point.

The route operates on weekdays between 4:40 am and 11:13 pm every 15 minutes during peak periods and every 30 minutes off-peak. The last eastbound evening trip terminates at 43rd Avenue and Glendale Avenue, and the first three westbound morning trips commence at 43rd Avenue or 67th Avenue and Glendale Avenue. It operates on Saturdays between 4:37 am and 10:01 pm on regular 30 minute headways. The first two Saturday morning trips and the last Saturday evening trip operate between 43rd Avenue and Glendale Avenue and Luke Air Force Base only. On Sundays, the route operates between 5:37 am and 9:31 pm on regular 30 minute headways throughout the day.

Route 90 Dunlap/Cave Creek

Route 90 Dunlap/Cave Creek operates between the eastern edge of Peoria at Olive Avenue at 67th Avenue and the North Phoenix via Olive Avenue, the Sunnyslope Transit Center, and Cave Creek Road.

Service operates every 30 minutes seven days a week, from 5:12 am to 9:52 pm on weekdays, and from 5:51 am to 9:24 pm on Saturdays and Sundays.

106 Peoria/Shea

Route 106 Peoria/Shea operates between the eastern edge of Peoria at Peoria Avenue at 67th Avenue and Scottsdale primarily via Peoria Avenue and Shea Boulevard. The main portion of the route operates between 67th Avenue and 90th Street in Scottsdale, but some trips also serve the Mayo Clinic Scottsdale in the eastern portion of the route and/or 11th Avenue at Thunderbird Road in the western portion of the route. Service operates seven days per week and runs approximately half hour headways on all days (with a few exceptions where short service gaps exist). Service operates on weekdays between 4:25 am and 10:32 pm; on Saturdays between 5:57 am and 9:35 pm; and on Sundays between 6:16 am and 9:22 pm.

Route 122 Cactus/39th Avenue

Route 122 Cactus/39th Avenue operates between the eastern edge of Peoria at Cactus Road at 67th Avenue and central Phoenix via Cactus Road, the Metrocenter Transit Center, and 39th Avenue. From the Peoria/Glendale city line, service operates east on Cactus Road, south on 19th Avenue, west on Peoria Avenue, south on 25th Avenue, west on Dunlap Avenue, in and out of the Metrocenter Transit Center, west on Dunlap Avenue, and south on 39th Avenue to Bethany Home Road.

Service operates every 60 minutes, seven days a week, from 5:29 am to 9:42 pm on weekdays, and from 6:18 am to 8:15 pm on Saturdays and Sundays.

138 Thunderbird

Route 138 Thunderbird operates primarily via Thunderbird Road between 71st Avenue and Paradise Valley Mall Transit Center. The route begins on its eastern end at a loop around 67th Avenue, Acoma Drive, 71st Avenue, and then operates via Thunderbird Road/Cactus Road until 32nd Street, travels north on 32nd Street, and rejoins Thunderbird Road. From there, it travels east until Tatum Boulevard, then turns into Paradise Valley Mall Transit Center.

The route operates on weekdays between 5:00 am and 9:55 pm on consistent 30 minute headways and on Saturdays and Sundays between 6:00 am and 8:54 pm on consistent 60 minute headways.

Route 170 Bell

Route 170 Bell provides service between Arrowhead Towne Center and the Scottsdale Municipal Airport area seven days per week. Service operates primarily on Bell Road, which becomes Frank Lloyd Wright Boulevard east of Scottsdale Road. The service operates with fairly consistent 30 minute headways on weekdays, Saturdays, and Sundays. Service operates on weekdays between 4:57 am and 10:43 pm, on Saturdays between 5:29 am and 9:13 pm, and on Sundays between 5:43 am and 9:11 pm. On Sundays, the route operates every other trip (half total) between Bell Road at 51st Avenue and Scottsdale; Sunday service to Arrowhead Towne Center therefore operates approximately every hour.

Route 186 Union Hills

Route 186 Union Hills provides east-west service between Arrowhead Towne Center and the Phoenix Mayo Clinic. The route operates primarily via Union Hills Drive, leaving Arrowhead via 79th Avenue and arriving at the Mayo Clinic via Tatum Boulevard and Mayo Boulevard. On weekdays, the route operates on regular 30 minute headways between 4:47 am and 10:19 pm, and on Saturdays and Sundays, on regular 60 minute headways between 5:50 am and 8:51 pm.

GL Grand Avenue Limited

The Grand Avenue Limited provides weekday rush hour service between the Surprise Aquatic Center and downtown Phoenix via Grand Avenue and the Peoria Park and Ride. The route provides limited-stop service, and only stops in two locations in Peoria: at 84th Avenue and Jefferson Street (Peoria Park and Ride) and at 67th Avenue and Northern Avenue.

The Grand Avenue Limited provides four inbound and four outbound trips per weekday. Inbound service operates between 5:20 am and 8:19 am and outbound service operates between 4:15 pm and 7:10 pm. Commuters are the primary market for Grand Avenue Limited services, as it only operates during the major commute-period hours and direction.

Route 573 Northwest Valley/Downtown Express

Route 573 Northwest Valley/Downtown Express provides weekday peak period express service between Glendale and downtown Phoenix. The route begins in Glendale at the Church of Joy Park and Ride Lot and travels on 75th Avenue to Arrowhead Towne Center. From there, the route takes Loop 101 (stopping at the Glendale Park and Ride at 99th Avenue and Glendale) and I-10 to Central Station in downtown Phoenix and Washington Street and Jefferson Street.

The route provides four morning inbound trips between 5:11 am and 7:54 pm at 30 minute headways and two morning outbound trips between 7:30 am and 9:05 am at a 25 minute interval. It operates four evening outbound trips between 4:05 pm and 6:52 pm at 30, 35, and 28 minute intervals, and two evening inbound trips between 3:45 pm and 5:18 pm at a 30 minute interval.

Route 575 Northwest Valley/Downtown Express

Route 575 Northwest Valley Downtown Express provides weekday peak period express service between Glendale and downtown Phoenix. The route begins in Glendale at Arrowhead Towne Center and travels north on 75th Avenue, Loop 101 east, and I-17 to downtown. The route operates three morning inbound trips between 5:55 am and 7:50 am, with 20 and 15 minutes between trips, and three evening outbound trips between 4:15 pm and 6:20pm at 30 minute intervals.

Route 660 Wickenburg Connector

Route 660 Wickenburg Connector provides weekday and Saturday express service between Wickenburg and Glendale. The route begins at Vulture Mine Road at North Tegner Street and travels via North Tegner Street to US 60, exiting at Bell Road and traveling west to 75th Avenue, terminating at Arrowhead Towne Center. The route has five regular stops, including Bell Road and Village Drive West in Surprise and Arrowhead Towne Center in Glendale. On weekdays, the route provides four trips per day in each direction, with eastbound service operating between 7:35 am and 8:00 pm, and westbound service between 5:45 am and 6:10 pm. On Saturdays, the route has two trips in each direction: eastbound trips beginning at 9:00 am and at 5:05 pm and westbound trips beginning at 7:10 am and 3:30 pm.

Fares on this route are different than on other Valley Metro routes, ranging between \$2.00 and \$4.00 depending on the origin and destination. Although this route operates close to Peoria, it is unlikely that it is used by Peoria residents.

Route 571 Surprise Express

Route 571 Surprise Express provides weekday peak period service between the park and ride at Surprise Aquatic Center and downtown Phoenix via Greenway Road and Grand Avenue. In the downtown area, the route serves Central Station, Van Buren Street, Washington Street, and Jefferson Street. The route provides three inbound trips in the morning between 5:35 am and 7:38 pm with 20 and 25 minutes between the trips. It also serves three outbound trips in the evening between 4:05 pm and 6:26 pm, with 30 minutes between trips.

While this route operates through Peoria, it does not currently make any stops in Peoria. However, with the development of an Old Town Peoria Transit Center and the development of additional services at and through that facility, there could be the potential to add a Peoria stop to this route.

PEORIA DIAL-A-RIDE SERVICE

Peoria's Dial-a-Ride provides service to the general public throughout most developed areas of the city. The Dial-a-Ride program also provides complementary paratransit service for Valley

Metro fixed-route service within Peoria. In addition, “Dial-A-Ride Plus” service provides transportation to medical facilities in Sun City and Glendale.

Hours of service and fares vary depending upon the type of trip:

- Regular service (available to anyone) is provided on weekdays between 6:00 am and 6:00 pm, and reservations must be made the previous day before 5:00 pm.
- ADA complementary service is provided on weekdays between 4:30 am and 9:00 pm and on weekends between 6:00 am and 10:00 pm. As with regular trips, reservations must be made by 5:00 pm the previous day. However, reservations can also be made up to 14 days in advance.

Fares also vary by type of trip, as well as by type of rider. Fares are \$3.00 for the general public, \$2.00 for ADA complimentary paratransit trips, and \$1.00 for children, seniors, and persons with disabilities.

PLANNED NEW SERVICES

Prop 400, which was passed by the voters in 2004, authorized the development of a Regional Transportation Plan that includes a wide variety of transportation improvements and a continuation of the ½¢ sales tax to help fund those improvements. Transit elements of the original plan included:

- Twenty-eight miles of extensions to the planned 30-mile light rail system.
- New or enhanced bus service on 28 routes, plus 12 new routes.
- New regional transit capital projects including park-and-rides, transit centers, maintenance facilities, and improved transit technologies.

Many of the planned transit improvements would extend more Valley Metro service to Peoria, and provide new types of services. Prop 400 included implementation timeframes for these projects. However, due to the recession, Prop 400 sales tax revenues are significantly lower than projected, and as a result, many planned projects are now being delayed. Planned projects, their original implementation timeframes, and current delays, are as described below.

SUPER GRID BUS SERVICE

Valley Metro local bus service largely operates as a grid, in which most routes operate along major arterials either north-south or east-west. The original Regional Transportation Plan (RTP) would maintain this basic structure, but significantly improve service on many routes to “Super Grid” service, and extend them farther to the west and east.

For Peoria, this would mean that Super Grid bus service would operate on many major arterials (see also Figure 3-3):

East-West

- Bell Road
- Thunderbird Road
- Peoria Avenue
- Olive Avenue

North-South

- 83rdth Avenue (originally planned for 75th Avenue, but recently shifted to 83rd Avenue)
- 99th Avenue

However, most of Super Grid routes that would serve Peoria were planned for relatively far in the future. In the 2008 RTP, implementation of the first Peoria Super Grid route would have been in 2015 (along Peoria Avenue) but other routes would not have been implemented until between 2015 and 2023. Now, due to the recession, implementation dates have been pushed back farther, to 2023 and beyond 2026. Most of the revised implementation dates are beyond the 2026 end of the Prop 400 program, and in effect, have been eliminated from the current program. In more detail, the Super Grid routes that would serve Peoria are as described below and summarized in Table 3-3.

- **Route T41 83rd Avenue/75th Avenue** that would operate between the Desert Sky Mall Transit Center and Arrowhead Towne Center. This route had been planned for 2022 but has now been deferred until 2023. The route’s alignment between Desert Sky Mall and Arrowhead Towne Center (which includes the segment through Peoria) was also shifted from 75th Avenue to 83rd Avenue.
- **T42 99th Avenue** that would operate between Bell Road in Sun City and Buckeye Road in Phoenix and through Peoria along 99th Avenue. This route had been planned for implementation in 2021 but has now been deferred beyond 2026.
- **T46 Bell Road** that would operate between Loop 303 in Sun City and Shea Boulevard/Frank Lloyd Wright Boulevard and through Peoria along Bell Road. This route had been planned for implementation in 2018 but has now been deferred to 2024.
- **T51 Dunlap Avenue/Olive Avenue** that would operate between Litchfield Road just west of El Mirage and the Metrocenter Transit Center off of 25th Avenue in Phoenix through Peoria along Olive/Dunlap Avenue. This route was originally planned for implementation in 2021 but has now been deferred beyond 2026.
- **T62 Peoria Avenue/Shea Boulevard** that would operate between Thunderbird Boulevard at 102nd Avenue in Youngtown and Fountain Hills through Peoria along Peoria Avenue. This route was originally planned for implementation in 2015 but has now been deferred beyond 2026.
- **T71 Waddell Road/Thunderbird Road** that would operate from Litchfield Road in Sun City to Scottsdale Airpark and through Peoria along Thunderbird Road. This route was originally planned for implementation in 2020 but has now been deferred until 2024.

Table 3-3: Planned Prop 400 Services and Recent Delays

Route	Original Implementation Year (2008 RTP)	Revised Implementation Year ¹	Delay (years) ³
Super Grid Routes			
T46 Bell Road	2019	2037	18
T42 99th Avenue	2021	2038	17
T62 Peoria Avenue/Shea Boulevard	2015	2029	14
T51 Dunlap Avenue /Olive Avenue	2021	2038	17
T71 Waddell Road/Thunderbird Road	2020	2038	18
T41 83rd Avenue/75th Avenue	2023	2039	16
BRT/Express Routes			
T13 Grand Avenue Limited	2012	2020	8
T20 Peoria Express	2013	2026	13

BUS RAPID TRANSIT/EXPRESS SERVICE

Prop 400 is also funding the development of an extensive Bus Rapid Transit (BRT) and express network (see Figure 3-4). A number of the Glendale routes described in the Existing Services section were implemented as part of this program (Routes 573 and 575 and discontinued Routes 572 and 576). The program also includes improvements to the Grand Avenue Limited route and a new Peoria express route. These had been planned for 2012 and 2013 but have now also been significantly delayed:

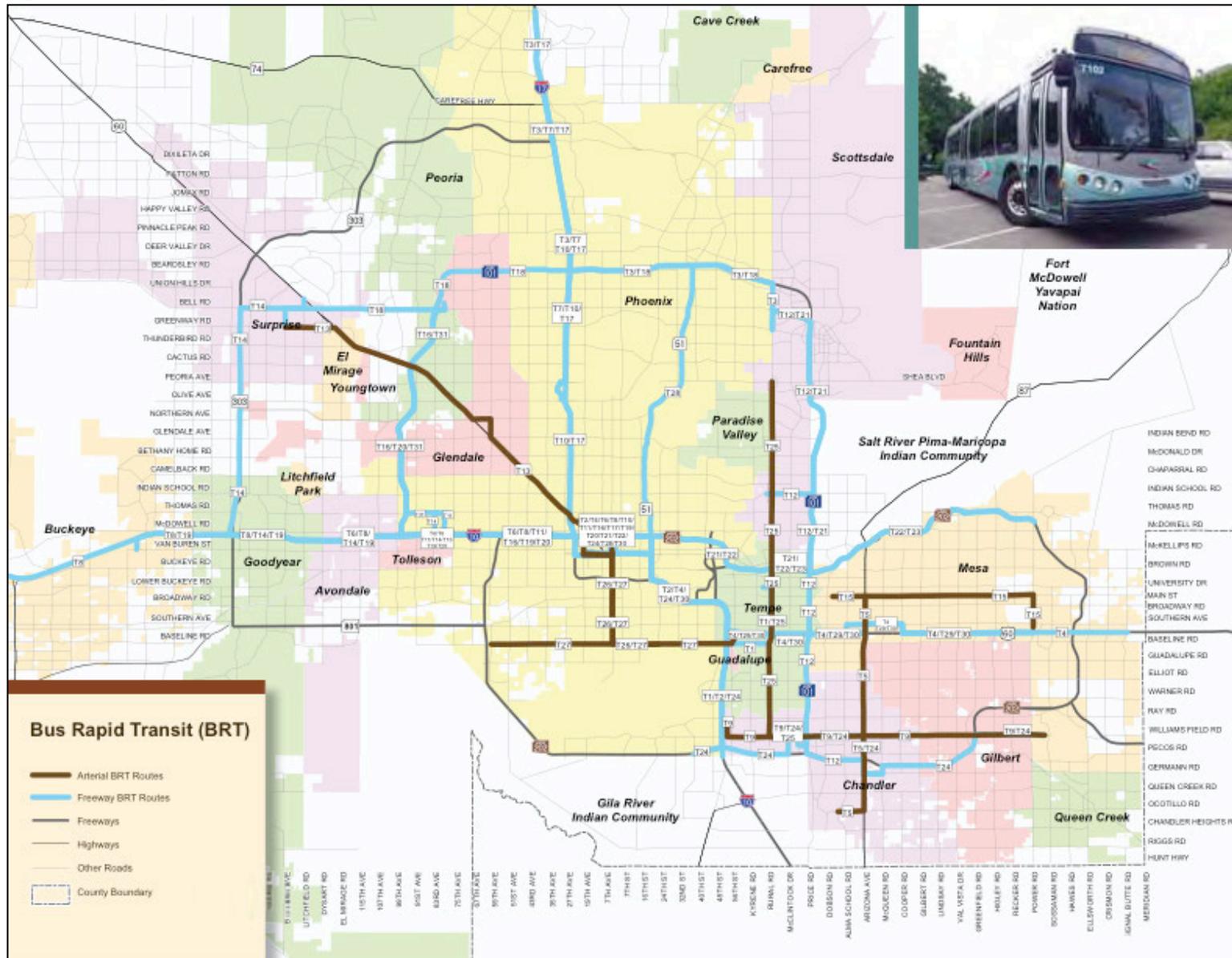
- **T13 Grand Avenue Limited** that would extend service to El Mirage and increase service from 8 one-way trips per day to 24. These improvements were planned for 2013. The increase in service has been deferred beyond 2026, but the extension of service to El Mirage has been moved forward to 2011.
- **T20 Peoria Express** that would provide express service between the Peoria Park and Ride Lot and downtown Phoenix. This route had been planned for 2013 but has been deferred beyond 2026.

PROP 400 FACILITY IMPROVEMENTS

In conjunction with the implementation of Peoria express service, the Prop 400 program also includes funding for the development of a new park and ride lot in the vicinity of Peoria Avenue and Grand Avenue and a transit center with four bus bays. Funding for the transit center is

¹ Note that these revised implementation years assume that RTP funding will be reauthorized beyond the current 2026 Prop 400 expiration date.

Figure 3-4: Prop 400 BRT and Express Network



programmed for 2015 (and has been maintained for 2015). Funding for the park and ride lot had been programmed for 2023, but has been advanced to 2018.

PROP 400 LIGHT RAIL EXTENSIONS

In total, the Regional Transportation Plan includes nearly 30 miles of new light rail (see Figure 3-5). Of particular importance to Peoria are:

- **Northwest Extension I** that would extend light rail from its current northern terminus at 19th Avenue and Bethany Home Road 3.2 miles north to 19th Avenue and Dunlap Avenue. This extension, which is one potential alignment for a further extension of service to Glendale, was scheduled for 2012, but has been delayed to at least 2017.
- **Northwest Extension II** that would extend light rail further north another 1.4 miles from 19th Avenue and Dunlap Avenue to 25th Avenue and Mountain View Road. This extension, which had been planned for 2017, has been delayed to at least 2026.
- **Phoenix West** that would extend light rail from downtown Phoenix along I-10 to the vicinity of 79th Avenue or the Desert Sky Mall. This extension, which is a second potential alignment for a further extension of service to Glendale, was scheduled for 2019, but has been delayed to 2021.
- **Glendale Extension** that would extend light rail to Glendale. A study of potential alignments is just beginning. Specific alignments will be examined as part of the study, but initial concepts include (see also Figure 3-6):
 - A branch from the Northwest Extension I that would operate along Glendale Avenue to downtown Glendale. This option is currently programmed in the RTP. It was originally scheduled for 2017 but has been delayed to 2026.
 - A branch from the Northwest Extension I that would operate along Glendale Avenue beyond downtown Glendale to the Westgate Center.
 - An extension west from Phoenix in the median of Interstate 10, then run along or parallel to Loop 101 to the Westgate Center via Glendale Stadium. This alignment would be in lieu of the Glendale Avenue alignment. Note that since the Phoenix West extension is currently programmed for 2021, then a Glendale extension via this alignment could occur no sooner than 2021.

HCT options for Peoria will include an extension of Glendale service to Peoria, or connections to Glendale service. The Glendale extension study will be progressing concurrently with this study and Peoria options will be developed to complement those options.

GRAND AVENUE COMMUTER RAIL

MAG is nearing completion of its Commuter Rail Systems Study and the Grand Avenue Commuter Rail Corridor Development Plan. These studies indicate that Grand Avenue commuter rail would perform relatively well, and that boardings per revenue mile would be about average for western commuter rail systems. The Systems Study indicates that Grand

Figure 3-5: Light Rail Extensions

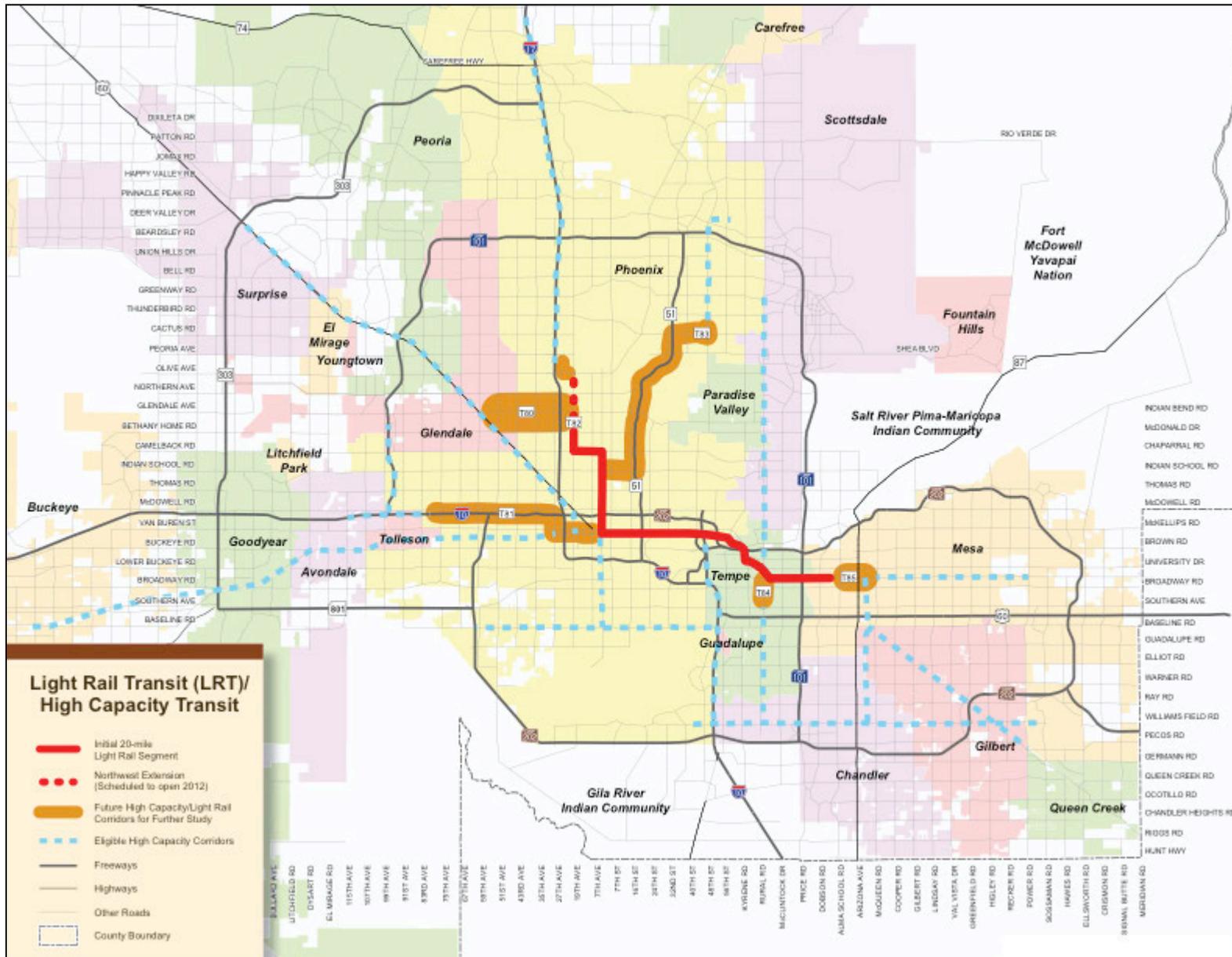
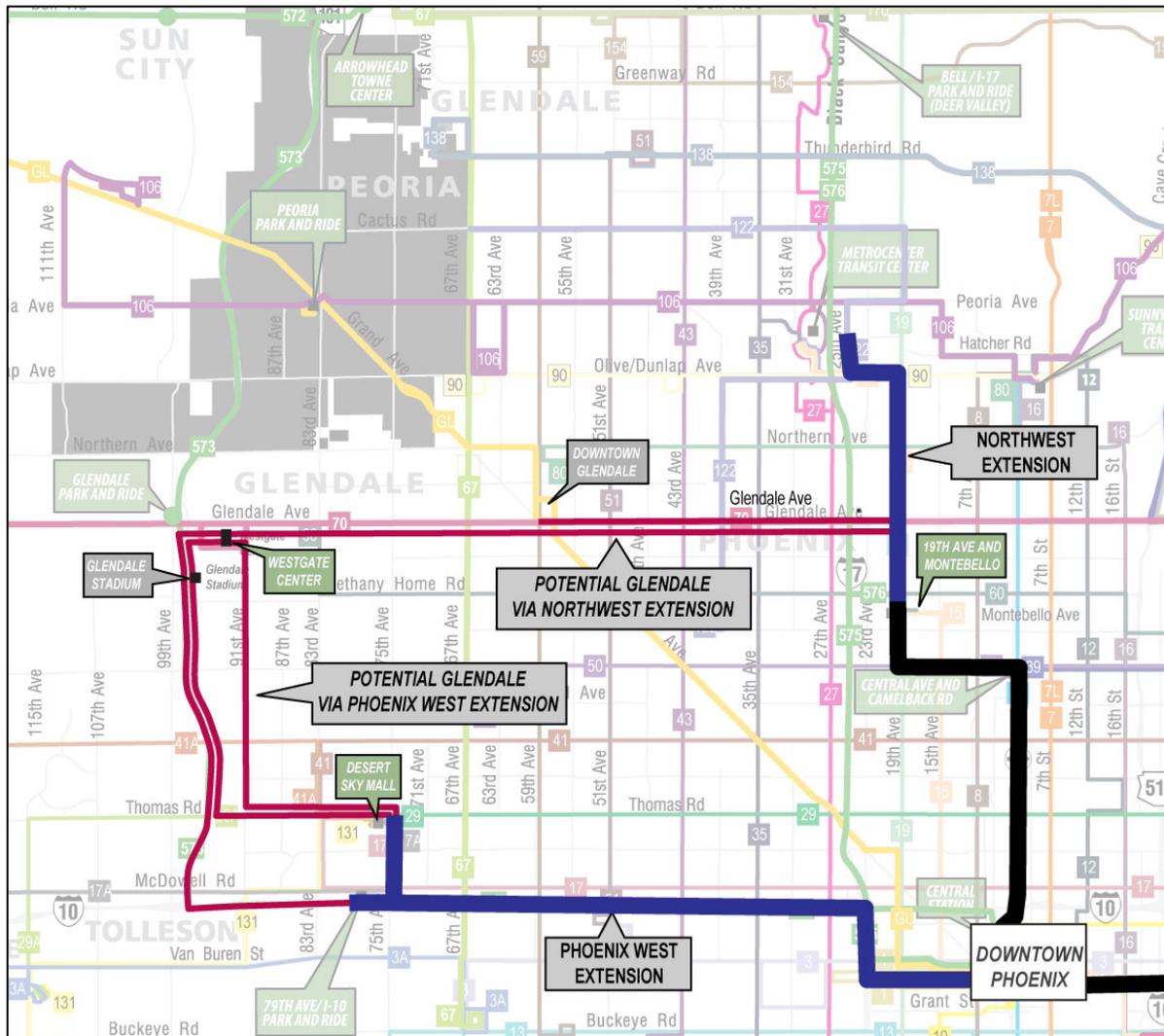


Figure 3-6: Potential Glendale LRT Extension Alignments



Avenue commuter rail would be tied with the Chandler Line for second best (in terms of passengers per revenue mile) after the Southeast Corridor Line (through Mesa to Queen Creek).

The Systems Study recommends that commuter rail study should be pursued, and that the Southeast Corridor Line be the first to be implemented. However, it also recommends that that if agreements cannot be reached with Union Pacific RR for use of that rail line or if costs to operate through rail yards in Central Phoenix are prohibitive, then an alternate startup scenario would be the Grand Avenue Line.

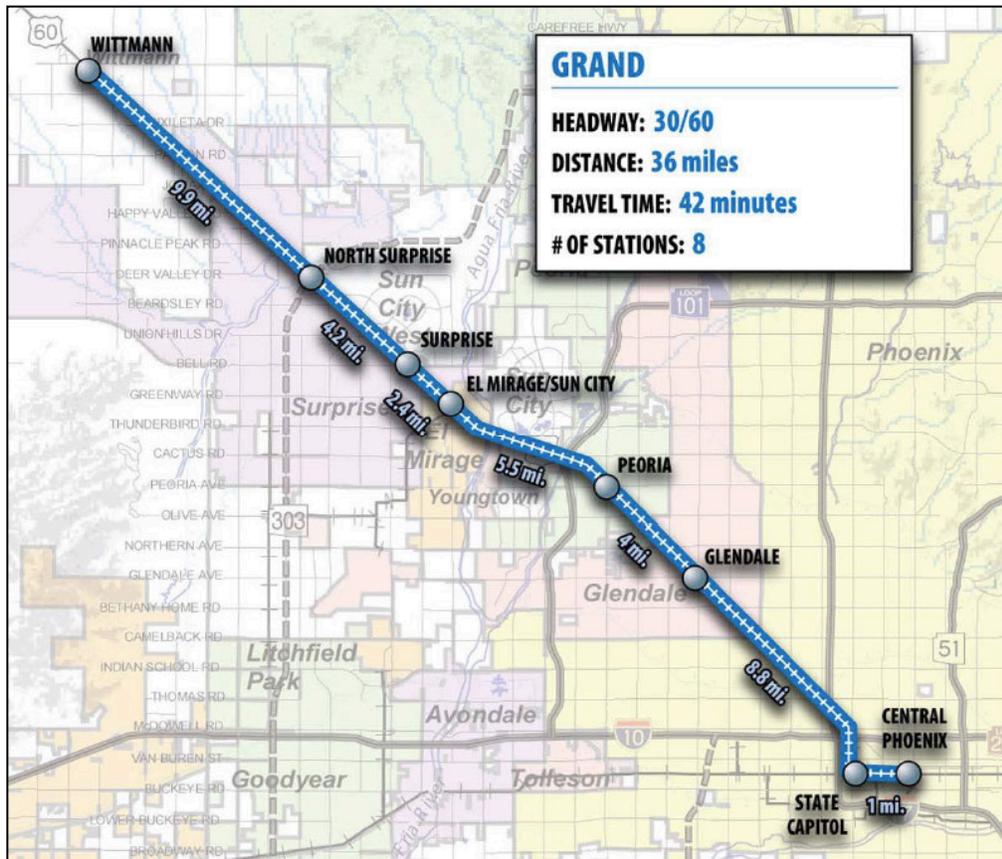
There are a large number of steps that will need to be accomplished before commuter rail can be implemented. Short-term implementation steps, which the Systems Plan schedules through 2015, include:

- Coordination with UPRR and BNSF Railway Companies
 - Establish points of contact and communication protocols
 - Develop partnership to investigate options
 - Pursue liability legislation
- Identify Funding Commitments
- Initiate Process for Federal Funding
- MAG Local Jurisdictions 2010-2011
- Develop and Implement Governance Plan
- Preserve Future Options Commuter Rail Authority or JPA
- Address Enabling Legislation (Liability and Indemnification)
- Coordinate with Local Governments

Once the above steps have been accomplished, then the commuter rail agency can develop formal agreements with the railroads, design the new service, obtain funding, and finally construct and operate the new service. Given the work that will need to be accomplished, it is likely that the earliest that commuter rail service would begin would be in the late 2010s.

As currently being considered, Grand Avenue commuter rail service would run for 36 miles between Wittmann and downtown Phoenix, with eight stations, one of which would be in Peoria near Old Town (see Figure 3-7). The service would operate every 30 minutes during

Figure 3-7: Potential Grand Avenue Commuter Rail



peak periods and every 60 minutes during off-peak periods. It is projected that there would be 490 boardings in Peoria, which would be the third highest on the line (after Surprise and Glendale). The large majority of these boardings would be during peak periods.

This line, if ultimately developed, would provide a fast and relatively frequent HCT service that would link the Old Town area of Peoria with downtown Phoenix. In addition, depending upon the ultimate alignment of a Peoria light rail extension, it could also provide connections to and from light rail.

SUMMARY OF PLANNED AND POTENTIAL SERVICES

In total, a large number of new services are either planned or are now being studied that would significantly improve transit service to and from Peoria. These include new Super Grid Bus routes, express bus routes, and commuter rail service. The Glendale light rail extension could also bring light rail service to within park and ride driving distance of many Peoria residents.

However, due to recession-related declines in Prop 400 sales tax revenue, most of these projects are 10-plus years away from implementation. Thus, while they will address many of Peoria's long-term needs, options need to be developed as part of this study to meet short-term needs.

CHAPTER 4 LOCAL SERVICE ALTERNATIVES

As part of this study, a large number of local service options were examined to improve transit within Peoria and to provide better connections with the rest of the Valley, and these included:

1. Local bus circulator services that would be similar to those that have been implemented in a number of other Valley communities.
2. Local flex services that would be a hybrid of fixed-route and dial-a-ride service.
3. An expansion of Valley Metro’s grid network into Peoria.
4. Combinations of the above.

All of the options would provide local service within Peoria, and provide connections to other local and regional services. To provide connections, all of the options would focus service around two transit centers:

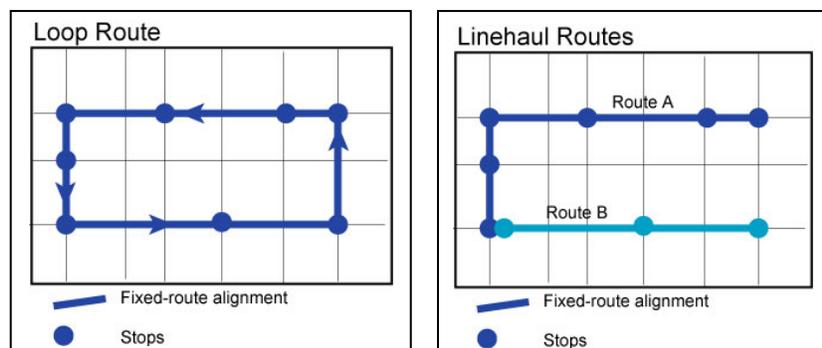
- Old Town Peoria, which would be located on 83rd Avenue between Grand Avenue and Peoria Avenue (as described in Chapter 6).
- Arrowhead Towne Center, which is now a major Valley Metro destination and will be developed as a transit center. Although this transit center is in Glendale, it is just east of the Peoria city line, and serves as a de-facto transit center for Peoria. This transit center would be used as a focal point for services north of Thunderbird Road.

LOCAL CIRCULATOR OPTIONS

Local circulator services could operate as either linehaul routes or loops, and as fixed-route or route-deviation service.

LINEHAUL SERVICE AND LOOPS

Most fixed-route transit services operate as linehaul service, which means that the bus travels along the same alignment in both directions. This type of route generally provides the fastest service, as riders only ride the segment of the route between their origin



and destination in both directions.

In low density areas and in areas where development is concentrated into a small area, routes also often operate as loops. One-way loop routes allow transit systems to provide greater service coverage with fewer vehicles. However, service is less convenient for riders as round trips require a trip around the full loop, rather than just the segment between the rider’s origin and destination. (Glendale’s circulator routes operate as loops.)

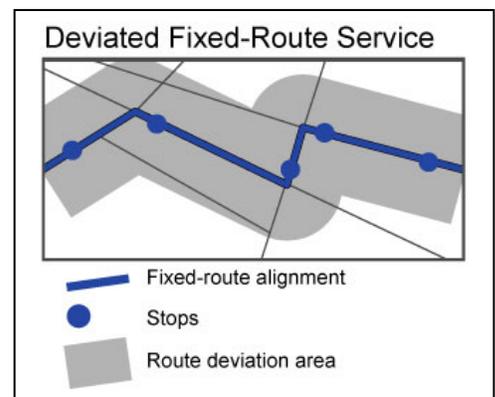
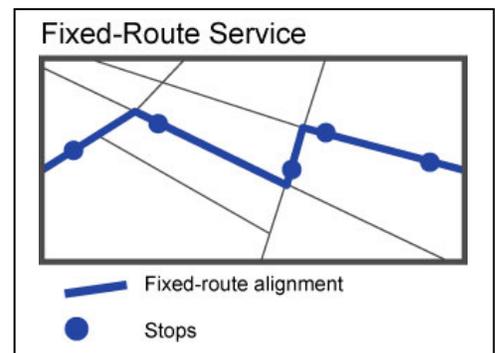
FIXED-ROUTE AND ROUTE DEVIATION SERVICE

Traditional fixed-route bus services operate along a fixed route at set times and headways. Services typically operate with designated stops or as a flag stop service, where riders “flag down” the bus at any safe location along the route.

Deviated fixed-route service is a variation of fixed-route service that deviates off of the fixed route to provide curbside service in certain locations. When there are no requests for the deviation, service operates in the same manner as standard fixed-route service.

In order to be dropped off at a location off of the normal route, riders simply request the service from the driver when they board the bus. For pick-ups, riders must call the transit system in advance with the location where they want to be picked-up, and the time or trip that they want to be picked-up by. Specific reservation procedures vary and are determined by the transit system based on factors such as policy, level and type of demand, and other factors.

Deviated fixed-route service is typically used on low volume routes to expand service coverage. Deviated fixed-route services are considered to be “demand-responsive” under ADA regulations. As a result, if deviated fixed-route service is provided, it is not necessary to provide complementary paratransit service. However, less distance can be covered with route-deviation service because time allowances must be made for the route deviations. Also, travel times for many riders are also longer as a result of the route deviations.

