Item 11A

Jump Around Carson (JAC) Transit System

Carson City Fiscal Year 2023

Monitoring Report

INTRODUCTION: COVID-19 CONTEXT-SETTING

Transit services remain an important, and often the only transportation option for many riders in Carson City. Providing a safe, friendly, and dependable service remain the mission of Jump Around Carson (JAC); however, JAC continues to be affected by the effects of the COVID-19 pandemic, increasing labor costs, and concerns about driver and passenger safety, consistent with transit agencies in the region and across the country. During Fiscal Years (FY or FYs) 2022 and 2023, JAC rolled back COVID-19 era mitigation policies, instituted in 2020, and has returned to what could be considered 'normal' service.

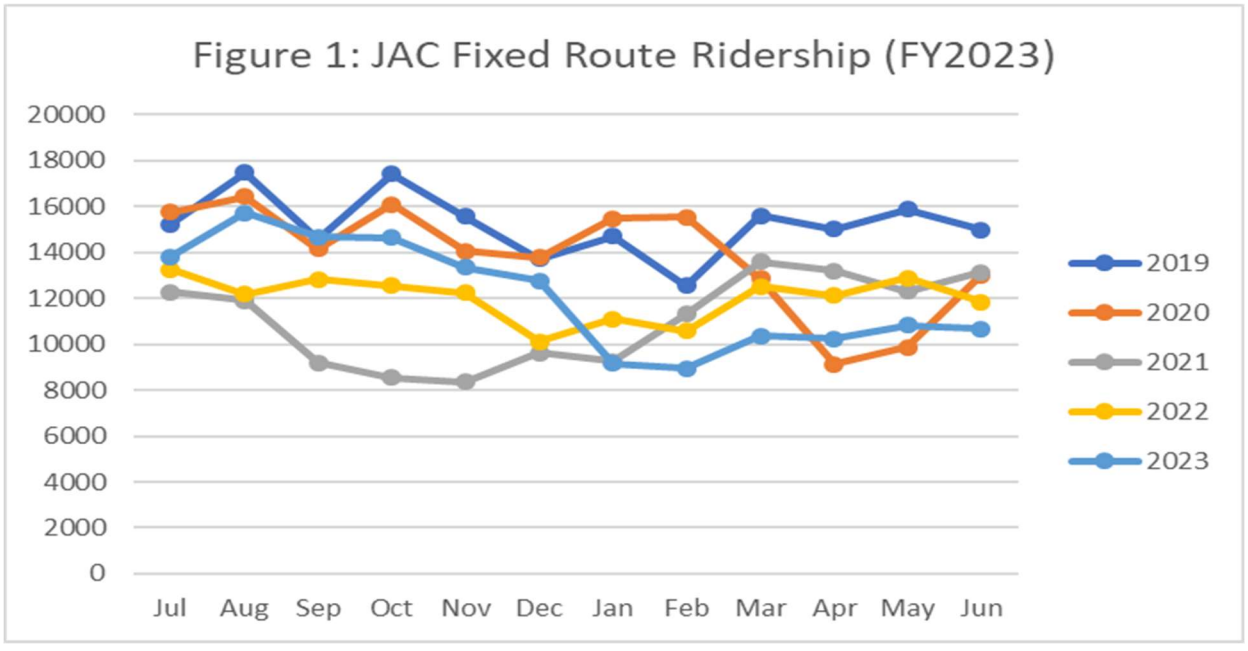
Transit ridership nationally plummeted during the COVID-19 pandemic, but it is beginning to slowly rebound. Nationally, ridership is still below pre-pandemic levels. The American Public Transportation Association reported an 18.18% increase in national public transportation ridership between September 2022 and September 2023. JAC's ridership has also increased from a pandemic low of 9540 trips per month to 13,300 trips per month, an increase of 39%

As cities and businesses adapt to the ever-changing world of public transportation, and transportation trends in general, JAC staff and customers have been resilient. JAC shifted to temporary free fares in March 2020 to keep both riders and drivers safe, and it remains one of few transit agencies that has not reduced or cut service. JAC will continue to provide service to Carson City and has begun to look towards the future with projects to provide more efficient and enjoyable service to riders while operating within limited local funding levels.

FISCAL YEAR 2023 OPERATIONS

1) Ridership

These following sections summarize operational statistics and characteristics from FY 2023. While no Monitoring Report was completed for FY 2022, all tables and figures include FY 2022 data for consistency purposes.



As shown in Figure 1, JAC fixed route ridership at the beginning of FY 2023 was above FY 2022 ridership. Ridership numbers mid-year dipped below the FY 2022 ridership number likely due the re-implementation of fares and the harsh winter experienced in 2023 from December through February. Ridership did increase from March through June of 2023. Ridership totals between FY 2022 and FY 2023 remained very close even with the dip in winter numbers. Total ridership for fixed route in FY 2022 was 144,199 trips versus 145,233 trips in FY 2023, an overall increase of 1,034 trips.

Figure 2 shows ridership for JAC Assist (ADA Paratransit). Overall, JAC Assist provided 14,473 unlinked passenger trips in FY 2023, up 2.7 percent from the 14,098 trips provided in FY 2022.

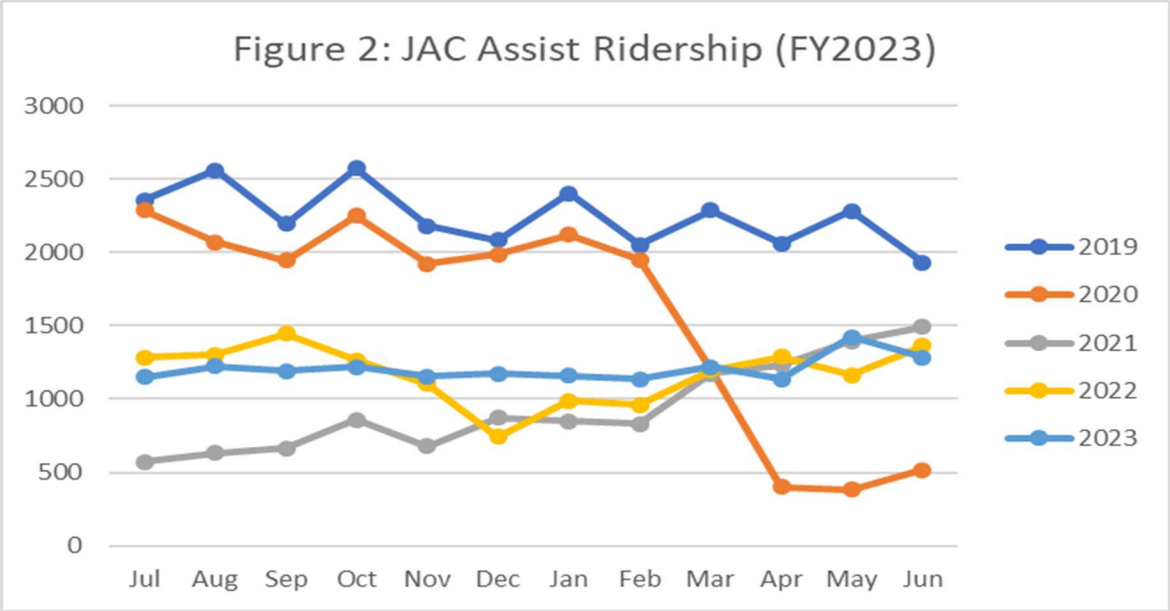


Table 1 below shows the additional details for ridership on JAC Assist. Staff have continued to observe that JAC Assist's ridership is much more dependent on medical business types, including dialysis centers. When compared with national statistics, the effectiveness of safety protocols and the essential services that JAC provides for its customers is clear. Hours of peak business for JAC Assist are Monday, Wednesday, and Friday between 7:30am to 9:30am, and 2:00pm to 5:00pm.

Table 1: JAC Assist Ridership Summary

		Trip Purpose*		Area		Trips by Day	
FY	Medicaid Trips	Medical & Dialysis Trips	General / Subscription Trips	3/4 Mile	Extended	Weekday	Saturday
2023	2,929	4,175	12,412	13,352	1,121	13,845	628

* Trips may be listed with multiple purposes.

2) Operational Efficiency

JAC uses Vehicle Revenue Hours and Vehicles Revenue Miles to account for the hours/miles a vehicle is in revenue service and excludes time and distance while traveling for administrative purposes, including maintenance, fueling, and driver training. Revenues and expenditures can be compared with other transit agencies through an analysis of the cost per revenue hour/mile statistic.

Table 2 summaries the cost per revenue hour/mile for FY 2023 as compared to past years. Additional statistics are provided within the National Transit Database reports that have been compiled and included in the Appendix of this report.

Table 2: Cost per Revenue Hour/Mile/Trip

	FY 2020		FY 2021		FY 2022		FY 2023	
	Fixed	Paratransit	Fixed	Paratransit	Fixed	Paratransit	Fixed	Paratransit
Annual Unlinked Trips	166,286	19,032	132,760	11,250	144,199	14,098	145,233	14,473
Vehicle Revenue Hours	14,930	6,045	13,045	4,874	13,330	5,761	14,784	6,121
Vehicle Revenue Miles	172,492	55,960	150,741	42,629	156,711	52,664	170,734	55,302
Operating Cost per Unlinked Passenger Trip	$7.44	$13.20	$8.41	$36.61	$10.00	$32.54	$9.86	$36.02
Operating Cost per Vehicle Revenue Mile	$7.17	$4.49	$7.41	$9.66	$9.20	$8.71	$8.39	$9.43
Operating Cost per Vehicle Revenue Hour	$82.89	$41.57	$85.60	$84.51	$108.19	$79.63	$96.88	$85.16
Number of Passengers per Revenue Hour	11.1	3.1	10.2	2.3	10.8	2.4	9.8	2.4
Number of passengers per Revenue Mile	1.0	0.3	0.9	0.3	0.9	0.3	0.9	0.3
Number of passengers per revenue day	540	62	444	39	494	48	478	48
Farebox recovery rate	3.30%	6.50%	0.00%	0.00%	0.00%	0.00%	3.16%	6.03%

Note: JAC operated fare free from March 2020 to January 2023.

JAC's average cost per revenue hour was less than FY 2022. JAC fixed route service reported 14,784 Vehicle Revenue Hours and $1,432,317 in operations costs in FY 2023, for a cost per revenue hour of $96.88, while the National Transit Database shows a national average of $160.33 in 2021 (the latest available data). JAC Assist reported 6,121 Vehicle Revenue Hours and $521,276 in operations costs in FY 2023, resulting in a cost per vehicle revenue hour of $85.61, compared to the national average of $101.30 in 2021. While comparing JAC FY 2023 data to FY 2021 national data is not ideal, it does provide context that would otherwise be unavailable. The comparison illuminates JAC's fixed route operational efficiency.[1]

The Jump Around Carson bus fleet currently consists of 17 revenue vehicles, with an average of $11,172.09 of maintenance costs per vehicle. No revenue vehicles were replaced in FY 2023. Total maintenance costs (parts and labor) for FY 2023 were $225,684. Replacing vehicles is a top priority for staff in FY 2024 as keeping the fleet in a state of good repair through preventative maintenance and timely replacement reduces costs.

1 - 2021 NTD National Transit Summaries and Trends, https://www.transit.dot.gov/ntd/annual-national-transit-summaries-and-trends

3) Safety

JAC remains one of the safest forms of transportation in Carson City. JAC completes annual updates to its Public Transit Agency Safety Plan (PTASP). The PTASP outlines safety related occurrences for the agency and establishes targets for the coming fiscal year. There were no fatalities or major injuries in FY 2023. JAC reported two (2) safety events for fixed route in FY 2023 as compared to two (2) for fixed route and one (1) for paratransit in FY 2022.

The PTASP received only minor changes from previous FY 2023 plan. The only changes made to the PTASP were the names of leadership positions, including Dan Kelsey as Transit Coordinator and Mike Peoples as General Manager of First Transit (TransDev).

The updates made to the FY 2024 PTASP plan were made in the Safety Performance Target category. Under the System Reliability category, the average miles between major mechanical failures was lowered for Fixed Route from 3,500 miles in FY 2023 to 3,000 miles in FY 2024. Paratransit was also reduced from 4,500 miles in FY 2023 to 4,000 miles in FY 2024. This was reported due to aging fleet and added mileage bus fleet vehicle.

4) Administration and Rider Feedback

JAC is operated by a contracted operator, First Transit (aka TransDev), who provides administration, dispatching, and drivers for the service. First Transit has been contracted with the Carson City RTC since August 2020. First Transit works closely with the Transit Coordinator, Dan Kelsey, who oversees the day-to-day administration and management of JAC. Over the course of 2023, there have been many notable events in the operation and administration of JAC.

- The RTC awarded a new operating contract to First Transit in August of 2023. The contract amount, which includes three base years and two option years, is for a total not to exceed amount of $7,747,566 over the 5-year period. With the execution of option years, the contract will end September 30, 2028.
- Fares for JAC were re-implemented in January 2023 for the first time since March of 2020. The RTC approved a fare increase for both JAC Fixed Route and JAC Assist services.
- FTA funding, in combination with Redevelopment Area funding was awarded to the construction of sidewalks along Robinson Street. This marks the first time FTA and Redevelopment funds have been combined in recent years.
- A feasibility study was completed for the downtown transfer center which identified short-term and long-term improvements.

JAC staff completed a rider survey in September of 2023. This survey, available in two languages, was conducted through in-person interviews, through paper copies available on the bus, and via a mobile application. Highlights of the survey results are listed below and additional details are attached as an appendix. 75 Surveys were completed.

- 80% of fixed route responders ride more than 3 times per week.
- Over 50% of responders are over the age of 60.
- Over 90% of responders make less than $50,000 per year.

- 68% of responders indicated they agree or strongly agree they feel safe on the bus

FUNDING AVAILABILITY: REVENUE AND EXPENSES

The FTA provides annual funding apportionments that are used for funding operations and capital purchases for the JAC transit system. Apportionment funding is available through various funding types including the FTA's Section 5307, 5310, and 5339 programs. These funds are apportioned directly to the Carson Area Metropolitan Planning Organization (CAMPO) and are formula based. A local match is required for each of these funding sources. The match share for an individual expenditure can range from 15% to 50% depending on the project and funding program. Typically, 15% is required for bus purchases, 20% for other capital purchases and maintenance, and 50% for operating expenditures. The majority of the local match is provided through a transfer from Carson City's General Fund. In FY 2023, JAC received $504,800 in General Fund transfers. JAC also receives local match for operations from State grants and through the sale of advertisements on busses and shelters. Total local match received in FY 2023 was $722,627.

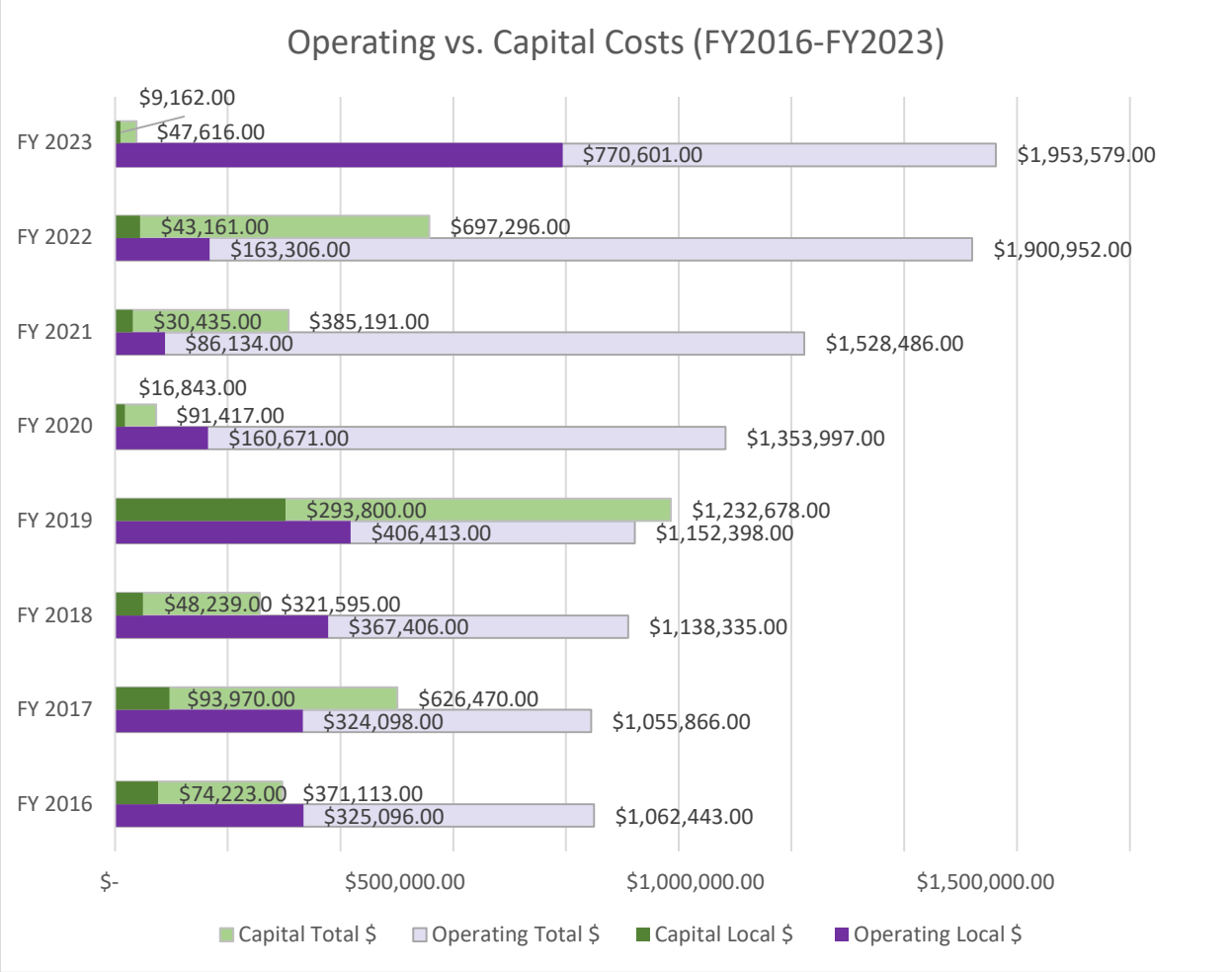
JAC receives revenue from ridership through the sales of fares. While fares cannot be used as local match, they do reduce the required local match. In FY 2023, JAC received $76,665 in total fare revenue during the 6-months following fare re-implementation.

JAC expenditures can be categorized into capital expenses and operating expenses. Capital expenses consist of large purchases, including rolling stock. Operating expenses include all other purchases necessary for JAC operations and include maintenance on the buses and the operations contract. While occurrence of capital expenses can fluctuate and be planned for, operating expenses are more frequent and consistent. Operating expenses are tied to labor and fuel costs, and typically increase year over year.

All funds received or expended make up the Transit Fund budget, which includes the City's "225" accounts. FTA grant funds must be allocated to specific activities/projects at the time the grant application is submitted in the federal electronic grant award system. This often results in the fund balance for some projects, remaining unused until a future need arises, or a grant amendment may be requested from FTA to allocate funds to another transit project when needed.

In FY 2023, JAC spent $2,001,195 between operations and capital, compared to $2,598,248 in FY 2022 and $1,913,677 in FY 2021. The required local match in recent years has been low due the CARES Act which provided federal funding at a match rate of 0% (free). The CARES Act funding was provided as a one-time apportionment, and as budgeted, will run out in FY 2024 or FY 2025. The majority of the CARES Act funding for operations has been expended, so in FY 2023, JAC spent $779,763 in local match compared to $206,467 in FY 2022. This is consistent with the local match spent in FY 2019 prior to the CARES Act. JAC's spending is expected to remain relatively flat in the short-term, but expected to increase due to several factors including future operations contracts, ADA compliance upgrades at bus stops, and rolling stock purchases in conformance with JAC's adopted Transit Asset Management (TAM) Plan. Figure 3 shows JAC's Operating and Capital Costs.

Figure 3: JAC Operating and Capital Costs



Annual apportionments of federal grant funds continue to become available to CAMPO and JAC. With the 5307, 5310, and 5339 grant funding, JAC must include a local share. Apportioned funding is further distributed into categories called Activity Line Items (ALI). The ALIs include categories such as preventative maintenance, operations, and facility rehabilitation and restoration. The distribution of available, executed grant funding and their ALI distributions is provided in Table 3.

JAC typically relies heavily on FTA 5307 (Urbanized Area Formula Program) funding. FTA 5307 funding covers operations of the fixed route service as well as bus maintenance and site facility upgrades. It can also be used for bus and bus facilities as well as sidewalk, bicycle, and bus stop infrastructure. In terms of executed agreements, JAC currently has $1,729,544 in unspent FTA funding with $870,581 required in local match. These totals include remaining CARES Act funding. There is $5,108,647 in FTA 5307 apportioned funds available to CAMPO for execution (Table 4). The required local match for these apportioned funds is not known as it depends on the use of the funding, but it is generally estimated to range from $3,000,000 to $4,250,000 based on historical averages.

FTA 5310 funding is aimed at enhancing mobility of seniors and people with disabilities. There is $360,533 of 5310 funds remaining through CAMPO's executed apportionments. A portion of these is available at 100% federal share. The required remaining local match for these funds is $62,269.

Bus and Bus Facilities funding is captured under FTA's 5339 program. JAC currently has two open grants with $822,222 remaining in FTA funding that requires $277,805 in local share. A portion of the FY 2022 and FY 2023 apportionments have been programmed, but the grant has not been executed. CAMPO has awarded $85,000 in funding to Douglas County as a subrecipient. The local match for this funding will be provided by Douglas County.

Table 3: Transit Fund Grant Summary (as of January 2024)

FTA Fund Type	Grant Title & Activity Line Item (ALI)	Original Budget Amount	Total Spent FTA	Total Spent Local	Total Remaining FTA	Total Remaining Local
5310	NV-2022-021 - FY 2022 & FY 2023 Apportionments					
	Operating Assistance-JAC ASSIST	$477,499.00	$132,924.00	$33,230.36	$249,075.00	$62,269.64
	TOTAL	**$477,499.00**	**$132,924.00**	**$33,230.36**	**$249,075.00**	**$62,269.64**
5307	NV-2022-016 - FY 2020 Apportionments					
	Operating	$1,304,000.00	$0.00	$0.00	$652,000.00	$652,000.00
	Capital Assistance - Preventive Maintenance	$652,000.00	$219,792.00	$54,948.58	$301,808.00	$75,451.42
	Capital Non-Fixed Route ADA Paratransit	$162,999.00	$130,399.00	$32,600.00	$0.00	$0.00
	Renovate Admin Facility (Safety & Security)	$16,465.00	$0.00	$0.00	$13,172.00	$3,293.00
	TOTAL	**$2,135,464.00**	**$350,191.00**	**$87,548.58**	**$966,980.00**	**$730,744.42**
5310	NV-2022-009 - FY 2020 & FY 2021 Apportionments					
	3rd Party Contracted Services	$143,471.00	$143,471.00	$0.00	$0.00	$0.00
	Acquire- Mobile Fare Coll Equip	$148,573.00	$37,115.00	$0.00	$111,458.00	$0.00
	TOTAL	**$292,044.00**	**$180,586.00**	**$0.00**	**$111,458.00**	**$0.00**
5307	NV-2022-005 – FY 2022 5307 ARPA Apportionment Operating Assistance					
	Emer. Operating Assistance 100% Fed Share	$417,083.00	$417,083.00	$0.00	$0.00	$0.00
	Support Equip and Facilities (1% Safety/Security)	$4,213.00	$0.00	$0.00	$4,213.00	$0.00
	TOTAL	**$421,296.00**	**$417,083.00**	**$0.00**	**$4,213.00**	**$0.00**
5339	NV-2022-003 - FY 2020 & FY 2021 5339 Apportionment Solar Lighting for all Bus Stops					
	Bus Station/Stops/Terminals	$306,021.00	$0.00	$0.00	$244,817.00	$61,204.00
	TOTAL	**$306,021.00**	**$0.00**	**$0.00**	**$244,817.00**	**$61,204.00**
5339	NV-2021-021 - FY 2019 5339 Apportionment Replacement Vehicle Purchase					
	Bus Rolling Stock - 35ft	$144,006.00	$0.00	$0.00	$122,405.00	$21,601.00
	TOTAL	**$144,006.00**	**$0.00**	**$0.00**	**$122,405.00**	**$21,601.00**

FTA Fund Type	Grant Title & Activity Line Item	Original Budget Amount	Total Spent FTA	Total Spent Local	Total Remaining FTA	Total Remaining Local
5339b	NV-2021-019 - FY 2019 5339(b) Bus & Bus Facilities, Bus Replacement					
	Bus Rolling Stock - 35ft	$650,000.00	$0.00	$0.00	$455,000.00	$195,000.00
	TOTAL	**$650,000.00**	**$0.00**	**$0.00**	**$455,000.00**	**$195,000.00**
5307	NV-2020-007 - FY 2020 CARES Act Apportionment Ops/PM/Capital Items					
	Operating	$2,241,894.00	$2,241,894.00	$0.00	$0.00	$0.00
	Other Capital Items (Bus)	$308,475.00	$308,475.00	$0.00	$0.00	$0.00
	Rehab/Renovate Admin Facility (safety $ security)	$37,253.00	$31,180.00	$0.00	$6,073.00	$0.00
	Rehab/Renovate Admin Facility	$217,747.00	$2,583.00	$0.00	$215,164.00	$0.00
	ADP Software	$33,600.00	$33,600.00	$0.00	$0.00	$0.00
	Bus Support Equip/Facilities Fare Collection (mobile)	$71,290.00	$26,043.00	$0.00	$45,247.00	$0.00
	Rehab/Renovate Bus Station	$51,250.00	$1,750.00	$0.00	$49,500.00	$0.00
	Rolling Stock (Three 24 Footers)	$413,964.00	$413,964.00	$0.00	$0.00	$0.00
	Rolling Stock (Mini Van)	$94,046.00	$94,046.00	$0.00	$0.00	$0.00
	Rolling Stock (Two 35 Foot to 24 Foot)	$255,790.00	$128,576.00	$0.00	$127,214.00	$0.00
	TOTAL	**$3,725,309.00**	**$3,282,111.00**	**$0.00**	**$443,198.00**	**$0.00**
5307	NV-2020-002 - FY 2019 Apportionment Ops/PM/Capital Items					
	Operating	$1,956,110.00	$896,657.00	$896,657.09	$81,398.00	$81,397.91
	Capital Assistance - Preventive Maintenance	$265,000.00	$211,999.00	$53,000.94	$1.00	($0.94)
	Capital Non-Fixed Route ADA Paratransit	$193,550.00	$154,841.00	$38,709.00	($1.00)	$1.00
	(Safety & Security)	$19,355.00	$4,140.00	$1,035.09	$11,344.00	$2,835.91
	ADP Software	$10,000.00	$8,000.00	$2,000.00	$0.00	$0.00
	Rehab/Renovate Bus Station	$225,000.00	$0.00	$0.00	$180,000.00	$45,000.00
	TOTAL	**$2,669,015.00**	**$1,275,637.00**	**$991,402.12**	**$272,742.00**	**$129,233.88**
5307	NV-2018-007 - FY 2018 5307 Apportionment Ops/PM/Capital Items					
	Operating	$999,808.00	$499,904.00	$499,904.00	$0.00	$0.00
	Capital – Prev. Maintenance	$358,075.00	$286,460.00	$71,615.00	$0.00	$0.00
	Capital - Non-Fixed, Paratransit	$150,970.00	$120,776.00	$30,194.42	$0.00	($0.42)
	Rehab/Reno - Yard/Shop (Safety & Security)	$15,098.00	$12,078.00	$3,020.04	$0.00	($0.04)
	Rehab/Reno - Admin Facility	$105,778.00	$58,212.00	$14,551.05	$26,411.00	$6,603.95
	ADP Software	$7,500.00	$6,000.00	$1,500.00	$0.00	$0.00
	Bus Stop Amenities	$62,902.00	$34,322.00	$8,580.00	$16,000.00	$4,000.00
	Bus Rolling Stock	$45,810.00	$36,648.00	$9,162.00	$0.00	$0.00
	Bus Rolling Stock	$130,530.00	$110,951.00	$19,580.00	$0.00	$0.00
	TOTAL	**$1,876,471.00**	**$1,165,351.00**	**$658,106.51**	**$42,411.00**	**$10,603.49**

Table 4: Existing FTA Apportionments yet to be executed.

FTA Fund Type	Existing Available Apportioned Grants and Use	FTA Amount
5307	TBD - FY 2021 Apportionment Ops/PM/Capital Items	
	Operating Assistance Available	$1,304,956.00
	(Safety & Security)	$13,200.00
	TOTAL	**$1,318,156.00**
5307	TBD - FY 2022 Apportionment Ops/PM/Capital Items	
	Operating Assistance Available	$1,856,650.00
	(Safety & Security)	$18,754.00
	TOTAL	**$1,875,404.00**
5307	TBD - FY 2023 Apportionment Ops/PM/Capital Items	
	Operating Assistance Available	$1,895,639.00
	(Safety & Security)	$19,148.00
	TOTAL	**$1,914,787.00**
5339	TBD - FY 2022 & FY 2023 Bus and Bus Facilities	
	Bus and Bus Facilities	$144,458
	Douglas County - Subrecipient	$85,000
	TOTAL	**$229,458**

MOVING FORWARD: CHALLENGES AND OPPORTUNITIES

1) Funding

JAC's future will be challenged by limited local match funding. While increases in provided matching funds have benefited the service, future continuation of limited local funding levels may result in future FTA apportionment reductions. FTA revenue is outpacing available local match, which may result in grant funds reverting to FTA for use by other agencies/jurisdictions when funds aren't utilized within each FTA program's required timeframes.

Staff is investigating creative ways to utilize the federal funding expanding the scope to include more ADA and pedestrian related infrastructure. Staff is also looking for new local funding sources in partnership with other agencies or organizations to complete projects or provide new service that mutually benefits both parties. CAMPO contributes the federal funds, and the partner agency provides the local match.

2) Short-Term Service Enhancements

JAC staff look forward to bettering the service for riders and to make JAC a more attractive mobility option to potential new riders. These enhancements include:

- Bus stop upgrades for ADA compliance
- Bus stop lighting and bus stop sign replacements

- Downtown Transit Center update
- Additional use of the JAC Transloc App and JAC website

These updates collectively increase the accessibility of the JAC transit system to users of all ages and abilities and has the potential to increase ridership with limited to no increases in cost. Furthermore, Carson City's continued investment in Complete Streets infrastructure complements JAC services. Elements like wide sidewalks and bicycle lanes help riders bridge the first/last mile gap, the part of the trip between their transit stop and the origin/destination. With so many riders walking less than 5 minutes to access JAC, there is significant un-tapped ridership potential as more Complete Street elements continue to be constructed.

3) Long-Term Service Enhancements

Long-term service enhancements can further increase ridership and use of JAC. Long-term concepts include:

- Future route updates.
- Construction of a Downtown Transit Center.
- Purchase of Low/No-Emission vehicles and associated facilities.
- New service areas along US 50 east and into Lyon County, and along south US 395 into the northern portion of Douglas County.
- The reduction of paper fare media and expansion of re-loadable cards or tap-and-go onboard payment systems.
- The addition of a Vanpool program for commuters.

CONCLUSION

Jump Around Carson has been able to withstand a difficult period in transit history through the resilience of the JAC staff and being flexible in a changing transit environment. JAC Services fills a void in the community and provides a vital transportation lifeline for those who need it. JAC is poised to remain a reliable, economical, and relaxing transportation option for the many residents and visitors that rely upon the services provided. Promoting the service, and adapting to changing demographics, funding streams, and technology must be prioritized in order to successfully serve the riding public and meet federal requirements. All staff who are a part of JAC's operation are committed to serving the community. Enjoy the ride!

APPENDIX A: National Transit Database Submittals (FY 2020-2022)

http://www.carsonareampo.com/
3505 Butti Way
Carson City, Nv 89701-3498

Carson Area Metropolitan Planning Organization
2020 Annual Agency Profile

Mrs. Lucia Maloney
775-283-7396

General Information

Urbanized Area (UZA) Statistics - 2010 Census

Carson City, NV

23 **Square Miles**
58,079 **Population**
454 **Pop. Rank out of 498 UZAs**

Other UZAs Served

0 Nevada Non-UZA

Service Area Statistics

26 **Square Miles**
53,969 **Population**

Service Consumption

185,318 **Annual Unlinked Trips (UPT)**

Service Supplied

228,452 **Annual Vehicle Revenue Miles (VRM)**
20,975 **Annual Vehicle Revenue Hours (VRH)**

Database Information

NTDID: 90215 **Asset Type:** Tier II
Reporter Type: Reduced Reporter **Sponsor NTDID:**

Financial Information

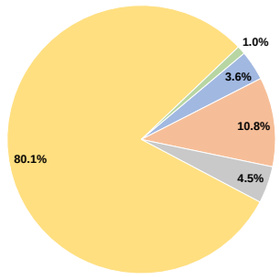
Sources of Operating Funds Expended

Fare Revenues	$53,555	3.6%
Local Funds	$160,671	10.8%
State Funds	$66,350	4.5%
Federal Assistance	$1,193,326	80.1%
Other Funds	$15,000	1.0%
Total Operating Funds Expended	$1,488,902	100.0%

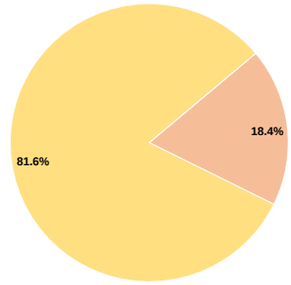
Sources of Capital Funds Expended

Fare Revenues	$0	0.0%
Local Funds	$16,843	18.4%
State Funds	$0	0.0%
Federal Assistance	$74,574	81.6%
Other Funds	$0	0.0%
Total Capital Funds Expended	$91,417	100.0%

Operating Funding Sources



Capital Funding Sources



Assets

Revenue Vehicles	**17**
Service Vehicles	**1**
Facilities	**2**

Performance Measure Targets - 2021

Performance Measure - Asset Type - Target % not in State of Good Repair
Equipment - Trucks and other Rubber Tire Vehicles - 100%
Facility - Administrative / Maintenance Facilities - 0%
Rolling Stock - BU - Bus - 0%
Rolling Stock - CU - Cutaway - 14%
Rolling Stock - MV - Minivan - 100%

Modal Characteristics

Operation Characteristics

Mode	Vehicles Operated at Maximum Service: Directly Operated	Vehicles Operated at Maximum Service: Purchased Transportation	Operating Expenses	Fare Revenues	Uses of Capital Funds	Annual Unlinked Trips	Annual Vehicle Revenue Miles	Annual Vehicle Revenue Hours	Average Fleet Age in Years[a]
Demand Response	-	5	$251,300	$14,448	$0	19,032	55,960	6,045	8.6
Bus	-	4	$1,237,602	$39,107	$91,417	166,286	172,492	14,930	6.4
Total	-	9	$1,488,902	$53,555	$91,417	185,318	228,452	20,975	

Performance Measures

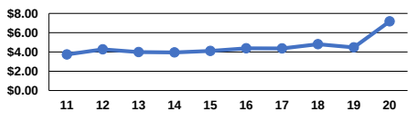
Service Efficiency

Mode	Operating Expenses per Vehicle Revenue Mile	Operating Expenses per Vehicle Revenue Hour
Demand Response	$4.49	$41.57
Bus	$7.17	$82.89
Total	$6.52	$70.98

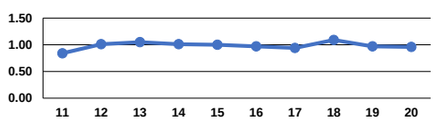
Service Effectiveness

Mode	Operating Expenses per Unlinked Passenger Trip	Unlinked Trips per Vehicle Revenue Mile	Unlinked Trips per Vehicle Revenue Hour
Demand Response	$13.20	0.3	3.1
Bus	$7.44	1.0	11.1
Total	$8.03	0.8	8.8

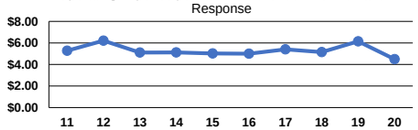
Operating Expense per Vehicle Revenue Mile: Bus



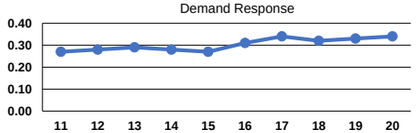
Unlinked Passenger Trips per Vehicle Revenue Mile: Bus



Operating Expense per Vehicle Revenue Mile: Demand Response



Unlinked Passenger Trips per Vehicle Revenue Mile: Demand Response



Notes:

[a]Demand Response - Taxi (DT) and non-dedicated fleets do not report fleet age data.

http://www.carsonareampo.com/
3505 Butti Way
Carson City, Nv 89701-3498

Carson Area Metropolitan Planning Organization
2021 Annual Agency Profile

Mr. Chris Martinovich
(775) 283-7367

General Information

Urbanized Area (UZA) Statistics - 2010 Census

Carson City, NV

23 **Square Miles**
58,079 **Population**
454 **Pop. Rank out of 498 UZAs**

Other UZAs Served

0 Nevada Non-UZA

Service Area Statistics

26 **Square Miles**
60,443 **Population**

Service Consumption

144,010 **Annual Unlinked Trips (UPT)**

Service Supplied

193,370 **Annual Vehicle Revenue Miles (VRM)**
17,919 **Annual Vehicle Revenue Hours (VRH)**

Database Information

NTDID: 90215 **Asset Type:** Tier II
Reporter Type: Reduced Reporter **Sponsor NTDID:**

Financial Information

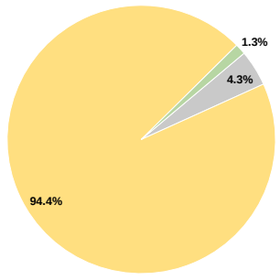
Sources of Operating Funds Expended

Fare Revenues	$0	0.0%
Local Funds	$0	0.0%
State Funds	$66,350	4.3%
Federal Assistance	$1,442,352	94.4%
Other Funds	$19,784	1.3%
Total Operating Funds Expended	**$1,528,486**	100.0%

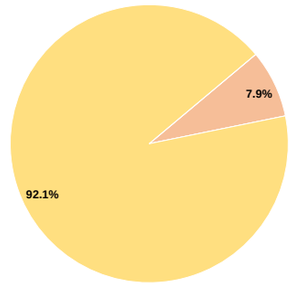
Sources of Capital Funds Expended

Fare Revenues	$0	0.0%
Local Funds	$30,435	7.9%
State Funds	$0	0.0%
Federal Assistance	$354,756	92.1%
Other Funds	$0	0.0%
Total Capital Funds Expended	**$385,191**	100.0%

Operating Funding Sources



Capital Funding Sources



Assets

Revenue Vehicles	**15**
Service Vehicles	**1**
Facilities	**2**

Performance Measure Targets - 2022

Performance Measure - Asset Type - Target % not in State of Good Repair
Equipment - Trucks and other Rubber Tire Vehicles - 100%
Facility - Administrative / Maintenance Facilities - 0%
Rolling Stock - BU - Bus - 0%
Rolling Stock - CU - Cutaway - 67%
Rolling Stock - MV - Minivan - 100%

Modal Characteristics

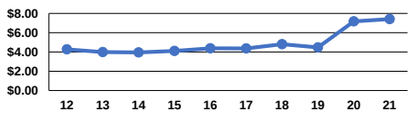
Operation Characteristics

Mode	Vehicles Operated at Maximum Service: Directly Operated	Vehicles Operated at Maximum Service: Purchased Transportation	Operating Expenses	Fare Revenues	Uses of Capital Funds	Annual Unlinked Trips	Annual Vehicle Revenue Miles	Annual Vehicle Revenue Hours	Average Fleet Age in Years[a]
Demand Response	-	5 [1]	$411,899 [1]	$0	$0 [1]	11,250	42,629	4,874	7.4
Bus	-	4 [1]	$1,116,587 [1]	$0	$385,191 [1]	132,760	150,741	13,045	4.7
Total	**-**	**9**	**$1,528,486**	**$0**	**$385,191**	**144,010**	**193,370**	**17,919**	

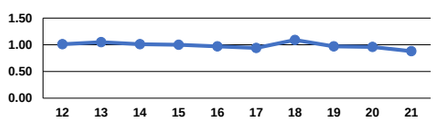
Performance Measures

Mode	Service Efficiency: Operating Expenses per Vehicle Revenue Mile	Service Efficiency: Operating Expenses per Vehicle Revenue Hour	Service Effectiveness: Operating Expenses per Unlinked Passenger Trip	Service Effectiveness: Unlinked Trips per Vehicle Revenue Mile	Service Effectiveness: Unlinked Trips per Vehicle Revenue Hour
Demand Response	$9.66	$84.51	$36.61	0.3	2.3
Bus	$7.41	$85.60	$8.41	0.9	10.2
Total	**$7.90**	**$85.30**	**$10.61**	**0.7**	**8.0**

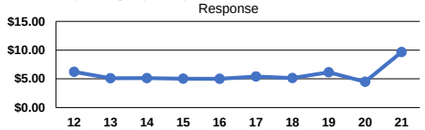
Operating Expense per Vehicle Revenue Mile: Bus



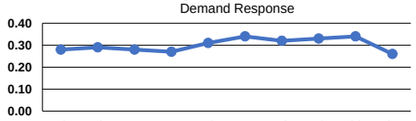
Unlinked Passenger Trips per Vehicle Revenue Mile: Bus



Operating Expense per Vehicle Revenue Mile: Demand Response



Unlinked Passenger Trips per Vehicle Revenue Mile: Demand Response



Notes:

[a]Demand Response - Taxi (DR/TX) and non-dedicated fleets do not report fleet age data.
[1]Includes data for a contract with another reporter.
*This agency has a purchased transportation relationship in which they buy service from First Transit (NTDID: Entity that Does Not Report to NTD), and in which the data are captured in this report for mode DR/PT.
*This agency has a purchased transportation relationship in which they buy service from MV Transportation (NTDID: Entity that Does Not Report to NTD), and in which the data are captured in this report for mode DR/PT.
*This agency has a purchased transportation relationship in which they buy service from First Transit (NTDID: Entity that Does Not Report to NTD), and in which the data are captured in this report for mode MB/PT.
*This agency has a purchased transportation relationship in which they buy service from MV Transportation (NTDID: Entity that Does Not Report to NTD), and in which the data are captured in this report for mode MB/PT.

3505 BUTTI WAY

CARSON CITY, NV 89701-3498

Carson Area Metropolitan Planning Organization

2022 Annual Agency Profile

NTD ID 90215

http://www.carsonareampo.com/

General Information

Service Consumed

158,297 **Annual Unlinked Trips (UPT)**

Service Supplied

209,375 **Annual Vehicle Revenue Miles (VRM)**

19,091 **Annual Vehicle Revenue Hours (VRH)**

Urban/Rural Area Statistics

Carson City, NV **Primary Urbanized/Rural Area**

26 **Service Area Square Miles**

62204 **Service Area Population**

Database Information

NTDID: 90215

Reporter Type: Reduced Reporter

Assets

Revenue Vehicles	21
Servie Vehicles	1
Facilities	8
Asset Type	Tier II
Sponsor NTDID	

Financial Information

Sources of Operating Funds Expended

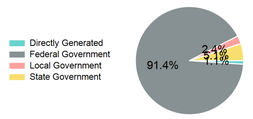
Directly Generated	$20,415
Federal Government	$1,737,645
Local Government	$46,141
State Government	$96,750
Total Operating Funds Expended	**$1,900,951**

Sources of Capital Funds Expended

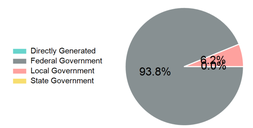
Directly Generated	$0
Federal Government	$654,135
Local Government	$43,161
State Government	$0
Total Capital Funds Expended	**$697,296**

2022 Financial Breakdown

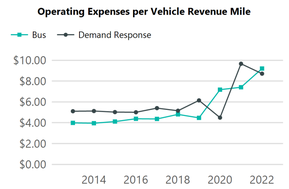
Operating Funding Sources

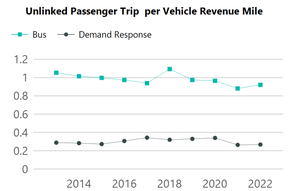


Capital Funding Sources



Metrics - Time Series





Performance Measure Targets - 2023

Performance Measure - Asset -Target % not in State of Good Repair

Equipment - Trucks and other Rubber Tire
Vehicles - 100%
Facility - Administrative / Maintenance
Facilities - 0%
Rolling Stock - BU - Bus - 0%
Rolling Stock - CU - Cutaway - 12%
Rolling Stock - MV - Minivan - 0%

Modal Characteristics

Overview

Mode	Directly Operated VOMS	Purchased Transportation VOMS	Total Vehicles Operated in Maximum Service (VOMS)	Fare Revenues	Operating Expenses	Capital Expenses	Annual Unlinked Pass. Trips	Annual Vehicle Revenue Miles	Annual Vehicle Revenue Hours	Average Fleet Age in Years
Demand Response	0	6	6	$0	$458,735	$9,552	14,098	52,664	5,761	8
Bus	0	4	4	$0	$1,442,216	$687,744	144,199	156,711	13,330	4
Total (all modes)	**0**	**10**	**10**	**$0**	**$1,900,951**	**$697,296**	**158,297**	**209,375**	**19,091**	

Metrics

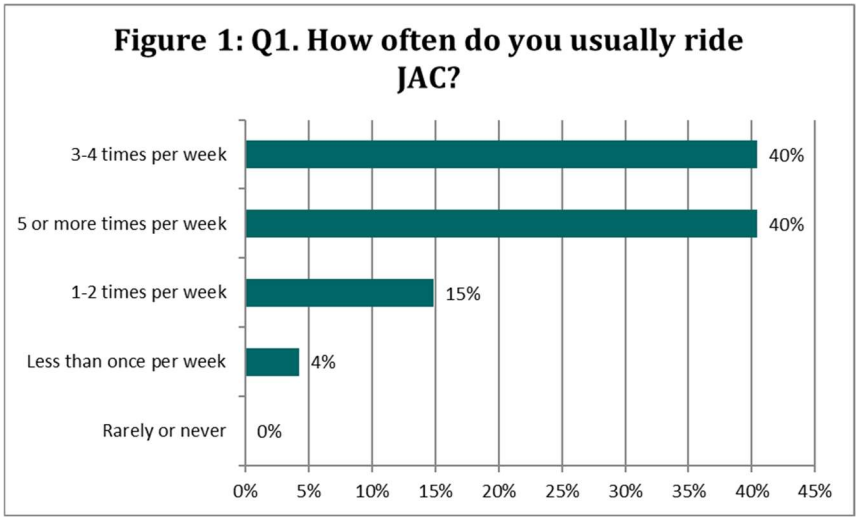
	Service Efficiency		Service Effectiveness		
Mode	Operating Expenses per Vehicle Revenue Mile	Operating Expenses per Vehicle Revenue Hour	Operating Expenses per UPT	UPT per Vehicle Revenue Mile	UPT per Vehicle Revenue Hour
Demand Response	$8.71	$79.63	$32.54	0.3	2.4
Bus	$9.20	$108.19	$10.00	0.9	10.8
Total	**$9.08**	**$99.57**	**$12.01**	**0.8**	**8.3**

APPENDIX B: 2023 Rider Survey Summary

JAC Fixed-Route Onboard Survey Summary

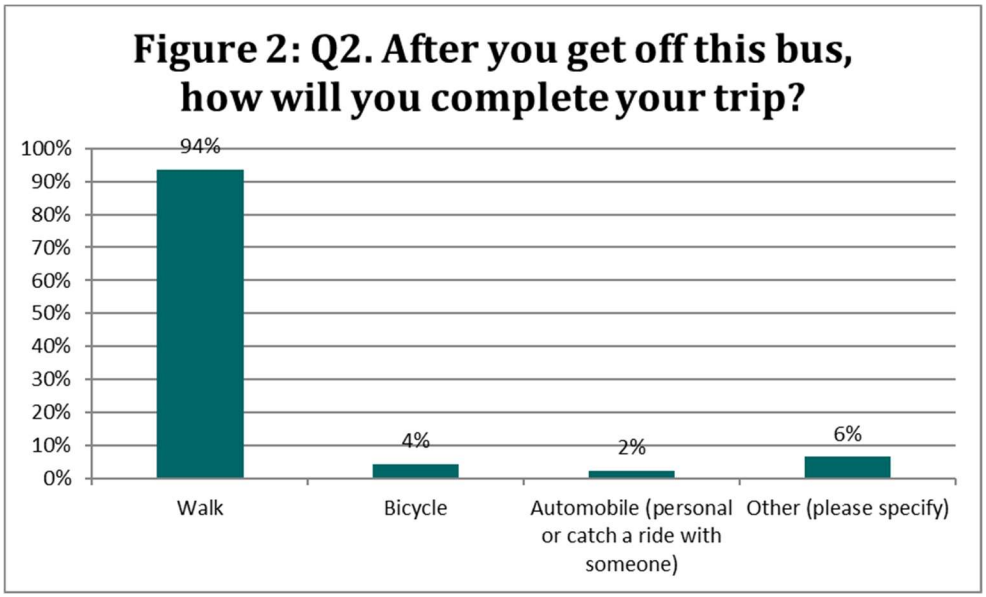
Q1: How often do you usually ride JAC? (47 Responses)

Most respondents reported using transit services frequently, with 40% reporting using the service 3-4 times per week and 40% of respondents indicating they used the service 5-6 times per week.



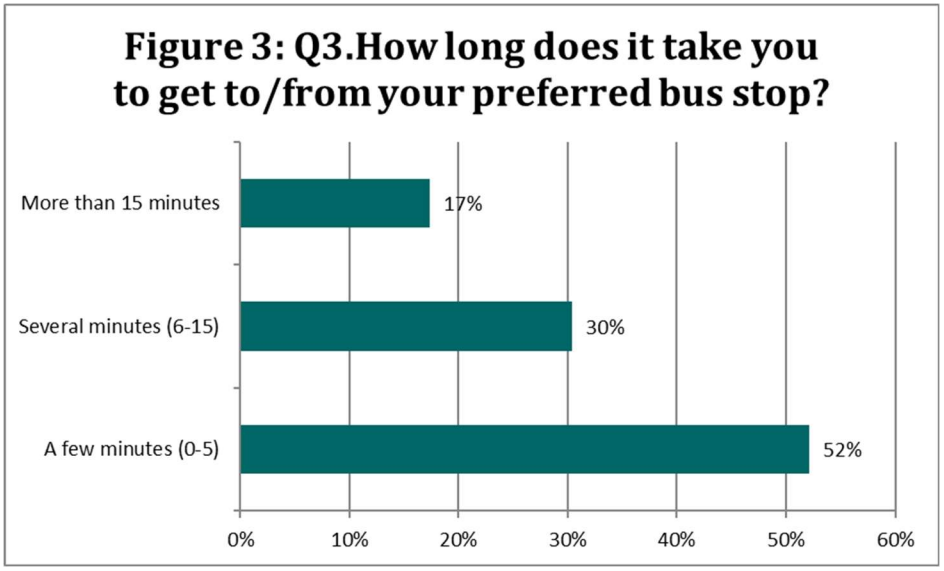
Q2: After you get off this bus, how will you complete your trip? (47 Responses)

Walking was the most frequent answer, with 94% of respondents reporting walking as the way they would complete their trip. Other responses (6%) included completing the trip on other buses or JAC Assist.



Q3: How long does it take you to get to/from your preferred bus stop? (46 Responses)

More than half of respondents (52%) reported it only takes 5 minutes or less to travel to or from their preferred bus stop.

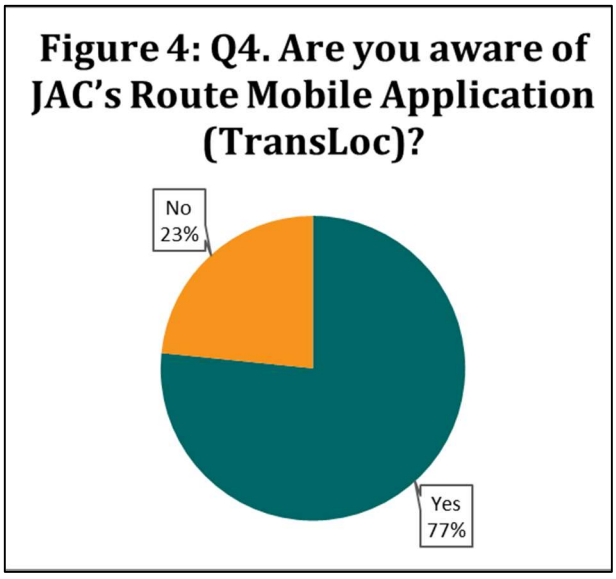


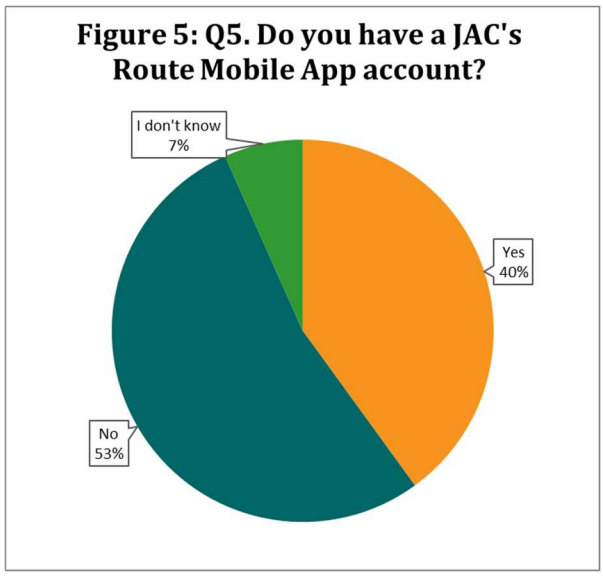
Q4: Are you aware of JAC's Route Mobile Application (TransLoc)? (47 Responses)

A majority of respondents were aware of the app, with 77% answering Yes. Those respondents who had not heard of the app or answered No accounted for 23% of respondents.

Q5: Do you have a JAC's Mobile App account? (45 Responses)

The survey asked those who had answered Yes to Question 4 if respondents had a JAC Route Mobile App account. Most respondents reported No (53%) or that they did not know if they had an account (7%). Those who reported No represented 40% of respondents.

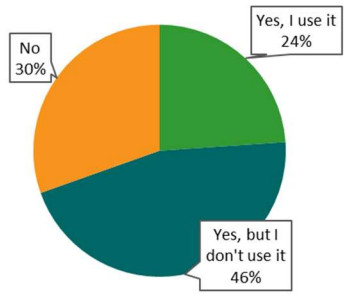




Q6: Are you familiar with JAC's Contactless Payment System (Token)? (46 Responses)

In total, 70% of respondents do know about the contactless payment system, but only 24% who do know about it use it. Those who do not know about the contactless payment system represent 30% of respondents.

Figure 6: Q6. Are you familiar with JAC's contactless payment system (Token)?



Q7: Please indicate whether you strongly agree (5) or strongly disagree (1) to the following statements (47 Responses)

Table 1 presents four statements about JAC service. The question asks respondents to rank each statement regarding transit services on a scale of 1 (strongly disagree) to 5 (strongly agree). In addition, the table presents an overall weighted score, with the highest priority transit improvements indicated by the greatest overall score. With this in mind, the survey respondents prioritized the following improvements:

- 60% strongly agreed and 16% agreed that bus fares are affordable. 55% strongly agreed and 15% agreed that the bus is convenient. A combined 68% agreed with feeling safe and secure on the bus and a combined 68% agreed that the buses are comfortable and clean.
- 13% strongly disagreed and 11% disagreed that they feel safe and secure on the bus. Combined, 18% disagreed that the buses were comfortable and clean, 17% disagreed that the bus service was convenient to them, and 13% disagreed that the bus fares were affordable.

Table 1: Q7. Please indicate whether you strongly agree or strongly disagree to the following statements

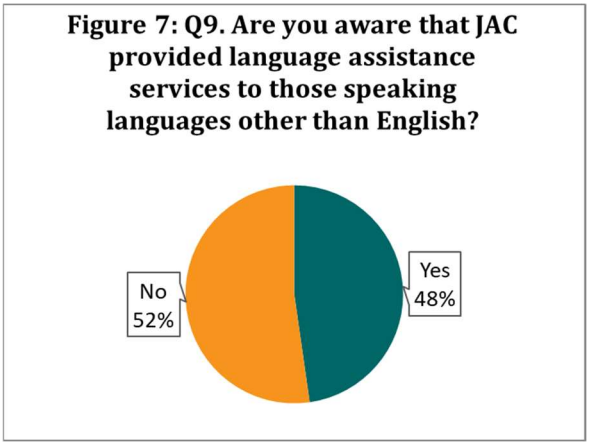
	Strongly Disagree 1	2	3	4	Strongly Agree 5	Overall Score (Weighted)
I feel safe and secure on the bus.	13%	11%	9%	28%	40%	3.7
The buses are comfortable and clean.	11%	7%	15%	20%	48%	3.9
The bus service is convenient for me.	15%	2%	13%	15%	55%	3.9
The bus fares are affordable.	11%	2%	11%	16%	60%	4.1

Q8: How do you prefer to get information and news about JAC? (46 Responses)

Table 2: Q8. How do you prefer to get information and news about JAC?

Answer Choices	Responses
Notices posted on buses	43%
JAC website	33%
Asking bus drivers	33%
JAC mobile app	30%
JAC System Map & Transit Guide	15%
Newspaper (i.e., Nevada Appeal)	11%
Word of mouth	9%
Other (please specify)	4%

Q9. Are you aware that JAC provided language services to those speaking languages other than English? (44 Responses)



Q10. What additional language assistance measures, information, or forms would be helpful to you? (39 Responses)

As shown in Table 3, 85% of respondents indicate that they do not require any additional language assistance measures, information, or forms. Those who wanted more outreach in other languages accounted for a combined 21 percent of respondents.

Table 3: Q10. What additional language assistance measures, information, or forms would be helpful to you?

Answer Choices	Responses
Nothing additional as I speak English.	85%
More signs/forms in other languages	8%
More outreach in other languages	5%
More website/mobile app information in other languages	5%
Access to JAC staff who speak additional languages	3%

Q11. Please provide your thoughts on the following route improvements (19 responses)

Respondents were asked to provide their thoughts on improvements for four specific routes:

Route 1 – There were nine total responses with feedback for the Route 1 route. Five of those responses were positive, praising the bus drivers or the service. Four had improvement suggestions or feedback, including:

- Moving the Foothill stop near the new hydrant.
- Bus driver sometimes doesn't open the door for boarding and then drives off
- Sometimes the bus doesn't stop and passes the rider's stop.
- Buses sometimes arrive too early.

Route 2A – There were four total responses. Three responses were positive, praising the service. One response suggested service to additional destinations, with no specific destinations named.

Route 2B: There were three total responses. Each were positive, praising the service.

Route 3: There were nine total responses with feedback for Route 3. Two responses were positive, praising the service.

- 5 responses would like to see a bus stop at the top of Topsy Lane or Walmart
- 1 response would like to see a bus stop along new developments in Carson City.

Q12: Is there anything else you would like to tell us? (31 Responses)

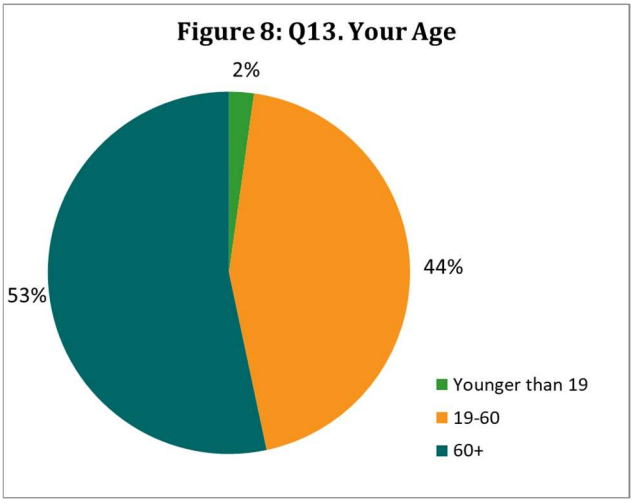
Table 4 is a summary of open-ended comments from respondents. The majority of responses wanted extended service area, (particularly to the Walmart/Topsy Lane area) and others wanted extended service time. General positive feedback made up 16% of responses. Added or improved bus stops (10%) or new or improved buses (6%) made up a combined 16% of responses. 13% of responses were commenting on the lack of live tracking of buses or announcements regarding late buses, closed stops, or other travel delays on the JAC Transit App, and 10% of respondents wanted better on-time service. Other responses included negative driver feedback, requests for better accessibility for disabled persons, no music played loudly on the bus, positive driver feedback, and a request to improve bus safety.

Table 4: Q12. Is there anything else you would like to tell us?

Categories	
Extended Service Area	19%
Positive Feedback	16%
Better Information on App	13%
Added or Improved Bus Stops	10%
Better On-time Service	10%
Extended Service Time	6%
Negative Driver Feedback	6%
New or Improved Buses	6%
Other	13%

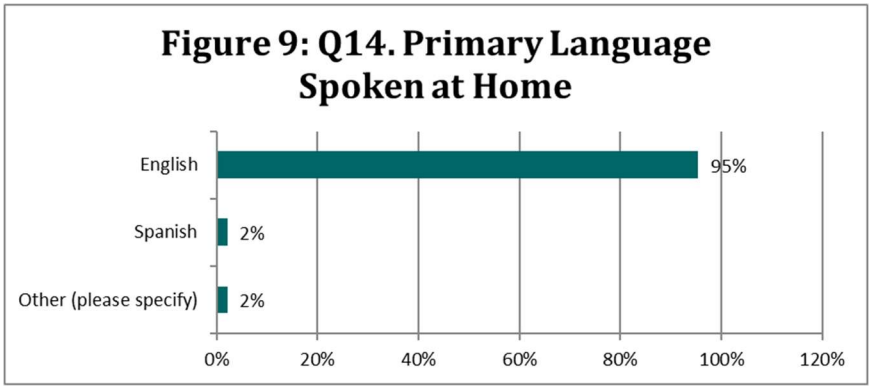
Q13: Your Age (45 Responses)

Figure 8 summarizes the ages of the respondents.



Q14: Primary Language Spoken at Home (42 Responses)

Languages spoken by respondents at home are shown in Figure 9.



Q15: What is your race or ethnicity? (37 Responses)

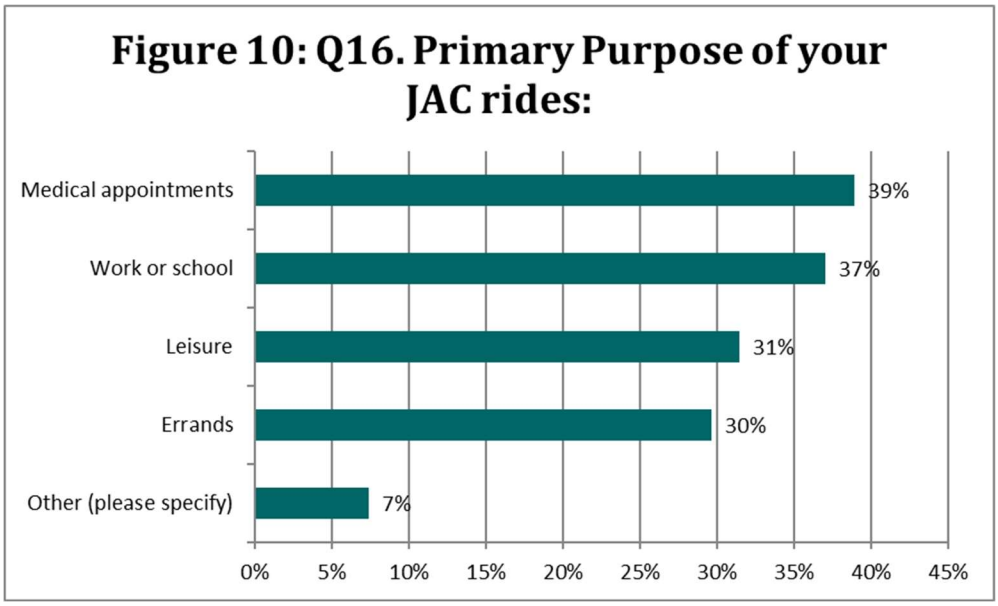
Table 5 shows a summary of the respondent's self-reported race or ethnicity.

Table 5: Q15. What is your race or ethnicity?

Answer Choices	Responses
White	77%
Hispanic or Latino	15%
Black or African American	8%
Multiracial or Multiethnic	5%
Native American or Alaska Native	3%
Asian	0%
Middle Eastern or North African	0%
Native Hawaiian or Pacific Islander	0%

Q16: Primary Purpose of Your JAC Rides (47 Responses)

The respondents were asked about the primary purposes of their JAC rides. Other purposes (7%) include using the transit service for independence, transportation needs, and access to the senior center.



Q17: Estimated Annual Income Level (37 Responses)

Table 6 shows that 92% of respondents have an income of less than $50,000. The JAC Transit service provides service to lower and middle-income persons.

Table 6: Q17. Estimated Annual Income Level

Answer Choices	Responses
less than $25,000	70%
between $25,000 and $50,000	22%
between $50,000 and 100,000	5%
more than $100,000	3%

JAC Assist Onboard Survey Summary

Q1. How frequently are you able to schedule days/times that you would like to travel on JAC Assist?

Answer Choices	Responses	
All of the time	64%	18
Most of the time	21%	6
Rarely	11%	3
Never	4%	1
	Answered	28

Q2. Have you changed your schedule to make it easier to book trips?

Answer Choices	Responses	
Yes	25%	4
No	75%	8
	Answered	12

Q3. How do you book a trip with JAC Assist?

Answer Choices	Responses	
Email	4%	1
In Person	0%	0
Phone	92%	26
Other (please specify)	4%	1
	Answered	28

Q4. How long does it usually take to book a trip?

Answer Choices	Responses	
Less than 5 minutes	59%	16
5 – 15 minutes	22%	6
15 minutes – 1 hour	15%	4
1 hour – 1 day	0%	0
More than 1 day	7%	2
	Answered	27

Q5. If it typically takes longer than 5 minutes to book a trip by phone, what is usually the reason?

Answer Choices	Responses	
Put on hold	50%	9
Technical issues	11%	2
Lack of customer service representative knowledge	0%	0
Difficulty negotiating trip time	0%	0
Slow response time of customer service representative after you have left a message	22%	4
Don't use Phone	17%	3
	Answered	18

Q6. Are you familiar with JAC's contactless payment system (Token)?

Answer Choices	Responses	
Yes, I use it	54%	15
Yes, but I do not use it	7%	2
No	39%	11
	Answered	28

Q8. Have you ever ridden on JAC fixed route buses?

Answer Choices	Responses	
Yes	79%	22
No, because...	21%	6
	Answered	28

Q9. Please rank the following potential improvements to JAC Assist in the order of your preference, with 1 being the highest rank and 8 being the lowest:

Answer Choices	Responses	
Sunday service	59%	13
Later or earlier weekday service	64%	14
Expanded service area	59%	13
Friendlier drivers	41%	9
Increased availability of my desired trip time	50%	11
Reduced fares	18%	4
Reduced travel times	36%	8
	Answered	22

Q11. Are you aware that JAC provided language assistance services to those speaking languages other than English?

Answer Choices	Responses	
Yes	64%	14
No	36%	8
	Answered	22

Q12. What additional language assistance measures, information or forms would be helpful to you?

Answer Choices	Responses	
More outreach in other languages	12%	2
More websites/mobile app information in other languages	0%	0
Access to JAC Staff who speak additional languages	12%	2
Nothing additional as I speak English	70%	12
More signs/forms in other languages, such as:	6%	1
	Answered	17

Q13. Your Age:

Answer Choices	Responses	
Younger than 19	0%	0
19-60	54%	15
60+	46%	13
	Answered	28

Q14. Primary Language Spoken at Home:

Answer Choices	Responses	
English	96%	27
Spanish	4%	1
Other (please specify)	0%	0
	Answered	28

Q15. What is your race or ethnicity?

Answer Choices	Responses	
Asian	0%	0
Black or African American	8%	2
Hispanic or Latino	4%	1
Middle Eastern or North African	0%	0
Multiracial or Multiethnic	0%	0
Native American or Alaska Native	4%	1
Native Hawaiian or Pacific Islander	4%	1
White	79%	19
Another race or ethnicity	0%	0
	Answered	24

Q16. Primary purpose of your JAC rides:

Answer Choices	Responses	
Work or school	43%	12
Medical appointments	25%	7
Leisure	0%	0
Other (please specify)	32%	9
	Answered	28

Q17. Estimated annual income level:

Answer Choices	Responses	
less than $25,000,	75%	18
between $25,000 and $50,000,	21%	5
between $50,000 and 100,000,	0%	0
more than $100,000	4%	1
	Answered	24


JAC Transit Development and Coordinated Human Services Plan

Final Report

Prepared for the

Carson Area Metropolitan Planning Organization
CAMPO

TRANSPORTATION CONSULTANTS, INC.

Carson Area Metropolitan Planning Organization (CAMPO)
and
Carson City Regional Transportation Commission (RTC)

JAC Transit Development and Coordinated Human Services Plan

Final Report

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Carson City Regional Transportation Commission (RTC)

Prepared by

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Supported by the CAMPO Board: October 9, 2019
Approved by the Carson City RTC: October 9, 2019

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Chapter 1
Introduction

The Carson City Regional Transportation Commission (RTC), using funding through the Nevada Department of Transportation (NDOT) and the Carson Area Metropolitan Planning Organization (CAMPO), has retained LSC Transportation Consultants, Inc. to prepare a Transit Development and Coordinated Human Services Plan (TDCHSP) for the Jump-Around-Carson (JAC) public transit program and the CAMPO service area. This planning process provides an opportunity to develop integrated short- and long-range plans for the JAC public transit program and meets the needs of the region's human services organizations by promoting coordination amongst agencies.

This document first presents a review of existing plans and services. The mobility needs of the region are then reviewed. This is followed by a discussion of potential service, capital, financial and institutional alternatives, as well as a summary of public input. Short-range (5 year) and long-range (20 year) plans are then presented. Finally, the coordinated human services transportation plan is presented.

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Chapter 2
Existing Planning Documents

The area governed under CAMPO is overseen by numerous organizations and agencies with various existing plans and studies. As a basis for the TDCHSP, it is useful to review these existing plans to consider how transit services can coordinate with them in the future. Below is a summary of the most relevant planning and transportation-related documents to date that have been taken into consideration during the planning process for the JAC TDCHSP.

Nevada Department of Transportation (NDOT) Coordinated Plans (2014 and 2018)

In the *2014 NDOT Coordinated Plan*, NDOT identified transportation needs for Douglas County and Carson City. These needs included the establishment of Dial-a-Ride services for seniors, simplification of transit transfers and trip planning, increased intercity fixed routes to and from Douglas County, and additional wheelchair lift assistance. NDOT outlined statewide strategies to increase funding for specialized services, coordinate planning between jurisdictions, advance technology to improve services, enhance services offered through driver trainings and administrator management, and increase intercity bus services between counties.

In the *2018 NDOT Coordinated Plan*, NDOT outlined plans to establish a statewide coordinating council with participation from MPOs and designated regional mobility managers. NDOT also highlighted a need to expand medical service options, increase public transportation in Douglas County, and develop vanpool and shuttle services through volunteer driver programs.

JAC Transit System Federal Fiscal Year 2019-2022 Transit Asset Management Plan (2018)

A Transit Asset Management (TAM) Plan is a federally required document that provides a system for monitoring and managing public transportation assets in the delivery of service to improve safety and increase reliability and performance, and to establish performance measures. The JAC Transit System completed their plan in October 2018. The TAM Plan contained the following elements:

- Inventory of Capital Assets
- Condition Assessment
- Decision Support Tools & Management Approach
- Investment Prioritization

NDOT One Nevada Transportation Plan (2018)

The *NDOT One Nevada Transportation Plan* provides guidance to NDOT and its partners, including MPOs, RTCs, local governments and modal transportation providers, for planning, developing, operating and maintaining Nevada's multimodal transportation system. The plan is intended to guide transportation investments across the state for the next 20 years. The following long term goals were identified for the state:

- Enhance Safety
- Preserve Infrastructure
- Optimize Mobility
- Transform Economies
- Foster Sustainability
- Connect Communities

The action plan for achieving these included increasing agency communication, engaging stakeholders, developing policy and process guidelines and improving data collection and analysis. In addition to these action items, the plan identified specific focus areas that included CAMPO area general improvements along the Interstate 580 (I-580) and US 395.

Washoe County Regional Transportation Commission (RTC) Regional Transportation Plan (2017)

The *2040 Washoe RTC RTP* identifies the long-term transportation investments that will be made in the urbanized area of Reno, Sparks, and Washoe County, Nevada, also known as the Truckee Meadows. The following four guiding principles were derived from community input:

- Safe and healthy communities
- Economic development and diversification
- Sustainability
- Increased travel choices

While the plan focuses on complete street improvements within Washoe County, projects affecting the northern portions of I-580 and US 395 were identified. As these highways ultimately affect access to Carson City, they have been considered in this plan. Elements that specifically pertain to Carson City are the replacement of diesel buses on the RTC INTERCITY route with battery electric buses. The RTP also indicates that the RTC Vanpool program includes 6 vanpools operating between Reno/Sparks and Carson City.

Tahoe Transportation District Short-Range Transit Plan (2017)

The Short-Range Transit Plan (SRTP) guides the development of the Tahoe Transportation District's (TTD) goals, objectives and policies for the next five years of transit service within the Lake Tahoe Region. The SRTP is developed within the context of the Long-Range transit plan, *Linking Tahoe: Lake Tahoe Transit Master Plan (TMP)*, which is aimed at implementing a new vision for transit as "the vehicle for change in the Tahoe Region." The SRTP identified the following goals:

- Safety
- Workforce Development
- Fleet Expansion and Replacement
- Facility Capacity and Modernization
- Future Service and Route Proposals

TTD receives policy direction from an eleven-member board of directors comprised of one member appointed from each of the following: the Boards of Supervisors of El Dorado and Placer Counties, the City of South Lake Tahoe City Council, the Boards of County Commissioners of Douglas and Washoe Counties, the Carson City Board of Supervisors, the Truckee-North Tahoe Transportation Management

Association (TNT-TMA) and the South Shore Transportation Management Association (SSTMA). The SRTP identified opportunities for expansion of existing services through the restoration of regularly-scheduled, single-seat service from the Stateline Transit Center to Carson City though no specific plans or timing of new service are defined.

Nevada Statewide Transportation Improvement Program (2016)

The Statewide Transportation Improvement Program (STIP) is a four-year, fiscally-constrained, planning and programming document created within the Code of Federal Regulation. With guidance from the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), a funding forecast is created to prioritize State projects by year. The STIP addressed all four Metropolitan Planning Organizations (MPOs), including CAMPO, for federal fiscal years 2016-2019.

The plan discussed general statewide funding sources for the individual MPOs such as the Nevada Transportation Alternatives Program (TAP). NDOT's TAP distributes funds based on three broad project category types: 1) community improvement activities, 2) non-motorized transportation and 3) safe routes to schools.

CAMPO 2040 Regional Transportation Plan (2016)

The *2040 CAMPO Regional Transportation Plan* (RTP) is a long-term planning document, intended to analyze the regional transportation network and to identify current and future needs to maintain a safe, efficient and sustainable transportation system. The RTP was supported by the following five goals:

- Increase the safety of the transportation system for all users
- Maintain a sustainable regional transportation system
- Increase the mobility and reliability of the transportation system for all users
- Maintain and develop a multi-modal transportation system that supports economic vitality
- Provide an integrated transportation system

The RTP defines a series of performance measures with the objective to improve transit system efficiencies and accessibilities. It refers to the Carson City Transit Development Plan (TDP) for specific service improvement plan elements.

Carson City Transit Development Plan (2014)

The *Carson City Transit Development Plan* (TDP) was developed to meet local priorities for existing transportation services including improving capital, modifying the existing operational system and increasing funding for existing program needs over the next five years. The most recent TDP evaluated existing demographic data, transit performance, and major trip generators to identify potential system improvements. The five major recommendations that resulted from the TDP were the following:

1) Maintain existing service levels
2) Increase evening service

3) Add routes
4) Provide Sunday service
5) Increase service frequency

Furthermore, the TDP found that while ridership levels had increased over the years, operating hours and mileage had not grown consistently. The TDP concluded that JAC would need to secure additional non-federal and/or local funding in order to successfully implement transit service expansions.

State of Nevada Coordinated Public Transit—Human Services Transportation Plan (2011)

The most recent state Coordinated Human Services and Transportation Planning (CHSTP), prepared by Fehr and Peers, focused on the transportation needs of individuals with disabilities, older adults and people with limited incomes throughout the State of Nevada. The plan provided an overview of the demographics, public involvement process, existing services and potential strategies to address human service transportation needs in Nevada. The following statewide service needs were identified with corresponding recommended strategies to meet those needs.

- Increased funding
  - Streamline grant approval procedures
  - Aid in joint multi-provider purchase agreements to reduce costs
- Coordination of planning and services
  - Undertake coordinated planning on a regional basis with area providers
  - Facilitate regional working groups to leverage assets and promote intercity collaboration
  - Offer an annual meeting with providers throughout Nevada and NDOT
  - Maintain a central transit website and assist in the creation of provider websites where appropriate
  - Develop a database of service providers
  - Provide user-friendly transit maps showing route connectivity
  - Pursue cross state line coordination where applicable
- Apply technology to improve service
  - Support joint-use technological investment by multiple providers
  - Expand the use of GPS and GIS technology
  - Identify and distribute “best practice” technology information
  - Explore the feasibility of using smart card media to improve fare and user data collection for larger transit systems
- Improve service provider capabilities
  - Provide standardized driver training
  - Provide administrator management and planning training
  - Develop an informational database/library as a resource for service providers
- Increase intercity bus service
  - Prioritize intercity bus service needs; focus on key routes to major destinations
  - Explore and initiate service options in cooperation with service providers
  - Review timetables to promote cross-provider transit connections

Carson City Unified Pathways Master Plan (2018)

This document, adopted in 2006 and revised in 2018, provides a comprehensive plan for improvements of non-motorized facilities throughout Carson City. As access to bus stops by pedestrians and bicyclists is vital to the effectiveness of a public transit system, this document will be used in the consideration of future bus stop locations as well as regarding improvements in access to existing stops.

