



COMPREHENSIVE OPERATIONS ANALYSIS

TECHNICAL ANALYSIS

DECEMBER 2017



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NAPA Valley Transportation Authority

Kate Miller, Executive Director

Matthew Wilcox, Public Transit Manager

Danielle Schmitz, Planning Manager

Rebecca Schenck, Transportation Program Manager

Sharma Shaveta, Transportation Program Manager

Document Preparation



1625 Shattuck Avenue, Suite 300

Berkeley, California 94709

510.848.3815

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1.

Introduction

The information in this document will create a baseline for all future planning efforts in the comprehensive operational analysis (COA). Route performance will be reviewed to better understand where service is underutilized or where demand is high requiring a service increase. Travel behaviors for current Vine riders will also be analyzed using data from automated passenger counters (APCs) and a transfer matrix, to analyze the frequency and popularity of various transfer locations and routes. By combining data from this document with the findings in the Market Assessment, the Napa Valley Transportation Authority (NVTA) can move into the planning phase of this COA with an understanding of where Vine service is operating most efficiently and where improvements can be made. The focus of this document and the COA as a whole will be on the local routes serving the City of Napa and Regional Routes 10 and 11. Data will also be provided for the Routes 21, 25¹, and 29. The changes applied to the latter three routes will be informed by the Express Bus Study.

¹ The Route 25 was discontinued as of December 29, 2017.

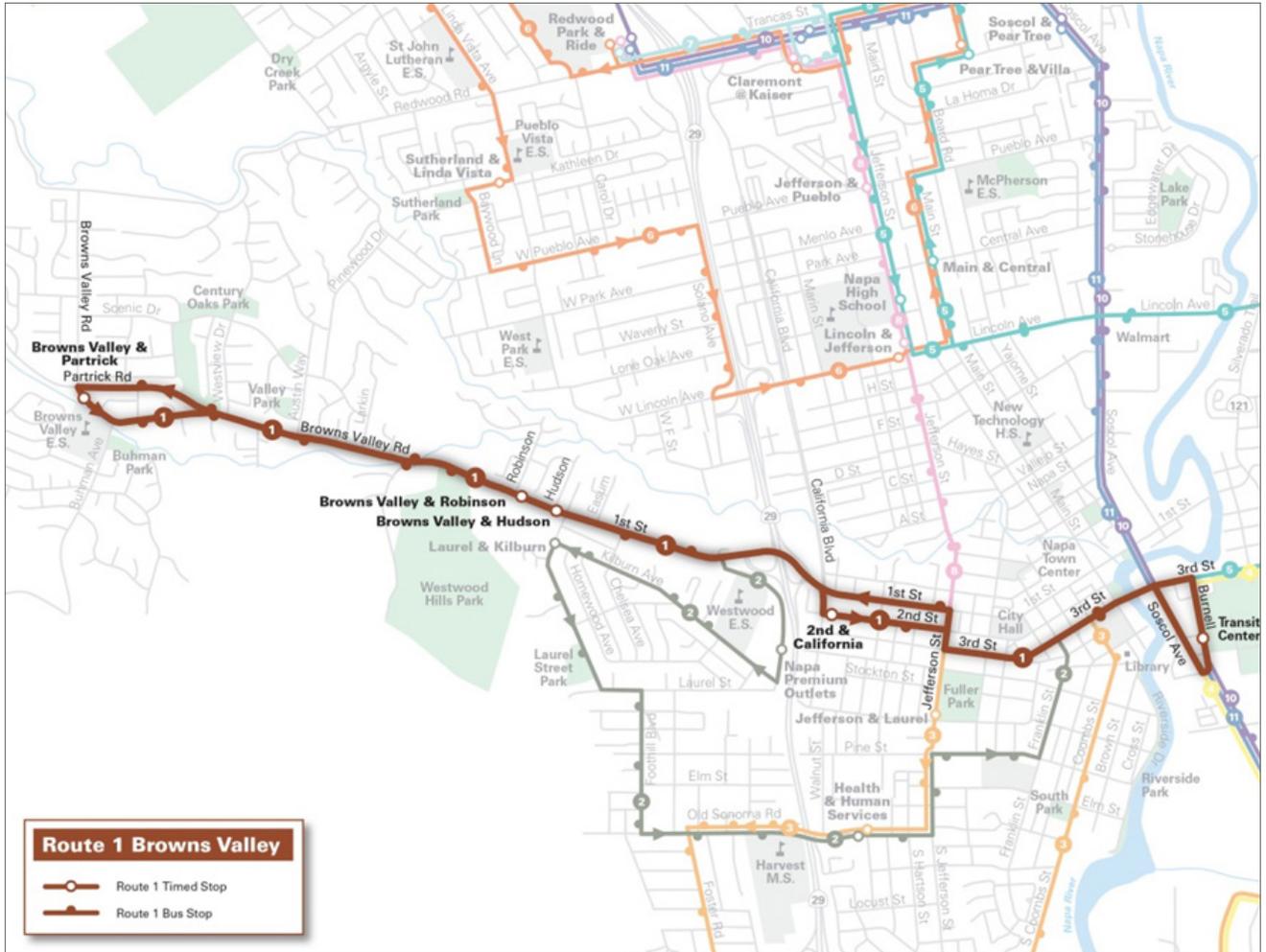


2.

Existing Routes and Service Profiles

The Napa Valley Transportation Authority (NVTA) oversees the operation of twelve fixed route services, four community dial-a-ride services, and complementary ADA paratransit. Of the twelve fixed route services, four provide service outside of Napa County. The Vine local service, Routes 1-8 are primarily one way loops beginning and ending at either the Soscol Gateway Transit Center or at the Redwood Park and Ride lot. This type of service works to cover the majority of the City's geography, however fails to deliver efficient two-way travel e.g. trips from home to the market then back along the same line. Depending on the destination some trips require a transfer hindering direct travel.

Figure 2.1.1: Route 1 Service Profile



2.1.1 Route 1

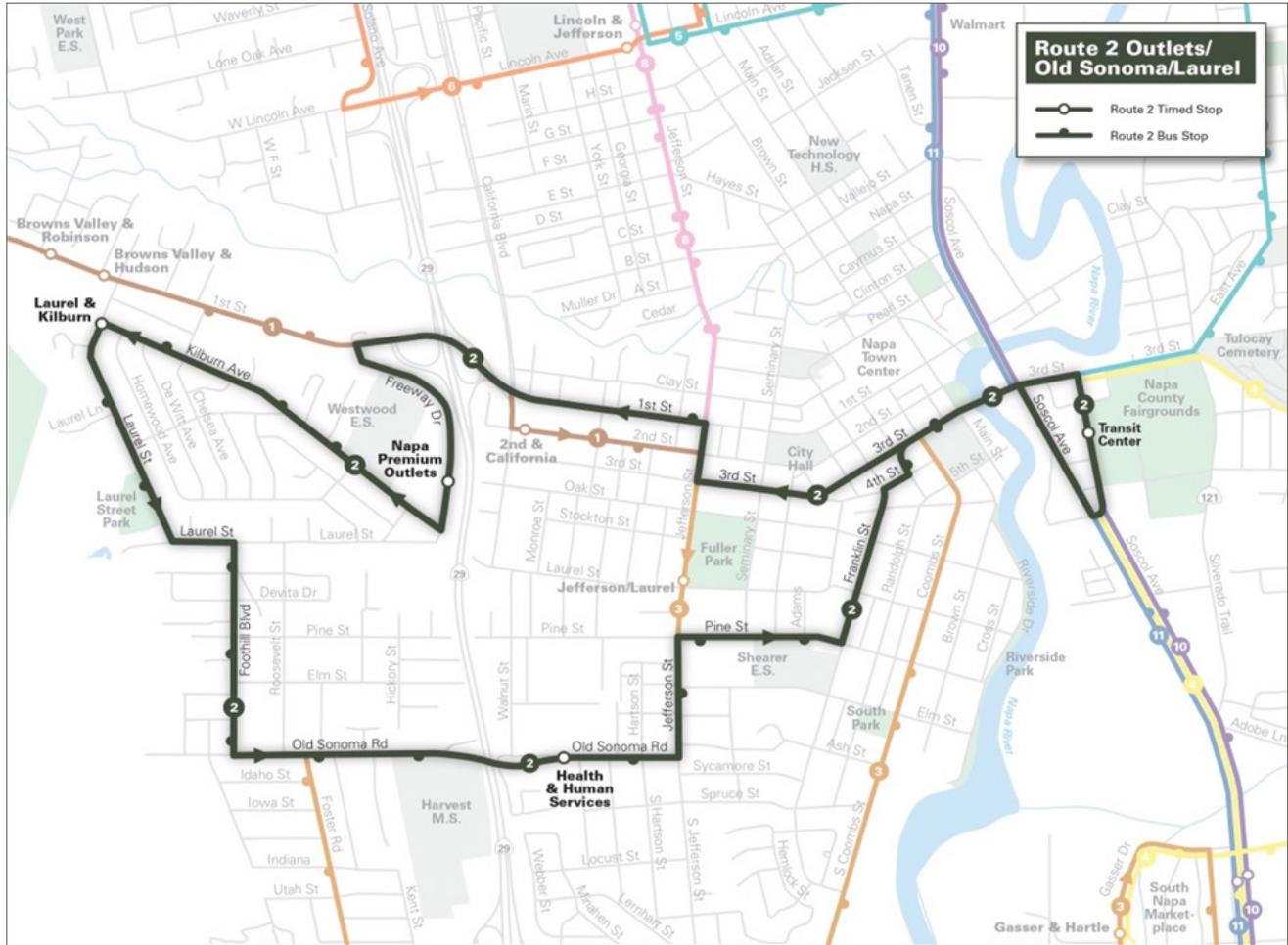
Span of Service:

Weekdays 7:05AM – 5:35PM | Saturdays 7:05AM – 5:35PM | Sundays No Service

Frequency (minutes):

Weekdays 45 | Saturdays 45

Figure 2.1.2: Route 2 Service Profile



2.1.2 Route 2

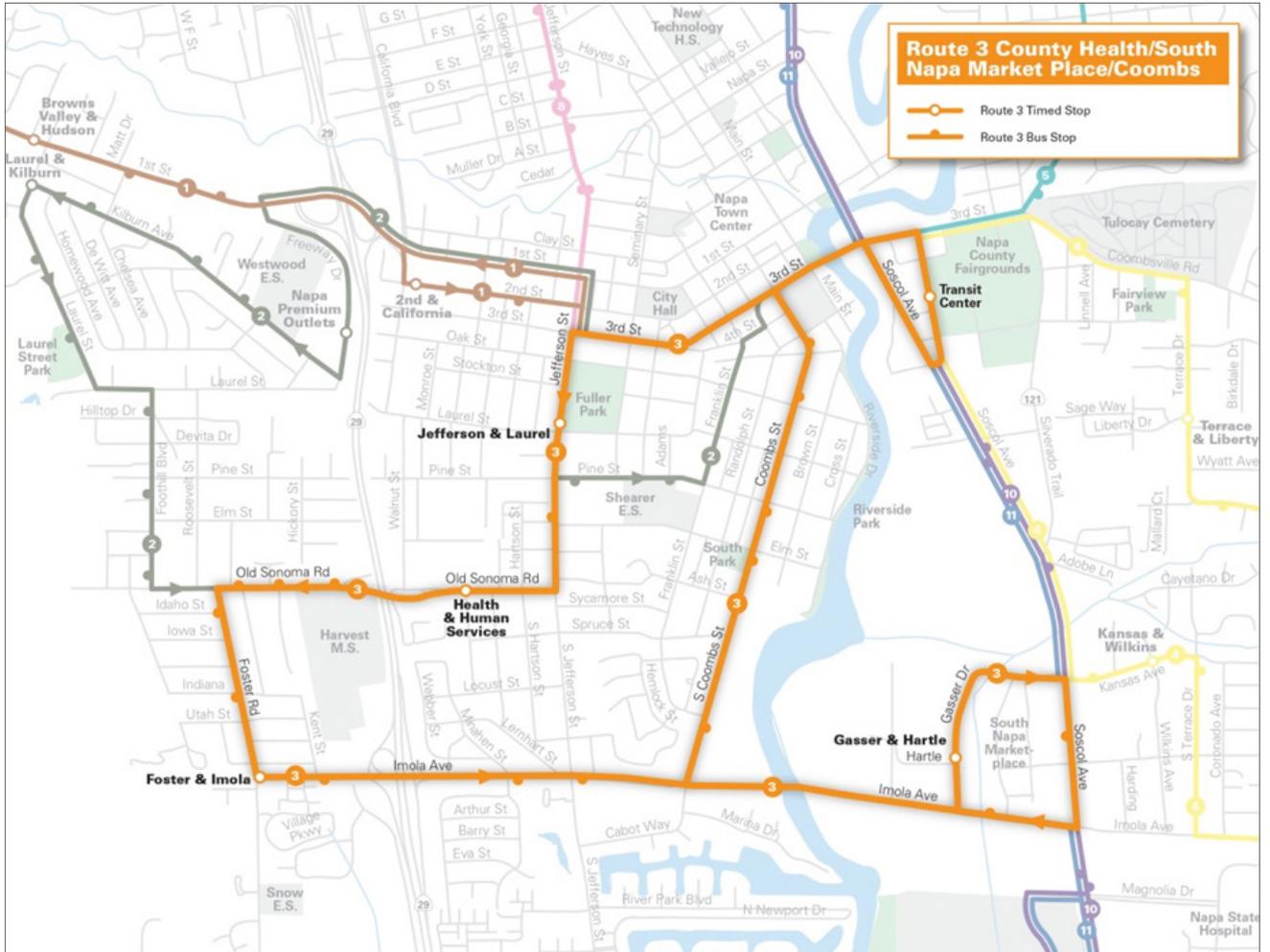
Span of Service:

