

## 6 PEER REVIEW

This peer review provides a comparative analysis of fixed-route transit characteristics of RoadRUNNER Transit and seven other transit systems. Peer systems chosen as part of this analysis and are shown in Figure 39 and mapped in Figure 40. Each peer selected operates in a similarly sized city within the western United States. Major universities are present in four of the peer cities.

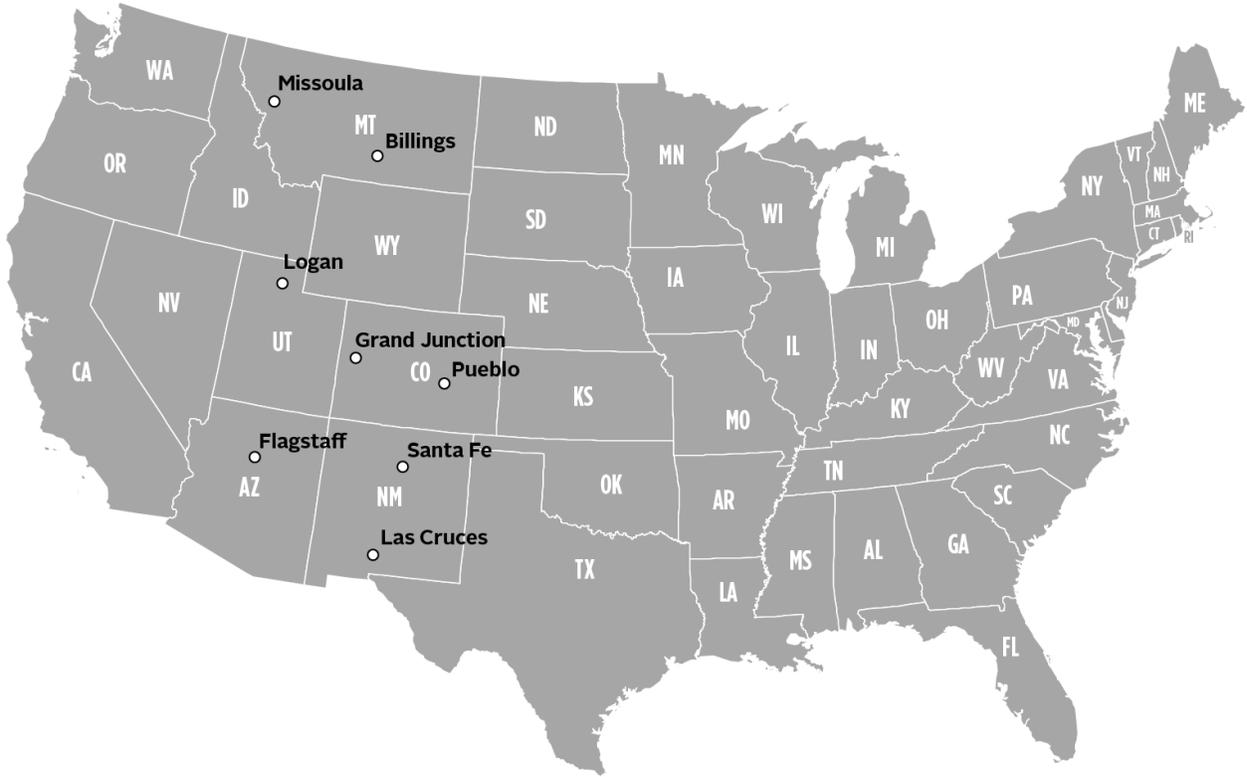
**Figure 39 Peer Review Agencies**

System/Agency Name	Location	Organization Type	Passenger Trips	Service Area Population	Service Area Size (sq mi)	Population per Square Mile	Peak Vehicles (Fixed Route)
RoadRUNNER	Las Cruces, NM	City	759,645	107,419	55	1,953	12
Billings Metropolitan Transit	Billings, MT	City	609,194	114,773	34	3,376	20
Cache Valley Transit District	Logan, UT	Authority	1,978,002	95,500	33	2,894	17
Mesa County Transit	Grand Junction, CO	City	974,644	120,000	66	1,818	12
Mountain Line	Flagstaff, AZ	Authority	1,842,322	71,957	35	2,056	15
Mountain Line	Missoula, MT	Authority	886,049	69,999	70	1,000	18
Pueblo Transit	Pueblo, CO	City	995,589	105,000	39	2,692	14
Santa Fe Trails	Santa Fe, NM	City	1,056,970	69,204	41	1,688	22

Source: NTD 2013 Transit Agency Profiles

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**Figure 40**    **Cities of Peer Review Agencies**



## Service Characteristics

Service characteristics such as service area population and service area size, as well as passenger trips, revenue hours, revenue miles, vehicles operated in peak service, total funds earned, total local contribution, and percent local contribution of total funds. RoadRUNNER’s performance in relation to the peer group is shown in Figure 41.

**Figure 41 Service Characteristics**

Measure	RoadRUNNER	Peer Group Minimum	Peer Group Maximum	Peer Group Average	RoadRUNNER % from Average
Service Area Population	107,419	69,204	120,000	94,232	14.0%
Service Area Size (sq mi)	55	33	70	47	18.0%
Population per Square Mile	1,953	1000	3,376	2,185	-10.6%
Revenue Hours	36,557	36,557	73,229	49,861	-26.7%
Revenue Miles	506,260	506,260	868,106	680,924	-25.7%
Vehicle Operated in Peak Service (Fixed Route)	12	12	22	16	-26.2%
Average Fleet Age (Fixed Route)	7.7	5.00	8.40	6.91	11.39%
Total Funds Earned	\$6,307,838	\$4,643,350	\$10,569,734	\$6,595,104	-4.4%
Total Local Contribution	\$2,322,141	\$1,565,869	\$6,707,768	\$3,036,973	-23.5%
Percent Local Contribution of Total Funds	37%	34%	69%	44%	-16.6%

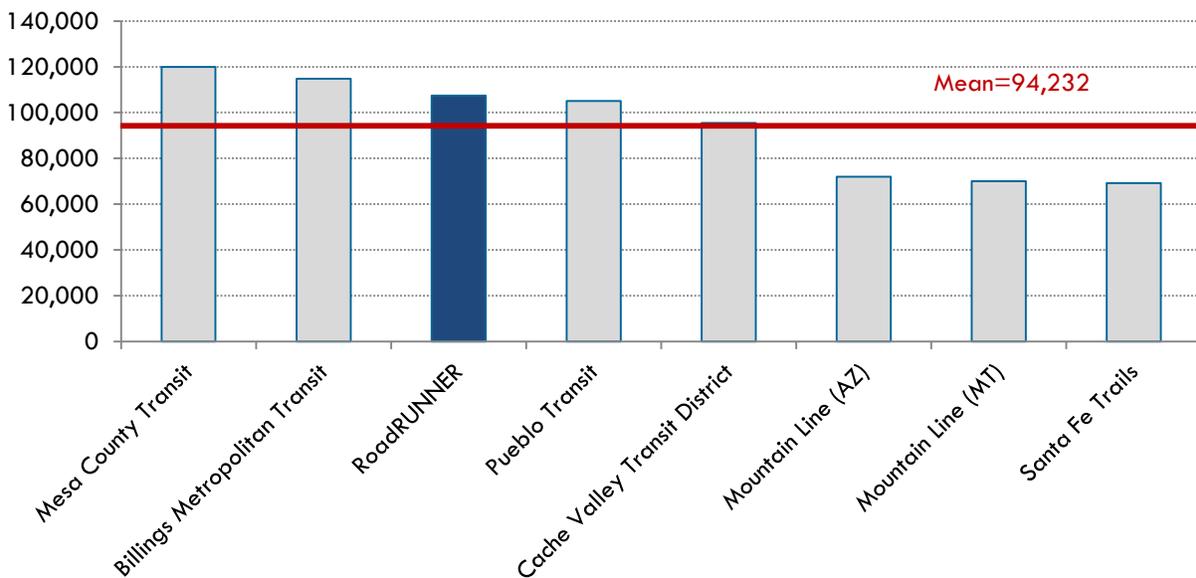
Source: NTD 2013 Transit Agency Profiles

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Figure 42 to Figure 51 illustrate RoadRUNNER’s performance characteristics in relation to each peer agency.

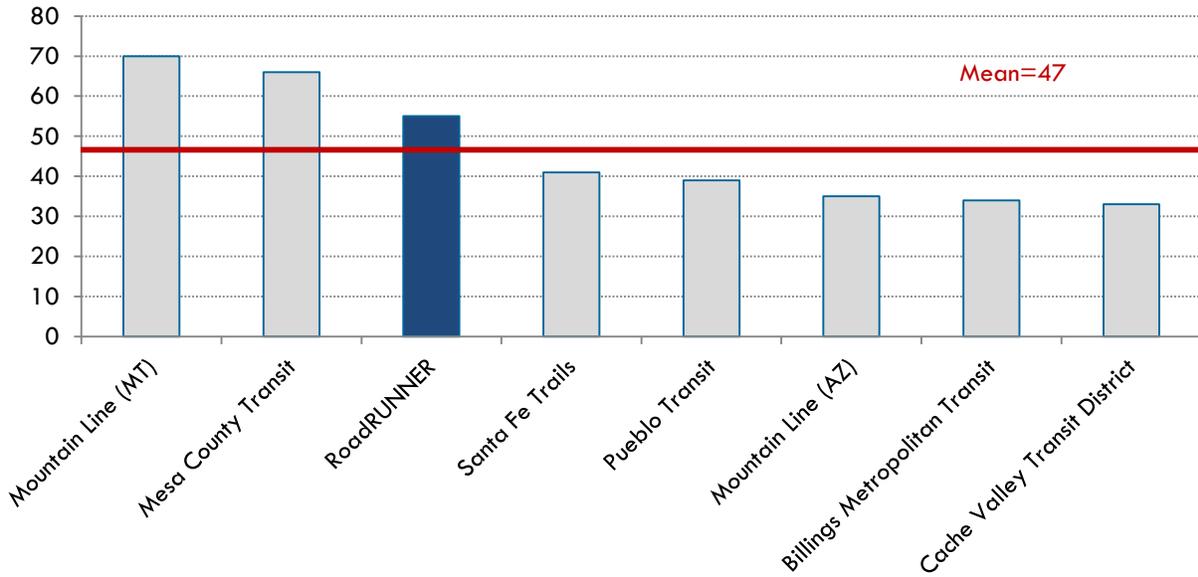
- Despite having the third highest service area population, RoadRUNNER operates the second fewest number of fixed-route peak vehicles.
- RoadRUNNER’s service area size is slightly above the peer group mean, and population density was 11% lower than the peer group average.
- For revenue hours and revenue miles, RoadRUNNER ranked lowest among the peer group. RoadRUNNER also had the second lowest number of passenger trips. Overall, RoadRUNNER had approximately one-third fewer passenger trips and 25% fewer revenue hours and miles than the peer group average.
- RoadRUNNER operates a larger proportion of demand response vehicles (54% of operating vehicles) compared to the peer agency average (35%)
- RoadRUNNER ranked below the mean in terms of total funds earned (\$6.3 million vs. \$6.6 million). Total local contribution (\$2.3 million) was 24% lower than the peer group average (\$3.1 million). The percent local contribution of total funds for RoadRUNNER was 38% (compared to the peer group average of 44%).

**Figure 42 Service Area Population**

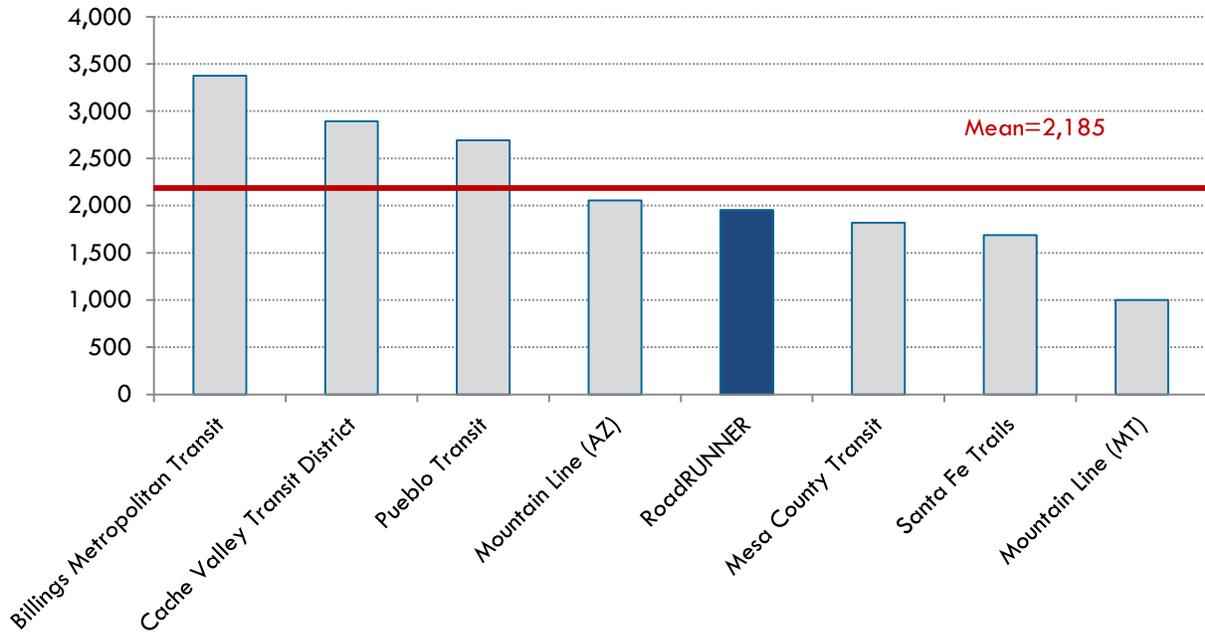


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**Figure 43 Service Area Size (sq mi)**