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Chapter 3
Study Area Characteristics

INTRODUCTION

Public transportation is an important service in and around Carson City. Transit services provide mobility to residents, including access to important educational, medical, recreational, social and economic services. In addition to being important to residential quality of life in Carson City and beyond, public transit services assist in supporting educational programs, public and private employers and social service programs throughout the region.

STUDY AREA

The study area for this plan encompasses the entire CAMPO region. As shown in Figure 1, this area includes Carson City, a portion of nearby northern Douglas County, as well as a portion of nearby western Lyon County (including Dayton). Carson City, officially the Consolidated Municipality of Carson City, is an independent city and the capital of the state of Nevada. The area is located 32 miles south of Reno and 15 miles north of Minden. The area is characterized by the Sierra Nevada on the west and the Carson River Valley. Primary access consists of US Route 50 (US 50) for travel west to Lake Tahoe and east to Fallon, and US Highway 395 for travel north to Reno and south to Gardnerville and Minden.

CAMPO is a federally recognized metropolitan planning organization that formed on February 26, 2003. Creation of the MPO was required after the Carson City urbanized area exceeded a population of 50,000 residents in the 2000 US census. CAMPO is the designated local decision-making body responsible for carrying out the metropolitan transportation planning process for the Carson City urbanized area.

POPULATION

Population Trends: Historic and Projected Population

According to the US Census Bureau's American Community Survey, the 2017 population for the Carson City was 54,219 persons. This represents a decrease of approximately 1,055 persons, or 2 percent, since the 2010 US Census. However, based on the most recent Nevada State Demographer estimates, the current population has grown to 56,417 over the past two years and is anticipated to continue growing to 62,108 (10 percent) by 2039. A smaller population increase of 4 percent is expected within Douglas County over the next 20 years, while Lyon County's population is expected to remain essentially unchanged (a 1 percent decline). Table 1 illustrates historic, current and projected population rates over time as well as regional predictions through 2040.

Transit Dependent Populations

A review of current population and demographic characteristics is presented in Table 2 and the discussion below. Data is provided for each of the population subsets that are considered to be "transit-dependent." In other words, these groups tend to rely more frequently on public transportation for their mobility needs based on age, income status or lack of private vehicles available to them. Understanding the population trends, as well as where within the Carson City and greater CAMPO region these persons are located, can help better define transit needs and determine if the transit

program is serving these groups. Table 2 includes US Census data organized by census tracts within the CAMPO region.

Youth (5 to 17 years old)

According to the *2013-2017 American Community Survey*, 15.3 percent of the census tract study area population was identified as youth. For the purposes of this study, the youth population is defined as persons who are between 5 and 17 years of age. The total CAMPO region totals (rather than by census tract) show a youth population of 12,343, which is 15 percent of the total population. The highest youth concentrations, as shown in Figure 2, are located within Carson City Census Tracts 10.01, 6 and 5.01; Douglas County Census Tract 20; and Lyon County Census Tract 9603.1. In general, these reflect concentrations of youths in central Carson City as well as in the Dayton area.

Senior (65 and Over)

Another important group to consider for transit services is the senior population, defined as persons age 65 and older. According to the *2013-2017 American Community Survey*, the total CAMPO region totals (rather than by census tract) show a senior population of 16,846, which is 20.4 percent of the total population. The highest concentrations of senior persons are shown in Figure 3. These higher populations are located in western Carson City, northern Douglas County and the Dayton area.

Low-Income

Low-income persons are defined by poverty status reported to the US Census, which are persons living below or at the poverty line over the last 12 months. According to the *2013-2017 American Community Survey*, data by Carson City Census Tract indicates that approximately 14.2 percent of the population is considered low income. This figure is consistent with the 2010 U.S. Census population (14 percent). The areas within the Carson City with the highest concentrations include Census Tracts 5.02, 6, 9 and 10.01, focusing on the central area east of Carson Street. Approximately 13.1 percent of people living within the CAMPO region are considered low-income. This information is presented in Figure 4.

Disabled

Data for mobility-limited persons from the *2013-2017 American Community Survey* is shown in Figure 5. Approximately 12,197 persons in Carson City, or 22.5 percent, have a disability that limits a person's mobility and potential to use public transportation. In Lyon County 3,702 people (21.5 percent) have a disability, followed by Douglas County at 1,832 people (14.8 percent). Relatively high numbers of persons with disabilities live in central Carson City and in the Dayton area. This is an increase of 9.2 percent from the *2008-2012 American Community Survey.*

Zero Vehicle Households

Households that do not have a vehicle available for use typically are more reliant on public transportation, as there are no other options available besides getting a ride with a friend or family member. As shown in Table 2, roughly 5.2 percent of the households in the CAMPO study area do not have a vehicle available. As shown in Figure 6, the highest concentrations of zero vehicle households are located in Carson City Census Tracts 1, 5.01 and 5.02 (the central portion of Carson City on both sides of Carson Street), along with the Dayton area.

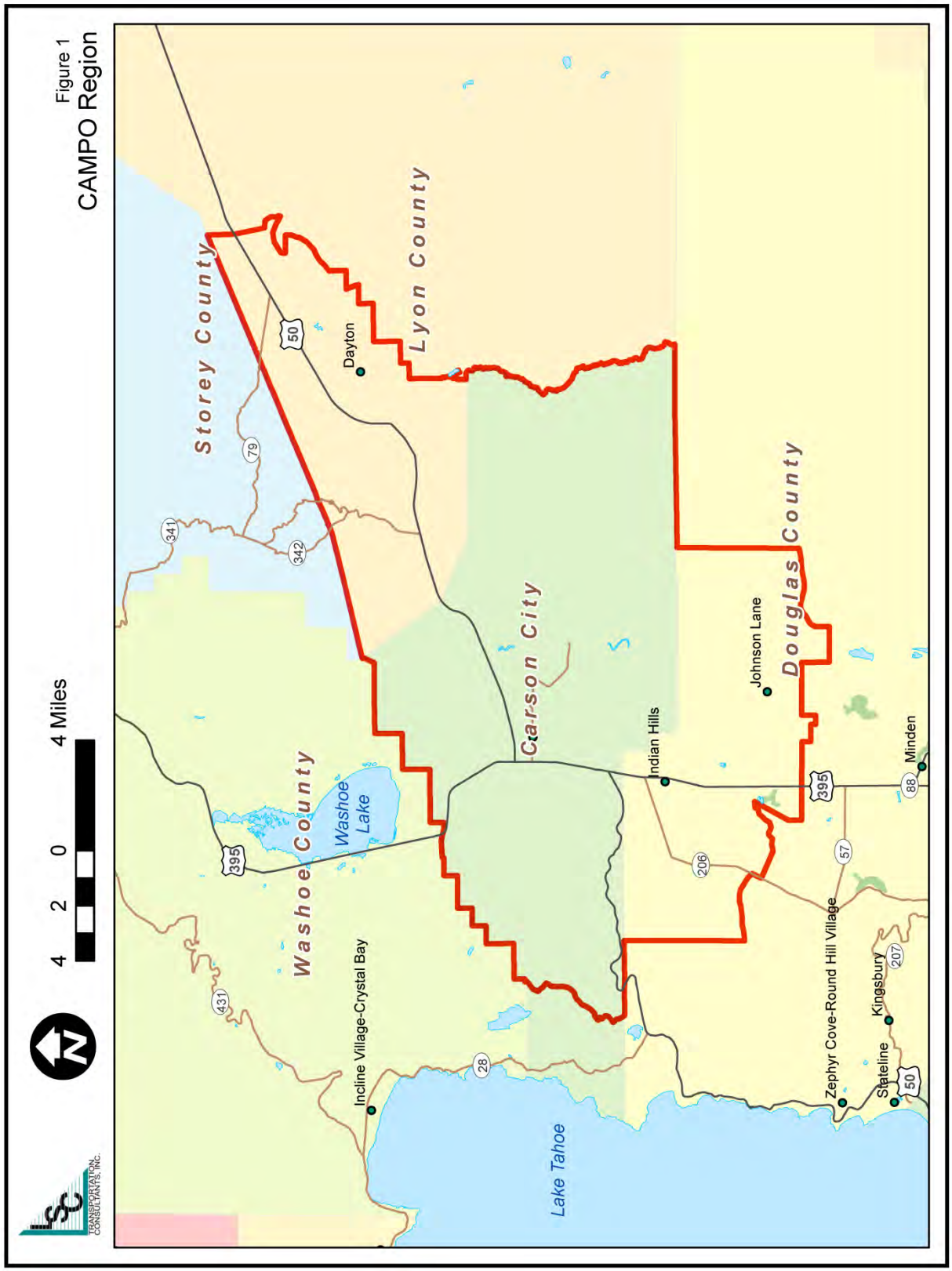


Figure 1
CAMPO Region
4 Miles
4 2 0
Storey County
Lyon County
Carson City
Douglas County
Washoe County
Lake Tahoe
Washoe Lake
Dayton
Johnson Lane
Indian Hills
Minden
Incline Village-Crystal Bay
Zephyr Cove-Round Hill Village
Kingsbury
Stateline
50
79
341
342
395
431
28
206
57
207
88

TABLE 1: Historic and Projected Populations

	Historic					Current	Projected	
	1970	**1980**	**1990**	**2000**	**2010**	**2019**	**2029**	**2039**
Carson City	15,468	32,022	40,443	52,457	55,274	56,417	57,382	62,108
Annual Percent Growth	--	7.5%	2.4%	2.6%	0.5%	0.2%	0.2%	0.8%
Growth Over Previous Period	--	107%	26%	30%	5%	2%	2%	8%
Douglas County	6,882	19,421	27,637	41,259	46,997	51,474	53,523	53,439
Annual Percent Growth	--	10.9%	3.6%	4.1%	1.3%	0.9%	0.4%	0.0%
Growth Over Previous Period	--	182%	42%	49%	14%	10%	4%	0%
Lyon County	8,221	13,594	20,001	34,501	51,980	56,054	55,815	55,556
Annual Percent Growth	--	5.2%	3.9%	5.6%	4.2%	0.8%	0.0%	0.0%
Growth Over Previous Period	--	65%	47%	72%	51%	8%	0%	0%
State of Nevada	488,738	800,493	1,201,833	1,998,257	2,700,551	3,115,609	3,372,145	--
Annual Percent Growth	--	5.1%	4.1%	5.2%	3.1%	1.4%	0.8%	--
Growth Over Previous Period	--	64%	50%	66%	35%	15%	8%	--

Source: US Census Bureau and ASRHO Estimates and Projections Summary, State of Nevada Demographer, 2018

TABLE 2: CAMPO Demographic Characteristics by Census Tract

		Youth (5-17 Yrs)		Senior (65 & Over)		Low Income		Disabled			Zero Vehicle Households	
Census Tracts	**Total Population**	**#**	***% of Census Tract***	**#**	***% of Census Tract***	**#**	***% of Census Tract***	**#**	***% of Census Tract***	**Total Households**	**#**	***% of Households***
Carson City												
1	3,015	387	*12.8%*	686	*22.8%*	306	*10.1%*	656	*21.8%*	1,483	215	*14.5%*
2	3,451	560	*16.2%*	890	*25.8%*	421	*12.2%*	750	*21.7%*	1,603	106	*6.6%*
3	3,708	387	*10.4%*	1,215	*32.8%*	240	*6.5%*	576	*15.5%*	1,653	42	*2.5%*
4	3,653	650	*17.8%*	706	*19.3%*	504	*13.8%*	750	*20.5%*	1,640	88	*5.4%*
5.01	6,027	1,087	*18.0%*	684	*11.3%*	1,075	*17.8%*	1,464	*24.3%*	2,541	266	*10.5%*
5.02	3,512	364	*10.4%*	755	*21.5%*	729	*20.8%*	952	*27.1%*	1,666	343	*20.6%*
6	6,529	1,313	*20.1%*	882	*13.5%*	1,361	*20.8%*	1,845	*28.3%*	2,302	141	*6.1%*
7.01	3,718	569	*15.3%*	776	*20.9%*	505	*13.6%*	873	*23.5%*	1,561	69	*4.4%*
7.02	3,268	459	*14.0%*	637	*19.5%*	141	*4.3%*	804	*24.6%*	1,404	31	*2.2%*
8	4,413	439	*9.9%*	922	*20.9%*	313	*7.1%*	706	*16.0%*	1,127	58	*5.1%*
9	5,142	700	*13.6%*	1,284	*25.0%*	981	*19.1%*	1,531	*29.8%*	2,155	29	*1.3%*
10.01	4,140	880	*21.3%*	334	*8.1%*	822	*19.9%*	897	*21.7%*	1,587	107	*6.7%*
10.02	3,643	525	*14.4%*	728	*20.0%*	300	*8.2%*	393	*10.8%*	1,436	18	*1.3%*
Subtotal	*54,219*	*8,320*	*15.3%*	*10,499*	*19.4%*	*7,698*	*14.2%*	*12,197*	*22.5%*	*22,158*	*1,513*	*6.8%*
Douglas County Within CAMPO												
19	405	63	*15.6%*	141	*34.8%*	11	*2.6%*	31.2	*7.7%*	158	0	*0.0%*
20	3,367	594	*17.6%*	576	*17.1%*	460	*13.7%*	567	*16.8%*	1,317	32	*2.4%*
21	2,179	249	*11.4%*	511	*23.5%*	98	*4.5%*	227	*10.4%*	869	25	*2.9%*
22	6,389	780	*12.2%*	1,988	*31.1%*	287	*4.5%*	1,007	*15.8%*	2,688	29	*1.1%*
Subtotal	*12,340*	*1,686*	*13.7%*	*3,216*	*26.1%*	*856*	*6.9%*	*1,832*	*14.8%*	*5,032*	*86*	*1.7%*
Lyon County Within CAMPO												
9603.1	1,689	289	*17.1%*	386	*22.9%*	455	*26.9%*	423	*25.0%*	721	28	*3.9%*
9603.2	9,678	1,524	*15.7%*	1,527	*15.8%*	1,354	*14.0%*	2,022	*20.9%*	3,607	99	*2.7%*
9603.3	4,581	524	*11.4%*	1,218	*26.6%*	444	*9.7%*	1,257	*27.4%*	1,809	18	*1.0%*
Subtotal	*15,948*	*2,337*	*14.7%*	*3,131*	*19.6%*	*2,253*	*14.1%*	*3,702*	*23.2%*	*6,137*	*145*	*2.4%*
CAMPO Region Total	**82,507**	**12,343**	***15.0%***	**16,846**	***20.4%***	**10,807**	***13.1%***	**17,731**	***21.5%***	**33,327**	**1,744**	***5.2%***

Source: US Census 2013 - 2017 American Community Survey Estimates.

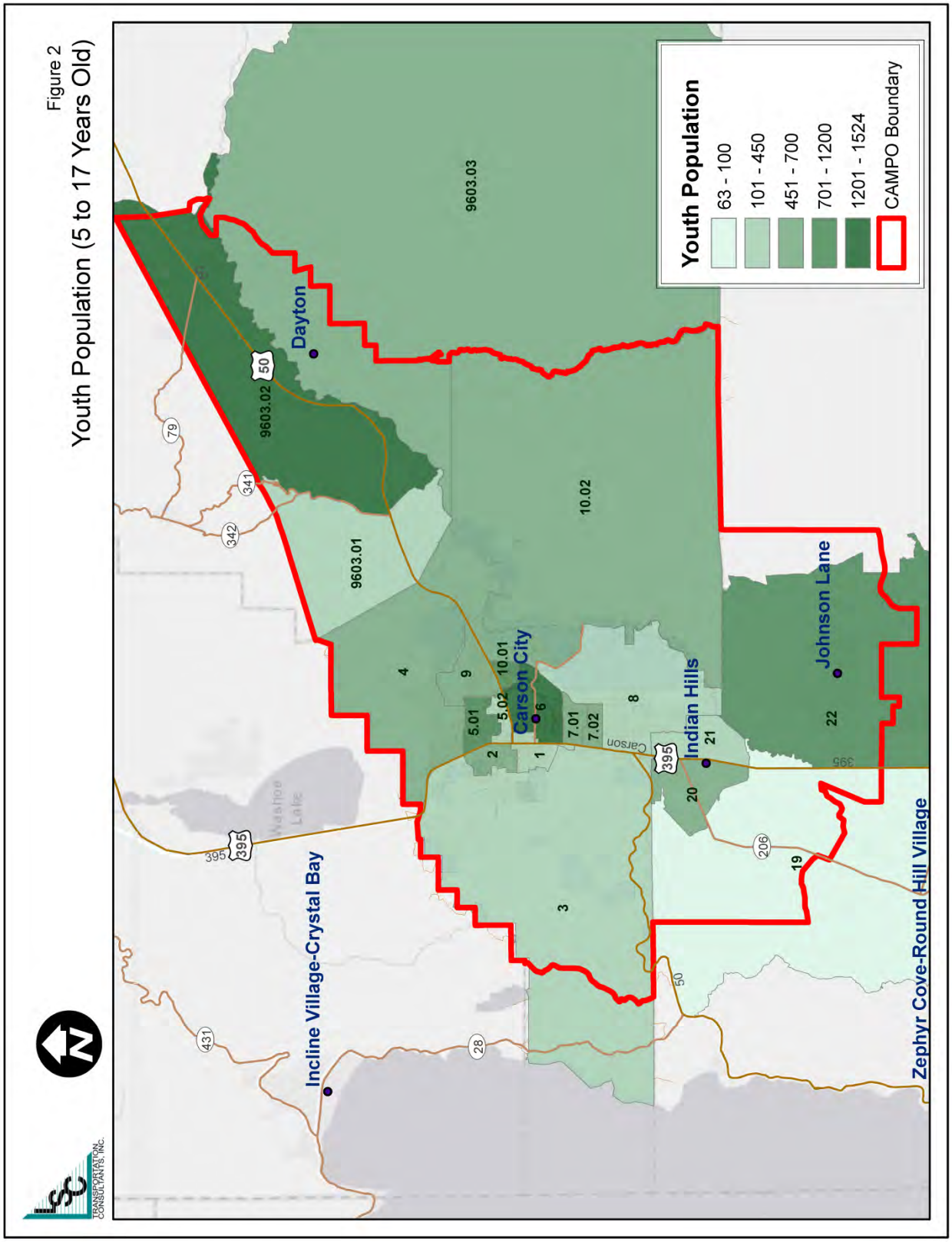


Figure 2
Youth Population (5 to 17 Years Old)
Youth Population
63 - 100
101 - 450
451 - 700
701 - 1200
1201 - 1524
CAMPO Boundary
Dayton
Carson City
Indian Hills
Johnson Lane
Incline Village-Crystal Bay
Zephyr Cove-Round Hill Village
9603.03
9603.02
9603.01
10.02
10.01
5.02
5.01
7.01
7.02
TRANSPORTATION CONSULTANTS, INC.

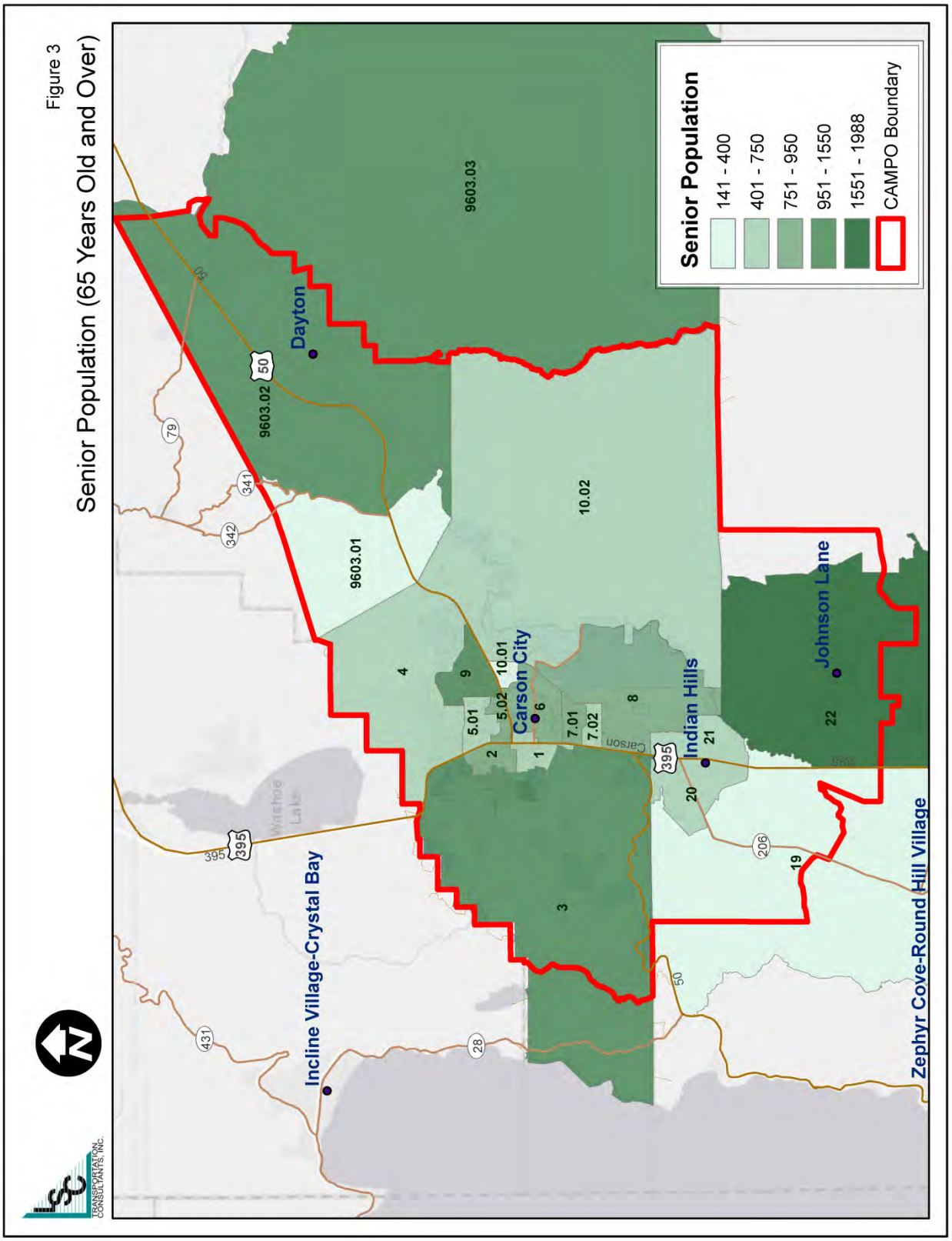


Figure 3
Senior Population (65 Years Old and Over)
Senior Population
141 - 400
401 - 750
751 - 950
951 - 1550
1551 - 1988
CAMPO Boundary
Dayton
Carson City
Indian Hills
Johnson Lane
Incline Village-Crystal Bay
Zephyr Cove-Round Hill Village
9603.03
9603.02
9603.01
10.02
10.01
5.02
5.01
7.01
7.02
Washoe Lake
Carson
50
395
341
342
79
431
28
206

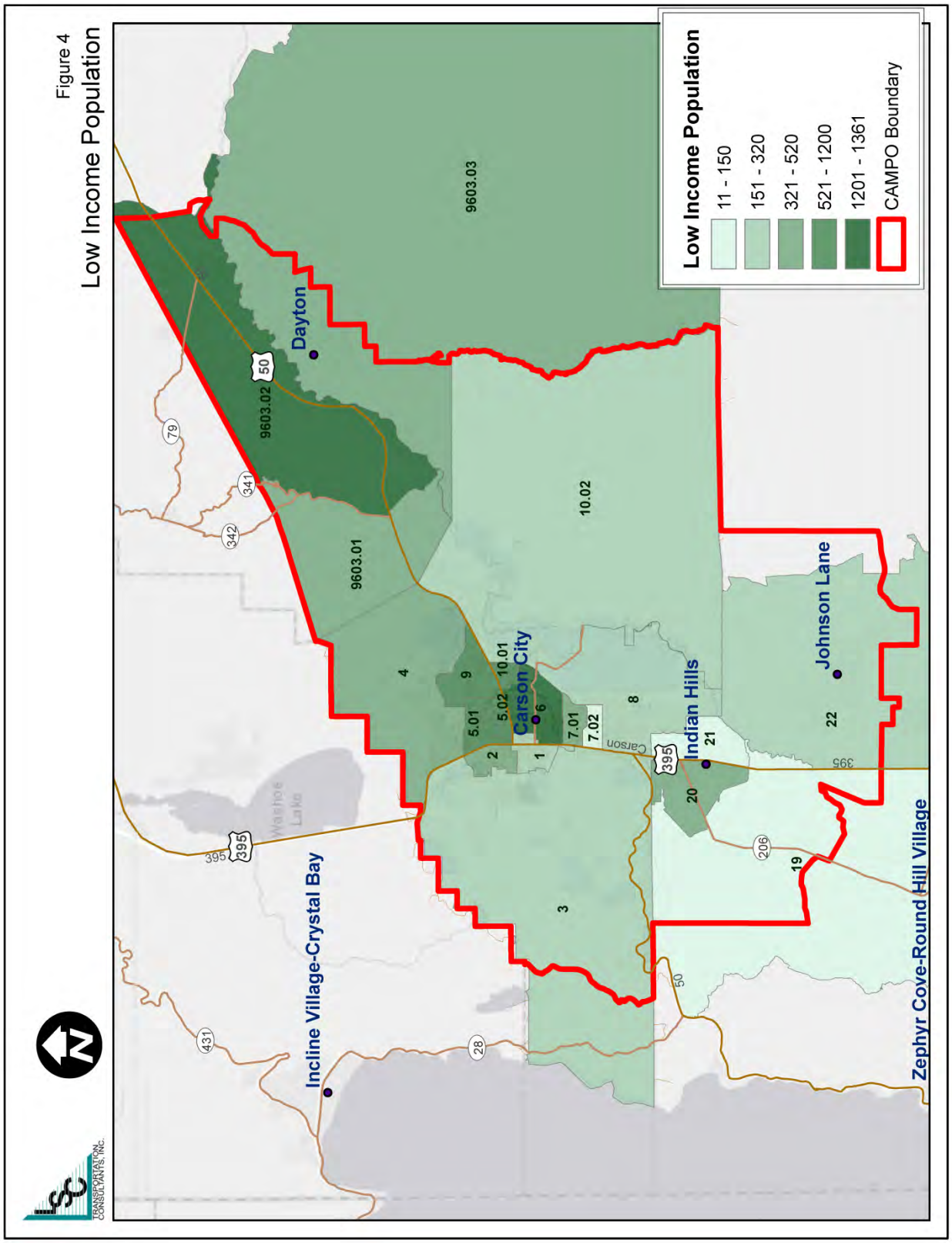


Figure 4
Low Income Population
Low Income Population
11 - 150
151 - 320
321 - 520
521 - 1200
1201 - 1361
CAMPO Boundary
Dayton
Carson City
Indian Hills
Johnson Lane
Incline Village-Crystal Bay
Zephyr Cove-Round Hill Village
9603.03
9603.02
9603.01
10.02
10.01
5.02
5.01
7.01
7.02
50
79
341
342
395
431
28
206
Washoe Lake
Carson
TRANSPORTATION CONSULTANTS, INC.

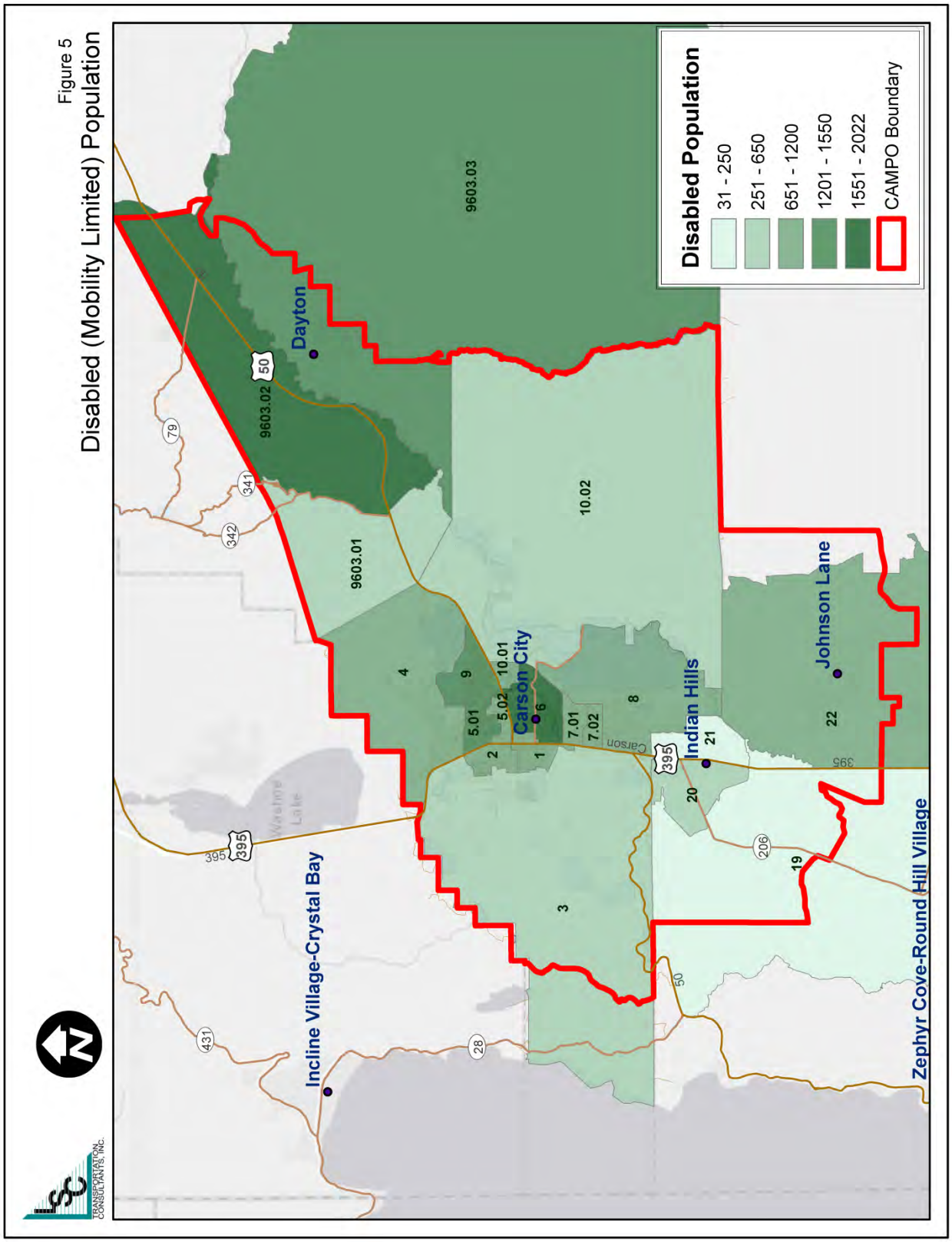


Figure 5
Disabled (Mobility Limited) Population
Disabled Population
31 - 250
251 - 650
651 - 1200
1201 - 1550
1551 - 2022
CAMPO Boundary
Dayton
Carson City
Indian Hills
Johnson Lane
Incline Village-Crystal Bay
Zephyr Cove-Round Hill Village
9603.03
9603.02
9603.01
10.02
10.01
5.02
5.01
7.01
7.02
50
395
341
342
79
431
28
206
Washoe Lake
Carson
TRANSPORTATION CONSULTANTS, INC.

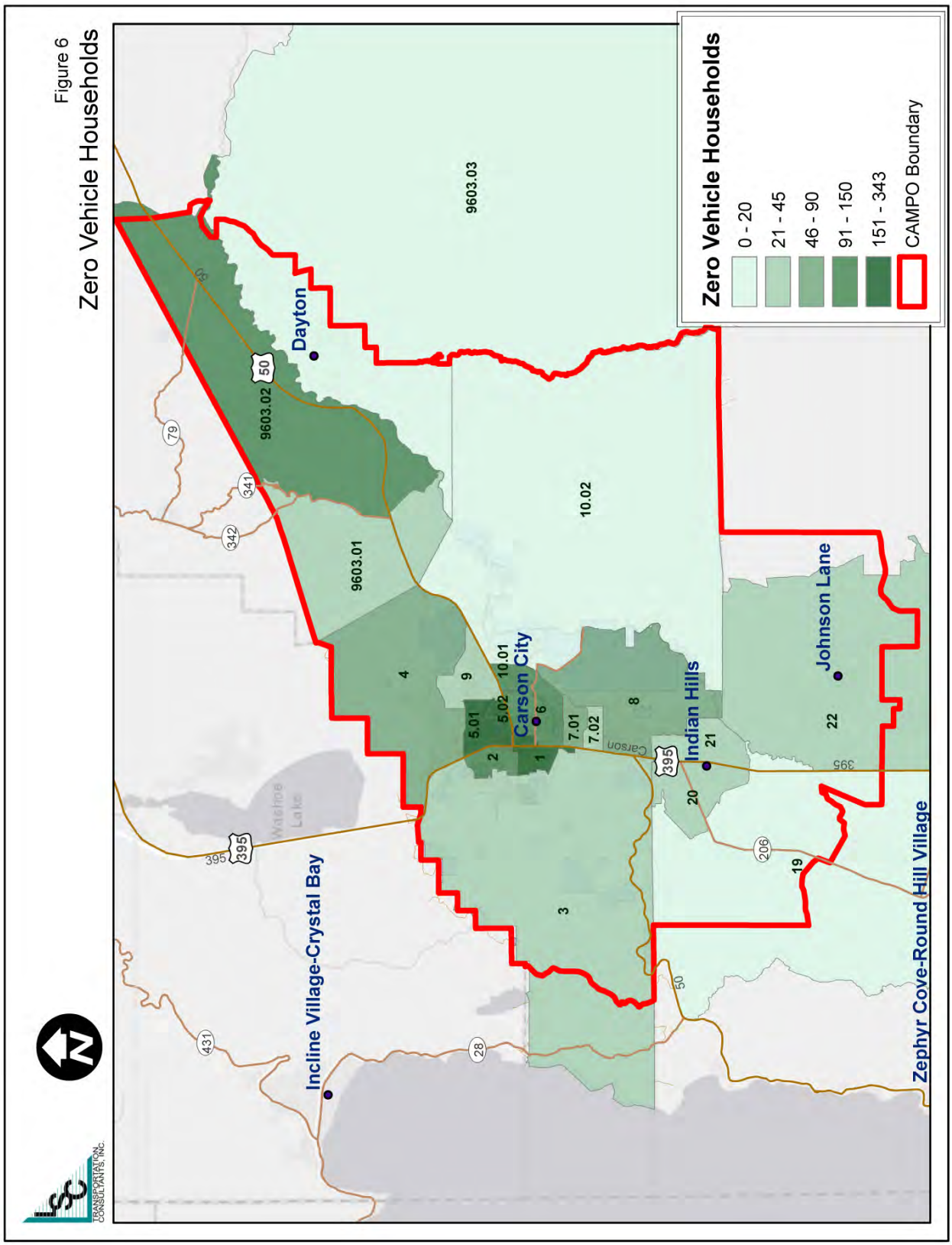


Figure 6
Zero Vehicle Households
Zero Vehicle Households
0 - 20
21 - 45
46 - 90
91 - 150
151 - 343
CAMPO Boundary
Dayton
Carson City
Indian Hills
Johnson Lane
Incline Village-Crystal Bay
Zephyr Cove-Round Hill Village
9603.03
9603.02
9603.01
10.02
10.01
5.01
5.02
7.01
7.02
Carson
Washoe Lake
50
395
341
342
79
431
28
206

EMPLOYMENT

According to the *2013-2017 American Community Survey,* the overall unemployment rate for the Carson City is approximately 7.7 percent, followed by Lyon County at 7.6 percent and Douglas County at 5.7 percent as shown in Table 3. While Carson City's cumulative unemployment rate is lower than the state of Nevada (8 percent), Census Tracts 9 and 10.01 experience the highest concentrations of unemployment in CAMPO at 18.8 percent and 11.7 percent, respectively. Consequently, both tracts are characterized as having the highest percentage of low-income residents. These unemployment rates are closely followed by Douglas County Census Tracts 19 (11.4 percent) and 20 (12.1 percent).

TABLE 3: CAMPO Employment Status, 2017-18

Census Tract	Population In Labor Force	Population Employed	Population Unemployed	Unemployment Rate	Population Not in Labor Force
Carson City					
1	1,472	1,362	110	*7.5%*	1,543
2	1,557	1,518	39	*2.5%*	1,894
3	1,695	1,539	156	*9.2%*	2,013
4	1,743	1,624	119	*6.8%*	1,910
5.01	3,248	3,053	195	*6.0%*	2,779
5.02	1,651	1,524	127	*7.7%*	1,861
6	3,005	2,861	144	*4.8%*	3,524
7.01	2,058	1,951	107	*5.2%*	1,660
7.02	1,863	1,727	136	*7.3%*	1,405
8	1,462	1,335	127	*8.7%*	2,951
9	2,358	1,915	443	*18.8%*	2,784
10.01	2,314	2,043	271	*11.7%*	1,826
10.02	1,967	1,902	65	*3.3%*	1,676
Subtotal	*26,393*	*24,354*	*2,039*	*7.7%*	*27,826*
Douglas County Within CAMPO					
19	322	285	37	11.4%	83
20	2,693	2,367	326	12.1%	674
21	1,832	1,773	59	3.2%	347
22	5,538	5,372	166	3.0%	851
Subtotal	*10,385*	*9,798*	*587*	*5.7%*	*1,955*
Lyon County Within CAMPO					
9603.1	1,358	*1,237*	*121*	8.9%	*331*
9603.2	7,672	*6,989*	*683*	8.9%	*2,006*
9603.3	3,828	*3,487*	*341*	8.9%	*753*
Subtotal	*12,858*	*11,714*	*1,144*	*8.9%*	*3,090*
CAMPO Region	49,636	45,865	3,771	7.6%	32,871

Source: 2013- 2017 American Community Survey 5-Year Estimates

Commute Patterns

The following summarizes commute patterns gathered by the US Census 2015 Longitudinal Employer Household Dynamics (LEHD). It is important to consider that it also includes information for employees that do not necessarily report to work on a daily or consistent basis, and can include persons who have a

permanent resident in one location, but stay elsewhere during their work week. Nevertheless, it provides the best available picture of commuting patterns. The top portion of the table presents information about where residents of Carson City work, while the lower portion shows where people live that work within the Carson City.

Where Carson City Residents Work

As shown in Table 4, 51.6 percent of employed Carson City residents work within the county, followed by those working in Washoe County (23.3 percent), Douglas County (10.3 percent), Lyon County (4.8 percent) and Clark County (2.2 percent). Of this employed population, approximately 16.8 percent work within Reno. Only 4 percent of Carson City residents commute to Sparks, followed by Indian Hills (1.8 percent), Minden (1.4 percent) and Stateline (1.3 percent). This data indicates that many jobs are located close to where residents live, resulting in shorter commute trips and less need for long distance commute travel to other urban areas.

TABLE 4: Carson City Commute Pattern Data, 2015

Where Carson City Residents Commute to…

County	Persons	% of Total	City/Town	Persons	% of Total
Carson City, NV	11,123	51.6%	Carson City, NV	11,123	51.6%
Washoe County, NV	5,027	23.3%	Reno, NV	3,614	16.8%
Douglas County, NV	2,216	10.3%	Sparks, NV	863	4.0%
Lyon County, NV	1,042	4.8%	Indian Hills, NV	379	1.8%
Clark County, NV	465	2.2%	Minden, NV	301	1.4%
El Dorado County, CA	206	1.0%	Stateline, NV	277	1.3%
Storey County, NV	167	0.8%	Incline Village, NV	272	1.3%
Placer County, CA	149	0.7%	Gardnerville, NV	211	1.0%
Churchill County, NV	109	0.5%	Paradise, NV	158	0.7%
Elko County, NV	96	0.4%	South Lake Tahoe, CA	154	0.7%
All Other Locations	953	4.4%	All Other Locations	4,201	19.5%
Total Number of Jobs	21,553	100%	*Total Number of Jobs*	21,553	100%

Where Carson City Employees Commute From…

County	Persons	% of Total	City/Town	Persons	% of Total
Carson City, NV	11,123	44.7%	Carson City, NV	11,123	44.7%
Washoe County, NV	4,924	19.8%	Reno, NV	2,221	8.9%
Douglas County, NV	3,240	13.0%	Dayton, NV	1,387	5.6%
Lyon County, NV	3,116	12.5%	Sparks, NV	974	3.9%
Clark County, NV	536	2.2%	Indian Hills, NV	781	3.1%
Churchill County, NV	313	1.3%	Gardnerville Ranchos, NV	717	2.9%
Storey County, NV	143	0.6%	Johnson Lane, NV	678	2.7%
Humboldt County, NV	118	0.5%	Gardnerville, NV	361	1.5%
El Dorado County, CA	97	0.4%	Fernley, NV	252	1.0%
Nevada County, CA	94	0.4%	Minden, NV	198	0.8%
All Other Locations	1,171	4.7%	All Other Locations	6,183	24.9%
Total Number of Workers	24,875	100%	*Total Number of Workers*	24,875	100%

Source: US Census LEHD Database, 2015

Where Persons Employed in Carson City Live

Most workers in Carson City (44.7 percent) live in Carson City, followed by those commuting in from Washoe County (19.8 percent), Douglas County (13 percent) and Lyon County (12.5 percent). Of those commuting to Carson City from outside the city, 8.9 percent are commuting from Reno, followed by Dayton (5.6 percent), Sparks (3.9 percent) and Indian Hills (3.1 percent).

In comparing these commute patterns, approximately 2,629 more workers are commuting into Carson City from neighboring counties for employment than those living and working within Carson City. It is also worth noting that more Carson City residents are commuting to Reno (a net northbound flow of 1,393 persons) for work than those commuting from Reno to Carson City. While 5.6 percent of those commuting to Carson City are coming from Dayton, only 0.6 percent of Carson City employees are commuting to Dayton.

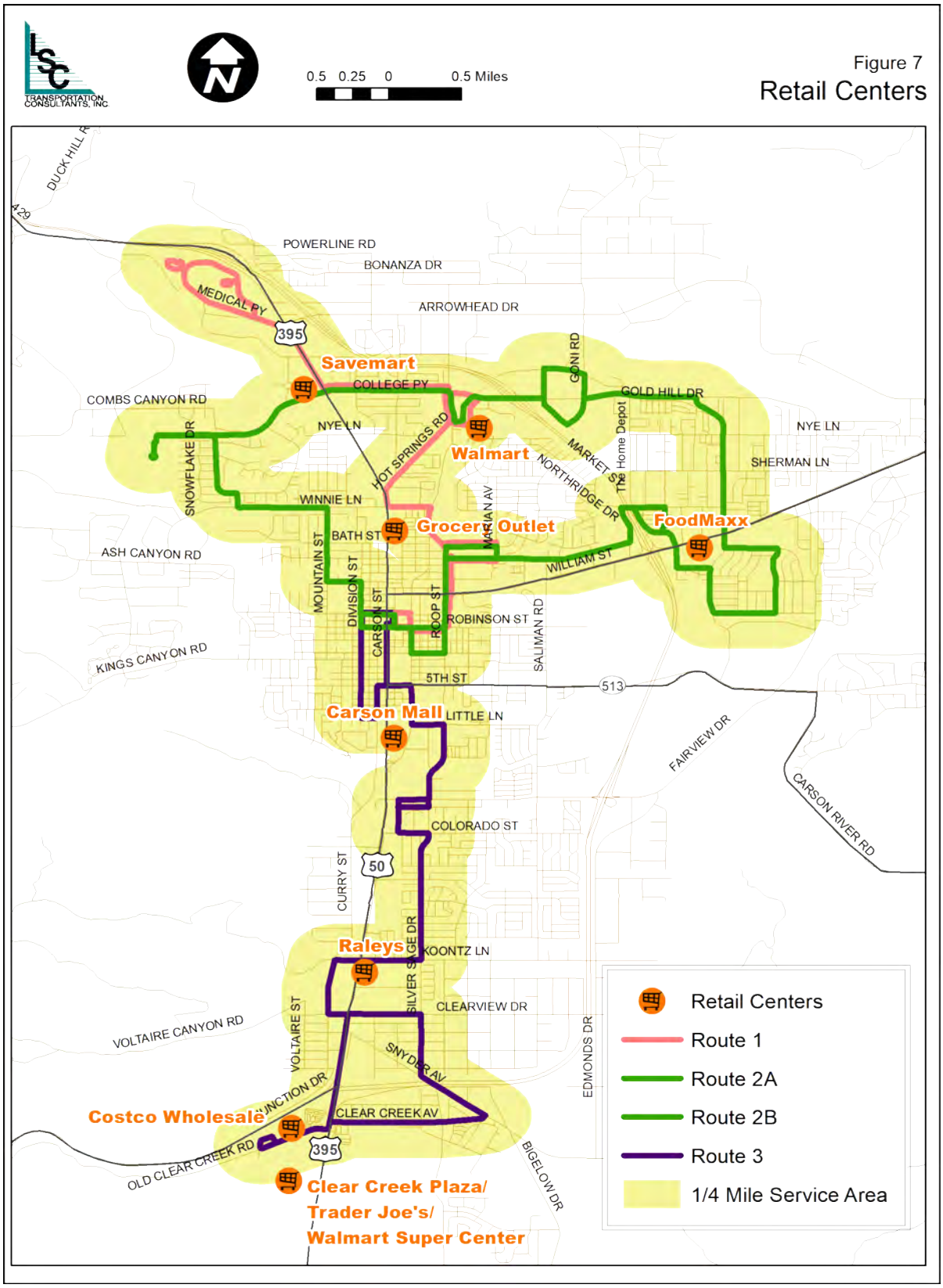
MAJOR TRANSIT ACTIVITY CENTERS

Major activity centers typically include large commercial retail areas, public and private educational institutions, medical centers, government facilities and consolidated residential areas. Activity centers within the Carson City and CAMPO region that are most likely to generate trips (and potential transit ridership) are summarized below and shown in Figures 7 through 11. Similar maps for social service activity centers are provided in Chapter 6.

Commercial Retail

Carson City and the CAMPO region have several concentrated retail areas located along major commercial roads such as Carson Street/US 395, College Parkway, and North Roop Street. Major commercial retail stores are listed below and shown in Figure 7.

- Walmart Supercenter—3200 Marketplace Street
- Clear Creek Plaza (Trader Joe's and Walmart Supercenter)—3790 US 395
- The Home Depot—3185 Marketplace Street
- Savemart—3620 North Carson Street
- Costco Wholesale—700 Old Clear Creek Road
- FoodMaxx—3325 US 50
- Grocery Outlet Bargain Market—1831 North Carson
- Raley's—3701 South Carson Street
- Carson Mall—1227 South Carson Street


LSC TRANSPORTATION CONSULTANTS, INC.
0.5 0.25 0 0.5 Miles
Figure 7
Retail Centers
DUCK HILL R
429
POWERLINE RD
BONANZA DR
ARROWHEAD DR
MEDICAL PY
395
Savemart
COLLEGE PY
GONI RD
GOLD HILL DR
COMBS CANYON RD
NYE LN
HOT SPRINGS RD
Walmart
MARKET ST
The Home Depot
NYE LN
SHERMAN LN
SNOWFLAKE DR
WINNIE LN
NORTHRIDGE DR
MARIAN AV
Grocery Outlet
FoodMaxx
BATH ST
ASH CANYON RD
MOUNTAIN ST
DIVISION ST
CARSON ST
ROOP ST
WILLIAM ST
ROBINSON ST
SALIMAN RD
KINGS CANYON RD
5TH ST
513
Carson Mall
LITTLE LN
FAIRVIEW DR
CARSON RIVER RD
COLORADO ST
CURRY ST
50
Raleys
KOONTZ LN
SILVER SAGE DR
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
EDMONDS DR
JUNCTION DR
Costco Wholesale
CLEAR CREEK AV
OLD CLEAR CREEK RD
395
BIGELOW DR
Clear Creek Plaza/
Trader Joe's/
Walmart Super Center
Retail Centers
Route 1
Route 2A
Route 2B
Route 3
1/4 Mile Service Area

Educational Institutions

Carson City Unified School District

The Carson City Unified School District offers public education to approximately 7,680 students throughout Carson City (Figure 8). The district includes six elementary schools, two middle schools, one alternative high school, and one comprehensive high school.

- Elementary, Middle and High Schools include:
  - *Carson High School*—1111 North Saliman Road (2,210 students)
  - *Pioneer High*—202 East Corbett Street (161 students)
  - *Carson Middle School*—1140 West King Street (1,210 students)
  - *Eagle Valley Middle School*—4151 East Fifth Street (679 students)
  - *Bordewich Elementary*—110 South Thompson Street (634 students)
  - *Empire Elementary*—1260 Monte Rosa Drive (503 students)
  - *Fremont Elementary*—1511 Firebox Road (505 students)
  - *Fritsch Elementary*—504 Bath Street (543 students)
  - *Mark Twain Elementary*—2111 Carriage Crest Drive (581 students)
  - *Seeliger Elementary*—2800 South Saliman Road (584 students)
  - *Adult/Prison Education*—275 East Park Street, Building E
  - *Carson City School Administration Offices*—1402 West King Street

- Private Schools
  - *Bethlehem Lutheran School* offers K-8 grades and is located at 1837 Mountain Street. There are approximately 150 students currently enrolled.
  - *St. Teresa of Avila Catholic School* offers preschool through 8th grade and is located on 567 Richmond Avenue.

Western Nevada College

Western Nevada College has campuses in five major western Nevada cities that include the Carson City campus located at 2201 West College Parkway. Of the 8,000 students currently enrolled in Western Nevada College for Fall 2018 semester, 875 students attend the Carson City campus full-time.

Medical Centers

Carson Tahoe Regional Medical Center is located at 1600 Medical Parkway and is a part of Carson Tahoe Health. It is one of the larger medical centers in the northwest portion of Carson City. Other surrounding services within this medical development include Carson Tahoe Cancer Center, Carson Tahoe Sierra Surgery and the Merriner Cottages. Other major medical facilities are described below and shown in Figure 9.

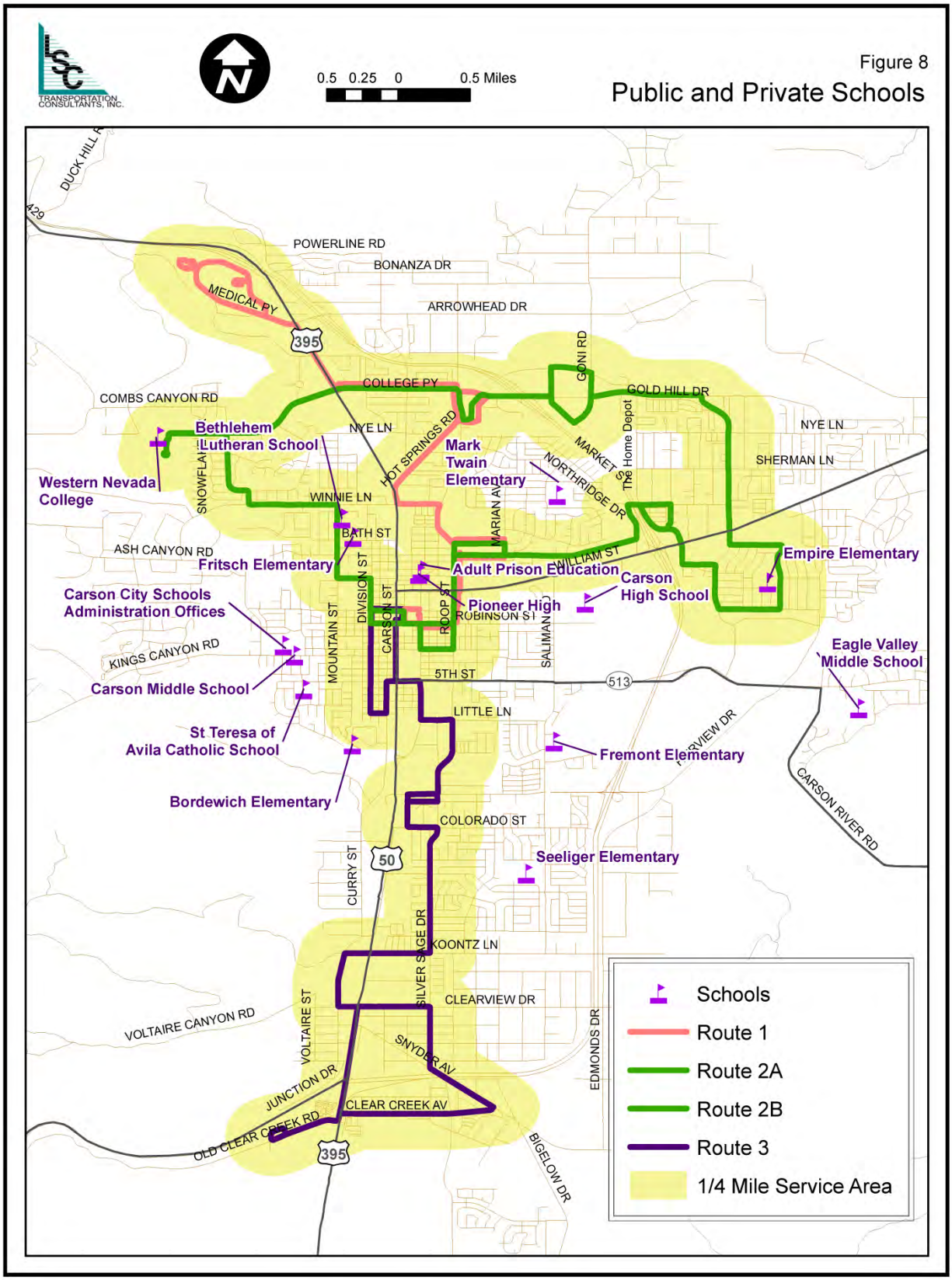


Figure 8
Public and Private Schools
0.5 0.25 0 0.5 Miles
TRANSPORTATION CONSULTANTS, INC.
DUCK HILL R
429
POWERLINE RD
BONANZA DR
MEDICAL PY
ARROWHEAD DR
395
GONI RD
COLLEGE PY
GOLD HILL DR
COMBS CANYON RD
Bethlehem Lutheran School
NYE LN
HOT SPRINGS RD
Mark Twain Elementary
MARKET ST
The Home Depot
NYE LN
SHERMAN LN
Western Nevada College
SNOWFLAKE
WINNIE LN
NORTHRIDGE DR
MARIAN AV
BATH ST
ASH CANYON RD
Fritsch Elementary
WILLIAM ST
Empire Elementary
Adult Prison Education
Carson High School
Carson City Schools Administration Offices
DIVISION ST
CARSON ST
ROOP ST
Pioneer High
ROBINSON ST
SALIMAN RD
KINGS CANYON RD
MOUNTAIN ST
Eagle Valley Middle School
5TH ST
513
Carson Middle School
LITTLE LN
St Teresa of Avila Catholic School
Fremont Elementary
FAIRVIEW DR
CARSON RIVER RD
Bordewich Elementary
COLORADO ST
50
Seeliger Elementary
CURRY ST
SILVER SAGE DR
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
EDMONDS DR
JUNCTION DR
CLEAR CREEK AV
OLD CLEAR CREEK RD
395
BIGELOW DR
Schools
Route 1
Route 2A
Route 2B
Route 3
1/4 Mile Service Area

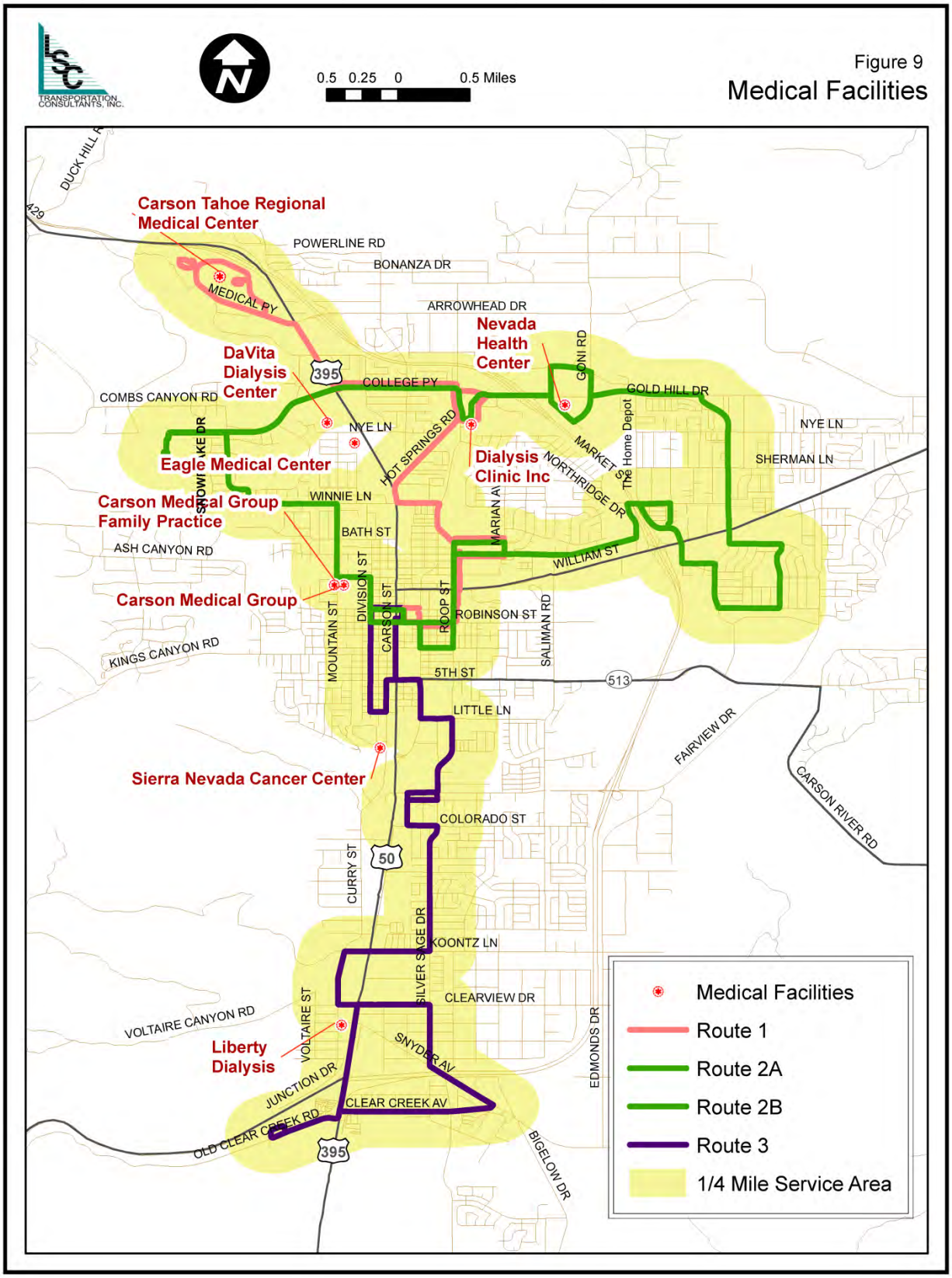


Figure 9
Medical Facilities
0.5 0.25 0 0.5 Miles
Carson Tahoe Regional Medical Center
DaVita Dialysis Center
Nevada Health Center
Eagle Medical Center
Dialysis Clinic Inc
Carson Medical Group Family Practice
Carson Medical Group
Sierra Nevada Cancer Center
Liberty Dialysis
POWERLINE RD
BONANZA DR
ARROWHEAD DR
COLLEGE PY
COMBS CANYON RD
NYE LN
HOT SPRINGS RD
WINNIE LN
BATH ST
ASH CANYON RD
KINGS CANYON RD
WILLIAM ST
ROBINSON ST
5TH ST
LITTLE LN
COLORADO ST
KOONTZ LN
CLEARVIEW DR
SNYDER AV
CLEAR CREEK AV
JUNCTION DR
VOLTAIRE CANYON RD
OLD CLEAR CREEK RD
GOLD HILL DR
SHERMAN LN
NORTHRIDGE DR
MARKET ST
The Home Depot
FAIRVIEW DR
CARSON RIVER RD
EDMONDS DR
BIGELOW DR
SALIMAN RD
ROOP ST
CARSON ST
DIVISION ST
MOUNTAIN ST
CURRY ST
SILVER SAGE DR
VOLTAIRE ST
MARIAN AV
GONI RD
395
50
513
Medical Facilities
Route 1
Route 2A
Route 2B
Route 3
1/4 Mile Service Area

- Carson Tahoe Specialty Medical Center—775 Fleischmann Way
- Sierra Nevada Cancer Center—1460 South Curry Street, Suite 100
- Dialysis Clinic Inc—778 Basque Way
- DaVita Carson City Dialysis Center—3246 North Carson Street, Suite 110
- Liberty Dialysis—4500 South Carson Street
- Eagle Medical Center—2874 North Carson Street
- Carson Medical Group Family Practice—1200 Mountain Street
- Nevada Health Centers—3325 Research Way

Government Facilities

The following is a list of State and local government buildings within Carson City (Figure 10). Additional social service-related government agencies are discussed in Chapter 6.

- Nevada State Prison—3301 East 5th Street
- NDOT—1263 South Stewart Street
- Nevada State Capitol Building—101 North Carson Street
- Governor's Office—101 North Carson Street
- Carson City Sheriff's Office—911 E Musser Street
- Carson City Federal Building—705 North Plaza Street
- Carson City Public Works Department—3505 Butti Way
- Carson City Hall—201 North Carson Street
- Carson City Airport—2600 East College Parkway
- Carson City DMV—555 Wright Way
- Carson City Justice Court—885 East Musser Street
- Carson City Community Center—851 East William Street

MAJOR DEVELOPMENT

Major residential and commercial development is expected within the CAMPO region over the next decade. The following developments have either been recently constructed, entitled, and/or issued a building permit. These developments are all shown in Figure 11.

- Carson Hills Apartments
- Clearview Ridge
- 4530 & 4580 Cochise Street
- My Place Hotel
- Lompa Ranch & Railroad Development
- Lakeview
- Timberline
- Silver Oak
- Villas Apartments
- Mills Landing Townhomes
- Edmonds Townhomes
- Lompa Phase 1 & 2
- RD Lompa Apartments
- Arbor Villas Townhomes
- Vintage
- Quail Run
- Jackson Village
- Ross Park
- Schulz Ranch
- Schulz

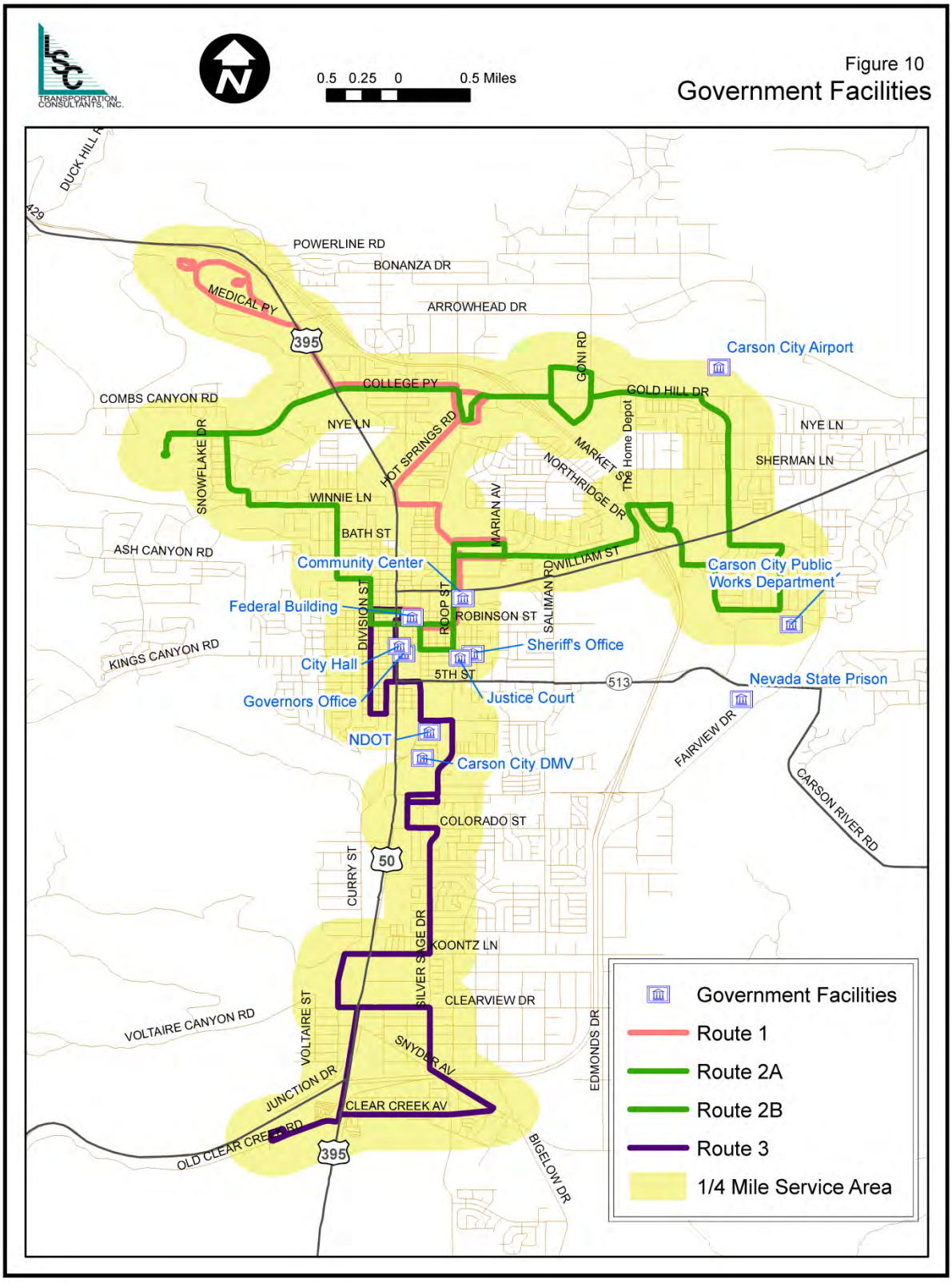
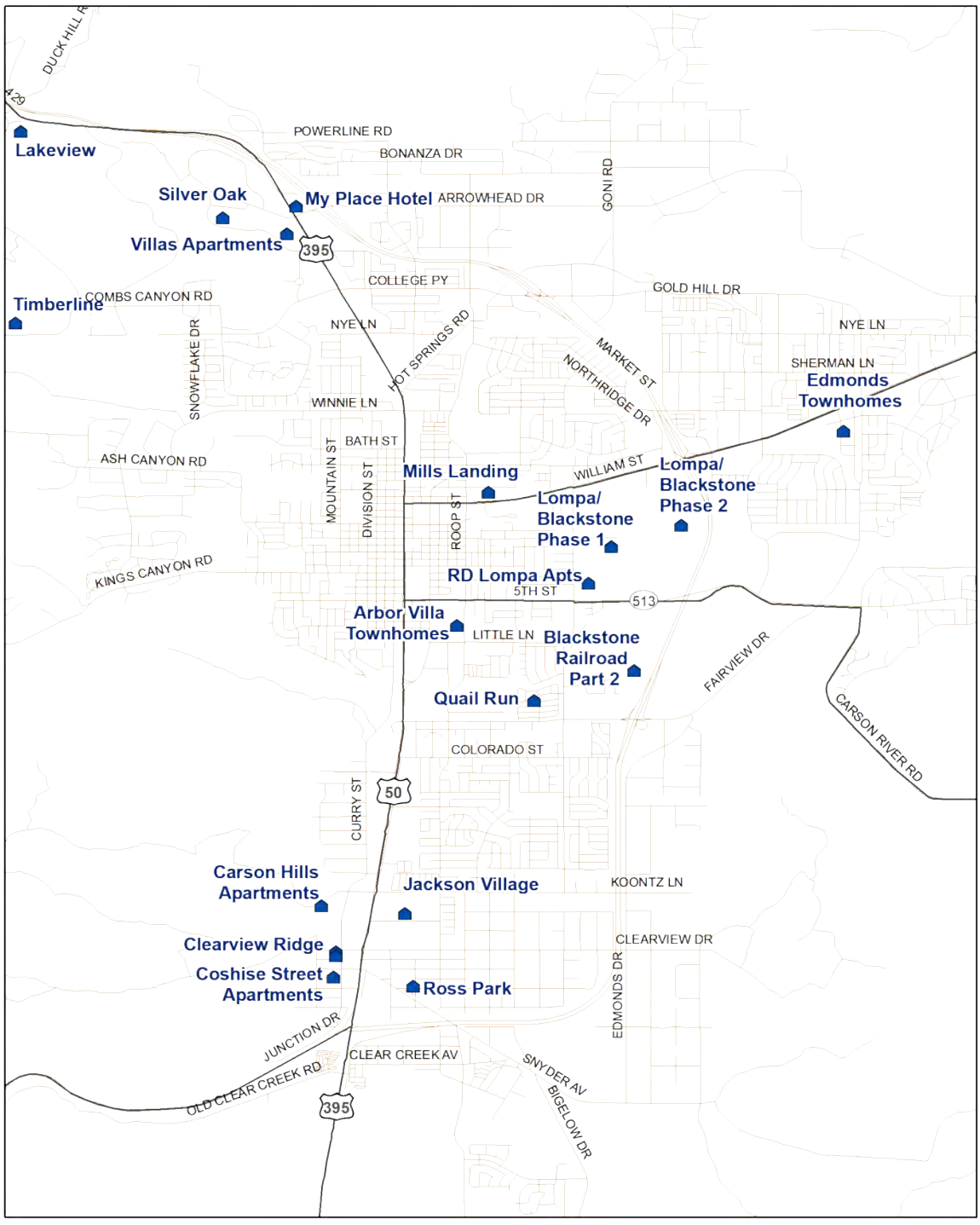

TRANSPORTATION CONSULTANTS, INC.
0.5 0.25 0 0.5 Miles
Figure 10
Government Facilities
DUCK HILL RD
429
POWERLINE RD
BONANZA DR
MEDICAL PY
ARROWHEAD DR
395
Carson City Airport
GONI RD
COLLEGE PY
GOLD HILL DR
COMBS CANYON RD
NYE LN
HOT SPRINGS RD
MARKET ST
The Home Depot
NYE LN
SHERMAN LN
NORTHRIDGE DR
SNOWFLAKE DR
WINNIE LN
MARIAN AV
BATH ST
ASH CANYON RD
Community Center
WILLIAM ST
Carson City Public Works Department
SALIMAN RD
ROOP ST
DIVISION ST
Federal Building
ROBINSON ST
Sheriff's Office
KINGS CANYON RD
City Hall
5TH ST
513
Nevada State Prison
Governors Office
Justice Court
NDOT
FAIRVIEW DR
Carson City DMV
CARSON RIVER RD
COLORADO ST
50
CURRY ST
SILVER SAGE DR
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
EDMONDS DR
JUNCTION DR
CLEAR CREEK AV
OLD CLEAR CREEK RD
395
BIGELOW DR
Government Facilities
Route 1
Route 2A
Route 2B
Route 3
1/4 Mile Service Area

Figure 11
Planned Developments



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Chapter 4

Evaluation of Current Transportation Services

INTRODUCTION

Following the consolidation of Ormsby County and Carson City in 1969, Carson City implemented a council-manager form of government with a council (board of supervisors) serving as a governing body. Nearly 30 years later, the Carson City urbanized area exceeded a population of 50,000 residents, thus requiring the formation of a Metropolitan Planning Organization. CAMPO formed in 2003 and became the designated regional decision-making body responsible for carrying out the metropolitan transportation planning process for the Carson City urbanized area.

In response to the 2005 *CAMPO Short-Range Transit Plan*, the Jump Around Carson (JAC) transit program was initiated. Operation of the fixed route and demand response/ADA paratransit services is overseen by the RTC and carried out through a contractor (MV Transportation). Maintenance, fueling and overall administrative services are provided by the Carson City Public Works Department and CAMPO.

GOVERNANCE

Carson City

The board of supervisors consists of four publicly-elected officials and the mayor. The board of supervisors then hires a city manager to carry out the policies it establishes. All of the members of the board serve 4-year staggered terms. The mayor and supervisors from Ward 2 and Ward 4 are elected during the Presidential election years. The supervisors from Ward 1 and Ward 3 are elected during off-Presidential election years.

The mayor is chairman of, and presides over, all board meetings. The board approves the budget, determines tax rates and focuses on the community's goals, major projects, capital financing and strategic planning, land use development, growth management, master plans and contractual agreements.

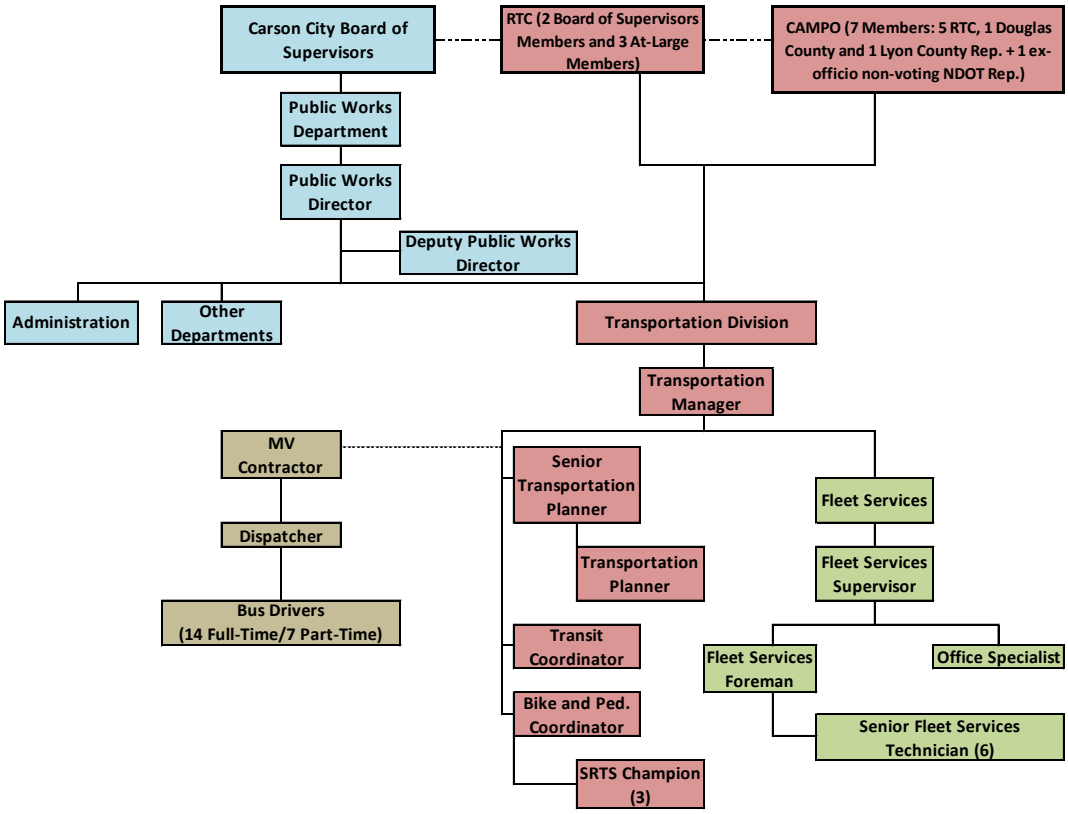
Carson City Regional Transportation Commission and Carson City Public Works Department

The Carson City Public Works Department is made up of many divisions, including the Operations divisions of Streets, Water, Sewer, Storm Water, Wastewater, Environmental, Landfill and Utility Billing. The Transportation Division, which includes Transportation Planning, Transportation Improvement Project Coordination and JAC Transit, is overseen by both RTC and CAMPO.

The Carson City Public Works Department employees provide staffing for RTC. The Transportation Manager is also the principal staff person responsible for administration of all CAMPO activities. The transportation planners primarily prepare federally-required CAMPO planning documents and are responsible for completing CAMPO's Unified Planning Work Program. The transit coordinator is responsible for verifying and applying for FTA and FHWA funds and is the primary contact person for duties related to CAMPO's role as the Designated Recipient and Grantee.

The RTC is comprised of two (2) seats filled by the board of supervisors and three (3) at-large seats. The RTC establishes priorities and recommends appropriate funding for transportation improvement projects within Carson City. The RTC meets the second Wednesday of every month in the Sierra Room of the Carson City Community Center. Figure 12 provides a brief overview of government organization.

FIGURE 12: Carson City Public Works Organizational Chart



CAMPO

CAMPO is governed by a seven (7)-member board consisting of the five (5) members of the Carson City Regional Transportation Commission (RTC), one (1) member representing Douglas County and one (1) member representing Lyon County. A representative from the Nevada Department of Transportation (NDOT) sits on the board serving as an ex officio, non-voting member. Through an agreement, Carson City provides the staffing necessary to execute the daily functions and responsibilities of the MPO.

The primary responsibility of CAMPO is to ensure existing and future expenditures for transportation projects and programs are based on a continuing, cooperative and comprehensive (3-C) planning process. CAMPO does not own nor operate the transportation systems they serve; rather, it serves in the overall coordination and consensus-building role in planning and programming funds for projects and operations.

Among other state and federal requirements, CAMPO is required to develop a regional transportation plan (RTP) with a minimum 20-year planning horizon and a transportation improvement program (TIP) with a four-year horizon.

EXISTING SERVICES

The JAC system is managed by Carson City Public Works staff, and is managed by the Transportation Manager and Transit Coordinator. The city (functioning as the RTC) contracts with a private firm (currently MV Transportation, Inc.) to operate these services with private employees, while remaining under the direct supervision of the RTC. The RTC is responsible for overall policy development, budgeting, fleet procurement, major fleet maintenance and contract oversight. MV is responsible for the day-to-day operations of the service, including: client registration; hiring, training and supervising operations staff; trip booking; scheduling and dispatch; and vehicle operations. The MV employees enlisted to carry out the contract with JAC include a general manager, an operations manager, dispatchers and 21 drivers, of which seven are part-time employees. Trip routing and scheduling are accomplished with the use of scheduling software provided by the RTC, and maintenance is performed by employees of the Carson City Public Works Fleet Maintenance Division. Fuel is provided by the City outside of the MV contract.