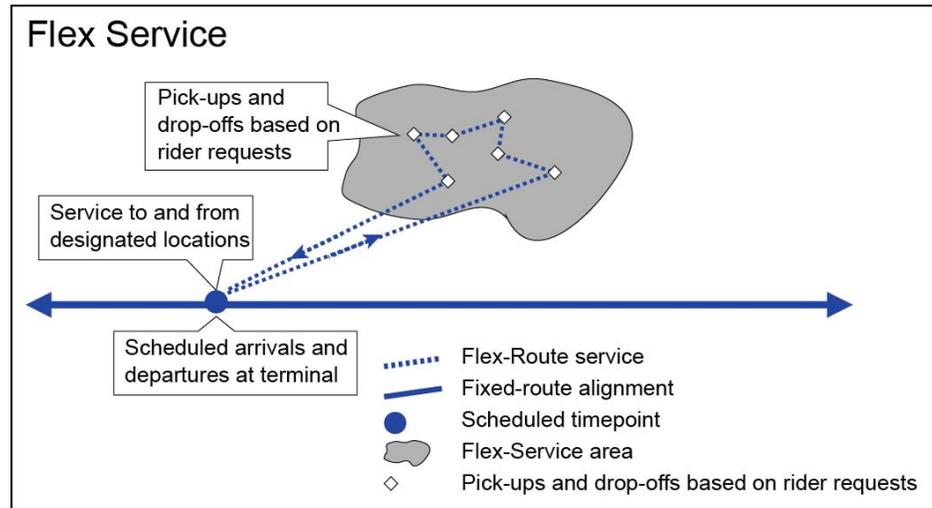


FLEX SERVICE

Flex service is a type of flexible bus service that combines the predictability of fixed-route bus service with the flexibility of demand response services. At one end of the route, buses arrive

and depart from a transit hub or major transfer point at scheduled times. For Peoria, the Old Town Peoria Transit Center and the nearby Arrowhead Transit Center would be logical locations. At other points, the service is entirely flexible, and will pick-up and drop-off passengers at any location within the service area.

These services are best suited to areas where current population and employment densities or the road network make traditional fixed route service difficult to provide. Because of the flexible nature of the service, Flex routes serve a number of different types of trips. These include connecting trips



between the Flex area and regular fixed-route transit services, and trips completely within the Flex area. Some of these trips would require reservations, while others would not:

- For trips from scheduled departure points to the Flex areas, riders would not need reservations. Riders would board the Flex route in the same manner as a regular route, and upon boarding, tell the driver where they want to go. They are then dropped off at the curb in front of their destination.
- For trips from Flex areas to terminal points, riders would need to make reservations to be picked up directly at the curb in front of their origin. They would call the transit office and schedule the trip based on their desired arrival time.
- For trips entirely within Flex areas, riders would make reservations for curb-to-curb service.

Specific reservation procedures vary and are determined by the transit system based on factors such as policy, level and type of demand, and other factors.

SERVICE CHARACTERISTICS AND COSTS

The operating costs for each service would be related to their length, span of service, and service frequency. The MAG’s Regional Transit Framework Study suggests that local service should operate at least every 30 minutes. However, due to recession-related revenue reductions, for the purposes of this study, short-term local service options were examined assuming service every 60 minutes in the short-term. For service every 60 minutes from 6:00 am to 6:00 pm Monday through Saturday, the costs and other details of service would be as

shown in Table 4-1. As the economy recovers, then service increases to 30 minutes could be considered, and vehicle requirements and operating costs would be twice as high.

Table 4-1: Operating Costs by Service Type (60 Minute Service)

Route Type	Route Length/ Area Service	Vehicles Required	Annual Operating Cost
Linehaul	11 – 13 miles	2	\$500,000
	17 – 20 miles	3	\$750,000
	22 - 26 miles	4	\$1,000,000
Loop	11 – 13 miles	1	\$250,000
	22 - 26 miles	2	\$500,000
Flex	5 – 6 sq miles	1	\$250,000

FIXED-ROUTE OPTIONS

A wide variety of linehaul and loop circulator options were examined, all of which would operate as traditional fixed-route service. Similar options could also be operated as route-deviation service. However, to do this, they would have to be shortened in length by approximately 20%, and due to distances in Peoria, would leave some “edges” of the community unserved. Thus, instead of examining route deviation services, an alternative approach was to examine Flex Service options (which are described in the next section).

The fixed-route circulator options include:

- NS1 Deer Valley Road – Old Town Peoria via Arrowhead Transit Center and 83rd Avenue, which would be a north-south linehaul route.
- NS2 Happy Valley Road – Olive Avenue, which would extend service northward to Happy Valley Road at Lake Pleasant Parkway via 83rd Ave.
- NS3 Happy Valley Road – Northern Avenue, which would extend service northward to Happy Valley at Lake Pleasant Parkway via Lake Pleasant Parkway.
- S1 Thunderbird/67th Avenue – Olive/107th Avenue via Peoria Town Center, which would be a linehaul route that would serve the southern portion of Peoria.
- S2 Thunderbird/67th Avenue – 99th Avenue, which would also be a linehaul route that would serve the southern portion of Peoria but in a more circuitous manner in order to increase service coverage.
- SL1 South Peoria Loop 1, which would be a loop route that would serve areas south of Peoria Avenue.
- SL2 South Peoria Loop 2, which would be a loop route that would serve areas between Thunderbird Road and Peoria Ave.
- N1 Thunderbird/67th Avenue – Sunrise High School via Arrowhead Transit Center and 83rd Avenue, which would be a linehaul route that would serve developed areas north of Thunderbird Road.

- N2 Thunderbird/67th Avenue – Walmart Supercenter via Arrowhead Transit Center and 83rd Avenue, which would be a linehaul route that would serve developed areas north of Thunderbird Road but operate to the Walmart Supercenter on Lake Pleasant Parkway instead of Sunrise High School.
- NL1 North Peoria Loop 1, which would be a loop that would serve areas between Deer Valley Road and Bell Road.
- NL2 North Peoria Loop 2, which would be a loop that would serve areas between Bell Avenue and Thunderbird Road.
- L Four Loop Option, which would consist of four loops that would provide service to most areas of Peoria that are currently developed.

A summary of each of these options, as well as ridership estimates, operating cost, vehicle requirements, and productivity measures is presented in Figures 4-1 to 4-12.

There could also be combinations of each of these options. For example, it would be possible to implement linehaul routes in higher demand areas, and less expensive (and less convenient) loop routes in lower demand areas.

FLEX SERVICE OPTIONS

Flex Service could be designed to provide service to most developed areas of Peoria, and connections to regional services. To do this, two routes would be developed that would provide service to and from the Arrowhead Transit Center, and three that would provide service to and from the Old Town Transit Center (see Figure 4-13). It would be possible to make connections to regional services at Arrowhead, in Old Town, and on three of the routes along 67th Avenue. Connections would also be possible between adjoining Flex Routes.

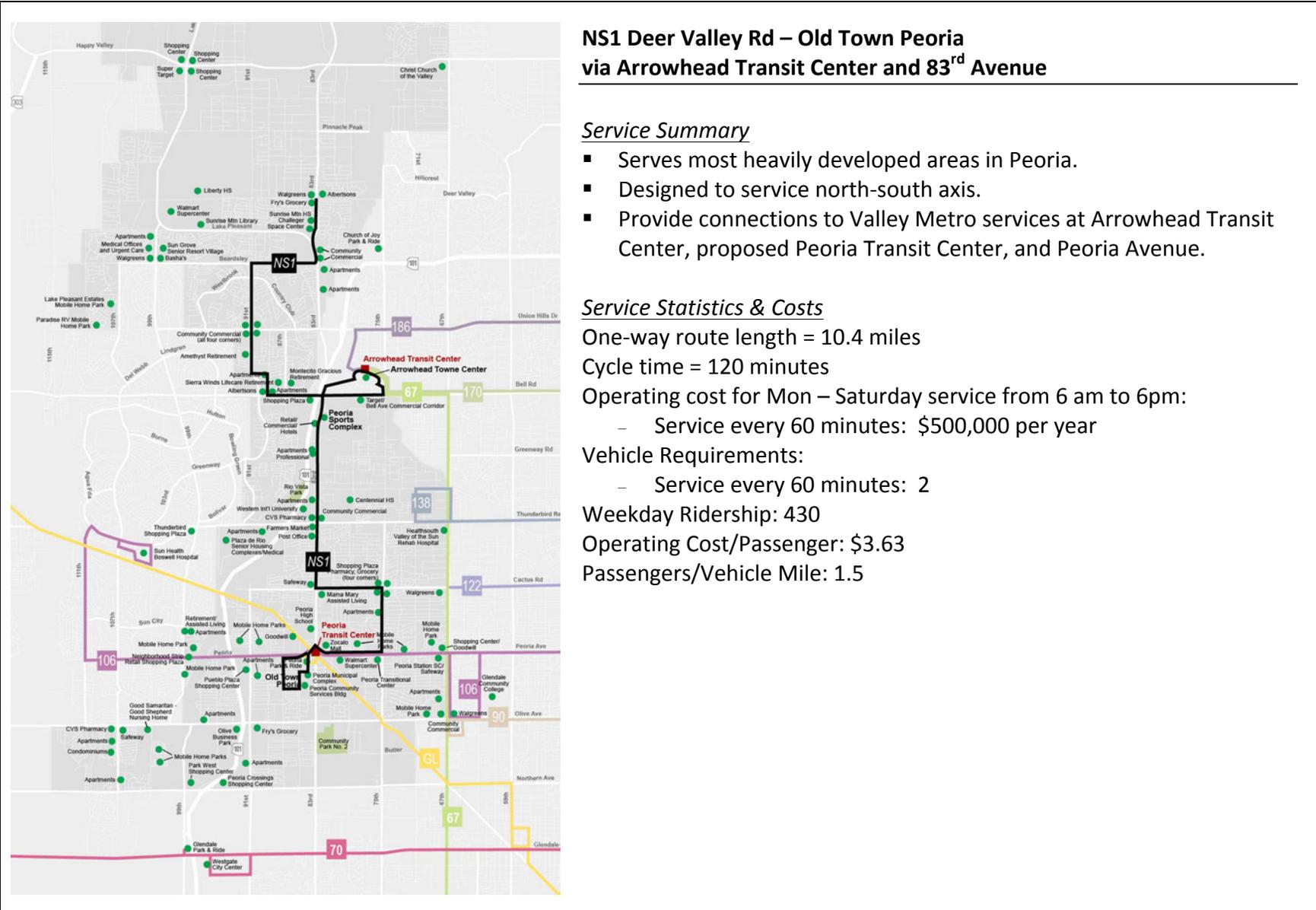
Flex Service would provide more convenient service in some respects but less convenient service in others:

- Door-to-door service would be provided at one end.
- Riders would need to make reservations in a least one direction.

With Monday to Saturday service that operated every 60 minutes from 6:00 am to 6:00 pm, each route would require one vehicle and cost approximately \$250,000 per year to operate. The cost to operate all five would be \$1.25 million per year.

Ridership on the Flex routes would be lower than on fixed-route services (125 to 180 passengers per day per route). However, Flex Service could also serve many riders who are now served by Peoria Dial-A-Ride service, and thus there could be offsetting savings from the Dial-A-Ride program.

Figure 4-1: Alternative NS1: Local Circulator Service/North-South Option 1



**NS1 Deer Valley Rd – Old Town Peoria
via Arrowhead Transit Center and 83rd Avenue**

Service Summary

- Serves most heavily developed areas in Peoria.
- Designed to service north-south axis.
- Provide connections to Valley Metro services at Arrowhead Transit Center, proposed Peoria Transit Center, and Peoria Avenue.

Service Statistics & Costs

One-way route length = 10.4 miles

Cycle time = 120 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$500,000 per year

Vehicle Requirements:

- Service every 60 minutes: 2

Weekday Ridership: 430

Operating Cost/Passenger: \$3.63

Passengers/Vehicle Mile: 1.5

Figure 4-2: Alternative NS2: Local Circulator Service/North-South Option 2

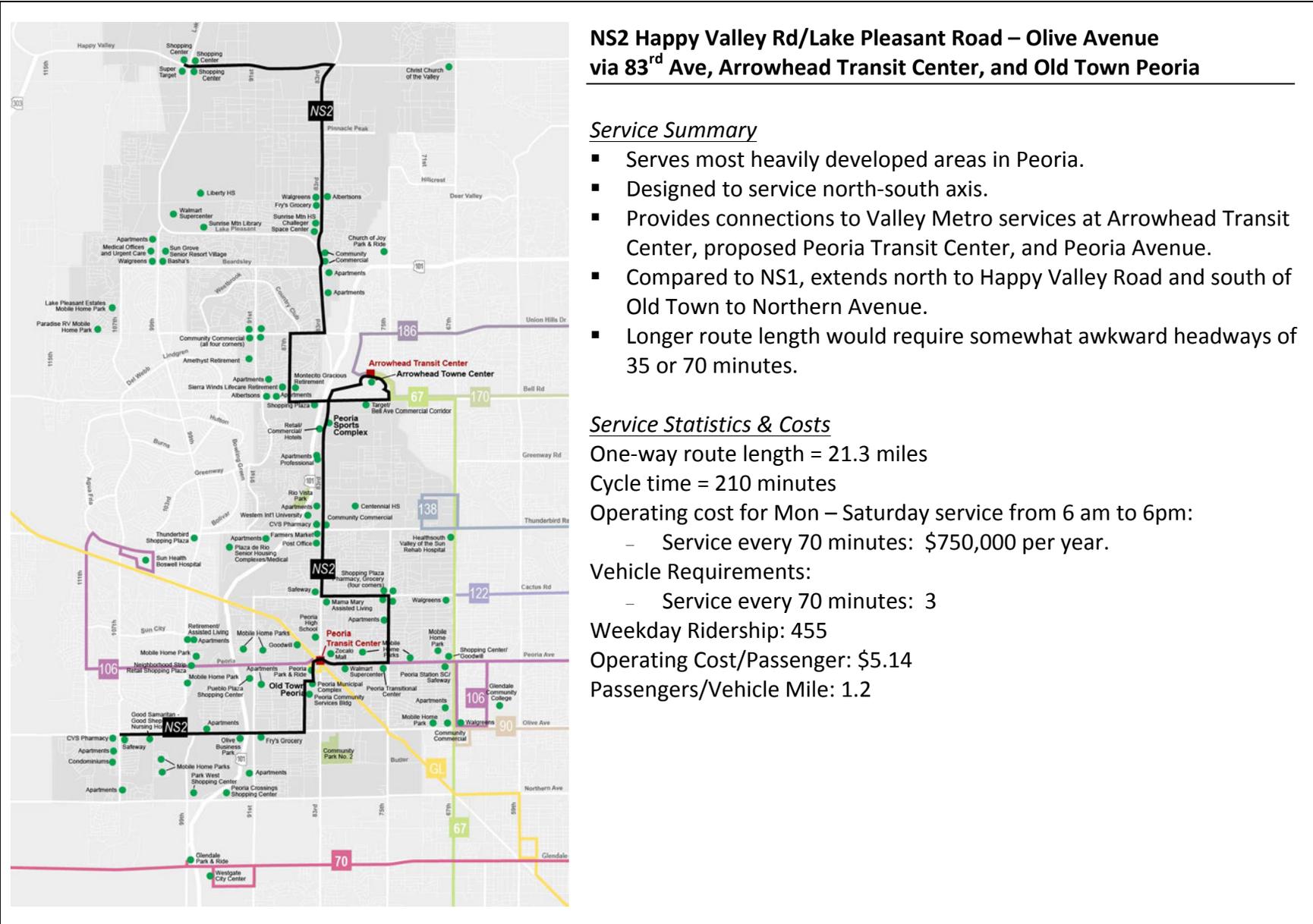
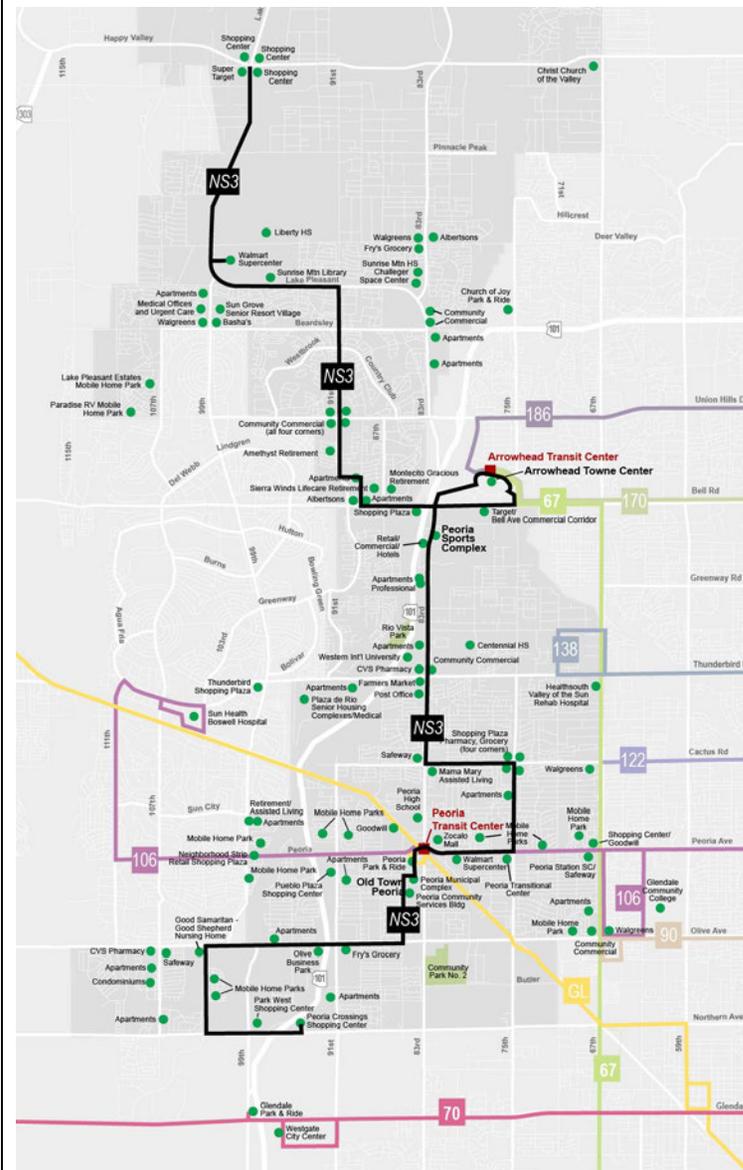


Figure 4-3: Alternative NS3: Local Circulator Service/North-South Option 2



NS3 Happy Valley Rd/Lake Pleasant Road – Northern Avenue via Walmart, Arrowhead Transit Center, and Old Town Peoria

Service Summary

- Serves most heavily developed areas in Peoria.
- Designed to service north-south axis.
- Provide connections to Valley Metro services at Arrowhead Transit Center, proposed Peoria Transit Center, and Peoria Avenue.
- Compared to NS2, north of Lake Pleasant Parkway, operates via Walmart instead of 83rd Avenue.

Service Statistics & Costs

One-way route length = 19.3 miles

Cycle time = 210 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 70 minutes: \$750,000 per year.

Vehicle Requirements:

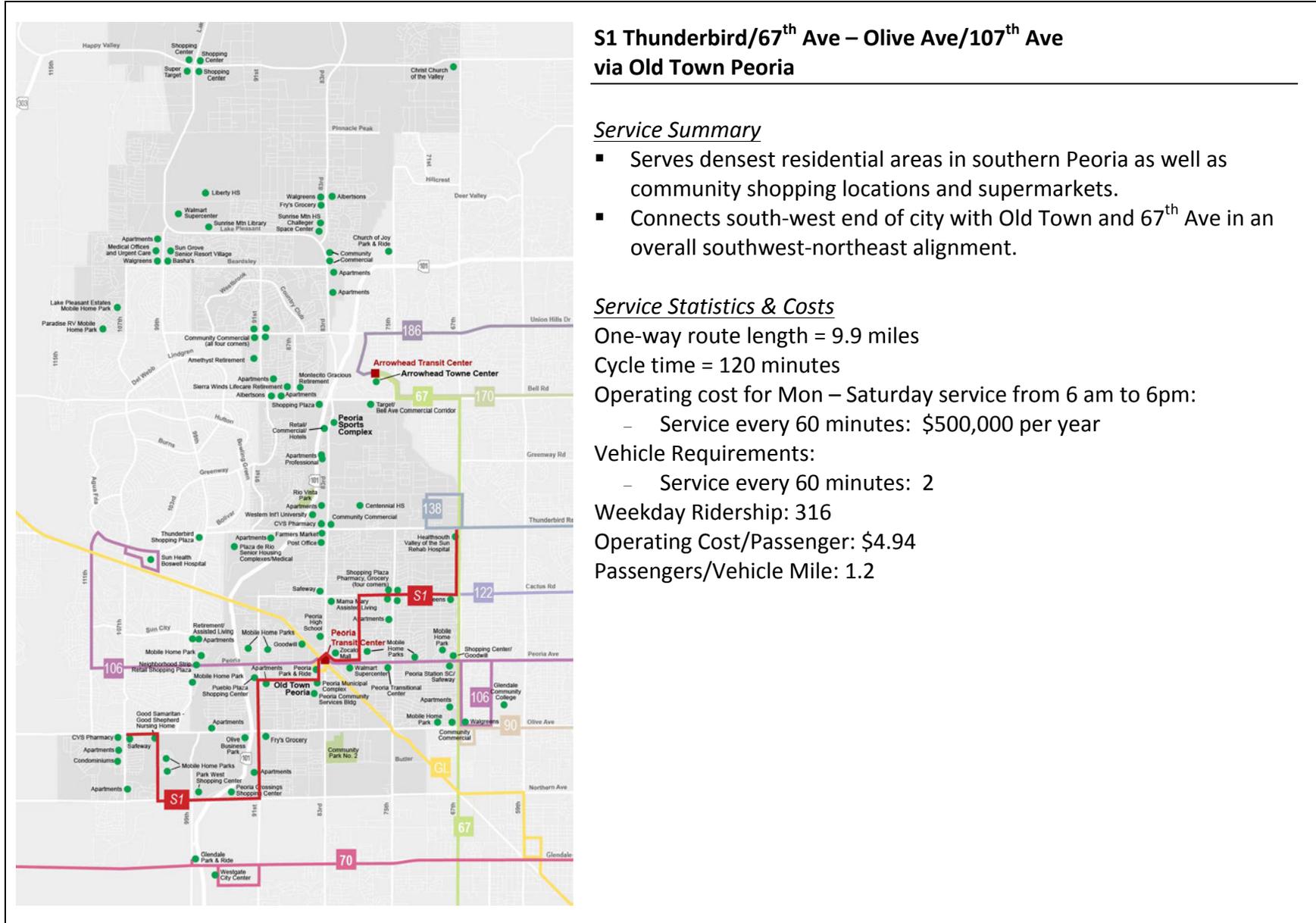
- Service every 70 minutes: 3

Weekday Ridership: 558

Operating Cost/Passenger: \$4.19

Passengers/Vehicle Mile: 1.3

Figure 4-4: Alternative S1: Local Circulator Service/South Option 3



S1 Thunderbird/67th Ave – Olive Ave/107th Ave via Old Town Peoria

Service Summary

- Serves densest residential areas in southern Peoria as well as community shopping locations and supermarkets.
- Connects south-west end of city with Old Town and 67th Ave in an overall southwest-northeast alignment.

Service Statistics & Costs

One-way route length = 9.9 miles

Cycle time = 120 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$500,000 per year

Vehicle Requirements:

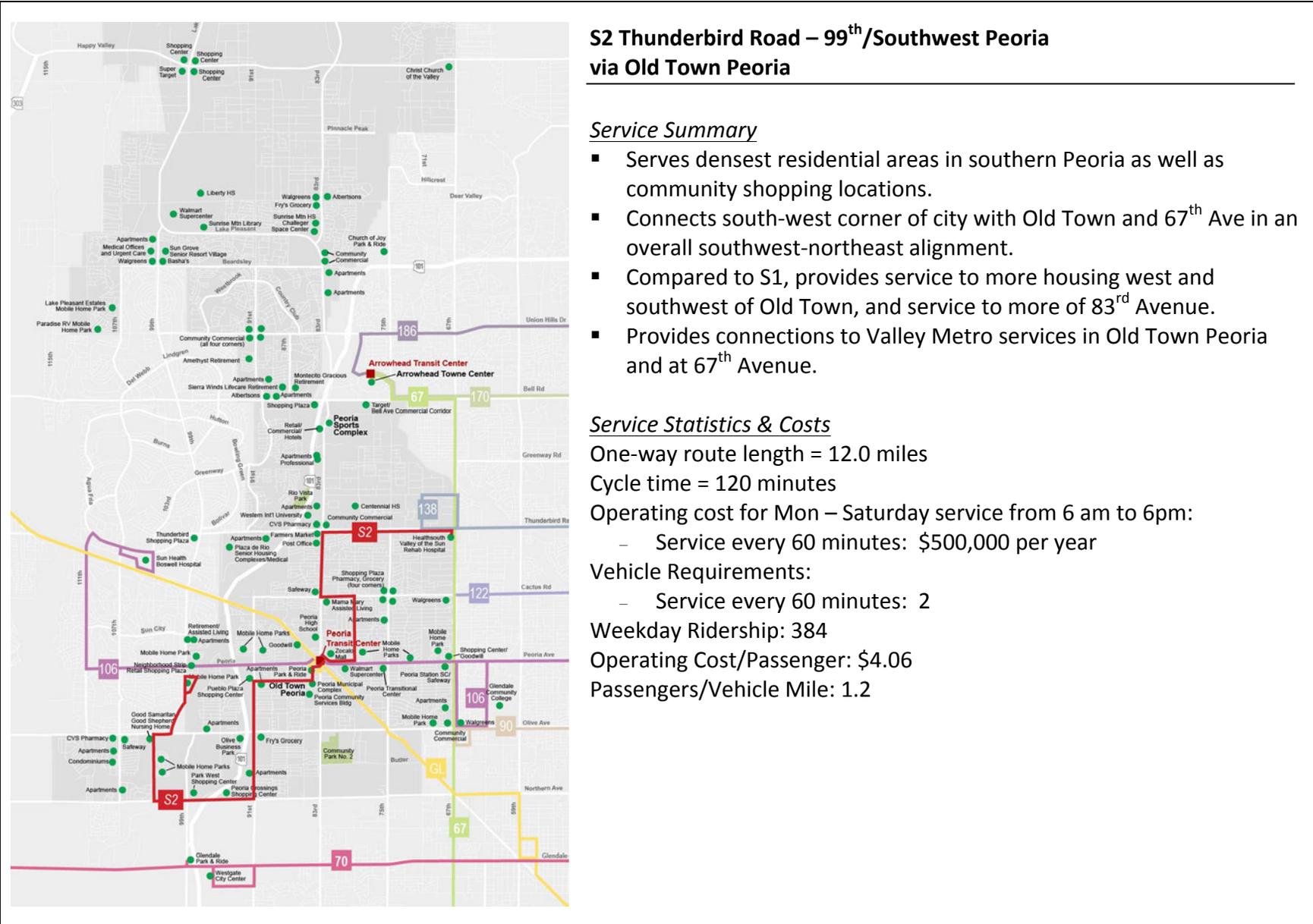
- Service every 60 minutes: 2

Weekday Ridership: 316

Operating Cost/Passenger: \$4.94

Passengers/Vehicle Mile: 1.2

Figure 4-5: Alternative S2: Local Circulator Service/South Option 2



S2 Thunderbird Road – 99th/Southwest Peoria via Old Town Peoria

Service Summary

- Serves densest residential areas in southern Peoria as well as community shopping locations.
- Connects south-west corner of city with Old Town and 67th Ave in an overall southwest-northeast alignment.
- Compared to S1, provides service to more housing west and southwest of Old Town, and service to more of 83rd Avenue.
- Provides connections to Valley Metro services in Old Town Peoria and at 67th Avenue.

Service Statistics & Costs

One-way route length = 12.0 miles

Cycle time = 120 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$500,000 per year

Vehicle Requirements:

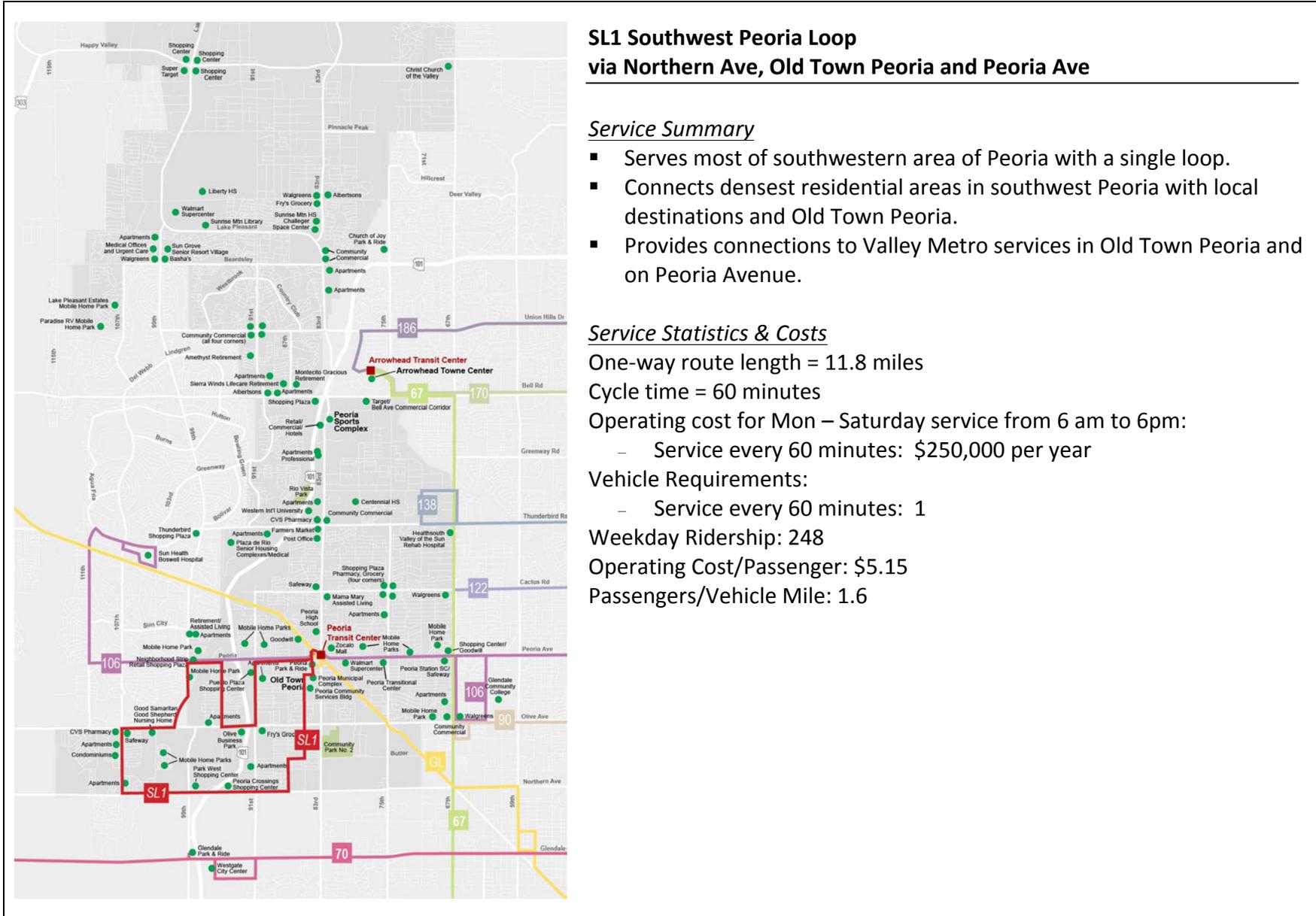
- Service every 60 minutes: 2

Weekday Ridership: 384

Operating Cost/Passenger: \$4.06

Passengers/Vehicle Mile: 1.2

Figure 4-6: Alternative SL1: Local Circulator Service/South Loop Option 1



**SL1 Southwest Peoria Loop
via Northern Ave, Old Town Peoria and Peoria Ave**

Service Summary

- Serves most of southwestern area of Peoria with a single loop.
- Connects densest residential areas in southwest Peoria with local destinations and Old Town Peoria.
- Provides connections to Valley Metro services in Old Town Peoria and on Peoria Avenue.

Service Statistics & Costs

One-way route length = 11.8 miles

Cycle time = 60 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$250,000 per year

Vehicle Requirements:

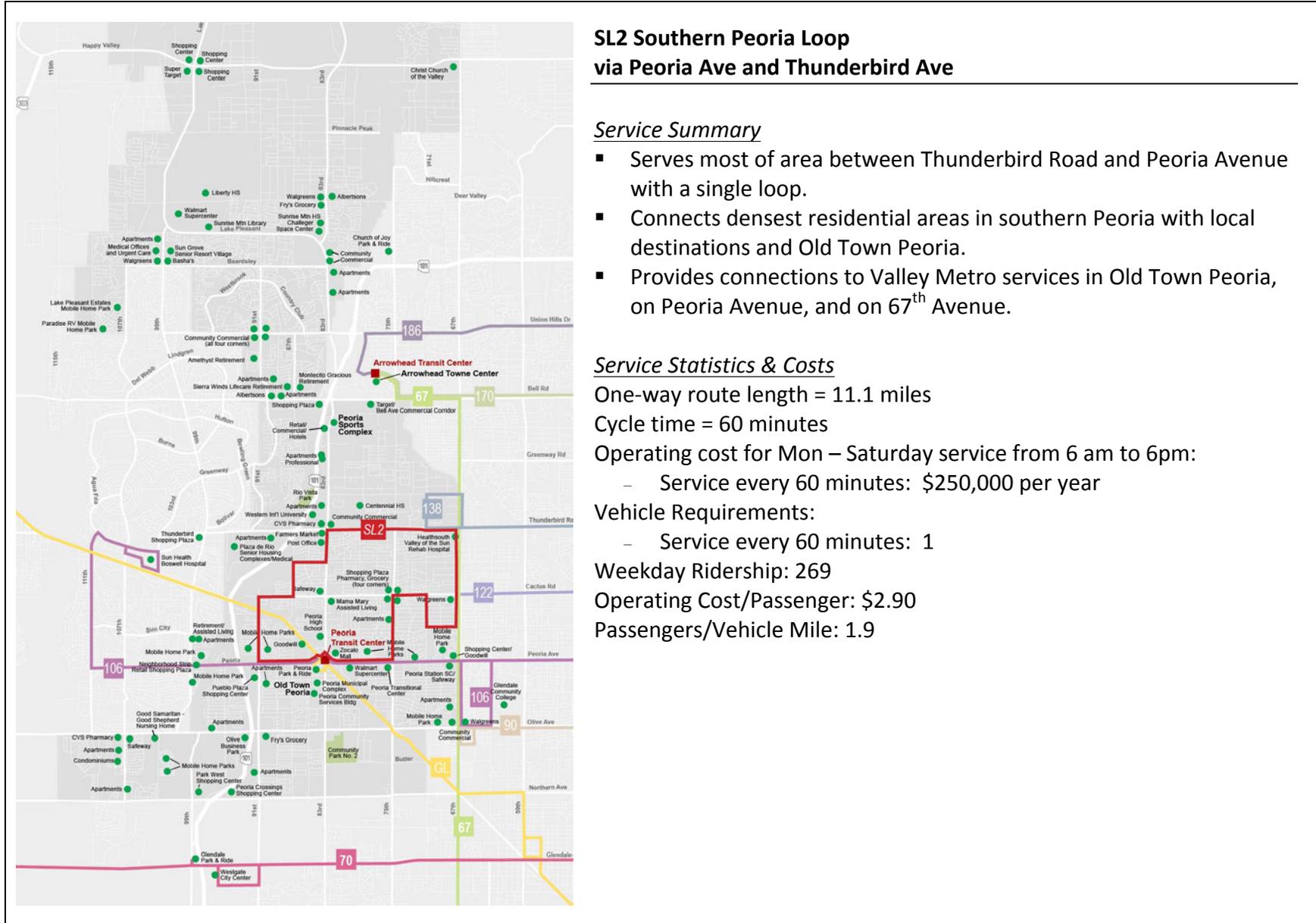
- Service every 60 minutes: 1

Weekday Ridership: 248

Operating Cost/Passenger: \$5.15

Passengers/Vehicle Mile: 1.6

Figure 4-7: Alternative SL2: Local Circulator Service/South Loop Option 2



**SL2 Southern Peoria Loop
via Peoria Ave and Thunderbird Ave**

Service Summary

- Serves most of area between Thunderbird Road and Peoria Avenue with a single loop.
- Connects densest residential areas in southern Peoria with local destinations and Old Town Peoria.
- Provides connections to Valley Metro services in Old Town Peoria, on Peoria Avenue, and on 67th Avenue.