Weekdays 6:45AM – 6:15PM | Saturdays 6:55AM – 5:25PM | Sundays No Service

Frequency (minutes):

Weekdays 30 | Saturdays 45

Figure 2.1.3: Route 3 Service Profile



2.1.3 Route 3

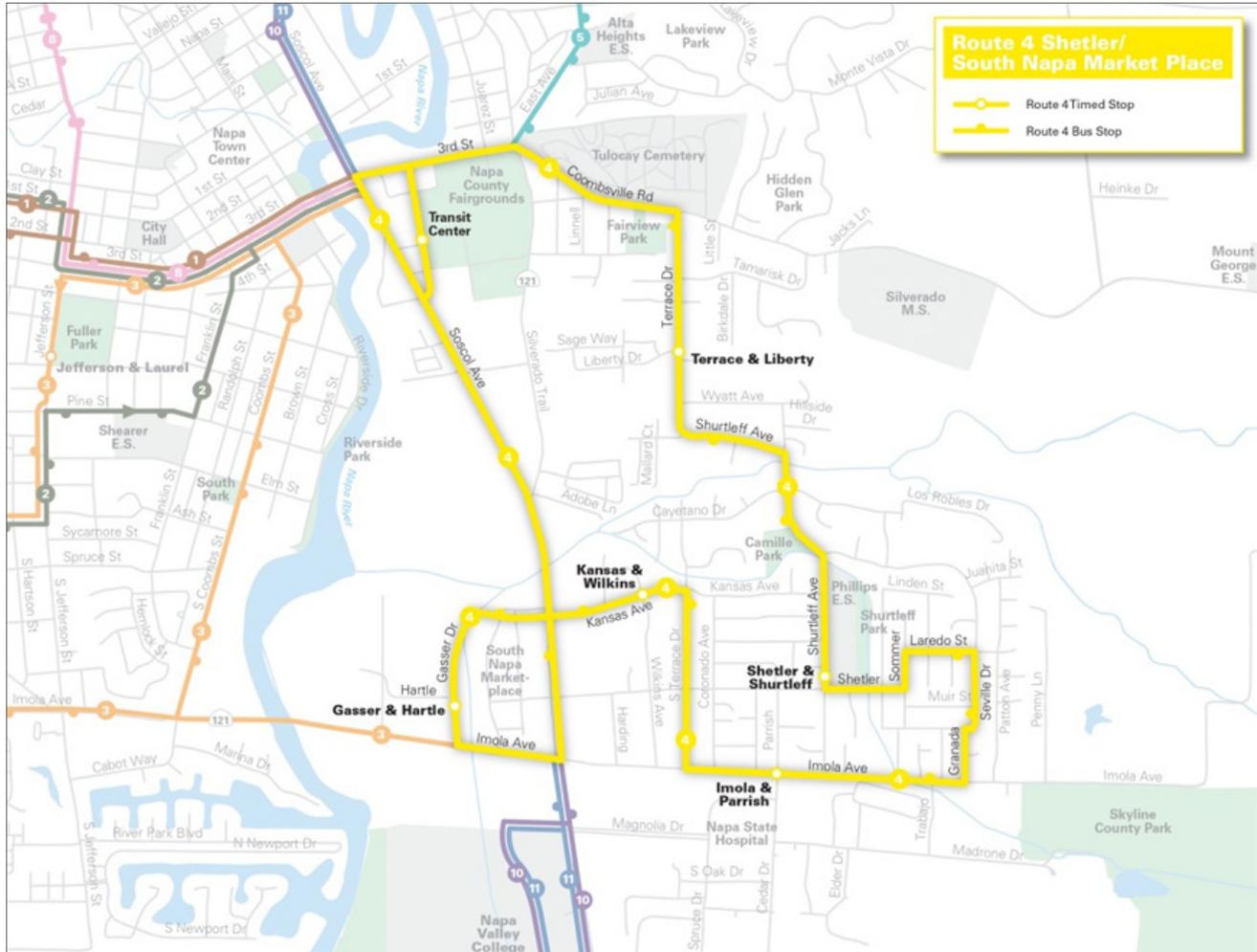
Span of Service:

Weekdays 6:30AM – 6:00PM | Saturdays 7:00AM – 5:30PM | Sundays No Service

Frequency (minutes):

Weekdays 30 | Saturdays 45

Figure 2.1.4: Route 4 Service Profile



2.1.4 Route 4

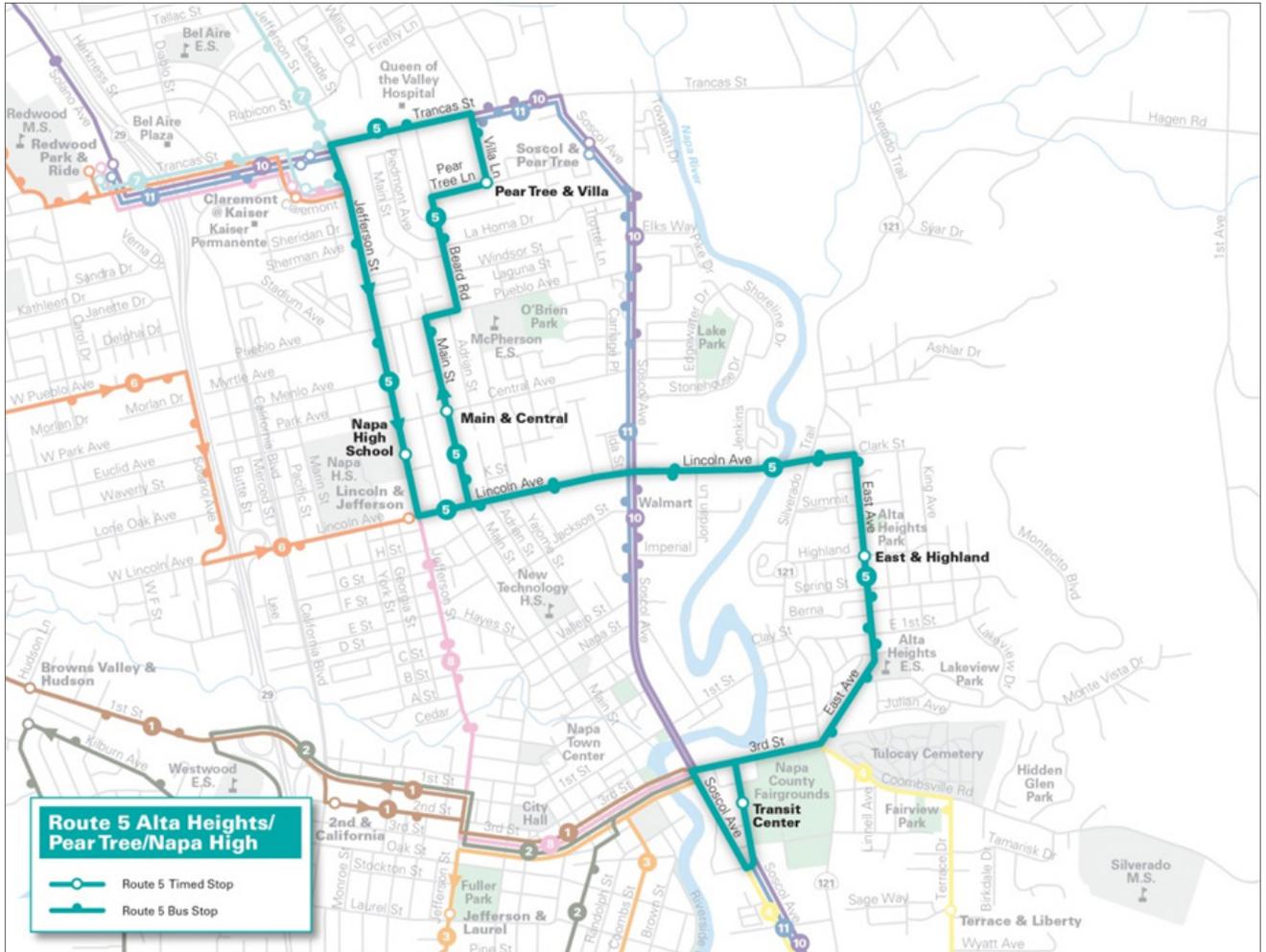
Span of Service:

Weekdays 6:45AM – 6:15PM | Saturdays 7:00AM – 5:30PM | Sundays No Service

Frequency (minutes):