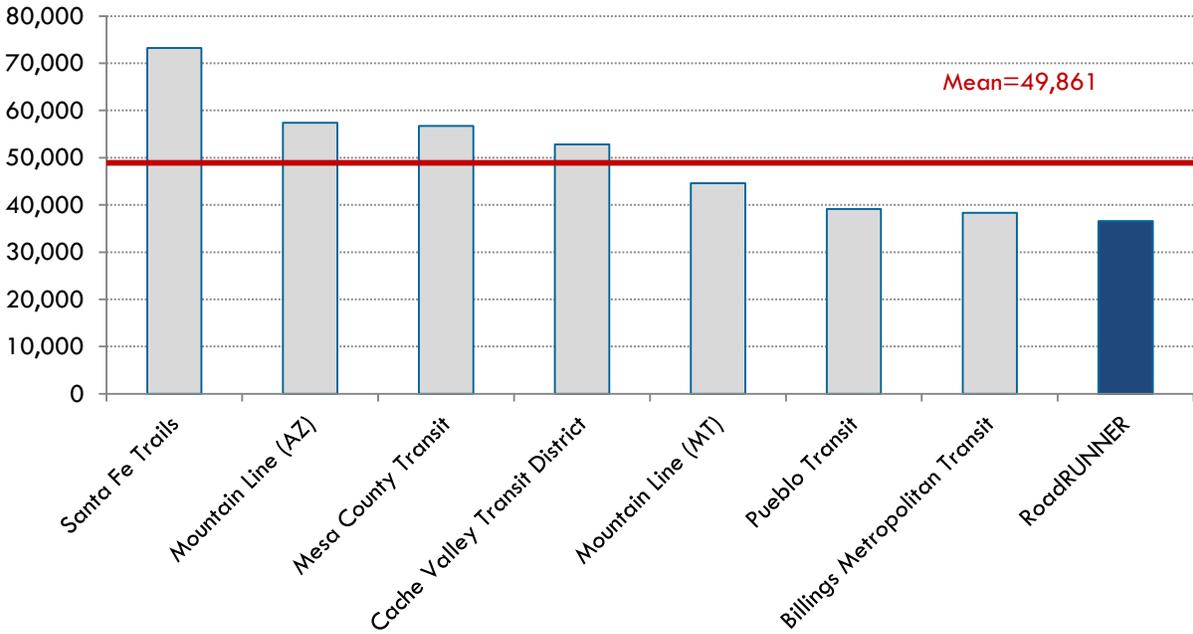


**Figure 44 Population per Square Mile**

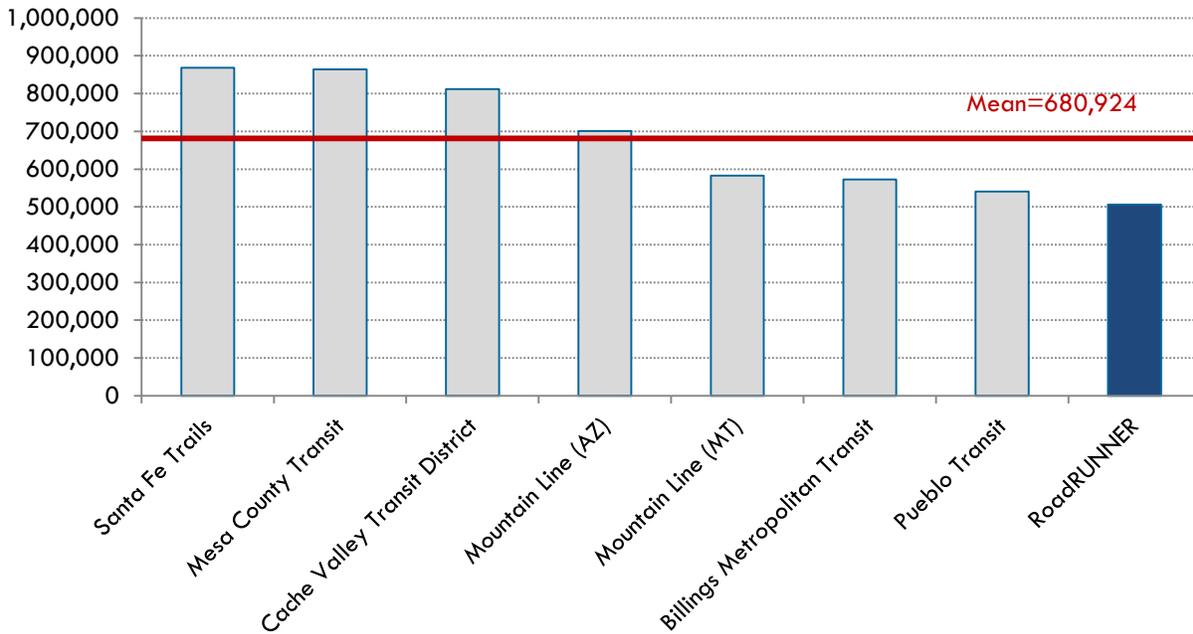


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**Figure 45 Revenue Hours**

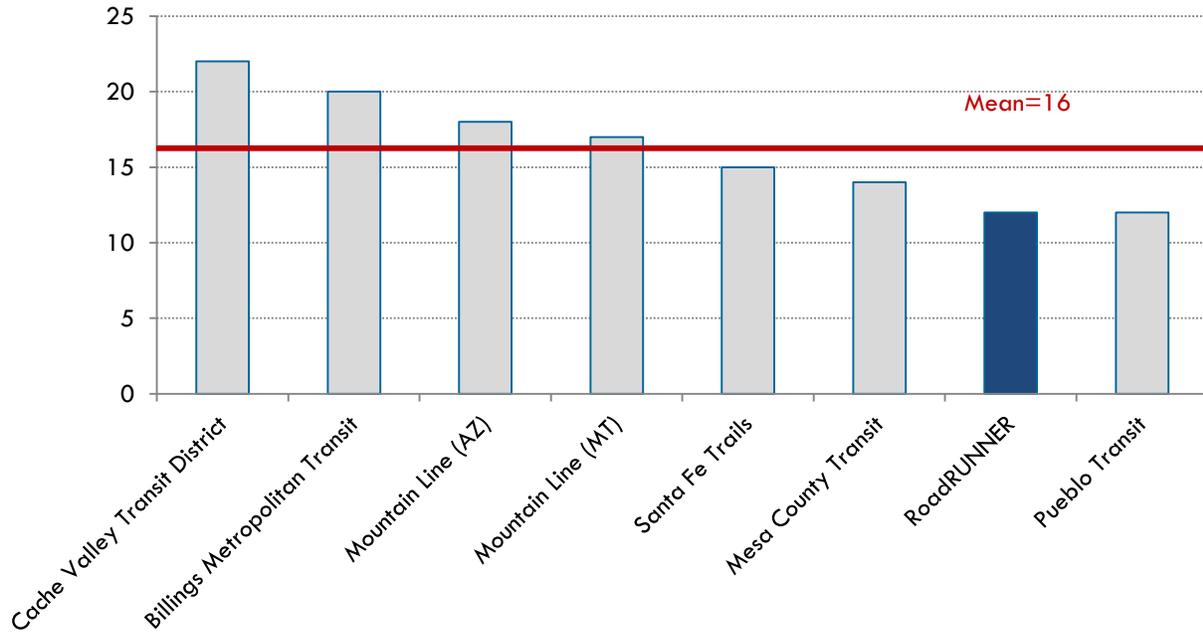


**Figure 46 Revenue Miles**

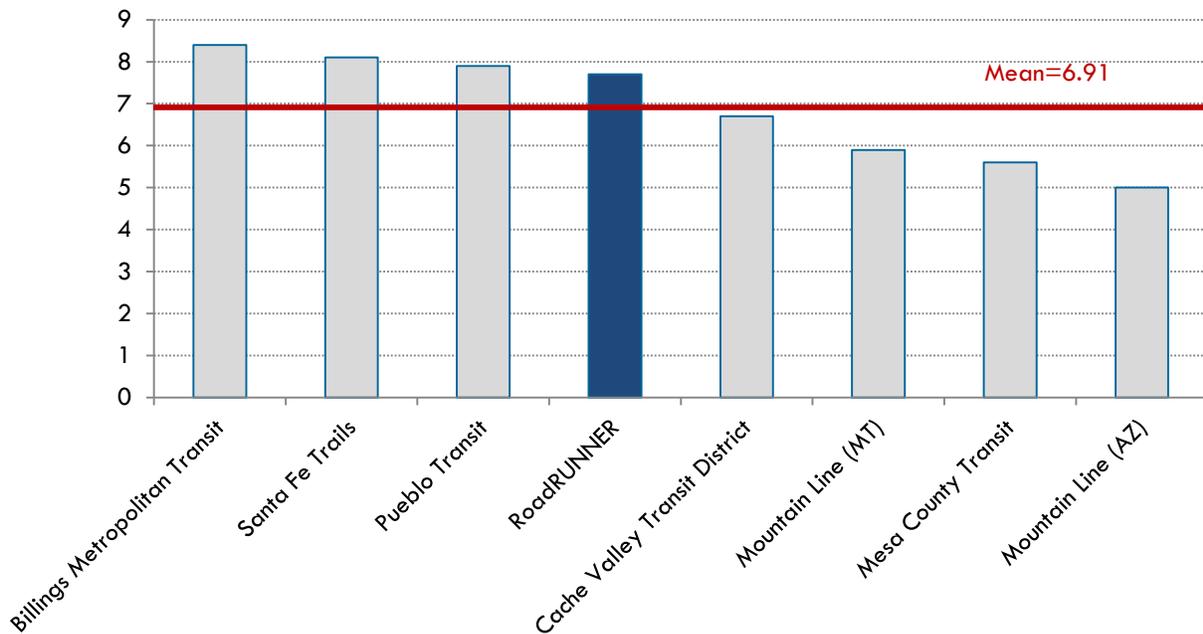


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**Figure 47 Vehicles Operated in Peak Service (Fixed Route)**

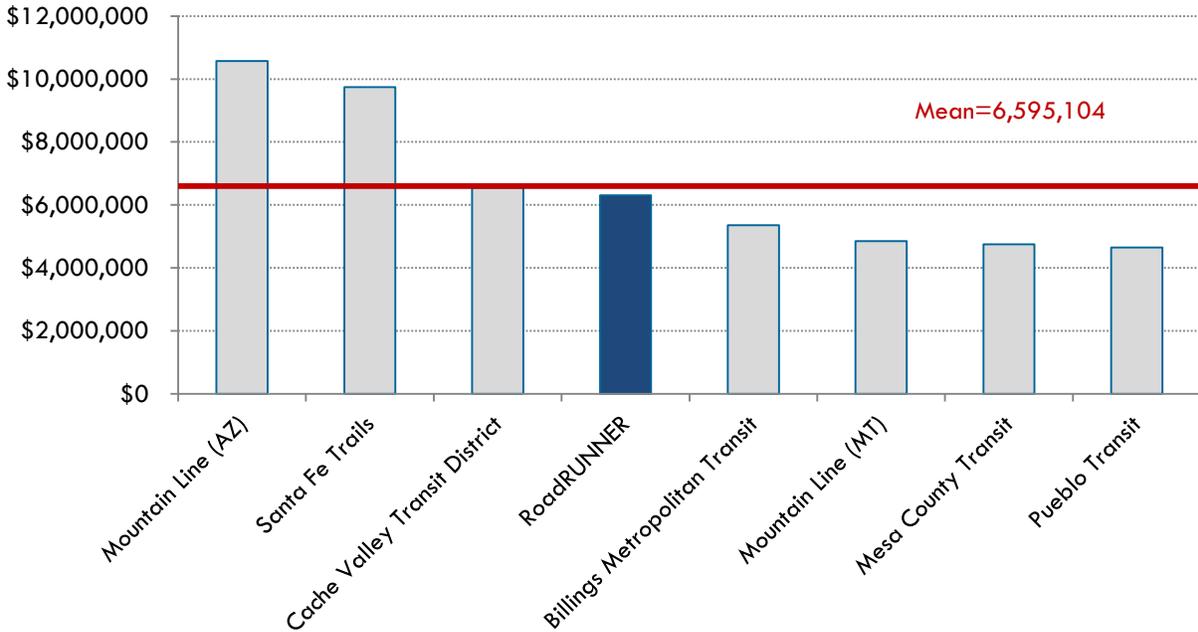


**Figure 48 Average Fleet Age (Fixed Route)**

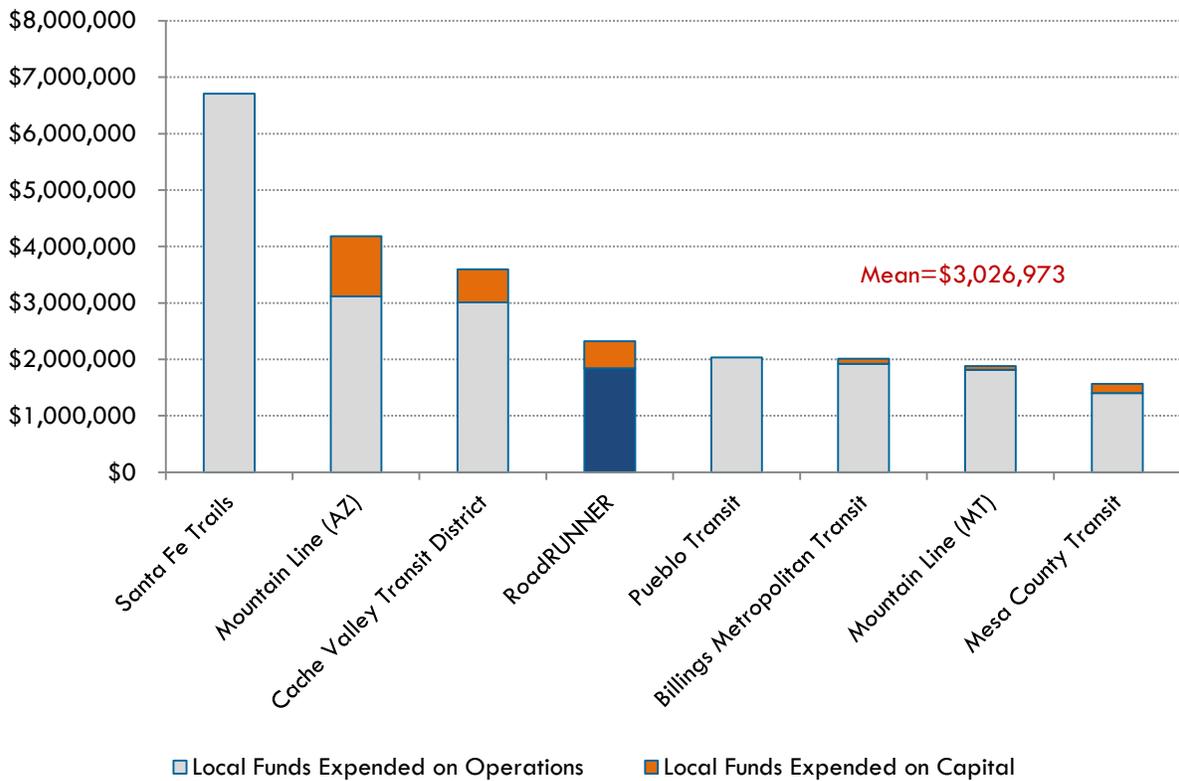


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**Figure 49 Total Funds Earned**

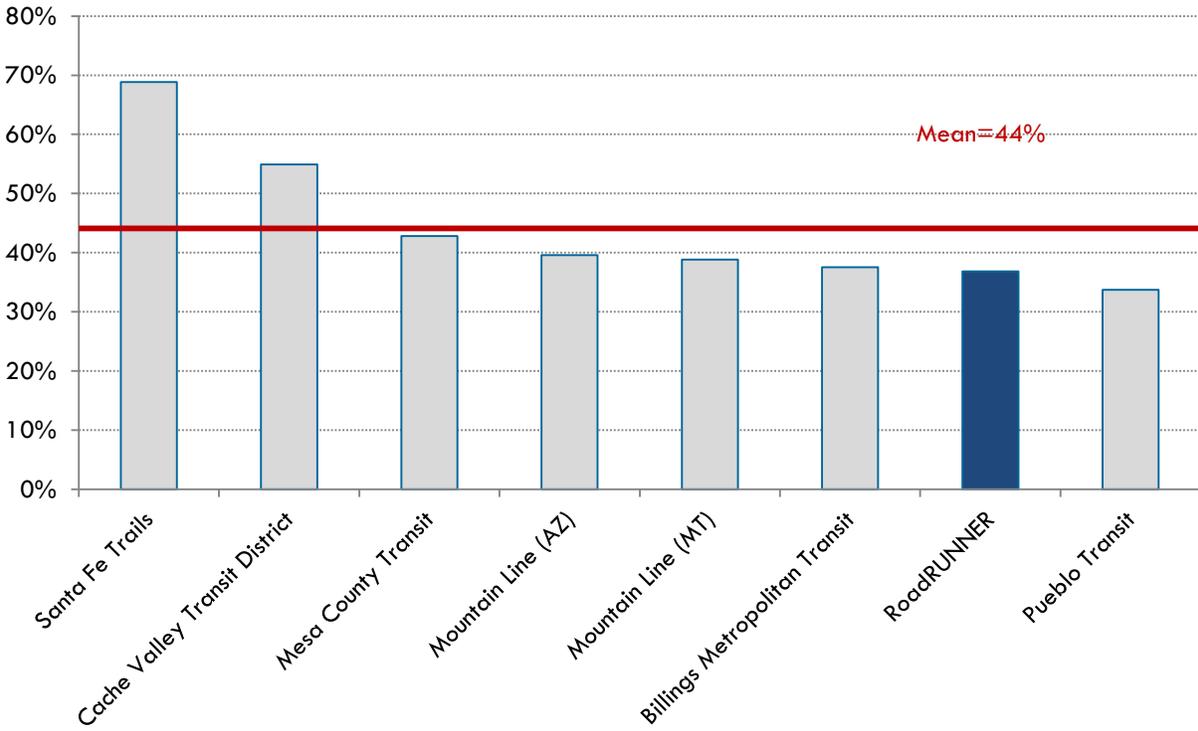


**Figure 50 Total Local Contribution**



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**Figure 51**    **Percent Local Contribution of Total Funds**



## Effectiveness Measures

Effectiveness measures include passenger trips and passenger trips per revenue. The comparison of RoadRUNNER’s measures in relation to the peer group is shown in Figure 52.

