Pima Association of Governments

Dial-a-Ride & Microtransit
Service Area Analysis

PAGregion.com

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SECTION 01

Introduction

Pima Association of Governments, a metropolitan planning organization, is studying the feasibility of introducing microtransit services in the greater Tucson region and evaluating existing Dial-a-Ride services. Microtransit is a flexible transit service that uses enhanced technology to allow passengers to request on-demand trips. Microtransit operates as a shared-ride model: passengers with similar request times and pickup and drop-off locations may be paired together and served by the same vehicle.

This study assesses needs and opportunities to provide transit in areas without service and to improve existing transit service in underserved areas. Currently, the county offers services in suburban and rural areas with a combination of fixed-route and Dial-a-Ride services. This study determines if those service models are the most effective, operationally and from the rider perspective, and makes recommendations to improve services.

1.1
Background

Pima Association of Governments (PAG) is the metropolitan planning organization (MPO) covering Pima County. PAG is an association of governments including Pima County, City of Tucson, City of South Tucson, Town of Marana, Town of Oro Valley, Town of Sahuarita, the Pascua Yaqui Tribe, Tohono O'odham Nation, and the Arizona State Transportation Board, which serves as an advisor to the Arizona Department of Transportation (ADOT), are member agencies of PAG. PAG is governed by a Regional Council made up of elected or appointed officials from these nine member governments.

PAG manages the Regional Transportation Authority (RTA), a state-established political subdivision within Pima County. The RTA serves as the fiscal manager of the 20-year voter-approved regional transportation plan passed in 2006 and the voter-approved half-cent sales tax that funds it. The RTA oversees the plan and delivery of transportation improvements across the greater Tucson region. The original plan and tax measures are set to expire at the end of June 2026. The RTA Board has approved a new $2.67 billion regional transportation plan called RTA Next, which similarly will require voter approval of both the plan and a related half-cent sales tax in March 2026 to continue RTA-funded improvements.

SECTION 02

Goals and Objectives

The following goals have guided this study:

- Explore the feasibility of providing microtransit to areas that lack access to transit
- Identify poor-performing routes that could be replaced with microtransit services
- Evaluate existing Dial-a-Ride services and opportunities for service improvements
- Explore the feasibility of upgrading current Dial-a-Ride service to microtransit to improve service provided to the community
- Identify general recommendations that could improve and strengthen current service across the greater Tucson region and Ajo
- Identify potential service models that could serve Picture Rocks and Vail
- Identify appropriate microtransit service models and prepare an implementation plan
- Evaluate transportation emissions through increased transit use and reduction of single-occupancy vehicles

SECTION 03

Existing Conditions and Needs Assessment

The existing conditions and needs assessment provides a snapshot in time of the market conditions, travel demand, and existing transit services in Pima County. The data and findings presented are accurate as of September 2024.

3.1 Review of Relevant Plans and Studies

To provide additional context to the needs assessment, previous plans and studies were reviewed to incorporate existing planning work. This microtransit assessment was prepared during the preparation of the next regional transportation plan for the region, the 2055 Regional Mobility and Accessibility Plan (RMAP). The plans included in this review are not intended to be exhaustive but are representative of existing documentation with relevance to the region, transit system, and the context of this plan.

3.1.1 TUCSON TRANSIT COMPREHENSIVE OPERATIONAL ANALYSIS (2024)

The ***Sun Tran Transit Comprehensive Operational Analysis*** includes an analysis and service plan for the Tucson regional transit network, including Sun Tran, Sun Shuttle, Sun Link, and Sun Express. The report evaluates the existing network and recommends an updated cost-neutral service plan, as well as recommendations that detail the City's upcoming improvements for the transit network.

Highlights of the new service plan include:

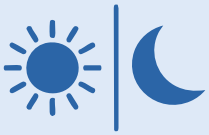
- Creation of a new Sun On Demand/Microtransit zone (Zone 3) in eastern Tucson
- Change in focus to better match the discretionary nature of most trips
- Alignment changes to reduce transfer wait times, connect higher-performing route segments, or streamline operations
- Improvement of frequencies, including a growing core network of routes with 15- to 20-minute weekday frequencies for spontaneous travel
- Improved spans with extended service
- Improved frequency/directness of routes south of I-10 to better serve Hispanic communities
- No major changes to overall network coverage
- Phased implementation, including some Phase 2 aspects contingent on construction or rapid transit project alignment decisions

Relevant information to this study included in the Operational Analysis report includes detailed lists of how changes will affect bus routes serving the existing Sun On Demand Zones 1 and 2, the proposed Sun On Demand Zone 3, and the Sun Shuttle General Public Dial-a-Ride Zones (Oro Valley, Marana/Avra Valley, Green Valley/Sahuarita, and Ajo). The report also notes the current limitations of the On Demand services, generally encouraging or requiring scheduling travel a day or several days prior.

3.1.2

LONG-RANGE REGIONAL TRANSIT PLAN (JANUARY 2020)

The ***Long-Range Regional Transit Plan*** details improvements to create a more robust regional transit system in the Tucson region, focused on a "frequency first" approach and building on the existing Sun Tran Frequent Transit Network. The plan explains the importance of transit improvements to improving mobility and job access in the region and lays out medium-term and long-term phased improvements and investments necessary to implement them. The medium-term improvements include the following:



PHASE 01
Includes improving evening and weekend service, purchasing new vehicles, and adding modern real-time bus arrival info. (Real-time tracking would likely be an important part of implementing fully on-demand microtransit services.)

PHASE 02
Would expand the Frequent Transit Network, especially in southern Tucson.

PHASE 03
Would further expand the Frequent Transit Network, implement transit priority measures and bus lanes across the system, and improve bus stops.

Notably, as the Long-Range Regional Transit Plan was published before the revisions to the service plan detailed in the 2024 Operational Analysis, the proposed route alignments in the plan may not fully reflect the most up-to-date implementation plans. Several portions of the plan also would require increased funding to implement.

The plan also includes some details of the challenges of providing efficient and cost-effective services that meet many people's needs in outlying suburban areas, noting the lower efficiency of Sun Shuttle routes compared to Sun Tran services even with significantly expanded or enhanced service.

3.1.3

REGIONAL PEDESTRIAN PLAN (DECEMBER 2014)

The ***Regional Pedestrian Plan*** details efforts to make the greater Tucson region a safer, more accessible, and more comfortable place to walk, identifying key demand generators, existing pedestrian conditions and needs, and funding opportunities.

The plan includes a general analysis of pedestrian demand, including a detailed heat map showing what areas have the highest demand and a detailed analysis of priority gaps and sidewalk conditions throughout the region. The highest demand was in Tucson proper; however, several corridors in outlying areas within today's Dial-a-Ride zones did emerge as having medium-to-high pedestrian demand, and the plan includes lists of top priority sidewalks by municipality/area.

While focused on pedestrian demand more broadly, the plan does note that transit stops are a major generator and attractor of pedestrian activity demand, and that areas with higher transit ridership and transit-dependent users are important to prioritize for walking condition improvements, considering limited funds. The plan also includes an analysis of Federal Transit Administration (FTA) grants and notes pedestrian improvements within a half-mile of a transit stop or station and bike improvements within three miles are considered valid uses of FTA funds.

This plan was written before the creation of the Sun On Demand zones as they currently exist and does not mention any of the Sun Shuttle Dial-a-Ride zones. Transit references in the document largely only refer to traditional fixed-route service.

3.1.4

PAG 2055 REGIONAL MOBILITY AND ACCESSIBILITY PLAN (JULY 2025)

The ***Regional Mobility and Accessibility Plan*** (RMAP) is the region's federally mandated long-range transportation plan covering PAG's designated planning area (Pima County, Arizona). The plan evaluates existing and future conditions, identifies goals and needs, and details a plan for multi-modal transportation investments over a 25- to 30-year timeframe within a fiscal constraint. Adopted on July 31, 2025, the 2055 RMAP factors in newer employment and population data and includes an updated In-Plan project list to adjust cost estimates, add new projects, and remove completed projects.

The 2055 RMAP responds to the 2020 Long-Range Regional Transit Plan by focusing transit investments on expanding service areas and frequency of service. The In-Plan project list includes capital improvements needed to make transit service expansion possible, including bus pullouts, funding for neighborhood circulator bus systems, bus shelters, improvements to administration and maintenance facilities, technology upgrades for transit communication and signalization, high-capacity transit, and other vehicle and equipment upgrades.

Adopted on July 31, 2025, the 2055 RMAP factors in newer employment and population data and includes an updated In-Plan project list to adjust cost estimates, add new projects, and remove completed projects.

3.1.5

MOBILITY ON DEMAND SANDBOX DEMONSTRATION: ADAPTIVE MOBILITY WITH RELIABILITY AND EFFICIENCY (JANUARY 2022)

Between June 2018 and June 2019, the RTA led a microtransit pilot service in the neighborhoods of Rita Ranch, Civano, and Vail named the Adaptive Mobility with Reliability and Efficiency (AMORE). The AMORE project sought to test the feasibility of microtransit as a public transit service, understand the demand for such a service, and improve mobility for populations with limited transportation options.

The service area included the UA Tech Park (a major employment center), some retail centers, and low-density residential neighborhoods. Sun Shuttle 450 and Sun Express 110X provided fixed-route transit to the area, which only ran on weekdays at low frequencies. AMORE allowed pre-scheduled and same-day trip requests, which were made through a smartphone app. Prices per ride were set at $2.50 for pre-scheduled trips and $3.00 for same-day trips. Eight drivers were recruited as hourly employees, drivers drove their own personal vehicles, and work schedules followed the drivers' availability.

Over 70% of trips on AMORE were commute trips, such as for school or work. Passenger feedback revealed that 50% of riders used AMORE because they had limited mobility options, and 30% were using it to transfer to the existing fixed-route services, indicating that microtransit could be a potential solution to serve transit-dependent populations while complementing traditional transit services. However, AMORE was challenged by a lack of trip volume: on most days, only one driver was required and rarely operated at above 25% utilization.

In planning future microtransit services, the AMORE project suggests analyzing how a given community travels and whether there are pain points compelling enough for travel patterns to shift to a new transit service. The project also notes that transportation behaviors are slow to change, and an integrated software platform is necessary for efficient operations. The RTA is evaluating whether an on-demand service like AMORE can replace low-performing fixed-route services.

3.2

Pima County Transit Overview

This section provides an overview of existing transit services in Pima County. **Figure 1** and **Figure 2** show existing fixed-route and demand-response transit service coverage in the greater Tucson region and Ajo.

Figure 1: Existing Transit Services

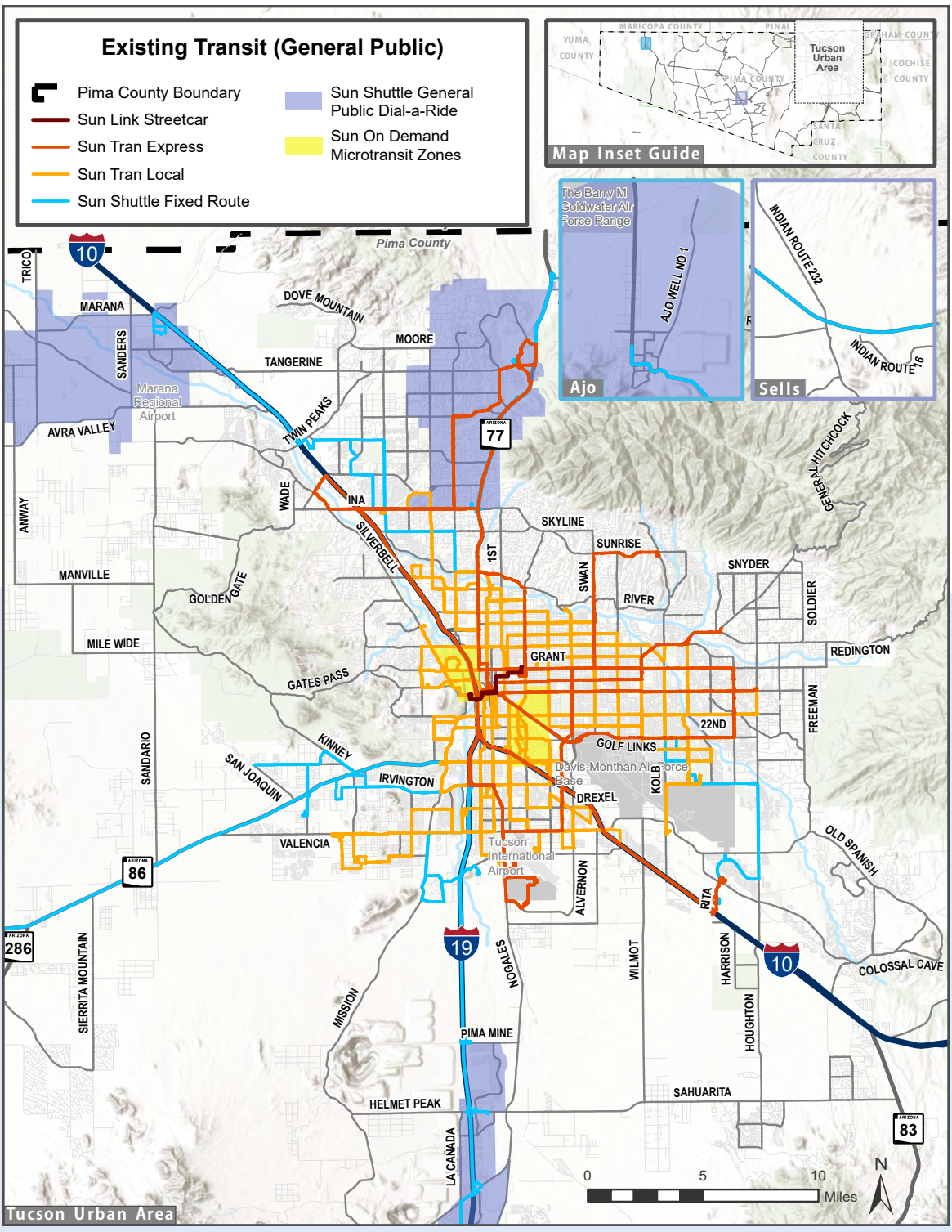
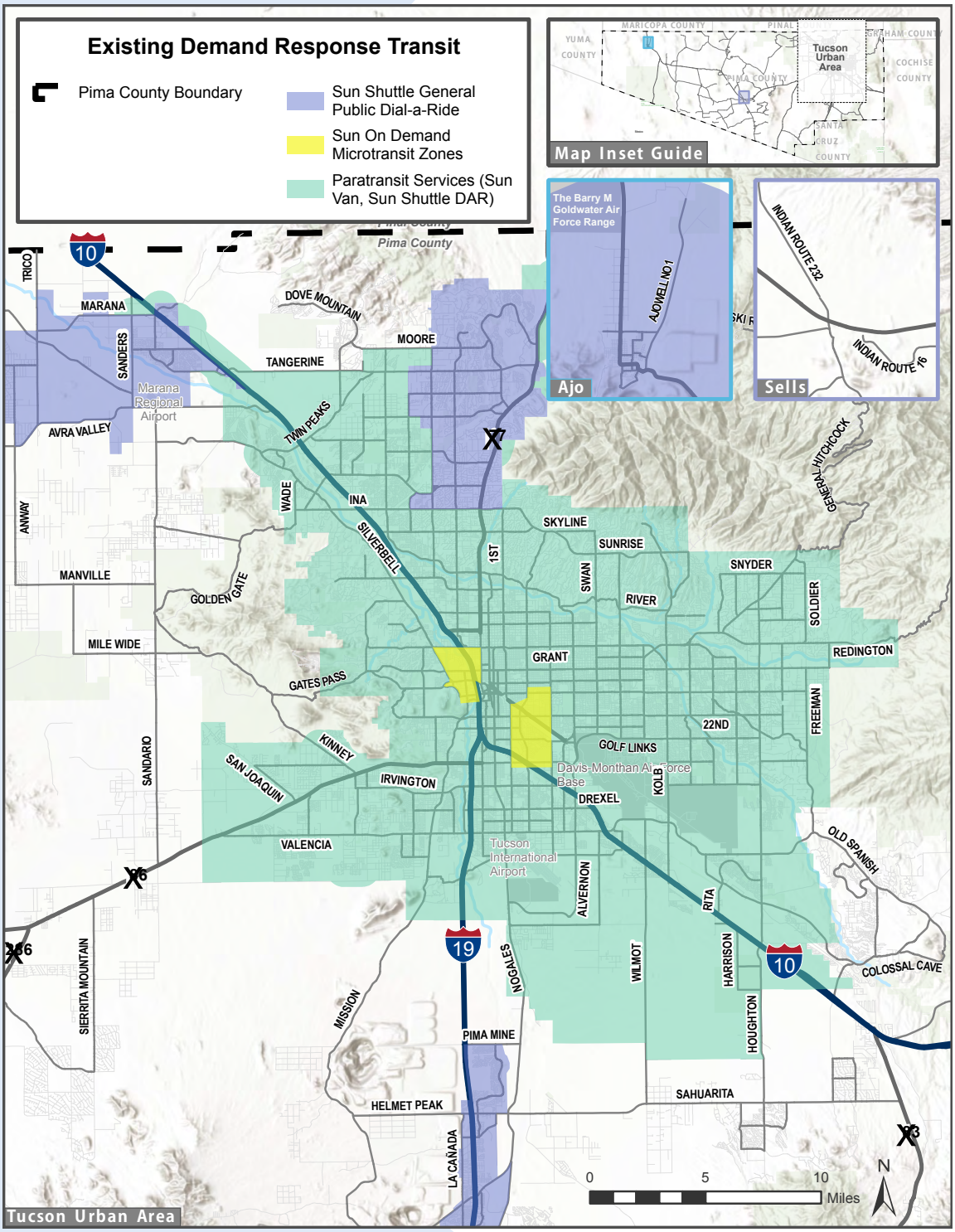


Figure 2: Existing Demand Responsive (General Public and ADA) Services



3.2.1

PAG AND THE RTA

As mentioned under 1.1 Background, the RTA serves as the fiscal manager, administering the funds of the regional transportation plan passed in 2006 by voters. The RTA operates transit services under the Sun Shuttle brand to connect outlying communities in the Tucson region. The RTA contracts with MTM Transit LLC to operate these services. There are currently three types of Sun Shuttle services:

- **Sun Shuttle:** Fixed-route transit
- **Sun Shuttle General Public Dial-a-Ride:** Curb-to-curb transit offered in four service areas
- **Sun Shuttle ADA Dial-a-Ride:** Paratransit offered in the Tucson area

All transit services in the greater Tucson region have been free to ride since March 2020 when fares were suspended for the COVID-19 pandemic.

TYPES OF SUN SHUTTLE SERVICES

Sun Shuttle fixed-route transit

Sun Shuttle General Public Dial-a-Ride

Sun Shuttle ADA Dial-a-Ride

Sun Shuttle Fixed Route

Sun Shuttle's fixed-route services include eight routes. Routes largely operate in outer areas of the Tucson region, with connections to Marana, Green Valley, Sahuarita, Oro Valley, Ajo, and other areas. Sun Shuttle routes are currently fare-free, with fares waived since the beginning of the COVID-19 pandemic in March 2020. **Table 1** details the service profiles of the eight Sun Shuttle fixed routes.

Table 1: Sun Shuttle Fixed-Route Service Profiles

Route	Weekday Frequency	Saturday Frequency	Destinations
401 N. Oracle/Catalina	**1 Hour**	**N/A**	Tohono Chul Gardens, Oracle Crossing, Canyon Del Oro High School, Steam Pump Village, Oro Valley Marketplace, Oro Valley Hospital, Golder Ranch Commercial Center
412 Thornydale/Orange Grove	**1 ½ Hours**	**1 ½ Hours**	Tucson Premium Outlets, Mountain View High School, Gold Canyon Plaza, Thornydale Plaza, Costco, Sprouts Grocery, Northwest Medical Center, Tucson Mall, Tohono Tadai Transit Center
413 Marana/Casas Adobes	**1 ½ Hours**	**1 ½ Hours**	Marana Municipal Complex, Marana Health Center, Tucson Premium Outlets, Pima College Northwest, Walmart
421X Green Valley/Sahuarita	**1 ½ Hours**	**N/A**	Walmart Sahuarita, Fry's Grocery, Sahuarita Town Hall, Desert Diamond Casino, Laos Transit Center, Ronstadt Transit Center
430 Tucson Estates/Valencia West	**1 ½ Hours**	**N/A**	Tucson Estates, Valencia West, Spectrum Mall, Laos Transit Center
440 San Xavier	**1 ½ Hours**	**1 ¼ Hours**	Laos Transit Center, Tohono O'odham Nation, San Xavier Del Bac Mission, San Xavier Health Center
450 Southeast Tucson/Rita Ranch	**1 ½ Hours**	**N/A**	Fry's Grocery (Golf Links Road), Santa Rita High School, Clements Center, Pima Community College East, Fry's Grocery (Houghton Road), Mesquite Elementary, UA Science & Technology Park
486 Ajo to Tucson	**Daily to Tucson; four a day between Ajo and Why**	**N/A**	Ajo, Why, Maish Vaya (Trading Post), Three Points (Robles Junction), Laos Transit Center, Tucson Greyhound Bus Station

PAG and the RTA also operated a pilot service in Picture Rocks connecting Picture Rocks to Tucson from October 2022 to November 2023. At the time, ridership did not meet goals (averaging 22 riders a week against a goal of 75 riders a week), and the route would have been too expensive to continue operating at that ridership level according to the RTA's discontinuation announcement. **Table 2** shows ridership numbers for Sun Shuttle Fixed Routes in Fiscal Year (FY) 2024.

Route 440 had the highest ridership of the Sun Shuttle fixed routes in FY 2024, connecting outlying communities throughout the Tohono O'odham Nation and San Xavier areas to shopping along Valencia Road and Laos Transit Center. 421X, connecting Green Valley and Sahuarita into downtown Tucson, sees the second-highest ridership, followed by 412 (Thornydale/Orange Grove) and 430 (Tucson Estates/ Valencia West). All four top routes connect to at least one of the region's three main transit centers.

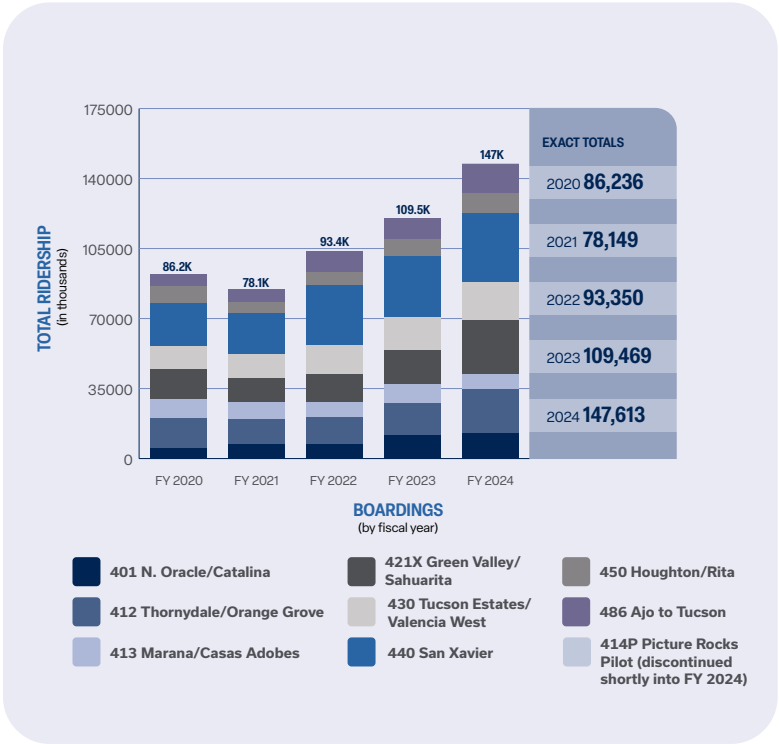
Route 440 had the highest ridership of the Sun Shuttle fixed routes in FY 2024.

Table 2: Sun Shuttle Fixed-Route Ridership (FY 2024)

Route	Boardings (FY 2024)	Ranking
401 N. Oracle/Catalina	**12,737**	**6**
412 Thornydale/Orange Grove	**22,069**	**3**
413 Marana/Casas Adobes	**7,213**	**8**
421X Green Valley/ Sahuarita	**27,237**	**2**
430 Tucson Estates/ Valencia West	**18,942**	**4**
440 San Xavier	**34,294**	**1**
450 Southeast Tucson/ Rita Ranch	**10,189**	**7**
486 Ajo to Tucson	**14,317**	**5**
414P Picture Rocks Pilot (discontinued shortly into FY 2024)	**615**	**9**

Figure 3: Annual Sun Shuttle Fixed-Route Ridership, by Route

Figure 4: Annual Sun Shuttle Fixed-Route Ridership, Cumulative Total



Ridership has continued to increase on most routes over the last two fiscal years.

Figure 3 and **Figure 4** show ridership on Sun Shuttle fixed-route services. As a whole, the Sun Shuttle services only saw a small decrease in ridership during the COVID-19 pandemic. Several routes had recovered as quickly as FY 2022, and seven out of eight routes have continued to increase in ridership over time. Notably, several of the highest ridership routes serve more isolated communities, including routes 440 (San Xavier) and 430 (Tucson Estates/Valencia West). Route 413 (Marana/Casas Adobes) is an exception and has continued to see a slight trend of declining ridership.

Table 3: Sun Shuttle Fixed-Route Highest Ridership Stops by Boardings (FY 2024)

17,145
Laos Transit Center

7,321
Tohono Transit Center

6,782
Valencia/ Midvale Park

6,442
Ronstadt Transit Center

Table 3 shows the highest ridership stops on Sun Shuttle fixed-route services. Three of the four highest ridership Sun Shuttle stops (based on boardings) were at major transit centers with connections to Sun Tran routes. Most other stops with high ridership served either a major grocery store or other shopping, a rural outlying community close to native reservation land, local government buildings like courts and town halls, or a school or college with nearby neighborhoods. Several stops also act as transfer points to Sun Tran services.

Table 3: Sun Shuttle Fixed-Route Highest Ridership Stops by Boardings (FY 2024)

Location	Boardings (FY 2024)	Destination Type	Sun Shuttle Routes Served
Laos Transit Center	17,145	Transit Center	421X, 430, 440, 486
Tohono Transit Center	7,321	Transit Center	412
Valencia/Midvale Park	6,782	Grocery/Shopping	440
Ronstadt Transit Center	6,442	Transit Center	421X
Mission San Xavier del Bac	4,770	Historic Site	440
Walmart Sahuarita	4,373	Grocery/Shopping	421X
Tucson Premium Outlets	4,181	Shopping	412, 413
Oracle/Ina	3,997	Grocery/Shopping	401
Desert Diamond Casino	3,601	Casino	421X
La Cañada/Trader (Flag Zone)	3,345	Rural Community	421X
Mission/San Xavier (Flag Zone)	3,345	Rural Community	440
San Xavier Health Center	3,242	Health Center in Rural Community	440
Valencia/12th*	2,942	Grocery/Shopping	440
Irvington/Santa Cruz	2,924	Grocery/Shopping	430
Kolb/Golf Links Park & Ride	2,524	Grocery/Shopping	450
Fry's Sahuarita	2,498	Grocery/Shopping	421X
Little Nogales/Campus (Flag Zone)	2,303	Rural Community	440
Campus/Mission (Flag Zone)	1,909	Rural Community	440
Thornydale/Ina	1,900	Grocery/Shopping	412, 413
12th/Valencia*	1,879	Grocery/Shopping	440
Marana Municipal Complex	1,869	Local Government	413
Hawser/Oracle	1,827	Grocery/Shopping	401
Bopp/San Joaquin	1,685	Rural Community	430
Rafter/Drexel (Flag Zone)**	1,452	Rural Community	430
Orange Grove/Camino de la Tierra	1,404	School & Residential	412
Orange Grove/Thornydale	1,334	Grocery/Shopping	412
Steam Pump Village	1,128	Shopping	401
Camino Verde/Drexel**	1,125	Rural Community	430
Thornydale/Linda Vista	1,074	School & Residential	412
PCC East	983	College	450
Sahuarita Town Hall	980	Local Government, Schools	421X
Oracle/Magee	845	Grocery/Shopping	401

**Different stops at same intersection | **Adjacent stops effectively at same intersection*

SUN SHUTTLE DIAL-A-RIDE (INCLUDING ORO VALLEY)

Sun Shuttle provides ADA paratransit services from outer parts of the Tucson area into more central areas and vice versa (while Sun Van provides paratransit services within more urban areas in Tucson itself).

Sun Shuttle also provides public Dial-a-Ride service within four service areas: Oro Valley, Ajo, Sahuarita/Green Valley, and Marana/Avra Valley. While these services are similar, they operate slightly differently, as shown in **Table 4**. Currently, trips largely require prior reservations and reservation methods may change between services. Moving towards a microtransit model could allow for more spontaneous trips akin to services provided by rideshares like Uber or Lyft while providing a more streamlined or uniform experience.

Trips largely require prior reservations and reservation methods may change between services. Moving towards a microtransit model could allow for more spontaneous trips…

- The Green Valley/Sahuarita Dial-a-Ride and Marana/Avra Valley Dial-a-Ride each have a service area that allows public curb-to-curb service anywhere within the zone or between a series of major stops.
- The Ajo Dial-a-Ride has a service area surrounding Ajo that allows public curb-to-curb service anywhere within the zone.
- The Oro Valley Dial-a-Ride is unique in that there are different overlapping service areas, with a small zone for the public, larger zones for seniors, and a larger area only served for ADA trips. The Town of Oro Valley also operates the Oro Valley Dial-a-Ride services in-house. This is the only Dial-a-Ride service that is not operated by MTM Transit LLC.
- Sun Shuttle Dial-a-Ride Paratransit specifically serves trips from outer areas into the Sun Van paratransit zone (and vice versa) for qualified ADA trips only.

Sun Shuttle Dial-a-Ride Service Profiles

SUN SHUTTLE DIAL-A-RIDE PARATRANSIT

Reservation:
ADA Trips only. Trip reservations must be made one to seven days before the day of travel. Same-day service first come/first served; half-hour pick-up window.

Service Hours:
ADA: Mon-Fri 5 a.m. - 8 p.m. | Sa-Su-Hol 9 a.m. - 6 p.m.

Reservation Options:
Suntran.com/sunshuttle | Call (520) 792-9222

ORO VALLEY DIAL-A-RIDE

Reservation:
Trip reservations must be made one to seven days before the day of travel.

Service Hours:
General Public + Seniors: Mon-Fri 6 a.m. - 8 p.m.
ADA: Mon-Fri 6 a.m. - 8 p.m. | Sa-Su-Hol 9 a.m. - 6 p.m.

Reservation Options:
Orovalleyaz.gov → "Need a Ride" | Call (520) 229-4990

AJO DIAL-A-RIDE

Reservation:
First come/first served. Trips are still typically made at least a day in advance and it's highly recommend reservations be made 24 hours in advance.

Service Hours:
General Public: Mon-Fri 7 a.m. - 5 p.m. | Sat 8 a.m. - 5 p.m.

Reservation Options:
TripShot app | Call (520) 792-9222

GREEN VALLEY/SAHUARITA DIAL-A-RIDE

Reservation:
All trip reservations must be made one to seven days before the day of travel; one-hour pick-up window.

Service Hours:
General Public: Mon-Fri 6 a.m. - 7 p.m. | Sat 9 a.m. - 3 p.m.

Reservation Options:
Sun Shuttle Dial-a-Ride app | Suntran.com/sunshuttle
Call (520) 792-9222

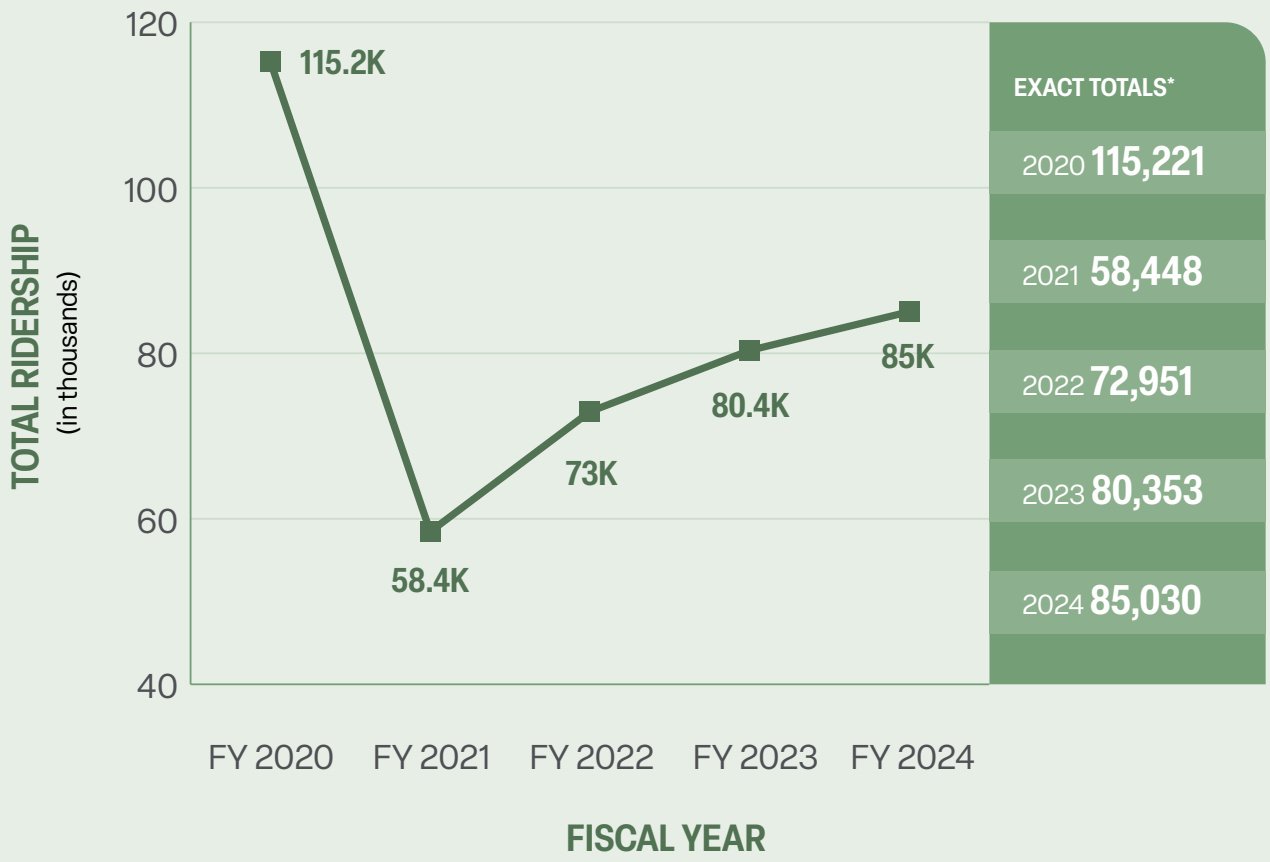
MARANA/AVRA VALLEY DIAL-A-RIDE

Reservation:
Trip reservations must be made one to seven days before the day of travel. Same-day service first come/first served: one-hour pick-up window.

Service Hours:
General Public: Mon-Fri 6 a.m. - 7 p.m.

Reservation Options:
Sun Shuttle Dial-a-Ride app | Suntran.com/sunshuttle
Call (520) 792-9222

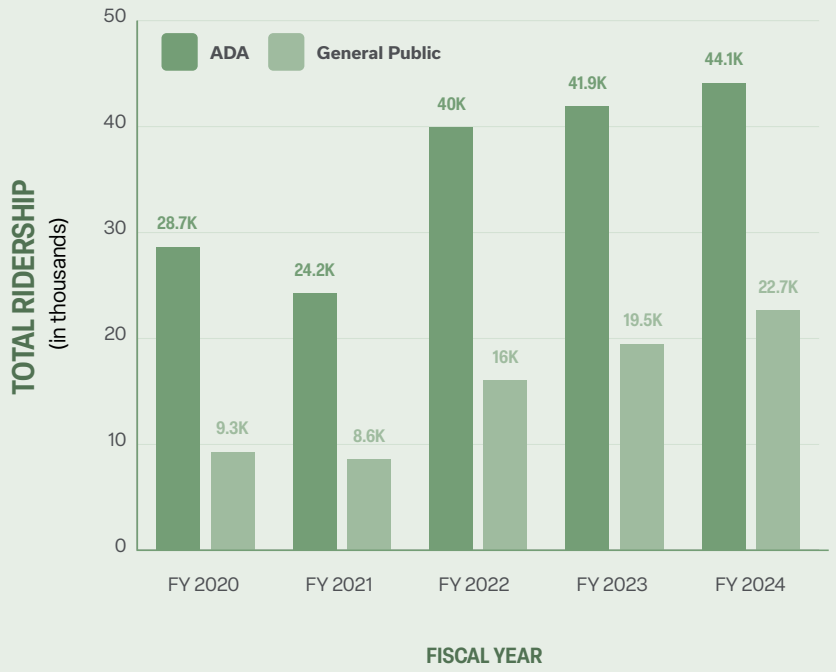
Figure 5 and Table 4: Sun Shuttle Dial-a-Ride Total Ridership by Fiscal Year*



*FY 2020 - FY 2022 numbers shown come from dial-a-ride monthly reports;
FY 2023 - FY 2024 numbers come from EcoLane data.

Figure 5 and Table 4 shows total ridership across all Sun Shuttle Dial-a-Ride services from FY 2020 to FY 2024, while **Figure 6 and Table 5** shows Oro Valley Dial-a-Ride ADA and General Public ridership from FY 2020 to FY 2024. **Table 6** shows total ridership across Sun Shuttle Dial-a-Ride services in FY 2023 and FY 2024 split out by service, including both ADA and General Public trips.

Figure 6 and Table 5: Oro Valley Dial-a-Ride Total Ridership By Fiscal Year



	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
ADA	28,663	24,245	39,957	41,897	44,107
General Public	9,316	8,636	16,044	19,517	22,661
Total	37,979	32,881	56,001	61,414	66,768

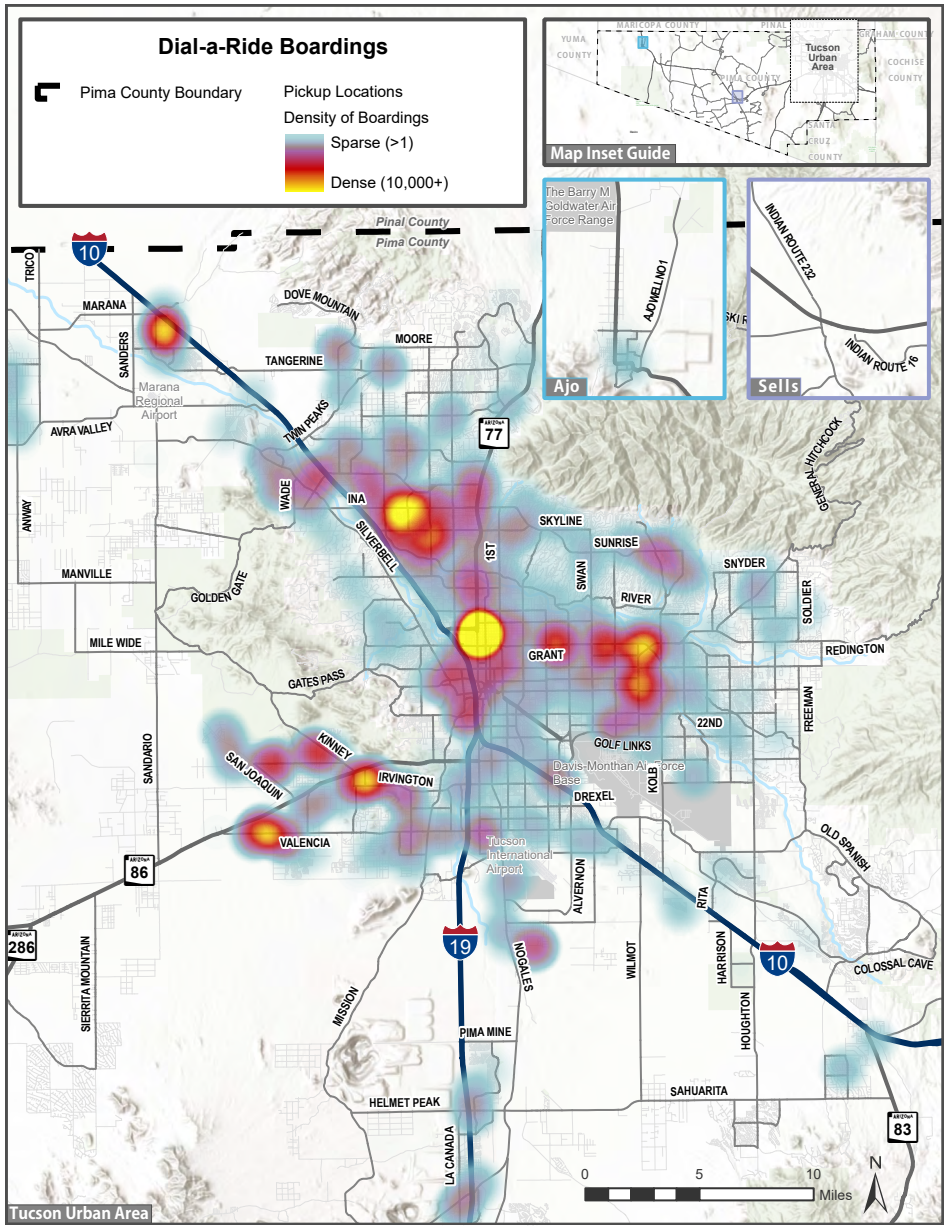
Table 6: Sun Shuttle Dial-a-Ride Total Ridership by Service

Service	FY2023	FY2024
Sun Shuttle Dial-a-Ride (ADA)	**80,353**	**85,030**
Oro Valley Dial-a-Ride (ADA))	**41,897**	**44,107**
Oro Valley Dial-a-Ride (General Public)	**19,517**	**22,611**
Ajo Dial-a-Ride	*	**6,086***
Green Valley / Sahuarita Dial-a-Ride	**8,481**	**8,576**
Marana / Avra Valley Dial-a-Ride	**3,325**	**3,083**
Total Dial-a-Ride Ridership	**144,909**	**153,443**

**Data for Ajo Dial-a-Ride was not collected in EcoLane data until January 2024*

- Sun Shuttle ADA Dial-a-Ride (specifically referring to service outside of the Dial-a-Ride zones connecting outlying areas into the Sun Van service area) carries over 80,000 passengers a year. The service saw a small increase in ridership between FY 2023 to FY 2024.
- Oro Valley Dial-a-Ride has fairly high ridership for both ADA riders (over 40,000 a year) and general public riders (around 25,000 a year). Both ADA and public services experienced growth between FY 2023 and FY 2024.
- Ajo Dial-a-Ride data was not collected by WeDriveU until January 2024. Available data shows that it is one of the region's highest ridership on-demand services, carrying over 6,000 passengers over 6 months.
- Green Valley/Sahuarita Dial-a-Ride carries around 8,500 passengers a year and saw a small increase in ridership between FY 2023 and FY 2024.
- The Marana/Avra Valley Dial-a-Ride service, the newest public Dial-a-Ride service, consistently has the lowest ridership of the RTA Dial-a-Ride services, carrying just over 3,000 passengers a year. It also saw a slight decline in ridership between FY 2023 and FY 2024.

Figure 7: Dial-a-Ride Boarding Locations in the Tucson Urbanized Area



The following heatmaps show pickup locations weighted by number of boarding passengers.

- Figure 7 shows the Tucson urbanized area
- Figure 8 shows Oro Valley, Marana, and Avra Valley
- Figure 9 shows Sahuarita and Green Valley
- Figure 10 shows Tucson Estates, Valencia West, and Drexel Heights
- Figure 11 shows Ajo and Why

Notably, several boarding location hot spots correspond with some of the most used Sun Shuttle fixed-route stops and highest ridership Sun Tran routes, potentially indicating that passengers are using Dial-a-Ride service to connect to the rest of the fixed-route network as intended.

Several boarding location hot spots correspond with some of the most used Sun Shuttle fixed-route stops and highest ridership Sun Tran routes.

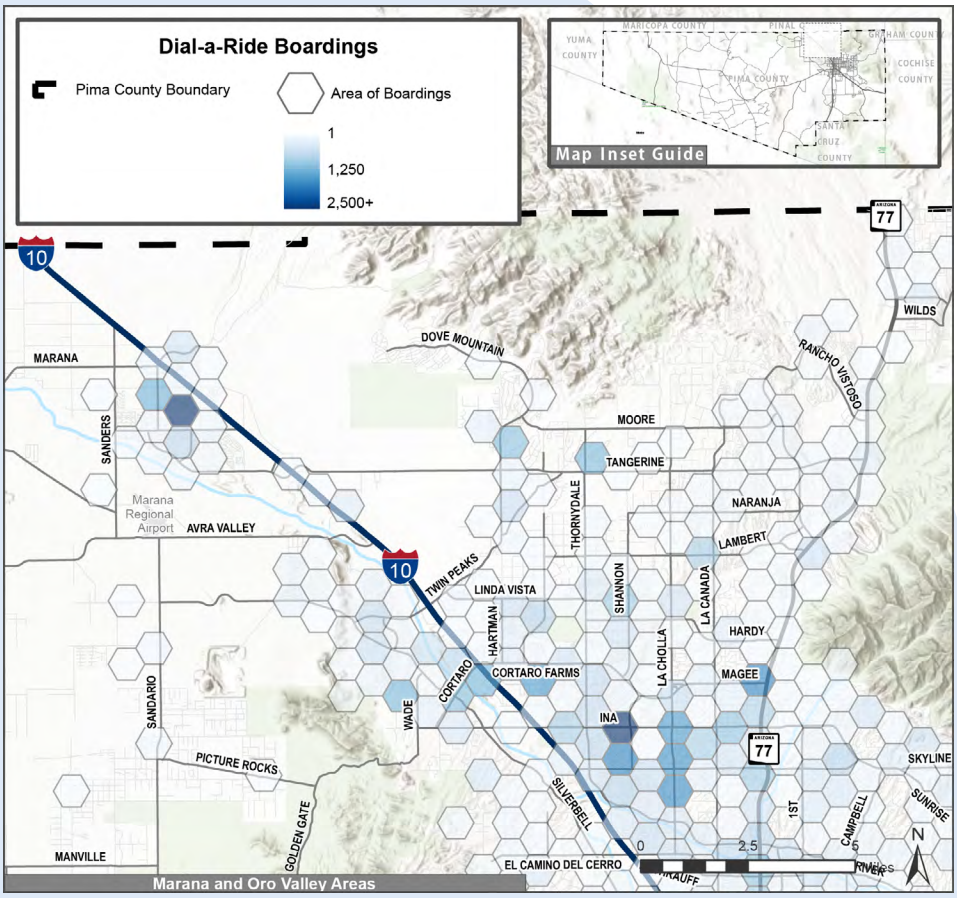


Figure 8:
Dial-a-Ride Boarding Locations in Oro Valley, Marana, and Avra Valley

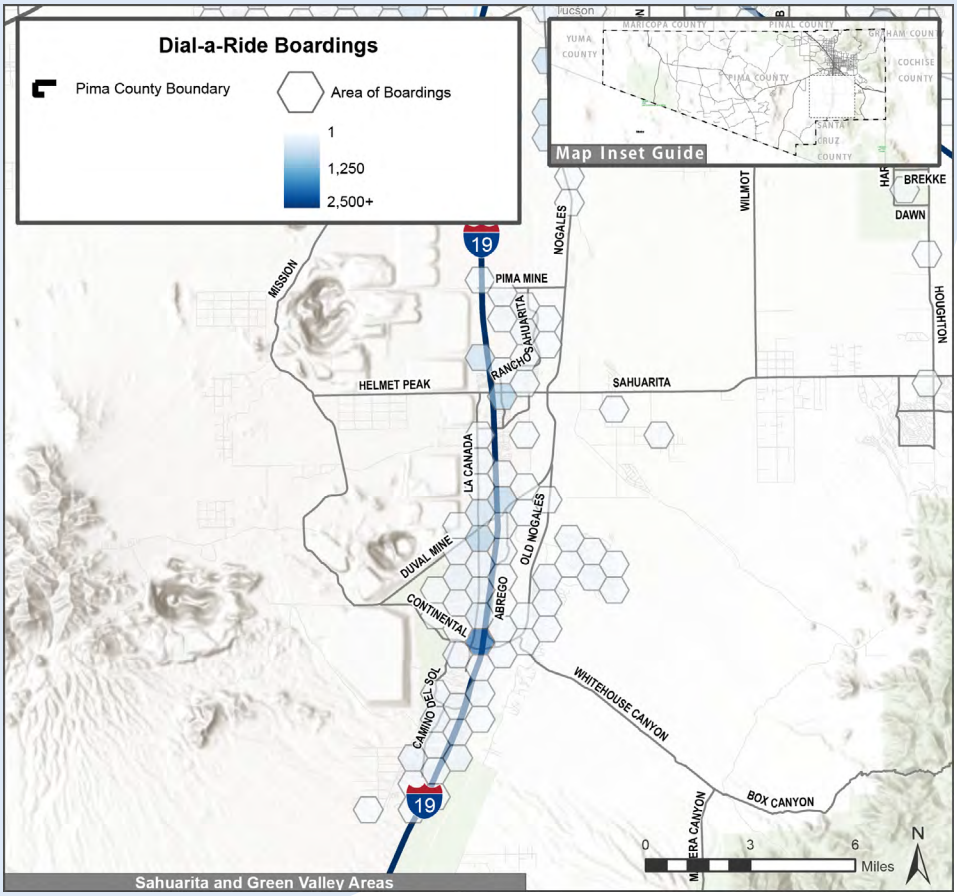


Figure 9:
Dial-a-Ride Boarding Locations in Sahuarita and Green Valley

Figure 10:
Dial-a-Ride Boarding Locations in Tucson Estates, Valencia West, and Drexel Heights

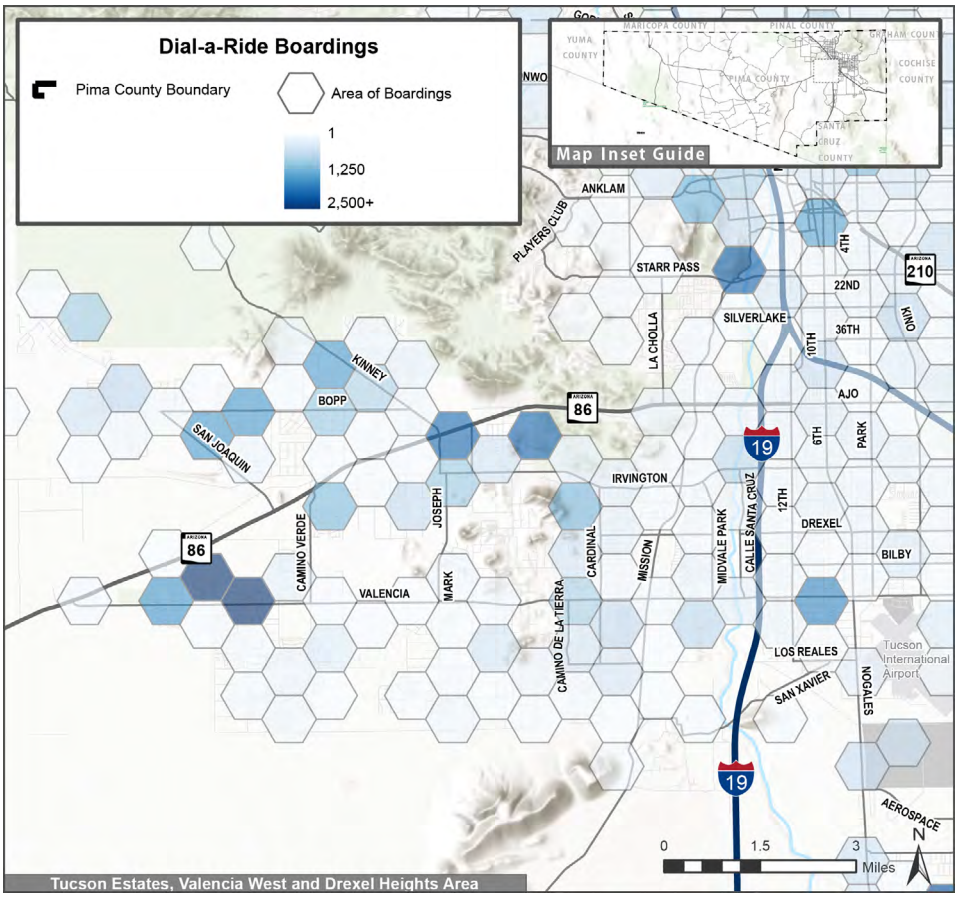


Figure 11:
Dial-a-Ride Boarding Locations in Ajo and Why

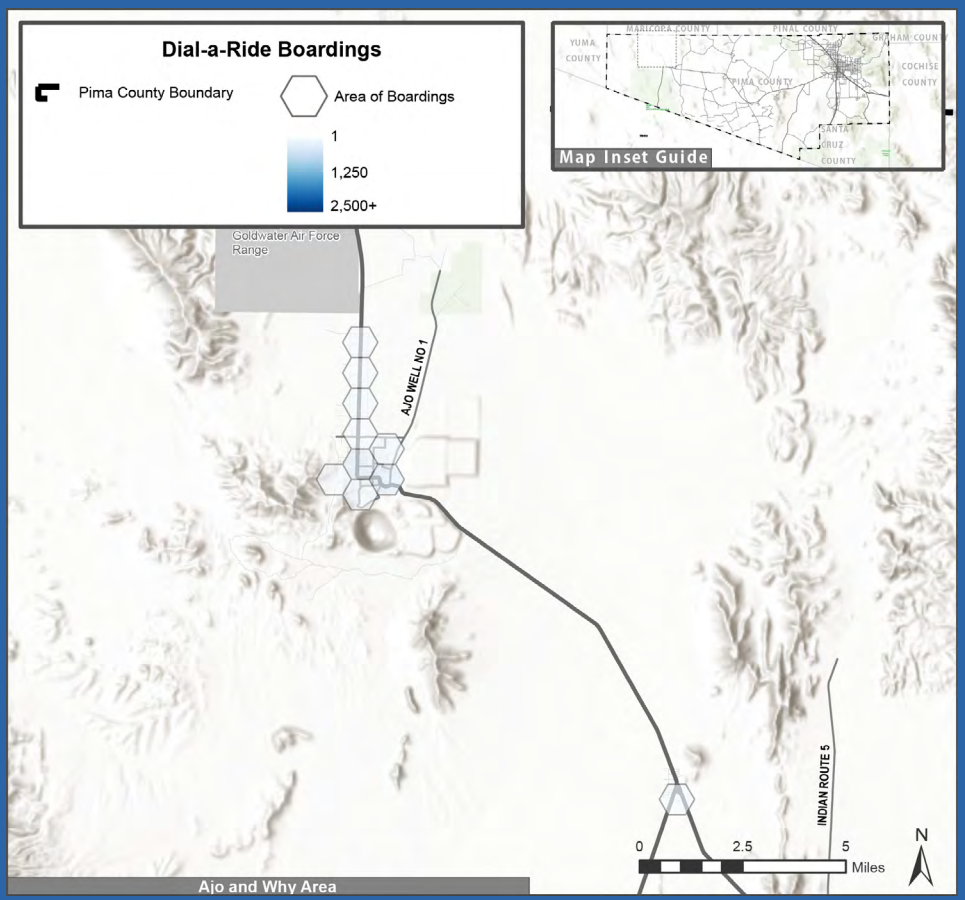
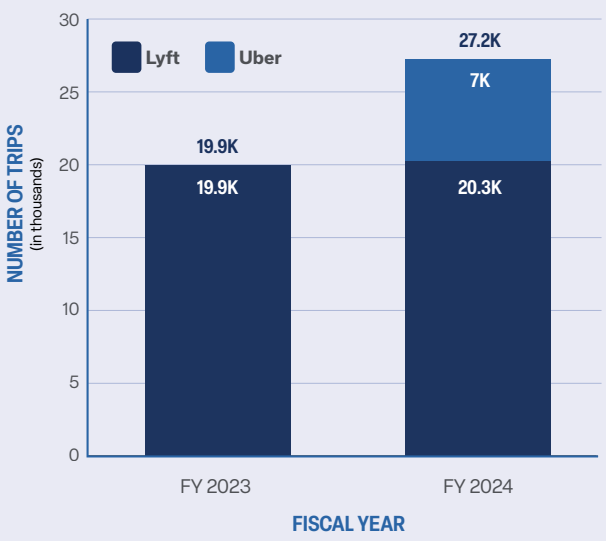


Figure 12 and Table 7: Dial-a-Ride Trips Operated By Lyft and Uber



	FY 2023	FY 2024
Dial-a-Ride Trips Operated by Lyft	19,931	20,267
Dial-a-Ride Trips Operated by Uber	0	6,973
Total	**19,931**	**27,240**

*included in Sun Shuttle Dial-a-Ride numbers

Additional Trips Served by Lyft and Uber

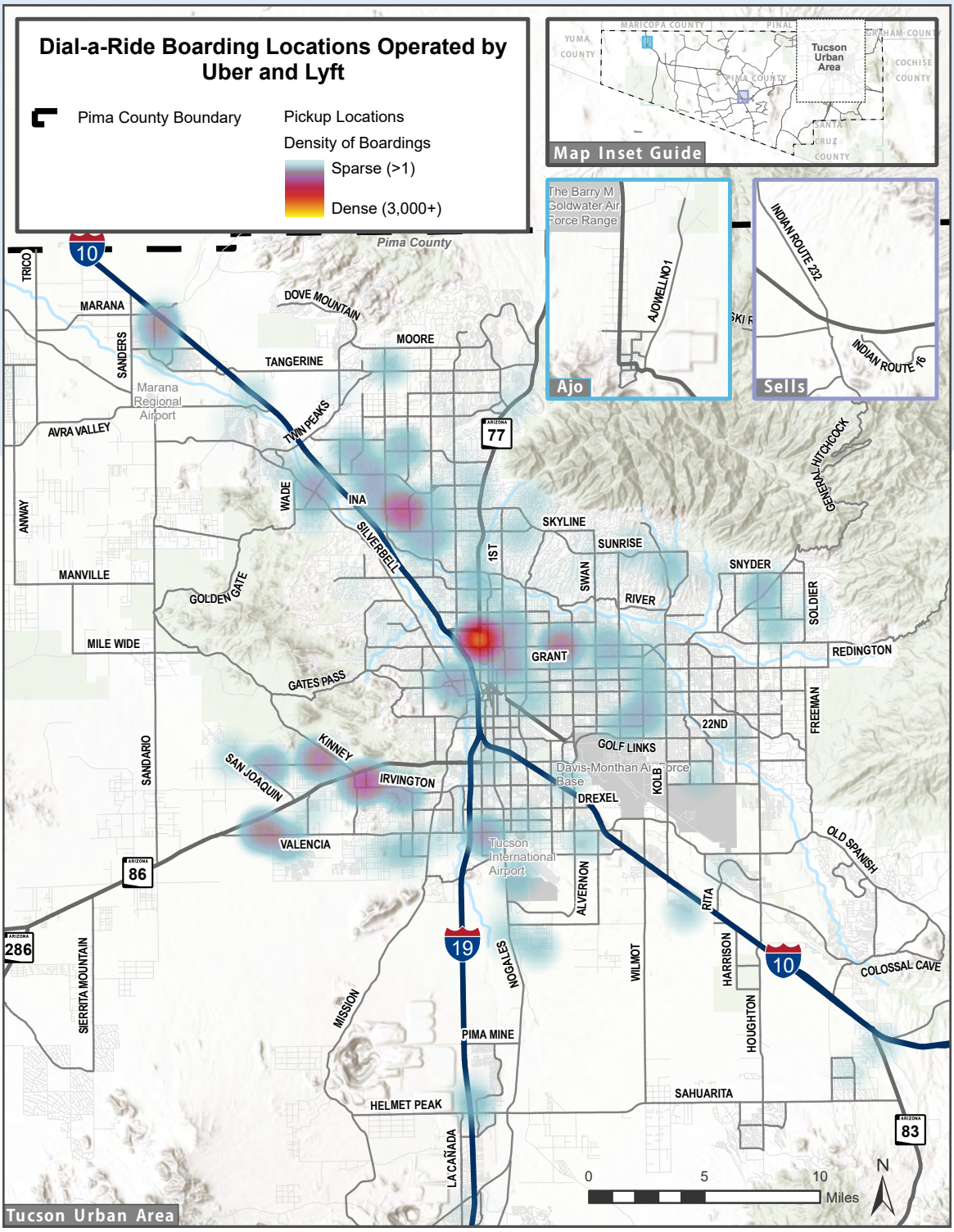
The RTA Dial-a-Ride services sometimes use Lyft and Uber to provide additional trips they cannot serve directly. Prior to 2024, ridership data only showed Lyft being used; Uber was added in January 2024. **Figure 12** shows Dial-a-Ride trips operated by Lyft and Uber in FY 2023 and FY 2024. These trips are included within the Sun Shuttle Dial-a-Ride numbers in **Table 7**.

