TABLE OF CONTENTS

1.0 Introduction ........................................................................................................................................ 1
2.0 Transit Service Options ..................................................................................................................... 2
  2.1 Microtransit ...................................................................................................................................... 2
  2.2 Neighborhood Circulator .................................................................................................................. 2
  2.3 Local Bus ......................................................................................................................................... 5
  2.4 Express Bus ...................................................................................................................................... 8
  2.5 Limited Stop Bus .............................................................................................................................. 10
  2.6 Other Service Options ..................................................................................................................... 12
3.0 Operating Assumptions ....................................................................................................................... 13
4.0 Cost Estimates ..................................................................................................................................... 14
  4.1 Capital Cost Estimates ..................................................................................................................... 14
  4.2 Operating Cost Estimates ................................................................................................................ 14
5.0 Next Steps ........................................................................................................................................... 15

TABLE OF FIGURES

Figure 1. Circulator Options ..................................................................................................................... 4
Figure 2. Improvements to Existing Local Service .................................................................................. 6
Figure 3. Local Route Extensions ......................................................................................................... 7
Figure 4. Express Bus Option .................................................................................................................. 9
Figure 5. Limited Stop Bus Option .......................................................................................................... 11

LIST OF TABLES

Table 1. Average Charter Bus Pricing (GOGO Charters) ......................................................................... 12
Table 2. Operating Assumptions ............................................................................................................. 13
Table 3. Capital Cost Estimates .............................................................................................................. 14
Table 4. Operating Cost Estimates ........................................................................................................ 15
1.0 INTRODUCTION

The Northwest Sun Cities Transit Implementation Plan was initiated in December 2018 to develop a comprehensive understanding of the transportation needs of the unincorporated communities of Sun City and Sun City West. The first phase of the project documented the existing conditions in the study area. Using the key findings from that effort, a series of transit service options were developed for consideration. This technical memorandum documents the transit service options, describes the operating assumptions, and identifies capital and operating cost estimates.
2.0 TRANSIT SERVICE OPTIONS

This section documents the transit service options that have been developed for consideration. The options cover a variety of modes and service types and offer both local and regional connectivity. Each option is described in the following sections.

2.1 Microtransit

Microtransit is an emerging transit mode that offers flexible and dynamic demand-driven transportation solutions to areas with limited transit access or where traditional fixed-route service is simply not feasible. Microtransit services typically operate with a fleet of smaller vehicles (e.g., cutaway vans or buses) in defined zones, with dynamic routing based on real-time demand. Similar to Transportation Network Companies (TNCs) like Uber and Lyft, users in designated areas simply specify the details of their trips on a mobile application, and a vehicle is summoned to deliver them to their destination. Operating specifics such as service hours and coverage area can be tailored to meet the needs and/or resources of the agency (e.g., fleet availability, operating budget, etc.).

Microtransit services can address a variety of challenges, from serving low-density areas more efficiently, to upgrading or supplementing existing dial-a-ride or paratransit services, to addressing the first mile/last mile issue of fixed-route services. Microtransit services are commonly implemented by transit agencies in partnership with third-party providers that handle technology, routing, dispatch, and customer service. Service delivery models can also be customized to fit an agency’s specific need. For example, some agencies may choose to purchase the technology only and provide their own vehicles and operators. Others looking for a more turnkey solution can choose a package that includes both the technology and the drivers, vehicles, and operations management.

While there are currently no microtransit services operating in the region, Valley Metro, in coordination with the City of Glendale, will launch a microtransit pilot in 2020. While the specifics of the service have yet to be finalized, Valley Metro and its technology vendor, TransLoc, are in the process of identifying candidate services areas and defining the service parameters. As part of the pilot, Glendale will provide the vehicles and drivers and TransLoc will provide the technology, routing, dispatch, and customer service. An additional pilot program is being considered in the City of Mesa, with Valley Metro and the City recently applying for a grant through FTA’s Integrated Mobility Innovation (IMI) program. Once these pilot programs are launched, their experiences can inform how a similar program could be implemented in the Northwest Sun Cities area.

2.2 Neighborhood Circulator

Neighborhood circulator services are short, circuitous routes that connect to local activity centers and the greater regional transit network. Whereas local bus routes primarily operate along arterial roadways, neighborhood circulators focus more on local and residential streets. Neighborhood circulator routes are typically served by smaller cutaway vehicles and can charge a fare or operate fare-free. (In this region, most circulators are fare-free). Passenger stops can either be fixed, on a “flag” basis, or a combination of both.
Three neighborhood circulator alternatives were developed for consideration that serve a variety of local and regional destinations. These options are illustrated in Figure 1 and briefly described below.