Weekdays 30 | Saturdays 45

Figure 2.1.5: Route 5 Service Profile



2.1.5 Route 5

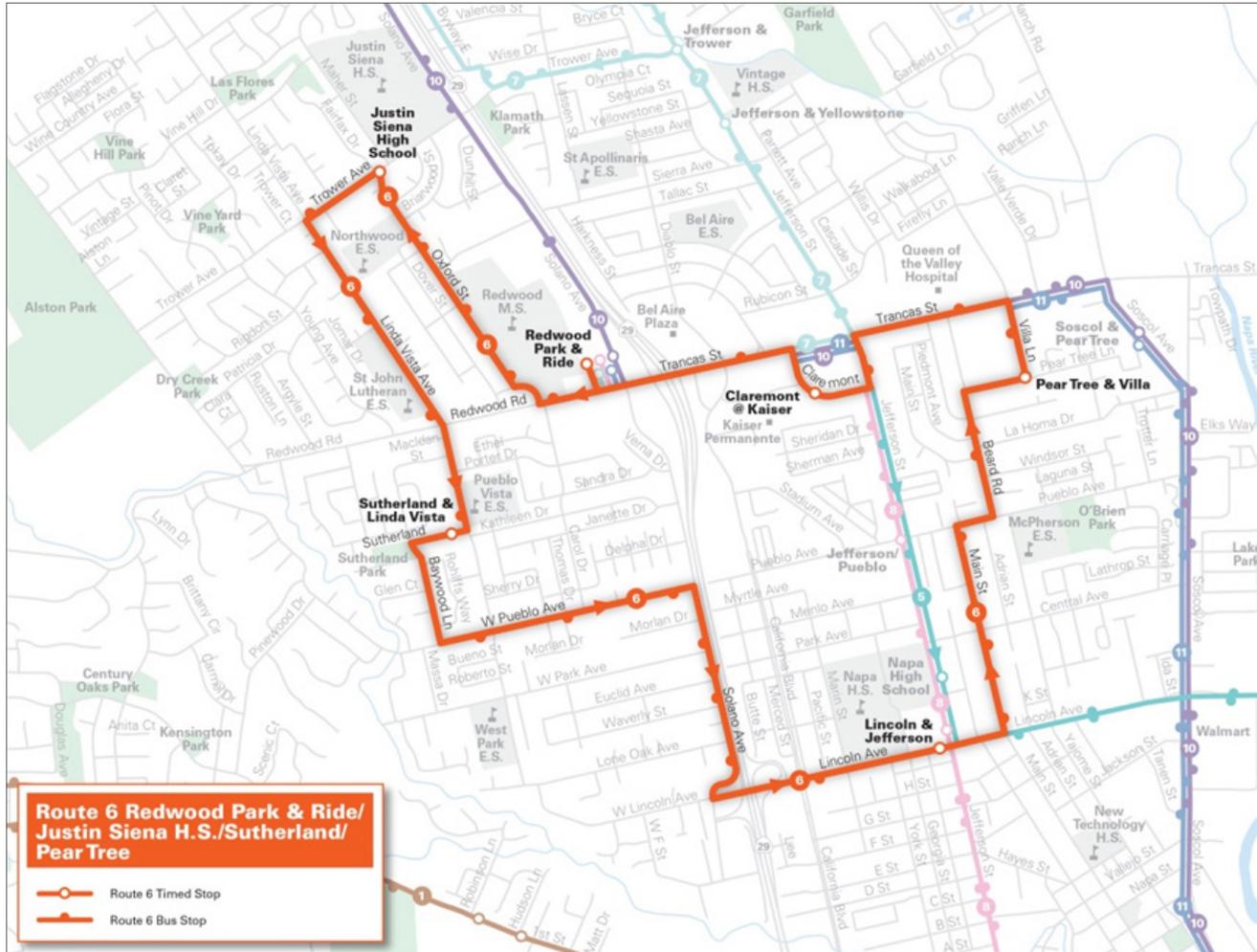
Span of Service:

Weekdays 6:30AM – 6:00PM | Saturdays 6:55AM – 5:20PM | Sundays No Service

Frequency (minutes):

Weekdays 30 | Saturdays 45

Figure 2.1.6: Route 6 Service Profile



2.1.6 Route 6

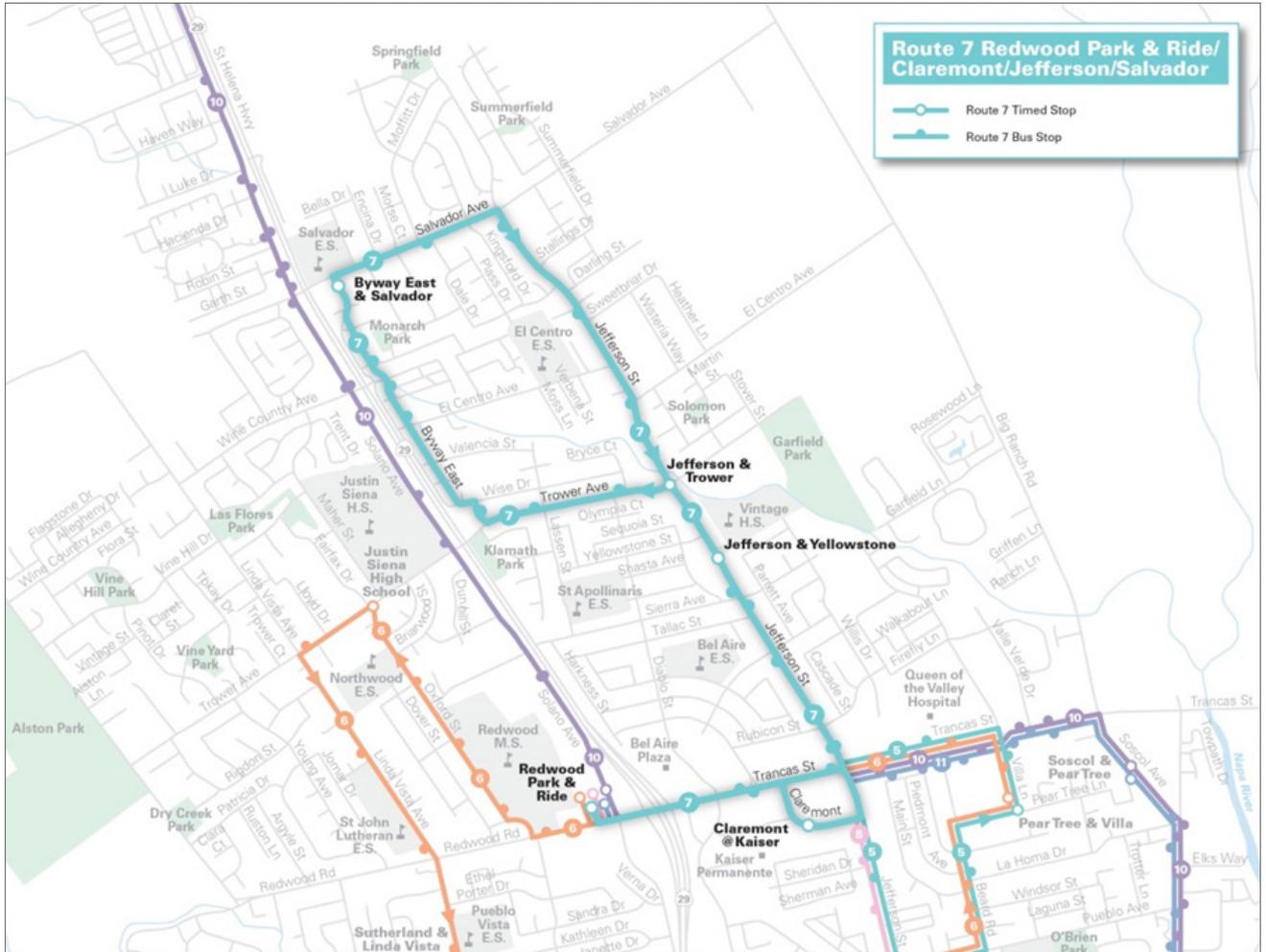
Span of Service:

Weekdays 7:15AM – 6:30PM | Saturdays 7:15AM – 5:45PM | Sundays No Service

Frequency (minutes):

Weekdays 45 | Saturdays 45

Figure 2.1.7: Route 7 Service Profile



2.1.7 Route 7

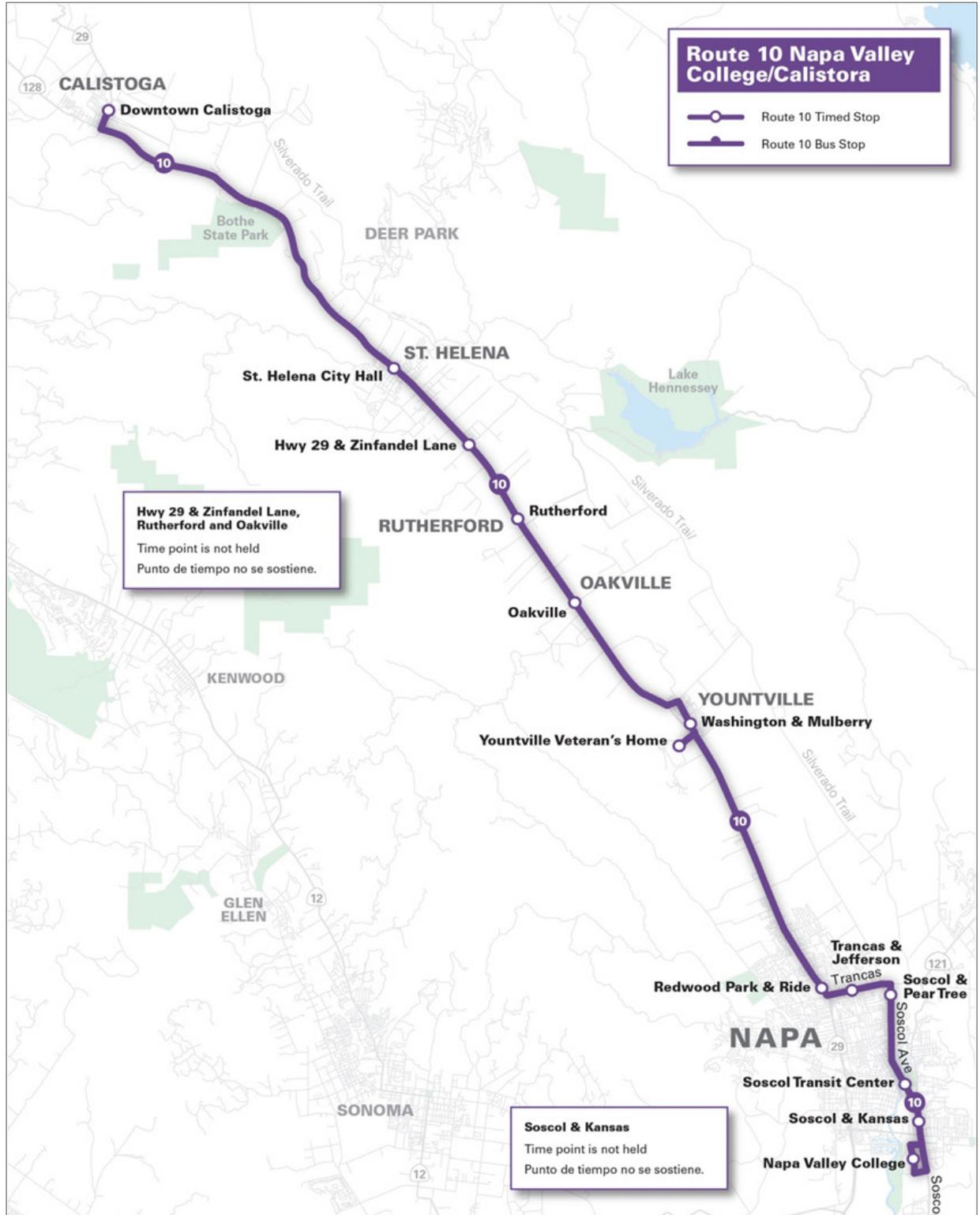
Span of Service:

Weekdays 7:05AM – 6:10PM | Saturdays 7:05AM – 5:35PM | Sundays No Service

Frequency (minutes):

Weekdays 45 | Saturdays 45

Figure 2.1.9: Route 10 Service Profile



2.1.9 Route 10

Span of Service: Weekdays 5:00AM – 10:00PM | Saturdays 5:50AM – 7:05PM | Sundays 7:30AM – 6:00PM

Frequency (minutes): Weekdays 30- 60 | Saturdays 60 | Sundays 60

Figure 2.1.10: Route 11 Service Profile



2.1.10 Route 11

Span of Service: Weekdays 4:00AM – 8:30PM | Saturdays 6:45AM – 7:15PM | Sundays 8:45AM – 7:15PM

Frequency (minutes): Weekdays 30- 60 | Saturdays 60 | Sundays 60



3.

Systemwide Performance

The performance measures discussed in the following sections establish baselines to assess route performance and inform whether service should be added and/or cut. The addition or removal of service will be based on recommendations that come from this document, the Market Assessment, and a needs assessment. The data in this section is from Fiscal Year 2016-17.