The following maps show heatmaps of pick-up locations weighted by number of boarding passengers.

- **Figure 13 shows the Tucson urbanized area**
- **Figure 14 shows Oro Valley, Marana, and Avra Valley**
- **Figure 15 shows Sahuarita and Green Valley**
- **Figure 16 shows Tucson Estates, Valencia West, and Drexel Heights**

While Lyft and Uber boardings were spread across the region in roughly the same areas as Dial-a-Ride boardings, they were most concentrated in Southwest Tucson around Ajo Highway, areas north of downtown Tucson, and Northwest Tucson around Ina Road and Marana. This may imply that these areas have sizable demand, but that the corresponding Dial-a-Ride services cannot meet all ridership demand themselves.

Figure 13: Lyft- and Uber-Operated Dial-a-Ride Boarding Locations in the Tucson Urbanized Area



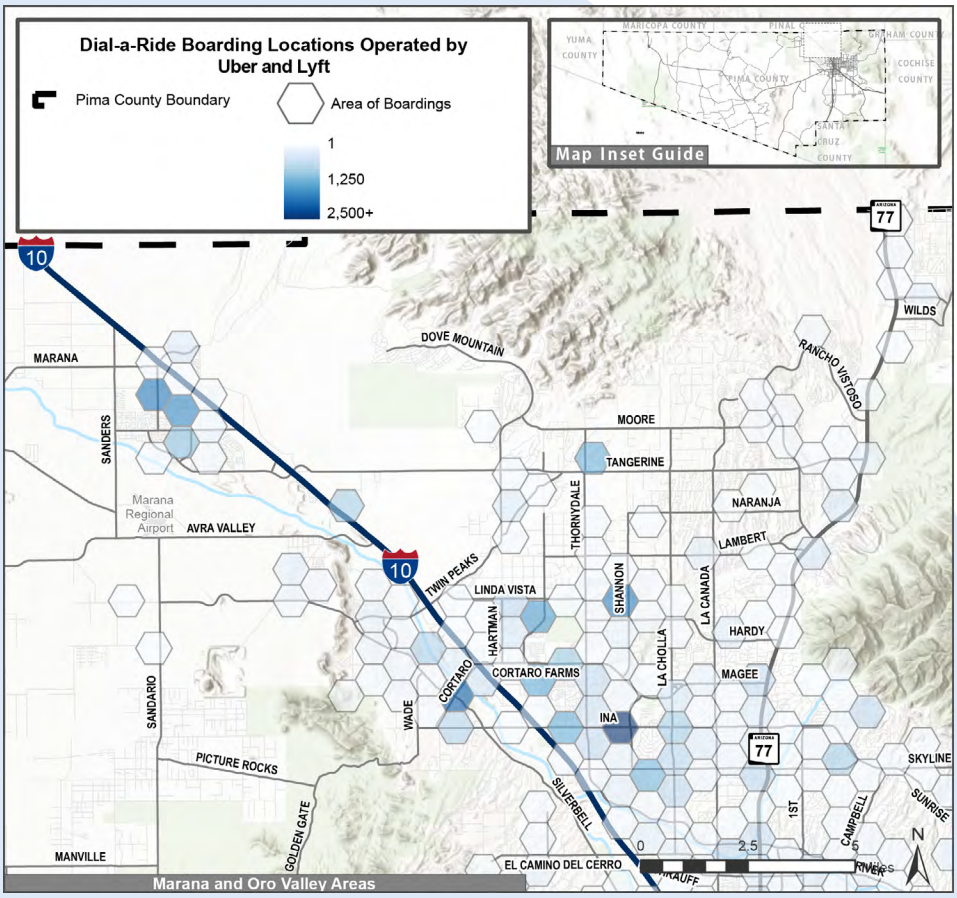


Figure 14:
Lyft- and Uber-Operated Dial-a-Ride Boarding Locations in Oro Valley, Marana, and Avra Valley

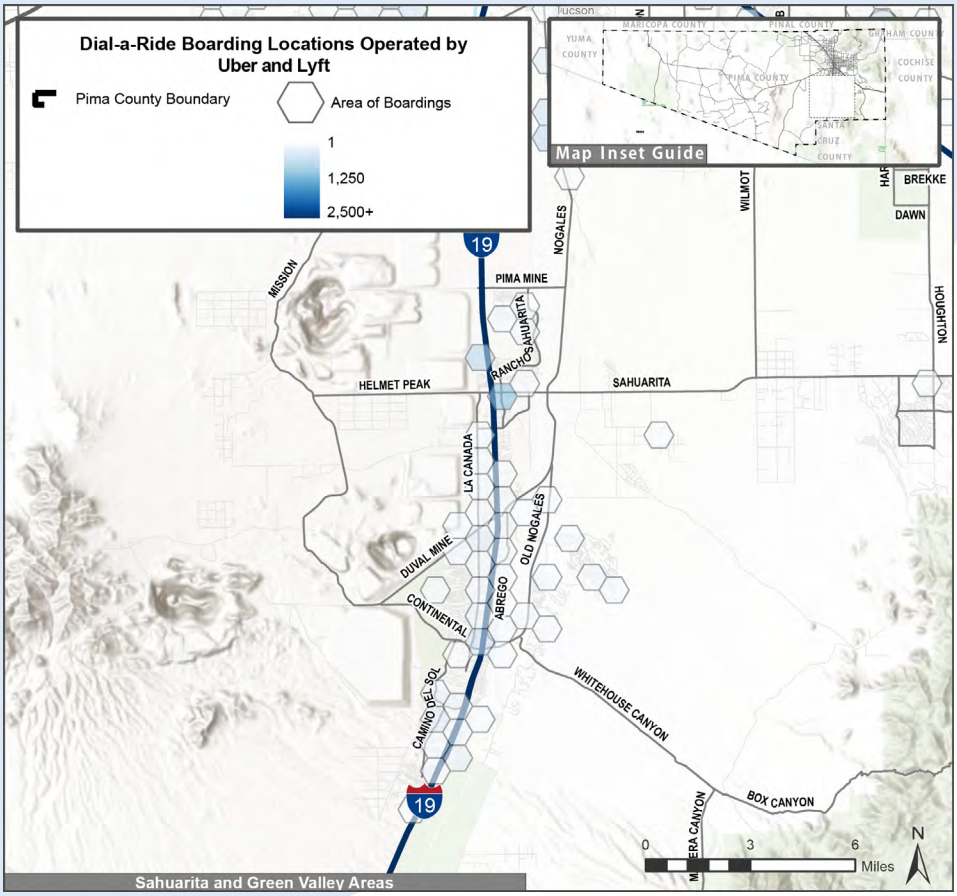


Figure 15:
Lyft- and Uber-Operated Dial-a-Ride Boarding Locations in Sahuarita and Green Valley

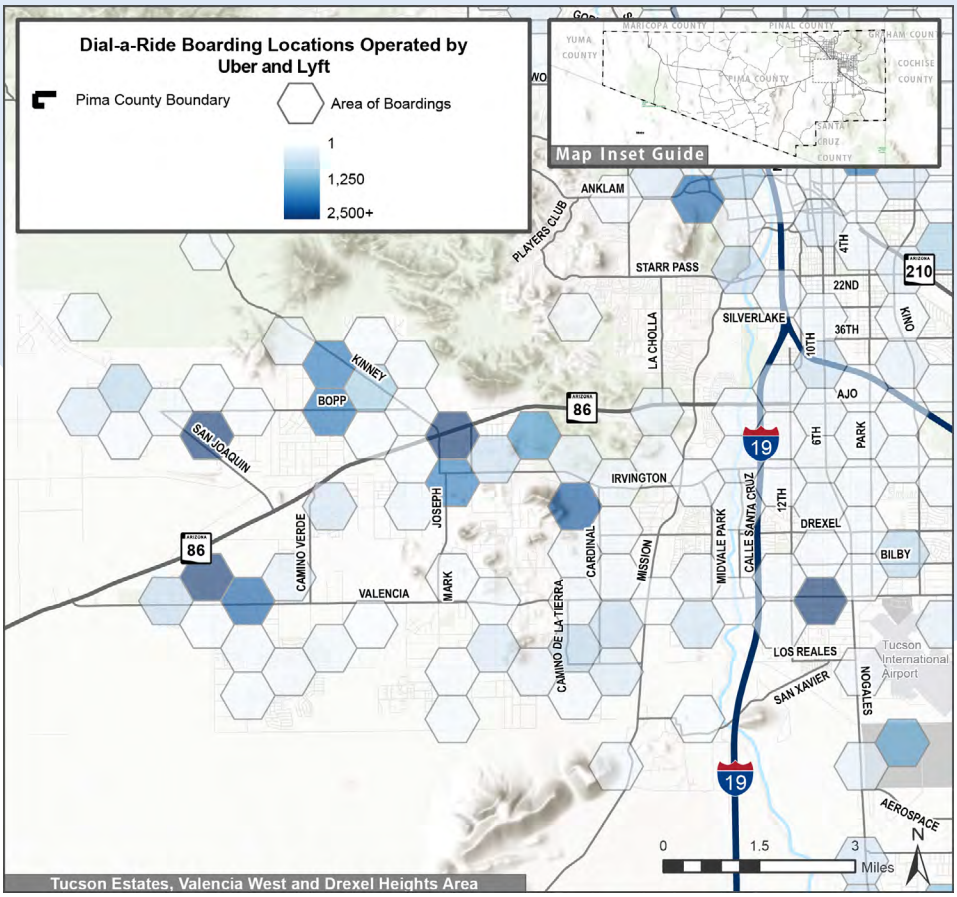


Figure 16:
Lyft- and Uber-Operated Dial-a-Ride Boarding Locations in Tucson Estates, Valencia West, and Drexel Heights

3.2.2

TOWN OF ORO VALLEY

The Town of Oro Valley previously operated a transit service, Coyote Run. This service and the Town's transit service division were discontinued in 2011 in favor of partnering with the RTA to provide Sun Shuttle service in the area formerly served by Coyote Run. This included paying the RTA as part of the Maintenance of Effort (MOE) requirement. While Oro Valley's ADA and public Dial-a-Ride services are branded as part of Sun Shuttle, they are operated by the Town of Oro Valley directly, unlike other RTA-operated Sun Shuttle services.

3.2.3

CITY OF TUCSON SERVICES

The City of Tucson's Transit Services Division manages Sun Tran, the primary local bus service in urban Tucson, as well as the associated Sun Express bus routes, the Sun Link Streetcar, Sun on Demand microtransit zones, and Sun Van curb-to-curb paratransit service. Funding for the transit services comes from a combination of the City's general fund, RTA funds, and FTA grants. The City contracts with RATP Dev to operate the system. The City of Tucson services predate the implementation of the RTA-operated Sun Shuttle services. Similar to the RTA, all City of Tucson transit services have been free to ride since March 2020 when fares were suspended for the COVID-19 pandemic.

Sun Tran/Sun Express

Operated outside of the RTA, Sun Tran includes all major local transit routes operated by the City of Tucson, while Sun Express includes the express routes operated by the City. **Figure 17** shows all Sun Tran and Sun Express routes, color-coded by total ridership by route.

Figure 17: Sun Tran Ridership by Route in FY 2024

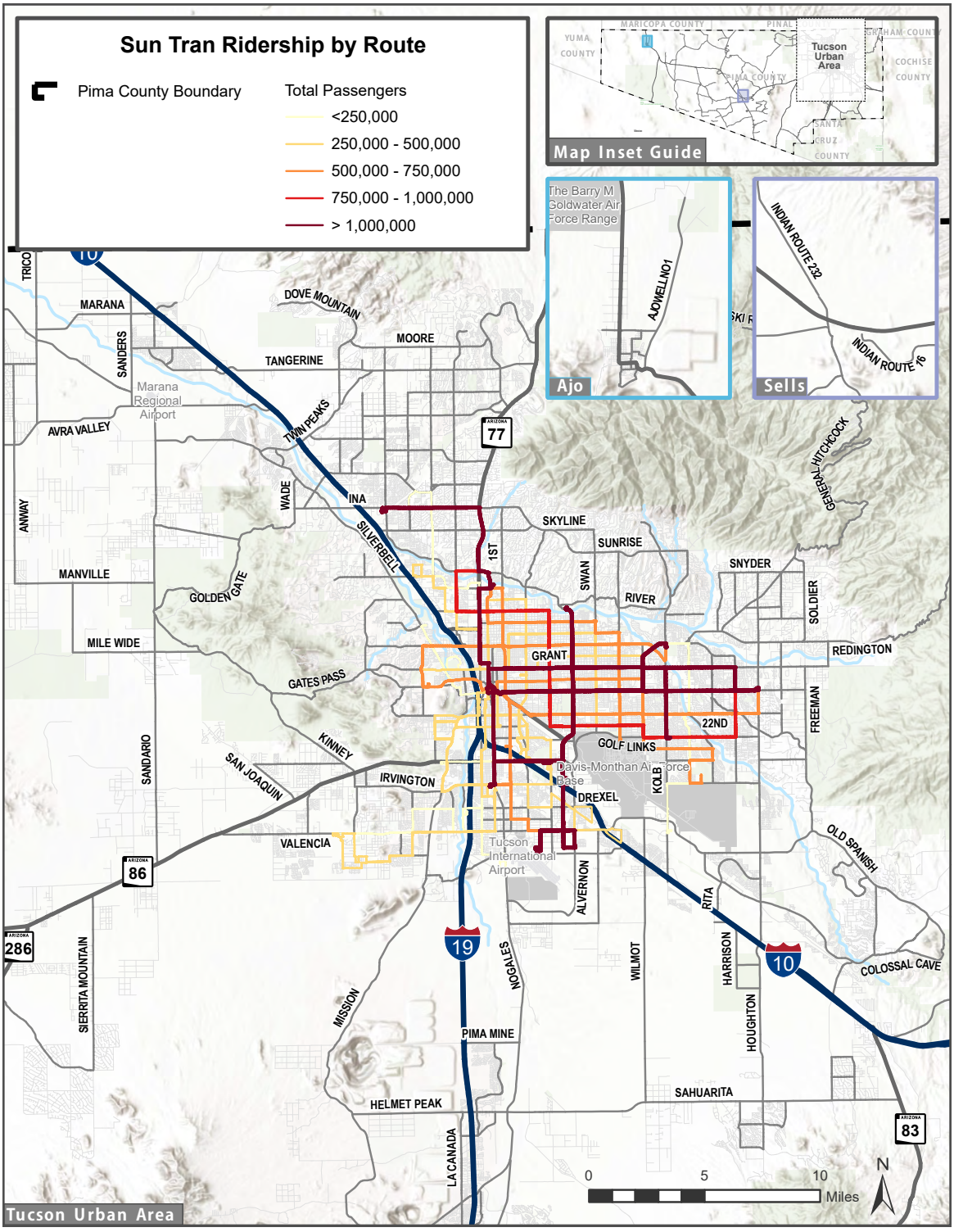


Figure 18 and Table 8: Sun Tran Ridership by Fiscal Year from FY 2019 to FY 2024

Figure 18 and **Table 8** show Sun Tran Ridership by fiscal year from FY 2019 to FY 2024.

Broadly, Sun Express routes have seen the least recovery out of Tucson area transit services since the pandemic, with only the 201X and 204X exceeding FY 2019 ridership. Route 22 has also failed to recover well. Notably, the service plan in the Sun Tran Transit Comprehensive Operational Analysis identifies route 22 for elimination due to a decrease in ridership and overlap with Route 5 and a Sun On Demand zone.

Both routes 201X and 204X, the two express services that have seen increases over FY 2019, serve Aero Park, connecting to the eastside and Northwest, respectively. Notably, route 203X, connecting Aero Park to Oro Valley, did not see similar success. **Table 9** shows ridership for each route in FY 2019 and FY 2024, demonstrating change over the period.

In FY 2024, the following Sun Tran Routes saw the highest ridership:

- **Route 8: Broadway**
- **Route 11: Alvernon**
- **Route 4: Speedway**
- **Route 16: Oracle/Ina**
- **Route 18: S. Sixth Ave**
- **Route 17: Country Club/29th Street**
- **Route 9: Grant**
- **Route 7: 22nd Street**

The following Sun Tran Routes saw the highest recovery after the pandemic:

- **Route 204X: Northwest-Aero Park Express**
- **Route 37: Pantano**
- **Route 10: Ruthrauff**
- **Route 2: Pueblo Gardens**

Table 9: Sun Tran and Sun Express Ridership Recovery Since FY 2019 (FY 2024)

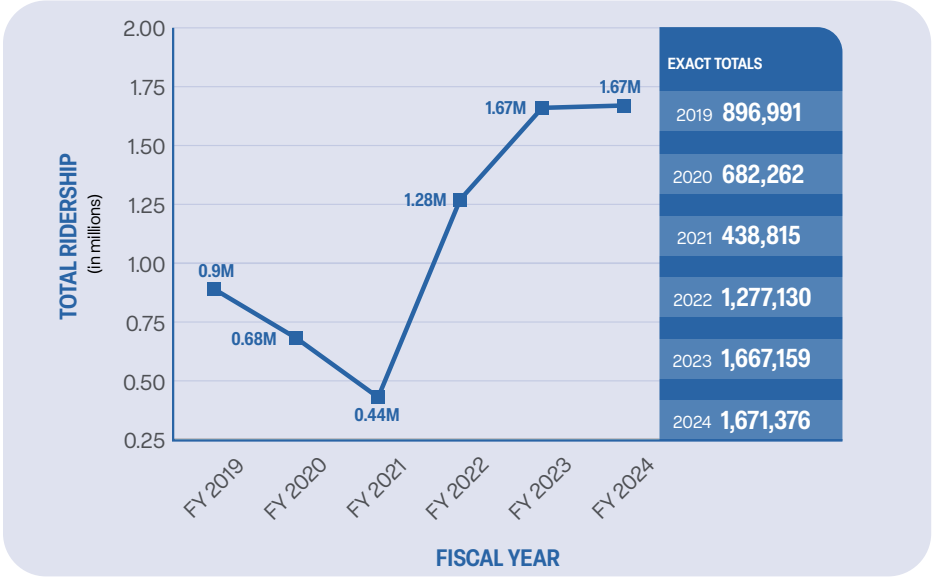
Routes	FY 2019	FY 2024	Percent of FY 2019 Ridership	% Change from FY 2019
1 – Glenn/Swan	464,527	459,994	99.0%	-1.0%
2 – Pueblo Gardens	234,168	337,157	144.0%	44.0%
3 – Sixth Street/Wilmot	684,177	608,214	88.9%	-11.1%
4 – Speedway	1,103,111	1,249,511	113.3%	13.3%
5 – Pima/W. Speedway	227,965	276,993	121.5%	21.5%
6 – Euclid/N. First Avenue	560,095	637,517	113.8%	13.8%
7 – 22nd Street	711,870	724,424	101.8%	1.8%
8 – Broadway	1,228,961	1,342,993	109.3%	9.3%
9 – Grant	596,764	718,365	120.4%	20.4%
10 – Ruthrauff	295,091	426,029	144.4%	44.4%
11 - Alvernon	1,027,247	1,307,394	127.3%	27.3%
12 – Tenth/12th Avenue	441,500	429,701	97.3%	-2.7%
15 – Campbell	366,185	290,142	79.2%	-20.8%
16 – Oracle/Ina	1,141,988	1,171,249	102.6%	2.6%
17 – Country Club/29th Street	686,526	886,791	129.2%	29.2%
18 – S. Sixth Avenue	996,340	1,111,772	111.6%	11.6%
19 – Stone	270,837	318,354	117.5%	17.5%
21 – W. Congress/Silverbell	145,915	163,442	112.0%	12.0%
22 – El Rio/W. Speedway	144,134	66,505	46.1%	-53.9%
23 – Mission	315,183	403,764	128.1%	28.1%
24 – 12th Avenue	164,741	206,261	125.2%	25.2%
25 – S. Park Avenue	421,454	566,449	134.4%	34.4%
26 – Benson Highway	208,601	251,848	120.7%	20.7%
27 – Midvale Park	233,324	214,682	92.0%	-8.0%
29 – Valencia	337,456	393,337	116.6%	16.6%
34 – Craycroft/Ft. Lowell	698,248	697,350	99.9%	-0.1%
37 – Pantano	163,531	239,552	146.5%	46.5%
50 – Ajo Way	84,979	95,326	112.2%	12.2%
61 – La Cholla	149,678	119,445	79.8%	-20.2%
101X – Golf Links – Downtown Express	17,879	10,902	61.0%	-39.0%

Table 9: Sun Tran and Sun Express Ridership Recovery Since FY 2019 (FY 2024) (Cont.)

Routes	FY 2019	FY 2024	Percent of FY 2019 Ridership	% Change from FY 2019
102X – Northwest – UA Express	17,473	5,733	32.8%	-67.2%
103X – Northwest – Downtown Express	5,621	3,690	65.6%	-34.4%
104X – Marana – Downtown Express	10,140	3,605	35.6%	-64.4%
105X – Foothills – Downtown Express	14,762	6,622	44.9%	-55.1%
107X – Oro Valley – Downtown Express	18,734	5,165	27.6%	-72.4%
108X – Broadway – Downtown Express	12,438	5,740	46.1%	-53.9%
109X – Catalina Hwy – Downtown Express	8,340	4,471	53.6%	-46.4%
110X – Rita Ranch – Downtown Express	17,278	7,075	40.9%	-59.1%
201X – Eastside – Aero Park Express	7,884	8,827	112.0%	12.0%
203X – Oro Valley – Aero Park Express	18,737	7,615	40.6%	-59.4%
204X – Northwest – Aero Park Express	9,260	14,342	154.9%	54.9%

While Tucson's transit as a whole has recovered well, collectively exceeding pre-pandemic ridership, express routes are still far below pre-pandemic levels. This may correspond with the finding that Sun Tran ridership focuses on discretionary trips over commute trips, public desire for the ability to take more spontaneous trips, and the move towards work from home and other flexible options after the pandemic. As travel patterns continue to shift, microtransit may be better suited to serve the new travel demand because it provides additional flexibility compared to traditional fixed-route transit.

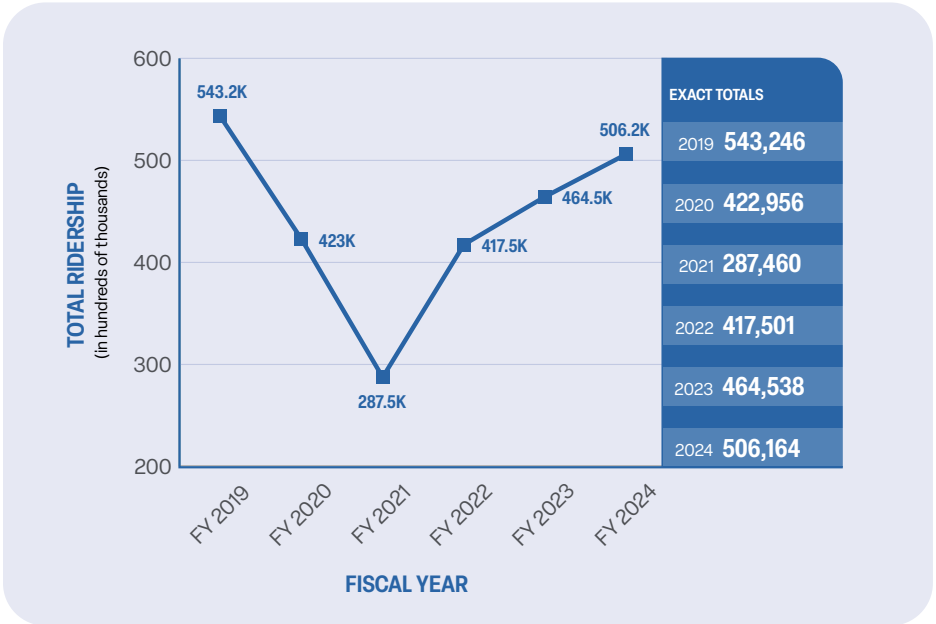
Figure 19 and Table 10: Sun Link Ridership by Year



Sun Link (Streetcar)

The City of Tucson operates the Sun Link streetcar, which runs from the Mercado District west of the Santa Cruz River through downtown and the Fourth Avenue Business District to the University of Arizona and Banner University Medical Center. Like other services, Sun Link has been free to ride since March 2020 when fares were suspended for the COVID-19 pandemic. **Figure 19** and **Table 10** show Sun Link ridership from FY 2019 to FY 2024.

Figure 20 and Table 11: Sun Van Ridership by Year



Sun Van

Sun Van provides ADA paratransit within three-quarters of a mile of Sun Tran local routes, Sun Link Streetcar, and Sun Shuttle Route 450 during the times available on the nearest fixed-route services. Like other services, Sun Van has been free to ride since March 2020 when fares were suspended for the COVID-19 pandemic. **Figure 20** and **Table 11** show Sun Van ridership from FY 2019 to FY 2024.

Sun On Demand

Sun On Demand currently operates two on-demand zones within the Tucson area. Similar to the Dial-a-Ride service areas in outlying areas, Sun On Demand provides curb-to-curb transportation to the public within specific service area zones. Riders can book within the Sun On Demand app or call the reservation line. Like other services, Sun On Demand has been free to ride since March 2020 when fares were suspended for the COVID-19 pandemic. **Table 12** details the service profile of the Sun On Demand service.

- **On Demand Zone 1 is located west of downtown and covers roughly the Silvercroft, El Rio Acres, Barrio Hollywood, and Menlo Park neighborhoods.**
- **On Demand Zone 2 is located southeast of downtown and covers much of the area between Eighth Street, Country Club Road, Ajo Way, and Park Road.**

The service plan included in the Sun Tran Transit Comprehensive Operational Analysis also proposes the creation of a third zone covering much of eastern Tucson. **Table 12** shows Sun On Demand ridership in FY 2023 and FY 2024.

Sun On Demand Service Profile

Reservation:
Trip reservations can be made one to seven days before the day of travel. Advance reservations are recommended, but not required. Same-day service is provided on a first come/first served basis.

Service Hours:
Mon-Fri 6 a.m. – 8 p.m.
Sat 6 a.m. – 7 p.m. | Sun 6 a.m. - 5 p.m.

Reservation Options:
Sun On Demand app
Call (520) 798-1000 during service hours

TABLE 12: Sun On Demand Ridership (per monthly performance reports)

FY 2023	**12,270**
FY 2024	**25,257**

SECTION 04

Transit Needs Assessment

The transit needs assessment analyzes demographic profiles and travel patterns to determine transit service gaps and needs in the greater Tucson region.

4.1

Socioeconomic Conditions

Certain socioeconomic and demographic characteristics of a neighborhood may indicate that there is a higher need for public transit service. High population and employment density indicate high trip potential that may correlate with high transit use. Additionally, indicators such as youth population, senior population, minority status, population under 200% of the federal poverty line, population with limited English proficiency, and zero-car households may reveal neighborhoods with higher transit-dependent populations. This section describes these socioeconomic conditions using data from the 2018-2022 American Community Survey at the census tract geographic level. Then, this data is combined into one index known as a "transit propensity score" that shows the census tracts with the highest overall transit need.

Table 13: Socioeconomic and Demographic Summary

Demographic Indicators	Arizona	Pima County	Tucson Urbanized Area
Population Density (people/sq mile)	**63.1**	**113.4**	**2,449.2**
Employment Density (people/sq mile)	**25.3**	**38.4**	**898**
Percent of Population Youth	**22%**	**20%**	**20%**
Percent of Population Senior	**18%**	**20%**	**20%**
Percent of Population People of Color	**33%**	**34%**	**35%**
Percent of Population Under 200% of Federal Poverty Line	**31%**	**34%**	**36%**
Percent of Population with Limited English Proficiency	**4%**	**4%**	**4%**
Percent of Households with Zero Cars	**5%**	**7%**	**8%**

Table 13 summarizes the socioeconomic and demographic characteristics of the State of Arizona, Pima County, and the Census Bureau defined Tucson Urbanized Area (which encompasses populated areas spanning the City of Tucson, the Town of Oro Valley, parts of the Town of Marana, and surrounding unincorporated areas).

Population under 200% of the federal poverty line, population with limited English proficiency, and zero-car households may reveal neighborhoods with higher transit-dependent populations.

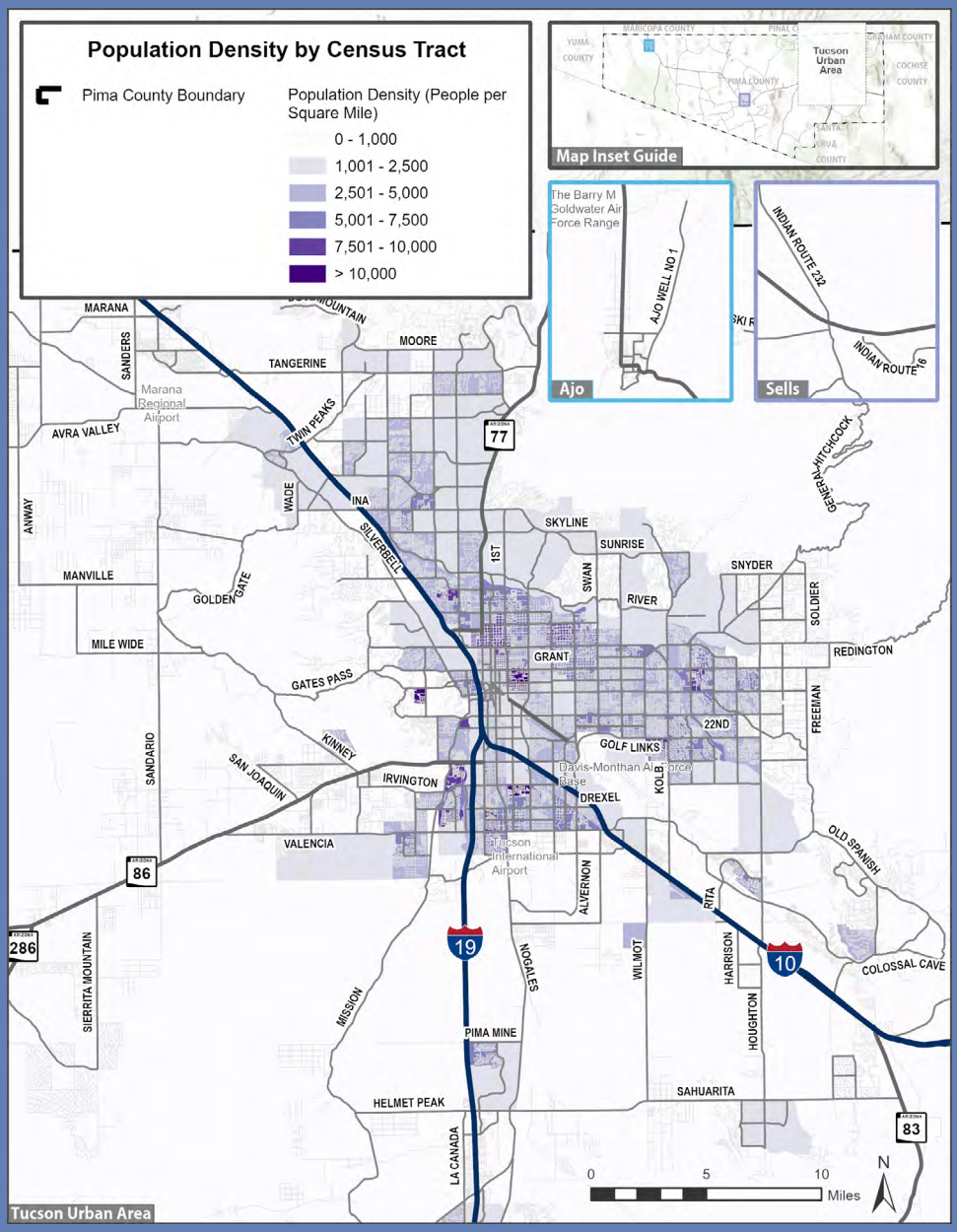
PIMA COUNTY

34% **Under 200% Poverty Line**

4% **Limited English Profiency**

7% **Households with Zero Cars**

Figure 21: Population Density in Pima County by Census Tract



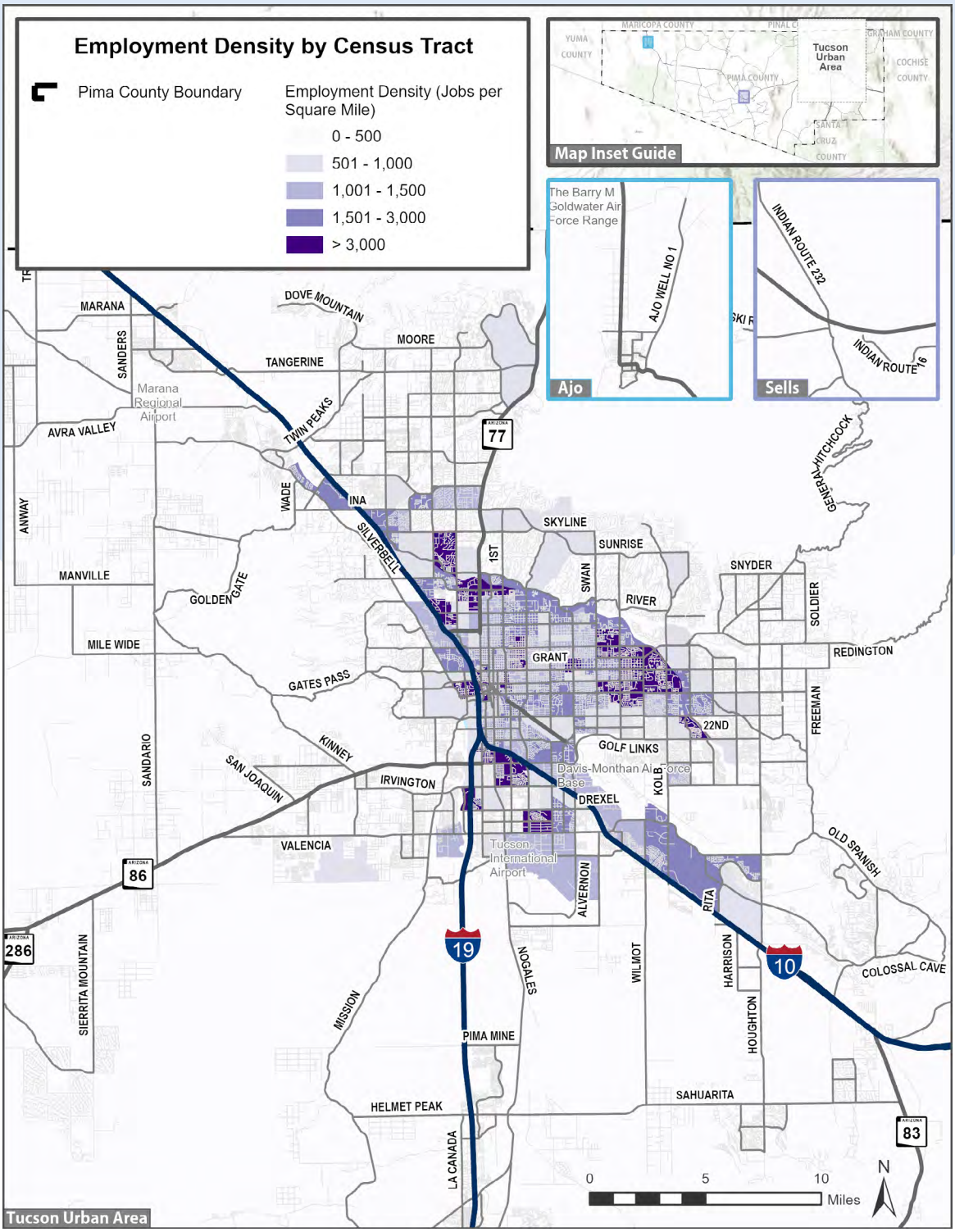
4.1.1

POPULATION DENSITY

Population density (people per square mile) is a strong indicator of public transit need, as the higher trip potential there is conducive to transit ridership. **Figure 21** shows the population density in the greater Tucson region. Population density is greatest in downtown Tucson and generally decreases farther from the city center. Most of the areas with a high population density are currently served by the existing bus system. However, areas with relatively high population density south of Drexel Heights and north of Casas Adobes are not served by as many bus routes as central Tucson.

Drexel Heights and north of Casas Adobes are not served by as many bus routes as Central Tucson.

Figure 22: Employment Density in Pima County by Census Tract

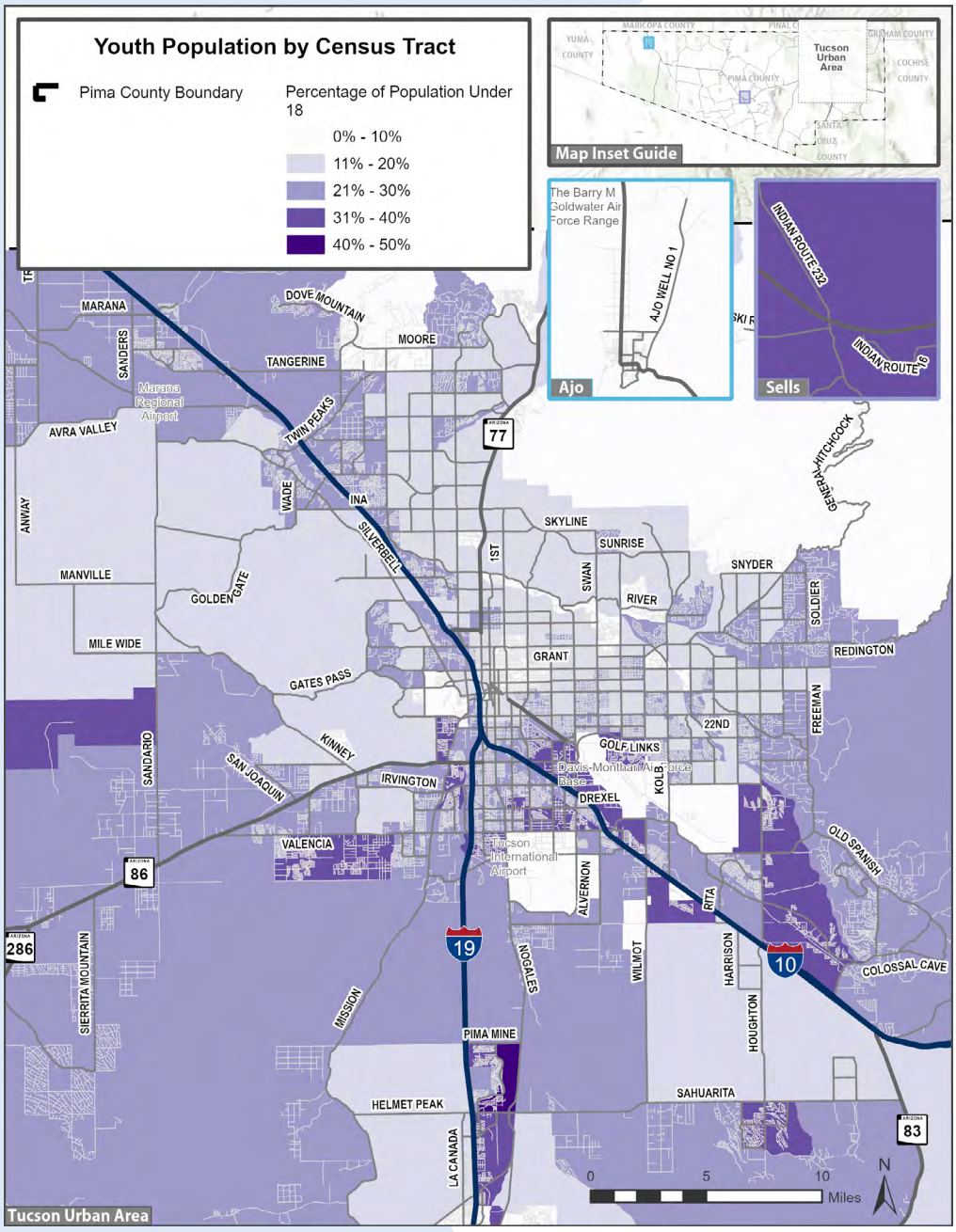


4.1.2

EMPLOYMENT DENSITY

Job density, which is the number of jobs per square mile, indicates locations where there are high numbers of commute trips that may be served by transit. Improving transit near these employment centers improves accessibility of job opportunities to a larger population. In the Tucson area, employment density is highest in downtown Tucson and near El Dorado Medical Center; other high-density areas include UA Tech Park, Tucson Mall area, University of Arizona, and Tucson Medical Center. **Figure 22** shows employment density in the greater Tucson region.

Figure 23: Youth Population in Pima County by Census Tract

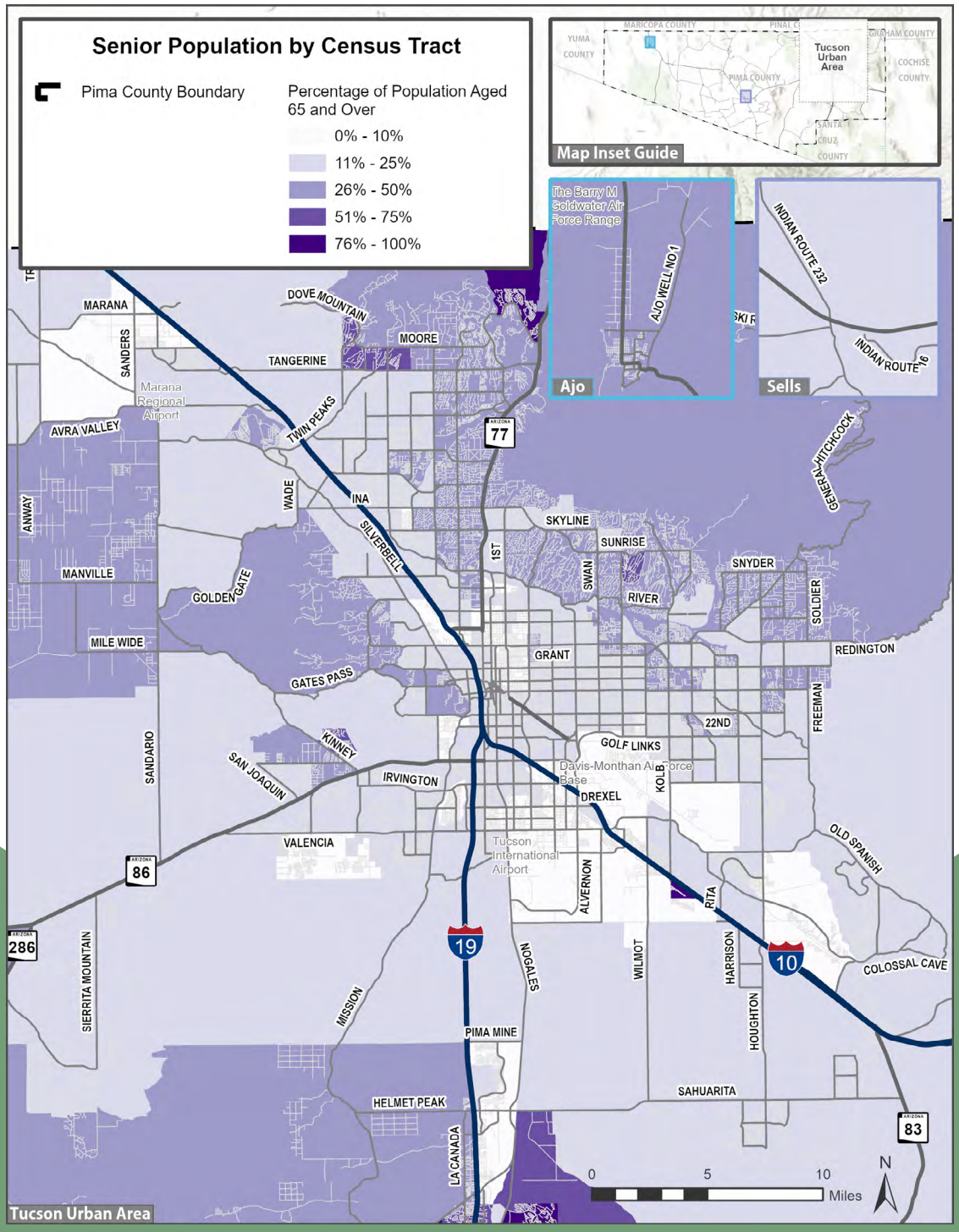


4.1.3

YOUTH POPULATION

Based on national trends, younger people may rely on public transit more often due to lifestyle factors and may not have access to personal vehicles. **Figure 23** shows the percentage of the population that is under 18 years old in the Tucson area. Overall, neighborhoods south of downtown Tucson have higher youth populations compared to those to the north of downtown. Many of the census tracts with a high percentage of youth follow the I-10 corridor. Other notable areas with a high percentage of youth include the Tohono O'odham Nation, the Pascua Pueblo Yaqui Reservation, Sahuarita, and Corona de Tucson.

Figure 24: Senior Population in Pima County by Census Tract



4.1.4

SENIOR POPULATION

Elderly populations are more likely to be unable to drive, making them more likely to rely on public transit for their mobility needs. **Figure 24** shows the percentage of the population that is over 65 years old in the Tucson area. The tract with the highest density senior population contains the Trails West Active Adult Community. Other areas with high density include Oro Valley (particularly in the Rancho Vistoso neighborhood), Dove Mountain, Tucson Estates, Sahuarita, and Catalina Foothills.

4.1.5

PEOPLE OF COLOR

Based on national trends, Black, Indigenous, and People of Color (BIPOC) populations tend to have higher rates of transit usage. For the purposes of this analysis, BIPOC status is defined as the percentage of the population that does not identify as White-only. **Figure 25** shows the percentage of the population that identifies as BIPOC in the Tucson area. In general, a higher percentage of the population south of downtown identifies as BIPOC compared to north of downtown. A majority of the population living within the Indian Nations identify as BIPOC.