The JAC transit services operated on behalf of Carson City includes four fixed routes—Route 1, 2A, 2B, and 3—and a demand response/ADA complementary paratransit service known as JAC Assist. These services are presented and evaluated in detail below.

JAC Fixed Routes

JAC hours of operation are Monday through Friday, 6:30 a.m. to 7:30 p.m. and Saturday 8:30 a.m. to 4:30 p.m. Each route operates on a 60-minute headway from the Downtown Transfer Plaza, which facilitates transfers to the entire service area. Below is a brief description of all four routes, which are also depicted in Figure 13.

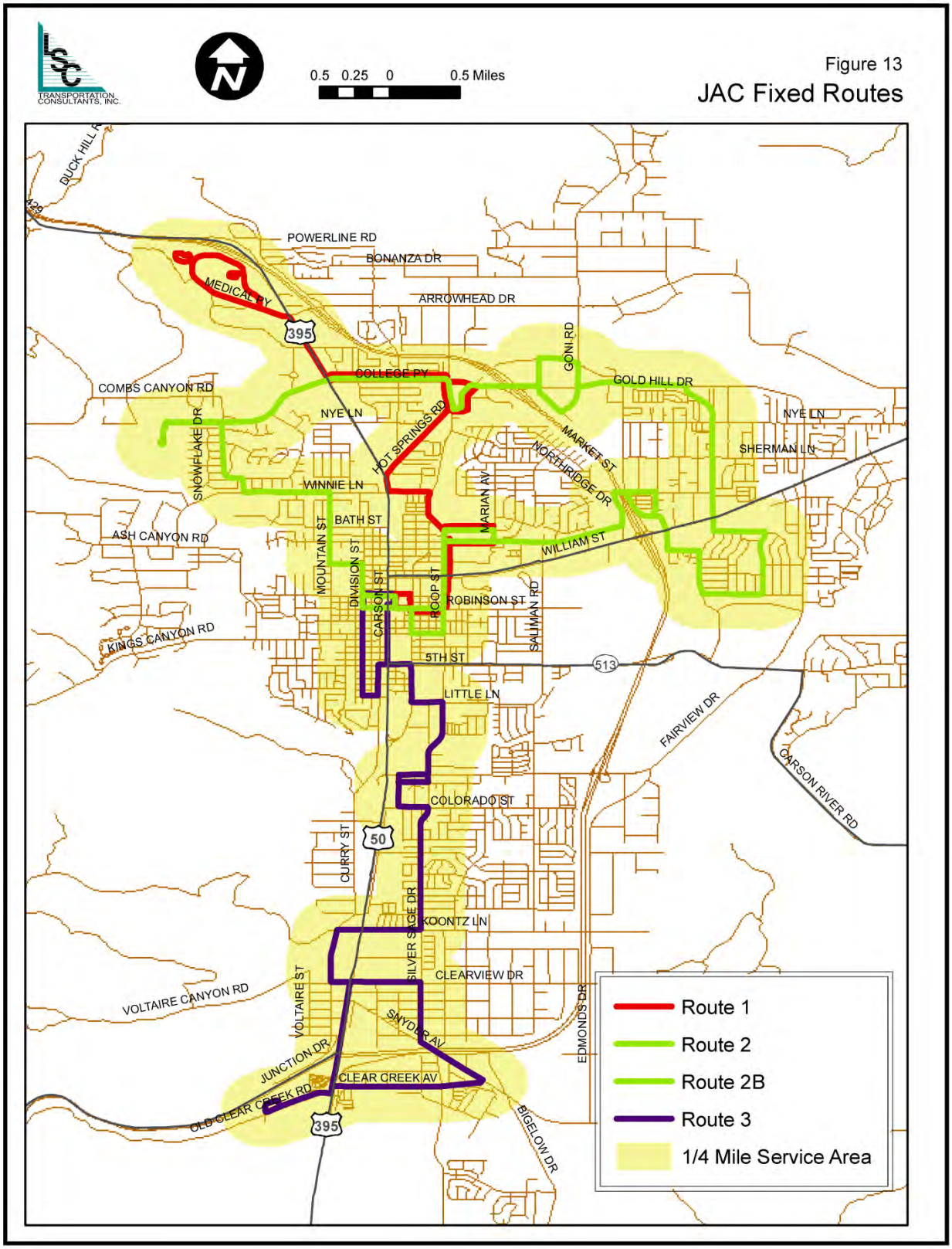
- Route 1 serves the northwest portion of Carson City. After leaving the Downtown Transfer Station the bus serves the Carson City Senior Center, the Walmart shopping center, the public library and the community center before making its way up to the Carson Tahoe Medical Center.

- Routes 2A and 2B serve the center portion of Carson City, running both clockwise (Route 2A) and counterclockwise (Route 2B) on virtually identical paths. Major stops along these routes include Western Nevada Community College, Mental Health and Development Services, Child and Family Services, Sierra Nevada Health Center and the Boys and Girls Club.

- Route 3 serves the southern portion of Carson City, running south towards Carson City Hall, Department of Motor Vehicles, NDOT, Costco and Fuji Park.

JAC Assist

JAC Assist provides complementary paratransit service in order to serve the travel needs of disabled individuals. The service is provided with smaller vehicles as an “origin to destination” service. JAC Assist


TRANSPORTATION CONSULTANTS, INC.
0.5 0.25 0 0.5 Miles
Figure 13
JAC Fixed Routes
POWERLINE RD
BONANZA DR
ARROWHEAD DR
MEDICAL PY
COLLEGE PY
COMBS CANYON RD
NYE LN
HOT SPRINGS RD
GONI RD
GOLD HILL DR
NYE LN
SHERMAN LN
MARKET ST
NORTHRIDGE DR
SNOWFLAKE DR
WINNIE LN
MARIAN AV
BATH ST
ASH CANYON RD
MOUNTAIN ST
DIVISION ST
CARSON ST
ROOP ST
ROBINSON ST
WILLIAM ST
SALIMAN RD
KINGS CANYON RD
5TH ST
LITTLE LN
FAIRVIEW DR
CARSON RIVER RD
COLORADO ST
CURRY ST
SILVER SAGE DR
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
EDMONDS DR
JUNCTION DR
CLEAR CREEK AV
OLD CLEAR CREEK RD
BIGELOW DR
395
50
513
Route 1
Route 2
Route 2B
Route 3
1/4 Mile Service Area

buses operate during the same days and hours as the JAC fixed route service (6:30 AM to 7:24 PM). This service is provided to comply with regulations of the Americans with Disabilities Act (ADA) of 1990, which require each recipient of Federal funds operating a fixed route transit system to provide a complementary paratransit service for disabled individuals who are unable to use fixed route. Individuals who wish to be considered for JAC Assist must complete an application, have the information verified by a medical professional, and be certified by JAC as ADA paratransit eligible.

FARE STRUCTURE

JAC fixed route fares are $1.00 for adults and $0.50 for children ages 5 to 18, seniors (age 60 and older) and persons with disabilities. Children under age five ride free. In addition, senior passengers may enroll in a Senior Bus Pass Program that offers unlimited free rides on all regular fixed routes. Monthly passes are available for $25.00/$12.50, and a 10-ride pass is available for $8.00/$4.00.

JAC Assist fares are $2.00 per one-way trip with an origin and destination within ¾ mile of any fixed route. As a matter of local policy, paratransit service is provided an additional ¼-mile (total of 1 mile from any fixed route) for a fare of $4.00 per one-way trip with an origin or destination within this zone.

EXISTING FLEET AND FACILITIES

As shown in Table 5, the JAC transit program has a total of 15 vehicles in the fleet, including 7 designated for fixed route service and 8 which are used in either fixed route or demand responsive service. The demand response vehicles range from a seating capacity of 5 to 21 seats and one wheelchair position, although additional seats may be moved to accommodate up to three wheelchairs at a time. The fixed route vehicles range in capacity from 21 to 32 seats and have one or two wheelchair positions and a two-capacity bike rack. Vehicles are stored a 3770 Butti Way and maintained at fleet maintenance facility located at 3505 Butti Way.

TABLE 5: JAC Transit Revenue Fleet Inventory

Vehicle ID#	Year	Make	Model	Length	Seating Capacity	Odometer	Anticipated Replacement Year	Investment Priority Tier
4005	2007	GMC	Uplander	17'	5	55,912	-	Low
4229	2009	Starcraft	Allstar	24'	21	135,207	2020	High
4230	2009	Starcraft	Allstar	24'	21	126,317	2020	High
4237	2012	Arboc Mobility	Spirit of Mobility	21'	10	99,623	2022	Medium
4238	2012	Arboc Mobility	Spirit of Mobility	21'	10	114,900	2022	Medium
4239	2012	Arboc Mobility	Spirit of Mobility	21'	10	109,900	2022	Medium
4241	2015	Arboc Mobility	Spirit of Mobility	24'	17	58,432	2023	Low
4242	2015	Arboc Mobility	Spirit of Mobility	24'	17	66,846	2023	Low
4233	2010	EDN (El Dorado National)	Passport	35'	31	245,898	2019	High
4234	2010	EDN (El Dorado National)	Passport	35'	31	2,811,093	2019	High
4236	2011	EDN (El Dorado National)	Passport	35'	31	143,618	2021	Medium
4240	2013	EDN (El Dorado National)	Passport	35'	31	115,216	2021	Medium
4243	2016	Arboc Mobility	Spirit Liberty	35'	32	77,589	2024	Low
4244	2016	Arboc Mobility	Spirit Liberty	35'	32	77,048	2024	Low
4245	2018	Arboc Mobility	Spirit Liberty	35'	32	39,384	2025	Low

Source: CAMPO Transit Asset Management Plan (TAM), 2019-2022

Based on the age and mileage of the vehicles, all of the vehicles are due to reach the end of their expected life as defined by the Federal Transit Administration (FTA) during the plan period. Therefore, an aggressive capital replacement plan will be needed.

RIDERSHIP PATTERNS

As shown in Figures 14 and 15, ridership heat maps were generated for both the JAC fixed route and JAC Assist services. The stops that are most frequented are those in the downtown Federal plaza area, followed by the stops near College Parkway and Hot Springs Road.

TRANSIT RIDERSHIP TRENDS

Annual Ridership

Table 6 and Figure 16 show ridership trends by service for the past eight years. As shown, systemwide ridership has varied from a high of approximately 223,300 passengers in Fiscal Year (FY) 2017-18, to a low of 166,200 in FY 2010-11. Since 2012, annual ridership for the JAC fixed routes has grown overall to a 2017/18 figure of 195,160. Overall fixed route ridership has increased by 3 percent over the last five years, and 9 percent in the most recent year. Looking at these figures by route, overall ridership over the last five years has grown by 7 percent on Route 3, 6 percent on Route 2B and 4 percent on Route 2A, while falling by 3 percent on Route 1.

While the fixed route ridership has fluctuated, ridership on JAC Assist has been steadily increasing since a nominal drop in ridership of 2 percent during FY 2011-12. Overall, ridership has grown by 65 percent over the past five years, including 3 percent in the most recent year. As nationwide bus ridership has fallen 1.8 percent during 2018,[1] it should be noted that JAC Transit's overall modest growth comes at a time when many other public transit services have seen declines in ridership.

Ridership by Month

Table 7 and Figure 17 show ridership monthly trends by service for the past three fiscal years. As indicated, service on the JAC fixed route services typically peaks between May and October and is lowest in mid-winter. Ridership on the busiest month (August) is 22 percent above the least busy month (February). JAC Assist ridership rises between May and October, with the busiest month (August) 45 percent higher than the slowest month (February).

Ridership by Day of Week

Ridership data is tracked by weekdays and Saturday. The average ridership by route is shown in Table 8. As shown, Route 1 experiences the highest weekday average daily ridership (185 passengers) followed by Route 3 (180 passengers). Route 2B carries the lowest weekday ridership (144 passengers). Saturday ridership is highest for Route 1 followed by Route 2A. Average Saturday ridership on the fixed route is just over half that of the average weekday. In contrast, the average weekday JAC Assist ridership (104 passengers) is nearly eight times the average Saturday ridership (12.8 passengers).

[1] APTA: Public Transit Ridership Down in 2018, https://www.smartcitiesdive.com/news/apta-public-transit-ridership-down-in-2018/552860/, Accessed April 2019.

Figure 14
JAC Fixed Route Ridership Heatmap

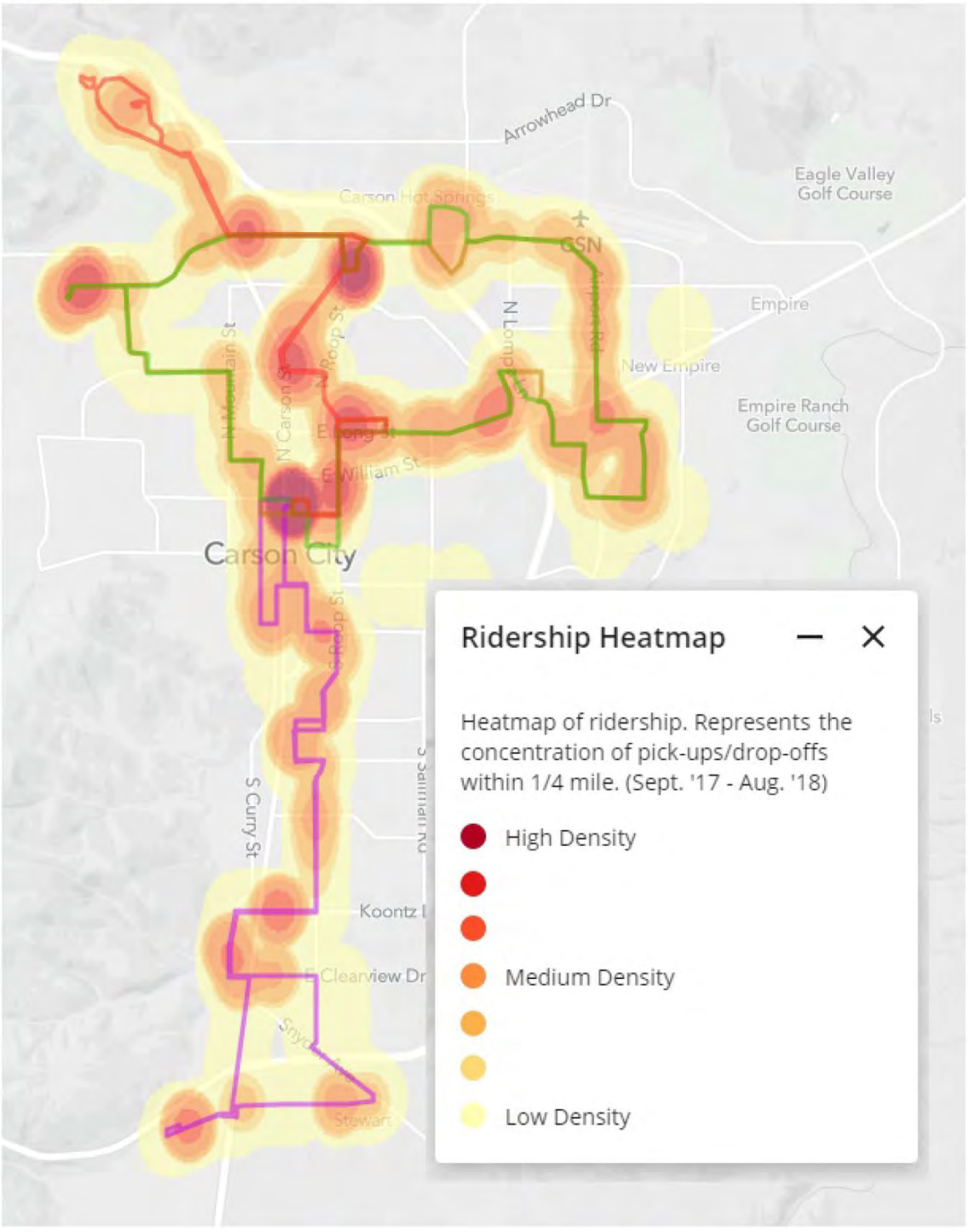


Figure 15

JAC Assist Ridership Heatmap

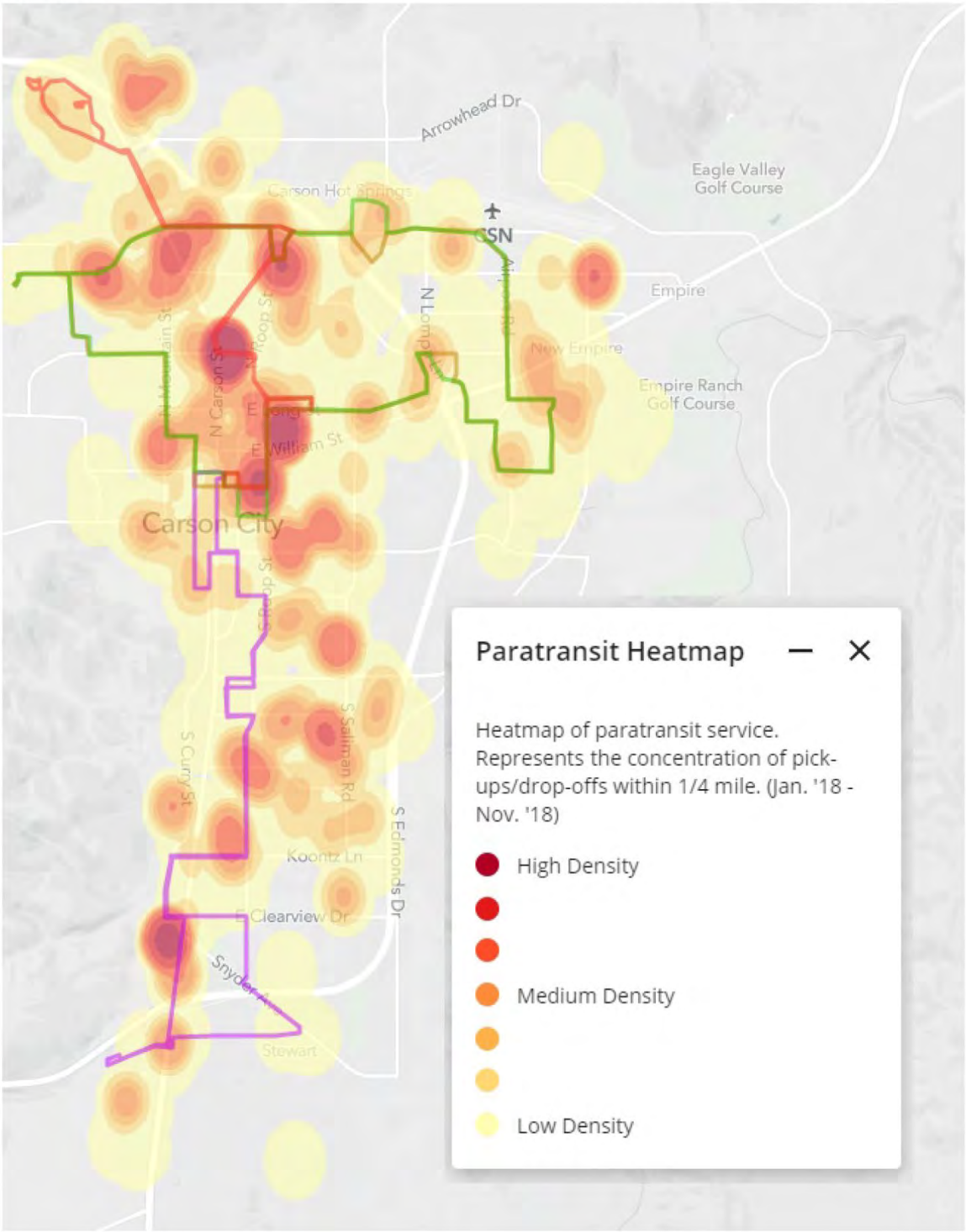


TABLE 6: JAC Transit Annual System Ridership

Service	Fiscal Year 2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Trend Last 5 Yrs	Last Year
JAC										
Route 1	42,523	54,186	55,272	53,327	54,213	54,092	50,840	53,453	-3%	5%
Route 2A	33,705	40,828	43,664	42,635	43,657	44,360	42,318	45,587	4%	8%
Route 2B	30,833	37,457	40,133	38,707	39,117	36,947	37,062	42,451	6%	15%
Route 3	45,054	51,245	50,289	48,266	59,790	56,223	47,986	53,636	7%	12%
WNC	--	--	--	--	264	228	224	33	--	--
Subtotal	*152,115*	*183,716*	*189,358*	*182,935*	*197,041*	*191,850*	*178,430*	*195,160*	3%	9%
JAC Assist	14,071	13,812	17,128	17,557	19,192	22,299	27,338	28,188	65%	3%
Systemwide	166,186	197,528	206,486	200,492	216,233	214,149	205,768	223,348	8%	9%

Source: Ridership by Route Data, Carson City Public Works Department, Received March 15, 2019

FIGURE 16: JAC Systemwide Annual Ridership

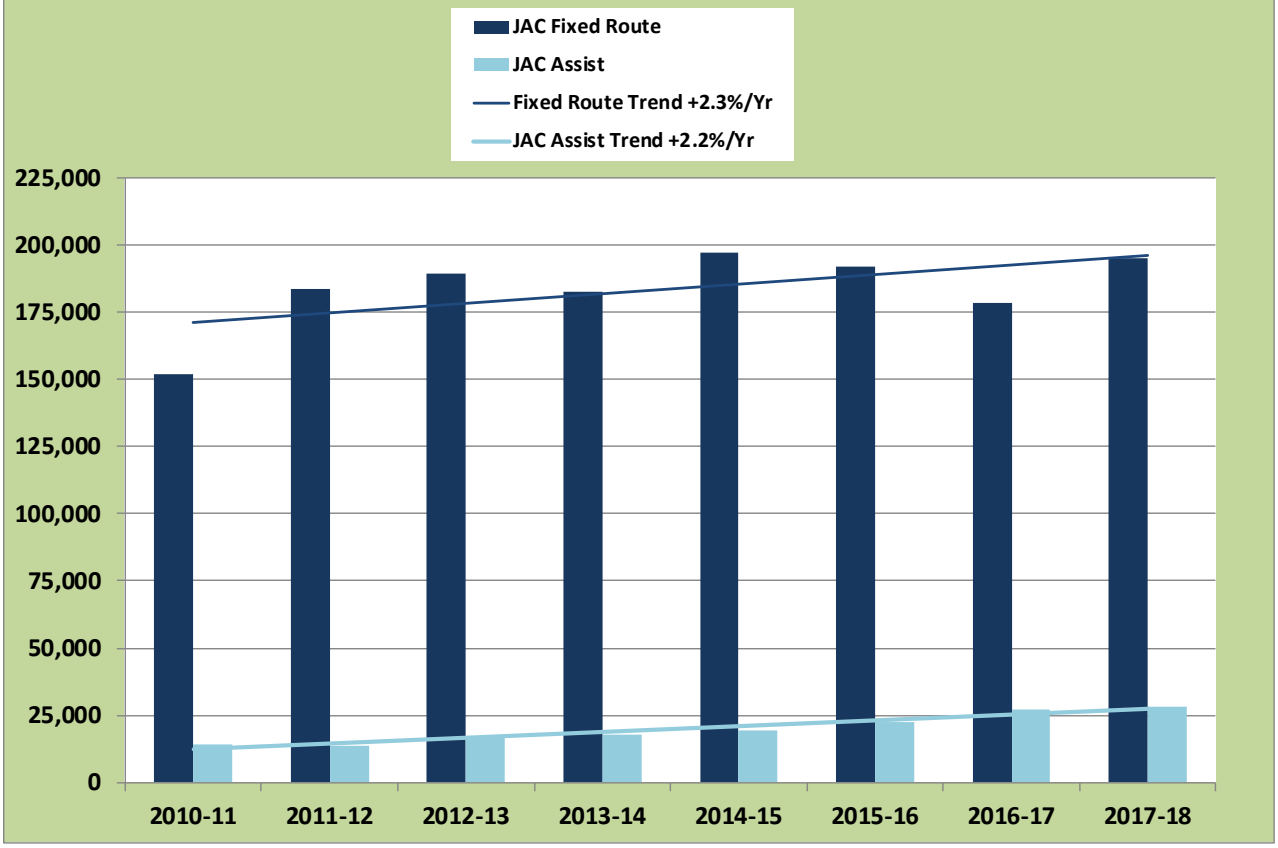


TABLE 7: Historical JAC Ridership by Month

Month	JAC Fixed Routes 2016	2017	2018	% Change 2016 to 2018	JAC Assist 2016	2017	2018	% Change 2016 to 2018
July	18,402	15,532	16,799	-10%	1,864	2,132	2,529	26%
August	19,779	16,834	18,440	-7%	1,952	2,500	2,905	33%
September	15,794	16,122	16,227	3%	1,796	2,168	2,456	27%
October	17,248	15,046	17,198	0%	1,877	2,146	2,715	31%
November	13,692	14,469	15,180	10%	1,734	2,092	2,246	23%
December	14,921	14,148	15,215	2%	1,995	2,272	2,010	1%
January	13,819	12,390	15,610	11%	1,717	2,215	2,179	21%
February	15,781	12,838	15,136	-4%	1,761	2,205	2,117	17%
March	16,347	15,455	15,666	-4%	1,940	2,554	2,126	9%
April	15,387	13,646	15,474	1%	1,821	2,185	2,146	15%
May	14,605	15,349	17,318	16%	1,879	2,514	2,378	21%
June	16,075	16,601	16,897	5%	1,963	2,355	2,381	18%
Monthly Average	15,988	14,869	16,263	2%	1,858	2,278	2,349	21%
Total Ridership	191,850	178,430	195,160	2%	22,299	27,338	28,188	21%

Source: JAC Systemwide Fiscal Year Ridership Report, 2019

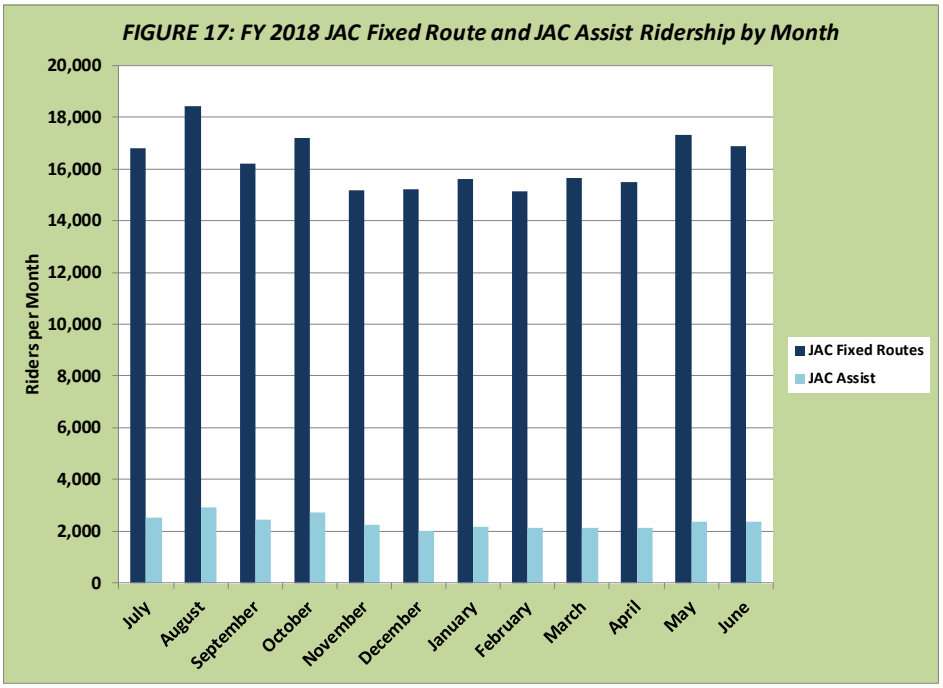


TABLE 8: Average Daily Ridership

	Route 1	Route 2A	Route 2B	Route 3	*Fixed Route Total*	JAC Assist
Weekday	185.1	155.1	144.2	180.3	664.6	104.4
Saturday	107.7	92.2	81.0	63.8	344.6	12.8

Source: Ecolane JAC Ridership data provided March, 2019

Average Ridership by Hour of the Day for Weekday/Saturday

Average weekday and Saturday ridership by hour is shown in Table 9, Figure 18, and Figure 19. As shown, the overall ridership is highest in the Noon hour on weekdays and in the 3 PM hour on Saturdays. Overall, this ridership pattern indicates a mix of commuters, shoppers and persons traveling for other reasons.

Based on this data, the following conclusions can be made about each route:

- Route 1: Ridership peaks at noon on both weekdays and Saturdays with the lowest ridership occurring between 5:00 PM and 7:00 PM. Route 1 average daily ridership during weekdays and Saturdays is the highest of all routes.

- Route 2A: Weekday ridership is highest around 2:00 PM with low ridership occurring between 6:00 PM and 7:00 PM. Saturday ridership experiences two peaks at both the 8:00 AM and 3:00 PM hours.

- Route 2B: Weekday ridership rises between 6:00 AM and reaches its peak at noon. After 3:00 PM ridership steadily declines to under 5 passengers per hour after 6:00 PM. Saturday ridership rises to a peak of 16 passengers an hour at 3:00 PM.

- Route 3: Weekday morning ridership is the highest of all the routes reaching nearly 24 passengers by 8:00 AM with the routes second highest ridership occurring at noon. Saturday ridership peaks around 11:00 AM and does not surpass 12 passengers at any point in the day. Route 3 has the lowest Saturday ridership of all routes with only about 64 passengers.

Ridership by Fare Category

As shown in Table 10, single ride fares make up the overwhelming majority (95 percent) of all boardings on JAC fixed route buses. Of these single rides, 60.8 percent are purchased by adults using general fare followed by 15.2 percent disabled persons, 12.7 percent seniors, and 11.3 percent youth. Only 2.9 percent of all fixed route boardings are by 10-ride pass, and 2.6 percent using a monthly pass. Of those using paratransit, 58.8 percent pay general fare, followed by 32.7 percent seniors and 8.5 percent persons with qualifying disabilities.

RIDER CHARACTERISTICS

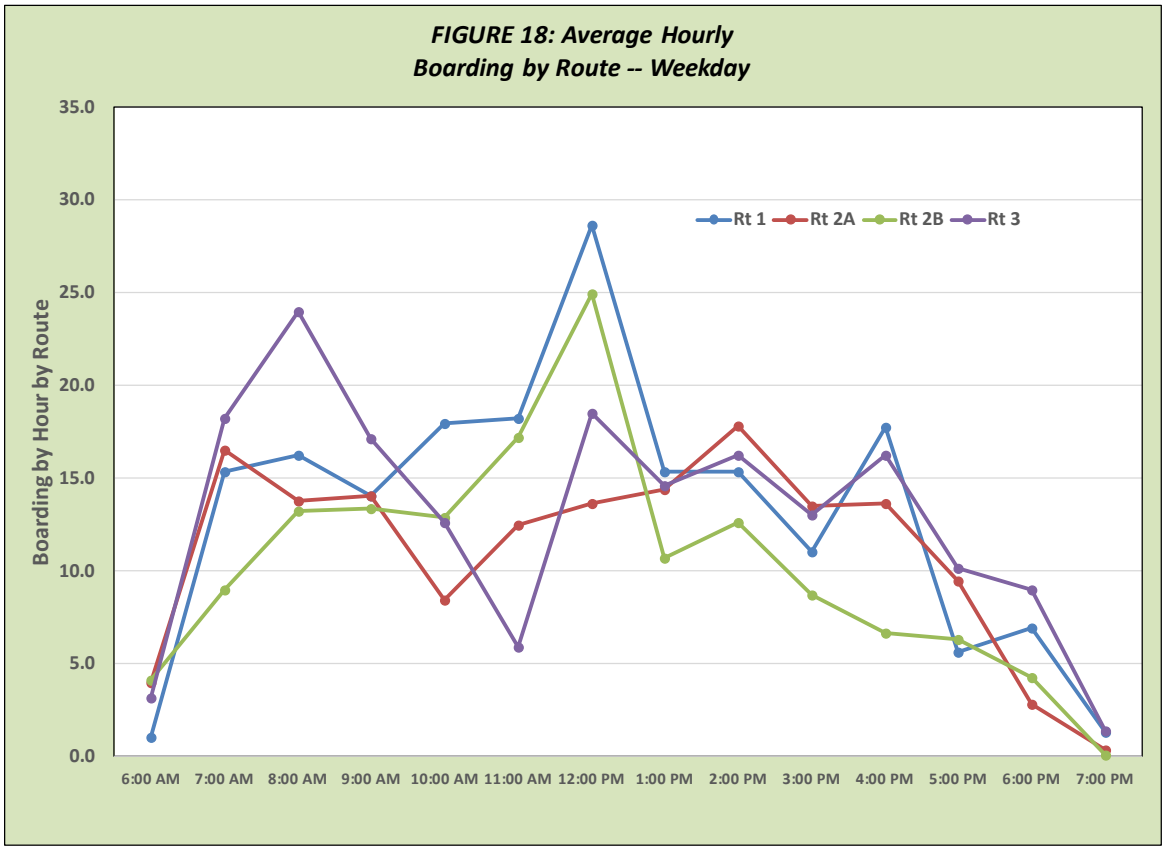
A transit survey was conducted on the fixed-route and paratransit services during the week of October 30, 2018 to understand travel patterns, preferences, and capture basic demographics of the riding public. The survey was conducted as part of CAMPO's FY 2017-2018 Unified Planning Work Program (UPWP) transit rider preference survey.

During this time, a survey administrator was physically on board each route, interacting with customers and assisting them with the survey as needed. A total of 295 surveys were completed, and some highlights of the results are as follows:

TABLE 9: JAC Fixed Route Ridership by Hour of Day

Hour Beginning	Average Weekday					Average Saturday				
	Rt 1	Rt 2A	Rt 2B	Rt 3	Total	Rt 1	Rt 2A	Rt 2B	Rt 3	Total
6:00 AM	1.1	4.0	4.1	3.2	12.4	--	--	--	--	--
7:00 AM	15.4	16.5	9.0	18.2	59.1	--	--	--	--	--
8:00 AM	16.3	13.8	13.2	24.0	67.3	6.1	17.2	7.8	3.3	34.5
9:00 AM	14.1	14.0	13.4	17.2	58.7	11.4	7.5	6.1	7.6	32.5
10:00 AM	18.0	8.5	12.9	12.6	51.9	4.4	8.2	4.4	2.4	19.3
11:00 AM	18.2	12.5	17.2	5.9	53.8	19.3	12.0	11.3	12.3	54.9
12:00 PM	28.6	13.7	25.0	18.5	85.7	30.6	4.5	10.5	4.3	49.8
1:00 PM	15.4	14.4	10.7	14.6	55.1	2.6	6.0	11.3	8.0	28.0
2:00 PM	15.4	17.8	12.6	16.3	62.1	17.5	14.2	7.0	8.0	46.8
3:00 PM	11.1	13.5	8.7	13.1	46.4	14.9	21.0	16.5	10.4	62.8
4:00 PM	17.8	13.7	6.7	16.3	54.4	0.9	1.5	6.1	7.6	16.0
5:00 PM	5.6	9.5	6.3	10.2	31.6	--	--	--	--	--
6:00 PM	6.9	2.9	4.2	9.0	23.0	--	--	--	--	--
7:00 PM	1.3	0.4	0.1	1.4	3.2	--	--	--	--	--
TOTAL	185.1	155.1	144.2	180.3	664.7	107.7	92.2	81	63.8	344.7

Source: Ecolane data. Totals for March 2019, factored by hourly ridership proportions for Sept and Oct 2017.



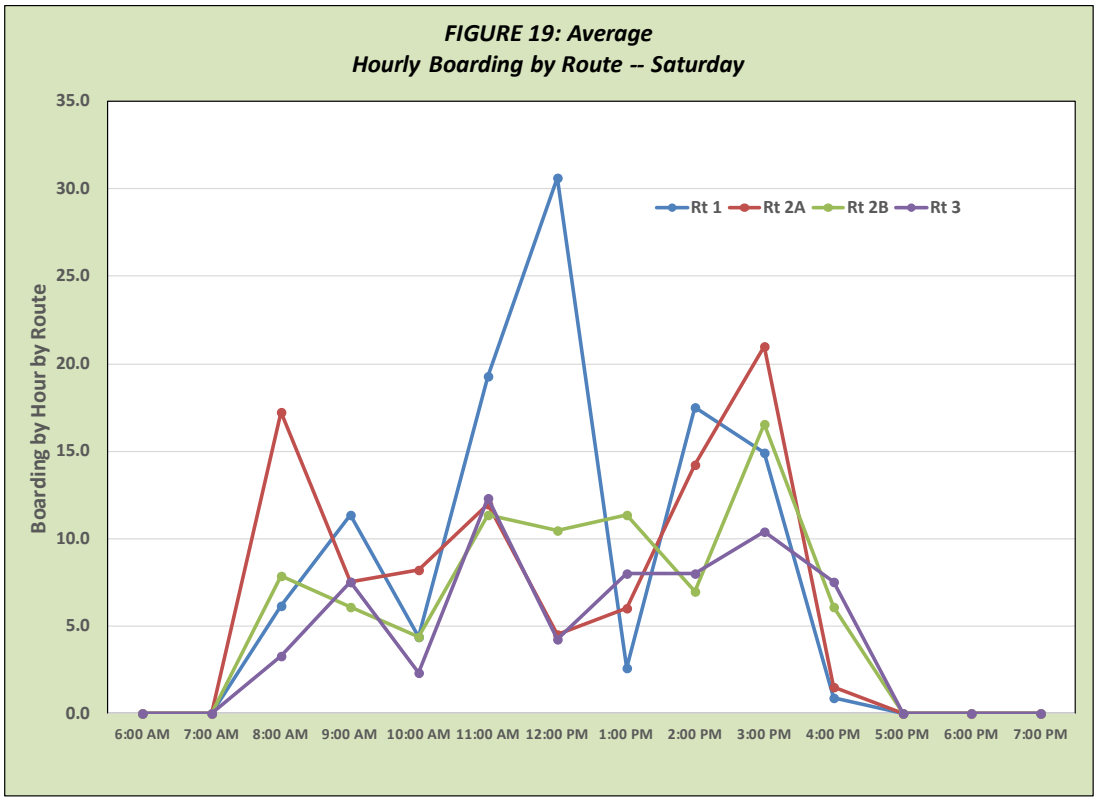


TABLE 10: JAC Ridership by Fare Type

	JAC Fixed Route							JAC Assist	
	10 Day Ride Pass	% of Total	Monthly Pass	% of Total	Single Fare	% of Total	Total by Faretype	Total by Fare Type	% of Total
Adult/General	765	48.2%	444	30.3%	31,925	60.8%	33,133	15,310	58.8%
Senior	63	4.0%	400	27.3%	6,646	12.7%	7,109	8,511	32.7%
Disabled	654	41.3%	425	29.0%	7,977	15.2%	9,056	2,208	8.5%
Youth	104	6.5%	197	13.5%	5,917	11.3%	6,217	-	
Total	**1,586**		**1,466**		**52,465**		**55,516**	**26,029**	
% of Total	**2.9%**		**2.6%**		**94.5%**		**100%**	**100%**	

Source: JAC FY 2017-18 Actual Revenue Report

- 87 percent of respondents walk to and from bus stops, with about 5 percent using a bicycle (all JAC fixed-route buses are equipped with bicycle racks); 57 percent typically spend no more than 10 minutes getting to and from a bus stop. These figures reflect the importance of sidewalks and bicycle facilities providing access to the bus stops.

- Over 80 percent of respondents agreed that service has improved since changes to routes and schedules were implemented on April 1, 2017 which resulted in improvements to on-time performance.

- Over half of respondents said they would be likely to use some form of electronic fare payment, should JAC implement such a feature (i.e., reloadable card or payment by mobile app).

- Respondents were asked to share how they prefer to get information and news about JAC, and the two media receiving the most votes were “JAC Website” and “JAC Mobile App.”

- The most commonly suggested way to improve service, across all routes, was to implement changes to routes and/or stops.

- Respondents were asked to rank nine different potential improvements to JAC in order of importance to them. The two highest ranked were “Additional Hours of Service” and “Additional Days of Service”.

- Demographically, there was a fairly even mix of age ranges amongst respondents, with only those with age 17 or below category receiving minimal representation.

A total of 29 surveys were also completed by users of the JAC Assist Paratransit service. Although not a statistically significant sampling, information gleaned from the completed surveys is useful for future service planning.

NON-RIDER CHARACTERISTICS

CAMPO staff conducted a survey of area residents that do not use the JAC system. A total of 43 responses yielded useful insight into awareness of the transit service and how changes in service could be perceived by persons not currently using the service:

- 49 percent of respondents indicated they were “not at all familiar” with JAC service, along with 23 percent that said they were “not very familiar.” This indicates a need for additional marketing.

- When asked the main reason they don’t ride JAC for their most frequent trips, the greatest response (47%) said they need their car during the day for work or to run errands. This was followed by 19 percent that indicated that there was no bus stop near their house. No other response garnered more than 5 percent of responses.

- Respondents were asked to indicate if they agreed or disagreed with four statements about the bus service. Approximately 91 percent disagreed with the statement “the bus service is convenient for me.” A majority disagreed with the other three statements regarding “the buses are comfortable and clean” (63 percent), “I feel safe and secure on the bus” (56 percent) and “The bus fares are affordable” (53 percent). While it should be noted that most of these respondents did not have much first-hand experience with the transit program, these results do indicate the public attitudes that a promotional campaign would need to address.

- These non-riders were asked, “What service delivery improvements would make you more inclined to use JAC transit service?” with multiple responses allowed. The most popular response was for adding a bus stop near their residence and improving bus stop amenities and improving frequency to half-hourly, all of which were mentioned by 26 percent of respondents.

- 19 percent indicated “addition of a bus stop near my destination”, while 14 percent mentioned both “faster service” and “improved technology, such as ability to purchase fares on my phone, etc.” No other responses were mentioned by more than 7 percent of respondents.

JAC FINANCIAL CHARACTERISTICS

Revenues

Table 11 provides revenues available to the JAC transit program as per the provided FY 2017-18 Carson City JAC budget summary. As shown, the Carson City General Fund and Federal Transit Administration (FTA) Operating funds represent the largest operating revenue sources for transit at 36 percent and 30 percent, respectively. Intergovernmental operating revenue is primarily made by FTA 5307 (30 percent), followed by FTA 5310 (16 percent), the Carson City Senior Transportation Grant and the Division of Health Care Financing and Policy Medicaid Services at 5 percent and 3 percent, respectively. JAC fixed route and JAC Assist paratransit fares only make up 8.8 percent of the overall operating funds.

TABLE 11: Fiscal Year 2017-18 JAC Revenues

Source		Total	% of Total
Operating Revenues			
Fares			
Fixed Route Fares		$70,865	6.4%
Paratransit Fares		$26,029	2.4%
	Subtotal	*$96,894*	
Intergovernmental			
Div. of Health Care Financing and Policy - Medicaid Services (Net)		$34,306	3.1%
Carson City Senior Transportation Grant		$50,000	4.5%
FTA 5310		$175,228	15.9%
FTA 5307 Operating		$332,788	30.1%
	Subtotal	*$592,322*	
Investment Interest		$1,495	0.1%
General Fund		$400,000	36.2%
Refunds and Reimbursements		$465	0.0%
Rents and Royalties		$14,298	1.3%
	Operations Subtotal	*$1,105,473*	
Capital Revenue			
FTA 5307 Capital		$745,705	
	Total Revenue	**$1,851,179**	

Source: JAC Fiscal Year 2017-18 Budget Report

Expenses

Operational expenses over the last five fiscal years are shown Table 12. As shown, the overall expenses have increased by 18 percent since FY 2012-13. The largest financial items to note include a 145 percent increase in vehicle management and maintenance and a 41 percent increase in administrative benefits over the last five years. This is consistent with cost trends in other similar transit systems, reflecting increased contractor costs and benefits costs. In the opposite direction, decreases in operation expenses include a 39 percent decrease in fuel costs, followed by a 21 percent reduction in administrative salaries.

TABLE 12: Operational Expense Trends Over 5-Year Period

	Annual Operational Expense by Fiscal Year					% Change FY 2012-13 to 2017-18
	2012-13	2014-15	2015-16	2016-17	2017-18	
Administrative Salaries	$67,474	$43,786	$49,413	$51,194	$53,291	-21%
Administrative Benefits	$25,868	$21,430	$27,759	$31,007	$36,370	41%
Other Admin. Operating Costs	$75,151	$91,903	$87,015	$113,321	$73,227	-3%
Operating Contract	$580,205	$591,299	$648,984	$654,057	$688,196	19%
RTC Intercity	$33,233	$34,904	$31,218	$38,272	$33,379	0%
Vehicle Maintenance	$103,000	$130,266	$171,867	$212,966	$252,580	145%
Vehicle Fuel	$156,557	$155,624	$130,645	$93,518	$96,261	-39%
Total	**$1,041,488**	**$1,069,211**	**$1,146,901**	**$1,194,335**	**$1,233,305**	18%

Source: JAC Budget Summary, Received April 9,2019

Operating Cost and Model

The actual operating cost of the JAC program in FY 2017-18 was $1,233,305. When evaluating individual services or developing and evaluating service alternatives, it is useful to develop a "cost model," which can easily show the financial impact of any proposed changes, as shown in Table 13. In a cost model, individual budget line items are assigned to one of three cost categories, depending on the service quantity that most directly drives the individual cost: the vehicle-hours of service (such as for driver or contractor salaries), the vehicle-miles of service (such as for vehicle fuel or maintenance) or fixed costs that do not vary with relatively modest changes in service quantities (such as administrative or marketing costs). For FY 2017-18, the resulting JAC cost model equation is:

Operating Cost = $0.82 x total vehicle miles
+ $35.96 per vehicle service hour
+ $180,266 annually for fixed costs

This equation can be used to estimate the cost of any changes in service, such as the operation of additional routes or changes in service span as well as evaluate JAC performance by route.

TABLE 13: Fiscal Year 2017-18 Operating Cost and Model

	Allocation Category		
	Fixed	**Vehicle - Hours**	**Vehicle - Miles**
Salaries and Wages	$52,027		
Overtime	$1,264		
Grant Fund Allocation	-$33,788		
Subtotal By Category	*$19,503*		
Employee Benefits			
Medicare	$717		
Retirement	$14,568		
Group Insurance	$20,419		
Workers' Compensation	$666		
Phone Allowance	$788		
Subtotal By Category	*$37,158*		
Services and Supplies			
Professional Services	$4,289		
Operating Contract		$688,196	
RTC Intercity	$33,379		
Vehicle Repair & Maintenance		$129,310	
Travel	$3,469		
Office Supplies	$1,807		
Operating Supplies		$17,025	
Vehicle Fuel/Oil			$96,261
Telephone	$2,679		
Power	$2,430		
Heating	$2,520		
General Fund	$38,220		
Fleet Management			$123,270
Grant Allocation	$31,385		
Technical Equipment	$3,428		
Subtotal By Category	*$123,606*	*$834,531*	*$219,531*
Grand Total by Category	**$180,266**	**$834,531**	**$219,531**
Cost Model			
Unit Quantities	-	23,209	266,655
Cost per Unit	-	$35.96	$0.82

Source: Fiscal Year 2017-18 JAC Budget Report and Vehicle Hour/Miles Reports

OPERATING STATISTICS AND PERFORMANCE

Systemwide Operational Trends

Table 14 presents FY 2017-18 systemwide service operating costs and performance. Note that the costs are allocated to the individual services based upon the cost equation, with fixed costs allocated based on the proportion of vehicle-hours of service. The top portion considers each of the routes and services,

for all days of service. A review of this data indicates the following: Systemwide productivity (as measured in one-way passenger trips per vehicle revenue hour) is 9.6 trips per vehicle hour.

  - JAC fixed routes provide 13 passenger trips per hour. Route 1 is the most productive (14.3) followed by Route 3 (14.1), though Route 2 figures are not significantly lower (12.2 for 2A and 11.4 for 2B).

  - JAC Assist Dial a Ride services provide 3.4 passenger trips per hour.

- Systemwide passengers per vehicle-service-mile is 0.8.

  - JAC fixed route services 1.1 passengers per vehicle service mile. The relative values for the individual routes follow the same pattern as that for the passenger per vehicle service-hour.

  - JAC Assist services 0.3 passenger per vehicle service mile.

- Systemwide operating cost per one-way passenger trip is $6.33

  - JAC fixed route services are $4.71 per one-way passenger trip. This ranges from a low of $4.24 on Route 1 to a high of $5.42 on Route 2B.

  - JAC Assist route services are over triple the fixed route at $17.59 per one-way passenger trip.

- Subsidy per trip reflects the desired output of a transit service (ridership) and the most important input (public subsidy or taxpayer dollars). A lower figure is preferred, as it reflects that less public funding is required for each passenger served. As shown, JAC Assist is the most expensive type of service with a subsidy per trip of $16.66, while the fixed route service requires only $4.35 in subsidy per passenger-trip. Operating subsidy per trip systemwide is $5.90.

The performance analysis for all weekday service and for Saturday service is shown in the lower portion of Table 14. Of note, the overall Saturday service is more productive than the weekday service, at 10.1 passenger-trips per vehicle hour. Routes 1, 2A and 2B are all more productive on Saturday than on weekdays, though Route 3 productivity is 38 percent lower on Saturday. Productivity of JAC Assist is much lower (by 55 percent) on Saturday than on weekdays. The overall cost per passenger-trip on Saturday is only 7 percent lower than on weekday, while the subsidy per passenger-trip is 6 percent lower. Saturday performance is strong in comparison with other similar transit systems, indicating a relatively strong demand for transit service on Saturday in Carson City.

TABLE 14: JAC Performance Analysis

Performance Measures	Fixed Route					JAC Assist	Systemwide
	Route 1	Route 2A	Route 2B	Route 3	Total		
Total: All Days							
One-Way Passenger-Trips	53,453	45,587	42,451	53,636	195,127	28,188	223,315
Vehicle Service Hours	3,733	3,733	3,732	3,792	14,990	8,220	23,209
Vehicle Service Miles	41,898	43,543	46,096	47,075	178,612	88,043	266,655
Marginal Operating Costs (Excluding Depreciation)	$197,707	$199,061	$201,141	$204,542	$802,451	$431,877	$1,234,329
Allocated Fixed Costs (Allocated by Vehicle-Hrs)	$28,993	$28,993	$28,989	$29,450	$116,424	$63,842	$180,266
Total Allocated Operating Costs (1)	$226,700	$228,054	$230,130	$233,992	$918,876	$495,719	$1,414,595
Farebox Revenues	$15,319	$17,754	$16,204	$18,771	$70,865	$26,029	$96,894
Operating Cost per One-Way Passenger-Trip	$4.24	$5.00	$5.42	$4.36	$4.71	$17.59	$6.33
Passengers per Vehicle Service Hour	14.3	12.2	11.4	14.1	13.0	3.4	9.6
Passengers per Vehicle Service Mile	1.3	1.0	0.9	1.1	1.1	0.3	0.8
Farebox Recovery Ratio[2]	6.8%	7.8%	7.0%	8.0%	7.7%	5.3%	6.8%
Subsidy Per Trip	$3.95	$4.61	$5.04	$4.01	$4.35	$16.66	$5.90
Weekdays							
One-Way Passenger-Trips	47,234	40,166	37,682	49,842	174,924	27,524	202,448
Vehicle Service Hours	3,324	3,324	3,323	3,376	13,347	7,804	21,150
Vehicle Service Miles	37,306	38,771	41,044	41,916	159,038	85,969	245,007
Marginal Operating Costs (Excluding Depreciation)	$176,040	$177,246	$179,098	$182,127	$714,512	$411,981	$1,126,492
Allocated Fixed Costs (Allocated by Vehicle-Hrs)	$25,815	$25,815	$25,812	$26,222	$103,666	$60,611	$164,276
Total Allocated Operating Costs (1)	$201,856	$203,062	$204,910	$208,349	$818,177	$472,591	$1,290,768
Farebox Revenues	$13,536	$15,643	$14,384	$17,443	$63,527	$25,416	$88,943
Operating Cost per One-Way Passenger-Trip	$4.27	$5.06	$5.44	$4.18	$4.68	$17.17	$6.38
Passengers per Vehicle Service Hour	14.2	12.1	11.3	14.8	13.1	3.5	9.6
Passengers per Vehicle Service Mile	1.3	1.0	0.9	1.2	1.1	0.3	0.8
Farebox Recovery Ratio[2]	6.7%	7.7%	7.0%	8.4%	7.8%	5.4%	6.9%
Subsidy Per Trip	$3.99	$4.67	$5.06	$3.83	$4.31	$16.25	$5.94
Saturday							
One-Way Passenger-Trips	6,219	5,421	4,769	3,794	20,203	664	20,867
Vehicle Service Hours	409	409	409	416	1,643	416	2,059
Vehicle Service Miles	4,592	4,772	5,052	5,159	19,574	2,074	21,648
Marginal Operating Costs (Excluding Depreciation)	$21,667	$21,815	$22,043	$22,416	$87,940	$19,897	$107,837
Allocated Fixed Costs (Allocated by Vehicle-Hrs)	$3,177	$3,177	$3,177	$3,227	$12,759	$3,231	$15,990
Total Allocated Operating Costs (1)	$24,844	$24,992	$25,220	$25,643	$100,699	$23,128	$123,826
Farebox Revenues	$1,782	$2,111	$1,820	$1,328	$7,337	$613	$7,950
Operating Cost per One-Way Passenger-Trip	$3.99	$4.61	$5.29	$6.76	$4.98	$34.83	$5.93
Passengers per Vehicle Service Hour	15.2	13.3	11.7	9.1	12.3	1.6	10.1
Passengers per Vehicle Service Mile	1.4	1.1	0.9	0.7	1.0	0.3	1.0
Farebox Recovery Ratio[2]	7.2%	8.4%	7.2%	5.2%	7.3%	2.7%	6.4%
Subsidy Per Trip	$3.71	$4.22	$4.91	$6.41	$4.62	$33.91	$5.55

Source: FY 2017-18 JAC Systemwide Reports and Operational Budget Summary Report
Note 1: Marginal costs plus fixed costs allocated by the % of vehicle-hours of service.
Note 2: Farebox divided by total allocated operating costs.

REGIONAL TRANSPORTATION SERVICES

The following describes existing public and private transportation services serving Carson City and the greater CAMPO region.

Tahoe Transportation District (TTD Services)

Lake and Valley Express Service

The Tahoe Transportation District operates Route 19X, connecting Carson City with Gardnerville, along with Route 22, which provides service between Gardnerville and South Lake Tahoe. Both routes provide daily connections between the South Shore area of Lake Tahoe and the Carson Valley. Route 19X offers service from 6:00 AM until 8:00 PM. This route begins in Gardnerville, Nevada at the Douglas County Community and Senior Center located at 1329 Waterloo Lane and continues north along the US 395 corridor through Minden, Nevada. The northbound route ends at the Downtown Transit Center in Carson City, where it turns around heading south for the return trip of this bi-directional route through Carson Valley. Transfers to Route 22 at the Douglas County Community and Senior Center provide access to Stateline, Nevada in the Tahoe Basin. Northbound buses arrive at the Downtown Transit Center at 7:40 AM, 9:40 AM, 4:10 PM, 6:10 PM and 7:40 PM, while southbound departures are provided at 6:15 AM, 7:45 AM, 9:45 AM, 4:15 PM and 6:15 PM. The one-way fare is $4.00 for the general public, and $2.00 for seniors, Veterans, persons with disabilities and Medicare recipients.

Washoe County RTC

The Washoe County Regional Transportation Commission (RTC) began operating transit services in 1978. Today there are numerous route and service options offered, including RTC RIDE and RTC Regional Connector. The RTC Ride service consists of 30 fixed routes serving Reno, Sparks and other areas of Washoe County (exclusive of the Tahoe Basin).

The RTC Regional Connector service consists of commuter transportation between Reno and Carson City. The route serves five stops in total, including three in Reno (4th Street Station, Meadowood Mall and the Wal-Mart at Damonte Ranch) and six in Carson City (including the Downtown Transfer Plaza and the southern terminus at the NDOT offices on Little Lane). Southbound, six runs per day are operated, arriving in Carson City at 6:45 AM, 7:15 AM, 7:45 AM, 4:12 PM, 5:12 PM and 6:37 PM. Northbound, runs depart Carson City at 5:47 AM, 6:17 AM, 6:47 AM, 3:05 PM, 4:05 PM and 5:30 PM. No weekend service is provided. A single ride fare is $5.00 for general public, with a 10-ride pass available at $42.50. This route carries approximately 30,000 riders per year (or 120 per service day).

Washoe RTC Regional Connector service provides connections to both JAC and TTD services. Transfers to the JAC service can be made in Carson City at the Downtown Transfer Plaza. TTD passengers on most runs will need to first transfer to JAC before transferring to RTC Intercity.

Private Transportation Services

Rural Senior Volunteer Program (RSVP)

The RSVP Transportation Program provides free rides to the low-income elderly for whom no other appropriate transportation is available. This service enables many seniors access to medical services, especially in the rural areas where public transit may not be an option. RSVP does not charge for rides but does accept donations. A mobility manager service is also provided to assist with providing information and coordinating available services.

Carson City School District

The Carson City School District maintains a significant fleet of 45 school buses and transports an average of roughly 2,100 students per school day on 29 designated routes. Buses are also used for field trips and, when necessary, for emergency evacuations.

Capitol Cab Company

Capitol Cab Company operates a fleet of taxi cabs which serve all of Carson City, Douglas County, and as far as Silver Springs in Lyon County. Service is also provided to the north on I-580/US Highway 395 into Washoe County. In addition, $1 rides are provided by Capitol Cab through an agreement between JAC transit and Western Nevada College.

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Chapter 5

Peer Analysis of Transportation Services

A "peer analysis" is a useful tool in comparing a transit program with other, similar programs. This can provide a good context for the ridership and performance figures, and help in identifying areas of relative strength and weakness. This discussion first presents the peer systems selected for comparison, followed by the data and analysis.

PEER TRANSIT OPERATORS

Table 15 displays operating data for five municipally operated transit systems serving similar areas. These peer cities were chosen based on the following characteristics:

- Service areas with similar population (50,000 to 75,000)
- Service areas of similar size. (The peer areas range from 18 square miles to 31, compared with the 23 square miles served by JAC)
- Absence of a major university or four-year college that impacts demand for transit
- A location not immediately adjacent to a major metropolitan area
- A location in the western U.S., but not in California (due to the unique funding and regulatory environment in California)

A brief overview of each system follows:

- **City of Loveland Transit (COLT)**—This system is located along the northern front range of Colorado and serves an area very similar in population and size as Carson City. COLT provides five routes (two half-hourly and three hourly) along with Demand and Response (DAR) service over a 12-hour operating day on weekdays and 9 hours on Saturday.

- **River Cities Transit**—Longview is located in the southwestern portion of Washington, approximately 1 ½ hours north of Portland, Oregon. This transit system provides service to a population slightly larger than JAC transit (61,000). The city operates six fixed route lines (a mix of hourly and half-hourly service) and a DAR service 12.5 hours per weekday and 10 hours on Saturday. Ridership is nearly double JAC's at approximately 380,000 passengers per year.

- **Great Falls Transit**—Great Falls is located in the northeastern portion of Montana approximately 1 ½ hours north of Helena. The service area population for this region is 64,000 with an annual ridership of about 407,000. The district runs seven fixed routes and a DAR service six days per week: 12 hours on weekdays and 8 hours on Saturdays. One route is hourly, while the other six are hourly in the mid-day and half-hourly in peak periods.

- **Casper Area Transportation Coalition (CATC)**—Casper is a city with a service area population of 57,561 in central Wyoming. Six routes provide service 12 hours per day on weekdays and four routes operate 8 hours of service on Saturday.

- **Cheyenne Transit**—This program operates six hourly routes over 13 hours per weekday and 7 hours on Saturday. It serves an area in southeast Wyoming with population of 59,446, similar to Carson City, which is also a state capital.

Other transit systems that were considered, but not included in the peer analysis, are listed below along with the reason they were not included:

- Jefferson City, Missouri—Population of only 43,000 is too small to be a good comparison.
- St. George, Utah—The presence of Dixie State University impacts the transit ridership.
- Grand Junction, Colorado—At a service area population of 101,846, this community is substantially larger than Carson City's.

Data was collected for 2017 (the most recent year with audited data available). As shown in the top portion of Table 15, Carson City's transit program has the smallest service area population of the six peer systems (though only 4,037 behind Longview, Washington). It also has a relatively small fixed route transit program, ranking 5th in terms of annual vehicle-service hours and peak buses in operation and 6th in terms of annual vehicle-miles. It also has the lowest annual operating costs of the six systems. However, the fixed route ridership is third from the highest, behind only Great Falls and Longview.

TABLE 15: JAC Transit Fixed Route Peer Analysis

		Input Data						
Transit System	City	Peak Buses	Annual Ridership	Vehicle Service Hours	Vehicle Service Miles	Service Area Population[1]	Annual Operating Costs	Fare Revenues
JAC Transit	**Carson City, NV**	**4**	**195,160**	**14,990**	**178,612**	**57,561**	**$802,451**	**$70,865**
City of Loveland Transit (COLT)	Loveland, CO	3	96,660	10,779	183,678	66,859	$1,132,687	$79,429
Great Falls Transit System	Great Falls, MT	13	407,085	33,049	418,446	64,010	$2,490,277	$222,101
River Cities Transit	Longview, WA	9	377,835	26,372	344,310	61,598	$3,033,187	$153,470
CATC	Casper, WY	6	153,760	19,612	236,404	64,548	$997,241	$65,166
Cheyenne Transit	Cheyenne, WY	8	59,466	26,718	328,286	73,588	$948,954	$116,002
Peer Average		**7.8**	**218,961**	**24,234**	**303,000**	**66,578**	**$1,659,794**	**$111,546**
JAC Rank		**5**	**3**	**5**	**6**	**6**	**6**	**5**

	Performance Measures							
	Annual Vehicle Service Hours per Capita	Annual Ridership per Capita	Passengers per Vehicle-Hour	Passengers per Mile	Operating Cost per Hour	Cost per Psgr-Trip	Subsidy Per Psgr-Trip	Farebox Ratio
JAC Transit	**0.26**	**3.39**	**13.0**	**1.09**	**$53.53**	**$4.11**	**$3.75**	**8.8%**
City of Loveland Transit (COLT)	0.16	1.45	9.0	0.53	$105.08	$11.72	$10.90	7.0%
Great Falls Transit System	0.52	6.36	12.3	0.97	$75.35	$6.12	$5.57	8.9%
River Cities Transit	0.43	6.13	14.3	1.10	$115.02	$8.03	$7.62	5.1%
CATC	0.30	2.38	7.8	0.65	$50.85	$6.49	$6.06	6.5%
Cheyenne Transit	0.36	0.81	2.2	0.18	$35.52	$15.96	$14.01	12.2%
Peer Average	**0.35**	**3.43**	**9.1**	**0.69**	**$76.36**	**$9.66**	**$8.83**	**7.9%**
JAC Percent of Peer Average	**-27%**	**-1%**	**43%**	**59%**	**-30%**	**-57%**	**-58%**	**11%**
JAC Rank (1 = Best)	**5**	**3**	**2**	**2**	**3**	**1**	**1**	**3**

Source: NTD Monthly Summary, 2017

The bottom portion of Table 15 presents a performance analysis of the various peer systems. A review of this indicates the following:

- The **cost per vehicle-hour of service** ranges between $35.52 in Cheyenne and $105.08. At $53.53, JAC is 30 percent below the peer average and is the third most efficient provider of transit service.

- The **annual vehicle-service-hours per capita** provided by JAC is 0.26, fifth out of the six systems and 27 percent below the peer average. This indicates that the Carson City fixed route transit program is relatively modest compared to most of the peers.

- JAC fixed route service generates a relatively high number of **passenger trips per vehicle-hour of service** (known as the service productivity). At 13.0, this figure is only behind the River Cities Transit program in Longview, Washington, and is 43 percent above the peer average.

- Similarly, JAC serves a relatively high number of **passenger-trips per vehicle-mile of service,** coming in just behind Longview and 59 percent above the peer average.

- The use of public transit in Carson City is very close to the peer average with 3.39 **transit trips per person per year.** Only the systems in Great Falls and Longview generate more transit use per person.

- JAC's **cost per passenger-trip**, or $4.11, is the lowest of any of the peer systems and is a full 57 percent below the peer average.

- An important measure of a transit service is the operating subsidy (costs minus passenger fares) per passenger-trip. This compares the key public "input" to a transit program (public funding) to the key desired "output" (passenger-trips). JAC is the best of the six peer systems by this measure, as it requires only $3.75 compared to a range of the peers of $5.57 to $14.01.

- Finally, the "farebox ratio" is the proportion of operating costs that are covered by the passenger fares. The peer systems range from a low of 5.1 percent in Longview to a high of 12.2 percent in Cheyenne. The JAC fixed routes generate a figure of 8.8 percent, which is slightly above the average of 7.9 percent.

Overall, these figures reflect well on the cost-efficiency of the JAC program (particularly given the relatively high wage rates along the West Coast). The relatively low vehicle service-hours per capita and high passengers per vehicle-hour and vehicle-mile indicate that service could be expanded while still resulting in transit figures that stay well within those of the peer systems.

DEMAND RESPONSE SERVICE PEER COMPARISON

A similar peer analysis was conducted for the demand response paratransit services operated in each community to address the Americans with Disabilities Act (ADA) requirements. As shown in the top portion of Table 16, a review of the characteristics of the various services indicates the following:

- The JAC Assist program, with a peak of four vehicles in operation, is relatively small with only the COLT program operating fewer vehicles.

- Service levels are relatively modest, with annual vehicle service-hours and service-miles roughly half of the peer average.

- Annual operating costs and fare revenues are relatively low. JAC Assist operating costs are 35 percent below that of the peer average.

- Annual JAC Assist ridership ranks fourth out of the six systems, with an annual ridership just slightly lower than the peer average.

TABLE 16: JAC Demand Response Peer Analysis

		Input Data						
Transit System	City	Peak Buses	Annual Ridership	Vehicle Service Hours	Vehicle Service Miles	Service Area Population[1]	Annual Operating Costs	Fare Revenues
JAC Assist	**Carson City, NV**	**4**	**28,188**	**8,220**	**88,043**	**57,561**	**$431,877**	**$26,029**
City of Loveland Transit (COLT)	Loveland, CO	2	9,257	4,254	53,227	66,859	$246,772	$14,249
Great Falls Transit System	Great Falls, MT	7	34,066	13,375	160,282	64,010	$606,536	$63,195
River Cities Transit	Longview, WA	15	49,546	22,600	184,707	61,598	$1,592,693	$35,145
CATC	Casper, WY	7	46,523	17,062	214,740	64,548	$1,038,963	$57,101
Cheyenne Transit Program	Cheyenne, WY	6	17,999	9,680	112,411	73,588	$659,443	$59,758
Peer Average		**7.4**	**31,478**	**16,447**	**170,619**	**66,578**	**$1,097,033**	**$50,668**
JAC Rank		**5**	**4**	**5**	**5**	**6**	**5**	**5**

	Performance Measures							
	Annual Vehicle Service Hours per Capita	Annual Ridership per Capita	Passengers per Vehicle-Hour	Passengers per Mile	Operating Cost per Hour	Cost per Psgr-Trip	Subsidy Per Psgr-Trip	Farebox Ratio
JAC Transit	**0.14**	**0.49**	**3.4**	**0.32**	**$52.54**	**$15.32**	**$14.40**	**6.0%**
City of Loveland Transit (COLT)	0.06	0.14	2.2	0.17	$58.01	$26.66	$25.12	5.8%
Great Falls Transit System	0.21	0.53	2.5	0.21	$45.35	$17.80	$15.95	10.4%
River Cities Transit	0.37	0.80	2.2	0.27	$70.47	$32.15	$31.44	2.2%
CATC	0.26	0.72	2.7	0.22	$60.89	$22.33	$21.10	5.5%
Cheyenne Transit Program	0.13	0.24	1.9	0.16	$68.12	$36.64	$33.32	9.1%
Peer Average	**0.21**	**0.49**	**2.3**	**0.21**	**$60.57**	**$27.12**	**$25.39**	**6.6%**
JAC Percent of Peer Average	**-31%**	**0%**	**49%**	**55%**	**-13%**	**-43%**	**-43%**	**-9%**
JAC Rank (1 = Best)	**4**	**4**	**1**	**1**	**2**	**1**	**1**	**3**

Source: NTD Monthly Summary, 2017

The peer performance analysis for the demand response services, shown in the bottom portion of Table 16, indicates the following:

- JAC Assist is relatively cost-efficient, second only to Great Falls with regards to the **operating cost per vehicle service-hour** and 13 percent below the peer average.

- The **annual ridership per capita**, at 0.49 trips per person per year, is exactly equal to the peer average.

- The productivity (**passenger-trips per vehicle service-hour**) of JAC Assist is the highest of all the peers, at 3.4 passengers per hour. This is 49 percent higher than the peer average of 2.3.

- Similarly, the p**assenger-trips per vehicle-service-mile** is the highest of the peers, and 55 percent above the peer average.

- The **operating cost per passenger-trip** for JAC Assist is $15.32—the lowest of the peer systems, and 43 percent below the peer average of $27.12 and less than half that of two of the peers.

- JAC Assist is at the top of the peers with regards to the **subsidy per passenger-trip**, requiring $14.40 compared to a peer average of $25.39.

- The **farebox ratio** for JAC Assist, at 6.0 percent, is close to the peer average of 6.6 percent.

Overall, this analysis indicates that the JAC Assist is very efficient with regards to the costs of serving paratransit passengers, with operating costs and subsidy per trip much lower than the peer average. This is a result of relatively high passenger-trips per service-hour (second from the highest) and relatively low cost per service-hour (second from the lowest). It also bears noting that the high passenger-trips per service-hour is not a result of serving a smaller (and therefore more easily served) area, as the JAC Assist service area is similar to the average of the peer systems.

In review of these results, it should be kept in mind that the goal of an ADA paratransit program is typically not to maximize ridership. As the cost to serve a passenger-trip on a paratransit service is much higher than fixed route services (3.7 times, in the case of the JAC Assist program), the goal of an ADA paratransit program is to serve those persons in need of door-to-door service at a high quality, rather than maximizing ridership.

PEER FARE COMPARISON

As part of the peer analysis, a comparison of the fares charged on the various systems was conducted, as shown in Table 17:

- The “base” one-way full fare is $1.00 for five of the six peer systems (including JAC), with the Cheyenne Transit Program charging $1.50.

- Four of the systems (including JAC) charge a $0.50 fare for seniors, persons with disabilities and persons showing a Medicare card. The exceptions are the COLT system ($0.60) and the Cheyenne Transit Program which does not provide a discount but (like JAC) has funding available to provide free rides for seniors that register.

- Two of the systems provide a day pass (good for unlimited rides over the course of a day), which JAC does not offer.

TABLE 17: JAC Fare Peer Comparison

	One-Way Fare			General Public Day Pass	General Public Punch Pass			General Public Monthly Pass	Free Transfers?	Electronic Passes?	Paratransit Fare
	General Public	Senior, Disabled, Medicare	Youth or Student		Cost	Rides	Cost per Ride				
JAC Transit	**$1.00**	**$0.50** (1)	**$0.50**	--	**$8.00**	10	**$0.80**	**$25.00**	**Yes**	**No**	**$2.00**
River Cities Transit	$1.00	$0.50	$1.00	$2.00		None		--	Yes	No	$0.50
Great Falls Transit System	$1.00	$0.50	$0.75	$4.00	$10.00	10	$1.00	$30.00	Yes	No	$1.00
City of Loveland Transit (COLT)	$1.00	$0.60	$0.50	--		None		$30.00	Yes	No	$2.00
CATC	$1.00	$0.50	$0.75	--		None		$30.00	Yes	No	$1.50
Cheyenne Transit Program	$1.50	$1.50(1)	$1.25	--	$30.00	22	$1.36	$45.00	Yes	No	$3.00

Source: Transit System Websites, Accessed April 10, 2019.
Note 1: Fares are voluntary for registerd seniors (60+).

- Three of the six peer systems offer a punch pass. JAC's punch pass provides a discount to the full fare as does the Cheyenne punch pass, while the Great Falls punch pass does not provide a discount.

With the exception of the River Cities Transit program in Longview, all of the peer systems offer a monthly pass. At $25.00 for the general public (and $12.50 for youth, seniors and persons with disabilities), JAC's monthly pass is the least expensive. Assuming a regular rider makes one round trip on 22 days per month, JAC's monthly pass allow boarding at only $0.57 per trip for general public and $0.28 for discount riders.

- All of the six peer systems provide free transfers. The Cheyenne system uses tokens, while the remainder use paper slips. While larger transit systems are generally doing away with transfer slips in favor of day passes, this is not the case for systems similar to JAC.

- None of the six peer systems provide any sort of electronic passes for passengers.

- JAC Assist's fare of $2.00 is second-highest of the six peers, behind the $3.00 charged in Cheyenne and equal to the $2.00 charged in Loveland.

Overall, transit fares in Carson City are consistent with the peers with regards to the one-way fare, relatively low for persons using punch passes or monthly passes, and generally consistent with the peers regarding the paratransit fare. This indicates that, if additional passenger revenues are needed, consideration should be given to raising the monthly pass rate and/or the punch pass rate.

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Chapter 6

Existing Social Service Programs and Transportation Services

This Coordinated Human Services and Transportation Plan (CHSTP) update assesses existing CAMPO social service programs available as well as current social service transportation providers. The transportation needs for individuals with disabilities and seniors are prioritized due to their potential transit dependency. In addition, gaps in service are identified and analyzed in detail. These social service programs are summarized in Table 18.

- Senior service organizations
- Health and welfare organizations
- Area Agency on Aging
- Developmental disability organizations
- Tribal organizations
- School districts
- Religious groups
- Mental health facilities
- Military/Veteran services
- Vocational rehabilitation centers
- Community action programs
- Jobs training sites
- Healthcare facilities

Senior Services

Senior services and living communities within the CAMPO region are described below.

Health Services

- *RSVP*—operating throughout Carson City region, this program supports senior to senior volunteering
- *Carson City Senior Citizens Center*—located at 911 Beverly Drive, this program hosts activities and serves meals for approximately 200 people per day
- *Home Instead*—operating from 444 West Washington Street, this organization provides home care services for seniors

Living Communities

- *Sierra Place at Carson City*—1111 West College Parkway (75 units)
- *Skyline Estates Senior Living and Memory Care*—2861 Mountain Street
- *Christina Courts Apartments and Sierra Ridge Apartments*—1800 and 1820 Russell Way
- *Autumn Village I and II*—1101 Beverly Drive
- *Carson Plaza Independent Retirement Living*—2120 East Long Street
- *The Lodge Assisted Living and Memory Care*—2200 East Long Street (90 units)

Community Health and Social Services

Carson City's non-profit and social services for youth, homeless and disabled populations are described below.