- **Option 1A/1B** operates from the Banner Del Webb Medical Center in Sun City West to the Arrowhead Transit Center in Glendale primarily along the Meeker Boulevard, R H Johnson Boulevard, Dysart Road, Grand Avenue, Thunderbird Road, 99th Avenue and Bell Road corridors (note: the only difference between options 1A and 1B is the corridor used between Dysart Road and Grand Avenue; Option 1A uses Dysart Road and Waddell Road while 1B uses Grand Avenue). This option would provide connections to the regional transit network at Banner Boswell Medical Center (routes 106 and 138) and the Arrowhead Transit Center (routes 67, 83, 170, and 186).

- **Option 2** operates from the Banner Del Webb Medical Center in Sun City West to the Banner Boswell Medical Center in Sun City primarily along the Meeker Boulevard, R H Johnson Boulevard, Bell Road, 99th Avenue, and Thunderbird Road corridors. This option would provide connections to the regional transit network at Banner Boswell Medical Center (routes 106 and 138).

- **Option 3** operates from the Banner Del Webb Medical Center in Sun City West to the Arrowhead Transit Center in Glendale primarily along the Meeker Boulevard, R H Johnson Boulevard, and Bell Road corridors. This option would provide connections to the regional transit network at the Arrowhead Transit Center (routes 67, 83, 170, and 186).
Figure 1. Circulator Options

Source: Valley Metro, 2019
2.3 Local Bus

Local bus is traditional fixed-route bus service that operates on arterial roadways and features stops every quarter-mile to maximize passenger access. Two local bus scenarios were developed for consideration. These include improvements to existing services to comply with Valley Metro’s established Transit Standards and Performance Measures and the extension of two routes into the study area. These scenarios are described in the following sections.

2.3.1 Improvements to Existing Local Service

In 2016, the Valley Metro Boards adopted regional Transit Standards and Performance Measures, which established minimum recommended operating characteristics for all transit modes operating in the region. It should be noted that these standards are simply recommendations intended to deliver uniform service to passengers and there are still routes in the system that operate below the standards. However, member cities are encouraged to meet the minimum standards as they plan and implement transit improvements in their community. The two local routes operating in the study area, Route 106-Peoria Ave and Route 138-Thunderbird Rd, do not currently meet the recommended service standards for either days of operation, span or service, frequency, or a combination of all three. As such, this option would improve these routes as follows:

- **Route 106-Peoria Ave**: increase weekday frequency in the study area from 60 minutes to 30 minutes; add Saturday service for a span of 14 hours with 30-minute frequencies; and add Sunday service for a span of 12 hours with 30-minute frequencies.

- **Route 138-Thunderbird Rd**: increase Saturday and Sunday frequency in the study area from 60 minutes to 30 minutes.

The improvements to existing local bus services are illustrated in Figure 2.

2.3.2 Local Route Extensions

This option would implement the extensions of Route 138 and Route 170 identified in Valley Metro’s FY 2019 Short Range Transit Program [note: no funding has been committed for these extensions]. These extensions are briefly described below.

- **Route 138-Thunderbird Rd**: extend service 7 miles west from current terminus at Banner Boswell Medical Center to Surprise Civic Center.

- **Route 170-Bell Rd**: extend service 10 miles west from current terminus at Arrowhead Transit Center to Surprise Civic Center.

The local route extensions are illustrated in Figure 3.
Figure 2. Improvements to Existing Local Service

- **SUN CITY WEST**
  - Increase weekday frequency
  - Add weekend service

- **SUN CITY**
  - Increase weekend frequency

- **SURPRISE**

- **EL MIRAGE**

- **YOUNGTOWN**

- **PEORIA**

- **GLENDALE**

**Source:** Valley Metro, 2019
Figure 3. Local Route Extensions

Source: Valley Metro, 2019
2.4 Express Bus

Express bus routes serve commuter markets by providing peak-period, peak-direction service between suburban areas and downtown Phoenix, primarily along freeway corridors. The Route 571-Surprise Express currently operates in the study area along Grand Avenue, providing service from the Surprise Park-and-Ride at Bell Road and Grand Avenue to downtown Phoenix (note: this service does not currently stop in the study area. However, passengers can board the service at stops in the neighboring communities of El Mirage and Surprise). This option would add two inbound/outbound trips to Route 571 during weekday off-peak periods (e.g., midday or evening), to meet the desire for special event service to downtown Phoenix that was identified in the transit survey.

The express bus option is illustrated in Figure 4.
Figure 4. Express Bus Option

Source: Valley Metro, 2019
2.5 Limited Stop Bus

Limited stop bus service is a high frequency, all-day service, with limited or infrequent passenger stops to facilitate higher operating speeds. In Valley Metro’s Grand Avenue Transit Feasibility Study (2017), all-day limited stop bus service was identified as the mid-term (defined as 2026) recommendation for the Grand Avenue corridor. This option would implement limited stop bus service from the Surprise Civic Center to Downtown Phoenix via Grand Avenue.