Figure 25: BIPOC Population in Pima County by Census Tract

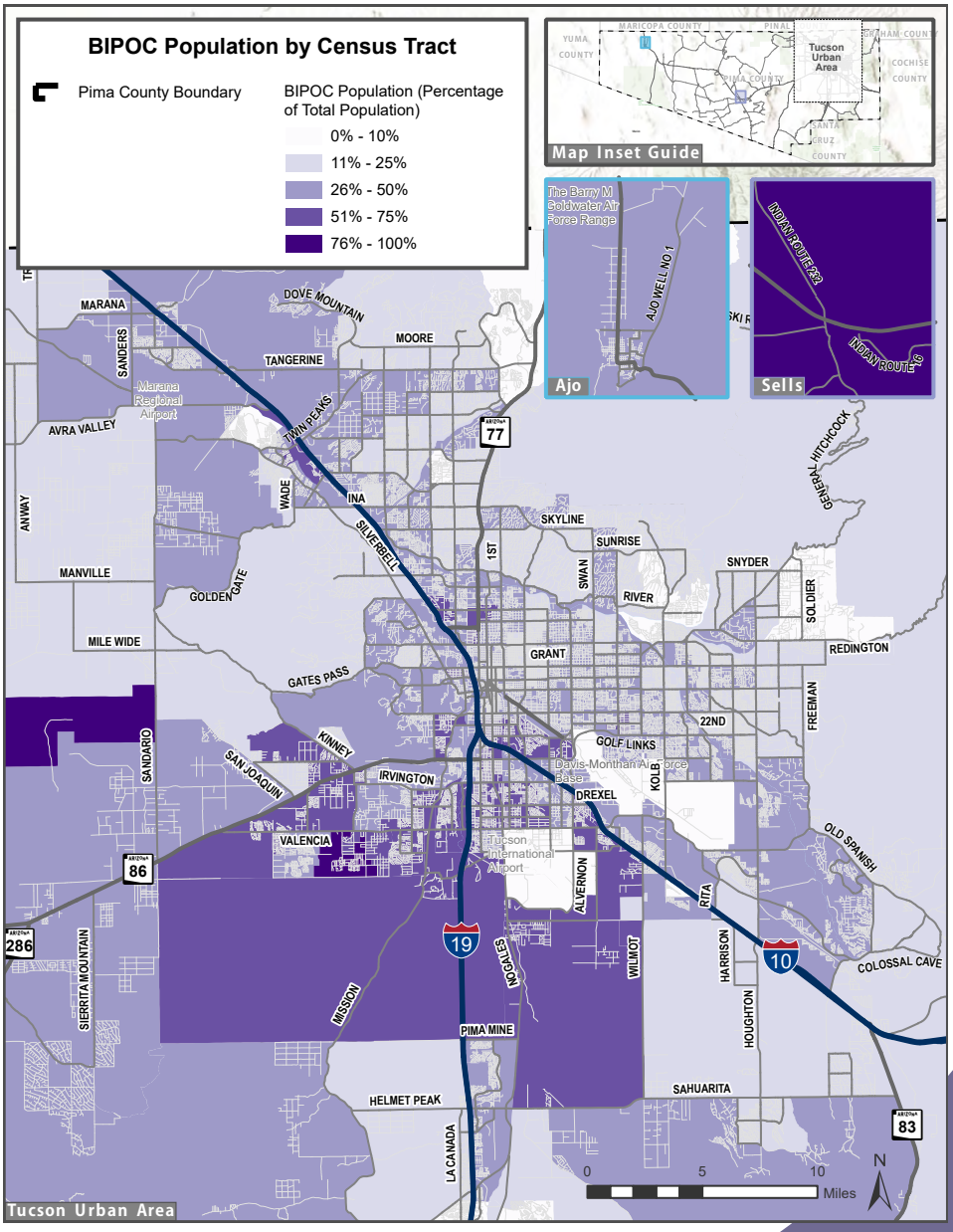
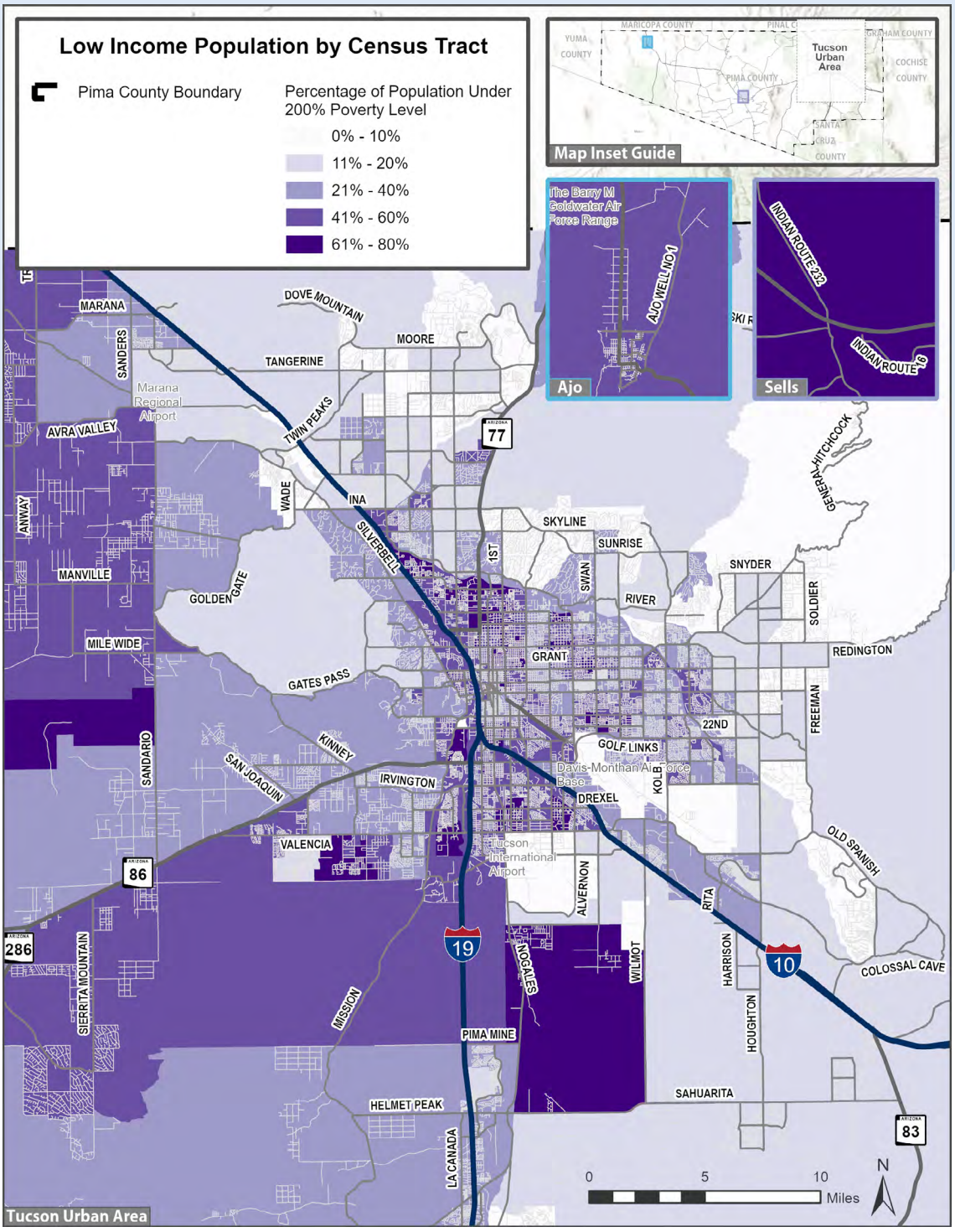


Figure 26: Low-Income Population in Pima County by Census Tract

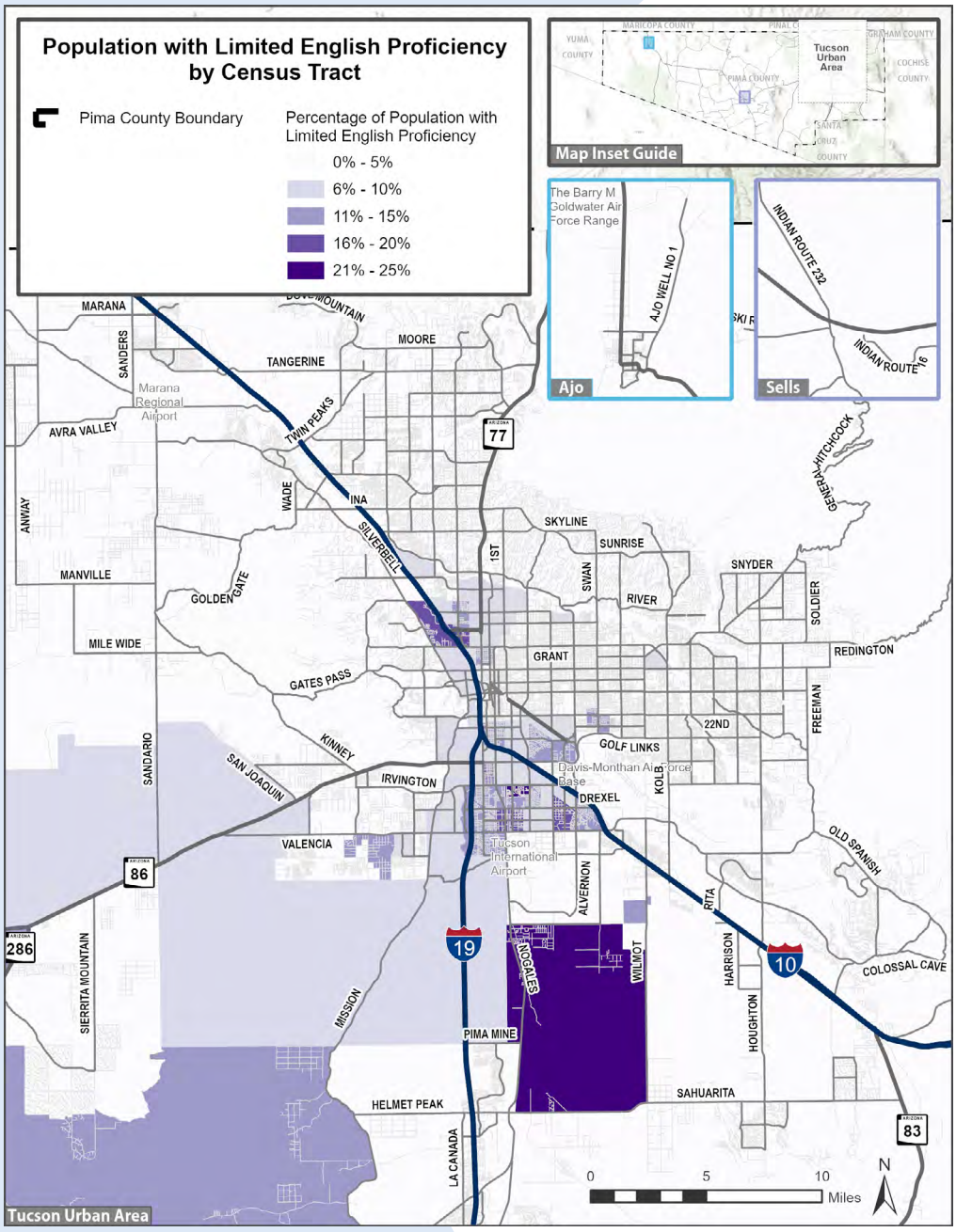


4.1.6

LOW-INCOME POPULATION

Personal vehicle ownership is less common among low-income populations, who rely more on public transit for their mobility needs. Improving transit for these populations improves their ability to reach community resources. **Figure 26** shows the percentage of the population under the 200% federal poverty level in the Tucson area. Areas with the highest density of low-income population include the neighborhoods directly north and south of downtown Tucson, as well as within tribal lands.

Figure 27: Limited English Proficiency in Pima County by Census Tract

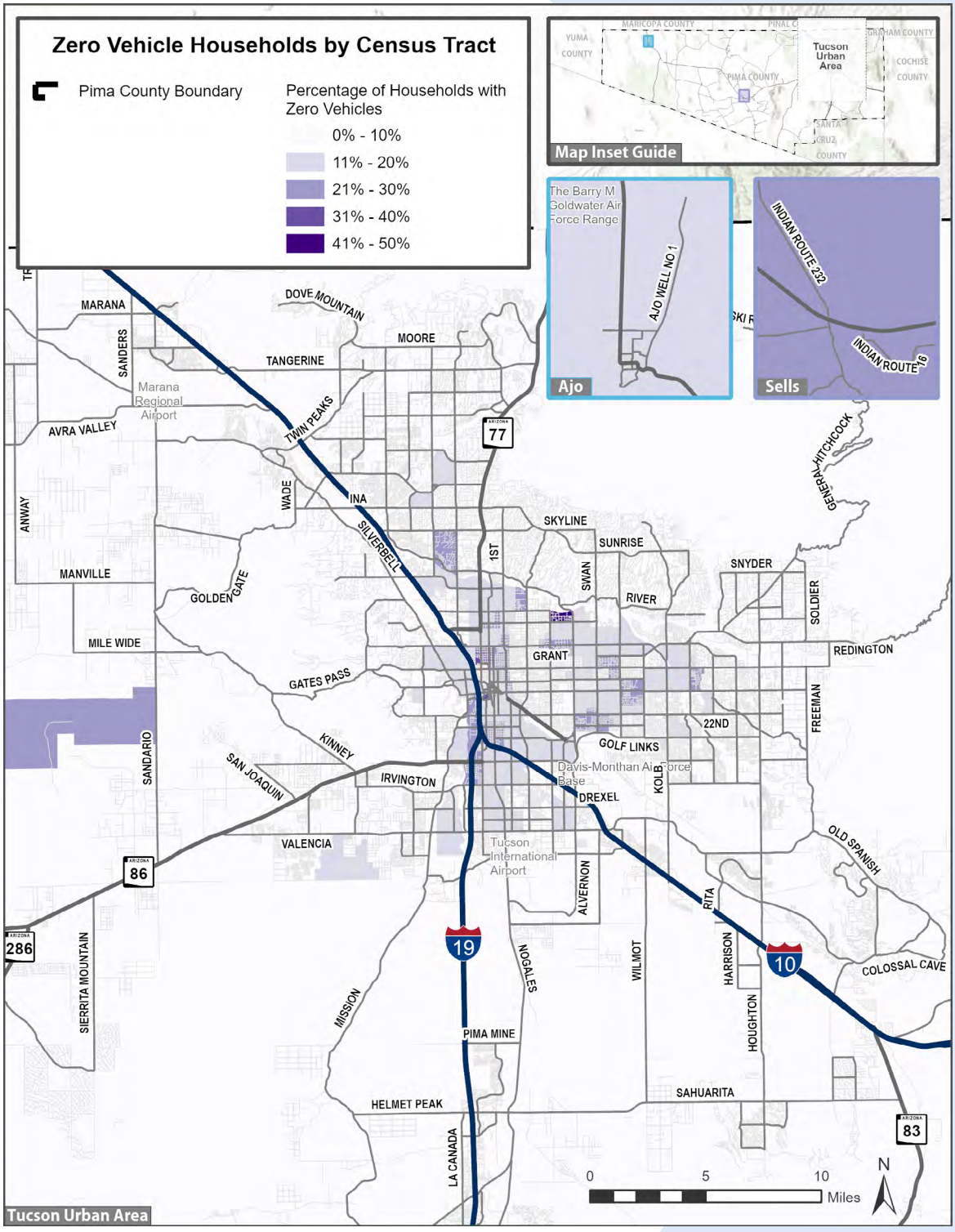


4.1.7

LIMITED ENGLISH PROFICIENCY (LEP)

People with LEP may require additional resources and support to successfully navigate the existing transportation network and access community resources. **Figure 27** shows the LEP population in the Tucson area. Summit has the largest concentration of LEP population in the Tucson area, with pockets of communities north and south of downtown Tucson also displaying higher percentages.

Figure 28: Zero-Vehicle Households in Pima County by Census Tract

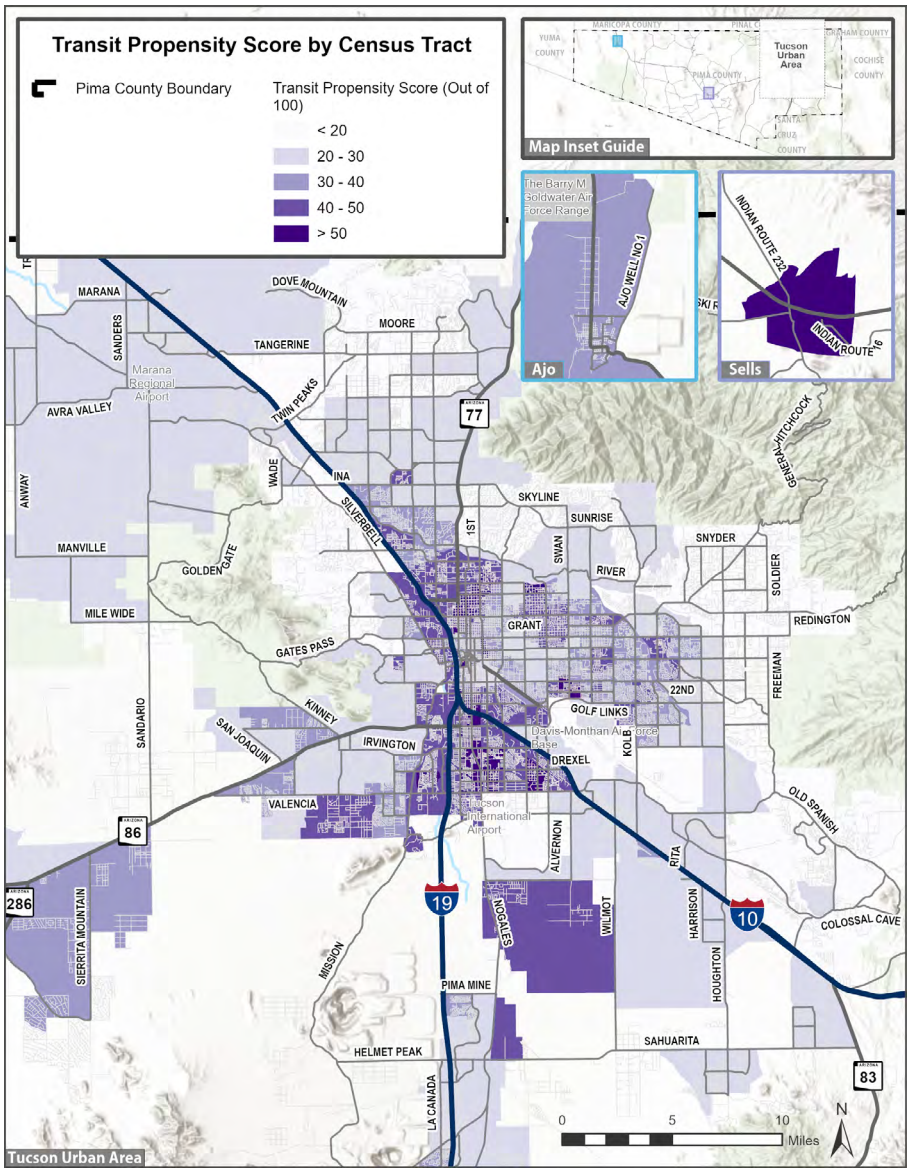


4.1.8

ZERO-VEHICLE HOUSEHOLDS

People living in zero-car households are more likely to rely on public transit for their mobility needs. **Figure 28** maps the percentage of households with zero vehicles in the Tucson area by census tract. The highest percentages of zero-car households are found in the Kleindale neighborhood and near the University of Arizona Campus (likely due to the student population). The Tohono O'odham Nation also has a higher density of zero-car households.

Figure 29: Transit Propensity in Pima County by Census Tract



4.1.9

TRANSIT PROPENSITY SCORE

For each census tract, a transit propensity score between 0 and 100 was assigned. The transit propensity score was developed by combining demographic and socioeconomic data into one index to identify which communities have the greatest propensity to use public transit. The score combines indicators of high trip activity, such as population and job density, with socioeconomic characteristics that indicate a higher propensity to take public transit. Each factor was assigned the following weight:

25% Population Density

25% Job Density

50% Socioeconomic Characteristics

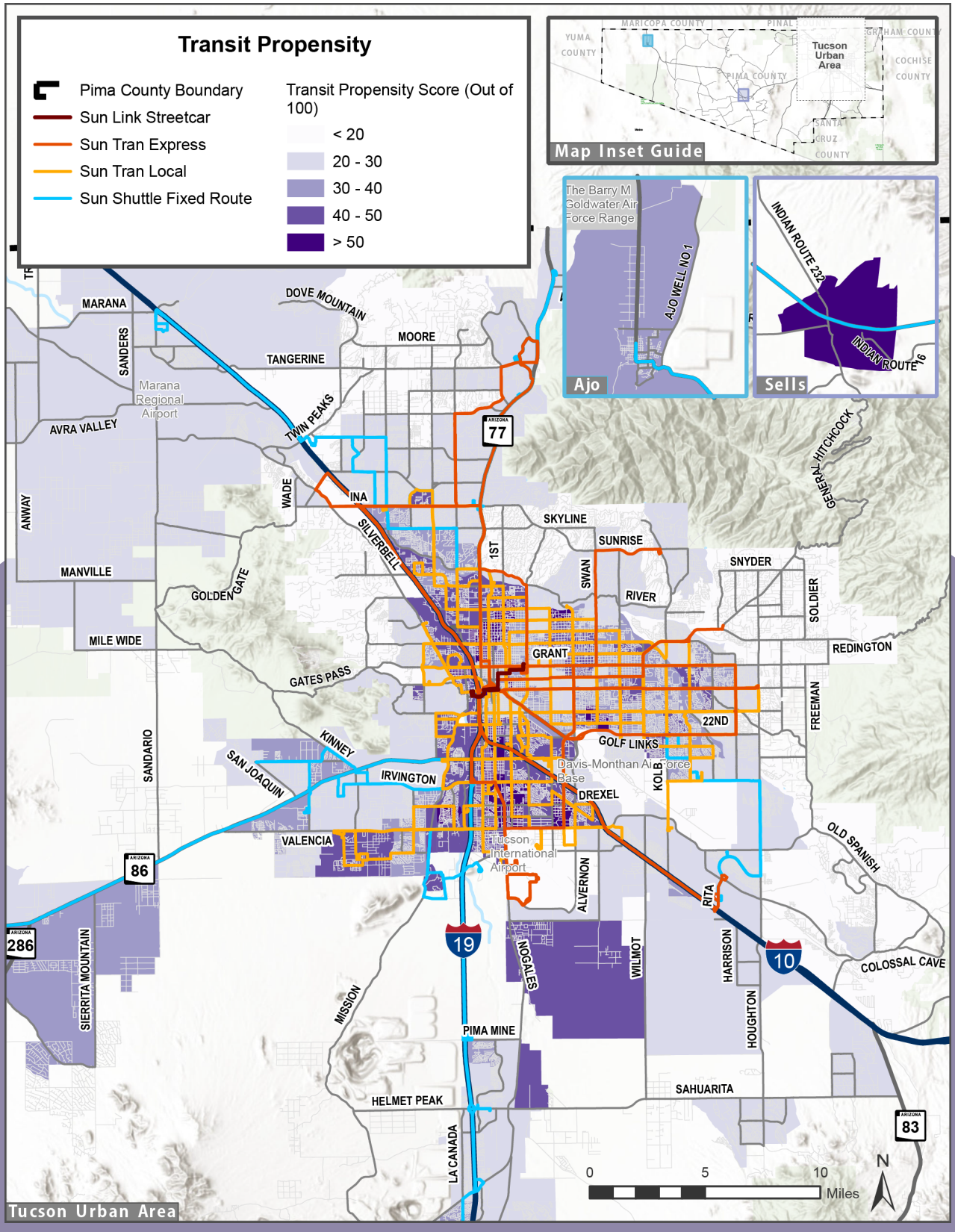
(youth, seniors, minorities, poverty, LEP, zero-car households)

Note that a community with a low transit propensity score does not necessarily indicate that it should not be served by transit, and vulnerable populations that rely on transit may exist there. In these cases, a transit system that provides flexibility and responds to the needs of that community may be considered for implementation.

Figure 29 shows the transit propensity score by census tract for the greater Tucson region and Pima County, respectively. The neighborhoods with the highest propensity for transit are the suburbs north, east, and south of downtown Tucson. The Tohono O'odham Nation and the Pascua Pueblo Yaqui Reservation also score high in this index. Vail and Picture Rocks score low in this index, suggesting that traditional fixed-route public transit may be less suited to serve these communities.

Figure 30 shows the transit propensity score overlaid with existing fixed-route transit services in Pima County. Existing service generally provides good coverage of locations with high propensity, though service may be expanded in certain areas on the network's fringe to serve additional high-need communities. In locations with high transit propensity, Sun Tran and Sun Shuttle may examine existing service frequencies and spans to ensure the quality of transit service provided meets the needs of those communities.

Figure 30: Transit Propensity by Census Tract and Existing Fixed-Route Transit in Pima County



Travel Demand

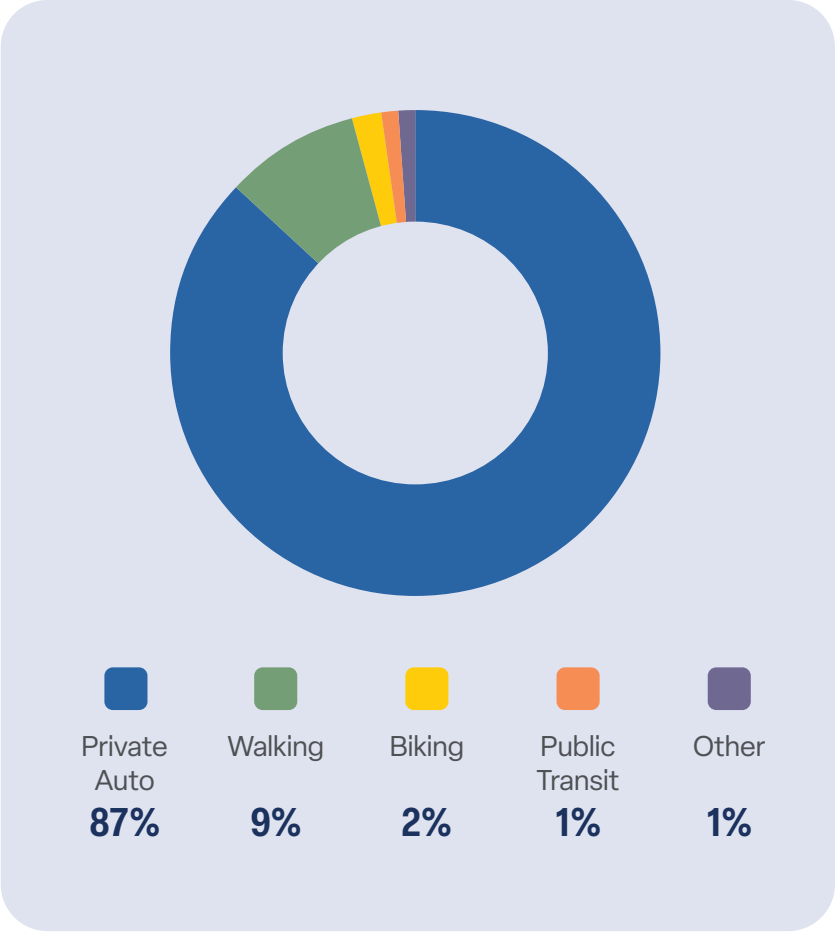
This section analyzes travel demand trends using data from Replica, an activity-based travel demand model. Replica aggregates census data, location-based "probe" data (such as connected devices and credit card transaction), and other sources to simulate the complete activities and movements on a typical day. It provides detailed attributes of each simulated trip, including trip time of day, purpose, mode, and the demographics of the trip taker. Replica data of a typical Thursday in fall 2023 was used for this analysis. Trips made by freight vehicles are not included in this analysis.

4.1.10

COUNTYWIDE OVERVIEW

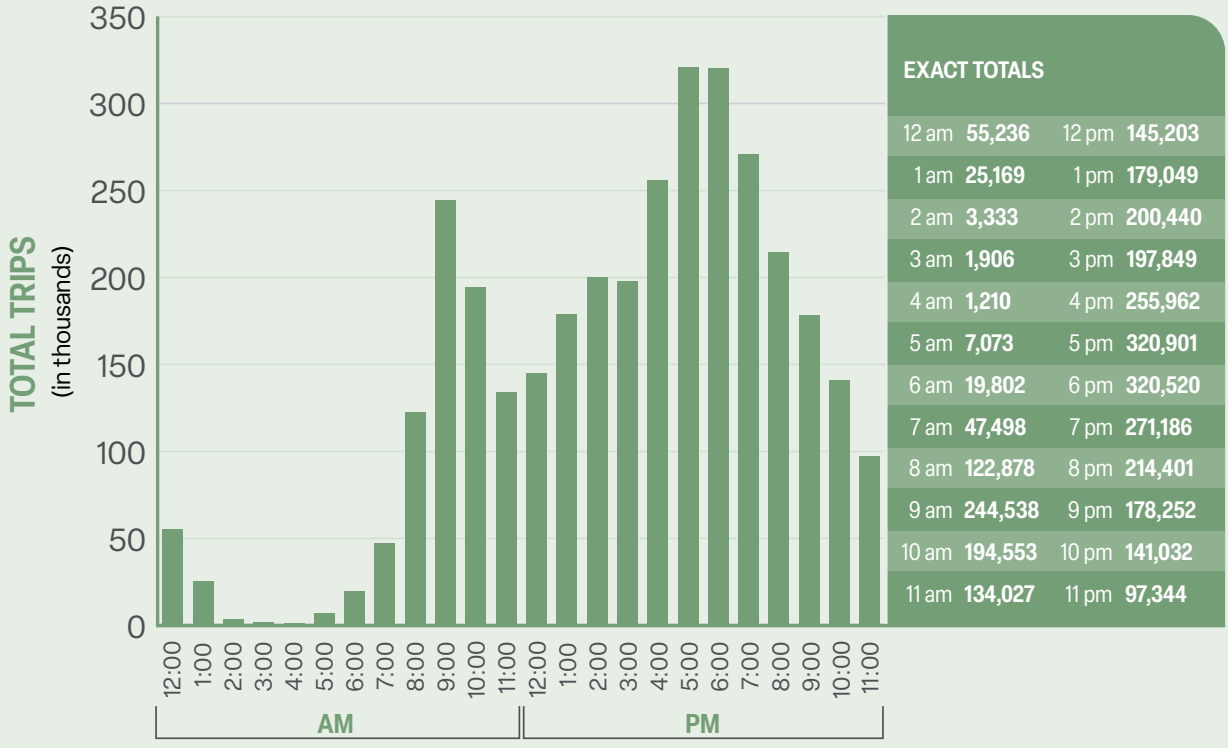
The Replica model indicates that there are about 3.54 million trips taken within Pima County on a typical weekday. **Figure 31** shows the mode of transportation taken for all trips within the County. Private auto is the predominant mode of travel for all trips taken within the County, comprising 87% of all trips, followed by walking and biking. Public transit makes up 1% of all trips taken.

Figure 31: Trips by Primary Mode of Transportation



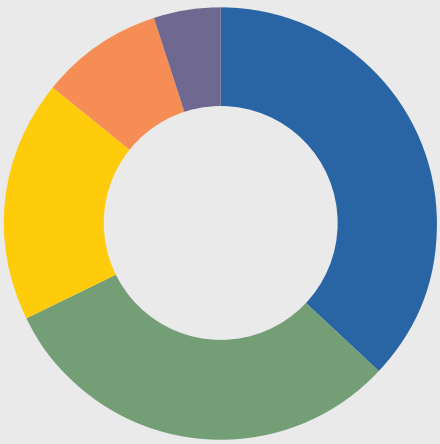
Private auto is the predominant mode of travel for all trips taken within the County, comprising 87% of all trips, followed by walking and biking. Public transit makes up 1% of all trips taken.

Figure 32: Trips by Time of Day*



EXACT TOTALS			
12 am	55,236	12 pm	145,203
1 am	25,169	1 pm	179,049
2 am	3,333	2 pm	200,440
3 am	1,906	3 pm	197,849
4 am	1,210	4 pm	255,962
5 am	7,073	5 pm	320,901
6 am	19,802	6 pm	320,520
7 am	47,498	7 pm	271,186
8 am	122,878	8 pm	214,401
9 am	244,538	9 pm	178,252
10 am	194,553	10 pm	141,032
11 am	134,027	11 pm	97,344

Figure 33: Trips by Trip Purpose*



Home	Eat/Shop/ Errands	Work/ School	Social/ Recreation	Other
37%	31%	18%	9%	5%

Figure 32 shows the distribution of trip activity by the time of day that the trip starts. Out of all times of day, the highest travel is observed in the PM peak, with around 330,000 trips starting between 5 and 6 p.m. The AM peak is observed between 9 and 10 a.m., with approximately 250,000 trips.

Figure 33 shows the purpose of all trips taken within the County. The purpose with the most trips is to go home, with 37%. Commuter trips to work or school only comprise 18% of all trips.

** Source: Replica*

Figure 34: Replica Trip Activity by One-Square-Mile Hexbins

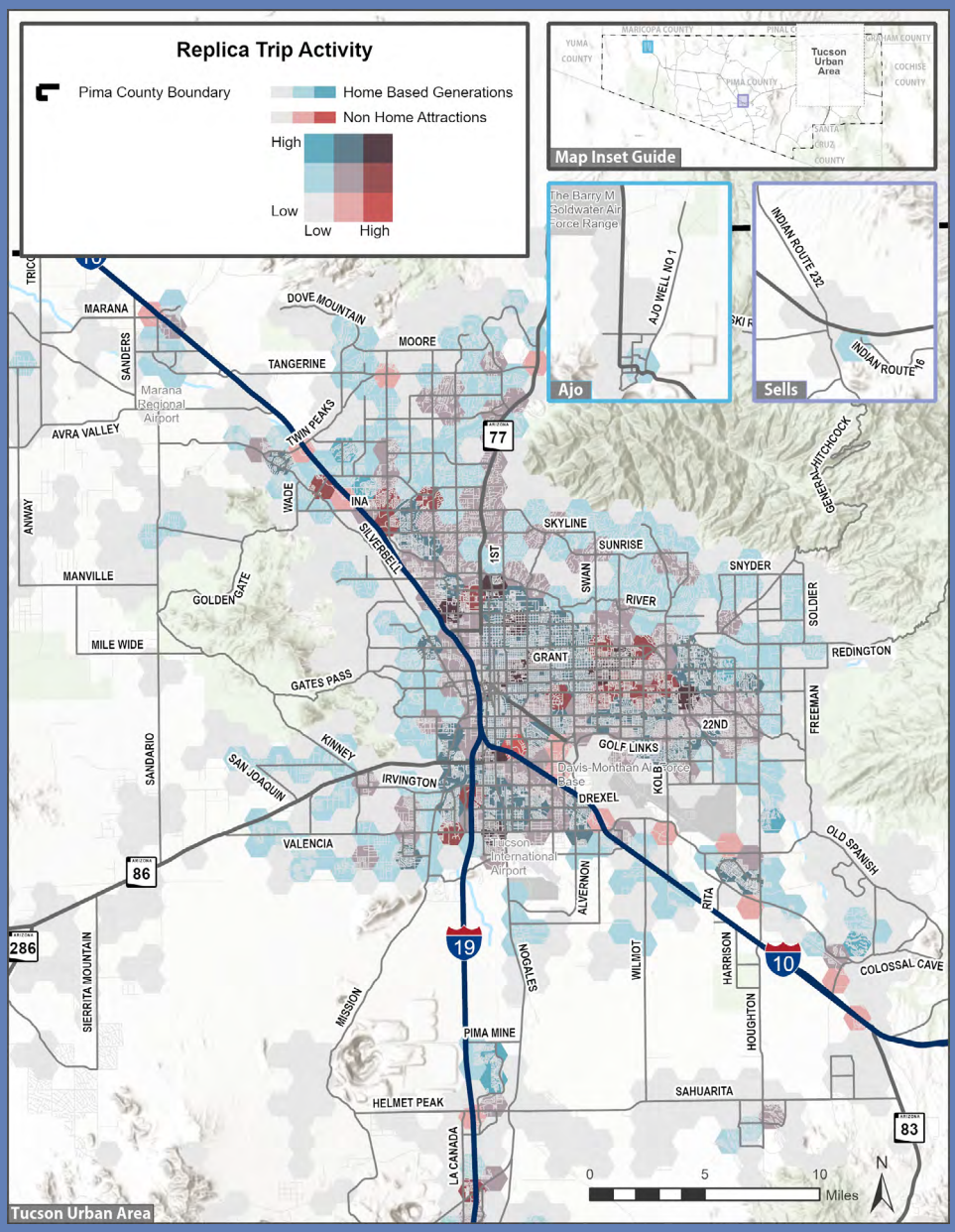


Figure 34 shows a bivariate visualization of home-based trip generations and non-home trip attraction in the greater Tucson region, derived from data from Replica. This one-square-mile map is based on a compilation of hexagon shapes. Neighborhoods to the north and east of downtown show the most trip activity of both types, suggesting that there are a mix of land uses and a variety of trip purposes in these areas. The edge of the metropolitan area shows more home-based generations that are likely low-density suburban neighborhoods. Picture Rocks shows low trip activity and is mostly home-based; Vail also shows low trip activity but has a mix of trip purposes.

Neighborhoods to the north and east of downtown show the most trip activity of both types, suggesting that there are a mix of land uses and a variety of trip purposes in these areas.

Figure 35: Origin-Destination Trip Flows Between Tucson Area Neighborhoods

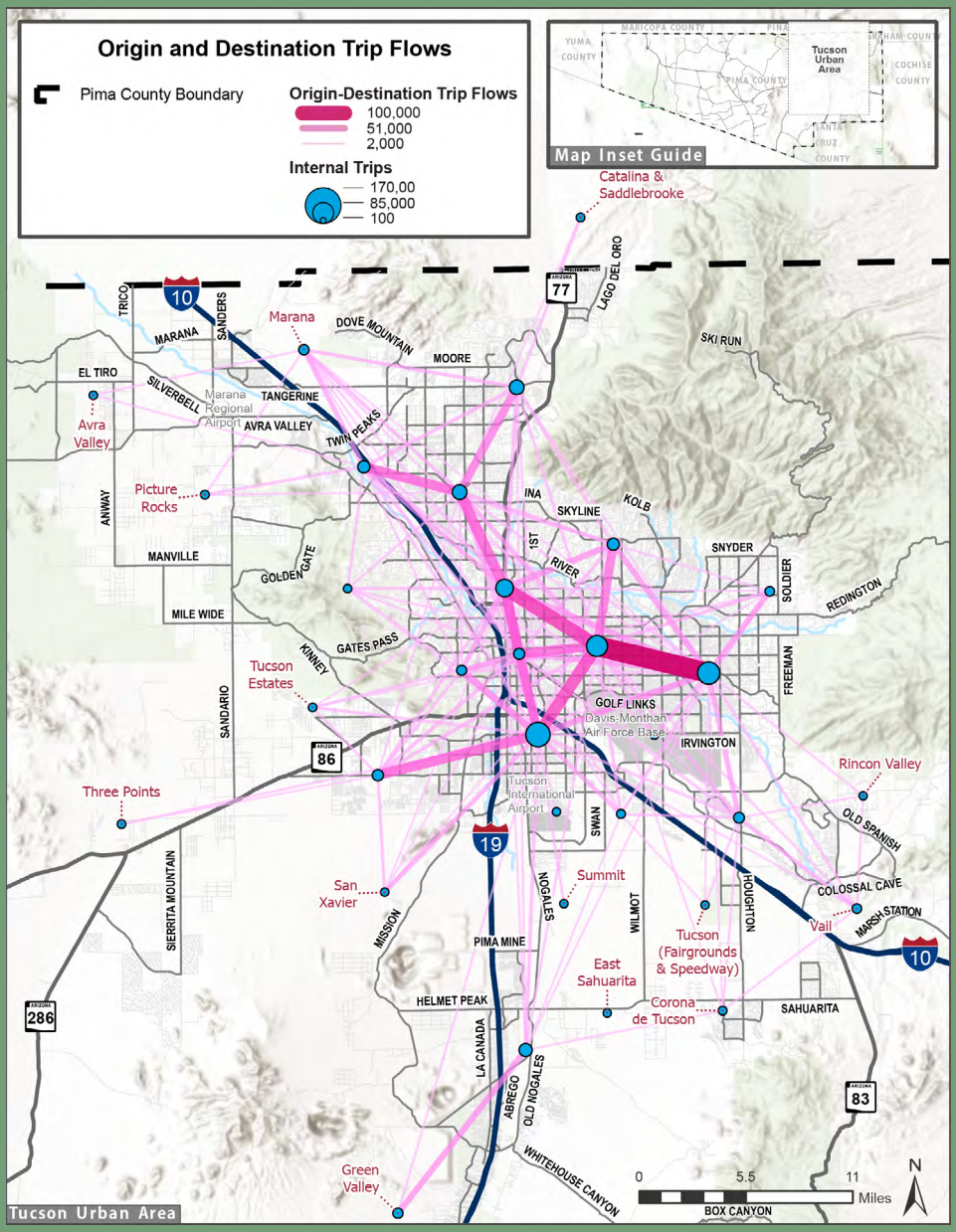


Figure 35 shows the origin-destination travel flow between Tucson area neighborhoods that reveals where trips most commonly start and end. To effectively visualize patterns in travel, broad "neighborhoods" are defined that are approximately equal in area and somewhat follow political boundaries. Trip flows within the same neighborhood are designated as "internal trips," while trip flows between neighborhoods are aggregated together as "trip flows." The results show that trip activity is dispersed over the Tucson area as opposed to being centered around downtown Tucson. The largest trip-generating neighborhoods are those immediately north, east, and south of downtown Tucson. The largest trip flows tend to be shorter in distance and between adjacent neighborhoods.

The results show that trip activity is dispersed over the Tucson area as opposed to being centered around downtown Tucson.

4.1.11

COMMUNITY DEMAND PROFILES

A more detailed analysis is conducted on the four regions currently served by the Sun Shuttle General Public Dial-a-Ride service, Picture Rocks, and Vail. In each neighborhood, origin-destination trip flows are aggregated to a uniform grid of one square-mile hexagons. Normalizing the area of each geographic unit can better reveal where travel demand hotspots are and whether they align with current transit service.

Ajo

Approximately 6,000 trips per day start or end within Ajo, which are mapped in **Figure 36.** As a geographically isolated location, most trips are within Ajo itself; very few trips extend outside of the community.

Sahuarita/Green Valley

Approximately 163,000 trips per day start or end within Sahuarita or Green Valley, which are mapped in **Figure 37.** Most of the travel activity follows the I-19 corridor. The highest trip generator is the retail cluster at the S. Nogales Highway/Duval Mine Road exit for I-19, followed by the civic facilities near Sahuarita Town Hall. Origin-destination pairs leading outside of the two communities end at downtown Tucson, Tucson Spectrum Shopping Center, and the nearby community of Arivaca Junction.

Figure 36: Origin-Destination Trip Flows in Ajo

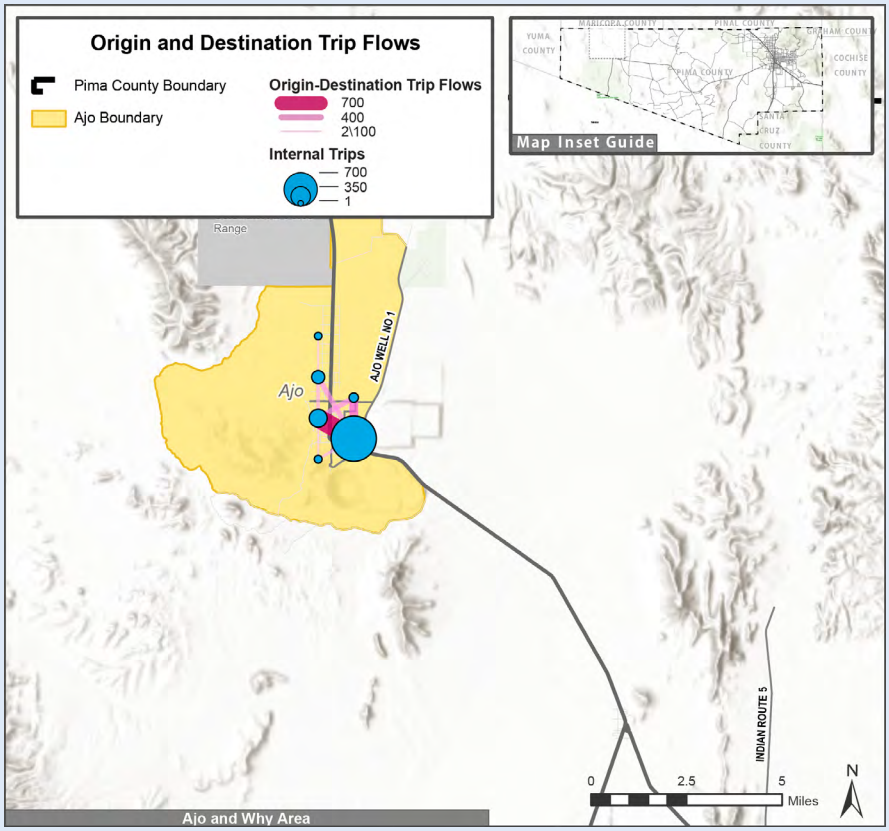


Figure 37: Origin-Destination Trip Flows in Sahuarita and Green Valley

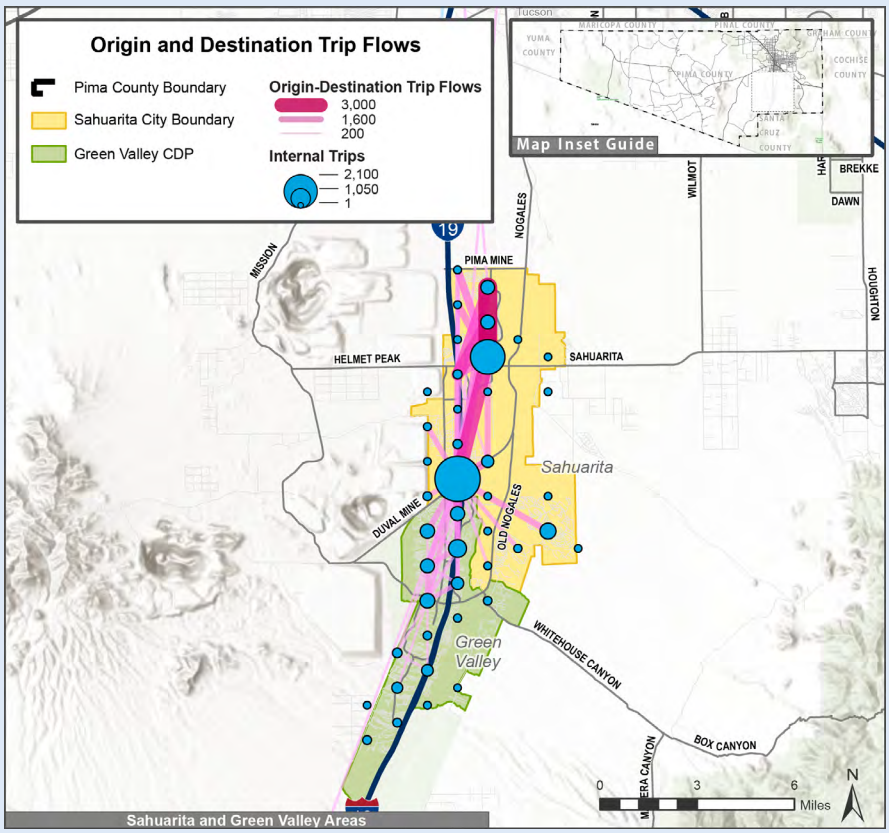
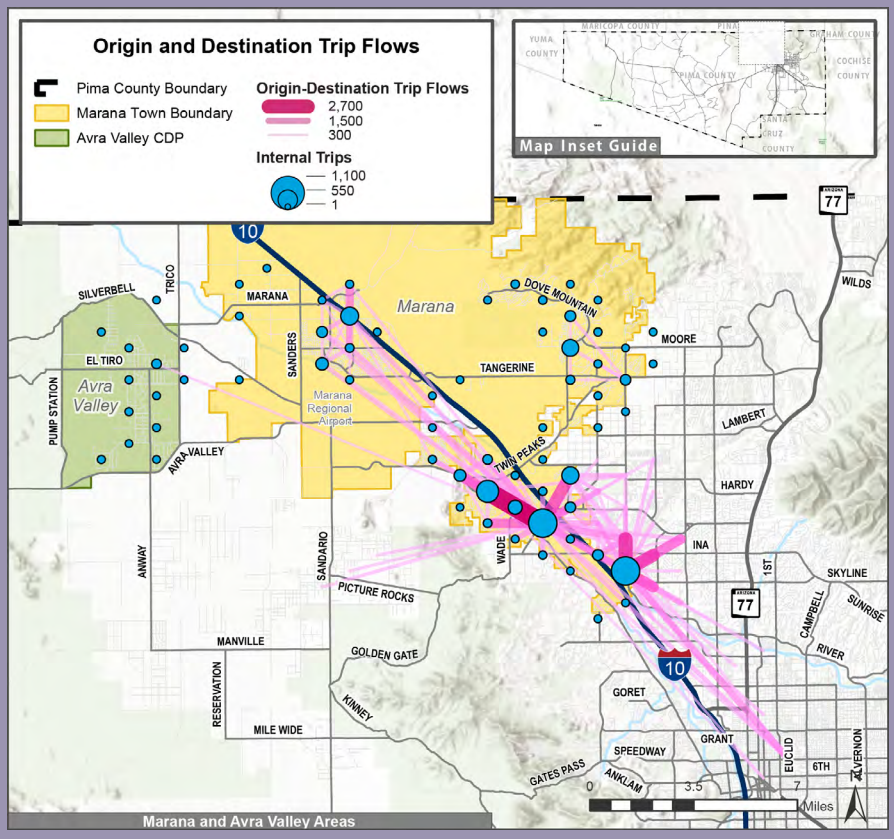


Figure 38: Origin-Destination Trip Flows in Marana and Avra Valley



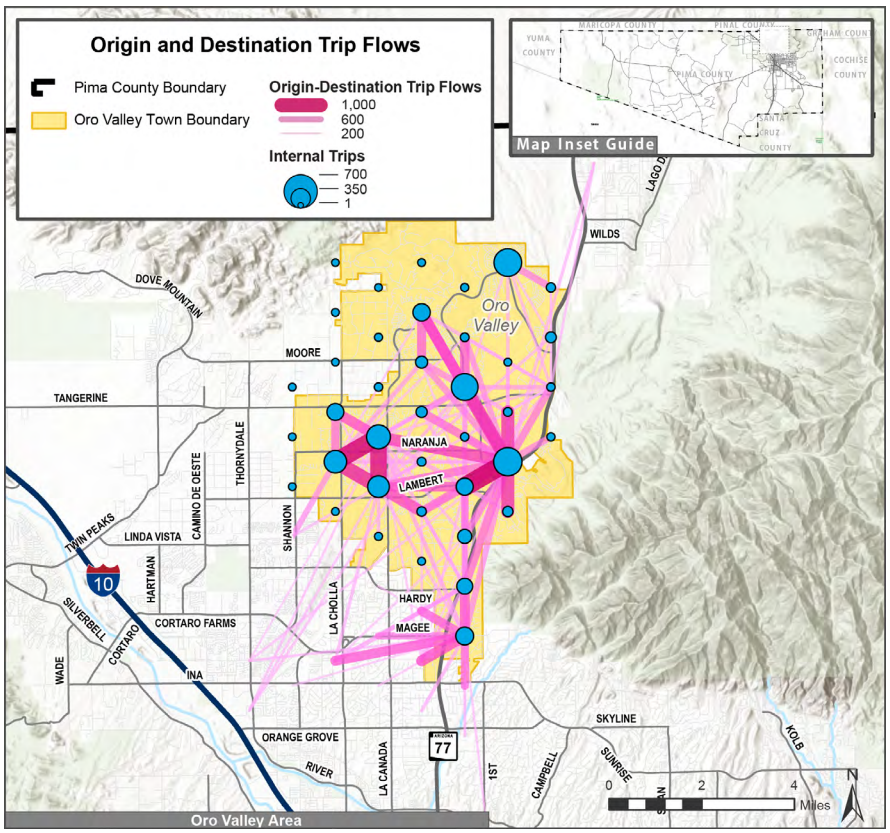
Marana/Avra Valley

Approximately 289,000 trips per day start or end within Marana or Avra Valley, which are mapped in **Figure 38**. The southern half of the Town contains the largest trip generators, including the Arizona Pavilions Shopping Center and the commercial corridor along Thornydale Road, which attract both internal and external trips. Continental Ranch, a master-planned residential development near the Arizona Pavilions Shopping Center, also generates a significant number of trips. Comparatively, downtown Marana does not generate a high number of trips. Avra Valley, a smaller community to the west, does not generate many trips. Marana also contains many trip flows to downtown Tucson and the University of Arizona, suggesting that it is a bedroom community for those employment and education centers.

Oro Valley

Approximately 179,000 trips per day start or end within Oro Valley, which are mapped in **Figure 39**. Trips in Oro Valley are predominantly shorter, local trips that are evenly dispersed across the Town. The largest trip generators are centered around commercial centers along the SR-77 corridor or near the Oro Valley Town Hall. Trip flows outside of Oro Valley travel to nearby destinations, such as the commercial corridor along Thornydale Road and Northwest Medical Center; there are comparatively fewer trips bound for downtown Tucson.

Figure 39: Origin-Destination Trip Flows in Oro Valley



Picture Rocks

Approximately 44,000 trips per day start or end within Picture Rocks, which are mapped in **Figure 40.** Most trips made in this community are bound for the Arizona Pavilions Shopping Center, which contains many retail and dining destinations. Within Picture Rocks, the highest trip activity is observed near the intersection of West Picture Rocks Road and North Sandario Road, which is the residential core of the neighborhood.

Vail

Approximately 62,000 trips per day start or end within Vail, which are mapped in **Figure 41.** The area north of I-10 is more densely populated and generates more trips. The location with the highest trip activity is near Cienega High School and Old Vail Middle School. Trips outside of Vail are generally bound for Houghton Town Center, the nearest large retail location in the Rita Ranch neighborhood. External trips headed elsewhere include downtown Tucson, Civano, and Corona de Tucson.

Figure 40: Origin-Destination Trip Flows in Picture Rocks

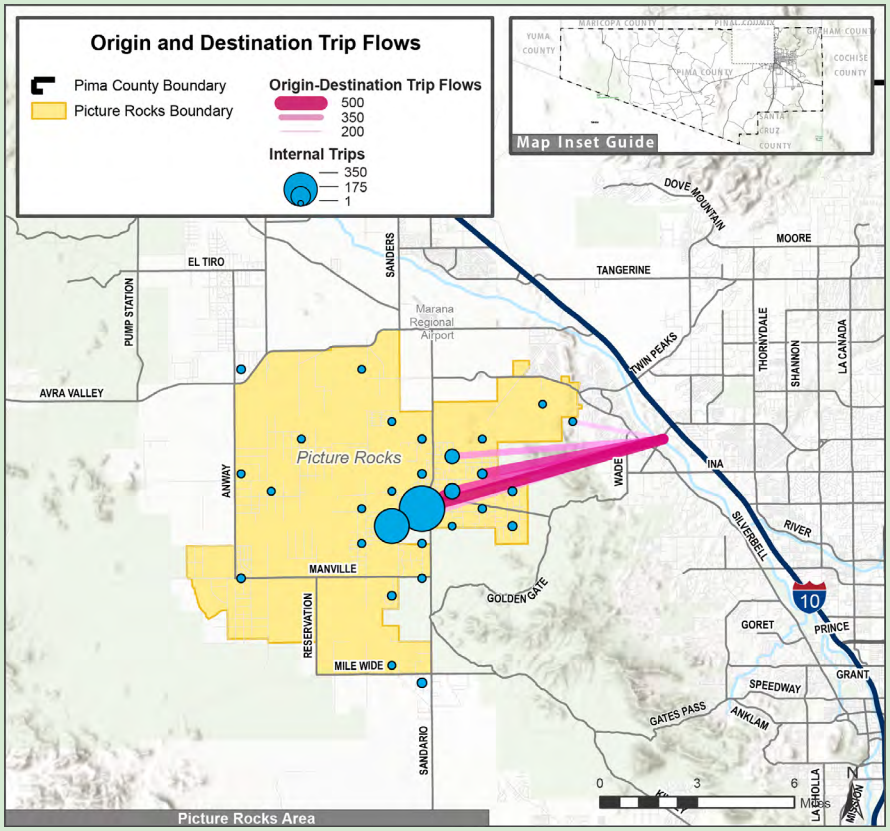
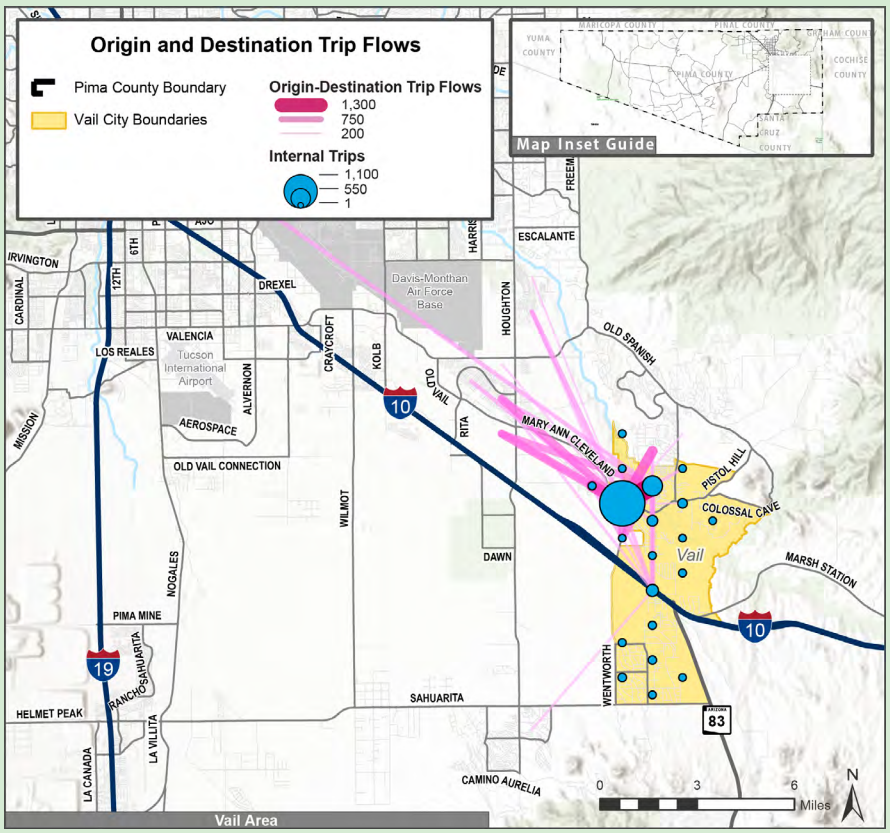


Figure 41: Origin-Destination Trip Flows in Vail



SECTION 05

Findings of Existing Transit Service

This section highlights the strengths and challenges of existing services based on the existing conditions assessment.