Figure 3.1: Systemwide Revenue Hours (FY 16/17)

ROUTE	WEEKDAY	SATURDAY	SUNDAY	TOTAL
Route 1	2,251	452	No Service	2,703
Route 2	3,120	387	No Service	3,506
Route 3	3,828	467	No Service	4,295
Route 4	3,435	537	No Service	3,972
Route 5	3,739	431	No Service	4,170
Route 6	2,580	496	No Service	3,076
Route 7	2,320	446	No Service	2,766
Route 8	4,610	400	No Service	5,010
Route 10	16,534	1,775	1,342	19,651
Route 11	15,624	1,710	1,390	18,724
Route 21	3,374	No Service	No Service	3,374
Route 25	2,132	No Service	No Service	2,132
Route 29	10,540	No Service	No Service	10,540
TOTAL	74,089	7,100	2,732	83,921

3.1 Systemwide Revenue Hours

Revenue hours are the hours of service during which a bus is picking up passengers. As shown in *Figure 3.1* the distribution of revenue hours are not consistent from route to route even on routes that share similar service spans. This inconsistency is due to the frequency of service operated on those routes as well as operational variables e.g. missed trips. Routes 10 and 11 have the greatest number of revenue hours between them. Cumulatively they account for 46% of the total revenue hours in the Vine’s fixed route system.

Figure 3.2: Revenue Miles (FY 16/17)

ROUTE	WEEKDAY	SATURDAY	SUNDAY	TOTAL
Route 1	25,809	5,248	No Service	31,057
Route 2	40,578	5,111	No Service	45,690
Route 3	44,401	5,632	No Service	50,032
Route 4	36,471	4,633	No Service	41,104
Route 5	44,179	5,645	No Service	49,825
Route 6	39,417	7,653	No Service	47,071
Route 7	33,248	6,464	No Service	39,712
Route 8	44,128	4,107	No Service	48,235
Route 10	352,630	40,526	1,601	394,757
Route 11	267,197	26,344	1,598	295,139
Route 21	76,685	No Service	No Service	76,685
Route 25	54,510	No Service	No Service	54,510
Route 29	296,792	No Service	No Service	296,792
TOTAL	1,356,045	111,363	3,199	1,470,609

3.2 Systemwide Revenue Miles

Revenue miles are the miles operated when a bus is picking up passengers. Much like revenue hours revenue miles are inconsistent from route to route. Routes 10 and 11 once again lead the way, making up 43% of the systems revenue miles.

Figure 3.3: Ridership (FY 16/17)

ROUTE	WEEKDAY	SATURDAY	SUNDAY	TOTAL
Route 1	18,127	2,623	No Service	20,750
Route 2	54,374	5,094	No Service	59,468
Route 3	60,096	5,172	No Service	65,268
Route 4	52,486	4,233	No Service	56,719
Route 5	52,518	4,286	No Service	56,804
Route 6	35,898	5,330	No Service	41,228
Route 7	23,487	2,931	No Service	26,418
Route 8	97,582	7,579	No Service	105,161
Route 10	199,974	23,989	14,894	238,857
Route 11	216,605	22,810	15,328	254,743
Route 21	20,383	No Service	No Service	20,383
Route 25	10,164	No Service	No Service	10,164
Route 29	67,460	No Service	No Service	67,460
TOTAL	909,154	84,047	30,222	1,023,423

3.3 Systemwide Ridership

Ridership is an indicator of passenger trips. A trip is defined as when a passenger gets on a bus and then gets off the bus and another stop. If the rider transfers to another bus, that is counted as a separate trip. The number of riders and the amount of revenue hours are proportionate. For example Routes 10 and 11 account for 46% of the total revenue hours operated. They in turn account for 48% of the total riders in the Vine system. This is especially true for the local services. The service hours and the number of riders on Routes 1-8, as a proportion of totals for each metric, match exactly or are within 1% of each other.

Figure 3.4: Passengers per Revenue Hour (FY 16/17)

ROUTE	WEEKDAY	SATURDAY	SUNDAY	TOTAL
Route 1	8	6	No Service	8
Route 2	17	13	No Service	17
Route 3	16	11	No Service	15
Route 4	15	8	No Service	14
Route 5	14	10	No Service	14
Route 6	14	11	No Service	13
Route 7	10	7	No Service	10
Route 8	21	19	No Service	21
Route 10	12	14	11	12
Route 11	14	13	11	14
Route 21	6	No Service	No Service	6
Route 25	5	No Service	No Service	5
Route 29	6	No Service	No Service	6
TOTAL	12	12	11	12

3.4 Passengers per Revenue Hour

Passengers per revenue hour are calculated by taking the number of passengers on a route and dividing it by the number of revenue hours operated. This metric is one of the best ways to measure a route’s productivity. *Figure 3.4* shows the passengers per revenue hour for each of the Vine’s routes. Route 8 is the most productive route in the system providing a crucial north-south connection through the center of the City of Napa.

Figure 3.5: Passengers per Revenue Mile (FY 16/17)

ROUTE	WEEKDAY	SATURDAY	SUNDAY	TOTAL
Route 1	0.8	0.5	No Service	0.7
Route 2	1.5	1.0	No Service	1.3
Route 3	1.6	0.9	No Service	1.3
Route 4	1.7	0.9	No Service	1.4
Route 5	1.2	0.8	No Service	1.1
Route 6	1.0	0.7	No Service	0.9
Route 7	0.9	0.5	No Service	0.7
Route 8	2.5	1.8	No Service	2.2
Route 10	0.6	0.6	0.4	0.6
Route 11	0.9	0.9	0.7	0.8
Route 21	0.3	No Service	No Service	0.3
Route 25	0.2	No Service	No Service	0.2
Route 29	0.2	No Service	No Service	0.2
TOTAL	0.7	0.8	0.5	0.7

3.5 Passengers per Revenue Mile

Passengers per revenue mile are calculated by dividing the number of passengers by the number of revenue miles operated on a route. Route 8 has the highest number of passengers per revenue mile. It is one of the Vine’s most productive services, as well as being one of the shorter routes operated.

Figure 3.6: Operating Cost Per Hour

ROUTE	FY 14/15	FY 14/15 - FY 15/16 Change	FY 14/15 - FY 15/16 % Change	FY 15/16	FY 15/16 - FY 16/17 Change	FY 15/16 - FY 16/17 % Change	FY 16/17
Route 1	\$64.58	-\$0.63	-0.98%	\$63.95	\$3.35	5.24%	\$67.30
Route 2	\$64.46	-\$0.58	-0.90%	\$63.88	\$3.40	5.32%	\$67.28
Route 3	\$64.87	-\$0.77	-1.19%	\$64.10	\$3.51	5.48%	\$67.61
Route 4	\$63.87	-\$0.44	-0.69%	\$63.43	\$3.25	5.12%	\$66.68
Route 5	\$64.91	-\$0.68	-1.05%	\$64.23	\$3.29	5.12%	\$67.52
Route 6	\$66.92	-\$1.16	-1.73%	\$65.76	\$3.51	5.34%	\$69.27
Route 7	\$65.80	-\$0.72	-1.09%	\$65.08	\$3.33	5.12%	\$68.41
Route 8	\$63.41	-\$0.14	-0.22%	\$63.27	\$3.05	4.82%	\$66.32
Route 10	\$70.37	-\$1.80	-2.56%	\$68.57	\$4.01	5.85%	\$72.58
Route 11	\$67.96	-\$1.42	-2.09%	\$66.54	\$3.58	5.38%	\$70.12
Route 21	\$68.34	-\$2.50	-3.66%	\$65.84	\$4.65	7.06%	\$70.49
Route 25	\$68.53	-\$0.20	-0.29%	\$68.33	\$3.94	5.77%	\$72.27
Route 29	\$69.96	-\$1.92	-2.74%	\$68.04	\$2.46	3.62%	\$70.50
TOTAL	\$67.55	-\$1.25	-1.85%	\$66.30	\$3.49	5.26%	\$69.79

3.6 Operating Cost per Hour

NVTA uses a contractor to operate its bus system. This model of service requires NVTA to pay its contractor an hourly rate. Despite having a single rate for all service types the actual cost per hour by route fluctuates based off the number of hours operated and the cost of fuel to operate that service. Costs for NVTA’s service have been steadily increasing due to changes in the hourly rate charged and fuel prices.

Figure 3.7: Operating Cost Per Mile

ROUTE	FY 14/15	FY 14/15 - FY 15/16 Change	FY 14/15 - FY 15/16 % Change	FY 15/16	FY 15/16 - FY 16/17 Change	FY 15/16 - FY 16/17 % Change	FY 16/17
Route 1	\$6.99	\$0.03	0.43%	\$7.02	\$0.39	5.56%	\$7.41
Route 2	\$7.12	\$0.00	0.00%	\$7.12	\$0.27	3.79%	\$7.39
Route 3	\$6.67	\$0.13	1.95%	\$6.80	\$0.19	2.79%	\$6.99
Route 4	\$7.87	\$0.02	0.25%	\$7.89	\$0.61	7.73%	\$8.50
Route 5	\$6.64	-\$0.01	-0.15%	\$6.63	\$0.49	7.39%	\$7.12
Route 6	\$5.15	-\$0.03	-0.58%	\$5.12	\$0.31	6.05%	\$5.43
Route 7	\$5.87	-\$0.21	-3.58%	\$5.66	\$0.47	8.30%	\$6.13
Route 8	\$8.64	-\$0.46	-5.32%	\$8.18	\$0.94	11.49%	\$9.12
Route 10	\$3.81	-\$0.07	-1.84%	\$3.74	\$0.09	2.41%	\$3.83
Route 11	\$4.65	-\$0.06	-1.29%	\$4.59	\$0.27	5.88%	\$4.86
Route 21	\$3.75	\$0.16	4.27%	\$3.91	\$0.01	0.26%	\$3.92
Route 25	\$3.55	\$0.21	5.92%	\$3.76	\$0.17	4.52%	\$3.93
Route 29	\$2.68	-\$0.04	-1.49%	\$2.64	\$0.23	8.71%	\$2.87
TOTAL	\$4.46	-\$0.04	-0.90%	\$4.42	\$0.22	4.98%	\$4.64

3.7 Operating Cost per Mile

Operating cost per mile results in an inverse correlation between miles and the cost per mile. The greater the number of miles operated the lower the cost to operate the service. This correlation is attributable to simple math, cost divided by miles. Miles operated is always higher than the number of hours operated thus resulting in the cost being divided by a larger factor.

Figure 3.8: Fare Revenue

ROUTE	FY 14/15	FY 14/15 - FY 15/16 Change	FY 14/15 - FY 15/16 % Change	FY 15/16	FY 15/16 - FY 16/17 Change	FY 15/16 - FY 16/17 % Change	FY 16/17
Route 1	\$15,583	\$871	5.59%	\$16,453	\$259	1.57%	\$16,712
Route 2	\$51,518	-\$792	-1.54%	\$50,726	-\$831	-1.64%	\$49,895
Route 3	\$51,434	\$3,930	7.64%	\$55,364	-\$3,121	-5.64%	\$52,243
Route 4	\$41,919	\$384	0.92%	\$42,303	\$4,318	10.21%	\$46,621
Route 5	\$42,698	-\$1,255	-2.94%	\$41,444	\$4,021	9.70%	\$45,465
Route 6	\$22,252	\$908	4.08%	\$23,160	\$1,114	4.81%	\$24,274
Route 7	\$18,542	\$1,535	8.28%	\$20,077	-\$64	-0.32%	\$20,013
Route 8	\$73,706	\$2,201	2.99%	\$75,907	\$2,224	2.93%	\$78,131
Route 10	\$230,587	\$3,085	1.34%	\$233,672	-\$29,152	-12.48%	\$204,519
Route 11	\$206,523	\$18,360	8.89%	\$224,882	-\$974	-0.43%	\$223,908
Route 21	\$50,507	\$1,772	3.51%	\$52,278	\$596	1.14%	\$52,874
Route 25	\$9,575	-\$1,341	-14.01%	\$8,234	-\$496	-6.02%	\$7,738
Route 29	\$164,536	\$12,175	7.40%	\$176,711	\$2,737	1.55%	\$179,449
TOTAL	\$979,380	\$41,831	4.27%	\$1,021,211	-\$19,369	-1.90%	\$1,001,842

3.8 Fare Revenue

Fare revenue is inconsistent from route to route. Local service results in farebox revenue anywhere from \$15,000 to \$73,000 per month. Some routes may have a substantial number of riders relative to the system but low revenues. This could be caused by a high number of transfers made on to the route, which are free. Analyzing these patterns will happen in later sections of this document.