- *Boys and Girls Club*—located at 1870 Russell Way, this organization offers after-school activities for Carson City youth
- *FISH*—located at 138 East Long Street, this organization provides food, clothing, shelter and medical aid to the homeless, hungry and underemployed within the Carson City community

TABLE 18: Carson City Area Social Services

Agency	Address	Hours of Operation	Services Provided	Transportation
Senior Services				
Health Services				
RSVP	2621 Northgate Ln Suite 6	Weekdays, 8:00 AM-5:00 PM	A program supporting senior to senior volunteering throughout Carson City.	
Carson City Senior Citizens Center	911 Beverly Drive	Weekdays, 9:00 AM-4:00 PM	A center that hosts activities and meals for approximately 200 people per day.	-
Home Instead	444 West Washington Street	Weekdays, 9:00 AM-5:00 PM	Provides in-home care for aging persons.	Staff personal vehicles
Living Communities				
Sierra Place at Carson City	1111 West College Parkway	-	These living communities typically have age minimums to apply and vary by services provided. They offer between 75 to 100 units and offer some in-home assistance to their residents.	-
Skyline Estates Senior Living and Memory Care	2861 Mountain Street	-		-
Christina Courts Apartments and Sierra Ridge Apartments	1800 and 1820 Russell Way	-		-
Autumn Village I and II	1101 Beverly Drive	-		-
Carson Plaza Independent Retirement Living	2120 East Long Street	-		-
The Lodge Assisted Living and Memory Care	2200 East Long Street	-		-
Community Social Services				
Boys and Girls Club	1870 Russell Way	School Year, 3:00 PM-6:30 PM Summer, 7:00 AM-6:30 PM	A national non-profit that offers after school activities for Carson City youth.	-
FISH	138 East Long Street	9:00 AM-6:00 PM, Closed Sundays	A non-profit providing food, clothing, shelter and medical aid to the homeless, hungry and underemployed within the Carson City community.	-
Focus House	57 Gibson Avenue	Weekdays and Weekends, 8:00 AM-10:00 PM	A program that provides short term housing for those facing homelessness.	-
Reach	709 East Robinson Street	Weekdays, 9:00 AM-3:00 PM	A program providing day programs, housing, and support for those living with disabilities.	-
Going Places / Moving Forward	244 East Winnie Lane	Weekdays, 8:00 AM to 3:00 PM	Provides support, activities, and job training for people living with disabilities.	-
Frost Yasmer Estates	1009 East 5th Street	-	Provides affordable and accessible housing units for those living with disabilities.	-
Ormbsy Association of Carson City	930 East Corbett Street	Weekdays 7:00 AM-5:00 PM	Provides support, activities, and job training for people living with disabilities.	-
Holdsworth	502 East John Street	Weekdays, 8:00 AM-5:00 PM	Provides housing, job training, access to recreation, access to health care, socialization and skill assessment for those living with disabilities.	Staff uses personal vehicles and three vans.
Carson Tahoe Behavioral Health	1080 North Minnesota Street	24 Hours	Provides social services and mental health support to community.	-
Carson Mental Health Center	1665 Old Hot Springs Road	Weekdays, 8:00 AM-5:00 PM	Provides social services and mental health support to community.	-
Carson City Community Counseling Center	205 S. Pratt Ave	Weekdays, 9:00 AM-5:00 PM	Provides mental health services to those living in poverty.	-
Nevada Food for Thought	3246 North Carson Street	Monday-Thursday, 9:00 AM-1:00 PM	Provides food to local students and their families weekly.	
National Alliance on Mental Illnesses	1711 North Roop Street		Provides mental health services nationally	-
McKinney Vento Services			Provides school-based services.	
Advocates to End Domestic Abuse	32 Sierra Avenue	Monday-Friday, 8:00 AM-4:00 PM (24 emergency support services)	Provides domestic violence support and shelter.	
Career and Vocational Services				
Join Inc	716 North Carson Street, Suite 108	Weekdays, 8:00 AM-5:00 PM	Provides career training services and access to free education to people ages 17 and older.	-
Career and Technical Education (Western Nevada College)	2201 West College Parkway	Weekdays, 8:00 AM-5:00 PM	Provides vocationial education and training in various subjects.	-
Nevada Department of Employment Training and Rehabilitation	500 East Third Street	Weekdays, 8:00 AM-5:00 PM	Provides assistance in vocational rehabilitation and workforce placing.	-
Nevada Job Connect	1929 North Carson Street	Monday-Thursday, 8:00 AM-5:00 PM	Provides a website database of workforce opportunities.	-
Labor Finders	1802 North Carson	Weekdays, 8:00 AM-6:00 PM	Provides online and in-person staffing services.	-
Government				
Nevada Department of Health and Human Services	4126 Technology Way, #100	Weekdays, 8:00 AM-5:00 PM	A state government department comprised of five Divisions including: Aging and Disability Services, Child and Family Services, Health Care Financing and Policy (Medicaid), Public and Behavioral Health, and Welfare and Supportive Services.	-
Bureau of Indian Affairs	311 East Washington Street	Weekdays, 8:00 AM-5:00 PM	Promotes economic opportunities and protection of American Indians, Indian tribes, and Alaska Natives.	-
Nevada Rural Housing Authority	3695 Desatoya Drive	Weekdays, 8:00 AM-5:00 PM	Offers various forms of housing and home owndership support for rural communities of Nevada	-
Carson City Health and Human Services	900 East Long Street	Weekdays, 8:00 AM-5:00 PM	Provides affordable health care services.	-
Aging and Disability Services Division	3416 Goni Road, #132	Weekdays, 8:00 AM-5:00 PM	Develops and coordinates services for aging population of Nevada.	-
Child and Family Services	4126 Technology Way, 3rd Floor	Weekdays, 8:00 AM-5:00 PM	Provides welfare, mental health, and judicial services for children and their families.	-
Veterans Resource Centers of America	106 East Adams Street, Suite 203	Weekdays, 8:00 AM-5:00 PM	Provides health and economic resources for veterans	-

- *Focus House*—located at 57 Gibson Avenue, this organization provides short-term housing for people facing homelessness
- *REM Nevada*—located at 709 East Robinson Street, this program provides training and home care services for adults with intellectual and developmental disabilities
- *Going Places / Moving Forward*—244 East Winnie Lane
- *Frost Yasmer Estates*—1802 North Carson Street
- *Holdsworth*—502 East John Street
- *Carson Tahoe Behavioral Health*—1080 North Minnesota Street
- *Carson Mental Health Center*—1665 Old Hot Springs Road
- *Nevada Food for Thought*—3246 North Carson Street
- *National Alliance on Mental Illnesses*—1711 North Roop Street

Career and Vocational Training Services

Career training programs offer opportunities to those who have recently become unemployed, are seeking training in new industries, or who are interested in obtaining higher education and skills.

- *Join, Inc.*—716 North Carson Street, Suite 108
- *Career and Technical Education (Western Nevada College)*—2201 West College Parkway
- *Nevada Department of Employment Training and Rehabilitation*—500 East Third Street
- *Nevada Job Connect*—1929 North Carson Street
- *Labor Finders*—1802 North Carson

Government Social Services

As the State of Nevada's capital, there are several government agency offices and services located in Carson City. The following is list of these services.

- *Nevada Department of Health and Human Services*—4126 Technology Way, #100
- *Bureau of Indian Affairs*—311 East Washington Street
- *Nevada Rural Housing Authority*—3695 Desatoya Drive
- *Carson City Health and Human Services*—900 East Long Street
- *Aging and Disability Services Division*—3416 Goni Road, #132
- *Child and Family Services*—4126 Technology Way, 3rd Floor
- *Veterans Resource Centers of America*—106 E Adams Street, Suite 203

IDENTIFIED GAPS IN SERVICE

Figures 20 through 23 illustrate the identified social service program locations in and around Carson City. As shown in these figures, almost all of the existing JAC fixed routes serve within ¼ mile of these social services. The key exceptions are:

- Health and Human Services Department on Arrowhead Drive
- Skyline Estates Senior Living and Memory Care on the northern end of Mountain Street
- FISH on N. Carson Street
- Frost Yasmer Estates on East 5th Street

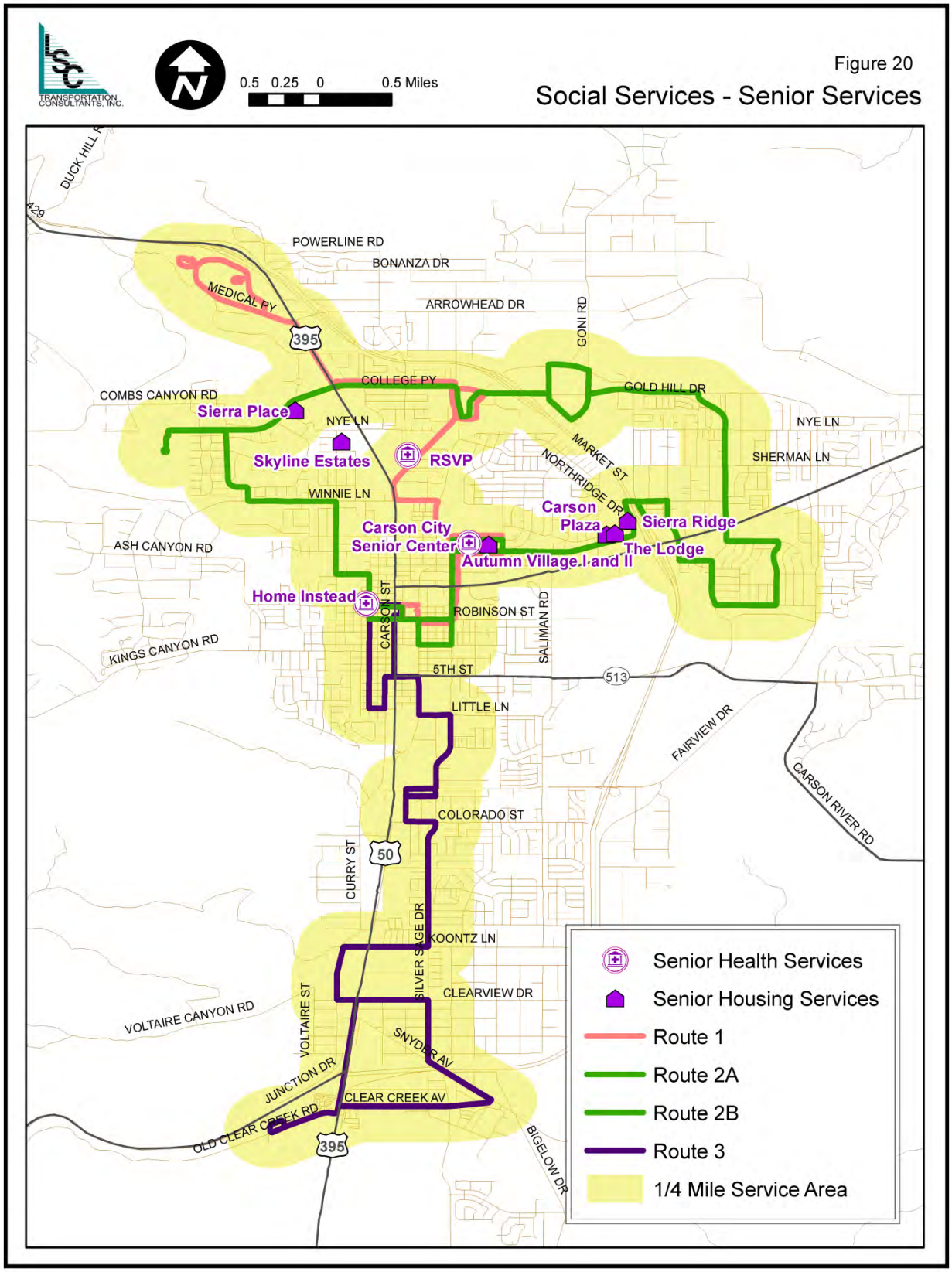


Figure 20
Social Services - Senior Services
0.5 0.25 0 0.5 Miles
TRANSPORTATION CONSULTANTS, INC.
DUCK HILL R
429
POWERLINE RD
BONANZA DR
MEDICAL PY
ARROWHEAD DR
GONI RD
395
COLLEGE PY
GOLD HILL DR
COMBS CANYON RD
Sierra Place
NYE LN
NYE LN
Skyline Estates
RSVP
MARKET ST
NORTHRIDGE DR
SHERMAN LN
WINNIE LN
Carson Plaza
Sierra Ridge
Carson City Senior Center
The Lodge
ASH CANYON RD
Autumn Village I and II
Home Instead
CARSON ST
ROBINSON ST
SALIMAN RD
KINGS CANYON RD
5TH ST
513
LITTLE LN
FAIRVIEW DR
CARSON RIVER RD
COLORADO ST
50
CURRY ST
SILVER SAGE DR
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
JUNCTION DR
CLEAR CREEK AV
OLD CLEAR CREEK RD
395
BIGELOW DR
Senior Health Services
Senior Housing Services
Route 1
Route 2A
Route 2B
Route 3
1/4 Mile Service Area

Figure 21

Social Services - Community Social Services

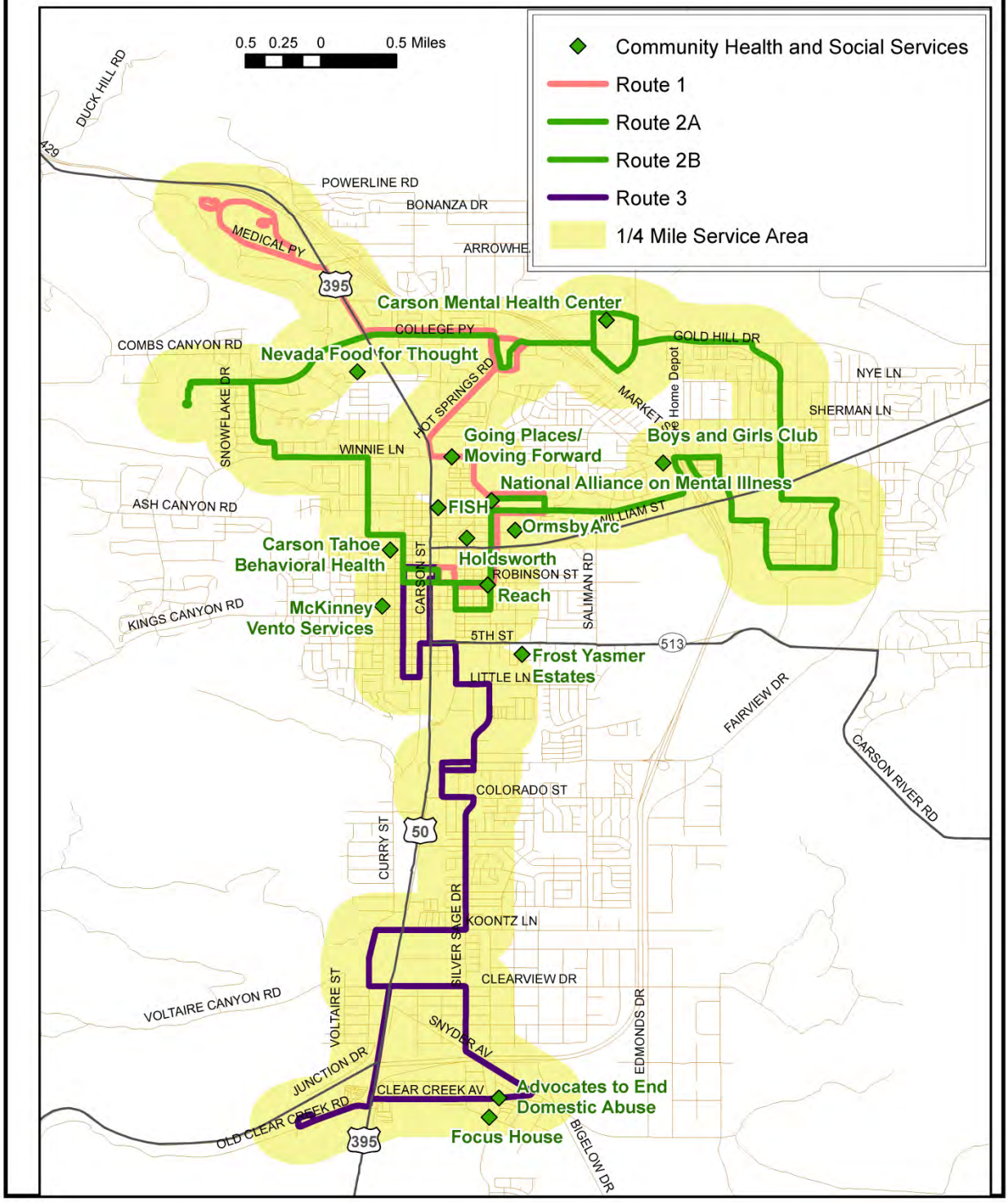
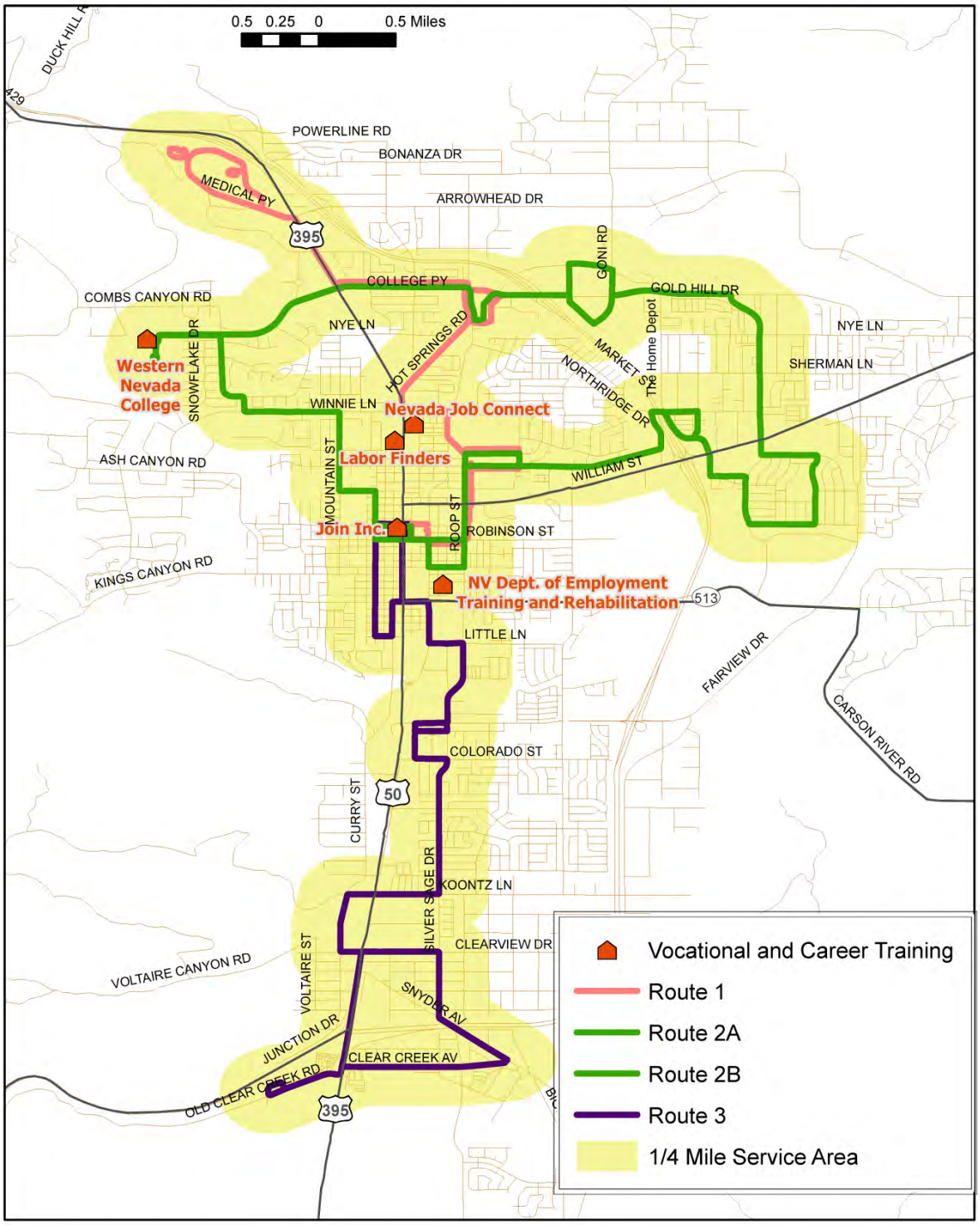


Figure 22

Social Services - Career and Vocational Training Services



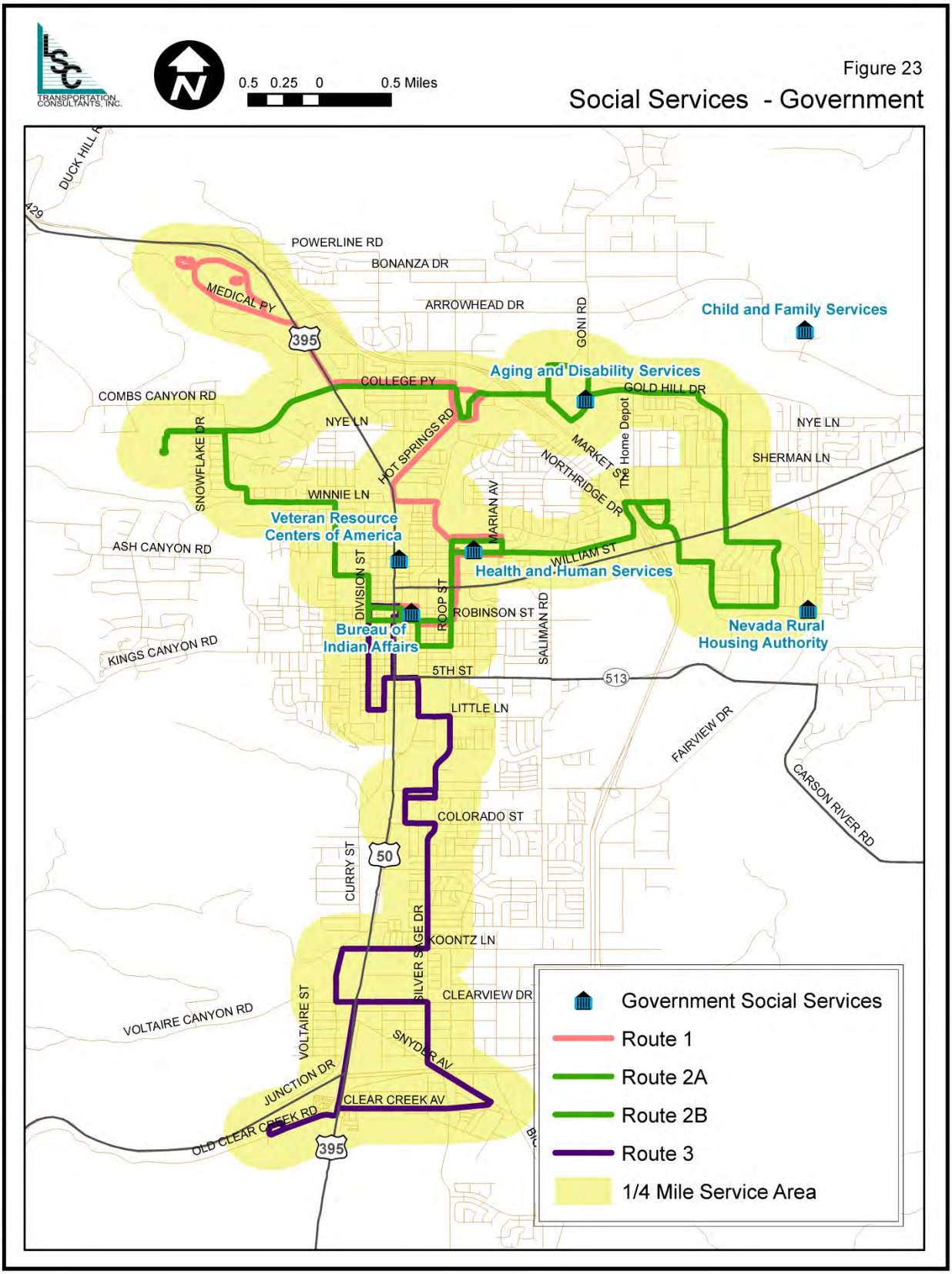


Figure 23
Social Services - Government
0.5 0.25 0 0.5 Miles
TRANSPORTATION CONSULTANTS, INC.
DUCK HILL RD
429
POWERLINE RD
BONANZA DR
MEDICAL PY
ARROWHEAD DR
GONI RD
395
Child and Family Services
Aging and Disability Services
COLLEGE PY
GOLD HILL DR
COMBS CANYON RD
NYE LN
HOT SPRINGS RD
SNOWFLAKE DR
MARKET ST
The Home Depot
NORTHRIDGE DR
NYE LN
SHERMAN LN
WINNIE LN
MARIAN AV
Veteran Resource Centers of America
ASH CANYON RD
WILLIAM ST
Health and Human Services
DIVISION ST
ROOP ST
ROBINSON ST
SALIMAN RD
Nevada Rural Housing Authority
Bureau of Indian Affairs
KINGS CANYON RD
5TH ST
513
LITTLE LN
FAIRVIEW DR
CARSON RIVER RD
COLORADO ST
50
CURRY ST
SILVER SAGE DR
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
JUNCTION DR
CLEAR CREEK AV
OLD CLEAR CREEK RD
395
Government Social Services
Route 1
Route 2A
Route 2B
Route 3
1/4 Mile Service Area

As shown in Table 18, only a few of the services identified offer private transportation services to their clients and participants.

CONCLUSIONS

While conducting outreach, it became apparent that a majority of the identified services encourage their participants to use the JAC fixed routes and JAC Assist programs as their primary mode of independent transportation when possible. Many of the services offer support to their clients through assisting them in applying for discounted passes, showing them how to use the buses affectively, and providing free passes for them when possible. As discussed above, there are a number of social services trip generators that are not conveniently served by JAC fixed routes, including group homes, Health and Human Services, and FISH. There are also neighborhoods that are not being served by JAC Assist that could merit extensions of the service area.

Chapter 7

Short-Range Service Alternatives

This chapter first presents alternatives regarding JAC fixed routes. Individual new routes or modifications to existing routes are first considered, followed by an evaluation of "system" alternatives that consider all routes together. Changes in the span of service (the hours and days of service) are then considered. This is followed by evaluation of modifications to the JAC Assist program. Finally, potential services connecting Carson City with Douglas, Lyon and Storey Counties are evaluated.

FIXED ROUTE REVISION ALTERNATIVES

As a basis for evaluating new or revised routes, the following is an analysis of the residential areas not currently served (within a quarter-mile walk distance) by the existing four fixed routes. At present, the existing route service area encompasses the residences of approximately 40,100 residents of Carson City, which is only 70 percent of the total population.[2] Figure 24 presents a map of the nine significant residential areas not currently served. As shown, eight of these areas are outside of the existing routes, while the ninth is the existing "gap" in the middle of the Route 2A/2B loop centered along Northridge Drive.

Table 19 presents the estimated population and the population characteristics within each of these unserved areas. As shown, these populations range between 650 in the southwest area up to 5,780 along the South Saliman Road corridor area. The demographic characteristics of each unserved area were then used to estimate a per capita annual transit trip rate for both the fixed route service and JAC Assist. These rates were calibrated against the existing observed trip rate of the existing service area (4.87 annual trips per capita for fixed route and 0.70 for JAC Assist). Trip rates were factored by the proportion of residents with characteristics associated with higher ridership potential in order to define trip rates specific to each area. The weight assigned to each factor was based on the proportion of ridership in various fare categories for the fixed route rates, while the rates for JAC Assist were based on the relative proportion of persons with disabilities. As an example, the center unserved area is expected to have a relatively high trip rate as the proportion of low-income, zero household and disabled residents are relatively high.

These trip rates are then multiplied by the unserved population figures to estimate the annual transit ridership that would be generated if all portions of each unserved area were to be served (at the current JAC transit service levels). As shown in Table 19 and Figure 25, two areas stand out as having a large potential unserved ridership: the South Saliman Road area with 25,800 potential fixed-route passenger-trips (equal to 13 percent of current fixed-route ridership) and the center area with 23,300 trips (equal to 12 percent of current ridership). No other individual areas exceed 8,500 annual passenger-trips, though if the northeast and east areas are considered together, they total 12,300 passenger-trips per year. Revisions to existing individual routes are discussed below and shown in Figure 26.

[2] Many other cities strive to provide service to at least 90 percent of the population.

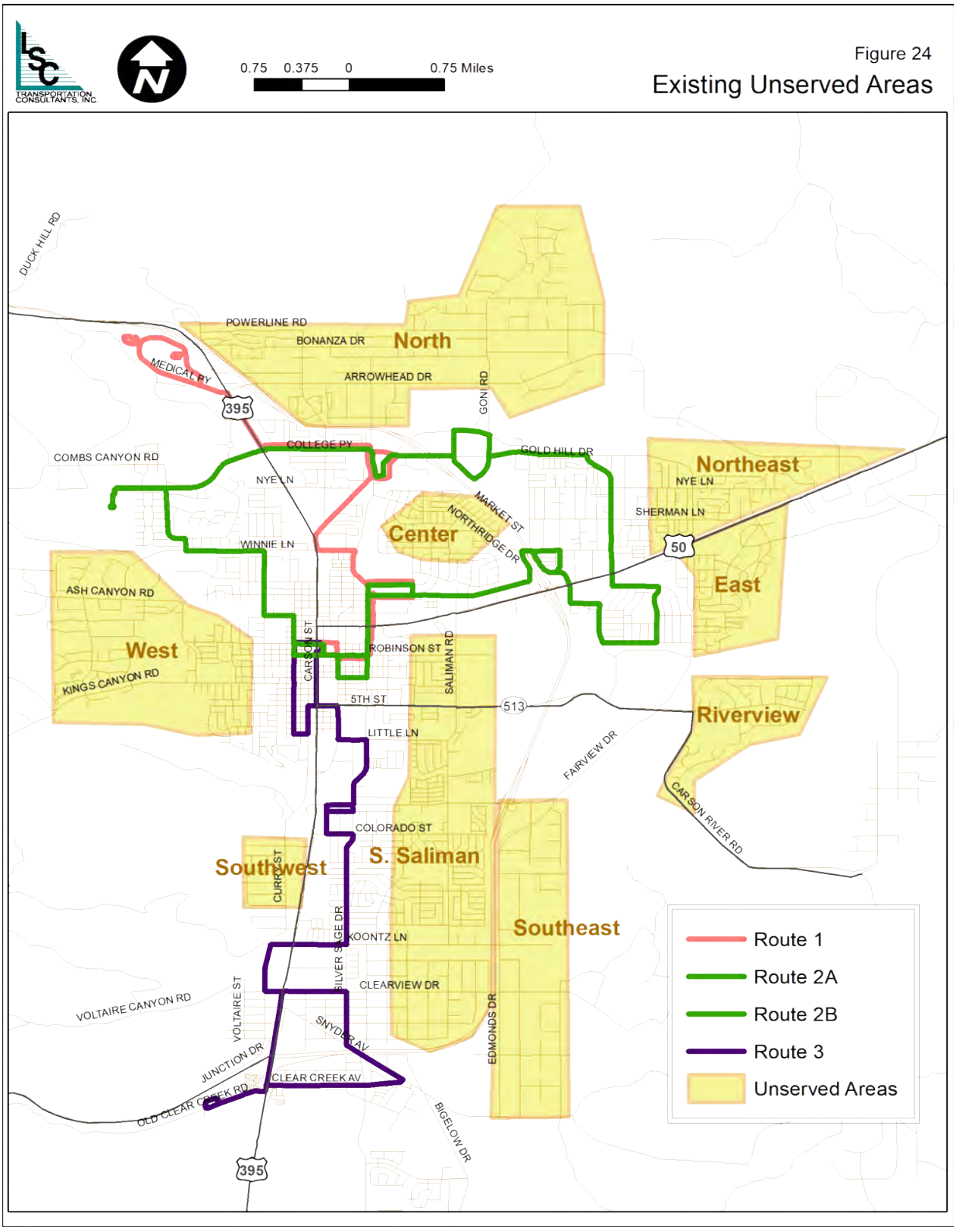
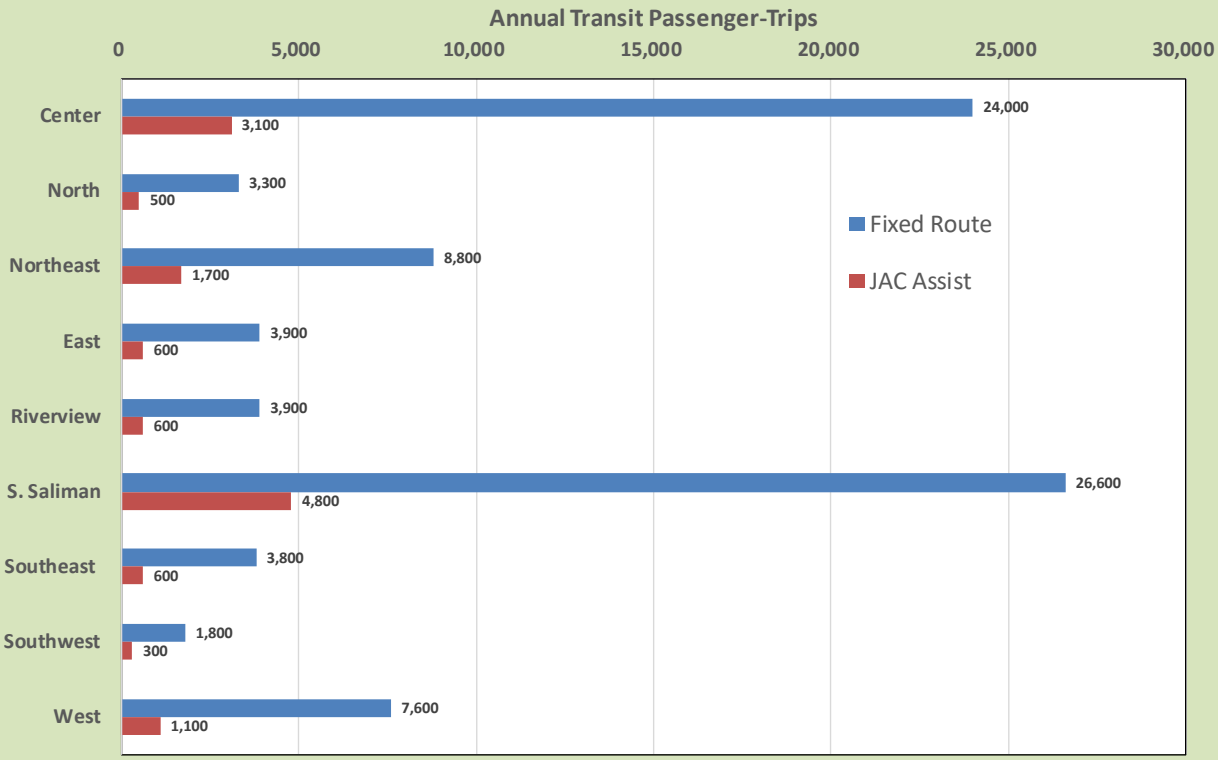
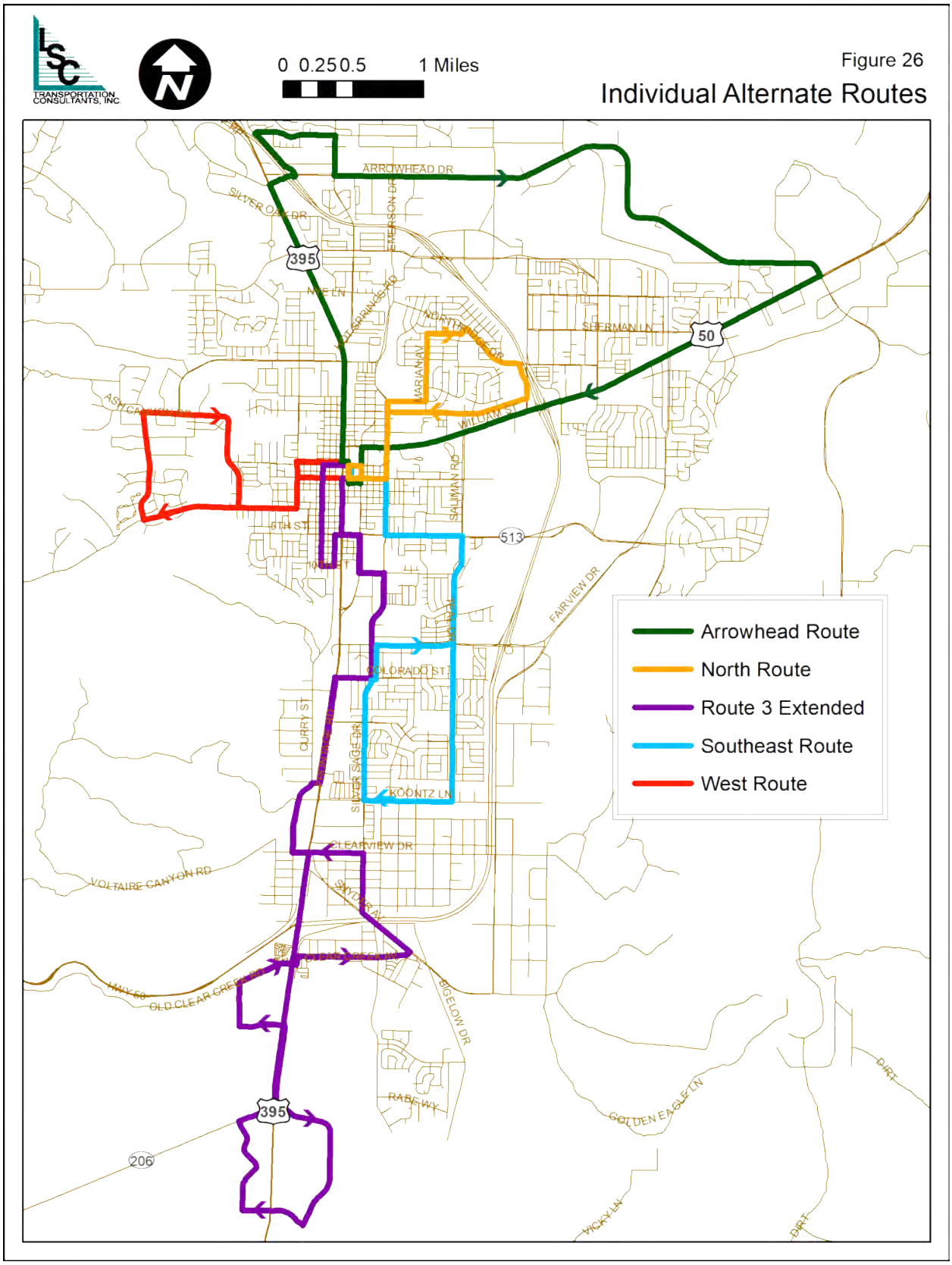

LSC TRANSPORTATION CONSULTANTS, INC
0.75 0.375 0 0.75 Miles
Figure 24
Existing Unserved Areas
DUCK HILL RD
POWERLINE RD
BONANZA DR
North
ARROWHEAD DR
GONI RD
MEDICAL PY
395
COLLEGE PY
COMBS CANYON RD
NYE LN
GOLD HILL DR
Northeast
NYE LN
SHERMAN LN
MARKET ST
NORTHRIDGE DR
Center
WINNIE LN
50
East
ASH CANYON RD
West
KINGS CANYON RD
CARSON ST
ROBINSON ST
SALIMAN RD
5TH ST
513
Riverview
LITTLE LN
FAIRVIEW DR
CARSON RIVER RD
COLORADO ST
Southwest
CURRY ST
S. Saliman
Southeast
KOONTZ LN
SILVER SAGE DR
CLEARVIEW DR
VOLTAIRE CANYON RD
VOLTAIRE ST
SNYDER AV
EDMONDS DR
JUNCTION DR
CLEAR CREEK AV
OLD CLEAR CREEK RD
BIGELOW DR
395
Route 1
Route 2A
Route 2B
Route 3
Unserved Areas

TABLE 19: Existing Key Residential Areas of Carson City Not Currently Served by JAC

Unserved Area	Population	Percent of Population				Annual Trip Rate		Est. Annual Transit Trip Generation	
		Zero Vehicle	Low Income	Seniors	Disabled	Fixed	JAC Assist	Fixed	JAC Assist
Center	3,920	10.5%	17.8%	11.5%	24.3%	6.13	0.78	24,000	3,100
North	730	5.4%	13.8%	19.3%	20.5%	4.53	0.66	3,300	500
Northeast	1,800	1.3%	19.1%	25.0%	29.8%	4.90	0.96	8,800	1,700
East	1,640	1.3%	8.2%	20.0%	10.8%	2.39	0.35	3,900	600
Riverview	1,640	1.3%	8.2%	20.0%	10.8%	2.39	0.35	3,900	600
S. Saliman	5,780	4.4%	13.8%	17.5%	25.7%	4.60	0.83	26,600	4,800
Southeast	1,100	5.0%	7.0%	20.9%	16.0%	3.50	0.52	3,800	600
Southwest	560	2.5%	6.5%	32.8%	15.5%	3.17	0.50	1,800	300
West	1,550	6.6%	12.2%	25.9%	21.7%	4.90	0.70	7,600	1,100
Existing Service Area	38,800	6.8%	14.2%	19.4%	22.5%	5.03	0.73	195,100	28,200

FIGURE 25: Potential Annual Ridership of Areas Currently Unserved




TRANSPORTATION CONSULTANTS, INC.
0 0.250.5 1 Miles
Figure 26
Individual Alternate Routes
ARROWHEAD DR
SILVER OAK DR
395
NYE LN
CLEARVIEW DR
EMERSON DR
NORTH SILVER DR
MARIANA AV
WILLIAM ST
SHERMAN LN
50
ASHCAN WAY
6TH ST
SALIMAN RD
513
FAIRVIEW DR
COLORADO ST
CURRY ST
SILVER SAGE DR
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
SKYLINE AV
HWY 50
OLD CLEAR CREEK RD
BIGELOW DR
RABE WY
395
206
GOLDEN EAGLE LN
VICKY LN
DIRT
DIRT
Arrowhead Route
North Route
Route 3 Extended
Southeast Route
West Route

Southeast Carson City/Saliman Road Corridor Route

A new route that could serve the largest currently-unserved population in southeast Carson City is shown in Figure 26. Leaving the Downtown Transfer Plaza, this route travels east on Robinson Street, south on Roop Street, east on Fifth Street and south on Saliman Road before making a one-way clockwise loop via Saliman Road, Koontz Lane, Baker Drive, and Colorado Street before returning via Saliman Road and the remainder of the outbound route. This route is 7.97 miles in length and would require approximately 40 minutes to operate. Over the course of a year, and with the same service span as the existing runs and assuming that the remainder of the hour could be put to good use on another route, this route would incur an operating cost of $120,900 per year, as shown in Table 20.

In addition to serving the residents of southeast Carson City west of I-580 and north of Clearview Drive, this new route would provide better service along the 5th Street corridor (including the Frost Yasmer Estates) and serve Fremont Elementary and Seeliger Elementary schools. Overall, the annual ridership that would be served by this new route is estimated to be 26,900 boardings per year. As an aside, this alternative was reviewed with regard to the potential increase in JAC Assist demand. The large majority of the new service area is already served by JAC Assist, as it is within 1 mile of existing Route 3. While the new route would extend the service area to include more of the residential areas east of I-580, this residential area has a relatively low potential demand for JAC Assist services, which would be roughly offset by a shift in existing JAC Assist ridership to use the new route.

New North Route

Besides southeast Carson City, the other relatively large concentration of unserved Carson City residents is the northern central area within the Route 2A/2B loop route, centered on the Northridge Drive area. This area is home to almost 4,000 Carson City residents and has a relatively high proportion of low-income residents living in zero-vehicle households. It could be efficiently served by a new route that connects the Downtown Transfer Center with the Carson City Senior Center in both directions, potentially with a one-way clockwise route along Marian Avenue, Longridge Drive, Northridge Drive and E. Long Street. This route is 4.5 miles in length and could be served within 20 minutes. If served hourly on the existing span of service (and assuming the remaining 40 minutes per hour could be put to good use elsewhere), this route would incur an annual operating cost of $66,900.

While the presence of roundabouts and narrow road widths may warrant the use of a smaller bus, this route would generate new ridership by serving the existing unserved residents in the central area, as well as providing additional schedule options between the downtown area, Senior Center, Multipurpose Athletic Center (MAC) and other uses along E. Long Street.[3] In total, ridership is estimated to equal 28,200 boardings per year. Subtracting the additional fare revenue, operating subsidy would equal $56,700 per year.

[3] Alternatively, this new service along E. Long Street could allow Route 2A/2B to instead serve new areas further to the east, as discussed below.

TABLE 20: Route Alternatives Analysis

	Run Parameters		Daily Service			Days per	Annual		Annual		Fare	Operating
	Hours	Miles	Runs	Hours	Miles	Year	Hours	Miles	Cost	Ridership	Revenues	Subsidy
SE Carson City/Saliman Rd. Corridor Route												
Weekday	0.67	7.97	13	8.7	104	255	2,219	26,421	$107,600			
Saturday	0.67	7.97	8	5.4	64	51	275	3,252	$13,300			
Total							2,494	29,672	$120,900	27,700	$10,100	$110,800
North Route												
Weekday	0.33	4.55	13	4.3	59	255	1,097	15,083	$55,000			
Saturday	0.66	4.55	8	5.3	36	51	270	1,856	$11,900			
Total							1,367	16,940	$66,900	28,900	$10,500	$56,400
West Route												
Weekday	**0.5**	4.9	13	6.5	64	255	1,658	16,244	$77,400			
Saturday	**0.5**	4.9	8	4	39	51	204	1,999	$9,500			
Total							1,862	18,243	$86,900	9,400	$3,400	$83,500
Arrowhead Drive Route												
All Day Weekday Service	**1**	11.9	13	13	155	255	3,315	39,449	$160,800			
Additional JAC Assist Service				2	22	255	510	5,618	$24,300			
							3,825		$185,100	17,300	$6,300	$178,800
Commute Peaks Only	**1**	11.9	4	4	48	255	1,020	12,138	$49,500	11,800	$4,300	$45,200
Revise Rts 2A/2B to Serve N. Carson St.												
Weekday	0	0.26	26	0	7	255	0	1,724	$1,500	0	$0	$1,500
Saturday	0	0.26	16	0	4	51	0	212	$200			
Total							0	1,936	$1,700	9,000	$3,300	-$1,600
Revise Rt 2A/2B Off of Narrow Streets												
Weekday	0	0.2	26	0	5	255	0	1,326	$1,200	0	$0	$1,200
Saturday	0	0.2	16	0	3	51	0	163	$100			
Total							0	1,489	$1,300	-1,200	-$400	$1,700
Revise Route 3 to Serve Topsy Lane												
Weekday	0	0.02	13	0	0	255	0	66	$100	6,100	$0	$100
Saturday	0	0.02	8	0	0	51	0	8	$0			
Total							0	74	$100	2,400	$800	-$700
Revise Rt 3 to Serve Mica Drive												
Weekday	1	4.2	13	13	55	255	3,315	13,923	$138,600			
Saturday	1	4.2	8	8	34	51	408	1,714	$17,100			
Additional JAC Assist Service				4	60	255	1,020	15,300	$52,200			
Total							4,743	15,637	$207,900	6,100	$2,100	$205,800
Downtown/Special Event Shuttle Service												
Weekday 11 AM - 7 PM												
All Year	0.17	1.33	48	8	64	306	2,448	19,535	$110,400	19,600	$4,900	$105,500
Leg. Session Only	0.17	1.33	48	8	64	103	824	6,576	$37,200	9,900	$2,500	$34,700
Special Events Only (13 Days per Year)	-	-	-	8	160	13	104	2,080	$5,800	2,100	$0	$5,800

Fixed Route Service to Western Carson City (Ash Canyon/Kings Canyon Area)

The lower Ash Canyon and Kings Canyon residential areas west of downtown and the existing JAC service area has a population of approximately 1,550 residents. While this population has a relatively high proportion of seniors, the proportion of low-income or zero-vehicle households is below the citywide average. A reasonable route serving this area would be as follows:

- Westbound from the downtown transit center along Washington Street
- Southbound along Mountain Street
- Westbound along W. Kings Street
- Northbound along Longview Way
- Eastbound along Ash Canyon Road
- Southbound along N. Ormsby Boulevard
- Eastbound along W. King Street
- Northbound along Mountain Street
- Eastbound along Robinson Street to the Transit Center

This route would be 4.9 miles in length and would require 30 minutes to operate (including driver layover time). Assuming this route could be paired with another to provide hourly service, it would cost $86,900 per year to operate. Ridership would be generated by service to this new residential area, and by providing service to Carson Middle School. The impact on JAC Assist would be minimal. Overall, an estimated 9,100 additional passenger-trips would be served each year, requiring an estimated $83,600 in increased operating subsidies.

Fixed Route Service to Arrowhead Drive / Northeast Carson City

The Arrowhead Drive corridor is not currently served by JAC. In addition to residential areas with a population of 2,500, this area has a wide variety of employers, including Chromalloy, Eaglemark Savings Bank, and Duro Manufacturing. There are a total of 3,267 jobs in this new transit service area, per the US Census Longitudinal Employer-Household Dynamic dataset. Of these, approximately 1,470 are held by Carson City residents. In addition, the Health and Human Services Department generates the need for transit access.

Due to the limited roadway network, this consists of a large clockwise loop of 11.6 miles, requiring an hour to operate.[4] Due to the prevalence of employment sites, this route would be operated on weekdays only. Two options were considered regarding the span of service (both options would require one more bus in peak operation):

- All-Day Service—13 runs per day, consistent with the other JAC routes. This would incur an annual operating cost of $160,800 per year. This option would also substantially expand the JAC Assist ¾ mile required service area, both to the north and to the northeast. An additional two vehicle-hours of service would be needed, increasing the total cost impact of this option to $185,100 per year.

- Commute Periods Only—Two runs in the AM commute period and two runs in the PM commute period. These runs would probably operate at 7:30 AM and 8:30 AM, as well as 4:30 PM and 5:30 PM, to transfer to other routes and the Downtown Transit Plaza. However, specific times would need to be based on surveys of work shift times in the service area. Given that JAC Assist has some available capacity in these limited hours, no expansion in JAC Assist service would be necessary. This more limited service would cost $49,500 per year to operate.

The US Census indicates that currently 0.3 percent of commuting by Carson City residents is via transit.

[4] Large one-directional loops are typically found to be inconvenient for passengers, as they require long travel times for some trips. However, in this case the potential ridership is not sufficient to consider two-directional service (which would double the operating cost).

This is in part a reflection of the limited area currently served. In comparison, the transit mode share in Reno is 2.4 percent. A reasonable proportion of the transit travel mode in the Arrowhead Drive area is 1.5 percent. Over the course of the year, these figures indicate that transit boardings for work purposes would total 5,500 per year. Ridership would also be generated by newly-served residents and social service transit trip generation, along with a modest level of ridership resulting from the additional service along North Carson Street and William Street. In total, all-day service would generate 17,100 boardings per year. Considering the proportion of employment vs. non-employment in the commute periods, if service is limited to commute periods per year, ridership would be 11,800 per year.

Revisions to Routes 1 or 2A/2B to Better Serve North Carson Street

The North Carson Street between downtown and Winnie Lane does not currently have JAC fixed-route transit service. Instead, Route 2A/2B serves stops along Mountain Street (0.3 miles to the west while Route 1 serves stops along Roop Street (0.3 miles to the east). With the completion of I-580, there are now more opportunities to accommodate bus stops and service along Carson Street.

One way of providing service on North Carson Street would be to revise Route 1 to use Long Street and North Carson Street, rather than Roop Street and Winnie Lane. After serving the Beverly Drive/Marion Avenue/Long Street loop, northbound Route 1 would travel west on Long Street and north on N. Carson Street to Winnie Lane, where the existing route would be regained. The southbound route would continue south on N. Carson Street from Winnie Lane, turning east on Long Street. This modification would not have an impact on operating costs. While it would add an estimated 2 minutes to the route running time, there is adequate time within the hourly schedule to accommodate this. Service would eliminate three existing stops:

- Winnie Lane/Carson Frontier Plaza. This stop generates 11.0 boardings per day eastbound. A new stop on N. Carson Street at Winnie Lane would be roughly 500 feet walking distance from areas to the east (such as the mobile home park).

- Winnie Lane/Lone Mountain Drive—This stop generates only 1.7 boardings per day westbound. Passengers would be served by the existing Carson / Hot Springs Road stop (a quarter-mile walk to the west).

- Roop Street/Stewart Street (northbound and southbound) —This stop, which generates 4.9 boardings per day, is only 850 feet away from existing stops on Beverly Drive.

In total, 17.6 boardings per day (and an equivalent level of deboardings) would be impacted by this revision. Most of these passengers would be required to walk substantial additional distances to the next available stop. A resulting loss of 6,000 existing passenger-trips would occur. Due to the forecast loss in ridership, this alternative is not recommended.

The other way of serving North Carson Street would be to revise Route 2A/2B to serve North Carson between Long Street and Winnie Lane. Route 2A would depart the Downtown Transfer Plaza on the current route as far as Division Street/Fleishman Way, then head east (rather than west) on Fleishman Way, north on N. Carson Street and west on Winnie Lane. In the counterclockwise direction, Route 2B would continue east on Winnie Lane beyond the current turn on Mountain Street to N. Carson Street,

south on N. Carson Street, west on Fleishman Way and then south on Division Street. This route is 0.26 miles longer than the current route, which would increase annual operating costs by $1,700.

While these revisions would eliminate service to seven existing stops along Mountain Street and Fleishman Way, ridership at these stops is relatively low. Excepting the southbound stop on Mountain Street just south of Winnie Lane (that could be relocated around the corner onto Winnie Lane) and the westbound stop on Fleishman Way just west of Division Street (that could be relocated onto northbound Division Street), these stops serve only 5 boardings per day, or approximately 3,000 total passenger-trips per year. Between the two options, therefore, realigning Routes 2A/2B has the lesser impact on existing ridership.

Service on N. Carson Street would serve a variety of commercial centers (including the FISH thrift store, Frontier Plaza and Grocery Outlet) as well as the Frontier Motel. Based on ridership generated by similar land uses currently served by JAC, this corridor would generate an estimated 12,000 passenger-trips per year. This would then result in an overall increase of 9,000 per year once the loss of existing ridership is considered. With an increase of $3,300 in fare revenue, a total net reduction of $1,600 in subsidy needs per year would occur. While this option would result in a net increase in subsidy and a reduction in funding requirements, it would eliminate ridership to a neighborhood that is currently provided with service.

Revisions to Avoid Narrow Streets on Existing Routes

Route 2A/2B: Lompa Lane and Menlo Drive

Just to the east of I-580 and south of US 50, Routes 2A/2B travel along Lompa Lane and Menlo Drive. Menlo Drive is 38 feet in width with parallel parking along both sides, leaving 22 to 24 feet in width for two way travel which is currently adequate for transit operations given the low traffic volumes. However, the 300-foot-long section of Lompa Lane to the north of Menlo Drive has only 22 feet of pavement width. This is a potential safety concern when buses and trucks both need to negotiate this stretch.

Routes 2A/2B could instead use US 50 and Airport Road to travel between US 50/Lompa Lane and Lompa Lane/Menlo Drive. This would add 0.2 miles per trip which, over the course of a year, would add 1,500 vehicle-miles and an operating cost of $1,300. The two stops that would be eliminated (and cannot be easily relocated) serve a relatively modest 4 boardings and alightings per day or 1,200 passenger-trips per year. Including the loss of $400 in fare revenues, this change would increase subsidy requirements by $1,700 per year. Alternatively, the city could increase the pavement width for the 300-foot-long stretch (perhaps as part of private development in this area). Adding this relatively modest construction to a larger roadway project could minimize the construction costs.

Route 3: California Street

Route 3 currently travels along California Street between Colorado Street on the south and Industrial Park Drive on the north. This roadway allows parking on both sides, and a portion has head-in parking. While the northern portion has curb and gutter on both sides with a width of 32 feet, the southernmost 250 feet has no curb and gutter on the east side and a pavement width of only roughly 20 feet. This roadway is difficult to negotiate with a bus. Should JAC continue to operate on California Street, the city

should explore the feasibility of continuing the curb, gutter and shoulder work south to connect with Colorado Street.

The key stops along this roadway at the Southgate Apartments generate a significant ridership (12.6 passenger boardings per day), so simply eliminating this stop is not an option. A feasible alternative, however, would be to relocate this stop to the north side of Industrial Park Drive, just to the east of California Street. This is a 400-foot walk distance from the existing stop. Route 3 buses in both directions would make a clockwise loop around the Industrial Park Drive/California Street/Fairview Drive/Roop Street, using Roop Street south of Industrial Park Drive. This modification would have a minimal impact on ridership and operating costs while providing a benefit to the safety of transit operations by avoiding the narrow section of California Street. However, this route revision moves transit further away from existing HUD housing in the area, resulting in a negative impact to those living in these buildings. Another option would be to improve the eastern side of the 250-foot section of California Street north of Colorado Street.

Revision to Route 3 to Serve Topsy Lane

The southernmost stop on Route 3 is at Fuji Park, on the south side (eastbound side) of Old Clear Creek Road opposite Costco. To access this stop, the bus circulates through the Costco parking lot on the north side of the Parkway, and makes a left turn to enter the stop eastbound. Transit systems typically avoid operating buses through parking lots, due to the increased potential for crashes. Another option for serving this stop would be for the Route 3 bus to continue south on US 395 one more intersection south of Old Clear Creek Road, turning right on Topsy Lane, right on Vista Grande Boulevard (behind Walmart) and right on Old Clear Creek Road. This would add an estimated 3 minutes of running time to Route 3; a review of travel times would be needed to ensure that this can be accommodated within the existing 60 minute schedule. The route is 0.6 miles longer than the existing route. This additional mileage would increase annual operating costs by $1,900.

This Route 3 extension would increase required service area for JAC Assist. Specifically the new area within ¾ mile of the extended route would be added. Note that this would not require JAC Assist service beyond the ¾ mile area. This would not include any major new destinations for paratransit services (such as medical facilities). While it does include a small portion of the neighborhood lying southwest of Topsy Lane, this would not require a significant increase in the cost of JAC Assist services overall.

This extension could serve the existing TTD Route 19X stop in Douglas County on Topsy Lane, between Clear Creek Plaza (Walmart, Trader Joes, etc.) and Carson Valley Plaza (Marshall's, Best Buy). In addition to providing Carson City residents with access to these retail stores, it provides access to jobs in these commercial centers. Considering ridership generated by other similar commercial centers along existing JAC routes, this stop would increase ridership by an estimated 2,500 passenger-trips per year. Subtracting the additional $800 in fare revenues, this option increases annual operating subsidy by $1,100 per year. In light of this modest increase in operating subsidy, the benefits to Carson City residents in terms of commercial and employment access and the fact that Douglas County residential areas would now be served, it is the Consultant recommendation that Carson City consider this option without the need for financial support from Douglas County.

Revision to Route 3 to Serve Target/Home Depot and Mica Drive

A more extensive modification to Route 3 would be to extend southward as far as Mica Drive, which serves the Sunridge and Indian Hills residential areas. As shown in Figure 26, this could serve stops near the Target Center, as well as the Indian Hills Shopping Plaza (Tahoe Orthopedics). This would extend existing Route 3 by an additional 4.2 miles, which would require an additional 20 minutes to operate. As this additional running time is not available within the existing Route 3 hourly schedule, a full additional bus would be needed to maintain the current hourly systemwide schedules. Absent other changes to JAC routes, this would increase annual operating costs by $155,700 per year. This option would require a substantial increase in JAC Assist service area to accommodate ADA requests within ¾ miles of the extended route (that includes both residential areas and medical facilities), thereby increasing total operating costs to $207,900.

This extension would provide service within a 5-minute walk of 2,050 residents. While this area has a relatively high proportion of seniors (20 percent) the proportion that are low-income is relatively low (10 percent) as is the proportion of zero-vehicle households (2.6 percent). Based on the demographics of the additional service area, ridership would be in increased by 5,900 per year, or approximately 20 passenger-trips per day.

Given that this alternative would serve a significant residential area in Douglas County, it would only be feasible with financial contributions from Douglas County. This would need to be negotiated between the city and county, including whether the funding should encompass only marginal operating costs, a portion of overhead/managements costs and/or vehicle capital costs. At a minimum, a reasonable cost contribution would be the marginal operating costs south of Topsy Lane, along with the additional JAC Assist costs. This consists of 3.76 miles of route length that would require 17 minutes to operate. Over the course of a year, this would total 1,061 hours of service and 14,000 vehicle-miles, which would incur an operating cost of $52,600. Including the additional JAC Assist costs and subtracting the $2,100 in fare revenues, the annual operating subsidy would be $102,700.

Downtown/Special Event Shuttle Service

Downtown Shuttle

Downtown Carson City is revitalizing and redeveloping. Particularly since the completion of the Downtown Carson Street project, there is increasing retail, restaurant, employment and entertainment options opening downtown. Downtown Carson City is particularly busy during the State Legislature session, which is a 120-day session every other (odd) year from early February through early June. Given this activity, one option would be to provide a downtown shuttle service, perhaps using a “trolley” replica or some other uniquely branded small transit vehicle. Examples of such services can be found in Santa Barbara and Morro Bay in California, as well as the Sierra Spirit service in Reno.[5]

There are some specific operating parameters that are important in a downtown shuttle:

- A frequent service is crucial. Optimally, service would be provided every ten minutes, which is the frequency at which most potential passengers decide to not consult the schedule and

[5] The Sierra Spirit shuttle will be eliminated once the current project to extend the Virginia Street RAPID bus rapid transit service north from downtown to the University of Nevada Reno is completed in 2020.

instead go to the stop knowing that the shuttle will be coming "soon enough." At the outside, no more than 15 minute frequency is needed.

- Routes should be simple and easy to understand. While operating back-and-forth on one street is preferable, a simple short one-way loop is possible.

- Boarding should require either no fare, or a small fare such as $0.25. Washoe RTC's Sierra Spirit was originally free fare, but a $0.25 fare was implemented in order to control persons riding multiple runs.

Overall, the service plan and public messaging should allow a non-rider unfamiliar with the area and the service to quickly understand the route, frequency, span and how to use the service.

Given the slow travel speeds and many signals in the downtown area, along with time needed for boarding/alighting, a reasonable operating speed for a downtown shuttle is 8 miles per hour. For a 10-minute headway, this is equal to 1.33 miles per trip, which is equal to 30 blocks of the downtown grid. A simple route for a downtown shuttle would be along Carson Street in both directions from 5th Street on the south to William Street on the north, which is 14 blocks in one direction or a total of 28 in both directions. Another option would be to use Curry Street in one or both directions, if siting stops along Carson Street that avoid blocking traffic is a problem and if a smaller vehicle were to be used. This corridor encompasses the State Legislature Building, the State Capitol Building, the State Museum, Children's Museum, lodging/casino properties (Carson City Nugget, Cactus Jack's Senator Club, Carson Tahoe Hotel and Hardman House) and an extensive variety of restaurants, shops and entertainment venues.

While there are a wide range of potential service spans that could be considered, a reasonable option (focusing on the workday and travel to/from restaurants) would be 11 AM to 7 PM on weekdays and Saturdays. This would incur an operating cost of $110,400 per year.

The ridership history of rubber-tired trolley services over recent years is not positive, particularly if there is not a very strong concentration of visitor activity. A successful nearby example is the "Emerald Bay Trolley" service operated in South Lake Tahoe, which caters almost exclusively to visitors. However, there are many examples of trolley services that have been discontinued due to lack of ridership, including services in Nevada City/Grass Valley, North Lake Tahoe and Yuba City/Marysville. As noted above, Reno's Sierra Spirit program is slated for elimination.

Factors that tend to limit the ridership potential of this type of service are:

- Visitors with convenient access to their private automobile tend to use it rather than a shuttle service unless there is some factor, such as limited available parking, which provides a disincentive for auto use.
- While there is an initial "fun" factor that generates ridership in the first year or two, few residents return to ride again.
- It is difficult for a shuttle service to conveniently serve a quick trip, such as for lunch. Even with a 10-minute frequency, using a shuttle can take roughly 15 minutes of a lunch hour.

Ridership generated by the "lunch crowd" on shuttle services has been disappointing. Based on these factors, the potential for ridership of a trolley service in Carson City would be limited, on the order of 8 passengers per vehicle-hour of service on a typical day and 12 during the legislative session. This is equivalent to roughly 19,600 boardings per year. Assuming a $0.25 fare, operating subsidy would be $105,500 per year.

Alternatively, this shuttle service could be provided Monday through Saturday during the legislative sessions only. This would cost $37,200 per year (in the odd years when a session is held) and would serve approximately 9,900 passengers. Subsidy would total $34,700 per year.

Special Events Shuttle

A shuttle vehicle could be used for special events, either those within the downtown area or to provide connecting service between an outlying special event and downtown. Specific special events that could warrant transit shuttle service are:

- V&T Season Opener—Memorial Day Weekend
- Stewart Pow Wow—3 days in mid-June (Stewart)
- Taste of Downtown—1 day in mid-June
- Nevada State Fair—3 days in early June (Mills Park)
- Carson City Fair—1 day in late July (Fuji Park)
- Nevada Day—A full Saturday in late October
- Festival of Light—Friday in early December

There may be other events hosted through the Downtown Business Association or the Brewery Arts Center that could benefit from a shuttle service. Considering only these 13 days of special events listed above, and assuming an average of 8 hours of service per day, a total of 104 vehicle-hours of service would be operated annually. This would incur an operating cost of approximately $5,800 per year.

Ridership generated by special events would vary dramatically depending on the level of visitor activity, the location of visitor lodging, the convenience of parking at the event venue as well as the marketing for the shuttle service. Overall, however, special event shuttles can be relatively effective. Assuming an average of 20 passengers per vehicle-hour, ridership is estimated to total 2,100 over the 13 days of service. As no fare is assumed for this service, operating subsidy would total $5,800 per year.

FIXED ROUTE SYSTEM ALTERNATIVES

Six-Route Alternative

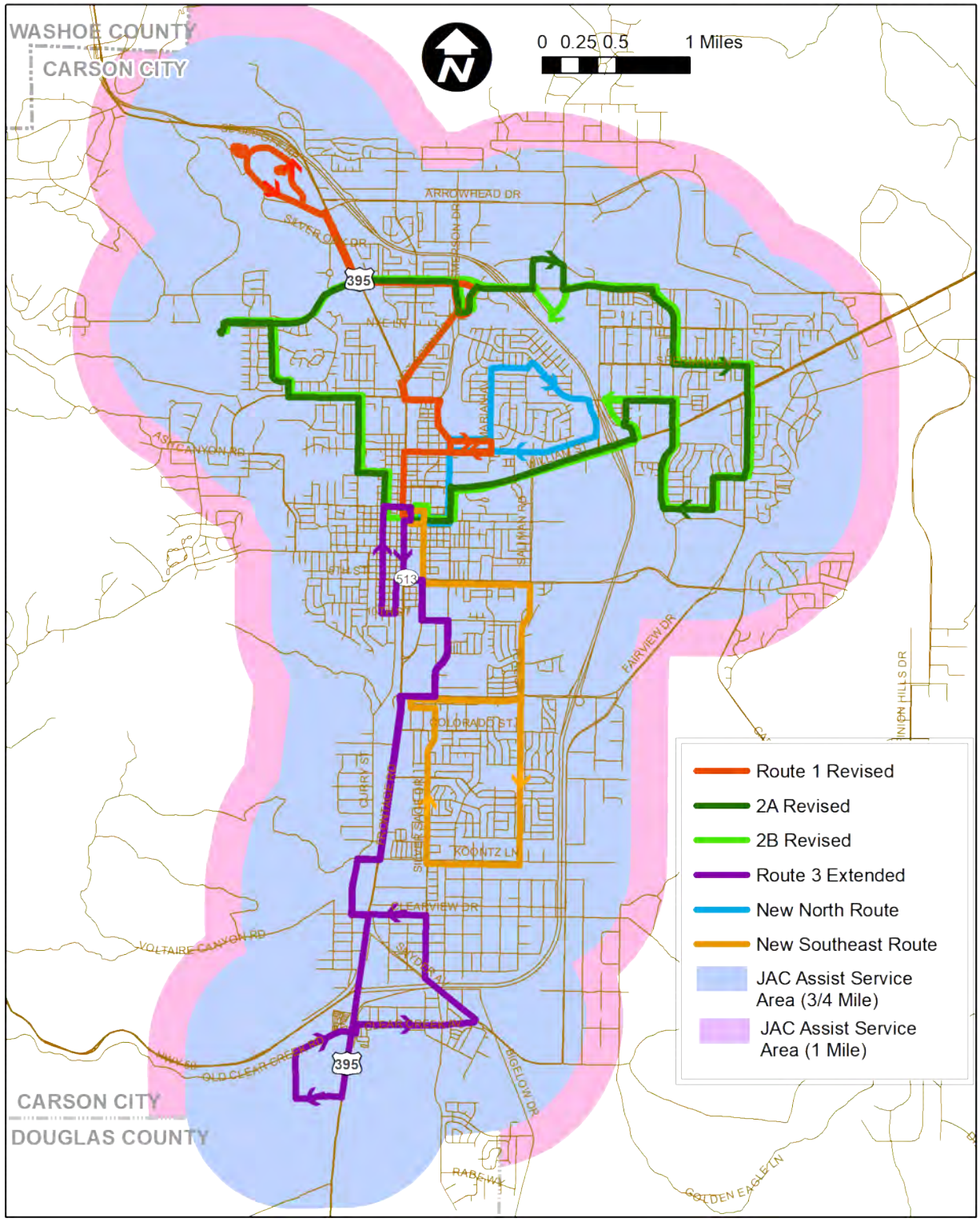
Based on the analysis results of the individual potential new routes as discussed above, a comprehensive fixed-route alternative was developed consisting of the following elements shown in Figure 27:

- Implementation of the Southeast and North Routes. Note that these two routes would be operated hourly using a single bus, alternating between the two routes.

- Revision of Routes 2A/2B to serve additional areas in northeast Carson City (while keeping both routes as hour-long loop routes in opposite directions). Specifically, Routes 2A/2B would travel along E. William Street rather than Long Street between Roop Street and I-580 (as the new

Figure 27

Six Route Alternative



North Route would serve Long Street), providing a time savings that can be used to travel east on Stanton Drive and Sherman Lane as far as Fairview Drive. This would expand service to eastern Carson City, as well as provide faster trips to existing stops in eastern Carson City. All existing stops could be served or relocated within 600 feet walking distance, except the stops near Lompa Lane/Menlo Drive would be eliminated.

- Revise Route 1 to use N. Carson Street between Washington Street and Long Street, adding service to the commercial uses along N. Carson Street and avoiding duplication with the North Route.

- Extension of Route 3 south to Topsy Lane and realignment to South Carson Street from Colorado Street to Koontz Lane.

As shown in Table 21, this overall plan would increase service levels by 3,723 additional vehicle-hours per year (a 25 percent increase) and by 54,200 vehicle-miles per year (a 30 percent increase). Overall marginal operating costs would be increased by $185,600 per year, a 24 percent increase in total operating costs. The total number of buses in fixed-route operation would increase from the current four to a new total of five.

New ridership would be generated by expansion of service as well as service to new commercial areas:

- Southeast area—26,900 passengers per year
- North area—12,000 passengers per year
- Eastern and northeastern area—5,800 passengers per year
- New service on North Carson Street to Long Street (Rodeway Inn, FISH, Roundhouse Inn) — 3,000 passengers per year
- New service along E. Williams Street (Gold Dust, 99 Cent Store) —4,000 passengers per year

In total, this alternative would increase ridership by 54,200 passenger-trips per year (a 28 percent increase in fixed-route ridership). Subtracting the $19,700 in additional fare revenues, operating subsidy requirements would increase by $165,900.

Full Pulse Route Alternative

A “clean slate” analysis was conducted to assess the route structure that would be most effective, given current understanding of transit service needs, if a service were to be designed from scratch. As a basis for this, it is worthwhile to review the general route structures that are commonly used in cities of similar size:

- Under a “pulse route” structure, routes are designed like spokes on a wheel with all routes serving a single transit hub. Buses “pulse” out of the transit hub on coordinated schedules, which allow passengers to typically transfer directly from one bus to another at the hub. As a result, all trips throughout the system can be accomplished by no more than one transfer. In addition to reducing travel time for cross-town trips, this structure provides better amenities for transferring passengers at the transit hub than would be provided out on the routes. This route structure is best suited to communities with a high concentration of activity in a central location (typically downtown). The individual routes are often designed as “balloon routes” with two-

way service near the transfer hub (the "string") along with a one-way loop (the "balloon") to provide expanded geographical coverage in the outlying area.

- A "grid route" structure operates routes along relatively straight east-west or north-south corridors. This is typically found in larger cities, particularly those with a strong roadway grid (such as Phoenix). This provides for relatively quick trips across the service area, but passengers often have to transfer between intersecting routes, typically at locations with limited amenities. The realities of scheduling also mean that there are often long waits while transferring, particularly with low frequency of service. The grid routes are sometimes tied together at the ends of the routes to form a loop.

The current JAC fixed routes are configured largely as a combination of pulse routes (Routes 1 and 3) while Route 2A/2B create elements of an east-west grid along the College Parkway and US 50/Winnie Lane corridors. As Route 2A/2B are scheduled to meet at the downtown transfer center with the other two routes, all routes are scheduled to "pulse," while the Route 2A/2B loop provides shorter travel times along the College Parkway corridor.

TABLE 21: Fixed Route System Alternatives Analysis

	Run Parameters		Daily Service			Days per	Annual		Annual	Annual	Fare	Operating
	Hours	Miles	Runs	Hours	Miles	Year	Hours	Miles	Cost	Ridership	Revenues	Subsidy
Existing Routes												
Route 1 Weekday	**1**	11.2	13	13	146	255	3,315	37,128	$158,800			
Route 2A Wkdy	**1**	11.7	13	13	152	255	3,315	38,786	$160,200			
Route 2B Wkdy	**1**	12.4	13	13	161	255	3,315	41,106	$162,200			
Route 3 Weekday	**1**	12.4	13	13	161	255	3,315	41,106	$162,200			
Route 1 Saturday	**1**	11.2	8	8	90	51	408	4,570	$19,500			
Route 2A Sat	**1**	11.7	8	8	94	51	408	4,774	$19,700			
Route 2B Sat	**1**	12.4	8	8	99	51	408	5,059	$20,000			
Route 3 Saturday	**1**	12.4	8	8	99	51	408	5,059	$20,000			
Total							14,892	177,587	$722,600			
Six-Route Plan												
Route 1 Weekday	**1**	11.1	13	13	144	255	3,315	36,797	$158,500			
Route 2A Wkdy	**1**	12.2	13	13	159	255	3,315	40,443	$161,700			
Route 2B Wkdy	**1**	12.8	13	13	166	255	3,315	42,432	$163,400			
Route 3 Weekday	**1**	12.5	13	13	163	255	3,315	41,438	$162,500			
Southeast Rt Wkdy	**0.67**	8.0	13	8.7	104	255	2,219	26,520	$107,700			
North Route Wkdy	**0.33**	4.5	13	4.3	59	255	1,097	15,050	$54,900			
Route 1 Saturday	**1**	11.1	8	8	89	51	408	4,529	$19,500			
Route 2A Saturday	**1**	12.2	8	8	98	51	408	4,978	$19,900			
Route 2B Saturday	**1**	12.8	8	8	102	51	408	5,222	$20,100			
Route 3 Saturday	**1**	12.5	8	8	100	51	408	5,100	$20,000			
Southeast Rt Sat	**0.67**	8.0	8	5.4	64	51	275	3,264	$13,300			
North Route Sat	**0.33**	4.5	8	2.6	36	51	133	1,852	$6,700			
Total							18,615	227,624	$908,200			
Net Change							**3,723**	**50,037**	**$185,600**	**55,100**	**$20,000**	**$165,600**
Full Pulse Plan												
Northwest Rt Wkdy	**1**	11.9	13	13	155	255	3,315	39,449	$160,800			
N-S Route Wkdy	**1**	11.6	13	13	151	255	3,315	38,454	$159,900			
East Route Wkdy	**1**	11.8	13	13	153	255	3,315	39,117	$160,500			
Southeast Rt Wkdy	**1**	13.3	13	13	173	255	3,315	44,090	$164,800			
South Rt Wkdy	**1**	9.2	13	13	120	255	3,315	30,498	$153,000			
Northwest Rt Sat	**1**	11.9	8	8	95	51	408	4,855	$19,800			
N-S Route Sat	**1**	11.6	8	8	93	51	408	4,733	$19,700			
East Route Sat	**1**	11.8	8	8	94	51	408	4,814	$19,800			
Southeast Rt Sat	**1**	13.3	8	8	106	51	408	5,426	$20,300			
South Rt Sat	**1**	9.2	8	8	74	51	408	3,754	$18,800			
Total							18,615	215,189	$897,400			
Net Change							**3,723**	**37,602**	**$174,800**	**37,200**	**$13,500**	**$161,300**

In considering a new overall route structure, it is important to note that downtown Carson City provides an economically active hub, reasonably close to the center of the overall service area. This argues strongly for a pulse system as the most appropriate overall structure for Carson City. The key question is whether a complete pulse network is a better option for Carson City, in which the Route 2A/2B service area is reconfigured into two individual routes with one bus in operation on each, along with a modification to Route 1.

Other factors considered in the clean slate analysis were:

- The relatively low vehicle-hours per capita compared with the peer systems and the 30 percent of Carson City population not served, a Six-Route system is warranted.

- Service more frequent than hourly is not warranted as discussed elsewhere.

- Service to the Saliman Road corridor, further eastward from the existing Route 2A/2B service area and filling the central "gap," is warranted.

- With the completion of I-580 around Carson City, Carson Street (Old US 395) is being incrementally improved to function as a more attractive locally-serving street. As part of this, it would be beneficial for service to be provided along Carson Street.

A route alternative addressing these factors is shown in Figure 28. Overall, a route network where all routes pulse out of the downtown area was developed. A key element is that the service plan for northern Carson City would be reconfigured into three pulse routes. This overall route structure consists of the following routes:

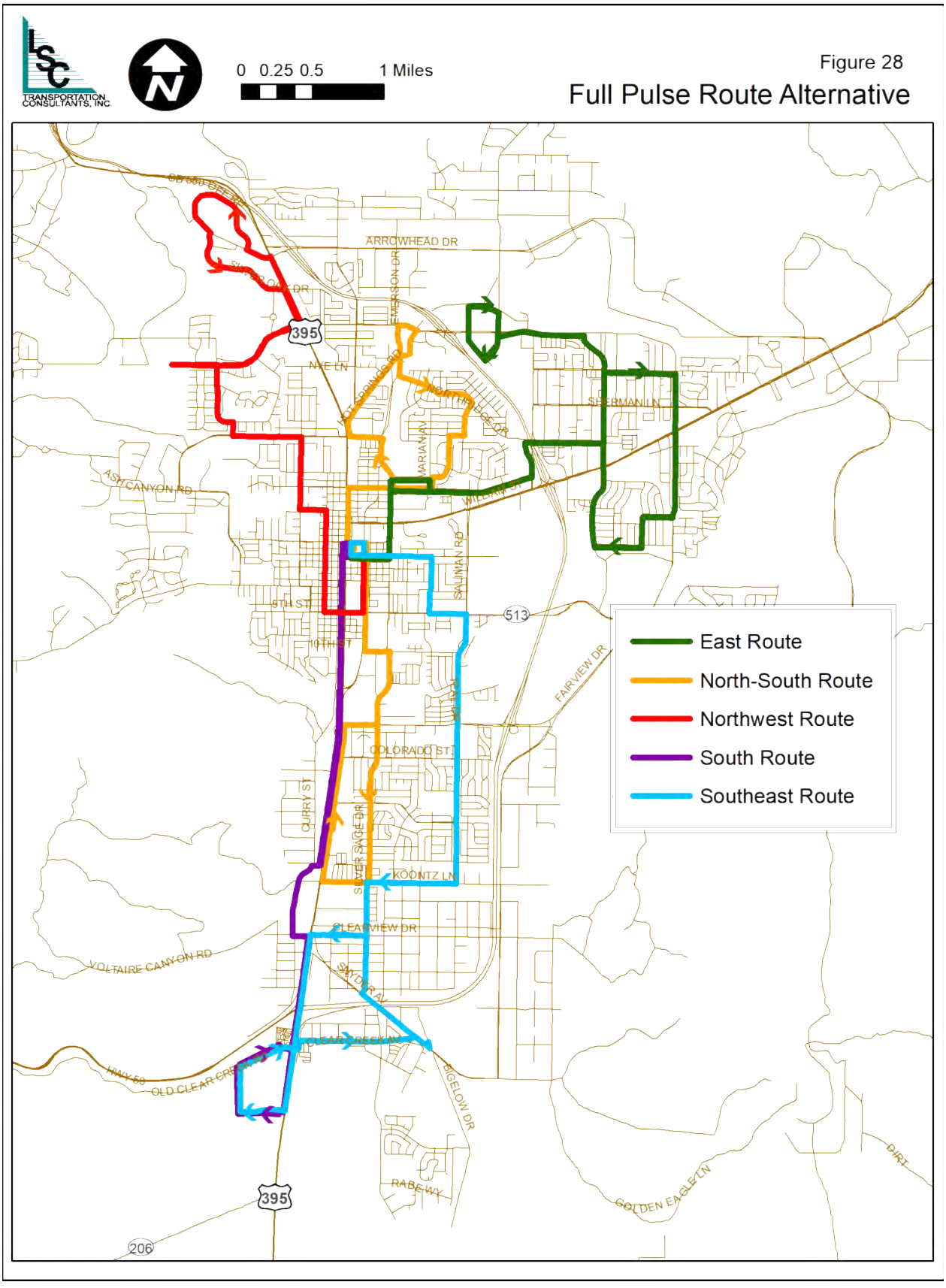
- Route 1 would be reconfigured into a Northwest Route to serve northwest Carson City west of Carson Street, including Western Nevada College and the Medical Parkway area. It would also serve stops along Division Street currently served by Route 3. Overall, it would be a hour-long route.