5.1

Strengths of Existing Service

5.1.1

COVERAGE

Most populated areas are well-covered by the existing services geographically. Other than some areas in the southeast parts of Pima County, Sun Shuttle fixed-routes and general public Dial-a-Ride zones cover most areas with population and demand, and the Sun Shuttle ADA paratransit service also serves outlying areas surrounding Tucson that don't have access to public transportation services. Most communities with high transit propensity are well covered by existing transit.

5.1.2

FARE-FREE TRANSIT

Since March 2020 and the outbreak of the COVID-19 pandemic, all Tucson area transit services, including public dial-a-ride and paratransit, have been free to ride. This removes a barrier for riders that boosts ridership and can help enable quicker service without having to handle fares and fare integration across systems. Tucson City Council has reiterated that Tucson public transit services will remain free for the foreseeable future.

5.2
Challenges of Existing Service

5.2.1
COMPLEX ADA SERVICE AREAS

While ADA service in the region is comprehensive, with the various overlapping zones (Sun Van Paratransit, Sun Shuttle ADA, Oro Valley ADA) running different kinds of trips and having different processes for requesting a ride (separate apps, different phone numbers), the service is complicated and may be difficult for new prospective riders to understand. Consolidation and streamlining these services and the reservation process, at least on the rider side, could improve the rider experience. In many cases, riders are required to transfer from system to system due to restrictions in service areas which adds difficulty for people with disabilities to their daily trips.

5.2.2
LIMITED OR NONEXISTENT EARLY MORNING/LATE NIGHT SERVICE

Most transit services in the County operate from at least 5-6 a.m. to 7-8 p.m.; most Sun Tran bus routes operate until 10 p.m. with some operating until 11 p.m. or 12 a.m. on weekdays. This accounts for 95% of all public transit service in the county. Most suburban and rural services rarely operate outside these hours. Sun Shuttle's services usually operate until 7 or 8 p.m., which serve the suburbs and rural areas. Frequencies during evening hours are lower, usually one trip per hour. The lack of service at these times restricts the mobility of workers that need to commute outside standard 9-to-5 work hours, which may disproportionally affect vulnerable populations. People without access to a car may need to rely on more expensive taxi or Transportation Network Capacity (TNC) services to make their trip.

5.2.3
LIMITED OR NONEXISTENT WEEKEND SERVICE

Weekend transit services are currently limited or nonexistent compared to weekday service. All Sun Shuttle fixed-route services and all public Dial-a-Ride services, except Sun On Demand, lack Sunday service entirely, and only a few services have Saturday service. Most Sun Tran routes operate at reduced frequencies and have shorter spans on weekends. This reduction in transit service can be a significant barrier to mobility for transit-dependent populations and may disincentivize potential riders from taking transit.

5.2.4
LACK OF SAME-DAY SERVICE AVAILABILITY FOR DIAL-A-RIDE AND ON DEMAND SERVICES

Most Dial-a-Ride services require a reservation at least one day in advance. While some services attempt to offer same-day service, they are usually unable to due to lack of capacity. This limits the ability of riders reliant on transit to take spontaneous trips, one of the top priorities identified in the Comprehensive Operational Analysis.

5.3
Picture Rocks

Picture Rocks is a low-density residential community with low transit propensity and low trip activity, which are conditions not ideal for traditional fixed-route services. In the origin-destination analysis, most trips are traveling to the nearby Arizona Pavilions Shopping Center. This suggests that a demand-responsive service that connects Picture Rocks with the shopping center may be most effective for this community; riders may also transfer to Sun Express services there to reach downtown Tucson and Oro Valley. Additionally, a demand-responsive service should connect to essential services and civic centers, such as Northwest Medical Center, Wheeler Taft Abbett Sr. Library, Marana High School, and others.

5.4
Vail

Vail is a low-density residential community with low transit propensity and low trip activity, which are also conditions not ideal for traditional fixed-route services. Most external trips are bound for Rita Ranch, which contains large retail stores such as Walmart and Home Depot; there are also more trips bound for downtown Tucson, suggesting that it serves as a bedroom community for the employment opportunities there. Some retail exists within Vail along East Colossal Cave Road, which attracts trips from residential communities such as Civano and Corona de Tucson. A demand-responsive service connecting Vail to Rita Ranch may be most effective; connections there through Sun Express and Sun Shuttle provides access to other destinations. Vail was previously served by the AMORE pilot service; findings from that service may be applied to implement a new transit service that best serves the needs of the Vail community.

Additional analysis and recommendations have been made for Picture Rocks and Vail, and those can be found in Appendix A.

SECTION 06

Microtransit Opportunity Zones

This study's Existing Transit Conditions and Transit Needs Assessment analysis revealed that within Tucson's urban core, Sun Tran's bus network and the Sun Link Streetcar provide frequent and convenient transit service that is effective at serving transit demand. Therefore, this study primarily studies microtransit's feasibility along the urban core's periphery, where the need for public transit exists, but the density of trip activity is not sufficient to support a cost-effective, fixed-route transit service.

For the purposes of this study, the following guiding principles were used to identify where microtransit's feasibility would be analyzed further:

01 **DIAL-A-RIDE CONVERSION**

Areas with an existing Sun Shuttle Dial-a-Ride service that is open to the public and could transition to a microtransit model for increased rider convenience, which may make transit service more attractive and increase ridership.

02 **FIXED-ROUTE REPLACEMENT**

Areas currently served by underperforming or non-efficient fixed-route transit could transition to a microtransit model to make public transit more cost effective. In fiscal year 2024, the lowest ridership routes in the Sun Shuttle system were Route 413 (Marana/Casas Adobes, 7,217 riders) and Route 450 (Southeast Tucson/ Rita Ranch, 10,189 riders). Additionally, the Sun Shuttle Route 430 currently operates in a meandering route, which leads to long trip times and is less attractive to potential transit riders.

03 **TRANSIT EXPANSION**

Areas where trip activity exists but fixed-route transit is sparse or non-existent can be good candidates for microtransit. Microtransit improves the accessibility of these areas and enables travel without a private vehicle. Microtransit can also serve as a first-/last-mile connection to other transit modes.

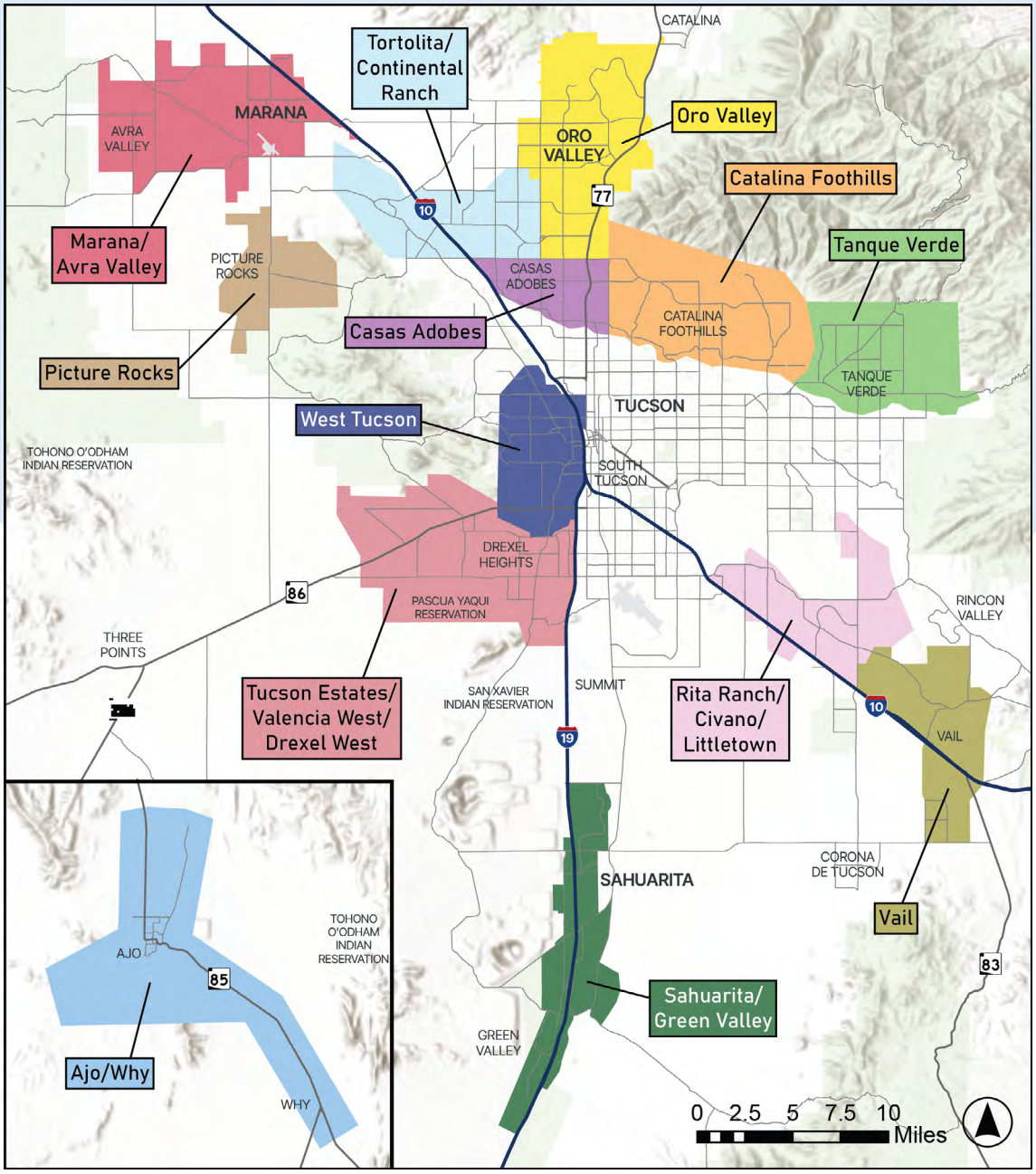
With these guiding principles, 13 *opportunity zones* were defined in Pima County where this study would evaluate microtransit's feasibility. The boundaries of the opportunity zones are informed by the Existing Transit Conditions and Transit Needs Assessment analysis and are later used in this study in a simulation (described in later sections) as potential service area boundaries. Considerations during the zone design process include existing trip activity, transit propensity, presence of major trip generators, and presence (or lack of) fixed-route transit. The size of the opportunity zone balances potential trip market capture with operational efficiency. Larger zones encompass more destinations and can attract higher ridership, but longer trips diminish service efficiency and raise operating costs. Smaller zones, while capturing less trip activity, are more cost-efficient to operate. Other microtransit deployments across the country reveal that the ideal service boundary size is between 15- to 30-square miles.

After defining the opportunity zone boundaries, *external destinations,* which are nearby locations outside the zone where travel would be permitted to, were identified for each zone. These destinations may be major trip generators, healthcare providers, community centers, or transit hubs that are not included in the zone but important for potential riders to be able to travel to. External destinations should be near the zone boundary to prevent too many long-distance trips.

Each opportunity zone connects to the fixed-route transit network within the zone boundary or through an external destination. Microtransit may be used as a first/last mile connection to fixed-route transit, improving transit accessibility by allowing potential riders to transfer between the modes. This improves ridership for both microtransit and fixed-route transit.

Figure 42 maps the opportunity zones as part of this study, and a description of each zone is provided below. Note that zone boundaries and external destinations were created for planning purposes; further outreach to stakeholders in the zone and coordination with operators should be conducted to refine zone boundaries and external destinations before deployment.

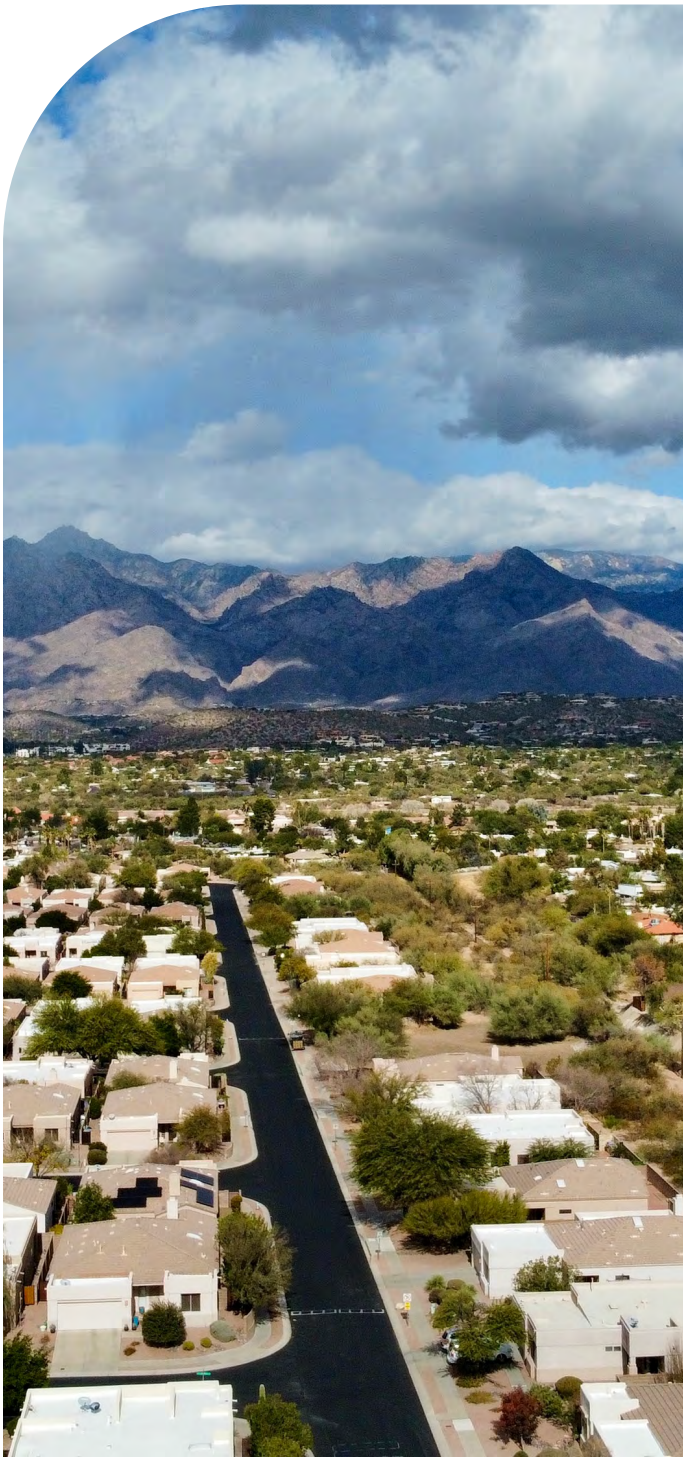
Figure 42: Map of Microtransit Opportunity Zones



The **Marana/Avra Valley** zone is a conversion of the Sun Shuttle Dial-a-Ride zone to microtransit. This zone boundary is unchanged from the existing Dial-a-Ride service for this study: it covers the northeast parts of the Town of Marana, including the Town Hall, as well as the census-designated places of Avra Valley, Nelson, and Rillito. The zone is generally rural, with some low-density residential land uses. The zone does not contain major trip generators, but downtown Marana contains essential services and schools that serve the wider community. Along with the Tortolita/Continental Ranch Zone, this zone is designed to replace Sun Shuttle 413, which sees the lowest ridership out of the fixed-route Sun Shuttle system. External destinations associated with this zone include Tucson Premium Outlets, Arizona Pavilions, and Northwest Medical Center.

The **Picture Rocks** zone is a new service that covers the census-designated place of Picture Rocks. The zone is rural with no major trip generators but was identified for study since it has a high need for transit but no existing transit services. Between 2022 and 2023, Sun Shuttle Route 414P, a fixed-route pilot service, operated between Picture Rocks and Tucson Premium Outlets via Twin Peaks Road; the service was discontinued due to low ridership. Microtransit can re-establish transit in Picture Rocks with more flexibility for riders and the operator. External destinations that this study identified include Tucson Premium Outlets, Arizona Pavilions, and Northwest Medical Center.

The **Tortolita/Continental Ranch** zone is a new service that covers the former census-designated place of Tortolita and the Continental Ranch master-planned communities within the Town of Marana. The zone contains mostly low-density residential land uses but also includes several commercial and industrial land uses along the I-10 and Ina Road corridors. This zone was chosen for study because it is rapidly developing but has few existing transit services. Along with the Marana/Avra Valley Zone, this zone is designed to replace Sun Shuttle 413, which sees the lowest ridership out of the Sun Shuttle system. Major trip generators within the zone include the Arizona Pavilions shopping center, Crossroads at Silverbell District Park, Pima Community College Northwest Campus, and the Uptown redevelopment project (formerly known as Foothills Mall). External destinations that this study identified include Northwest Medical Center and Tucson Mall/Tohono Tadai Transit Center. A future northward expansion to Dove Mountain may be considered to include more residential neighborhoods that currently have no transit access.



The **Oro Valley** zone is a conversion of the Sun Shuttle Dial-a-Ride zone to microtransit. This zone boundary is unchanged from the existing Dial-a-Ride service: it covers the Town of Oro Valley, as well as parts of the census-designated places of Casas Adobes and Catalina. The zone is mostly residential suburban but also includes several commercial plazas along the SR-77 (Oracle Road) corridor. Major trip generators within the zone include Oro Valley Hospital and the Uptown redevelopment project (formerly known as Foothills Mall). External destinations that this study identified include Northwest Medical Center and Tucson Mall/Tohono Tadai Transit Center. Note that the existing Dial-a-Ride service in Oro Valley is operated by the Town of Oro Valley directly.

The **Casas Adobes** zone is a new service that covers the census-designated place of Casas Adobes south of Ina Road. The zone contains a mix of low- to medium-density residential, commercial plazas along Ina Road and SR-77 (Oracle Road), and the Northwest Medical Center campus. This zone was chosen because it has high trip activity but lacks extensive fixed-route transit. External destinations that this study identified include Arizona Pavilions and Tucson Mall/ Tohono Tadai Transit Center.

The **Catalina Foothills** zone is a new service that covers the census-designated place of Catalina Foothills. This zone is a generally affluent, low-density residential area that is only served by one Sun Tran Express route (105X). The zone was identified to be studied to expand transit access and connect residents to essential services in Tucson and Casas Adobes. External destinations identified for this zone include Tucson Mall/Tohono Tadai Transit Center, Tucson Medical Center, and Udall Park.

The **Tanque Verde** zone is a new service that covers the census-designated place of Tanque Verde. Like the Catalina Foothills zone, this zone is a generally affluent, low-density residential area that is only served by one Sun Tran Express route (109X). The zone was identified to be studied to expand transit access and connect residents to essential services in Tucson. External destinations identified for this zone include Tucson Medical Center, Udall Park, and the Speedway and Harrison Park-and-Ride.

The **Rita Ranch/Civano/Littletown** zone is a new service that covers the City of Tucson's neighborhoods of Rita Ranch, Civano, and Littletown. This zone contains a mix of low-density residential, office, and industrial land uses. The zone was chosen for study to replace Sun Shuttle Route 450, which sees the second-lowest ridership in the Sun Shuttle system, as well as provide transit options in Littletown, which is not served by the fixed-route network. Major trip generators in this zone include UA Tech Park (a research campus affiliated with the University of Arizona), a retail plaza anchored by a Walmart Supercenter, and the Pima Air & Space Museum. External destinations identified for this zone include Northwest Medical Center Houghton, Pima Community College East Campus, Pima County Fairgrounds, Golf Links and Kolb Park-and-Ride, and the Safeway store on Mary Ann Cleveland Way.

This zone encompasses the service area of the former Adaptive Mobility with Reliability and Efficiency (AMORE) microtransit pilot, which operated between 2018 and 2019. The AMORE pilot found that while microtransit improved transit access for people with limited mobility options, the service had low ridership and was not cost effective due to not having enough destinations included in the zone. This opportunity zone builds on the findings of the AMORE pilot by including more employment opportunities, retail sites, healthcare, and transit connections that should attract more riders.

The **Vail** zone is a new service that covers the census-designated place of Vail. This zone contains rural and low-density residential land uses and does not have major trip generators, though essential services and schools serving the wider community are located near the intersection of Colossal Cave Road and Mary Ann Cleveland Road. This zone was selected for study since it does not have any fixed-route transit service. External destinations identified for this zone include UA Tech Park, the Rita Ranch Walmart Supercenter, Rita Ranch Park-and-Ride, and Pima County Fairgrounds. Additionally, it is recommended that Sun Tran Route 110X to be extended to the Vail zone, which can directly connect this community with downtown Tucson. Potential future expansions for this zone could include north to Rincon Valley, which is undergoing rapid housing development, and southwest to Corona de Tucson, which does not have transit service. Note that Vail was briefly included in the AMORE service area for the last two months of the pilot program.

The **Tucson Estates/Drexel Heights/ Valencia West** zone is a new service that covers the census-designated places of Tucson Estates, Drexel Heights, and Valencia West, as well as the Pasqua Pueblo Yaqui Reservation and parts of the San Xavier Reservation. The zone contains a mix of low-density residential, mobile-home parks, commercial plazas, and rural land uses. Major trip generators within the zone include the Tucson Spectrum shopping center, Casino Del Sol, and Casino of the Sun. This zone was selected for study because it demonstrates high transit propensity but has limited fixed-route service. It is also designed to replace Sun Shuttle Route 430, which takes a meandering route through Tucson Estates and Valencia West; microtransit service may provide a more direct and efficient service. External destinations identified include the Laos Transit Center and San Xavier Health Center.

The **West Tucson** zone is designed as an extension of the existing Sun On Demand Zone 1, which is a microtransit service operated by the City of Tucson. The existing service covers a small area immediately west of downtown Tucson, including St. Mary's Hospital and the west end of the Sun Link Streetcar. An expansion was included in this study to understand the potential benefits of including more destinations. The new opportunity zone contains Pima Community College West Campus and expands transit access to the residential neighborhoods to the west and south that currently have limited fixed-route transit. No external destinations were identified for this zone.

The **Sahuarita/Green Valley** zone is a conversion of the Sun Shuttle Dial-a-Ride zone to microtransit. This zone boundary is mostly unchanged from the existing Dial-a-Ride service: it follows I-19 and covers low-density residential and some retail land uses. This study recommends modifying the boundary to include Desert Diamond Casino Sahuarita, located within the San Xavier District of the Tohono O'odham Nation, to be served by the zone; a future expansion to the Quail Creek master-planned community may also be considered. No external destinations were identified for this zone.

The **Ajo/Why** zone is a conversion of the Sun Shuttle Dial-a-Ride zone to microtransit. The existing Dial-a-Ride service performs well despite the small size of the Ajo community, and microtransit can leverage the success of the Dial-a-Ride program and offer more flexibility to riders. This opportunity zone expands the existing Ajo Dial-a-Ride boundary to include the unincorporated community of Why, approximately ten miles to the southeast, and the Desert Diamond Casino, located within the Tohono O'odham Nation. These communities are generally self-sufficient but rely on Sun Shuttle Route 486 to travel to Tucson for medical and other needs, and the route is often at capacity. Therefore, this study also recommends adding more frequency to Route 486, and riders can use microtransit as a first/last mile connection. No external destinations were identified for this zone.

SECTION 07

Microtransit Simulation

To understand each opportunity zone's potential demand and costs, this study utilized a proprietary simulation process developed by Via Transportation. Via is a microtransit operator and software provider with more than 100 microtransit deployments across the country, and their simulation process is well validated by real-world operational data collected through their operations. Outputs of the simulation include estimated fleet requirements, associated costs, and projected performance metrics, which can inform which opportunity zones are best suited for microtransit implementation.

7.1

Simulation Process and Assumptions

The simulation relies on several assumptions about microtransit's operational parameters, which define the quality of service that microtransit provides. Parameters are assumed at this stage as they influence ridership projections: a more convenient service is expected to yield higher ridership. The list of parameters is:

01 **TRAVEL RULES**
Restrictions on the types of trips, purposes, or locations that microtransit will be permitted to serve

02 **BOOKING MODEL**
Whether pre-booking of trips would be allowed

03 **TARGET WAIT TIME**
How long passengers are expected to wait between making a trip booking request and being picked up by a vehicle

04 **BUS STOP MODEL**
Whether riders will be asked to walk to meet the vehicle for pick-ups and drop-offs

05 **FLEET**
Type of vehicles used to operate the service

06 **SERVICE HOURS**
What times a rider can book a trip

07 **FARE**
Fee paid by passengers to take the service

The opportunity zones have a wide range of local contexts where a one-size-fits-all simulation is not appropriate; therefore, the zones are divided into two tiers of assumed service quality, "Weekday" and "Extended," based on transit propensity, trip density, and ridership of existing Dial-a-Ride (if applicable). The parameters for the two tiers are listed in **Table 14** below. The only difference between the two tiers is in the target wait time and service hours; all other parameters are the same. Placing no travel rule restrictions and using a curb-to-curb bus stop model that is most convenient for riders due to the hot climate in Pima County and lack of pedestrian infrastructure in some areas. The fleet is assumed to be minivans, out of which at least 20%, or one vehicle, are wheelchair accessible. Fares are assumed to be free, like current fixed-route and dial-a-ride services. The assumed parameters are not definitive and should be adjusted through stakeholder engagement if microtransit is implemented in the future.

Table 14: Simulation Operational Parameter Assumptions

	Weekday	Extended
Travel Rules	**No restriction**	
Booking Model	**On-demand only**	
Target Wait Time	**20-25 min, 60 min max**	**10-15 min, 30 min max**
Bus Stop Model	**Curb-to-curb**	
Fleet	» **Minivans with capacity of five ambulatory passengers** » **At least 20% or one wheelchair-accessible minivan with capacity for one wheelchair and two ambulatory passengers**	
Service Hours	**Weekdays 7 a.m. - 6 p.m.**	**Weekdays 6 a.m. - 8 p.m. Weekends 9 - 6 p.m.**
Fare	**Free**	
Opportunity Zones Included	» **Marana/Avra Valley** » **Picture Rocks** » **Catalina Foothills** » **Tanque Verde, Rita Ranch/Civano/ Littletown** » **Vail/Corona De Tucson/Rincon Valley** » **Sahuarita/Green Valley**	» **Tortolita/Continental Ranch** » **Oro Valley** » **Casas Adobes** » **Tucson Estates/Drexel Heights/ Valencia West** » **West Tucson** » **Ajo/Why**

After the opportunity zones and operational parameters are defined, a ridership estimate can be generated for each zone. Via's process uses the zone's population and number of jobs, applies a capture rate assumption, and adds the ridership of any replaced transit services to estimate weekday demand. The capture rate is based on Via's proprietary demand model and on the operational parameters, socioeconomic factors (such as vehicle ownership, commute mode, and access to existing public transit), and demographic factors (such as income, percent of seniors, and percent of people with disabilities). The capture rate is validated by Via's real-world microtransit deployment. In general, zones with higher transit propensity and trip activity, as calculated in the Existing Transit Conditions and Transit Needs Assessment, will exhibit higher estimated ridership.

Table 15: Projected Ridership by Opportunity Zone

Opportunity Zone	Service Tier	Weekday Average			Annual Medium
		Low	Medium	High	
Tucson Estates/ Drexel Heights/Valencia West	**Extended**	**80**	**205**	**310**	**59,000**
Tortolita/ Continental Ranch	**Extended**	**75**	**200**	**300**	**57,000**
Oro Valley	**Extended**	**80**	**195**	**290**	**56,000**
West Tucson	**Extended**	**65**	**170**	**255**	**49,000**
Casas Adobes	**Extended**	**55**	**150**	**225**	**43,000**
Rita Ranch/ Civano/Littletown	**Weekday**	**50**	**130**	**200**	**35,000**
Sahuarita/Green Valley	**Weekday**	**45**	**115**	**175**	**31,000**
Catalina Foothills	**Weekday**	**40**	**110**	**160**	**28,000**
Ajo/Why*	**Extended**	**15**	**40**	**65**	**12,000**
Marana/Avra Valley	**Weekday**	**15**	**40**	**65**	**11,000**
Vail	**Weekday**	**15**	**40**	**60**	**10,000**
Tanque Verde	**Weekday**	**15**	**35**	**50**	**9,000**
Picture Rocks	**Weekday**	**<10**	**15**	**20**	**4,000**

**Uses existing FY 2024 Sun Shuttle Dial-a-Ride ridership instead of Via model*

Table 15 shows the estimated weekday and annual ridership by zone, sorted from high to low. These values represent ridership approximately a year after microtransit is implemented and riders have gotten accustomed to the service. Three ridership scenarios, "Low," "Medium," and "High," were developed to capture the range of potential values, where the "Medium" scenario is Via's best estimate for ridership. It is assumed that no fares are collected; should fares be implemented again, the estimated ridership may drop closer to the "Low" scenario. Note that because Ajo's existing Sun Shuttle Dial-a-Ride service is performing better than what Via's model projects, the Ajo/Why opportunity zone's "Medium" estimate uses the FY 2024 ridership.

After estimating ridership, Via uses an agent-based simulation to estimate the vehicle requirements and costs. The agent-based simulation uses the opportunity zone boundary, road network, ridership estimate, and operational parameters as inputs, then applies a routing optimization algorithm to understand the fleet size required to serve rider demand. This process emulates deploying the ride-dispatching software in a simulated demand environment, and microtransit's performance metrics may be measured how they would be in the real world.

The following simulation outputs are key to determining whether microtransit is a good fit for an opportunity zone:

01 **FLEET SIZE NEEDED AT PEAK**
The number of fleet vehicles required to serve rider demand at the busiest time of day, which is equivalent to the number of vehicles that the RTA should procure to implement microtransit at the opportunity zone.

02 **UTILIZATION**
The number of riders per vehicle-hour, which is a measure of service efficiency.

03 **COST EFFICIENCY**
The estimated operating cost divided by ridership. The estimated operating cost per year of the microtransit service is calculated by multiplying the annual vehicle-hours of microtransit (an output of the simulation) by an operator cost per vehicle-hour assumption that is inclusive of all operating costs. This study assumes that the RTA's operating cost is approximately $80/vehicle-hour, which includes labor, fuel, maintenance, software, insurance, utilities, and all other operating costs. This assumption is derived from the latest available data from the National Transit Database.

Other simulation outputs include:

04 **TYPICAL WAIT TIME**
The simulated duration passengers are expected to wait between making a trip booking request and being picked up by a vehicle. This is used to verify that the fleet size is meeting the operational parameters defined earlier.

05 **TYPICAL RIDE DURATION**
The simulation duration that passengers spend within a vehicle. This is mostly influenced by the size of the opportunity zones.

06 **VEHICLE-MILES TRAVELED (VMT)**
The estimated vehicle-miles resulting from the microtransit service. An estimate of change in overall VMT can be derived by comparing microtransit VMT by existing private vehicle and public transit VMT. The methodology and results of this analysis are discussed in-depth in the Cost-Benefit Analyses section. Note that for a new microtransit zone, overall VMT is expected to increase due to vehicles traveling empty to pick up a rider, vehicles taking detours from the most direct path, and new trips being generated from the more convenient transportation service.

Table 16 summarizes these key metrics for each opportunity zone, sorted by annual ridership. For each metric, green indicates the top three values, while red indicates the bottom three values.

Table 16: Simulation Key Metrics by Opportunity Zone

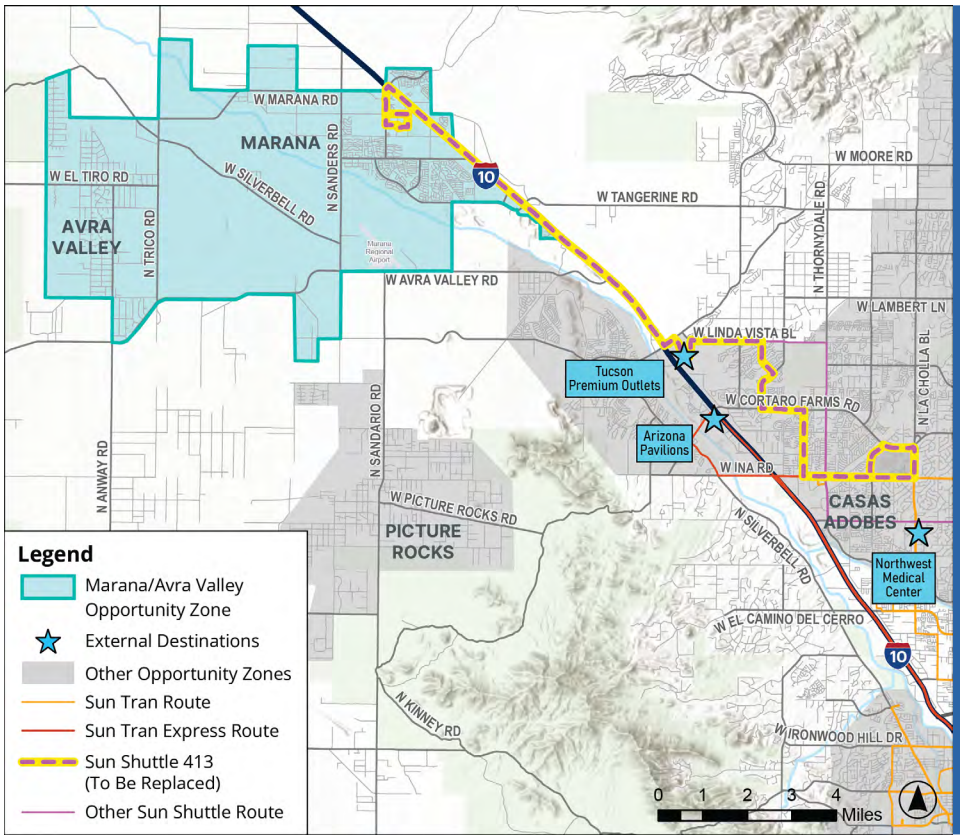
Zone	Service Tier	Annual Ridership	Fleet Size Needed at Peak	Utilization (Rides per Hour)	Cost Per Trip
Tucson Estates/ Drexel Heights/Valencia West	**Extended**	59,000	8	2.0 – 2.6	$30
Tortolita/ Continental Ranch	**Extended**	57,000	6	2.7 – 3.3	$28
Oro Valley	**Extended**	56,000	8	2.2 – 2.8	$32
West Tucson	**Extended**	49,000	5	2.7 – 3.3	$27
Casas Adobes	**Extended**	43,000	5	2.4 – 3.0	$30
Rita Ranch/ Civano/Littletown	**Weekday**	35,000	5	3.1 – 3.7	$23
Sahuarita/Green Valley	**Weekday**	31,000	4	3.1 – 3.7	$23
Catalina Foothills	**Weekday**	28,000	4	2.8 – 3.4	$26
Ajo/Why*	**Extended**	12,000	2	1.8 – 2.4	$39
Marana/Avra Valley	**Weekday**	11,000	3	1.4 – 2.0	$50
Vail	**Weekday**	10,000	2	2.1 – 2.7	$34
Tanque Verde	**Weekday**	9,000	2	1.9 – 2.5	$41
Picture Rocks	**Weekday**	4,000	2	0.7 – 1.3	$80

Note: Green denotes top-three highest performing, red denotes bottom-three lowest performing.

7.2
Simulation Results by Opportunity Zone

The following sections summarize each opportunity zone's design and simulation results. The map shows the opportunity zone boundaries, external destinations, and other transit services nearby. Transit connections listed are current as of August 2025. The simulation results of all three ridership scenarios (low, medium and high) are listed in **Tables 17–28.**

Figure 43: Marana/Avra Valley Simulation



7.2.1

MARANA/AVRA VALLEY

Proposed Service

» Dial-a-Ride Conversion/ Fixed-Route Replacement

- Replaces Sun Shuttle 413

Simulated Service Tier

» Weekday

Transit Connections

» Sun Tran 61, 104X, 204X

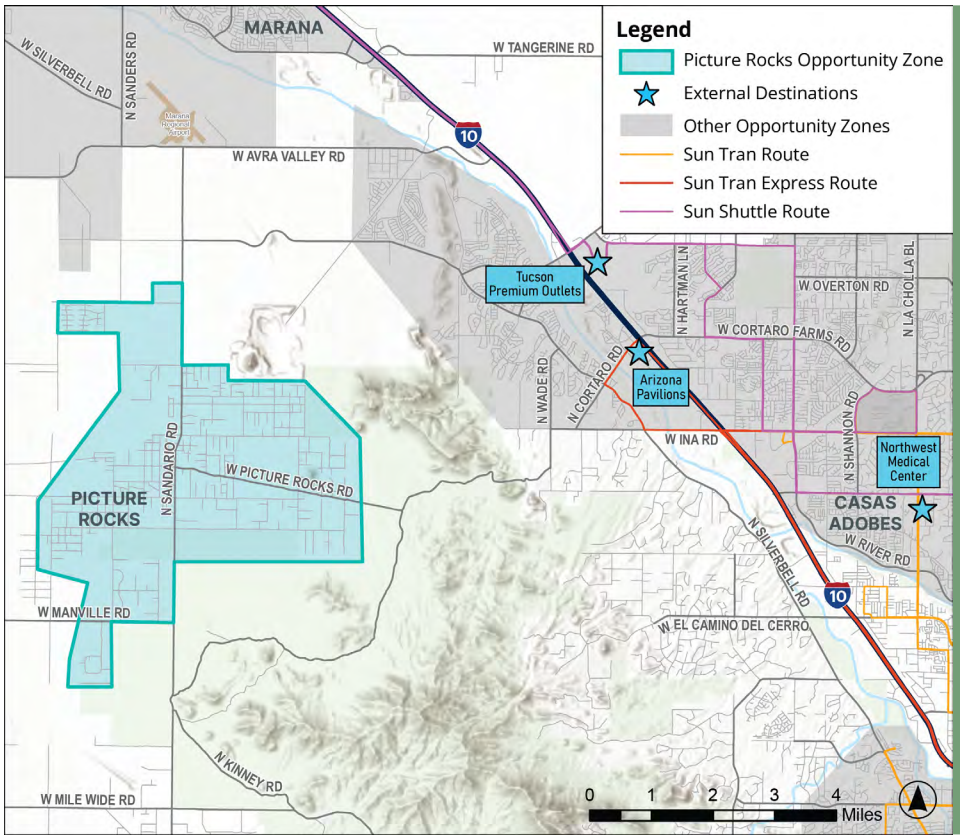
» Sun Shuttle 412

» Sun Shuttle 413 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	15	40	65
Annual Ridership	4,000	11,000	17,000
Fleet Size Needed at Peak (Vehicles)	2	3	4
Typical Wait Time (Minutes)	17 – 21	17 – 21	17 – 21
Typical Ride Duration (Minutes)	28 – 32	30 – 34	28 – 32
Utilization (Riders per Hour)	0.7 – 1.3	1.4 – 2.0	1.5 – 2.1
Estimated Annual Cost	$300,000	$550,000	$700,000
Cost Efficiency	$77/ride	$50/ride	$44/ride

Table 17: Marana/Avra Valley Simulation Results

Figure 44: Picture Rocks Simulation



7.2.2

PICTURE ROCKS

Proposed Service

» Transit Expansion

Simulated Service Tier

» Weekday

Transit Connections

» Sun Tran 61, 104X, 204X

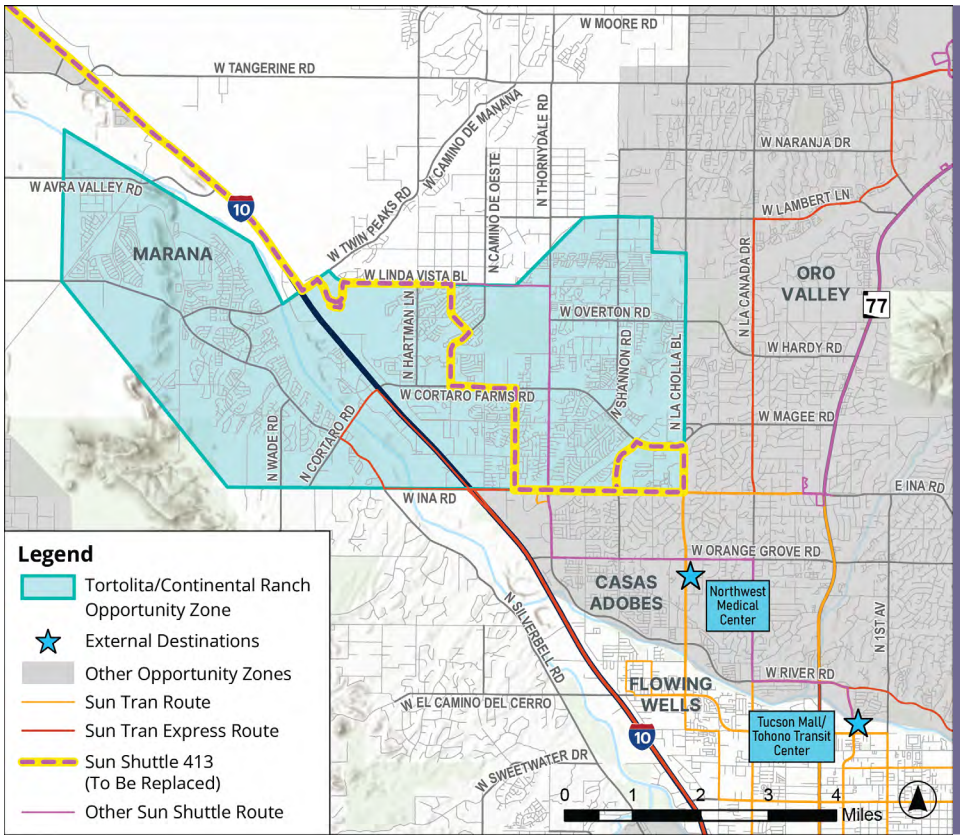
» Sun Shuttle 412

» Sun Shuttle 413 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	<10	15	20
Annual Ridership	<2,000	4,000	6,000
Fleet Size Needed at Peak (Vehicles)	2	2	2
Typical Wait Time (Minutes)	10 – 14	18 – 22	12 – 16
Typical Ride Duration (Minutes)	18 – 22	22 – 26	18 – 22
Utilization (Riders per Hour)	0.2 – 0.8	0.7 – 1.3	0.7 – 1.3
Estimated Annual Cost	$200,000	$300,000	$500,000
Cost Efficiency	>$100/ride	$80/ride	$80/ride

Table 18: Picture Rocks Simulation Results

Figure 45: Tortolita/Continental Ranch Simulation



7.2.3

TORTOLITA/ CONTINENTAL RANCH

Proposed Service

» Fixed-Route Replacement/ Transit Expansion

- Replaces Sun Shuttle 413

Simulated Service Tier

» Extended

Transit Connections

» Sun Tran 6, 15, 16, 17, 19, 34, 61, 62, 102X, 103X, 104X, 203X, 204X

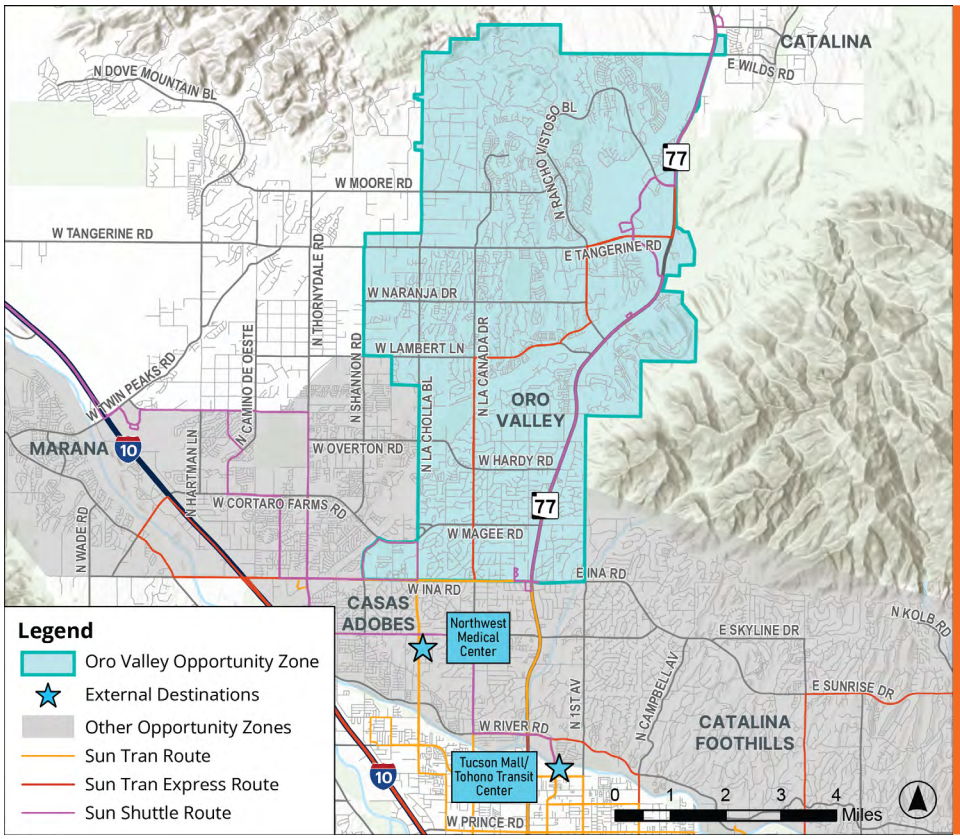
» Sun Shuttle 412

» Sun Shuttle 413 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	75	200	300
Annual Ridership	22,000	57,000	86,000
Fleet Size Needed at Peak (Vehicles)	3	6	8
Typical Wait Time (Minutes)	12 – 16	13 – 17	15 – 19
Typical Ride Duration (Minutes)	15 – 19	19 – 23	19 – 23
Utilization (Riders per Hour)	1.9 – 2.5	2.7 – 3.3	3.3 – 3.9
Estimated Annual Cost	$800,000	$1.6M	$1.9M
Cost Efficiency	$38/ride	$28/ride	$23/ride

Table 19: Tortolita/ Continental Ranch Simulation Results

Figure 46: Oro Valley Simulation



7.2.4

ORO VALLEY

Proposed Service

» Dial-a-Ride Conversion

Simulated Service Tier

» Extended

Transit Connections

» Sun Tran 6, 15, 16, 17, 19, 34, 61, 62, 102X, 103X, 107X, 203X

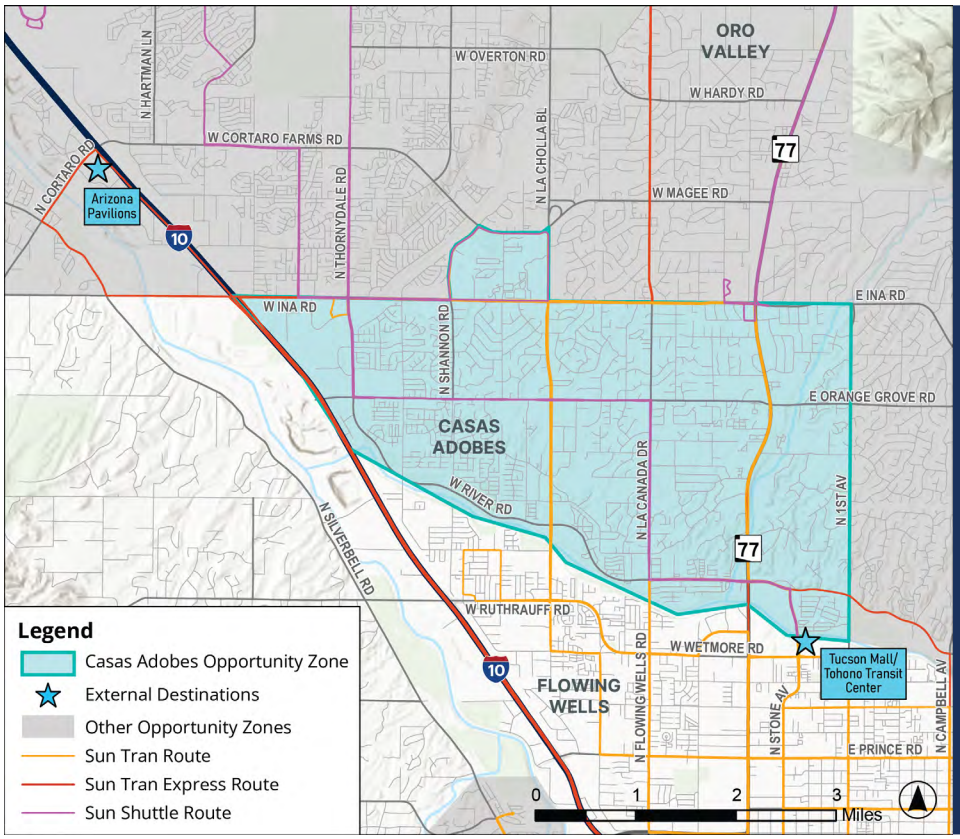
» Sun Shuttle 401, 412

» Sun Shuttle 413 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	80	195	290
Annual Ridership	23,000	56,000	83,000
Fleet Size Needed at Peak (Vehicles)	5	8	10
Typical Wait Time (Minutes)	11 – 15	12 – 16	11 – 15
Typical Ride Duration (Minutes)	16 – 20	19 – 23	18 – 22
Utilization (Riders per Hour)	1.3 – 1.9	2.2 – 2.8	2.5 – 3.1
Estimated Annual Cost	$1.1M	$1.8M	$2.4M
Cost Efficiency	$49/ride	$32/ride	$29/ride

Table 20: Oro Valley Simulation Results

Figure 47: Casas Adobes Simulation



7.2.5

CASAS ADOBES

Proposed Service

» Transit Expansion

Simulated Service Tier

» Extended

Transit Connections

» Sun Tran 6, 15, 16, 17, 19, 34, 61, 62, 102X, 103X, 107X, 203X

» Sun Shuttle 401, 412

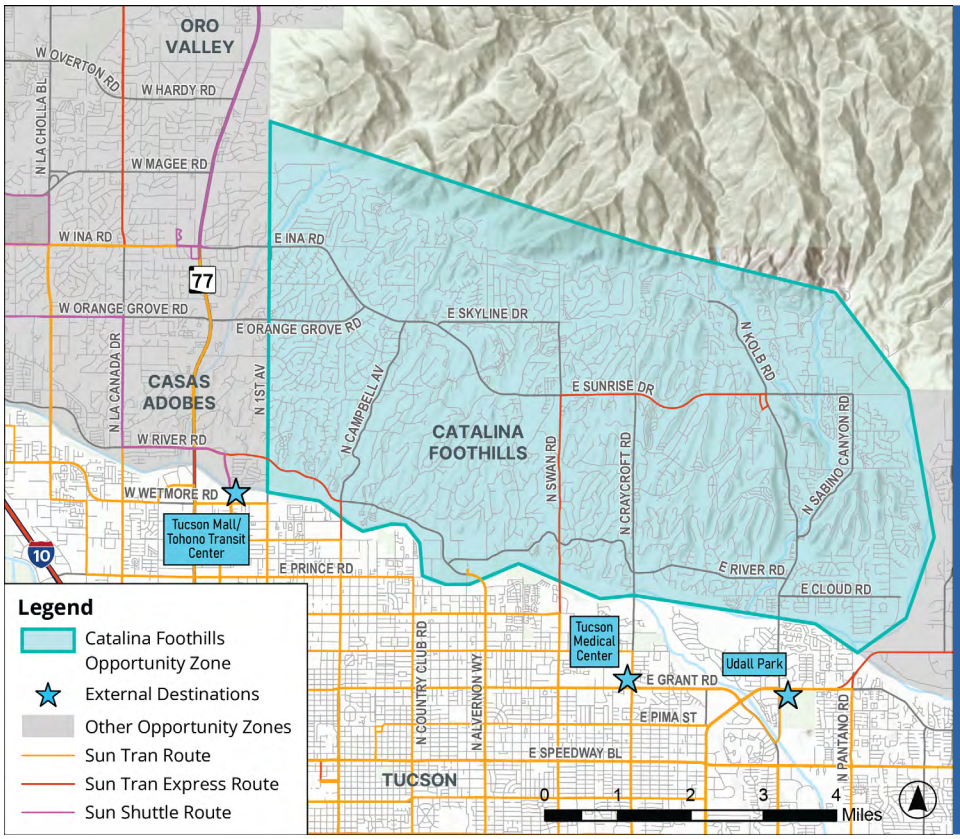
» Sun Shuttle 413 (recommended to be replaced)

»

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	55	150	225
Annual Ridership	16,000	43,000	64,000
Fleet Size Needed at Peak (Vehicles)	3	5	6
Typical Wait Time (Minutes)	8 – 12	10 – 14	8 – 12
Typical Ride Duration (Minutes)	10 – 14	12 – 16	13 – 17
Utilization (Riders per Hour)	1.3 – 1.9	2.4 – 3.0	3.0 – 3.6
Estimated Annual Cost	$800,000	$1.3M	$1.5M
Cost Efficiency	$50/ride	$30/ride	$23/ride

Table 21: Casas Adobes Simulation Results

Figure 48: Catalina Foothills Simulation



7.2.6

CATALINA FOOTHILLS

Proposed Service

» Transit Expansion

Simulated Service Tier

» Weekday

Transit Connections

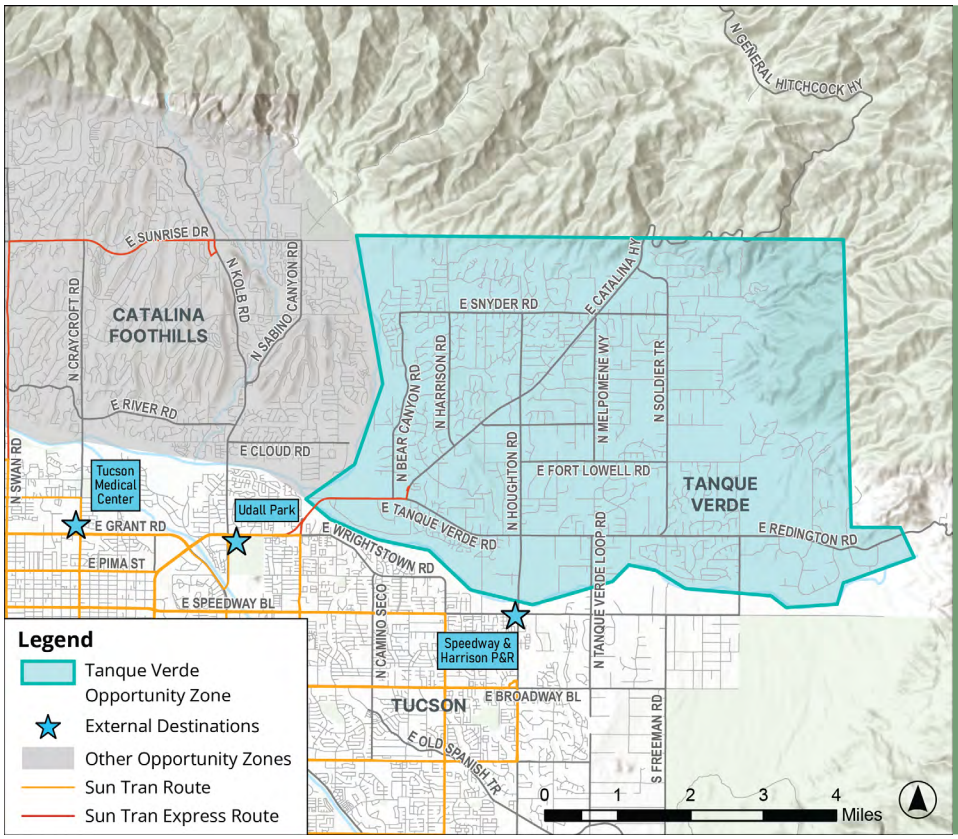
» Sun Tran 5, 6, 8, 9, 11, 15, 16, 17, 19, 34, 37, 61, 62, 103X, 105X, 109X