Figure 3.9: Farebox Recovery Ratio

ROUTE	FY 14/15	FY 15/16	FY 16/17
Route 1	6.9%	7.2%	7.0%
Route 2	15.5%	15.3%	14.4%
Route 3	15.1%	16.3%	14.6%
Route 4	12.6%	12.8%	13.0%
Route 5	12.7%	12.4%	12.6%
Route 6	9.0%	9.4%	9.3%
Route 7	7.7%	8.5%	8.0%
Route 8	17.1%	17.7%	17.4%
Route 10	13.7%	14.1%	12.2%
Route 11	15.2%	14.8%	13.9%
Route 21	15.8%	16.8%	17.0%
Route 25	5.1%	3.8%	3.4%
Route 29	20.4%	22.1%	19.4%
TOTAL	14.3%	14.6%	13.6%

3.9 Farebox Recovery Ratio

The farebox recovery ratio is the proportion of operating costs recouped by farebox revenue. NVTA's standard for this metric is 15% system wide. As shown in *Figure 3.9* NVTA has not met this standard over the past three fiscal years. Routes 1, 6, 7, and 25 have had the greatest effect on NVTA's ability to meet the standard. If they are removed from the average, the resulting ratio meets or exceeds the standard. The agency's farebox recovery ratio should improve somewhat with the elimination of Route 25 which is scheduled for the end of December 2017.

Figure 3.10: Subsidy Per Passenger

ROUTE	FY 14/15	FY 14/15 - FY 15/16 Change	FY 14/15 - FY 15/16 % Change	FY 15/16	FY 15/16 - FY 16/17 Change	FY 15/16 - FY 16/17 % Change	FY 16/17
Route 1	\$8.33	\$0.44	5.28%	\$8.77	\$1.89	21.55%	\$10.66
Route 2	\$3.81	\$0.40	10.50%	\$4.21	\$0.77	18.29%	\$4.98
Route 3	\$3.83	-\$0.15	-3.92%	\$3.68	\$0.99	26.90%	\$4.67
Route 4	\$4.31	\$0.17	3.94%	\$4.48	\$1.03	22.99%	\$5.51
Route 5	\$4.70	\$0.28	5.96%	\$4.98	\$0.59	11.85%	\$5.57
Route 6	\$6.32	-\$1.36	-21.52%	\$4.96	\$0.79	15.93%	\$5.75
Route 7	\$8.20	-\$1.51	-18.41%	\$6.69	\$2.02	30.19%	\$8.71
Route 8	\$2.92	\$0.08	2.74%	\$3.00	\$0.54	18.00%	\$3.54
Route 10	\$5.22	\$0.22	4.21%	\$5.44	\$0.72	13.24%	\$6.16
Route 11	\$4.58	\$0.30	6.55%	\$4.88	\$0.58	11.89%	\$5.46
Route 21	\$15.44	-\$2.56	-16.58%	\$12.88	-\$0.21	-1.63%	\$12.67
Route 25	\$16.36	\$3.83	23.41%	\$20.19	\$1.43	7.08%	\$21.62
Route 29	\$9.46	-\$0.42	-4.44%	\$9.04	\$2.04	22.57%	\$11.08
TOTAL	\$5.24	\$0.11	2.10%	\$5.35	\$0.88	16.45%	\$6.23

3.10 Subsidy per Passenger

Subsidy per passenger is the operating cost, minus fare revenue, divided by the number of riders. The resulting number shows how much NVRTA is paying to transport each passenger. The more productive the service the lower this number becomes. Route 8 has the lowest subsidy per passenger at \$3.54. The highest subsidy per passenger is on the Route 25 at \$21.62.



4.

Systemwide Trends by Route

Performance trends inform planners where the system has been and where it is going. The ultimate goal of the Comprehensive Operational Analysis is to create an operational plan that will build on past successes and rectify any inefficiency that currently exists.

Figure 4.1.1: Revenue Hours by Route, Weekdays

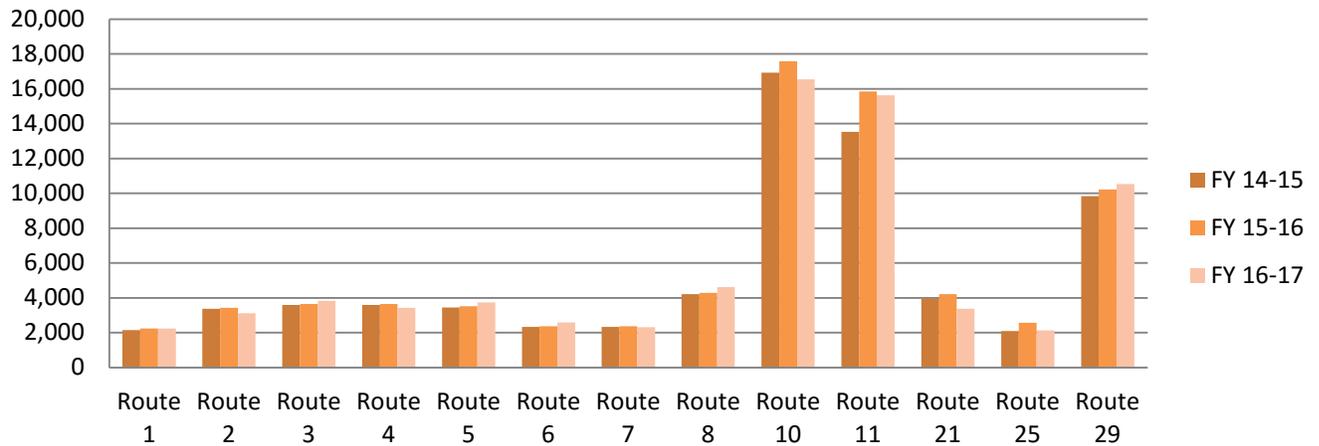
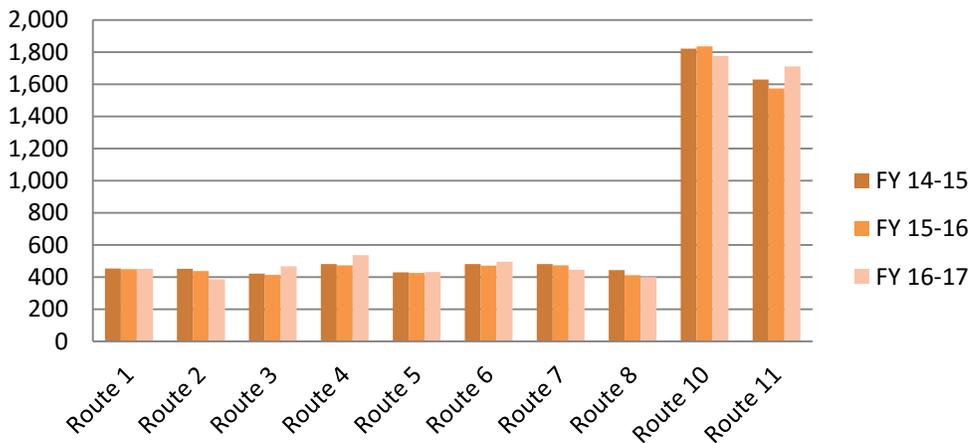


Figure 4.1.2: Revenue Hours by Route, Saturdays



4.1 Revenue Hours by Route (FY 2014-15 – FY 2016-17)

4.1.1 Weekdays

As shown in *Figure 4.1* the distribution of revenue hours are not consistent on a route by route basis. Local routes 1 – 8 are relatively similar, but they are markedly different when compared to Routes 10 and 11. This inconsistency is due to the frequency of service; span of service operated on those routes, as well as operational variables e.g. missed trips. Decreases and increases in revenue hours are not consistent year-over-year either. Missed trips play into this inconsistency to a slight degree; however the primary cause is NVTa schedule adjustments to better meet demand.

4.1.2 Saturdays

Saturday service has been consistent from year to year with the most significant change occurring on Route 11 between FY 2015-16 and FY 2016-17. Hours were reallocated from Sunday service at this time to enhance more productive portions of the Route 11 operating on the weekends.

Figure 4.1.3: Revenue Hours by Route, Sundays

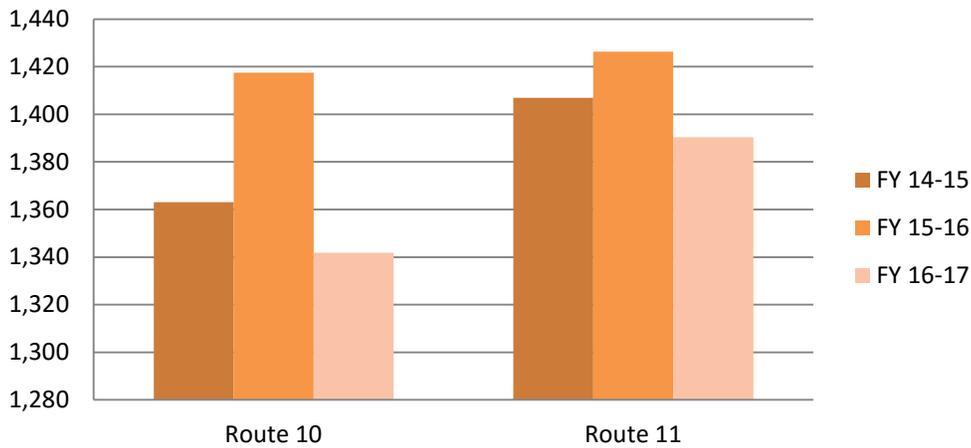
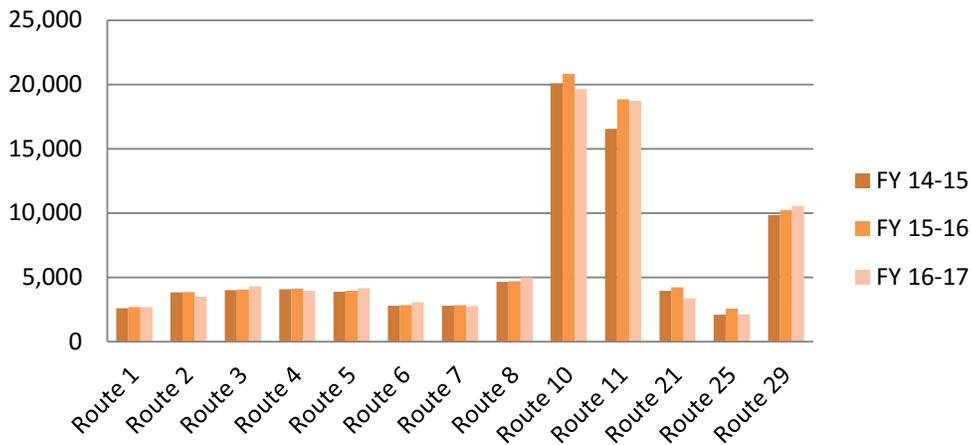


Figure 4.1.4: Revenue Hours by Route, Total



4.1.3 Sundays

Only Routes 10 and 11 are operational on Sundays. Both routes had an increase in revenue hours from FY 2014-15 to FY 2015-16, which was followed by a decrease in revenue hours in FY 2016-17. These decreases were due to a reallocation of revenue hours to enhance more productive parts of the service.

4.1.4 Total

Since the Vine’s revenue hours are largely dedicated to weekday service, the year over year changes for all service/service parameters correlates strongly with weekday service trends.