The limited stop bus option is illustrated in Figure 5.
Figure 5. Limited Stop Bus Option

Source: Valley Metro, 2019
2.6 Other Service Options

A key finding of the transit survey was the desire for special event service to downtown Phoenix. Traditional fixed-route transit service is dependent on consistent, regular travel markets to generate the ridership necessary to sustain the service. In consideration of the anticipated level of demand and the inconsistent nature of special event scheduling, it is likely that this travel market could be served more effectively by private charter bus.

Charter bus service can be priced on a per hour, per day, or per mile basis depending on the trip details. Trips within the city where the bus is stationed are typically priced on a per hour basis. A review of publicly available information for one charter bus company (GOGO Charters) revealed average per hour/day/mile costs for both charter buses and minibuses. These costs are summarized in Table 1.

<table>
<thead>
<tr>
<th>Bus Type</th>
<th>Per Hour</th>
<th>Per Day</th>
<th>Per Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter Bus</td>
<td>$125 - $180</td>
<td>$1,300 - $1,700</td>
<td>$4.00 - $5.50</td>
</tr>
<tr>
<td>Minibus</td>
<td>$125 - $160</td>
<td>$1,200 - $1,500</td>
<td>$4.00 - $5.50</td>
</tr>
</tbody>
</table>

Source: [https://gogocharters.com/blog/charter-bus-prices/](https://gogocharters.com/blog/charter-bus-prices/)

As an example, a per passenger cost for a 5-hour rental to downtown Phoenix could be determined as follows:

**Example**: 5-hour rental to downtown Phoenix

\[
\text{Hours} \times \text{Hourly Rate} \div \text{Group Size} = \text{Cost per Passenger}
\]

\[
5 \times \$180 \div 56 = \$16.07 \text{ per passenger}
\]

**Assumptions**
- 5-hour rental
- Maximum hourly rate ($180)
- Group size = 56 (typical seating capacity for charter bus)

It should be noted that these costs are based on a single vendor and that there are numerous companies that offer charter bus service in the region. However, data indicates that a private charter bus service could potentially meet the demands for special event service at a relatively low cost per passenger.
3.0 OPERATING ASSUMPTIONS

Operating assumptions were identified for the transit service options in order to develop capital and operating cost estimates. The operating plans are based on Valley Metro’s established standards for service span, frequency, and days of operation for each respective transit mode. As the operating parameters for the microtransit option are dependent on several variables that have yet to be determined (e.g., service delivery model, service area, etc.), no assumptions were developed for this option. Similarly, the charter bus option was excluded from this exercise as that service would be delivered on-demand through a private vendor. The operating assumptions for the transit service options are summarized in Table 2.

Table 2. Operating Assumptions

<table>
<thead>
<tr>
<th>Option/Mode</th>
<th>Operating Days</th>
<th>Service Span</th>
<th>Headways</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Weekday / Saturday / Sunday</td>
<td></td>
</tr>
<tr>
<td>Neighborhood Circulator</td>
<td>Monday – Friday</td>
<td>12 hours / 0 hours / 0 hours</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Local Bus</td>
<td>Monday – Sunday</td>
<td>16 hours / 14 hours / 12 hours</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Express Bus</td>
<td>Monday – Friday</td>
<td>N/A</td>
<td>2 additional inbound trips</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 additional outbound trips</td>
</tr>
<tr>
<td>Limited Stop Bus</td>
<td>Monday – Sunday</td>
<td>16 hours / 14 hours / 12 hours</td>
<td>Scenario 1 ¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekday/weekend: 30 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Scenario 2 ¹</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekdays: 15-minute peak, 30-minute base</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weekends: 30 minutes</td>
</tr>
</tbody>
</table>

¹ Based on operating scenarios identified in Valley Metro’s Grand Avenue Transit Feasibility Study (2017)

Source: Valley Metro, 2019
4.0 **COST ESTIMATES**

This section details the capital and operating cost estimates for the transit service options. As noted previously, the microtransit and charter bus options were excluded from this analysis.

4.1 **Capital Cost Estimates**

Capital costs are the fixed, up-front costs associated with the provision of transit services. The primary capital element related to the transit service options is vehicles (other capital elements, such as bus stop infrastructure, would be identified as specific options are advanced). The number of vehicles required for each option ranges from zero for the Route 138 improvements to fifteen for the limited stop bus scenario 2. The capital cost estimates for the transit service options are summarized in Table 3.