» Sun Shuttle 412

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	40	110	160
Annual Ridership	11,000	28,000	42,000
Fleet Size Needed at Peak (Vehicles)	2	4	5
Typical Wait Time (Minutes)	22 – 26	20 – 24	24 – 28
Typical Ride Duration (Minutes)	20 – 24	18 – 22	24 – 28
Utilization (Riders per Hour)	2.6 – 2.6	2.8 – 3.4	3.0 – 3.6
Estimated Annual Cost	$400,000	$700,000	$1M
Cost Efficiency	$34/ride	$26/ride	$24/ride

Table 22: Catalina Foothills Simulation Results

Figure 49: Tanque Verde Simulation



7.2.7

TANQUE VERDE

Proposed Service

» Transit Expansion

Simulated Service Tier

» Weekday

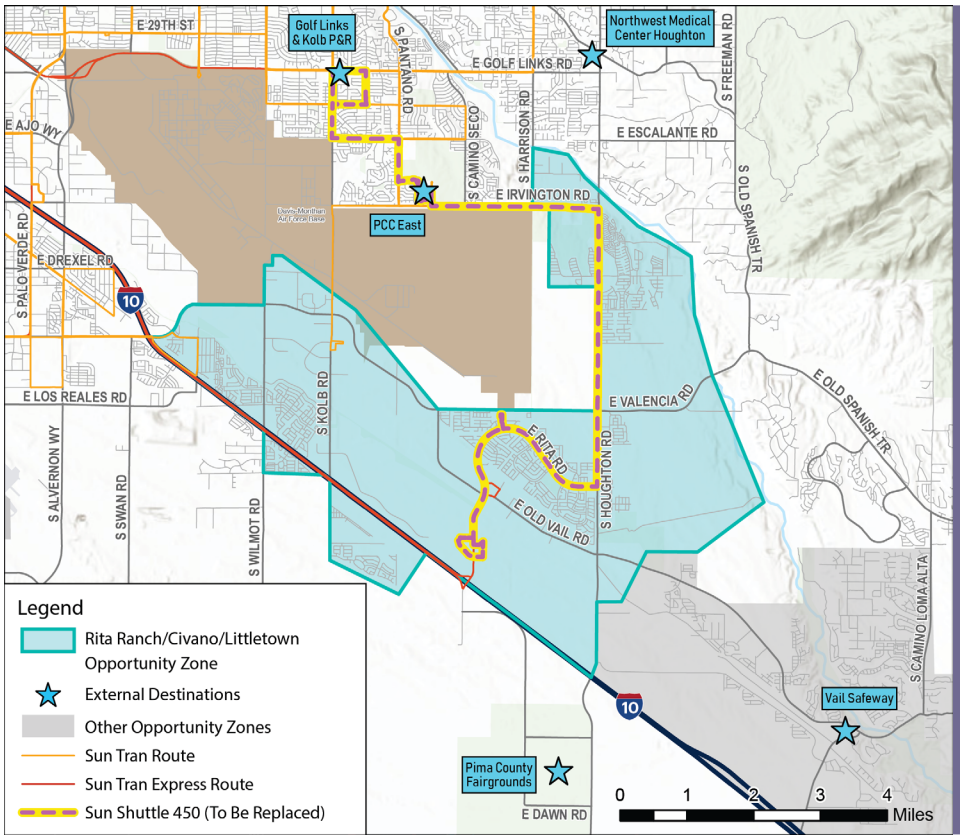
Transit Connections

» Sun Tran 4, 5, 8, 9, 34, 37, 109X

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	15	35	50
Annual Ridership	3,000	9,000	14,000
Fleet Size Needed at Peak (Vehicles)	2	2	3
Typical Wait Time (Minutes)	10 – 14	12 – 16	10 – 14
Typical Ride Duration (Minutes)	11 – 15	11 – 15	10 – 14
Utilization (Riders per Hour)	0.6 – 1.2	1.9 – 2.5	1.9 – 2.5
Estimated Annual Cost	$300,000	$350,000	$500,000
Cost Efficiency	$95/ride	$41/ride	$41/ride

Table 23: Tanque Verde Simulation Results

Figure 50: Rita Ranch/Civano/Littletown Simulation



7.2.8

RITA RANCH/CIVANO/ LITTLETOWN

Proposed Service

» Fixed-Route Replacement/ Transit Expansion

- Replaces Sun Shuttle 450

Simulated Service Tier

» Extended

Transit Connections

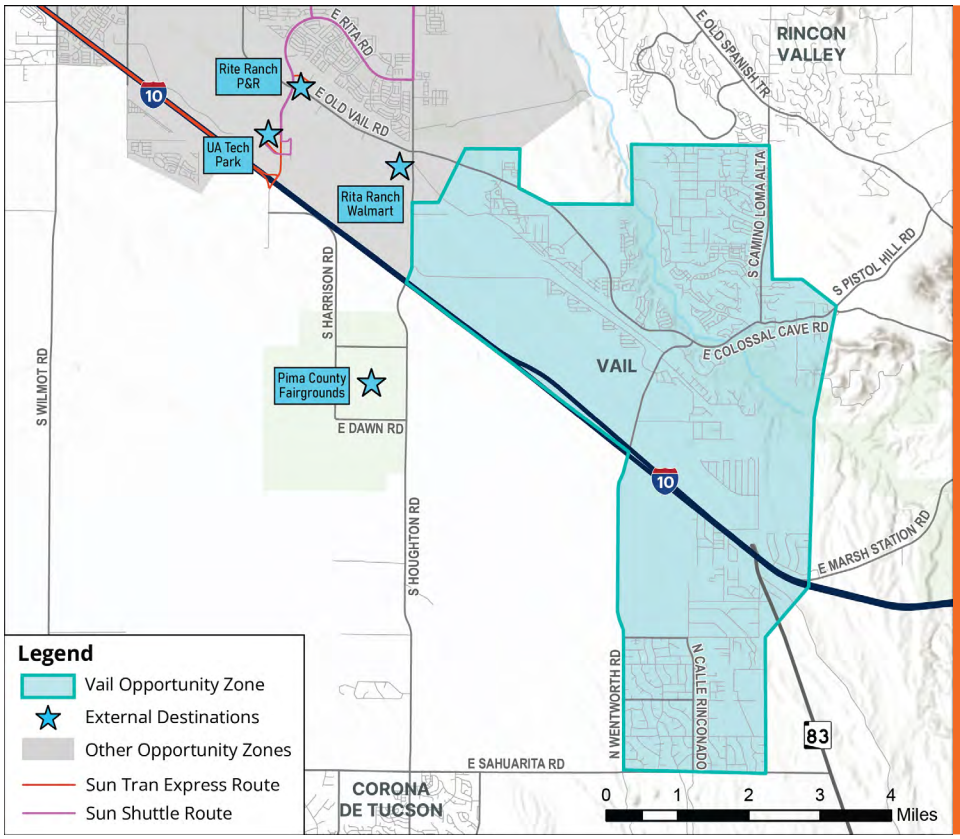
» Sun Tran 3, 4, 17, 26, 37, 101X, 110X

» Sun Shuttle 450 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	50	130	200
Annual Ridership	13,000	35,000	52,000
Fleet Size Needed at Peak (Vehicles)	2	5	6
Typical Wait Time (Minutes)	26 – 30	22 – 26	26 – 30
Typical Ride Duration (Minutes)	17 – 21	21 – 25	25 – 31
Utilization (Riders per Hour)	2.6 – 3.2	3.1 – 2.7	3.5 – 4.1
Estimated Annual Cost	$400,000	$800,000	$1.1M
Cost Efficiency	$28/ride	$23/ride	$21/ride

Table 24: Rita Ranch/ Civano/Littletown Simulation Results

Figure 51: Vail Simulation



7.2.9

VAIL

Proposed Service

» Transit Expansion

Simulated Service Tier

» Weekday

Transit Connections

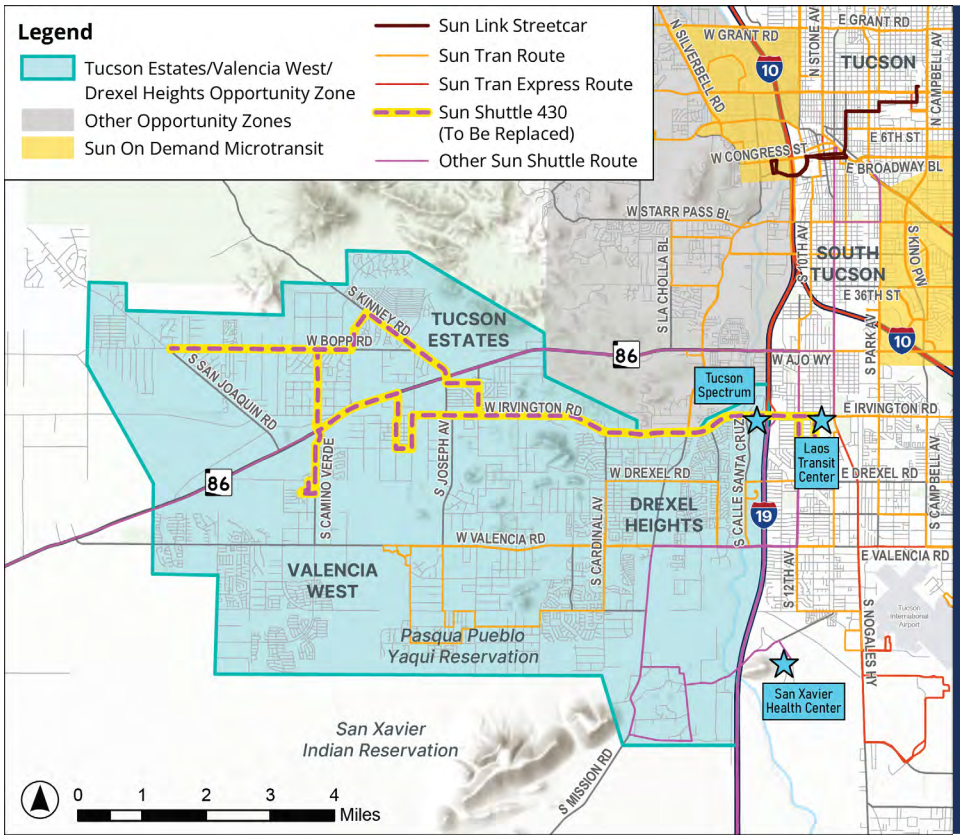
» Sun Tran 110X (extension to Vail recommended)

» Sun Shuttle 450 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	15	40	60
Annual Ridership	4,000	10,000	16,000
Fleet Size Needed at Peak (Vehicles)	2	2	3
Typical Wait Time (Minutes)	8 – 12	11 – 15	10 – 14
Typical Ride Duration (Minutes)	13 – 17	15 – 19	12 - 16
Utilization (Riders per Hour)	0.9 – 1.5	2.1 – 2.7	2.1 – 2.7
Estimated Annual Cost	$250,000	$350,000	$550,000
Cost Efficiency	$66/ride	$36/ride	$34/ride

Table 25: Vail Simulation Results

Figure 52: Tucson Estates/Drexel Heights/Valencia West Simulation



7.2.10

TUCSON ESTATES/DREXEL HEIGHTS/VALENCIA WEST

Proposed Service

» Fixed-Route Streamlining/ Transit Expansion

- Replaces Sun Shuttle 430

Simulated Service Tier

» Extended

Transit Connections

» Sun Tran 12, 16, 23, 26, 27, 29, 203X, 204X

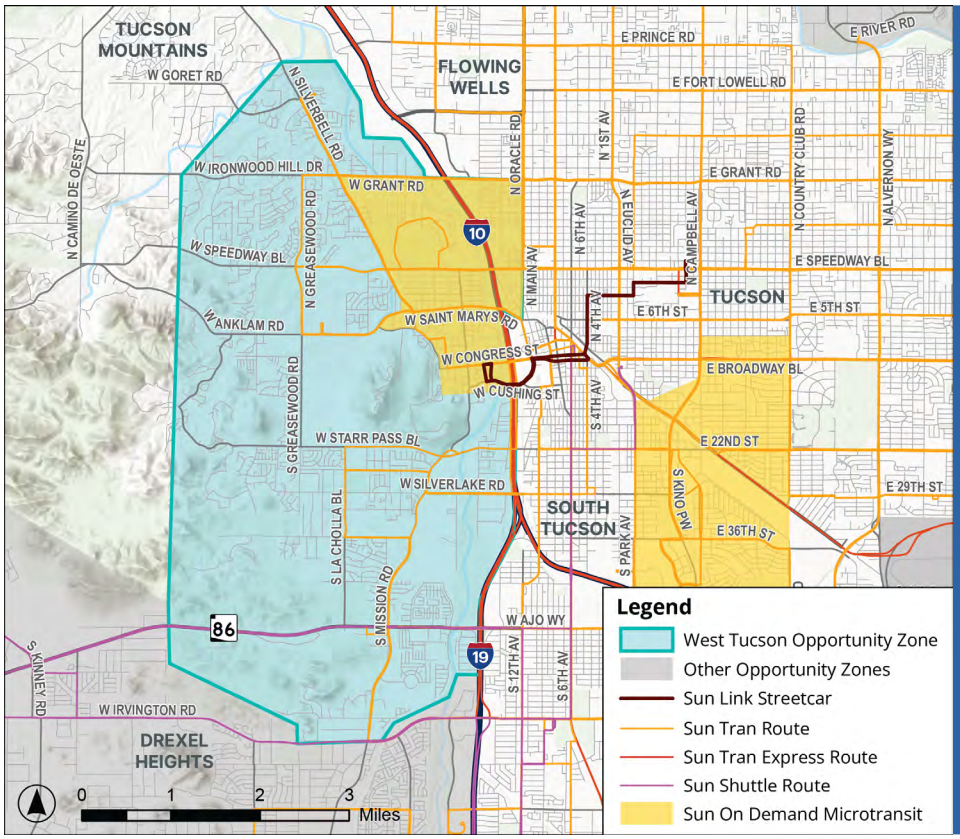
» Sun Shuttle 421, 440, 486

» Sun Shuttle 430 (recommended to be replaced)

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	80	205	310
Annual Ridership	22,000	59,000	88,000
Fleet Size Needed at Peak (Vehicles)	5	8	10
Typical Wait Time (Minutes)	8 – 12	14 – 18	6 – 10
Typical Ride Duration (Minutes)	15 – 19	22 – 26	11 – 15
Utilization (Riders per Hour)	1.1 – 1.7	2.0 – 2.6	2.6 – 3.2
Estimated Annual Cost	$1.3M	$2.0M	$2.4M
Cost Efficiency	$57/ride	$30/ride	$27/ride

Table 26: Tucson Estates/ Drexel Heights/Valencia West Simulation Results

Figure 53: West Tucson Simulation



7.2.11

WEST TUCSON*

Proposed Service

» Transit Expansion

- Expansion of Sun On Demand

Simulated Service Tier

» Extended

Transit Connections

» Sun Link Streetcar

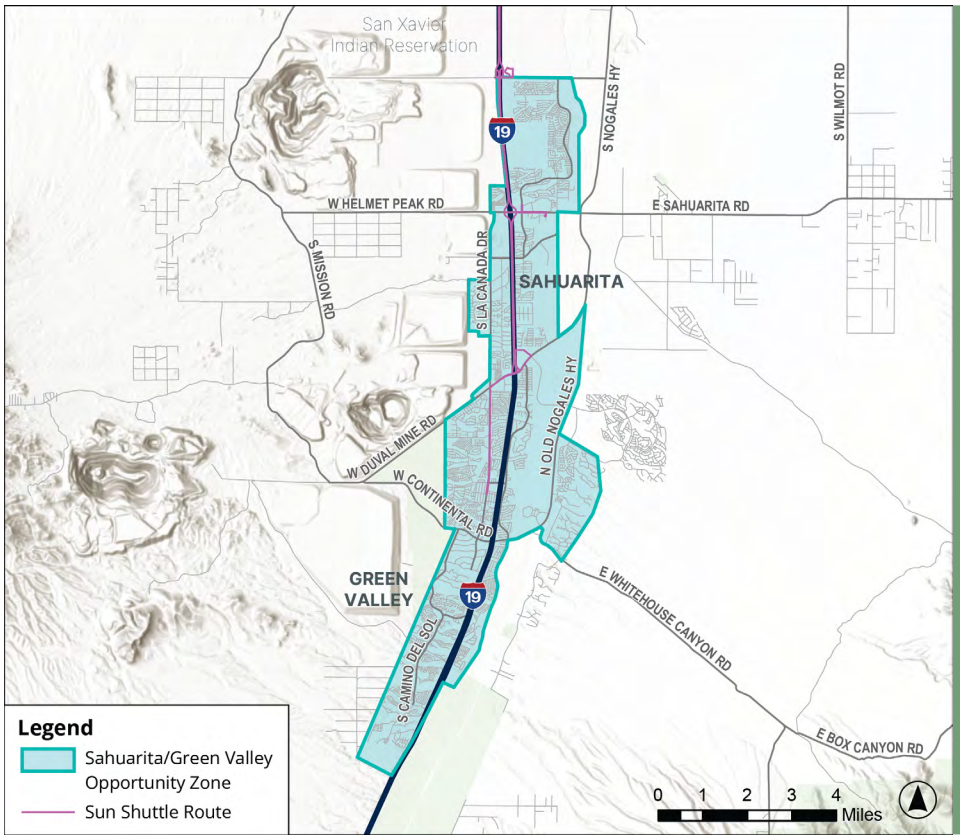
» Sun Tran 3, 5, 9, 10, 16, 21, 22

*Encompasses the existing Sun On Demand Zone 1

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	65	170	255
Annual Ridership	19,000	49,000	74,000
Fleet Size Needed at Peak (Vehicles)	3	5	6
Typical Wait Time (Minutes)	9 – 13	11 – 15	16 – 20
Typical Ride Duration (Minutes)	13 – 17	13 – 17	14 – 18
Utilization (Riders per Hour)	1.6 – 2.2	2.7 – 3.3	3.5 – 4.1
Estimated Annual Cost	$800,000	$1.3M	$1.5M
Cost Efficiency	$42/ride	$27/ride	$21/ride

Table 27: West Tucson Simulation Results

Figure 54: Sahuarita/Green Valley Simulation



7.2.12

SAHUARITA/ GREEN VALLEY

Proposed Service

» Dial-a-Ride Conversion

Simulated Service Tier

» Weekday

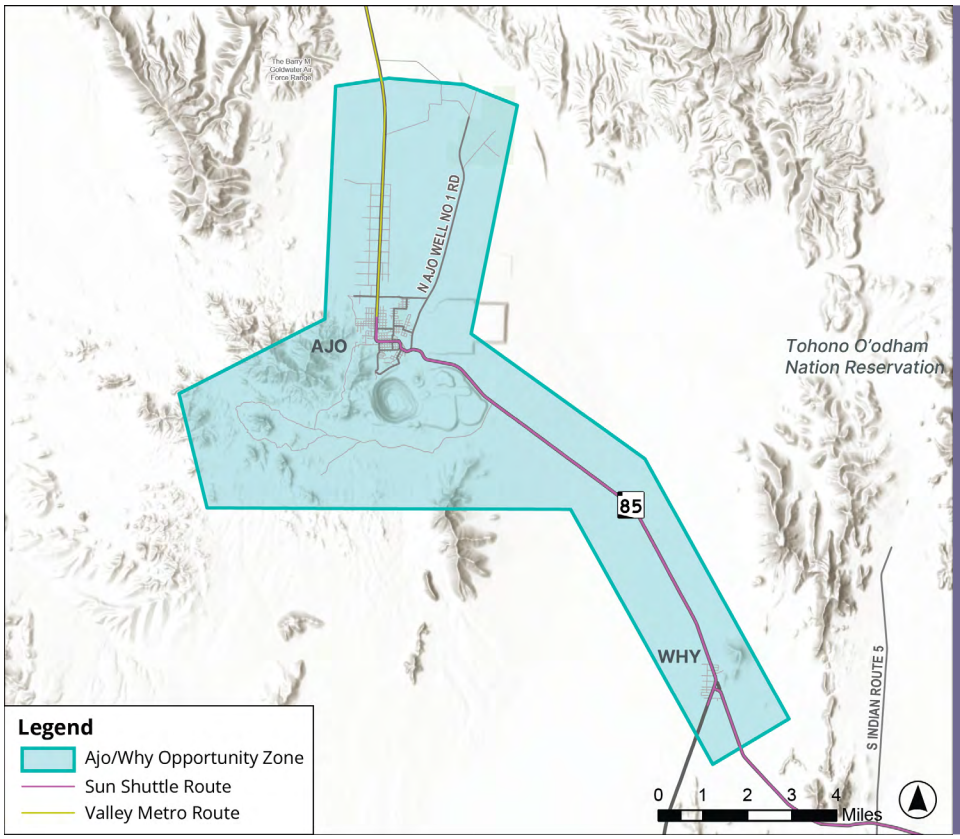
Transit Connections

» Sun Shuttle 421

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	45	115	175
Annual Ridership	11,000	31,000	46,000
Fleet Size Needed at Peak (Vehicles)	2	4	5
Typical Wait Time (Minutes)	13 – 17	14 – 18	13 – 17
Typical Ride Duration (Minutes)	15 – 19	13 – 17	14 – 18
Utilization (Riders per Hour)	2.1 – 2.7	3.1 – 3.7	3.7 – 4.3
Estimated Annual Cost	$400,000	$700,000	$900,000
Cost Efficiency	$32/ride	$23/ride	$20/ride

Table 28: Sahuarita/Green Valley Simulation Results

Figure 55: Ajo/Why Simulation



7.2.13

AJO/WHY

Proposed Service

» Dial-a-Ride Conversion

Simulated Service Tier

» Extended

Transit Connections

» Sun Shuttle 486

» Valley Metro 685

Simulation Results	Low Scenario	Medium Scenario	High Scenario
Weekday Ridership	15	40	65
Annual Ridership	5,000	12,000	18,000
Fleet Size Needed at Peak (Vehicles)	2	2	3
Typical Wait Time (Minutes)	5 – 9	6 – 10	8 – 12
Typical Ride Duration (Minutes)	7 – 11	7 – 11	9 – 13
Utilization (Riders per Hour)	0.7 – 1.3	1.8 – 2.4	1.8 – 2.4
Estimated Annual Cost	$400,000	$500,000	$700,000
Cost Efficiency	$87/ride	$39/ride	$37/ride

Table 29: Ajo/Why Simulation Results

SECTION 08

Microtransit Service Models

As an on-demand service, microtransit offers a wide range of deployment models that can be tailored to each community's needs. This section summarizes what models are recommended in the PAG region, informed by the Existing Transit Conditions analysis and industry best practices.

8.1
Rider Experience

The typical rider experience on microtransit is as follows:

01 The rider uses a smartphone application ("app"), navigates to a website, or calls a call center to request a trip. The rider inputs their starting and ending location and number of passengers. The app displays on a map with the service boundary to communicate where the service is available; if the requested trip travels outside the service boundary, the request will be declined. If the locations are inaccessible by vehicles, a nearby alternative location is suggested. In the rare situation where the system is at capacity and no vehicles are available, the app may offer to serve the trip through a Transportation Network Company (TNC) or taxi service instead.

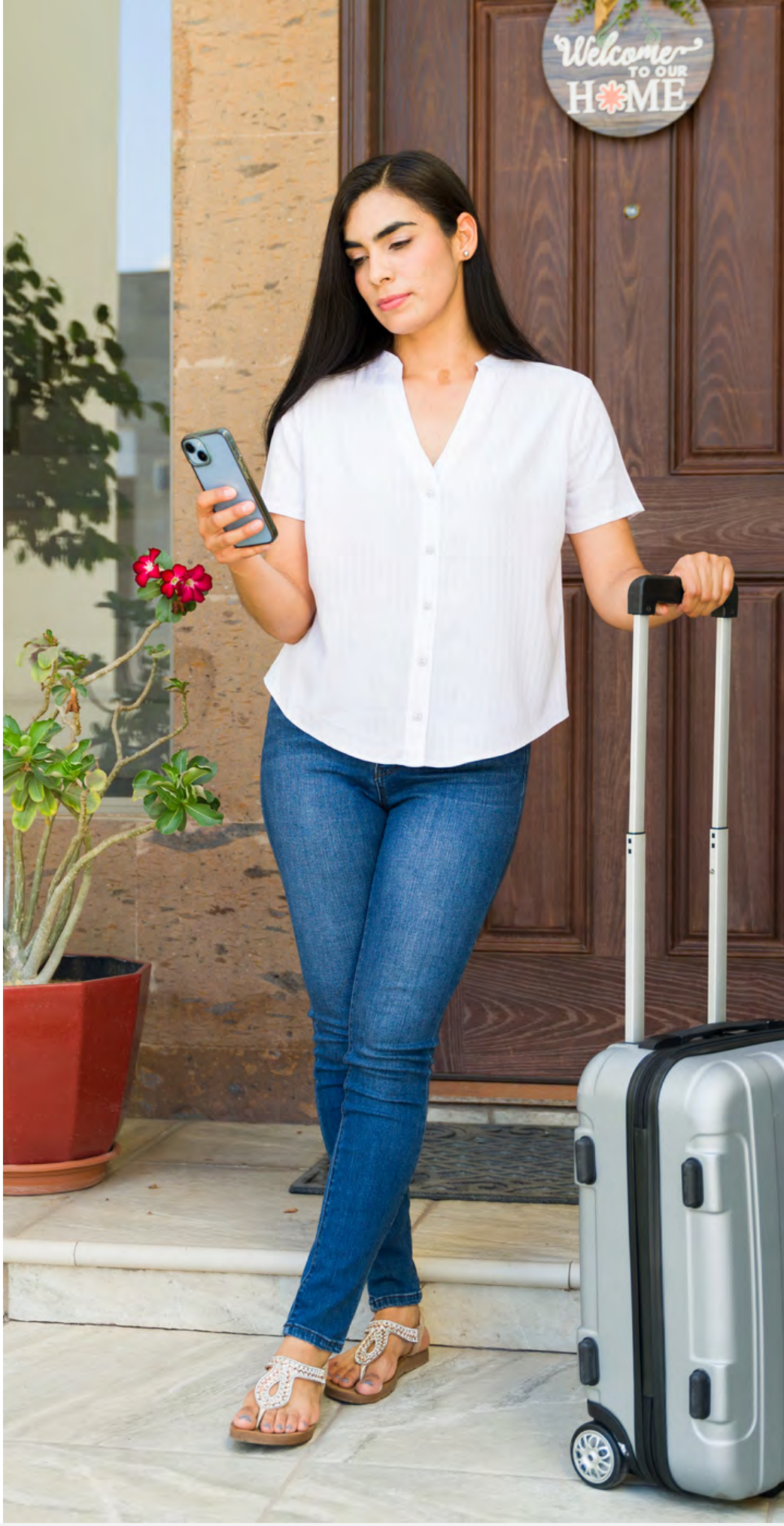
02 At the time of the completion of this study, all transit services in Pima County are free to ride. If the microtransit service is collecting fares, payment is collected through the app or website using a credit card. Cash, vouchers, or transit passes may be collected on board by the driver.

03 Once a trip is booked, a vehicle is assigned to serve the trip and begins traveling to the pickup location. The vehicle license plate, driver name, and estimated arrival time are communicated to the rider, who should meet the driver at the pickup location when the driver arrives. If the app was used to book the trip, real-time vehicle locations and updates to vehicle arrival time are displayed as the rider waits. During this time, the rider may cancel the trip but may be charged a cancellation fee because it impacts other passengers.

04 Once the vehicle arrives, the rider boards the vehicle, and the vehicle starts traveling to the drop-off location. The vehicle may take detours to pick up or drop off other riders to optimize efficiency. The app displays real-time vehicle locations and updates to drop off time.

05 The vehicle arrives at the drop-off location, and the rider alights from the vehicle. The app offers to send a receipt via email or text and prompts an optional feedback form to the rider.

From the rider's perspective, microtransit provides several benefits over other transportation modes. Compared to fixed-route transit, microtransit is more convenient because it allows on-demand trip booking instead of planning around a trip schedule and it picks up riders curb-to-curb. Microtransit is also less costly to ride compared to TNC services. However, it is important to note that microtransit's on-demand, shared-ride nature introduces variability into wait and travel times. Excessive wait and travel times can be mitigated by monitoring vehicle performance and adding vehicles in service as needed to maintain a quality of service consistent with regional goals.



8.2

Similar Microtransit Deployments Elsewhere

Microtransit has a variety of potential applications in both urban and rural areas and has been successfully deployed across the country. This study analyzed a variety of existing microtransit programs to understand the use cases in differing contexts. Findings from each program are summarized below:

Arlington On-Demand, Arlington, TX
Arlington launched its microtransit program in 2017 to replace the city's single fixed-route bus line, known as MAX, that had underperforming ridership. Microtransit service was then expanded citywide in 2021, making it the first city to rely solely on microtransit as a public transit system. The city is also testing autonomous vehicles to operate microtransit in the downtown core.

CATS Micro, Charlotte Area, NC
Charlotte Area Transit System (CATS) has begun working to replace some fixed-route bus services in suburban parts of the Charlotte, NC, area with a microtransit service called CATS Micro. Currently, CATS is testing a microtransit zone covering an area of northern Mecklenburg County, previously served by a series of infrequent circulator routes running about once an hour. With CATS Micro, transit service is available for a longer span of time and with a standard pickup time within thirty minutes, quicker than the previous hour-long wait between fixed-route buses.

RideKC Micro Transit, Kansas City Area, KS/MO
The Kansas City metro area includes several lower-density suburban cities that have few fixed-route bus services with low service levels and coverage. In some of these areas, including parts of Kansas City and Overland Park, RideKC has introduced Micro Transit zones to cover common destinations.

WeRIDE, Phoenix Area, AZ
WeRIDE is a microtransit service providing on-demand shared microtransit service to the Phoenix suburbs of Peoria, Goodyear, Avondale, and Surprise. Several of these communities, including Peoria and Avondale, had tested local fixed-route circulator services with limited success, with high costs and low ridership. Surprise had no local transit options prior to WeRIDE. After the implementation of WeRIDE, the service has seen significant growth in usage, and while costs per passenger have varied, they have mostly remained below the cost of operating previous circulators.[1]

JCATS QuickRide, Johnston County, NC
Johnston County, NC, is a rural and suburban county outside of the Raleigh area. While one of the state's fastest-growing counties, transportation alternatives in Johnston County are limited. TNCs are largely unavailable in most of the county. Johnston County Area Transit System previously only operated traditional rural on-demand transit service that required advance scheduling and often ran out of space for the public due to the high demand for more specialized medical trips. Recently, JCATS launched a microtransit pilot serving the county seat, Smithfield, and the neighboring town of Selma. Within the zone, including most of Smithfield and Selma's town limits, trips can be requested on-demand same-day or scheduled in advance.

UTA On Demand, Salt Lake City Area, UT
Utah Transit Authority (UTA) operates microtransit in four communities in the Salt Lake City area. Notably, microtransit was deployed in Tooele County, which is composed of low-density residential, agricultural areas, and industrial employment centers. Riders in Tooele County can also connect to Salt Lake City by transferring to a fixed-route service at a park and ride in the northeastern corner of the zone.

[1]https://www.govtech.com/fs/arizona-suburbs-shake-things-up-with-microtransit-service

8.3 Integration with Existing Transit Services

Microtransit's effectiveness can be further improved when it is well-integrated within Pima County's wider transit network. Each opportunity zone analyzed by this study has at least one connection to other transit services, allowing riders to transfer and reach destinations outside of the zone boundaries. This section discusses key considerations of the other transit services if and when microtransit is implemented.

8.3.1 FIXED-ROUTE TRANSIT (SUN TRAN, SUN LINK, AND SUN SHUTTLE)

Microtransit should be designed to supplement traditional fixed-route transit services, instead of competing with them. Microtransit can provide new transit access to communities where there is not enough trip activity to support a fixed-route service, and it can be more quickly implemented since it does not require constructing transit stops. However, microtransit tends to be less cost-effective and efficient in higher density scenarios than fixed-route service. When carefully implemented, microtransit can be used as a first/last mile connection by transferring to and from fixed-route transit, which bolsters the ridership of both modes.

The rider app should include a comprehensive trip planner that provides step-by-step instructions for how the rider can transfer between modes. The planner can be programed to choose transfer locations with more stop amenities, such as benches and shelters.

When both modes are equally feasible for a given trip, the rider should be encouraged to take fixed-route transit. This is because fixed-route transit is more cost-effective to provide from an operator standpoint, and the availability of microtransit vehicles can be better allocated to trips that are not feasible on fixed-route. When a rider inputs a microtransit trip request in the app where fixed-route is feasible, the app should recommend fixed-route as a preferred alternative before the trip booking is submitted.

8.3.2

PUBLIC DIAL-A-RIDE (SUN SHUTTLE)

There are four existing Sun Shuttle public Dial-a-Ride zones in Pima County. Dial-a-Ride and microtransit are both on-demand transit services, with the only major difference being the ability for riders to book same-day trips. These zones are good candidates to be converted to microtransit because they already have an established user base, have drivers familiar with operating in the area, and have vehicles already purchased. The improved flexibility offered to existing riders makes the service more attractive, which will likely make the service more popular.

The current dial-a-ride software platform, RideCo, is already capable of handling on-demand trips, which should streamline the process of converting existing dial-a-ride zones to a microtransit model. The conversion can also be a good opportunity to adjust service parameters (such as service areas and span) and address concerns that current riders may have. Before rollout, a comprehensive advertising campaign should be used to communicate upcoming changes to existing and potential future riders.

8.3.3

PARATRANSIT (SUN VAN AND SUN SHUTTLE ADA DIAL-A-RIDE)

The two existing paratransit services in the region, Sun Van and Sun Shuttle ADA Dial-a-Ride, combine to offer service within three-quarters of a mile of an existing fixed-route transit route as required by the Americans with Disabilities Act (ADA) and an additional premium service area. This study did not analyze microtransit as a replacement of paratransit services; instead, microtransit is intended to complement paratransit. Microtransit can expand accessible transit options to places outside paratransit's service area and can increase accessible transit capacity where the two services overlap. As most opportunity zones have some overlap with paratransit's service area, transfers between the two systems will also be possible. Recommendations regarding microtransit's accessibility are discussed in the Accessibility section below.

Sun Van's 2024 Comprehensive Operational Analysis revealed that while the existing service has strengths, the top areas for improvement include booking flexibility, on-time performance, and service availability. For trips within service areas, microtransit's on-demand model addresses these needs by providing a more flexible service, which also frees capacity for paratransit to serve trips outside the service area.

Upon microtransit rollout, a comprehensive advertising and public education campaign can help ensure existing paratransit riders are aware of microtransit as a travel option. Each paratransit service's booking app and call center agents may also encourage riders to take microtransit when they are traveling within a microtransit service boundary. Note that eligible paratransit riders should not be discouraged from taking paratransit when they are eligible, even if the trip can be served by microtransit.

8.4
Implementation Considerations

As with other types of transit services, various implementation structures can be employed to deliver microtransit service. This section will describe the different key elements to consider, how the RTA currently delivers transit service, and this study's recommendation for future microtransit service.

Even though it is possible to have different implementations across services, this study recommends using a uniform model across the county to ensure a similar riding experience across local jurisdictions.

8.4.1

SOFTWARE PLATFORM

As a technology-enabled service, microtransit relies on a robust software platform that allows on-demand trip booking and dispatch. There are three major components to microtransit's software platform: a public-facing interface (mobile app, website, and/or call center) that allows riders to book rides and track real-time vehicle locations, a vehicle dispatch software that automatically calculates how to most efficiently route vehicles to serve requested trips, and a driver-facing interface that navigates drivers to pick-up and drop-off locations. These three components should work seamlessly with one another for a smooth experience for riders and drivers. Additionally, the platform should keep ride histories and have a method to easily extract performance measures for monitoring system performance.

In some cases, on-demand scheduling is an add-on module to other transportation management software (TMS) used for traditional dial-a-ride services. This means that a system with dial-a-ride service may be able to upgrade to a microtransit model while retaining their current transportation management software.

Currently, booking systems for on-demand transit varies by service. While most services offer phone reservations, there is little consistency in booking apps and websites between services:

01 **SUN ON-DEMAND**
Booked on the Sun On-Demand app same day and up to seven days in advance

02 **SUN SHUTTLE GENERAL PUBLIC DIAL-A-RIDE differs by zone:**

- **MARANA/AVRA VALLEY, GREEN VALLEY/ SAHUARITA, AND AJO:**
  Booked through the Sun Shuttle Dial-a-Ride app or through the Sun Shuttle call center, but only for next-day service or prior reservations at least 24 hours in advance. For same-day availability, riders must call in.
- **ORO VALLEY:**
  Booked through the Town of Oro Valley's website or through Oro Valley's call center. Rides are also generally booked at least 24 hours in advance.

This variety of booking processes adds complication for riders if traveling through multiple parts of the region or across different services. An opportunity exists to create an easier-to-understand system that is more convenient for riders and more consistent across services.

During public outreach for this project, feedback and areas for improvement regarding the existing booking platform was received, including:

- **Consistency and coordination across services**
  Different services go through different dispatches and apps/booking websites, making coordination or connections between services difficult.
- **Minimizing human error by automating dispatching where possible**
  Some older platforms require manual scheduling, which is more labor intensive and may not be most efficient. Several newer platforms have more automatic scheduling and dispatching, helping to avoid additional errors.
- **Reliability of real-time updates**
  Drivers expressed that delayed real-time updates could cause mix-ups between drivers or give drivers incorrect routing.
- **Difficulty in identifying rural pickup locations**
  Drivers noted that in rural communities, addresses may not effectively communicate where riders would like to be picked up, and alternatives such as landmarks or mileposts may be more convenient for riders.
- **Trip histories**
  Sun On Demand's original software didn't incorporate ways to track and record trips histories, making monitoring system performance difficult.
- **User-friendliness of the rider-side interface (app, website, etc.)**
  This includes ease of scheduling, trip planning, tracking, and (if applicable) payment. Drivers indicated that a potential new feature is offering alternative trip times if the initial request cannot be booked. Riders have also expressed appreciation for the ability to track vehicles in real-time.

The RTA recently selected and procured RideCo as its on-demand software platform. The City of Tucson is also in the process of bidding their microtransit platform again. The above considerations will be important to consider in future software procurement.

Public-Facing Interface

For riders to book trips and receive trip updates, the primary interface is the mobile app, which is most convenient for typical microtransit riders. However, alternatives such as a website and a call center should be provided to keep microtransit accessible to all, especially for seniors and people without smartphone access.

Technical capabilities of the mobile app and website should include:

- The service area boundary overlaid on a map to understand where microtransit is offered
- Ability to input trip starting and ending locations and book a ride
- Ability to display information about the vehicle, such as license plate and driver's name
- Real-time updates, such as estimated wait and travel times, and vehicle locations on a map
- Multimodal trip planner with step-by-step instructions to assist riders to transfer onto other modes, such as fixed-route transit, micromobility services, and TNCs
- TNC (Uber, Lyft, taxi) integration to allow for overflow bookings when microtransit is at capacity
- Ability for employers and call center staff to book trips on behalf of riders
- Ability to indicate disability status to ensure an accessible vehicle is dispatched when needed
- Ability to add notes to assist drivers navigating to pick up and drop off locations
- Ability to collect fares through card payments and flexibility in the type of fare, such as flat fares, distance-based fares, along with dynamic fares; while transit is currently free in Pima County, the software should have this capability in case the RTA transitions to a fared service

Mobile apps generally come in one of two forms: integrated within a standard transit agency app with all transit services available, or standalone apps dedicated solely to microtransit.

This study recommends limiting the number of pre-booked trips allowed, or restricting the ability to pre-book a trip, to those with ADA needs.

8.4.2

PRE-BOOKING TRIPS

Besides offering on-demand trips, which assign vehicles to trip requests in real-time, microtransit may also allow riders to book trips earlier in advance. Pre-booking provides more certainty to riders as it minimizes the wait and travel times that riders experience; however, too many pre-booked trips reduce the available capacity to serve on-demand trips, which diminish the system's ability to serve these trips in a timely manner.

To ensure microtransit has the capacity to serve on-demand trips, this study recommends limiting the number of pre-booked trips allowed, or restricting the ability to pre-book a trip, to those with ADA needs. Additionally, the ability to book a TNC or taxi ride for overflow could also be used to ensure riders are not left behind during peak demand periods where microtransit vehicles may not be available.

8.4.3

STAFFING AND PROCUREMENT

Different methods of staffing and procurement include:

- **SOFTWARE-AS-A-SERVICE (SAAS)**
  Agencies operate the service using agency-owned vehicles and employed operators, but purchase scheduling and dispatching software to manage trip booking, vehicle dispatching, and payment.
- **TURNKEY**
  Private contractors are hired to provide vehicles, operators, and software platform.

The RTA currently uses a turnkey model to deliver the Sun Shuttle and Dial-a-Ride services but relies on TNCs to deliver trips when it is at capacity. This study recommends that the RTA continue using a turnkey model but should minimize the use of TNCs by ensuring that enough vehicle capacity is provided to serve all trip demand.

Microtransit's software platform is generally not developed by agencies but purchased as part of a Request for Proposals (RFP) process. If a turnkey model is used, the RFP for software is recommended to be combined with the RFP for contractors to ensure that contracted staff are familiar with the software platform. Alternatively, there are also purchasing cooperatives and cooperative agreements that allow member agencies to purchase directly from registered vendors using pre-designed contracts that meet state and federal cooperative bidding requirements.

This study recommends that the RTA continue using a turnkey model but should minimize the use of TNCs by ensuring that enough vehicle capacity is provided to serve all trip demand.

8.4.4

PERMITTED PICKUP AND DROP-OFF LOCATIONS

Aside from curb-to-curb service, agencies may choose to place additional restrictions on pickup and drop-off locations, depending on the goals of the service, such as:

- **Corner-to-corner:** This model requires riders to walk to the nearest major intersection within a maximum distance. A corner-to-corner service streamlines operations by reducing vehicle travel distance and time but may discourage riders from taking microtransit.
- **Node-based:** This model only permits travel between predetermined nodes, which are usually major trip or activity centers. A node-based model streamlines operations and lowers operating costs but leads to lower ridership due to decreased convenience.
- **Transit connections only:** This model requires the microtransit trip to either start or end at a fixed-route transit stop, which dedicates the service to be a first/last mile connection. This model will result in less ridership.

The RTA's Dial-a-Ride service currently places no restriction of travel location and operates curb-to-curb service. This study recommends that future microtransit services follow the same model for the greatest rider convenience, especially considering the high temperatures in the region and incomplete pedestrian facilities outside of urban areas.

8.4.5

FARE POLICY

As of the completion of this study, all transit services in Pima County are fare-free since March 2020. Collecting fares introduces additional revenue for agencies but may result in lower ridership. If agencies decide to collect fares in the future, microtransit should use a similar fare structure with fixed-route transit. Methods that fares can be paid include the mobile app or website with a card payment, or on board with cash, voucher, or reloadable transit cards (such as the SunGO card).

8.4.6

BRANDING

Branding refers to the public-facing identity of the service, which includes the name, logo, colors, visual design, and other components that make up how riders distinguish between services. Currently, on-demand services in Pima County are delivered under three brands: Sun On Demand for microtransit in the City of Tucson, Sun Shuttle Dial-a-Ride for public dial-a-ride, and Sun Van for paratransit services. This study recommends any future microtransit zones to use the Sun On Demand brand for consistency across the County.

8.4.7

ACCESSIBILITY

As a public transit service, microtransit is required to meet the accessibility requirements as outlined by the ADA.

App Accessibility

To keep microtransit accessible, booking trips should be possible through the mobile app, a website, and a call center, which allow those without smartphone or internet access to still ride the service. The mobile app and website should have accessible features for those with hearing and visual impairments, such as text-to-speech and high display contrast. The apps used for microtransit services must meet Web Content Accessibility Guidelines (WCAG) standards, including features for screen-readers. A clear and concise tutorial should be provided in the app and website to help guide unfamiliar riders through the app. User testing of the app and website before rollout can help identify that the user interface is intuitive to use. The app and website should also provide the ability to indicate disability status, which will dispatch accessible vehicles to serve that rider when requested. These features must be incorporated in the procurement documents, to ensure providers meet the requirements.

Data Privacy

Data privacy is a concern when implementing microtransit services and procuring technology to schedule and manage trips. There are mitigation strategies that should be put in place and incorporated in the procurement documents when the agencies initiate the procurement process.

01 **PRIVACY-BY-DESIGN**
Integrating privacy considerations into the design and development of microtransit systems from the outset

02 **DATA COLLECTION**
Collecting only the data necessary for service provision

03 **ANONYMIZATION AND AGGREGATION**
Protecting user privacy by anonymizing or aggregating data before sharing or making it public

04 **ENCRYPTION**
Protecting data at rest and in transit with encryption technologies

05 **ACCESS CONTROLS**
Implementing strict access controls to limit who can access sensitive data

06 **TRANSPARENCY AND USER CONSENT**
Providing clear and transparent information to users about data collection practices and obtaining consent where required

07 **USE TECHNOLOGY AUDITORS AND EXPERTS**
Conducting regular audits to ensure compliance with data privacy regulations, identify potential vulnerabilities, and engage legal counsel to ensure compliance with regulations and best practices

08 **DATA SUBJECT ACCESS REQUESTS (SARS)**
Implementing processes to handle SARs, allowing individuals to access, correct, or delete their personal data

It is recommended to use the ADA paratransit eligibility in determining if the individual will be better served by ADA paratransit and if microtransit can safely fulfill the request.

Vehicle Accessibility

Microtransit services must provide accessible vehicles to individuals with disabilities, but not all vehicles need to be accessible. Some vehicles in service should be wheelchair accessible, which will require them to be outfitted with ramps or lifts. Typically, accessible microtransit vans will have space to carry one wheelchair and at least two ambulatory riders. Not all microtransit vehicles are required to be ADA accessible, but there must be adequate accessible vehicles in service to provide riders with disabilities with an equivalent quality of service as ambulatory passengers. This study recommends having at least 20% of vehicles in service to be accessible per service area, and one accessible vehicle to always be in service per service area.

Though not all microtransit users are individuals with disabilities, drivers must be trained to handle situations when riders with various needs require assistance. ADA training must be provided for all drivers, as required by law.

It is recommended to use the ADA paratransit eligibility in determining if the individual will be better served by ADA paratransit and if microtransit can safely fulfill the request.

General Accessibility

This study recommends curb-to-curb service be provided, which will pick up and drop off passengers nearest to their starting and ending locations. However, some passengers may require additional door-to-door service if they are unable to safely walk to and from the curb themselves. The booking method should allow riders to specify their pickup and drop off needs such that a driver can help. Drivers should be provided with training to understand how to assist these riders.

As the RTA and the agencies in the greater Tucson region begin implementing microtransit services, it will be important to continue involving stakeholders that represent individuals with disabilities in the planning process; this way barriers can be identified early in the process and addressed during implementation.

SECTION 09

Microtransit Key Performance Indicators

After microtransit implementation, consistent monitoring will help the RTA understand if the service meets regional goals and help identify improvement countermeasures, if necessary. Key performance indicators (KPIs) were identified through gathering information from PAG/RTA on current objectives for microtransit in the County, examining industry-wide best practices, and determining measurable metrics from available data sources. Target values based on the County's regional context are proposed for each KPI.

The most important KPIs to monitor include:

01 **RIDERSHIP**

High ridership indicates that the service provides a useful form of mobility for residents. Ridership is impacted by many factors, including the number of residents and jobs in the service area, whether the service includes places riders want to go, demographic and socioeconomic characteristics of the community, service quality, fares, and marketing. It can take six to 12 months for ridership to mature on a new service. Ridership targets should be set to meet the service goals and needs of the community and balance available resources to fund the service.

02 **EFFICIENCY**

To ensure the microtransit service delivers value for money, the agency should set targets for the efficiency of the service. A high efficiency service ensures providers are maximizing the use of vehicles and funding resources. Efficiency is typically measured through utilization (passenger boardings per vehicle-hour) and cost efficiency (operating cost per passenger trip).

03 **QUALITY OF SERVICE**

Quality of service includes aspects of the rider experience and whether the service meets riders' expectations. The quality of service impacts ridership: high-quality service is more likely to attract new riders and retain existing riders. Agencies must balance providing a high quality of service with the available funding and transit needs of the community. Quality of service KPIs include quantitative metrics, such as wait time and on-time performance, and perceived experience informed through post-ride surveys.

04 **ACCESSIBILITY**

Riders with disabilities are often dependent on on-demand transit services and may require wheelchair-accessible vehicles. To track whether the service is meeting these needs, it is recommended to compare KPIs across riders with disabilities, particularly riders that require a wheelchair-accessible vehicle. KPIs, such as wait time and seat availability, should be the same (or within a reasonable margin of difference) for riders requiring wheelchair accessible vehicles and riders with no specific vehicle requirements.

05 **EQUITY**

To evaluate whether disadvantaged communities have equal access to a service, the demographics of riders can be compared to the demographics of the community. Tracking rider demographics are often done in surveys which can be distributed to riders in the app.

Table 30: Key Performance Measures

Metric Category	KPI	Description	Suggested Target Values
RIDERSHIP	Passenger boardings	The number or average number of passenger boardings in a given time period, e.g., boardings per hour. It is recommended that ridership be looked at by time of day, day of week, and total by month and year.	Ridership is dependent on a variety of factors and will vary from zone to zone. The RTA should use the ridership estimates from this study to set reasonable targets for each zone.
	Trips per rider	The average number of trips taken by a single rider in a given time period, e.g., average trips per week or month.	Average trips per rider per month: » **High-performing: >20** » **Average: 5 - 15** » **Low-performing: <5** Target range may vary depending on service use cases. For example, services targeted to commuters may have more repeat riders than services targeted to shopping or medical appointments.
EFFICIENCY	Productivity	Number of passenger boardings per weekday vehicle revenue hour. Higher productivity indicates greater efficiency in a service.	Passengers per vehicle hour: » **High-performing: >6** » **Average: 3-6** » **Low-performing: <3**
	Cost per passenger trip	Lower cost per passenger trip indicates better cost effectiveness and efficiency.	Cost per passenger trip: » **High-performing: <$15/passenger trip** » **Average: $15 - $30/passenger trip** » **Low-performing: >$30/passenger trip**

Table 30 lists recommended KPIs of the future microtransit service to monitor and suggests initial target values.

Metric Category	KPI	Description	Suggested Target Values
QUALITY OF SERVICE	Shared ride duration percentage	Percentage of passenger ride time in which the vehicle is occupied by more than one passenger.	Percentage of ride time: » **High-performing: > 40%** » **Average: 10% - 40%** » **Low-performing: 10%**
	Wait time (on-demand services only)	The average time a passenger waits between requesting a trip and a vehicle arriving at the designated picked up spot (for on-demand services).	Percentage of ride time: » **High-performing: <15** » **Average: 15 - 20** » **Low-performing: 25+**
	Seat availability	The percentage of trip requests where a valid trip proposal was available and offered.	Percentage of requests: » **High-performing: 95%** » **Average: 90% - 95%** » **Low-performing: 90%** Seat availability in lower density areas may have a lower average between 85% - 95%.
	Customer satisfaction	The average rating provided by passengers, ranked from one to five stars (one being very unsatisfied, five being very satisfied). Typically, riders are asked in the rider-app after their trip is completed to rank their experience.	Percentage of ride time: » **High-performing: >4.8** » **Average: 4.6 - 4.8** » **Low-performing: < 4.6**
	Ride duration	The average time a passenger spends in a vehicle from the time they are picked up to the time they are dropped off.	Depends on the service design. Larger zones or zones with many allowed travel destinations outside of the zone will have longer average ride durations. The RTA should use the estimates from the simulations to set reasonable targets for each zone. In general, shorter trips allow a better service quality, more efficient service, and a higher seat availability rate.
AIR QUALITY/ VMT SAVED		Percent of emission reduction comparing average projected emissions of private car travel in zones and microtransit emissions.	The greenhouse gas emissions per passenger mile will vary depending on the service implemented. The RTA should use the results of the air quality analysis to establish the baseline.

SECTION 10

Title VI and Service Equity Analysis

This section documents the Service Equity Analysis performed for the recommended removal of fixed-route transit service when implementing microtransit. Service Equity Analyses are a requirement of the FTA under Title VI of the Civil Rights Act of 1964, which prohibits the recipients of federal assistance from discrimination based on "race, color, or national origin." The purpose of the analysis is to determine, before implementing any major service change, whether the planned change would have a disparate impact on protected classes. Although low-income populations are not a protected class under Title VI, the FTA also requires transit providers to determine whether low-income populations would bear a disproportionate burden (or if non-low-income populations would receive a disproportionate benefit) from a proposed major service change. FTA's Title VI regulations, including the guidelines for conducting Service Equity Analyses, are available for reference in FTA Circular 4702.1B.

10.1

This study proposes the removal of three Sun Shuttle fixed-route services when transitioning to a microtransit model to make public transit more efficient and cost effective. The locations of these routes are shown in **Figure 55**. These routes are:

Route Profiles

413 (MARANA/CASAS ADOBES)
Operates weekdays from 6:19 a.m. – 6:19 p.m. and Saturdays from 9:29 a.m. – 3:29 p.m., with limited stops connecting Marana and Casas Adobes, at a 90-minute frequency. This route is replaced with the Marana/Avra Valley and Tortolita/Continental Ranch opportunity zones.

430 (TUCSON ESTATES/ VALENCIA WEST)
Operates weekdays from 5:56 a.m. – 5:56 p.m., with limited stops connecting Drexel Heights and Tucson Estates, at a 90-minute frequency. This zone is replaced by the Tucson Estates/Drexel Heights/Valencia West opportunity zone.

450 (SOUTHEAST TUCSON/ RITA RANCH)
Operates weekdays from 5:44 a.m. – 5:24 p.m., with limited stops connecting Houghton and Rita, at a 100-minute frequency. This route is replaced by the Rita Ranch/Civano/ Littletown opportunity zone.

While a conversion of services from fixed-route to microtransit is not a 1:1 replacement, based on the information analyzed in this report, it is expected to increase services available/access on balance. The purpose of this Title VI analysis is to fulfill FTA requirements and better understand and document the potential impacts these changes have on overall equity for low-income and minority populations.