- A North-South Route would serve the Senior Center, Walmart and Northridge Drive areas on the northern end. After serving the Downtown Transfer Plaza, it would serve much of the existing Route 3 service along Stewart Street and Roop Street as far south as Koontz Lane (allowing Route 3 to be revised). The overall route would operate on an hourly schedule.

- An East Route would serve the eastern end of the existing Route 2A/2B service area, including a one-way loop formed by Airport Road, Nye Lane, Fairview Drive and Desatoya Drive. Another route element would extend west on College Parkway to the existing stops around Goni Road and Research Way.

- A Southeast Route would serve the Saliman Road Corridor in both directions, extending south to Walmart (Topsy Lane) and Stewart.

- Route 3 would be reconfigured into a more direct but longer route along the South Carson Street Corridor, extending as far south as Topsy Lane in Douglas County.


LSC TRANSPORTATION CONSULTANTS, INC.
0 0.25 0.5 1 Miles
Figure 28
Full Pulse Route Alternative
East Route
North-South Route
Northwest Route
South Route
Southeast Route
ARROWHEAD DR
NYE LN
ASH CANYON RD
5TH ST
10TH ST
COLORADO ST
CURRY ST
KOONTZ LN
CLEARVIEW DR
VOLTAIRE CANYON RD
SANDORAL
HWY 50
OLD CLEAR CREEK RD
RABE WY
BIGELOW DR
GOLDEN EAGLE LN
DIRT
FAIRVIEW DR
SHERMAN LN
SALIMAN RD
MARIAN AV
395
513
206

The impacts on operating parameters and costs would be very similar to that of the Six-Route Alternative, with an annual operating cost impact of $174,800. This alternative would have characteristics that both increase and decrease ridership. Key generators of new ridership would be as follows:

- New service to southeastern Carson City. As direct service would be available from the Saliman Road area both to downtown as well as south to the Walmart area, ridership generation in this area would be enhanced.

- Service to new areas in north-central Carson City as well as eastern Carson City.

- Service to new areas in northern Douglas County.

- Faster service between downtown Carson City (and connecting routes) and south Carson City, saving approximately 10 minutes over current running times.

As a whole, a total increase generated by these service improvements would increase ridership by 48,700 per year.

The key negative factor is the loss of east-west service across the College Parkway corridor in northern Carson City. As an example, a trip from Western Nevada College to Walmart on Retail Drive currently takes 9 minutes via Route 2A. Under this alternative, this trip would require 30 minutes, including a transfer from the East Route to the North Route at the Downtown Transfer Plaza. As another example, a trip from Walmart to a residence around Airport Road/Nye Lane would take 65 minutes (including a 30 minute wait at the Downtown Transfer Plaza between the North and East Routes), rather than the existing 10 minutes.

An evaluation of existing boarding and alighting counts indicates that a substantial portion of existing Route 2A/2B passengers are making trips along the College Parkway corridor, totaling 22 percent. An analysis of the impact of the increase in travel time (and need to transfer) indicates that a loss of 12,500 annual existing passenger-trips would occur. The net increase in annual boardings would be 36,200. Subtracting $13,100 in additional fares, this alternative would increase operating subsidy needs by $161,700 per year.

SPAN OF SERVICE ALTERNATIVES

Beyond the physical configuration of the routes, the other key variable with regards to a fixed-route transit system is the span of service, the hours and days that service is provided and the frequency of service.

Evening Weekday Service (to 9:30 PM Last Run)

Evening service on weekdays is a popular suggestion for improvement in JAC transit service. In particular, residents are interested in using transit service to access evening recreational activities as well as the many jobs (such as restaurant jobs) that extend beyond the existing last 6:30 PM run on the JAC system. Under this alternative, each route would be operated for three additional hours, with the last departures at 9:30 PM. As shown in Table 22, providing this service would increase the fixed-route hours and miles of service. In addition, JAC Assist service

would need to be provided during the additional hours and a dispatcher would be needed to staff the office. The overall annual operating cost would be increased by $214,100.

Ridership can be estimated by reviewing the pattern of ridership per hour observed in similar cities with evening service. This indicates that this service would generate a ridership increase of 9.7 percent over existing weekday ridership, or 16,900 passenger-trips per year. Subtracting the $6,400 in additional fares yields an estimate of additional operating subsidy of $207,700 per year.

TABLE 22: Fixed Route Span of Service Alternatives Analysis

	Run Parameters		Daily Service			Days per Year	Annual		Annual Cost	Ridership	Fare Revenues	Operating Subsidy
	Hours	Miles	Runs	Hours	Miles		Hours	Miles				
Weekday Evening Service												
Route 1	**1**	**11.2**	3	3	34	255	765	8,568	$36,600	4,600	$1,300	
Route 2A	**1**	**11.7**	3	3	35	255	765	8,951	$37,000	3,700	$1,400	
Route 2B	**1**	**12.4**	3	3	37	255	765	9,486	$37,400	4,800	$1,800	
Route 3	**1**	**12.4**	3	3	37	255	765	9,486	$37,400	2,700	$900	
JAC Assist	--	--	--	**3**	**33.05**	**255**	765	8,428	$36,500	1,100	$1,000	
Additional Dispatcher Hours				**3**		**255**	765	--	$29,200	--	--	
Total							3,825	44,918	$214,100	16,900	$6,400	$207,700
Eliminate Rt 2A Wkdy 6:30 PM Run												
Route 2A	**1**	**11.7**	-1	-1	-12	255	-255	-2,984	-$12,300	-500	-$200	-$12,100
Saturday 7:30 AM Runs												
Route 1	**1**	**11.2**	1	1	11	51	51	571	$2,400	400	$100	
Route 2A	**1**	**11.7**	1	1	12	51	51	597	$2,500	1,200	$500	
Route 2B	**1**	**12.4**	1	1	12	51	51	632	$2,500	600	$200	
Route 3	**1**	**12.4**	1	1	12	51	51	632	$2,500	200	$100	
JAC Assist	--	--	--	**1**	**11.02**	51	51	562	$2,400	100	$100	
Additional Dispatcher Hours				**1**		**51**	51	--	$1,900	--	--	
Total							255	2,995	$14,200	2,500	$1,000	$13,200
Saturday 4:30 PM Runs												
Route 1	**1**	**11.2**	1	1	11	51	51	571	$2,400	900	$300	
Route 2A	**1**	**11.7**	1	1	12	51	51	597	$2,500	800	$300	
Route 2B	**1**	**12.4**	1	1	12	51	51	632	$2,500	700	$300	
Route 3	**1**	**12.4**	1	1	12	51	51	632	$2,500	600	$210	
JAC Assist	--	--	--	**1**	**11.02**	51	51	562	$2,400	50	$50	
Additional Dispatcher Hours				**1**		**51**	51	--	$1,900	--	--	
Total							255	2,995	$14,200	3,050	$1,160	$13,040
Saturday 4:30 & 5:30 PM Runs												
Route 1	**1**	**11.2**	2	2	22	51	102	1,142	$4,900	1,500	$400	
Route 2A	**1**	**11.7**	2	2	23	51	102	1,193	$4,900	1,300	$500	
Route 2B	**1**	**12.4**	2	2	25	51	102	1,265	$5,000	1,200	$500	
Route 3	**1**	**12.4**	2	2	25	51	102	1,265	$5,000	900	$310	
JAC Assist	--	--	--	**2**	**22.03**	51	102	1,124	$4,900	*$100*	$90	
Additional Dispatcher Hours				**1**		**51**	102	--	$3,900	--	--	
Total							510	5,989	$28,600	5,000	$1,800	$26,800
Sunday Service												
Route 1	**8**	**11.2**	2	16	22	51	816	1,142	$32,100	4,600	$1,300	
Route 2A	**8**	**11.7**	2	16	23	51	816	1,193	$32,200	4,000	$1,600	
Route 2B	**8**	**12.4**	2	16	25	51	816	1,265	$32,200	3,500	$1,300	
Route 3	**8**	**12.4**	2	16	25	51	816	1,265	$32,200	2,800	$980	
JAC Assist	--	--	--	**8**	**88**	51	408	4,495	$19,500	700	$650	
Additional Dispatcher Hours				**8**		**51**	408	--	$15,600	--	--	
Total							3,672	9,360	$163,800	15,600	$5,830	$157,970
Weekday Half-Hourly Service												
Route 1	**1**	**11.2**	12	12	134	255	3,060	34,272	$146,600	17,700	$5,100	
Route 2A	**1**	**11.7**	12	12	140	255	3,060	35,802	$147,900	15,100	$5,900	
Route 2B	**1**	**12.4**	12	12	149	255	3,060	37,944	$149,800	14,200	$5,400	
Route 3	**1**	**12.4**	12	12	149	255	3,060	37,944	$149,800	18,700	$6,540	
Total							12,240	145,962	$594,100	65,700	$16,400	$577,700

Eliminate Route 2A Weekday 6:30 PM Runs

The review of existing ridership by run by hour presented in Technical Memorandum One indicates that the final 6:30 PM run serves an average of only 2.3 passenger-trips per day. While there is a benefit of providing a consistent service plan that is easy to communicate to passengers, eliminating this run would save $12,300 in operating costs per year. Considering that some passengers could still complete their trips using Route 2B (though with a longer travel time), a total of 500 passenger-trips and $200 in fare revenues would be eliminated annually. This results in a net reduction in subsidy requirements of $12,100 per year.

Saturday 7:30 AM Runs

The ridership that occurs during Saturdays' first runs are relatively strong, with an average of 50 boarding on the 8:30 AM runs. This is an indication of potential demand for an earlier run at 7:30 AM. A review of the relative ridership on runs in the 7:00 AM hour on similar systems indicates that this additional hour of service would boost overall Saturday ridership by 12 percent, or 2,400 passengers per year. This additional service (including additional JAC Transit and dispatcher hours) would increase annual costs by $14,200 and annual subsidy requirements by $13,200.[6]

Later Saturday Runs

Ridership on the last existing run on Saturdays (at 3:30 PM) is relatively strong, carrying 47 passengers per day on average. Many similar transit systems operate later on Saturdays, typically until around 5 PM. Two options were considered for an extension to the Saturday span of service:

- Operating a 4:30 PM run would increase costs by $14,200 per year. Based on the relative ridership by hour in similar systems, it would serve approximately 3,050 passenger-trips per year, and require $13,040 in subsidy.

- Operating both 4:30 PM and a 5:30 PM runs on Saturday would increase costs by $28,600 per year and ridership by 5,000 boardings. The overall subsidy requirements would increase by $26,800 annually.

Sunday Service

Providing service on Sundays has long been a common request. In addition to providing access to worship services, many Sunday riders on other systems are traveling for social events and shopping as well as retail jobs. Experience in other similar areas that provide fixed route transit service on Sundays indicates that the ridership generated on Sundays is approximately 30 percent lower than Saturday ridership. Operating the Saturday service plan (four routes plus JAC Assist from 8:30 AM to 4:30 PM) would cost a total of $163,800 per year. Ridership is estimated to be 15,600 passenger-trips per year. By subtracting fare revenues, the subsidy would be increased by approximately $157,970 annually.

[6] As the first run ridership on Route 3 is relatively low, another option would be to operate this 7:30 AM run only on Routes 1, 2A/ 2B, which would reduce operating subsidies by $2,300 per year.

Half-Hourly Weekday Service

Providing transit service every half-hour rather than every hour generates a substantial improvement in the overall attractiveness of a fixed-route service. In particular, employees with defined work start and stop times often find that hourly service can require leaving for work much earlier (if the hourly bus serves their worksite only a few minutes after their required start time) or a long wait after quitting time before the next bus home arrives. Similarly, passengers with defined appointment times for medical or social service visits often are required to add substantial time to their overall trip.

Providing half-hourly service on all four JAC fixed routes would require an additional four buses in operation. As shown in Table 4, this would require a sobering $594,100 per year in increased operating costs. An elasticity analysis indicates that ridership would be increased by approximately 65,700 boardings per year, resulting in an increase in operating subsidy of $577,700 per year.

COMPARISON OF FIXED ROUTE ALTERNATIVES

The ridership impacts of the fixed route service alternatives, as presented in Table 23 and Figure 29, range from an increase of 65,700 (for half-hourly weekday service) and 54,200 (for the Six-Route system plan) to a reduction of 1,200 associated with revision of Route 2A/2B service off of Menlo Place and Lompa Lane. Other alternatives with relatively high ridership potential are the full pulse system alternative (39,600), the North Route (28,200) and the Southeast Route (26,900).

The operating subsidy impacts vary widely, as shown in Figure 30. The most costly options would be half-hourly weekday service ($577,700) followed by weekday evening service until 9:30 PM ($207,700 per year). Other alternatives would have a relatively modest impact on subsidy needs, while two (revising Routes 2A/2B to serve North Carson Street and eliminating the Route 2A weekday 6:30 PM run) would reduce subsidy needs.

Fixed Route Alternatives Performance Analysis

An analysis of the performance of the service alternatives is presented in Table 23. This considers the following key transit service performance measures.

Passenger-Trips per Vehicle-Hour

The marginal passenger-trips per vehicle-hour is a key measure of the productivity of a transit service. Note that several of the alternatives do not result in a change in vehicle-hours, making this measure inapplicable. These values are charted in Figure 31.

Of the other alternatives, the majority yield a positive value resulting from an increase in ridership divided by an increase in vehicle-hours. In these cases, a high figure is preferred in that it reflects a relatively high ridership gain for every new vehicle-hour operated. For one alternative (the elimination of the last Route 2A weekday run), this figure is a result of a reduction in ridership over a reduction in vehicle-hours. In this condition, a lower value is preferable as it reflects fewer passenger-trips lost for every hour of service reduction. In this case, the value of 2.0 indicates that relatively few passengers would be eliminated. Of those increasing ridership, the “best” alternatives are a new North Route (20.6) and the special event shuttle (20.5), followed by the Six-Route systems plan (14.6). Note that these values are shaded in Table 23 indicating that they exceed the existing systemwide fixed-route average of

13.0. Alternatives that generate relatively few new passenger-trips per new vehicle-hour are the West Route (4.9) extending Route 3 southward to Mica Drive (1.2) and the Sunday service (4.2).

Marginal Subsidy per Passenger-Trip

This measure directly relates the key public input (tax funding) to the key desired output (ridership). As shown in Figure 32, the majority of these values reflect an increase in subsidy divided by an increase in ridership, in which case a lower value indicates a "better" alternative in that fewer dollars are needed to expand the ridership. Of these, the best performing alternatives are revising Route 3 to serve Topsy Lane ($0.46), the North Route ($2.01) and the Special Event Shuttle ($2.72). Others would require relatively high levels of new funding per passenger-trip, such as the extension of Route 3 to Mica Drive ($34.88), weekday evening service ($12.29) and Sunday service ($10.13). Several other results regarding this performance measure merit discussion:

- The positive figure of $24.40 for the elimination of the last weekday Route 2A run indicates that $24.40 would be saved for every passenger-trip lost—an indication that this is a good alternative.

- The negative figure (-$0.18) for the revision of Route 2A/2B to serve North Carson Street is also a positive result, in that $0.18 in subsidy would be *saved* for every new passenger-trip *added.*

- Finally, the revision of Route 2A/2B would *reduce* ridership while *increasing* costs, yielding a figure of -$1.42 (a negative result).

TABLE 23: JAC Fixed Route Service Alternatives Performance Analysis

	Change From Existing Service				
	Net Annual Ridership	Net Annual Vehicle-Hours	Net Annual Operating Subsidy	Psgr-Trips per Service-Hour	Marginal Subsidy per Psgr-Trip
Existing Fixed Route Performance	*Alternative Exceeding Average Shaded*			13.0	$4.35
SE Carson City/Saliman Rd. Corridor Route	27,700	2,494	$110,800	11.1	$4.00
North Route	28,900	1,367	$56,400	21.1	$1.95
West Route	9,400	1,862	$83,500	5.0	$8.88
Arrowhead Drive Route - All Day	17,300	3,825	$178,800	4.5	$10.34
Arrowhead Drive Route - Peak	11,800	1,020	$45,200	11.6	$3.83
Revise Rts 2A/2B to Serve N. Carson St.	9,000	0	-$1,600	--	-$0.18
Revise Rt 2A/2B Off of Narrow Streets	-1,200	0	$1,700	--	-$1.42
Revise Route 3 to Serve Topsy Lane	2,400	0	-$700	--	-$0.29
Revise Rt 3 to Serve Mica Drive	6,100	4,743	$205,800	1.3	$33.74
Downtown Shuttle - Year-Round	19,600	2,448	$105,500	8.0	$5.38
Downtown Shuttle - Legislative Session	9,900	824	$34,700	12.0	$3.51
Special Event Shuttle - 11 Days/Yr	2,100	104	$5,800	20.2	$2.76
6-Route System Plan	55,100	3,723	$165,600	14.8	$3.01
Full Pulse System Plan	37,200	3,723	$161,300	10.0	$4.34
Weekday Evening Service	16,900	3,825	$207,700	4.4	$12.29
Eliminate Rt 2A Wkdy 6:30 PM Run	-500	-255	-$12,100	2.0	$24.20
Saturday 7:30 AM Runs	2,500	255	$13,200	9.8	$5.28
Saturday 4:30 PM Runs	3,050	255	$13,040	12.0	$4.28
Saturday 4:30 & 5:30 PM Runs	5,000	510	$26,800	9.8	$5.36
Sunday Service	15,600	3,672	$157,970	4.2	$10.13
Weekday Half-Hourly Service	65,700	12,240	$577,700	5.4	$8.79

FIGURE 29: Service Alternatives Annual Ridership Impact

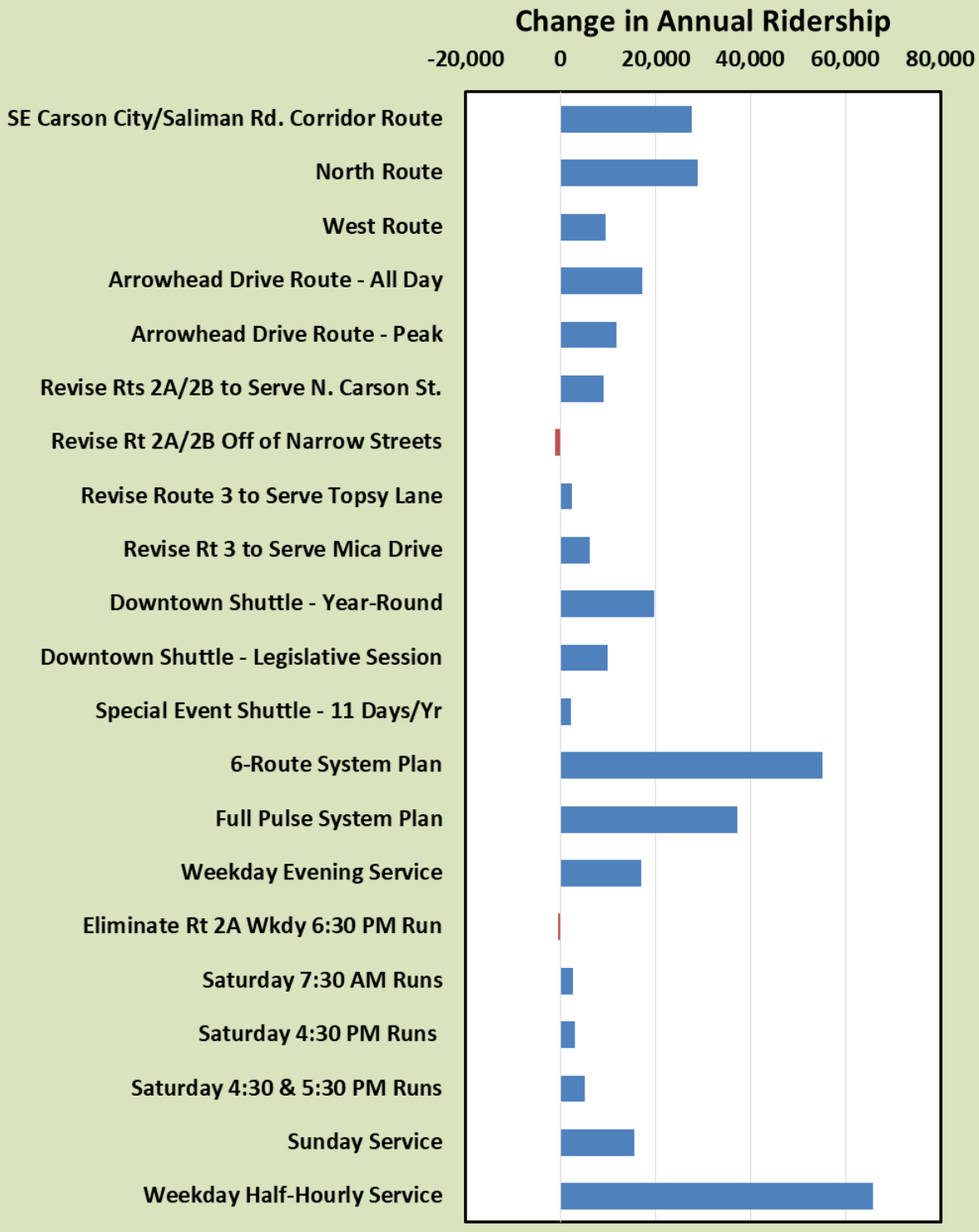


FIGURE 30: Service Alternatives Annual Operating Subsidy Impact

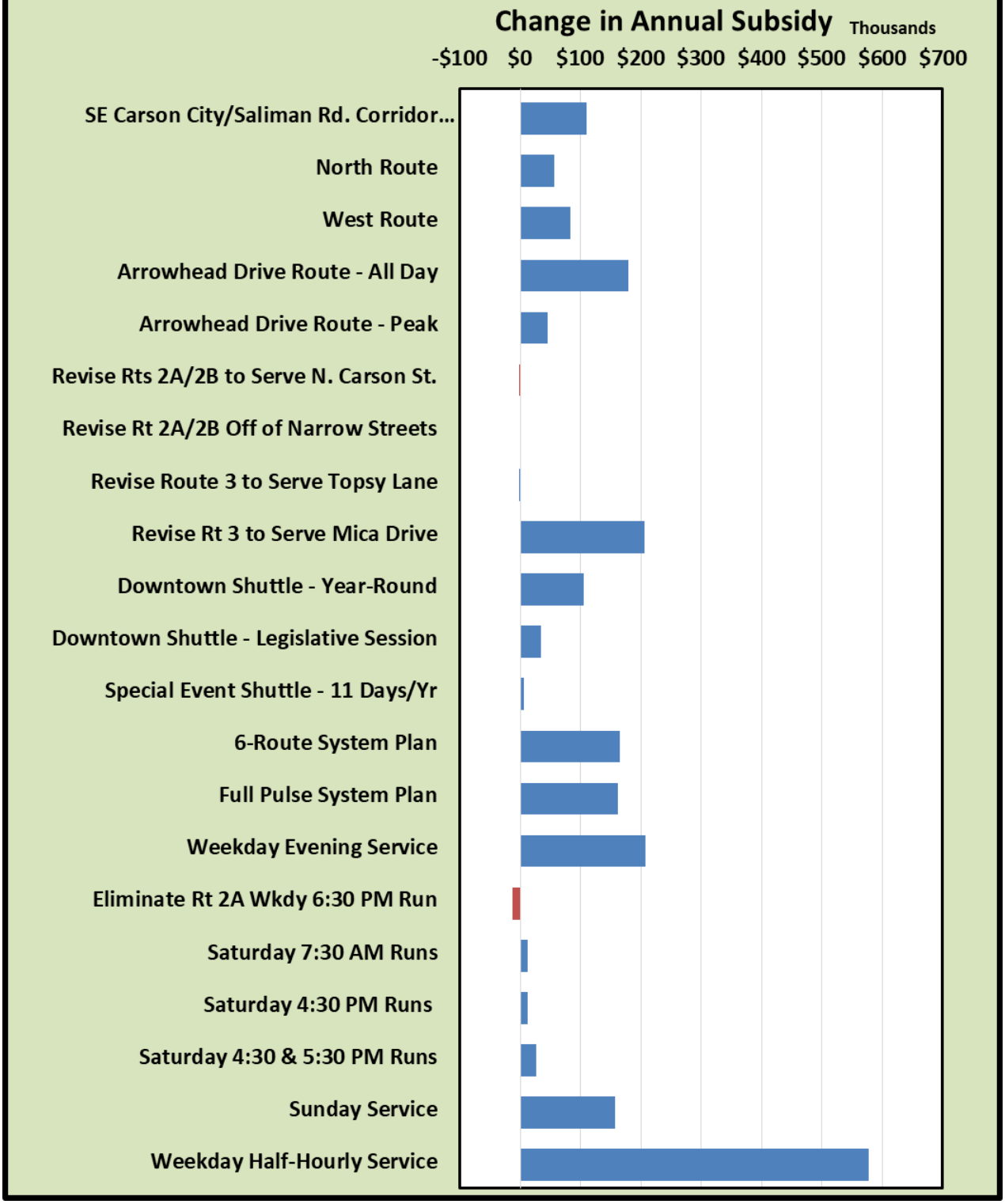


FIGURE 31: Service Alternatives Passengers per Vehicle Service-Hour (VSH)

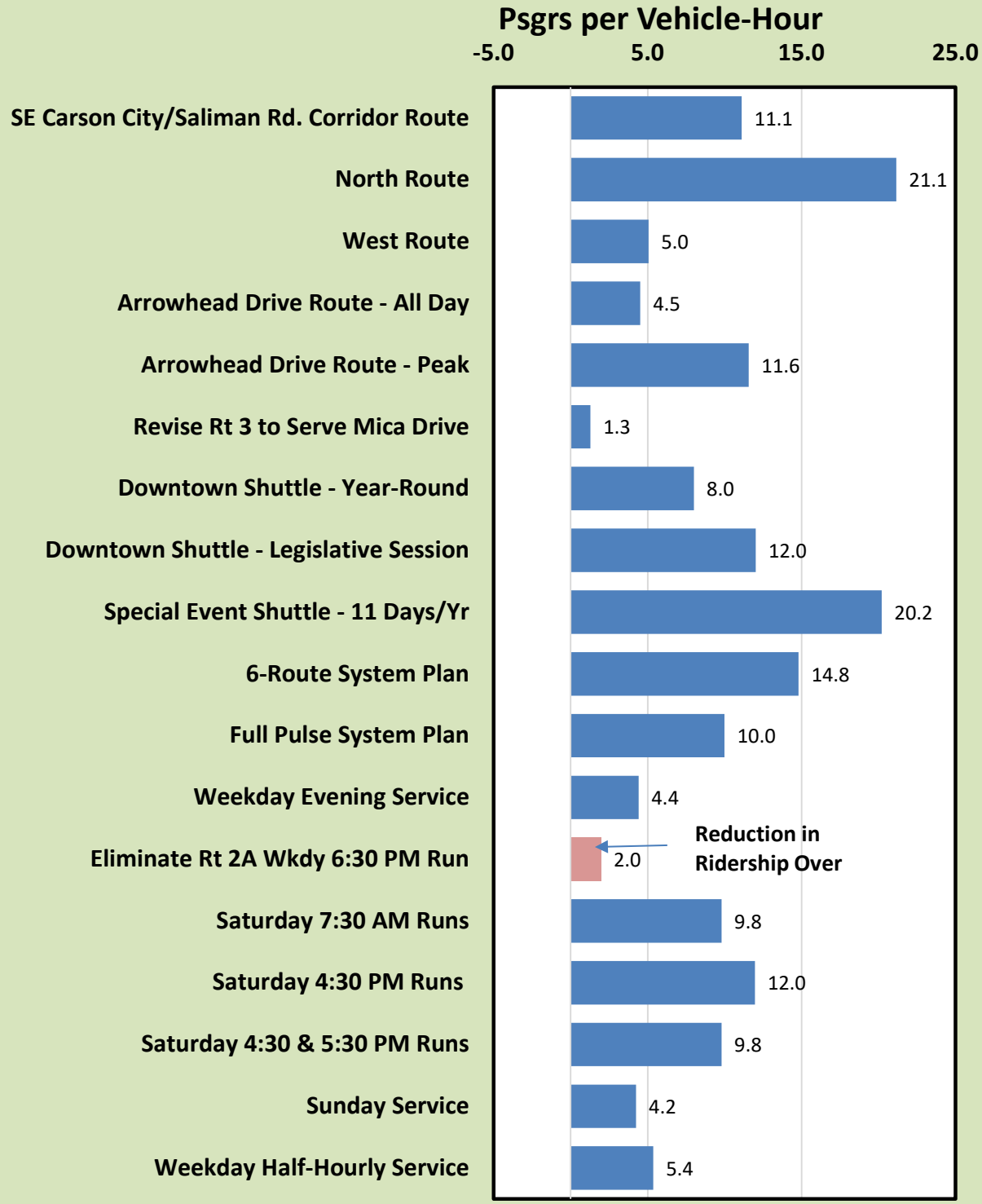
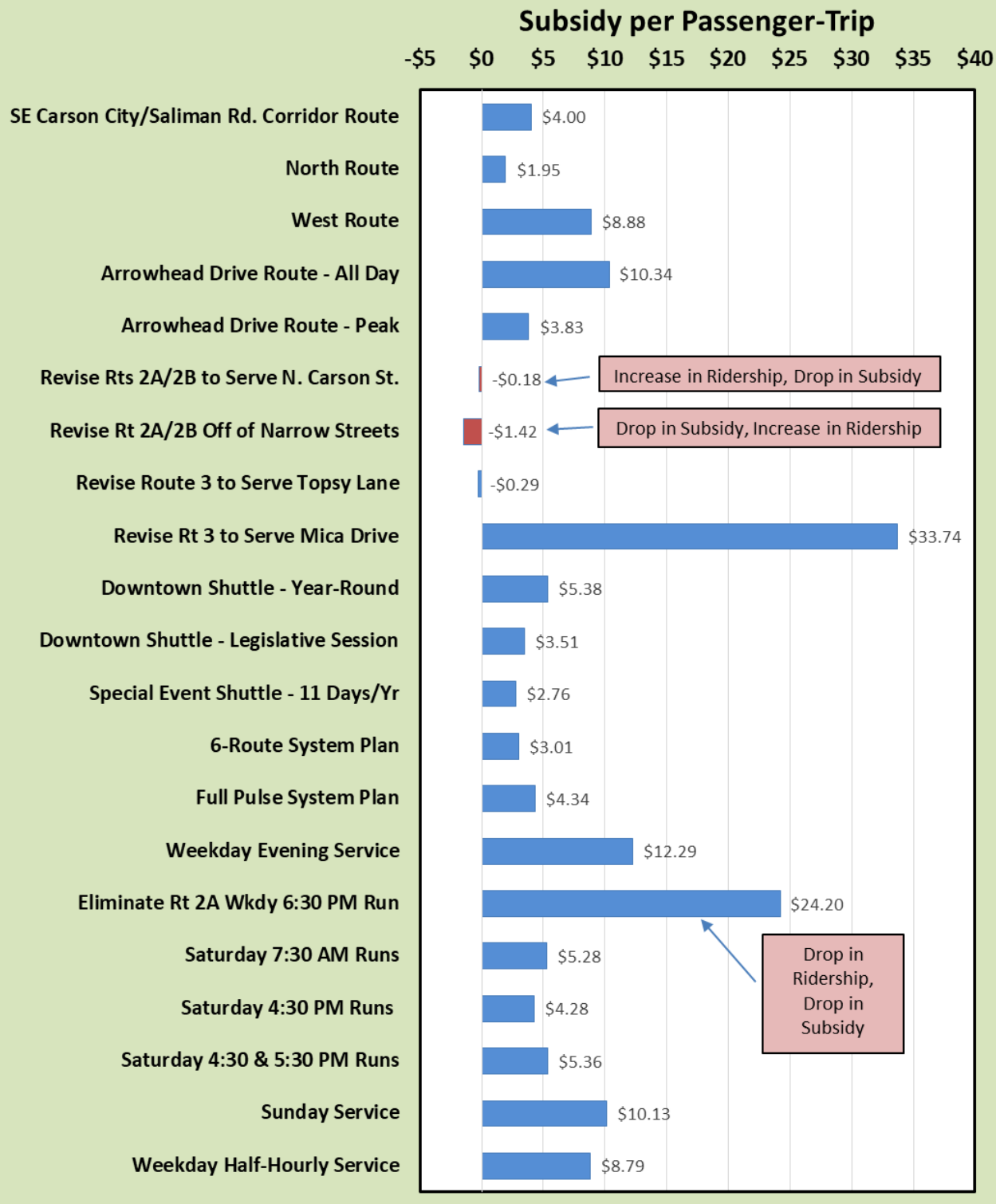


FIGURE 32: Service Alternatives Operating Subsidy per Passenger



Fixed Route Alternatives Conclusions

The above review provides useful information for making decisions regarding the individual routes, and ultimately the JAC fixed route network as a whole. The appropriate alternatives to work into the overall plan will depend on the relative balance between the desire for ridership growth and the financial realities of available operating funding. It is important to consider that there are many other factors (in particular, the ability to provide a dependable and safe transit service) beyond these financial and performance measures. There is a benefit in providing a consistent service that is easy to communicate and understand. Nonetheless, the following are key overall findings that result from this evaluation:

- Assuming that funding is available for operation of a fifth fixed-route bus, the Six-Route System scenario is the preferable option, providing greater ridership at lower cost than the Full-Pulse System scenario. The strong performance of new service to southeast Carson City and to the northern area helps to increase the effectiveness of the Six-Route System scenario.

- Extension of Route 3 south to Mica Drive in Douglas County would not be an effective use of funds. However, the shorter extension to Topsy Lane provides strong benefits at little cost.

- Sunday service, evening service and half-hourly weekday service all perform relatively poorly and would be very expensive.

- A special event or downtown shuttle has a high potential for good performance, so long as the periods when service is provided are considered carefully. The ridership potential of this service should be considered cautiously.

- Expansion of the hours of Saturday service has a moderately good potential. Of the hours considered, providing one additional later hour (4:30 PM departures) would be the most effective.

- The revision of Route 2A/2B to serve a portion of North Carson Street would be a net benefit, but would impact existing ridership. Note that the Six-Route System scenario provides this new service without the impact on existing passengers.

JAC Assist Alternatives

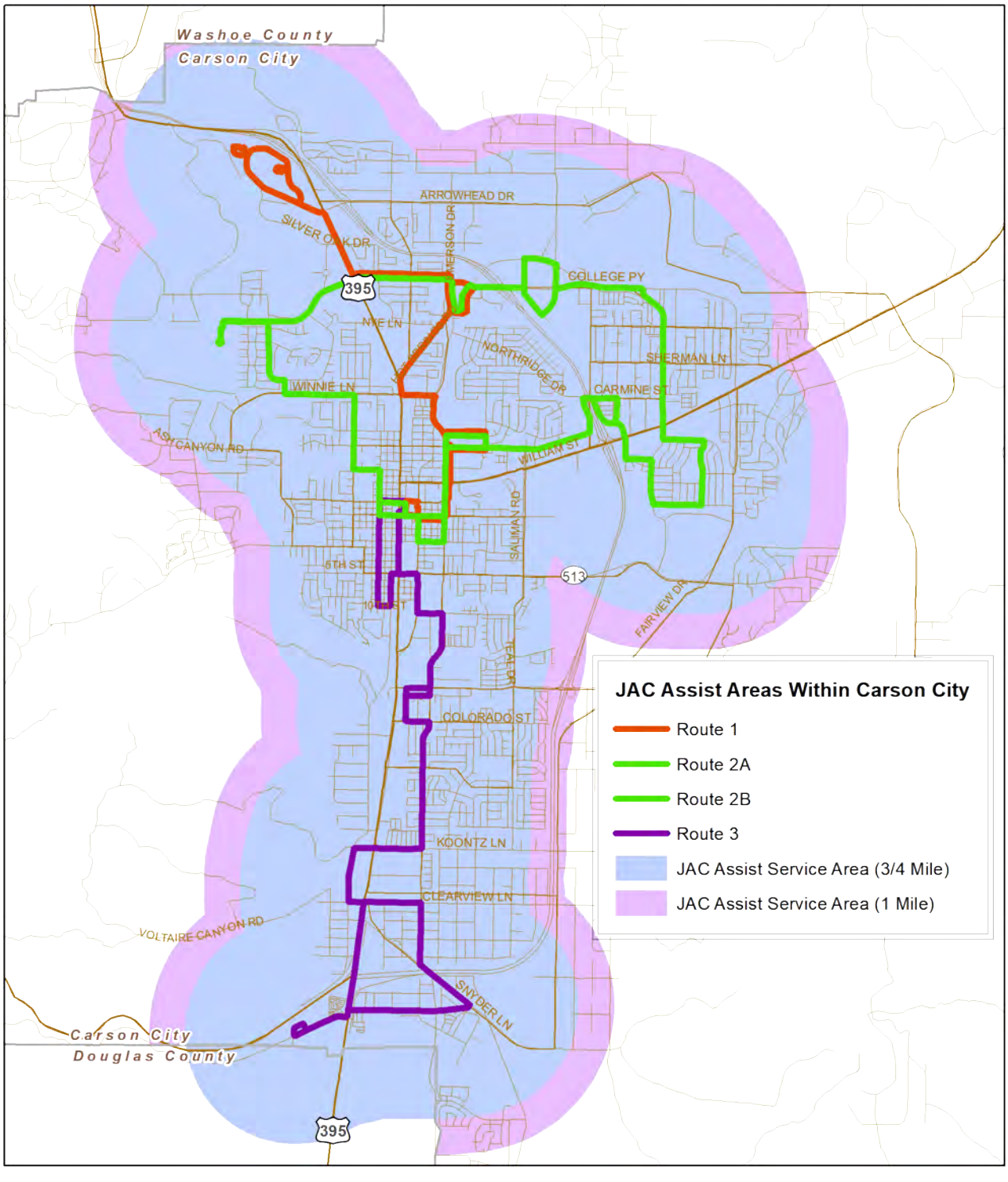
JAC Assist currently provides service to persons eligible under Americans with Disability Act qualifications as follows:

- Within ¾ miles of a fixed route—$2.00 per one-way trip
- Between ¾ miles and 1 mile of a fixed route—$4.00 per one-way trip

These service areas are shown in Figure 33. Table 24 presents estimates of the population, and their population characteristics, currently within and outside of these service areas. As shown, 80 percent of all Carson City residents live within the ¾-mile area and 84 within the 1-mile area. A higher proportion of persons with disabilities live within the existing service area, with only 13 percent outside of the ¾-mile area and 10 percent outside of the 1-mile service area. The senior population outside of the existing service area is very much in line with the overall population proportions of Carson City.

Figure 33

Existing JAC Assist Service Area



Residential areas outside the service area are largely found to the west (Kings Canyon area), northwest (Lakeview area), north (northern end of Goni Road) and southeast (east of I-580 and south of Fairview Drive). Overall, the total population outside of any JAC Assist service area is as follows:

- Total population—8,413
- Disabled population—1,365
- Senior population—2,050

In reviewing the need for service, it is useful to review the proportion of JAC Assist trips made to and from the extended area (3/4-mile to 1-mile). An analysis of Ecolane data for a full year (June 2018 through May 2019) indicate only 354 such trips were made (or 1.2 per day). This is equal to only 1.3 percent of all JAC Assist trips over a year.

TABLE 24: Carson City Population Served by JAC Assist

	Total Population				Persons With Disabilities			Senior Population		
Census Tract	Total Tract Population	Within 3/4 Mile	Outside 3/4 Mile	Outside 1 Mile	Within 3/4 Mile	Outside 3/4 Mile	Outside 1 Mile	Within 3/4 Mile	Outside 3/4 Mile	Outside 1 Mile
3	3,708	371	3,337	2,781	58	518	432	122	1093	911
4	3,653	1,206	2,447	2,009	248	502	413	233	473	388
8	4,413	1,986	2,427	1,545	318	388	247	415	507	323
9	5,142	4,731	411	257	1,409	122	77	1,181	103	64
10.02	3,643	1,457	2,186	1,822	157	236	197	291	437	364
Other Tracts	33,660	33,660	0	0	8,241	0	0	5,644	0	0
TOTAL	54,219	43,411	10,808	8,413	12,197	1,767	1,365	10,499	2,613	2,050
% of Total		80%	20%	16%	87%	13%	10%	80%	20%	16%

Expansion of Base ADA Service Area to Encompass All Residential Areas

The ADA service area could be expanded to include all residential portions of the consolidated city and county. This would exclude the areas in the Tahoe Basin and the eastern portion of the county with no or minimal population. The best indicator of the potential ridership demand that would be generated by this expansion is the increase in the number of persons with disability in the expanded area.[7] This is equal to a 14.5 percent increase in demand, or 15.1 passenger-trips per day on the average weekday and 1.8 passenger-trips per day on the average Saturday.

A utilization analysis was conducted of the run manifests for a selection of service days to identify if the current services (up to 4 vehicles in operation on a weekday and 1 vehicle in operation on a Saturday) could accommodate this increase in demand. This analysis found that there is some available capacity on weekdays early in the service day between 9:30 AM and 1:30 PM as well as on Saturdays (recognizing that the dispatchers can negotiate specific service times by up to one hour). However, available capacity is not adequate between 7:30 AM and 9:30 AM, and between from 1:30 PM to 4:30 PM. This expansion in service area would therefore require operation of one additional AM and one additional PM

[7] It is possible that this is a conservative assumption, as a substantial proportion of JAC Assist ridership is generated by social service programs and housing options focused on the disabled community, which tend to be located within the JAC Assist service area. However, expansion of the service area could allow these types of facilities to relocate to these new areas, creating the potential for expansion of demand.

paratransit vehicle for a total of 5 hours per weekday. Over the course of a year, this would incur an operating cost of $67,000 as shown in Table 25. It would serve up to 3,900 new passenger-trips (under this conservative cost analysis), yielding an operating subsidy of $63,400 per year. This is equal to a marginal subsidy per passenger of $16.26, which is similar to the existing JAC Assist average. This alternative would also require an additional vehicle.

TABLE 25: JAC Assist Service Area Alternatives Analysis

	Run Parameters		Daily Service			Days per Year	Annual		Annual Cost	Ridership	Fare Revenues	Operating Subsidy
	Hours	Miles	Runs	Hours	Miles		Hours	Miles				
Expand Base Area to Encompass All Residential Areas												
JAC Assist	--	--	--	5	82.62	255	1,275	21,069	$67,000	3,900	$3,600	$63,400
Expand Extended Area to Encompass All Residential Areas												
JAC Assist	--	--	--	4	66.1	255	1,020	16,855	$53,600	1,550	$1,400	$52,200

Expansion of Extended ADA Service Area to Encompass All Residential Areas

Another option would be to expand the extended area (with the $4.00 fare) to include all residential areas. The population in the existing extended area generates an average of 1.14 trips per disabled person per year. Applying this rate to the disabled population outside of the existing service area indicates an annual ridership increase of 1,550 per year, or 5.9 per weekday and 0.7 per Saturday. Though this is a lower figure than expanding the base area, it would still require additional JAC Assist capacity in both the AM and PM periods (particularly considering that the time required to serve each trip would be greater than the current average). A total of four vehicle-hours of service would be required (7:30 AM to 9:30 AM, and 2:00 PM to 4:00 PM), which would increase operating costs by $53,600 and operating subsidy requirements by $52,200. At $33.68 in subsidy per passenger, this option would be twice as expensive as current JAC Assist service.

Modifications in Certification Procedures

An important element of ensuring that the limited funds available for paratransit services are focused on those most in need of the service is defining an appropriate "certification" process—the steps by which an individual is certified to use the service. The *JAC Assist ADA Complementary Paratransit Policies and Procedures* (revised July 17, 2018) lays out a detailed and comprehensive process that already includes key steps such as a certification by a qualified medical professional as well as an appeals process.

One modification that is recommended to improve this process is to require an in-person interview as part of the "Part A" application process. Requiring an in-person interview has been found to decrease the number of applications by 25 to 30 percent. The in-person interview provides an opportunity for staff to make a preliminary determination of eligibility. It provides an opportunity to educate the applicant about other options, including accessible fixed-route transit and travel training. While JAC Assist could require a functional assessment, the cost to implement assessments likely exceeds the benefit for a system the size of JAC. JAC Assist will need to offer a free ride to and from the in-person interview and have sufficient staff time to conduct the interviews.

In addition, the Consultant Team has the following other recommendations:

- Change recertification to five years to reduce the workload. The difference in the number of people certified between a three-year and five-year certification will be very small and there is minimal benefit to having staff spend time on recertification every three years.

- Consider eliminating the conditional and trip-by-trip rides. The number of actual conditional or trip ineligible requests should be determined to verify if the benefit is worth the staff time spent determining conditional eligibility and approving individual trip requests. While this approach to approving trips on a case by case basis appears to be beneficial, the number of trips that fall in this category may be so small that the effort is not justified. Tracking the number and percentage of trips that are approved on a conditional basis or not approved will support evaluation of this policy.

As discussed earlier, a travel training program should be considered. Travel training for some applicants may allow them to use the fixed-route service and not need JAC Assist for some or possibly all of their trips. Given that the operating cost of providing a JAC Assist trip averages almost four times more than that of a fixed route trip, and considering that many persons with disabilities find that fixed-route services provide overall greater mobility and opportunities, this can benefit both the transit program as a whole as well as the individual rider.

INTERCOUNTY SERVICE ALTERNATIVES

Dayton-Mound House-Carson City Service

The western portion of Lyon County, in particular the Mound House and Dayton areas (within the CAMPO boundaries), has a substantial population, totaling approximately 16,000. This population has a relatively high proportion of persons with disabilities (23.2 percent) and low-income residents (14.1 percent). While residents of these areas typically travel to Carson City for medical and urban services, currently the only transit access is provided by the once-per-week service (on Thursdays) from Silver Springs to Carson City, along with once-a-month (on the fourth Tuesday) from Yerington to Carson City via Silver Springs. These services, moreover, don't arrive in Carson City until 9:30 AM on the weekly service and 10:30 AM on the once-a-month service, with both departing at 2:00 PM. These service times require a long time away from home with only limited options for appointments in Carson City.

Additional service could be provided by Carson City to western Lyon County with funding provided through a combination of local Lyon County sources and Federal Transit Administration sources. This could consist of "lifeline" service, which is defined as limited service to smaller communities or rural areas intended to provide at least a minimum of access to urban services such as medical facilities, shopping and social service programs. At a minimum, these services consist of two runs on one day a week. Reservations are required (typically at least 24 hours in advance), though if a pattern of regular reservations emerges, "standing reservations" can be established for popular stops and times. Examples of lifeline transit services are the service connecting Markleeville, California with Minden/Gardnerville and the service connecting Benton, California with Bishop, California.

This may be an appropriate service model to serve the western Lyon County area. Specifically, a route could be operated between Carson City and Dayton, as far east as Chaves Road (approximately 2 miles

east of SR 79), one day per week.[8] This vehicle would operate on a deviated basis, providing door-to-door service to nearby residential areas in Lyon County, and direct service to key medical and commercial centers in Carson City. Three runs per day could be operated, providing arrivals into Carson City at 8:30 AM, a midday 11:00 AM eastbound departure dropping and picking up passengers around Noon, and a 4:30 PM eastbound departure.

The route would run approximately 19 miles east of downtown Carson City. Including time for service to individual homes and destinations, a 2 hour period for every round trip would be needed. Including 12 miles for services off of the highways, each round trip would require approximately 50 miles of operation. This service would cost an estimated $18,700 if operated through the JAC program, as shown in Table 26.[9] Funds would be needed for marketing, not included in Table 26.

The potential ridership for this service is substantial, if properly marketed. A review of per-capita ridership on similar lifeline services indicates an average of 0.34 passengers per year per capita, for every day of service offered each week. This indicates a potential for 5,400 passenger-trips per year, or 106 per service day. In reality, ridership would be limited to the capacity of the buses. Assuming a 21-passenger Starcraft vehicle were used, total daily ridership would be limited to approximately 80 passenger-trips per day, or approximately 4,000 per year. Assuming a fare of $2.00 per one-way ride, $8,000 in fare revenues would be generated. An operating subsidy of $10,700 would be required.

TABLE 26: Intercounty Service Alternatives Analysis

	Run Parameters		Daily Service			Days per Year	Annual		Annual Cost	Ridership	Fare Revenues	Operating Subsidy
	Hours	Miles	Runs	Hours	Miles		Hours	Miles				
Dayton Lifeline Service	2	50	3	6	150	52	312	7,800	$18,700	4,000	$8,000	$10,700
Dayton/Virginia City Lifeline Service	2.33	56	3	7	168	52	364	8,736	$21,500	4,250	$8,500	$13,000

Virginia City—Dayton—Mound House—Carson City Service

Another option would be to provide lifeline service to the Virginia City portion of Storey County, including Silver City, Gold Hill, and areas of Lyon County. This area has a population of 705 persons, 18 percent of which are low-income and 36 percent are seniors. US 50, State Route 341 and State Route 79 make a convenient loop through Virginia City and Dayton. This adds only 6 miles to a round-trip, resulting in roughly 56-mile trip length and a 2-hour, 20-minute running time. Annual operating costs would be on the order of $21,500 per year (assuming ridership requests are made for all runs). This additional service area would increase ridership demand by an estimated 250 passenger-trips per year (or 5 per service day). Assuming there is adequate capacity, this would increase fare revenues by $500 per year. The incremental impact of this expanded service area would be to increase operating subsidies by $2,300. However, it would open the possibility for funding through Storey County sources, and possibly increase the competitiveness of a grant application for federal funding.

[8] If this day falls on a holiday, service would be operated on an alternate day for that week.
[9] Providing service on a second day per week would double the cost to $36,000 per year.

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Chapter 8
Capital Alternatives

INTRODUCTION

This chapter first discusses capital facilities, including transfer centers and bus stops. Fleet improvements are then discussed, including the appropriate size of transit vehicles as well as the potential for battery electric buses.

FACILITIES

Downtown Transit Center

The current hub of the JAC fixed route system is the Downtown Transit Plaza. This consists of the curb along the eastern side of N. Plaza Street between E. Robinson Street and E. Washington Street as well as a portion of the curb adjacent to the Federal Building. Excluding the driveway to a parking lot, there is a total of 200 feet of curb length available for buses. This is sufficient to accommodate up to six vehicles at one time. At present, up to four JAC buses are at the Plaza at the peak times (at the bottom of the hour). Up to approximately 30 passengers are waiting for buses at peak times.

The Tahoe Transportation District Route 19X serves a stop on the south side of E. Washington Street east of N. Plaza Street. This stop is served five times a day but not at the same time as JAC. In addition, the Washoe RTC Intercity Route serves the stop on E. Washington Street six times per day in the southbound direction from Reno to NDOT Headquarters on Stewart Street and serves a stop on the north side of E. Robinson Street east of N. Plaza Street six times per day in the northbound direction. While the Washoe RTC schedules do not define a specific time for service to these stops, the southbound runs arriving at NDOT at 7:15 AM, 4:12 PM and 5:12 PM provide a reasonably convenient transfer from the Intercity buses to JAC fixed routes while the northbound runs departing at 7:20 AM, 4:17 PM and 5:17 PM provide the opportunity (with coordination between the systems) for convenient transfers from JAC fixed routes to the Intercity service.

Beyond the curbside bus loading locations, this facility consists of a 14-foot-wide sidewalk (sufficient for wheelchair loading and unloading), along with an 8-foot-long shelter at the south end and a 20-foot-long shelter at the north end. There are three 6-foot benches and a bike rack.

This facility provides a reasonably convenient location with regards to downtown activity centers as well as efficient bus movements into and out of the site. However, there are numerous deficiencies to the existing transit plaza:

- It lacks restroom facilities for drivers. Drivers currently have to depart their buses (requiring all passengers to disembark) and go into the Nugget to use their restrooms (on a “gratis” basis). This additional walk time can add roughly 5 minutes to the layover time at the transit plaza and can add to service delays.

- It provides insufficient protection from the elements. In particular, the west facing shelters do not provide adequate seating capacity for peak waiting loads, provide little shade in the late afternoon on hot summer days, and provide scant protection from wind-driven rain and snow.

- Because of the limited seating and shade opportunities, passengers are tempted to wander into the landscaping areas of the Federal Building, potentially causing damage.

- Lighting is limited to two streetlights and low lighting in the shelters. As a result, passengers are often boarding and alighting in dark locations, adding to safety concerns.

- Walks of up to 400 feet are required between Intercity and JAC buses, increasing the delays as passengers transfer.

As a long-term capital investment, it is important for a transit center to be able to accommodate the needs of the transit program for at least the next twenty years. The following describes design elements and site considerations for such an investment.

Design Elements

Specific design elements that should be considered in the redesign of the Transit Center should include the following:

- Bus Loading Area: The facility needs to accommodate five JAC fixed route buses as well as a Washoe Intercity bus, a TTD bus and potentially a downtown shuttle vehicle. Lighting should be provided for all loading areas.

- Passenger Facilities: A climate controlled indoor waiting area should be provided with a minimum floor area of 600 square feet (such as 15' X 40'). This waiting area should have clear lines of sight for security purposes, as well as a clear view of approaching buses. Public restrooms are not necessary so long as public restrooms are available within a block walk. In addition, outdoor shaded passenger waiting areas should be provided with benches, totaling approximately 1,500 square feet in area.

- Bicycle racks or other bicycle parking should be provided.

- Driver Facilities: As the key facility for the transit drivers, restroom facilities should be provided. In addition, a separate entrance (with key card access) should be provided to a portion of the space that includes a driver break room as well as the restrooms.

- Improved Passenger Information: "Real time" information screens should be provided in the facility that provides information on schedules, service interruptions and public notices.

- A small utility space (approximately 160 square feet) should be provided for custodial storage.

Site Location Considerations

The following are key considerations in considering the location of a transit center.

- Adequate size to accommodate the transit program.
- Proximity to the center of the local transit service area, to minimize out-of-direction travel time and costs. Given the many times per day that transit vehicles travel to and from the site, even an additional distance of a few blocks can add thousands of dollars to the annual operating costs.
- Convenient access for regional transit routes that minimize out-of-direction travel.
- Adequate access, thus avoiding excessive delays for transit routes.
- Convenience to major trip destinations. As the single location most accessible by public transit, it benefits the overall effectiveness of transit services if there is a concentration of transit trip generators (shopping, community facilities, public offices, etc.) within a convenient walk distance of the transit center.
- High visibility that enhances the community's awareness of transit services.
- Personal security and safety. Locations in area's with a high crime reputation (deserved or not) should be avoided, and locations that have greater vehicle and pedestrian activity are preferable.
- Appropriate zoning and consistency with community plans.
- Availability of adequate utilities.
- Lack of known hazardous soils.

Potential Second Transit Hub in South Carson City

As a transit system grows, there is sometimes the need to establish a second transit hub. As discussed in the service alternatives, the geography of Carson City lends itself to a strong central hub in the downtown area. However, if a second route in South Carson is established, there is a potential for transfers between the existing Route 3 and an additional route serving the southern area.

The prevailing trip pattern, however, is such that this demand is not expected to be significant. A full second transit hub is therefore not warranted. However, if a second route serves the Fuji Park stop, this could serve as an informal transfer location. While this stop already has a good shelter and loading facilities, it could benefit from additional outside bench seating, improved lighting and a bike rack.

Review of Existing Stop Locations

When reviewing the distance between existing stops throughout Carson City, most appeared to be adequately spaced from one another. A major gap in service was identified between Emerson Drive and

Research Way along East College Parkway. Currently, there is 0.6 mile distance between bus stops and while much of this distance consists of the I-580 interchange, it includes retail and multifamily residential areas west of the interstate. A stop near Retail Drive/Retail Court could alleviate this gap and improve access for the adjacent land uses.

Bus Stop Improvements

In addition, improvements are warranted at other bus stops not affected by the route revisions. The quality of bus stops is a very important factor in a passenger's overall perception of a transit service. Depending on the trip, a passenger can spend a substantial proportion of their total time using the transit service waiting at their boarding location. If this is an uncomfortable experience, if it is perceived to be unsafe, or if it does not provide adequate protection from winter rain or summer sun, the bus stop can be the deciding factor regarding a potential passenger's use of the transit system.

Transit systems serving small to mid-sized cities typically strive to provide seating (such as a bench) for stops that average 5 or more boardings per day, and shelter for stops that average 10 or more boardings per day. Using the above criteria, an analysis of existing stops and their average daily ridership was performed with recommendations for potential bench and shelter locations summarized in Table 27.

TABLE 27: Recommended Bus Stop Improvements

Route	Stop	Recommendation	Average Daily Boarding
2B	Airport & Nye southbound	Add paved walkway, bench, and shelter	10
3	Clear Creek & Center	Add paved walkway, bench, and shelter	10
2B	Airport & Harrison	Add bench and shelter	10
1	Hot Springs & Northgate	Add bench	9.3
1	Hot Springs & Pine Southbound	Add bench	8.5
1	Robinson & Walsh	Add paved walkway	7.5
1	Sierra Surgical Hospital	Add bench	7.2
2B	Airport & U.S. 50 @ CVS	Add bench	5.7
1 & 2B	College Parkway & Granite	Add bench	5.2

Source: JAC Ridership Portal and Average Daily Boarding by Stop

Providing space for a traditional bus bench can be a challenge at constrained locations. A popular option developed over recent years is seating that is part of the bus stop pole, such as the paired seats manufactured by Simme, LLC (shown at right). These cost on the order of $600 per pair, depending on the need to improve the foundation of the sign pole. Transit systems that have installed this type of seating include Samtrans (San Mateo County), Sunline Transit (Palm Springs) and Rogue Valley Transit (Medford, Oregon).

FLEET IMPROVEMENTS

Vehicle Fleet Requirements

Within the next five years, a total of seven JAC vehicles will warrant replacement: three 8-passenger Arboc Vans and four 31-passenger El Dorado buses. While the fleet (with these replacements) is sufficient to operate a fifth fixed-route bus, a downtown or special event shuttle could warrant an additional vehicle purchase.

Appropriate Size of Vehicles

The size of transit vehicles used to operate the JAC fixed route service is an important consideration in both the impact of transit operations on the community as well as the quality of service provided by the transit program. At present, the service fleet has a total of seven buses with 31 or 32-passenger seating capacity, along with two mid-size buses with seating for 21 passengers and six smaller vans with seating capacity from 5 to 8. The size of a vehicle used to provide transit service possesses many implications:

- Buses need to be large enough to provide adequate passenger capacity. Specifically, it is desirable to provide a seat for all passengers. While standees on some runs are typically considered acceptable, providing a seat for all passengers (1) improves the rider's experience, (2) reduces the potential for trips and falls, (3) reduces the potential for conflicts between passengers and (4) improves on-time performance by reducing the time needed to board and deboard the bus.

- Large buses provide greater flexibility to accommodate infrequent peaks in passenger loads such as school field trips.

- Smaller buses have less noise and visual presence impacts on neighborhoods than do larger vehicles.

- While smaller buses are less expensive to operate than larger buses, this cost savings is less than might be expected as driver wage and benefit costs are the same for smaller vehicles as for larger buses. Overall, smaller buses are typically only 10 percent to 15 percent less expensive to operate. If the use of smaller buses even infrequently requires operating a second vehicle for peak loads, this can quickly eliminate any cost savings.

- Larger buses have a substantially longer useful life (12 to 16 years) compared to that of smaller buses (6 to 8 years). While smaller buses are less expensive to purchase than larger buses, much of the cost of bus purchases is be funded through state or Federal funding programs. Overall, the per-hour capital costs are roughly similar.

- Larger buses provide a smoother ride than do smaller buses, and can better accommodate passengers with disabilities. Overall, passengers prefer using larger buses.

- Smaller buses without airbrakes may be preferable in instances with driver shortages.

- Maintenance costs of smaller (gas powered) versus larger (diesel fuel) buses.

Driver run manifests showing boarding and alighting activity by run by stop were evaluated for several weekdays in May, 2019 and used to generate the maximum passenger load per run data shown in Table 28. As indicated, up to 24 passengers at one time were carried on Route 1, 23 on Route 2A, 18 on Route 2B and 12 on Route 3. These figures exceed the seating capacity of the existing mid-sized buses on Routes 1 and 2A, and all exceed the seating capacity of the smaller vans. This clearly indicates that using smaller vans (such as 8 to 12 passenger vehicles) that could be also used for JAC Assist would not be feasible. Mid-size buses (in the 21- to 25 capacity range) could potentially be operated but would leave no capacity for any ridership growth or for unusual events. Overall, the existing 31-seat capacity of JAC's larger fixed-route buses is appropriate.

TABLE 28: Maximum Passenger Load by Run

Run Start Time	1	2A	2B	3
6:30 AM	3	11	4	8
7:30 AM	8	8	7	7
8:30 AM	7	7	11	6
9:30 AM	20	11	12	6
10:30 AM	10	9	18	12
11:30 AM	8	23	7	10
12:30 PM	24	8	9	11
1:30 PM	19	11	13	5
2:30 PM	10	14	10	10
3:30 PM	8	11	10	7
4:30 PM	8	5	8	5
5:30 PM	6	2	6	7
6:30 PM	3	5	3	4
Maximum	24	23	18	12

Source: Analysis of driver run manifests.

Battery-Electric Transit Vehicles

Battery Electric Buses (BEBs) are rapidly being implemented in larger transit systems. An excellent example is the Washoe RTC, which was one of the first six systems in the nation to operate a BEB in public transit service, and currently has a fleet of 21 in operation. Recharging BEBs can either occur at the fleet operations facility (generally overnight using a slow charging station) or along the route at stops where at least 10 minutes of time are available (using an overhead fast-charging technology). As an example of cost, Marin County recently purchased two battery-electric vehicles for $1.6 million. The cost includes purchase of the buses, GPS and fare collection equipment purchase and vehicle inspections.

Beyond the issue of cost, a key factor regarding battery electric buses is the potential range between charges. While buses with a range of 120 – 150 miles have been available for several years, some manufacturers have recently announced new technology that can operate up to 350 miles between charges. However, these claims do not reflect the requirements to power onboard heating and cooling systems—an important consideration due to Carson City's climate.

The costs associated with battery electric buses can vary dramatically depending on the status and costing arrangement with the local utility. In particular, the capacity of the local electrical grid serving the maintenance/charging facility is crucial. As an example, a recent study on the conversion of the 51-bus transit fleet for the Yuba-Sutter Transit Authority in Marysville, CA, identified capital charging and electrical equipment (excluding bus purchase costs) as totaling $12 Million. In addition, many transit systems are finding that the high charging loads placed on the local grid trigger high "peak" prices, thereby adding to the operating costs.

Defining the appropriate BEB strategy for Carson City will require a detailed study of the operational, facility, capital cost and environmental options. This study should include the following:

- Compare the cost, facility and operational impacts of BEB versus fossil fuel costs.
- Review existing and planned services and schedules to identify the potential for on-route charging.
- Evaluate the transit center and bus maintenance facility to identify the physical and electrical capacity to accommodate charging equipment and power supply.
- Work with NV Energy to identify charging rates and define strategies to minimize overall costs.
- Assess impacts on maintenance staff and facilities as well as on-the-road service reliability.

This study may warrant consideration of conversion of other elements of the Carson City fleet. The overall results of this study should be a BEB implementation plan that minimizes costs, maintains a good quality of service to the passengers and achieves the environmental benefits of BEB technology as it matures.

Recommended Transit Fuel Strategy

There are several reasons why Carson City should take a "go slow" strategy with regards to the initial implementation of BEBs for the JAC system:

- At present, there are no available smaller vehicles that have met federal testing requirements that are of an appropriate size for JAC services.
- The BEB industry is changing very rapidly, both in terms of the available technology as well as the individual manufacturers.
- As a smaller system, Carson City can less afford to expend funds on changing technologies than can larger transit systems. It is better to monitor the experience of larger transit systems with BEBs over the next few years and learn from this experience.

- Implementing the appropriate charging systems will take time for analysis and construction as well as working with NV Energy.

Fare Technology

Electronic fares or "E-Fares" are popular amongst similarly-sized and larger transit systems. As indicated in the 2017 User Survey, as well as the most recent 2019 online survey, increasing access to purchasing various types of fare were expressed to be very important to Carson City's population. The following e-fare and technological improvements that are currently being explored:

- On-board and Transit Station Wi-Fi
- Online/smart phone fare purchasing
- On-board magnetic card fare, reader, and reload technology

Chapter 9

Long-Range Transit Strategy Analysis

This chapter first presents a review of various factors that can be expected to impact the demand for transit services, as a basis for evaluation of long-range transit needs. This is followed by a discussion of long-range strategies, building upon the evaluation of Short-Range service alternatives presented in the previous chapter.

FACTORS IMPACTING TRANSIT DEMAND

Change in Population

The Nevada State Demographer prepares demographic forecasts on a countywide basis, by age category. The forecasts for Carson City, Douglas County and Lyon County are summarized in Table 29.[10] A review of these forecasts indicates the following:

- Carson City population is forecast to decrease slightly (by 1 percent) over the next five years, but then expand to a 2039 value of 62,108 a 10 percent overall increase, as shown in Figure 34.

- The characteristics of the Carson City population by age cohort will change significantly over time. Youth population (through age 18) is forecast to decrease by 13 percent over the next 10 years but then rebound between 2029 and 2039. Typical "working age" population (19 to 64) is forecast to overall decline over the next 20 years. However, substantial growth will occur in senior population with a 48 percent overall growth in persons 65 to 74, 69 percent in ages 75 to 84, and 53 percent in ages 85 and above. This has important consequences for the need senior transportation, including JAC Assist. Put another way, while persons age 65 and above constitute 21 percent of the Carson City population today, by 2039 this figure will grow to 30 percent.

- Lyon County total population is forecast to remain relatively unchanged with a 2039 population within 500 persons of the current population. However, the number and proportion of residents that are over 75 are forecast to increase by 1,843, or by 38 percent. Those over age 84 will increase by a full 118 percent.

- Similarly, Douglas County total population is forecast to increase only modestly (4 percent) over the next twenty years. Residents ages 65 to 74 will increase by 36 percent, while those age 85 and above will increase by 82 percent.

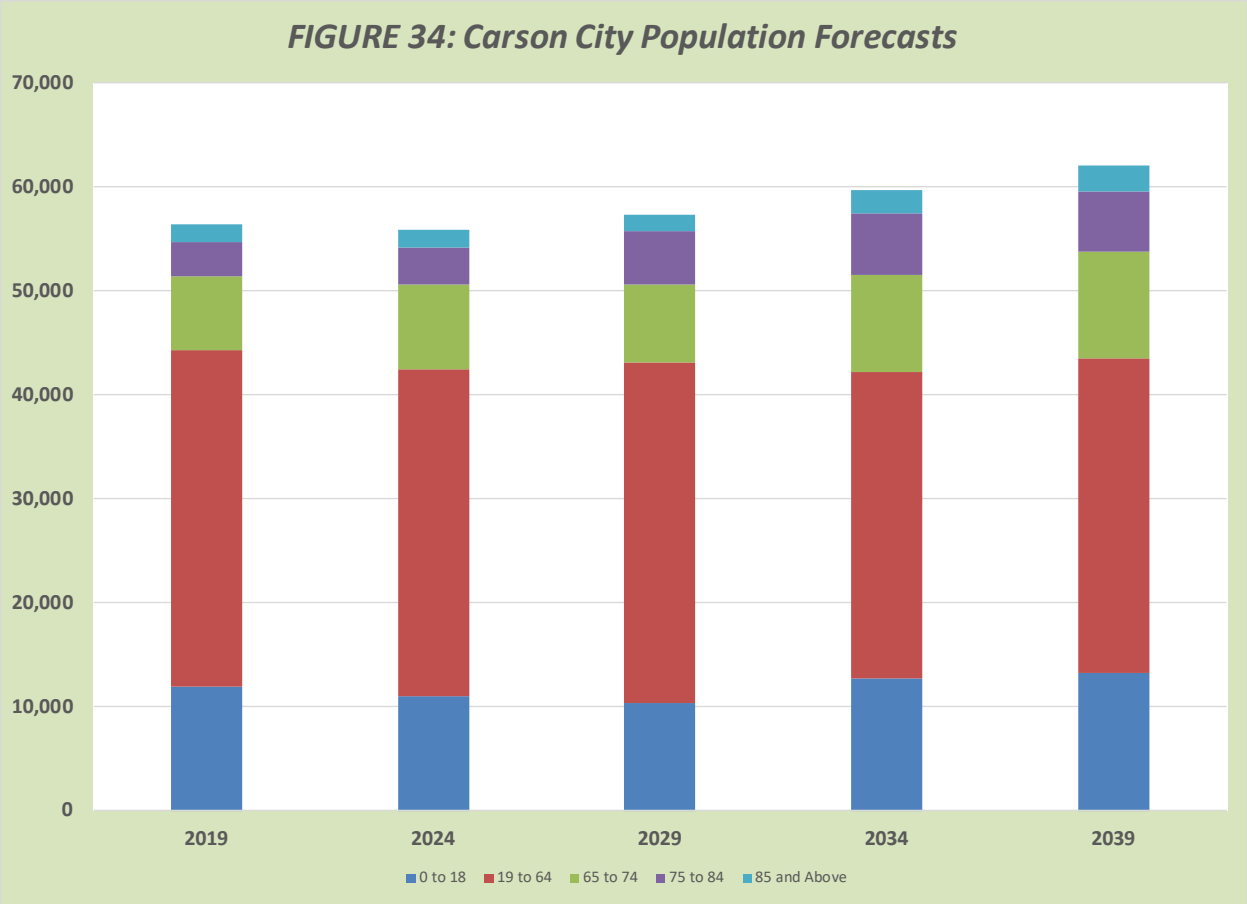
This growth in senior population in Lyon and Douglas Counties will increase the need for medical transportation to Carson City, particularly if Carson City remains a center for medical services in the region.

[10] The State's forecasts extend to 2037. To provide a 20-year timeframe, 2035 to 2037 figures were extrapolated to 2039.

TABLE 29: Population Forecasts by County and Age Cohort

	2019	2024	2029	2034	2037	Est. 2039
Carson City						
0 to 18	11,933	10,938	10,394	12,770	13,080	13,286
19 to 64	32,445	31,480	32,688	29,484	29,926	30,221
65 to 74	6,986	8,206	7,556	9,329	9,931	10,332
75 to 84	3,394	3,629	5,078	5,897	5,800	5,735
85 and Above	1,658	1,708	1,667	2,256	2,422	2,533
Total	56,417	55,961	57,382	59,736	61,159	62,108
% Change From 2019						
0 to 18	-	*-8%*	*-13%*	*7%*	*10%*	*11%*
19 to 64	-	*-3%*	*1%*	*-9%*	*-8%*	*-7%*
65 to 74	-	*17%*	*8%*	*34%*	*42%*	*48%*
75 to 84	-	*7%*	*50%*	*74%*	*71%*	*69%*
85 and Above	-	*3%*	*1%*	*36%*	*46%*	*53%*
Total	-	*-1%*	*2%*	*6%*	*8%*	*10%*
Lyon County						
0 to 18	12,633	12,151	11,903	11,835	11,855	11,868
19 to 64	31,903	32,285	32,011	31,418	31,070	30,838
65 to 74	6,736	6,973	6,568	6,355	6,277	6,224
75 to 84	3,849	4,165	4,580	4,692	4,633	4,593
85 and Above	933	1,409	1,661	1,902	1,980	2,032
Total	56,054	56,984	56,723	56,203	55,815	55,556
% Change From 2019						
0 to 18	-	*-4%*	*-6%*	*-6%*	*-6%*	*-6%*
19 to 64	-	*1%*	*0%*	*-2%*	*-3%*	*-3%*
65 to 74	-	*4%*	*-2%*	*-6%*	*-7%*	*-8%*
75 to 84	-	*8%*	*19%*	*22%*	*20%*	*19%*
85 and Above	-	*51%*	*78%*	*104%*	*112%*	*118%*
Total	-	*2%*	*1%*	*0%*	*0%*	*-1%*
Douglas County						
0 to 18	10,848	11,194	11,371	11,585	11,522	11,481
19 to 64	26,980	26,214	25,660	25,415	25,687	25,868
65 to 74	7,742	8,725	8,677	8,128	7,663	7,353
75 to 84	4,402	4,938	5,515	6,121	6,053	6,008
85 and Above	1,503	1,815	2,158	2,400	2,598	2,729
Total	51,474	52,886	53,381	53,649	53,523	53,439
% Change From 2019						
0 to 18	-	*3%*	*5%*	*7%*	*6%*	*6%*
19 to 64	-	*-3%*	*-5%*	*-6%*	*-5%*	*-4%*
65 to 74	-	*13%*	*12%*	*5%*	*-1%*	*-5%*
75 to 84	-	*12%*	*25%*	*39%*	*38%*	*36%*
85 and Above	-	*21%*	*44%*	*60%*	*73%*	*82%*
Total	-	*3%*	*4%*	*4%*	*4%*	*4%*

Note: With Group Quarters
Source: ASRHO Estimates and Projections Summary, State of Nevada Demographer, 2018



Changes in Employment

The *One Nevada Transportation Plan Draft Travel Demand Model Update* (Wood Rogers, November 2017) indicates that total employment in Carson City is forecast to increase as follows:

- 2015—29,634 jobs.
- 2030—36,720 jobs. (A 24 percent increase over 2015)
- 2040—39,108 jobs. (A 32 percent increase over 2015)

The fact that employment is forecast to grow substantially more than working-age residents in Carson City indicates growth in commuting into Carson City from other counties such as Douglas and Lyon.

Auto Use

The demand for public transit service in urban areas is impacted by the relative cost and convenience of private auto travel. In particular, high rates of paid parking and limited parking availability in key activity or employment centers "drive" much of the demand for transit ridership in our large cities, along with congestion delays. None of these factors are expected to develop over the next twenty years in Carson City. As a result, it can be concluded that the private auto will remain a convenient and popular travel mode choice.

Transportation Network Companies

Transportation Network Companies (TNCs), such as Lyft and Uber are becoming an increasingly important element of the transportation network, particularly in larger cities. While growth has been rapid over the last few years, the long-term role of TNC service is currently uncertain. To date, TNC services have been heavily subsidized, which indicates that rates will increase in the future. In addition, changes in regulations or the economics of being a driver may increase TNC operating costs. Both of these factors may significantly increase fare levels, and thus limit the attractiveness of TNCs compared with using the JAC services. Moreover, TNC services typically do not accommodate persons with disabilities, and particularly those using mobility devices. In addition, many paratransit riders prefer a service that uses consistent public transit drivers (that allow them to form a more stable relationship) than a TNC service where drivers change from day to day. The replacement of JAC Assist with a TNC program is not assumed in this analysis.

Fuel Costs

The cost of gas has in the past had a substantial impact on the demand for transit service (particularly long-distance commuting). While we are currently in a period of moderate gas prices, advances in drilling technology (such as hydraulic fracturing) have helped to keep supplies up and costs down. Over the long term, the growth in electric vehicles and reduction in their costs can be expected to provide an alternative to gas-powered private vehicles and reduce overall operating costs. In sum, no growth in transit ridership associated with an increase in effective per-mile fuel costs is assumed.

Autonomous Private Vehicles

The technology for autonomous vehicles is rapidly advancing. Within this long-range plan period of 2039, it is reasonable to assume that private autonomous vehicle will be available and within the financial reach of many Carson City residents. For many persons unable to drive due to a disability, the availability of an autonomous vehicle that can provide a door-to-door trip can expand mobility options and reduce the need for transit ridership (particularly on JAC Assist).

Autonomous Transit Buses

Autonomous vehicle technology could ultimately eliminate the need for drivers to operate buses. However, transit drivers perform other tasks beyond driving, including collecting fares, providing a security function as well as the crucial role of assisting passengers into and out of the vehicles and in settling and securing the passengers. Many passengers (particularly those more sensitive to security concerns) may well refuse to use a bus without the presence of a driver. There could be the potential to have a lower paid attendant on the vehicles to assist passengers rather than a higher paid driver, which could provide some cost savings. However, in an urban system with a paid fare and many passengers needing assistance, unstaffed AV's would not be appropriate.

Tahoe Reno Industrial Center

The TRIC area development (Tesla, etc.), while large, will have a relatively modest impact on Carson City. Simply put, Carson City is further from TRIC (53 miles one-way) than other areas with development capacity such as Sparks (20 miles) and Silver Springs (22 miles), which limits the attractiveness of Carson City as a residential area for TRIC employees. This is corroborated by recent surveys of existing TRIC

employees, indicating that only 1.8 percent live in Carson City with an additional 0.7 percent living in Douglas County. This development is therefore not expected to significantly impact the need for public transit in the study area.

Summary

In sum, there are factors such as population changes that can be expected to change demand for transit services in reasonably foreseeable ways. Other factors—notably the impact of autonomous vehicles and fuel costs—are very uncertain over a long-range planning horizon. Absent any certainty on these factors, base ridership demand is assumed for purposes of this analysis to change as follows:

- Fixed route demand will change parallel with population growth.