Service Statistics & Costs

One-way route length = 11.1 miles

Cycle time = 60 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$250,000 per year

Vehicle Requirements:

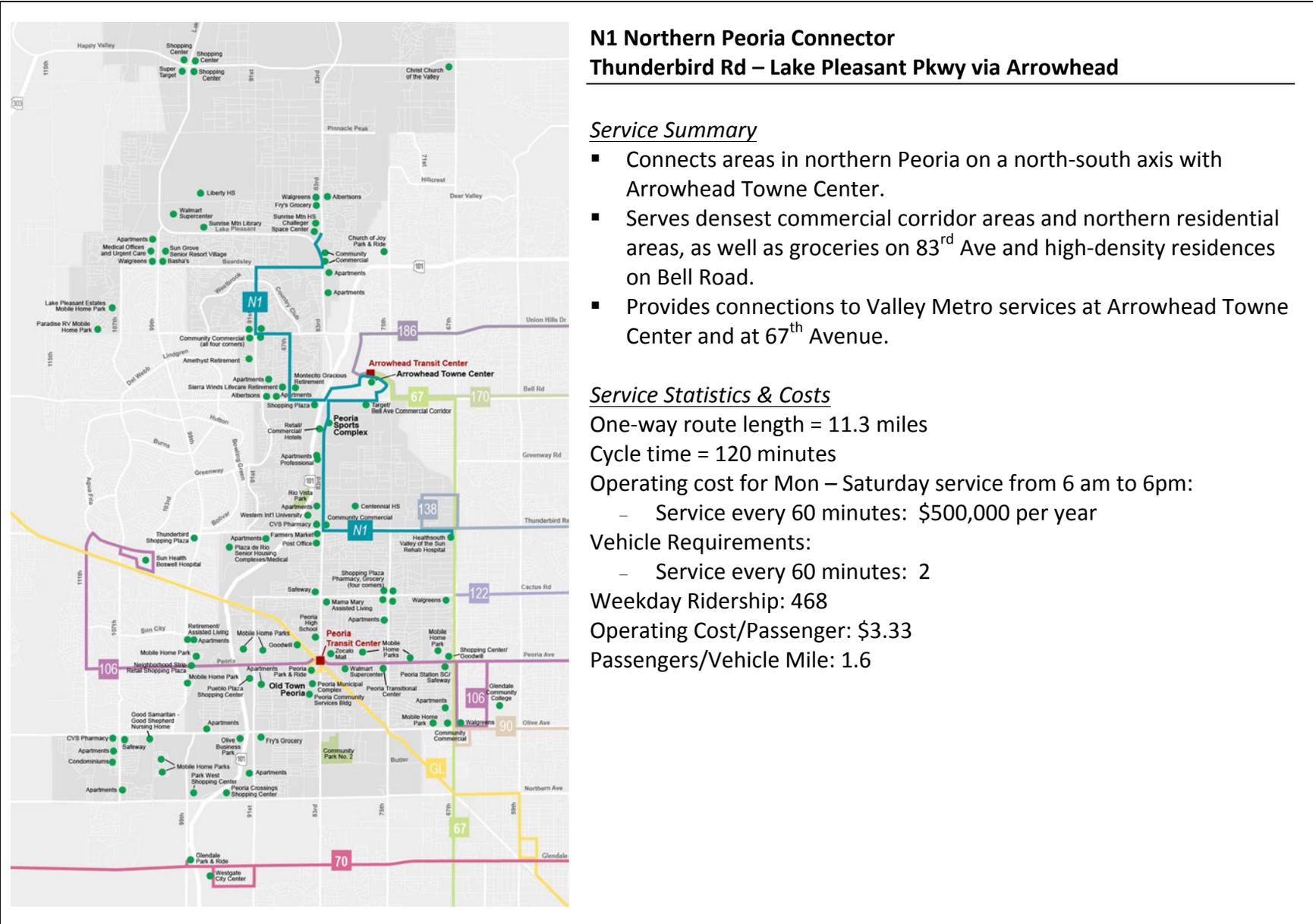
- Service every 60 minutes: 1

Weekday Ridership: 269

Operating Cost/Passenger: \$2.90

Passengers/Vehicle Mile: 1.9

Figure 4-8: Alternative N1: Local Circulator Service/North Option 1



**N1 Northern Peoria Connector
Thunderbird Rd – Lake Pleasant Pkwy via Arrowhead**

Service Summary

- Connects areas in northern Peoria on a north-south axis with Arrowhead Towne Center.
- Serves densest commercial corridor areas and northern residential areas, as well as groceries on 83rd Ave and high-density residences on Bell Road.
- Provides connections to Valley Metro services at Arrowhead Towne Center and at 67th Avenue.

Service Statistics & Costs

One-way route length = 11.3 miles

Cycle time = 120 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$500,000 per year

Vehicle Requirements:

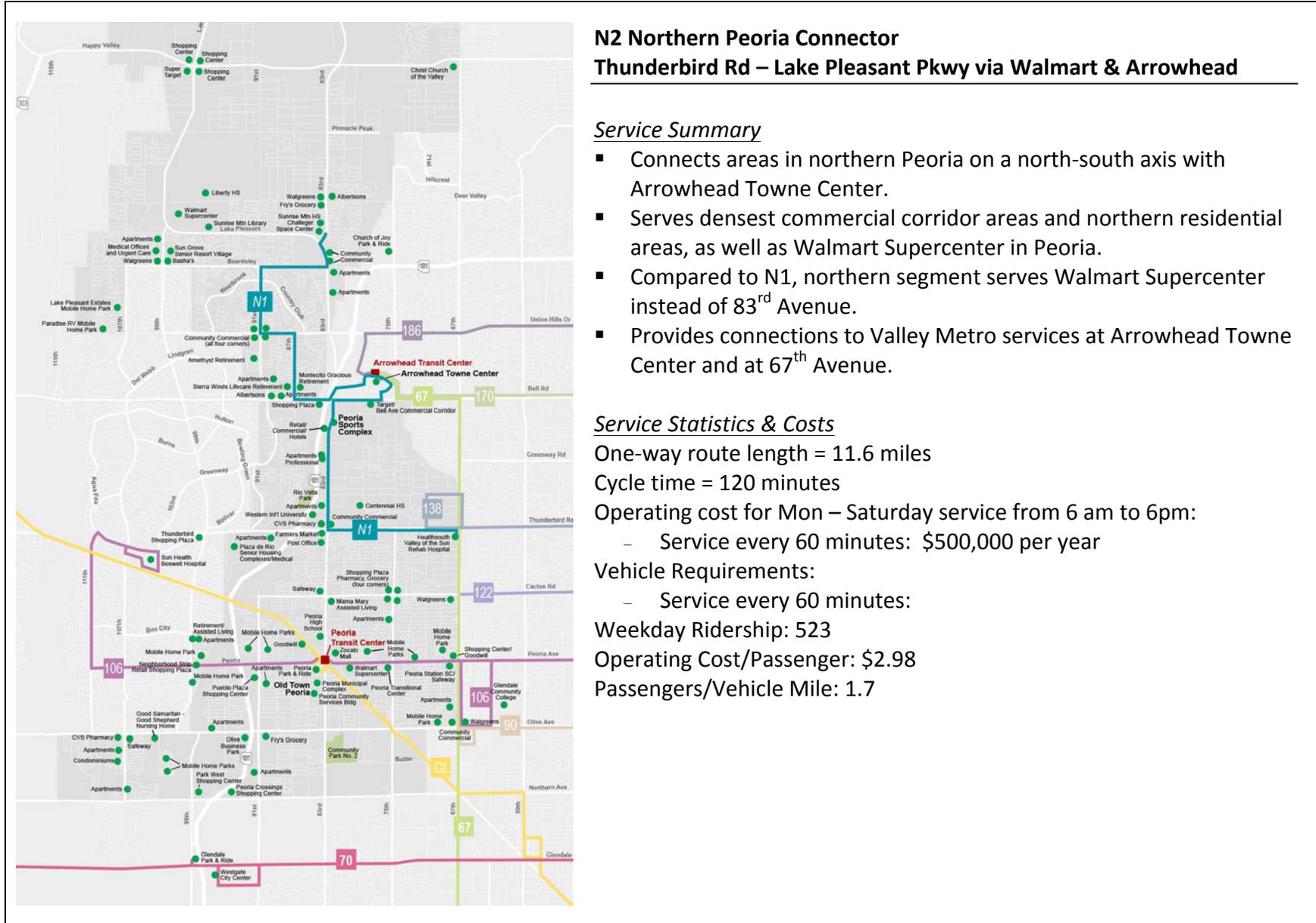
- Service every 60 minutes: 2

Weekday Ridership: 468

Operating Cost/Passenger: \$3.33

Passengers/Vehicle Mile: 1.6

Figure 4-9: Alternative N2: Local Circulator Service/North Option 2



**N2 Northern Peoria Connector
Thunderbird Rd – Lake Pleasant Pkwy via Walmart & Arrowhead**

Service Summary

- Connects areas in northern Peoria on a north-south axis with Arrowhead Towne Center.
- Serves densest commercial corridor areas and northern residential areas, as well as Walmart Supercenter in Peoria.
- Compared to N1, northern segment serves Walmart Supercenter instead of 83rd Avenue.
- Provides connections to Valley Metro services at Arrowhead Towne Center and at 67th Avenue.

Service Statistics & Costs

One-way route length = 11.6 miles

Cycle time = 120 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$500,000 per year

Vehicle Requirements:

- Service every 60 minutes:

Weekday Ridership: 523

Operating Cost/Passenger: \$2.98

Passengers/Vehicle Mile: 1.7

Figure 4-10: Alternative NL1: Local Circulator Service/North Loop Option 1

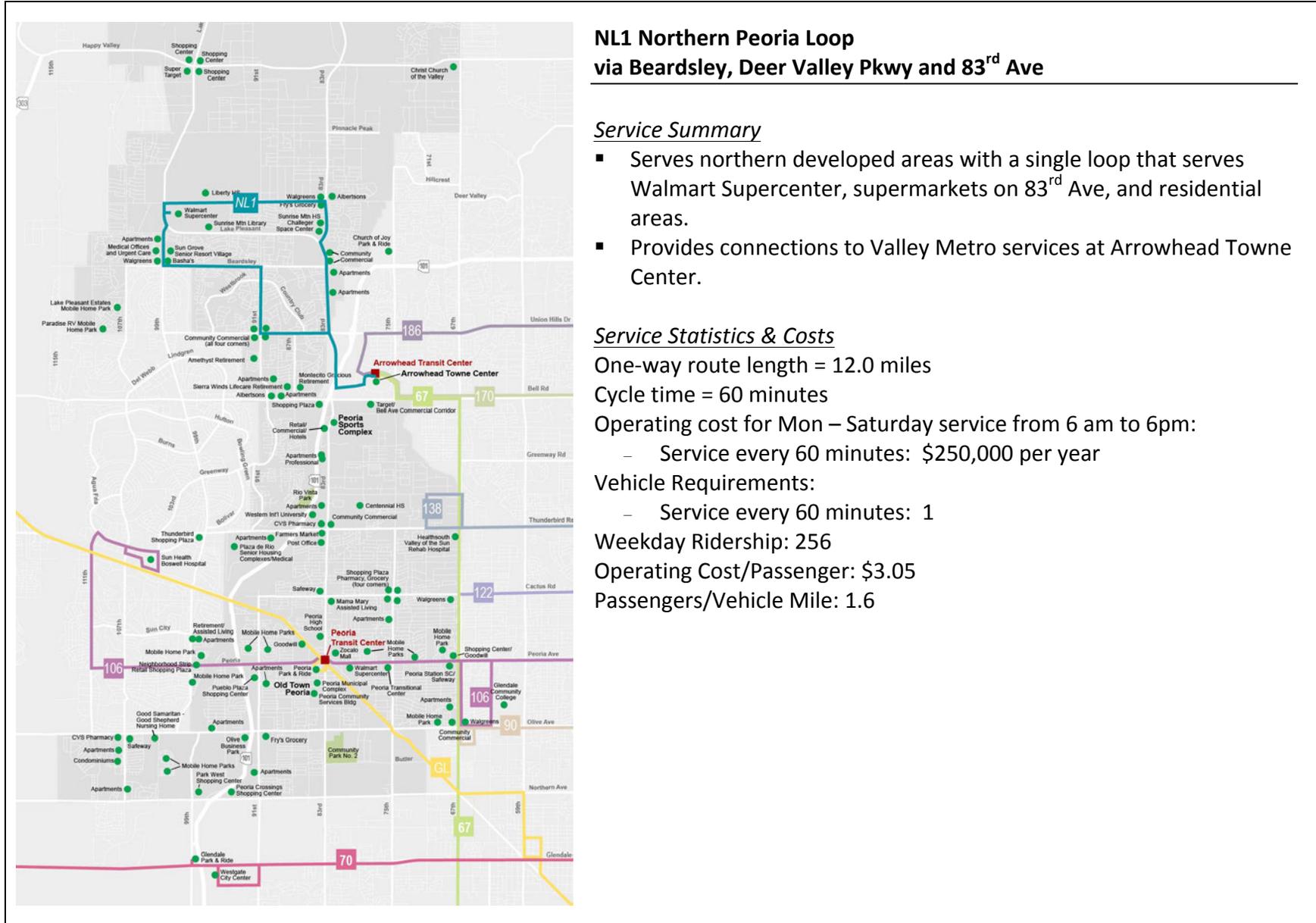
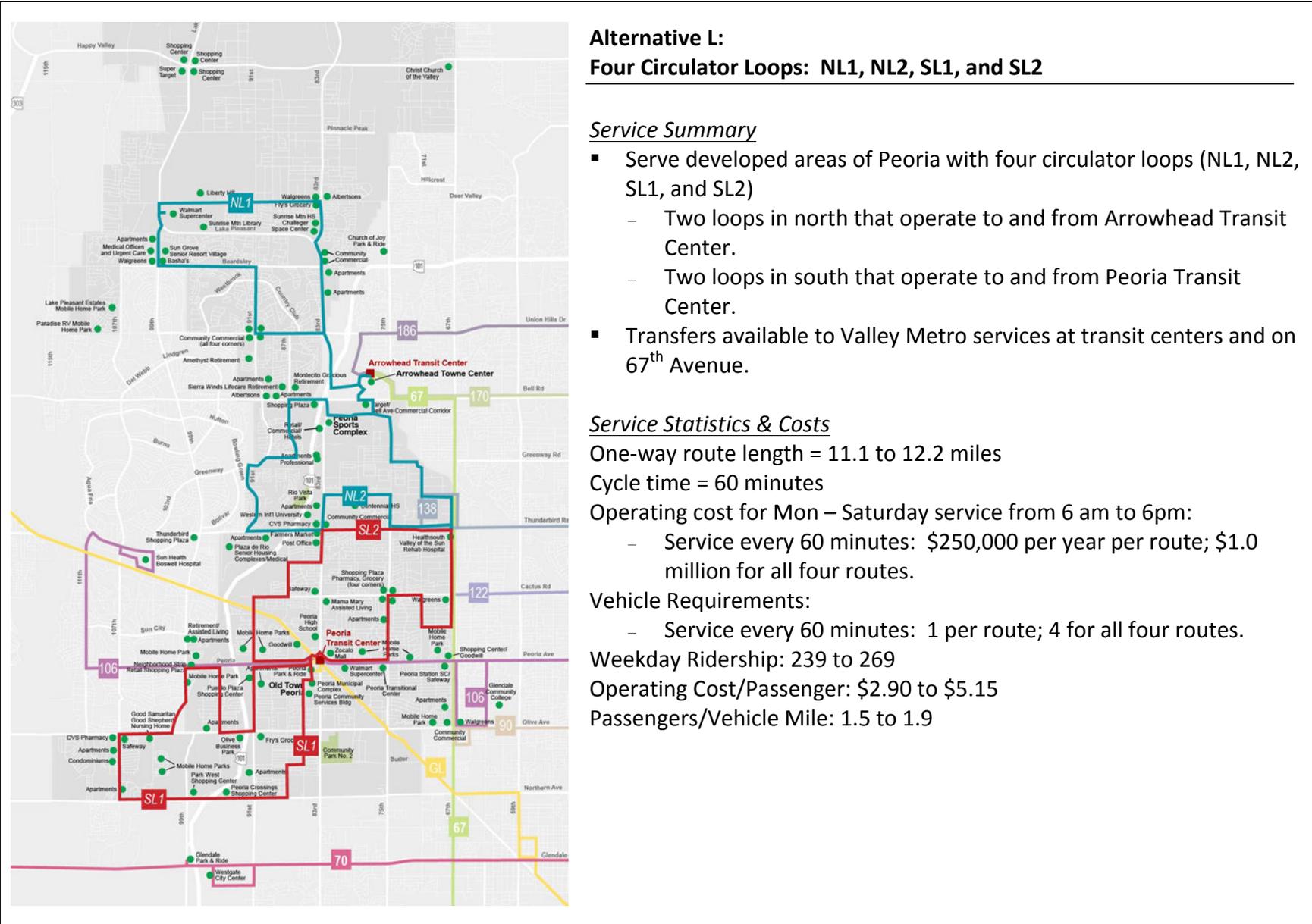


Figure 4-12: Alternative L: Four Loops



**Alternative L:
Four Circulator Loops: NL1, NL2, SL1, and SL2**

Service Summary

- Serve developed areas of Peoria with four circulator loops (NL1, NL2, SL1, and SL2)
 - Two loops in north that operate to and from Arrowhead Transit Center.
 - Two loops in south that operate to and from Peoria Transit Center.
- Transfers available to Valley Metro services at transit centers and on 67th Avenue.

Service Statistics & Costs

One-way route length = 11.1 to 12.2 miles

Cycle time = 60 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$250,000 per year per route; \$1.0 million for all four routes.

Vehicle Requirements:

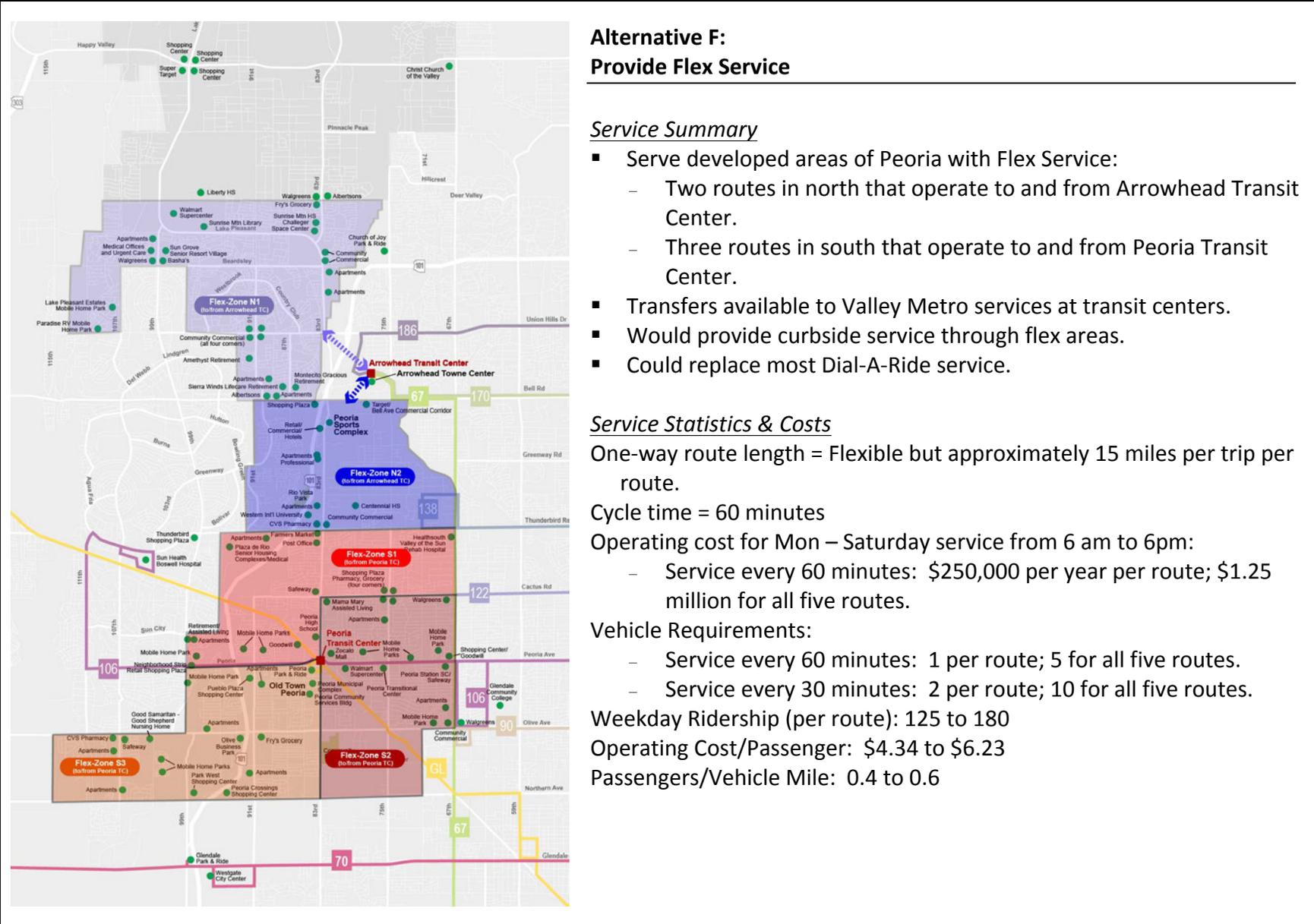
- Service every 60 minutes: 1 per route; 4 for all four routes.

Weekday Ridership: 239 to 269

Operating Cost/Passenger: \$2.90 to \$5.15

Passengers/Vehicle Mile: 1.5 to 1.9

Figure 4-13: Alternative F: Provide Flex Service



**Alternative F:
Provide Flex Service**

Service Summary

- Serve developed areas of Peoria with Flex Service:
 - Two routes in north that operate to and from Arrowhead Transit Center.
 - Three routes in south that operate to and from Peoria Transit Center.
- Transfers available to Valley Metro services at transit centers.
- Would provide curbside service through flex areas.
- Could replace most Dial-A-Ride service.

Service Statistics & Costs

One-way route length = Flexible but approximately 15 miles per trip per route.

Cycle time = 60 minutes

Operating cost for Mon – Saturday service from 6 am to 6pm:

- Service every 60 minutes: \$250,000 per year per route; \$1.25 million for all five routes.

Vehicle Requirements:

- Service every 60 minutes: 1 per route; 5 for all five routes.
- Service every 30 minutes: 2 per route; 10 for all five routes.

Weekday Ridership (per route): 125 to 180

Operating Cost/Passenger: \$4.34 to \$6.23

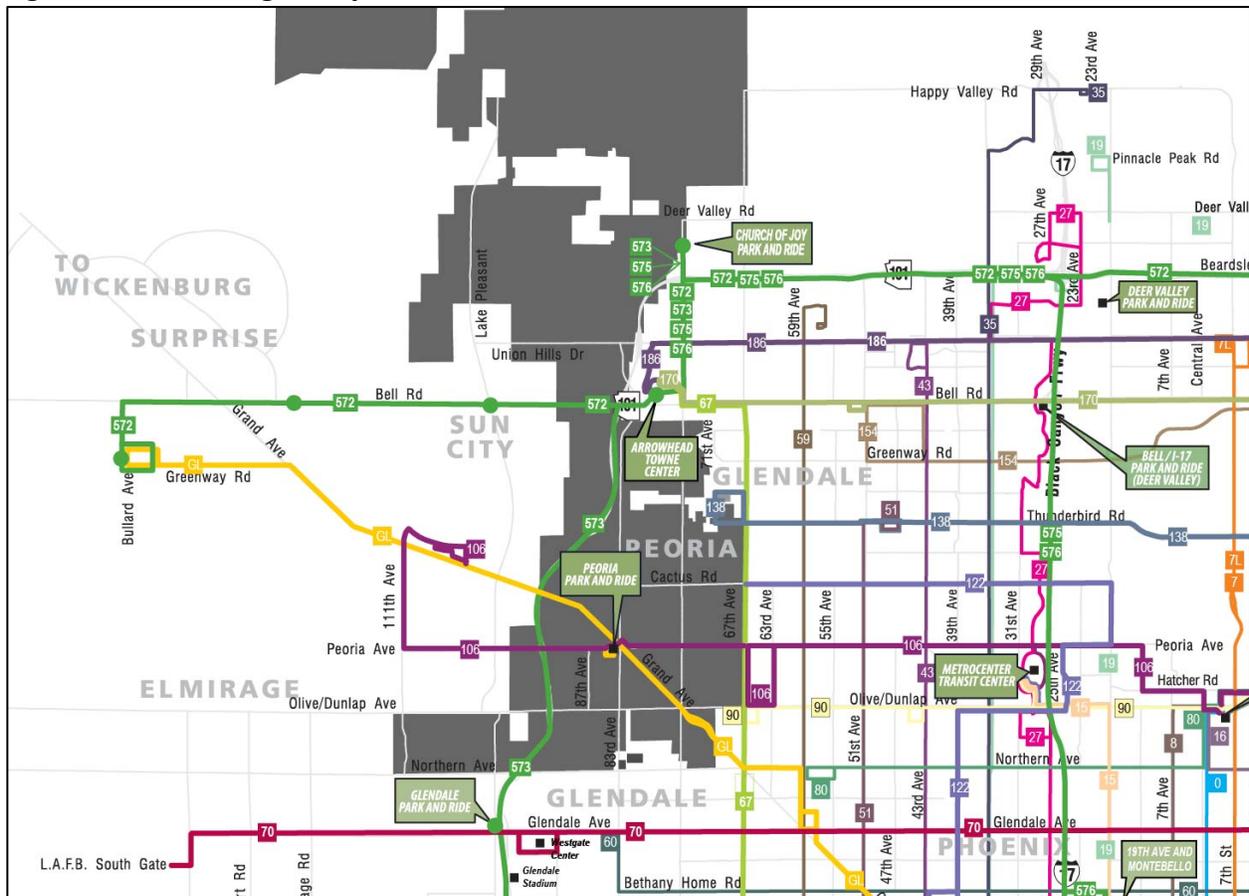
Passengers/Vehicle Mile: 0.4 to 0.6

As with the fixed-route options, Flex Services could also be implemented in combination with fixed-route options. For example, it would be possible to implement linehaul routes in higher demand areas, and Flex Routes in lower demand areas.

EXTEND VALLEY METRO GRID INTO PEORIA

Valley Metro serves the Valley with a system that is largely configured as a grid of routes that operate along major north-south and east-west arterials. Peoria, with a few limited exceptions, is just beyond the western edge of the grid—only two routes operate through Peoria, but five end at or near Peoria’s eastern border (see Figure 4-14).

Figure 4-14: Existing Valley Metro Local Service



Thus, as an alternative to developing its own circulator routes, Peoria could fund the extension of Valley Metro routes into Peoria to provide service within Peoria as well as service to the rest of the Valley.

The extension of service would be designed to:

- Make Peoria part of the Valley Metro system.

- Provide service within Peoria.
- Provide much better regional service.

The extension of Valley Metro routes into and through Peoria would cost up to \$600,000 to \$1.2 million per route, which would total approximately \$4.1 million for comprehensive service. The costs are higher than local options because Valley Metro runs as frequently as every 30 minutes and from early morning until late evening. Costs could be reduced by considering several options.

One option would be to provide less comprehensive service, and focus service on areas where demand is greatest. These locations are:

- Between Beardsley Rd and Bell Road (including the Arrowhead Towne Center).
- Between Thunderbird Rd and Olive Ave (including the Peoria Sports Complex and Old Town).

A second option would be to provide less frequent service, with service every 60 minutes versus every 30 minutes during off-peak periods. Similarly, service could be every 60 minutes throughout the day instead of every 30 minutes all day. Shorter spans of service and weekday only service are also options.

A third option would be to extend fewer routes, at least in the short term.

SUMMARY

As described above, there are a number of different ways to improve local transit service within Peoria and to improve connections to the rest of the Valley. Of the different options, the extension of the Valley Metro grid into Peoria was viewed the most favorably by project staff, stakeholders, and the public who attended the project open houses. The major reason for this was that connections to the rest of the Valley were considered to be extremely important. This view is substantiated by the market analysis that showed that very large volumes of trips are made between Peoria and other areas, particularly Glendale and North Phoenix. The technical analysis also indicates that this approach would serve more riders and be more productive and cost-effective.

CHAPTER 5 HIGH CAPACITY TRANSIT ALTERNATIVES AND ISSUES

This chapter presents an overview of the six High Capacity Transit (HCT) alternatives that were examined to potentially extend HCT service to Peoria. These six alternatives are:

- L1 LRT from downtown Glendale via Grand Avenue
- L2 LRT from Westgate Center via 91st Avenue
- B1 BRT from 19th Street at Montebello Avenue via Grand Avenue
- B2 BRT from Westgate Center via 91st Avenue
- B3 BRT from Northwest Extension via Dunlap Avenue
- B4 BRT via Peoria Avenue

All six alternatives would operate to Old Town Peoria from either a currently planned or potential LRT extension (the Northwest Extension or one of the potential Glendale extensions). From Old Town, all six alternatives would follow a common alignment to the planned Arrowhead Transit Center via 83rd Avenue and the Peoria Sports Complex.

As described in this chapter, none of the HCT alternatives would be feasible because projected ridership would be much too low to justify the associated costs. Ridership would be low largely because projected development patterns will not be dense enough to provide markets that would be large enough to support HCT. If Peoria desires to develop HCT at some point in the future, then changes will need to encourage denser development. These issues are discussed in the final sections of the chapter.

DEFINITION OF HCT/MODES EXAMINED

High capacity transit is defined by its function: to carry high volumes of passengers quickly and efficiently from one place to another. Other defining characteristics of HCT include the ability to bypass traffic and avoid delays by operating in exclusive or semi-exclusive rights-of-way, faster overall travel speeds due to wide station spacing, frequent service, transit priority street and signal treatments, and premium station and passenger amenities.

Transit modes that are most frequently associated with HCT are light rail, urban streetcar, bus rapid transit (BRT), and commuter rail. MAG’s Transit Framework Study further categorizes HCT as “HCT Peak Period,” which focuses primarily on providing peak period commuter service, and “HCT All Day,” which provides all day, seven day a week service that serves a wide variety of trip purposes in high volume corridors.

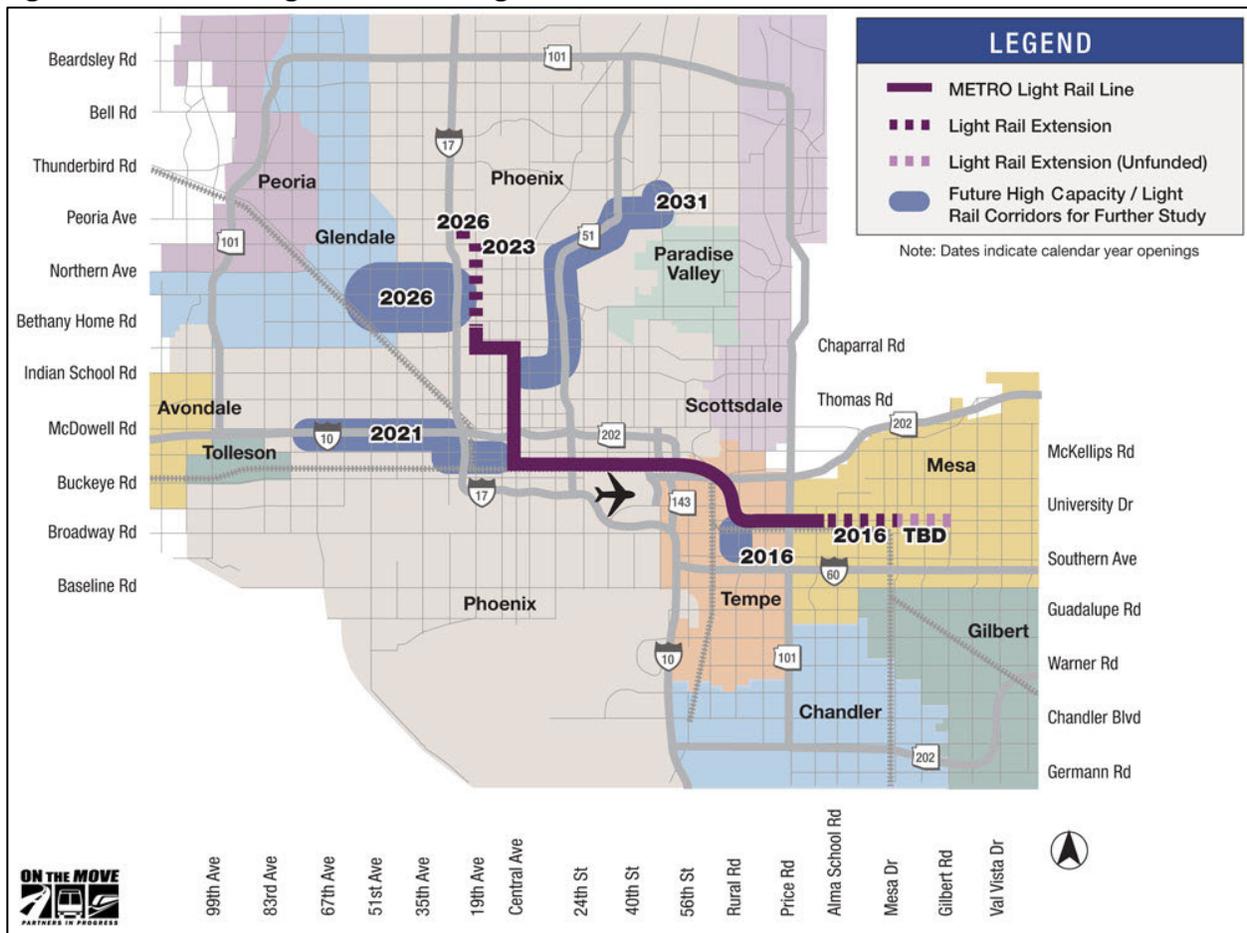
Of the four modes most commonly defined as HCT, urban streetcar is designed to serve medium to large densely developed downtown areas, which for the foreseeable future, Peoria

will not have. A second mode, commuter rail, is being examined in MAG’s Commuter Rail System Study. One of the most promising lines being examined in that study is along Grand Avenue between Wickenburg and downtown Phoenix via Peoria. This document examines the remaining two modes, which are light rail and BRT.

LIGHT RAIL ALTERNATIVES

To be most effective, light rail would need to be developed as part of the METRO system. At present, this system operates between Mesa and Phoenix via downtown and midtown Phoenix. A number of extensions to the line are planned, but due to recession-related declines in Prop 400 revenues, have been delayed a number of times (see Figure 5-1). The most relevant of these for Peoria are:

Figure 5-1: METRO Light Rail: Existing Service and Planned Extensions



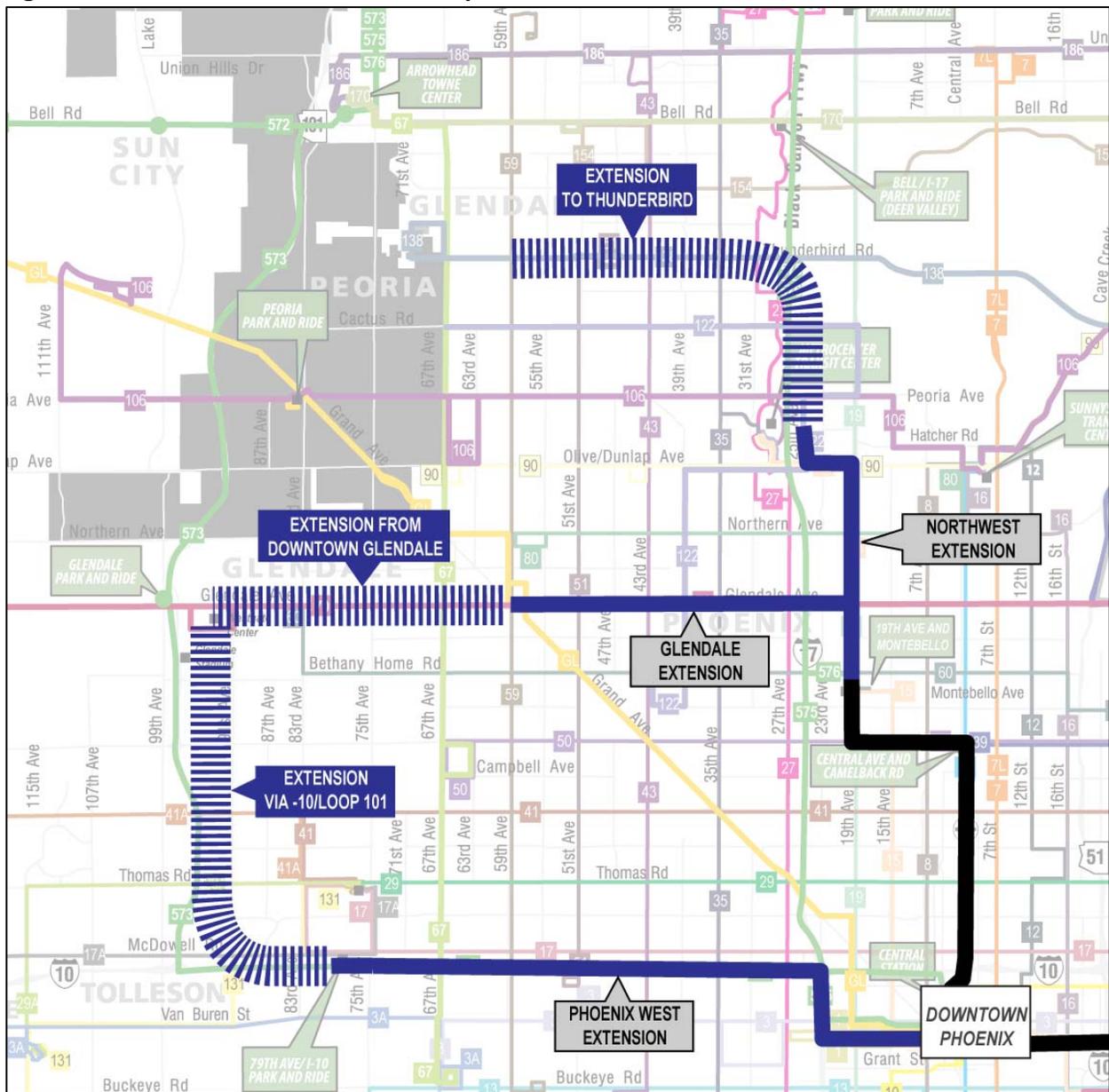
- The Northwest Extension, which would extend the northern end of the existing line northward to the vicinity of Peoria Avenue at I-17. This extension would be constructed in two phases. The first would be along 19th Avenue to Dunlap Avenue, which is now

scheduled for completion in 2023. The second phase to Peoria Avenue is now scheduled for completion in 2025.