In fiscal year 2024, the lowest-ridership routes in the Sun Shuttle system were Route 413 (Marana/Casas Adobes, 7,217 riders) and Route 450 (Southeast Tucson/Rita Ranch, 10,189 riders). Sun Shuttle Route 430 also has long trip times due to its meandering route, making it less attractive to potential riders. Transitioning to a microtransit model is intended to provide a mode of transit more appropriate to existing land use and densities of riders. Microtransit may also make public transit more cost-effective in these areas, as well as increasing accessibility, reducing wait times, enhancing the coverage area, and improving rider experience. If eliminated, passengers will have access to on-demand microtransit service provided by the RTA.

The three routes identified for removal were selected based on where the need for public transit is high, but the density of the area does not support a fixed-route service. By replacing routes 413, 430, and 450 with microtransit, the proposed service change aims to right-size transit services in low-to-moderate density contexts with known transit demand.

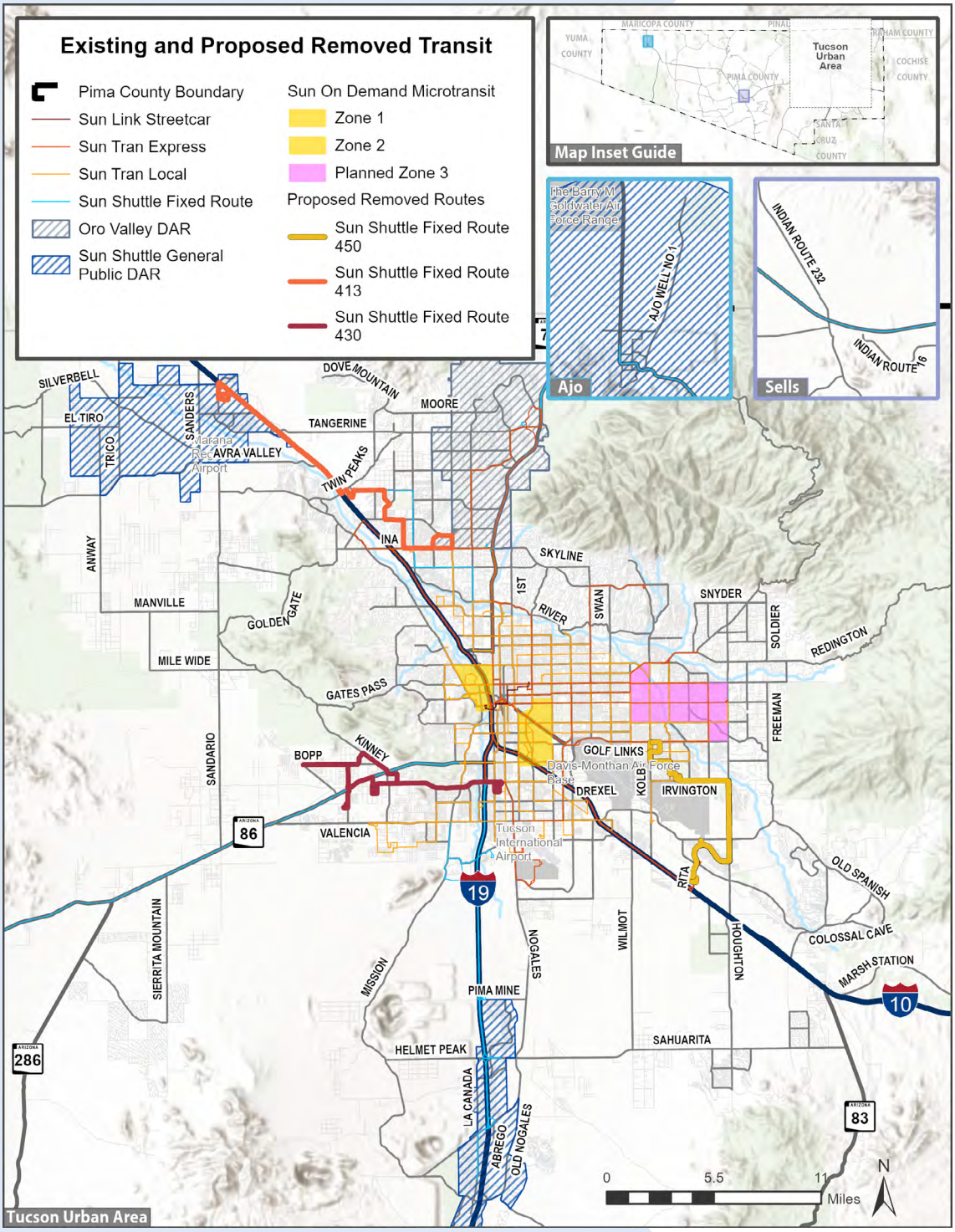


Figure 55: Map of Existing Transit Routes & Proposed Removed Routes

10.2
PAG/RTA Policies

PAG/RTA annually updates its Title VI Implementation Plan to align with requirements established by the Arizona Department of Transportation on behalf of FWHA and FTA. This plan defines the procedures and policies for non-discriminatory planning, programming, and project implementation. Relevant to the equity analysis, Title VI procedures must be followed in the event of a major service change to assess disparate impact (regarding impacts affecting racial or ethnic minorities) and disproportionate burden (regarding impacts affecting low-income populations).

10.2.1

MAJOR SERVICE CHANGE POLICY

The FTA requires all Tucson transit providers to define what major service changes include; only "major service changes" are subject to a service equity analysis. Typically, a major service change stems from the elimination of a route, a reduction in a portion of a route, rerouting an existing route, etc. PAG/RTA considers the following criteria as a major service change:

- Any project that increases or decreases route revenue miles by 25% or more compared to the previous fiscal year
- Any project that increases or decreases route revenue hours by 25% or more compared to the previous fiscal year

10.2.2

DISPARATE IMPACT POLICY

The Disparate Impact Policy sets a threshold to determine if a service or fare change disproportionately affects minority populations compared to non-minority populations. For the intention of this analysis, "minority" is defined as any individuals who do not identify as white and non-Hispanic or Latino. This includes the following racial and ethnic groups, based on classifications from the U.S. Census: Black/African American, American Indian/Alaska Native, Asian, Hawaiian Native/Pacific Islander, Other, Two or More Races, and Hispanic, Latino, or Spanish Origin.

While PAG/RTA itself does not have stated Title VI policies and procedures related to disparate impacts, Sun Tran, the City of Tucson's major transit service provider, states that "a disparate impact occurs if a proposed fare or major service change requires a minority population to bear adverse effects by 20% or more than the adverse effects borne by the non-minority population."[2] For this analysis, PAG/RTA will be using the 20% threshold used by Sun Tran.

10.2.3

DISPROPORTIONATE BURDEN POLICY

While PAG/RTA itself does not have stated Title VI policies and procedures related to disproportionate impacts, Sun Tran, the City of Tucson's major transit service provider, states that "a disproportionate burden occurs if a proposed fare or major service change requires a low income population to bear adverse effects by twenty 20% or more than the adverse effects borne by the non- low income population."[3] For this analysis, PAG/RTA will apply the 20% threshold used by Sun Tran. PAG's/RTA's Title VI program does not currently define a local threshold for "low income." Therefore, for this analysis, "low income" is defined as individuals or households earning an income of 150% or less of the federal poverty guideline amount, in alignment with federal standards.

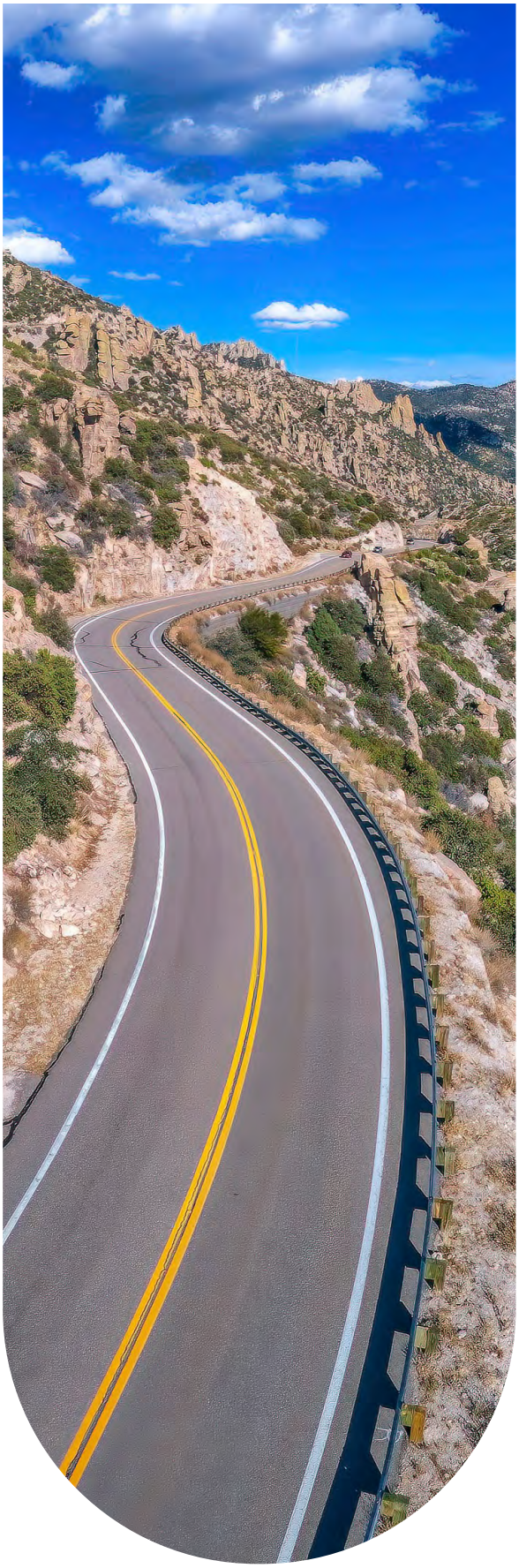
[2] City of Tucson, Sun Tran, "Title VI Program," Revised June 2021, Page 54. Accessed May 23, 2025. Retrieved from Appendix A - 2022 FTA Certifications.pdf.

[3] City of Tucson, Sun Tran, "Title VI Program," Revised June 2021, Page 54. Accessed May 23, 2025. Retrieved from Appendix A - 2022 FTA Certifications.pdf. (Second citation)

Methodology

A count of the total, low-income/non-low-income, and minority/non-minority populations was measured for the existing service area, each individual microtransit zone, the routes proposed to be removed (413, 430, and 450), and the future or proposed service area, reflecting the service area post-implementation of the service changes. This applies to the cumulative impact of service changes as well as individual routes/zones; if the cumulative impact of service changes on the low-income and/or minority populations before and after the service changes is greater than 20%, there is a disproportionate burden or disparate impact found, respectively.

The analysis was conducted using route data provided by Sun Tran, the RTA, and Oro Valley. Population data is sourced from 2023 ACS Five-Year Estimates at the census block group level. The service area for the system and each route was defined as block groups located within a quarter mile of a public transit stop within Pima County. This methodology assumes that if any reasonable area of a block group is within a service area, the entire population of that block group is assumed to have access and counts towards the population of the service area. The comparisons of totals for each service area allow for the assessment of a disparate impact and disproportionate burden using the selected threshold of 20%.



Disparate Impact Analysis

The results of the analysis indicate that there is no disparate impact caused by the elimination of Sun Shuttle Routes 413, 430, and 450. **Table 31** displays the minority and non-minority populations of Pima County, the existing service area, the three removed routes, the new proposed microtransit service areas, and the impacted service area after the elimination of Routes 413, 430, and 450, with the addition of the new microtransit service area zones. Cumulatively, access is being increased for both minorities (13% increase) and non-minority populations (30% increase), as shown in **Table 32**. The proportional increase is greater for non-minorities than minorities, but within the +/- 20% threshold.

For Route 450, being replaced by Rita Ranch/Civano/Littletown opportunity zone, populations previously served decrease, and the proportional difference is greater than the 20% threshold.

For Route 430, being replaced by Tucson Estates/Drexel Heights/Valencia West opportunity zone, populations previously served increase. However, there are proportionally more minorities served after the service change (22% increase), going beyond the 20% threshold.

Table 31: Comparison of Minority Populations – Disparate Impact

Area	Total Population	Minority Population	% Minority	Non-Minority Population	% Non-Minority
Pima County	**1,049,947**	**384,575**	**37%**	**665,372**	**63%**
Existing Service Area	**780,822**	**312,840**	**40%**	**467,982**	**60%**
Route 413 Service Area	**44,415**	**14,486**	**33%**	**29,929**	**67%**
Route 430 Service Area	**45,558**	**25,517**	**56%**	**20,041**	**44%**
Route 450 Service Area	**53,477**	**18,713**	**35%**	**34,764**	**65%**
Ajo/Why Service Area – Dial-A-Ride Conversion/Transit Expansion	**3,946**	**1,174**	**30%**	**2,772**	**70%**
Casas Adobes Service Area – Fixed-Route Replacement	**47,939**	**16,884**	**35%**	**31,055**	**65%**
Catalina Foothills Service Area – Transit Expansion	**65,532**	**15,848**	**24%**	**49,684**	**76%**
Marana/Avra Valley Service Area – Dial-A-Ride Conversion/Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**9,153**	**32%**	**19,246**	**68%**
Oro Valley Service Area – Dial-A-Ride conversion	**75,766**	**16,838**	**22%**	**58,928**	**78%**
Picture Rocks Service Area – Transit Expansion	**24,092**	**8,107**	**34%**	**15,985**	**66%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**20,172**	**31%**	**44,724**	**69%**
Sahuarita/Green Valley Service Area – Dial-A-Ride Conversion	**54,588**	**11,809**	**22%**	**42,779**	**78%**
Tanque Verde Service Area – Transit Expansion	**31,840**	**6,231**	**20%**	**25,609**	**80%**

Table 31 (Cont.): Comparison of Minority Populations – Disparate Impact

Area	Total Population	Minority Population	% Minority	Non-Minority Population	% Non-Minority
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**23,472**	**30%**	**53,933**	**70%**
Tucson Estates/Drexel Heights/Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**56,980**	**57%**	**43,569**	**43%**
Vail Service Area – Transit Expansion	**29,253**	**9,547**	**33%**	**19,706**	**67%**
West Tucson Service Area – Transit Expansion	**59,258**	**28,377**	**48%**	**30,881**	**52%**
Impacted Service Area	**961,284**	**354,433**	**37%**	**606,851**	**63%**

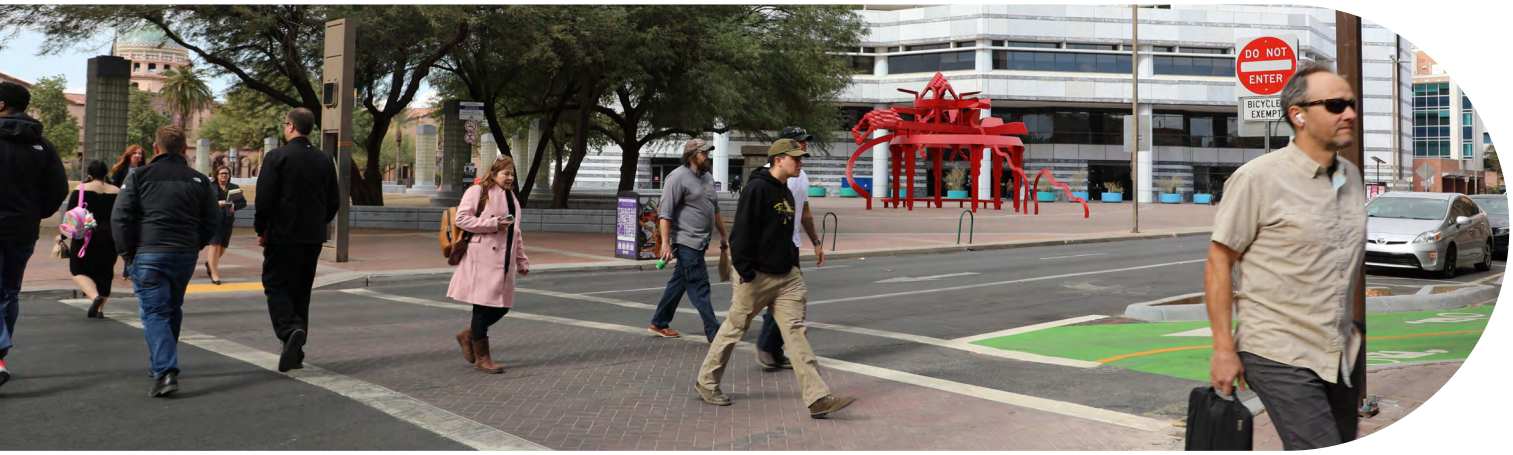


Table 32: Comparison of Cumulative Impacts - Disparate Impact

	Existing Service Area	Impacted Service Area	Change	Percent Change
Total Population	**780,822**	**961,284**	**180,462**	**+23%**
Minority Population	**312,840**	**354,433**	**17,761**	**+13%**
Non-Minority Population	**467,982**	**606,851**	**138,869**	**+30%**

Table 33: Comparison of Minority Populations – Disparate Impact on Removed Routes

Area	Total Population	Minority Population	% Minority	Non-Minority Population	% Non-Minority
Route 413 Service Area	**44,415**	**14,486**	**33%**	**29,929**	**67%**
Route 430 Service Area	**45,558**	**25,517**	**56%**	**20,041**	**44%**
Route 450 Service Area	**53,477**	**18,713**	**35%**	**34,764**	**65%**
Marana/Avra Valley Service Area – Dial-A-Ride Conversion/Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**9,153**	**32%**	**19,246**	**68%**
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**23,472**	**30%**	**53,933**	**70%**
Tucson Estates/Drexel Heights/Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**56,980**	**57%**	**43,569**	**43%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**20,172**	**31%**	**44,724**	**69%**

Figure 56: Percent Minority Populations – Existing Transit Service Area

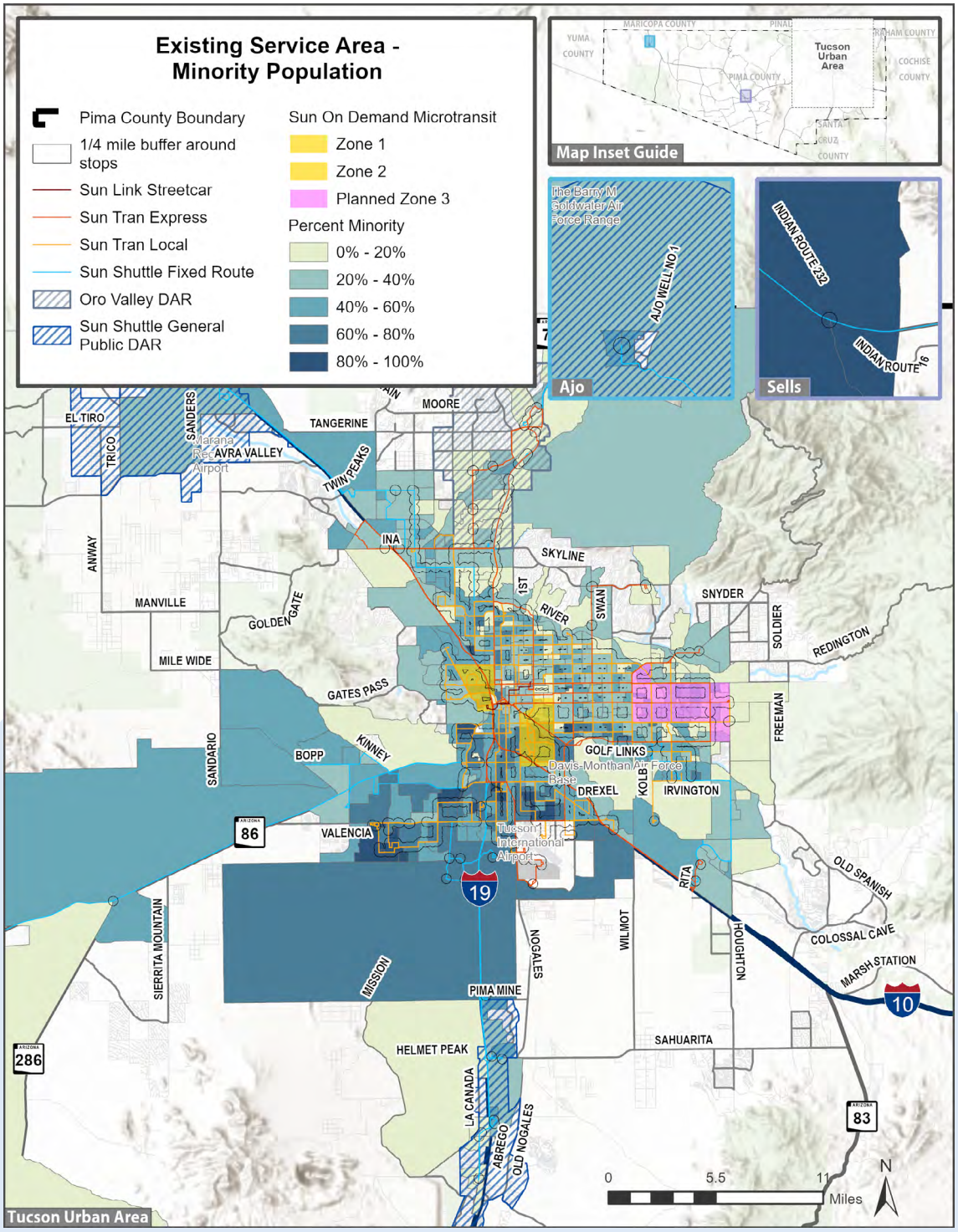
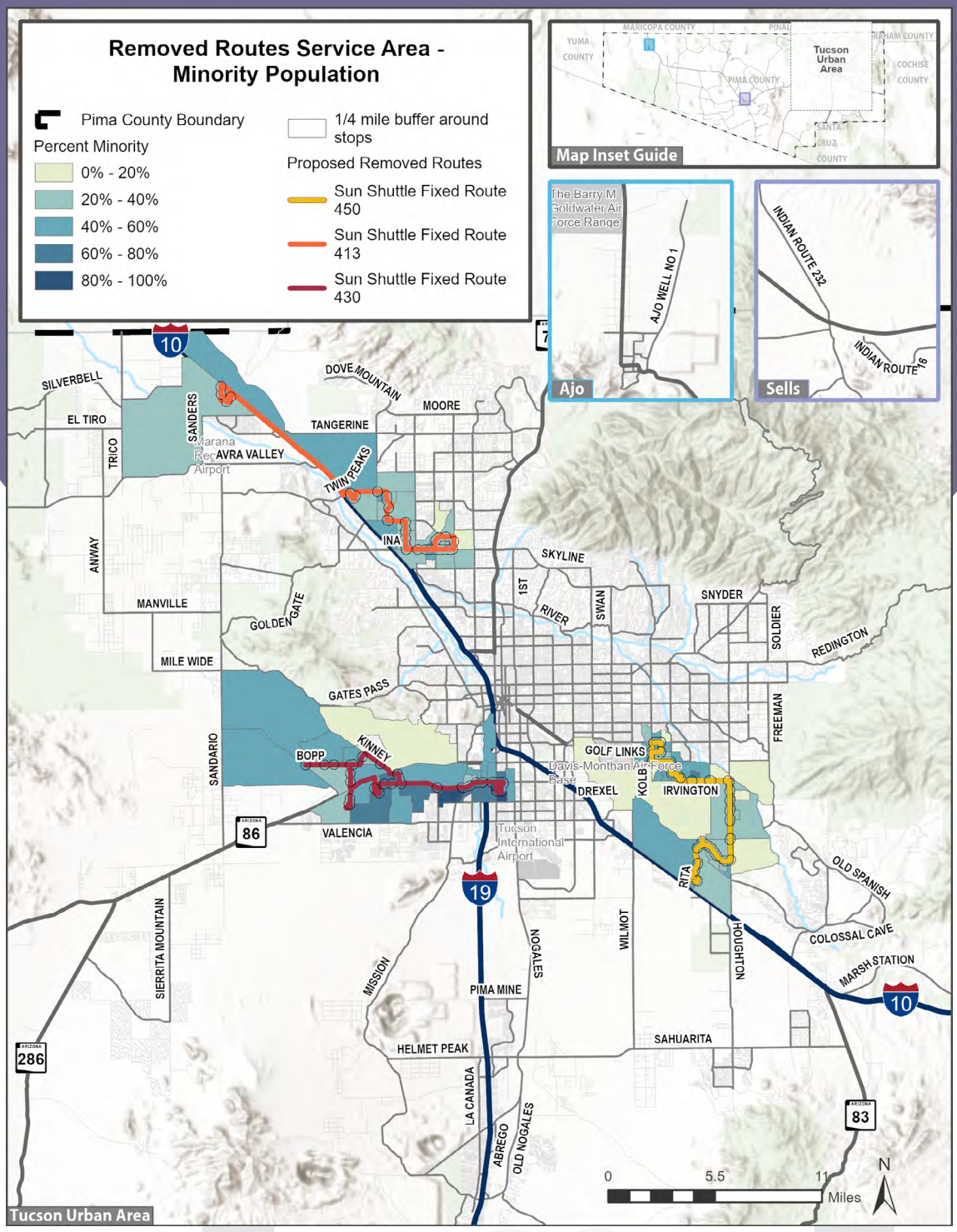


Figure 57: Percent Minority - Removed Routes Service Area



Disproportionate Burden Analysis

The results of the analysis indicate that there is no disproportionate burden caused by the removal of Sun Shuttle Routes 413, 430, and 450. **Table 34** displays the low-income and non-low-income populations of Pima County, the existing service area, the three removed routes, the proposed microtransit service areas, and the impacted service area after the elimination of Routes 413, 430, and 450, with the addition of the proposed microtransit service area zones. The removal of the routes comes close to but does not exceed the 20% threshold used for Title VI. As mentioned, the elimination of Routes 413, 430, and 450 does not cause disproportionate burden but does have a cumulative impact — overall populations potentially served increased by 23%, low-income populations by 9%, and non-low-income by 28% versus existing counts.

Table 34: Comparison of Low-Income Populations – Disproportionate Burden

Area	Total Population	Low-Income Population	% Low-Income	Non-Low-Income Population	% Non-Low-Income
Pima County	**1,049,947**	**237,420**	**23%**	**812,527**	**77%**
Existing Service Area	**780,822**	**205,904**	**26%**	**574,918**	**74%**
Route 413 Service Area	**44,415**	**5,659**	**13%**	**38,756**	**87%**
Route 430 Service Area	**45,558**	**11,614**	**18%**	**33,944**	**75%**
Route 450 Service Area	**53,477**	**9,571**	**18%**	**43,906**	**82%**
Ajo/Why Service Area – Dial-A-Ride Conversion/Transit Expansion	**3,946**	**741**	**19%**	**3,205**	**81%**
Casas Adobes Service Area – Fixed-Route Replacement	**47,939**	**8,296**	**17%**	**39,643**	**83%**
Catalina Foothills Service Area – Transit Expansion	**65,532**	**7,532**	**11%**	**58,000**	**89%**
Marana/Avra Valley Service Area – Dial-A-Ride Conversion/Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**6,606**	**23%**	**21,793**	**77%**
Oro Valley Service Area – Dial-A-Ride conversion	**75,766**	**9,348**	**12%**	**66,418**	**88%**
Picture Rocks Service Area – Transit Expansion	**24,092**	**4,400**	**18%**	**19,692**	**82%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**8,763**	**14%**	**56,133**	**86%**

Table 34 (Cont.): Comparison of Low-Income Populations – Disproportionate Burden

Area	Total Population	Low-Income Population	% Low-Income	Non-Low-Income Population	% Non-Low-Income
Sahuarita/Green Valley Service Area – Dial-A-Ride Conversion	**54,588**	**8,880**	**16%**	**45,708**	**84%**
Tanque Verde Service Area – Transit Expansion	**31,840**	**2,601**	**8%**	**29,239**	**92%**
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**7,590**	**10%**	**69,815**	**90%**
Tucson Estates/Drexel Heights/Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**25,239**	**25%**	**75,310**	**75%**
Vail Service Area – Transit Expansion	**29,253**	**2,974**	**10%**	**26,279**	**90%**
West Tucson Service Area – Transit Expansion	**59,258**	**18,690**	**32%**	**40,568**	**68%**
Impacted Service Area	**961,284**	**224,397**	**23%**	**736,887**	**77%**

Table 35: Comparison of Cumulative Impacts – Disproportionate Burden

	Existing Service Area Low-Income Population	Impacted Service Area Low-Income Population	Change	Percent Change
Total Population	**780,822**	**961,284**	**180,462**	**23%**
Low-Income Population	**205,904**	**224,397**	**18,493**	**9%**
Non-Low-Income Population	**467,982**	**736,887**	**161,969**	**28%**

Table 36: Comparison of Low-Income Populations – Disproportionate Burden on Removed Routes

Area	Total Population	Low-Income Population	% Low-Income	Non-Low-Income Population	% Non-Low-Income
Route 413 Service Area	**44,415**	**14,486**	**33%**	**29,929**	**67%**
Route 430 Service Area	**45,558**	**25,517**	**56%**	**20,041**	**44%**
Route 450 Service Area	**53,477**	**18,713**	**35%**	**34,764**	**65%**
Marana/Avra Valley Service Area – Dial-A-Ride Conversion/Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**9,153**	**32%**	**19,246**	**68%**
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**23,472**	**30%**	**53,933**	**70%**
Tucson Estates/Drexel Heights/Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**56,980**	**57%**	**43,569**	**43%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**20,172**	**31%**	**44,724**	**69%**

Figure 58: Percent Low-Income Populations - Existing Transit Service Area

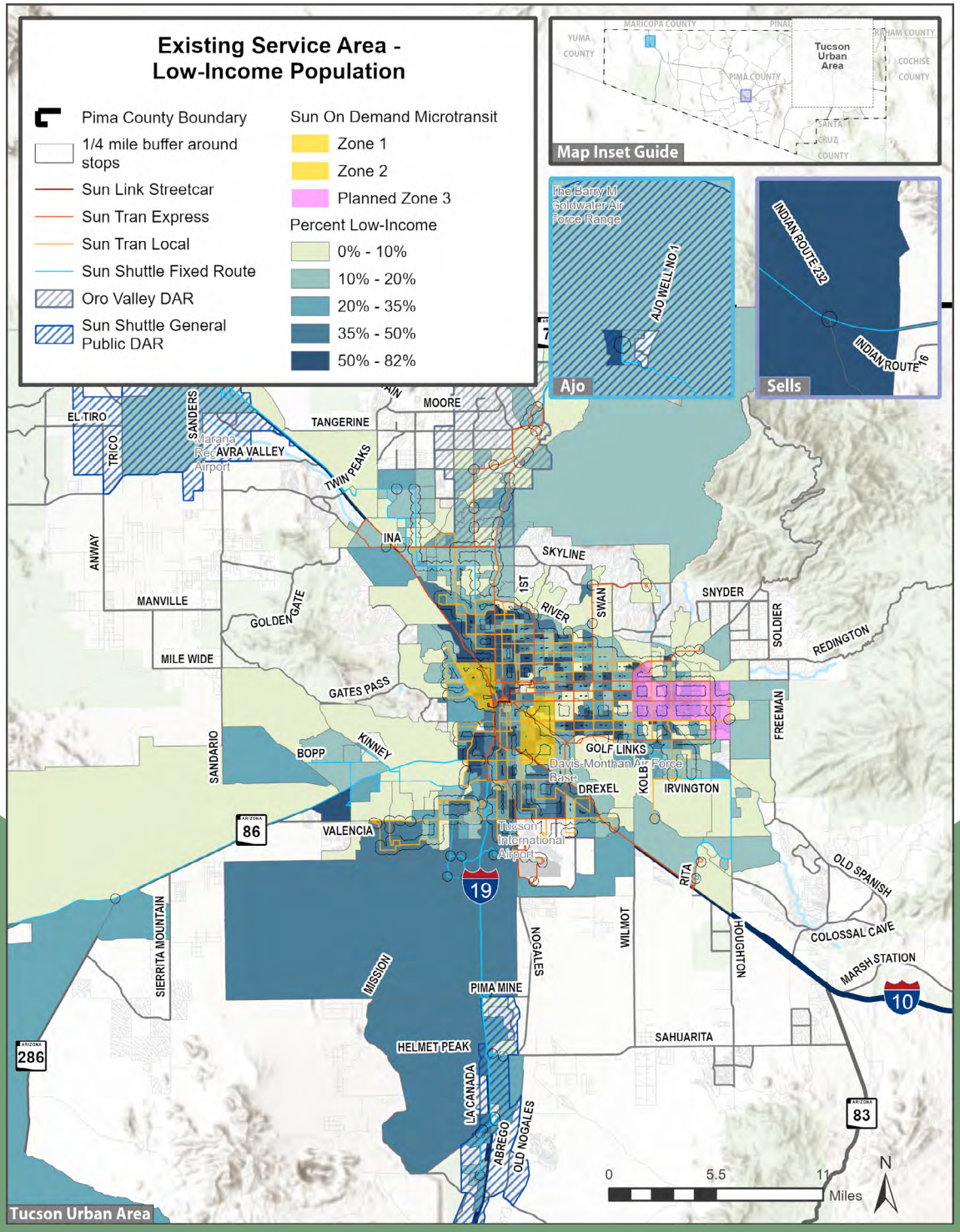
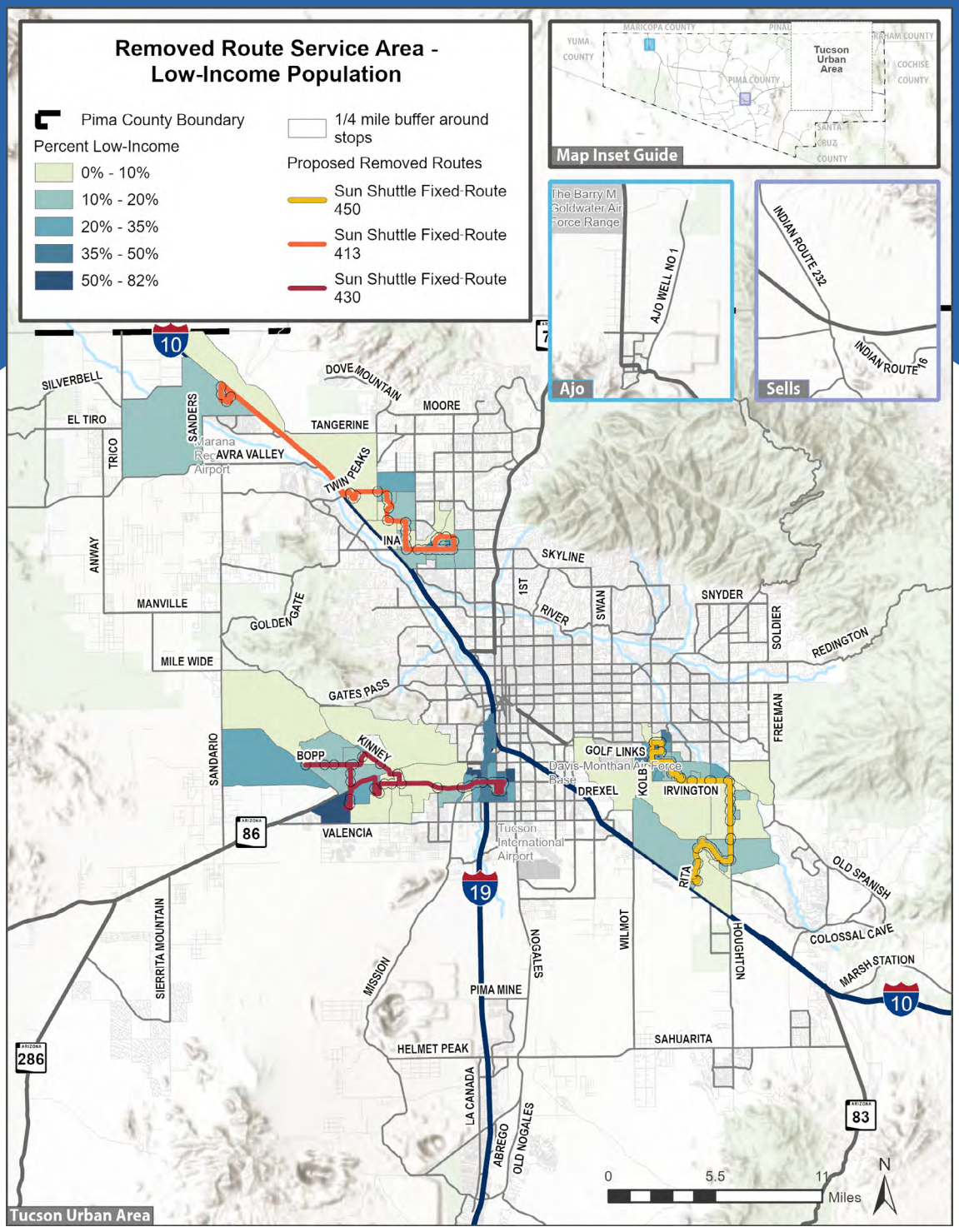


Figure 59: Percent Low-Income Populations – Removed Routes Service Area



Public Engagement

As part of the City of Tucson's Title VI engagement process, public comment is required on service changes prior to implementation for Sun Tran, Sun Van, or Sun Link. The policy requires at least 14 days of notice before holding the public hearing and must include a description of the proposed changes. This process complies with Title VI by ensuring all public transit decisions consider all riders, specifically those of minority and low-income populations. Though this policy only applies to Sun Tran, it is recommended to request public comment for any changes RTA implements as well.

10.3 Conclusion

10.3.1 SUMMARY OF FINDINGS

The analysis found that the proposed service changes do not exceed the 20% threshold cumulatively, meaning PAG/RTA is not required to develop alternatives to the recommended route changes and new microtransit service zones. However, there is still an impact, and there are cases of localized changes having disproportionate burdens and disparate impacts to protected populations. The replacement of Sun Shuttle Routes 413, 430, and 450 with microtransit zones and transit expansion in the proposed service zones should supplement the loss in service availability to populations specifically affected by the elimination of fixed-route service.

10.4 Additional Analysis of Impact

Further analysis was completed outside of Title VI to identify any disparate impact on seniors (those 65 and older) and Areas of Persistent Poverty (AoPP). AoPP are areas, census tracts in this case, that have had a poverty rate of 20% or higher during the last three decades.

Impact to Senior Population

The proposed route changes improve access for seniors, those 65 and older. This is highlighted in **Table 37**, which shows that the route changes will increase the senior population served by 39%. Despite representing only 17% of the population served by the existing service area, 65% of seniors in Pima County are within the existing service area. The proposed changes will increase the service to 89% of seniors in Pima County. Areas with a high density of seniors will have little to no service changes, as shown in **Figure 61**. The areas with the highest density of seniors, shown in darkest shades of blue, are served by existing or proposed microtransit services.

Table 37: Impact to Senior Populations

Area	Total Population	Senior Population	% Senior	Population Under 65	% Under 65
Pima County	**1,049,947**	**206,771**	**20%**	**841,366**	**80%**
Existing Service Area	**780,822**	**133,572**	**17%**	**647,250**	**83%**
Route 413 Service Area	**44,415**	**7,362**	**17%**	**37,053**	**83%**
Route 430 Service Area	**53,477**	**6,973**	**13%**	**46,504**	**87%**
Route 450 Service Area	**45,558**	**8,502**	**19%**	**37,056**	**81%**
Ajo/Why Service Area – Dial-a-Ride Conversion/Transit Expansion	**3,946**	**1,024**	**26%**	**2,922**	**74%**
Casas Adobes Service Area – Fixed-Route Replacement	**47,939**	**8,689**	**18%**	**39,250**	**82%**
Catalina Foothills Service Area – Transit Expansion	**65,532**	**20,277**	**31%**	**45,255**	**69%**
Marana/Avra Valley Service Area – Dial-a-Ride Conversion/Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**3,618**	**13%**	**24,781**	**87%**
Oro Valley Service Area – Dial-a-Ride conversion	**75,766**	**22,588**	**30%**	**53,178**	**70%**
Picture Rocks Service Area – Transit Expansion	**24,092**	**4,590**	**19%**	**19,502**	**81%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**9,167**	**14%**	**55,729**	**86%**

Table 37: Impact to Senior Populations (Cont.)

Area	Total Population	Senior Population	% Senior	Population Under 65	% Under 65
Sahuarita/Green Valley Service Area – Dial-a-Ride Conversion	**54,588**	**20,300**	**37%**	**34,288**	**63%**
Tanque Verde Service Area – Transit Expansion	**31,840**	**8,958**	**28%**	**22,882**	**72%**
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**14,440**	**19%**	**62,965**	**81%**
Tucson Estates/Drexel Heights/Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**17,254**	**17%**	**83,295**	**83%**
Vail Service Area – Transit Expansion	**29,253**	**4,166**	**14%**	**25,087**	**86%**
West Tucson Service Area – Transit Expansion	**59,258**	**9,409**	**16%**	**49,849**	**84%**
Impacted Service Area	**961,284**	**185,933**	**19%**	**775,351**	**81%**

Table 38: Cumulative Impacts to Senior Population

	Existing Service Area	Impacted Service Area	Change	Percent Change
Total Population	**780,822**	**961,284**	**180,462**	**+23%**
Senior Population	**133,572**	**185,933**	**52,361**	**+39%**
Population Under 65	**647,250**	**773,531**	**128,101**	**+20%**

Table 39: Impact of Removed Routes on Senior Population

Area	Total Population	Senior Population	% Senior	Population Under 65	% Under 65
Route 413 Service Area	**44,415**	**7,362**	**17%**	**37,053**	**83%**
Marana/Avra Valley Service Area – Dial-a-Ride Conversion/Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**3,618**	**13%**	**24,781**	**87%**
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**14,440**	**19%**	**62,965**	**81%**
Route 430 Service Area	**53,477**	**6,973**	**13%**	**46,504**	**87%**
Tucson Estates/Drexel Heights/ Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**17,254**	**17%**	**83,295**	**83%**
Route 450 Service Area	**45,558**	**8,502**	**19%**	**37,056**	**81%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**9,167**	**14%**	**55,729**	**86%**

Figure 60: Percent Senior Population – Existing Transit Service Area

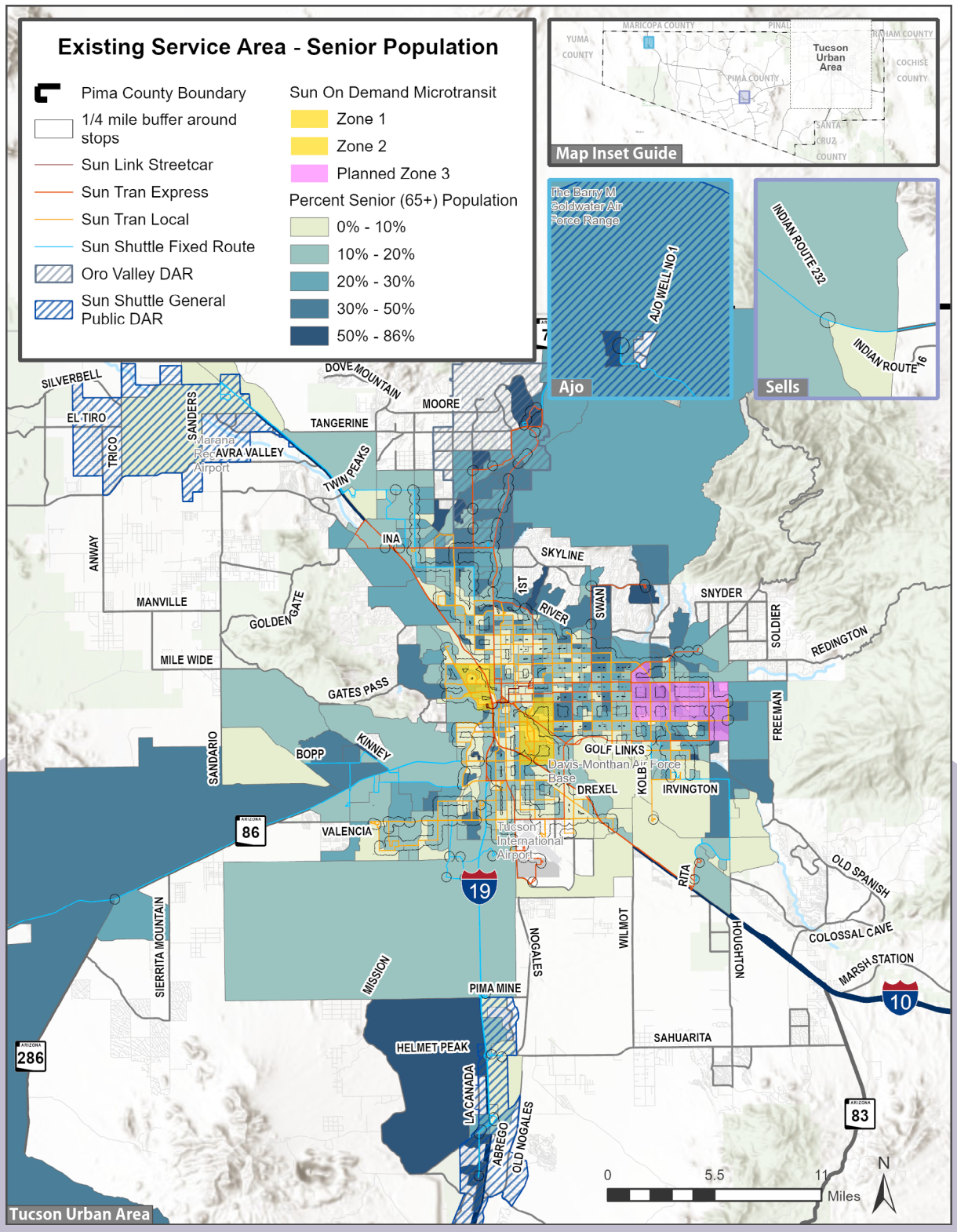
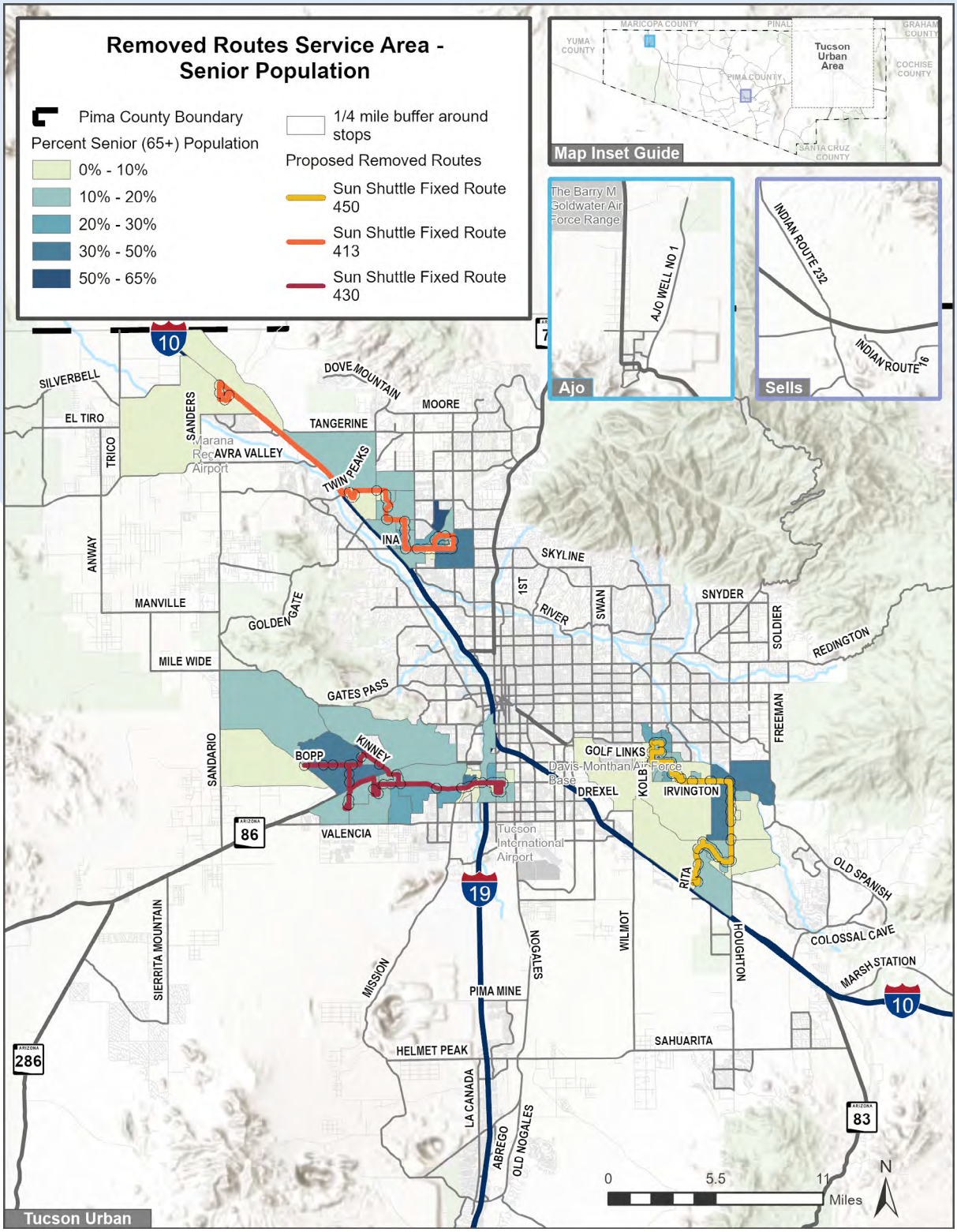


Figure 61: Percent Senior Population – Removed Routes Service Area



Areas of Persistent Poverty

The proposed service changes slightly decrease service (-0.2% change) to AoPP. **Table 39** details the impact to AoPP by each route change. **Figure 62** and **Figure 63** show that the AoPP impacted by the service removed will primarily be covered by the additions of new microtransit services. This is detailed in **Table 40**, which shows that the area most adversely impacted is the areas previously serviced by route 450.

Table 40: Impact to AoPP

Area	Total Population	AoPP	% AoPP	Population Outside AoPP	% Non-AoPP
Pima County	**1,049,947**	**396,814**	**38%**	**653,133**	**62%**
Existing Service Area	**780,822**	**372,509**	**48%**	**408,313**	**52%**
Route 413 Service Area	**44,415**	**5,401**	**12%**	**39,014**	**88%**
Route 430 Service Area	**53,477**	**27,364**	**51%**	**26,113**	**49%**
Route 450 Service Area	**45,558**	**5,382**	**12%**	**40,176**	**88%**
Ajo/Why Service Area – Dial-a-Ride Conversion/Transit Expansion	**3,946**	**0**	**0%**	**3,946**	**100%**
Casas Adobes Service Area - Fixed-Route Replacement	**47,939**	**10,740**	**22%**	**37,199**	**78%**
Catalina Foothills Service Area – Transit Expansion	**65,532**	**4,936**	**8%**	**60,596**	**92%**
Marana/Avra Valley Service Area – Dial-a-Ride Conversion/ Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**0**	**0%**	**28,399**	**100%**
Oro Valley Service Area – Dial-a-Ride conversion	**75,766**	**6,540**	**9%**	**69,226**	**91%**
Picture Rocks Service Area – Transit Expansion	**24,092**	**0**	**0%**	**24,092**	**100%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**1,812**	**3%**	**63,084**	**97%**
Sahuarita/Green Valley Service Area – Dial-a-Ride Conversion	**54,588**	**0**	**0%**	**54,588**	**100%**
Tanque Verde Service Area – Transit Expansion	**31,840**	**1,587**	**5%**	**30,253**	**95%**

Table 40: Impact to AoPP (Cont.)