**Table 3. Capital Cost Estimates**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Route</th>
<th>Vehicles Required</th>
<th>Capital Cost 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circulator</td>
<td>Option 1A</td>
<td>6</td>
<td>$960,000</td>
</tr>
<tr>
<td></td>
<td>Option 1B</td>
<td>6</td>
<td>$960,000</td>
</tr>
<tr>
<td></td>
<td>Option 2</td>
<td>5</td>
<td>$800,000</td>
</tr>
<tr>
<td></td>
<td>Option 3</td>
<td>5</td>
<td>$800,000</td>
</tr>
<tr>
<td>Local Bus – Improvements to Existing Services</td>
<td>106 - Peoria Ave</td>
<td>1</td>
<td>$600,000</td>
</tr>
<tr>
<td></td>
<td>138 - Thunderbird</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>Local Bus – Route Extensions</td>
<td>138 - Thunderbird</td>
<td>2</td>
<td>$1,200,000</td>
</tr>
<tr>
<td></td>
<td>170 - Bell Rd</td>
<td>2</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Express Bus</td>
<td>Route 571 – Additional Trips</td>
<td>0 2</td>
<td>$0</td>
</tr>
<tr>
<td>Limited Stop</td>
<td>Scenario 1 – Base</td>
<td>9</td>
<td>$5,400,000</td>
</tr>
<tr>
<td></td>
<td>Scenario 2 - Enhanced</td>
<td>15</td>
<td>$9,000,000</td>
</tr>
</tbody>
</table>

1 Based on an assumed vehicle cost of $160,000 for circulator and $600,000 for local, express, and limited stop bus.
2 Assumes trips are added during off-peak period when existing express fleet would be available. If trips are added during peak-periods, two additional vehicles would be required.

**Source:** Valley Metro, 2019

4.2 **Operating Cost Estimates**

Operating costs are the annual expenses related to the operation and maintenance of transit services. Transit services in the region are costed on a revenue mile basis and operated by two primary service providers: City of Phoenix and Valley Metro. It is important to note that each of the options include revenue miles in neighboring jurisdictions. As such, cost estimates have been identified for both the study area and for the full route or extension (note: while the circulator options include some miles of service outside the study area, it was assumed the full costs would be attributed to the Sun Cities/Maricopa County as they are localized services that provide circulation within the study area). The operating cost estimates are summarized in Table 4.
Table 4. Operating Cost Estimates

<table>
<thead>
<tr>
<th>Type</th>
<th>Route</th>
<th>Study Area</th>
<th>Full Route / Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Annual Revenue Miles</td>
<td>Net Operating Cost¹</td>
</tr>
<tr>
<td>Neighborhood Circulator</td>
<td>Option 1A</td>
<td>198,145</td>
<td>$1,310,136</td>
</tr>
<tr>
<td></td>
<td>Option 1B</td>
<td>185,433</td>
<td>$1,226,085</td>
</tr>
<tr>
<td></td>
<td>Option 2</td>
<td>127,835</td>
<td>$845,245</td>
</tr>
<tr>
<td></td>
<td>Option 3</td>
<td>124,178</td>
<td>$821,064</td>
</tr>
<tr>
<td>Local Bus - Improvements to Existing Services</td>
<td>106 - Peoria Ave</td>
<td>60,826</td>
<td>$412,781</td>
</tr>
<tr>
<td></td>
<td>138 - Thunderbird</td>
<td>4,930</td>
<td>$33,456</td>
</tr>
<tr>
<td>Local Bus - Route Extensions</td>
<td>138 - Thunderbird</td>
<td>25,629</td>
<td>$214,854</td>
</tr>
<tr>
<td></td>
<td>170 - Bell Rd</td>
<td>66,909</td>
<td>$560,904</td>
</tr>
<tr>
<td>Express Bus</td>
<td>Route 571 Additional Trips</td>
<td>2,530</td>
<td>$16,665</td>
</tr>
<tr>
<td>Limited Stop Bus</td>
<td>Scenario 1</td>
<td>54,780</td>
<td>$445,772</td>
</tr>
<tr>
<td></td>
<td>Scenario 2</td>
<td>85,138</td>
<td>$692,811</td>
</tr>
</tbody>
</table>

¹ Includes complementary ADA service (assumes 20 percent of gross operating cost) for all options except the local bus improvements and the express bus, which would not require these services. Also assumes 15 percent farebox recovery for all modes except neighborhood circulator, which is assumed to operate fare-free.

Source: Valley Metro, 2019

5.0 NEXT STEPS

This technical memorandum documented the transit service options developed for consideration in the Northwest Sun Cities study area. The next phase of the project will be to develop potential funding scenarios and solutions to support future transit service in the study area.