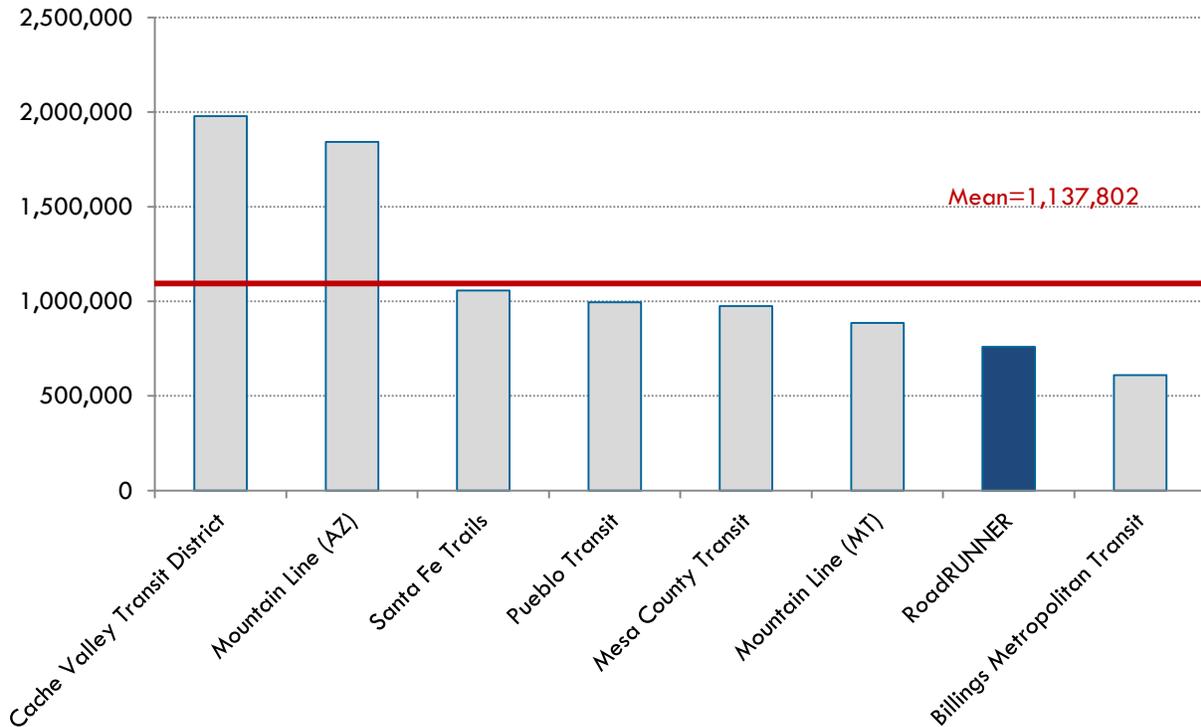
**Figure 52 Effectiveness Measures**

Measure	RoadRUNNER	Peer Group Minimum	Peer Group Maximum	Peer Group Average	RoadRUNNER % from Average
Passenger Trips	759,645	609,194	1,978,002	1,137,802	-33.2%
Passenger Trips Per Revenue Hour	20.78	14.43	37.44	22.89	-9.21%

Source: NTD 2013 Transit Agency Profiles

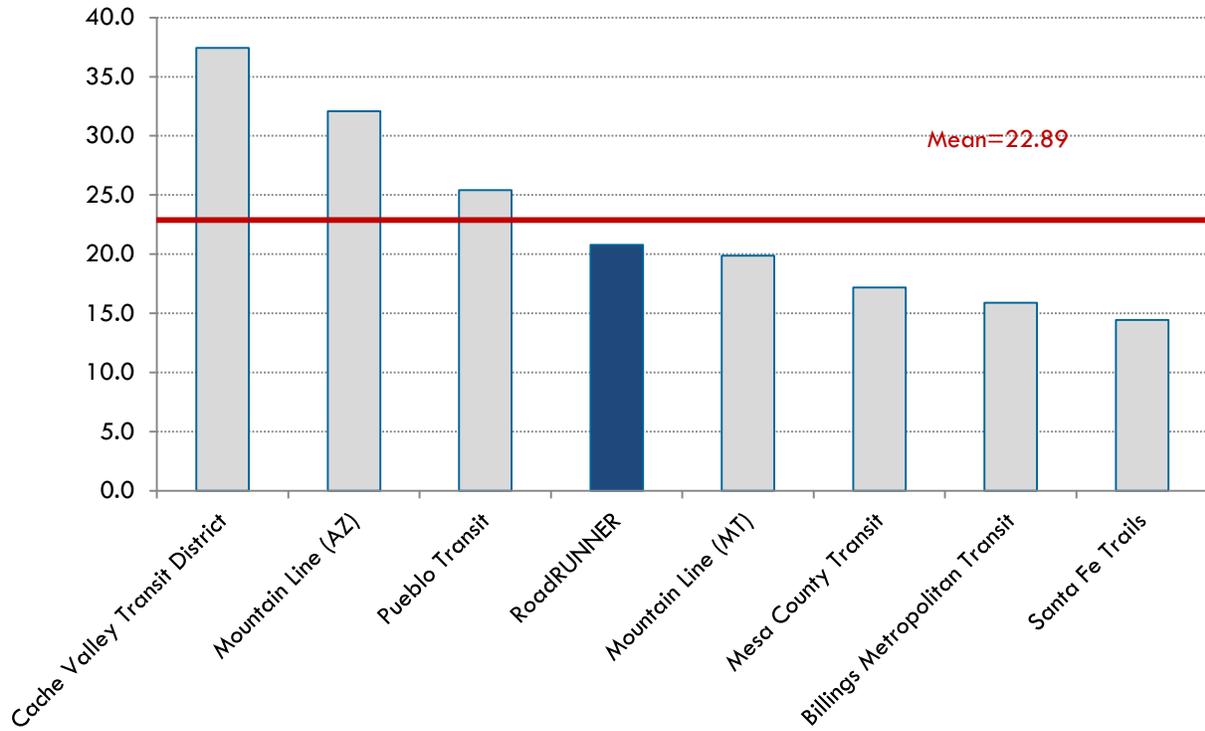
RoadRUNNER ranked second to last in annual passenger trips. In terms of passenger trips per revenue hour, RoadRUNNER was just below the group average.

**Figure 53 Passenger Trips**



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Figure 54 Passenger Trips per Revenue Hour



## Efficiency Measures

Farebox recovery is a measure of efficiency. RoadRUNNER’s farebox recovery measure in relation to the peer group can be seen in Figure 55.

**Figure 55 Efficiency Measures**

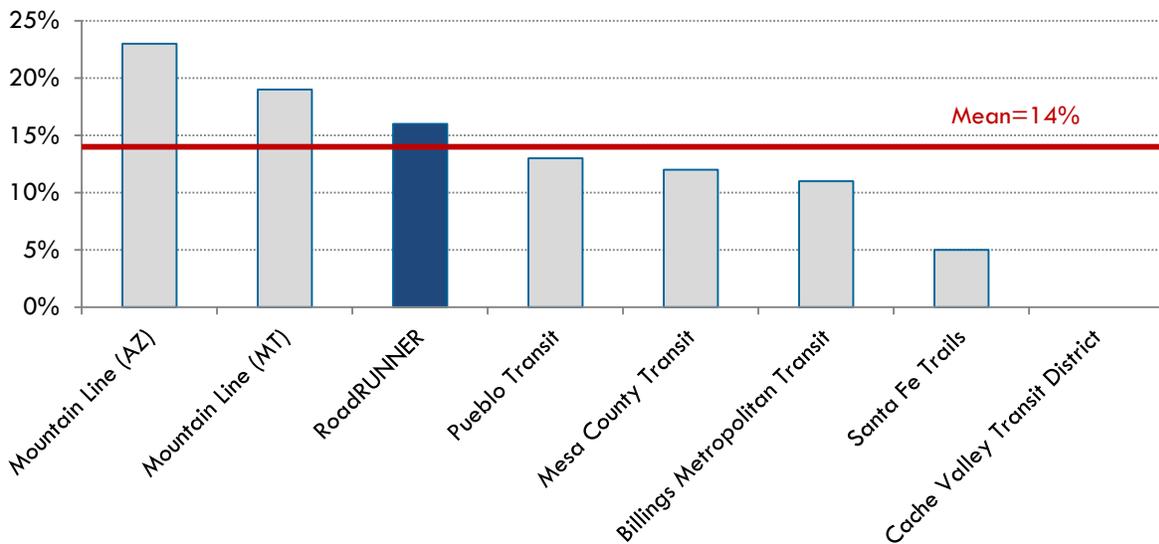
Measure	RoadRUNNER	Peer Group Minimum	Peer Group Maximum	Peer Group Average	RoadRUNNER % from Average
Farebox Recovery	16%	5%	23%	14%	13%

Source: NTD 2011 Transit Agency Profiles.

Note: RoadRUNNER farebox recovery data was unavailable from NTD in 2012 and 2013. Cache Valley Transit District farebox recovery data was unavailable and is not included in the peer group measure.

Figure 56 illustrates RoadRUNNER’s farebox recovery in relation to each peer agency. RoadRUNNER ranked third highest, slightly above the peer group average.

**Figure 56 Farebox Recovery**



Note: Cache Valley Transit District operates as a fare free system and is not included in the peer group measure.

## **Conclusion**

Overall, RoadRUNNER's measures largely fell in the middle to the low end of the peer group. RoadRUNNER had fewer passenger trips, revenue hours, revenue miles, and vehicles operated in peak service compared with the selected peer agencies. When considering remaining measures, RoadRUNNER finished neither first nor last among its peer agencies. In particular, fleet age was closely in line with other peer agencies.

RoadRUNNER had a lower amount of total funds earned and local contribution of total funds compared to the peer group average. At the same time, it was very close to the mean for farebox recovery ratio, placing second overall among peer agencies in this category.

Despite having the second highest service area population, RoadRUNNER operates the fewest number of fixed-route peak vehicles and has a higher proportion of demand response vehicles. Since RoadRUNNER's passenger trips per revenue hour currently ranks below the peer group mean, additional local funding could help improve overall system productivity by improving service and increasing the attractiveness of transit for passengers.

The comparative performance measures included in the peer analysis indicate that RoadRUNNER would experience increased ridership due to increased investment in transit services.

## 7 CUSTOMER SURVEY RESULTS

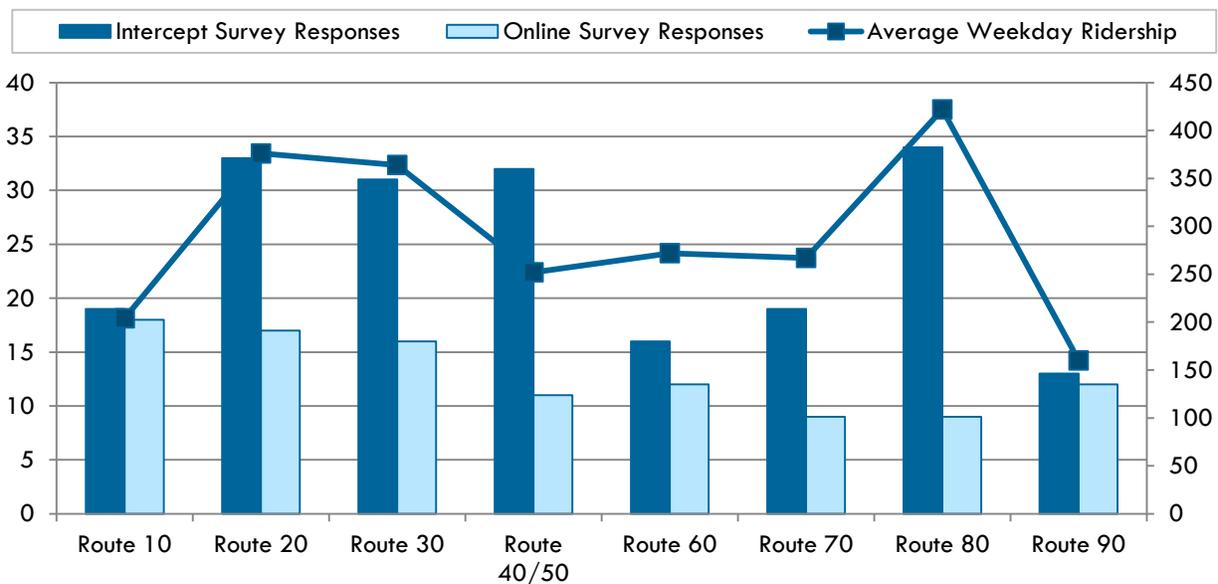
A rider intercept survey was conducted by Mesilla Valley MPO staff during December 2014 and January 2015. The intercept survey was administered at the Mesilla Valley Intermodal Transit Terminal, Mesilla Valley Mall, and on board buses. The survey included a range of questions focused on travel patterns, rider demographics, and general feedback.

An online version of the customer survey was also made available from December 10, 2014 through May 1, 2015. A flyer describing the Short Range Transit Plan with a link to the online survey was distributed on buses. The online survey was also promoted on the City’s cable broadcast and mentioned in the Weekly Newsletter to City Council.

### Survey Responses

A total of 94 intercept survey and 45 online survey responses were received. Both surveys asked respondents to indicate which routes they used. The results are graphically displayed in Figure 57. The chart also compares average weekday ridership. The number of intercept surveys collected was approximately nine percent of the average weekday ridership for all routes. The number of online surveys collected was approximately two percent of the average weekday ridership for all routes. The ratio of intercept survey responses to ridership was fairly consistent across all routes.

**Figure 57 Survey Responses by Route**



### Number of Routes Taken

Forty-seven percent of intercept survey respondents and 64% of online survey respondents indicated that they regularly take two or more routes. Sixteen percent of intercept survey respondents and 21% of online survey respondents indicated that they take four or more routes on a regular basis.

Figure 58 Intercept Survey: Number of routes taken

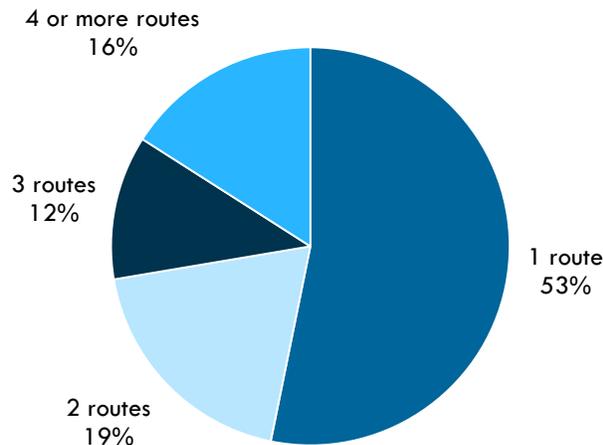
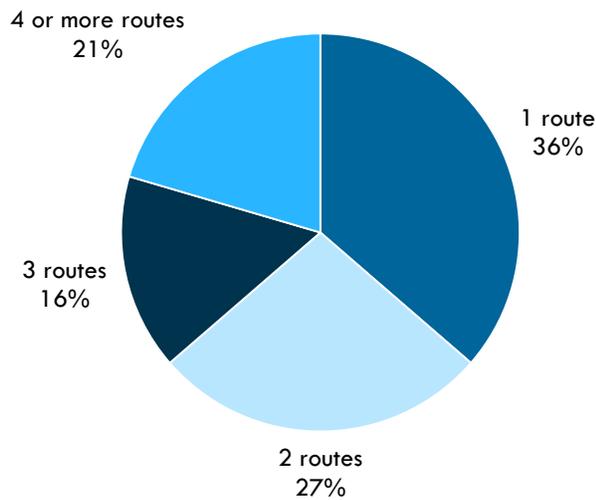


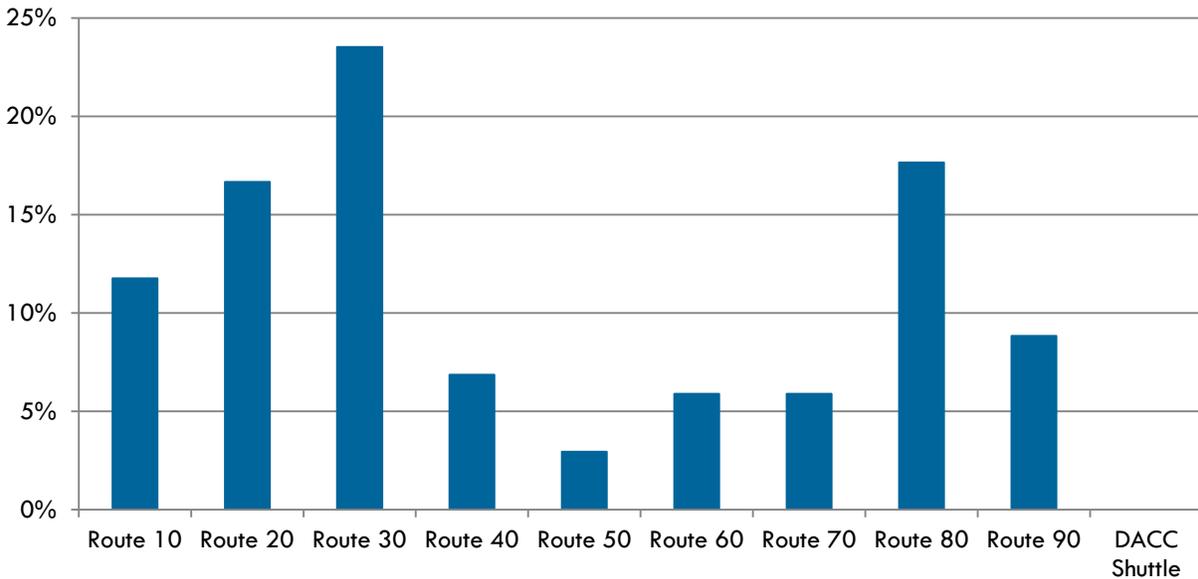
Figure 59 Online Survey: Number of routes taken



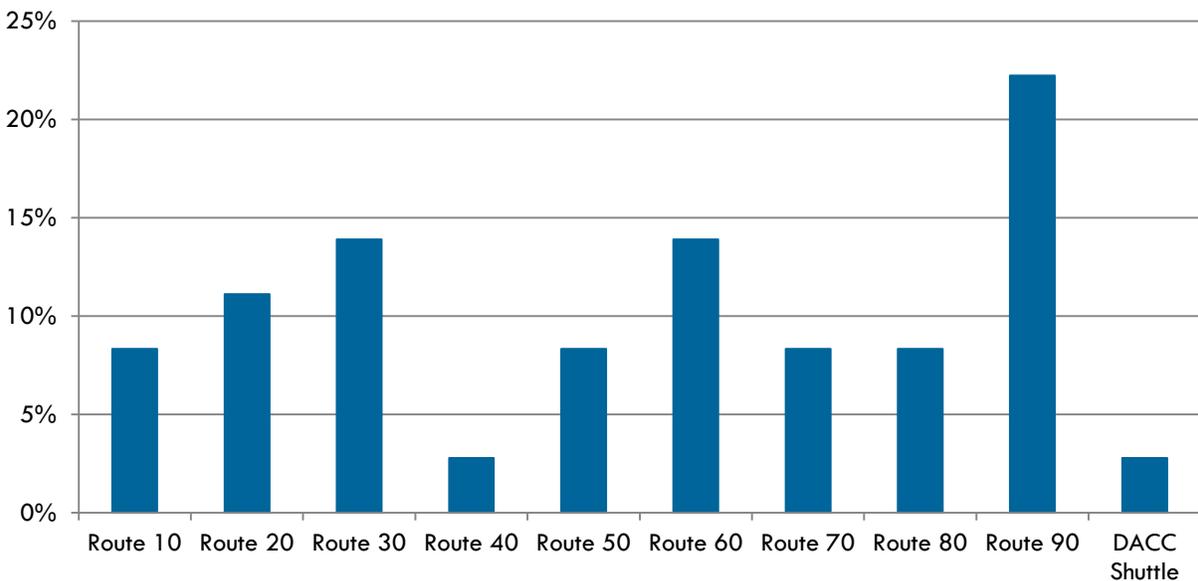
**Reported Transfers between Routes**

Each survey asked respondents to provide information regarding potential transfer activity. According to the intercept survey results, Routes 20, 30, and 80 have the highest percentage of total transfers. It should be noted that the aforementioned routes do not have access to a major grocery store. Less than 10% of riders who use routes 40, 50, 60, and 90 transfer to another route to reach their destination. Survey respondents transferred most frequently to Routes 20 and 30. Many participants also transferred to 10, 60, 80, and 90. Routes 40, 50, and 70 are significantly less utilized for transfers. The online survey had a higher percentage of Route 90 riders.