Area	Total Population	AoPP	% AoPP	Population Outside AoPP	% Non-AoPP
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**6,540**	**8%**	**70,865**	**92%**
Tucson Estates/Drexel Heights/Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**58,827**	**59%**	**41,722**	**41%**
Vail Service Area – Transit Expansion	**29,253**	**0**	**0%**	**29,253**	**100%**
West Tucson Service Area – Transit Expansion	**59,258**	**41,981**	**71%**	**17,277**	**29%**
Impacted Service Area	**961,284**	**371,830**	**39%**	**589,454**	**61%**

Table 41: Cumulative Impacts to AoPP

	Existing Service Area	Impacted Service Area	Change	Percent Change
Total Population	**780,822**	**961,284**	**180,462**	**+23%**
AoPP Population	**372,509**	**371,830**	**-679**	**-0.2%**
Areas Outside AoPP	**408,313**	**589,454**	**181,141**	**+44%**

Table 42: Impact of Removed Routes on AoPP

Area	AoPP Population	% AoPP	Population Outside AoPP	% Non-AoPP	AoPP Population
Route 413 Service Area	**44,415**	**5,401**	**12%**	**39,014**	**88%**
Marana/Avra Valley Service Area – Dial-a-Ride Conversion/ Fixed-Route Replacement (replaces Sun Shuttle 413)	**28,399**	**0**	**0%**	**28,399**	**100%**
Tortolita/Continental Ranch Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 413)	**77,405**	**6,540**	**8%**	**70,865**	**92%**
Route 430 Service Area	**53,477**	**27,364**	**51%**	**26,113**	**49%**
Tucson Estates/Drexel Heights/ Valencia West Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 430)	**100,549**	**58,827**	**59%**	**41,722**	**41%**
Route 450 Service Area	**45,558**	**5,382**	**12%**	**40,176**	**88%**
Rita Ranch/Civano/Littletown Service Area – Fixed-Route Replacement/Transit Expansion (replaces Sun Shuttle 450)	**64,896**	**1,812**	**3%**	**63,084**	**97%**

Figure 62: AoPP – Existing Transit Service Area

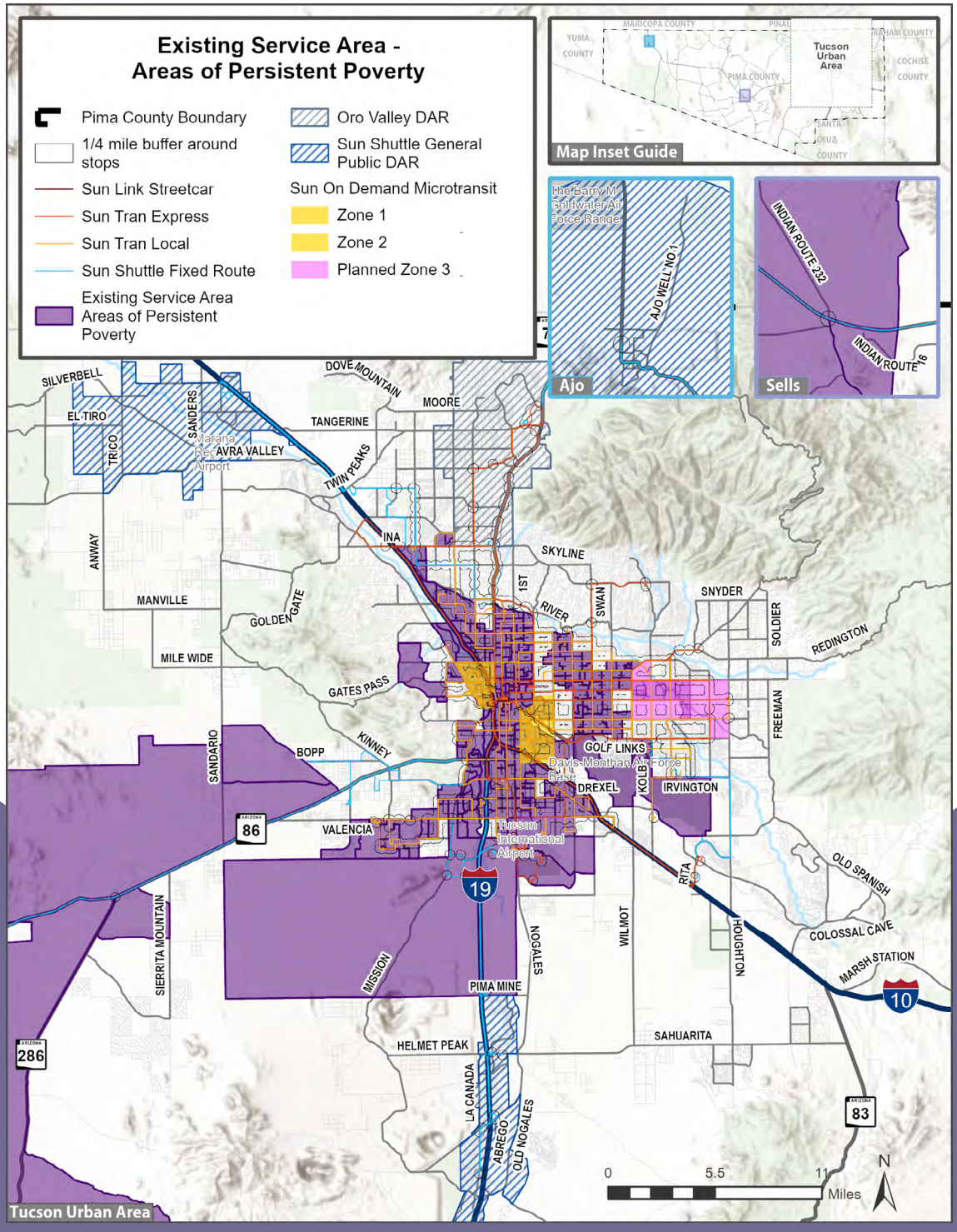
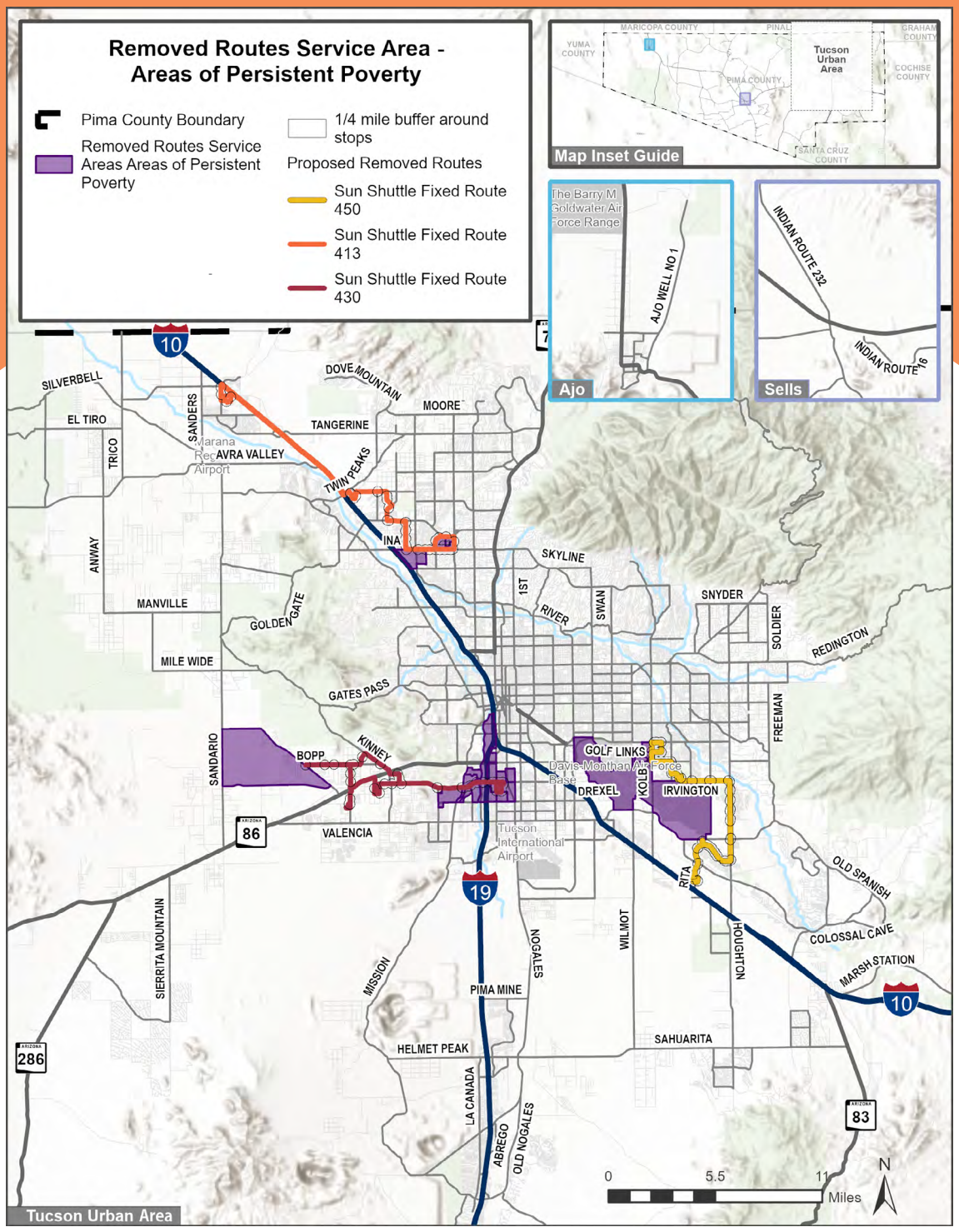


Figure 63: AoPP - Removed Routes Service Area



SECTION 11

Public and Stakeholder Engagement Summary

This public and stakeholder engagement summary highlights how the community, advisory committees, and certain geographical areas were engaged with by the project team to solicit feedback necessary to inform the project.

Rounds of public engagement primarily took place during October 2024 and March 2025. This section of the report describes the format and results of these meetings and workshops.

11.1

Stakeholder Engagement

There were many types of meetings held, both in person and virtual, to engage and gather feedback from the Technical Advisory Committee (TAC) and key stakeholders including bus drivers, jurisdictional staff, and community representative focus groups. Summaries of these meetings are below.

Meeting Type	Date
Sun Shuttle Driver Focus Group	**Oct. 22, 2024**
TAC Meeting #1	**Oct. 23, 2024**
Sun Tran Driver Focus Group	**Oct. 24, 2024**
TPC Meeting #1	**Dec. 18, 2024**
Ajo WPCCC Community Focus Group #1	**Dec. 19, 2024**
Social Service Agencies Community Focus Group #1	**Jan. 27, 2025**
TAC Meeting #2	**Feb. 18, 2025**
Pima County/City of Tucson Community Staff Focus Group	**March 18, 2025**
TAC Meeting #2	**March 18, 2025**
Town of Oro Valley Community Staff Focus Group #1	**March 18, 2025**
Citizens for Picture Rocks Community Focus Group	**March 18, 2025**
TPC Meeting #2	**March 19, 2025**
Vail Community Focus Group	**March 19, 2025**
Ajo WPCCC Community Focus Group #2	**March 20, 2025**
Social Service Agencies Community Focus Group #2	**April 9, 2025**
Ajo WPCCC Community Focus Group #3	**May 15, 2025**
Town of Oro Valley Community Focus Group #2	**May 21, 2025**
TPC Meeting #3	**June 11, 2025**
TAC Meeting #3	**Aug. 14, 2025**
TPC Meeting #4	**Aug. 20, 2025**

11.1.1

FOCUS GROUPS

Bus Drivers and Operators

The project team met with Sun Shuttle drivers and operators on Oct. 22, 2024, and Sun Tran drivers and operators on Oct. 24, 2024, to gather their input on their experiences, suggestions, and service improvement ideas.

Sun Shuttle drivers expressed the need for software that allocates trips more efficiently. Currently, drivers have some long stretches of downtime because trips are not stacked efficiently. The current software is not grouping similar destinations and causing these inefficiencies.

Regarding passenger needs, drivers expressed concern for ADA riders who often must navigate several different call centers and transit systems to get to their destination. This is true for most riders though, as buses do not provide curb-to-curb service, so riders must often transfer to another bus to finally reach their destination, which can take a significant amount of time.

Sun Tran bus drivers and operators specifically mentioned a concern about their general population of riders. Because the bus is free, individuals experiencing homelessness frequently use the service. This deters working-class riders because they are concerned about their safety, cleanliness, and smoking/drug use on the buses. Some bus drivers feel similarly, and this adds stress and discomfort to their job. Other bus drivers feel a concern for certain riders and have become friendly with them, looking forward to each daily interaction.

Overall, drivers discussed a lack of direct service to key destinations like medical centers and grocery stores and consider Vail, Dove Mountain, Picture Rocks, and parts of Marana and Green Valley, to be underserved communities. In their opinion, there is a need for better connectivity between different towns and cities in the region.

Overall, drivers discussed a lack of direct service to key destinations like medical centers and grocery stores and consider Vail, Dove Mountain, Picture Rocks, and parts of Marana and Green Valley to be underserved communities. In their opinion, there is a need for better connectivity between different towns and cities in the region.

Community and Agency Representatives

The project team met with a variety of community partners and jurisdictional representatives which included:

- Ajo Western Pima County Community Council (WPCCC)
- Picture Rocks community residents including Citizens for Picture Rocks
- Vail Chamber of Commerce, Vail School District, and area developers
- Oro Valley staff, community residents, employers, senior care and healthcare providers, and the Oro Valley Chamber of Commerce
- Social service agency representatives
- Pima County and City of Tucson Departments of Transportation
- Technical Advisory Committee (TAC) members which included representatives from all PAG member agencies. This comprised of group meetings and individual meetings with representatives as needed.

Across all community and agency groups, there was a clear demand for improved, accessible, and reliable transit services, with microtransit emerging as one key solution for addressing gaps in coverage, service hours, and rider needs. Residents and business owners expressed concerns about replacing existing dial-a-ride services with microtransit, emphasizing the importance of maintaining personal ties with familiar drivers while ensuring ADA accessibility and ease of use. Elderly people make up the majority of the population using existing dial-a-ride services, so making sure there are easy-to-use options when it comes to requesting a ride, allotting extra time and help for elderly users to get on and off the microtransit vehicles, having vehicles that are ADA accessible, and possibly employing the current dial-a-ride drivers/operators as microtransit drivers/operators would be key to making microtransit a viable option for this group of people. Maintaining a sense of familiarity and use for these individuals should be a primary focus.

Funding uncertainty was a common theme; communities questioned how expanded services would be sustained, and the PAG Transportation Planning Committee (TPC) similarly questioned whether funding would originate from general or regional funds. Rural and underserved areas, including Ajo, Picture Rocks, and Catalina Foothills voiced a strong desire for better options, particularly for essential trips like grocery shopping, healthcare visits, and commuting to work.

Stakeholders also expressed a desire for clear communication and advertising regarding how exactly the project will supplement residents' current public transportation options. Communities recognized the need for public education efforts to help residents understand microtransit benefits over current services, taxis, and ride-sharing options. Business owners highlighted transportation challenges impacting workforce availability, while city and county officials discussed refining service boundaries based on demand and determining the logistics of implementation through each jurisdiction. A cautious yet optimistic tone prevailed throughout discussions, with an emphasis on ensuring new transit solutions that effectively meet the needs of residents, improve connectivity, and provide sustainable, safe, and accessible options for those who rely on public transportation.

A survey taken during a TAC meeting revealed that riders would prefer more frequency and more routes to connect to existing destinations. Frequent riders are familiar with the destinations, but would prefer to have more options for when they can come and go.

11.1.2

TECHNICAL ADVISORY COMMITTEE (TAC)

The project's TAC consisted of subject matter experts from PAG member agencies that critically reviewed the technical content of the research and deliverables. This group was created to enhance recommendations and decisions by incorporating diverse perspectives and ensuring transparency and accountability. Throughout the study, the TAC provided valuable review and feedback. The project management team presented in-person and virtually to the TAC periodically.

A survey taken during a TAC meeting revealed that riders would prefer more frequency and more routes to connect to existing destinations. Frequent riders are familiar with the destinations but would prefer to have more options for when they can come and go.

TAC members also expressed a need for additional resources, and their top desires were for affordable transit services for vulnerable populations along with more convenient service options (shorter wait times, online booking/payment, curb-to-curb service). When asked where PAG/RTA should focus their efforts, the majority of TAC members responded with "local microtransit zones that connect the local community and integrate with express routes."

11.1.3

PAG TRANSPORTATION PLANNING COMMITTEE (TPC)

Throughout the study, the project management team presented in-person and virtually to PAG's TPC.

The TPC expressed the need for routes to key locations outside of the microtransit zones presented at the time, which will be incorporated in the final recommendation. They also reinforced the importance of ensuring the public involvement team getting the opinions of people with disabilities and people who don't speak English.

They were supportive of the project but questioned how it could be implemented throughout each jurisdiction. Funding, whether from general funds or regional funds, was a question they were interested to learn more about. Safety and security of the riders and drivers was also discussed.

11.2

General Public Outreach

The public outreach focused on events held at places where people are, such as the transit centers, fairs, and other locations. It included two public surveys that were available at these events and also online on the PAG website.

Event	Date
Tucson Meet Yourself	**Oct. 4-6, 2024**
Tohono Tadai Transit Center Pop-Up #1	**Oct. 22, 2024**
University of Arizona Student Union Pop-Up	**Oct. 22, 2024**
Vail Public Library Open House	**Oct. 22, 2024**
Roy Laos Transit Center Pop-Up #1	**Oct. 23, 2024**
Ronstadt Transit Center Pop-Up #1	**Oct. 23, 2024**

Event	Date
Picture Rocks Community Center Open House	**Oct. 23, 2024**
VailFest Pop-Up	**Nov. 2, 2024**
Tohono Tadai Transit Center Pop-Up #2	**March 19, 2025**
Sahuarita Public Library Pop-Up	**March 19, 2025**
Roy Laos Transit Center Pop-Up #2	**March 20, 2025**
Ronstadt Transit Center Pop-Up #2	**March 20, 2025**

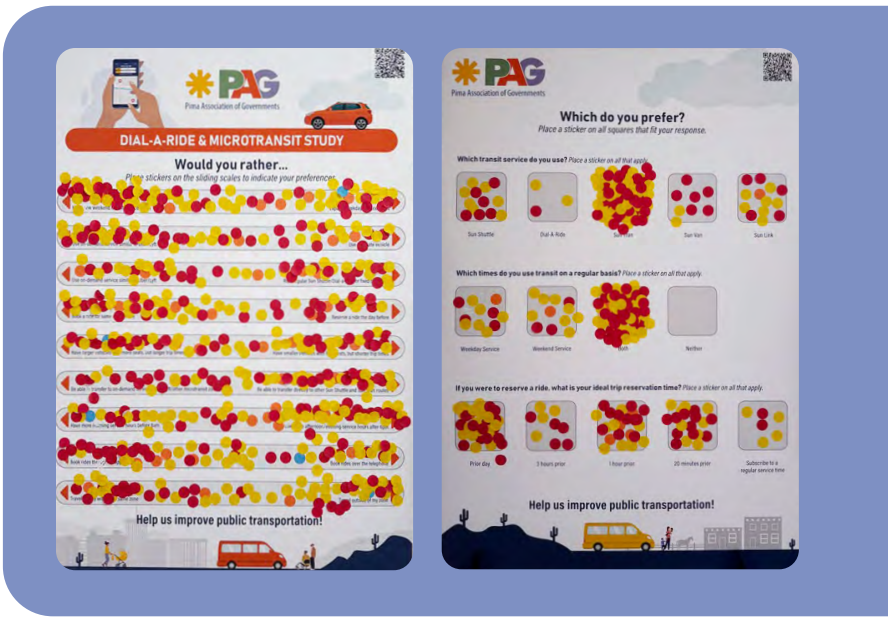
11.2.1

POP-UP EVENTS

Pop-up events were held at key transit centers in the region and student activity areas. The goal of these pop-ups was to engage with a variety of community members who might use public transit in places they frequent or may be in need of public transit service. Specific groups were targeted in order to ensure equity in the research gathering. These groups included, but were not limited to, transit riders, limited-English-proficiency populations, Spanish-speaking communities, people with disabilities, no-vehicle households, low-income populations, foreign-born populations, and older adult populations.

Project information and materials were brought to each event and presented in both English and Spanish. In-person translation was provided as needed. Bags of chips, cookies, and other snack foods were provided to help draw people to the event table/booth in order to solicit meaningful conversations and discussions.

Figure 64: Public Preference Boards



Pop-ups and open houses took place at the following locations/events:

- Tucson Meet Yourself, downtown Tucson
- University of Arizona Student Union
- W. Anne Gibson-Esmond Station Public Library in Vail
- Tohono Tadai Transit Center
- Roy Laos Transit Center
- Ronstadt Transit Center
- Picture Rocks Community Center
- Sahuarita Public Library
- VailFest at the Pima County Fairgrounds

Overarching issues/requests that were heard from transit riders at these pop-up/open house events included:

- There are too few bus connections to get to and from work, and more routes or options would be appreciated
- It can be difficult to find public transportation late at night and on the weekends
- Dial-a-ride drivers are often late to pick up and drop off
- Safer and cleaner transit options are needed
- Too time-consuming going to and from key destinations such as from Casino Del Sol into the urban core
- No public transportation options exist

Figures 65 and 66: Images from Engagement

11.2.2

SURVEY

Two main surveys were developed for this project and made available in English and Spanish. The first survey was posted in October 2024. It was used to gather a basic understanding of current transit use in the identified study areas and the public's desire and need for improvement. The second survey was posted in March 2025 and was focused on specific solutions/improvements the public would like to see. Multiple "would you rather" questions were asked to narrow down improvement options and ultimately influence the consultant team's study recommendations. PDF examples of the surveys are included in Appendix A: Vail and Picture Rocks Microtransit Service Area Analysis.

Survey Results – Phase 1

For the first survey, 79.1% of respondents expressed interest in using microtransit services. The most-used travel modes of the respondents include the Sun Tran bus (51.2%), walking (37.8%), and driving alone (34.7%), with the primary travel purposes being errands/grocery shopping (69.5%), commuting to work (60.2%), and medical appointments (41.5%). Among transit users, 53.9% use it daily and 23.5% use it multiple times a week but not every day. For those who do not use transit, their top reasons include long travel times, lack of direct service, and safety concerns. The most requested transit improvements include extended weekend service hours (47.6%), more frequent service (40.3%), and extended weekday service hours (38.7%).

Most of the respondents (74.8%) live in the City of Tucson. Other areas represented include Casas Adobes, Marana, Oro Valley, South Tucson, Catalina Foothills, Vail, and Sahuarita. The majority of respondents fell into the 46–65 years old age group (35.3%), and most identified as White or European American (37.5%) and Hispanic or Latino (30.8%). 32.8% of respondents identified as having a disability or chronic illness, and 31% reported a household income under the poverty line of $15,000. 41.9% reported having no vehicle in their household.

For the first survey, 79.1% of respondents expressed interest in using microtransit services. The most-used travel modes of the respondents include:

51.2%
Sun Tran bus

37.8%
Walking

34.7%
Driving alone

Figure 67: Sign-in Table

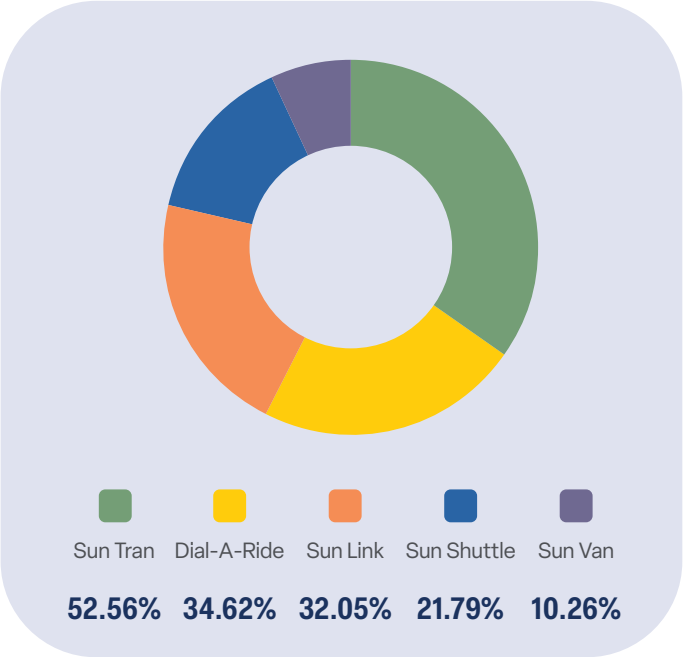
Survey Results – Phase 2

Sun Tran (52.56%), Sun Shuttle (21.79%), and Dial-a-Ride (34.62%) were the most used transit services for respondents of the second survey. 40.5% reported using transit on both weekdays and weekends, while 27% reported using it only on weekdays.

Figures 68-74 are charts that display results from the survey used during the second round of public engagement.

Figure 68: Survey Response 1 - Which transit service do you use?

Figure 68 shows which types of transit service each individual rider may utilize, such as riding Sun Tran and also Sun Shuttle services. Therefore, a double counting may occur as multiple services could be selected.



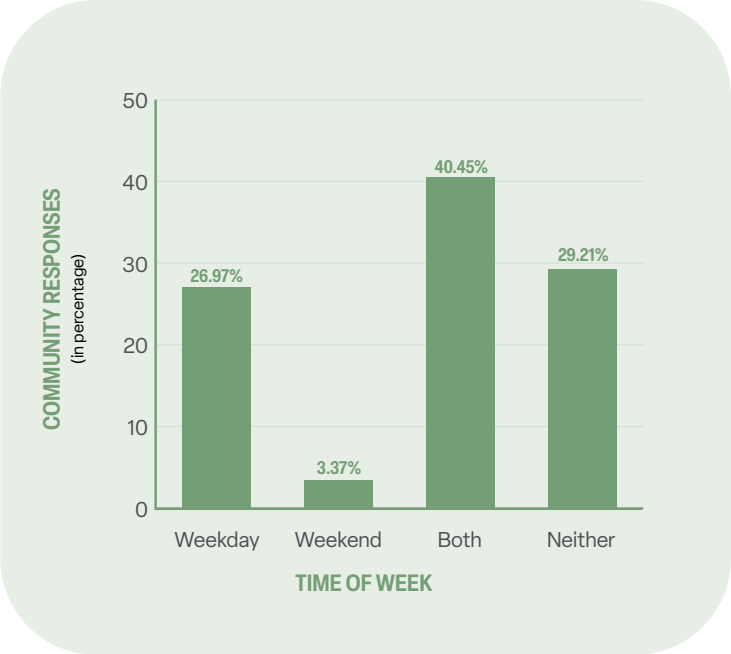


Figure 69: Survey Response 2 - Which times do you use transit on a regular basis?

Figures 72 and **71** A variety of "would you rather" questions showed a moderate preference for expanding weekday service hours over adding new weekend hours and a slight preference for smaller vehicles with shorter trip times over larger vehicles with longer trips.

Figure 70: Survey Response 3 - Would you rather...

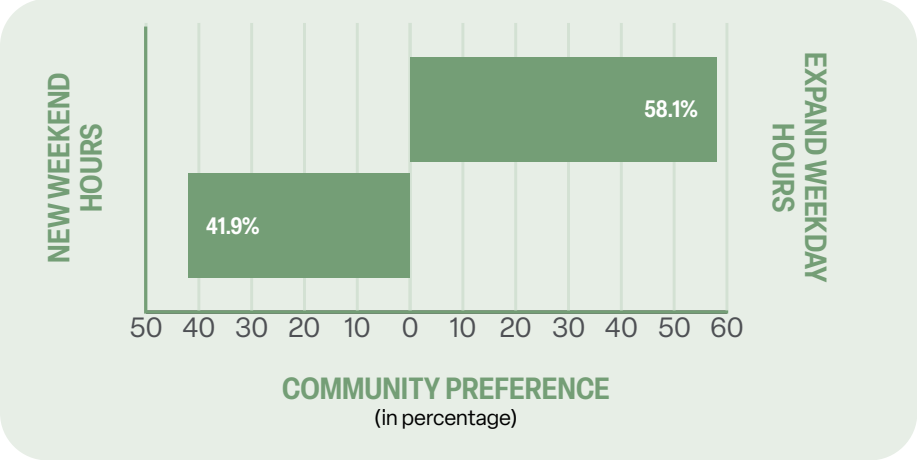


Figure 71: Survey Response 4 - Would you rather...

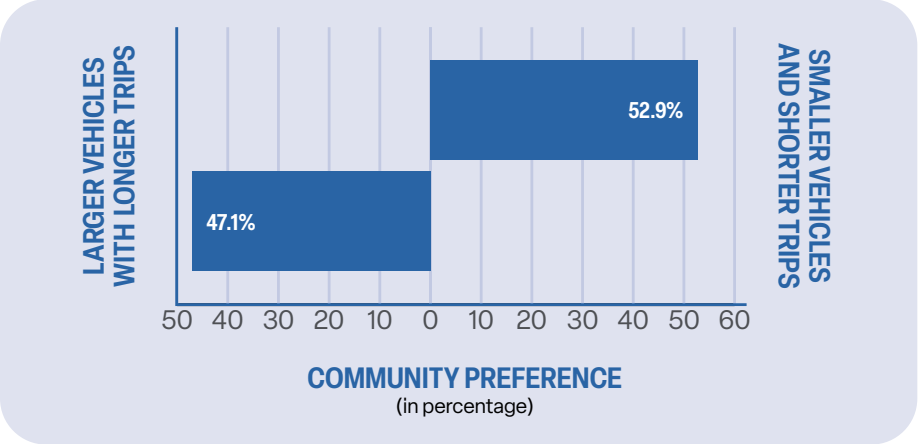
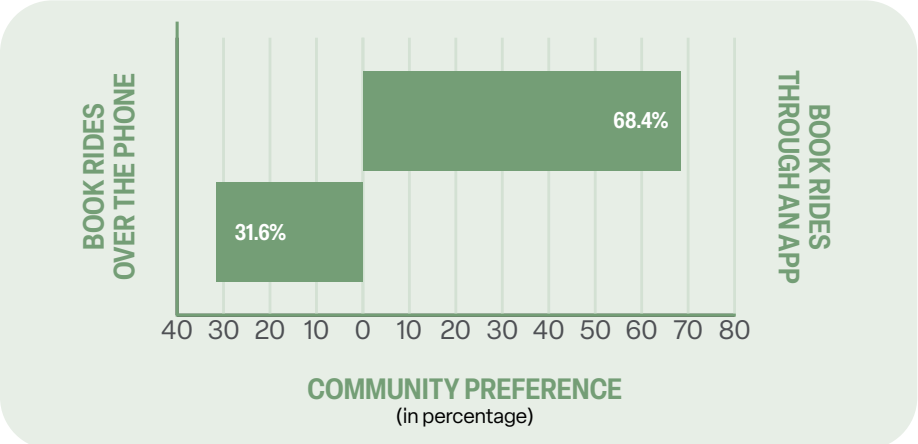


Figure 72: Survey Response 5 - Would you rather...



There was a slight preference for using on-demand services (like Uber/Lyft) over private vehicles and a slight preference for fixed-route services (Sun Shuttle/ Sun Tran) over on-demand services. Survey results also showed a slight preference for direct transfers to Sun Shuttle/ Sun Tran routes over transfers to on-demand services. Additionally, there was a slight preference for more afternoon/ evening service hours (after 6 p.m.) over morning hours (before 8 p.m.). The majority of respondents prefer traveling outside of their proposed microtransit zone.

The majority of respondents prefer booking rides through an app and favor same-day booking over prior-day reservations. Preferences were split when it came to ideal reservation timing. 28.7% prefer 20 minutes prior, 27.6% prefer prior-day booking, and 19.5% each for one-hour and three-hour advance booking. The most used zones include West Tucson and Ajo (each 36.1%), Casas Adobes and Oro Valley (22.9% each), and Catalina Foothills (15.7%).

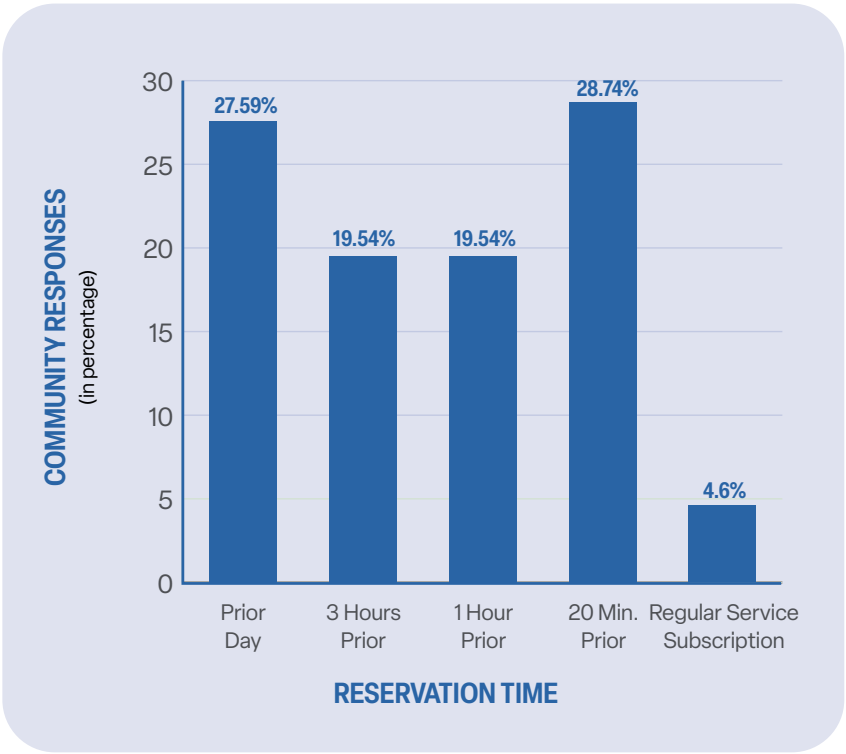


Figure 73: Survey Response 6 - If you were to reserve a ride, what is your ideal trip reservation time?

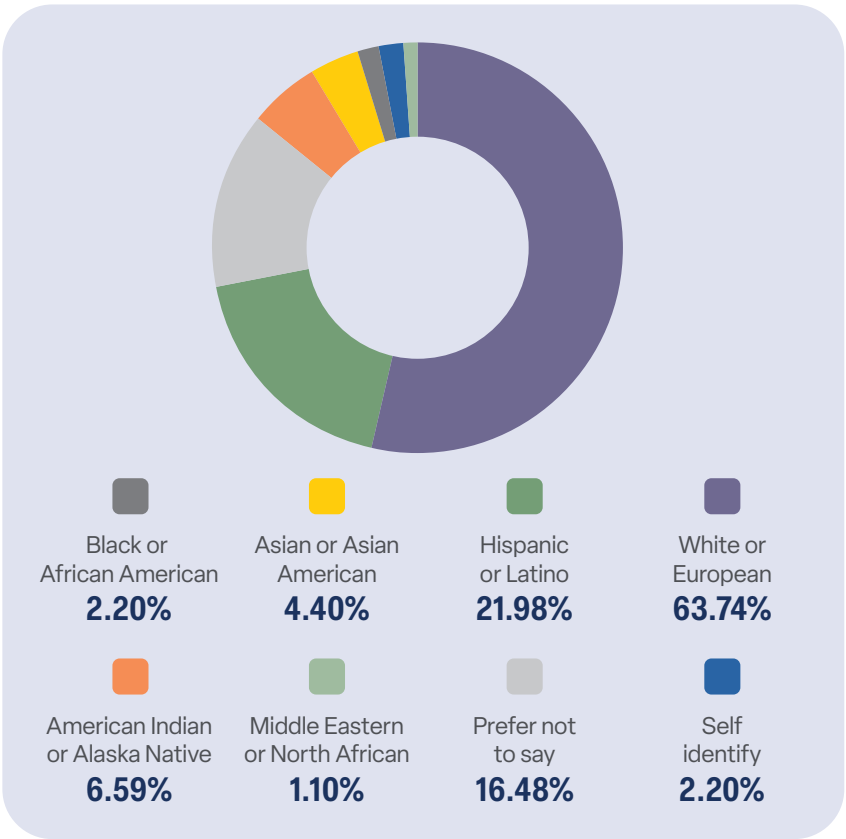


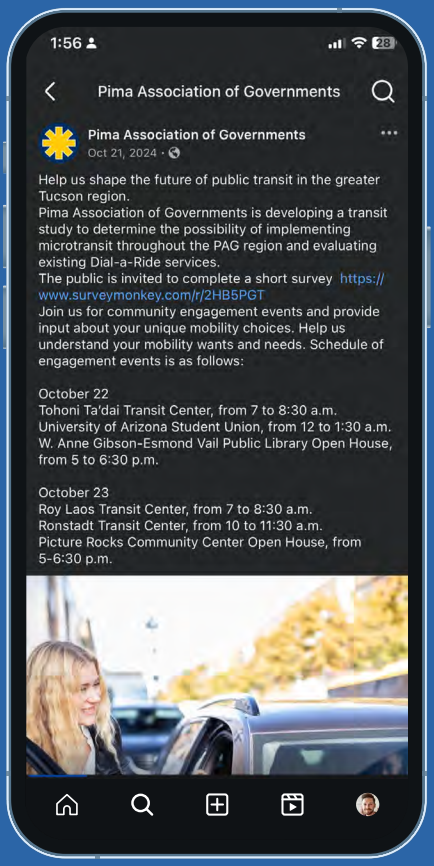
Figure 74: Survey Response 7 - What is your race or ethnicity? (Check all that apply)

For demographics, the majority of respondents fell under the 65+ age ground (32.6%), followed by 46–65 (27.2%). Most identified as White or European American (63.7%), followed by Hispanic or Latino (22%), and 27.8% identify as having a disability or chronic illness. 24.4% reported household income over $75,000 and 11.1% reported under $15,000. 14.4% reported having no vehicle in their household. 59.3% of respondents were female, 28.6% male, 3.3% other, and 8.8% preferred not to answer.

Advertisement Materials

Project flyers, press releases, news stories, and social media posts were developed for this project. Each served to highlight the study and included a “call to action” for soliciting feedback from the public. QR codes with links to the project survey were included. Printed materials were produced in both English and Spanish.

Figures 75: Advertisement Materials



Figures 76 and 77: Local News Coverage

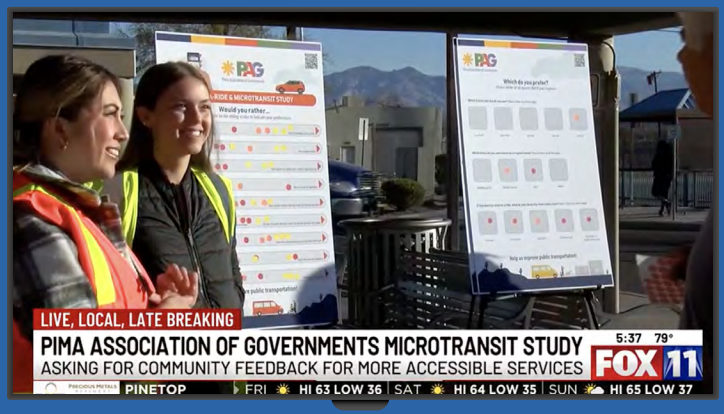


Figure 78:
Bilingual Advertising Materials

Pima Association of Governments

SCAN THE QR CODE TO TAKE THE SURVEY OR VISIT

www.surveymonkey.com/r/M5538RX

DIAL-A-RIDE & MICROTRANSIT STUDY

We want to hear from YOU!

HELP US IMPROVE PUBLIC TRANSPORTATION

Pima Association of Governments is evaluating the feasibility of providing microtransit services to Pima County residents and improving existing Dial-a-Ride services. Your input will help us determine public transportation and community needs and develop recommendations to improve mobility options for all of you.

WHAT IS MICROTRANSIT?

Microtransit is a service model used to serve areas that have difficult or no access to regular bus service. Similar to private on-demand services, such as Uber and Lyft, microtransit users can reserve and pay for trips online and receive same day service, usually within a 10-to-30-minute window, whether using personal computers or personal mobile devices connected to the internet. Riders are typically picked up at their preferred location and taken to their preferred destination (curb-to-curb service). Microtransit trips are shared with other riders that have destinations in the same service area.

In compliance with the Americans with Disabilities Act (ADA), those requiring special assistance, such as large typeface print, sign language or other reasonable accommodations, may request those through the PAG administrative offices at: (520) 792-1093. PAG operates its programs without regard to race, color and national origin in compliance with Title VI of the Civil Rights Act. We invite you to complete our voluntary self-identification survey (https://pagregion.com/get-involved/public-policies/title-vi/). If you need translation assistance, please call (520) 792-1093 and ask for Zonia Kelley. Si necesita ayuda con traducción, por favor llame al (520) 792-1093 y pregunte por Zonia Kelley.

Pima Association of Governments

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ESTUDIO DIAL-A-RIDE Y MICROTRÁNSITO

¡Queremos saber de TI!

AYÚDENOS A MEJORAR EL TRANSPORTE PÚBLICO

La Asociación de Gobiernos de Pima (PAG, por sus siglas en inglés) está evaluando la factibilidad de proporcionar servicios de microtránsito a los residentes del condado de Pima y mejorar los servicios existentes de Dial-a-Ride. Sus comentarios nos ayudarán a determinar transporte publico y las necesidades de la comunidad y a desarrollar recomendaciones para mejorar las opciones de movilidad para todos ustedes.

¿QUÉ ES EL MICROTRÁNSITO?

El microtránsito es un modelo de servicio utilizado para servir a áreas que tienen difícil o ningún acceso al servicio regular de autobús. Al igual que los servicios privados a pedido, como Uber y Lyft, los usuarios de microtránsito pueden reservar y pagar viajes en línea y recibir el servicio el mismo día, generalmente dentro de un período de 10 a 30 minutos, ya sea usando computadoras personales o dispositivos móviles personales conectados a Internet. Por lo general, los pasajeros son recogidos en su ubicación preferida y llevados a su destino preferido (servicio de acera a acera). Los viajes de microtránsito se comparten con otros pasajeros que tienen destinos en la misma área de servicio.

De conformidad con la Ley de Estadounidenses con Discapacidades (ADA, por sus siglas en inglés), aquellos que requieran asistencia especial, como letra grande, lenguaje de señas u otras adaptaciones razonables, pueden solicitarla a través de las oficinas administrativas de PAG al: (520) 792-1093. PAG opera sus programas sin distinción de raza, color y origen nacional de conformidad con el Título VI de la Ley de Derechos Civiles. Lo invitamos a completar nuestra encuesta voluntaria de autoidentificación (https://pagregion.com/get-involved/public-policies/title-vi/). Si necesita ayuda con la traducción, por favor llame al (520) 792-1093 y pregunte por Zonia Kelley.

SECTION 12

Cost-Benefit, Vehicle Miles Traveled, and Air Quality Analyses

The study determined the cost-benefit of the recommended transit service changes and the impact on air quality. Below is a detailed analysis of these two elements.

12.1

Cost-Benefit Analyses

The cost-benefit analyses focused on the most substantial capital and operational costs associated with microtransit deployment. These are discussed in the following subsections.

12.1.1

CAPITAL COST

The most substantial capital cost associated with microtransit deployment is the cost of vehicles. To estimate vehicle costs, manufacturer's suggested retail prices (MSRP) were examined in two sources for three minivan models that were widely available in the U.S. during 2025.[4,5] These included the Chrysler Pacifica, Honda Odyssey, and Kia Carnival. All were from model year 2025, and all models were gasoline-powered vehicles (versus hybrids, battery electric vehicles [BEVs], or plug-in hybrid electric vehicles [PHEVs]). MSRPs ranged from a low of $36,800 to $38,235 for the Kia Carnival to a high range of $42,450 to $44,445 for the Chrysler Pacifica. Across all models and sources, the average cost for a model year 2025 minivan in 2025 was approximately $41,197 (see **Table 43**).[6]

Hybrid minivans (which combine an internal combustion engine [ICE] with an electric motor and a battery pack) or PHEV minivans (which combine an ICE with an electric motor and a larger battery pack that is recharged by plugging into an external power source such as a wall outlet or charging station) are typically associated with higher upfront costs and lower operating costs. There were three hybrid and PHEV minivans widely available in the U.S. for model year 2025: the Chrysler Pacifica (PHEV), Kia Carnival (Hybrid), and the Toyota Sienna (Hybrid). The average MSRP for these three vehicles was approximately $43,862 (see **Table 43**), less than 10% more than the average cost of conventional minivan models.[6, 7]

Table 43: Base Model Prices and Average Price for Minivans by Drivetrain Type (Model Year 2025)

	Gasoline-Powered		Hybrid or PHEV		
Make/Model	Edmunds*	MotorTrend	Edmunds*	MotorTrend	Type
Chrysler Pacifica	**$42,450**	**$44,445**	**$51,055**	**$51,055**	**PHEV**
Honda Odyssey	**$41,920**	**$43,670**	-	-	-
Kia Carnival	**$36,800**	**$38,235**	**$40,800**	**$41,895**	**Hybrid**
Toyota Sienna	-	-	**$39,185**	**$39,185**	**Hybrid**
Lowest-Cost Model Average (across all models and sources)		**$41,197**		**$43,863**	

**Uses existing FY 2024 Sun Shuttle Dial-a-Ride ridership instead of Via model*

[4] *Edmunds.com, Inc., 2025. Best Minivans of 2025 and 2026. n.d. Retrieved from https://www.edmunds.com/minivan/.*

[5] *Stoklosa, A. and B. Hernandez, 2025. The Best Minivans to Buy in 2025. MotorTrend, March 21, 2025. Retrieved from https://www.motortrend.com/features/best-minivans-to-buy.*

[6] *Note some of these vehicles may require aftermarket modifications (or "upfitting") to support paratransit services. Associated costs have not been addressed herein.*

[7] *Note the Chrysler Pacifica PHEV would require an electric vehicle charger. Associated costs have not been addressed herein.*

To determine the grand total capital cost of conventional gasoline microtransit vehicles across all zones, the average conventional minivan cost of approximately $41,197 was multiplied by the number of microtransit vehicles required for each zone (from simulation results) to yield the vehicle cost per zone. Costs ranged from approximately $82,393 in the four zones with two gasoline-powered vehicles each (Vail, Picture Rocks, Tanque Verde, and Ajo/Why) up to a high of approximately $329,573 in zones with eight vehicles each (Tucson Estates/Drexel Heights/Valencia West and Oro Valley). Zone-specific estimates were totaled to yield the grand total estimated capital cost for conventional gasoline-powered microtransit vehicles of approximately $2,307,013 (see **Table 44**).

To determine the grand total capital cost of hybrid and PHEV microtransit vehicles across all zones, the average hybrid/PHEV minivan cost of approximately $43,863 was multiplied by the number of microtransit vehicles required for each zone (from simulation results) to yield the vehicle cost per zone. Costs ranged from approximately $87,725 in the four zones with two hybrid vehicles or PHEVs vehicles each up to a high of approximately $350,900 in zones with eight vehicles each. Zone-specific estimates were totaled to yield the grand total estimated capital cost for PHEV/hybrid microtransit vehicles of approximately $2,456,300 (see **Table 44**), approximately 6.5% higher than for conventional gasoline-powered microtransit vehicles.

Table 44: Number of Microtransit Vehicles and Vehicle Cost by Drivetrain Type, 2025

Make/Model	# of Microtransit Vehicles	Estimated Vehicle Cost by Drivetrain Type (based on average cost per vehicle)	
		Gas-Powered ($41,196)	Hybrid/PHEV ($43,862)
Tucson Estates/Drexel Heights/ Valencia West	**8**	**$329,573**	**$350,900**
Tortolita/Continental Ranch	**6**	**$247,180**	**$263,175**
Oro Valley	**8**	**$329,573**	**$350,900**
Rita Ranch/Civano/Littletown	**5**	**$205,983**	**$219,312**
West Tucson	**5**	**$205,983**	**$219,312**
Sahuarita/Green Valley	**4**	**$164,786**	**$175,450**
Casas Adobes	**5**	**$205,983**	**$219,312**
Catalina Foothills	**4**	**$164,786**	**$175,450**
Marana/Avra Valley	**3**	**$123,590**	**$131,587**
Vail	**2**	**$82,393**	**$87,725**
Picture Rocks	**2**	**$82,393**	**$87,725**
Tanque Verde	**2**	**$82,393**	**$87,725**
Ajo/Why	**2**	**$82,393**	**$87,725**
Grand Total Vehicle Cost	**56**	**$2,307,013**	**$2,456,300**

12.1.2

OPERATING COST

Operating costs for microtransit were based on the microtransit simulation discussed in the Microtransit Simulation section. The estimated operating cost by opportunity zone is listed in **Table 45**. The simulation outputs an estimated annual vehicle-hours required to meet projected microtransit demand, which is multiplied by an all-inclusive operating cost assumption of $80 per vehicle-hour to yield total operating cost. The $80 per vehicle-hour assumption includes all direct and indirect costs, including labor, fuel, maintenance, software, insurance, utilities, etc., and is derived from the latest data acquired from the National Transit Database.

Table 45: Estimated Annual Operating Cost by Opportunity Zone

Zone	Service Tier	Annual Operating Cost
Marana/Avra Valley	**Weekday**	**$550,000**
Picture Rocks	**Weekday**	**$300,000**
Tortolita/Continental Ranch	**Extended**	**$1,600,000**
Oro Valley	**Extended**	**$1,800,000**
Casas Adobes	**Extended**	**$1,300,000**
Catalina Foothills	**Weekday**	**$700,000**
Tanque Verde	**Weekday**	**$350,000**
Rita Ranch/Civano/Littletown	**Weekday**	**$800,000**
Vail	**Weekday**	**$330,000**
Tucson Estates/Valencia West/ Drexel Heights	**Extended**	**$2,000,000**
West Tucson	**Extended**	**$1,300,000**
Sahuarita/Green Valley	**Weekday**	**$700,000**
Ajo/Why	**Extended**	**$500,000**
Total		**$12,250,000**

12.1.3

BENEFITS

Microtransit vehicles may offer financial benefits when compared to traditional transit solutions. For example, microtransit vehicles have lower costs for acquisition, operations, and maintenance than buses, as well as potentially lower costs for operator salaries (versus bus drivers with specialized licenses). Shifting trips from other modes (such as transit buses and private passenger vehicles) to microtransit vehicles may also achieve reduced carbon dioxide (CO_2) emissions from vehicle tailpipes, particularly if electric vehicles are ever used in the future. CO_2 emissions are discussed in further detail in the Social Cost of Carbon section below. When the social cost of these emissions is considered, the transition may result in additional costs from a societal perspective due to additional vehicle miles traveled.

The U.S. Environmental Protection Agency (EPA) publishes periodic estimates of the social cost of greenhouse gas emissions in U.S. dollars. In this context, "social cost" refers to a monetary estimate of the economic damage caused by releasing CO_2 into the atmosphere. The value attempts to represent the total cost to society of each additional ton of carbon emissions. Societal costs include impacts on health, agriculture, property damage, and so on. The EPA published its most recent update to these estimates in November 2023. At that time, the projected near-term social cost of CO_2 emissions in the U.S. in 2025 was $212 per metric ton.[8,9]

Adding microtransit service increases tailpipe CO_2 emissions in three zones and decreases CO_2 emissions in eight zones. In aggregate, this results in an overall increase in CO_2 emissions across all zones at a social cost of approximately $78,700 based on the U.S. EPA's estimated 2025 social cost of CO_2.

Table 60 in the Social Cost of Carbon section below provides additional detail.

12.2 Vehicle Miles Traveled Analyses

An analysis of the change in annual vehicle miles traveled (VMT) was conducted for each opportunity zone to understand microtransit's impact on the environment and the transportation network. For each opportunity zone, two VMT scenarios were calculated for each opportunity zone: the future scenario, which is the sum of VMT of microtransit and corresponding fixed-route transit modifications, and the baseline scenario, which is the sum of the avoided VMT that microtransit replaces. The change in VMT is the difference between the baseline and future scenarios. The following subsections describe how VMT values were calculated in detail.

[8] *U.S. EPA, 2023. Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances. National Center for Environmental Economics, Office of Policy and Climate Change Division, Office of Air and Radiation. Docket ID No. EPA-HQ-OAR-2021-0317. Washington, DC, November 2023. Retrieved from https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf.*

[9] *The EPA includes high, central, and low estimates for the near-term social cost of CO_2 emissions; these analyses use the central estimate.*

12.2.1

FUTURE SCENARIO

Microtransit's VMT was estimated through the simulation process as described in the Microtransit Simulation section. Unlike fixed-route transit that has a constant VMT, microtransit's on-demand nature means that its VMT is variable.

For this study, an estimate of VMT per rider was derived from the simulation results, which is listed in **Table 46**. These estimates were derived by dividing the total fleet vehicle-miles by the projected ridership; therefore, these estimates will factor in distance for grouped trips and distance accrued when the vehicle is empty (leaving or returning to the depot, traveling empty to pick up a passenger). The VMT value is influenced by zone design and travel patterns: larger zones will attract longer trips that increase VMT per rider, and trip demand that can be grouped will permit more shared trips that decrease VMT per rider.

Table 46: Estimated Annual Average Microtransit VMT per Rider by Opportunity Zone

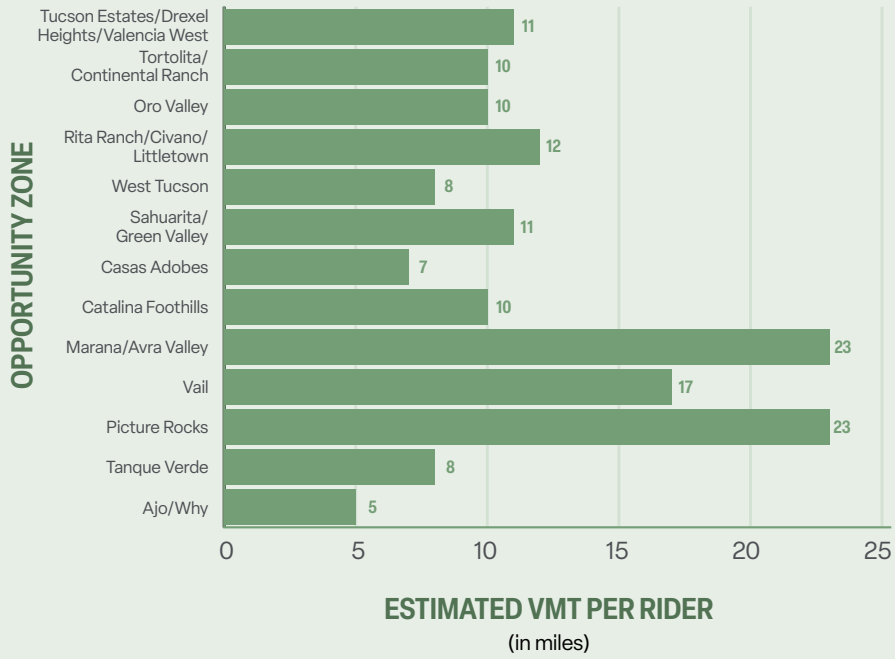


Table 47: Future Scenario Annual VMT

	Microtransit		Bus Modification	
Zone	Ridership	Microtransit VMT	New Bus VMT	Total VMT of Future Scenario
Tucson Estates/Drexel Heights/Valencia West	**59,000**	**649,000**	**-**	**649,000**
Tortolita/ Continental Ranch	**57,000**	**570,000**	**-**	**570,000**
Oro Valley	**56,000**	**560,000**	**-**	**560,000**
Rita Ranch/Civano/ Littletown	**35,000**	**420,000**	**-**	**420,000**
West Tucson	**49,000**	**392,000**	**-**	**392,000**
Sahuarita/Green Valley	**30,000**	**330,000**	**-**	**330,000**
Casas Adobes	**43,000**	**301,000**	**-**	**301,000**
Catalina Foothills	**28,000**	**280,000**	**-**	**280,000**
Marana/Avra Valley	**11,000**	**253,000**	**-**	**253,000**
Vail	**11,000**	**187,000**	**6,240**	**193,240**
Picture Rocks	**4,000**	**92,000**	**-**	**92,000**
Tanque Verde	**9,000**	**72,000**	**-**	**72,000**
Ajo/Why	**12,000**	**60,000**	**70,200**	**130,200**

Two opportunity zones, Vail and Ajo/Why, also have recommended fixed-route transit modifications. The VMT associated with these modifications equals the distance of the additional service multiplied by the number of trips per year. **Table 47** summarizes the annual VMT in the future scenario by opportunity zone.

12.2.2

BASELINE SCENARIO

The baseline scenario VMT has two components: existing transit trips replaced, which are trips currently taken on fixed-route transit or Dial-a-Ride that is replaced with microtransit, and new transit trips, which are existing trips currently taken in a private vehicle and new trips generated. The sum of each component's trips must equal microtransit's expected ridership and sum of each component's VMT is equal to microtransit's avoided VMT.

For existing transit trips replaced, it is assumed that microtransit provides an equal or more convenient transit option than is currently provided. Therefore, all trips are assumed to shift modes from fixed-route transit or Dial-a-Ride to microtransit instead of other modes, and the total number of avoided transit trips is equal to the FY 2024 ridership. The existing trips taken on fixed-route transit component only considers cases where the opportunity zone replaces an existing fixed-route route, which are Sun Shuttle Routes 413, 430, and 450. The avoided VMT is equal to the distance of each bus trip multiplied by the number of trips per year. This analysis does not consider mode shift from fixed-route transit that will remain, as it is assumed that the app will recommend that rider to continue using fixed-route transit. The small number of trips that shift modes is not expected to significantly influence the results of this analysis.

The existing trips taken on Dial-a-Ride component assumes that Dial-a-Ride's VMT per rider is the same as microtransit's, since the zone boundaries are unchanged in this study, and operations are similar from the vehicle's point of view. Therefore, the avoided VMT is equal the FY 2024 ridership multiplied by the VMT per rider estimated in **Table 47**. Note that the Marana/Avra Valley and Oro Valley opportunity zones propose external destinations that are provided only for seniors and ADA passengers, but not for the general public. This means that **Table 46** may slightly overestimate VMT per rider for public riders but is not expected to significantly influence the results of this analysis. **Table 48** summarizes the total annual VMT of existing transit trips replaced by opportunity zone.