- The currently programmed Glendale extension, which would branch off of the Northwest extension along or near Glendale Avenue to downtown Glendale. This extension is now scheduled for completion in 2026.

However, due to the construction of the Westgate Center and sports areas in that area, development along Loop 101, and development opportunities in downtown Glendale, Glendale has begun to reassess its light rail options. Initially it considered three alternative services (see Figure 5-2):

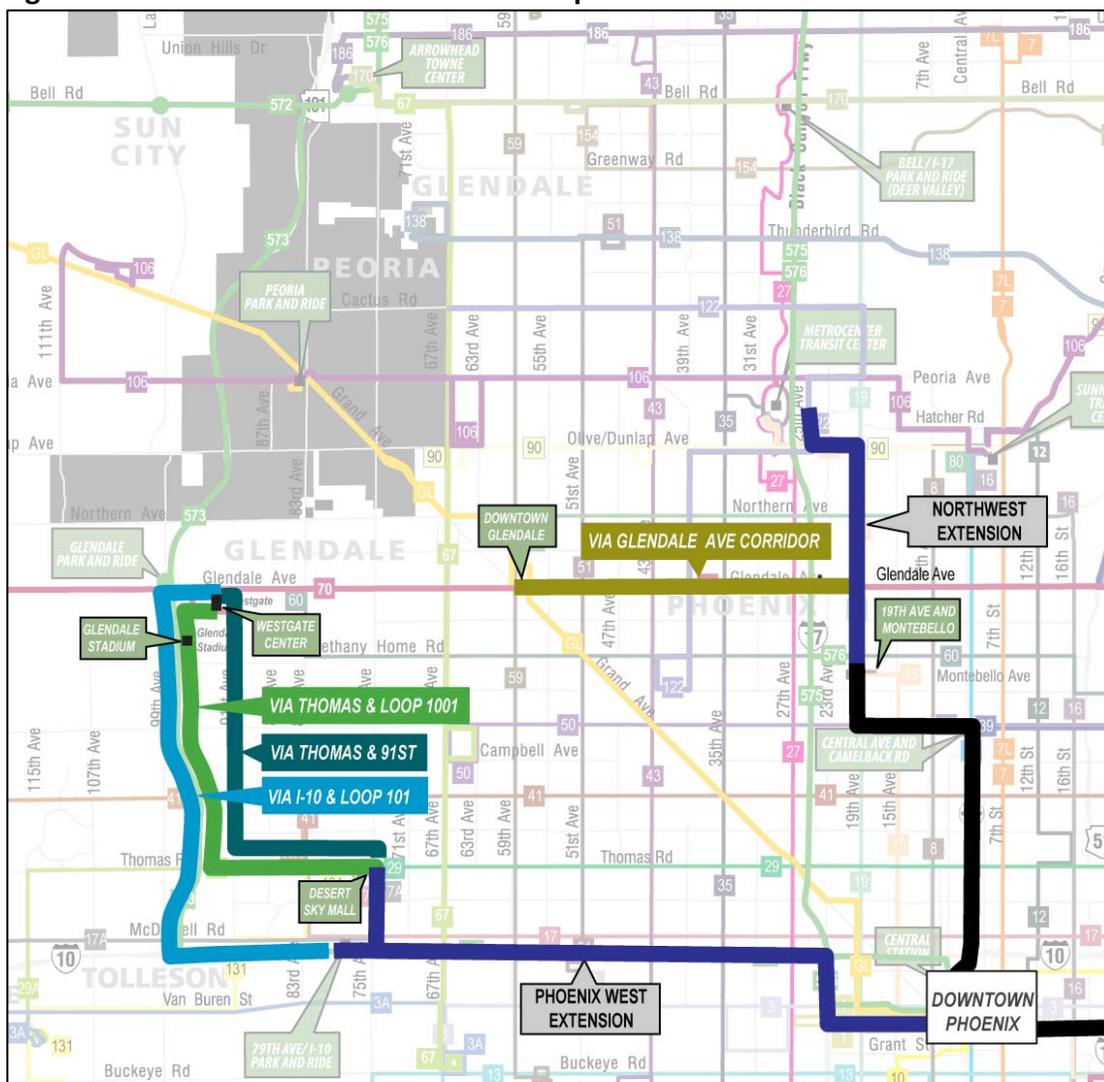
Figure 5-2: Glendale Extension Initial Options



1. An extension from the end of the Northwest extension to Thunderbird Road, and then along Thunderbird Road into Glendale.
2. A longer extension of the currently programmed Glendale extension along Glendale Avenue to the Westgate Center.
3. An extension of the Phoenix West extension to Westgate Center via I-10 or Thomas Road and 91st Avenue or Loop 101.

Of these initial options, the first two, which were the options that would bring service closest to Peoria, were eliminated because they would not perform well. Now, with the first two options eliminated, the focus of the Glendale extension study is to compare the relative merits of the currently programmed Glendale extension to those for the “I-10/Loop 101” corridor that would extend service to Westgate Center via the end of the Phoenix West extension. To date, three different alternative alignments have been developed for the I-10/Loop 101 corridor (see Figure 5-3), which are:

Figure 5-3: Glendale Extension Short-List Options



- Via I-10 and Loop 101.
- Via Thomas Road and Loop 101.
- Via Thomas Road and 91st Avenue.

In addition, alternative alignments will be examined for the Glendale Avenue corridor extension. These could be as far north as Northern Avenue or as far south as Bethany Home Road, but would still run east-west between the Northwest Extension and downtown Glendale.

For the purposes of light rail service to Peoria, the decisions that have been made to date help to narrow options. The decisions made by Glendale not to pursue service to Thunderbird Road or west of downtown in the Glendale Avenue corridor indicate that it is unlikely that Glendale would partner with Peoria for service through those areas. In a similar manner, the decision to further examine options to downtown Glendale and Westgate indicate that those two locations would be logical starting points for light rail service to Peoria.¹

In terms of potential alignments through Peoria, the most densely developed areas of Peoria are projected to be in selected areas generally along 83rd Avenue and Loop 101. As described in previous work, Peoria will need to take steps to concentrate development to make HCT feasible, but if this is done, the 83rd Avenue and Loop 101 corridors would be logical corridors. Also, in the same manner as for local service options, connections to the rest of the Phoenix metro area will be important, and the best places to make those connections will be at the planned Old Town and Arrowhead Transit Centers. The Arrowhead Transit Center would also be a logical northern terminal, at least until development intensifies further north. In this respect, potential options would be:

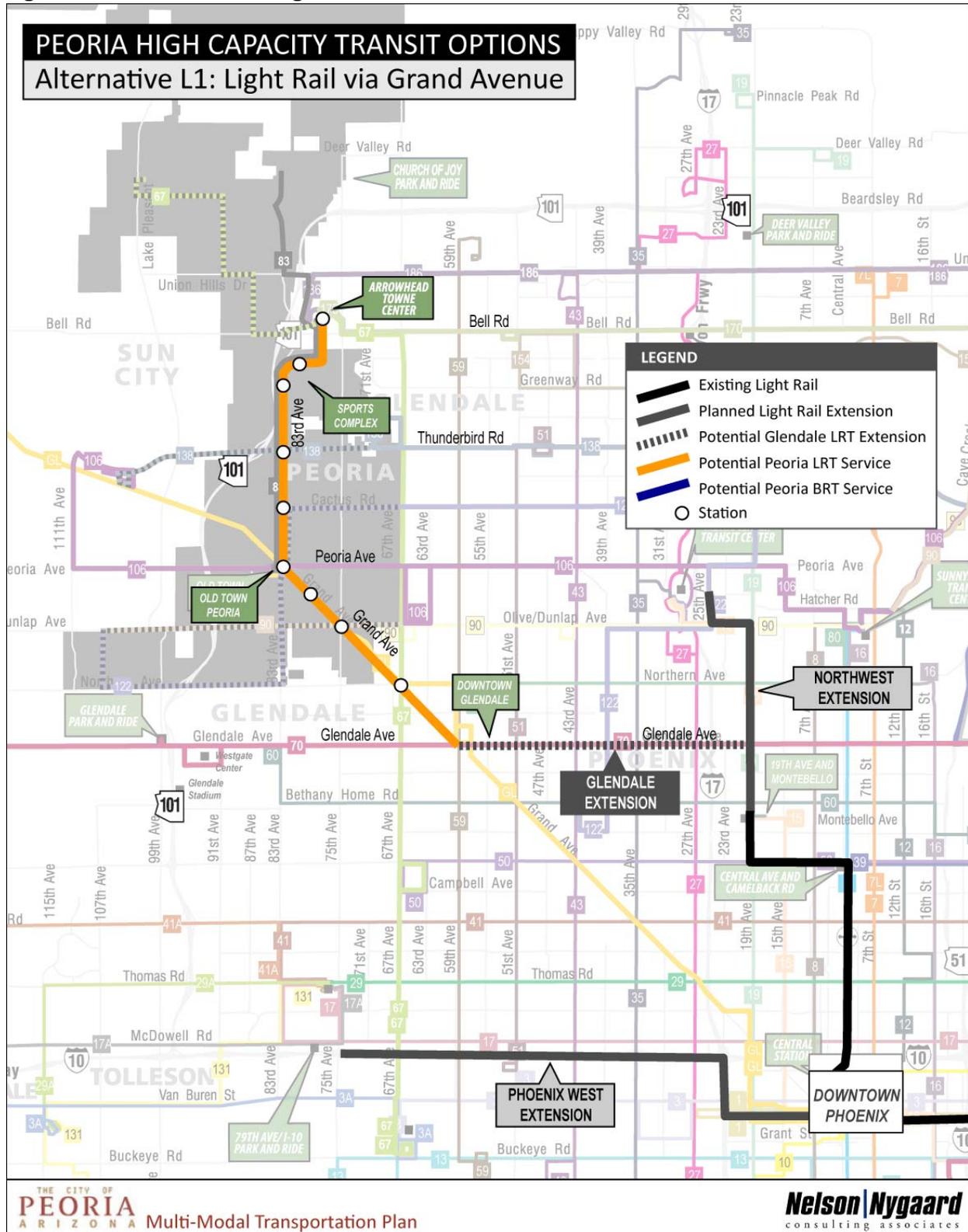
- L1 LRT from downtown Glendale via Grand Avenue
- L2 LRT from Westgate Center via 91st Avenue

L1 LRT FROM DOWNTOWN GLENDALE VIA GRAND AVENUE AND 83RD AVENUE

This light rail alternative, which would be dependent upon the development of the Glendale Extension to downtown Glendale, would run from downtown Glendale to Arrowhead Town Center via Grand Avenue, Old Town, 83rd Avenue, and the Peoria Sports Complex (see Figure 5-4).

¹ A third conceivable starting point for light rail to Peoria could be the northern terminus of the Northwest Extension, near Peoria Avenue at I-17. However, prior work has indicated that the crossing of I-17 would be prohibitively expensive, and thus a light rail extension from the Northwest Extension was dropped from consideration.

Figure 5-4: Alternative L1 Light Rail via Grand Avenue



Alignment

Alternative L1's alignment, and key characteristics of the alignment would be as follows:

Downtown Glendale – Old Town Peoria

From Downtown Glendale, LRT would use local streets (which would need to be identified based on the location of the downtown Glendale LRT station), to the northern side of Grand Avenue. It would then run in an exclusive right-of-way parallel to the north side of Grand Avenue through to Old Town Peoria.²

This alignment would likely require land acquisition along most of its length. However, most of this land is currently undeveloped, or underutilized, and so impacts on existing uses could be relatively minor.

Old Town Peoria

In Old Town, service would operate consistent with the plans previously developed for an Old Town Transit Center to Peoria Avenue/83rd Avenue.

LRT would operate in the center of Peoria Avenue in front of the what is now the Zocalo Mall. This section of Peoria Avenue has a six-lane cross section that currently consists of four through lanes and up to two left-turn lanes. However, the roads in this area will be reconfigured, and could presumably be reconfigured in a manner that would accommodate light rail.

Old Town to Peoria Sports Complex

The primary alignment between Old Town and the Peoria Sports Complex would be along 83rd Avenue. Most of this roadway has two through travel lanes in each direction and a center left-turn lane. The operation of LRT on this roadway would require that the number of through travel lanes be reduced to one in each direction, or that the roadway be widened. It would also impact left-hand turns at many locations. The Skunk Creek Bridge would also need to be assessed to determine whether it could accommodate light rail.

If a commuter rail station and/or park and ride lot is developed near Loop 101, then an alternative alignment that would serve that location would be for LRT to continue from Old Town in an exclusive right-of-way to the vicinity of 91st Avenue and then north to Cactus Road. It would then operate east along Cactus Road to rejoin the 83rd Avenue alignment. This alignment would be more circuitous than the 83rd Avenue alignment. However, the impacts of developing an exclusive right-of-way north of Old Town would be similar to those

² Initial options for extending LRT from downtown Glendale included of one that would operate west on Glendale Avenue to 83rd Avenue. However, crossing Grand Avenue and the BNSF rail line would be difficult and expensive, and thus was dropped from consideration.

south of Old Town, and the impacts of operating on Cactus Avenue would be similar to those on 83rd Avenue.

Peoria Sports Complex – Arrowhead Transit Center

Between the Peoria Sports Complex and the Arrowhead Transit Center, service would operate along 83rd Avenue, Paradise Lane, and 77th Avenue. Approaching the Sports Complex, 83rd Avenue widens to three travel lanes in each direction, with a center left-turn lane. Paradise Lane and 77th Avenue are both two lanes in each direction, with only a limited number of additional lanes at some intersections.

In this area, it is likely that widening would be needed on some or all of each of the three roadways. However, this area will be reconfigured as part of the city's Sports Complex development plans, and most roads are fronted on at least one side by parking lots. As a result, the widening of these roadways should not present major obstacles.

Station Locations

In the Phoenix area, outside of downtown Phoenix, light rail stations are generally spaced approximately one mile apart. Using this general spacing, potential station locations, from south to north, would be:

Downtown Glendale – Old Town Peoria

- 67th Avenue, with parking (near Grand Avenue and Northern Avenue, and primarily as a park and ride location).
- Olive Avenue, with parking (near Grand Avenue and 75th Avenue, and primarily as a park and ride location).

Old Town Peoria

- Old Town Peoria Transit Center at or near 83rd Avenue and Peoria Avenue.

Old Town to Peoria Sports Complex

- 83rd Avenue at Cactus Road.
- 83rd Avenue at Thunderbird Road.

Peoria Sports Complex – Arrowhead Transit Center

- 83rd Avenue at Stadium Way.
- Paradise Lane near 77th Avenue.
- Arrowhead Transit Center.

Service Levels

Peoria light rail service would operate in the same manner as existing Valley METRO service, with spans of service and service frequencies as shown in Table 5-1.

Table 5-1: Alternative L1 Spans of Service and Headways³

	Begin	End	Headway
Weekdays			
Monday - Thursday			
Early AM	4:40	6:00	20
Day	6:00	19:00	10
Evening/Night	19:00	23:00	20
Friday			
Early AM	4:40	6:00	20
Day	6:00	19:00	10
Evening/Night	19:00	26:00	20
Saturday			
Early AM	5:00	6:00	20
Day	6:00	19:00	15
Evening/Night	19:00	26:00	20
All Day			
Sundays			
All Day	5:00	23:00	20

Travel Times

Alternative L1 light rail service would average approximately 35 mph in an exclusive right-of-way along Grand Avenue and 17 mph in other areas. With these speeds, travel times would be 17 minutes between Arrowhead and Old Town, and 25 minutes along the entire length between downtown Glendale and Arrowhead.

This alternative would provide the fastest travel times to and from downtown Phoenix, at 51 minutes from Old Town, and 69 minutes from Arrowhead.

Transit-Oriented Development Opportunities

As described in more detail at the end of this chapter, higher density development would be required to produce the travel volumes that would be needed to make HCT feasible. A number of undeveloped “islands” exist along this alignment that could be developed in a transit-oriented manner to support HCT. These include:

Downtown Glendale – Old Town Peoria

A large number of undeveloped parcels exist along Grand Avenue. However, the high-speed nature of Grand Avenue, the presence of the BNSF tracks, and many industrial uses,

³ These service levels are those that were in effect before the July 26, 2010 service reductions. It is assumed that these service levels will be restored once economic conditions improve.

indicate that there would be only minimal opportunities for transit-oriented development (TOD) along this segment.

Old Town Peoria

The Old Town Revitalization Plan envisions the types of TOD that would support HCT.

Old Town to Peoria Sports Complex

There are a number of undeveloped parcels in the vicinity of the intersection of 83rd Avenue and Thunderbird Road. In addition, there may be opportunities to redevelop some of the already developed parcel in a more transit-oriented manner.

Peoria Sports Complex – Arrowhead Transit Center

The planned development of the Sports Complex district provides very strong opportunities for TOD that would support HCT.

L2 LRT FROM WESTGATE CENTER VIA 91ST AVENUE AND 83RD AVENUE

If LRT is extended into Glendale via I-10 to the Westgate Center, then LRT to Peoria would be extended from that location, along 91st Avenue and 83rd Avenue (see Figure 5-5).

Alignment

Alternative L2's alignment, and key characteristics of the alignment, would be as follows:

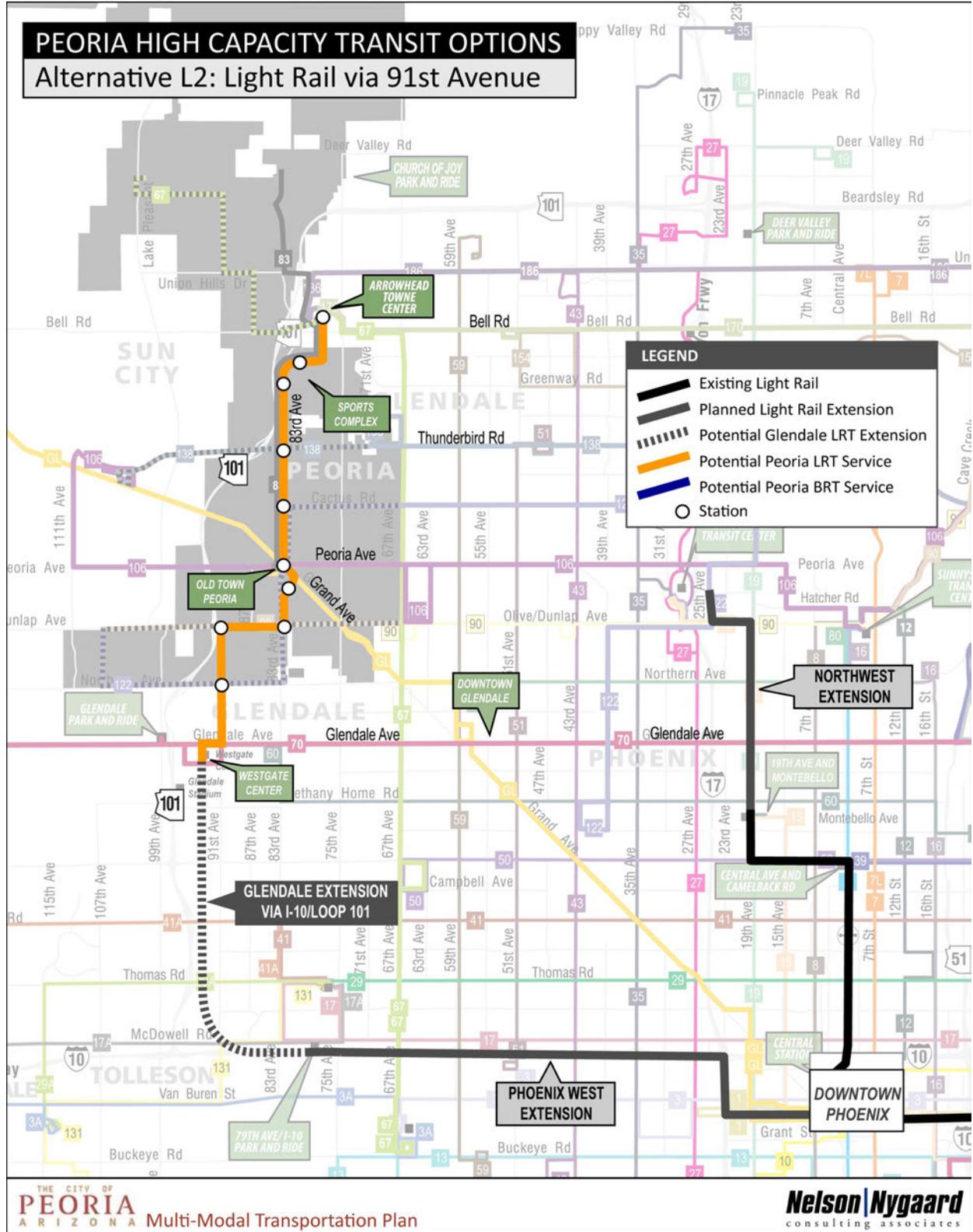
Westgate Center – Old Town Peoria

From the Westgate Center, LRT would operate to Old Town north on 91st Avenue, east on Olive Avenue, north on 83rd Avenue, in an exclusive right-of-way parallel to Cotton Crossing, and then via an aerial (or underground) crossing of Grand Avenue and the BNSF tracks. Key considerations include:

- Between Glendale Avenue and Olive Avenue, 91st Avenue has a cross section that varies from two to four lanes, with some wider intersections. Thus, 91st Avenue would need to be widened to accommodate light rail.
- Olive Avenue currently has two travel lanes in each direction plus a center left-turn lane. However, setbacks along Olive Avenue indicate that the additional right-of-way would be available to widen the road to accommodate light rail.
- Between Olive Avenue and Cotton Crossing, 83rd Avenue is generally two lanes, but with some much wider sections (that are still striped to two lanes). As with Olive Avenue, setbacks indicate that additional right-of-way would be available to widen the road to accommodate light rail.
- Along Cotton Crossing, light rail would operate in an exclusive right-of-way parallel to Cotton Crossing, and the land adjacent to Cotton Crossing is currently vacant.

- Between Cotton Crossing and the Old Town Transit Center, light rail would need to travel over or under Grand Avenue and the BNSF tracks. An overcrossing with sufficient vertical clearance (23' 4") would need to be over 1,000 feet long. A tunnel

Figure 5-5: Alternative L2 Light Rail via 91st Avenue



would reduce visual impacts, but with the planned depression of Grand Avenue, would need to be below that and even longer.

Old Town Peoria

In Old Town, service would operate consistent with the plans previously developed for an Old Town Transit Center to Peoria Avenue/83rd Avenue. The roads in this area will be reconfigured, and could presumably be reconfigured in a manner that would provide the needed space to accommodate light rail.

Old Town to Arrowhead Transit Center

Alternative L2 would operate between Old Town and the Arrowhead Transit Center in the same manner as Alternative L1, and impacts and implications would be the same as for that alternative.

Station Locations

Potential station locations, from south to north, would be:

Peoria/Glendale Line – Old Town Peoria

- 91st Avenue at Northern Avenue.
- 91st Avenue at Olive Avenue.
- 83rd Avenue at Olive Avenue.
- Cotton Crossing at 83rd Avenue.

Old Town Peoria, and Old Town Peoria to Arrowhead Transit Center.

- Same as Alternative L1.

Service Levels

Service levels would be the same as presented above for Alternative L1.

Travel Times

Alternative L2 light rail service would average approximately 17 mph along its entire length. At this speed, travel times would be 17 minutes between Arrowhead and Old Town, and 32 minutes along the entire length between Westgate Center and Arrowhead.

Travel times to downtown Phoenix would be significantly longer than with Alternative L1, at 68 minutes from Old Town, and 85 minutes from Arrowhead. These longer travel times would be due to the more circuitous north-south to east-west alignment.

Transit-Oriented Development Opportunities

As described previously, higher density development would be needed to produce the travel volumes that would be needed to make HCT feasible. A number of undeveloped “islands” exist along this alignment that be developed in a manner that could support HCT. TOD opportunities along the corridor include:

Westgate Center – Old Town Peoria

Alternative L2 would operate via the intersections of 91st Avenue and Olive Avenue (near Loop 101) and Olive Avenue and 83rd Avenue. There are a large number of undeveloped, or underdeveloped parcels, in the vicinity of both intersections that would provide the potential for TOD.

Old Town Peoria, and Old Town to Arrowhead Transit Center

Alternative L2 would operate between Old Town and the Arrowhead Transit Center in the same manner as Alternative L1, and TOD opportunities would be the same as for that alternative.

BRT OPTIONS

In the Phoenix area, arterial BRT service, called Valley Metro LINK, is provided in Mesa between Sycamore Station at the eastern end of the light rail line and Superstition Springs Center, largely along Main Street. A second line is currently under construction that will operate between Sycamore Station and Chandler, largely along Arizona Avenue. Both of these services are designed to act as an extension of the light rail system.

In a similar manner, arterial BRT could be developed between Peoria and a western light rail station. This type of service could be provided as an alternative or as a precursor to extending light rail to Peoria. Furthermore, in the shorter-term, BRT could be developed between Peoria and an existing light rail station. Then, if light rail is extended northward and/or into Glendale, the BRT service could be shortened to provide connections to a closer station.

Through 2023, when Phase 1 of the Northwest Extension will be constructed, the closest light rail station to Peoria will be the northern terminus at 19th Avenue and Montebello Avenue. The development of BRT between this station and Peoria would be similar to the light rail alignments between downtown Glendale and Peoria, except that they would also include service between 19th Avenue and Montebello Avenue and downtown Glendale.

Over the longer-term, once light rail has been extended closer to Peoria, BRT service could be revised to operate to and from a closer station. BRT alignments would be dependent upon how LRT is extended, especially into Glendale. However, for each potential LRT extension, potential BRT alignments would be essentially the same as the alignments described above for LRT

extensions to Peoria. In addition, BRT service could also be developed from the end of the Northwest Extension. For both the short and long-term, potential options would include:

- B1 BRT from 19th Street at Montebello Avenue via Grand Avenue.
- B2 BRT from Westgate Center via 91st Avenue.
- B3 BRT from Northwest Extension via Dunlap Avenue.
- B4 BRT from Northwest Extension via Peoria Avenue.

B1 BRT FROM METRO LIGHT RAIL AT 19TH AND MONTEBELLO VIA GRAND AVE AND 83RD AVE

In a similar manner to Mesa’s Valley Metro LINK service, arterial BRT could be developed between Peoria and the current end of the light rail system at 19th Avenue and Montebello Avenue (see Figure 5-6). This type of service could be provided as an alternative or as a precursor to extending light rail to Peoria.

Alignment

BRT service would operate largely on existing roadways. Depending upon the area, it would operate in exclusive bus lanes, with queue jump lanes, and in mixed traffic. Also, whereas Alternatives L1 and L2 would add service in Glendale and Peoria, Alternative B1 would also add service in Phoenix. Key characteristics of the alignment would be as follows:

METRO Light Rail – Downtown Glendale

To be most effective, the B1 BRT line would provide service between the end of the METRO Rail line at 19th Avenue and Montebello Avenue and downtown Glendale, and the most logical alignment would probably be along Glendale Avenue.

Downtown Glendale – Old Town Peoria

From Downtown Glendale, BRT would operate along 59th Avenue to Myrtle Avenue to Grand Avenue. Along Grand Avenue, traffic conditions would probably allow BRT to operate in mixed traffic. However, there would need to be pullouts for stations located along Grand Avenue, as well as pedestrian overcrossings to connect the inbound and outbound platforms.

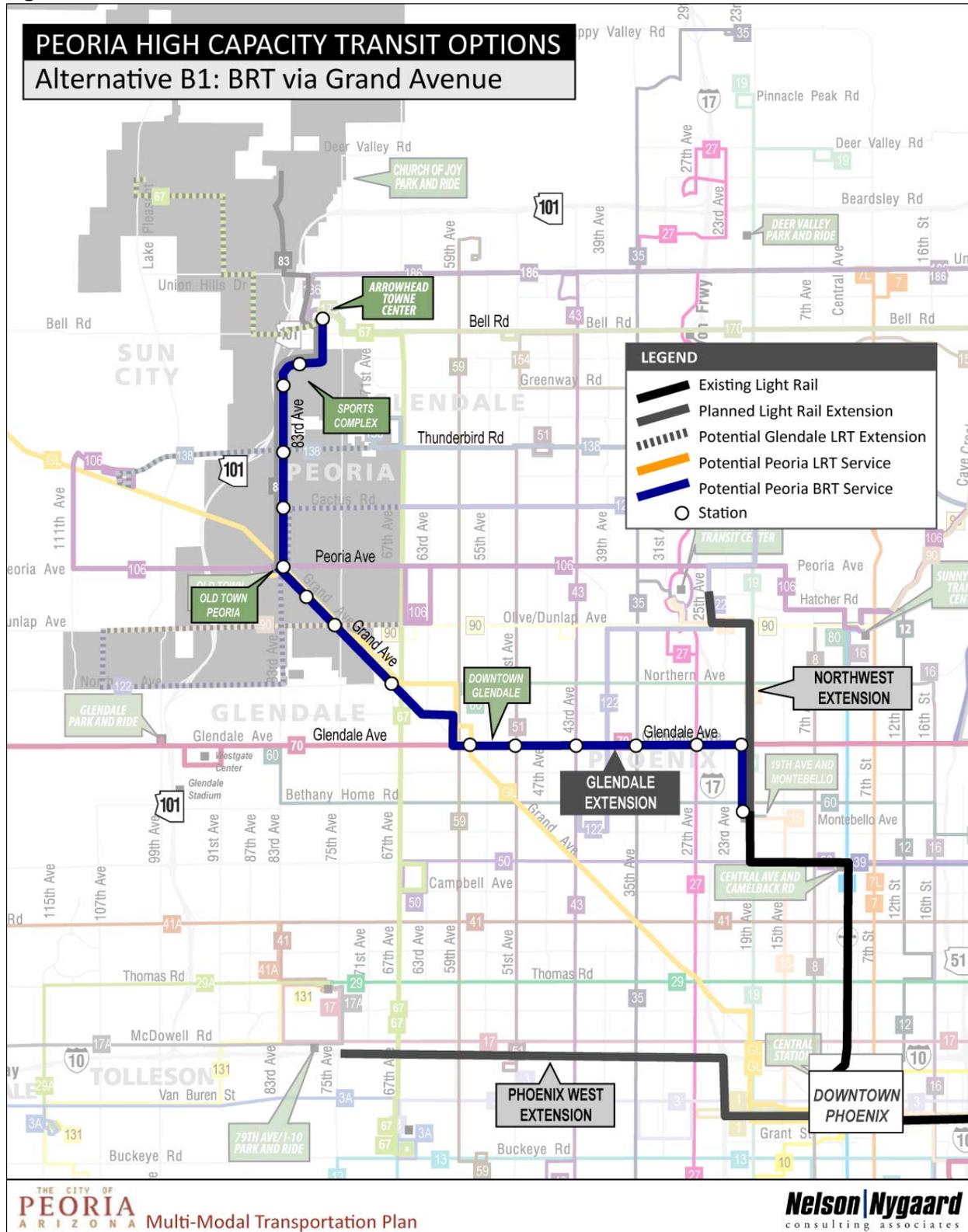
Old Town Peoria

In Old Town, service would operate consistent with the plans previously developed for an Old Town Transit Center to Peoria Avenue/83rd Avenue. The roads in this area will be reconfigured, and could presumably be reconfigured in a manner that would provide the needed space for the exclusive lanes or queue jump lanes.

Old Town to Arrowhead Transit Center

Between Old Town and the Arrowhead Transit Center, BRT would operate along the same alignment as the two light rail alternatives. Since traffic flows well along most of the

Figure 5-6: Alternative B1 BRT via Grand Avenue



alignment, it would likely be possible to provide transit priority through queue jump lanes and transit signal priority at intersections.

Station Locations

In Peoria, station locations for BRT would be the same as for LRT Alternative L1. In addition, there would be opportunities for BRT stations in Glendale between the end of the METRO light rail line and Peoria.

Service Levels

BRT could operate with the same or different span of service and frequencies as light rail. For the purposes of these alternatives, it is assumed that Alternative B1 would operate with the same levels of service as Mesa’s LINK BRT service, which would be as presented in Table 5-2. This would be less service than for the LRT alternatives. On weekdays, BRT service would operate every 15 minutes during the day compared to 10 minutes for LRT, and every 30 minutes in the early morning and at night, versus every 20 minutes for LRT. On weekends, service would only operate every 60 minutes, versus every 15 to 20 minutes for LRT.

Table 5-2: Alternative B1 Spans of Service and Headways⁴

	Begin	End	Headway
Weekdays			
Early AM	4:15	5:15	30
Day	5:15	18:00	15
Evening/Night	18:00	22:00	30
Saturday			
All Day	5:00	22:00	60
Sunday			
All Day	5:00	22:00	60

Travel Times

Alternative B1 BRT service would average approximately 35 mph along Grand Avenue and 15 mph in other areas. With these speeds, travel times would be 20 minutes between Arrowhead and Old Town (about 3 minutes slower than light rail), and 53 minutes along the entire length between Montebello/19th Avenue Station at the current end of the METRO light rail line and Arrowhead.

⁴ As with the LRT alternatives, these spans of service and headways are those that were in effect before the July 26, 2010 service reductions and it is assumed that original service levels will be restored once economic conditions improve.

Travel times to downtown Phoenix would be the second lowest of all alternatives (after Alternative L1), at 60 minutes from Old Town and 80 minutes from Arrowhead. Travel times would be longer for BRT than for light rail due to BRT's slightly lower average operating speeds and the need to transfer between BRT and light rail at Montebello/19th Avenue Station.

Transit-Oriented Development Opportunities

BRT would likely encourage and stimulate TOD to a lesser extent than LRT, but opportunities would still exist, and at the same locations as for LRT Alternative L1.

B2 BRT FROM METRO LIGHT RAIL AT WESTGATE CENTER VIA 91ST AVENUE AND 83RD AVENUE

If LRT is extended into Glendale via I-10 to the Westgate Center, then BRT service to Peoria could be provided from that location, with the most likely alignment along 91st Avenue and 83rd Avenue (see Figure 5-7).

Alignment

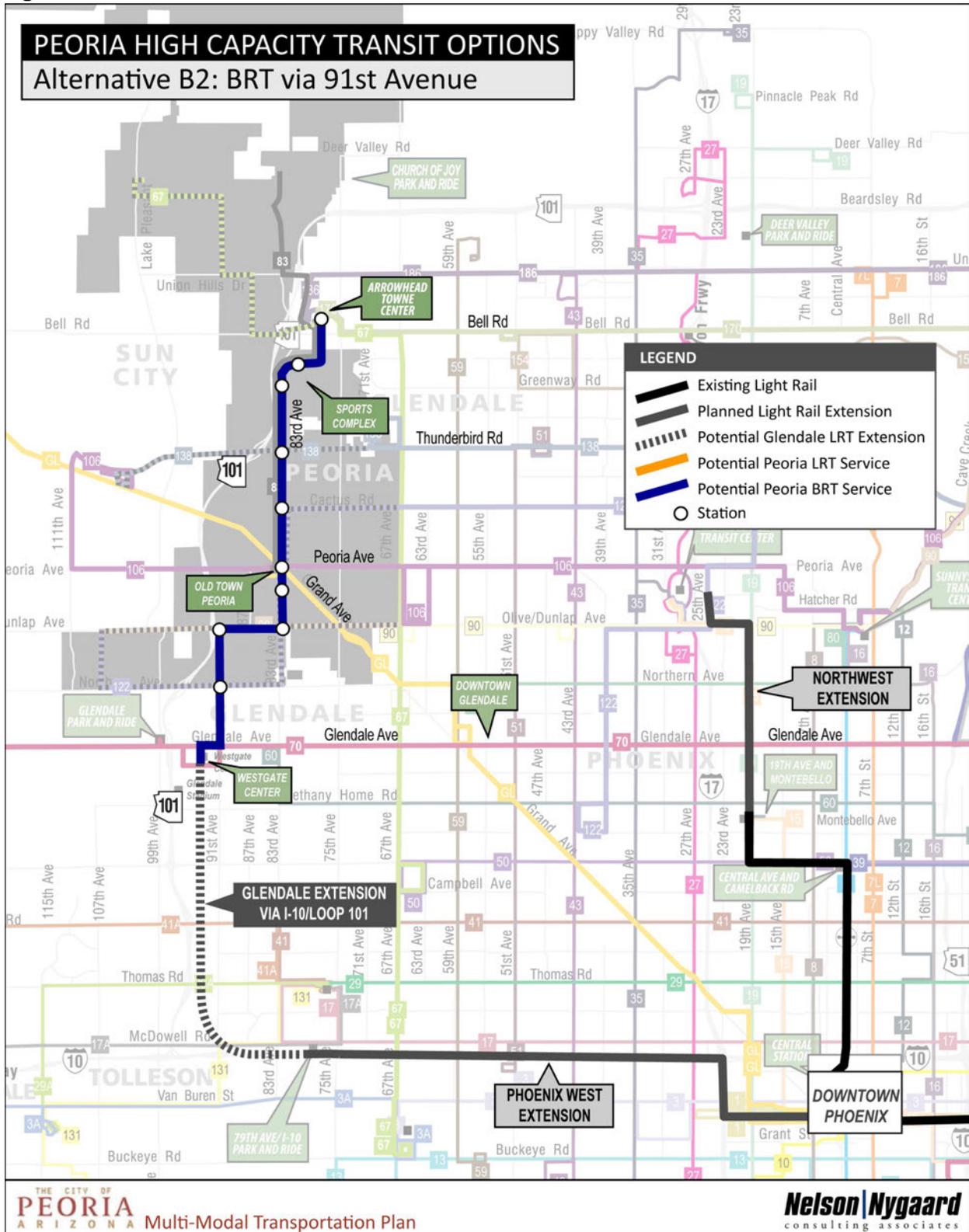
BRT service would operate largely on existing roadways. Depending upon the area, it would operate in exclusive bus lanes, with queue jump lanes, and in mixed traffic. In most areas, the alignment would be the same as for an LRT extension from Westgate Center. However, one major exception would be in Old Town Peoria, where BRT would cross the BNSF tracks at-grade at 83rd Avenue rather than via an aerial structure or tunnel. Key characteristics of the alignment would be as follows:

Westgate Center – Old Town Peoria

From the Westgate Center, LRT would operate to Old Town north on 91st Avenue, east on Olive Avenue, and north on 83rd Avenue:

- Between Glendale Avenue and Olive Avenue, 91st Avenue has a cross section that varies from two to four lanes, with some wider intersections. Traffic conditions would probably allow BRT to operate in mixed traffic. However, there would need to be pullouts for stations, as well as pedestrian overcrossings to connect the inbound and outbound platforms at some locations.
- Olive Avenue currently has two travel lanes in each direction plus a center left-turn lane. As on 91st Avenue, traffic conditions would probably allow BRT to operate in mixed traffic, but bus pullouts and pedestrian crossings would be needed at stations.
- Between Olive Avenue and Cotton Crossing, 83rd Avenue is generally two lanes, but with some much wider sections (that are still striped to two lanes). As on 91st and 83rd Avenues, traffic conditions would probably allow BRT to operate in mixed traffic, but bus pullouts and pedestrian crossings would be needed at stations.