- JAC Assist demand will change with population growth, factored to reflect the significant growth in senior population and that seniors currently generate 32.7 percent of the total ridership.

LONG-RANGE TRANSIT DEMAND AND SERVICE ANALYSIS

Applying these forecast assumptions, the "base" ridership demand figures for fixed route service are shown in the top portion of Table 30. Current passenger loads and capacities of the fixed route services indicate that this ridership growth does not trigger the need for fixed route service expansion. However, JAC Assist service cannot accommodate any significant growth in demand without an expansion of service-hours and additional vehicles. This demand in JAC Assist ridership is shown in the following section assuming expansion parallel with the growth in demand.

The service and ridership impacts of the recommended long-range service improvements can then be analyzed, as shown in the bottom portions of Table 30. Based upon this discussion as well as the results of the service alternatives analysis, the long-range plan incorporates the following service improvement elements, by 5-year planning horizon:

- Implementation of a fifth bus providing service to north Carson City and southeast Carson City starting by 2024.

- Provision of fixed route 4:30 PM Saturday runs starting by 2024 (but no provision of Sunday service).

- Implementation of a downtown shuttle during the Legislative Session and for special events by 2024. As demand for this service grows, full year-round downtown shuttle is assumed to be implemented by 2029.

- Provision of a peak commute route on the Arrowhead corridor starting by 2035.

- Expansion of JAC Assist, consistent with the growth in base demand for the service. Five buses may be required, with vehicle-hours expanding consistent with the growth in ridership.

TABLE 30: Analysis of Long-Range Transit Ridership, Service Quantities and Cost

	2019	2024	2029	2034	2039
Base Demand Ridership					
Local Fixed Route	195,000	193,400	198,300	206,500	211,400
JAC Assist (1)	28,200	28,200	28,200	28,200	28,200
Ridership With Service Enhancements					
Local Fixed Route	195,000	262,400	296,900	305,100	310,000
JAC Assist	28,200	29,400	29,900	32,400	33,200
Intercounty Service	0	7,700	17,000	17,000	17,000
Total	223,200	299,500	343,800	354,500	360,200
% Change From 2019		34%	54%	59%	61%
Vehicle-Hours of Service					
Local Fixed Route	15,000	19,900	23,300	23,300	23,300
JAC Assist	8,200	8,500	8,700	9,400	9,700
Intercounty Service	0	730	1,760	1,760	1,760
Total	23,200	29,130	33,760	34,460	34,760
% Change From 2019		26%	46%	49%	50%
Vehicle-Miles of Service					
Local Fixed Route	178,600	244,100	274,000	274,000	274,000
JAC Assist	88,000	91,700	93,300	101,100	103,600
Intercounty Service	0	17,500	42,200	42,200	42,200
Total	266,600	353,300	409,500	417,300	419,800
% Change From 2019		33%	54%	57%	57%
Peak Buses in Operation					
Local Fixed Route	4	6	7	7	7
JAC Assist	4	5	5	5	5
Intercounty Service	0	1	1	1	1
Total	8	12	13	13	13
% Change From 2019		50%	63%	63%	63%
Annual Operating Costs (2019 Dollars)					
	$1,295,800	$1,593,400	$1,816,300	$1,849,400	$1,863,000
% Change From 2019		23%	40%	43%	44%

Note 1: There is no available existing capacity to expand ridership.

- Provision of an intercounty service connecting Lyon County (and potentially Storey County) with Carson City. This is assumed to consist of three round-trip per day, starting with service one day per week, expanding to two days per week by 2024 and expanding further to five days per week by 2029. Note that specific intercounty plans will require further discussions with the other counties and funding partners.

As shown, in sum these long-range service enhancements along with the base growth in demand will increase total 2039 JAC ridership by 137,000 passenger-trips per year (61 percent). The large majority of this growth (115,000 riders per year) will be on the fixed routes.

Vehicle-hours of service will grow by 50 percent over the next 20 years under this scenario, while vehicle-miles of service will grow by 57 percent. The peak buses in operation will expand

from the current 8 to a total of 13. Of this growth, one vehicle will be JAC Assist, one for shuttle services, two for the regular local fixed route expansion and one for intercounty service. In total, annual operating costs (in constant 2019 dollars) will grow by approximately $567,200 per year or by 44 percent.

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Chapter 10

Social Service Transportation Coordination

The coordinated planning process involves the mutual effort of human service agencies, transportation providers, workforce development agencies, citizens and others who need some form of transportation assistance. As discussed in the previous chapters, the study is based on communication among these entities by sharing the perspectives and specialized expertise that different agencies, organizations and individuals have to offer.

The following includes recommended strategies for consideration to enhance social service mobility, including more traditional approaches and those identified as national best practices.
In addition to a description of each strategy, the potential benefits and the challenges to implementation are discussed.

As a prologue to this discussion, it should be noted that there already is a high level of coordination of services within Carson City. While other communities of similar size have multiple organizations serving individual social service needs, the JAC program—and particularly the JAC Assist service—provides transportation to many social service programs, including Ormsby ARC, REM Nevada, Going Places and the Senior Center. This benefits the region by avoiding the additional costs of individual services. Services connecting the other portions of the CAMPO area (in Lyon and Douglas County) with Carson City programs are less well-developed.

Existing Partnerships and Coordination

Through research and stakeholder group outreach, there did not appear to be any current sanctioned transportation partnerships amongst local social services. In most cases, social service programs were using their own means of transportation to provide accessibility for their clients. For these reasons, future coordination of resources could be a viable solution. The following offers recommendations on how to begin to bring like-services together to provide viable transit options to their clientele.

CAMPO Coordinating Coalition

The first recommendation is to form a CAMPO Coordinating Coalition. The Coalition is group of individuals, agencies, and organizational partners that are committed to improving services available within the community. This group should include local decision makers, business leaders, social service providers and representatives of groups with mobility challenges. The coalition could be either an informal or formal group that is recognized by the decision-makers and that has some standing within the community. Coalitions can be established for a specific purpose (such as to obtain funding) or for broad-based purposes (such as to educate local communities about transportation needs). Their main purpose would be to advocate for improvements of the existing systems and continue to meet periodically to discuss challenges and possible points of collaboration amongst social services. At a minimum, this group should meet semiannually to review and coordinate services.

Joint Planning and Grant Applications

Local agencies should work together to determine transportation needs and priorities for meeting those needs. Transportation needs related to more rural CAMPO areas have been identified as part of this plan and may be used as the basis for grant applications. A single consolidated grant application would then be submitted for each of the funding programs that are used by agencies in that local area. As an example, rural public transit services are eligible for funding through the FTA Section 5311 program. This provides the opportunity for more local decision-making to set priorities for service and often increases the possibilities of funding by showing the cooperative efforts and local priorities.

Public / Private Education and Outreach

Transit Ambassador Program

Under a Transit Ambassador Program, volunteers are trained to work with individuals or small groups to encourage use of transit options. Many persons—particularly those in less urban areas without experience with bus or van services—find the use of a fixed route bus or paratransit service to be intimidating. Transit Ambassadors can work with individuals (such as persons who have recently given up their driver's license) to help them make a reservation and actually ride along on their first trip, to get over the hurdle of this first experience. This can be particularly beneficial in shifting individuals (that have the capability) to shift from paratransit service to fixed route services. In turn, this can benefit both the individual (by providing more travel choices that are not dependent on a reservation) and the transit program by ensuring that limited paratransit resources are targeted towards those individuals most in need of them. Transit Ambassadors can make presentations to groups (such as a senior nutrition program) that can include a quick "demonstration" trip on a transit vehicle.

This strategy can be a great way to market transit services and adjust public perception of transit services, in addition to its primary role in assisting riders and potential riders in understanding how to travel with confidence throughout a transportation network. The training of a Transit Ambassador is primarily designed to assist seniors and individuals with disabilities, but it can also be used as a general public educational program to dispel fears and negative perceptions of traveling via transit. Transit ambassadors can consist of recruited volunteers through various social service agencies and non-profit organizations.

A good example of a Transit Ambassador can be found at the City of Roseville, CA, where city staff manages a Transit Ambassador Program for the four transit services in western Placer County. The program includes conducting a variety of outreach efforts to existing and potential passengers, such as face-to-face assistance to passengers, transit training for potential transit users and attending outreach events. The City of Roseville manages the program, recruits and trains volunteers and provides insurance for the volunteers, while the local social service coalition pays up front for insurance for volunteers and bills Roseville for the cost. Volunteers undergo anywhere from 6 to 30 hours of training. The cost to the City of Roseville for administering the Transit Ambassador program in FY 2016/17 was $37,000. This was used to fund a total of seven Transit Ambassadors contributed 469 volunteer hours.

Staff Training

A lack of up-to-date knowledge among social service staff members regarding mobility options is often a problem. As the "front line" that interacts with social service clients, it is important for agency staffers to

be aware of the availability of services and be able to direct clients and their caregivers to these resources. Meetings (perhaps over lunch) should be held with social service staff members at which Carson City staff (and perhaps others) present the services provided and respond to questions as to how individuals can use the service. Given staff turnover, conducting this meeting on at least an annual basis is recommended.

Marketing Campaign

During discussions with current staff, it does not appear that there have been any active efforts in marketing and outreach within the past ten years. Aside from an annual or biannual press release announcing changes to service or an anniversary, the transit program could benefit from a coordinated effort in a public outreach, advertising, and marketing campaign. As discussed in the next chapter, many of those who took the online survey expressed that they either didn't "know a transit service existed" or were "not aware how it worked and where it went." A targeted campaign and increased presence at local events, social services and institutions could be an effective way to increase ridership from the general public.

Fixed Route Service Strategies to Improve Social Service Mobility

Chapter 7 offers a variety of service alternatives that could help address identified gaps in social service mobility services. The following is a brief summary of these alternatives and how they would meet existing service gaps that have been identified in previous chapters:

- Arrowhead Drive and northeast Carson City provides a lot of employment within Carson City. By providing an Arrowhead Drive service, more people may be able to access the office of Nevada State Human Health and Social Services and other employment opportunities within that area. These may only run during peak hours of service but would provide service to an area not currently served by a public transit.

- Service to Topsy Lane would provide access to various employment opportunities and commercial retail locations most requested in our public workshop and online survey.

- Changes to Route 1 could better serve the FISH Thrift Store.

- Later-evening service has been offered as an alternative to meet the needs of those wanting to attend activities that last past the existing service time of 6:30 PM.

- Increased intercounty transit services to Mound House and the Dayton area (and potentially Storey County) would allow improved access to medical and social services being provided in Carson City for those living in this region of Lyon County.

- Both the "Six-Route" and "Full Pulse" fixed route alternatives would provide service to Yasmer Estates and areas of Carson City currently not being served by public transit.

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Chapter 11
Community Input

In previous chapters, existing transit ridership, social service agencies, and providers of transit and transportation services were identified. This chapter provides an overview of the stakeholder and public outreach workshops, in addition to the online survey conducted. This information has been considered to develop strategies to address the gaps in service and transportation needs identified in the previous chapters.

WORKSHOPS

In an effort to capture in-person feedback from both stakeholders and the general public, two workshops were held between April and May of 2019. In addition to these, another stakeholder workshop took place in July 2019 to present the elements of the draft plan.

Stakeholder Workshop

Using the list of social services described in previous chapters, a group of key stakeholders were invited to a workshop held on April 29th, 2019 at the Carson City Community Center. The workshop was led by LSC Transportation Consultants and Carson City staff, who gave a brief presentation of existing demographics, service performance and social services. This was followed by break out groups where each stakeholder had a chance to discuss a series of questions. The following provides a summary of these questions and the stakeholders' responses.

When discussing *"the strengths and weaknesses of the existing public mobility network,"* stakeholders identified the following:

<u>Strengths</u>

- Current JAC Transit fares are affordable
- JAC, Carson City and CAMPO agencies work well together and have local expertise
- JAC Transit schedule is good
- The major medical center is well served by transit
- Taxi voucher program is a great option
- JAC Free senior bus passes
- Current system serves low-income housing
- Bilingual inclusion
- Phone app is clear and easy to use

<u>Weaknesses</u>

- Bus route service area is limited
- No late evening service
- ¼ mile service area doesn't consider proximity to bus stops
- RSVP is filling in gaps and there are challenges with that
- Restricted funding sources

- Lack of communication of services to the public
- No free passes for disabled persons
- No service to 5th street corridor (Frost/Yasmer)
- Service to FISH is too far away
- No service to Lyon County
- No service to industrial areas

When asked *"what is the top priority transportation needs for each organization and the community as a whole,"* the most commonly expressed needs included the following:

- Improved service to and from the Storey County Senior Center (Including areas of Virginia City/Gold Hill/ Mark Twain)
- Evening services to and from Mound House/Dayton to Western Nevada College
- Expanded services and better connections to and from Lyon County Senior Center and Douglas County Senior Center
- Later evening fixed route services
- Increased service along school route

When asked *what strategies should be pursued to address these needs*, stakeholders suggested the following:

- Connecting WAVE with the Storey County Senior center
- Looking to the existing partnership between Family Support Council and DART as an example of resource sharing and communication between providers
- Providing more service to elementary schools to increase ridership (DART noticed increases through their partnership with the local community center and providing service to the community center from school)
- Increase local marketing to show what current services exist
- Implement special event hours and services seasonally

At the end of the meeting, LSC and Carson City staff distributed public workshop fliers requesting that attendees distribute them amongst their respective workplaces.

Public Workshop

The Public Workshop was held on May 14th, 2019 in the Carson City Senior Center. Similar to the stakeholders workshop, the meeting began with an overview of existing conditions followed by questions. Attendance included people in the senior and disabled communities. The following list provides a summary of identified needs:

- Expanded service to the eastern (Saliman Road) and northern (Arrowhead Drive) areas of Carson City
- Remove barriers to purchasing passes:
  - Frequently out of stock at certain locations
  - Unavailable for purchase online
  - Not enough places for purchase of tickets
- Provide more frequent service to Dayton/Mound House areas.

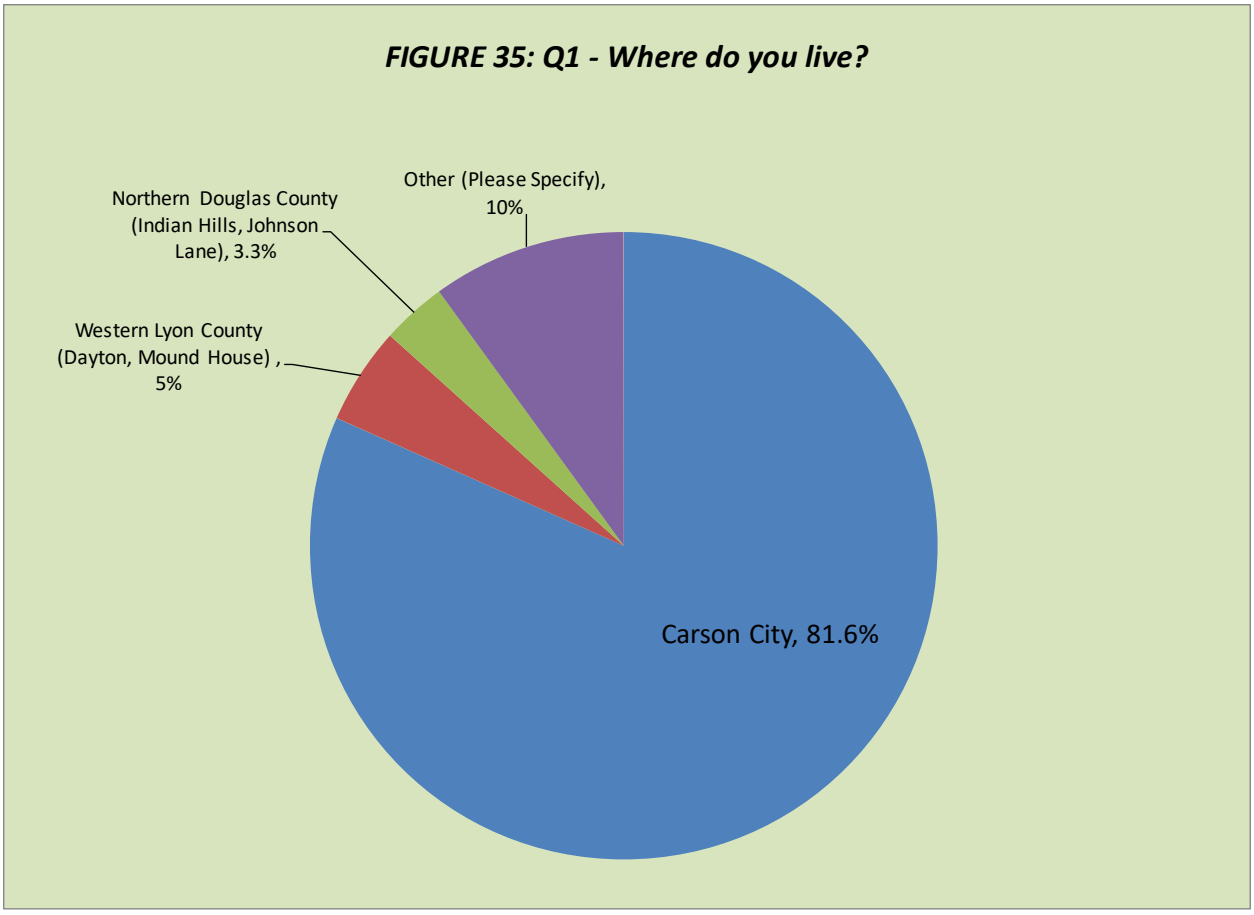
- Expand service to Topsy Lane.
- Add evening service on Saturdays.

ONLINE COMMUNITY SURVEY

Online surveys were conducted during April and May of 2019 for those located in and around Carson City. The surveys were advertised through our identified stakeholders and various social media groups. The survey consisted of 12 questions and an analysis of these surveys is described below. The specific survey form is provided in Appendix A.

Online Survey Results

Question 1—Where do you live?: As shown in the corresponding Figure 35, 82 percent of those who took the survey lived in Carson City. The 10 percent who responded "Other" lived in areas such as Gardnerville, Sparks, Reno, Minden and Stagecoach.



Questions 3, 4, 5, and 6—The following highlights summarize the data presented in Table 31.

- Nearly 64 percent of those taking the survey were between the ages of 25 and 64, followed by 31 percent being age 65 or older.

- When asked about familiarity with JAC Transit, 41 percent answered that they were somewhat familiar, followed by 36 percent stating that they know that a bus service exists but are unfamiliar with the schedule/route.
- Over the past year, 57 percent of those taking the survey had not used any transit services, followed by 36 percent stating that they have used JAC Transit's fixed-route services.
- Of the 57 percent who have not used any transit services in the past year, nearly 41.7 percent indicated that the bus routes do not go where they need to go, followed by nearly 39 percent stating that they need their car during the day for work or to run errands.

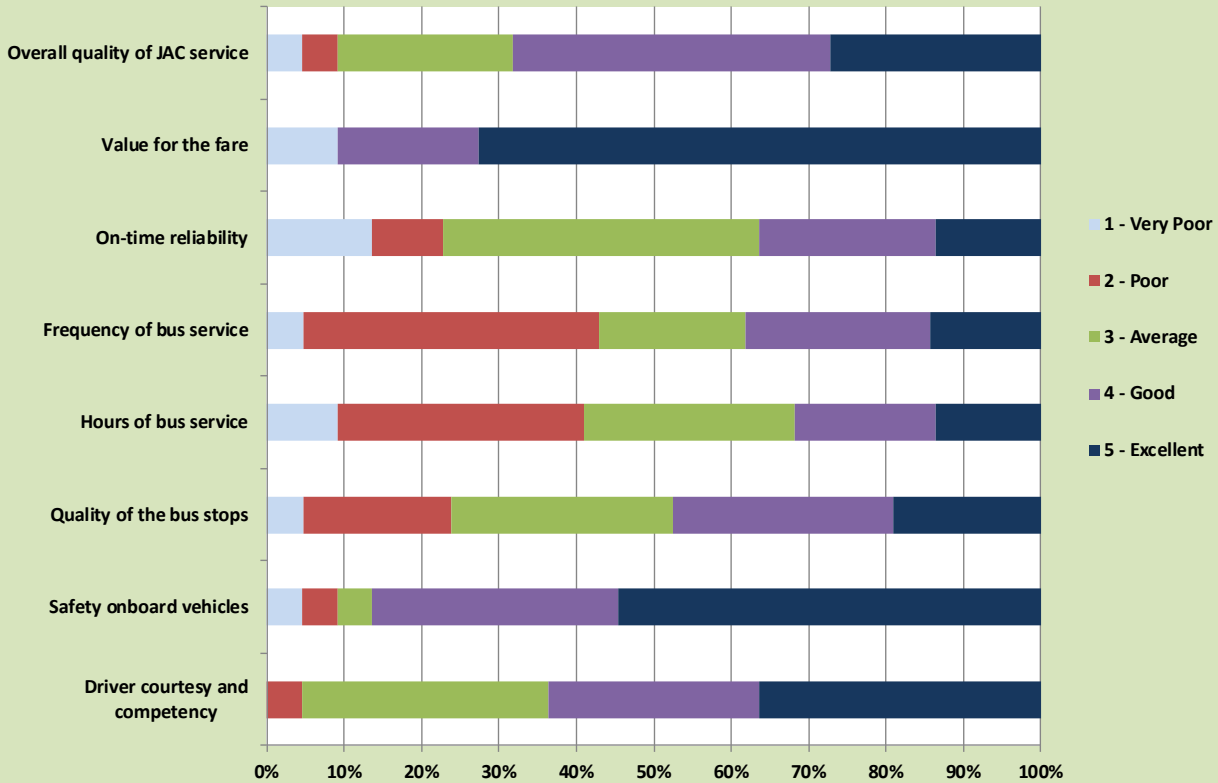
TABLE 31: Online Survey Responses Regarding Age and Use of Transit Services

Question		Responses #	Responses %
Q3	**What is your age?**		
	17 or Younger	0	0.0%
	18 to 24	3	4.9%
	25 to 64	39	63.9%
	65 and Older	19	31.1%
Q4	**How familiar are you with the JAC Transit system?**		
	Very familiar - I use the bus on a weekly basis	12	19.7%
	Somewhat familiar – I've used it before and/or know someone who uses it	25	41.0%
	Not familiar – I know that there is a bus, but I don't know the schedule or any details	22	36.1%
	I didn't know there was public transit in Carson City	2	3.3%
Q5	**Which of the following services have you used within the past year?**		
	JAC Fixed Route	22	36.1%
	JAC Assist	4	6.6%
	RTC Regional Connector	6	9.8%
	TTD Route 18x	2	3.3%
	None of the above	35	57.4%
Q6	**Why do you not use the JAC Transit or other Transit services?**		
	Bus routes do not go where I need to go	15	41.7%
	I need my car during the day for work or to run errands	14	38.9%
	The buses do not operate when I need to travel	3	8.3%
	Buses are not frequent enough	2	5.6%
	The bus trip takes too long	2	5.6%

Question 7—Ranking of Characteristics: The survey asked the public to rank various JAC service characteristics. The following highlights summarize the data presented in Figure 36:

- Overall, respondents had a good opinion of the quality of JAC services, with 68 percent indicating "Good" or "Excellent" and only 9 percent indicating "Poor" or "Very Poor"
- Characteristics that generated a particularly high overall opinion were "value for the fare," "driver courtesy and competency" and "safety onboard vehicles"
- Those characteristics with a relatively low ranking were "frequency of bus service" (with 43 percent indicating "poor" or "very poor") and the hours of bus service (41 percent "poor" or "very poor"
- Of all characteristics, the one with the highest proportion ranking it "very poor" was on-time reliability, at 13 percent

FIGURE 36: Ranking of JAC Transit Characteristics

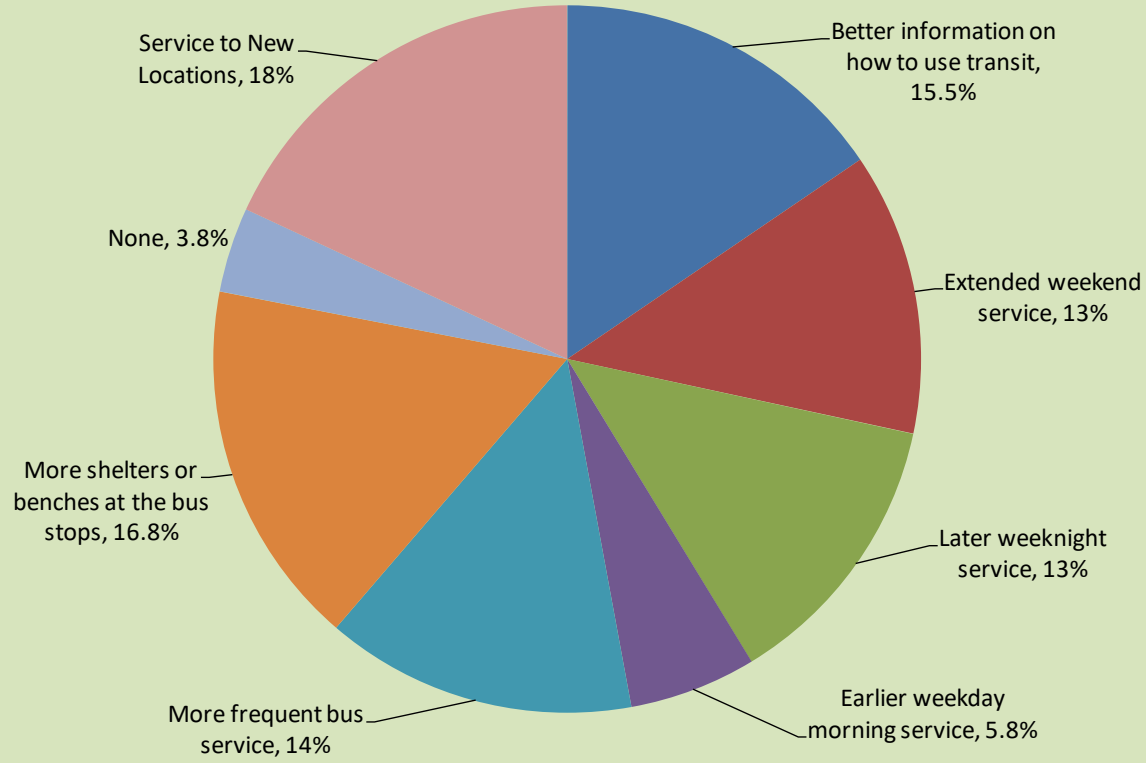


Question 8—Do you agree or disagree with the following statements: Approximately 98 percent of respondents agreed with the statement, "It is good that Carson City has a bus service." In addition, a majority of those surveyed agreed that the JAC buses are clean and comfortable (96 percent) and that they are safe and secure on the buses (98 percent). However, only 40 percent agreed that the bus service is convenient.

Question 10—JAC Transit Improvements: The survey asked the public what improvements could be made to encourage ridership. The following highlights summarize the data presented in Figure 37.

- 18 percent would like to see service to new locations. Many of the responses included schools, Topsy Lane and Saliman Road.
- 16.8 percent would like to see more shelters and benches at bus stops.
- 15.5 percent would like better information on how to use existing transit.

FIGURE 37: What JAC Transit improvements would encourage you to use JAC or ride more frequently?

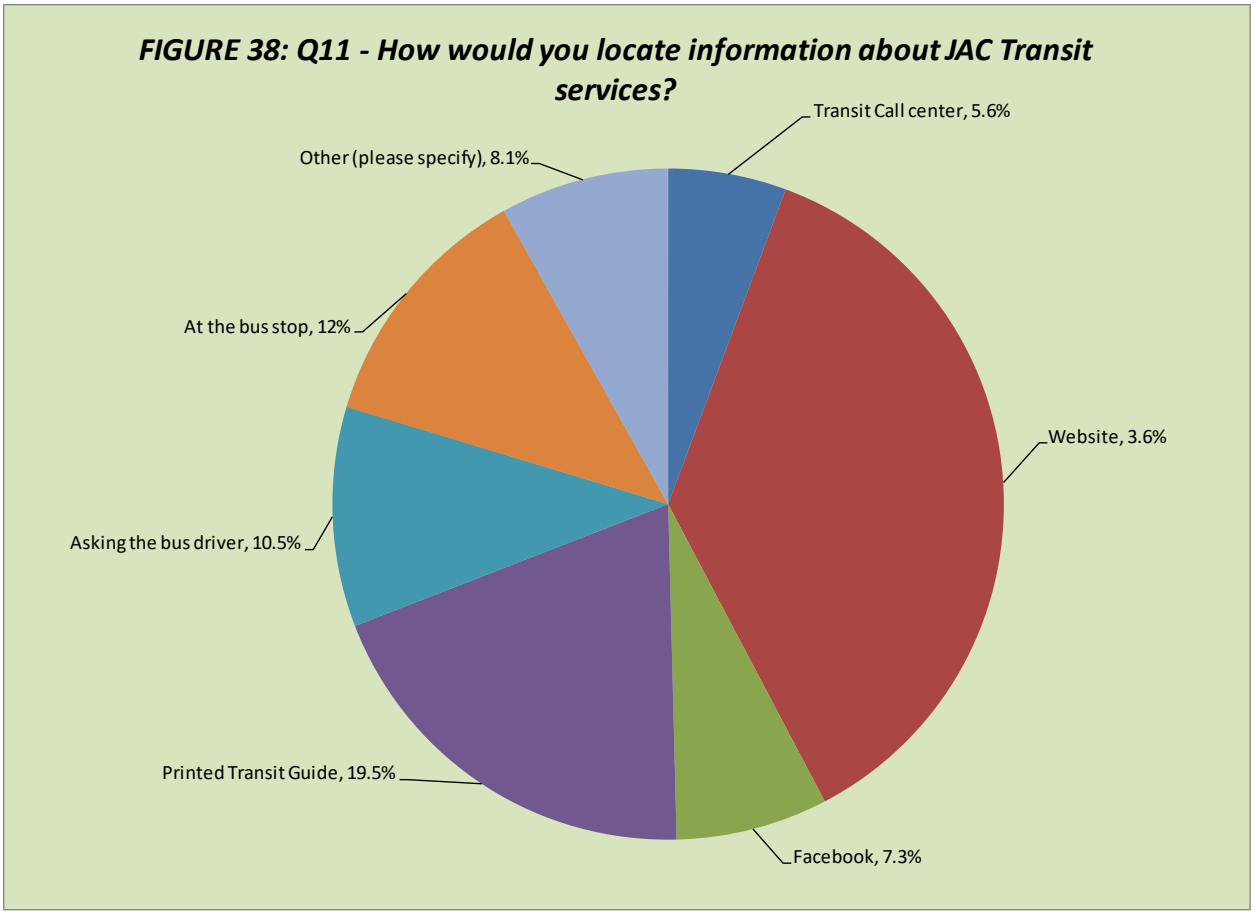


Question 11—JAC Transit Information: As shown in Figure 38, when asked how the public located information about the transit system, the responses were as follows:

- 36.6 percent of people locate bus info from the website.
- 19.5 percent use the printed transit guide.
- Of the ten people that responded "Other", 4 people mentioned that they use the JAC Phone Application.

Question 12—How can transit services in Carson City be improved? As an open ended question, these responses have been included under Appendix B with a brief summary of common responses below.

- Extended service to new areas (including Tospy Lane and Saliman Road)
- Half hour running time rather than one-hour
- First time ride discounts to encourage more ridership
- Holiday service



- Increased marketing and outreach (including better information/signage on-bus as well as at various commonly used stops and shelters)
- No music on the bus
- Service to mound House and Dayton areas
- Create fewer barriers to purchasing the passes

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Chapter 12

Short- and Long-Range Transit Plan

INTRODUCTION

The following plan presents service enhancements, capital improvements, management plan elements and marketing and financial strategies to enhance public transit services in Carson City and the CAMPO region. It is based on a review of existing transit service and demand conditions, analysis of a wide range of alternatives and public input. This chapter presents the individual plan elements in brief based on the substantial discussions presented in previous chapters; the reader is encouraged to refer to previous chapters for additional background on the plan elements. The overall plan features are presented graphically in Figure 39. These service changes build upon the "base" of the existing services, which are planned to continue except as modified by the plan elements.

SHORT RANGE SERVICE PLAN

The Short Range Transit Plan (SRTP) encompasses service strategies that are envisioned for implementation within the coming five years. The recommended service enhancements are listed below and depicted in Figure 39. These service plan elements are considered in two categories: "financially constrained" elements, and "financially unconstrained" elements. While all future funding is dependent on future allocation and grant decisions, for purposes of this plan it is assumed that an annual increase in subsidy funding levels of approximately $225,000 per year (from all sources) is reasonably foreseeable and thus financially constrained.

Fixed Route Service Plan

Financially Constrained

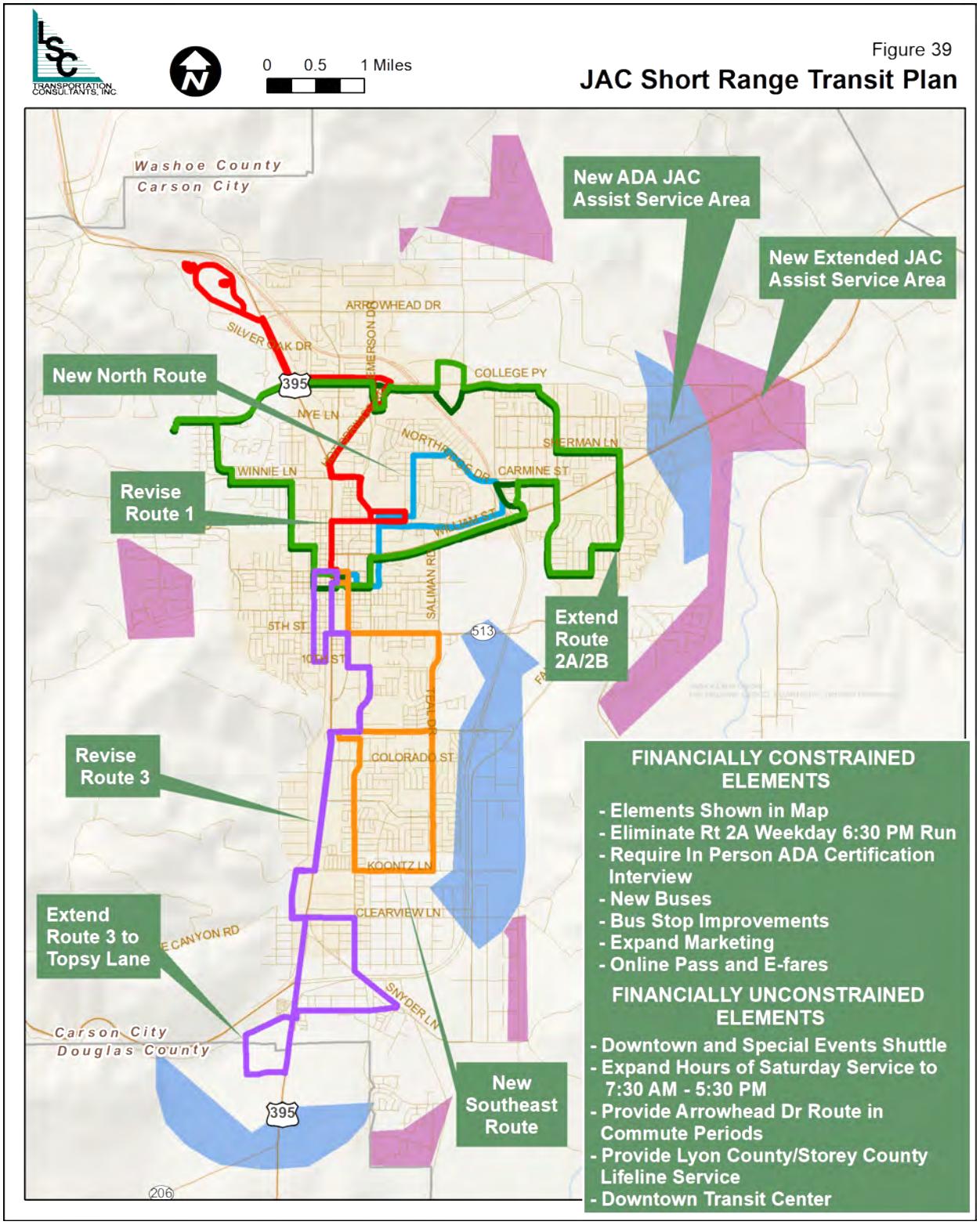
Implement the Six Route Service Plan

The availability of fixed route transit service to Carson City residents could be expanded by operating one additional bus, increasing the number of buses in operation from four to five. This fifth bus would be used to operate two additional routes throughout the day: Route 4 serving the southeast portion of the community (focusing on the Saliman Road corridor) and Route 5 service the central area focusing on Northridge Drive. Example schedules for these two new routes are shown in Table 32. In addition, the following modifications could be made to existing routes to improve and expand service:

- Route 1 could be realigned between the Downtown Transfer Plaza and the Senior Center to use N. Carson Street and Long Street, rather than E. Robinson Street and N. Roop Street. This will provide new service on N. Carson Street. Route 2A/2B could be realigned east of downtown to use Williams Street rather than Long Street. This will save running time that could be used to extend the route beyond its existing easternmost point on Monte Rosa Drive eastward to Fairview Drive, serving new neighborhoods. It would provide faster service between eastern Carson City and downtown.

Figure 39

JAC Short Range Transit Plan



- Route 3 could be realigned to shift to S. Carson Street between Fairview Drive and Koontz Lane, providing a faster trip and improving the ability of this route to served S. Carson Street as it redevelops over time. It could also be extended slightly to Topsy Lane, to provide better access to commercial destinations for Carson City residents and to eliminate the existing turn around through the Costco parking lot.

Additional detailed service planning will be needed prior to implementation of this service strategy, including review of running times, selection of the specific routes and defining and installing new stops.

Overall, these route expansions would provide transit service within a convenient five-minute walk of 11,000 additional Carson City residents resulting in an increase of 27 percent. It would serve new activity centers and schools, and provide some additional service times for specific trips. To provide time needed for the necessary bus purchase and bus stop improvements, this element is planned for implementation in Fiscal Year 2022/23.

TABLE 32: Example Schedules for New JAC Routes

ROUTE 4 Saliman						
Leave Downtown Transfer Plaza	Saliman & Little Ln	Seeliger Elementary	Koontz & Silver Sage	California & Fairview	Fremont Elementary	Arrive Downtown Transfer Plaza
6:30	6:36	6:40	6:45	6:50	6:54	7:02
7:30	7:36	7:40	7:45	7:50	7:54	8:02
8:30	8:36	8:40	8:45	8:50	8:54	9:02
9:30	9:36	9:40	9:45	9:50	9:54	10:02
10:30	10:36	10:40	10:45	10:50	10:54	11:02
11:30	11:36	11:40	11:45	11:50	11:54	**12:02**
12:30	**12:36**	**12:40**	**12:45**	**12:50**	**12:54**	**1:02**
1:30	**1:36**	**1:40**	**1:45**	**1:50**	**1:54**	**2:02**
2:30	**2:36**	**2:40**	**2:45**	**2:50**	**2:54**	**3:02**
3:30	**3:36**	**3:40**	**3:45**	**3:50**	**3:54**	**4:02**
4:30	**4:36**	**4:40**	**4:45**	**4:50**	**4:54**	**5:02**
5:30	**5:36**	**5:40**	**5:45**	**5:50**	**5:54**	**6:02**
6:30	**6:36**	**6:40**	**6:45**	**6:50**	**6:54**	**7:02**

ROUTE 5 - North Central						
Leave Downtown Transfer Plaza	Beverly & Roop (Senior Center)	Marian & Rolling Hills	Northidge & Spooner	Russell & Northridge (MAC)	Long & Roop (H&HS)	Arrive Downtown Transfer Plaza
7:03	7:07	7:10	7:12	7:14	7:19	7:24
8:03	8:07	8:10	8:12	8:14	8:19	8:24
9:03	9:07	9:10	9:12	9:14	9:19	9:24
10:03	10:07	10:10	10:12	10:14	10:19	10:24
11:03	11:07	11:10	11:12	11:14	11:19	11:24
12:03	**12:07**	**12:10**	**12:12**	**12:14**	**12:19**	**12:24**
1:03	**1:07**	**1:10**	**1:12**	**1:14**	**1:19**	**1:24**
2:03	**2:07**	**2:10**	**2:12**	**2:14**	**2:19**	**2:24**
3:03	**3:07**	**3:10**	**3:12**	**3:14**	**3:19**	**3:24**
4:03	**4:07**	**4:10**	**4:12**	**4:14**	**4:19**	**4:24**
5:03	**5:07**	**5:10**	**5:12**	**5:14**	**5:19**	**5:24**
6:03	**6:07**	**6:10**	**6:12**	**6:14**	**6:19**	**6:24**
7:03	**7:07**	**7:10**	**7:12**	**7:14**	**7:19**	**7:24**

Shaded area is Saturday schedule. **Bold** is PM.

Eliminate 2A Weekday 6:30 PM Run

The last run of Route 2A service could be eliminated, to improve overall service performance and providing funding for more effective service expansions. This run currently only serves 2.3 passengers per day. Though riders would experience longer in-vehicle-travel times, Route 2B would still provide service to these passengers. This could be implemented in the near-term, to provide immediate cost savings.

Expand JAC Assist Service Areas

ADA Service Area

Since the Americans with Disabilities Act (ADA) requires complementary paratransit service be provided to all areas within ¾ miles of a fixed route, the fixed route service expansion will trigger a modest expansion of ADA service area. As shown in Figure 39, these expanded ADA service areas are located to the south (south of Topsy Lane), to the southeast (the area east of I-580 between roughly Clearview Drive and Fairview Drive) and to the east (the area along US 50 between roughly Sherman Lane and Sunrise Drive). Based on U.S. Census data, these additional ADA service areas include the residences of approximately 2,630 persons of which 450 are persons with disabilities.

Expanded Service Area

The JAC Assist goes beyond the requirements of the ADA to also provide service in the quarter-mile area beyond the ¾ mile requirement for an additional $1.00 fare. Portions of the boundary of this area cut through some residential areas and leaves some residents just outside the area. While the cost of JAC Assist service makes it infeasible to serve all areas, the expanded JAC Assist area will be expanded as shown in Figure 39 to expand service to more residential areas and to make the service easier to administer. This expanded area includes approximately 7,640 Carson City residents, of which 1,270 are persons with disabilities.[11]

This expansion of both the ADA and expanded service areas will increase ridership by an estimated 950 passenger-trips per year within the ADA area plus 1,450 in the extended service area, for a total of approximately 2,400 passenger-trips per year. This is equal to an 8.5 percent increase in demand. Serving this increase in demand will require one additional vehicle, operating five additional vehicle-hours per weekday. This improvement could be made parallel with the fixed route expansion in FY 2022/23.

Require In-Person Application for ADA Certification

JAC Assist policies could be revised to require an in-person interview as part of the "Part A" application process. An in-person interview provides an opportunity for staff to make a preliminary determination of eligibility as well as providing an opportunity to educate the applicant about the fixed route service and travel training. As existing passengers would not be required to re-apply, this will not provide any immediate reduction in service or costs. However, over the long term requiring an in-person interview has been found to decrease the number of clients by 25 to 30 percent, ensuring that services are

[11] This value was approximated using census tracts information from the US Census Bureau 2013-2017 American Community Survey.

focused on those most in need of curb-to-curb service. A free JAC Assist ride to and from the in-person interview would be provided, if needed.

Financially Unconstrained Service Plan Elements

Downtown and Special Events Shuttle

Downtown Carson City is growing as a retail and entertainment hub and is particularly busy during the Nevada State Legislative session. A convenient shuttle service that could encourage staff and visitors to explore the various elements of the downtown core could enhance economic activity. There are also other special events and activities in the downtown area (such as concerts at the Brewery Arts Center) that could benefit from a shuttle program that ties event venues with off-site parking as well as dining and shopping. So long as services are focused on periods of high demand, a shuttle program could provide a strong benefit to the downtown area.

Accordingly, a downtown shuttle service should be implemented for the 2021 Legislative session on a demonstration basis. This service would run over the course of four months (February through May) on Mondays through Saturdays between 10:00 AM and 5:00 PM.

A specific route should be identified based on a detailed review of bus stop opportunities, and should ensure that one vehicle can provide frequent (no more than every 15 minutes) service. A pilot route could consist of a 1 mile loop that travels along Carson Street, 5th Street, Stewart Street and Robinson Street. This potential route could serve the State Legislature, all commercial retail located along Carson Street and various parking lots located on Stewart Street.

As a demonstration project, leasing a vehicle rather than purchasing a vehicle is recommended. This vehicle should be approximately 25- to 30-feet in length and could be a rubber-tired faux trolley or another distinctive type of vehicle. Bus stops should be established no more than every two blocks apart. A distinctive public image should be established with bus stop signs and marketing materials different from the JAC marketing image as well as a strong marketing effort made prior to and during the service period. To be most effective, the service should be provided at free-fare in order to encourage initial ridership. This pilot demonstration would be evaluated based on daily ridership and overall public perception.

If service for the legislative session has proven successful, a permanent vehicle can be purchased. This would then be available for other special event transportation services. Based on the attendance levels at the Brewery Arts Center and the current parking challenges, a service connecting the venue with parking lots in the southern portion of downtown could serve on the order of 300 passenger-trips per day. For purposes of this plan, this service is assumed to operate during the legislative session starting in 2021, along with 13 special event days per year.

Expand Saturday Service to 7:30 AM – 5:30 PM

The JAC fixed route service provides a relatively limited span of service on Saturdays (compared to that on similar systems), starting at 8:30 AM and ending at 4:30 PM. As passengers can typically not arrive at their destination prior to 9:30 AM and must depart by 3:30 PM, few passengers can use the service for commuting and the time available for many other types of trips are limited. If funds are available,

expanding service to begin at 7:30 AM and end at 5:30 PM would be cost-effective and significantly increase the utility of Saturday service.

Arrowhead Drive Route in Peak Periods

The Arrowhead Drive area in northern Carson City includes approximately 2,500 residents and 3,300 jobs as well as other transit generators such as the Health and Human Services Department. Operating two runs in the morning and two runs in the afternoon commute periods (weekday only) would be cost-effective and would provide transit access to this important corridor.[12]

Lyon County / Storey County / Carson City Lifeline Service

If partnerships with Lyon County or Lyon and Storey Counties can be established, the JAC program should provide "lifeline" transit service to the Mound House/Dayton/Silver City area in Lyon County at a minimum, and the Virginia City area if Storey County participation can potentially also be included. "Lifeline" transit services are intended to connect residents to medical, social programs and other urban services on at least a weekly basis. As a whole, this area shown in Figure 40 has a population of approximately 16,700 residents. Many residents of this area have disabilities (23 percent) or are low income (14 percent), which combined with the limited medical and other services generates a significant and growing need for travel to/from the Carson City area (or beyond, using connecting services).

At a minimum, service should be provided one day a week, with round-trips in the morning, mid-day and late afternoon. This will allow residents the flexibility to make half-day trips, which is particularly convenient for persons that have difficulties with long travel days. Reservations at least 24-hours in advance would be required, though "standing reservations" could also be provided for regular riders (avoiding the need to make a reservation for every trip). A wheelchair-accessible vehicle should be used. While some centralized stops could be served (such as a post office or coffee shop) for passengers that can congregate at such a stop, service to individual residences within at least ¾ miles would be available to ensure persons with disabilities have equal access. As a result, separate paratransit service will not be necessary. In Carson City, service would be provided to the Downtown Transfer Plaza as well as to specific destinations (such as medical facilities) that can be more conveniently served using this bus rather than a transfer to JAC or JAC Assist.

As the service grows in ridership, additional days of service could be provided. In addition, as ridership patterns become established, a more formal schedule could be defined to specific stops.

Service Plan Impacts

Table 33 depicts the annual operating cost for JAC, including the cost of the base case (existing services) plus the impact of the individual plan elements. The costs assume a 3 percent annual inflation rate, as well as the recently-negotiated contractor rates. As shown, the financially constrained plan elements would provide a modest cost savings in the first two years (from the elimination of the 6:30 PM 2A run), and would add $281,200 per year in FY 2022-23, rising with inflation to $289,500 by FY 2023-24. This reflects a 16 percent increase over base (existing) operating costs, adjusted for inflation. The impact of

[12] While service during the mid-day or on Saturday would not be effective in the short-range plan period, this could potentially grow to the level warranting such service in the long term.

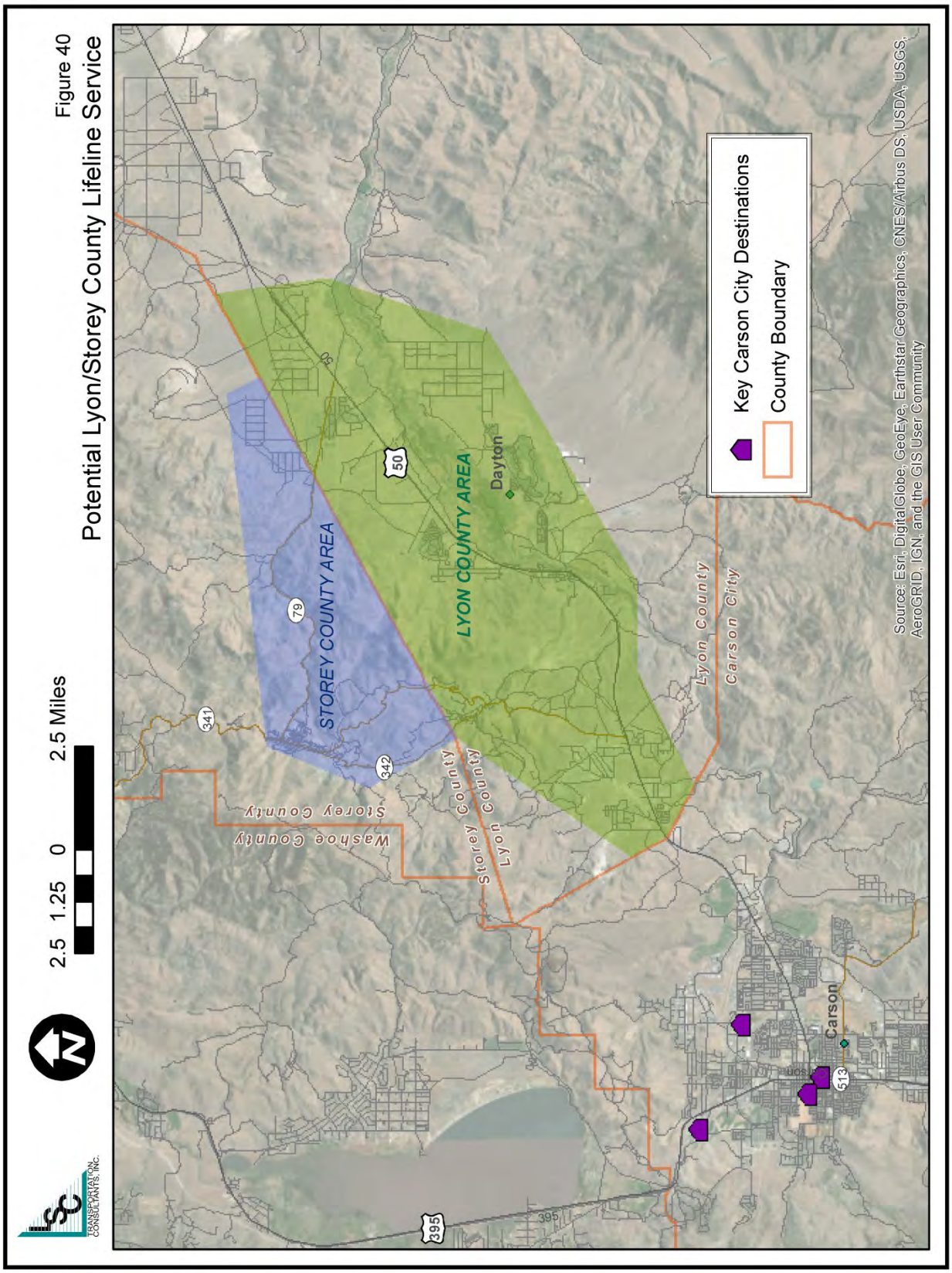


Figure 40
Potential Lyon/Storey County Lifeline Service
2.5 1.25 0 2.5 Miles
Key Carson City Destinations
County Boundary
STOREY COUNTY AREA
LYON COUNTY AREA
Dayton
Carson
Lyon County
Carson City
Storey County
Lyon County
Washoe County
Storey County
50
79
341
342
395
513
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

TABLE 33: Carson City JAC SRTP Estimated Annual Operating Cost

Plan Element	Fiscal Year 2019-20	2020-21	2021-22	2022-23	2023-24	5-Year Plan Total
Base Case Operating Cost [1]	$1,631,400	$1,680,300	$1,730,800	$1,782,700	$1,836,200	$8,661,400
Financially Constrained Service Plan Elements						
6-Route Service Plan	$0	$0	$0	$220,500	$227,100	$447,600
Eliminate 6:30 PM Route 2A Run	$0	-$13,800	-$14,200	-$14,600	-$15,100	-$57,700
Expand JAC Assist Service Areas	$0	$0	$0	$75,300	$77,500	$152,800
Subtotal: Financially Constrained	$0	-$13,800	-$14,200	$281,200	$289,500	$542,700
Percent Increase	*0%*	*-1%*	*-1%*	*16%*	*16%*	*6%*
Financially Unconstrained Service Plan Elements						
Downtown Shuttle Service	$0	$41,900	$6,600	$51,300	$7,000	$106,800
Expand Saturday Service: 7:30 AM – 5:30 PM	$0	$0	$33,300	$34,300	$35,300	$102,900
Arrowhead Drive Route - Peak Periods	$0	$0	$0	$58,900	$60,700	$119,600
Lyon/Storey County Lifeline Service[2]	$0	$23,800	$24,500	$50,500	$52,000	$150,800
Subtotal: Service Plan Elements	*$0*	*$65,700*	*$64,400*	*$195,000*	*$155,000*	$480,100
Percent Change	*0%*	*4%*	*4%*	*11%*	*8%*	5.5%
Total Service Plan Elements	*$0*	*$51,900*	*$50,200*	*$476,200*	*$444,500*	$1,022,800
	0%	*3%*	*3%*	*27%*	*24%*	*12%*
Additional Activities						
Increased Marketing	$25,000	$25,800	$26,500	$27,300	$28,100	$288,221
Total Operating Cost	$1,656,400	$1,758,000	$1,807,500	$2,286,200	$2,308,800	$9,816,900
Percent Change	*1.5%*	*4.6%*	*4.4%*	*28.2%*	*25.7%*	

Note 1: Per 2019/20 Final Budget, excluding capital outlays; assumes 3% annual inflation.
Note 2: 1 day per week starting in July 2020, expanding to a second day in 2022.
Source: LSC Transportation Consultants, Inc.

the unconstrained plan elements would be to add between $64,400 and $195,000 per year (varying by the level of downtown shuttle service). This is equal to 4 to 11 percent over base case costs.

As discussed in greater detail in Chapters 3 and 4, ridership projections for all plan elements are based on the demographics of the area as well as historical ridership trends, peer system comparisons and studies of how ridership has responded in similar systems to similar changes. Typically, it takes two years for expanded services to reach full ridership potential if the service is well advertised. The base ridership is expected to increase consistent with average growth over the last five year (0.6 percent annually). The resulting ridership forecasts are shown in Table 34. Financially-constrained service improvements are forecast to increase ridership (total of fixed and JAC Assist) by 58,500 boardings per year by the end of the five-year SRTP period, which is equal to a 25 percent increase. Significantly, the percentage ridership increase (25 percent) is substantially more than the percentage increase in operating cost (13 percent), indicating a substantial improvement in the overall cost efficiency of the transit program. The financially unconstrained service elements would add another 35,500 boardings per year, bringing the total increase to 93,400 boardings, or 41 percent over base case ridership.

Table 35 shows the estimated fare revenue, based on the projected ridership. The added passengers generated by the financially constrained service enhancements increase farebox revenues by $15,300 in FY 2022-23, rising to $22,400 per year by the end of the plan period (an 8.3 percent increase).

Table 34: Carson City JAC SRTP Estimated Annual Ridership

Plan Element	Fiscal Year 2019-20	2020-21	2021-22	2022-23	2023-24	5-Year Plan Total
Base Case [1]						
Fixed Route	196,300	197,500	198,700	199,900	201,100	993,500
JAC Assist	28,400	28,500	28,700	28,900	29,100	143,600
Total	224,700	226,000	227,400	228,800	230,200	1,137,100
Financially Constrained Service Plan Elements						
6-Route Service Plan	0	0	0	37,300	56,800	94,100
Eliminate 6:30 PM Route 2A Run	0	-500	-500	-500	-500	-2,000
Expand JAC Assist Service Areas	0	0	0	2,200	2,200	4,400
Subtotal: Financially Constrained	0	-500	-500	39,000	58,500	96,500
Percent Increase	0%	0%	0%	17%	25%	8%
Financially Unconstrained Service Plan Elements						
Downtown Shuttle Service	0	10,200	4,100	15,100	4,400	33,800
Expand Saturday Service: 7:30 AM – 5:30 PM	0	0	5,100	5,700	5,700	16,500
Arrowhead Drive Route - Peak Periods	0	0	0	12,100	12,200	24,300
Lyon/Storey County Lifeline Service[2]	0	3,900	4,300	8,700	8,800	25,700
Subtotal: Financially Unconstrained	0	24,300	17,600	56,700	35,500	100,300
Total Increase	*0*	*23,800*	*17,100*	*95,700*	*94,000*	230,600
Percent Increase	*0%*	*11%*	*8%*	*42%*	*41%*	20%
Total Ridership	224,700	249,800	244,500	324,500	324,200	1,367,700

Note 1: Base case ridership assumed to grow at half the pace of population growth (0.67% annually).
Note 2: 1 day per week starting in July 2020, expanding to a second day in 2022.
Source: LSC Transportation Consultants, Inc.

CAPITAL PLAN

Downtown Transit Center

A crucial capital improvement in the development of the JAC service will be the development of a new Downtown Transit Center. The current hub along North Plaza Street has served adequately to date but has a number of deficiencies including the lack of protection from the weather, the lack of facilities for drivers and riders, poor lighting, inconvenient locations of bus loading zones and the provision of an overall poor public image. The service planning conducted as part of this study underscores the importance of a downtown transit hub in the JAC system for both the short term and the long term.

Chapter 8 presents details regarding the recommended program for a new Downtown Transit Center, including space for up to eight buses as well as passenger and driver facilities, as well as location criteria. Fortunately, there are a number of identified potential sites in the downtown area that could be considered.

The first step should be to conduct a detailed study regarding possible sites. This study should compare potential sites with regards to availability ("willing seller"), adequacy to accommodate the proposed program, proximity to major destinations, impact on transit operations, consistency with zoning and other regulations, traffic impacts and impacts on adjacent properties. It should identify development and construction cost estimates. Based on this study, funding opportunities (including potential Federal

TABLE 35: Carson City JAC SRTP Estimated Annual Farebox Revenues

Plan Element	Fiscal Year 2019-20	2020-21	2021-22	2022-23	2023-24	5-Year Plan Total
Base Case [1]						
Fixed Route	$71,300	$71,700	$72,200	$72,600	$73,000	$360,800
JAC Assist	$26,200	$26,300	$26,500	$26,700	$26,800	$132,500
Total	$97,500	$98,000	$98,700	$99,300	$99,800	$1,001,800
Financially Constrained Service Plan Elements						
6-Route Service Plan	$0	$0	$0	$13,500	$20,600	$34,100
Eliminate 6:30 PM Route 2A Run	$0	-$200	-$200	-$200	-$200	-$800
Expand JAC Assist Service Areas	$0	$0	$0	$2,000	$2,000	$4,000
Subtotal: Financially Constrained	$0	-$200	-$200	$15,300	$22,400	$37,300
Financially Unconstrained Service Plan Elements						
Downtown Shuttle Service	$0	$15,300	$6,150	$22,650	$6,600	$50,700
Expand Saturday Service: 7:30 AM – 5:30 PM	$0	$0	$2,000	$2,200	$2,200	$6,400
Arrowhead Drive Route - Peak Periods	$0	$0	$0	$4,400	$4,400	$8,800
Lyon/Storey County Lifeline Service [2]	$0	$7,700	$8,700	$17,400	$17,500	$51,300
Subtotal: Service Plan Elements	$0	$22,800	$16,650	$61,950	$53,100	$103,200
Percent Increase	*0.0%*	*23.3%*	*16.9%*	*62.4%*	*53.2%*	*10.3%*
Total Farebox Revenues	$97,500	$120,800	$115,350	$161,250	$152,900	$647,800

Note 1: Base case ridership assumed to grow at half the pace of population growth (0.67% annually).
Note 2: 1 day per week starting in July 2020, expanding to a second day in 2022.
Source: LSC Transportation Consultants, Inc.

and state funding programs) should be defined and pursued for engineering, environmental clearance, permitting and construction. A total of $60,000 is included in this plan for this planning and project development work.

There are many factors that will impact the overall cost of a Downtown Transit Center such as land availability/costs, environmental remediation costs, and future trends in construction costs. Given these uncertainties, it is not possible to make a reasonable estimate prior to the initial planning work. This project will require identification of funding that does not unduly impact the City's General Fund.

Transit services require a substantial amount of capital items, notably buses and facilities. Planned capital improvements are discussed below, and summarized in Table 36.

Bus Stop Improvements

As detailed in Table 27 in Chapter 8, a review of existing JAC bus stops indicates that the following improvements are warranted:

- 3 additional shelters
- 5 additional benches
- 3 stops needing a short section of walkway connecting the stop with the adjacent sidewalk in order to avoid walking in landscaping materials.

In addition, between the two new routes and the extensions of existing routes, a total of 13.4 miles of new routes would be added. This will require establishing approximately 35 new stops. While the level of stop improvements should be based on observed ridership activity, this plan assumes that four new shelters and five additional benches will be warranted. In addition, it is assumed that half of these new stops would require new wheelchair pads. The following unit costs were applied:

- New bus stop pole and sign—$300
- New pad—$800
- New bench—$800
- New shelter and pad—$8,000

Upon applying these costs, an estimated $37,500 is needed prior to the implementation of the Six Route Plan to construct new poles, signs and pads. The existing stop improvements will cost $32,500, while the remainder of the improvements at the new stops will cost $51,000, for a total of $83,500. The existing stop improvements are spread over the five years of the short-range plan period (adjusted for inflation), while the costs associated with stops along the new routes are incurred in FY 2021/22.

TABLE 36: JAC Short Range Capital Plan

Plan Element	Fiscal Year 2019-20	2020-21	2021-22	2022-23	2023-24	5-Year Plan Total
Vehicle Purchases						
Number of Buses -- Replacement						
Small Bus	0	2	0	0	0	2
Van	0	0	0	3	2	5
Bus	2	0	2	0	0	4
Total Cost (1)	*$650,000*	*$339,900*	*$689,600*	*$524,500*	*$360,200*	$2,564,200
Number of Buses -- Expansion						
Fixed Route Bus	0	0	1	0	0	1
Paratransit Van	0	0	1	0	0	1
Total Cost (1)	*$0*	*$0*	*$514,500*	*$0*	*$0*	$514,500
Bus Stop Improvement Program	$13,700	$14,100	$54,300	$15,000	$15,400	$112,500
Fare Payment Software & Maintenance	$0	$50,300	$10,600	$10,900	$11,300	$83,100
Downtown Transit Center	$0	$30,000	$30,000	TBD	TBD	TBD
Total Capital Plan Elements	$663,700	$434,300	$1,299,000	$550,400	$386,900	$3,334,300

Note 1: All costs include 3 percent annual inflation.
Source: LSC Transportation Consultants, Inc.

Bus Purchases

A total of seven existing buses would need to be replaced over the coming five years as shown in the top portion of Table 36. At current unit prices and assuming a three percent capital inflation rate, this will require $2,800,100 over the SRTP plan period. In addition, one fixed-route bus (35 feet in length) and one additional paratransit van (21 feet in length) will need to be purchased to provide an adequate ratio of spare buses with the planned service expansions, adding $514,500 in capital costs.

Monitor Progress in Battery Electric Bus Technology

The bus purchases listed above are planned to continue to use gasoline and diesel as a fuel. Battery Electric Bus (BEB) technology is rapidly improving, and has the potential to reduce operating/maintenance costs as well as to reduce noise impacts along the routes and overall environmental impacts. At present, however, large BEB buses are on the order of $300,000 more expensive than gas buses. BEB fleets require a large investment in charging facilities and upgrades to the supporting power grid. Smaller transit vehicles (such as the JAC Assist vans) with BEB propulsion, moreover, are not currently available that qualify for federal funding. Due to these factors, Carson City should not immediately shift to BEB transit vehicles but rather should continue to monitor improvements in the technology and reductions in cost to determine if and when this technology is right for the JAC program.

MARKETING AND FARE TECHNOLOGY IMPROVEMENTS

The JAC program has included only modest marketing efforts over recent years. While the system has historically seen small growth in ridership without extensive marketing efforts, increased public education, outreach and advertising will be vital in the system's continued expansion and growth moving forward. The following recommendations are consistent to other relative agency efforts.

Social Media

The JAC Transit system does not currently have an independent social media presence. While it may not be necessary to exist amongst all platforms, most transit systems of similar sizes have a Facebook page and Twitter presence. These platforms are free and would require a simple log in by current staff. Once established, the accounts could friend and follow a variety of active local agencies and organizations such as:

- Visit Carson City
- Carson City, Nevada
- Carson City Department of Public Works
- Carson City Parks, Recreation, & Open Space Department
- Brewery Arts Center
- Douglas County, Nevada
- Carson City Senior Center
- Youth Theater Carson City
- Carson City Sheriff's Office
- Carson City Chamber of Commerce
- Carson City Health and Human Services Department

Having a JAC specific social media presence would connect the transit system to these local agencies and organizations and aid in future transit outreach. The benefits of this networking effort include a platform to announce route change information, special event services and general updates regarding the system. It would also strengthen future public outreach efforts related to expansions. Additionally, Facebook advertisements have been found to be effective in some regions due to their ability to be targeted towards particular demographics such as age and residential location. For instance, marketing

messages can be targeted to the residents of the neighborhoods that will get new service as part of the Six Route Plan.

Marketing Materials and Advertising

JAC currently has some informational marketing materials including small schedule and route pamphlets as well as schedule and route poster boards on buses and at major bus stops. While this level of informational distribution has been sufficient in educating existing riders, we recommend revisiting all current information materials and their levels of visibility. This includes the following:

- Ensure all buses have visibly mounted enlarged schedules and route maps.

- Distribute educational pamphlets to all social service organizations, downtown businesses and hotels.

- Improve physical community engagement efforts overall through increased presence at Carson City special events and Western Nevada University student orientations.

- Increase digital and print advertisements in local news organizations such as *Nevada Appeal* and *Carson Now*.

The implementation of new services (such as the new Southeast and North Routes discussed above) provides an excellent opportunity to conduct additional targeted marketing. Social media options, such as Facebook, provide the opportunity to target marketing to specific neighborhoods at modest cost of a few hundred dollars.

Website Improvements

Currently the JAC Transit website is nested within the official Carson City website. It is currently easy to navigate but will need ongoing maintenance and revisions if future route and schedules changes occur, social media accounts are created and electronic fares are implemented. In addition to minor changes to information presented on the page, the website would require an ecommerce backend website that can process credit cards for ticket purchases or auto-charge for reoccurring monthly pass holders.

Transit Ambassador Program

JAC staff will work with social service agencies to develop a Transit Ambassador program, wherein volunteers are trained to conduct presentations and work with individuals to educate residents on their mobility options. This type of program, which has proven successful in similar communities, encourages new potential riders to use transit services, encourages use of the more cost-effective fixed route services and ensures that riders understand the rules of paratransit services to minimize the cost of the service. Overall, the Transit Ambassador program would expand mobility among area residents while increasing the cost-effectiveness of the overall JAC program.

Marketing Costs

Much of the day-to-day work on marketing can be accomplished using existing staff, so no additional staff is recommended. However, printing and media costs will be incurred, along with some additional website development costs. A budget of $25,000 for these additional costs is included in this plan. This is

in line with transit industry guidelines that marketing should reflect roughly two percent of the total transit operating budget.

Fare Technology

Fare payment technologies for public transit have evolved from paper tickets to magnetic stripe cards, smart cards, and mobile device applications. These next generation transit fare payment systems can be implemented in the form of physical card passes or electronically through "token" transit models.

Our plan has considered the pros and cons of two next generation transit fare payment systems. JAC may either implement a physical card-based fare system for which value is added to a card with magnetic striping or smart chip technology or implement an electronic fare system requiring a phone application that functions as a "token." The positive and negative aspects of each are presented below.

Transit Card

A physical transit card-based system would provide the ability to reload at an electronic kiosk, a physical presence in ones' wallet or purse and general accessibility for those who do not own a smart phone device. In a card-based system, all fare transactions take place at the front-end of the system, at the card reader located at the farebox, barrier, or other transit system point-of-entry (POE). Potential challenges to the implementation of such a system include high costs of physical kiosk and on-board reader maintenance as well as the high likelihood that the system will become out of date in the near future.

Costs of implementing and maintaining a card-based fare program are sobering, particularly for a system of JAC's size. Based on the costs incurred in other services, up-front implementation could total on the order of $250,000, while ongoing maintenance and operating costs would be roughly $20,000 per year. Given the characteristics of JAC ridership, there is only a small potential that the convenience of a transit card would generate any noticeable increase in ridership.

Smartphone Fare Payment

As indicated in the 2017 User Survey, as well as the most recent 2019 online survey, increasing access to purchasing various types of fare electronically was very important to Carson City's population. Electronic fare systems are quickly replacing many transit card systems in creating easier access for those using smart phones. Companies such as Bytemark and Passport Parking are amongst the more affordable mobile ticketing software companies offering these services. Implementation of this sort of system would result in device access to trip planning, schedules and route maps, advisories and alerts functions, and easier maintenance via software improvements over time. Some drawbacks include lack of access by those without smart phone devices and potential system glitches that may occur.

Recommendations

In the short term, JAC should focus on improving access to traditional passes through the following short term actions:

- Strengthen existing Monthly and 10-Ride Pass distribution by offering online purchasing. These passes can then be mailed to passengers' homes once purchased.

- Increase pass purchasing locations and ensure that these locations are stocked with passes more frequently.

- Maintain cash payment fareboxes on all routes.

As the costs associated with these actions are modest, they are considered to be financially constrained. In addition, JAC staff should continue to investigate and monitor the potential for smartphone-based fare systems to become an additional (though not sole) means of paying for JAC fares. This technology is evolving rapidly and become more standardized and may well be a cost-effective option for JAC in the near term.

INSTITUTIONAL PLAN

Establish Service Standards

At present, there are no established service standards for the JAC service. Transit systems typically find that standards are a useful management tool in tracking the effectiveness and quality of services, as well as to help explain to the public why services are operated. It is recommended that service standards be established (considering existing performance and the results of the peer analysis) for the following:

- Passengers per Vehicle-Hour: Fixed Route

- Passengers per Vehicle-Hour: JAC Assist and Rural Route Deviation Service

- Marginal Operating Subsidy per Passenger-Trips: Fixed Route

- Marginal Operating Subsidy per Passenger-Trip: JAC Assist and Rural Route Deviation Service

- On Time Performance Standard: Fixed Route

- On Time Performance Standard: JAC Assist and Rural Route Deviation Service

- Miles Between Accidents

- Miles Between Road Calls

Agreements with Other Counties Regarding Intercounty Lifeline Service

As the potential lifeline service serving Lyon County or Lyon and Storey Counties would benefit residents of these other counties, an intergovernmental agreement will be necessary between the participating counties. While specific details will be based on negotiations, it is the consultant's recommendation that the following be reflected in this agreement:

- Carson City would administer any state or federal grants.

- Carson City would charge to the service the marginal cost (fuel, maintenance, driver wages, marketing, etc.) of the program but would not charge any allocated fixed or administrative

costs. These costs would be based on services provided by the city's service contractor. Not charging allocated costs would be part of the city's effort to support this new service.

- Lyon or Lyon and Storey Counties would be responsible for the local match of any grants used to fund the service.

- Carson City would track the service provided, ridership and passenger fares (by jurisdiction) and provide regular reports to the other jurisdictions.

FINANCIAL PLAN

The financial plan to fund the financially-constrained operating plan elements and capital elements is shown in Table 37. Operating costs and fare revenues are drawn from Tables 33 and 35, respectively. Starting from the adopted budget and negotiated contractor rates for Fiscal Year 2019 – 20, a three-percent annual rate of inflation is assumed and used to increase the rent income, interest income and state grant income. The Division of Health Care Financing and Policy funding for JAC Assist Medicare passengers is assumed to increase proportionate to JAC Assist ridership. The remaining funding needed to address the growth in operating costs is then split 50 percent to Federal sources and 50 percent to the City General Fund, based on Federal operating grant requirements. This forecast assumes the city is successful in gaining the necessary growth in grant funds. By 2024 (the final year of the short-range transit planning period), city operating funding would be 42 percent above current levels (including the impacts of inflation).

Capital funding is shown in the bottom portion of Table 37. Federal funding is assumed for 80 percent of the capital needs, consistent with standard requirements for the 5307 and 5339 programs. City funding requirements will vary depending on the need for vehicle replacement and facility improvements. In particular, the increases in the final two years reflect the assumption that construction of a downtown transit center is underway. Capital funding is contingent on future grant decision-making.
Note that Table 37 does not reflect the financially unconstrained service improvements discussed above, such as the Lyon/Storey County Lifeline Service. These unconstrained plan elements would require funding beyond that shown in the table such as funds generated by other funding partners.

LONG RANGE PLAN

This long range plan builds upon the short range plan and the detailed discussion and analysis presented in Chapter 10 to define transit strategies through 2039. Beyond the short-range plan elements (both financially constrained and unconstrained) as discussed above, the following plan elements are identified for 2024 to 2039:

- Provision of evening transit service on weekdays and Saturdays until approximately 9:30 PM.

- Expansion of the Downtown Shuttle to year-round operation.

- Expansion of the Intercounty Service to Storey and Lyon Counties, ultimately to five days a week.

TABLE 37: Carson City JAC SRTP Financial Plan -- Financially Constrained

Numbers in Thousands	*Fiscal Year*					
	2019-20	2020-21	2021-22	2022-23	2023-24	Total
OPERATING PLAN						
Base Case Costs	*$1,631,400*	*$1,680,300*	*$1,730,800*	*$1,782,700*	*$1,836,200*	*$8,661,400*
Operating Plan Elements (From Table 33)	$25,000	$12,000	$12,300	$308,500	$317,600	$675,400
Total Operating Costs	$1,656,400	$1,692,300	$1,743,100	$2,091,200	$2,153,800	$9,336,800
Operating Revenues[1]						
Passenger Fares (From Table 35)[1]	$97,500	$97,800	$98,500	$114,600	$122,200	$530,600
Rents and Royalties[2]	$13,000	$13,400	$14,200	$15,500	$17,400	$73,500
Interest Earnings[2]	$1,000	$1,000	$1,100	$1,200	$1,400	$5,700
Div. of Health Care Financing & Policy[3]	$34,306	$34,400	$34,800	$35,400	$36,300	
FTA (5307, 5310)[4]	$1,028,194	$1,045,000	$1,068,600	$1,232,800	$1,258,000	$5,632,594
State Grants[2]	$50,000	$51,500	$53,000	$54,600	$56,300	$265,400
City General Fund[3]	$466,300	$449,200	$472,900	$637,100	$662,200	$2,687,700
Total Operating Revenues	$1,690,300	$1,692,300	$1,743,100	$2,091,200	$2,153,800	$9,370,700
CAPITAL PLAN						
Capital Costs (From Table 36)[5]	$663,700	$434,300	$1,299,000	$550,400	$386,900	$3,334,300
Capital Revenues						
FTA (5307, 5339)[6]	$531,000	$347,400	$1,039,200	$440,300	$309,500	$2,667,400
CAMPO Planning Funds	$0	$30,000	$30,000	$0	$0	
City Carry Forward Funds[6]	$132,700	$0	$0	$0	$0	$132,700
City General Fund[6]	$0	$86,900	$259,800	$110,100	$77,400	
Total Capital Revenues	$663,700	$347,400	$1,039,200	$440,300	$309,500	$2,800,100
Total City General Fund	$466,300	$449,200	$472,900	$637,100	$662,200	$2,687,700

Note 1: 2019-20 figures based upon adopted budget.
Note 2: Assumed to increase to keep even with inflation.
Note 3: Assumed to increase proportionate to growth in JAC Assist ridership.
Note 4: 50% of growth in operating costs, subtracting growth in fares, rents, interest, DHCFP and state grant funds.
Note 5: 80 percent Federal / 20 percent local match.
Note 6: 80 percent Federal / 20 percent local match.
Source: LSC Transportation Consultants, Inc.

- Additional runs of the Arrowhead Drive Route, beyond the peak period service included in the SRTP, to provide weekday all-day service.

- Gradual expansion of the vehicle-hours of service provided on JAC Assist. Beyond the one additional vehicle in peak operation identified in the SRTP, current demand forecasts indicate that the peak vehicles will not need to be expanded further.

- Implementation of fare technologies appropriate for the JAC program size as they mature and become more cost-effective.

- Onboard Wi-Fi service.

- Half-hour fixed-route weekday service frequency, implemented as warranted by growth in demand. This plan assumes that half-hourly service is ultimately warranted for the existing four routes and the planned southeast and north routes.

- Potential ultimate conversion to Battery Electric Bus (BEB) technologies, if cost reduction and improvements in range and dependability makes this appropriate for JAC. BEB implementation could potentially be part of a larger electrification program for the overall city fleet.

Table 38 presents the impacts of this long-range plan. As shown, operating costs are forecast to rise relatively slowly over the first five years (27 percent), and more rapidly towards the end of the 20-year plan period to a 2039 figure just over twice the current operating budget.[13] In particular, half-hourly fixed route service contributes to this cost increase.

Ridership is forecast to increase by 52 percent over the coming five years and by 104 percent over the next 20 years. As ridership grows at a faster rate than costs, this indicates that the JAC program will become more cost-effective under this plan.