Table 48: Existing Transit Trips Replaced Annual VMT

	Dial-a-Ride Trips Replaced		Fixed-Route Transit Trips Replaced			
Zone	Ridership (FY 2024)	Dial-a-Ride VMT	Ridership (FY 2024)	Bus VMT	Total Existing Transit Trips Replaced	Total VMT of Existing Transit Trips Replaced
Tucson Estates/ Drexel Heights/ Valencia West	-	-	**18,942**	**67,860**	**18,942**	**67,860**
Tortolita/ Continental Ranch	-	-	**7,213**	**96,330**	**7,213**	**96,330**
Oro Valley	**22,611**	**226,110**	-	-	**22,611**	**226,110**
Rita Ranch/ Civano/Littletown	-	-	**10,189**	**66,456**	**10,189**	**66,456**
West Tucson	-	-	-	-	-	-
Sahuarita/ Green Valley	**8,576**	**94,336**	-	-	**8,576**	**94,336**
Casas Adobes	-	-	-	-	-	-
Catalina Foothills	-	-	-	-	-	-
Marana/ Avra Valley	**3,083**	**70,909**	**7,213**	**96,330**	**10,296**	**167,239**
Vail	-	-	-	-	-	-
Picture Rocks	-	-	-	-	-	-
Tanque Verde	-	-	-	-	-	-
Ajo/Why	**6,086**	**3,043**	-	-	**6,086**	**3,043**

For new transit trips, it is assumed that 20% of them are newly generated trips that were not previously possible, such as riders that do not have access to or cannot operate a private vehicle; this proportion was estimated from Via's other microtransit deployments. The remaining 80% are assumed to have shifted modes from private vehicles to microtransit. The avoided VMT of newly generated trips is zero. The avoided VMT of existing trips taken on a private vehicle is estimated through Replica, a travel-demand model. The average private vehicle distance per trip was calculated for all private vehicle trips that fit the origin-destination travel rules of the microtransit opportunity zone and then multiplied by the number of trips to estimate the avoided VMT from private vehicles.

Table 49: New Transit Trips Annual VMT

	Newly Generated Trips	Mode Shift from Private Vehicle				
Zone	Trip Count	Trip Count	VMT per Trip	Total VMT	Total New Transit Trips	Total VMT of New Transit Trips
Tucson Estates/ Drexel Heights/ Valencia West	**8,012**	**32,046**	**4.13**	**132,352**	**40,058**	**132,352**
Tortolita/ Continental Ranch	**9,957**	**39,830**	**5.12**	**203,928**	**49,787**	**203,928**
Oro Valley	**6,678**	**26,711**	**4.00**	**106,845**	**33,389**	**106,845**
Rita Ranch/ Civano/Littletown	**4,962**	**19,849**	**4.56**	**90,511**	**24,811**	**90,511**
West Tucson	**9,800**	**39,200**	**2.65**	**103,880**	**49,000**	**103,880**
Sahuarita/ Green Valley	**4,285**	**17,139**	**4.52**	**77,469**	**21,424**	**77,469**
Casas Adobes	**8,600**	**34,400**	**5.50**	**189,200**	**43,000**	**189,200**
Catalina Foothills	**5,600**	**22,400**	**3.79**	**84,896**	**28,000**	**84,896**
Marana/ Avra Valley	**141**	**563**	**8.71**	**4,905**	**704**	**4,905**
Vail	**2,200**	**8,800**	**4.62**	**40,656**	**11,000**	**40,656**
Picture Rocks	**800**	**3,200**	**6.37**	**20,384**	**4,000**	**20,384**
Tanque Verde	**1,800**	**7,200**	**3.86**	**27,792**	**9,000**	**27,792**
Ajo/Why	**1,183**	**4,731**	**3.32**	**15,708**	**5,914**	**15,708**

12.2.3

OVERALL CHANGE IN VMT

Table 50 shows the overall change in VMT by opportunity zone. Microtransit is not always expected to result in a decrease in VMT, especially when compared to travel on private vehicles, as there is some distance accrued when vehicles are traveling empty to a pickup and vehicles may detour to pick up or drop off other riders. Opportunity zones that have a lower impact on VMT tend to have higher productivity, meaning that it is operationally efficient and carries more riders per distance traveled.

Table 50: Change in Annual VMT by Opportunity Zone

Zone	Total VMT of Future Conditions	Total VMT of Existing Transit Trips Replaced	Total VMT of New Transit Trips	Change in VMT
Tucson Estates/Drexel Heights/Valencia West	**649,000**	**(67,860)**	**(132,352)**	**+448,788**
Tortolita/ Continental Ranch	**570,000**	**(96,330)**	**(203,928)**	**+269,742**
Oro Valley	**560,000**	**(226,110)**	**(106,845)**	**+227,045**
Rita Ranch/Civano/ Littletown	**420,000**		**(90,511)**	**+263,033**
West Tucson	**392,000**		**(103,880)**	**+288,120**
Sahuarita/ Green Valley	**330,000**	**(94,336)**	**(77,469)**	**+158,195**
Casas Adobes	**301,000**		**(189,200)**	**+111,800**
Catalina Foothills	**280,000**		**(84,896)**	**+195,104**
Marana/ Avra Valley	**253,000**	**(167,239)**	**(4,905)**	**+80,856**
Vail	**193,240**		**(40,656)**	**+152,584**
Picture Rocks	**92,000**		**(20,384)**	**+71,616**
Tanque Verde	**72,000**		**(27,792)**	**+44,208**
Ajo/Why	**130,200**	**(30,430)**	**(15,708)**	**+84,062**

12.3

Air Quality Analysis

Emissions associated with new microtransit service and expanded fixed-route bus service (in Vail and Ajo/Why) were estimated for the following pollutants:

- **Nitrogen Oxides (NOx)**: a group of reactive gases that contribute to air pollution including nitric oxide (NO) and nitrogen dioxide (NO2). They can be produced from burning fuels and react with volatile organic compounds (VOCs) to form ground-level ozone.
- **Volatile Organic Compounds (VOCs):** organic chemicals that can evaporate into the air and contribute to air pollution. They react with NOx to form ground-level ozone.
- **Particulate matter with aerodynamic diameter of 2.5 micrometers (µm) or smaller (PM2.5):** these small particles pose a substantial health as they can be inhaled deep into the lungs and potentially enter the bloodstream. They are linked to various health problems, including respiratory and cardiovascular issues.
- **Particulate matter with aerodynamic diameter of 10 µm or smaller (PM10):** these are often referred to as "coarse particles" and can include soot, dust, salt, and other materials. Exposure to high concentrations of PM10 can result in health impacts ranging from coughing to asthma and bronchitis to high blood pressure, heart attacks, and premature death.
- **CO_2 equivalent:** a standardized unit of measurement used to compare the global warming potential of different greenhouse gases in terms of the amount of CO_2 that would have the same effect.

To estimate pollutant emissions, three steps were taken:

01 Estimate total new emissions from microtransit and expanded bus service

02 Estimate avoided emissions from trips replaced by microtransit and expanded bus service (including trips that would otherwise have been taken via Dial-a-Ride vehicles, transit buses, and private vehicles)

03 Combine the two preceding estimates to yield overall net emissions associated with the new and expanded services

The following subsections describe these steps in detail. The last subsection provides further detail regarding the social cost of CO_2 emissions estimates described in the Cost-Benefit Analyses section above.

12.3.1

TAILPIPE CO2 EMISSIONS FROM MICROTRANSIT BUS SERVICE

Approaches to estimating tailpipe CO_2 emissions differed for the new microtransit service versus the expanded fixed-route bus service in the Vail and Ajo/Why zones.

Microtransit

Estimating emissions for the new microtransit service involves converting VMT to each of the pollutants based on conversion factors provided by PAG.[10,11] PAG developed these factors using the U.S. EPA's Motor Vehicle Emission Simulator (MOVES), which estimates air pollution emissions for criteria air pollutants, greenhouse gases, and air toxics for mobile sources (on-road and nonroad vehicles). Conversion factors differ for each pollutant by vehicle type and fuel type and are expressed in grams of emissions per mile. **Table 51** shows the conversion factors.

Table 51: Emissions Conversion Factors

	Vehicle Type and Fuel Type				
Pollutant	Shuttle Bus (Diesel)	Shuttle Bus (Gasoline)	Fixed-Route Transit Bus (CNG)	Microtransit Van (Gasoline)	Average Commuter Vehicle (Gasoline)
NOx	**10.085**	**1.044**	**0.945**	**0.297**	**0.217**
VOC	**0.508**	**2.000**	**0.697**	**0.367**	**0.316**
PM10	**0.526**	**0.132**	**0.100**	**0.039**	**0.039**
PM2.5	**0.359**	**0.073**	**0.019**	**0.010**	**0.010**
CO_2e	**1,729.18**	**1,510.45**	**1,939.91**	**428.17**	**377.84**

[10] UPAG, 2025. Personal Communications (via email) from D. Fitzpatrick to M. Echeverry and J. McDavid. June 11 and June 12, 2025.

[11] PAG used MOVES source type 31 (Passenger Trucks) - Gas to represent gasoline-powered microtransit van emissions; source type 41 (Other Buses) - Gas for gasoline-powered shuttle shuttles; source type 41 (Other Buses) - Diesel for diesel-powered shuttles; and source type 42 (Transit Buses) - CNG for transit buses powered by compressed natural gas (CNG).[10]

For each pollutant, VMT was multiplied by the relevant conversion factor (to express the pollutant in grams) then divided by 1,000,000 to convert grams into metric tons. As shown in **Table 52**, new gasoline-powered microtransit van service results in approximately 1.24 metric tons of NOx, 1.53 metric tons of VOCs, 0.16 metric tons of PM10, 0.04 metric tons of PM2.5, and approximately 1,784 metric tons of CO_2e emissions.

Table 52: Annual Emissions Associated with Microtransit Service

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Tucson Estates/ Drexel Heights/ Valencia West	**0.193**	**0.238**	**0.025**	**0.006**	**277.88**
Tortolita/ Continental Ranch	**0.169**	**0.209**	**0.022**	**0.006**	**244.06**
Oro Valley	**0.166**	**0.206**	**0.022**	**0.006**	**239.78**
Rita Ranch/Civano/ Littletown	**0.125**	**0.154**	**0.016**	**0.004**	**179.83**
West Tucson	**0.116**	**0.144**	**0.015**	**0.004**	**167.84**
Sahuarita/ Green Valley	**0.098**	**0.121**	**0.013**	**0.003**	**141.30**
Casas Adobes	**0.089**	**0.110**	**0.012**	**0.003**	**128.88**
Catalina Foothills	**0.083**	**0.103**	**0.011**	**0.003**	**119.89**
Marana/ Avra Valley	**0.075**	**0.093**	**0.010**	**0.003**	**108.33**
Vail	**0.056**	**0.069**	**0.007**	**0.002**	**80.07**
Picture Rocks	**0.027**	**0.034**	**0.004**	**0.001**	**39.39**
Tanque Verde	**0.021**	**0.026**	**0.003**	**0.001**	**30.83**
Ajo/Why	**0.018**	**0.022**	**0.002**	**0.001**	**25.69**
Total Annual Emissions	**1.237**	**1.529**	**0.162**	**0.042**	**1,783.77**

Expanded Fixed-Route Bus Service

The method for estimating pollutant emissions from expanded fixed-route bus service differed for the two zones (Vail and Ajo/Why) based on vehicle fuel type. In Vail, the expanded service relies on a transit bus powered by compressed natural gas (CNG) and in Ajo/Why upon a diesel-powered shuttle bus. Estimating CO_2 emissions for this vehicle follows the same approach as used for microtransit above except using the emissions conversion factors associated with a CNG transit bus and diesel shuttle bus in Vail and Ajo/Why routes, respectively, from **Table 51**.

Together, expanded fixed-route bus service in the Vail and Ajo/Why zones result in estimated emissions of 0.714 metric tons of NOx, 0.040 metric tons of VOCs, 0.038 metric tons of PM10, 0.025 metric tons of PM.5, and approximately 133 metric tons of CO_2e (see **Table 53**).

Table 53: Annual Emissions Associated with Expanded Fixed-Route Bus Service

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Vail (CNG transit bus)	**0.006**	**0.004**	**0.001**	**< 0.001**	**12.11**
Ajo/Why (diesel shuttle bus)	**0.708**	**0.036**	**0.037**	**0.025**	**121.39**
Total Annual Emissions	**0.714**	**0.040**	**0.038**	**0.025**	**133.49**

OVERALL POLLUTANT EMISSIONS FROM NEW MICROTRANSIT AND EXPANDED FIXED-ROUTE BUS SERVICE

The above estimates for microtransit service and expanded fixed-route bus service were combined to yield an overall estimate of emissions for these new services of approximately 1,917 metric tons of CO_2e, which is listed in **Table 54**. Overall CO_2e emissions were still highest in the Tucson Estates/Drexel Heights/Valencia West zone (277.88 metric tons) and lowest in Tanque Verde (30.83 metric tons).

Table 54: Annual Emissions Associated with Microtransit Service and Expanded Fixed-Route Bus Service (Vail and Ajo/Why)

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Tucson Estates/ Drexel Heights/ Valencia West	**0.193**	**0.238**	**0.025**	**0.006**	**277.88**
Tortolita/ Continental Ranch	**0.169**	**0.209**	**0.022**	**0.006**	**244.06**
Oro Valley	**0.166**	**0.206**	**0.022**	**0.006**	**239.78**
Rita Ranch/Civano/ Littletown	**0.125**	**0.154**	**0.016**	**0.004**	**179.83**
West Tucson	**0.116**	**0.144**	**0.015**	**0.004**	**167.84**
Sahuarita/ Green Valley	**0.098**	**0.121**	**0.013**	**0.003**	**141.30**
Casas Adobes	**0.089**	**0.110**	**0.012**	**0.003**	**128.88**
Catalina Foothills	**0.083**	**0.103**	**0.011**	**0.003**	**119.89**
Marana/ Avra Valley	**0.075**	**0.093**	**0.010**	**0.003**	**108.33**
Vail	**0.061**	**0.073**	**0.008**	**0.002**	**92.17**
Picture Rocks	**0.027**	**0.034**	**0.004**	**0.001**	**39.39**
Tanque Verde	**0.021**	**0.026**	**0.003**	**0.001**	**30.83**
Ajo/Why	**0.726**	**0.058**	**0.039**	**0.026**	**147.08**
Total Annual Emissions	**1.951**	**1.569**	**0.200**	**0.067**	**1,917.26**

12.3.2

AVOIDED POLLUTANT EMISSIONS

Deploying microtransit and enhancing fixed-route bus service generates new sources of emissions, but these services may be offset by avoided emissions from trips that would otherwise have been taken via Dial-a-Ride, transit buses, or personal passenger vehicles. The approach to estimating these avoided emissions involves four steps:

01 Estimate the avoided pollutant emissions from Dial-a-Ride trips in gasoline-powered shuttle buses replaced with trips in gasoline-powered microtransit vans

02 Estimate avoided emissions from replaced transit trips in gasoline-powered shuttle buses

03 Estimate avoided emissions from replaced private vehicle trips (assumed to be gasoline-powered)

04 Combine the three preceding estimates to yield overall avoided pollutant emissions from these three modes from trips replaced by trips in gasoline-powered microtransit vans across all zones, as well as expanded bus service in Vail (using a CNG transit bus) and Ajo/Why (using a diesel shuttle)

Avoided Emissions from Replaced Dial-a-Ride Trips

The same steps were taken to estimate avoided pollutant emissions from microtransit trips that would otherwise have been taken via gasoline-powered Dial-a-Ride shuttle bus service as for gasoline-powered shuttle bus trips in the Ajo/Why zone using the same emissions conversion factors from **Table 51**.

As shown in **Table 55**, Dial-a-Ride trips were replaced by trips via microtransit or the expanded bus service in four zones: Oro Valley, Sahuarita/Green Valley, Marana/Avra Valley, and Ajo/Why. Of these, the greatest single-zone CO_2e emissions reduction occurred in the Oro Valley zone (approximately 342 metric tons of CO_2e) and the smallest in Ajo/Why zone (approximately 46 metric tons). Across these four zones, approximately 637 metric tons of CO_2e were displaced because of microtransit deployment and expanded bus service. These estimates are shown as negative numbers (in parentheses) because they are avoided emissions (i.e., emissions that would have occurred from Dial-a-Ride vehicles if microtransit vehicles or expanded bus service were not available).

Table 55: Avoided Annual Emissions from Dial-a-Ride Trips Replaced with Trips via Microtransit and Expanded Fixed-Route Bus Service

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Oro Valley	**(0.236)**	**(0.452)**	**(0.030)**	**(0.017)**	**(341.53)**
Sahuarita/ Green Valley	**(0.098)**	**(0.189)**	**(0.012)**	**(0.007)**	**(142.49)**
Marana/ Avra Valley	**(0.074)**	**(0.142)**	**(0.009)**	**(0.005)**	**(107.10)**
Ajo/Why	**(0.032)**	**(0.061)**	**(0.004)**	**(0.002)**	**(45.96)**
Total Annual Emissions	**(0.440)**	**(0.844)**	**(0.056)**	**(0.031)**	**(637.09)**

Avoided pollutant emissions from transit trips on shuttle buses replaced by trips via gasoline-powered microtransit vans were estimated using the same factors to convert VMT to emissions as used for the gasoline-powered Dial-a-Ride shuttles. As shown in **Table 56**, across the four relevant zones, approximately 494 metric tons of CO_2e emissions were avoided by converting transit trips to microtransit trips. Again, these estimates are shown as negative numbers (in parentheses) because they are avoided emissions (i.e., emissions that would have occurred from transit vehicles if microtransit vehicles were not available).

Table 56: Avoided Annual Emissions from Fixed-Route Transit Trips Replaced with Microtransit Trips

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Tucson Estates/ Drexel Heights/ Valencia West	**(0.071)**	**(0.136)**	**(0.009)**	**(0.005)**	**(102.50)**
Tortolita/ Continental Ranch	**(0.101)**	**(0.193)**	**(0.013)**	**(0.007)**	**(145.50)**
Rita Ranch/Civano/ Littletown	**(0.069)**	**(0.133)**	**(0.009)**	**(0.005)**	**(100.38)**
Marana/ Avra Valley	**(0.101)**	**(0.193)**	**(0.013)**	**(0.007)**	**(145.50)**
Total Annual Emissions	**(0.341)**	**(0.654)**	**(0.043)**	**(0.024)**	**(493.88)**

Avoided Emissions from Replaced Private Vehicle Trips

To estimate avoided emissions associated with private vehicle trips replaced by trips via microtransit or expanded bus service, private vehicle miles traveled were multiplied by the conversion factors associated with the average gasoline-powered commuter vehicle from **Table 51**. Results suggest trips microtransit and expanded bus service replacing private vehicle trips yielded approximately 415 metric tons of avoided CO_2e emissions (**Table 57**). Again, these estimates are negative numbers because they are avoided emissions (i.e., emissions that would have occurred from private vehicles if microtransit and expanded bus services were not available). Private vehicle trips were reduced by the new and expanded services in all 13 zones.

Table 57: Avoided Annual Emissions from Private Vehicle Trips Replaced with Trips via Microtransit and Expanded Fixed-Route Bus Service

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Tucson Estates/ Drexel Heights/ Valencia West	**(0.029)**	**(0.042)**	**(0.005)**	**(0.001)**	**(50.01)**
Tortolita/ Continental Ranch	**(0.044)**	**(0.064)**	**(0.008)**	**(0.002)**	**(77.05)**
Oro Valley	**(0.023)**	**(0.034)**	**(0.004)**	**(0.001)**	**(40.37)**
Rita Ranch/Civano/ Littletown	**(0.020)**	**(0.029)**	**(0.004)**	**(0.001)**	**(34.20)**
West Tucson	**(0.023)**	**(0.033)**	**(0.004)**	**(0.001)**	**(39.25)**
Sahuarita/ Green Valley	**(0.017)**	**(0.024)**	**(0.003)**	**(0.001)**	**(29.27)**
Casas Adobes	**(0.041)**	**(0.060)**	**(0.007)**	**(0.002)**	**(71.49)**
Catalina Foothills	**(0.018)**	**(0.027)**	**(0.003)**	**(0.001)**	**(32.08)**
Marana/ Avra Valley	**(0.001)**	**(0.002)**	**(< 0.001)**	**(< 0.001)**	**(1.85)**
Vail	**(0.009)**	**(0.013)**	**(0.002)**	**(< 0.001)**	**(15.36)**
Picture Rocks	**(0.004)**	**(0.006)**	**(0.001)**	**(< 0.001)**	**(7.70)**
Tanque Verde	**(0.006)**	**(0.009)**	**(0.001)**	**(< 0.001)**	**(10.50)**
Ajo/Why	**(0.003)**	**(0.005)**	**(0.001)**	**(< 0.001)**	**(5.94)**
Total Annual Emissions	**(0.238)**	**(0.347)**	**(0.043)**	**(0.011)**	**(415.07)**

Overall Avoided Emissions From All Replaced Trips

To estimate total avoided emissions from trips in Dial-a-Ride vehicles, transit buses, and private vehicles replaced by trips via microtransit and expanded bus service, estimates of avoided emissions from each vehicle type were summed. As **Table 58** shows, total avoided CO_2e emissions total approximately 1,546 metric tons across the three trip modes. Again, these estimates are shown as negative numbers (in parenthesis) because they are avoided emissions (i.e., emissions that would have occurred if microtransit vehicles were not available). Replaced fixed-route transit trips yielded the largest volume of avoided CO_2e emissions of all three modes based on a combination of low fuel economy and high mileage.

Table 58: Avoided Annual Emissions from Dial-a-Ride, Fixed-Route Transit, and Private Vehicle Trips Replaced with Trips via Microtransit and Expanded Fixed-Route Bus Service

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Tucson Estates/ Drexel Heights/ Valencia West	**(0.100)**	**(0.178)**	**(0.014)**	**(0.006)**	**(152.51)**
Tortolita/ Continental Ranch	**(0.145)**	**(0.257)**	**(0.021)**	**(0.009)**	**(222.55)**
Oro Valley	**(0.259)**	**(0.486)**	**(0.034)**	**(0.018)**	**(381.90)**
Rita Ranch/Civano/ Littletown	**(0.089)**	**(0.162)**	**(0.012)**	**(0.006)**	**(134.58)**
West Tucson	**(0.023)**	**(0.033)**	**(0.004)**	**(0.001)**	**(39.25)**
Sahuarita/ Green Valley	**(0.115)**	**(0.213)**	**(0.015)**	**(0.008)**	**(171.76)**
Casas Adobes	**(0.041)**	**(0.060)**	**(0.007)**	**(0.002)**	**(71.49)**
Catalina Foothills	**(0.018)**	**(0.027)**	**(0.003)**	**(0.001)**	**(32.08)**
Marana/ Avra Valley	**(0.176)**	**(0.336)**	**(0.022)**	**(0.012)**	**(254.46)**
Vail	**(0.009)**	**(0.013)**	**(0.002)**	**(0.000)**	**(15.36)**
Picture Rocks	**(0.004)**	**(0.006)**	**(0.001)**	**(0.000)**	**(7.70)**
Tanque Verde	**(0.006)**	**(0.009)**	**(0.001)**	**(0.000)**	**(10.50)**
Ajo/Why	**(0.035)**	**(0.066)**	**(0.005)**	**(0.002)**	**(51.90)**
Total Annual Emissions	**(1.020)**	**(1.845)**	**(0.142)**	**(0.066)**	**(1,546.04)**

12.3.3

OVERALL NET EMISSIONS FROM NEW MICROTRANSIT AND EXPANDED FIXED-ROUTE BUS SERVICE

To estimate net emissions, emissions from the new or expanded services (microtransit and fixed-route transit) were combined with avoided emissions from the three replaced trip modes (Dial-a-Ride, transit buses, and private vehicles). The results are listed in **Table 59**. If trips via microtransit and new fixed-route bus service replace trips from these other modes, emissions increase in most cases (10 zones) and decrease in others (three zones). Similarly, net emissions increase for most pollutants (NOx, PM10, PM2.5, and CO_2e) and decrease for others (VOCs). Overall, these new and expanded services yield additional CO_2e emissions of approximately 371 metric tons.

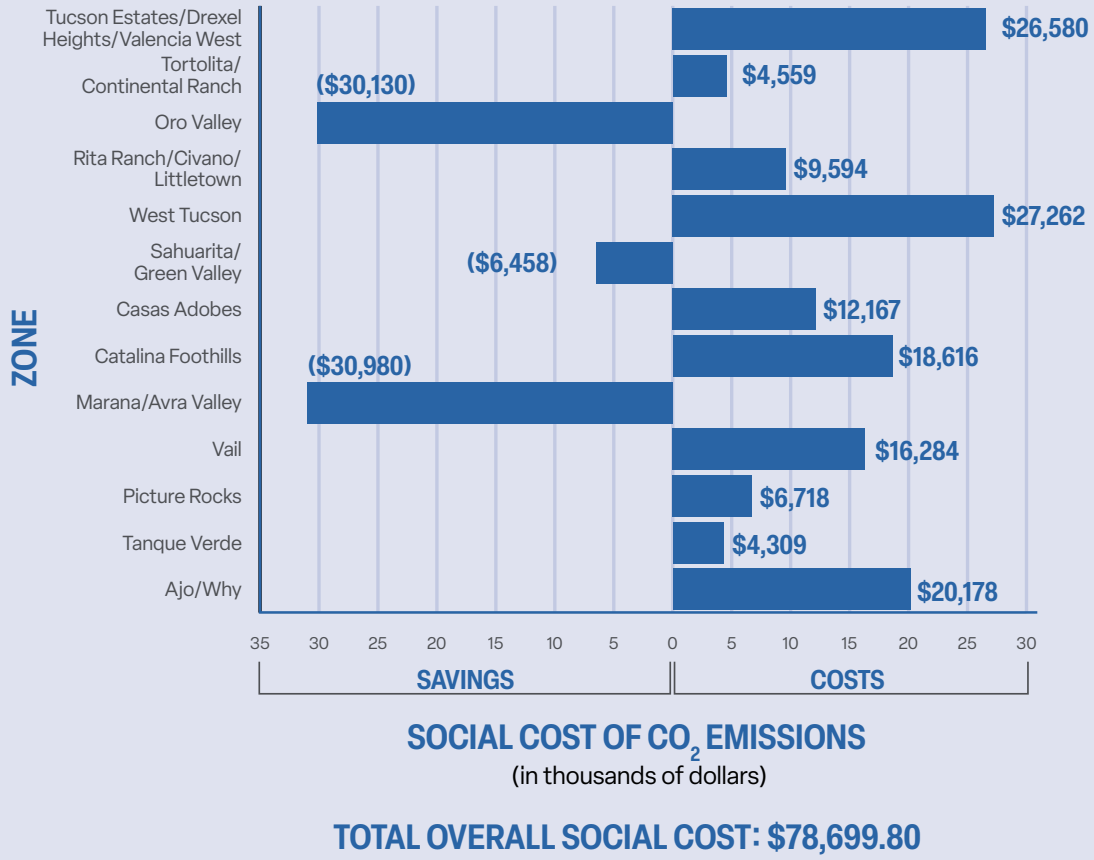
Positive numbers in the table indicate increased emissions while negative numbers represent reduced emissions. The Marana/Avra Valley zone achieves the greatest CO_2e emissions reduction by converting a portion of existing dial-a-ride, transit bus, and private vehicle trips to the new and expanded services (approximately 146 metric tons). The greatest increase in CO_2e emissions across zones is in West Tucson (approximately 129 metric tons).

It is worth noting that while CO_2e emissions would increase if all microtransit zones were implemented, if the three highest annual emission areas (West Tucson, Tucson Estates/Drexel Heights/Valencia West and Ajo/Why) were not implemented, the remaining 10 zones could be implemented on a near net-carbon-neutral basis. Additionally, the PAG Regional Greenhouse Gas Inventory reported 4,097,117 MT of CO_2e in 2021 for onroad transportation emissions. The estimated 371.23 MT of CO_2e from implementation of all mictrotransit service areas is approximately 0.009% of the 2021 onroad emissions.

Table 59: Net Annual Emissions from Dial-a-Ride, Fixed-Route Transit, and Private Vehicle Trips Replaced by Microtransit and Expanded Bus Service

	Pollutant (in Metric Tons)				
Zone	NOx	VOC	PM10	PM2.5	CO_2e
Tucson Estates/ Drexel Heights/ Valencia West	**0.093**	**0.061**	**0.011**	**< 0.001**	**125.38**
Tortolita/ Continental Ranch	**0.024**	**(0.048)**	**0.002**	**(0.003)**	**21.50**
Oro Valley	**(0.093)**	**(0.280)**	**(0.012)**	**(0.012)**	**(142.12)**
Rita Ranch/Civano/ Littletown	**0.036**	**(0.007)**	**0.004**	**(0.002)**	**45.26**
West Tucson	**0.094**	**0.111**	**0.011**	**0.003**	**128.59**
Sahuarita Green Valley	**(0.017)**	**(0.092)**	**(0.003)**	**(0.004)**	**(30.46)**
Casas Adobes	**0.048**	**0.051**	**0.004**	**0.001**	**57.39**
Catalina Foothills	**0.065**	**0.076**	**0.008**	**0.002**	**87.81**
Marana/ Avra Valley	**(0.101)**	**(0.243)**	**(0.012)**	**(0.010)**	**(146.13)**
Vail	**0.053**	**0.060**	**0.006**	**0.002**	**76.81**
Picture Rocks	**0.023**	**0.027**	**0.003**	**0.001**	**31.69**
Tanque Verde	**0.015**	**0.018**	**0.002**	**0.000**	**20.33**
Ajo/Why	**0.691**	**(0.008)**	**0.035**	**0.023**	**95.18**
Total Annual Emissions	**0.931**	**(0.276)**	**0.058**	**0.001**	**371.23**

Table 60: Annual Social Cost of Tailpipe CO_2 Emissions from Microtransit and Expanded Bus Service, 2025



TOTAL OVERALL SOCIAL COST: $78,699.80

Social Cost of Carbon

As explained in the Cost-Benefit Analyses section above, CO_2 emissions have a social cost since they cause economic damage such as impacts on health and agriculture as well as property damage and so on. When these costs are considered, the emissions reductions resulting from transition toward microtransit vehicles and expanded bus service may have monetary value from a societal perspective.

The EPA's most recent estimate of the social cost of CO_2 emissions in the U.S. is from 2023 and includes projected costs for later years. Based on these data, the projected near-term social cost of CO_2 emissions in 2025 is $212 per metric ton.[12,13]

Adding microtransit service and expanding fixed-route bus service increases tailpipe CO_2e emissions in 10 zones and decreases CO_2e emissions in three zones. This results in an increase in CO_2e emissions across all zones valued at approximately $78,700 based on the U.S. EPA's projected 2025 social cost of CO_2 emissions (**Table 60**). In the table above, positive numbers represent costs and negative numbers (in parentheses) represent savings.

[12] U.S. EPA, 2023.

[13] As noted previously, these analyses rely on the EPA's central estimate of the near-term social cost of CO_2 emissions (versus the low or high estimates).

SECTION 13

Recommendations

This study assessed the feasibility of implementing microtransit service in areas without transit service, and where current services underperform or do not fulfill the community's needs. Additionally, this study determined if the current dial-a-ride services could be replaced by these service models.

Having the opportunity to reserve the same day, get curb-to-curb service, and connect to important destinations, including transfers to fixed-route services, was something that appealed to riders and key stakeholders when asked about their preferences, as shown in the public involvement summary.

The needs assessment illustrates the gaps in service that come not only from the lack of service in some areas in the region but also the need for more expedited service in areas where there are Dial-a-Ride services where riders can only reserve their rides the day before. Having the opportunity to reserve the same day, get curb-to-curb service, and connect to important destinations, including transfers to fixed-route services, was something that appealed to riders and key stakeholders when asked about their preferences, as shown in the public involvement summary.

Based on the needs assessment and public feedback, 13 potential microtransit opportunity zones were identified in the Microtransit Opportunity Zones section. Then, each opportunity zone was analyzed through a simulation to understand performance and fleet requirements in the Microtransit Simulation section above.

Table 61 lists the KPIs analyzed through the simulation (using the medium-demand scenario) for each opportunity zone, sorted by annual ridership, and proposes a phased approach to implementation. Three phases are suggested: “near term” (1 – 4 years), “medium term” (5 – 9 years), and “long term” (more than 10 years). The phasing is informed by the KPIs, feedback collected from public and stakeholder engagement, and productivity factors; zones that demonstrated a higher need for transit and are projected to perform higher are placed in a nearer phase. The reasoning behind the recommended phasing is described below.

Table 61: KPIs and Proposed Phasing by Opportunity Zone

Zone	Service Tier	Annual Ridership	Fleet Size Needed at Peak	Utilization	Operating Cost per Trip	Phasing
Tucson Estates/ Valencia West/ Drexel Heights	**Extended**	**59,000**	**8**	**2.0 – 2.6**	**$30**	**Medium Term**
Tortolita/ Continental Ranch	**Extended**	**57,000**	**6**	**2.7 – 3.3**	**$28**	**Near Term**
Oro Valley	**Extended**	**56,000**	**8**	**2.2 – 2.8**	**$32**	**Medium Term**
West Tucson	**Extended**	**49,000**	**5**	**2.7 – 3.3**	**$27**	**Medium Term**
Casas Adobes	**Extended**	**43,000**	**5**	**2.4 – 3.0**	**$30**	**Near Term**
Rita Ranch/ Civano/Littletown	**Weekday**	**35,000**	**5**	**3.1 – 3.7**	**$23**	**Near Term**
Sahuarita/ Green Valley	**Weekday**	**31,000**	**4**	**3.1 – 3.7**	**$23**	**Near Term**
Catalina Foothills	**Weekday**	**28,000**	**4**	**2.8 – 3.4**	**$26**	**Long Term**
Ajo/Why	**Extended**	**12,000**	**2**	**1.8 – 2.4**	**$39**	**Near Term**
Marana/ Avra Valley	**Weekday**	**11,000**	**3**	**1.4 – 2.0**	**$50**	**Long Term**
Vail	**Weekday**	**10,000**	**2**	**2.1 – 2.7**	**$36**	**Medium Term**
Tanque Verde	**Weekday**	**9,000**	**2**	**1.9 – 2.5**	**$41**	**Long Term**
Picture Rocks	**Weekday**	**4,000**	**2**	**0.7 – 1.3**	**$80**	**Medium Term**

Based on the needs assessment and public feedback, 13 potential microtransit opportunity zones were identified in the Microtransit Opportunity Zones section.

Near-Term Opportunity Zones

» **Tortolita/Continental Ranch**
This is one of the highest-ridership zones that encompasses some of the largest trip generators in the County. The Continental Ranch community has indicated interest in transit service, which does not currently exist. Simulation results indicate that it has high utilization and low cost per trip compared to other zones.

» **Casas Adobes**
This zone exhibits high ridership, high utilization, and low cost per rider compared to the other zones analyzed. It captures some large trip generators that are not served by fixed-route transit. The zone may be considered in tandem with the Tortolita/Continental Ranch zone and could share vehicles, potentially leading to less vehicles being required.

» **Rita Ranch/Civano/Littletown**
This zone exhibits the highest utilization and lowest cost per rider out of all zones analyzed and captures an area of high trip activity but low transit availability. Public and stakeholder engagement indicated that there is a need for expanded transit services in this area. Riders in this area may be already familiar with microtransit since the RTA implemented the AMORE pilot service a few years ago, potentially leading to higher ridership at the beginning of the implementation.

» **Sahuarita/Green Valley**
This zone exhibits the highest productivity and lowest cost per rider out of all zones analyzed. As an existing public dial-a-ride zone, an on-demand model is familiar to riders, and a conversion to microtransit is more straightforward than establishing a new service.

» **Ajo/Why**
Out of the public dial-a-ride zones, the current Ajo service's ridership is high considering the small size of the community. Public engagement has indicated that the dial-a-ride service is essential, and an upgrade to microtransit is expected to bring further convenience to riders. A conversion to microtransit is more straightforward than establishing a new service.

Medium-Term Opportunity Zones

» **Tucson Estates/Valencia West/Drexel Heights**
This zone has the highest projected ridership, likely due to its large size. The major trip generators being clustered on the east side of the zone results in long trip distances. While it has higher productivity and lower cost per trip out of the zones analyzed, its large size is resource-intensive to operate microtransit in.

» **Oro Valley**
This zone has high projected ridership, higher productivity, and lower cost per trip out of the zones analyzed. The existing dial-a-ride service is operated by the Town of Oro Valley, who have indicated that the dial-a-ride is effective at serving local trip needs. However, public engagement did not indicate a high interest in microtransit due to the success of the existing service, leading this study to recommend it for implementation in the medium term.

» **West Tucson**
This zone was designed to be an expansion of the existing Sun On Demand Zone 1. It exhibits higher ridership, higher productivity, and lower cost per rider out of zones analyzed. However, this zone has several Sun Tran fixed-route transit services available and a lower need for expanded transit services. This zone is one of the frequently requested microtransit zones during public engagement. Implementation will require further coordination with Sun Tran and the City of Tucson.

» **Vail**
Public and stakeholder engagement indicated that Vail has a high need for transit services, which do not currently exist. However, this zone is projected to have lower ridership and longer trips compared to other zones. This study recommends implementation in Vail to be after the Rita Ranch/Civano/Littletown zone, which exhibits higher performance.

» **Picture Rocks**
The zone has the lowest ridership out of all zones, leading to the lowest utilization and highest cost per rider out of all zones analyzed. However, there is a high need for transit services following the termination of Sun Shuttle Route 414P. Public input indicated that transit service is needed as residents have no other options. The RTA could initiate transit service in Picture Rocks as Dial-a-Ride and convert to microtransit in the future as ridership grows.

Long-Term Opportunity Zones

» **Catalina Foothills**
This zone has one of the highest productivity and lowest cost per rider out of all zones. However, the community is generally affluent with low transit propensity. Microtransit resources should be prioritized in other communities that have a higher need.

» **Tanque Verde**
This zone has low ridership and high cost per trip. The community is also generally affluent with low transit propensity. This zone has been placed in the long term so other communities that have a higher need could be prioritized.

» **Marana/Avra Valley**
This zone demonstrates low productivity and high cost per trip. While it is an existing dial-a-ride zone, long trip distances diminish the efficiency and increases the costs of operating microtransit.

Tortolita/Continental Ranch (near-term zone) and Marana/Avra Valley (long-term zone) are recommended to be used to replace Sun Shuttle Route 413, which has low ridership. This study recommends that Route 413 to be removed in the near term with the implementation of the Tortolita/Continental Ranch Zone, which would remove a transit connection between downtown Marana and the Casas Adobes area. The RTA may consider providing this connection with the existing Sun Shuttle Dial-a-Ride service.

Dial-a-Ride Considerations

The proposed microtransit zones identify multiple areas that either fully or partially lack existing transit service. It is possible that these zones could also be considered for dial-a-ride service and transitioned to microtransit service in the future.

Based on community feedback, there was a strong desire for extended hours earlier in the morning and later in the evening, as well as additional weekend service. These extended services could be implemented as part of existing dial-a-ride services, particularly for the existing zones identified as an extended service tier in advance of microtransit implementation.

Lastly, implementation considerations for microtransit included in this study are also largely applicable to enhance existing dial-a-ride services including software, fares, agency coordination and partnerships, and technology considerations to make operations as streamlined and user friendly as possible across all transit services.

13.1

Implementing Microtransit

Two important factors in implementing microtransit services are the operational and capital costs. Below is the cost by zone and the total investment once the services that will be replaced are considered in the calculation.

13.1.1

CAPITAL COSTS

Effective microtransit service requires smaller vehicles to provide service. This is due to the shorter trips where the software groups similar origins and destinations and guarantees faster trips for the riders. **Table 62** shows the capital cost of acquiring the vehicles.

Table 62: Capital Costs

Zone Name	Phasing	Number of Vehicles	Total Costs
Tortolita/Continental Ranch	**Near Term**	**6**	**$246,000**
Casa Adobes	**Near Term**	**5**	**$205,000**
Rita Ranch/Civano/ Littletown	**Near Term**	**5**	**$205,000**
Sahuarita/Green Valley	**Near Term**	**4**	**$164,000**
Ajo/Why	**Near Term**	**2**	**$82,000**
Total Near Term		**22**	**$902,000**
Oro Valley	**Medium Term**	**8**	**$327,000**
Tucson Estates/Valencia West/Drexel Heights	**Medium Term**	**8**	**$327,000**
West Tucson	**Medium Term**	**5**	**$205,000**
Vail	**Medium Term**	**2**	**$82,000**
Picture Rocks	**Medium Term**	**2**	**$82,000**
Total Medium Term		**25**	**$1,023,000**
Tanque Verde	**Long Term**	**2**	**$82,000**
Catalina Foothills	**Long Term**	**4**	**$164,000**
Marana/Avra Valley	**Long Term**	**3**	**$123,000**
Total Long Term		**9**	**$369,000**
Total Microtransit Capital Costs			**$2,294,000**

13.1.2

OPERATING COSTS

Annual operating costs have been calculated for each zone based on the current operating cost of $80/revenue hour (**Table 63**). The near-term implementation results in $4.9 million; of these services, three dial-a-ride zones are recommended to be transitioned to microtransit, and two are new services.

Table 63: Annual Operating Costs

Zone Name	Phasing	Operating Cost	Discontinued Services	Total
Tortolita/ Continental Ranch	**Near Term**	**$1,600,000**	**$318,000**	**$1,282,000**
Casa Adobes	**Near Term**	**$1,300,000**		**$1,300,000**
Rita Ranch/Civano/ Littletown	**Near Term**	**$800,000**	**$244,000**	**$556,000**
Sahuarita/ Green Valley	**Near Term**	**$700,000**	**$289,000**	**$411,000**
Ajo/Why	**Near Term**	**$500,000**	**$240,000**	**$260,000**
Total Near Term		**$4,900,000**		**$3,809,000**
Oro Valley*	**Medium Term**	**$1,800,000**	**$284,000**	**$1,516,000**
Tucson Estates/Valencia West/Drexel Heights	**Medium Term**	**$2,000,000**	**$284,000**	**$1,716,000**
West Tucson	**Medium Term**	**$1,300,000**		**$1,300,000**
Vail	**Medium Term**	**$350,000**		**$350,000**
Picture Rocks	**Medium Term**	**$300,000**		**$300,000**
Total Medium Term		**$5,550,000**		**$5,182,000**
Tanque Verde	**Long Term**	**$350,000**		**$350,000**
Catalina Foothills	**Long Term**	**$700,000**		**$700,000**
Marana/ Avra Valley	**Long Term**	**$550,000**	**$264,000**	**$286,000**
Total Long Term		**$1,600,000**		**$1,336,000**
Total Microtransit Capital Costs		**$12,250,000**		**$10,327,000**

**Operating costs are $56/revenue hour for current dial-a-ride service*

13.1.3
IMPLEMENTATION CONSIDERATIONS

The implementation of microtransit projects requires the agency to make decisions related to the type of service they want to use, software, storage, coordination, funding and others, as shown below.

Staffing and Procurement Model

As discussed in the Microtransit Service Models section, microtransit is typically operated with a software as a service (SaaS) or turnkey model. Some agencies use some elements of each model to take advantage of fleet, software, equipment, personnel, etc. This study recommends that the RTA operates microtransit under a turnkey model, similar to how it currently operates Sun Shuttle services. The operator should provide vehicles, staff, and software. Ongoing hourly costs will decrease as fleet size increases because fixed costs are spread among the revenue hours.

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Software

An effective microtransit service should include a robust software platform as discussed in the Microtransit Service Models section. The rider-facing interface should be a mobile app and website that includes a multimodal trip planner, real-time vehicle updates, payment, and other features in an easy-to-use and accessible user interface. A call center option should be provided for riders without smartphone or internet access. The software platform should also be capable of tracking ride histories and extra performance metrics for easy monitoring.

Since the RTA already hires a turnkey provider, it is recommended that the contract includes the on-demand app and technology to operate the microtransit service. The app needs to have the option to add new and modify existing microtransit zones to respond quickly to needs anywhere in the County.

Vehicle Storage

Microtransit typically uses vans to provide service, which have more flexible storage space requirements compared to cutaway shuttles and buses. It is recommended to store vehicles close to where they will provide service to reduce deadhead miles. This will also allow the provider to allocate additional vehicles when needed and to respond timely to issues in service. Agreements could be made with agencies or shopping centers/parking garages to facilitate vehicle storage and staging.

Fares

Transit in Pima County has been operating fare-free since the COVID-19 pandemic. If fares are reinstated, microtransit fares are recommended to match the fares of other fixed-route and dial-a-ride services. Fee transfers from microtransit to fixed-route and other microtransit zones to encourage transit usage should also be considered.

Marketing and Outreach

Successful microtransit programs across the County highlight the importance of marketing and outreach, especially since microtransit is a newer transit service that potential riders may be unfamiliar with. An effective marketing and outreach campaign should be conducted before and after service launch that generates awareness and excitement. The campaign should also explain how to ride microtransit, which can help reduce riders' anxiety in trying a new service.

Agency Coordination and Partnerships

In general, the RTA will oversee operating the microtransit service, requiring only internal coordination with fixed-route services and dial-a-ride as it is phased out. If microtransit service is extended beyond the boundaries to reach zones operated by Sun Tran or Oro Valley, it is recommended to coordinate these services with those agencies to offer seamless transfers and enhanced experiences.

Additionally, it is recommended that the RTA coordinates with social service agencies, volunteer services, and the school district when implementing microtransit, and adjust service if needed.

Funding

Currently, the RTA relies on a combination of funding sources, including local sales taxes, and FTA grant funds. For nearly two decades, the RTA has supported countywide transit operations through these funds.

If these funding sources become unavailable, particularly if RTA Next is not approved by voters, both the RTA and other transit service providers will need to reassess the structure and priorities of the regional transit system in the county to align with community needs and available resources. Additionally, the City of Tucson will need to evaluate their resources to determine if the implementation aligns with their budget and priorities.

The recommendations outlined in this report would result in an estimated increase of **$10.2 million in annual operating costs and $2.1 million in capital costs** by year 10 of implementation if all potential zones are implemented.

For Fiscal Year 2025, the current transit funding allocation for the greater Tucson region stands at **$31.6 million**. Voters will have the opportunity to consider the new half-cent sales tax and associated RTA Next plan in the election anticipated for March 2026. While future funding levels remain uncertain, advancing the **RTA Next** initiative will be essential to support the proposed improvements. Without these funds, a comprehensive reevaluation of transit operations and investment priorities across the County will be necessary.

If these funding sources become unavailable, particularly if RTA Next is not approved by voters, both the RTA and other transit service providers will need to reassess the structure and priorities of the regional transit system in the county to align with community needs and available resources.

13.1.4
PILOT PROJECTS

One of the most effective ways to determine whether microtransit is the right solution for the community is to implement a pilot project. Pilot projects are limited in duration and provide information to the agency to refine the service, extend it, or eliminate it. In general, microtransit is a very popular solution in the communities that have implemented it, due to the high level of service. Based on data collected during the development of the feasibility study and public input, Ajo/Why is the zone that could be ready to receive this type of service, followed by Sahuarita/Green Valley. Since these two zones have very defined boundaries, it should have a quick deployment timeline and will be easier to determine effectiveness. As PAG/RTA consider where to implement the pilot projects, the TAC could assist in helping identify the zones that would be most suitable. Pilot projects should not be less than six months and ideally would be in place for a year; this will give the agency a good sense of what works and what needs to be adjusted.

13.2

Implementation Roadmap

Launching an effective microtransit service involves planning, design, procurement, operations, and monitoring. This roadmap in **Table 66** identifies the steps the RTA, or its turnkey provider, would need to take to launch a pilot or full microtransit service. It is important to note that many of these steps can be completed concurrently, and need to be, to expedite the launch of new microtransit services. The general timing of these steps is shown in **Figure 79**.

Table 66: Microtransit Implementation Roadmap Steps

01 PLANNING	Estimated Duration
» Develop a Data Management Plan (DMP) to specify data collected, ownership, storage, sharing, and security	**2 – 3 months**
» Develop an Equity and Accessibility Plan (EAP) to address how microtransit service will be accessible to populations with disabilities, unbanked populations, and populations without access to internet and/or smartphones	**2 – 3 months**
» Select which microtransit service zone(s) to implement	**2 – 3 months**
» Decide if service will be launched as a pilot or regular service	**1 – 2 months**
» Conduct rider education sessions and publicize information through the website, traditional media, and social media prior to launch	**3 months**

02 DESIGN	Estimated Duration
» Select the microtransit service model, either the recommended turnkey model, SaaS, or a combination of the two	**1 – 2 months**
» Determine fare structure for the microtransit service, if needed	**1 – 2 months**
» Update the Rider Guide to reflect the selected service zone(s), operating days and hours, fares, and guidelines for riding	**2 – 3 months following selection of microtransit vendor**

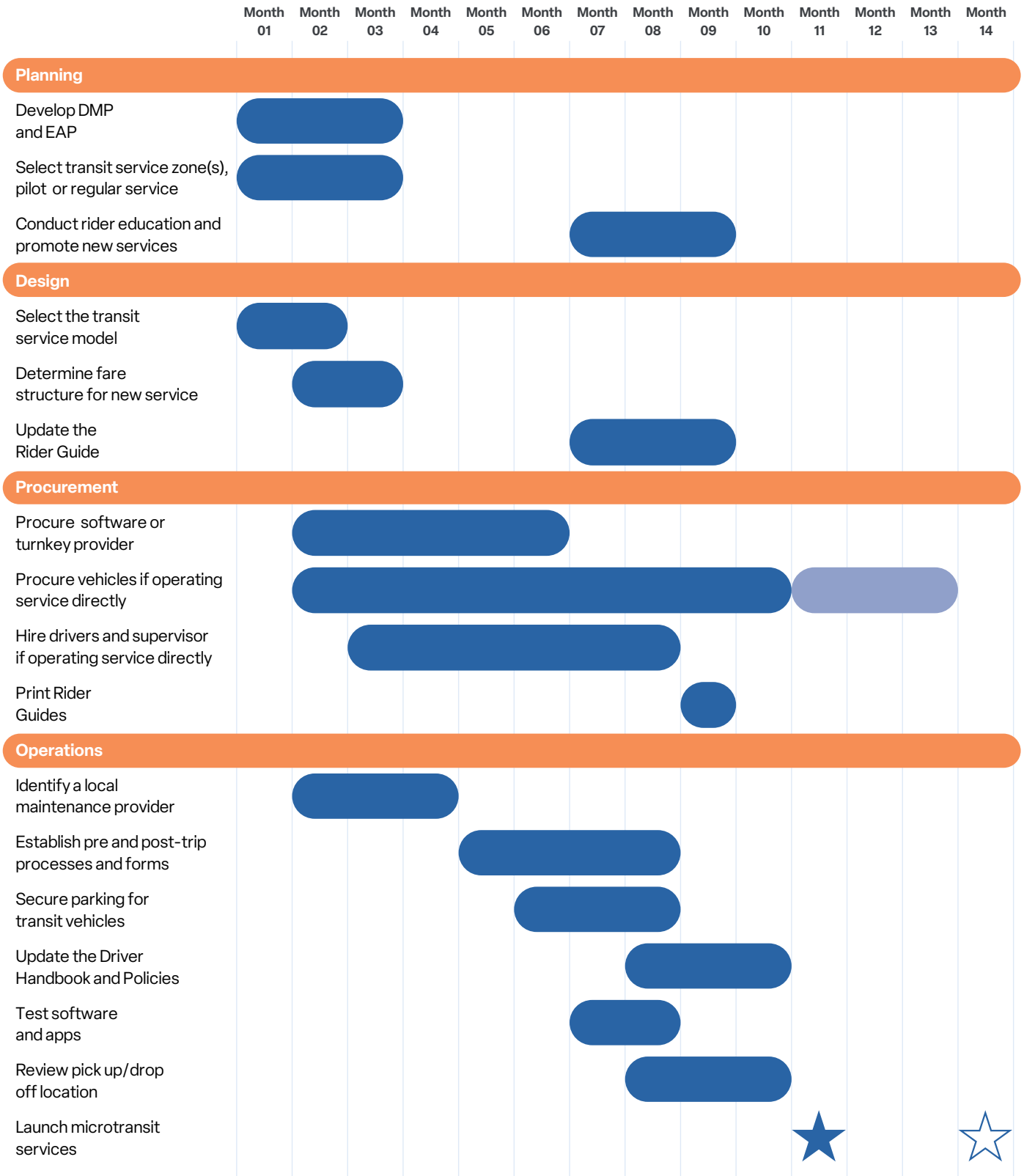
Table 66: Microtransit Implementation Roadmap Steps (Cont.)

03 PROCUREMENT	Estimated Duration
» Develop a Request for Proposal for microtransit software and app if operating the service directly. If using the current turnkey provider, amend the contract to include microtransit service. If using a new turnkey provider, develop a Request for Proposal for microtransit turnkey operations. Turnkey services should include the microtransit software and app	**3 – 5 months**
» Procure vehicles with required technology (e.g., tablets) if operating the microtransit service directly	**9 – 12 months**
» If operating the microtransit service directly, hire drivers (including spare drivers) and one supervisor	**3 – 6 months**
» Print updated Rider Guides, update website	**1 month before launch**

04 OPERATIONS	Estimated Duration
» Identify a local maintenance provider for microtransit vehicles	**2 – 3 months**
» Establish the pre-trip and post-trip inspection process and forms for microtransit drivers	**2 – 3 months**
» Secure parking locations for microtransit vehicles	**2 – 3 months**
» Update the driver handbook and policies to reflect microtransit service	**2 – 3 months**
» Test dispatcher microtransit platform, driver microtransit application, rider app, and call center process	**1 – 2 months**
» Review pick-up/drop-off locations generated by the microtransit software that may be unsafe or unsuitable, and remove them from the platform	**2 – 3 months**

05 MONITORING	Estimated Duration
» Collect data on microtransit service performance	**Monthly**
» Assess microtransit service for improvements based on operational data, surveys, and stakeholder input	**3 – 6 months**

Figure 79: Implementation Roadmap Timeline



Vehicle procurement is estimated to take nine to 12 months, denoted by the dark and light blue bars under Procurement. This timeline demonstrates when microtransit service could be launched under either scenario, denoted by the solid and transparent stars.

SECTION 14

Conclusion

The findings of this study show that even though the existing transit network for the greater Tucson region covers the most important locations, there are still unmet transit needs. There are areas with no transit service, such as the communities of Picture Rocks and Vail, and other areas where there is a need to provide further access to essential services. The analysis also showed that there are areas where more flexibility can be offered to riders, such as same-day reservations and shorter wait times.

In terms of technology, the current software (RideCo) that Sun Shuttle uses for scheduling and managing dial-a-ride trips is sufficient for microtransit. Microtransit relies heavily on the ability to group similar trips. However, this is a cost that the service operator will incur as part of the turn-key operational contract.

Out of the fixed-route services, some routes have been underperforming, and those resources could be reallocated to microtransit services. Microtransit may be more cost-effective to operate in these scenarios.

In general, the simulations show that microtransit is a viable alternative to expand transit coverage and increase ridership in the greater Tucson region. Should all opportunity zones be implemented, microtransit will require an investment of approximately an additional $2.9 million in capital costs and $12.3 million per year in operating costs, which could be covered partially by the RTA Next referendum that is anticipated to take place in Spring 2026.

Air quality impacts resulting from implementation of microtransit are minimal and would result in fractional increases in regional transportation-related air pollutants and greenhouse gas emissions.

Microtransit is a valuable tool to bring transit to areas that are difficult to serve with traditional transit service, provide mobility alternatives to vulnerable populations, and improve the quality of life of the residents of Pima County.

In general, the simulations show that microtransit is a viable alternative for Pima County to expand transit coverage and increase ridership.