Figure 4.2.1: Revenue Miles by Route, Weekdays

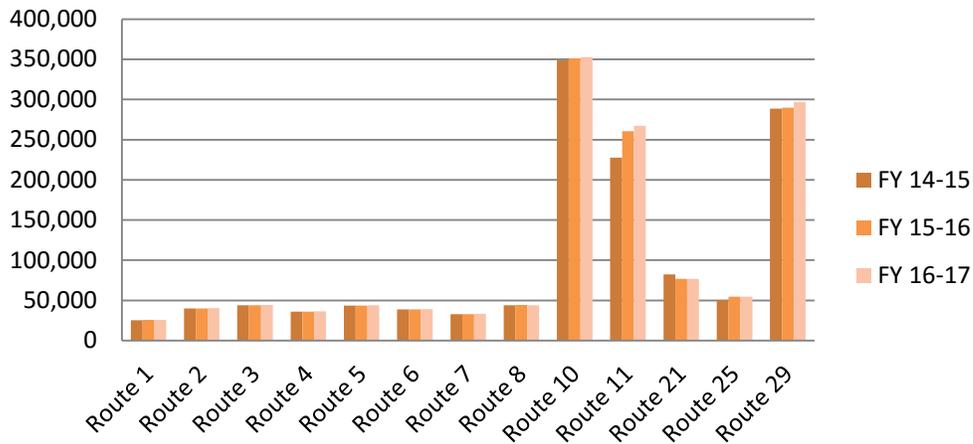
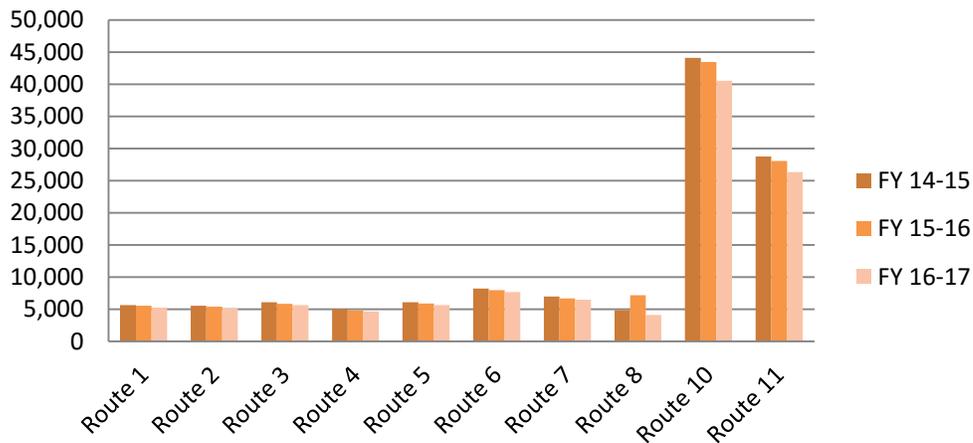


Figure 4.2.2: Revenue Miles by Route, Saturdays



4.2 Revenue Miles by Route (FY 2014-15 - FY 2016-17)

Revenue miles are the miles operated when a bus is picking up passengers. Much like revenue hours, revenue miles are inconsistent from route to route. Routes 10, 11, and 29 make up the majority of the revenue miles. The Route 29 consumes the second greatest number of revenue miles behind the Route 10 despite having considerably less service hours. This is because of the route length—where some trips begin in Calistoga and end at the El Cerrito del Norte BART station.

4.2.1 Weekdays

Weekday revenue miles have stayed fairly consistent over the years, as little has changed with the individual routes. The routes with the most variance are Routes 10, 11, 21, 25, and 29. These routes are the longest routes, and are the most affected by congestion or roadwork, which sometimes requires deviations from the standard route. These routes have also undergone the greatest number of schedule changes as NVRTA staff attempts to match travel times with shifting travel patterns on the highways in and out of Napa County.

4.2.2 Saturdays

Revenue miles on Saturdays show more variance than weekday miles, with most routes showing a decrease year over year. An exception to this trend is Route 8, which increased in FY 2015-16.

Figure 4.2.3: Revenue Miles by Route, Sundays

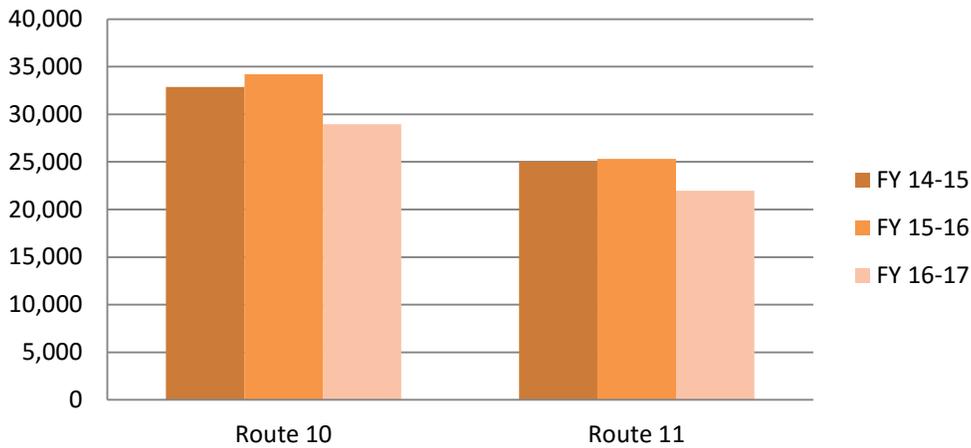
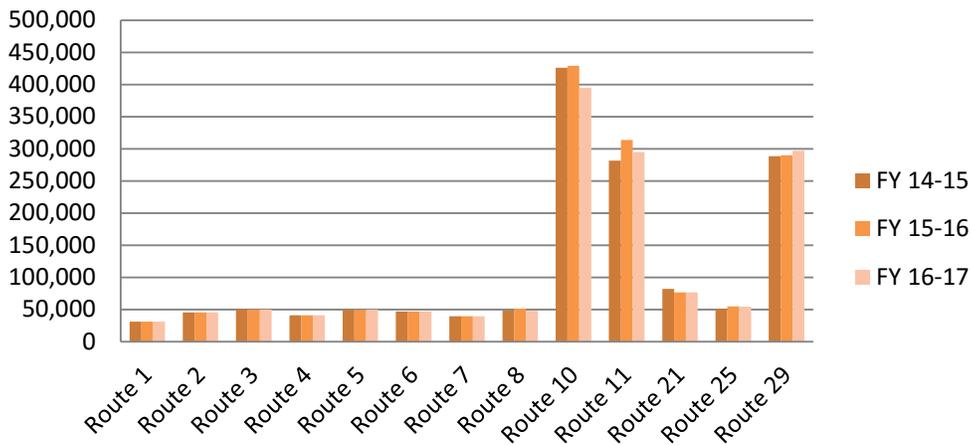


Figure 4.2.4: Revenue Miles by Route, Total



4.2.3 Sundays

Revenue miles for Sunday were consistent between FY 2014-15 and FY 2015-16 then took a roughly 5,000 mile drop in FY 2016-17 largely as a result of service reallocation.

4.2.4 Total

The total revenue miles follow a similar pattern to weekday miles. This is due to the fact weekday miles make up the majority of hours for all days of the week.

Figure 4.3.1: Ridership by Route, Weekdays

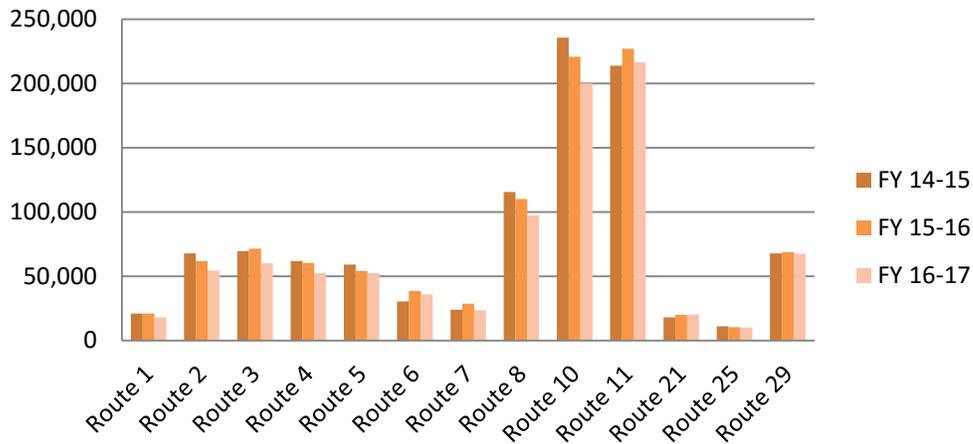
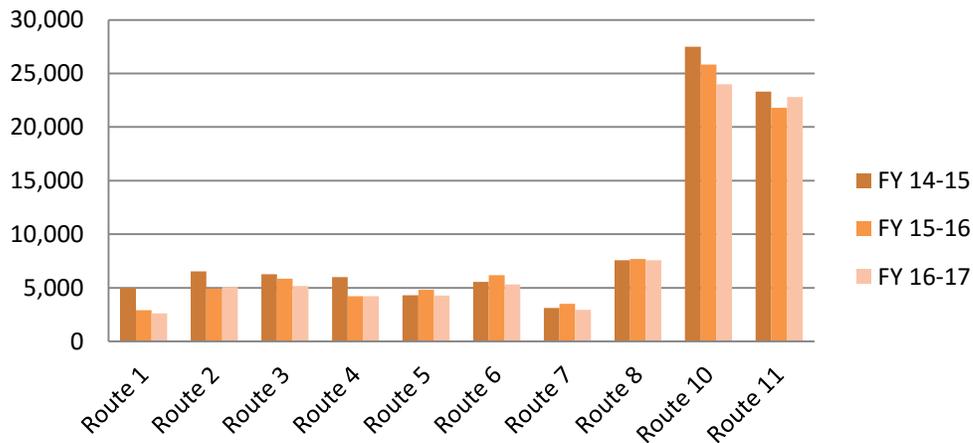


Figure 4.3.2: Ridership by Route, Saturdays



4.3 Ridership by Route (FY 2014-15 – FY 2016-17)

Ridership has been on a downward trend nationwide since FY 2014-15 and the Vine is no exception. This trend seems to stem from a stronger economy, lower gas prices, and the greater acceptance of ride sharing technology. Some routes have been able to show improvement and not decrease year over year.

4.3.1 Weekdays

Commuter service on the Routes 21, 25, and 29 has been relatively consistent year over year. The bulk of the decrease in ridership has occurred on the Local routes serving the City of Napa and the Vine’s two regional services Routes 10 and 11.

4.3.2 Saturdays

Saturday ridership shows a similar pattern to weekday ridership. A small drop occurred on the local routes in FY 2016-17, with an increase on Route 11.