**Figure 60 Intercept Survey: Routes transferred to or from**



**Figure 61 Online Survey: Routes transferred to or from**



### Trip Purpose

The trip purposes reported by survey respondents are shown below. Over 50% of intercept survey respondents were traveling to go shopping. Slightly over 40% of riders were traveling to or from work, and a further 37% of riders were traveling for medical reasons. Fifteen percent of ridership was generated by K-12 students, while the remaining seven percent of ridership was comprised of college students. In contrast, over 50% of online survey respondents listed travel to and from work as their trip purpose.

Figure 62 Intercept Survey: Trip Purpose

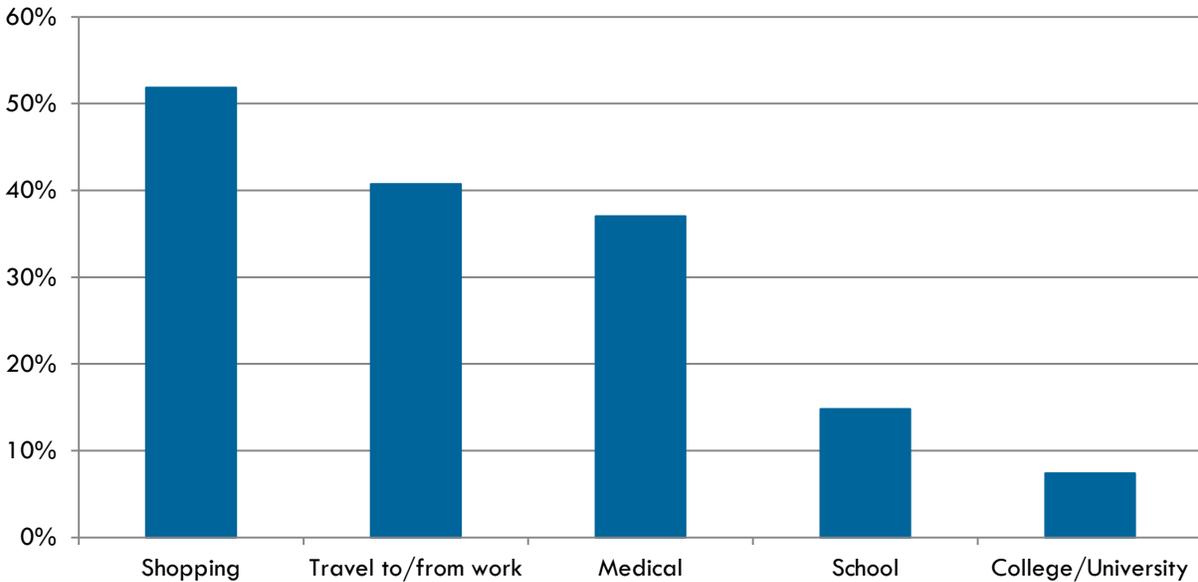
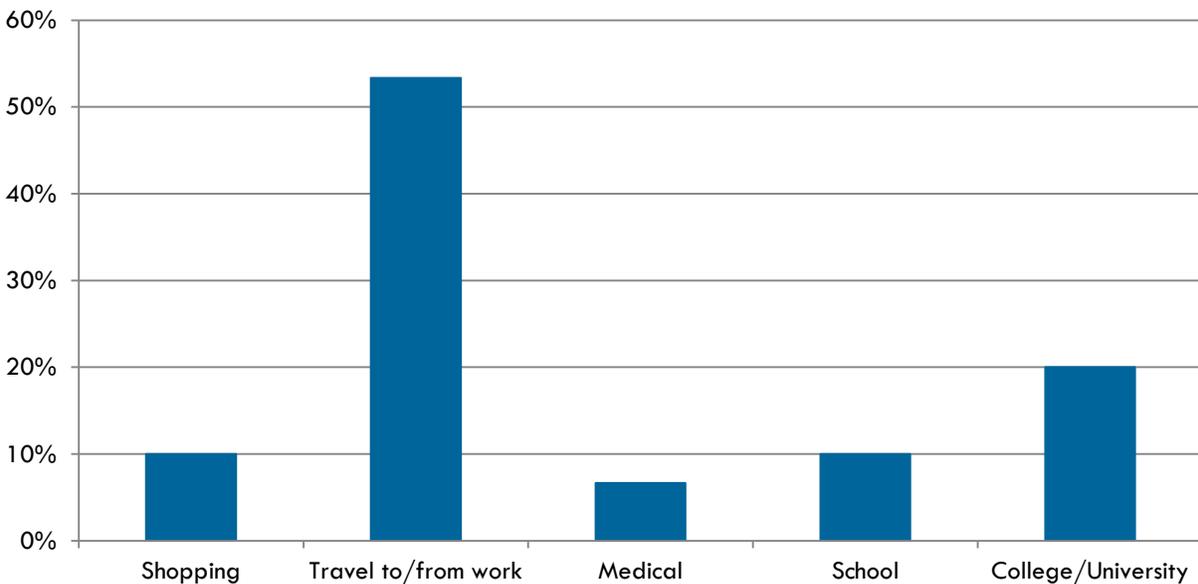


Figure 63 Online Survey: Trip Purpose



### Ridership by Age

The age distribution of survey respondents varied significantly from intercept to online survey. Seventy-seven percent of riders who took the intercept survey are between the ages of twenty-five and sixty-four. Over 33% of customers who took the online survey are between the ages of 25-34, indicating that online methods are the most effective ways to reach younger adults.

Figure 64 Intercept Survey: Age

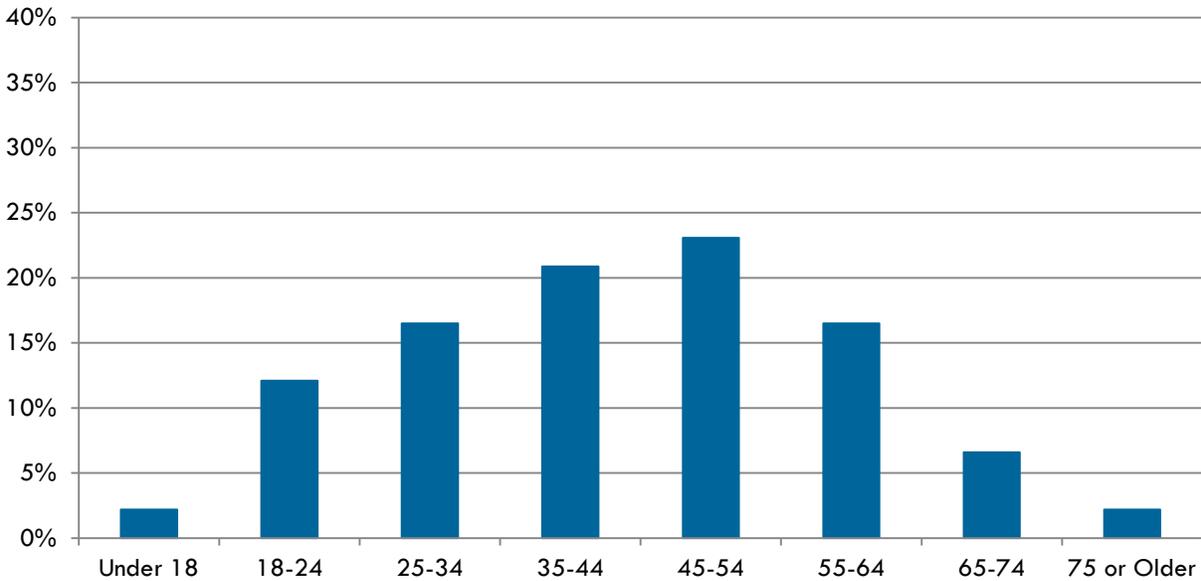
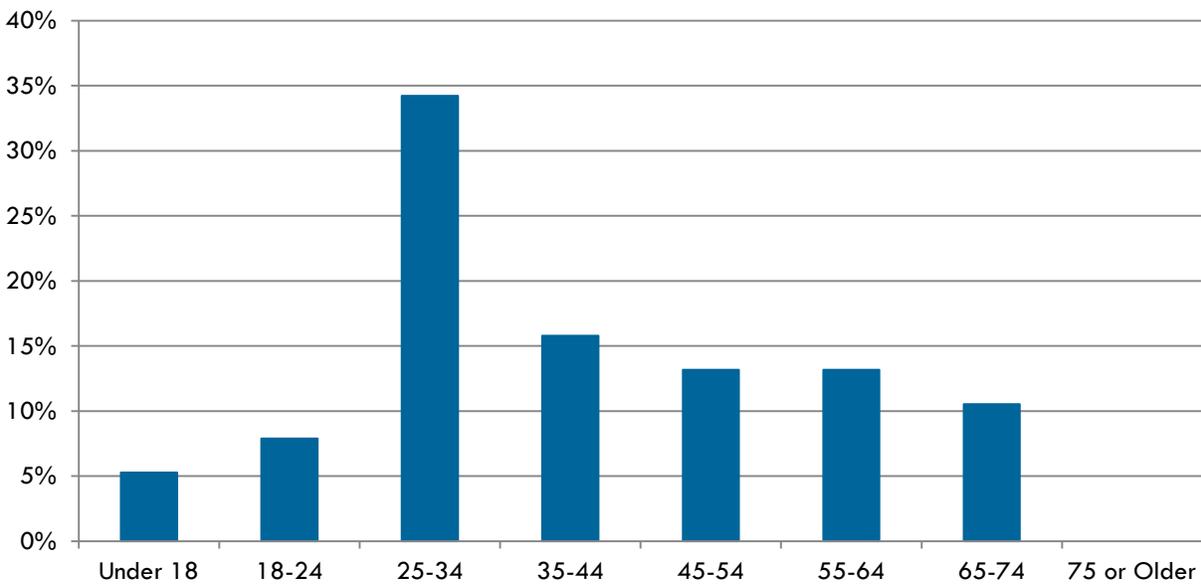


Figure 65 Online Survey: Age



### Ridership by Ethnicity

Survey respondents were asked to list their ethnicity. According to each survey, approximately 80% of transit riders are either Hispanic or Caucasian. African-Americans, Pacific Islanders, Asian-Americans, and people who identify as more than one ethnicity comprise a combined 20% of survey respondents.

Figure 66 Intercept Survey: Ethnicity

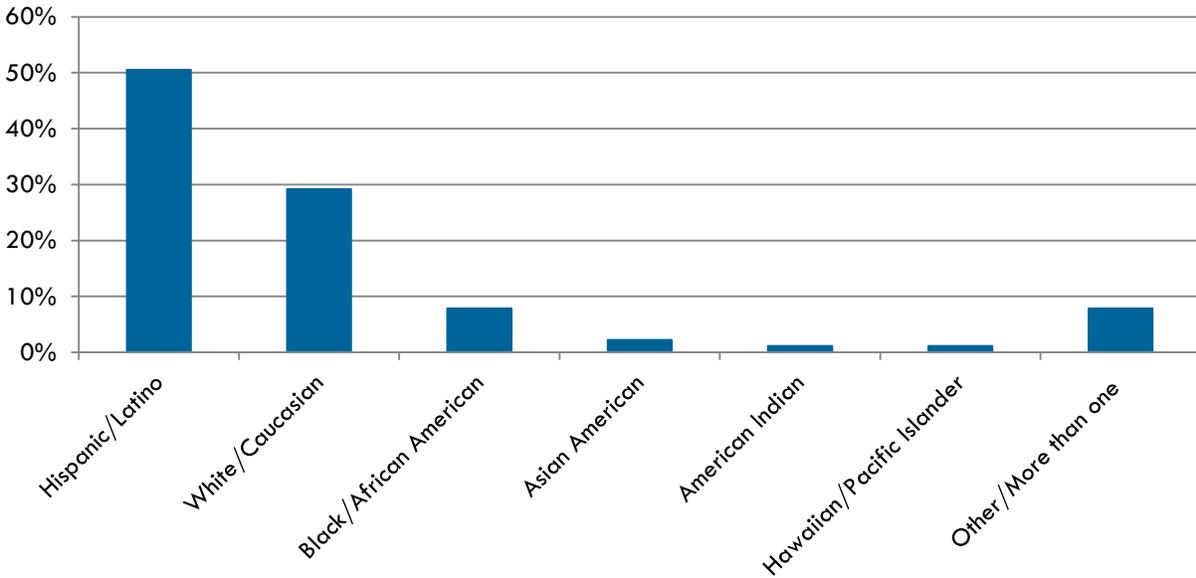
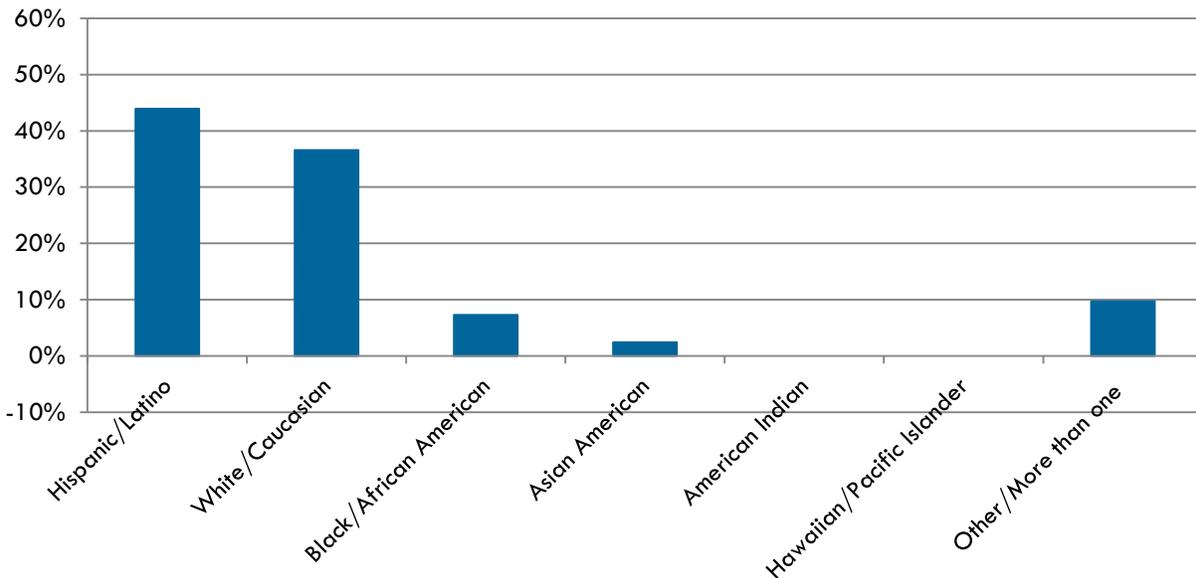


Figure 67 Online Survey: Ethnicity



### Ridership by Household Size

The following charts depict distribution of household sizes in the survey sample population. Over 60% of transit riders who took the intercept survey live in one- or two-person households. Online survey respondents tend to have larger household sizes.