Figure 5-7: Alternative B2 BRT via 91st Avenue



- Between Cotton Crossing and Grand Avenue, 83rd Avenue is two lanes. One station would be constructed opposite City Hall, and there appears to be sufficient right-of-way at that location. For the rest of this segment, BRT would operate in mixed traffic without any stations.

Old Town Peoria

In Old Town, service would operate consistent with the plans previously developed for an Old Town Transit Center to Peoria Avenue/83rd Avenue. The roads in this area will be reconfigured, and could presumably be reconfigured in a manner that would provide the needed space for the exclusive lanes or queue jump lanes.

Old Town to Arrowhead Transit Center

Between Old Town and the Arrowhead Transit Center, BRT would operate along the same alignment as the two light rail alternatives. Since traffic flows well along most of the alignment, it would likely be possible to provide transit priority through queue jump lanes and transit signal priority at intersections.

Station Locations

Potential station locations, with one exception, would be the same as for LRT Alternative L2. The one exception would be that the station located in the vicinity of Peoria City Hall would be located on 83rd Avenue instead of Cotton Crossing.

Service Levels

Service levels would be the same as presented above for Alternative B1.

Travel Times

Alternative B2 BRT service would average approximately 15 mph along the entire alignment. At this speed, travel times would be 20 minutes between Arrowhead and Old Town, and 36 minutes along the entire length between Westgate Center and Arrowhead.

Travel times to downtown Phoenix would be significantly longer than with Alternatives L1 and B1, at 74 minutes from Old Town, and 94 minutes from Arrowhead. These longer travel times would be due largely to the more circuitous north-south to east-west alignment.

Transit-Oriented Development Opportunities

BRT would likely encourage and stimulate TOD to a lesser extent than LRT, but opportunities would still exist, and at the same locations as for LRT Alternative L2.

B3 BRT FROM METRO RAIL NORTHWEST EXTENSION VIA DUNLAP/OLIVE AVENUES

Phase 1 of light rail's Northwest Extension will extend light rail service to the vicinity of Dunlap Avenue at 19th Avenue in Phoenix. This extension is currently planned for 2023. At that time, BRT could also be extended along Dunlap Avenue, which becomes Olive Avenue, to 83rd Avenue then through Old Town Peoria, and then to the Arrowhead Transit Center along the same alignment as BRT Alternative B2 (see Figure 5-8).

Alignment

BRT service would operate largely on existing roadways and would operate in exclusive bus lanes, with queue jump lanes, and in mixed traffic. Similar to Alternative B1 BRT via Grand Avenue, Alternative B3 would add service in Phoenix, Glendale and Peoria:

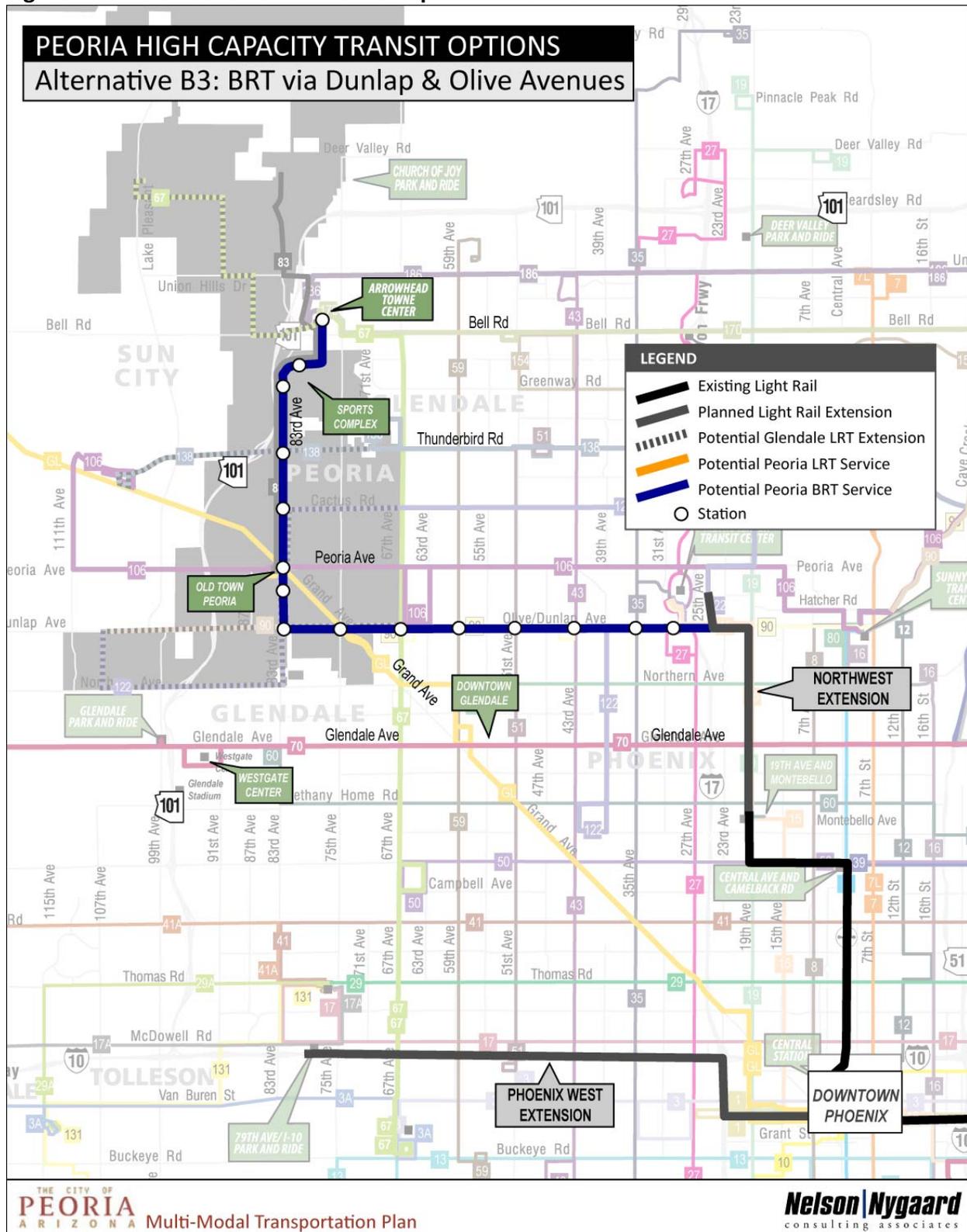
Northwest Extension – 83rd Avenue

From the terminus of the Northwest extension near Dunlap and 19th Avenues, BRT would operate west along Dunlap Avenue/Olive Avenue. Along this segment, it would be desirable to develop bus lanes or queue jump lanes and transit signal priority. Key considerations include:

Dunlap Avenue/Olive Avenue

- Between 19th Avenue and I-17, Dunlap Avenue generally has two lanes westbound and three lanes eastbound, with left-turn lanes at major intersections. It appears that there is right-of-way available on both sides of the road to develop bus lanes, queue jump lanes, and stations.
- Between I-17 and 35th Avenue, Dunlap Avenue has three lanes in each direction, with left-turn lanes at major intersections. The right-of-way is generally more constrained along this segment, which may present some constraints in placing queue jump lanes and stations.
- Between 35th Avenue and 42nd Avenue, Dunlap Avenue has three lanes westbound and two lanes eastbound, with left-turn lanes at major intersections. In addition, most of this segment has a parallel westbound service road that serves the houses that front Dunlap Avenue. There is also a short section of eastbound service road near 42nd Avenue. The service roads may present some constraints in placing queue jump lanes and stations, but overall there is a lot of width to work within (more than 130 feet in many locations).
- Between 42nd Avenue and 67nd Avenue, Dunlap/Olive Avenue has three lanes westbound and two lanes eastbound, with left-turn lanes at major intersections. Throughout most of this segment, it appears that there is right-of-way available on both sides of the road to develop bus lanes, queue jump lanes, and stations.
- Between 67th Avenue and 83rd Avenue, Olive Avenue currently has two travel lanes in each direction plus a center left-turn lane. It appears that there is right-of-way available on both sides of the road to develop bus lanes, queue jump lanes, and stations.

Figure 5-8: Alternative B3 BRT via Dunlap and Olive Avenues



83rd Avenue/Old Town

Between Olive Avenue and the Old Town Transit Center, BRT would operate along 83rd Avenue in the same manner as BRT Alternative B2. Key considerations include:

- Between Olive Avenue and Cotton Crossing, 83rd Avenue is generally two lanes, but with some much wider sections (that are still striped to two lanes). Traffic conditions would probably allow BRT to operate in mixed traffic, but bus pullouts and pedestrian crossings would be needed at stations.
- Between Cotton Crossing and Grand Avenue, 83rd Avenue is one lane in each direction. One station would be constructed opposite City Hall, and there appears to be sufficient right-of-way at that location. For the rest of this segment, BRT would operate in mixed traffic without and stations.

Old Town Peoria

In Old Town, service would operate consistent with the plans previously developed for an Old Town Transit Center to Peoria Avenue/83rd Avenue. The roads in this area will be reconfigured, and could presumably be reconfigured in a manner that would provide the needed space for the exclusive lanes or queue jump lanes.

Old Town to Arrowhead Transit Center

Between Old Town and the Arrowhead Transit Center, BRT would operate along the same alignment as the two light rail alternatives BRT Alternative B1. Since traffic flows well along most of the alignment, it would likely be possible to provide transit priority through queue jump lanes and transit signal priority at intersections.

Station Locations

As with the other BRT alternatives, stations would be located approximately every mile, at the one-mile arterials plus other key locations. In Peoria, these locations would include:

67th Avenue – 83rd Avenue

- Olive Avenue @ 67th Avenue.
- Olive Avenue at Grand Avenue (with parking).
- 83rd Avenue at Olive Avenue.

Old Town Peoria

- 83rd Avenue at Cotton Crossing.
- Old Town Peoria Transit Center at or near 83rd Avenue and Peoria Avenue.

Old Town to Peoria Sports Complex

- 83rd Avenue at Cactus Road.
- 83rd Avenue at Thunderbird Road.

Peoria Sports Complex – Arrowhead Transit Center

- 83rd Avenue at Stadium Way.
- Paradise Lane near 77th Avenue.

Service Levels

Service levels would be the same as presented above for Alternative B1.

Travel Times

Alternative B3 BRT service would average approximately 15 mph along the entire alignment. Travel times would be 20 minutes between Arrowhead and Old Town, and 55 minutes along the entire length between 19th Avenue at Dunlap Avenue and Arrowhead.

Travel times to downtown Phoenix would be the same as those for Alternative B2 BRT via 91st Avenue, at 74 minutes from Old Town, and 94 minutes from Arrowhead. These long travel times would be due largely to the circuitous east-west to north-south alignment.

Transit-Oriented Development Opportunities

BRT would likely encourage and stimulate TOD to a lesser extent than LRT, but opportunities would still exist. In Peoria, these opportunities would be the same as for LRT Alternative L2 and BRT Alternative B2 for all locations from Olive Avenue northward.

B4 BRT FROM METRO RAIL NORTHWEST EXTENSION VIA PEORIA AVENUE

MAG's Regional Transit Framework Study identified Peoria Avenue as a major east-west travel corridor that will likely warrant BRT service. In addition, Phase 2 of light rail's Northwest Extension will extend light rail service to 25th Avenue and Mountain View Road, which is just south of Peoria Avenue. This extension is currently planned for 2026. At that time, BRT could also be extended along Peoria Avenue to 83rd Avenue then through Old Town Peoria, and then to the Arrowhead Transit Center along the same alignment as BRT Alternative B2 (see Figure 5-9).

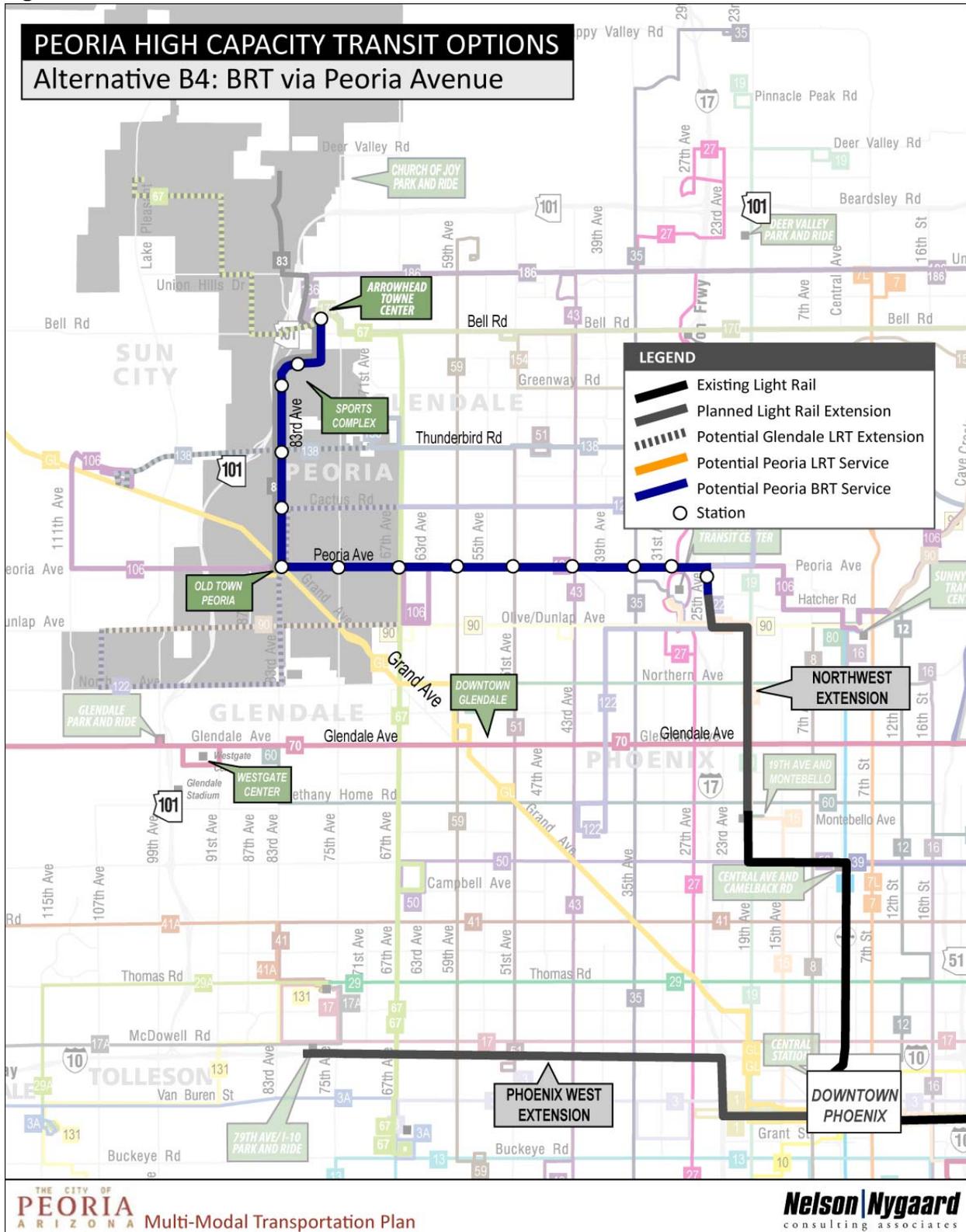
Alignment

BRT service would operate largely on existing roadways and would operate in exclusive bus lanes, with queue jump lanes, and in mixed traffic. As would be the case with Alternatives B1 and B3, this alternative would also add service in Phoenix, Glendale, and Peoria:

Northwest Extension – 83rd Avenue

From the terminus of the Northwest extension near Dunlap and 19th Avenues, BRT would operate west along Dunlap Avenue/Olive Avenue. Along this segment, it would be desirable

Figure 5-9: Alternative B4 BRT via Peoria Avenue



to develop bus lanes or queue jump lanes and transit signal priority. Key considerations include:

Peoria Avenue

- Between 25th Avenue and I-17, the major feature is the I-17 intersection, which has three to four lanes in each direction and is often congested. There would not be any significant opportunities for BRT treatments at this intersection without major construction.
- Between I-17 and 35th Avenue, Peoria Avenue has three lanes in each direction, a center median, left-turn lanes at major intersections, and fairly frequent right-turn lanes that could be used as queue jump lanes.
- Between 35th Avenue and 53rd Avenue, Peoria Avenue generally has three lanes westbound and two lanes eastbound, with a center two-way left-turn lane, and dedicated left-turn lanes at major intersections. Throughout most of this segment, there appears to be sufficient right-of-way to develop queue jump lanes and stations.
- Between 53rd Avenue and 63rd Avenue, Peoria Avenue generally has three lanes, a center median, and left-turn lanes at major intersections and many locations in between. Throughout most of this segment, there appears to be sufficient right-of-way to develop queue jump lanes and stations.
- Between 63rd Avenue and 67th Avenue, Peoria Avenue generally has three lanes westbound and two lanes eastbound, with a center two-way left-turn lane, and dedicated left-turn lanes at major intersections. Throughout most of this segment, there appears to be sufficient right-of-way to develop queue jump lanes and stations.
- Between 67th Avenue and 83rd Avenue, Peoria Avenue currently has two travel lanes in each direction plus a center left-turn lane. It appears that there is right-of-way available on both sides of the road to develop queue jump lanes and stations.

Old Town Peoria

In Old Town, service would operate consistent with the plans previously developed for an Old Town Transit Center to Peoria Avenue/83rd Avenue. The roads in this area will be reconfigured, and could presumably be reconfigured in a manner that would provide the needed space for the exclusive lanes or queue jump lanes.

Old Town to Arrowhead Transit Center

Between Old Town and the Arrowhead Transit Center, BRT would operate along the same alignment as the two light rail alternatives BRT Alternative B1. Since traffic flows well along most of the alignment, it would likely be possible to provide transit priority through queue jump lanes and transit signal priority at intersections.

Station Locations

As with the other BRT alternatives, stations would be located approximately every mile, at the one-mile arterials plus other key locations. In Peoria, these locations would include:

67th Avenue – 83rd Avenue

- Peoria Avenue @ 67th Avenue.
- Peoria Avenue @ 75th Avenue.

Old Town Peoria

- Old Town Peoria Transit Center at or near 83rd Avenue and Peoria Avenue.

Old Town to Peoria Sports Complex

- 83rd Avenue at Cactus Road.
- 83rd Avenue at Thunderbird Road.

Peoria Sports Complex – Arrowhead Transit Center

- 83rd Avenue at Stadium Way.
- Paradise Lane near 77th Avenue.

Service Levels

Service levels would be the same as presented above for Alternative B1.

Travel Times

Alternative B4 BRT service would average approximately 15 mph along the entire alignment. At this speed, travel times would be 20 minutes between Arrowhead and Old Town, and 48 minutes along the entire length between 25th Avenue at Mountain View Drive and Arrowhead.

Travel times to downtown Phoenix would be similar to Alternative B3 BRT via Dunlap/Olive Avenue, at 72 minutes from Old Town, and 92 minutes from Arrowhead.

TOD Opportunities

BRT would likely encourage and stimulate TOD to a lesser extent than LRT, but opportunities would still exist. In Peoria, these opportunities would be the same as for LRT Alternative L2 and BRT Alternative B2 for all locations from Old Town northward.

COMPLEMENTARY LOCAL SERVICE

With all of the HCT alternatives, there would also need to be complementary local service, to provide local service in the HCT corridor, to provide connections to and from HCT service, and to provide local service within, to, and from Peoria. For all of the HCT alternatives, it is assumed that complementary local service would be provided by extending Valley Metro's grid into Peoria as described in Chapter 4.

LOCAL SERVICE ALIGNMENTS

New and extended local services would operate as follows (see also Figure 5-10):

- **Route 67 67th Avenue:** Route 67 would be extended from the Arrowhead Transit Center to Walmart on Lake Pleasant Pkwy/Deer Valley road via west on Campo Bello Drive, south on 83rd Avenue, west on Bell Road, north on 87th Avenue, west on Union Hills Drive, north on 91st Avenue, west on Lake Pleasant Parkway to Walmart.
- **Route 83 83rd Avenue:** A new Route 83 would be developed that would operate north-south route generally along 83rd Ave between Old Town and just south of Deer Valley Road via the planned Arrowhead Transit Center. From the Old Town Transit Center, service would operate north on 83rd Avenue to east on Paradise Lane to north on 71st Avenue to the Arrowhead Transit Center. From there, Route 83 would operate west on Union Hills Drive to back to north on 83rd Avenue.
- **Route 90 Dunlap/Cave Creek:** Route 90 would be extended from 67th Avenue 107th Avenue along Olive Avenue.
- **Route 122 Cactus/39th Avenue:** Route 122 would be extended from 67th Avenue to 107th Avenue at Olive Avenue via west on Cactus Road, south on 83rd Avenue through Old Town, west on Northern Avenue, and north on 107th Avenue.
- **Route 138 Thunderbird:** Route 138 would be extended from 67th Avenue to the Peoria/Sun City line along Thunderbird Road.

SERVICE LEVELS

Improved local services would operate generally with existing weekday spans of service, but more frequently, and with weekend service on all routes (see Table 5-3). On weekdays, service would operate every 30 minutes on all routes. On weekends, service would operate either every 30 or 60 minutes.

RIDERSHIP, COST, AND PRODUCTIVITY ESTIMATES

To assess the effectiveness of the HCT alternatives, ridership, capital cost, operating cost, and basic productivity measures were developed for each. As described in the following sections, none of the HCT alternatives would attract sufficiently high levels of ridership to justify the costs that would be required, or for them to be productive relative to the amount of service that would be required.

RIDERSHIP

Ridership estimates for the HCT alternatives were produced by the Maricopa Association of Governments (MAG) using their regional travel demand model. The critical component for

Figure 5-10: Complementary Local Service

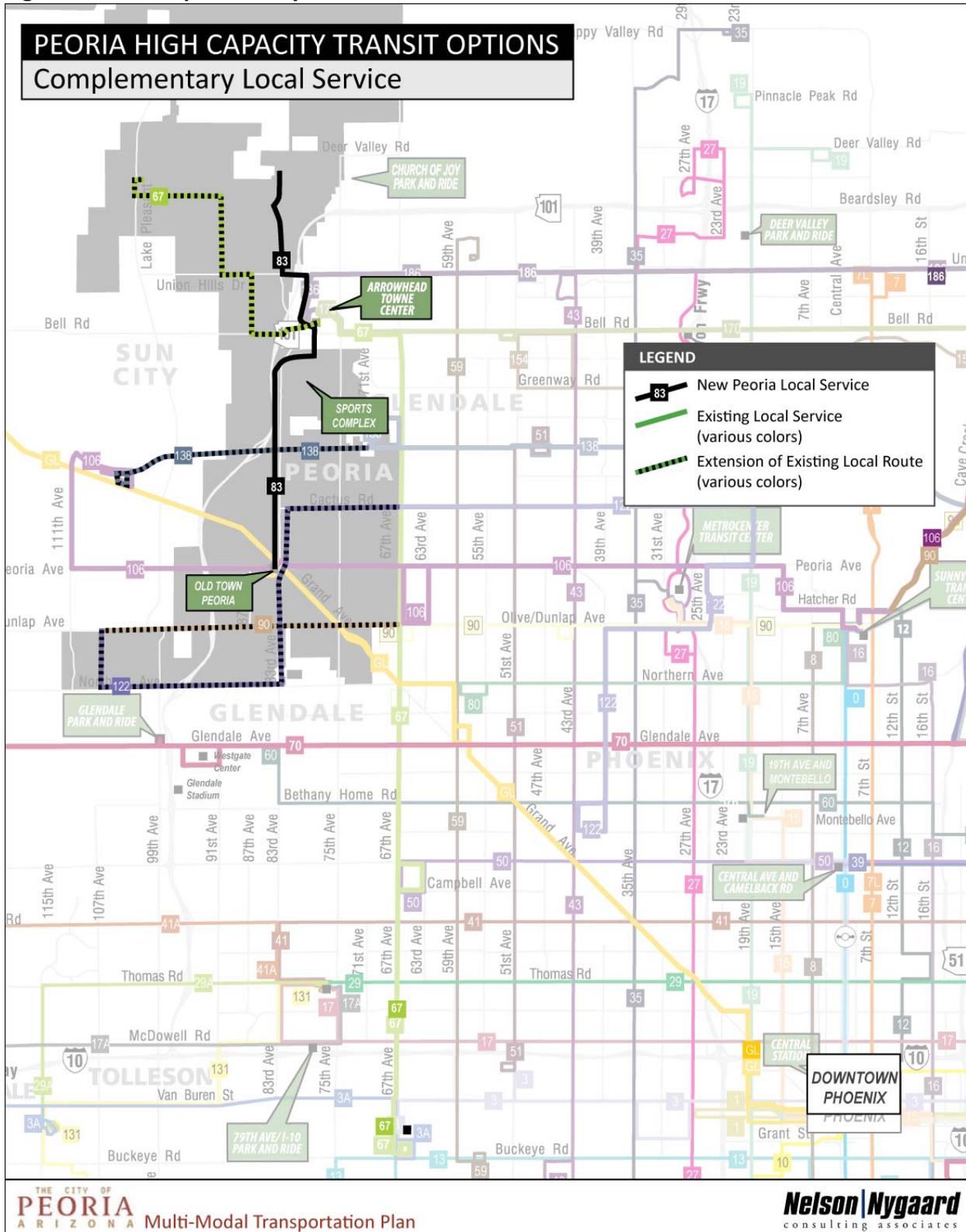


Table 5-3: Local Service Spans of Service and Headways

	Begin	End	Headway
Weekdays			
67 67th Avenue	5:45	22:16	30
83 83rd Street	6:00	22:00	30
90 Dunlap/Cave Creek	5:12	22:15	30
106 Peoria/Shea	5:12	21:37	30
122 Cactus/39th Avenue	4:25	21:33	30
138 Thunderbird	5:00	21:55	30
Saturdays			
67 67th Avenue	5:50	20:51	30
83 83rd Street	6:00	21:00	60
90 Dunlap/Cave Creek	5:51	21:28	60
106 Peoria/Shea	5:39	22:03	30
122 Cactus/39th Avenue	6:18	20:15	60
138 Thunderbird	6:00	20:54	60
Sundays			
67 67th Avenue	5:50	20:51	30
83 83rd Street	6:00	21:00	60
90 Dunlap/Cave Creek	5:51	21:28	60
106 Peoria/Shea	6:00	21:23	60
122 Cactus/39th Avenue	6:18	20:15	60
138 Thunderbird	6:00	20:54	60

these forecasts was mode choice, which predicts the percentage of the population that will choose a specific mode of travel. Mode choice is based on a number of independent variables including:

- Land use, which includes population, employment, and occupied dwelling units. Planned land uses not conducive to transit, such as enclosed planned developments and activity centers removed from residential centers, for example, will negatively impact transit opportunities.
- Socioeconomic and demographic characteristics of the population which include factors such as property values, percentage of households with zero or one car, percentage of households with mobility limitations, and other related variables.
- Regional accessibility, which includes variables that measure whether transit is available, and the ease of travel by transit.
- Transit accessibility, which measures how easy or hard it is to get to and from transit by different modes (vehicle, walking, transfers from other transit, bicycle, etc.).

The variables associated with this data are used in utility functions to determine the modal split among the total number of person trips generated in a region. The following specific variables have a significant impact on the determination of usage between automobiles and the various transit modes:

- Walk accessibility: Walks longer than one-half mile from a transit stop drastically decrease transit usage.
- Transfer accessibility: The ability to walk to various transit modes (i.e. from a bus to light rail or commuter rail) will increase transit usage.
- Population and employment: Higher densities increase transit usage, especially if they are clustered near a transit stop/center.
- Park and ride lots: The availability of park and ride lots will typically significantly increase transit ridership, especially for long trips such as those made on commuter rail.

Using this process, projected weekday ridership for the six HCT alternatives range from 1,238 for alternative B2 (BRT via 91st Avenue) to 3,404 for alternative L1 (LRT via Grand Avenue) (see Table 5-4). In comparison, the existing Mesa Link BRT service serves 1,174 passenger trips per weekday, while ridership on the existing Valley METRO LRT system is 44,576 passengers per average weekday.

Table 5-4: Weekday Ridership Projections

	Projected Ridership	Actual Ridership
LRT Alternatives		
L1 – LRT via Grand	3,404	
L2 – LRT via 91st	1,951	
BRT Alternatives		
B1 – BRT via Grand	2,183	
B2 – BRT via 91st	1,238	
B3 – BRT via Olive	1,920	
B4 – BRT via Peoria	1,394	
Existing HCT		
METRO LRT		44,579
Mesa Link BRT		1,174

Ridership on all six alternatives would be low primarily because the large majority of existing development is low density in nature, and with only limited exceptions, future development patterns will be similar. As described in more detail at the end of this chapter, most people walk to or from transit for at least one end of their trip. As a result, for HCT to be effective, there must be large numbers of people who live and/or work in close proximity to it. Based on the zoning and policies in Peoria’s current Comprehensive Plan, even with all the growth that will occur, much of the development will occur beyond the reach of potential HCT.

Beyond the overall low levels of ridership, there would still be significant differences in demand levels among the six alternatives, and these would be due to the connections that they would provide to the regional network, their directness and travel times, and whether or not transfers would be required:

- Connections to Regional Transit Network: all six HCT alternatives will provide connections to the Valley METRO light rail system, although the four BRT options would require a transfer. In addition, all six alternatives present transfer opportunities to and from other local and regional service where stations coincide with intersecting bus routes. Of the BRT alternatives, B1 (via Grand) presents the most such opportunities with an estimated 16 station locations, intersecting more than a dozen bus routes before reaching the light rail transfer point. The LRT alternatives provide fewer connection opportunities in Peoria and Glendale, but would reduce the number of transfers needed to connect to local service in Phoenix (as a result of the “one-seat” LRT service).
- Directness and Travel Times: Alternatives L1 (LRT) and B1 (BRT), which would both operate along Grand Avenue, would provide the shortest travel times to downtown Phoenix. This is a key determinant of transit ridership, as downtown Phoenix has the largest concentration of transit-accessible destinations in the region. Alternatives that travel south and east from Peoria to Phoenix rather than southeast (along Grand) are less direct and thus less competitive with automobile trips to downtown Phoenix. Thus, Alternatives L2 (LRT via 91st), B2 (BRT via 91st), B3 (BRT via Olive), and B4 (BRT via Peoria) are projected to generate considerably lower ridership than either L1 or B1.
- Transfers: a large proportion of BRT trips would require transfers from BRT to light rail, whereas the LRT alternatives would provide more one-seat rides. A number of measures can be implemented to make transfers relatively convenient, but still, services that involve transfers will carry fewer riders than those that do not. Largely for this reason, BRT ridership would be lower than light rail ridership.

OPERATING COSTS

As a group, the light rail alternatives would be substantially more expensive than the BRT alternatives in terms of estimated operating cost (see Table 5-5). This is a function of the higher operating unit costs associated with LRT (for FY 2010, \$16.54 per revenue vehicle mile for METRO light rail service versus \$6.00 for RPTA Link BRT service).

In summary, operating costs for the light rail alternatives would be approximately \$12 million per year. Assuming that costs would be shared between Peoria, Glendale, and Phoenix on the basis on the number of route miles in each community, Peoria’s share of operating costs would be \$10.3 million for Alternative L1 (via Grand) and \$11.1 million for Alternative L2 (via 91st Avenue).⁵ The differences are due to the number of route miles in Peoria.

⁵ Responsibilities for existing light rail operating costs are shared in this manner. However, for an extension of light rail along Glendale Avenue, Glendale had agreed to be responsible for 50% of the operating costs of the extension through Phoenix. Actual splits would be based on agreements between the involved communities.

Table 5-5: Annual HCT Operating Costs (\$2010)

	Total Estimated Operating Cost (millions)	Peoria Share of Operating Cost (millions)
LRT Alternatives		
L1 – LRT via Grand	\$11.7	\$10.3
L2 – LRT via 91st	\$12.0	\$11.1
BRT Alternatives		
B1 – BRT via Grand	\$6.1	\$4.4
B2 – BRT via 91st	\$3.6	\$3.3
B3 – BRT via Olive	\$5.5	\$4.3
B4 – BRT via Peoria	\$5.0	\$3.9

Total operating costs for the BRT alternatives would range from \$5.0 million (Alternative B4 via Peoria Avenue) to \$6.1 million (Alternatives B1 via Grand Avenue). The differences in total costs are due to the differences in total route lengths, and the differences in Peoria’s share of the costs are due to differences in the number of route miles in Peoria.

Other than the difference in modal operating costs, the remaining differences are due to the lengths of each alternative. For example, the 15.5 mile alignment of Alternative B1 (BRT via Grand) results in an estimated annual operating cost of \$6.1 million, while the 9.1 mile B2 (BRT via 91st) alignment results in a much lower \$3.6 million annual operating cost.

CAPITAL COSTS

Light rail is significantly more expensive to construct than BRT. This is because much more infrastructure is required; for example, track and electrical power systems, including substations and overhead catenary, and larger stations. Vehicles are also much more expensive, at approximately \$4 million per light rail vehicle versus \$750,000 for a BRT vehicle.

As a result, the light rail alternatives would be significantly more expensive to construct than the BRT alternatives, at \$885 to \$900 million, versus \$18 to \$29 million (see Table 5-6). On a per mile basis, the LRT alternatives would cost \$97 to \$98 million per mile, versus less than \$2 million per mile for BRT.

PRODUCTIVITY AND COST-EFFECTIVENESS

Despite its higher cost, if ridership is high enough, light rail can be more productive than BRT. However, this would not be the case in Peoria, and LRT would be less productive than BRT (see Table 5-7). For the six HCT options, annual operating costs per weekday passenger range from \$2,815 for B1 (BRT via Grand) to \$6,149 for L2 (LRT via 91st), but it is capital costs per weekday

Table 5-6: HCT Capital Costs

	LRT Alternatives		BRT Alternatives			
	L1 LRT via Grand	L2 LRT via 91st	B1 BRT via Grand	B2 BRT via 91st	B3 BRT via Olive	B4 BRT via Peoria
Vehicles	\$44.0	\$28.0	\$6.8	\$5.3	\$7.5	\$6.8
Stations	\$18.0	\$40.0	\$6.8	\$4.0	\$6.0	\$5.6
Queue Jump Lanes			\$14.5	\$8.0	\$11.5	\$10.5
Transit Signal Priority	\$1.2	\$0.7	\$0.6	\$0.4	\$0.5	\$0.5
Parking	\$1.1		\$1.1			
Track	\$404.5	\$420.7				
ROW/Utility Relocation	\$109.2	\$111.6				
Traction Power/Operations Control	\$45.5	\$46.5				
Communications	\$6.8	\$7.0	\$0.8	\$0.5	\$0.7	\$0.6
ROW Acquisition	\$13.5		\$0.2			
EIS/Design/Public Involvement	\$64.4	\$65.5	\$3.2	\$1.9	\$2.8	\$2.5
Contingency	\$177.0	\$180.0	\$8.9	\$5.2	\$7.6	\$6.9
Total Capital Cost	\$885.2	\$900.0	\$42.8	\$25.2	\$36.6	\$33.4
Total Capital Cost per Mile	\$97.3	\$96.8	\$1.8	\$1.9	\$1.8	\$1.9

passenger where the two modes most significantly diverge. As a group, the BRT alternatives would have an average capital cost per weekday passenger of \$1,172, while the LRT options would average a far greater \$39,089 per weekday passenger.

In terms of the amount of service provided, light rail would carry the highest number of passengers, at 0.6 to 1.0 passengers per revenue vehicle miles. However, these numbers are very low, and compare to 6.4 passengers per revenue vehicle mile for existing METRO light rail service. The BRT alternatives would carry only 0.3 to 0.4 passengers per revenue vehicle mile. These figures are also very low and compare to 1.0 passengers per mile for existing Mesa Link BRT service. Overall, Alternative B1 (BRT via Grand) is the most cost-effective of the six HCT options considered, both in terms of capital cost per weekday passenger and annual operating cost per weekday passenger.

HCT ISSUES AND OPTIONS

There are a number of reasons that ridership on light rail or BRT through Peoria would be low, most of which are related to planned development patterns. Based on the city’s current land use plan and projections of future population and employment through 2028, sufficient populations of residents and workers will not exist to support HCT, and it is largely for this reason that HCT would not attract large numbers of ridership. Furthermore, much of Peoria’s new growth will be directed to areas of the city that will be relatively far from the existing Valley Metro regional transit system. This, in turn, will increase costs to provide transit connections to the rest of the region.