Figure 4.3.3: Ridership by Route, Sundays

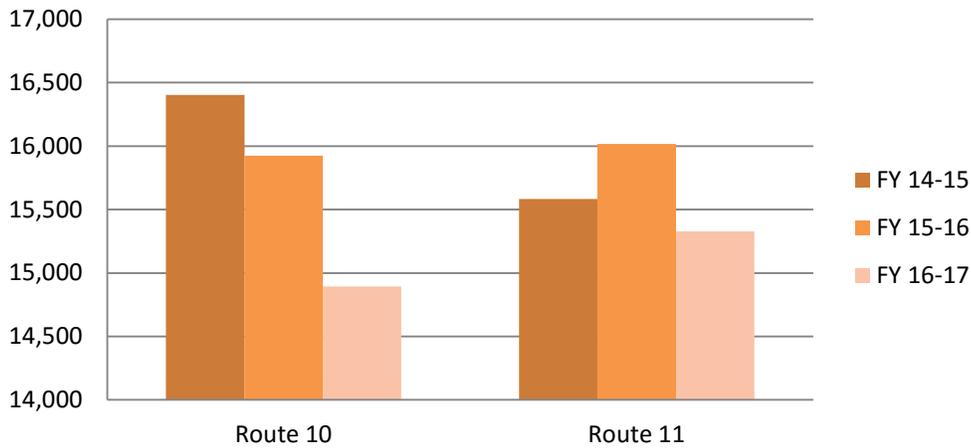
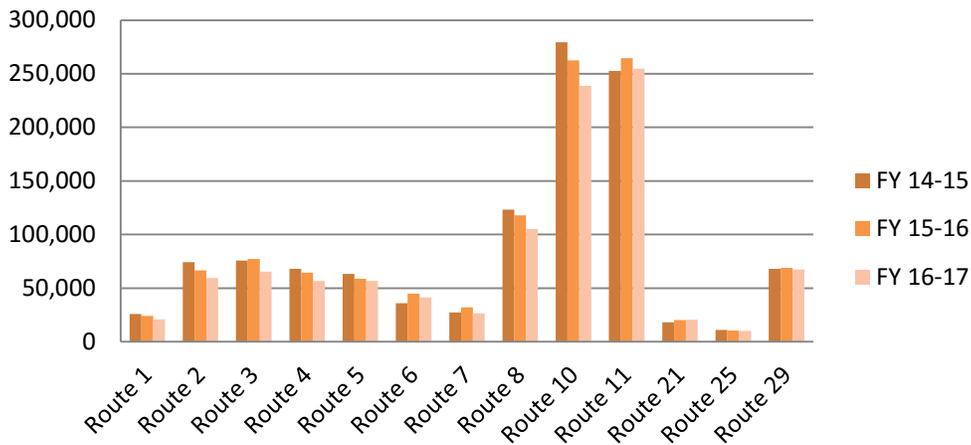


Figure 4.3.4: Ridership by Route, Total



4.3.3 Sundays

Sunday ridership shows a decline over the last three years for Route 10, whereas Route 11 increased in FY 2015-16 and then decreased in FY 2016-17.

4.3.4 Total

Total ridership trends are similar to weekday trends with all local routes showing a decline in ridership over the last three years. However, the three express Routes 21, 25, and 29 show the least decline, with Route 21 showing a slight increase.

Figure 4.4.1: Passengers per Revenue Hour, Weekdays

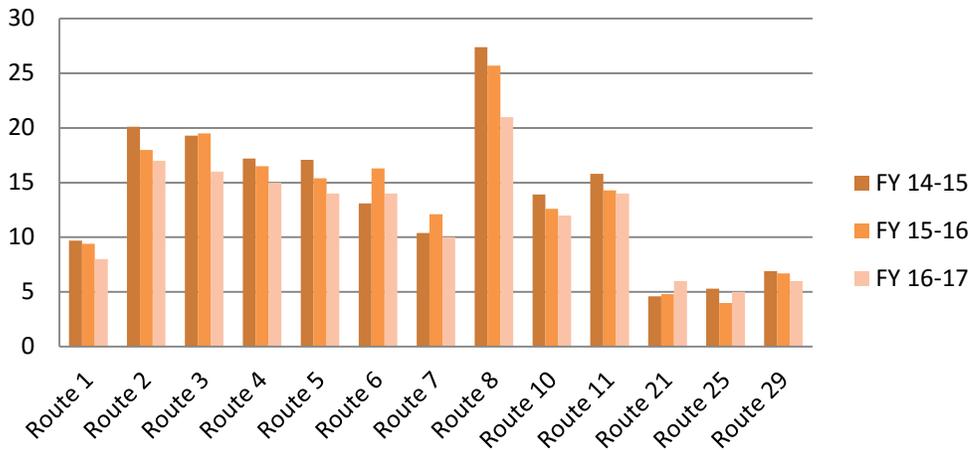
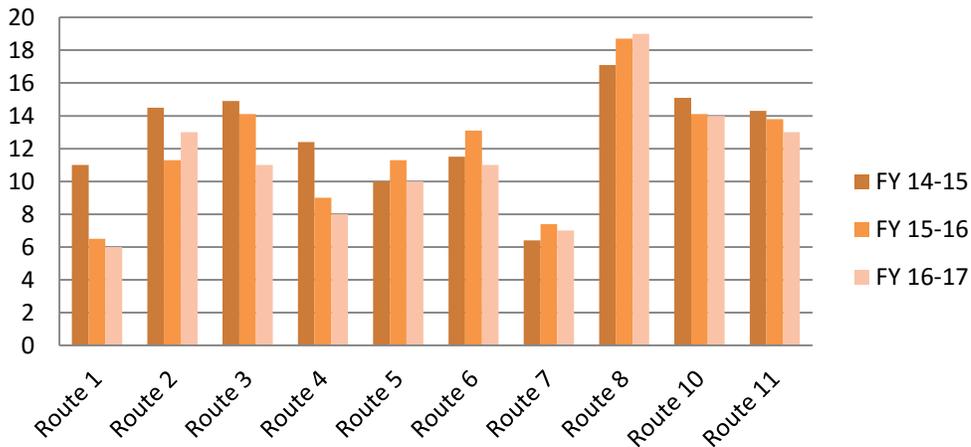


Figure 4.4.2: Passengers per Revenue Hour, Saturdays



4.4 Passengers per Revenue Hour (FY 2014-15 – FY 2016-17)

The passengers per revenue hour metric is calculated by taking the number of passengers on a route and dividing it by the number of revenue hours operated. This metric is one of the best ways to measure a route’s productivity.

4.4.1 Weekdays

Figure 4.4.1 shows the passengers per revenue hour for each of the Vine’s routes. For weekdays, Route 8 is the most productive service year over year and provides a crucial north-south connection through the center of the City of Napa.

4.4.2 Saturdays

Most routes on Saturdays show a decline in passengers per revenue hours in FY 2016-17, with exception of Route 2 and Route 8. Route 2 provides services to the downtown area and Route 8 runs from the Redwood Park and Ride to the Soscol Gateway Transit Center.

Figure 4.4.3: Passengers per Revenue Hour, Sundays

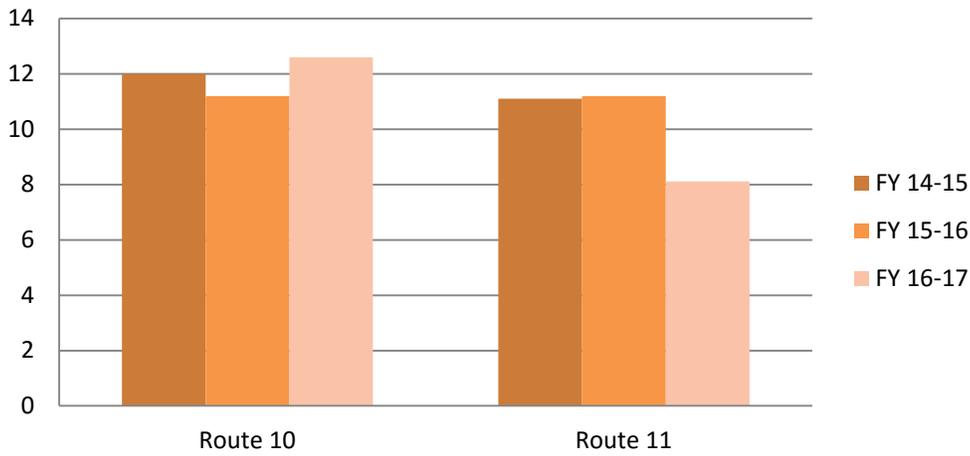
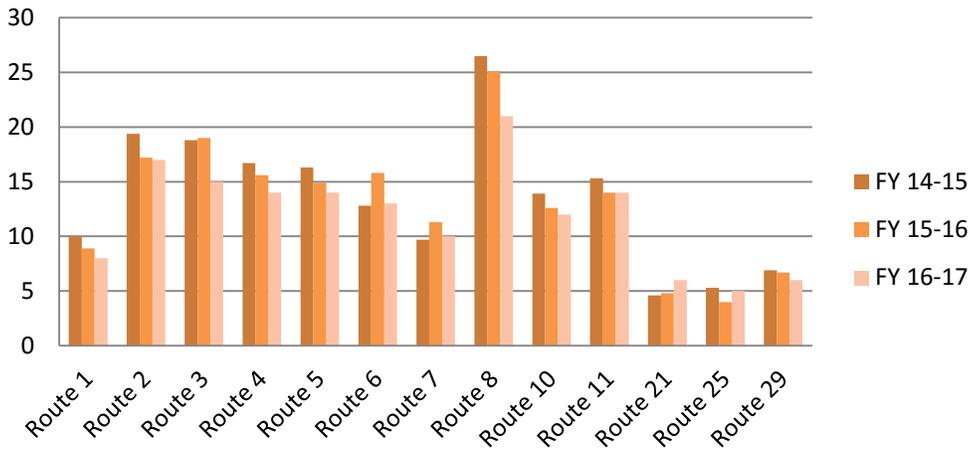


Figure 4.4.4: Passengers per Revenue Hour, Total



4.4.3 Sundays

On Sundays, Route 10 showed a slight increase in FY 2016-17 while Route 11 decreased.

4.4.4 Total

The decline in passengers per revenue hour is systemic in FY 2016-17 with the exclusion of Route 21.

Figure 4.5.1: Passengers per Revenue Mile, Weekdays

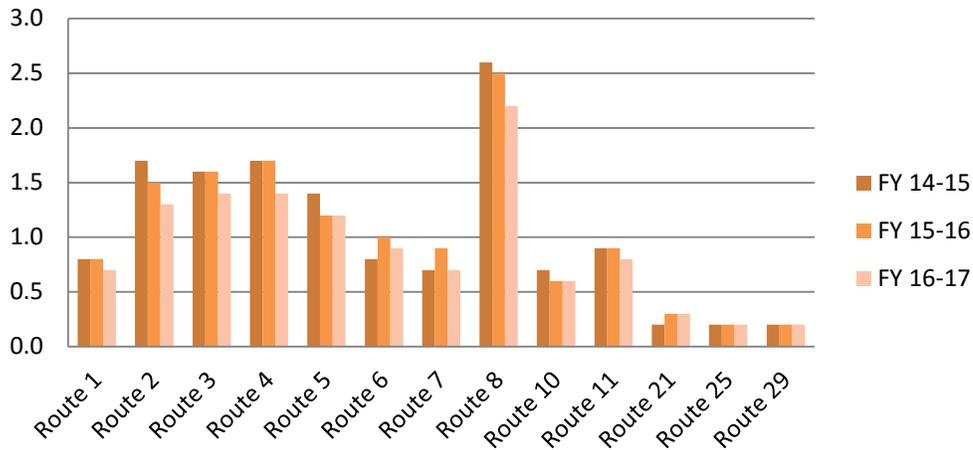
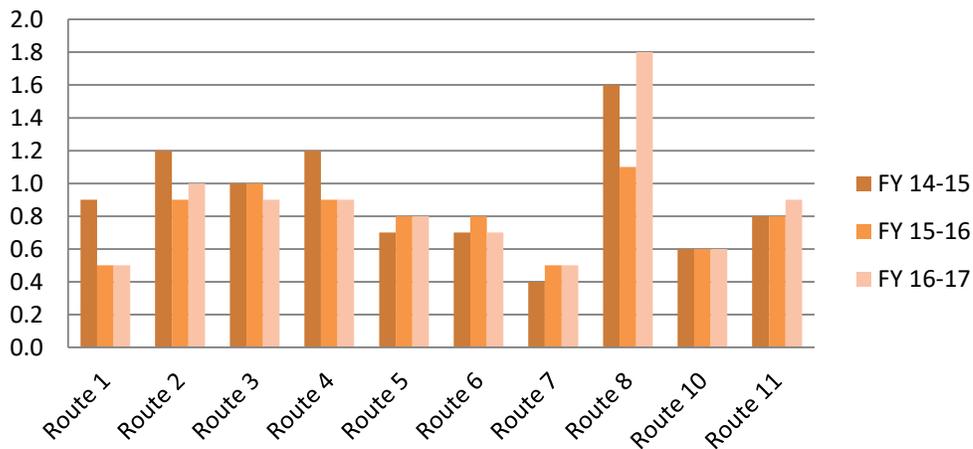


Figure 4.5.2: Passengers per Revenue Mile, Saturdays



4.5 Passengers per Revenue Mile (FY 2014-15 – FY 2016-17)

Passengers per revenue mile are calculated by dividing the number of passengers by the number of revenue miles operated on a route. Route 8 has the highest number of passengers per revenue mile. It is one of the Vine’s most productive services as well as being one of the shorter routes operated.