Figure 68 Intercept Survey: Household Size

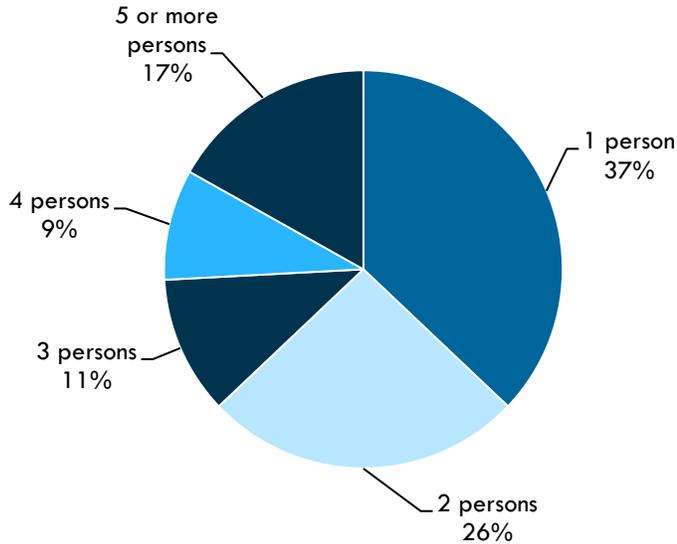
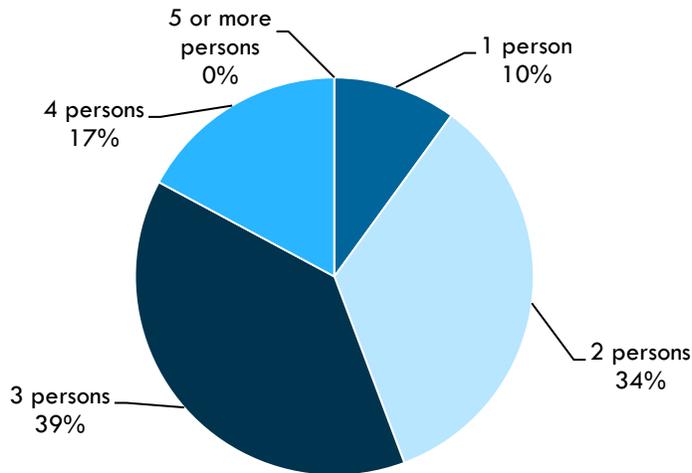


Figure 69 Online Survey: Household Size



### Vehicles per Household

An overwhelming majority of transit users do not own a vehicle. Approximately 68% of intercept survey participants do not own a vehicle, 20% have a single car in their household, and 12% have two or more cars in their household. Online survey respondents have a lower percentage of customers without access to a vehicle.

Figure 70 Intercept Survey: Vehicles per Household

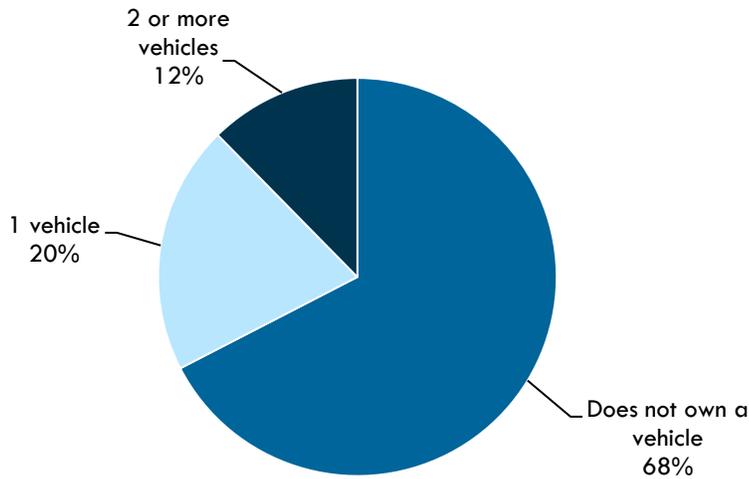
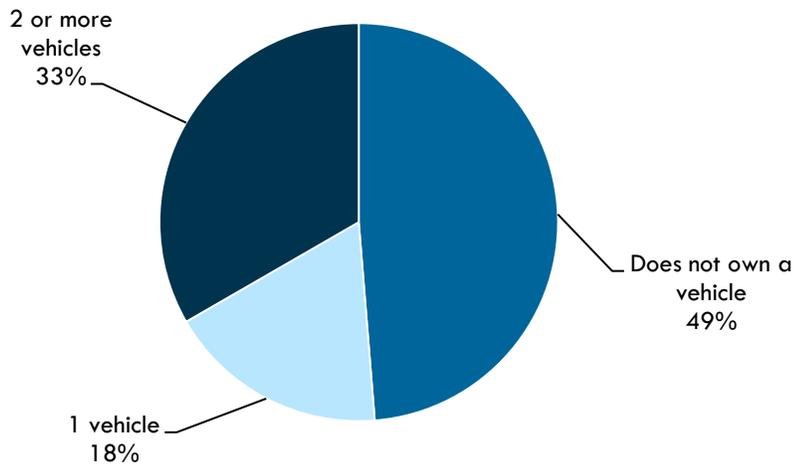


Figure 71 Online Survey: Vehicles per Household



### Annual Household Income of Survey Respondents

The majority of transit riders have a household income of less than \$20,000. None of the intercept survey respondents reported a household income of over \$40,000. However, online survey respondents had a higher percentage of choice riders with higher incomes than intercept survey respondents.

Figure 72 Intercept Survey: Annual Household Income

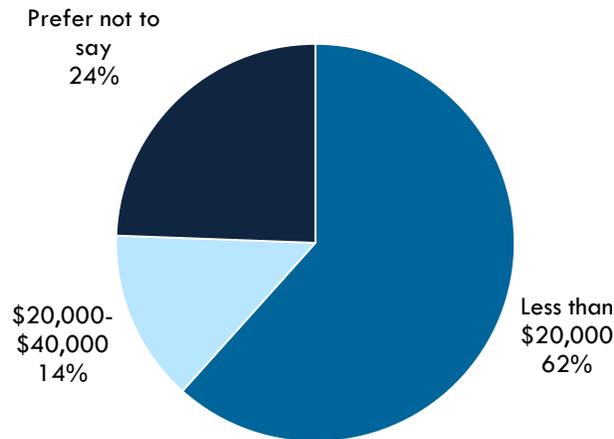
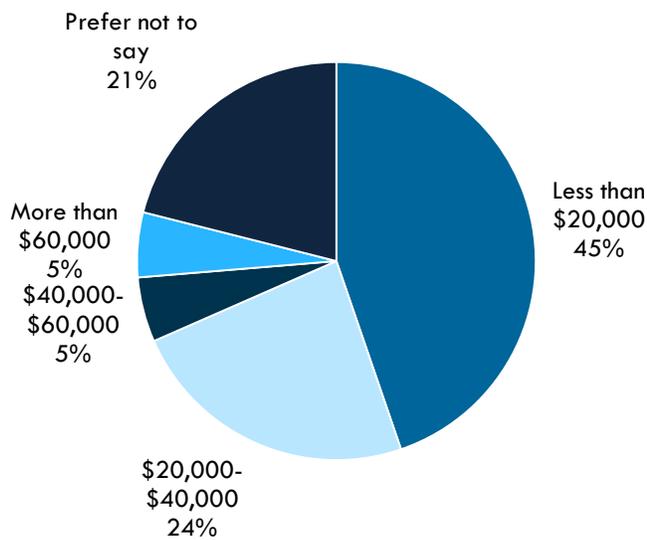


Figure 73 Online Survey: Annual Household Income



### Open-Ended Comments

Survey respondents were asked to provide additional comments at the end of each survey. The most significant customer requests included extending hours and providing more service on Sundays.

**Figure 74 Intercept Survey: Comments by Category**

40 minute interval routes
A bus at Main and Picacho
A bus route on Dona Ana and Del Rey
A stop on Amador near US bank, Later Hours, Upper Management does not accept suggestions, Complaints to management are not heard
Bench at the California & Solano Bus Stop
Better Fares and Better Directions
Drive Faster?
Excellent Service
Good service
Great
Great Drivers!
Great Routes!
Great, Thank You!
Have noticed great improvements to the transit system in the last few years
Kinder Drivers, more frequent routes
Later Hours
Later Hours
Later Hours/Sunday
Longer Hours
Longer Hours/Routes
Longer Hours/Sunday Hours
Make a crosswalk sign by the Walmart on Lohman, hard to cross street
More Buses
More mindful drivers
More routes
More routes
More routes
Nicer Drivers
None
Quicker Times
Some rude drivers
Sunday Hours
Sunday Hours
Sunday Hours
Sunday Hours, Later Hours
Sunday Hours, Later Hours
Very Helpful
Veterans park stop needs a waiting area
Would like a payphone at ITC

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**Figure 75 Online Survey: Comments by Category**

<p>1. Better communication as to re-routes, especially concerning the last run of the day. On the day of the horrible fatal accident at Trivitz &amp; University there was no service to any NMSU stops. Since I catch the bus after 5 I had no way to get info. I was stranded. This has happened more than once. I would suggest someone answer 5412500 during all hours when RRT is operating, or at least when there is a rerouting in progress. 2. It seems that sometimes 90 leaves the VTP prior to 15 after (cell-phone time). I know my stop is 3 miles away and the speed limit is 35 mph and I should never miss the bus if I am out there at 19 after, but it happens once in a while. 3. Bus 30 time points at Locust/University and Missouri/Telshor are only 5 minutes apart. Time point #1 should be earlier. 4. I used to use bike service frequently. I stopped because racks were frequently full after the route change in 2008, and the "no bikes on bus" signs appeared shortly thereafter. I see no problem with bringing a bike onto a nearly empty bus. This policy should be modified to "subject to driver discretion". 5. Some passengers expect too much of drivers for route planning, often to the point of delaying the bus. I think on more than one occasion the driver should have just said "schedules are over there and we have a schedule to keep" instead of providing 5 minutes worth of trip planning details. Sometimes big city attitudes are called for in dealing with passengers. 6. I would suggest later service, at least between NMSU and MVM. The only days that I drive are the days where I know I can't leave work until about 7PM. 7. I seem to be one of about 5 NMSU employees taking the bus to East Mesa neighborhoods, when there are probably more than 500 people making this run every day. I would recommend some sort of advertisement/promotion to make people that for \$1 someone will take you to a place that's probably closer to your office than where you actually park.</p>
<p>Earlier and later bus services. Maybe a discount for buying a 30 day/trip pass.</p>
<p>Have a stop on Main St. for the 20. Create parallel routes so transferring is easier.</p>
<p>I believe that service would improve if buses ran on larger/main streets and completely avoid smaller streets in residential areas. It's less confusing if you avoid the " loop" routes that are currently used.</p>
<p>i fall asleep on the bus because of my tourettes syndrome i wish the bus drivers where more understanding</p>
<p>I think you do a very good job with the equipment and staff you have. It would be nice to get a county wide system funded somehow.</p>
<p>If your team doesn't care for the way I'm responding to your questions, then please reconsider how Ms. Margaret responds to your customers.</p>
<p>It would be nice if the Aggie transit near Arrowhead Park Early College would be implemented soon. The time to get from the college back to Porter Drive is 2 hours, it is not a terribly long time, but it would be nice if it was shorter.</p>
<p>Later service for people who work would boost economy and employment opportunities</p>
<p>los horarios el sabado mas temprano (Earlier Saturday hours)</p>
<p>Make sure buses always connect at Transfer Point! Bus service needs to be dependable. More routes please!</p>
<p>More covered bus stops for the handicapped apply for grant to feds check on this I know they have funds for this if it for handicapped people</p>
<p>Please ask the drivers who chew gum to avoid popping their gum into an open microphone</p>
<p>Saturday, to run later and for it to run on Sunday, cause of church service</p>
<p>Seek funding for additional buses and drivers, to provide service two or three times an hour rather than only once an hour in one direction per route.</p>
<p>Sunday service and keeping the lobby open during the weekend</p>
<p>Survey should be given to all who ride the bus. More buses should be added &amp; the city should look into the fixing issues within the transportation department in order for the bus routes, etc to run properly</p>
<p>The drivers are always very helpful and friendly. My only complaint is with people who bring rolling cart on the bus, they take up room and often end up out of the persons control.</p>

## **8 SERVICE RECOMMENDATIONS**

Recommendations were developed based on detailed route analysis, demographic assessment, operator and customer feedback. The initial route restructure is cost-neutral in terms of revenue hours and peak vehicles. The intention of the route restructure was to lay the foundation for growth as additional funds become available. Key benefits of the service recommendations are:

- 30 minute service on high ridership routes
  - Route 20 University
  - Route 80 Picacho/Lohman
- New crosstown service along Lohman/Amador corridor to reduce travel time and transfers
- Direct service to Doña Ana Community College East Mesa Campus from New Mexico State University and Mesilla Valley Intermodal Transit Terminal
- Improved directness on most routes
- Improved access to major grocery and shopping destinations
- Future crosstown service along Solano
- Elimination of Venus Transfer Point and reduced emphasis on Mesilla Valley Mall
- High probability of increased ridership

Each of the eight recommended routes are described below and detailed with a map. Newly installed stops listed for each route do not include existing stops that should be assigned to recommended routes.

## Route 10 North Main

**Replaces: 10 Desert Orange**

Route 10 will be realigned from Northrise Drive, Rinconada Bataan Memorial Highway to Elks Drive and Del Rey Boulevard to improve coverage in North Las Cruces and serve a major employer in Convergys. The shorter route length will also result in improved schedule reliability, thereby reducing the number of missed connections or delays at the Mesilla Valley Intermodal Transit Terminal.

Northrise Drive, Bataan Memorial Highway and Rinconada Boulevard will be served by the new Route 110 Bataan. The Venus Transfer Point bus stop will no longer be served by any routes.

New stops will be installed at the following locations:

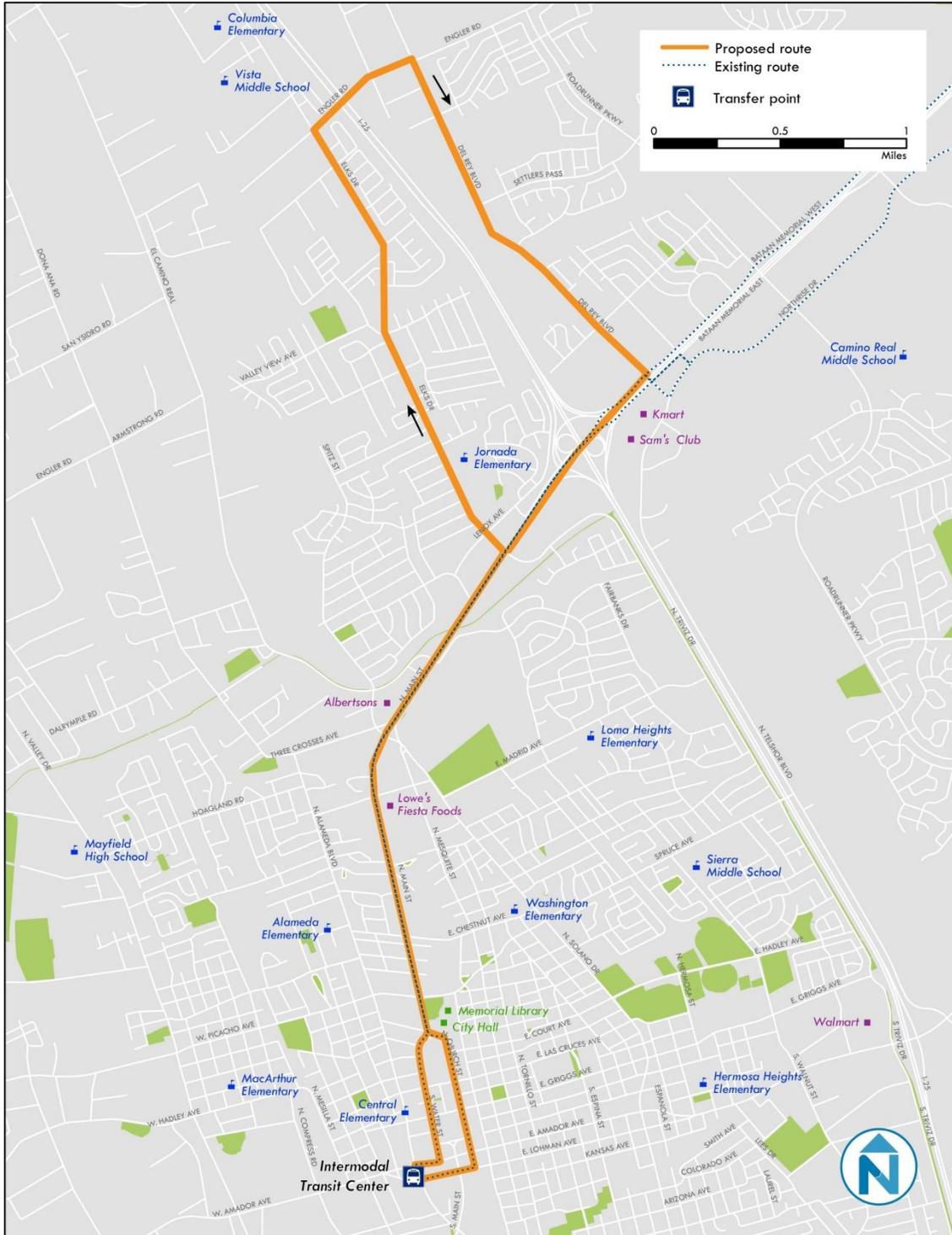
- Elks & Lenox
- Elks & Ellendale
- Elks & Edgewood
- Elks & Mohegan
- Elks & Reina
- Elks & Engler
- Del Rey & Parkhill
- Del Rey & Convergys
- Del Rey & Settlers Bend
- Del Rey & Mars

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am–7:00 pm	60	1	9:30 am-6:00 pm	-	-	-
Phase 1	60	1	6:30 am–7:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 2	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 3	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 4	60	1	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm
Phase 5	60	1	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm

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**Figure 76 Proposed Route 10 North Main**



## Route 20 University

**Replaces: 20 Sun Yellow and 30 Aggie Crimson**

Routes 20 and 30 will be consolidated to serve the strongest corridors of each route while establishing 30-minute service throughout the entire route. The primary streets served by the new route will be El Paseo Road, Espina Street, East University Avenue, Telshor Boulevard, and Roadrunner Parkway. Connections to all RoadRUNNER routes, with the exception of Route 110, can be made at the Mesilla Valley Intermodal Transit Terminal.