The JAC program's peak number of buses in operation may increase from the existing eight vehicles by five vehicles over the next five years (two for fixed-route improvement, one for JAC Assist expansion, one for the Downtown Shuttle and one for intercounty service) assuming funding is available for all service elements. An additional five buses would be needed in peak operation with half-hourly service, bringing the total buses in operation to 18. Applying the standard Federal Transit Administration guideline of no more than a 20 percent spare ratio indicates a total fleet size in 2039 of 22 vehicles. Any long range plan is based on assumptions regarding future conditions, which can change significantly. There is a particularly high level of uncertainty at present in the field of transportation planning due to the potential for changes in technology and society that can impact the demand for public transit services. Individual elements of this long-range plan should therefore be carefully considered in light of current conditions prior to implementation. These long-range plan elements are also dependent on funding availability and future budget decision-making.

[13] Note that inflation is not reflected in these long-range figures, in order to provide a better picture of how the program would change from current conditions.

TABLE 38: JAC Long Range Transit Plan

	2019	2024	2029	2034	2039
Annual Operating Cost (1)					
Existing Services	$1,631,400	$1,631,400	$1,631,400	$1,631,400	$1,631,400
SRTP Elements (2)	$25,000	$419,900	$419,900	$419,900	$419,900
Arrowhead Route Full Day	--	--	--	$121,300	$121,300
Downtown Shuttle Expansion	--	--	$74,100	$74,100	$74,100
Evening Service	--	--	$330,000	$330,000	$330,000
Half Hourly Service	--	--	--	--	$809,125
Additional JAC Assist Expansion	--	$17,100	$28,400	$68,200	$85,300
Intercounty Service Expansion	--	--	$65,300	$65,300	$65,300
Total	$1,656,400	$2,068,400	$2,549,100	$2,710,200	$3,536,425
Total Increase	$25,000	$437,000	$917,700	$1,078,800	$1,905,025
Percent Increase	2%	27%	56%	66%	117%
Annual Ridership					
Existing Services	224,700	221,600	226,500	234,700	239,600
SRTP Elements	--	95,700	95,700	95,700	95,700
Arrowhead Route Full Day	--	--	--	5,500	5,500
Downtown Shuttle Expansion	--	--	--	7,600	7,600
Evening Service	--	--	25400	25400	25,400
Half Hourly Service	--	--	--	--	82,100
Additional JAC Assist Expansion	--	1,200	1,700	4,200	5,000
Intercounty Service Expansion	--	--	9,400	9,400	9,400
Total	224,700	318,500	358,700	382,500	470,300
Total Increase	*0*	*96,900*	*132,200*	*147,800*	*230,700*
Percent Increase	*0%*	*44%*	*58%*	*63%*	*96%*
Peak Buses in Operation					
Existing Services	8	8	8	8	8
SRTP Elements	0	5	5	5	5
Half Hourly Service	--	--	--	--	5
Total	8	13	13	13	18
Total Increase	*0*	*5*	*5*	*5*	*10*
Percent Increase	*0%*	*63%*	*63%*	*63%*	*125%*

Note 1: These costs exclude the impacts of inflation. As even a 3 percent inflation rate over 20 years increases figures by 80 percent, excluding inflation effects provides a better picture of the overall impacts.

Note 2: Includes both financially constrained and unconstrained elements.

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Chapter 13

Coordinated Public Transit-Human Services Transportation Plan

This Coordinated Public Transit-Human Services Transportation Plan has been developed through input from human service organizations, public input and evaluations of social service needs and trends. It is built upon the review of existing services and programs (as discussed in Chapter 6) as well as the evaluation of social service transportation needs presented in Chapter 3.

Service Improvements

The following Short-Range Transit Plan elements would enhance social service transportation as discussed below:

- The JAC fixed route expansion (Six Route Plan) would provide new fixed-route service to an additional 2,700 disabled residents of Carson City, 1,800 seniors and 1,700 low-income residents. It would also provide new access to the North Carson corridor (including the FISH Thrift Store), Yasmer Estates and Target.

- Expansion of the JAC Assist service area would provide curb-to-curb service to an additional 1,720 local residents.

- Extended Saturday hours of service would provide greater access to programs and job opportunities.

- Service along Arrowhead drive could allow more people to access the office of Nevada State Human Health and Social Services and other employment opportunities within that area.

- The intercounty lifeline service may significantly expand mobility options for residents of the Mound House and Dayton areas of Lyon County and the Virginia City area of Storey County. These areas include approximately 3,900 persons with disabilities, 3,300 seniors and 2,400 low-income residents who currently have very limited access to medical and urban services.

CAMPO Coordinating Coalition

A Coordinating Coalition may be formed among public transit and social service representatives of the region. This Coalition may meet a minimum of twice per year to:

- Present information and discuss challenges to mobility among area residents.

- Identify ongoing opportunities for coordination of services and grant applications.

- Direct staff training and public outreach efforts.

- Advocate for social service mobility programs.

Joint Planning and Grant Applications

Many of the mobility challenges extend beyond the individual city/county borders and warrant a regional approach to services. CAMPO staff should work with the individual jurisdictions to develop joint grant applications for services extending over these boundaries. New sources of "local match" funding will be essential in expanding the regional social service transportation network. These local services could include sources beyond the governmental jurisdictions, such as major hospitals, the community college and major employers.

Transit Ambassador Program

A volunteer program should be established that develops a group of individuals that are knowledgeable in transit options and are trained in working with social service program clients in expanding their awareness of mobility services. These volunteers can accomplish the following:

- Make presentations to groups (such as senior luncheons) to explain the various transit services, how to use the services and how to gain information on the services. Optimally, these presentations can end with a short ride on a transit vehicle to provide clients with a "hands-on" understanding of the service, as a means of overcoming any caution about using a new service.

- Work with individuals to provide travel training. As an example, a volunteer could meet with resident who has recently lost their ability to drive and conduct a transit trip with them to show how to understand the schedule, board the bus, request a stop and the other elements of using a transit service.

- Work with JAC Assist passengers to better use the service, including how to make reservations, schedule discretionary trips when capacity is available and avoid late cancellations or no-shows.

Staff Training

JAC staff may offer training sessions for social service staffers regarding the transit services and how to work with their clients and the transit program to solve mobility problems. This training can include the following:

- A description of the JAC fixed route and JAC Assist programs, the hours of operation, fares, etc. that is focused on the needs of an individual social service program.

- A discussion of eligibility requirements for JAC Assist and the ways that the more cost-effective fixed route service can meet the needs of clients.

- A discussion of how best the social service program and appointment times can best use the periods of the day when JAC Assist has greater available capacity.

As social service staffers are key in providing information to program clients, and as staff can turn over on a frequent basis, city staff should check in with program managers on at least an annual basis to see if additional training is warranted.

APPENDIX A

JAC Online Community Survey Form

Introduction

The Carson City Area Metropolitan Planning Organization is preparing a plan to guide transit services over the coming years, and we need your input to improve JAC transit services in and around Carson City. We want to know your familiarity with existing public transit services and learn how public transit can better serve your needs. We are interested in your input even if you currently do not use JAC Transit. Please answer the following questions and thank you for your participation!

1. Where do you live
    a. Carson City
    b. Northern Douglas County (Indian Hills, Johnson Lane)
    c. Western Lyon County (Dayton, Mound House)
    d. Other: _____

2. What neighborhood do you live in? Please provide a major intersection near your home: _____ and _____

3. What is your age?
    a. 17 or younger
    b. 18 to 24
    c. 25 to 64
    d. 65 or older

4. How familiar are you with the JAC Transit system?
    a. Very familiar - I use the bus on a weekly basis
    b. Somewhat familiar – I've used it before and/or know someone who uses it
    c. Not familiar – I know that there is a bus, but I don't know the schedule or any details
    d. I didn't know there was public transit in Carson City

5. Which of the following services have you used within the past year? *(Check all that apply)*
    a) JAC fixed route
    b) JAC Assist
    c) RTC Regional Connector between Carson City and Reno
    d) TTD Route 19X between Carson City and Minden
    e) None of the above

6. (If #5 not equal a or b) Why do you not use the JAC Transit services?
    a. I have a disability that precludes use of the bus
    b. Bus routes do not go where I need to go
    c. The buses do not operate when I need to travel
    d. Buses are not frequent enough
    e. The bus trip takes too long
    f. The fare is too high
    g. I don't feel safe riding the bus
    h. Buses are too crowded
    i. I need my car during the day for work or to run errands
    j. Other *(please specify)* _____

7. (If 5 = a,b) If you currently use JAC fixed route or Assist services, or have used in the past, please let us know what you think by ranking the following *(1= Very Poor to 5=Excellent)*

	1	2	3	4	5
Driver courtesy & competency					
Safety onboard vehicles					
Quality of the bus stops					
Hours of bus service					
Frequency of bus service					
On-time reliability					
Value for the fare					
Overall quality of JAC service					

8. Please indicate whether you agree or disagree to the following statements:

	Agree	Disagree
It's good that Carson City has a bus service		
The buses are clean and comfortable		
The bus service is convenient to me		
I feel safe and secure on the bus		

9. Please indicate why you did or did not agree with the previous statements:
   - It's good that Carson City has a bus service _____
   - The buses are clean and comfortable _____
   - The bus service is convenient to me _____
   - I feel safe and secure on the bus _____

10. How would you locate information about JAC Transit services? *(Check all that apply)*
    a. Transit Call center
    b. Website
    c. Facebook
    d. Printed Transit Guide
    e. Asking the bus driver
    f. At the bus stop
    g. Other: _____

11. What JAC transit service improvements would make you more likely to use JAC or encourage you to ride more? (Please check all that apply)
    a. Better information on how to use the transit
    b. Extended weekend service
    c. Later weeknight service
    d. Earlier weekday morning service
    e. Service to new locations (*if so, where* _____*)*
    f. More frequent bus service
    g. More shelters or benches at the bus stops
    h. None
    i. Other (Please specify) _____

12. In general, how can transit services in Carson City be improved to better serve the community?
    _____

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APPENDIX B

JAC Online Community Survey Comments

APPENDIX B: Online Survey Open Ended Responses

In general, how can transit services in Carson City be improved to better serve the community?
Adding Topsy stop.
An evening services say until about 9.00 pm. Service more of the East Side of town. Half hour service, instead of having to wait a whole hour if bus is missed.
Better coverage and increased frequency.
Better link-ups with surrounding areas (South Lake Tahoe, Incline, Reno) so people don't need to drive.
Better signage on the bus itself. What does counterclockwise mean if I don't know the route? Transportation up and down Spooner to the state parks.
Coordination with surrounding counties; expand services south (Stewart area) and east (neighborhoods along hwy 50 corridor.
Do you have student/senior (or 'Honored Citizens' as Seniors are called in Portland, Oregon) passes? Do you have ways to introduce people to using rapid transit? (Offer a first-timer discount and even a repeat customer discount to get the ball rolling.... maybe offer passes to schools to give to students for 'Citizen of the Month' awards and such. Allow some freebies to generate more use and get people into the habit of using public transport. Have KOLO News do a piece every week for a while. (Public Service Announcements?) Offer service between casinos? Offer service from specific neighborhoods to grocery stores/WalMart/CVS and/or Walgreens/laundromats.... I'm just throwing ideas out there.
Downtown circulator, service on holidays (just because it's a holiday doesn't mean people don't need to get places). Please add trash cans to highly-used stops.
Easier to find out about.
Extend the hours and boundries of the bus
Faster central routes and more coverage of the area.
Faster times
Further out
Half hour run times not hour, more locations around town, routes listed on stops
Have longer hours, rather than stopping at 7 p.m. go until 11 at least
Have more routes and more times
Have service information more readily available to the public and simplified. Maps of routes are very confusing - why use clockwise and counter clockwise concept? Why not just simply list pick-up and drop-off locations and their times?
I'd say keep up outreach and always tinker with line routes and frequency. As I'm sure you know, effective transit moves people between destinations. Identify destinations and then boost length of service (i.e., morning to night) and frequency as much as you can afford. Aim to be a viable alternative to driving.
Increase frequency evenings.sunday
it is nice to have a transit system in Carson city
Just try and make it more on schedule. We have some extreme weather so difficult for some people having to wait for late buses. Maybe a pick up close to the Seeliger school. That would be super convenient for people in the neighborhoods around the school.
Keep cars off the road and public safe
Later workforce transport on Saturday
longer hours, say midnight.
Look to service areas in need such as Micah dr.and Carson st.
More frequent pickups and closer bus stops.
More reliable service
more routes
More shelters and probably impossible 20 min waits.
More stops
More stops and better covered us stops.
More stops within residential neighborhoods, earlier and later service 7 days a week, free shuttle service during drinking holidays, e.g. 4th of July, New Year's Eve, Nevada Day.
More transit maps at public locations such as Dr. offices, hospital, public offices, grocery stores, etc. as I do not believe people are aware of the services offered. More frequent stops and extended hours of operations.
Not really sure yet
Not sure
Please see above statement on separate bus service to the airport!
Put stops on College Parkway
Run more, more stops, more often
See above. Carson has a very active "outdoor" community. If JAC busses could take hikers and bikers to trailheads, I believe it would be a hit.
Smaller buses. More routes. Shorter wait times.
Some of the bus drivers are not friendly, but for the most part they are much friendlier than in other cities. Two points: bus drivers often talk to passengers. They should never do so, instead paying attention to the road. Put in a sign no talking to the driver when the bus is in motion. Other point, why do bus drivers have to play music? It almost seems it is there for their own satisfaction. I don't want music blasting when I am in a bus, particularly music I don't care for.
Tap the recreational market - bikers, hikers, concert/restaurant goers.
The basic service is as good as it gets, just like to see more frequency of times, later times and up to mound house and Dayton.....thank you for a great community service.....also reduced carbon footprint
Uber
Update the app times
We had to get a disabled pass for my son and it was not very clear how to get a card the first time. We were told we needed a medicare card and at 21 he doesn't have one. It took some calling around to find out where to go and that we only needed his SSI approval letter. It shouldn't be that hard. I was able to do it but if a person with intellectual disabilities needed to do it on their own it could be very difficult.

APPENDIX C

Carson City JAC Transit 10 Year Financial Plan

APPENDIX C: Carson City JAC 10 Year Financial Plan

Numbers in Thousands	*Fiscal Year*										
	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	Total
OPERATING PLAN											
Base Case Costs	*$1,631,400*	*$1,680,300*	*$1,730,800*	*$1,782,700*	*$1,836,200*	*$1,878,387*	*$1,921,590*	*$1,965,786*	*$2,010,999*	*$2,057,252*	*$8,661,400*
Operating Plan Elements (From Table 33)	$25,000	$12,000	$12,300	$308,500	$317,600	$326,006	$333,489	$341,188	$349,003	$357,035	$675,400
Total Operating Costs	$1,656,400	$1,692,300	$1,743,100	$2,091,200	$2,153,800	$2,204,393	$2,255,079	$2,306,974	$2,360,002	$2,414,287	$9,336,800
Operating Revenues[1]											
Passenger Fares (From Table 35)[1]	$97,500	$97,800	$98,500	$114,600	$122,200	$123,300	$124,100	$124,800	$125,500	$126,200	$530,600
Rents and Royalties[2]	$13,000	$13,400	$14,200	$15,500	$17,400	$20,000	$23,600	$28,400	$35,000	$44,100	$73,500
Interest Earnings[2]	$1,000	$1,000	$1,100	$1,200	$1,400	$1,600	$1,900	$2,300	$2,800	$3,500	$5,700
Div. of Health Care Financing & Policy[3]	$34,306	$34,400	$34,800	$35,400	$36,300	$37,300	$38,600	$40,200	$42,200	$44,400	
FTA (5307, 5310)[4]	$1,028,194	$1,045,000	$1,068,600	$1,232,800	$1,258,000	$1,280,200	$1,301,900	$1,323,400	$1,344,300	$1,364,400	$5,632,594
State Grants[2]	$50,000	$51,500	$53,000	$54,600	$56,300	$57,600	$58,900	$60,200	$61,600	$63,100	$265,400
City General Fund[3]	$466,300	$449,200	$472,900	$637,100	$662,200	$684,393	$706,079	$727,674	$748,602	$768,587	$2,687,700
Total Operating Revenues	$1,690,300	$1,692,300	$1,743,100	$2,091,200	$2,153,800	$2,204,393	$2,255,079	$2,306,974	$2,360,002	$2,414,287	$9,370,700
CAPITAL PLAN											
Capital Costs (From Table 36)[5]	$663,700	$434,300	$1,299,000	$550,400	$386,900	$394,239	$214,888	$24,648	$25,418	$26,100	$3,334,300
Capital Revenues											
FTA (5307, 5339)[6]	$531,000	$347,400	$1,039,200	$440,300	$309,500	$315,400	$171,900	$19,700	$20,300	$20,900	$2,667,400
CAMPO Planning Funds	$0	$30,000	$30,000	$0	$0	$0	$0	$0	$0	$0	
City Carry Forward Funds[6]	$132,700	$0	$0	$0	$0	$0	$0	$0	$0	$0	$132,700
City General Fund[6]	$0	$86,900	$259,800	$110,100	$77,400	$78,839	$42,988	$4,948	$5,118	$5,200	
Total Capital Revenues	$663,700	$347,400	$1,039,200	$440,300	$309,500	$315,400	$171,900	$19,700	$20,300	$20,900	$2,800,100
Total City General Fund	$466,300	$449,200	$472,900	$637,100	$662,200	$684,393	$706,079	$727,674	$748,602	$768,587	$2,687,700

Note 1: 2019-20 figures based upon adopted budget.
Note 2: Assumed to increase to keep even with inflation.
Note 3: Assumed to increase proportionate to growth in JAC Assist ridership.
Note 4: 50% of growth in operating costs, subtracting growth in fares, rents, interest, DHCFP and state grant funds.
Note 5: 80 percent Federal / 20 percent local match.
Note 6: 80 percent Federal / 20 percent local match.
Source: LSC Transportation Consultants, Inc.

Carson City JAC Transit Center Study

Final Report

July 17, 2023

Prepared for the

Carson City Department of Public Works

Prepared by LSC Transportation Consultants

Carson City JAC Transit Center Study

Final Report

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July 17, 2023

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INTRODUCTION

Public transportation is an important service in and around Carson City. Transit services provide mobility to residents, including access to important educational, medical, recreational, social, and economic services. In addition to being important to residential quality of life in Carson City and beyond, public transit services assist in supporting educational programs, public and private employers and social service programs throughout the region.

In an effort to better serve Carson City, the City commissioned LSC Transportation Consultants to conduct the following study to explore the possible relocation and/or expansion of the existing transit center (the Downtown Transfer Plaza) along the east side of Plaza Street south of Washington Street to better serve existing passengers as well as to accommodate future transit service growth. This facility would serve as the hub for the Jump Around Transit (JAC) public transit service, as well as the key downtown Carson City stop for other regional transit services such as Washoe RTC Regional Connector service to Reno, Tahoe Transportation District service to Minden/Gardnerville, and Eastern Sierra Transit Authority service to Bishop and Reno.

This document first presents a review of the existing transit center followed by a summary of other plans regarding the transit service and the downtown area. Future transit center needs are then evaluated, including input from transit staff. An initial set of potential sites are described and assessed followed by a summary of public outreach efforts, including an on-site popup workshop and public survey. A focused set of three sites is then evaluated. Based on this detailed analysis, recommendations are presented towards a preferred site.

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Chapter 2
EXISTING CONDITIONS

EXISTING DOWNTOWN TRANSFER PLAZA

The current transit hub of the JAC fixed route system is the Downtown Transfer Plaza. This limited facility consists of the curb along the eastern side of N. Plaza Street between E. Robinson Street and E. Washington Street, as well as a portion of the curb on eastbound E. Washington Street just east of Plaza Street and a portion of the curb on westbound Robinson Street just east of Plaza Street. This site is adjacent to the Federal Building, which encompasses the entire block. There is a total of 260 feet of curb length available for buses along Plaza Street, excluding a driveway to a parking lot. This is sufficient to accommodate up to six vehicles at one time. At present, up to four JAC buses are at the Plaza at peak times (at 30 minutes past each hour). Up to approximately 40 passengers can be waiting for buses at peak times.

Beyond the curbside bus loading locations, this facility consists of a 14-foot-wide sidewalk (sufficient for wheelchair loading and unloading), along with an 8-foot-long shelter at the south end and a 20-foot-long shelter at the north end. There are three 6-foot benches and a bike rack.

Existing Site Conditions: Strengths and Weaknesses

The current transit center location has both benefits and challenges. The current transit center provides a reasonably convenient location with regards to downtown activity centers as well as efficient bus movements into and out of the site. It is also well located within the fixed route system. However, there are numerous challenges to the existing transit plaza, including the following:

- It lacks restroom facilities for drivers. Drivers currently have to depart their buses (requiring all passengers to disembark) and go into the Carson Nugget to use their restrooms (on a “gratis” basis). This additional walk time can add roughly five minutes to the layover time at the transit plaza and can add to service delays.

- It provides insufficient protection from the elements. In particular, the west facing shelters lack adequate seating capacity for peak waiting loads, provide little to no shade in the late afternoon on hot summer days, and deliver scant protection from wind-driven rain and snow.

- Because of the limited seating and shade opportunities, passengers are tempted to wander into the landscaping areas of the Federal Building, potentially causing damage.

- Lighting is limited to two streetlights and low lighting in the shelters. As a result, passengers are often boarding and alighting in dark locations, adding to safety concerns.

- Walks of up to 400 feet are required between Intercity and JAC buses, inconveniencing passengers and increasing the delays as passengers transfer between services.

RECENT PLANNING DOCUMENTS

JAC Transit Development and Coordinated Human Services Plan (2019)

The Carson City Regional Transportation Commission (RTC), using funding through the Nevada Department of Transportation (NDOT) and the Carson Area Metropolitan Planning Organization (CAMPO), retained LSC Transportation Consultants, Inc. to prepare a Transit Development and Coordinated Human Services Plan (TDCHSP) for the Jump-Around-Carson (JAC) public transit program and the CAMPO service area in 2019. This planning process provided an opportunity to develop integrated short- and long-range recommended alternatives for the JAC public transit program while meeting the needs of the region's human services organizations by promoting coordination amongst agencies.

As a long-term capital investment, the plan stressed the importance for a transit center that would be able to accommodate the needs of the transit program for at least the next twenty years. The following describes design elements and site consideration the plan recommended for consideration.

Design Elements

Specific design elements that should be considered in the redesign of the future transit center should include the following:

- Bus Loading Area: The facility needs to accommodate up to four JAC fixed route buses as well as a Washoe Intercity bus or a TTD bus. The space should also accommodate a downtown microtransit shuttle vehicle. Lighting should be provided for all loading areas.

- Passenger Facilities: A climate controlled indoor waiting area should be provided with a minimum floor area of 600 square feet (such as 15' X 40'). This waiting area should have clear lines of sight for security purposes, as well as a clear view of approaching buses. Public restrooms are not necessary so long as public restrooms are available within a block walk. In addition, outdoor shaded passenger waiting areas should be provided with benches, totaling approximately 1,500 square feet in area.

- Bicycle racks or other bicycle parking should be provided.

- Driver Facilities: As the key facility for the transit drivers, restroom facilities should be provided. In addition, a separate entrance (with key card access) should be provided to a portion of the space that includes a driver break room as well as the restrooms.

- Improved Passenger Information: "Real time" information screens should be provided in the facility that provides information on schedules, service interruptions and public notices.

- A small utility space (approximately 160 square feet) should be provided for custodial storage.

Site Location Considerations

The following are key elements in considering the location of a transit center. These key elements were considered in the creation of the potential site criteria evaluated in Chapter 5.

- Adequate size to accommodate the transit program.
- Proximity to the center of the local transit service area, to minimize out-of-direction travel time and costs. Given the many times per day that transit vehicles travel to and from the site, even an additional distance of a few blocks can add thousands of dollars to the annual operating costs.
- Convenient access for regional transit routes that minimize out-of-direction travel.
- Adequate access, thus avoiding excessive delays for transit routes.
- Convenience to major trip destinations. As the single location most accessible by public transit, it benefits the overall effectiveness of transit services if there is a concentration of transit trip generators (shopping, community facilities, public offices, etc.) within a convenient walk distance of the transit center.
- High visibility that enhances the community's awareness of transit services.
- Personal security and safety. Locations in areas with a high crime reputation (deserved or not) should be avoided, and locations that have greater vehicle and pedestrian activity are preferable.
- Appropriate zoning and consistency with community plans.
- Availability of adequate utilities.
- Lack of known hazardous soils.

In addition to transit center facility study recommendation, the plan also suggested rerouting specific routes, improving various bus stops, and implementing a strong marketing plan.

JAC OPERATIONS AND RIDERSHIP

Fleet Inventory

As shown in Table 1, the JAC transit program has a total of 17 vehicles in the fleet, along with a staff car, including 5 designated for fixed route service, 5 used for paratransit service, and 7 which are used in either fixed route or demand responsive service. The demand response vehicles range from a seating capacity of 5 to 21 seats and one wheelchair position, although additional seats may be moved to accommodate up to three wheelchairs at a time. The fixed route vehicles range in capacity from 21 to 32 seats and have one or two wheelchair positions and a two-capacity bike rack. Vehicles are stored at 3770 Butti Way and maintained at fleet maintenance facility located at 3505 Butti Way.

Table 1: JAC Fleet Inventory

Model Year	Vehicle #	Type	Use	Length
2008	2233	JAC Explorer	Staff	--
2012	4238	JAC Bus	Para	21'
2012	4239	JAC Bus	Para	21'
2015	4241	JAC Bus	Para	24'
2015	4242	JAC Bus	Para	24'
2016	4243	JAC Bus	Fixed	35'
2016	4244	JAC Bus	Fixed	35'
2016	4245	JAC Bus	Fixed	35'
2019	4249	JAC Bus	Fixed	34'
2019	4250	JAC Bus	Fixed	34'
2020	4253	JAC Van	Para	--
2020	4251	JAC Bus	P1/F	24'
2020	4252	JAC Bus	P1/F	24'
2022	4254	JAC Bus	P/F1	28'
2022	4255	JAC Bus	P/F1	28'
2022	4256	JAC Bus	P/F1	28'
2022	4257	JAC Bus	P/F1	28'
2022	4258	JAC Bus	P/F1	28'

Source: Carson City Department of Public Works, 2023

Historical Annual Ridership

Overall JAC ridership along fixed routes has varied over the last decade with pre-COVID levels resulting in a decrease in ridership by 11 percent (Table 2). During that time, the route that experienced the greatest decline was Route 3 with a decrease in ridership by 23 percent between FY 2014-15 and FY 2018-19. Over the pre-COVID fiscal years of 2017-18 and 2018-19 overall ridership declined by 10 percent, with the greatest decrease in ridership occurring along Route 3 (a drop of 14 percent). However, since Covid-19, ridership has grown to close to the pre-covid systemwide ridership (168,519 passengers). This is an increase of 27 percent from FY 2020-2021, the start of the Covid-19. This shows the system's ability to recover and demonstrates a continued need for public transit in the region.

Table 2: JAC Transit Fixed Route Annual Ridership

	Fiscal Years								Pre-Covid Trends		Post Covid Trend
JAC Route	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	5 Yrs	2 Yrs	2020-2021
Route 1	54,213	54,092	50,840	53,453	48,095	-	-	-	-11%	-10%	-
Route 2A	43,657	44,360	42,318	45,587	41,243	-	-	-	-6%	-10%	-
Route 2B	39,117	36,947	37,062	42,451	39,680	-	-	-	1%	-7%	-
Route 3	59,790	56,223	47,986	53,636	46,166	-	-	-	-23%	-14%	-
WNC	264	228	224	33	--	-	-	-	--	--	-
Total	197,041	191,850	178,430	195,160	175,184	166,286	132,760	168,519	-11%	-10%	27%

Note: Ridership by Route for FY 2019 through 2021 was unavilable at the time of this report.
Source: Ridership by Route Data, Carson City Public Works Department, Received March 15, 2019

Pre-COVID Ridership by Route

Weekly ridership along each route is depicted in Table 3. As shown, weekday ridership is greatest on Route 1, with 185 passengers per day, followed by Route 3 with 180 passengers per day. The average daily weekday ridership along all routes is 665 passengers per day. The average ridership on Saturdays is 108 passengers along Route 1, followed by 92 passengers along Route 2A. The total ridership along all routes is 345 passengers on Saturdays.

Table 3: Average Daily Ridership

	Route 1	Route 2A	Route 2B	Route 3	*Total*
Weekday	185	155	144	180	665
Saturday	108	92	81	64	345

Source: Ecolane JAC Ridership data provided March, 2019

Hourly ridership illustrates how many passengers will possibly need to use the transit center at one time. As depicted in Table 4 and Figures 1 and 2, hourly ridership peaks around noon with 86 passengers, followed by 8:00 AM with 67 passengers. On Saturdays the peak is 63 passengers around 3:00 PM. Note that many passengers stay on the bus while at the transit center.

Based on this data, it is estimated that approximately 360 passengers passed through the existing transit center over the course of an average weekday prior to the pandemic. Of these, approximately 240 passengers transfer between buses and an additional 120 passengers ride through without changing buses.

TRANSIT CENTER BENEFITS TO RIDERSHIP

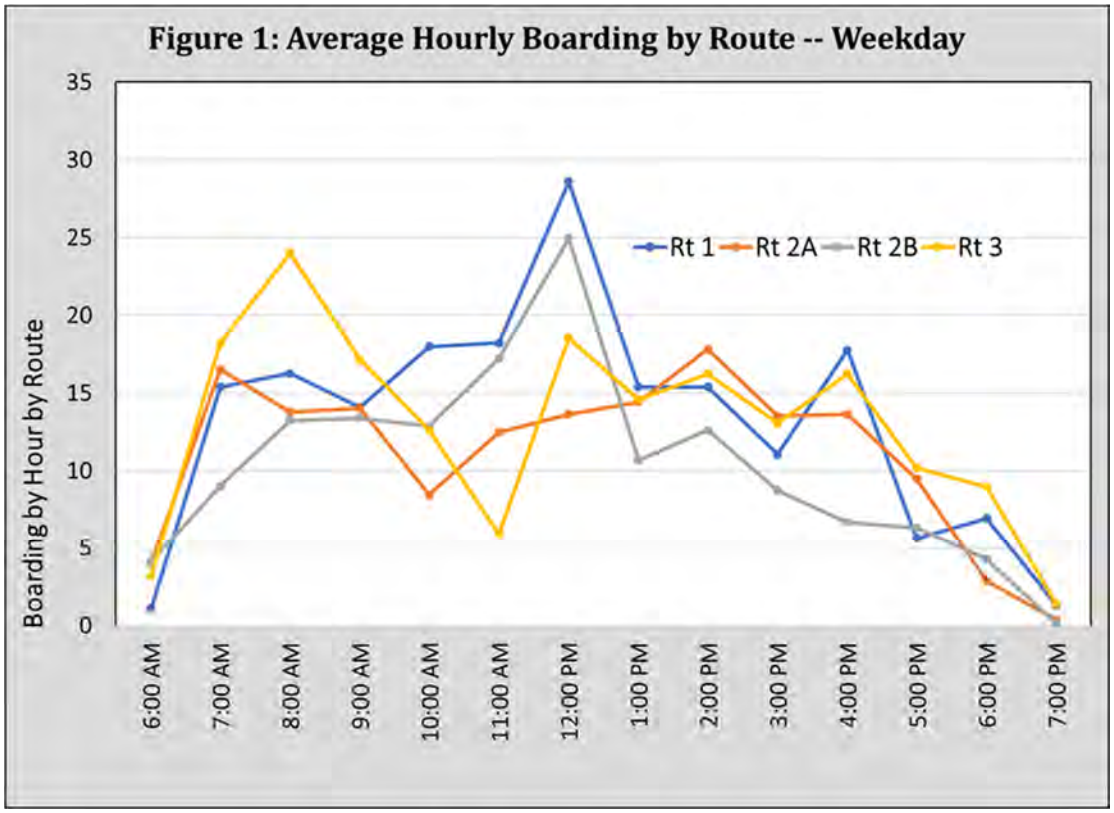
The professional literature regarding the ridership increase generated by new transit facilities is limited. This is in large part because service enhancements are typically implemented along with a new center, making it difficult to define the ridership benefit specifically resulting from the new facility. Bus Rapid Transit planning guides[1] indicate anecdotal evidence ranging from a negligible impact up to a 10 percent increase. Given the importance of a central transit center to the JAC transit system and as a stop to serve the surrounding region (through other regional services), a modest (4 percent) increase in ridership on the routes serving the new potential transit center can be applied. Based on pre-COVID ridership (FY 2018-19), this would be equal to an additional 7,000 passenger-trips per year.

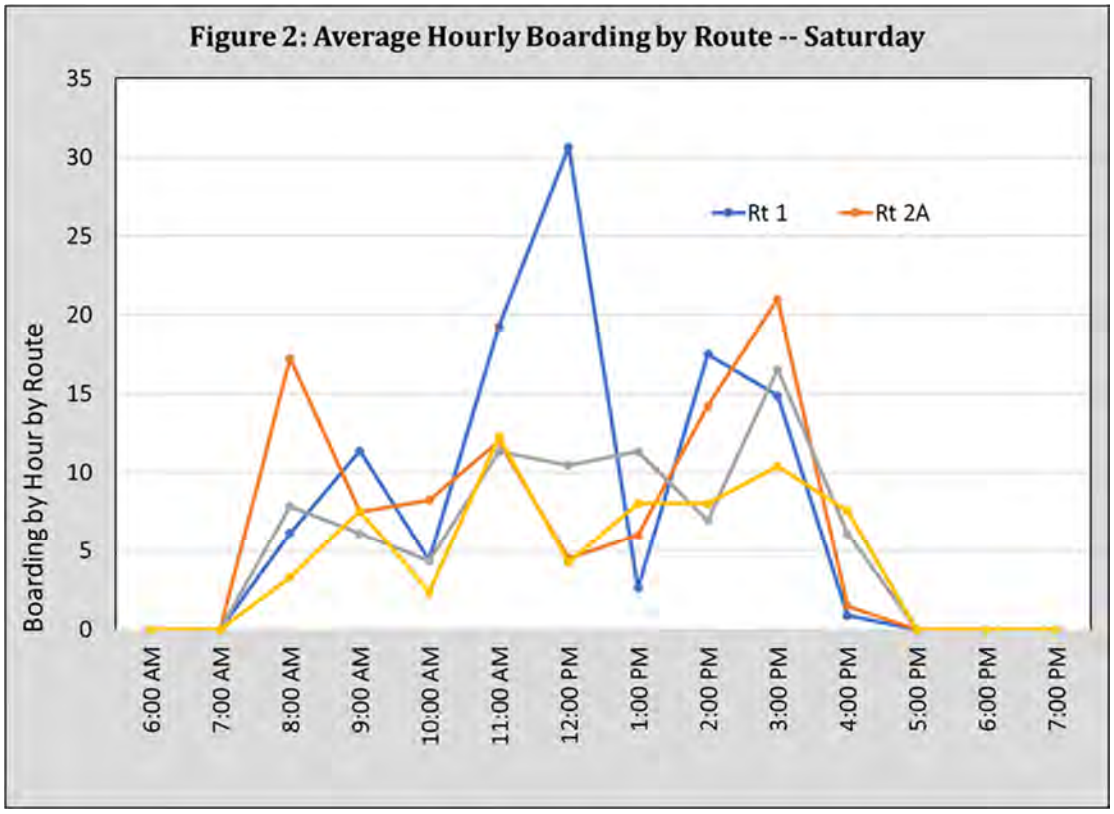
[1] *Such as the Transit Cooperative Research Program Report 90: Bus Rapid Transit, 2003.*

Table 4: JAC Fixed Route Ridership by Hour of Day

Hour Beginning	Average Weekday					Average Saturday				
	Rt 1	Rt 2A	Rt 2B	Rt 3	Total	Rt 1	Rt 2A	Rt 2B	Rt 3	Total
6:00 AM	1	4	4	3	12	--	--	--	--	--
7:00 AM	15	17	9	18	59	--	--	--	--	--
8:00 AM	16	14	13	24	67	6	17	8	3	35
9:00 AM	14	14	13	17	59	11	7	6	8	33
10:00 AM	18	8	13	13	52	4	8	4	2	19
11:00 AM	18	12	17	6	54	19	12	11	12	55
12:00 PM	29	14	25	19	86	31	4	10	4	50
1:00 PM	15	14	11	15	55	3	6	11	8	28
2:00 PM	15	18	13	16	62	18	14	7	8	47
3:00 PM	11	14	9	13	46	15	21	17	10	63
4:00 PM	18	14	7	16	54	1	1	6	8	16
5:00 PM	6	9	6	10	32	--	--	--	--	--
6:00 PM	7	3	4	9	23	--	--	--	--	--
7:00 PM	1	0	0	1	3	--	--	--	--	--
TOTAL	185	155	144	180	665	108	92	81	64	345

Source: Ecolane data. Totals for March 2019, factored by hourly ridership proportions for Sept and Oct 2017.





REGIONAL TRANSIT SERVICES

Regional transit services are essential for transit dependent community members needing to get to medical appointments, job opportunities, and social services. The transit plaza currently facilitates the connection of three regional routes, as described in further detail below.

Tahoe Transportation District (TTD) Service

The TTD operates Route 19X (Lake and Valley Express Service) connecting Carson City with Gardnerville, along with Route 22 that provides service between Gardnerville and South Lake Tahoe. The Tahoe Transportation District Route 19X serves a stop on the south side of E. Washington Street east of N. Plaza Street. This stop is served five times a day but not at the same time as JAC. Both routes provide daily connections between the South Shore area of Lake Tahoe and the Carson Valley. Route 19X offers service from 7:00 AM until 7:40 PM. This route begins in Gardnerville, Nevada at the Douglas County Community and Senior Center located at 1329 Waterloo Lane and continues north along the US 395 corridor through Minden, Nevada.

The northbound route ends at the Downtown Transfer Plaza in Carson City, where it turns around before heading south for the return trip of this bi-directional route through Carson Valley. Transfers to Route 22 at the Douglas County Community and Senior Center provide access to Stateline, Nevada in the Tahoe Basin. Northbound buses arrive at the Downtown Transfer Plaza at 7:40 AM, 9:40 AM, 4:10 PM,

6:10 PM and 7:40 PM, while southbound departures are provided at 6:15 AM, 7:45 AM, 9:45 AM, 4:15 PM and 6:15 PM.

Washoe Regional Transportation Commission (RTC) Regional Connector Service

The Washoe RTC Regional Connector service consists of commuter transportation between Reno and Carson City between 5:47 AM and 6:37 PM. The route serves five stops in total, including three in Reno (4th Street Station, Meadowood Mall, and the Wal-Mart at Damonte Ranch) and two in Carson City (including the Downtown Transfer Plaza and the southern terminus at the NDOT offices on Little Lane). Southbound, six runs per day are operated, arriving in Carson City at 6:35 AM, 7:05 AM, 7:35 AM, 3:59 PM, 4:59 PM and 6:24 PM. Northbound, runs depart Carson City at 6:50 AM, 7:20 AM, 7:50 AM, 4:17 PM, 5:17 PM and 6:42 PM.

The RTC Regional Connector service provides connections to both JAC and TTD services. Transfers to the JAC service can be made in Carson City at the Downtown Transfer Plaza. TTD passengers on most runs will need to first transfer to JAC before transferring to RTC Intercity.

Eastern Sierra Transit Authority (ESTA) Service

ESTA currently operates their Hwy 395 routes running between Reno, Nevada and Lancaster, California. The 395 North Route leaves Lone Pine at 6:10 AM and arrives in Carson City at 11:17 AM, making a stop Walmart in northern Carson City on to Reno and Sparks (it does not serve a stop in the downtown area). Southbound, this route departs Reno at 1:30 PM, stopping at Walmart in Carson City at 2:15 PM. This route runs Monday through Friday and does not operate during federal holidays. As a part of their Short Range Transit Plan, consideration is being given to providing service seven days a week.

EXISTING ZONING ORDINANCES AND ALLOWABLE LAND USES

The Carson City Downtown Mixed-Use Consolidated Development Code established a form-based zoning code for the area. It is designed to accommodate a variety of uses based on how they relate to one another. The Downtown Mixed Use (DT-MU) areas established in downtown Carson City include the following sub areas:

- Main Street Mixed-Use: Provides opportunities for infill and redevelopment, while retaining the traditional "Main Street" character and scale of Carson Street. To support this objective, building heights will be limited along the Carson Street frontage and adjacent to the State Capitol Complex and other historic structures, but will be permitted to "step up" away from the street – providing for a broader range of development opportunities. Active uses, such as retail shops and restaurants, as well as urban residential units, are desired throughout the character area to promote a lively street environment and expanded hours of activity.

- Urban Mixed-Use: Provides for urban-intensity mixed-use development in areas of Downtown that contain larger tracts of vacant or underutilized land. It is intended to provide opportunities

for concentrations of active uses such as convention space, casinos, hotels, urban residential or similar uses which typically have more intensive land requirements than could be readily accommodated in other areas of Downtown. To support these objectives, building heights in this area are permitted to be higher than in other character areas within Downtown, provided appropriate transitions are provided to the more modest scale of development found along Carson Street, the surrounding neighborhoods, and the State Capitol Complex.

- Neighborhood Transition: Provides a more gradual transition between the more urban patterns of development desired in other locations within Downtown and the surrounding residential neighborhoods. To support this objective, building heights are much more restrictive than in other character areas and are required to "step down" towards the surrounding neighborhood and building design becomes less blocky and urban and more residential in character. Uses in this area will tend to be primarily a mix of office and residential, however, a broad range of uses is permitted provided the design of the uses is compatible with the established character of the area.

Each of these districts permit a "Transit Passenger Facility" as an allowed, primary permitted use.

Land Use Compatibility Analysis

Sites 2 through 5 are within 400 feet of the existing Transfer Plaza. The area is characterized by commercial businesses, government offices, and large surface parking lots. When considering equity to the area, these sites are not expected to result in any new or increased impacts to the area due to the potential sites being such a short distance to the existing site with no adjacent sensitive land uses. Site 6 however is within 100 feet of a residential neighborhood boundary. For this reason, the use of Site 6 may generate inequitable impacts to adjacent residents.

In addition, redevelopment of the area has been long planned by nearby parcel owners. Evaluation and an ultimate recommendation for a long-term transfer center site may be affected by redevelopment. A downtown transfer center in this area of Downtown Carson City can enhance possible land uses by providing options for transportation mode and alternatives to auto access. Working in partnership with existing development or planned redevelopment could provide additional, mutual benefit to all parties.

STAFF INTERVIEWS

A series of questions were distributed in the form of a paper survey to drivers during a safety meeting conducted during September. Questions ranged from types of preferred amenities to how many passengers are typically observed at any given time at the existing transit center. The four completed surveys are included under Appendix A and the results summarized below.

Question 1: What are some pros and cons about the existing location along Plaza Street by the Federal Building?

- Pros included the following:
  - Wide parking area to pull in and out from.
  - Central location in town.
  - Close proximity to casinos.
- Cons included the following:
  - Fire hydrant location is too close to curb.
  - No restrooms.
  - No food or beverage options.
  - Lack of designated bus bays.

Question 2: As a driver, what should site planners consider when evaluating a site for a transit center (access, circulation, etc.)

- Need for restrooms.
- Parking provision.
- Shelter orientation that blocks weather.
- Marked bus bays for each bus.
- Accessible pedestrian walkways.

Question 3: What are some transit center features you would like to see included in the new location?

- Of the amenities listed in the survey, security cameras and lighting and restrooms for drivers ranked as the most desirable amenities.
- Public restrooms, additional seating, and a small office space ranked lowest.

Question 4: What is the greatest number of people you have seen waiting at the current Plaza Street stop?

- Two drivers mentioned that they typically observe between 10 to 20 people waiting at one time while the other two noted 20 to 30 and 30 to 40 people at one time.

Question 5: Is there anything else you would like to share regarding the evaluation of a future transit center?

- Only two drivers replied to this question. One mentioned that the transit center should be driver friendly with a one-way in and out for bus traffic only. The other asked what the future size and make of JAC vehicles would be.

Overall, it appeared that there is a need for driver restrooms. They also had input on the existing location needing some improvements regarding improving passenger shelter, security and the location of the fire hydrant if this site was to remain the Downtown Transfer Plaza.

Chapter 3
TRANSIT CENTER PROGRAM NEEDS AND POTENTIAL SITES

A potential site program was developed for two general scenarios: an optimal long-term improvement scenario (for a variety of sites) as well as a near-term update to the existing transfer site.

LONG-TERM PROGRAM

A development program for the transit center has been prepared, based on the following:

- Discussions with City and JAC staff, as well as the driver surveys.
- Evaluation of the existing and recent (pre-pandemic) service and ridership data.
- Review of forecasts for transit service and for growth in the Carson City area.
- Review of transit centers that have proven effective and efficient in similar-sized communities and transit systems with a hub route design.

The following have been indicated as desired and needed for a future transit center to accommodate service and ridership growth. A summary of these perceived needs, as well as their estimated space requirements, is shown in Table 5. The following describes what will be included in the new transit center:

- A small climate-controlled building with the following features:
    - Indoor and outdoor passenger waiting areas. "Indoor" areas may consist of a large shelter or shelters with heating elements.
    - One staff restroom.
    - One small office space for JAC staff, including a public counter area that can be locked.
    - Real-time public information, including a screen showing mapped location of buses and a departures screen.
    - Vending machines for snacks/drinks.
    - Closet for janitorial supplies, with space for electronics.

    In total, this building should be approximately 1,306 square feet in floor area to accommodate long-term demand.

- Vehicle bays as follows:
    - Seven total bus bays including:
        - Four bus bays accommodating 35' buses for current service, with a potential of two additional bays for future growth.
        - One bus bay accommodating a 40' Intercity (RTC, TTD, ESTA) bus.

Table 5: JAC Transit Facility Space Requirements

Program Element	Sq.Ft. per Unit Standard	Square Feet of Floor Area
Office Space		
Office Space/Counter	250	250
Subtotal: Administrative Space		*250*
Building Support Space		
Restrooms (One single stall restroom w/no public access)	150	300
Janitor Closet	36	36
Utility space (electronics, water heater)	120	120
Subtotal: Building Support Space		*456*
Indoor Passenger Waiting Area		
Standing (20 passengers)	10	200
Sitting (20 passengers)	20	400
Subtotal Waiting Area		600
Subtotal Building Footprint		1,306
Landscape/Plaza Area		
Outdoor waiting area (benches)		600
Pedestrian Circulation		1,600
Bicycle Racks (5 racks)	19	95
Subtotal Plaza Area		2,200
Landscaping Area (25 percent of Plaza)		550
Total Landscape/Plaza Area		2,750
Total Building Footprint and Landscape/Plaza Area		4,056
Bus Bays (Seven Bus Bays at 35' - 40')	800	5,600
JAC Assist/Operational Parking (2 parking spots)	360	720
Total Site Development Program		**10,376**

- One parking space for JAC Assist vehicle (25') that could also be used for crew van or supervisor vehicle.
- Optimally, 1 space (at center or nearby) to stage one additional JAC bus in order to swap buses over the course of the day.

- Bike parking for up to 10 bikes. Should be covered and provide locking capability. No need for bike lockers.
- One single stall restroom for staff (not accessible to the general public).
- Security improvements (lighting and cameras).
- Optimally, some park-and-ride auto spaces would be provided as part of the facility, or nearby. This would be for intercity (Regional Connector or TTD) service, as there is no demand for JAC park-and-ride parking. Typical park-and-ride patterns for intercity service are that passengers tend to use the last stop served in a community rather than in the center of a community, which reduces the need for park-and-ride spaces in downtown Carson City.

NEAR-TERM UPGRADES TO THE EXISTING SITE

Depending on funding availability, staff availability and the need to coordinate with adjacent property owners, implementing the full site program discussed above may take several years or more. It is thus useful to also define a set of improvements to this existing site that can meet some of the project goals (enhancing the passenger environment, improving security, and reducing conflicts with adjacent properties) at a lower cost.

Upgrade the existing site would generally include the enhancement of features to address the most of basic of identified challenges to provide immediate short-term site safety and security solutions. The following is a summary of the upgrades:

- Expanded Bus Shelters – The existing shelters only provide covered seating for up to 8 riders. Given current ridership activity and the sometimes harsh environment, the lack of shelter impacts waiting passengers. In particular, summer heat drives some passengers to use nearby trees on private property for shade. Seating within shelters for a minimum of 24 passengers should be provided. Note that seating should be designed to deter sleeping in the shelters. Depending on the size of shelters available, this would consist of 2 to 4 additional shelters. Sign holders should be included in the shelters to enhance the ability to provide service information.

- Additional Benches – Benches should be provided at the bus stop along E. Washington Street and E. Robinson Street.

- Improved Fencing -- The existing chain-on-post fencing along the back of sidewalk should be replaced with a higher fence (on the order of 3 feet in height) to discourage use of the adjacent lawn area. Note that this would not change the access to the existing monument.

- Upgraded Lighting – At present, lighting is limited to a single central streetlight and lighting within the shelters. Additional street lighting illuminating the sidewalk (lower height, placed at the back of the sidewalk) consisting of 4 to 6 additional fixtures would enhance security.

- Relocation of the Fire Hydrant or other roadside elements – At present, there is a fire hydrant located behind the face of curb on the east side of N. Plaza Street opposite E. Caroline Street. It conflicts with the ability to load/unload passengers, and particularly to deploy the wheelchair lift, and should be relocated to the back of the sidewalk.

- Pavement Patching and Reconstruction – A moderate level of pavement and sidewalk improvements are warranted for ADA Compliance to fix cracking, potholes, damaged curb and gutter and uneven pavement.

- Signing and Striping – A monument sign (on the order of 3 feet in height and 6 feet in width) should be provided stating “Carson City Transit Center” within the existing right of way on the southeast corner of N. Plaza Street and E. Washington Street (just to the north of the existing

utility poles). In addition, pavement striping to designate the outer edge of the bus loading zones should be provided, and a painted crosswalk across N. Plaza Street south of E. Washington Street.

These upgrades do not preclude the construction of any future improvements on this or another site.

According to the *Transit Capacity and Quality of Service Manual*, 3rd Edition (TCRP, 2017) (p 4-4) 7 to 10 square feet per standing waiting passenger is recommended for a transit facility. Sitting passengers require approximately 20 square feet per passenger. Assuming that half are standing and half are sitting (as the "pulse" nature of the JAC system means than many passengers wait only a few minutes), this indicates that the provision of between 450 and 600 square feet of waiting area should be considered for a future transit center, preferably the higher figure. A similar area should be provided for outdoor waiting areas.

Including bus bays, parking areas, building area and landscaping areas, as shown in Table 5 the space that is selected would ideally require between 8,400 and 11,300 square feet total to accommodate near term and future growth.

POTENTIAL LOCATIONS

In discussion with City and JAC staff, a total of six potential locations for a future transit center were identified. Reflecting the results of the Transit Development/Coordinated Human Services Plan, only sites within the general downtown area (which provides for efficient transit operations) were considered. These sites are described in further detail below and shown in Figure 3. A more in-depth page summary of each site is also included under Appendix B. In addition, for the purpose of this study, strengths and weaknesses of each site are discussed, focusing on the availability of the site, impact on transit/traffic opportunities, impact on access to nearby transit destinations, constructability factors such as onsite utilities, and impacts on downtown parking spaces.

Additional sites may be available in the future because of changes to land use and redevelopment; however, any potential downtown transit center should be centrally located in this general region as it provides the best option of the JAC operations and passengers. In addition to the six sites, the existing site (Site 1) was evaluated both regarding a long-term new facility as well as for a minimum alternative to provide short-term benefits to JAC, its passengers, and the adjacent property owner, as was discussed further in the previous section.

Site 1 – Downtown Transfer Plaza

This is the existing site located west adjacent to the Federal Building on the east side of Plaza Street between Robinson Street and Washington Street. It consists of approximately 200 feet of curb length and is sufficient enough to accommodate up to six vehicles at one time. At present, up to four JAC buses are at the Plaza at the peak times (at the bottom of the hour). In its current configuration, there is a limitation in its space to accommodate more than six vehicles at one time. There is also not sufficient space in the existing 14-foot-wide sidewalk to provide a building.

Figure 3
JAC Transit Center Site Options

A potential option to develop a transit center at this site would be to convert N. Plaza Street to one way (northbound) between E. Robinson Street and E. Washington Street. With 54 feet between the existing west curb face and the eastern back of sidewalk and elimination of on-street parking on the west side of the street, sufficient width would be available to provide a single northbound travel lane as well as space for a building site (with pedestrian circulation) and bus bays to the north and/or south.

- Strengths: Familiarity and functionality at current service levels. High visibility along Washington Street.

- Weaknesses: The current property owners and employees of the Federal Center parcel do not like the loitering that occurs on site. There is also a lack of existing space to expand and include any amenities for drivers and passengers such as restrooms or weatherproof shelter. However, removal of on-street parking on the west side of Plaza Street and/or conversion to one-way northbound operation could provide the footprint needed for a facility building. As the lack of adequate shelter (such as from the sun) is a factor in waiting passengers entering the Federal Building site, improving the facility along with fencing could reduce the loitering issue. Traffic reconfiguration associated with one-way street conversion.

Site 2 - V&T Train Station

The building originally constructed as the Virginia and Truckee Train Station is located along the south side of Washington Street just west of Plaza Street. Currently owned by the Masonic Lodge, it is an existing structure of approximately 6,000 square feet. The owner has indicated they are not currently interested in a sale or a joint use. Even so, the site could potentially provide several benefits to downtown and to JAC.

Bus bays would remain along Plaza Street with three bays proposed in the northbound directions, and three bays proposed in the southbound direction. One additional bay and space for a JAC crew car would be located along Washington Street. This configuration would require JAC riders to cross the street; however, curb extensions and enhanced crosswalk features could be added at both the Washington Street and Caroline Street intersections. The majority of the V&T Station would continue function without change. The restroom and office facilities would be located in the eastern end of the existing building. These facilities could be jointly shared by the owners of the building, by the drivers, and available for the public.

- Strengths: Location convenient to downtown land uses. The building has a history of public transportation use. Adjacent to existing downtown transfer center area. Familiarity and functionality at current service levels. High visibility along Washington Street. Partnership with the building owner to provide services and maintenance of the new public facilities. The building likely has heating and utility connections.

- Weaknesses: The current property owners are currently not interested in a partnership with the City. Once constructed, there would be limited opportunity to expand and include future

amenities in the building for drivers and passengers. The building would have limited indoor passenger waiting area as the lack of adequate shelter (such as from the sun) is a factor in waiting passengers of the existing site in front of the Federal Building site, but this could be mitigation with additional shelters of canopies. The station is listed on the National Register of Historic Places and as such would require particularly close coordination with the State Historic Preservation Office.

The site is not recommended for further analysis as part of this current study, due to the owner's current lack of interest. If the owner reconsiders a future partnership with the City, this location provides an optimal location to meet the basic facility needs for JAC. The V&T Station can continue to serve as a transportation hub for Carson City preserving the long history of the building.

Site 3 - Coin Lot

This site is located along the north side of Caroline Street and the west side of Plaza Street from Caroline Street south to Robinson Street. This is the northeast portion of the small block formed by Caroline Street, Plaza Street, Robinson Street and Carson Street and is currently the site of Carson City Coin (in the southwest corner) with the remainder consisting of a surface parking lot. The owner indicates that the existing parcel is not available. Setting aside the private lot, the use of existing public right-of-way was considered. Caroline Street could be converted to one-way eastbound operation, providing adequate width on the south side of the right-of-way for the transit center building (closing the eastern access point to the coin lot, but preserving the western access point).

One bus bay could be provided on the south side of Caroline Street between the western lot driveway and the building, and two bus bays could be provided on the west side of Plaza Street between Caroline Street and Robinson Street. However, other bus bays would need to be provided across Caroline Street along the west side of Plaza Street and on the east side of Plaza Street. This would require JAC passengers to cross streets while transferring between buses.

- Strengths: Location convenient to downtown land uses.

- Weaknesses: Traffic changes of one-way street conversion, including changes to parking lot access and impact to Shell station access. Requires passengers to cross travel lane while transferring between buses. Constrained space between surface parking and public streets would provide less potential for landscaping and less attractive environment.

Site 4 - Robinson Street

Under this site, the transit center would be located along the north side of Robinson Street between Stewart Street and Plaza Street, with some bus bays on the east side of Plaza Street just north of Robinson Street. This stretch has a wide (16 foot) existing sidewalk and is currently where the RTC Regional Connector serves passengers heading northbound to Reno. Given the traffic activity on Robinson Street, it is probably not feasible to convert it to one-way traffic. Expanding the area available

for a transit center by narrowing the existing 32-foot wide street would therefore be limited to reducing Robinson Street to two 12-foot travel lanes (an additional 8 feet), yielding 24 feet total without using Federal Building land. Considering the need for an ADA-accessible sidewalk and the building floor area identified in Table 5, use of this site would require some land from the Federal Building parcel (such as the western 12 parking spaces in the southernmost row of perpendicular parking spaces.

- Strengths: The site is already being used by Washoe RTC Regional Connector and is likely a familiar location being less than a block from the existing transit center. It is also the most efficient in access by existing routes, though as mentioned above, these impacts are minor.

- Weaknesses: As Robinson Street is too busy to close or convert to a 1-way street, this site would require land from the Federal government, which may be very difficult to negotiate. It could also have many of the similar weaknesses the current transit center location experiences including lack of space for amenities and its location on federally owned parcel with negative employee opinions regarding the stop location.

Site 5 - Spear St. West

This site consists of the westernmost block of Spear Street just east of the Carson Nugget (between Fall Street and Stewart Street. The existing-curb-to-curb width (34 feet) is not sufficient to provide a transit center building, and the owner of the adjacent parking lots to the north and south indicates that the private parcels are not available. However, the existing public right-of way is approximately 66 feet in width (north-south dimension) by 200 feet in length (east-west dimension). This is sufficient to accommodate a center island for the building, with an eastbound one-way bus lane to the north and a westbound one-way bus lane to the south, sufficient to accommodate up to 8 buses at peak time. As shown in Appendix B, at present, off-street parking spaces encroach on the right-of-way. Reconfiguring the lots to provide the transit center space would reduce the total number of spaces by approximately 17 (along with 14 on-street spaces). In addition, as there is not sufficient space for a bus passing lane, buses could be delayed if a bus in front does not depart in a timely manner (such as delays for securing a wheelchair passenger).

- Strengths: As this site is bound by surface parking lots and located at the end of Spear Street that terminates into a parking lot, there are no immediate adjacent land use incompatibility concerns. A center island layout would provide conveniently short walk distances between buses, and the building amenities would be close to all bus loading locations.

- Weaknesses: This site would require removing the existing encroachments (surface parking spaces) to the north and south, resulting in a 31-space reduction in total parking supply. Bus operations could be delayed as buses must depart in the same order they arrive. This location is also non-signalized and could cause issues with left-turns into the stations and with pedestrians crossing the area.

Site 6 – Spear Street East

This would be located along the south side of Spear Street between Stewart Street and North Valley Street. It is currently adjacent to a surface parking lot. The owner of this lot has indicated that the lot (which consists of two parcels) is potentially available for a long-term ground lease. (Note that Federal transit funds are typically available for use on leased sites, so long as the lease term is at least 20 years). This site is approximately 172 feet in the east-west dimension and 85 feet in the north-south dimension. This is sufficient (along with the adjacent Spear Street travel lane) to allow buses to circulate past the individual bus bays.

- Strengths: Sufficient land to provide a central transit plaza allowing convenient walk distances between the bus bays, close proximity between the bays and the transit building, and independent operation of the individual bus bays.

- Weaknesses: This site is adjacent to residential uses to the east and south and lodging uses (including the Nugget Inn) to the north. It is a farther walk from destinations in the area, such as along Carson Street. Buses circulating east of the site could also impact residences.

Other Sites Considered

Other sites were discussed, including the Library and Community Center, but each were found to be too far from the center of the route system and thus would be inefficient to serve. The Old V&T railyard site (N. side of Washington/E side of Stewart Street) was not viable due to possible contamination and lack of an overall master plan for the property.

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Chapter 4
PUBLIC OUTREACH

During the month of October 2021, LSC led a public outreach effort including a community-wide online survey and an on-site outreach event. The survey was advertised on Carson NOW and posted to Carson City municipality Facebook pages.

ONLINE COMMUNITY SURVEY

Questions 1 – 6 – Getting to know our participants.

Questions 1 through 6 were asked to better understand who was taking our survey. As shown in Table 6, 39 percent of participants were between the age of 45 and 64 years old. Ages 25 to 44 years old (25 percent) and 65 to 74 years old (25 percent) made up the second most popular age groups participating in the survey.

Table 6: Survey Summary of Questions 1, 2, 4, 5, and 6

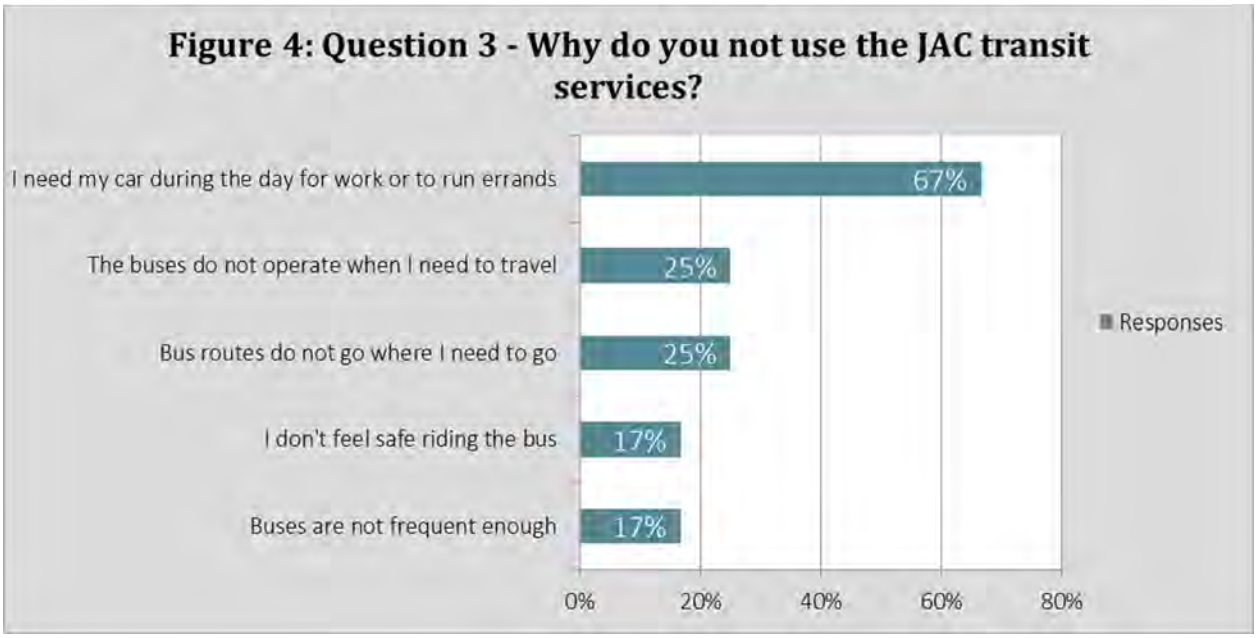
Question		Responses #	Responses %
Q1	What is your age?		
	17 years old or younger	0	0.0%
	18 to 24 years old	1	3.6%
	25 to 44 years old	7	25.0%
	45 to 64 years old	11	39.3%
	65 to 74 years old	7	25.0%
	75 years or older	2	7.1%
Q2	Have you ever used JAC transit services before?		
	Yes	15	53.6%
	No	13	46.4%
Q4	How often do you use JAC transit?		
	5 or more times per week	4	26.7%
	1 to 4 times per week	2	13.3%
	1 to 4 times per month	1	6.7%
	Less than once a month	3	20.0%
	1 to 2 times per year	5	33.3%
Q5	When riding JAC, do you start your ride or transfer buses at the current transit center on Plaza Street near the Federal Building?		
	Yes	7	50.0%
	No	7	50.0%
Q6	How do you typically get to or from the transit center?		
	I walk	2	25.0%
	I ride a bike	1	12.5%
	I drive	0	0.0%
	I get dropped off or picked up by a vehicle	0	0.0%
	I transfer between buses	5	62.5%

More than half (53.6 percent) of respondents had used JAC transit services before. Of these participants, 33.3 percent use JAC 1 to 2 times per year, followed by about 26.7 percent who use JAC 5 or more times per week. The number of participants who either start their ride at or transfer through the existing JAC transit center was 50 percent with 62.5 percent of these respondents getting to the transit center by transferring from another bus. Another 37.5 percent either walk or bike.

The survey asked participants why they don't use JAC transit services (Figure 4). Over half responded that they need their car during the day to work or run errands. Others indicated that the buses don't go where they need to go (25 percent) or that the bus doesn't operate when they need them (25 percent).

Question 7 – What do you like about the existing transit center?

Participants indicated that they like the general location of the existing transit center. Comments included that the transit center is within 5 blocks of their home and feels very centralized.

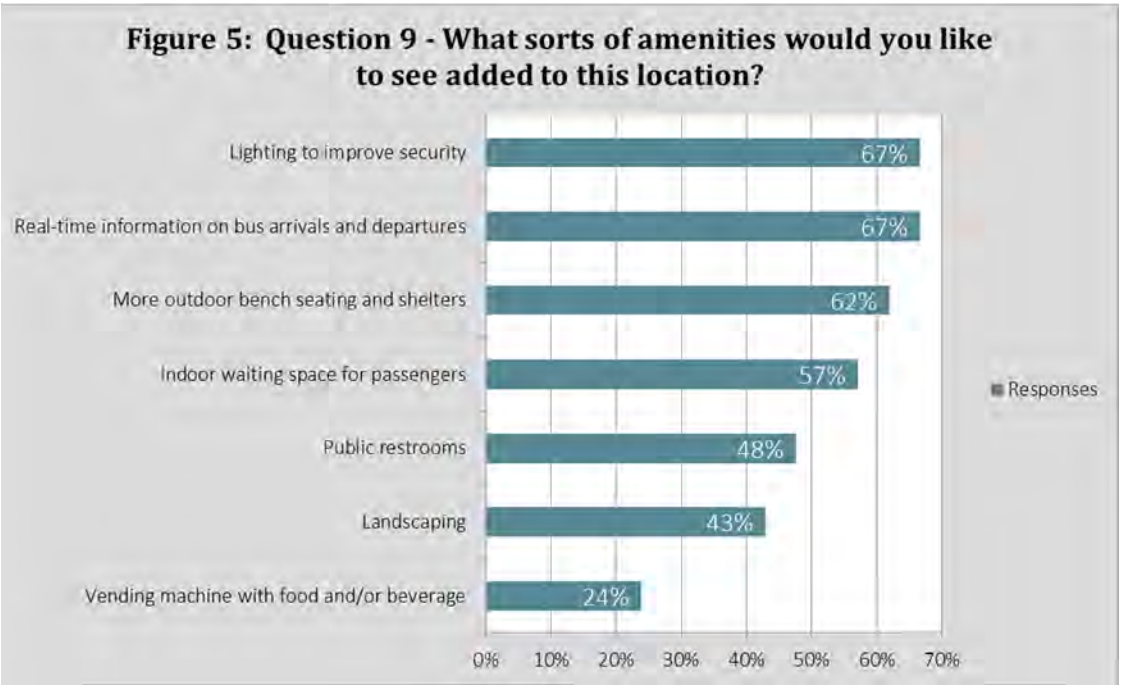


Question 8 - What do you not like about the existing transit center location?

Respondents indicated that the existing transit center doesn't feel safe due to lack of sufficient lighting and/or security. Others indicated that having no public amenities or restrooms is an issue for them. The lack of protection from seasonal weather was also disliked. One respondent indicated that they don't feel safe due to the homelessness population and loitering at the site.

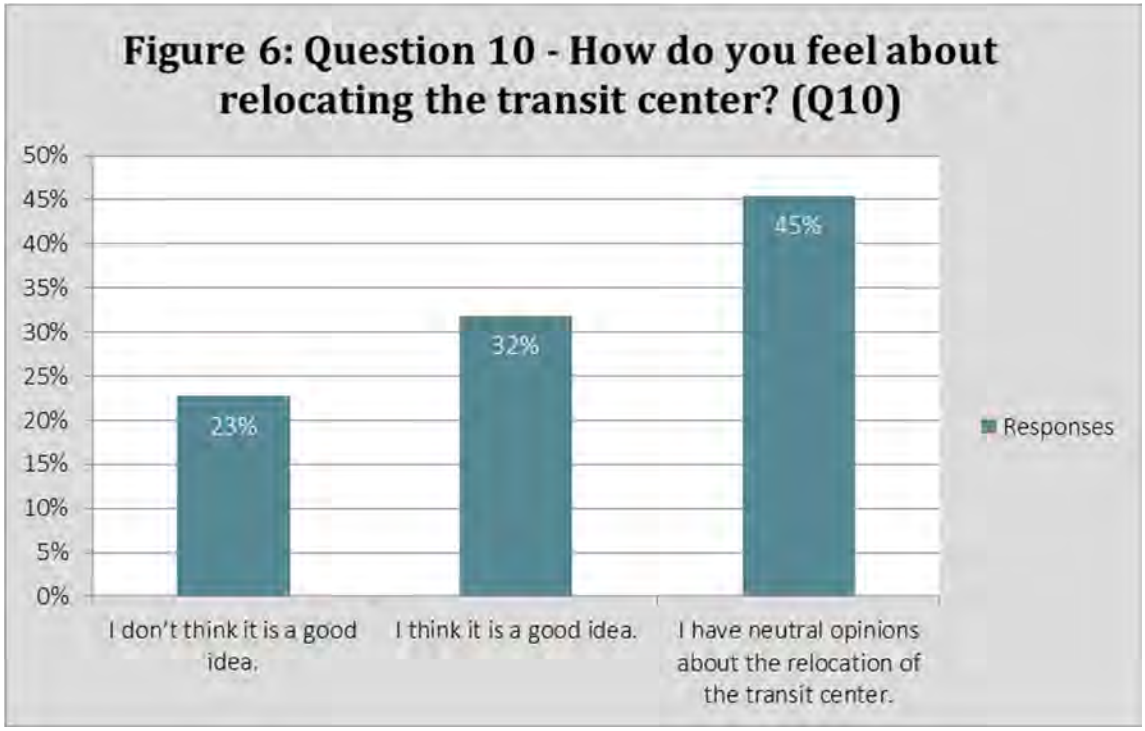
Question 9 - What sorts of amenities would you like to see added to this location?

Participants were asked to select all amenities they would like to see at a new transit center. As shown in Figure 5, providing lighting to improve security (66.7 percent) and real-time information on bus arrivals and departures (66.7 percent) are the most desired amenities for transit center improvements. Adding more outdoor bench seating and shelters were also requested by 61.9 percent of participants, followed by indoor waiting space (57.1 percent).



Question 10 - How do you feel about relocating the transit center?

When asked about the potential relocation of the transit center, 45.5 percent of participants had neutral opinions about it (Figure 6). Another 31.8 percent thought it is a good idea, followed by 22.7 percent who did not think it is a good idea.



Question 11 - Is there anything else you would like to add for our consideration?

Additional comments for consideration included amenity requests (coffee, WiFi, and landscaping). Others commented that they were not aware of the existing center and that it needed to be marketed more.

ON-SITE POP-UP OUTREACH

LSC Transportation Consultants conducted an on-site public outreach event between 11:00 AM and 4:00 PM on October 28th. A questionnaire was distributed to various passengers and JAC drivers. The survey was simple and asked two questions: "What do you like about the existing JAC transit center?" and "What do you not like about the existing transit center? Of the 15 participants, many respondents indicated that the existing site was conveniently located and easy to access. Characteristics that people did not like about the existing transit center included that there is currently no schedule information displayed, there is not enough shelter to protect from poor weather, and that there are no restrooms.

Chapter 5
SITE ANALYSIS AND SCREENING RECOMMENDATIONS

This chapter presents the results of an initial site analysis and screening process, in order to focus the study on the sites with the highest potential.

OPERATIONAL IMPACT BY SITE

Table 7 represents site impacts by how many blocks the existing routes would need to deviate to accommodate the change in transit center location. The existing site was determined by how many blocks each route travels from their turn off Roop Street. Each alternative site was then measured against the existing, resulting in a total deviated block count by each route (as shown at the bottom of Table 7). As shown, Site 2 resulted in the most deviated blocks from existing route paths, followed by Site 3. These blocks were then converted to miles per year and multiplied by $0.82 (cost per mile). As depicted, the differences in annual operational cost were very small (between $500 less than current and $1,000 more than current cost conditions).

Table 7: Blocks Deviated from Route by Site

	Blocks Deviated Per Site											
	Site 1		Site 2		Site 3		Site 4		Site 5		Site 6	
Route	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
1	7	9	9	9	9	7	5	11	6	6	6	4
2A	7	1	10	3	9	4	6	3	4	5	4	7
3	5	2	6	3	5	2	6	4	5	6	6	7
4	5	7	8	6	7	5	3	9	2	4	3	1
Difference by Site												
1	-	-	2	0	2	-2	-2	2	-1	-3	-1	-5
2A	-	-	3	2	2	3	-1	2	-3	4	-3	6
3	-	-	1	1	0	0	1	2	0	4	1	5
4	-	-	3	-1	2	-2	-2	2	-3	-3	-2	-6
Total by Direction			*9*	*2*	*6*	*-1*	*-4*	*8*	*-7*	*2*	*-5*	*0*
Total Both Direction			**11**		**5**		**4**		**-5**		**-5**	
Total Miles per hour			**0.49**		**0.22**		**0.18**		**-0.22**		**-0.22**	
Total Miles per year			**1,279**		**582**		**465**		**-582**		**-582**	
Cost Impact per year			**$1,000**		**$500**		**$400**		**($500)**		**($500)**	

INITIAL SITE RANKING AND SCREENING RECOMMENDATIONS

LSC conducted a two-step analysis in order to evaluate and screen the initial list of sites. First, the sites were reviewed based on the two following "screening" criteria:

1. Site Availability – As Site 2 (V&T Station) is not available, it was screened from further consideration as part of this study. While the Coin Lot (Site 3) is not available, it is included as the program could be accommodated in the right-of-way.

2. Site Capacity – If a site cannot accommodate the program presented above in Table 5 (including the number of bus bays, building floor area, etc.), it would be screened from further consideration. As all sites have this adequate capacity, none were screened out by this criteria.

Next, in an effort to quantify the above-mentioned site-factors, LSC created a set of six site factors to differentiate various characteristics amongst each potential site, as shown in Table 8. The sites were evaluated based on the following six factors:

1. Construction Cost – Is there any extra associated costs with implementing a transit center on the site (obvious utilities, additional need for street reconfiguration, etc)? Note that a relatively high cost is reflected in a relatively low score.

2. Parking Impact – Will existing parking be eliminated?

3. Downtown Area Goals – Does it align with the Downtown Area Goals?

4. Transit Efficiency & Access – Does it negatively impact transit operating costs or accessibility along the existing routes? This reflects both the excess bus circulation as well as the potential for buses to be delayed due to site design complaints.

5. Passenger Safety and Convenience – Can passengers conveniently walk between buses? Are bus bays close to the transit building amenities?

6. Adjacent Land Use Compatibility – Is a transit center use consistent with existing surrounding land uses?

These various factors were then weighted based on feasibility of project implementation, project benefits to the community, and potential operational impacts. Based on the Consultant's experience and discussions with JAC staff, the Consultant has assigned weights reflecting the relative importance, on a scale of 0.0 (no importance) to 1.0 (highest importance).

Next, a score was identified for each site and for each factor, on a scale of 1 (worst score) to 5 (best score), based on the site characteristics. Each score was multiplied by the factor weight and then summed over all factors to determine a weighted score. As shown, four sites (Site 1 – Existing Site, Site 2 V&T Station, and Site 5 – Spear Street West, all rank relatively high and close in value (between 18.8 and 22.5). These are followed by Site 6 – Spear Street East, and Site 3 - Coin Lot. However, as Site 2 is not currently available, it is dropped from further analysis as part of this study. Based on this analysis and the background information, LSC recommends further analysis of providing an improved transit center on the following sites:

- Site 1 – Existing Site
- Site 4 – Robinson Street
- Site 5 – Spear Street West

Table 8: Scoring of Initial Site Alternatives

		Scoring (1 = Very Poor to 5 = Very Good)					
	Factor Weight (0 to 1)	Site 1 - Existing Site	Site 2 - V&T Station	Site 3 - Coin Lot	Site 4 - Robinson St.	Site 5 - Spear St. West	Site 6 -Spear St. East
Site Availability (Screening)	*NA*	*Yes*	*Possibly*	*Limited to ROW*	*Possibly*	*Yes*	*Yes*
Adequate Site Capacity (Screening)	*NA*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Construction Cost	0.50	2	4	3	3	4	3
Parking Impact	0.75	5	5	3	3	2	3
Downtown Area Goals	1.00	5	5	5	5	5	4
Transit Efficiency & Access	0.75	4	5	4	4	3	4
Passenger Safety & Convenience	1.00	4	3	1	4	5	4
Adjacent Land Use Compatibility	1.00	4	5	3	3	5	2
Weighted Score		**20.8**	**22.5**	**15.8**	**18.8**	**20.8**	**16.8**

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Chapter 6
DETAILED ANALYSIS OF THREE CONCEPTUAL SITES

Based on the screening process described in the previous chapter, the following three sites have been identified as those with the highest potential to meet the needs of the service in a cost-effective manner:

- *Existing Downtown Transfer Plaza Site*—This could include use of existing Plaza Street travel lanes. Not that this site is evaluated both for the long-term full program as well as for an interim limited set of improvements.

- *Robinson Street Site*—This consists of the north side of Robinson Street, east of Plaza Street.

- *E. Spear Street Site*—This consists of the existing public right-of-way between N. Fall Street on the west and N. Stewart Street on the east.

This chapter presents a detailed evaluation of each site.