Table 5-7: HCT Productivity and Cost-Effectiveness

	L1 LRT via Grand	L2 LRT via 91st	B1 BRT via Grand	B2 BRT via 91st	B3 BRT via Olive	B4 BRT via Peoria
Productivity						
Passengers/ Revenue Vehicle Mile	1.0	0.6	0.4	0.4	0.4	0.3
Cost-Effectiveness						
Capital Cost/Weekday Passenger	\$28,577	\$49,601	\$847	\$1,563	\$949	\$1,327
Annual Operating Cost/Weekday Passenger	\$3,449	\$6,149	\$2,815	\$2,914	\$2,890	\$3,584

For HCT to be feasible, much higher density development will be needed, not only in a few distinct areas, but along much of the HCT corridor. The following sections describe the types of actions that Peoria would need to undertake for HCT to become feasible.

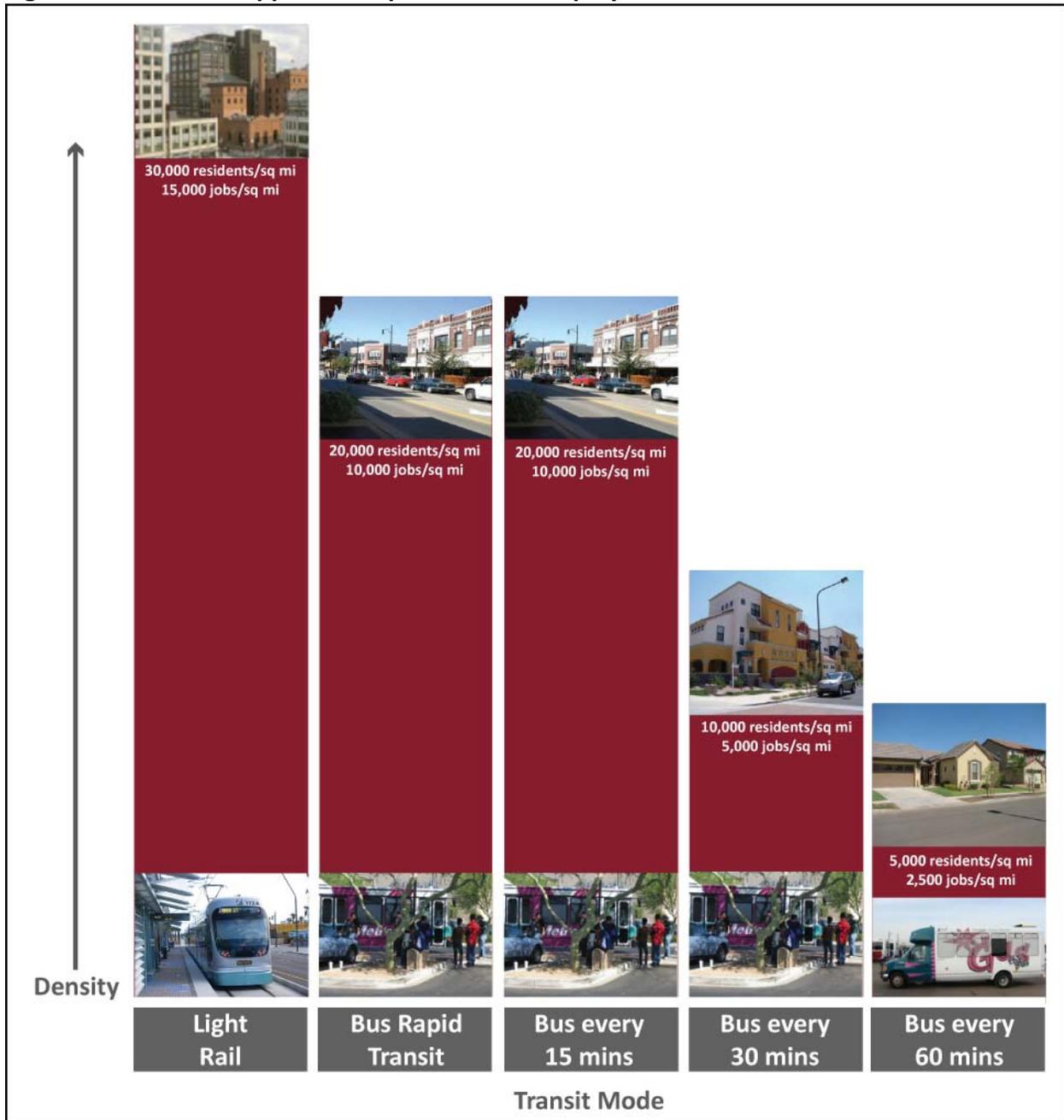
MARKET DEMAND FOR HCT

Of all of the factors that impact the demand for transit, the most important is that sufficient numbers of people must live and work in close proximity. Since most people walk to or from transit for at least one end of their trip, the starting points for determining whether or not there will be sufficient demand are population and employment densities. A large number of studies have shown that there is a strong correlation between population and employment densities and the demand for transit. In densely developed areas there will be many residents and employees who will be able to easily access the HCT service. In less densely developed areas, fewer people will be able to easily use the HCT service and thus demand will be lower. Park and ride lots and feeder bus service can extend the “reach” of transit service, but almost without exception, the more people who live and work within close proximity of an HCT line, the higher the demand will be. In Portland, Oregon, a detailed regression analysis showed that population and employment density can predict 80 percent of transit demand in an area.

Population and employment densities can also be used to provide an indication of the type and frequency of service that would be most appropriate. As shown in Figure 5-11,⁶ Bus Rapid Transit generally requires more than 20,000 residents or 10,000 employees per square mile, and light rail generally requires more than 20,000 residents or 10,000 employees per square mile.

⁶ Note that this chart does not include commuter rail because large proportions of commuter rail typically drive to a station. As a result, commuter rail is much less dependent upon surrounding population and employment densities.

Figure 5-11: Transit Supportive Population and Employment Densities



Source: Composite data compiled by Nelson\Nygaard from various sources.

Service frequencies also have a strong impact on the types of riders who will use transit. Infrequent service is inconvenient, and thus will largely serve residents and workers who, for one reason or another, cannot drive. Frequent service, conversely, is convenient, and thus will attract many who choose to take transit rather than other alternatives. Frequent service is clearly desirable, but because of the operating costs involved, and to avoid running empty buses, transit service levels must be matched to demand.

Population and employment densities can also provide an indication whether it will be feasible to provide frequent enough service in a cost-effective manner to attract significant numbers of riders who have other options but choose to use transit (“choice riders”). Various studies indicate that at least 8,000 residents per square mile are required to support transit service that will be frequent enough to attract choice riders. Below that level, transit will be used largely by those who do not drive. Put another way, low density development encourages driving and discourages transit use, while higher density development enables the development of conditions that will encourage high levels of transit use.

In Peoria, most residential development consists of low density single family housing. Currently, and as shown in Figure 5-12, population densities throughout most of the city are below 5,000 residents per square mile. Only a few areas, which are north and south of Peoria Avenue, and between Bell Road and Union Hills Drive, have 5,000 to 10,000 residents per square mile. MAG population estimates for 2028, as shown in Figure 5-13, indicate minimal changes in densities throughout the city, and the highest populations densities will continue to be in the 5,000 to 10,000 residents per square mile range.

The situation is similar for employment. As shown in Figure 5-14, 2008 employment densities in most of the city are below 3,000 jobs per square mile, and the highest densities are in the 3,000 to 5,000 jobs per square mile range. Through 2028, and as shown in Figure 5-15, employment densities will intensify to between 5,000 and 10,000 jobs per square miles in a few areas. However, throughout most of the city, employment densities will remain low.

These population and employment densities indicate that, based on the current Peoria General Plan, the major role for transit will be to provide transportation for those who do not drive, and will be far below the levels that would be required for HCT. Thus, if the city desires to be able to develop a more balanced transportation system that will attract significant numbers of choice riders, it will first have to change its development patterns to encourage and/or require denser development.

TRANSIT SUPPORTIVE ENVIRONMENTS

If Peoria desires to become less auto-oriented, and to develop attractive transit services such as HCT, it will need to change the nature of its development. The following sections discuss the types of changes that would be necessary.

Transit-supportive Development

Traditional zoning separates land uses, sets maximum densities and minimum lot sizes, and usually contains explicit regulations such as bulk and height limits and minimum parking

Figure 5-12: 2008 Population Density

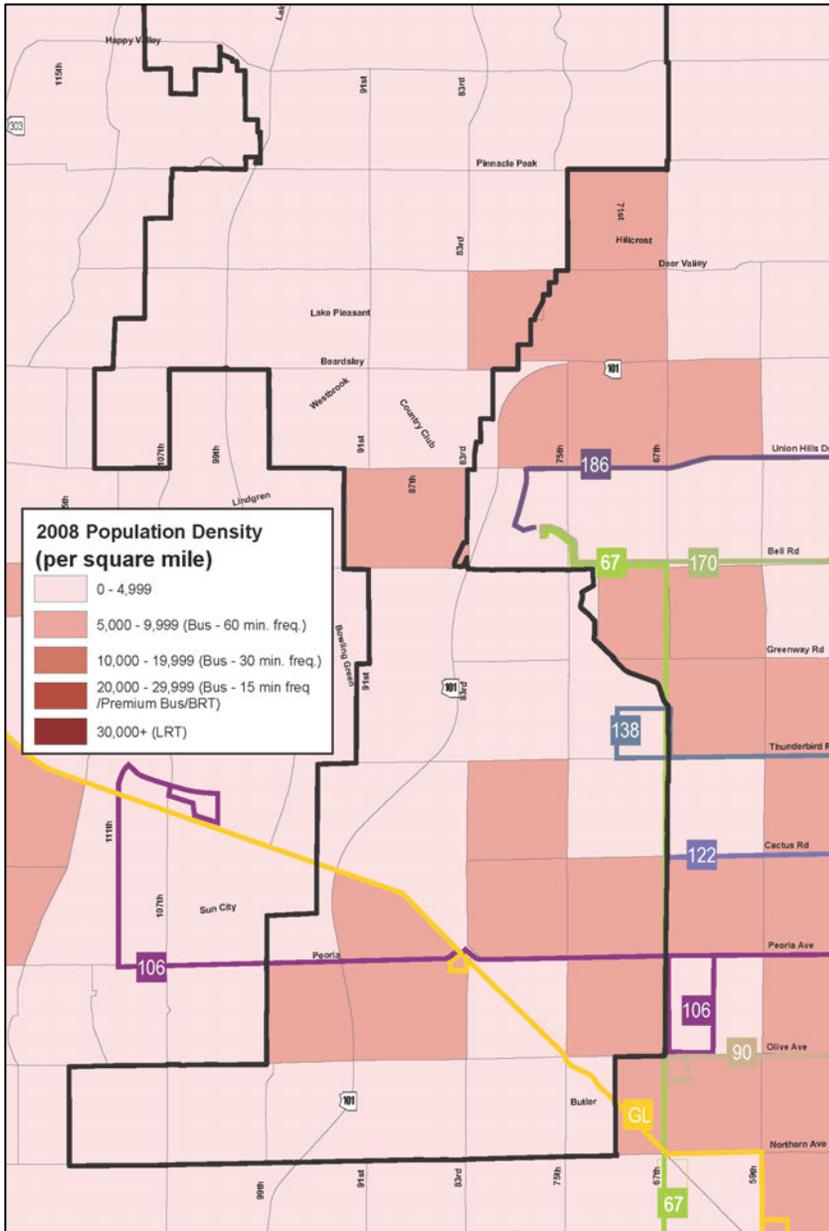


Figure 5-13: 2028 Population Density

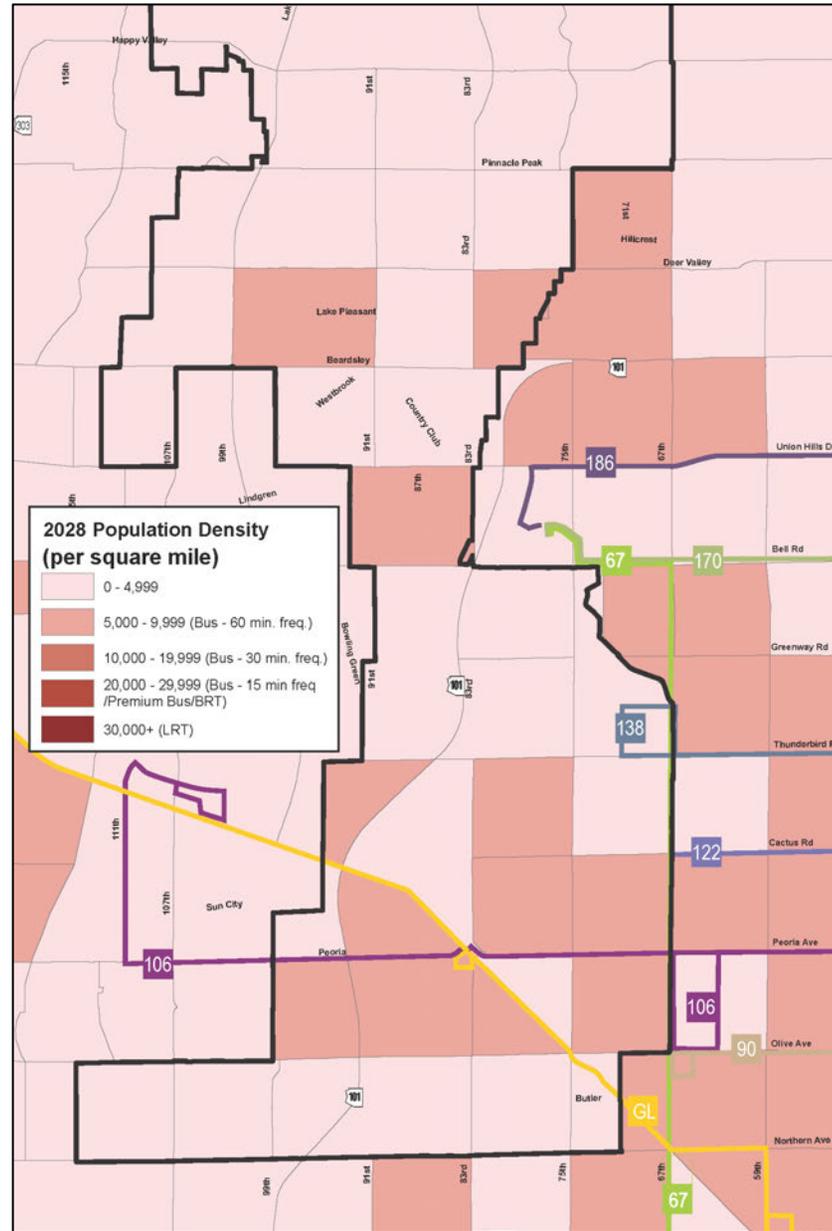


Figure 5-14: 2008 Employment Density

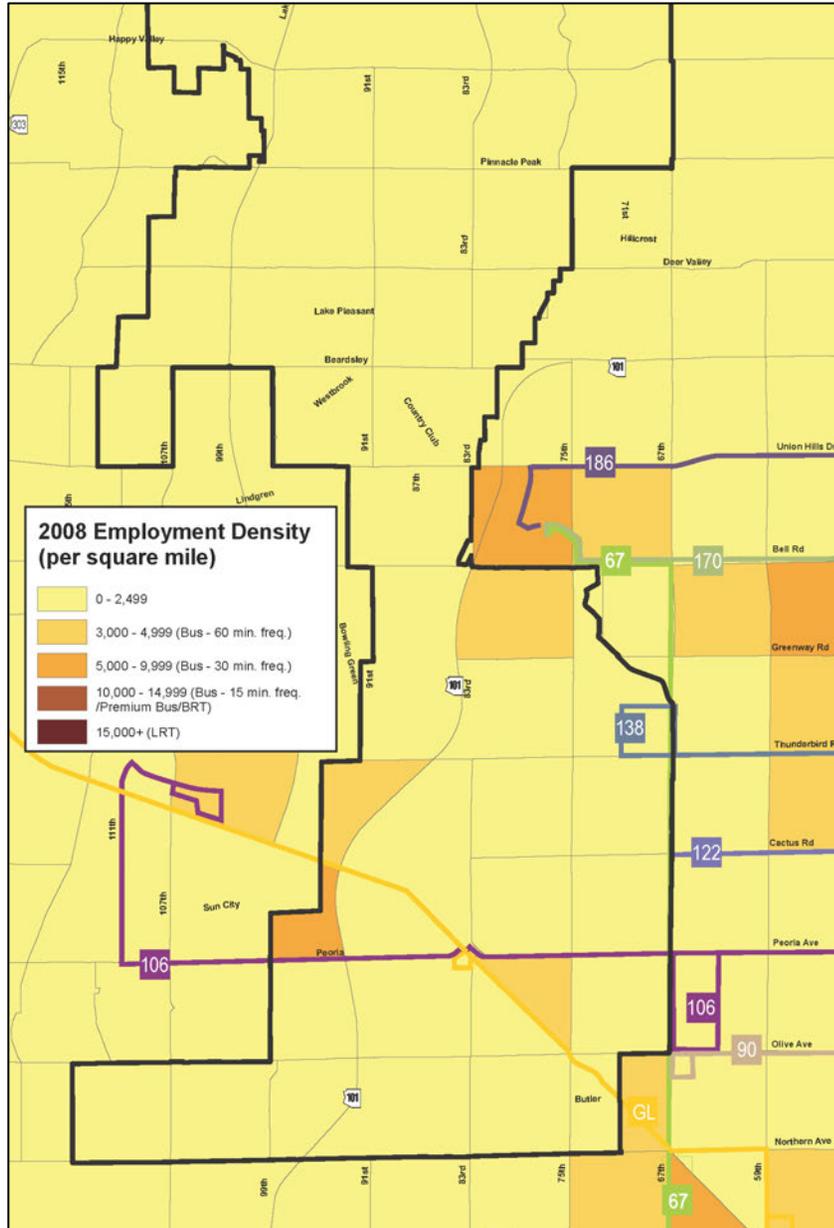
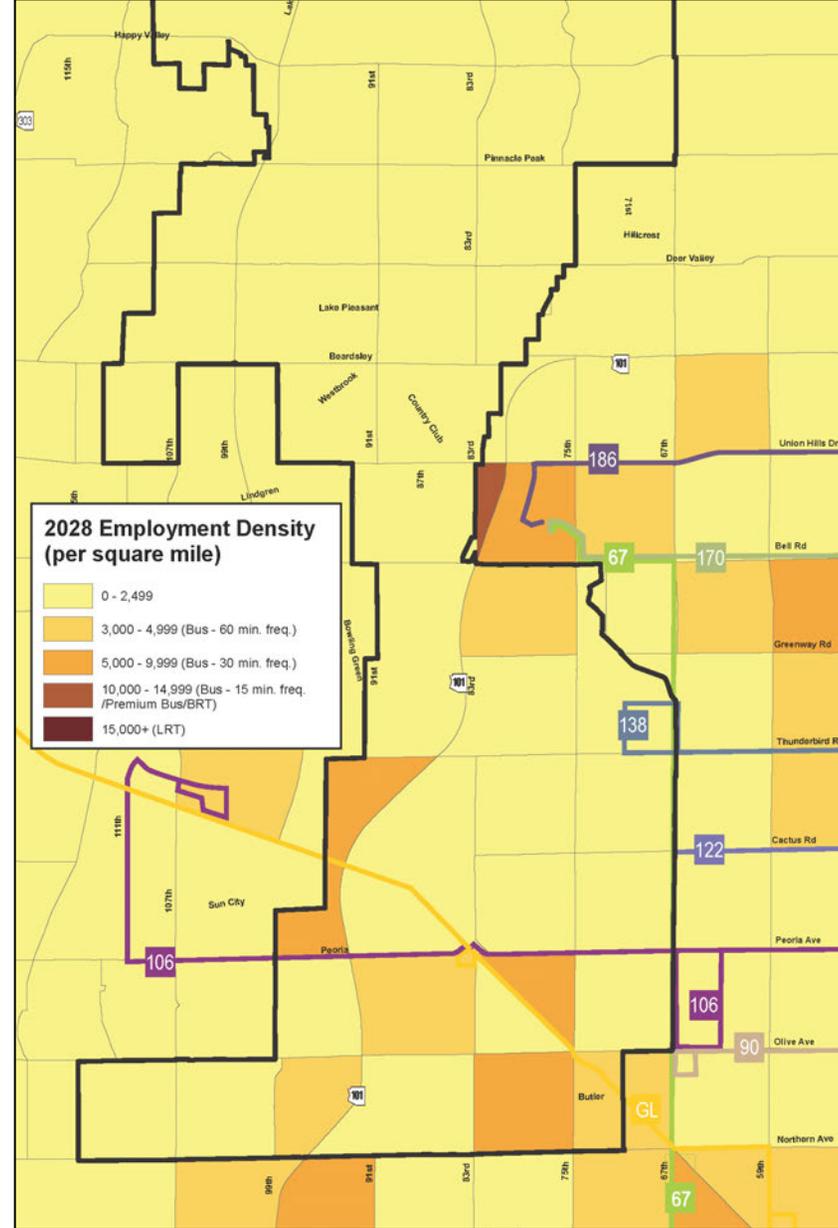


Figure 5-15: 2028 Employment Density



requirements. Transit-supportive development reverses this approach in order to knit different uses together in a manner that creates a more interesting environment that encourages transit, walking, and bicycling, and focuses much less on automobiles and parking.

With transit-supportive development, traditional zoning is often reversed. Land uses are intermixed rather than separated, there are parking caps rather than minimums, and priority is given to transit, walking, and biking, rather than to automobiles. Furthermore, the uses included in transit supportive areas are those that people would travel to and from by transit, for example:

- Mid- to high-density residential.
- Retail stores.
- Banks.
- Private offices/professional businesses.
- Government offices.
- Schools (especially higher education).
- Child-care centers.
- Community facilities.
- Entertainment complexes.
- Public space.

The mix of uses should also generate trips throughout the day. This strategy takes advantage of unused transit supply in off-peak hours and results in routes that are more productive than in areas with traditional rush-hour peaks. Ideally, transit-supportive areas should generate approximately 1 to 1.5 jobs per household in order to provide significant employment opportunities for both residents and commuters.

Transit-supportive developments should also provide a strong pedestrian orientation, both within the area and to and from transit service. Pedestrians who can walk to different land uses within a neighborhood are more likely to utilize those sites, including retail, parks, and community facilities. Furthermore, placing daily goods and services, as well as recreational destinations, within walking distance of residents increases the incentive to use alternative modes, supporting transit use for commuting and other regional travel. Actions that increase pedestrian orientation include:

Building Design and Uses

- Locate active uses that generate a higher number of daily trips on the bottom two floors of a mid to high-rise building (see Figure 5-16). These should include retail space located in the first 15-20 feet of building height, and open space. Land uses that generate fewer trips should occupy higher floors. Local examples of this type of development include Westgate Center in Glendale and Keirland Commons in Phoenix (see Figure 5-17).
- Locate buildings at the face of the sidewalk.

Parking

- Provide on-street parking to reduce the need for off-street parking, calm traffic, and provide separation between pedestrians and vehicular traffic.
- Prohibit parking from being located between sidewalk and buildings.

Streetscape Design

- Reduce vehicular roadway lane widths to 11 feet per lane.
- Provide sidewalks that are at least five feet wide.
- Rededicate any excess roadway space to widen sidewalks, crosswalks, paths, and to provide bike lanes.
- Provide pedestrian refuges in the medians of roadways that are over three lanes wide.
- Install bollards, trees, benches, and other street furniture to provide a sense of separation between pedestrians and vehicular traffic.
- Provide shelter, including shade, at transit stops and other key areas.

Roadway/Pedestrian Interfaces

- Reduce the number of conflict points between motorized and non-motorized modes. Where conflict points are unavoidable, ensure that non-motorized modes have clearly delineated pathways and drivers are aware of their responsibility to share the road.
- Provide pedestrian signals at all traffic signals, and continuously actuate the pedestrian phase, e.g. not pedestrian actuated.
- Include Leading Pedestrian Intervals at all signals to allow pedestrians to start ahead of traffic.

Figure 5-17: Active Uses on Ground Floor

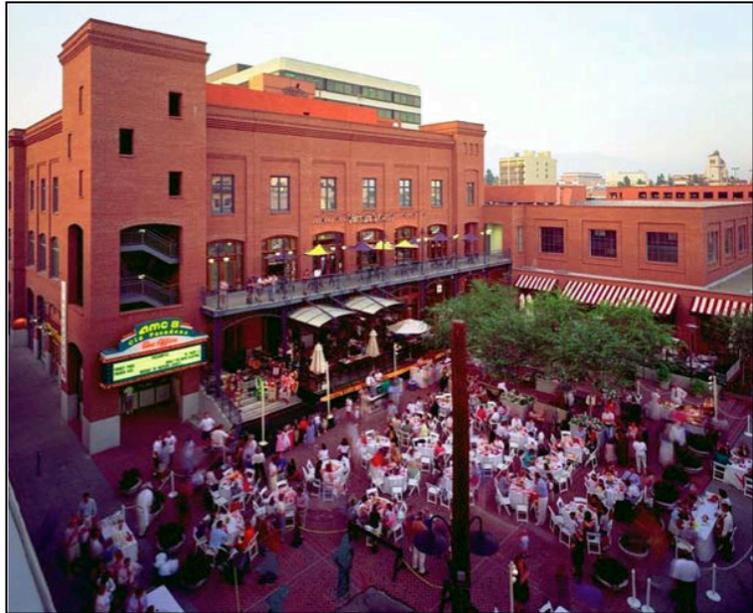


Figure 5-17: Keirland Commons, Phoenix



Other Elements

- Increase road and path connectivity, with non-motorized shortcuts, such as paths between cul-de-sac heads and mid-block pedestrian links.
- Provide passenger amenities and bicycle parking at transit facilities.
- Provide wayfinding information on how to walk and cycle to local destinations.

Finally, it should be noted that transit-supportive development must be complemented by effective transit service. HCT can form the backbone of transit service in a corridor, but it also needs to provide effective connections to other areas. For Peoria, this will mean that the development of HCT would also require the development of a much stronger local network to provide those connections.

Transit-Oriented Development

Transit-supportive development is designed to produce an environment in which effective and attractive transit service can be provided. Transit-oriented development takes this approach further and is specifically designed to integrate development with transit facilities to facilitate transit use. Transit-oriented development typically features higher density development immediately surrounding a transit station and progressively lower density development spreading outwards for ¼ to ½ mile. More specifically, transit-oriented developments typically include:

- Orientation around a major transit service that provides fast, frequent, reliable, and comfortable service.
- A balanced mix of uses with places to live, work, and shop that is active throughout the day, evening, and night.
- Buildings that shape and define memorable streets, squares, and plazas.
- Smaller blocks to develop a finer-grained network of streets that disperses traffic and makes walking and biking more comfortable.
- Smaller parking areas located in less visible areas.
- Roadway space is allocated and traffic signals are timed for the convenience of walkers and cyclists.

Transit-oriented development is often most effectively developed along corridors, and to accomplish this, cities and/or regions must establish a corridor vision. Each station area would be part of the corridor and of the greater transit system. As such, land use planning needs to be tied to broader corridor analysis and visioning. For example, if Peoria desires to develop HCT along 83rd Avenue, it will need to develop a vision and strategies for the corridor that will produce transit-oriented development that will make HCT feasible. *The Old Town Revitalization Plan and the Sports Complex planning study can provide a starting point, but a similar efforts would be needed for the entire corridor.*

EXISTING DEVELOPMENT AND TRANSIT RELATED CITY POLICIES

Existing city policies and standards both promote and work against the development of a transit supportive environment and the development of HCT.

Peoria General Plan

The Circulation Element of Peoria's General Plan (Chapter 3) includes many transit-supportive policies. Specifically, Objective 3.1.G and its associated policies state:

Objective 3.1.G: Provide for the existing and future linkage of pedestrian and automobile traffic with existing and future public transit, light rail, and commuter rail systems and facilities.

Policy 3.1.G.1: The City should coordinate with the Regional Public Transportation Authority (RPTA) to develop passenger transit and Park-and-Ride facilities at selected locations in commuter corridors.

Policy 3.1.G.2: The City shall encourage site planning and transit-oriented design and land uses around future express route light rail and commuter rail transit centers to emphasize the ease and safety of pedestrian circulation and orientation of compatible and mutually supportive uses.

Policy 3.1.G.3: The City shall include sidewalks, bus pullout bays, and transit shelters within future development located along designated commuter corridors and transit routes.

Policy 3.1.G.4: The City should establish transit-oriented and rail-oriented development regulations, guidelines, and incentives to provide land uses and improvements around future transit and rail centers that facilitate and encourage ridership.

However, as described above, the success of transit is closely related to development densities. As shown in the General Plan's Land Use Element (see Figure 5-18), the areas of Peoria that can be best connected to the regional transit system (generally south of Union Hills Drive) are dominated by low density residential development. Most new medium and high density residential, which would support transit service is designated for as yet undeveloped areas along the planned Loop 303, where it will be very difficult to provide transit connections to the rest of the region.

Specifically with respect to HCT, 83rd Avenue is seen by many as the most attractive corridor, as HCT would serve both a revitalized Old Town and the Peoria Sports Complex. However, this alignment would travel directly through many of the areas that have been developed as low density residential. To support HCT, 83rd Avenue would not need to be densely developed along its entire length. However, there would need to be a critical mass of high activity nodes along 83rd Avenue, which would include the Sports Complex District and Old Town, plus others.

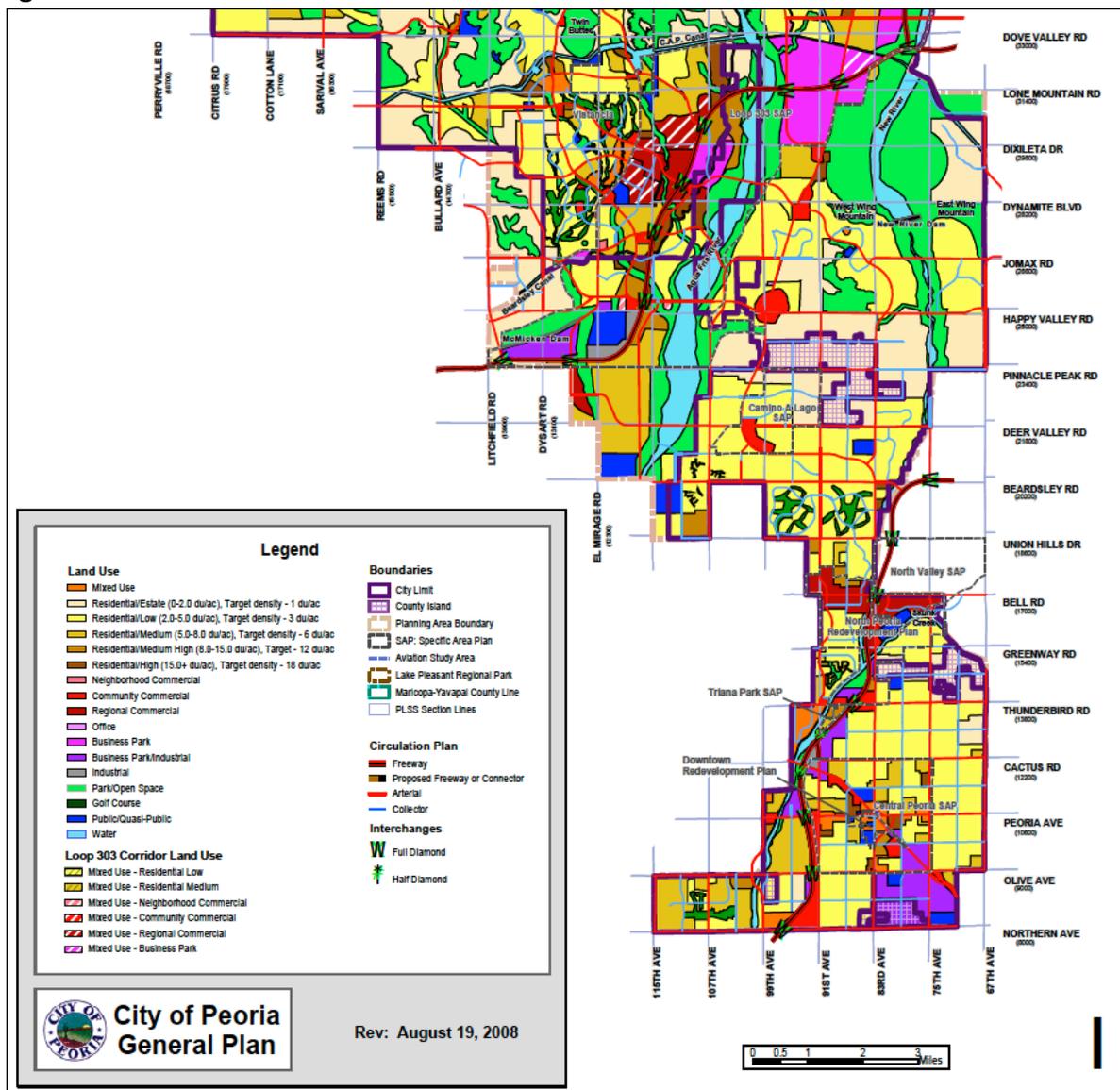
Similarly, the Economic Development Element (Chapter 4) also includes transit-supportive policies, especially with respect to Old Town:

Goal 4:3: Develop Downtown Peoria into a Quality Environment.

Objective 4.3.B: Facilitate and support the development of quality employment and retail opportunities to support a high quality urban living space.

Policy 4.3.B.1: Partner with public and private entities to create a pedestrian-oriented, mixed-use environment with high quality retail, business, employment, and residential development supportive of a self-sufficient neighborhood economy.

Figure 5-18: Peoria Land Use Plan



Policy 4.3.B.2: Partner with public and private entities to develop a core focal point for commercial and community activity in the Osuna Park area.

Policy 4.3.B.3: Examine redevelopment and adaptive re-use opportunities.

A revitalized Old Town could become a strong transit-oriented area. However, most other commercial center areas are slated for locations along freeways (Loops 101 and 303) and in northern areas. It is difficult to make freeway-oriented developments transit, pedestrian, and bicycle friendly, and again, most of these developments will be located relatively far from the rest of the regional transit system.

Finally, the Growth Areas Element (Chapter 5) includes a discussion about the negative impacts of sprawl and the need to “make automobile, transit, and other multimodal circulation more efficient, make infrastructure expansion more economical and provide for a rational pattern of land development.” It further states growth areas are intended to promote “new development into targeted areas that are amenable to creating viable and concentrated areas integrating open spaces, natural resources, and accommodating a variety of land uses (commercial, office, residential, tourism, industrial), oriented to multi-modal (transit, pedestrian, bicycling etc.) activity.” Specific goals, objectives, and policies include:

Goal 5.1: Promote efficient development areas which support a variety of land use types, conserve natural resources, reduce automobile dependency, and exhibit a logical extension of infrastructure and service capacities.

Objective 5.1.A: Direct attractive development into identified growth areas, creating dynamic urban pockets with diverse economic, housing, cultural, and entertainment opportunities.

Policy 5.1.A.3: The City shall encourage a mix of land uses within each growth area, including varied housing types and densities, employment opportunities and businesses.

Objective 5.1.B: Within growth areas, promote attractive, inviting public spaces and streets that reduce automobile dependency and enhance the function and character of the community.

Policy 5.1.B.1: The City shall balance traffic circulation needs with the goal of creating pedestrian-friendly neighborhoods and employment centers.

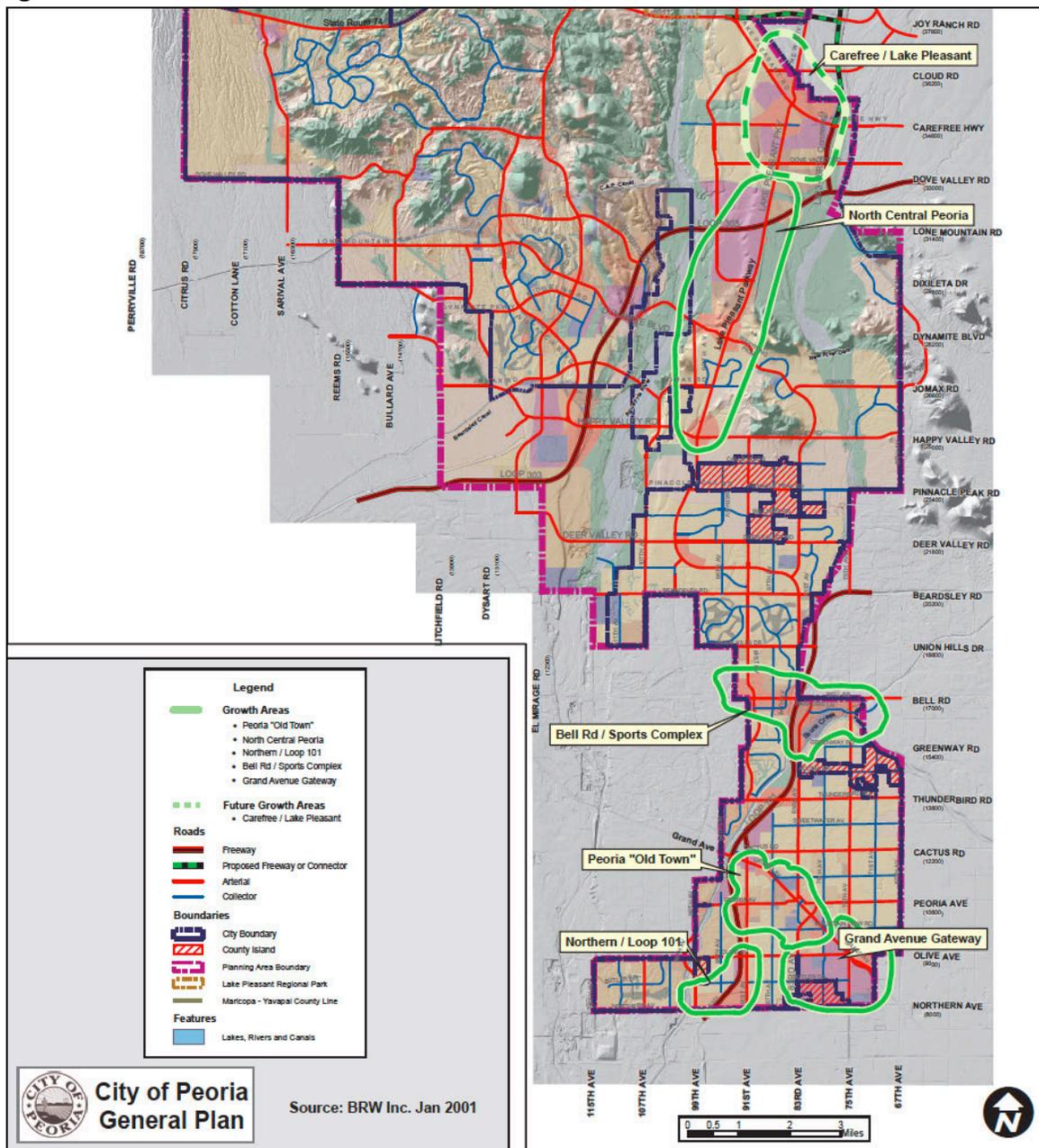
Policy 5.1.B.2: The City shall identify street improvements that promote pedestrian-oriented development including wider sidewalks, street furniture, landscaped medians, angled parking on local streets, and inviting landscaped areas.