Mesilla Valley Mall will no longer be directly served by Route 20 due to travel time. Triviz Drive and Don Roser Drive will no longer be served due to low ridership. Union Avenue will be served by Route 40 rather than Route 20.

On weekdays, the route should extend to Doña Ana Community College East Campus, replacing the existing Doña Ana Shuttle. On weekends, service will be truncated to Mountain View Hospital.

New stops will be installed at the following locations:

- Sonora Springs & Cheyenne
- Sonora Springs & Palm Canyon
- Doña Ana Community College East Mesa Campus

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am–7:00 pm	60	1	9:30 am–6:00 pm	-	-	-
Phase 1	30	3	7:00 am–7:00 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 2	30	3	7:00 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 3	30	3	7:00 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 4	30	3	7:00 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm
Phase 5	30	3	7:00 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm



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**Figure 78 Proposed Route 20 University (Saturday)**



## Route 40 Mesilla

**Replaces: 40 Pecan Brown and a segment of 20 Sun Yellow**

Route 40 will be realigned to operate bi-directionally between the Mesilla Valley Intermodal Transit Terminal, the Town of Mesilla, and Mesilla Park, and the western edge of New Mexico State University. Bi-directional service will improve access to the Walmart on South Valley Drive, which is the primary destination on the route.

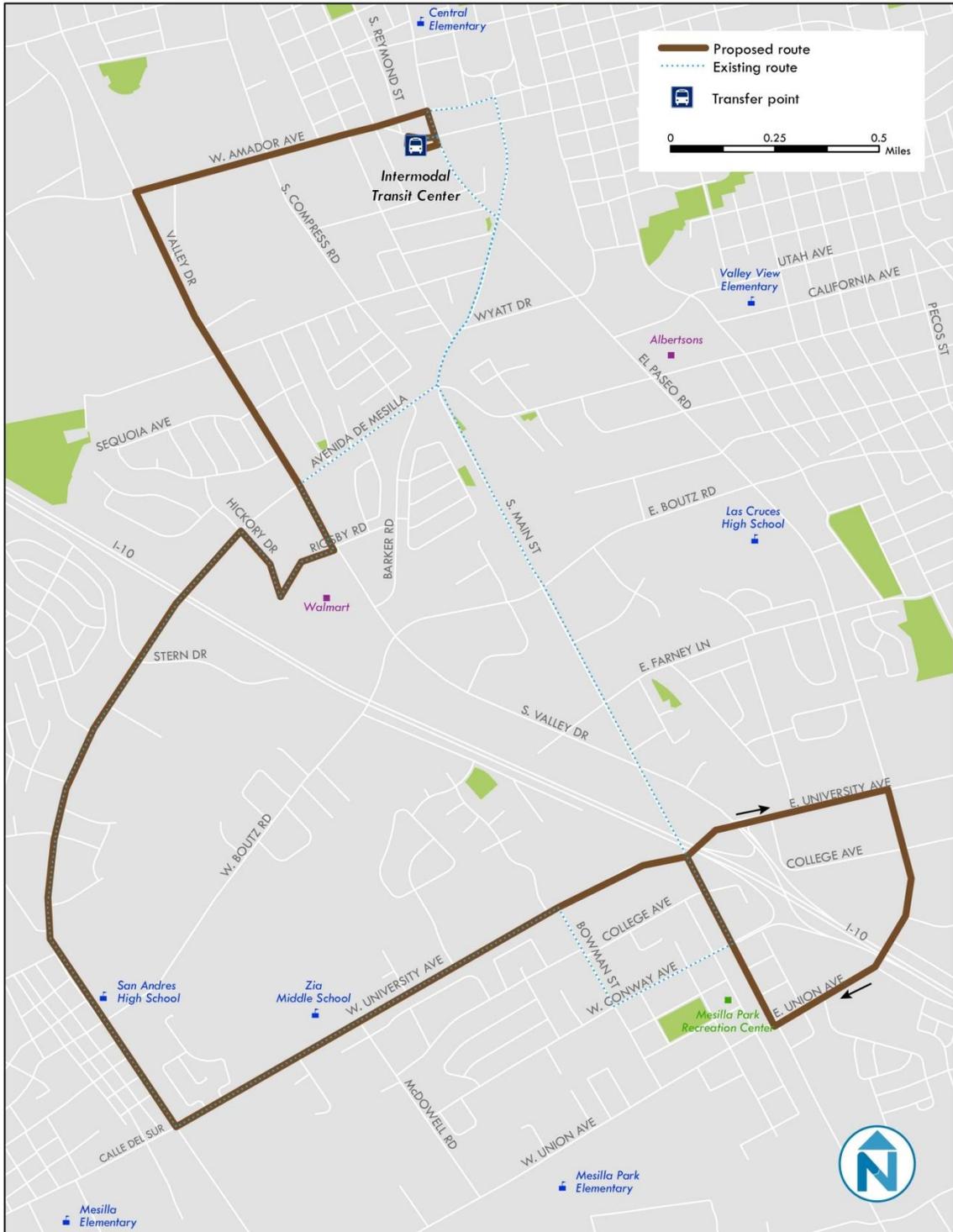
East Union Avenue and East University Drive will be added to Service along South Main Street will be eliminated due to low ridership and lack of sidewalks. Rather than being interlined with Route 50, one vehicle will be assigned to Route 40.

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am–7:00 pm	60	1	9:30 am–6:00 pm	-	-	-
Phase 1	60	1	6:30 am–7:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 2	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 3	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 4	60	1	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm
Phase 5	60	1	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm

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Figure 79 Proposed Route 40 Mesilla



## Route 60 Missouri

**Replaces: 60 Sky Blue**

Route 60 will be realigned from Lohman Avenue, Amador Avenue, and Solano Drive to Avenida de Mesilla, South Valley Drive, and Boutz Road to improve access to Walmart, First Step Clinic, and Las Cruces High School. The route will continue to function as an east-west crosstown connection linking neighborhoods with grocery stores and schools. Route 60 will terminate at the Walmart on Walton Boulevard and no longer serve Mesilla Valley Mall.

New stops will be installed at the following locations:

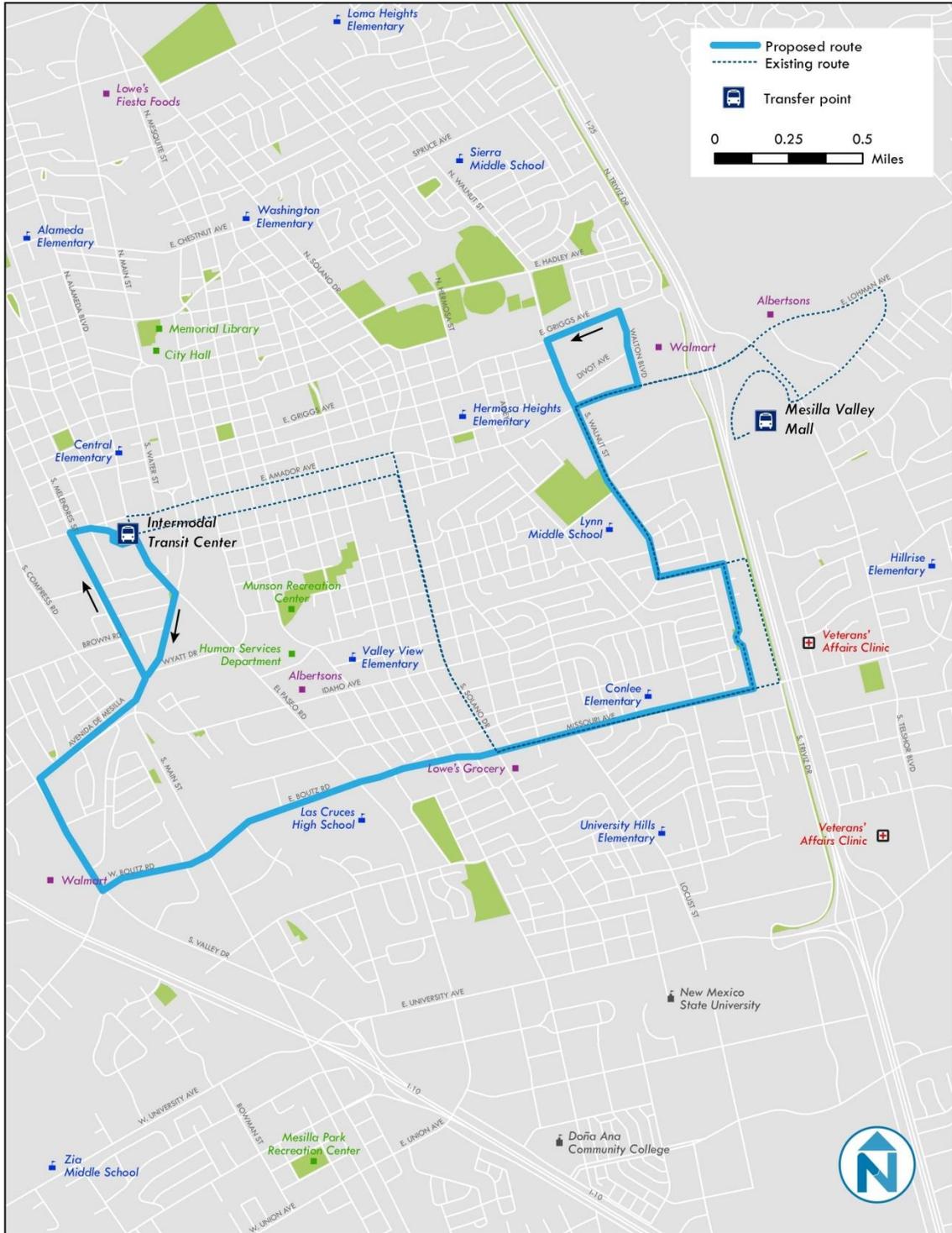
- Boutz & South Main
- Boutz & El Paseo

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am-7:00 pm	60	1	9:30 am-6:00 pm	-	-	-
Phase 1	60	1	6:30 am-7:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 2	60	1	6:30 am-8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 3	60	1	6:30 am-8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 4	60	1	6:30 am-8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm
Phase 5	60	1	6:30 am-8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm

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**Figure 80 Proposed Route 60 Missouri**



## Route 70 Madrid

**Replaces: 70 Chile Green and 50 Rio Grande Blue**

Route 70 will be realigned from Campo Street, Spruce Avenue, and North Solano Drive to North Valley Drive and Hoagland Drive to provide bi-directional service along segments served by existing Route 50. Similar to Route 60, this route provides east-west connectivity between centrally-located neighborhoods, grocery stores, and schools. Route 70 will terminate at the Walmart on Walton Boulevard and no longer serve Mesilla Valley Mall.

New stops will be installed at the following locations:

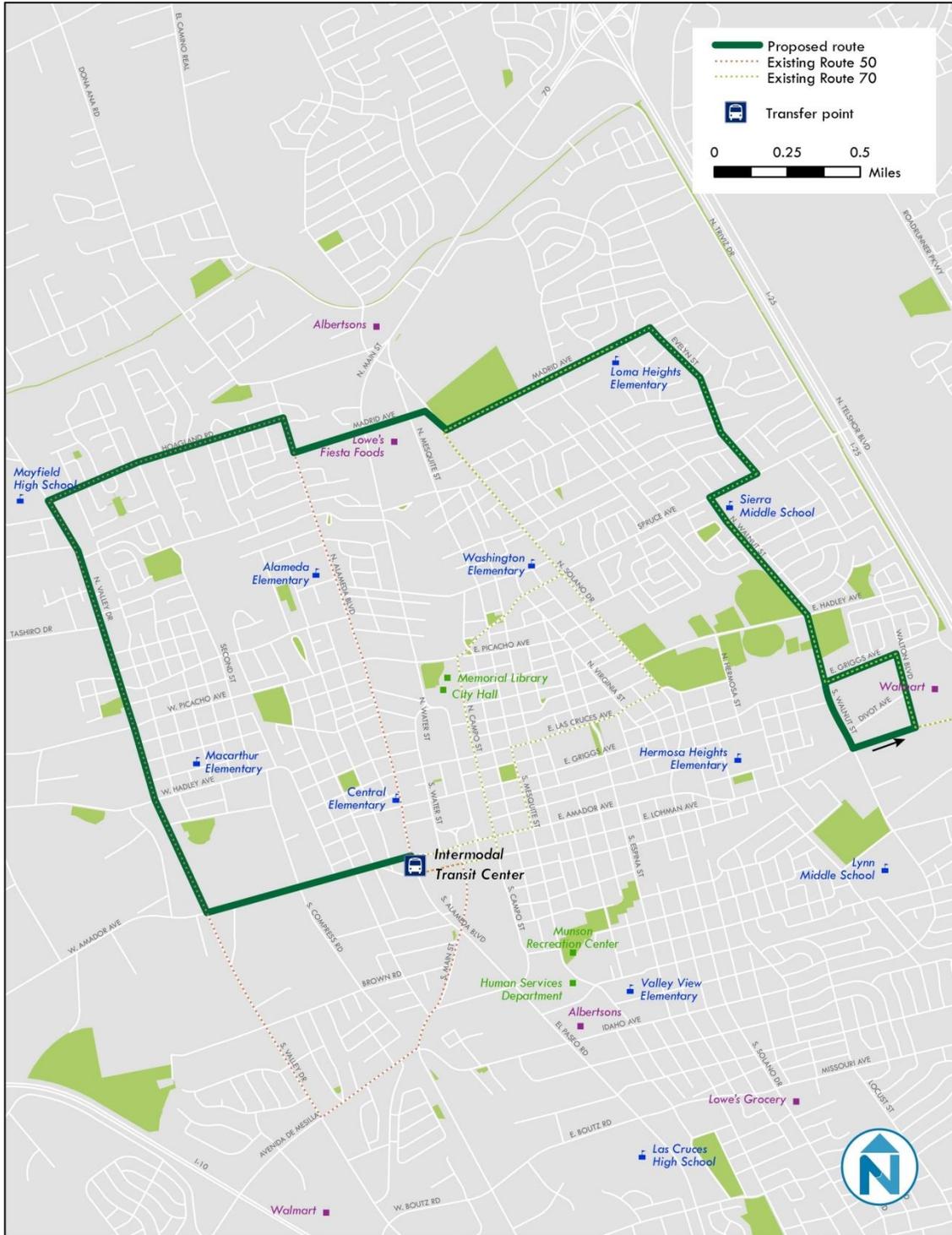
- Madrid & North Main

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am–7:00 pm	60	1	9:30 am–6:00 pm	-	-	-
Phase 1	60	1	6:30 am–7:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 2	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 3	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 4	60	1	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm
Phase 5	60	1	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm

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**Figure 81 Proposed Route 70 Madrid**



## Route 80 Picacho/Lohman

**Replaces: 80 Picacho**

Route 80 will operate bi-directionally along Picacho to improve route directness and reduce travel time. The route will also be extended to Mesilla Valley Mall, serving the East Amador Avenue and East Lohman corridors. The new service along East Amador and East Lohman reintroduces direct crosstown service that was previously tested and well-received by customers but was eventually discontinued due to a lack of permanent funding.