EXISTING DOWNTOWN TRANSFER PLAZA SITE – LONG-TERM

Under this site option, the transit hub would remain in its current location along the east side of N. Plaza Street between E. Washington Street and E. Robinson Street, adjacent to the Federal Building. The facility would be improved as shown in Figure 7 and as follows:

- Between E. Robinson Street and E. Washington Street, the eastern curb would be extended approximately 19 feet to the west. This segment of N. Plaza Street would be converted to one-way northbound traffic only. As shown in the cross section provided in Figure 8, the remaining street width would be 28 feet (excluding curb and gutter), sufficient to provide 9 feet for a northbound bus parking lane and a 19-foot northbound travel lane. Parking along the west side of N. Plaza Street would be prohibited for this portion of the block.[2]

- The curb extension would yield a building pad/plaza area 32 feet in width and 150 feet in length north of the northern Federal Building parking lot driveway. This space would be used to provide:

[2] Consideration was given to converting only the portion north of the northern driveway to one-way, leaving the segment between E. Robinson Street and this northern driveway two-way. However, this could be potentially confusing to drivers.

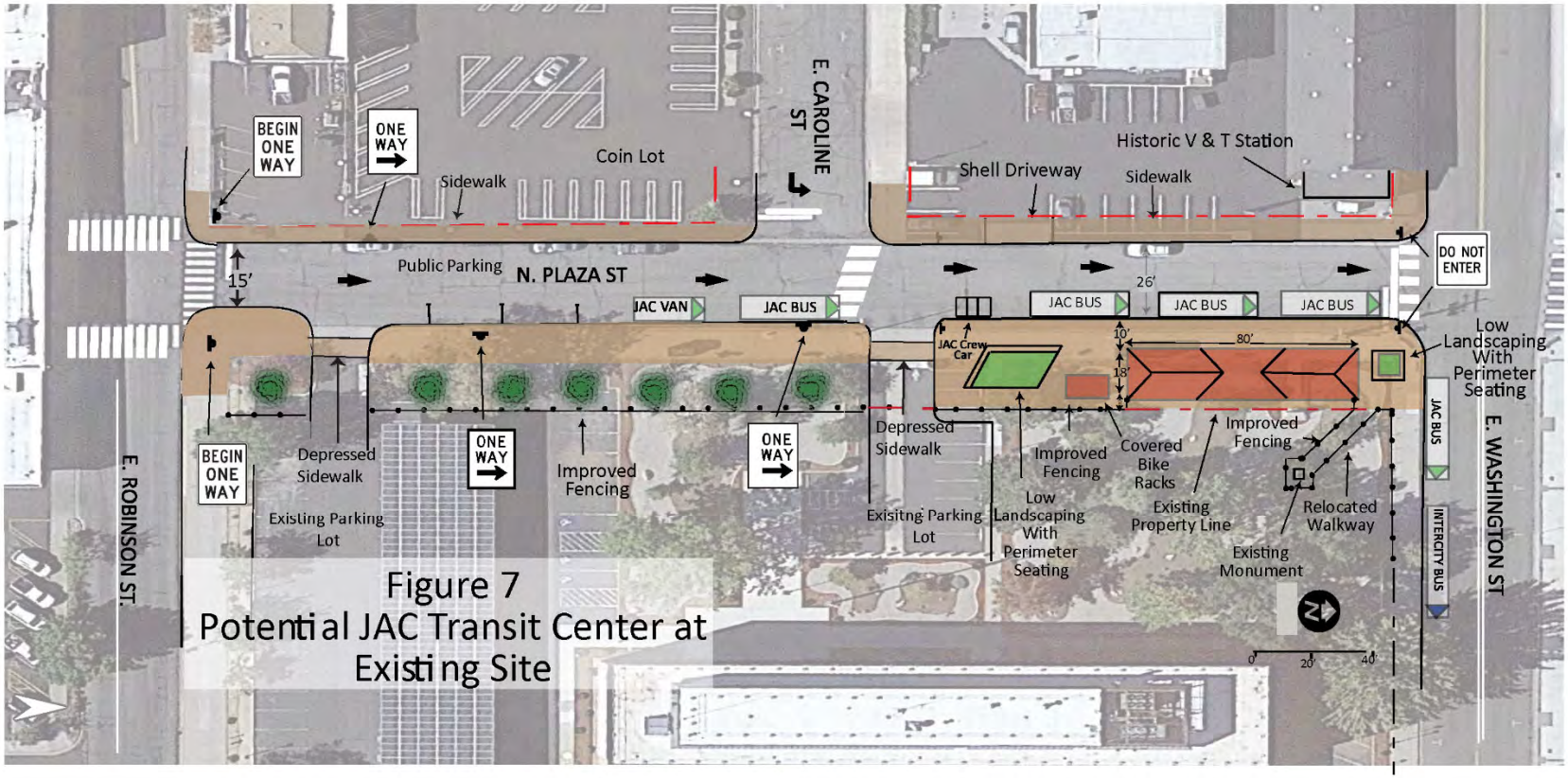
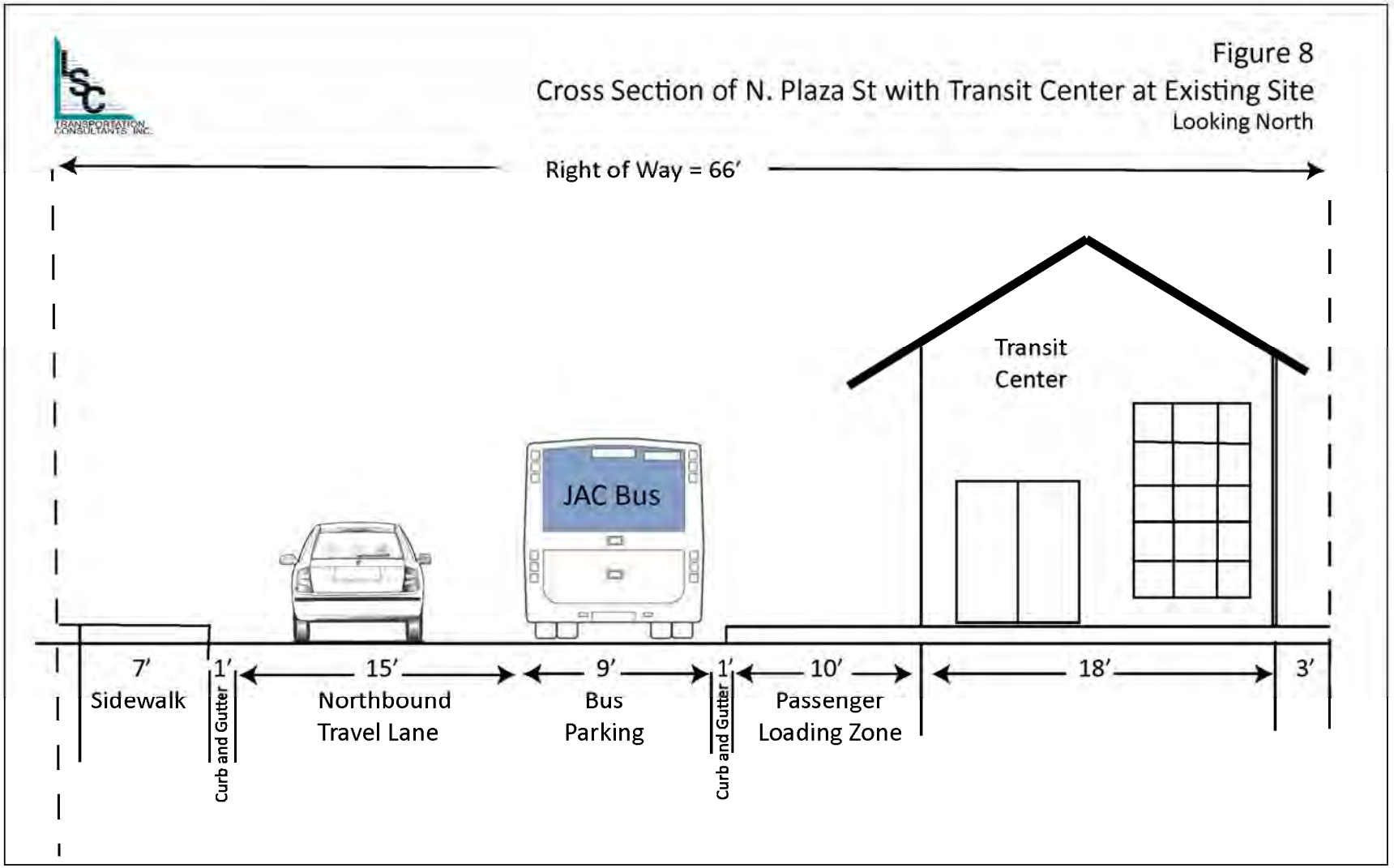


Figure 7
Potential JAC Transit Center at Existing Site

Figure 8
Cross Section of N. Plaza St with Transit Center at Existing Site
Looking North



- A single-story transit center building approximately 1,450 square feet in floor area, providing passenger waiting space, restrooms, JAC counter and operational space and custodial space. The center portion of this building could have a raised roof section to provide some architectural interest; Low landscaping areas to the north and south with perimeter passenger seating. Landscaping in these areas would be designed to provide good line of sight across the plaza for security reasons; and

- A set of covered bike racks.

- An improved fence would be provided along the east side of N. Plaza Street, as well as along the south side of E. Washington Street eastward to the first driveway. This fencing would preferably incorporate artwork (such as steel cutouts) and would be designed to stop direct access into the Federal Building property. It would tie into the corners of the transit center building to eliminate pedestrian access behind the building. The existing short walkway to the monument would be relocated to avoid the transit center building.

- Three JAC bus bays would be provided on N. Plaza Street along the extended curb, while the fourth JAC bus bay needed for regular service would be provided along E. Washington Street. Space for an intercity (RTC, ESTA, TTD) bus would also be provided on E. Washington Street.

- To the south of the northern Federal Building driveway on N. Plaza Street, space would be available for a layover JAC bus (such as when buses are being switched out) and a JAC Assist van. The existing sidewalk would be shifted to the west and a new landscaping strip provided along the eastern right-of-way line. Optimally, one of the two existing driveways serving the Federal Building lot would be eliminated. As passenger loading/unloading would typically not occur in this area, no benches or shelters would be provided. Curb parking could be provided to the south. If battery electric bus charging equipment is needed at the transit center in the future, this area would be the appropriate location and there would be more than adequate space available for the equipment.

National Historic Preservation Act Considerations

This site is immediately across the street from the Virginia and Truckee Railroad Depot, which is listed on the National Register of Historic Places. As such, any federal funding for a transit center project would trigger the need to comply with Section 106 of the National Historic Preservation Act of 1966. Any site that would have a visual impact on the Depot (e.g., could be seen from the Depot) would need to conform to the Section 106 process of consultation and review. This should include a discussion of the plan with the Carson City Historic Resources Commission. In discussing the potential project with the Nevada State Historic Preservation Office, the Office indicated that while the project proponent would need to go through this process, there is no reason to expect that it would prohibit a transit center on this site. It was also concluded that shifting the building location to the southern end of the block would not change the process, as in both cases the building could be seen from the Depot.

Traffic Impact of One-Way Street Conversion

Any conversion of an existing street to one-way operation warrants careful consideration of the impact on existing drivers and traffic movements. As a basis for this review, LSC conducted traffic counts over a weekday afternoon peak period. As shown in Table 9, these counts focused on tracking the southbound movements from E. Washington Street through the site to their destination or exit location. A review of these counts indicates the following:

- The observed peak hour of southbound traffic occurred between 2:45 PM and 3:45 PM, when a total of 13 southbound vehicle-movements were observed. Of these, 5 made southbound through movements from N. Plaza Street north of E. Robinson Street), 5 made westbound left turns off of E. Washington Street and 3 made eastbound right turns from E. Washington Street.

- Most of these drivers departed the area by making a southbound left turn movement from N. Plaza Street to eastbound E. Robinson Street (9), while 2 parked along the west side of N. Plaza Street (including a JAC bus), 1 pulled into the Shell station and 1 pulled into the Coin Lot.

Based on these observed patterns, most of the vehicles eliminated from N. Plaza Street southbound would shift to N. Stewart Street. The few drivers heading to the Shell station or Coin Lot would likely shift to Carson Street to the west. At most, the greatest shift would be 5 southbound through movements at Plaza/Washington that would shift to southbound left turn movements. Given these low volumes and the generally good traffic conditions in the area, there is no potential for any significant traffic issues or driver delays, beyond the need for a low number of drivers to circle the block. Access to individual adjacent parcels would be provided as follows:

- The Shell station would lose southbound ingress to the driveway on N. Plaza Street, as well as eastbound egress to the south on N. Plaza Street. However, inbound drivers can easily go around the block to Stewart Street or Carson Street to use one of the other four access points, and outbound drivers can exit onto E. Caroline Street less than 100 feet away.

- While southbound movements in and out of the Coin Lot at the two driveways on Plaza Street would be eliminated, this lot also has access drives on both Caroline and Robinson Streets. The few drivers from the north on N. Plaza Street can easily go around the block to Stewart or Carson.

Access to the Federal Building would remain unchanged, except that southbound ingress on N Plaza Street would be eliminated. As the larger lot on the south side of the parcel also has access off of N. Stewart Street, drivers from the north would shift to that street. For the smaller 13-space lot, drivers from the north would largely access via Carson Street and Caroline Street. Left turns out of this smaller lot would still be provided.

TABLE 9: North Plaza Street Southbound Traffic Counts

Location: North Plaza Street, Carson City, Nevada
Date: Monday, January 10, 2022
Time: 2:30pm-5:30pm

Southbound Peak Hour Shown in Blue

Number of Vehicles by Southbound Entry Movement and Destination

	1 - Shell Gas			2 - Fed Bldg Small Lot			3 - E Carolina Street			4 - Coin Parking Lot		
	EBR	SBT	WBL	EBR	SBT	WBL	EBR	SBT	WBL	EBR	SBT	WBL
2:30 PM												
2:45 PM												
3:00 PM												
3:15 PM	1											
3:30 PM												1
3:45 PM												
4:00 PM												
4:15 PM												
4:30 PM												
4:45 PM												
5:00 PM												
5:15 PM												
Total	1	0	0	0	0	0	0	0	0	0	0	1

	5 - Fed Bldg Large Lot			6 - SBR E Robinson St			7 - SBL E Robinson St			Parked on Plaza Street		
	EBR	SBT	WBL	EBR	SBT	WBL	EBR	SBT	WBL	EBR	SBT	WBL
2:30 PM												
2:45 PM							1	1	1			1
3:00 PM								1				1
3:15 PM								1				
3:30 PM							1	2	1			
3:45 PM								1			1	
4:00 PM				1			1	1				
4:15 PM									1			
4:30 PM									1			
4:45 PM		1						1				
5:00 PM								1				
5:15 PM												
Total	0	1	0	1	0	0	3	9	4	0	1	2

	Total Northbound			JAC Buses
	NBL	NBT	NBR	
2:30 PM	1		3	
2:45 PM	1	1	1	
3:00 PM		2	4	
3:15 PM		2	2	4
3:30 PM	1	2	1	
3:45 PM		2		
4:00 PM	2	1	1	
4:15 PM		3	1	4
4:30 PM		2		
4:45 PM			1	
5:00 PM	1	5	2	
5:15 PM		2	2	4
Total	6	22	18	12

Total			
SB	NB	Total	
0	4	4	
4	3	7	
2	6	8	
2	8	10	Peak Hr
5	4	9	
2	2	4	
3	4	7	
1	8	9	
1	2	3	
2	1	3	
1	8	9	
0	8	8	
23	58	81	
13	21	34	Peak Hr

Transit Operations During Construction

Construction at this site would require staging to allow continuance of JAC operations during construction. Bus bays would be relocated to the south (south of Caroline Street) and the existing northern shelter would be relocated temporarily to the south. In the limited periods when Plaza Street north of Caroline Street is closed for construction, buses would exit via Caroline Street westbound. Once construction north of Caroline Street is complete, the relatively simple construction south of Caroline Street could be completed by shifting to the new bus bays to the north. When this segment is closed, buses would access the busy bays via Caroline Street eastbound. The temporarily relocated bus shelter would then be removed and made available for another location in the JAC system.

Construction Cost Estimate – Full Program

Table 10 presents a planning-level cost estimate for development of a transit center on the existing site. This estimate applies standard unit costs provided by Carson City Department of Public Works for many of the standard roadway and streetscape islands, and unit costs defined by LSC for similar previous studies regarding the transit-specific items. Items of note in this cost estimate are as follows:

- A unit cost of $660 per square foot is assumed for the transit center building. This factor can vary widely based on the quality of finish and the degree to which custom architectural features are incorporated. While this is consistent with other transit center projects, it reflects a high level of finish and could well be lower if a more utilitarian design approach is used.

- Roadway costs assume full removal and replacement of Plaza Street between E. Robinson Street and E. Washington Street, including adjacent areas of Robinson and Washington Streets to allow transitions.

- Costs are included for the removal of the existing fencing and replacement with a non-standard custom designed fence (that could incorporate artwork).

- Sidewalk/plaza area is assumed to be removed and replaced from E. Robinson Street around to the existing Federal Building driveway on Washington Street.

- It is assumed that the existing fire hydrant south of the northern driveway can remain in the current location.

- Costs for enhanced lighting is included.

- Costs are included for the additional mobilization and relocation of the bus shelter to allow for staged construction.

- “Soft costs” are included for contingency, design/engineering, construction management and project administration.

TABLE 10: Existing Site Transit Center Cost Estimate

ITEM	QTY	UNIT	UNIT PRICE	TOTAL ESTIMATE	Subtotal
Site Preparation					
Mobilization and Demobilization	1	EA	$50,000	$50,000	
Erosion and Sediment Control	1	LS	$5,000	$5,000	
Construction Staking / Survey	1	LS	$10,000	$10,000	
Temporary Fence	1,210	LF	$6.00	$7,260	
Utility Relocation	1	EA	$10,000	$10,000	$166,760
Remove Existing Sidewalk	6,660	SF	$4.50	$29,970	
Remove Existing Curb Ramp	3	EA	$800	$2,400	
Remove Existing Curb and Gutter	1,005	LF	$10.00	$10,050	
Remove Existing Roadway	19,200	SF	$1.15	$22,080	
QC/Materials Testing	1	LS	$20,000	$20,000	
Earthwork					
Fine Grading	27,350	SF	$0.50	$13,700	$13,700
Road, Parking Lot, Curb, Sidewalk					
Circulation Aggregate Base	375	CY	$80.00	$30,000	
Site Concrete	78	CY	$250	$19,500	
5" Bituminous Pavement	3,602	SF	$4.20	$15,100	
Concrete Ribbon Curb	1,110	LF	$45.00	$50,000	
Concrete ADA Ramp	10	LS	$4,800	$48,000	$447,500
Plaza and Walkways	10,870	SF	$20.00	$217,400	
Planting Beds/Perimeter Seating	550	SF	$50.00	$27,500	
Landscaping/Irrigation	--	LS	--	$30,000	
Miscellaneous	1	LS	$10,000	$10,000	
Facilities, Furnishings, Lighting					
Transit Building	1,458	SF	$660	$962,280	
Benches	8	LS	$1,500	$12,000	
Facility Furnishings	1	LS	$50,000	$50,000	
Covered Bicycle Rack	120	SF	$100	$12,000	$1,185,000
Enhanced Fencing	500	LF	$100	$50,000	
Lighting	9	EA	$7,080	$63,720	
Utility Connections	1	EA	$30,000	$30,000	
Miscellaneous	1	LS	$5,000	$5,000	
Signing & Striping					
Monument Sign	1	LS	$4,000	$4,000	
Misc Signs	28	LS	$650	$18,200	$72,400
Crosswalk Markings	9,000	SF	$5.50	$49,500	
Pavement Markings	120	LF	$6.00	$700	
Total Construction Cost					$1,885,360
Contingency (15%)					$282,800
Subtotal					$2,168,160
Design & Engineering (15%)					$325,200
Construction Management/Oversight (10%)					$216,800
Project Administration (5%)					$10,800
TOTAL DEVELOPMENT COSTS -- 2022					**$2,720,960**
Land Acquisition					
Land Value	0	Acre	**$700,000**	$0	
Closing Costs	**5%**			**$0**	**$0**
Appraisal	0	EA	$10,000	$0	
TOTAL ESTIMATE - 2022					***$2,720,960***
2022 to 2028 Escalation Factor - 3 years at 5% per year, 3 years at 3% per year					**1.26**
TOTAL ORDER OF MAGNITUDE ESTIMATE - 2028					***$3,430,000***

To reflect that the project will require several years to obtain funding and prepare plans and contracts, costs are increased to reflect estimated 2028 values. 2022 values are increased assuming 3 years of 5 percent inflation and 3 years of 3 percent inflation.[3]

As indicated, total project construction and development costs are estimated to be $3,430,000. Of this total, just over half consists of the transit facility building costs and associated soft costs.

Construction Cost Estimate – Interim Improvements

A cost estimate was also developed for interim improvements at the existing site (Site 1), as discussed above. Note that quantities for repairs to existing pavement and curb are estimates only and would require a detailed evaluation for final costing. No costs regarding design and engineering were included, given the simplicity of the improvements. In addition, the construction year was assumed to be 2025, rather than 2028. As indicated, a 2025 cost estimate of $233,800 was identified.

ROBINSON STREET SITE

This site consists of the north side of E. Robinson Street between N. Plaza Street and N. Stewart Street, and also makes use of the southern portion of the existing transit center sidewalk area along N. Plaza Street. As shown in Figure 9, to provide a footprint for the transit center building it would be necessary to negotiate purchase (or long-term lease) of a portion of the existing Federal Building parcel in the northeast corner of the Plaza/Robinson intersection. This land area is approximately 88 feet in east-west dimension and 28 feet in north-south dimension (2,464 square feet). It would allow the existing driveway on Plaza Street to remain unchanged but would require the elimination of eight existing parking spaces. As shown in the cross-section provided in Figure 10, Robinson Street would provide 2 24' travel lanes.

The Transit Center building is configured to wrap partially around the corner to provide good line of sight and pedestrian travel paths. To the east, the existing sidewalk area would include shelters and benches for passengers waiting for the buses queuing farther east along Robinson Street. Enhanced fencing would be provided between the transit uses and the Federal Building. All buses would line up along the north side of E. Robinson Street (facing westbound), with room for a van or crew vehicle along the existing curb on N. Plaza Street. This site alternative would require no changes to existing streets or circulation.

East of Fell Street, the Robinson Street centerline would need to transition approximately 8 feet to the north over a 110' distance, in order to align with the eastbound left turn lane at Stewart Street. As the through movement vehicles do not need to shift, this is effectively a bay taper for the eastbound left turn vehicles. Section 9.7.2.3 of the *Manual on Uniform Traffic Control Devices* (American Association of State Highway and Transportation Officials, 2018) indicates a minimum bay taper length of 100 feet, indicating that this restriping can be accommodated.

[3] The Congressional Budget Office forecasts consumer inflation for 2023 at 2 to 4 percent. However, construction costs are expected to increase by 5 percent in 2023 per the firm of CBRE.

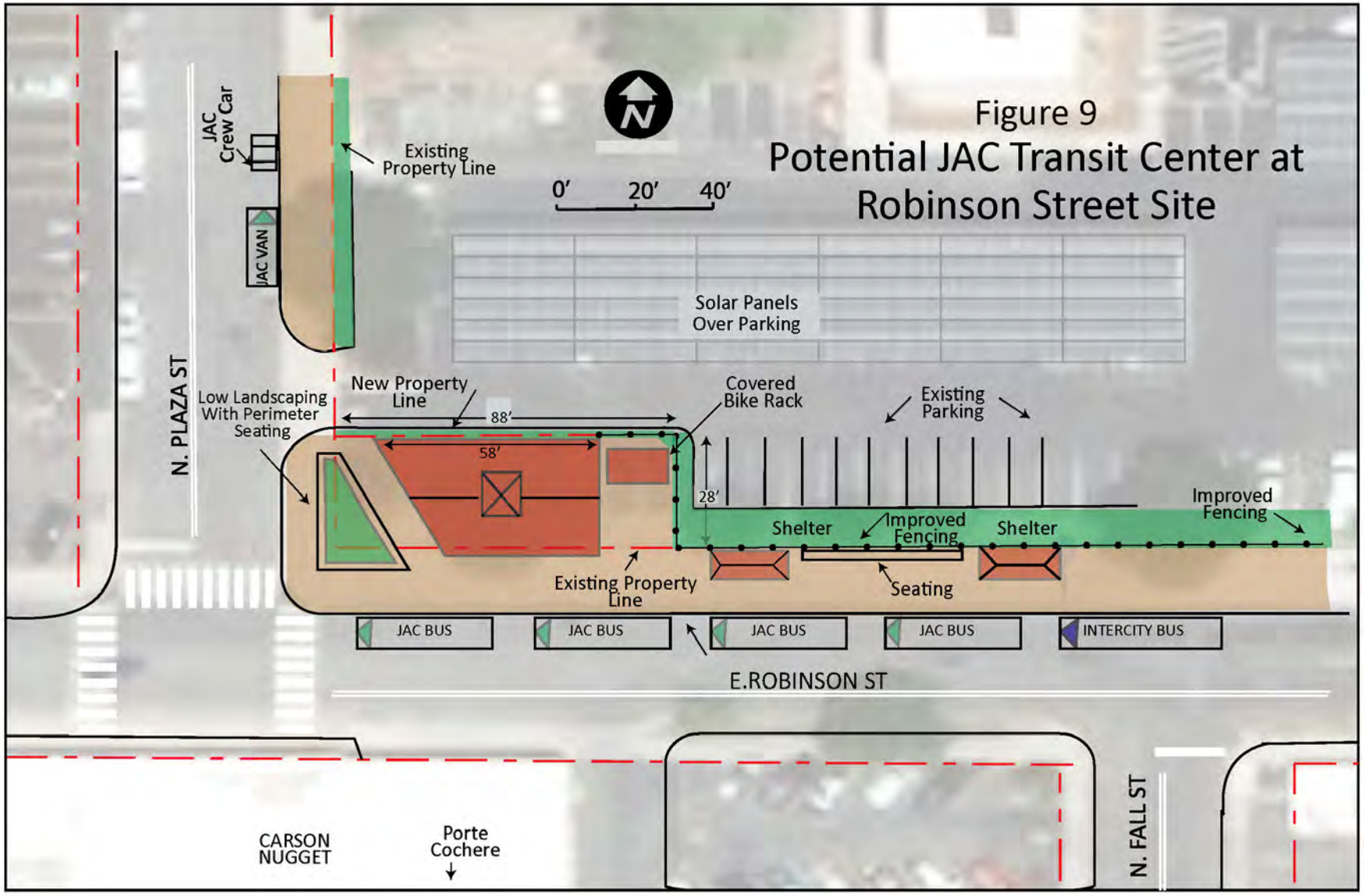
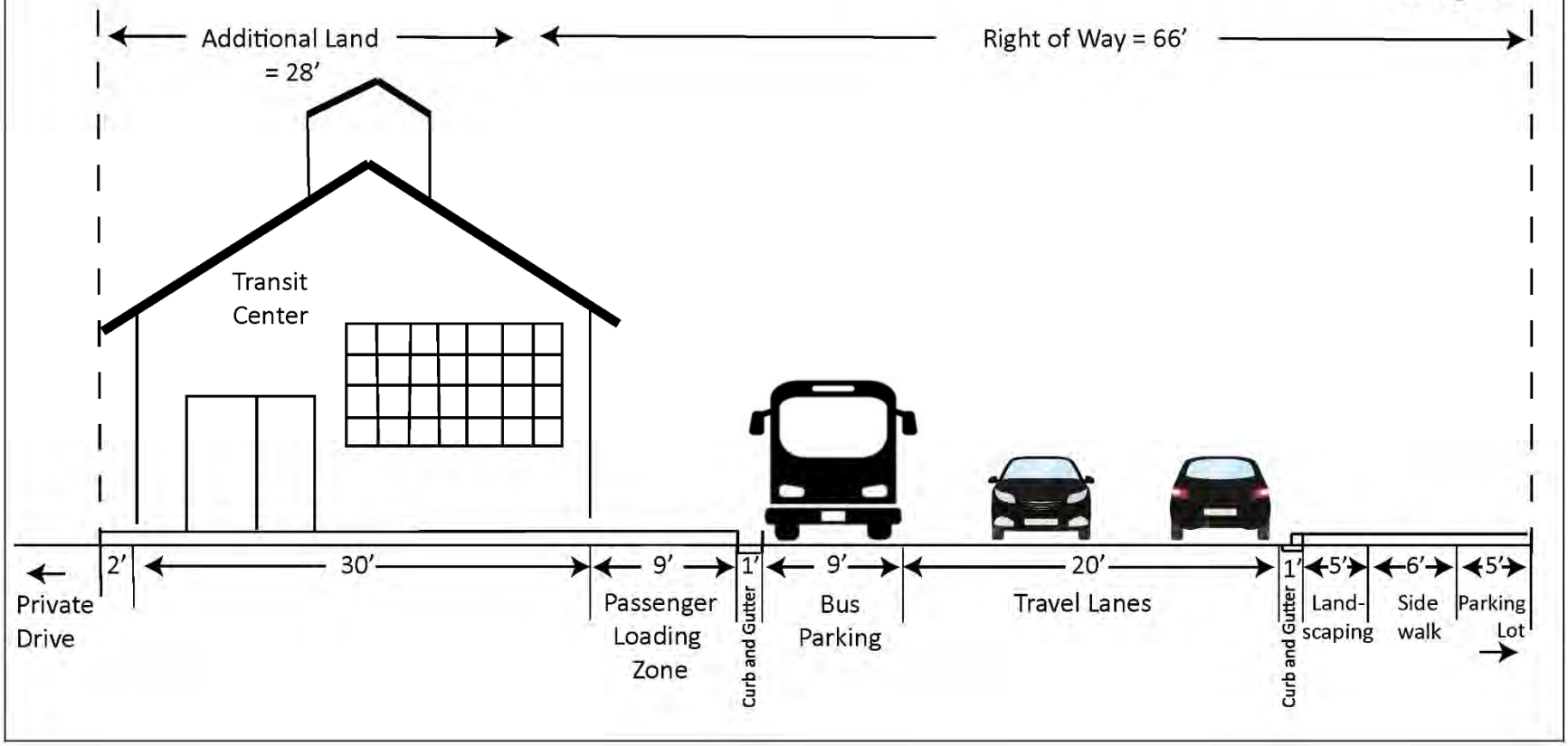


Figure 9
Potential JAC Transit Center at Robinson Street Site
JAC Crew Car
JAC VAN
Existing Property Line
0′ 20′ 40′
Solar Panels Over Parking
N. PLAZA ST
Low Landscaping With Perimeter Seating
New Property Line
88′
58′
Covered Bike Rack
Existing Parking
28′
Improved Fencing
Shelter
Improved Fencing
Shelter
Seating
Existing Property Line
JAC BUS
JAC BUS
JAC BUS
JAC BUS
INTERCITY BUS
E.ROBINSON ST
CARSON NUGGET
Porte Cochere
N. FALL ST

Figure 10
Cross Section of E. Robinson St with Transit Center
Looking East



To allow adequate distance for the eastbound through lane shift entering the site, the existing 40' yellow curb taxi loading zone directly south of Plaza Street (between the existing crosswalks) would need to be eliminated with a red curb, reducing capacity by two loading vehicles. The loading zone west of the western crosswalk would remain.
One option to this plan would be for the overall project to include "decommissioning" of the existing transit center by reducing the existing sidewalk width and expanding landscaping into this area.

Construction Cost Estimate

A cost estimate for development at this site is shown in Table 11, consistent with the approach used for the existing site cost estimate. Items of note in this cost estimate are as follows:

- A unit cost of $660 per square foot is assumed for the transit center building. This factor can vary widely based on the quality of finish and the degree to which custom architectural features are incorporated. While this is consistent with other transit center projects, it reflects a high level of finish and could well be lower if a more utilitarian design approach is used.

- Roadway costs assume full removal and replacement of the north side of E. Robinson Street from N. Fall Street and N. Plaza Street.

- Costs are included for the removal of the existing fencing and replacement with a non-standard custom designed fence (that could incorporate artwork).

- Sidewalk/plaza area is assumed to be removed and replaced from the existing southern Federal Building driveway on Plaza Street and along the north side of E. Robinson Street as far east as N. Fall Street. East of this point, a relatively new sidewalk is already in place that appears to be adequate.

- Costs for enhanced lighting is included.

- $5,000 is included for decommissioning of the existing transit center site, including removal of shelters and benches and minor pavement repair.

- "Soft costs" are included for contingency, design/engineering, construction management and project administration.

- Land acquisition costs are included, assuming current land value of $700,000 per acre for commercial land in central Carson City and including appraisal costs and closing costs.

As indicated, total project construction, land acquisition and development costs are estimated in 2028 to be $2,890,000. This is approximately $540,000 less than for the existing site option, largely due to the smaller area of street reconfiguration.

TABLE 11: Robinson Street Site Transit Center Cost Estimate

ITEM	QTY	UNIT	UNIT PRICE	TOTAL ESTIMATE	Subtotal
Site Preparation					
Mobilization and Demobilization	1	EA	$50,000	$50,000	$115,485
Erosion and Sediment Control	1	LS	$5,000	$5,000	
Construction Staking / Survey	1	LS	$10,000	$10,000	
Temporary Fence	600	LF	$6.00	$3,600	
Utility Relocation	0	EA	$10,000	$0	
Remove Existing Sidewalk	3,660	SF	$4.50	$16,470	
Remove Existing Curb Ramp	2	EA	$800	$1,600	
Remove Existing Curb and Gutter	180	LF	$10.00	$1,800	
Remove Existing Roadway	6,100	SF	$1.15	$7,015	
QC/Materials Testing	1	LS	$20,000	$20,000	
Earthwork					
Fine Grading	5,000	SF	$0.50	$2,500	$2,500
Road, Parking Lot, Curb, Sidewalk					
Circulation Aggregate Base	333	CY	$80.00	$26,700	$244,600
Site Concrete	125	CY	$250	$31,200	
5" Bituminous Pavement	8,520	SF	$4.20	$35,800	
Concrete Ribbon Curb	390	LF	$45.00	$17,600	
Concrete ADA Ramp	3	LS	$4,800	$14,400	
Plaza and Walkways	2970	SF	$20.00	$59,400	
Planting Beds/Perimeter Seating	390	SF	$50.00	$19,500	
Landscaping/Irrigation	--	LS	--	$30,000	
Miscellaneous	1	LS	$10,000	$10,000	
Facilities, Furnishings, Lighting					
Transit Building	1,440	SF	$660	$950,400	$1,172,880
Bus Shelters (Custom)	2	EA	$20,000	$40,000	
Benches	6	LS	$1,500	$9,000	
Facility Furnishings	1	LS	$50,000	$50,000	
Covered Bicycle Rack	120	SF	$100	$12,000	
Enhanced Fencing	290	LF	$100	$29,000	
Lighting	6	EA	$7,080	$42,480	
Utility Connections	1	EA	$30,000	$30,000	
Decommissioning of Existing Site	1	EA	$5,000	$5,000	
Miscellaneous	1	LS	$5,000	$5,000	
Signing & Striping					
Monument Sign	1	LS	$4,000	$4,000	$14,550
Misc Signs	10	LS	$650	$6,500	
Crosswalk Markings	700	SF	$5.50	$3,850	
Pavement Markings	500	LF	$0.42	$200	
Total Construction Cost					$1,550,015
Contingency (15%)					$232,500
Subtotal					$1,782,515
Design & Engineering (15%)					$267,400
Construction Management/Oversight (10%)					$178,300
Project Administration (5%)					$8,900
TOTAL DEVELOPMENT COSTS					**$2,237,115**
Land Acquisition					
Land Value	0.06	Acre	$700,000	$42,000	**$54,100**
Closing Costs	5%			$2,100	
Appraisal	1	EA	$10,000	$10,000	
TOTAL ESTIMATE - 2022					***$2,291,215***
2022 to 2028 Escalation Factor - 3 years at 5% per year, 3 years at 3% per year					1.26
TOTAL ORDER OF MAGNITUDE ESTIMATE - 2028					***$2,890,000***

SPEAR STREET SITE

The final site under consideration consists of the existing right-of-way of E. Spear Street between N. Fall Street and N. Stewart Street. While the existing right-of-way is currently used as part of parking lots on both the north and south sides of Spear Street, the existing right-of-way is 66 feet in width, which is sufficient to accommodate the transit center site program (with reconfiguration of the existing adjacent parking lots), as shown in Figure 11.

To provide a footprint adequate for the transit center building as well as adequate width for passenger loading/unloading at five bus bays, it is necessary to configure the site as a central plaza area with one-way 15-foot-wide transit-only drive lanes on the north and south sides. These one-way lanes need to be eastbound on the north side and westbound on the south side.

As there is not sufficient right-of-way width to provide transit lanes with width to allow buses to pass each other, bus drivers would typically need to pull as far forward as possible upon entering. Bus drivers would also need to wait for buses in front to depart before they can depart. This could create some delays of a few minutes at times, such as when the bus in front is loading a wheelchair user. Typically, JAC buses are scheduled to only be at the transit center for a few minutes. The Washoe RTC and ESTA routes also are on-site only as long as needed to deboard and board passengers. At present, only the TTD route uses Carson City as a layover point, which could necessitate a longer stay. Depending on the specific schedule overlap with JAC schedules, it may be necessary for the TTD bus to deboard passengers and then exit the transit center to lay over at another location (such as along the north side of Telegraph Street to the south) in order to not delay the JAC bus using the other bus bay on the north side.

This layout is convenient for passengers transferring between buses, as the walk distances between buses are relatively short. This also allow the transit center building to be conveniently located close to all five bus bays. However, there is very limited space for snow storage provided by this site design.

To ensure that entering buses are not blocked in a manner that stops traffic on Stewart Street, the bus bays on the south side of the transit plaza would be shifted to the west, providing space for an additional bus to pull into the transit lane even with three buses present on the south side of the plaza.

The lot to the north would need to be restriped to eliminate the existing 13 angled spaces along the south side (partially on City right-of-way) but would allow 1 more head-in space on the east side for a net loss of 12 spaces. In the lot to the south, 14 angled spaces partially on City right-of-way would be eliminated but six parallel spaces could be provided for a net loss of 8 spaces. Overall, 20 parking spaces would be eliminated.

The lot to the south of Spear Street is currently used for the Carson Farmers Market, which operated on Saturdays in June through September, from 8:30 AM to 1:00 PM. Use of the full right-of-way for the transit center would eliminate the northernmost 10 feet of the existing lot (or roughly 5 percent of the existing lot area).

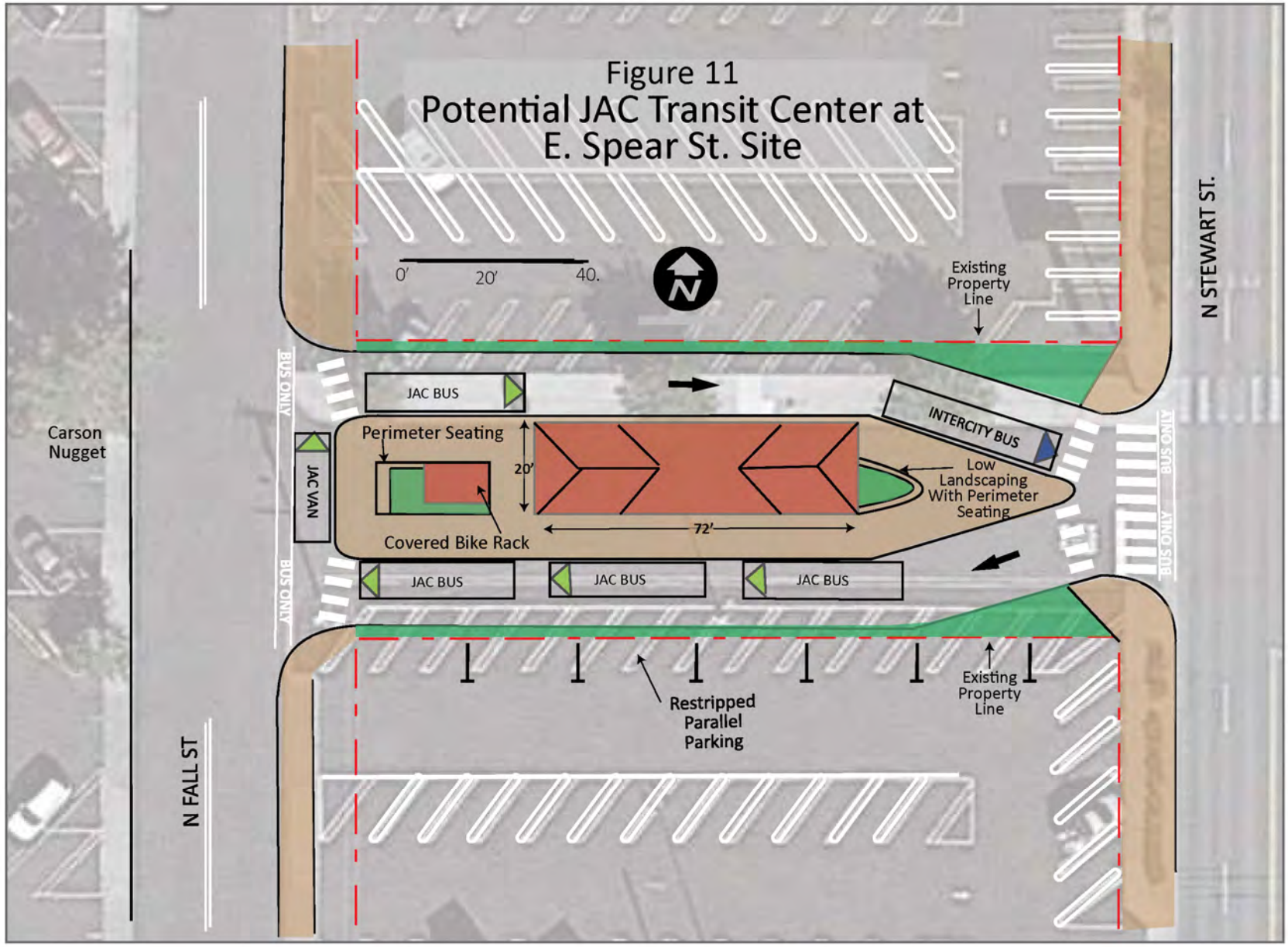


Figure 11
Potential JAC Transit Center at
E. Spear St. Site
0'
20'
40.
N
Existing
Property
Line
N STEWART ST.
BUS ONLY
JAC BUS
INTERCITY BUS
Carson
Nugget
Perimeter Seating
JAC VAN
20'
Low
Landscaping
With Perimeter
Seating
72'
Covered Bike Rack
JAC BUS
JAC BUS
JAC BUS
BUS ONLY
BUS ONLY
Restripped
Parallel
Parking
Existing
Property
Line
N FALL ST

Traffic Discussion

This site option would require the closure E. Spear Street west of N. Stewart Street to general public traffic. This 200-foot-long roadway effectively only serves as internal circulation to Carson Nugget parking lots. Existing traffic activity exclusive of special events is exceptionally low. Given that alternative access is provided both 200 feet to the north via Robinson Street and 200 feet to the south via Telegraph Street and considering the good overall traffic conditions in the vicinity, there is no chance that the relocation of existing traffic would create any significant traffic issues.

The bus circulation plan does present an unusual condition at the intersection of Spear Street and Stewart Street. Buses entering from Stewart Street will need to pass to the left of buses waiting to exit onto N Stewart Street. Exiting drivers will need to be aware that entering drivers from the north will pass in front of them. Given that only bus drivers will be making these movements, they can be trained to be aware of this condition. In addition, there is good driver sight distances in all directions. Signage and pavement markings would need to clearly identify that access is limited to buses only. In addition, the presence of the traffic signal on Stewart Street 200 feet to the north at Robinson Street creates gaps in southbound traffic that helps exiting bus drivers to pull onto Stewart Street. Given these factors, it is likely that no significant traffic safety impacts would be created. However, if this site is pursued a detailed traffic operations and safety analysis should be conducted.

Construction Cost Estimate

As shown in Table 12, the cost estimate for development at this site reflects the following (in addition to the factors discussed above):

- Removal of all roadways, parking lot pavement, sidewalk and curb and gutter within the Spear Street right-of-way and to the centerlines on Fall Street and Stewart Street is assumed.

- Costs are included for reconstruction of curbs at the new edges of the parking lots, as well as fencing between the transit center and adjacent lots.

- Costs are included for new sidewalks along the east side of Fall Street and the west side of Stewart Street between Telegraph Street and Robinson Street.

- $5,000 is included for decommissioning of the existing transit center site, including removal of shelters and benches and minor pavement repair.

In total, and including soft costs, development of a transit center on this site is estimated to require total costs of $2,990,000 in 2028 dollars. This is $100.000 more than the estimated cost of the E. Robinson Street site, and $300,000 less than the existing site.

TABLE 12: Spear Street Site Transit Center Cost Estimate

ITEM	QTY	UNIT	UNIT PRICE	TOTAL ESTIMATE	Subtotal
Site Preparation					
Mobilization and Demobilization	2	EA	$50,000	$100,000	$179,260
Erosion and Sediment Control	1	LS	$5,000	$5,000	
Construction Staking / Survey	1	LS	$10,000	$10,000	
Temporary Fence	530	LF	$6.00	$3,180	
Temporary Relocation of Shelter	1	LS	$2,000	$2,000	
Utility Relocation	1	EA	$10,000	$10,000	
Remove Existing Streetlight	2	EA	$650	$1,300	
Remove Existing Sidewalk	2,200	SF	$4.50	$9,900	
Remove Existing Curb Ramp	0	EA	$800	$0	
Remove Existing Curb and Gutter	500	LF	$10.00	$5,000	
Remove Existing Roadway	11,200	SF	$1.15	$12,880	
QC/Materials Testing	1	LS	$20,000	$20,000	
Earthwork					
Fine Grading	13,200	SF	$0.50	$6,600	$6,600
Road, Parking Lot, Curb, Sidewalk					
Circulation Aggregate Base	243	CY	$80.00	$19,500	$300,100
Site Concrete	150	CY	$250	$37,500	
5" Bituminous Pavement	3,870	SF	$4.20	$16,300	
Concrete Ribbon Curb	830	LF	$45.00	$37,400	
Concrete ADA Ramp	8	LS	$4,800	$38,400	
Plaza and Walkways	2900	SF	$20.00	$58,000	
Sidewalks along Fall and Stewart Sts.	4000	SF	$12.00	$48,000	
Planting Beds/Perimeter Seating	300	SF	$50.00	$15,000	
Landscaping/Irrigation	--	LS	--	$20,000	
Miscellaneous	1	LS	$10,000	$10,000	
Facilities, Furnishings, Lighting					
Transit Building	1,440	SF	$660	$950,400	$1,134,880
Bus Shelters (Custom)	0	EA	$20,000	$0	
Benches	4	LS	$1,500	$6,000	
Facility Furnishings	1	LS	$50,000	$50,000	
Covered Bicycle Rack	120	SF	$100	$12,000	
Enhanced Fencing	340	LF	$100	$34,000	
Lighting	6	EA	$7,080	$42,480	
Utility Connections	1	EA	$30,000	$30,000	
Decommissioning of Existing Site	1	EA	$5,000	$5,000	
Miscellaneous	1	LS	$5,000	$5,000	
Signing & Striping					
Monument Sign	1	LS	$4,000	$4,000	$22,390
Misc Signs	16	LS	$650	$10,400	
Crosswalk Markings	1,380	SF	$5.50	$7,590	
Pavement Markings	1,000	LF	$0.42	$400	
Total Construction Cost					$1,643,230
Contingency (15%)					$246,500
Subtotal					$1,889,730
Design & Engineering (15%)					$283,500
Construction Management/Oversight (10%)					$189,000
Project Administration (5%)					$9,500
TOTAL DEVELOPMENT COSTS					**$2,371,730**
Land Acquisition					
Land Value	**0**	Acre	**$700,000**	$0	
Closing Costs	5%			$0	**$0**
Appraisal	**0**	EA	$10,000	$0	
TOTAL ESTIMATE - 2022					***$2,371,730***
2022 to 2028 Escalation Factor - 3 years at 5% per year, 3 years at 3% per year					**1.26**
TOTAL ORDER OF MAGNITUDE ESTIMATE - 2028					***$2,990,000***

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Chapter 7
BENEFIT COST ANALYSIS

A new transit center for Carson City would have many benefits that are not possible to quantify, including the following:

- Raising the overall perception of public transit in the community as an attractive mobility option. The current facility does not provide an inviting environment to encourage "discretionary" travelers to use public transit.

- Addressing the existing lack of convenient driver restroom and break facilities.

- Addressing the existing impacts on the adjacent properties. The current lack of amenities on the site causes passengers to encroach on the adjacent Federal Building property, particularly in search of shade. An improved center can also accommodate improvements in fencing and security systems to minimize impacts on adjacent properties.

- Providing indoor climate-controlled waiting areas for passengers. This is particularly important for persons travelling on intercity buses with lower service frequency (Washoe RTC, ESTA, TTD).

Beyond these "intangibles," the US Department of Transportation's *Benefit-Cost Analysis Guidance for Discretionary Grant Programs* (January 2023) provides a framework for evaluating quantitative financial benefits, specifically the net present value benefits over a 20-year period (2027—the first year that a transit center is assumed to be open—to 2046). Per the guidelines, benefits are calculated at a seven percent annual discount rate.

Some of the potential quantifiable benefits identified for transit center proposals in other communities do not pertain for the Carson City proposal. As the existing center is in a good, centralized location and the potential alternative sites are within a few blocks of the existing site, there is no appreciable reduction in transit operating costs. The existing facility also accommodates all the buses in a convenient timed-transfer schedule, so a new center does not allow improved connections between buses (and associated reductions in passenger travel times). There is therefore no direct reduction in passenger travel time that would accrue from a new transit center.

ANALYSIS OF TRANSIT RIDERSHIP IMPACTS

The basis for this benefit analysis is an evaluation of how the project elements will expand transit ridership. The Carson City Transit Center would provide an improvement in amenities, including expanded indoor passenger waiting area, space for public information systems and greater visibility/public profile.

The professional literature regarding the ridership increase generated by new transit facilities (absent any reduction in travel time, as discussed above) is limited. This is in large part because service enhancements are typically implemented along with a new center, making it difficult to define the ridership benefit specifically resulting from the new facility. Bus Rapid Transit planning guides[4] indicate anecdotal evidence ranging from a negligible impact up to a 10 percent increase. Given the importance of the downtown Transit Center site as a key junction in the JAC transit system and as a transfer facility for other intercity transit services, a moderate (4 percent) increase in JAC fixed route ridership is applied. This is equal to an additional 11,700 passenger-trips per year. In addition, a modest (2 percent) increase in ridership on the Washoe RTC Regional Connector. The ridership impact on TTD and ESTA services is expected to be minimal. In sum, the transit center is estimated to increase existing annual ridership by 8,400 passenger-trips.

ANALYSIS OF QUANTIFIABLE TRANSIT BENEFITS

The transit improvement program will generate the quantifiable benefits discussed below.

Transit Rider Transportation Cost Savings

The increased transit ridership will reduce overall travel-related costs, as the operating costs for auto use are higher than transit fares. As shown in Table 13, the ridership estimates were divided by an average vehicle occupancy (over all trip types) of 1.67, per the BCA Guidance document, to yield the eliminated annual one-way vehicle-trips for each service. Multiplying by the average person-trip length on each service corridor yields the reduction in annual Vehicle-Miles of Travel (VMT). The cost savings per VMT rate is calculated at an average operating cost per vehicle-mile of 46 cents (per the BCA Guidance document) minus the average fare per person-mile for the various routes multiplied by the average vehicle occupancy. The ridership is expected to grow at the forecast rate of Carson City annual population growth (0.2 percent per year). As shown in Table 14, this benefit is $6,000 in 2027, increasing to $6,300 in 2046 with growth in ridership. The net present value of this benefit is $58,357.

Air Emission Benefits

The reduction in private vehicle (auto, light truck, and SUV) use will yield overall reductions in air pollutant emissions, even when the additional transit service is considered. The analysis of this benefit, as shown in Table 15, is based upon the VMT reductions (identified in Table 14) multiplied by standard auto emission cost factors. This yields a relatively small benefit of $700 per year. Over the 20-year analysis period this yields a net present value benefit of $7,799.

[4] Such as the Transit Cooperative Research Program Report 90: Bus Rapid Transit, 2003.

TABLE 13: Transit Benefits -- Base Year

	JAC Fixed Route	Washoe RTC Regional Connector	Total
Existing Annual Ridership (2018)	*195,160*	*30,000*	
Ridership Increase	7,800	600	**8,400**
Percent Increase	4%	2%	
Average Avoided Vehicle Occupancy	1.67	1.67	
Eliminated 1-Way Vehicle-Trips (1)	4,700	400	
Average Trip Length (Miles)	2.5	28	
Reduction in Private Vehicle VMT	11,800	11,200	**23,000**

TABLE 14: Motorist Travel Cost Reduction Benefits

Year	Annual Reduction in VMT by Transit Service: JAC Fixed Route	Annual Reduction in VMT by Transit Service: Washoe RTC Regional Connector	TOTAL	Annual Value	Discounted at 7 Percent
2027	12,000	11,400	23,400	$6,000	$5,189
2028	12,100	11,500	23,600	$6,100	$4,907
2029	12,100	11,500	23,600	$6,100	$4,563
2030	12,100	11,500	23,600	$6,100	$4,244
2031	12,100	11,500	23,600	$6,100	$3,947
2032	12,200	11,600	23,800	$6,200	$3,731
2033	12,200	11,600	23,800	$6,200	$3,469
2034	12,200	11,600	23,800	$6,200	$3,227
2035	12,200	11,600	23,800	$6,200	$3,001
2036	12,300	11,600	23,900	$6,200	$2,791
2037	12,300	11,700	24,000	$6,200	$2,595
2038	12,300	11,700	24,000	$6,200	$2,414
2039	12,300	11,700	24,000	$6,200	$2,245
2040	12,400	11,700	24,100	$6,200	$2,088
2041	12,400	11,800	24,200	$6,300	$1,973
2042	12,400	11,800	24,200	$6,300	$1,835
2043	12,400	11,800	24,200	$6,300	$1,706
2044	12,500	11,800	24,300	$6,300	$1,587
2045	12,500	11,900	24,400	$6,300	$1,476
2046	12,500	11,900	24,400	$6,300	$1,372
TOTAL					$58,357

TABLE 15: Air Emission Reduction Benefit

Year	Annual Value of Auto Air Emission Reduction: Annual Reduction in Auto VMT	Particulate Matter (PM)	Nitrous Oxides (NOx)	Sulfur Oxides (SOx)	Volatile Organic Compunts (VOC)	Carbon Dioxide	Net Annual Value	Discounted at 7 Percent
Value ($ per VMT) (1)		*$0.01893*	*$0.00602*	*$0.00039*	*$0.00219*	*$0.00520*		
2027	23,400	$400	$100	$0	$100	$100	$700	$605
2028	23,600	$400	$100	$0	$100	$100	$700	$563
2029	23,600	$400	$100	$0	$100	$100	$700	$524
2030	23,600	$400	$100	$0	$100	$100	$700	$487
2031	23,600	$400	$100	$0	$100	$100	$700	$453
2032	23,800	$500	$100	$0	$100	$100	$800	$481
2033	23,800	$500	$100	$0	$100	$100	$800	$448
2034	23,800	$500	$100	$0	$100	$100	$800	$416
2035	23,800	$500	$100	$0	$100	$100	$800	$387
2036	23,900	$500	$100	$0	$100	$100	$800	$360
2037	24,000	$500	$100	$0	$100	$100	$800	$335
2038	24,000	$500	$100	$0	$100	$100	$800	$311
2039	24,000	$500	$100	$0	$100	$100	$800	$290
2040	24,100	$500	$100	$0	$100	$100	$800	$269
2041	24,200	$500	$100	$0	$100	$100	$800	$251
2042	24,200	$500	$100	$0	$100	$100	$800	$233
2043	24,200	$500	$100	$0	$100	$100	$800	$217
2044	24,300	$500	$100	$0	$100	$100	$800	$201
2045	24,400	$500	$100	$0	$100	$100	$800	$187
2046	24,400	$500	$100	$0	$100	$100	$800	$174
TOTAL								$7,799

Note 1: Based on emission rates identified in *Methods to Fiind the Cost-Effectiveness of Fundinig Air Quality Projects -- Emission Factor Tables*, California Air Resources Board, September 2019.

Safety Benefits

As fatality/injury rates per mile traveled are significantly lower for bus passengers than for auto (and light truck/SUV) passengers, the increase in transit ridership resulting from the transit center would provide a safety benefit. Existing crash rates were defined from NDOT Office of Traffic Safety data. Based on National Safety Council data[5], the fatality rate (deaths per million passenger-miles) for light duty motor vehicles (passenger cars, light trucks, SUVs) for the ten years between 2009 and 2018 was 0.488, while the rate over the same period for buses was 0.047.

This indicates that the ratio of bus fatality rate to light duty motor vehicle rate was 9.63 percent (a crash modification factor of 90.4). This in turn can be used to identify the number and severity of crashes that would be avoided due to the shift of motorists to transit use. These are multiplied by the costs associated with crashes by severity, as identified in *Benefit-Cost Analysis Guidance for Discretionary*

[5] Death by Transportation Mode, Website: https://injuryfacts.nsc.org/home-and-community/safety-topics/deaths-by-transportation-mode/, 2007-2018

Grant Programs to yield the safety benefit. As shown in Table 16, the annual safety benefits are estimated to be $6,505 in the 2027. In total, the 20-year net present value of safety benefits is found to be $62,656.

TABLE 16: Safety Benefits

Year	Annual Reduction in Auto Million Passenger-Miles by Transit Service: JAC Fixed Route	Washoe RTC Regional Connector	TOTAL	Annual Value	Discounted at 7 Percent
2027	0.0200	0.0190	0.0391	$6,505	$5,626
2028	0.0202	0.0192	0.0394	$6,561	$5,277
2029	0.0202	0.0192	0.0394	$6,561	$4,908
2030	0.0202	0.0192	0.0394	$6,561	$4,564
2031	0.0202	0.0192	0.0394	$6,561	$4,245
2032	0.0204	0.0194	0.0397	$6,616	$3,981
2033	0.0204	0.0194	0.0397	$6,616	$3,702
2034	0.0204	0.0194	0.0397	$6,616	$3,443
2035	0.0204	0.0194	0.0397	$6,616	$3,202
2036	0.0205	0.0194	0.0399	$6,643	$2,990
2037	0.0205	0.0195	0.0401	$6,672	$2,793
2038	0.0205	0.0195	0.0401	$6,672	$2,597
2039	0.0205	0.0195	0.0401	$6,672	$2,416
2040	0.0207	0.0195	0.0402	$6,698	$2,255
2041	0.0207	0.0197	0.0404	$6,728	$2,107
2042	0.0207	0.0197	0.0404	$6,728	$1,959
2043	0.0207	0.0197	0.0404	$6,728	$1,822
2044	0.0209	0.0197	0.0406	$6,754	$1,701
2045	0.0209	0.0199	0.0407	$6,784	$1,589
2046	0.0209	0.0199	0.0407	$6,784	$1,478
TOTAL					$62,656

Benefit-Cost Analysis

Costs will consist of capital costs (design, engineering, construction, land acquisition and project management) as well as ongoing maintenance costs. These costs were defined as follows:

- The middle of the three site cost estimates was assumed ($2,990,000).
- Ongoing facility maintenance costs also need to be considered. A reasonable planning-level estimate is as follows:
    - Custodial and Grounds—$40,000
    - General building maintenance—$15,000
    - Utilities—$6,000
    - Security/Cameras/IT—$4,000.

This indicates a total annual facility cost of $65,000 per year. Annualized over the period from 2027—2046, the net present value of all costs is $4,201,050 as shown in Table 17. The various benefits discussed above, as shown in the bottom portion of Table 17, total $128,812 in present value. Dividing this figure by the total present value of all costs, the Benefit-to-Cost Ratio is found to be 0.04.

TABLE 17: Annual Costs and Benefit-Cost Ratio

Year	Capital Costs	Maintenance Costs	Total Annual Costs	Discounted at 7 Percent
2027	$2,990,000	$65,000	$3,055,000	$2,642,270
2028	$0	$65,000	$65,000	$52,283
2029	$0	$65,000	$65,000	$48,623
2030	$0	$65,000	$65,000	$45,220
2031	$0	$65,000	$65,000	$42,054
2032	$0	$65,000	$65,000	$39,111
2033	$0	$65,000	$65,000	$36,373
2034	$0	$65,000	$65,000	$33,827
2035	$0	$65,000	$65,000	$31,459
2036	$0	$65,000	$65,000	$29,257
2037	$0	$65,000	$65,000	$27,209
2038	$0	$65,000	$65,000	$25,304
2039	$0	$65,000	$65,000	$23,533
2040	$0	$65,000	$65,000	$21,886
2041	$0	$65,000	$65,000	$20,354
2042	$0	$65,000	$65,000	$18,929
2043	$0	$65,000	$65,000	$17,604
2044	$0	$65,000	$65,000	$16,372
2045	$0	$65,000	$65,000	$15,226
2046	$0	$65,000	$65,000	$14,160
TOTAL				$3,201,050

Benefits	Net Present Value
Rider Travel Cost Savings	$58,357
Air Emission Reductions	$7,799
Safety Benefits	$62,656
TOTAL	$128,812

Benefit-Cost Ratio	
Benefit	$128,812
Cost	$3,201,050
Ratio	0.04

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Chapter 8
FOCUSED SITE SCORING AND COMPARISON

ANALYSIS OF FOCUS SITES

Chapter 5 of this study prepared as part of this study presented a ranking/weighting system for evaluation of potential sites. This was used to narrow down the six original site options to the three discussed in this document. Using the results of the additional design and analysis documented in previous chapters of this document, this analysis was updated, as shown in Table 18.

Table 18: Updated Weighted Score of Site Alternatives

	Factor Weight (0 to 1)	Scoring (1 = Very Poor to 5 = Very Good)		
		Existing Site	Robinson St.	Spear St. West
Site Availability (Screening)	*1.00*	*Yes*	*Possibly*	*Yes*
Construction Cost	0.50	2	3	3
Parking Impact	0.75	4	3	3
Downtown Area Goals	1.00	5	5	5
Transit Efficiency & Access	0.75	4	4	3
Passenger Safety & Convenience	1.00	5	4	3
Adjacent Land Use Compatibility	1.00	4	4	5
Expandability/Flexibility	0.75	4	3	1
Weighted Score		**24.0**	**22.0**	**19.8**

These scores were defined as follows:

- Construction Cost— The Existing Site costs would be higher than the other two sites (due to the larger roadway reconstruction area), scoring slightly lower on this factor.

- Parking Impact—The Existing Site would reduce on-street parking by a net five spaces, while the Robinson Street Site would reduce parking supply by 8 spaces (along with two taxi loading spaces) and the Spear Street Site would reduce parking by 20 spaces.

- Downtown Area Goals—All sites align with Downtown Area Goals.

- Transit Efficiency and Access—As discussed in Chapter 5, the transit mileage needed to serve any of the sites are remarkably similar (within $400 per year of operating costs). The potential for buses at the Spear Street site to be blocked from exiting due to the presence of other buses is a disadvantage to that site.

- Passenger Safety and Convenience—All three sites allow passengers to transfer between buses without the need to cross public streets or driveways, which is a safety benefit. The Spear Street Site has a convenience benefit in that bus bays are closer together (reducing walk distance) than for the other two sites. However, the Spear Street Site is a one block longer walk to trip destinations along Carson Street. The Existing Site benefits in this regard by the relatively low traffic volumes on Plaza Street compared with Robinson Street.

- Adjacent Land Use Compatibility—Both the Existing Site and the Robinson Street Site would keep the transit functions immediately adjacent to the Federal Building, which has been an issue in the past. While the site improvements are expected to address this issue, the Spear Street Site avoids the issue altogether. Assuming the slight 5 percent reduction in the parking lot to the south of the site does not have a substantial impact on the Farmers Market, the Spear Street Site ranks slightly higher than the other two sites.

- Expandability/Flexibility – While each of the sites can accommodate the currently-foreseeable site program, as a long-term facility investment there is always the potential for new technologies or site requirements to be accommodated. Examples may include charging equipment for battery electric transit vehicles or providing space for a bike share or scooter share program. The relatively large amount of space provided at the Existing Site due to the viability of reducing Plaza Street to a single lane provides a clear benefit in this category.

Consideration was given to also adding a "Traffic Impact" category, as two options (existing and Spear Street) change current traffic access patterns slightly. As none of the options were found to have any significant traffic/circulation impacts, however, adding this category would not change the relative weighted rankings.

As shown, all sites yield an overall score within a relatively narrow range of 19.8 to 24.0. This analysis, however, does indicate a modest overall advantage to the Existing Site at 24.0, compared with 22.0 for the Robinson Street Site and 19.8 for the Spear Street Site. As mentioned in Chapter 5, the scoring analysis did not include Site 0 – Upgrade Existing, as it remains a short-term option regardless of the final recommendation and selection of a long-term location.

Chapter 9
STUDY FINDINGS AND RECOMMENDATIONS

KEY STUDY FINDINGS

Ultimately, after assessing existing transit center site challenges, generating potential new sites, exploring each site for feasible viability in development and operations, and determining cost impacts to implementation, the key findings of this study are as follows:

- The JAC fixed route service is important to many Carson City residents. As a "hub and spoke" "pulse" system, a transit center for bus transfers in this general area of downtown is a key element of the service. It also serves as a connection point for regional transit services providing service to Reno/Sparks and Lake Tahoe.

- The existing Downtown Transfer Plaza consists only of a wide sidewalk with 2 shelters, 3 benches, and a bike rack along the sidewalk adjacent to the east side of North Plaza Street. This facility has numerous existing deficiencies:

    - It lacks sufficient shelter for the existing peak passenger loads.
    - It does not provide driver break facilities, such as restrooms.
    - Lack of lighting is a potential safety issue.
    - The poor facilities result in some passengers encroaching onto nearby properties (in particular, the Federal Building) in search of seating and shade.
    - The current configuration results in long walking distance for passengers transferring between some buses.
    - The facility does not provide a positive public image for the transit service, nor does it have adequate wayfinding signage, real-time information, or marketing for the services it accommodates and links together.

- An improved transit center would warrant the provision of a modest enclosed building of approximately 1,500 square feet of floor area, providing a passenger waiting area, staff break facilities and office, and restrooms. Transit bays to accommodate up to 7 buses are also warranted.

- None of the three sites evaluated in detail (Site 1, Site 4, or Site 5) fully meet the space requirements identified in Table 5. Changes to adjacent land use, redevelopment of adjacent parcels, and further coordination with nearby building owners may present new partnership opportunities over the long-term that could result in a Downtown Transfer center that meets all the stated requirements.

- The City should carefully consider short and long-term costs of the site, not only for construction, but also for ongoing maintenance and care of the facility.

RECOMMENDATIONS

With these findings in mind and based on a detailed analysis of each site, it is recommended to pursue construction on the existing site along Plaza Drive. Of the options analyzed, and with these findings in mind, Site 1 at the existing location along Plaza Drive is the best long-term location for the Downtown Transfer Center. Advantages of this site over the others considered are as follows:

- It does not require the purchase of additional property.
- It provides greater flexibility to provide for future modifications, such as for electric vehicle charging.
- It has less impact on other adjacent uses. By providing better facilities on site, in fact, it can reduce the existing nuisance use of the Federal Building lawn area.
- It provides for better pedestrian safety than the other locations.

However, there are additional challenges and questions to be addressed prior to recommending this site for construction in the short-term. Therefore, the following two recommendations are made:

1) Proceed with design and construction of interim improvements at Existing Site 1 to address short-term challenges with the site.
2) Continue to monitor changes to adjacent land use and continue open dialog and coordination with nearby building owners related to future opportunities in addressing the long-term goals for JAC.

Implementation

Achieving a new transit center for Carson City is a substantial endeavor. Key implementation steps consist of the following for the short-term recommendation:

- Pursue Federal funding for planning and construction, such as existing transit funding apportioned for JAC operations, or by perusing the Federal Transit Administration's Section 5339 Grants for Buses and Bus Facilities program.
- Coordinate with the property owners of the adjacent Federal Building parcel. While the transit center project will not require additional land, it will affect this parcel. Discussions are needed regarding access to the monument, modifications to the central driveway, and changes to fencing and landscaping areas.
- Begin design of the facility including by conducting a review and identification of potential environmental mitigations.

For the long-term transit center to be successful, the following are key steps:

- Coordinate with all adjacent the property and building owners to understand future plans and partnership opportunities.

- Through the environmental process, present the proposed project to the Carson City Historic Resources Commission and discuss how the project center can minimize impacts on the Virginia and Truckee Railroad Station and best be compatible with this historic asset.

- Pursue federal funding for ongoing maintenance and operations, including on-site staffing by JAC or contractor personnel.

- Conduct a focused traffic study to support the conversion of Plaza Street to one-way northbound.

- Conduct a procurement process to retain an architectural/engineering firm to develop plans for the new facility.

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Appendix A

DRIVER SURVEY RESULTS

Carson City JAC Transit Center Facility Feasibility Study
– Bus Driver Interview Questions –

In the 2019 Carson City Transit Development Plan, the need for an improved JAC transit center was identified. Carson City has hired LSC Consultants, Inc to complete a feasibility study to identify needs, conduct outreach, and to evaluate the existing downtown transfer site as well as other potential locations to consider for a future transit station. As a part of these efforts, we would like to ask the bus drivers a few questions.

This is only a study; future action requires direction from the Carson City Regional Transportation Commission

1. What are some pros and cons about the existing location along Plaza Street by the Federal Building?

Pros	Cons
	- Fire Hydrant need remove

2. As a driver, what should site planners consider when evaluating a site for a transit center (access, circulation, etc.)?

* Need to build a public restroom!

Use back if needed

3. What are some transit center features you would like to see included in the new location? (Check the following)

Amenities	Yes	No
Indoor waiting area	✓	
Driver Restrooms	✓	
Public Restrooms	✓	
Security (Cameras and Lighting)	✓	
Bicycle Racks	✓	
Additional seating	✓	
Small Office Space	✓	
Storage Area	✓	
Vending Machine (Food and Drinks)	✓	

4. What is the greatest number of people you have ever seen waiting at the current Plaza Street stop? (Check the best answer) ☐ Less than 10 people ☐ 10-20 people ☒ 20-30 people ☐ 30-40 people ☐ 40-50 people ☐ More than 50, specifically my best estimate is _____

5. Is there anything else you would like to share regarding the evaluation of a future transit center?

Carson City JAC Transit Center Facility Feasibility Study
– Bus Driver Interview Questions –

In the 2019 Carson City Transit Development Plan, the need for an improved JAC transit center was identified. Carson City has hired LSC Consultants, Inc to complete a feasibility study to identify needs, conduct outreach, and to evaluate the existing downtown transfer site as well as other potential locations to consider for a future transit station. As a part of these efforts, we would like to ask the bus drivers a few questions.

This is only a study; future action requires direction from the Carson City Regional Transportation Commission

1. What are some pros and cons about the existing location along Plaza Street by the Federal Building?

Pros

Wide parking area

Cons

Not always enough time to get to restroom
No Food plaza close by

2. As a driver, what should site planners consider when evaluating a site for a transit center (access, circulation, etc.)?

Plenty of parking
Restroom Employee accessable only
waiting area

Use back if needed

3. What are some transit center features you would like to see included in the new location? (Check the following)

Amenities	Yes	No
Indoor waiting area	X	
Driver Restrooms	X	
Public Restrooms		X
Security (Cameras and Lighting)	X	
Bicycle Racks	X	
Additional seating		
Small Office Space		
Storage Area	X	
Vending Machine (Food and Drinks)	X	

4. What is the greatest number of people you have ever seen waiting at the current Plaza Street stop? (Check the best answer) ☐ Less than 10 people ☒ 10-20 people ☐ 20-30 people ☐ 30-40 people ☐ 40-50 people ☐ More than 50, specifically my best estimate is _____

5. Is there anything else you would like to share regarding the evaluation of a future transit center?

make it Driver freindy one way in/out for Bus Traffic only

Carson City JAC Transit Center Facility Feasibility Study
– Bus Driver Interview Questions –

In the 2019 Carson City Transit Development Plan, the need for an improved JAC transit center was identified. Carson City has hired LSC Consultants, Inc to complete a feasibility study to identify needs, conduct outreach, and to evaluate the existing downtown transfer site as well as other potential locations to consider for a future transit station. As a part of these efforts, we would like to ask the bus drivers a few questions.

This is only a study; future action requires direction from the Carson City Regional Transportation Commission

1. What are some pros and cons about the existing location along Plaza Street by the Federal Building?

Pros	Cons
1. General location in town.	1. Position of fire hydrant?

2. As a driver, what should site planners consider when evaluating a site for a transit center (access, circulation, etc.)?

1. Direction of weather?
2. Safety of clients in wait.
3. Transfers?
4.

Use back if needed

3. What are some transit center features you would like to see included in the new location? (Check the following)

Amenities	Yes	No
Indoor waiting area		
Driver Restrooms	X	
Public Restrooms		
Security (Cameras and Lighting)	X	
Bicycle Racks	X	
Additional seating		
Small Office Space		
Storage Area		
Vending Machine (Food and Drinks)		

4. What is the greatest number of people you have ever seen waiting at the current Plaza Street stop? (Check the best answer) ☐ Less than 10 people ☒ 10-20 people ☐ 20-30 people ☐ 30-40 people ☐ 40-50 people ☐ More than 50, specifically my best estimate is _____

5. Is there anything else you would like to share regarding the evaluation of a future transit center?

What type of vehicles are in the transit future?
Electric / Battery?

Carson City JAC Transit Center Facility Feasibility Study
– Bus Driver Interview Questions –

In the 2019 Carson City Transit Development Plan, the need for an improved JAC transit center was identified. Carson City has hired LSC Consultants, Inc to complete a feasibility study to identify needs, conduct outreach, and to evaluate the existing downtown transfer site as well as other potential locations to consider for a future transit station. As a part of these efforts, we would like to ask the bus drivers a few questions.

This is only a study; future action requires direction from the Carson City Regional Transportation Commission

1. What are some pros and cons about the existing location along Plaza Street by the Federal Building?

Pros:
EASY TO PULL INTO
NEARBY CASINO
STREET IS WIDE
EASY TO PULL OUT from

Cons:
FIRE HYDRANT NEAR CURB.
NO Designated BAYS for Buses
CARS Sometimes INTERFERE by PARKING too close.

2. As a driver, what should site planners consider when evaluating a site for a transit center (access, circulation, etc.)?

PEDESTRIAN WALKWAYS
BAYS FOR EACH BUS
Shelter for Bad weather

Use back if needed

3. What are some transit center features you would like to see included in the new location? (Check the following)

Amenities	Yes	No
Indoor waiting area	✓	
Driver Restrooms	✓	
Public Restrooms		✓
Security (Cameras and Lighting)	✓	
Bicycle Racks		✓
Additional seating	✓	
Small Office Space	✓	
Storage Area	✓	
Vending Machine (Food and Drinks)	✓	

4. What is the greatest number of people you have ever seen waiting at the current Plaza Street stop? (Check the best answer) ☐ Less than 10 people ☐ 10-20 people ☐ 20-30 people ☒ 30-40 people ☐ 40-50 people ☐ More than 50, specifically my best estimate is _____

5. Is there anything else you would like to share regarding the evaluation of a future transit center?

NO

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Appendix B

POTENTIAL SITE INFORMATION

Site 1 - Existing Site Summary

Site Information

Site Address	705 N Plaza Street
APN	426202
Owners	US Government
Zoning	Public Regional
Allowable Use	Yes

Site 2 - V&T Freight House Summary

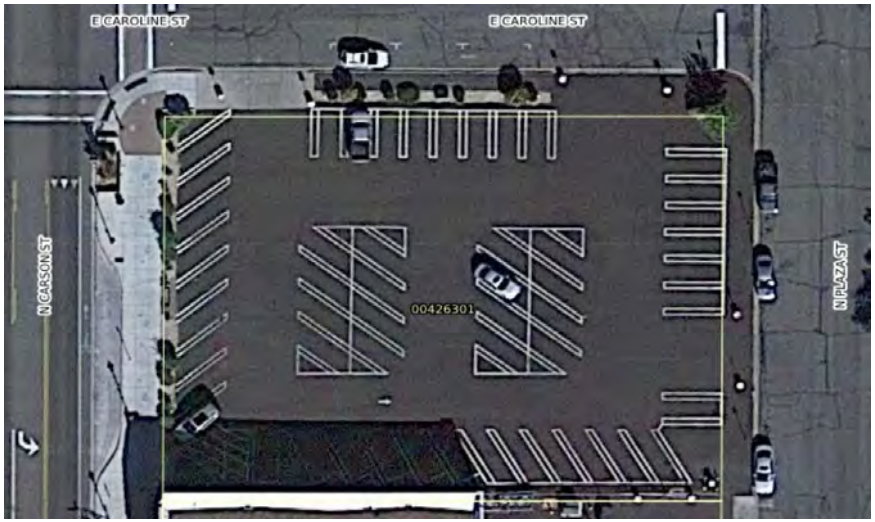
Site Information

Address	113 E Washington Street
APN	426101
Owners	Masonic Lodge, Carson
Size	0.2 Acres
Zoning	Downtown Mixed Use
Allowable Use	Yes

Site 3 - Coin Lot

Site Information

Address	617 N Carson Street
APN	426301
Owners	Adams N Carson LLC
Size	0.51 Acres
Zoning	Downtown Mixed-Use
Allowable Use	Yes



Site 4 - Robinson St.

Site Information

Address	705 N Plaza Street
APN	426202
Owners	US Government
Zoning	Public Regional
Allowable Use	Yes

Site 5 - Spear St. West

Site Information

Address	East Spear Street between Fall Street and Stewart Street
APN	00422407, 00422408, & 00422402
Owners	Adams N Carson LLC
Zoning	Downtown Mixed Use

Site 6 – Spear Street East

Site Information

Addresses	Spear Street between Stewart Street and Valley Street
APN	00422306 & 00422307
Owners	Adams N Carson LLC
Zoning	Downtown Mixed Use