Policy 5.1.B.3: The City shall encourage street frontages that contribute to retail vitality; particularly, street corners with buildings that approach the sidewalk or form corner plazas should be expressly promoted.

Policy 5.1.B.4: The City shall identify funding for the expansion of bicycle facilities and transit related improvements (bus pullouts, park and rides, etc.) commensurate with the Trails Master Plan and the Circulation Element.

Four of the planned growth areas will be in the southern part of Peoria (Northern/Loop 101, Grand Avenue Gateway, Peoria Old Town, and Bell Road/Sports Complex (see Figure 5-19), where it will possible to provide transit connections to the rest of the Phoenix area. The challenges in providing HCT or other high quality transit service is that based on future projections of population and employment densities, not enough development will be concentrated in those growth areas. Furthermore, as previously discussed, the low density “gap” between the Old Town and Bell Road/Sports Complex will reduce the effectiveness of transit service along 83rd Avenue.

Figure 5-19: Peoria Growth Areas



Peoria Design Review Manual

The Peoria Design Review Manual provides guidelines for the design of the city's commercial, industrial, and residential developments. The guidelines are well articulated and provide excellent examples that are generally consistent with transit supportive policies.

Consistent with current design practices, the Design Review Manual provides guidelines on how to lessen the pedestrian and visual impacts of large parking lots, including those that are located in front of buildings. As described above, the preferred approach for transit-oriented development is to avoid the placement of parking between the street and buildings, and instead to locate it behind the buildings and activity areas.

Old Town Peoria Revitalization Plan

Peoria's Old Town provides a valuable opportunity for the City to embrace its original heritage and urban form, and develop a strong transit-oriented district. The Old Town Revitalization Plan fully incorporates best practices for transit supportive areas including pedestrian access, a mix of land uses, multi-modal transportation, and a built form that encourages person-scale activity and relegates vehicular parking to a supportive role; specifically:

- A pedestrian-friendly destination with an integrated mix of land uses (civic, retail, office, residential, and cultural) woven together by attractive and cohesive street improvements.
- An atmosphere with buildings facing and interacting with the street creating an interesting and engaging pedestrian environment. New development moves forward to the sidewalk and seas of parking no longer dominate the frontage. Suburban
- development is a way of the past, as automobiles learn to share the district with other users.
- An area with a diversity of cultural, entertainment, and evening uses, restaurants with outdoor dining, adorned with broad sidewalks, and gathering spaces that feature shaded places for outdoor enjoyment, attractive atmosphere, and engaging multicultural events.
- A centralized multi-modal transit center (which is being further developed as part of this study). The transit center will provide a focal point for local and regional transit service, walking connections to Old Town, and potentially mixed-use parking.

This plan provides an excellent model on how other growth areas can be developed in a transit-supportive manner. Furthermore, the development of HCT would require the development of more transit-oriented nodes than are currently envisioned, and these nodes would need to be located along the HCT corridor. The Old Town Revitalization Plan also provides a model on the types of elements for inclusion in a corridor planning effort that would be required to develop land use changes that would be needed to make HCT possible.

CHAPTER 6

OLD TOWN TRANSIT CENTER

With the redevelopment of Old Town, there will be an increased emphasis on transit, and to provide a focal point for local and regional transit services, a transit center will be developed in Old Town. This chapter describes the sites that were considered for the transit center, the preferred site, and presents a preliminary site plan.

DESIGN AND LOCATION CONSIDERATIONS

To initially determine potential locations, a set of location requirements was developed, which were as follows:

- In the short-term, the Old Town Transit Center will need to accommodate local and express buses and provide parking for transit users, carpoolers, and vanpoolers.
- The transit center needs to be in a location where it could also serve as the station for future Grand Avenue commuter rail service (which would require that the transit center be sited along the BNSF rail line that runs parallel to Grand Avenue).
- In the longer-term, the transit center may need to accommodate potential High Capacity Transit (HCT) options, such as light rail or BRT.
- HCT and bus facilities need to be in close proximity to each other.
- The site must be able to provide for efficient transit circulation.
- The facility should support the Old Town Revitalization Plan.
- The facility should encourage transit-oriented development (TOD).
- The transit center should be within convenient walking distance to Old Town.
- The transit centers needs to work with either Grand Avenue at grade or depressed.

The initial sites were identified and evaluated before the HCT work described in Chapter 5 was completed, and to ensure consistency between the two efforts, the initial sites were developed to ensure that they could accommodate light rail or BRT. The alternative sites and layouts presented in the following sections show how light rail or BRT could be accommodated. However, since HCT was subsequently determined to be not feasible, these elements are not included in the preliminary site plan presented at the end of the chapter.

SITE ALTERNATIVES

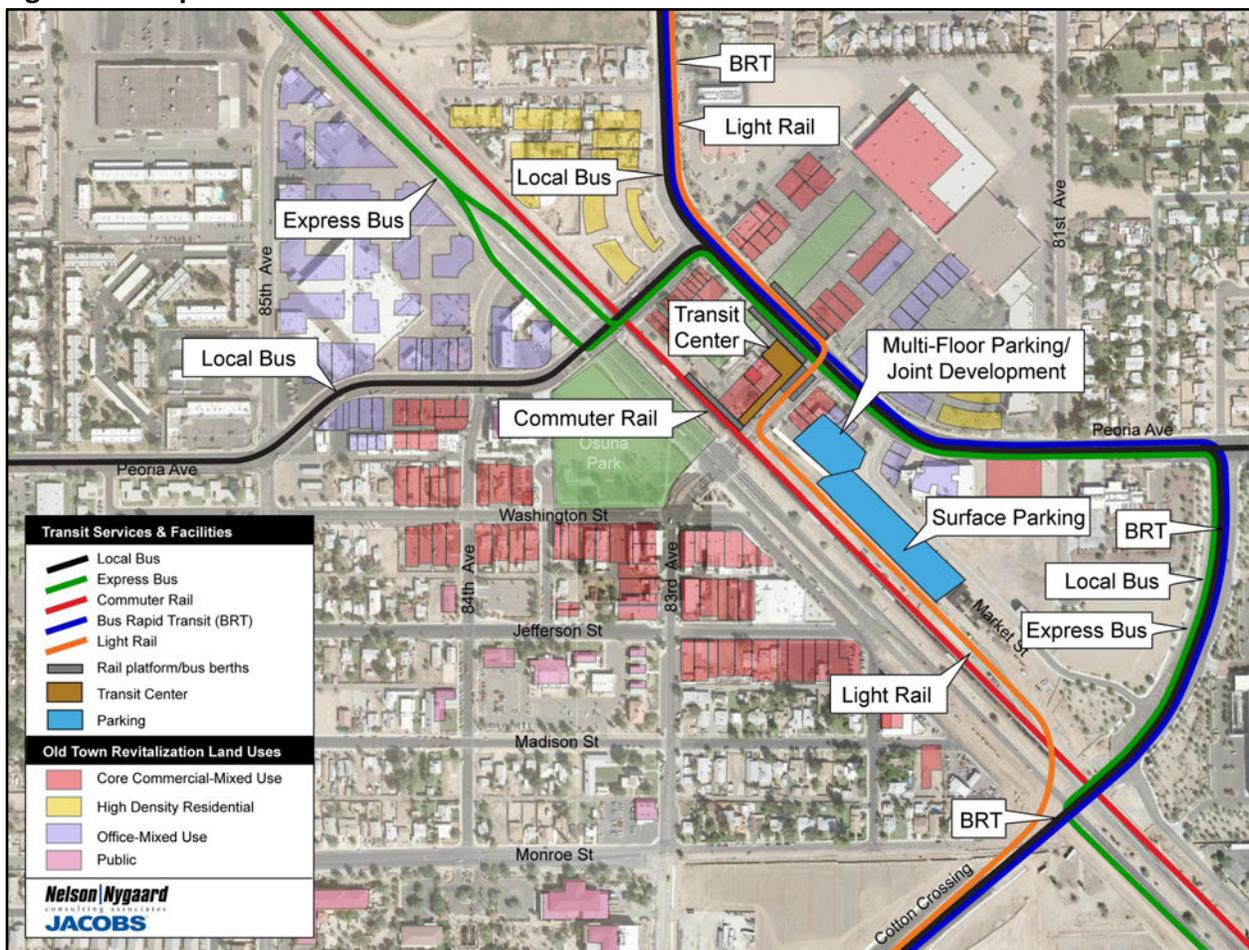
Using the above requirements, three alternative sites were identified, all of which were in the vicinity of the intersections of Peoria Avenue and 83rd Avenue on the north side of Grand Avenue. These were:

- Option A: Peoria Avenue in front of current Zocalo Mall.
- Option B: 83rd Avenue between Peoria and Grand Avenues.
- Option C: Market Street between Cotton Crossing and 83rd Avenue.

OPTION A: PEORIA AVENUE

Option A would locate the transit center on Peoria Avenue directly across from the Zocalo Mall (see Figure 6-1). Bus/BRT berths and stops would be located on Peoria Avenue. A future commuter rail platform would be located alongside the BNSF railroad tracks and connected to the transit center building by a pedestrian walkway. Light rail platforms could be sited on the section of 83rd Avenue between Peoria Avenue and Grand Avenue. Parking would be located across 83rd Avenue between Peoria Avenue and the BNSF tracks, with automobile access from Peoria Avenue.

Figure 6-1: Option A: Transit Center on Peoria Avenue



The advantages of Option A would be:

- Strong integration with Old Town and Old Town revitalization plans.

- The transit center would be in a location that could spur other development.
- The location of bus stops and berths on Peoria Avenue would provide for very efficient transit circulation.
- The site would have good pedestrian access to heart of Old Town.
- The site would provide for the planned closing of 83rd Avenue between Grand Avenue and Peoria Avenue, which BNSF desires following the opening of Cotton Crossing (just to the south).

The disadvantages of the site would be that:

- Buses would bypass heart of Old Town.
- Parking would be located farther from the heart of transit activity than with the other options.
- Walks between future commuter rail and bus services would be longer than with the other options.

OPTION B: 83RD AVENUE

Option B would locate the transit center on Peoria Avenue directly across from the Zocalo Mall (see Figure 6-2). Bus/BRT berths and stops would be located on the section of 83rd Avenue between Grand Avenue and Peoria Avenue, and instead of this section being eliminated, it would be converted to transit-only. A future commuter rail platform would be located alongside the BNSF railroad tracks which would be conveniently located perpendicular to bus/BRT stops and berths, and potentially light rail platforms. Furthermore, all platforms would be located in close proximity to the transit center building. Parking would be located directly across 83rd Avenue between Peoria Avenue and the BNSF tracks, with automobile access from Peoria Avenue.

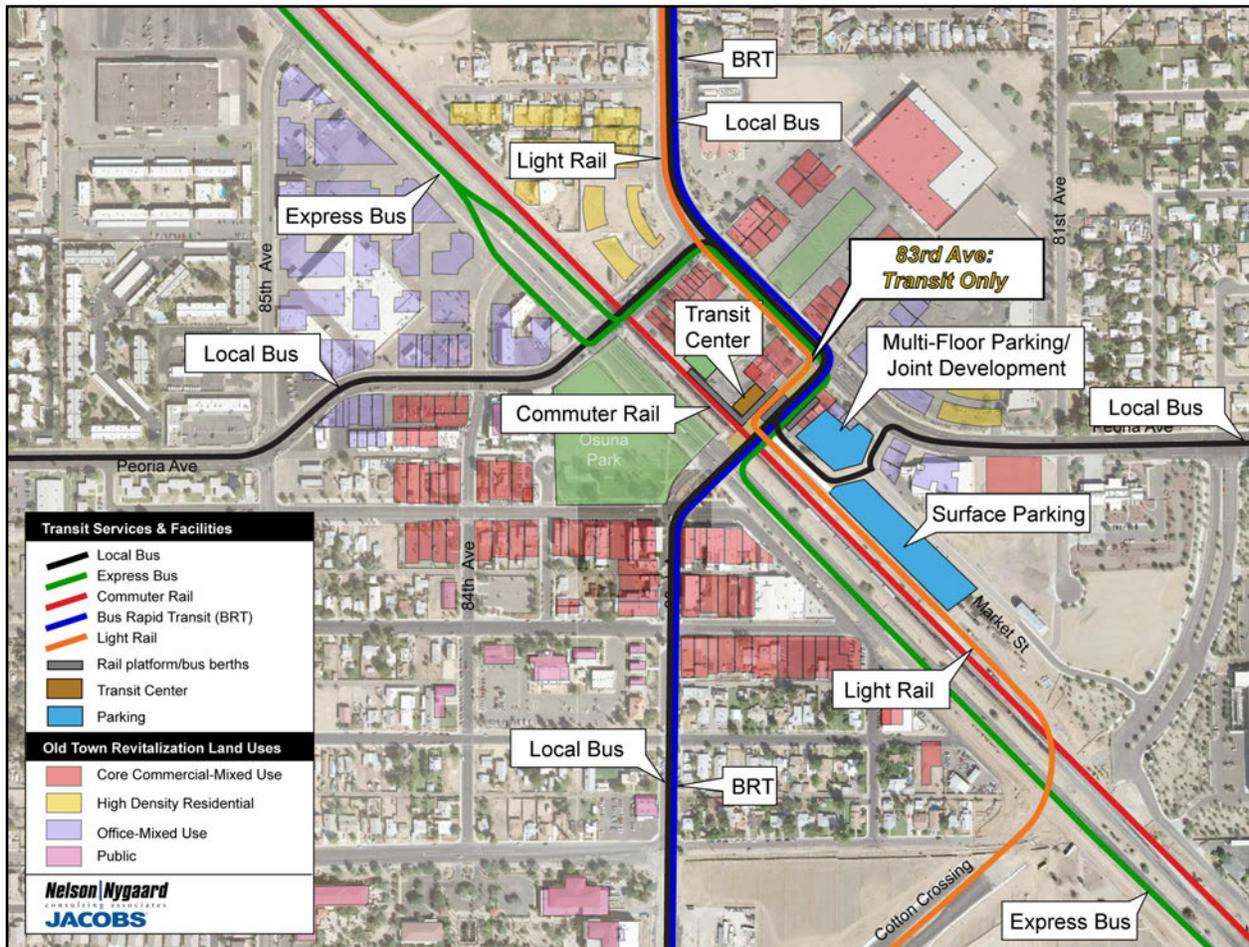
The advantages of Option B would be:

- Strong integration with Old Town and Old Town revitalization plans.
- The transit center would be in a location that could spur other development.
- The location would allow for bus circulation through the heart of Old Town.
- The location of bus stops and berths on Peoria Avenue would provide for very efficient transit circulation.
- The site would have very good pedestrian access to heart of Old Town.
- Stops, berths, and platforms for all modes would be in close proximity to each other.

The disadvantages of the site would be that:

- Bus circulation would be slightly less efficient than with Option A.
- Walks between future commuter rail and bus services would be longer than with Option C.

Figure 6-2: Option B: Transit Center on 83rd Avenue



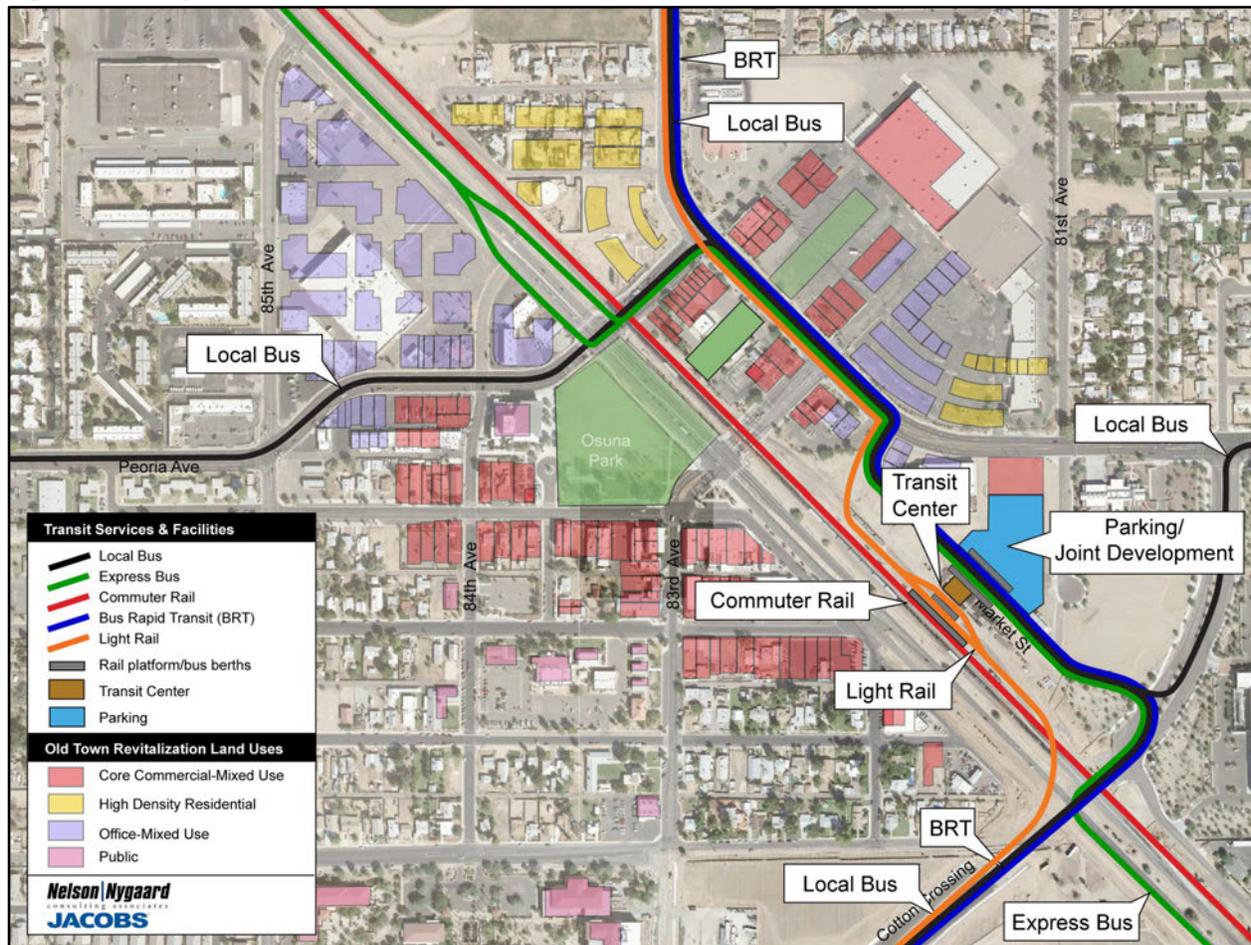
OPTION C: MARKET STREET

Option C would locate the transit center on Market Street approximately halfway between 83rd Avenue and Cotton Crossing (and this is the option that was provided for illustrative purposes in the Old Town Revitalization Plan) (see Figure 6-3). Bus/BRT berths and stops would be located on Market Street, and a future commuter rail platform would be located alongside the BNSF railroad tracks parallel to and in close proximity to the Market Street bus berths and platforms. All platforms would be located in close proximity each other and to the transit center building. Parking would be located directly across Market Street from the transit center, with automobile access from Market Street.

The advantages of Option C would be:

- All parcels that the transit center would use are currently vacant.
- As a result, this site would likely have the lowest development costs.
- Parking would be located closer to the platforms than with Options A or B.

Figure 6-3: Option C: Transit Center on 83rd Avenue



The disadvantages of the site would be that:

- The transit center would not be well integrated with Old Town.
- The transit center would be located too much on periphery of Old Town to spur other development.
- The site would have poor walk access to the heart of Old Town.
- Most buses would bypass the heart of Old Town.

COMPARISON OF OPTIONS/PREFERRED SITE

In summary, Options A (Peoria Avenue) and B (83rd Avenue) would provide the best integration with the Old Town Revitalization Plan, good walk connections to Old Town, and the best opportunities to stimulate development and develop TOD. Option B would provide the best bus service to heart of Old Town. Option C (Market Street) could be easiest to implement, but could not be integrated well with the Old Town Revitalization Plan, and would have poor walk

access to most of Old Town. Option C would also provide the lowest potential to stimulate transit-oriented development.

Overall, Options A (Peoria Avenue) and B (83rd Avenue) would have similar advantages and disadvantages, and both would be significantly better than Option C (Market Street). However, between Options A and B, Option B would provide better bus service through the heart of Old Town, and was determined to be the preferred location on that basis.

FACILITY REQUIREMENTS

As described above, the Old Town Transit Center is intended to be a focal point for local and regional transit services that will provide comfortable and convenient passenger facilities and amenities. The Old Town Transit Center is also intended to fit within, and help spur, Old Town redevelopment efforts.

To ensure that this would be the case, project staff developed a set of facility requirements for both the mid and long-term. These were developed based on a review of best practices elsewhere in the Valley, including at the Tempe Transit Center, and the bus facility improvement work described in Chapter 7. The resulting set of transit center facilities and amenities, which is summarized in Table 6-1, are intended to ensure that the Old Town Transit Center works well as a transit facility and that it is well integrated with Old Town.

PRELIMINARY PLAN – MID-TERM

For the mid-term, the Old Town Transit Center would be developed to serve Route 106 Peoria/Shea, Grand Avenue Limited, a new Route 83 83rd Avenue local route, and to provide park and ride spaces for transit riders, carpoolers, and vanpoolers. Key elements of the plan include:

- A transit center building on the north side of 83rd Avenue between Grand Avenue and Peoria Avenue.
- The conversion of 83rd Avenue between Grand Avenue and Peoria Avenue to transit-only use, with bus berths, passenger waiting areas, bicycle racks, water fountain, vending machines and public art.
- Passenger pick-up and drop-off areas behind the transit center building in the area where Taco Bell is currently located.
- Parking south of 83rd Street adjacent to the transit platforms with access from Peoria Avenue. Amenities would include covered parking, landscaped walkways and seating at the pedestrian way.
- Roadway improvements on Peoria Avenue that would include striping and island revisions from south of the Market Street intersection to south of the northern most Peoria Avenue/83rd Avenue intersection.

Table 6-1: Desirable Facilities and Amenities for Old Town Transit Center

	Mid-Term	Long-Term
Transit Berths		
▪ Bus	√	√
▪ Space for future commuter rail	√	√
▪ Space for future HCT		√
Passenger Waiting Area		
▪ Exterior shelters	√	
▪ Enclosed climate controlled waiting area, with public uses		√
Seating	√	√
Signage		
▪ Bus/rail stop signage	√	√
▪ Static boards with transit service maps and schedules	√	
▪ Local area maps	√	√
▪ Real-time passenger information		√
▪ Pathfinding signage	√	√
Ticket Sales (ticket vending machines)		√
Bike Racks	√	√
Pedestrian Circulation		
▪ Between modes	√	√
▪ To/from Old Town (both north and south of Grand Avenue)	√	√
Retail/Concession Space		√
▪ Convenience store, newsstand, deli, fast food, etc.		√
Vending Machines	√	√
Public Art	√	√
Restrooms		
▪ For bus drivers	√	
▪ For public		√
Parking		
▪ Ground (Covered Canopies)	√	
▪ Parking Structure with joint development		√
Closed-Circuit Camera Security	√	√

Property adjacent to 83rd Avenue will also be needed for the transit center, the park and ride space, and passenger pick-up and drop-off. The mid-term plan will require the acquisition of four pieces of property:

- Two parcels north of 83rd Avenue, east of the BNSF tracks and west of Peoria Avenue (where Taco Bell and Wong’s Jr. are currently located) for the station building and passenger drop-off and pick-up.

- One property south of 83rd Avenue, east of the BNSF tracks and west of Peoria Avenue (where Wendy's is currently located) for parking and access to the transit platforms.
- A piece of industrial land adjacent to Market Street for access to the parking area.

However, while these parcels would need to be acquired, the current businesses could remain open in the mid-term. To do this, on the north side of 83rd Avenue, the transit center passenger drop-off and pick-up area would share access and parking with Taco Bell and Wong's Jr. On the south side of the 83rd Avenue, the transit center would share parking and access with Wendy's. This would be done as shown in Figure 6-4.

Figure 6-4: Mid-Term Site Layout



The estimated capital cost for the mid-term facility, in \$2010, would be approximately \$5.5 million (see Table 6-2).

Table 6-2: Capital Cost Estimate for Mid-Term Transit Center

	Capital Cost
Construction	
Transit Berths	\$355,000
Passenger Waiting Area	\$180,000
Ticket Sales	\$0
Retail/Concession Space	\$0
Public Art	\$18,000
Restrooms	\$226,000
Parking	\$802,000
Closed-Circuit Camera Security	\$46,000
Off-Site Improvements	\$354,000
Support Services	
Design	\$197,000
Construction Administration	\$178,000
Project and Construction Management	\$79,000
Land Acquisition	
Parcels	\$3,040,000
Total	\$5,475,000

PRELIMINARY PLAN – LONG -TERM

Over the longer-term, the transit center will need to accommodate additional local bus service, Grand Avenue commuter rail service, and potentially, light rail or BRT service. These increases in transit service would require that the transit center be expanded to accommodate increased transit usage, and to integrate it with Old Town as it redevelops. To do this:

- The transit platforms would be expanded to accommodate additional bus service and, as required, additional modes.
- Up to 200 commuter spaces would be needed, and to accommodate these, structured parking would be developed south of 83rd Avenue. This structure would include transit-oriented joint development along Peoria Avenue.
- Portions of the transit center properties not required for transit uses (for example, where Taco Bell, Wong’s Jr., and Wendy’s are now located) would be redeveloped in a transit-oriented manner consistent with the Old Town Redevelopment Plan.

An example of the site layout is shown in Figure 6-5 and Figure 6-6.

The estimated capital cost for the mid-term facility, in \$2010, would be approximately \$7.1 million (see Table 6-3).

Figure 6-5: Long-Term Site Layout (Looking North)



Figure 6-6: Long-Term Site Layout (Looking South)



Table 6-3: Capital Cost Estimate for Long-Term Transit Center

	Capital Cost
Construction	
Transit Berths	\$147,000
Passenger Waiting Area	\$369,000
Ticket Sales	\$9,000
Retail/Concession Space	\$104,000
Public Art	\$62,000
Restrooms	\$833,000
Parking	\$4,422,000
Closed-Circuit Camera Security	\$143,000
Off-Site Improvements	\$108,000
Support Services	
Design	\$375,000
Construction Administration	\$418,000
Project and Construction Management	\$125,000
TOTAL	\$7,115,000

CHAPTER 7 BUS STOP IMPROVEMENTS

Waiting for the bus is a significant part of nearly every bus rider’s transit experience. If bus stops provide a comfortable waiting environment, people traveling to and from that area will be more likely to use transit. Conversely, if bus stops do not provide a comfortable environment, people will be less likely to use transit. In addition, well designed bus shelters can also help to provide a unifying design element for a city. Shelters created by artists can be used to create diversity and interest with designs specifically for unique locations.

This chapter presents a review of bus stop facilities and practices in other communities, including the incorporation of artwork into major stops and the development of a preferred approach for Peoria. Note that in addition to the information provided in this chapter, the study also produced a standalone document that presents new bus stop standards for the improvement of bus stops in Peoria, as well as a process for the incorporation of artwork at major stops. That document is entitled, “City of Peoria, Bus Stop Design Standards,” and is dated June 2010.

BUS STOP PRACTICES IN OTHER COMMUNITIES

In order to determine how Peoria could incorporate art into bus stops and shelters, a review was conducted of how five other communities—Scottsdale, Tempe, Mesa, Phoenix, and Tucson—design and integrate artwork into their bus stops. The review examined:

- How art was incorporated into bus stops.
- Capital costs.
- Maintenance costs, practices, and experiences.
- Other issues highlighted by the cities that were surveyed.

BUS SHELTER TYPES

Cities with substantial bus systems have a large number of bus stops, and different stops serve different purposes and different volumes of passengers. To manage costs, cities and transit systems typically develop (either formally or informally) a hierarchy of stops that range from those with no amenities to those with a very high level of amenities. In the Phoenix area, where shelter from the sun is very important, most stops have shelters, and there is also a large range in shelter design and the use of artwork.

Bus shelters can generally be categorized into one of three types:

Standard Bus Shelters: At the lower end, “standard” shelters are used that consist of a single design (or variations of a single design) that is mass produced and installed at the large majority of stops. Virtually all transit systems use standard shelters, and these are the most common types of shelters in the Valley. Two basic designs are currently being used throughout the Valley: the “Phoenix-style” shelter that is used throughout Phoenix and in other communities that have not developed their own style (including Peoria), and a second design that is being used in Mesa, Scottsdale, and Tempe. It should also be noted that standard designs are often changed periodically, as old designs become dated and/or better options become available. For example, Scottsdale’s stops have three versions of standard designs: two older versions plus the current version.

Special Purpose Designs: For a variety of reasons, there is also a need and desire to develop special purpose designs that are either more attractive and/or provide better facilities and amenities than standard bus shelters. Examples are for premium services such as light rail, Rapid Bus, and BRT, and where special stop facilities are desired as part of a streetscape or development project.

Art Bus Stops: At the upper end, very attractive one-of-kind designs that are works of art are often developed key locations such as transit centers, major schools, high volume downtown stops, art centers, sport centers, medical centers, etc. The Phoenix area has been especially active in developing art bus stops, and as described in this document, provide many examples of what could be done in Peoria.

ART BUS SHELTERS

All five cities that were surveyed have developed bus stops that are also one-of-a-kind works of art. These stops are typically at high passenger volume stops in key locations. In general, these stops have been developed in a manner that can create a focal point for a destination or a neighborhood, and also be functional.

Phoenix

Phoenix has approximately 50 art shelters that are located throughout the city. Area residents and workers like these bus shelters because they are attractive and provide a distinguishing feature to the areas that they live and work. Examples are provided in Figure 7-1.

Mesa

Mesa has approximately 10 art shelters, many of which are along Main Street. Examples are provided in Figure 7-2.

Figure 7-1: Phoenix Art Bus Stops

	<p>City: Phoenix Location: 35th Avenue Artist: Mary Lucking Cost: \$300,000 for 5 shelters and 15 art benches. Constructed in: 2008 Other: Developed as part of 35th Avenue Streetscape project</p>
	<p>City: Phoenix Location: Cricket Pavilion Artist: Joe Tyler Cost: \$34,000 Constructed in: 2005</p>
	<p>City: Phoenix Location: Sky Harbor Airport Artist: Kevin S. Berry Cost: \$40,000 Constructed in: 2001</p>
	<p>City: Phoenix Location: Baseline Road Artists: Mags Harries & Lajos Heder Cost: Unknown (constructed as part of larger Baseline Road streetscape project) Constructed in: 2005</p>

Figure 7-2: Mesa Art Bus Stops

	<p>City: Mesa Location: Mesa Arts Center Name: Rain Artist: Laurie Lundquist</p>
	<p>City: Mesa Location: SEC of Southern & Dobson Name: Mesa Oasis Artist: Joe Tyler Cost: \$35,000 Constructed in: 2004</p>
	<p>City: Mesa Location: Mesa Community College Name: College Garden Station Artist: Joe Tyler Cost: \$35,000 Constructed in: 2005</p>

Scottsdale

Scottsdale has approximately 20 art bus shelters, many of which are located along the Scottsdale Road corridor between South Scottsdale to north of downtown, and along Shea Boulevard. Examples are provided in Figure 7-3.

Figure 7-3: Scottsdale Art Bus Stops

	<p>City: Scottsdale Location: Camelback Road Name: Wavelength Artist: Kevin S. Berry Cost: \$40,000 Other: There are several versions of this shelter, some of which do not have the front shade screens (see below).</p>
	<p>City: Scottsdale Location: Scottsdale Road Name: Wavelength Artist: Kevin S. Berry Cost: \$40,000</p>
	<p>City: Scottsdale Location: Shea Boulevard Name: Desert Moods Artist: Joe Tyler Constructed in: 1996 Cost: \$28,000</p>
	<p>City: Scottsdale Location: Shea Boulevard Name: Sonoran Monsoon Artist: Joe Tyler Constructed in: 1996 Cost: \$30,000</p>

Tempe

Tempe has 21 art bus shelters. Several of these have been placed at high schools, and art teachers and students have been instrumental in the development of these stops. Examples are provided in Figure 7-4.

Figure 7-4: Tempe Art Bus Stops

	<p>City: Tempe Location: McClintock High School Name: The Elements Cost: \$33,500 Constructed in: 2000</p>
	<p>City: Tempe Location: Tempe High School Name: Come Together Artist: Joe Tyler Constructed in: 1995 Cost: \$14,000</p>
	<p>City: Tempe Location: University Drive Name: Waiting on a Date Artist: Joe Tyler Cost: \$14,500 Constructed in: 1995</p>

Tucson

Tucson began developing Art Shelters in the late 1980s and since that time developed approximately 25 art bus shelters. However, now, to reduce maintenance costs, the city has discontinued the development of unique Art Bus Shelters. Instead, the city will install works of art at bus stops, but not as part of the shelter. Examples of Tucson’s existing Art Bus Shelters are provided in Figure 7-5.

Figure 7-5: Tucson Art Bus Stop

	<p>City: Tucson Location: South Park Avenue Cost: \$30,000 Constructed in: 1999</p>
	<p>City: Tucson Location: Oak Flower neighborhood Name: Shade for Oak Flower Artist: Mary Lucking Cost: \$27,000 Constructed in: 2004</p>
	<p>City: Tucson Location: Pima County Courthouse Name: Arbor Depot Artist: Joe Tyler Cost: \$17,000 Constructed in: 1998</p>

SPECIAL PURPOSE BUS SHELTERS

In addition to one-of-a-kind art shelters where one of the most important objectives is to create a work of art, cities, transit systems, and private developers also develop a variety of “special purpose” shelters that often also include works of art. These shelters are usually more attractive and/or provide better facilities and amenities than standard bus shelters. Examples are for premium services such as light rail, Rapid Bus, and BRT, and where special stop facilities are desired as part of a streetscape or development project.

Special Purpose Shelters generally fall into one of two categories:

1. Custom shelters designed and constructed by developers as part of development projects. These are often one-of-a-kind designs that are intended to compliment the design of the development.
2. Unique designs intended to differentiate premium services from regular services. In most cases, these special purpose designs used in multiple locations.

Phoenix

Phoenix typically requires developers to construct bus shelters to serve major developments. These shelters are designed and constructed by the developers, who also pay all costs. The first custom shelters were implemented along Central Avenue in the late 80’s and early 90’s, and several office towers have included shelters that complement their architecture (see Figure 7-6).

Figure 7-6: Phoenix Developer Constructed Stop

	<p>City: Phoenix Type: Developer constructed Location: NEC Thomas & Central Cost: Not Known Constructed in: Early 1990’s</p>
---	--

In addition, Valley Metro has implemented a premium type of express bus service called Rapid Bus that provides better and more visible stop facilities than “regular” bus service. As shown in Figure 7-7, Rapid Bus stops are specially designed and include ticket machines, solar lighting, a “wave” bench, and canopy. To date, Phoenix has 14 Rapid Bus stops that use this design.

Figure 7-7: Phoenix Rapid Bus Stop

	<p>City: Phoenix Type: Rapid Bus Location: 14 locations served by Rapid Bus Cost: \$75,000 (includes ticket vending machines and solar lighting, but not installation) Constructed in: 2003</p>
---	---

Mesa

Mesa has constructed 26 Custom-BRT shelters along its LINK BRT that serves as an extension of METRO light rail service between the Sycamore light rail station and the new Power Road Transit Center. Most LINK stops have a standard design identifying them with LINK, and a unique feature is that a tree is installed the ends for shade (see Figure 7-8).

Figure 7-8: Mesa Special Purpose Stops

	<p>City: Mesa Type: BRT Station Location: Along LINK BRT line Cost: \$80,000 to \$100,000 (depending upon site specific variables) Constructed in: 2007-2008</p>
	<p>City: Mesa Type: Main Street Streetscape Project Location: Main Street Cost: \$16,000 Constructed in: 2000-2003</p>

In addition, Mesa also developed specially designed shelters for its 2000-2003 Main Street streetscape project. These shelters, which are also shown in Figure 7-8, were designed to include what was then the city’s logo.

Scottsdale

Scottsdale has not developed specially designed bus stops that are mass produced for multiple locations. The closest that it has to specially designed shelters are variations of the “Wavelength” shelter described in the previous section. These shelters share a unique look and provide similar amenities, but are all developed individually and are unique in some respects.

Scottsdale also has a number of developer-installed bus shelters. As in Phoenix, these shelters are designed, installed, and constructed by developers as part of development projects. As illustrated in Figure 7-9, these range from very basic to very elaborate.