Route 80 will no longer serve Amador Avenue west of Alameda Boulevard. West Amador Avenue between Alameda Boulevard and South Valley Drive will be served by Route 70. Due to the anticipated customer interest of crosstown service along Lohman and Amador, Route 80 will likely require an additional bus following implementation of its new alignment.

New stops will be installed at the following locations:

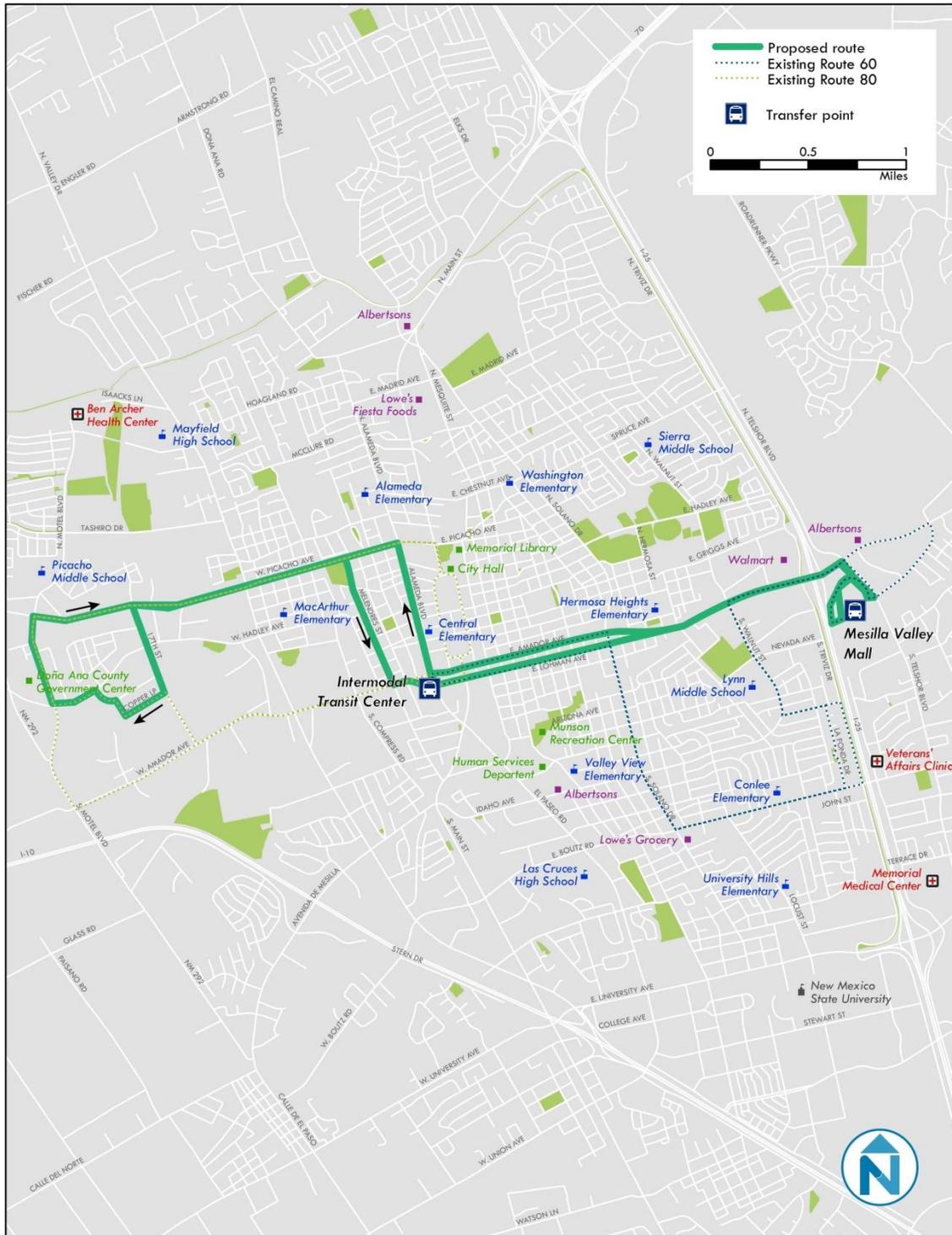
- Lohman & Solano
- Amador & Solano
- Lohman & Del Monte
- Lohman & Walnut
- Lohman & Walton

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am–7:00 pm	60	1	9:30 am–6:00 pm	-	-	-
Phase 1	60	1	6:30 am–7:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 2	60	1	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 3	30	2	6:30 am–8:30 pm	60	1	9:30 am-7:30 pm	-	-	-
Phase 4	30	2	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm
Phase 5	30	2	6:30 am–8:30 pm	60	1	8:30 am-8:30 pm	60	1	9:30 am-7:30 pm

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**Figure 82 Proposed Route 80 Picacho**



## Route 110 Bataan

**Replaces: Portions of 10 Desert Orange and 90 Roadrunner Red**

Route 110 replaces the eastern half of existing Route 10 and the western half of existing Route 90. This segment of existing Route 10 generates minimal ridership, yet serves as a lifeline for residents at the northeastern edge of the city, as well as just beyond city limits.

New stops will be installed at the following locations:

- Rinconada & Walmart
- Sonoma Ranch Road & Northrise

### Recommended Service Levels

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Existing	60	1	6:30 am–7:00 pm	60	1	9:30 am–6:00 pm	-	-	-
Phase 1	60	1	7:00 am–7:00 pm	-	-	-	-	-	-
Phase 2	60	1	7:00 am–7:00 pm	-	-	-	-	-	-
Phase 3	60	1	7:00 am–7:00 pm	-	-	-	-	-	-
Phase 4	60	1	7:00 am–7:00 pm	60	1	8:30 am–8:30 pm	60	1	9:30 am–7:30 pm
Phase 5	60	1	6:30 am–8:30 pm	60	1	8:30 am–8:30 pm	60	1	9:30 am–7:30 pm

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**Figure 83 Proposed Route 110 Bataan**



## Route 120 Solano

### **New Route**

Route 120 provides crosstown service along the full length of Solano Drive, terminating at North Main and New Mexico State University. This future route will provide faster and more direct service to New Mexico State University from several central neighborhoods.

New stops will be installed at the following locations:

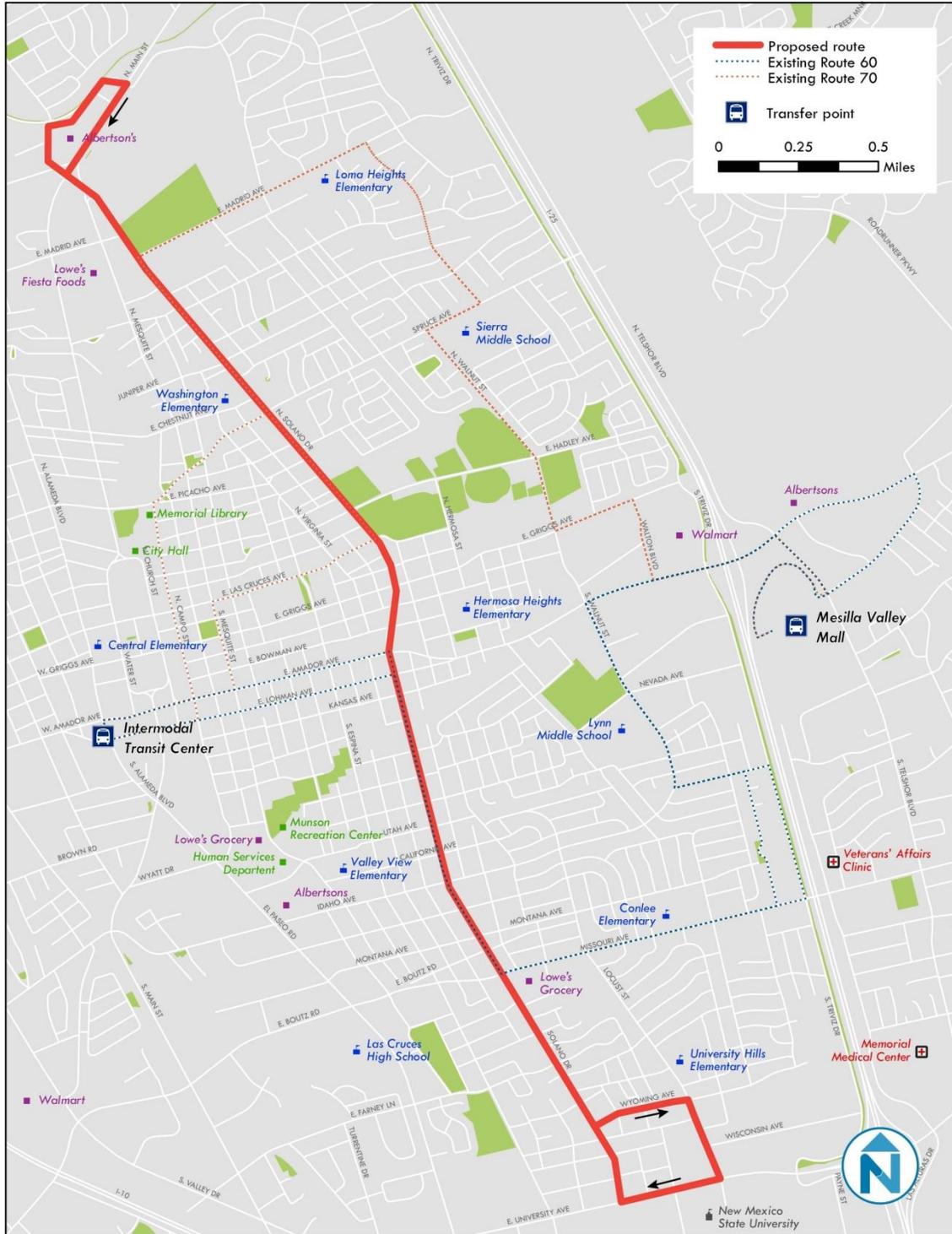
- Spitz & El Camino Real
- Solano & Madrid
- Solano & Griggs
- Solano & Amador/Lohman
- Solano & Missouri
- Solano & Wyoming
- University & Chaparral
- Locust & Wisconsin
- Wyoming & Jordan

### **Recommended Service Levels**

Period	Weekday			Saturday			Sunday		
	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span	Headway	Vehicles	Service Span
Phase 5	60	1	6:30 am–8:30 pm	60	1	8:30 am–8:30 pm	60	1	9:30 am–7:30 pm

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**Figure 84 Proposed Route 120 Solano**



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**Figure 85 System Map (Phase 1-4)**





## Additional Route Characteristics

Route distances vary significantly however, each recommended cycle time is based on running times, speed limits of new corridors, and typical transit conditions (frequent stops and potential delays). Route distances and speeds are listed in Figure 87. The average speed of all proposed routes is 12.8 miles per hour. The average speed of all existing routes is 13.8 miles per hour.

**Figure 87 Route Distances and Speeds**

Route	Distance (miles)	Cycle Time (minutes)	Average Speed (mph)
Route 10 - North Main	10.7	60	10.7
Route 20 – University (weekdays)	22.0	90	14.7
Route 20 – University (weekends)	13.8	60	13.8
Route 40 - Mesilla	12.3	60	12.3
Route 60 - Missouri	12.0	60	12.0
Route 70 - Madrid	13.4	60	13.4
Route 80 - Picacho/Lohman	12.4	60	12.4
Route 110 - Bataan	17.8	60	17.8
Route 120 - Solano	9.2	60	9.2

Departure times at select route endpoints are listed in Figure 88. Each time indicates the minute of the hour in which the route departs from the specified location.

**Figure 88 Connection Times**

Route	MVITT	MVM	Walton
Route 10 - North Main	:00	-	-
Route 20 - University	:00	-	-
Route 40 - Mesilla	:00	-	-
Route 60 - Missouri	:00	-	:30
Route 70 - Madrid	:00	-	:30
Route 80 - Picacho/Lohman	:00	:30	-
Route 110 - Bataan	-	:30	-
Route 120 - Solano	-	-	-

A spatial comparison of the existing and recommended RoadRUNNER Transit system is provided in Figure 89.

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**Figure 89 Existing and Recommended System**



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**Figure 90 Summary of Phase 1 Recommendations**

Route	Recommendation	Revenue Hours	Peak Vehicles
10 North Main	Realign from Northrise/Bataan to Elks/Del Rey	3,835	1
20 University	Consolidate with Route 30; Extend to DACC on weekdays; shorten to Hospital on Saturday	9,700	3
40 Mesilla	Two-way service to Walmart, Mesilla, Mesilla Park, NMSU	3,835	1
60 Missouri	Shorten to Walmart, extend to North Valley/Hogland	3,835	1
70 Madrid	Short to Walmart, extend to South Valley/Boutz	3,835	1
80 Lohman/Picacho	Operate bi-directionally; extend to Mesilla Valley Mall	3,835	1
110 Bataan	New route serving Bataan, Northrise, and North Telshor	3,060	1
<b>Total</b>		<b>31,935</b>	<b>9</b>

**Figure 91 Summary of Phase 2 Recommendations**

Route	Recommendation	Revenue Hours	Peak Vehicles
10 North Main	Increase Saturday span	4,090	1
20 University	Increase weekday span	10,848	3
40 Mesilla	Increase weekday span	4,090	1
60 Missouri	Increase weekday span	4,090	1
70 Madrid	Increase weekday span	4,090	1
80 Lohman/Picacho	Increase weekday span	4,090	1
110 Bataan	No change	3,060	1
<b>Total</b>		<b>34,358</b>	<b>9</b>

**Figure 92 Summary of Phase 3 Recommendations**

Route	Recommendation	Revenue Hours	Peak Vehicles
10 North Main	No change	3,835	1
20 University	No change	9,700	3
40 Mesilla	No change	3,835	1
60 Missouri	No change	3,835	1
70 Madrid	No change	3,835	1
80 Lohman/Picacho	Improve to 30-minute headway on weekdays	7,660	2
110 Bataan	No change	3,060	1
<b>Total</b>		<b>37,928</b>	<b>10</b>

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**Figure 93 Summary of Phase 4 Recommendations**

Route	Recommendation	Revenue Hours	Peak Vehicles
10 North Main	Increase Saturday span and add Sunday service	4,714	1
20 University	Increase Saturday span and add Sunday service	11,472	3
40 Mesilla	Increase Saturday span and add Sunday service	4,714	1
60 Missouri	Increase Saturday span and add Sunday service	4,714	1
70 Madrid	Increase Saturday span and add Sunday service	4,714	1
80 Lohman/Picacho	Increase Saturday span and add Sunday service	8,284	2
110 Bataan	Add weekend service	4,204	1
<b>Total</b>		<b>42,816</b>	<b>10</b>

**Figure 94 Summary of Phase 5 Recommendations**

Route	Recommendation	Revenue Hours	Peak Vehicles
10 North Main	No change	4,714	1
20 University	No change	11,472	3
40 Mesilla	No change	4,714	1
60 Missouri	No change	4,714	1
70 Madrid	No change	4,714	1
80 Lohman/Picacho	No change	8,284	2
110 Bataan	Increase weekday span	4,714	1
120 Solano	New route	4,714	1
<b>Total</b>		<b>48,040</b>	<b>11</b>

## 9 LONG-RANGE INVESTMENTS

### Introduction

For many of the citizens of the City of Las Cruces, public transportation is not a luxury, but a necessity. It allows them to get to work, school, grocery stores, medical services, recreational facilities and to visit friends and relatives. The majority of existing riders do not have a vehicle at their disposal or cannot drive due to physical challenges. For these individuals, the RoadRUNNER system allows them independence and flexibility.

Another goal of public transportation is to decrease the dependence of the urban population on motorized private transportation. Having less private vehicles on the City's streets realizes less vehicular pollution, a decrease in the area's non-renewal energy consumption and a more pleasant environment for pedestrians and bicyclists. Moving away from an automobile-oriented environment contributes to creating a more sustainable urban environment and a better quality of life for the citizens of Las Cruces. A good public transportation system also attracts and retains new customers, particularly millennials. Many existing residents might choose public transportation over driving their personal vehicle if given an improved public transit system.

While the Short Range Transit Plan concentrates on route modifications and schedule revisions, this is only one element in ensuring an effective public transportation system. There are additional key components that should accompany this plan as transit-oriented development, bike lockers and bike sharing, a potential relocation of the east side transfer center, supplemental funding for public and private entities, marketing and coordination with other public transportation providers which will enhance the plan.

### Transit-Oriented Development

Transit-Oriented Development (TOD) is mixed residential, commercial and employment sites and supplemental facilities for bicycles and pedestrians that enhance the use of public transportation. One of the aspects of TODs is increased density and a concentration of destinations. In addition, being able to bike or walk to transit stops safely encourages transit usage. TOD can be an integral part of Planned Unit Developments, proposed corridors or redevelopment of existing corridors.

### Bike Lockers, Bike Sharing

The integration of bicycles with transit extends its coverage area and creates a more transit-friendly environment. On the RoadRUNNER system, there is a heavy utilization of the bike racks located in the front of the buses. At times, there is not enough space for those wishing to store their bicycles on RoadRUNNER buses. Secure bike lockers are one way to provide an alternative for those wishing to store their bike near their originating bus stop. This is also a means to extend the coverage area of routes. Bike sharing consists of individuals paying on-site or online for the use of communal bicycles. The individuals can either use a bike at bike share stand at either end of the trip by putting in money or a credit card or then return it to another bike share stand when finished. Potential bicycle facilities are depicted in Figure 95.

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**Figure 95 Potential Bicycle Facilities**



### **Additional Transfer Centers**

In the beginning stages of the examination of the RoadRUNNER system, there were concerns about the delays at the Mesilla Valley Intermodal Center and the difficulty entering and exiting the Mesilla Valley Mall Transfer Center. Most of this was related to the length of Routes 10 and 90 and connection at timed transfer sites. The proposed route structure in Phase One resolves these issues and decreases the amount of routes having to transfer at Mesilla Valley Mall.

However, in the future it is anticipated that there will be the necessity of having another East Side Transfer Center, possibly located along East Lohman Avenue. The east side of the Las Cruces area is growing more than other areas and has a number of significant attractors (e.g. Memorial Hospital, East Mesa Branch of Doña Ana Community College. In addition, a relocated eastside transfer center could serve as focus for transit-oriented development.

There is also a potential for a Southern New Mexico State University Transfer Center connecting with the internal campus routes, South Central Regional Transit District, and the New Mexico Department of Transportation routes.

### **Supplemental Funding and Subsidized Services**

Many public transit systems in the nation have funds supplied outside of farebox revenue and Federal and State subsidies. Private funds may be directly related to providing direct service for a particular public or private entity. Also, a traditional supplemental private funding can be advertising on public transit vehicles either inside or outside of the bus. These help these systems to provide additional services. The RoadRUNNER system runs internal routes for NMSU and provides a route from the Mesilla Valley to the East Mesa Campus of Doña Community College which is subsidized by the College. In addition, NMSU provides bus passes (UPASS) for all students enrolled at the university.

There may be other services in the future to extend the service of the RoadRUNNER with possible subsidy from private or public entities. This may take the form of late night paratransit services for workers after regular operating hours or for students with late night classes. It could also be late night fixed route services to key destinations subsidized by educational institutions. Such services are being offered by the similar sized or peer group systems.

The subsidy may be by employers in terms of reduced or free bus passes to their employees. This has been done frequently for public and private employers for their employees. Subsidized bus passes could also be through public service organizations such as those whose clients are homeless, low-income, elderly etc. Subsidies are also often provided by various entities for traffic congestion mitigation during festivals and sport events.

### **Marketing**

Changes to the RoadRUNNER system impact the everyday travel routines of customers. Like any product or service change, there is a need for the public to be aware. A major source of information will be the new route maps which will be available at the Mesilla Valley Intermodal Center and other key locations (i.e. Las Cruces City Hall, locations that sell bus passes and important public gathering places.) In addition, the staff through the public information office of the City of Las Cruces will make the public aware of the route and schedule changes.

While it is important to promote the new route changes, marketing is an ongoing effort, essential to the function of any public transit operator. This can take many forms from advertisement in newspapers and newsletters, visibility in local organizations, television spots, and social media. It

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can be through programs that will help persons use the bus for the first time. Marketing efforts may also consist of visits to educational institutions major employers.

Many transit systems at the same size as RoadRUNNER transit have personnel to be in charge of marketing, advertising and/or community involvement. Presently, the system does not have dedicated staff for this purpose. It would be recommended that a portion of the budget be allocated for a full-time marketing person with an appropriate budget for advertising and contracting for services.

**Closing Remarks**

The RoadRUNNER system is a vital to the mobility needs of the urbanized area and the surrounding region. For some, it is their lifeline to jobs, shopping, services and social events particularly those who cannot afford a vehicle or unable to drive because of being too young or disabled. To others, it provides an alternative to their private vehicle saving them money and giving them convenience away from the parking problems etc. The expansion of public transportation adds to the quality of life that is essential in the developing nature of urbanization. It is also crucial to maintaining mobility, reducing air pollution, decreasing dependency on fossil fuels, and minimizing the costs associated with additional roadway construction.

## 10 PERFORMANCE METRICS

Performance metrics will maximize the effective use of limited resources by creating a rational and transparent evaluation process. This process will assist RoadRUNNER in determining priorities when allocating funds and programming future transit investments. Performance metrics describe the methodology by which services are evaluated. Five metrics are proposed to measure each fixed-route.

### Ridership Productivity

Ridership productivity measures route performance based on a unit of service. Routes are evaluated based on passengers per revenue hour, which is calculated by dividing the total number of boardings by the total number of vehicle revenue hours.

$$\text{Average Daily Boardings} \div \text{Daily Revenue Hours}$$

### Passenger Loads

While passengers per revenue hour and passengers per trip are the important measures of overall route performance, they do not provide insight into conditions along specific segments of the route. Managing passenger loads is crucial in maintaining customer satisfaction, schedule reliability, and safe operations.

Automated passenger counting systems (APC's) provide the capability to record the size of the maximum load on each trip in the system. While RoadRunner does not currently own APC's, two units have been purchased to be rotated among the routes for reliable samples. Passenger load data will highlight where capacity issues are creating routine standing loads or pass-by situations, and where seating capacity is going unused. Depending upon individual circumstances, service level modifications or vehicle assignment modifications may be appropriate when the peak loads approach or exceed seating capacity. Similarly, routes or trips with minimal passenger loads may warrant a closer examination of the route alignment and/or schedule.

Load factors reflect the ratio of passengers to total seated capacity. Load factors vary by route type and time of day. Average peak load factor is the average of all peak loads divided by the average seated capacity of buses employed on a route. For example, if the average peak load of all trips is 30 and the average vehicle capacity is 40, the average peak load factor is 75%.

$$\text{Average Peak Load} \div \text{Seating Capacity}$$

Overcrowding on buses often indicates the need for improved headways or increased capacity. Appropriate load factors vary by time of day. During peak periods it is generally acceptable for some passengers to be expected to stand for part of the trip. Thus, during peak periods, routes operating primarily on local arterials may operate with load factors exceeding 100%.

### Cost-Effectiveness

Cost-effectiveness is typically expressed in terms of operating cost per passenger or subsidy per passenger. Operating cost per passenger is calculated by dividing all operating and administrative costs by total boardings. Subsidy per passenger is a further refinement of this measure and is calculated by subtracting revenue generated by fares from gross operating and administrative costs, and dividing by total passengers.

$$\text{Daily Administrative and Operating Costs} \div \text{Total Daily Boardings}$$

### Schedule Reliability

Schedule reliability is a measure of how well a particular route adheres to its schedule. It suggests whether a customer can count on a bus being there when the schedule says it will be. For most systems, buses are considered on-time if they depart a designated timepoint between zero and 5 minutes later than the scheduled departure time. Buses should never depart a timepoint ahead of schedule unless operators are given explicit permission to do so.

Potential impacts on on-time performance include inadequate running times, traffic conditions, or constructions. A high number of boardings on a particular trip or at a specific stop may also affect schedule reliability if recovery time is insufficient to absorb the added time.

$$\text{Trips Departing Between Zero and Five Minutes of Scheduled Time} \div \text{Total Daily Trips}$$

### Schedule Efficiency

Schedule efficiency can sometimes be improved by reducing layover at the end of a route or deadhead (time spent traveling to/from the garage or another route), thereby allowing a larger percentage of total service hours to be devoted to revenue time.

Schedule efficiency is measured by calculating the ratio of revenue hours to total platform hours (deadhead, layover, and revenue hours). Schedule efficiency ratios that are higher than those of peer services may point to operating issues such as schedules that cannot be cost-effectively broken into vehicle assignments or routes with distant or inefficient terminal points. Typical schedule efficiency ratio targets are within 80-90%.

While schedule efficiency does not consider actual ridership, it is suggested because it so often points to major inefficiencies in current scheduling practices. Schedules with a high percentage of non-service time are expensive. If that ratio can be improved, cost savings can be achieved, often with minimal impact on riders.

$$\text{Total Revenue Hours} \div \text{Total Platform Hours}$$

## Recommended Performance Standards

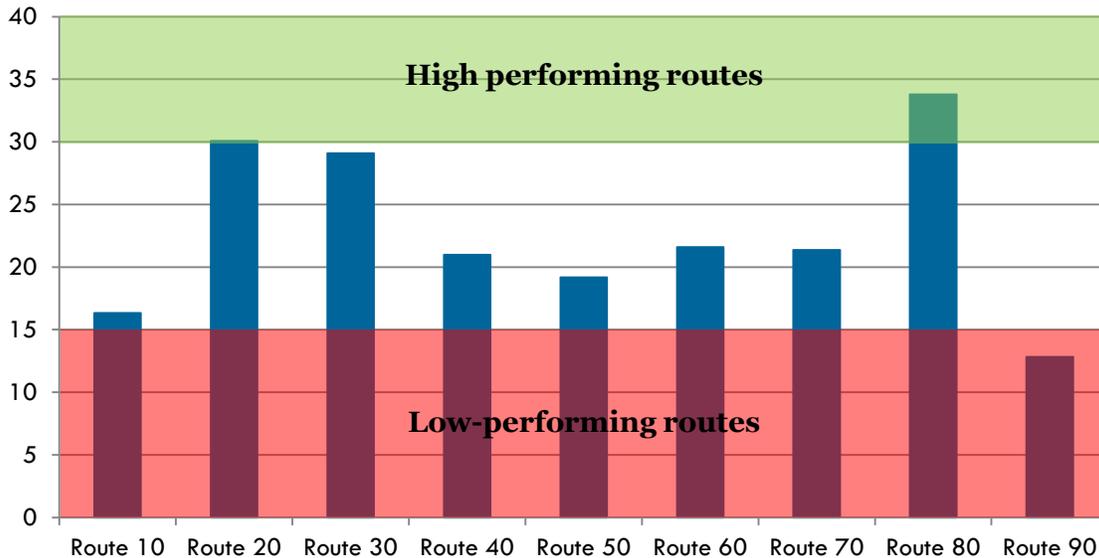
Recommended performance standards are detailed in the table below. Standards are based on recent ridership performance trends and best practices for similar services. Performance standards should be re-evaluated biennially.

**Figure 96 Recommended Performance Standards**

Service Level	Ridership Productivity	Maximum Passenger Load	Schedule Reliability	Schedule Efficiency
Weekday	25	125%	90%	95%
Saturday	20	125%	90%	95%

Routes performing below 66% (low-performing routes) may require corrective action such as schedule adjustments, route modifications, or consolidation. At the opposite end of the scale, ratings above 133% (high-performing routes) may indicate the demand for additional service in the form of improved headways or peak hour supplemental trips.

**Figure 97 Route Performance Categories**



# 11 SERVICE DESIGN GUIDELINES

Service design guidelines are planning tools that are used to expand service to new areas or modify existing routes. RoadRUNNER Transit strives to serve as many local area residents, students, workers, and visitors as they can with their available resources. Service features that attract one type of rider to transit can deter other riders, requiring a balance these types of competing demands. However, there are certain service design principles that will improve service for nearly all riders. This section describes practices that will attract the most riders and balance competing demands.

## **Service Planning Principles**

For people to use transit, service should be designed so that it is easy to understand. In this way, current and potential riders can grasp and use the transportation options available to take them where and when they want to go with ease. Most of the guidelines in this section are aimed at making service intuitive, logical, and easy to understand. Most transit networks are very complicated, and simplification is a key value in creating networks that people can navigate easily to make many kinds of trips.

### **Route Directness**

Routes should be designed to operate as directly as possible to maximize average speed for the bus and minimize travel time for passengers while maintaining access to service. Fast and direct routes tend to be useful to more people than circuitous routes. Even if a trip requires transferring between two routes, it is likely to be faster than a trip using a circuitous route.

Travel times and directness of service can be affected by a series of factors that are a function of the environment in which service operates. Some of these factors include:

- Traffic congestion
- Street geometry and turning movements
- Presence and operations of traffic signals
- Accessibility of streets from adjacent areas
- Stops with high ridership or mobility-impaired customers

### **Route Alignment**

Routes should operate along the same alignment in both directions to make it easy for riders to know how to return to their trip origin location. Exceptions can be made in cases where such operation is not possible due to one-way streets, turn restrictions, or near the end of a route where the bus must turn around. In those cases, routes should be designed so that the opposite directions parallel each other as closely as possible.

While routes that include large loops or several deviations maximize transit coverage, they also result in out-of-direction travel that is not intuitive or attractive to potential customers.

### **Route Deviations**

Routes should not deviate from the most direct alignment unless there is a compelling reason. Potential destinations to deviate service include major shopping centers, employment sites, schools, etc.

In these cases, the benefits of operating the route off of the main route must be weighed against the inconvenience caused to passengers already on board. Additional considerations include the impact on overall route productivity, the increase time added as a result of the deviation, and the schedule coordination with connecting services. In most cases, where route deviations are provided, they should be provided on an all day basis. Exceptions include early morning or late night trips to schools or employment centers with limited hours.

### **Arterial Streets**

All frequent local and local routes should operate on major roadways. The operation of bus service along arterials makes transit service faster and easier for riders to understand and use. Current and potential riders typically have a general knowledge of an area's arterial road system and use that knowledge for geographic points of reference.

### **Route Length**

Routes should be the appropriate length to maximize ridership potential and minimize operational issues. Two routes serving different parts of the service area with a shared terminus, such as a transit center or major destination may be combined as one route or interlined in order to operate more cost-effectively. However, excessively long local routes (cycle times greater than 120 minutes) should be avoided to minimize potential schedule adherence issues.

### **Schedule Simplicity**

A consistent pattern to the schedule is strongly recommended. While headways may vary during the day according to demand, it should not vary with apparent randomness from one trip to the next. Whenever possible, routes should also have clockface headways that divide evenly into an hour, such as every 15, 20, 30, or 60 minutes.

Clockface headways are easier for passengers to remember and can help facilitate better transfer connections between routes. Whenever possible, headways should be set at regular clock-face intervals. However, there are two key exceptions:

- Where individual trips must be adjusted away from clock-face intervals to meet shift times, work times, transfer connections, or other special circumstances
- Where the desired headway of service causes round trip recovery time to exceed 20% of the total round trip vehicle time, leading to inefficient service

Clockface headways also offer greater ease in scheduling timed connections between routes that occur consistently in each hour.

## **Service Allocation**

Service allocation guidelines are used to determine appropriate service levels for fixed-route service and are tailored to each specific route type. RoadRUNNER should strive to meet the minimum service span and headways guidelines. Additional service guidelines are based on transit best practices.

### **Service Span**

The number of hours per day that a route operates plays a role in determining the effectiveness of transit service for potential users. Transit service must be available near the time a trip needs to be made in order for transit to be a viable travel option. Weekday routes should permit workers and students to make their morning start times, and should end late enough to provide return trips home for second shift workers in urban areas. Service oriented to non-work travel can start later and end sooner.

### **Headways**

Service headways are one of the most important determinants of ridership. More frequent service attracts more passengers assuming a market is present. At the same time, headways have a significant impact on operating costs, and service requirements increase significantly with improvements in headways. Because of the expense of frequent service, headways are normally scheduled based upon existing or potential demand. This may translate into variations in headways throughout the day, with higher headways in peak periods, and less frequent service outside of the peak.

### **Stop Spacing**

The distance between stops is a key element in balancing transit access and service efficiency. More closely spaced stops provide customers with more convenient access as they are likely to experience a shorter walk to the nearest bus stop. Since most riders want service that balances convenience and speed, the number and location of stops is a key component of determining that balance.

### **Stop Placement**

Bus stop placement involves a balance of customer safety, accessibility, and operations. All stops should be fully accessible with a concrete landing and access to sidewalk or pathway. Bus stops should be compatible with adjacent land use and minimize adverse impacts on the built and natural environment.

Near-side and far-side stops allow passengers to board and alight closer to intersection crosswalks and are generally preferred over mid-block stops. Far-side stops allow bus operators to use intersection as a deceleration lane and are preferred at intersections in which buses make left turns and intersections with a high volume of right turning vehicles. Mid-block stops should only be considered if pedestrian crosswalks are present. Mid-block stops may be the only option at major intersections with dedicated turn lanes.

Specific ridership generators may determine the placement of a bus stop. Infrastructure consideration for bus stop placement includes lighting, topography, and roadside constraints such as driveways, trees, poles, fire hydrants, etc.