Figure 7-9: Scottsdale Developer Designed and Constructed Bus Shelters

	<p>City: Scottsdale Location: Scottsdale Road Cost: Unknown (paid by development as part of overall development cost.)</p>
	<p>City: Scottsdale Location: Scottsdale Healthcare Artist: Kevin S. Berry Cost: \$30,000 Other: Privately developed as part of Scottsdale Healthcare project. Constructed in: early 2000s</p>

Tempe

Tempe developed custom bus shelters for its 1980s Mill Avenue Streetscape Project (see Figure 7-10). However, only two of these are still used as bus shelters, and those that are no longer used are scheduled to be removed.

Figure 7-10: Tempe Mill Avenue Streetscape Shelter

	<p>City: Tempe Type: Mill Avenue Streetscape project Cost: Unknown (included in of overall development cost. Constructed in: 1980s</p>
---	---

STANDARD BUS SHELTERS

Most bus shelters in the Valley are simple standardized designs that are mass produced and installed at the large majority of stops. This type of shelter is the most common type largely because they provide a basic level of convenience and shelter in a cost-effective manner.

Standard bus shelters can be considered to fall within one of two categories: those without advertising and those with advertising. Those without advertising are almost always purchased, installed, and maintained by the cities in which they are located or by the area’s transit system. Those with advertising are usually provided, installed, and maintained by advertising companies in return for the advertising revenues.

The benefit, and the appeal, of the use of advertising shelters is as simple as that it reduces public costs. However, there is often community opposition to the use of shelters for advertising, usually on aesthetic grounds and because they are seen as overly commercializing the public environment. Of the five cities surveyed, Phoenix and Tucson use advertising to defray costs, while Mesa, Scottsdale, and Tempe do not.

Phoenix

Phoenix has approximately 2,400 stops with standard bus shelters: 1,400 without advertising and 1,000 with advertising. The stops with advertising include it either on one of the shelter’s end panels or on a freestanding kiosk (see Figure 7-11). The advertising shelters were purchased, installed, and are maintained by the advertising company, but with ownership

subsequently turned over to the city. (Note that these are the same shelters—both with and without advertising—that are used in Peoria.)

Figure 7-11: Phoenix Standard Bus Shelter

	<p>City: Phoenix Type: Without advertising Cost: \$5,000</p>
	<p>City: Phoenix Type: With advertising inside shelter Cost to city: \$0</p>
	<p>City: Phoenix Type: With advertising on free standing kiosk Cost to city: \$0</p>

Mesa, Scottsdale, And Tempe

Mesa, Scottsdale, and Tempe all currently use a similar standard non-advertising shelter, with slight differences in color, size, and other features. These shelters have metal-pitched roofs and metal columns (see Figure 7-12). The shelters also include flip benches, trash cans,

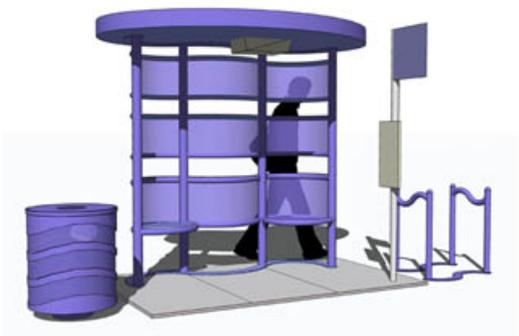
schedules, bus stop signs, and bike racks. In Scottsdale, this design is being used to replace older shelter types.

Figure 7-12: Mesa, Scottsdale, and Tempe Standard Shelters

	<p>City: Mesa Type: Without advertising Cost: \$15,000 w/ 1 bench); \$25,000 w/ 2 benches (including installation)</p>
	<p>City: Scottsdale Type: Without advertising Cost: \$24,000 (including installation)</p>
	<p>City: Tempe Type: Without advertising Cost: \$8,200 (not including installation)</p>

Finally, and more recently, Mesa has been considering a new smaller shelter that could be used either at special locations or throughout the city. Designs have been developed (see Figure 7-13), but none have yet been constructed.

Figure 7-13: Potential New Mesa Standard Shelter

	<p>City: Mesa Type: Potential new design Location: To be determined Artist: Mary Lucking Cost: To be determined Constructed in: None to date</p>
---	---

Tucson

Tucson uses both advertising and non-advertising standard shelters. The non-advertising design was designed by an architect about 20 years ago and has proven to be distinctive, functional, and requires little maintenance (see Figure 7-14).

Figure 7-14: Tucson Special Purpose Shelter

	<p>City: Tucson Type: Without advertising Cost: \$4,000 - \$6,000</p>
	<p>City: Tucson Type: With advertising Cost to city: \$0 (or \$8,200 without advertising)</p>

Tucson also uses advertising shelters that are purchased, installed, and maintained by an advertising company (ATA). For these shelters, the advertising company created a unique design for Tucson by incorporating a saguaro cactus into a standard bus shelter. Recently, the city has also started purchasing these shelters on its own and has begun installing them without advertising as an alternative to the older-style non-advertising shelters.

DESIGN/CONSTRUCTION COSTS

Design and construction costs vary greatly for different types of shelters and stop facilities. For the five peer cities, the lowest costs, not surprisingly, were for standard bus shelters. However, the highest costs were for special purpose stops such as Rapid Bus and BRT. Costs for Art Shelters fell in the middle:

Art Shelters: Capital costs for art bus shelters range widely generally depending upon how elaborate the stop is, and the examples cited in this document range from \$12,000 to \$60,000 (see Table 7-1). (However, note that many of the lower cost shelters were constructed in the 1990s.) Most of the art shelters were funded using “percent for the arts” funds.

Special Purpose Stops: Capital costs for special purpose bus shelters range widely (see Table 7-1). Those developed for Mesa’s Main Street streetscape project cost \$16,000 each (in 2000-2003). Recent stops developed for Rapid Bus and BRT services have been significantly more substantial and have ranged in cost from \$75,000 to \$100,000 per stop.

Standard Stops: Capital costs for standards stops range from \$0, for stops with advertising that are purchased, installed, and maintained by advertising companies, to \$25,000 for attractive stops with a modest level of amenities.

Table 7-1: Bus Shelter/Stop Capital Costs¹

	Art Stops	Special Purpose	Standard
Phoenix	\$20,000 - \$60,000	\$75,000 (Rapid Bus)	\$0 - \$5,000
Mesa	\$25,000 - \$40,000	\$16,000 - \$100,000	\$15,000 - \$25,000
Scottsdale	\$28,000 - \$48,000	NA	\$24,000
Tempe	\$12,000 - \$33,500	Unknown	\$8,000
Tucson	\$15,000 - \$30,000	NA	\$4,000 - \$6,000

¹ Note that there are inconsistencies between costs, especially with respect to installation. Lower costs do not include installation, while higher costs usually do.

MAINTENANCE COSTS

As is the case, with capital costs, maintenance costs vary significantly. Also, the ways in which different cities handle bus stop maintenance vary widely:

Phoenix’s total cost for routine maintenance of shelters is approximately \$1.8 million per year, or approximately \$1,300 per shelter. In addition, the city budgets \$60,000 per year for repair of all of its artwork, which includes the Art Bus Shelters.

Mesa budgets \$150,000 to \$200,000 for all shelters, including art shelters and BRT shelters, per year, or approximately \$700 to \$900 per shelter.

Tempe: Maintenance costs for Tempe’s bus shelters were not available. However, costs for routine maintenance such as trash pickup and power washing is covered in the city’s maintenance budget. Costs for repair of Art Bus Stops are covered through the city’s art budget.

Scottsdale had originally planned to contract with an outside firm for bus stop maintenance at a cost of \$108,000 per year, or approximately \$540 per stop. Instead, the city decided to do the work internally, which requires one employee and a total budget of \$70,000 per year, or \$350 per stop.

Tucson contracts with ATA, which is the company that provides and maintains the advertising shelters, for all of its routine shelter maintenance. The cost is approximately \$550 per year per location. In addition, Tucson budgets an additional \$720 per year for each of its 25 art shelters.

Given the differences in how shelter maintenance is accounted for the by different communities, it is difficult to determine a precise annual maintenance costs by type of shelter. However, based on the information available, approximate ranges are as shown in Table 7-2.

Table 7-2: Maintenance Costs (Annual)

Shelter Type	Annual Cost
Art Bus Shelters	\$700 - \$1,200
Special Purpose (Rapid Bus and BRT)	\$550 - \$1,200
Standard	\$0 (w/advertising) - \$900 (w/o advertising)

PROCESS FOR INCORPORATING ART

Cities use a variety of different processes for incorporating art into bus stops. For Art Bus Stops, the typical practice is to issue a Request for Proposals (RFP) that covers the design, fabrication, and installation for each individual location. Special purpose stops that are part of larger projects—for example streetscape, Rapid Bus, and BRT projects—are typically designed

as part of the overall project, and then constructed as part of the overall project. Art is incorporated into standard stops as part of a new standard design for a community, or as in the case of Tucson, by modifying an existing design to include art.

OTHER FINDINGS

The five cities also provided additional advice and information based on their experience:

- Public reaction to art bus shelters is mostly positive, as they add a distinctive character to the areas where they are constructed.
- Vandalism is typically not a problem with art shelters as they are usually located in visible areas and are used daily.
- Many communities are using solar or LED lighting to reduce electric costs. In Tucson, thin film solar panels are being used on bus shelters in Tucson as opposed to thicker hard panels, which are more easily stolen.
- Standard materials should be used to reduce repair and replacements costs. In addition, all materials should be well documented.
- Standard materials that are high quality will last much longer than less expensive which will not have to be replaced as often.
- All shelter colors and materials should be well documented, especially for art bus shelters, to mitigate part replacement time.
- Rusted metal, which is a popular material for art shelters, needs to be coated to prevent it rubbing off on riders.
- Shelters should not be placed too close to lawn or irrigation sprinklers as any overspray would deteriorate the material.
- Water harvesting can be considered to cut down on the irrigation costs on much desired landscaping at bus shelters.

SUMMARY

As described above, other cities in the Valley, and Tucson, integrate artwork into their shelters in a number of ways, and these include one-of-a-kind art shelters, as well as art elements in designs that are used in multiple locations. All of the cities that were surveyed have had very favorable reactions to the use of art at bus stops, especially among those who live and work in the areas served by art bus stops.

Costs and practices vary significantly. However, representative costs are as follows:

Capital Costs

Art Bus Shelters	\$20,000 - \$60,000; \$40,000 is approximate 2010 cost
Special Purpose Shelters	
Rapid Bus & BRT	\$75,000 - \$100,000
Other	\$10,000 - \$25,000
Standard Bus Shelters	\$4,000 - \$25,000 (lower costs w/o installation; higher costs w/installation)

Maintenance Costs (Annual)

Art Bus Shelters	\$700 - \$1,200
Special Purpose Shelters	\$700 - \$1,200
Standard Bus Shelters	\$0 (with advertising) - \$900 (w/o advertising)

PROPOSED PEORIA APPROACH

Based on the review of bus stop practices in other communities, and Peoria’s desire to improve bus stops and incorporate artwork into major stops, the following design principles were adopted:

1. Stops should be located in convenient, comfortable, and safe locations.
2. Bus stops should be visible and easily identifiable.
3. Bus stops should provide information that informs riders where buses serving the stop go and at what times.
4. Bus stops should have good pedestrian links to the areas that they serve.
5. Bus stops should be well integrated with their surroundings.
6. Stops should provide basic amenities to make the wait comfortable.

In all areas, different stops serve different purposes and volumes of passengers. It is accepted that the most important stops need to be well designed, attractive, comfortable, and convenient. However, much less planning and fewer resources are directed to the design of other stops, with the result that they are often located in inconvenient locations and/or provide fewer amenities than may be warranted.

For a number of reasons—particularly cost—it is not practical to provide all amenities at all stops. Typically, more extensive amenities are provided at the busiest locations (for example, transit centers), and only basic amenities (such as bus stop signs) are provided at very low volume stops. In Peoria, most bus stops can currently be characterized as one of two types:

1. **With Shelter:** Most Peoria bus stops provide the standard Phoenix advertising shelter (see Figure 7-15). All stops with shelters provide seating within the shelter, and have paved waiting areas. Most have a bus stop sign that identifies the routes that serve the stop, and most also have a trash can. All also have advertising, either on one wall of the shelter or on a free standing triangular pylon.

2. **Without Shelter:** Stops without shelters often consist simply of a bus stop sign that identifies the route that serves the stop. A few of these stops also provide a bench.

Figure 7-15: Peoria Bus Stops: With and Without Shelter



Source: Nelson/Nygaard

Rather than determine which amenities should be provided at which stop on a stop-by-stop basis, these standards are based on a more systematic approach that consists of a hierarchy of stops based on relative importance. The level of amenities that should be provided is then based upon that hierarchy. For example, basic stops that serve relatively few riders would consist simply of a bus stop sign with bus route information, and if possible, a paved waiting area pad, lighting, and a trash receptacle. At the other end of the spectrum, major regional portals would be uniquely designed, and would include a full range of amenities including local area information and real-time passenger information.

BUS STOP HIERARCHY

At the present time, transit service in Peoria is limited, and thus a relatively small hierarchy would be appropriate. However, as the city, and its transit services grow, a larger hierarchy would be more apt. The recommended approach includes:

Short-Term

- **“Signature” Art Stops:** Stops in key high visibility locations where design is particularly important and/or can contribute to the vitality and character of the area. Examples would be at the Peoria Sports Complex and at the Peoria Performing Arts Center. These stops would have custom art installations such as those that were shown in Figure 7-1.
- **“Standard” Art Stops:** Stops in prominent locations that would have artwork built into the design of the stop (for example, as was shown in Figure 7-28). These stops would be smaller in scale than the Signature Stops, with artwork incorporated into a standard design (as opposed to the custom designs for the Signature Stops).
- **Regular Stops:** Most stops—those that would not be Signature Stops, Standard Art Stops, or low volume stops. These stops would provide a basic set of amenities,

including shelters. As in Tucson, artwork could be incorporated into the design of the standard shelter.

- **Low Volume Stops:** Stops that serve very few riders and that are provided largely to ensure comprehensive service coverage. These stops would have limited facilities.

Mid to Long-Term

- **Transit Centers:** Transit centers, such as the proposed Old Town Transit Center, can act as a focal point for local and regional transit services, and typically handle high volumes of passengers. These facilities would include similar elements as Signature Stops, plus additional passenger amenities.
- **HCT Stops:** High capacity transit stops would consist of specially designed “stations” that would be designed to be consistent with stations constructed for other Valley high capacity transit services such as commuter rail, and possibly light rail, BRT, and Rapid Bus (see Figure 7-16 and Figure 7-17).

Figure 7-16: Phoenix Light Rail Station



Figure 7-17: Mesa BRT Station



With this type of a hierarchy, different amenities could be defined for each type of stop. The proposed hierarchy and associated facilities and amenities are presented in Table 7-3.

Table 7-3: Station and Stop Classifications and Associated Amenities

	Transit Centers	HCT Stops	Signature Art Stops	Standard Art Stops	Regular Stops	Low Volume Stops
Station/stop signage	√	√	√	√	√	√
Lighting	√	√	√	√	√	√
Seating	√	√	√	√	√	√
Paved, accessible area	√	√	√	√	√	√
Bus berths/pullout(s)	√	√	√	√	√	
Standard shelter w/o Art					√	
Standard shelter w/ Art				√		
Custom shelter(s) w/ Art	√	√	√			
Bike rack or enclosure	√	√	√	√	√	
Route map(s)	√	√	√	√	√	
Trash can	√	√	√	√	√	
Transit system map	√	√	√			
Schedule information	√	√	√			
Real-time schedule info	√	√				
Ticket vending machines	√	√				
Unique design	√	√				
Landscaping	√	√				
Public art	√	√				
Passenger drop-off area	√	Possible				
Local area info/maps	√	Possible				
Enclosed waiting area	Possible					
Restrooms	Possible					

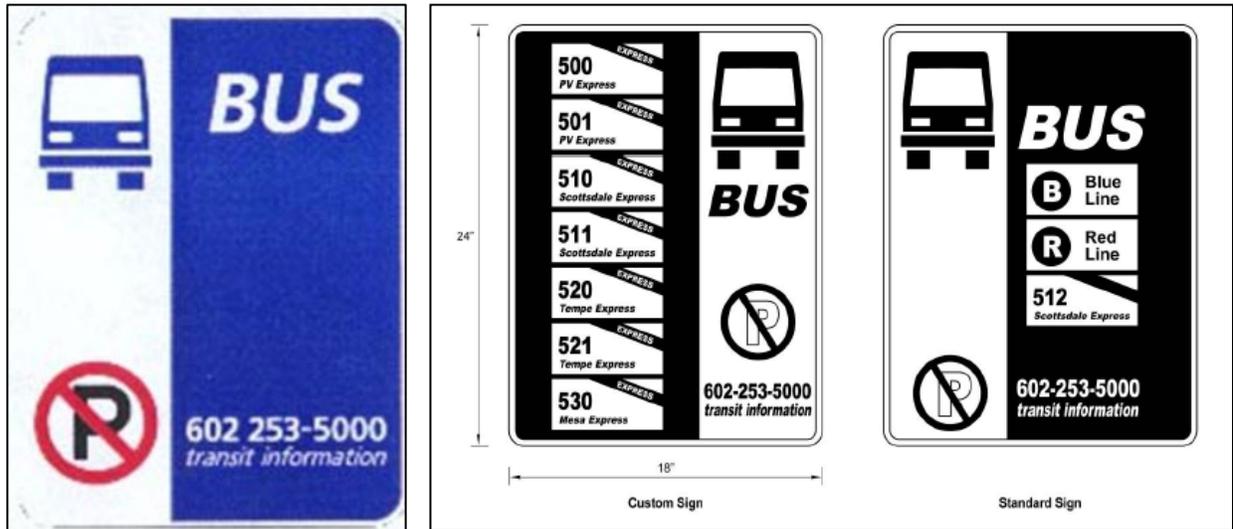
Examples of how each of these elements should be implemented are provided in the following sections:

BUS STOP SIGNS

Bus stop signs are the most basic element of a bus stop. Bus stop signs should present a uniform look that identifies the stop and associated services. It should present basic information such as route numbers and names, the direction of the routes, and a phone number to call for additional information. All stops should have a bus stop sign.

Valley Metro uses one of two bus stop designs for all of its bus stops throughout its service area. For regional consistency, all new or upgraded stops in Peoria should continue to use these designs (see Figure 7-18).

Figure 7-18: Valley Metro Bus Stop Signs



Source: RPTA

SCHEDULE INFORMATION

The provision of schedule information can help reduce some of the uncertainty associated with taking a bus, as it helps to inform people whether they are at the right place at the right time, and when buses are scheduled to come. At lower volume stops, this information can be mounted on the bus stop pole (see Figure 7-19). At higher volume stops, more extensive information can be mounted in shelters, on walls, and on freestanding signs. It would be desirable for all stops to provide schedule information.

Figure 7-19: Schedule Information



Source: www.commuterpage.com

PAVED & ACCESSIBLE WAITING AREAS

Wherever possible, stops should have a paved waiting area where riders can sit or stand while waiting. In most cases, bus stop waiting pads can be sidewalks. They should be accessible to persons with a disability and ideally should be relatively flat. There should be adequate room on the waiting area for a bus to extend its wheelchair ramp and for wheelchair users to navigate their chairs onto the ramp. Bus stop waiting pads can be defined through the use colored or stylized pavers. (Nearly all stops in Peoria do have paved waiting areas.)

RPTA recommends that the pad be eight-by-eight to allow a bus operator to easily position a wheelchair ramp. It is also recommended, although not required, that bus stops in areas with sidewalks that are less than eight feet wide or with sidewalks separated from the curb be upgraded to meet the minimum clear area.

BUS PULLOUTS

Bus pullouts provide an area for buses to pull out of the traffic flow to stop (see Figure 7-20). Bus pullouts have both advantages and disadvantages in that they can be helpful for overall roadway operations, but can cause delays for transit passengers because the bus must exit and re-enter the traffic stream. To balance the advantages and disadvantages, bus pullouts are most often used on higher speed roadways and at stops with higher passenger volumes.

Figure 7-20: Bus Pullout



Source: Nelson\Nygaard

SEATING

Seating should be provided wherever possible. Benches are the most typical type of seating, but alternatives such as low walls or bollards can also be used. The most effective seating provides shelter from the elements, but where this is not feasible, seating can sometimes be placed under trees or large bushes to provide some shelter. At stops with shelters, the seating

should be provided within the shelter (see Figure 7-21). Benches also present an opportunity to integrate art into the bus stop, or to generate advertising revenues.

Figure 7-21: Bus Stop Seating



Source: *Proposed Bus Stop and Bus Shelter Policy & Guidelines, Manukau, NZ.*

LIGHTING

At night, passengers will feel much more comfortable waiting at a bus stop if it is lit. In most urban settings, stops can be sited at locations that are lit through other sources, such as streetlights, or lighting from nearby businesses. It is also possible to provide lighting at the stop itself, either via solar mounted lights or within shelters (see Figure 7-22).

Figure 7-22: Bus Stop Lighting



Source: *left photo: www.fairfaxcounty.gov; right photo: unknown*

TRASH RECEPTACLES

Trash receptacles provide a convenience for waiting riders, and help to reduce the amount of trash left on buses and on the street. Trashcans should be within easy reach of the bus stop waiting area, but not block sidewalk traffic or pedestrian access to buses. If the stop has a shelter, the trash receptacles can be integrated with the shelter. In busier areas (and where pick-up is scheduled on a regular basis), a recycling receptacle can also be provided to collect newspapers and/or bottles and cans. Trash receptacle design should be consistent with the design of the other bus stop furniture and amenities (as is currently the case in Peoria).

SHELTERS

Shelters provide shelter for waiting passengers, and help to identify stop locations (see Figure 7-23). Aside from buses, they are one of the most visible elements of the transit system. As such, attractive and well designed shelters can help to provide a strong positive image, and also publicize the availability of transit.

Figure 7-23: Bus Stop Shelters (Peoria and Mesa)



Source: Left photo: Nelson\Nygaard; right photo: The Sherman Group

Shelters can be designed in an unlimited number of ways, and can range from simple off-the-shelf designs to complex custom designs. Shelters, as their name implies, should shelter passengers from the elements, including the summer sun, and to do this they should have at least two walls. They should also provide seating and clear areas for wheelchairs. Similar to benches, shelters present an opportunity to integrate art into the bus stop, and/or generate advertising revenues.

In addition, bus shelters should provide a clear line of sight to approaching buses. For security reasons, they should also provide additional lines of sight, as it is safer for people waiting at stops to be seen from multiple angles.

SYSTEM AND LOCAL AREA MAPS

Transit system maps can be installed on the sides of bus shelters or on free-standing signs. They provide regional transit information, and can help orient bus riders who are unfamiliar with the area. The simplest approach is to install full system maps (see Figure 7-24). However, a more customized approach (that is more difficult to administer and maintain) is to provide locally specific maps, or both.

Figure 7-24: System Maps



Source: left photo: LAMTA; right photo: Jason McHuff

REAL-TIME PASSENGER INFORMATION

Real Time Passenger Information informs passengers when buses will actually arrive or depart from stations, which reduces some of the uncertainty that is often associated with bus service (see Figure 7-25).

Figure 7-25: Real Time Passenger Information at Bus Stops



Source: TCRP

(Note also that while the above refers to real-time information that is displayed at stops via variable message signs, real-time information can also be provided system-wide via the internet and cell phones.)

BICYCLE RACKS

Bicycle racks help to provide an additional way for passengers to access bus service. Bike racks can range from very basic to whimsical shapes that act as a type of public art (see Figure 7-26).

Figure 7-26: Bicycle Racks (Standard and Art Bike Rack)



Source: left photo: CycleSafe; right photo: www.bikingbis.com

ART

The inclusion of art into bus stops can make them much more attractive, improve the character of the surrounding area, accentuate area themes, and make transit more appealing. There are a wide variety of ways that artwork can be incorporated into transit stops. These include:

- Development of the entire stop as a piece of art.
- Incorporation of artwork into a standard bus stop/bus shelter design that is used throughout the system.
- Installation of artwork at standard bus stops.

In the Phoenix area, and throughout the world, many communities have developed entire stops as works of art. Two Phoenix area examples are shown in Figure 7-27.

Figure 7-27: Art Bus Stop (Scottsdale and Tempe)



Source: Artist-Kevin Berry/Artist-Joe Tyler

A second approach is to incorporate art into the design of standard shelters. For example in Tucson, a Saguaro cactus theme has been incorporated into the standard shelters used throughout most of the system (see Figure 7-28). Neighborhood or business interests can also develop designs reflect the character of the district.

Figure 7-28: Tucson Saguaro Cactus-Themed Shelters



Source: City of Tucson

Valley Metro supports the integration of art into bus stops, but the RTPA standards emphasize that “custom-designed passenger waiting areas should not obscure identification of the bus stop. Transit agency bus stop signs and schedule displays should be available at these types of bus stops. The functionality of the stop should not be compromised in the name of art—the stop should provide as much patron comfort, safety, and security as possible.”

LANDSCAPING

Attractive landscaping and public art can add aesthetic quality to the bus stop and make waiting a more pleasant experience at higher-volume stops (see Figure 12). They also offer an opportunity to involve communities in the creation and maintenance of bus amenities that reflect the local community.

Figure 12: Well-Landscaped Bus Stops



Source: left photo: unknown; right photo: bustopart.tribe.net/photos.

BUS STOP ART SELECTION PROCESS

To implement art at bus stops, the following process and guidance is recommended:

1. Develop Stakeholder Group.

The city's Art Commission should develop a stakeholder group that will guide where and how artwork should be incorporated into bus stops. This stakeholder group could be comprised of:

- A. Members of the Peoria Arts Commission.
- B. Artists from the local community who have previously developed art bus stops in the greater Phoenix area.
- C. Members of other Peoria commissions and boards that have an interest in the process; for example, the Economic Development Advisory Board; Central Peoria Revitalization Plan Advisory Committee; Historic Preservation Commission; Peoria Sports Complex Area Urban Design Plan Project Advisory Committee; and Parks and Recreation Commission.
- D. Interested citizens.

2. Develop Site Selection Criteria.

Once formed, the stakeholder group will develop criteria for where artwork should be incorporated into bus stops. These will be locations such as:

- High ridership stops (for example, the planned Old Town Transit Center).
- Tourist/visitor attractions (for example, the Peoria Sports Complex).
- Cultural Centers (for example, the Peoria Center for the Performing Arts).
- Historic areas (for example, Old Town).
- Major shopping areas.
- Schools (for example, Peoria High School).
- Medical centers.
- Major entry points into Peoria (for example Peoria Avenue at 67th Avenue).
- Other major activity centers (for example, city hall, and Sunrise Mountain Library).

3. Identify Specific Locations and Themes and prioritize stops.

Once the site selection criteria have been developed, the stakeholder group will identify specific sites, the proposed type of art stop (i.e., whether the stop should be a Signature Art Stop or a Standard Art Stop). As appropriate, the stakeholder group will also recommend themes for specific locations (for example, a sports theme for stops at the Peoria Sports Complex).

4. Prioritize stops.

Based on the amount of funding that is expected to be available through the Percent for the Arts program, the stakeholder group will set priorities and recommend implementation timeframes.

Once the stakeholder group has identified the specific locations, the type of stop, and recommended priorities, the Department of Public Works will then work with the Arts Commission to implement the improvements. There will be two types of art bus stops: (1) Signature Art Stops that will be uniquely designed, and (2) Standard Art Stops that will be based on a standard design that incorporates art. For all Signature Art Stops, the city will utilize a Request for Qualification (RFQ) process similar to those used by other area communities. An example RFQ from Santa Clarita, CA is included in the “City of Peoria, Bus Stop Design Standards,” document (June 2010) and additional information on the process that will be used is presented in the “Call for Artists Resource Guide,” which was developed by the Public Art Network (and is available at: www.artsusa.org/pdf/networks/pan/CallforArtistsGuide.pdf)

For Standard Art Stops, with input from the stakeholder committee, the Department of Public Works will work with the Arts Commission to solicit ideas and develop the standard design.

CHAPTER 8 RECOMMENDATIONS

In summary, this study has examined a large number of improvements, including:

- New local circulator services.
- The extension of Valley Metro services further west into Peoria.
- The development of High Capacity Transit (HCT) services such as light rail and Bus Rapid Transit (BRT).
- The development of an Old Town Peoria Transit Center.
- Improvements to bus stops, including the incorporation of art into major stops.

As part of the evaluation of these potential improvements, a number of priorities and conclusions emerged:

- Transit services in Peoria should be well integrated with the regional transit system, and to accomplish this, it is more important to extend Valley Metro services into Peoria than to develop purely local circulator services.
- For existing and new services, it is important to provide “full” rather than only limited service (at the present time, only half of existing Route 106 Peoria/Shea weekday service, and no Saturday or Sunday service, operates through Peoria).
- Peoria Dial-A-Ride service needs to be maintained, and to do this, local revenues should be used to offset cuts in state funding.
- Bus stop facilities should be improved, and artwork should be incorporated into major stops.
- An Old Town Transit Center should be developed on 83rd Avenue between Grand Avenue and Peoria Avenue.
- High Capacity Transit will not be feasible in the foreseeable future, as projected population and employment levels and densities will not be sufficient to support cost-effective service.

These priorities and conclusions, and available funding levels, were used to develop the project’s recommendations, which are presented for the short-term (2011 to 2015), the mid-term (2016 to 2026), and long-term (beyond 2026). Based on current funding projections, a combination of local transportation sales tax, Prop 400, and federal funding is available for the short and mid-term recommendations. Recommended long-term improvements, due to uncertainties about which areas of Peoria will develop at what rate, are more generalized. Also, because implementation of those projects will occur beyond the end of the Prop 400 program, funding for those projects will need to be identified at the time plans are being made for a successor to the Prop 400 program.

SUMMARY OF RECOMMENDATIONS

As described in more detail below, the following services and facilities are recommended:

Short-Term (2011 to 2016)

- Use local funding to maintain Peoria Dial-A-Ride service.
- Use local funding to maintain Grand Avenue Limited service.
- Improve Route 106 Peoria service.
- Improve bus stops.

Mid-Term (2016 to 2026)

- Develop Old Town Transit Center/Park and Ride.
- Extend Route 138 Thunderbird into Peoria.
- Implement new Route 83 83rd Avenue local route.
- Continue to improve bus stops.

Long-Term (Beyond 2026)

- Extend Valley Metro's local bus grid service into much of Peoria.
- Extend service to northern areas.
- Develop new park and ride lots.
- Support development of Grand Ave commuter rail.

SHORT-TERM RECOMMENDATIONS (2011 – 2015)

The project's short-term recommendations are aimed at using available revenues to offset cuts in state and regional funding to maintain existing services, to provide a full level of service on the city's only existing Valley Metro local route, and improve facilities (see Figure 8-1 and Table 8-1):

1. Maintain Peoria Dial-A-Ride Service.
2. Expand Route 106 Peoria/Shea service.
3. Maintain Grand Avenue Limited service.
4. Improve bus stop facilities.

MAINTAIN PEORIA-DIAL-A-RIDE SERVICE

Peoria had been using state Local Transportation Assistance Fund II (LTAF II) revenues to fund most of the costs of its Dial-A-Ride service. This funding has been eliminated, to continue service, and the city should use local sales tax revenues to maintain service. The cost to maintain service will be \$1.0 million per year.

Figure 8-1: Short-Term Recommendations: Route 106 Peoria/Shea & Grand Ave Limited



Table 8-1: Short-Term Recommendations: Ridership, Costs, and Funding Sources

Program	Ridership/ Month	Annual Operating Cost	Capital Cost	Funding Source
Maintain Dial-A-Ride	2,600	\$1.0 m	\$0.0	Peoria Sales Tax
Expand Route 106 Peoria Service	8,460	\$125,000	\$0.0	Prop 400
Maintain Grand Avenue Limited Service	800	\$12,500	\$0.0	Prop 400
Improve Bus Stops	--		\$100,000 - \$200,00/yr <i>(over 2-3 yrs)</i>	Peoria Sales Tax

EXPAND ROUTE 106 PEORIA/SHEA SERVICE

At the present time, approximately half of Route 106 Peoria/Shea weekday service, and all weekend service, terminates at Peoria Avenue at 67th Avenue, which means that only half of weekday service, and no weekend service, operates through Peoria. In the short-term, the city should use available Prop 400 revenues to extend all Route 106 service into Peoria. This would provide service:

- On weekdays, every 30 minutes on weekdays (instead of every 60 minutes) from approximately 4:30 am to 9:30 pm.
- On weekends, every 30 minutes from approximately 6:00 am to 10:00 pm.

Because of recent reductions elsewhere, RPTA has available buses, and there will be no associated capital costs. Annual operating costs will be approximately \$125,000 per year.

MAINTAIN GRAND AVENUE LIMITED SERVICE

Valley Metro’s Grand Avenue Limited provides limited stop commuter service between El Mirage and Phoenix, largely along Grand Avenue, with a stop in Old Town Peoria. The route is partially funded by the communities that it serves and some of that funding is being reduced. To preserve service at present levels, Peoria should allocate some of its available Prop 400 funding to maintain service at three AM inbound and three PM outbound trips. The cost to maintain this service will be approximately \$12,500 per year.

IMPROVE FACILITIES AT HIGHER VOLUME BUS STOPS

Better bus stop facilities can make the use of transit much more comfortable, and improve the aesthetics and character of the areas in which they are located. The city should work over time to improve bus stops as described in Chapter 7. It is recommended that over the next two to three years that the city spends \$100,000 to \$200,000 per year of local sales taxes revenues on bus stop improvements.

MID-TERM IMPROVEMENTS (2016 - 2026)

Over the mid-term, transit demand will grow, and mid-term recommendations are aimed at maintaining the short-term services, extending Valley Metro's Route 138 into Peoria, implementing new local service on 83rd Avenue, and developing a new Old Town Transit Center, and continuing the bus stop improvement program (see Figure 8-2 and Table 8-2).

EXTEND ROUTE 138 THUNDERBIRD THROUGH PEORIA

Route 138 Thunderbird, which now operates between the Paradise Valley Mall and the Peoria/Glendale line, should be extended through Peoria along Thunderbird Road. Service will be provided:

- On weekdays, every 30 minutes on weekdays from approximately 5:00 am to 10:00 pm.
- On weekends, every 60 minutes from approximately 6:00 am to 9:00 pm.

Because of recent reductions elsewhere, RPTA has available buses, and there will be no associated capital costs. Annual operating costs will be approximately \$250,000 per year.

DEVELOP NEW ROUTE 83 83RD AVENUE LOCAL ROUTE

The expansion and extension of Routes 106 Peoria/Shea and 138 Thunderbird will improve east-west service in Peoria and connections to the rest of the Valley. The development of a new Route 83 83rd Avenue local route will provide north-south service through the core of Peoria from Arrowhead Mall to Phoenix via the Peoria Sports Center, Old Town, and Glendale. This service will operate:

- On weekdays, every 30 minutes on weekdays from approximately 5:00 am to 10:00 pm.
- On weekends, every 60 minutes from approximately 6:00 am to 9:00 pm.

Annual operating costs will be approximately \$1.0 million per year for the Peoria portion of the route, and will be funded with programmed Prop 400 funds.

Figure 8-2: Mid-Term Recommendations: Routes 83 & 138 and Old Town Transit Center



Table 8-2: Mid-Term Recommendations: Ridership, Costs, and Funding Sources

Program	Ridership/ Month	Annual Operating Cost	Capital Cost	Funding Source
Extend Route 138 through Peoria	6,200	\$250,000	\$0.0	Prop 400
Develop New Route 83 83 rd Ave Route	27,200	\$1,000,000 <i>(Peoria service)</i>	\$0.0	Prop 400
Old Town Transit Center	TBD	\$70,000	\$8.0	Prop 400 and federal funds
Continue to Improve Bus Stops	--		\$80,000/yr <i>(average)</i>	Peoria Sales Tax

DEVELOP OLD TOWN TRANSIT CENTER/PARK AND RIDE LOT

To provide a focus for transit services in Peoria, to provide parking for carpoolers and vanpoolers, and to serve future Grand Avenue commuter rail service, a transit center should be developed in Old Town. As described and illustrated in detail in Chapter 6, this transit center would be integrated with and support the city’s Old Town revitalization plans, and would be located north of Grand Avenue at the intersection of 83rd Avenue and Peoria Avenue. The Old Town Transit Center would cost \$8.0 million to construct and would be funded with programmed Prop 400 funds and federal funds. Annual operating cost would be approximately \$70,000 and would be funded with local sales tax revenues.

IMPROVE BUS STOP FACILITIES

As in the short term, the city should continue to improve bus stops. It is recommended that between 2016 and 2026 the city spend an average of \$80,000 per year of local sales tax revenues to improve bus stops. Part of this spending will be for the development of new bus stops for the extension of Route 138 Thunderbird through Peoria and for the new Route 83 83rd Avenue.

LONG-TERM IMPROVEMENTS (BEYOND 2026)

Beyond 2026, as Peoria continues to develop, and as development moves northward, transit services and facilities should also be extended northward (see Figure 8-3). Given the uncertainties involved in how this development will occur—in terms of which areas will develop first and more intensely and potential funding availability—recommendations for beyond 2026

are necessarily more general than those through 2026. However, the following types of improvements will be desirable:

- Additional local bus service improvements to extend Valley Metro’s grid system into much of Peoria, including northern areas.
- New express routes from northern areas, with specific routes determined based on future growth patterns.
- New park and ride lots, at locations to be determined based on growth.
- Grand Avenue commuter rail between Wittmann and downtown Phoenix via Peoria in the Grand Avenue corridor (as described in Chapter 3).

Operating and capital costs would depend upon the specific services and facilities that would be developed, and funding will need to be identified for these services as they are developed.