4.5.1 Weekdays

On weekdays no local routes showed increases in passengers per revenue mile. Route 5 is the one inconsistency staying relatively the same between FY 2015-16 and FY 2016-17. Route 10 is consistent, as are the three express Routes 21, 25, and 29. Route 11 showed a decrease in FY 2016-17.

4.5.2 Saturdays

Saturday passengers per revenue mile are inconsistent from year to year with no overarching trend up or down when comparing fiscal years. Route 8 presents itself as the most discernable outlier with a large increase in passengers per revenue hour in FY 2016-17.

Figure 4.5.3: Passengers per Revenue Mile, Sundays

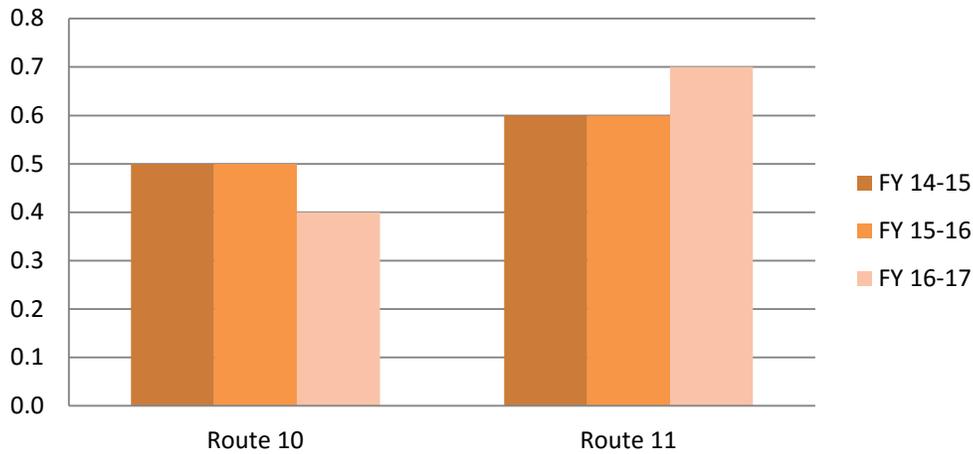
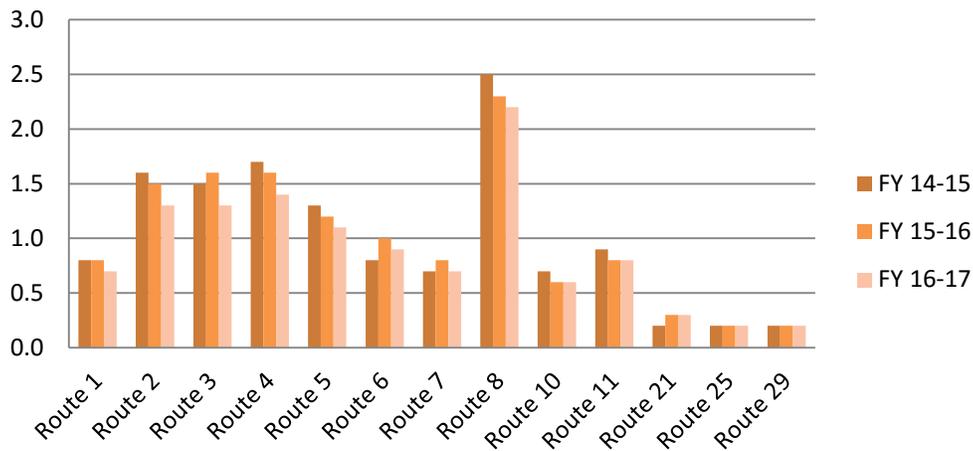


Figure 4.5.4: Passengers per Revenue Mile, Total



4.5.3 Sundays

Sundays have shown little change between FY 2014-15 and FY 2015-16 for both Routes 10 and 11. However, in FY 16/17 there is a change for both routes, upward for Route 11 and downward for Route 10.

4.5.4 Total

The general trend for passengers per revenue mile between the three fiscal years has been downward. Some exceptions do exist, specifically Routes 6 and 7 which had a marginal gain in FY 2015-16, however, the increase was not sustained in FY 2016-17.

Figure 4.6.1: Average Passengers per Day by Route, Weekdays

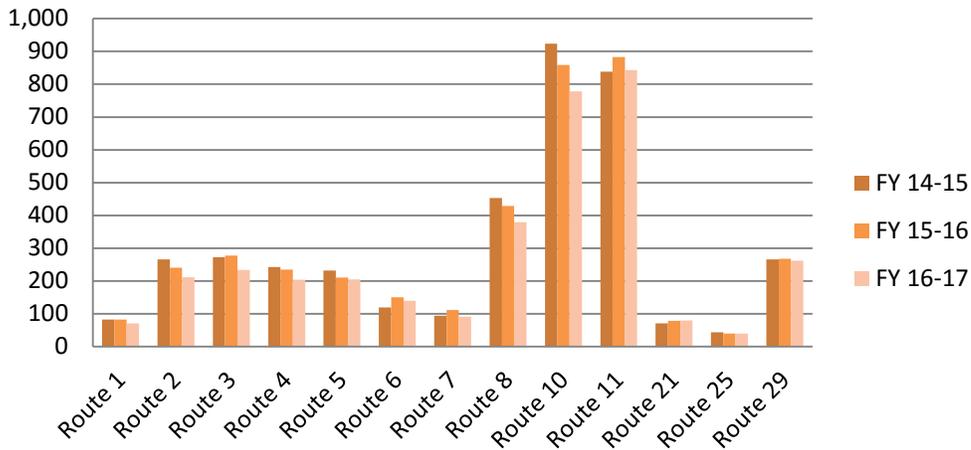
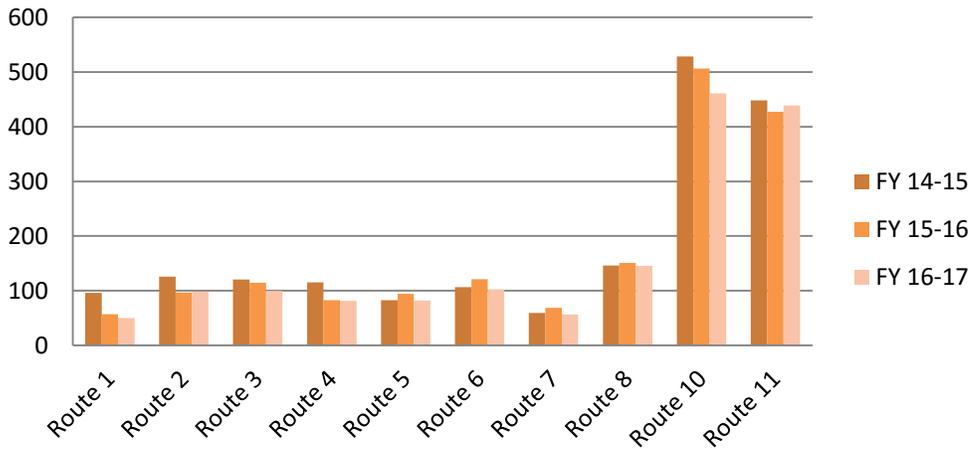


Figure 4.6.2: Average Passengers per Day by Route, Saturdays



4.6 Average Passengers per Day by Route (FY 2014-15 - FY 2016-17)

Average passengers per day is a good indicator of when the greatest amount of service is being consumed. This is especially helpful when the service is broken out by day of the week.

4.6.1 Weekdays

The highest trip volume is generally on weekdays because of work, school, and ad hoc trips. Over the last three fiscal years, there has been a general downward trend of average daily riders. The Vine’s intra-county routes (11, 21, 25, and 29) have shown

the least change. Route 11 decreased between FY 2015-16 and FY 2016-17 but still out performed FY 2014-15.

4.6.2 Saturdays

For local service (Routes 1-8), Saturday trends are consistent with weekday trends. Route 10 also has the same downward trend as weekdays. The Route 11 is a different story with the high point of ridership taking place in FY 2016-17 and the low point in FY 2015-16 whereas the rest of the services experienced peak ridership in FY 2014-15.

Figure 4.6.3: Average Passengers per Day by Route, Sundays

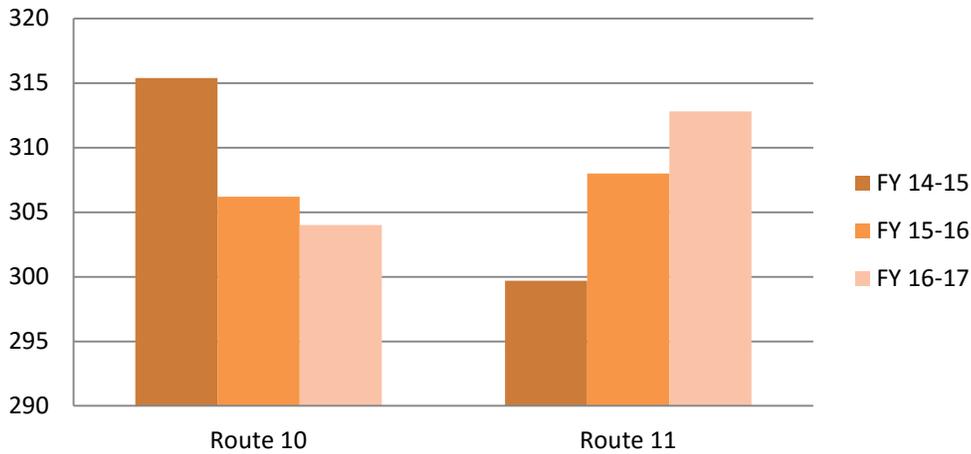
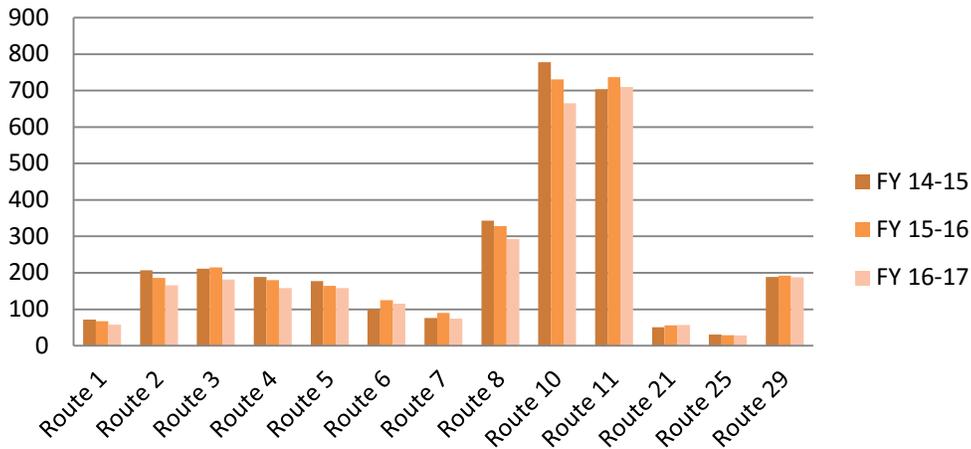


Figure 4.6.4: Average Passengers per Day by Route, Total



4.6.3 Sundays

While ridership on the Route 10 has decreased year over year, the Route 11 has actually increased. The increase in Route 11 ridership on Sundays goes against the general trends. This could be an indicator that it serves a larger population as well as it navigates in areas with more congestion. More congestion makes it a more desirable service. Commuters may find it more bearable to sit on a bus in heavy traffic than in their own car because it affords them the opportunity to read and work or enjoy other leisure activities.

4.6.4 Total

A combined total of all days of the week yield a similar trend to what is seen on weekdays.

Figure 4.7.1: Passenger Miles Travelled by Route, Weekdays

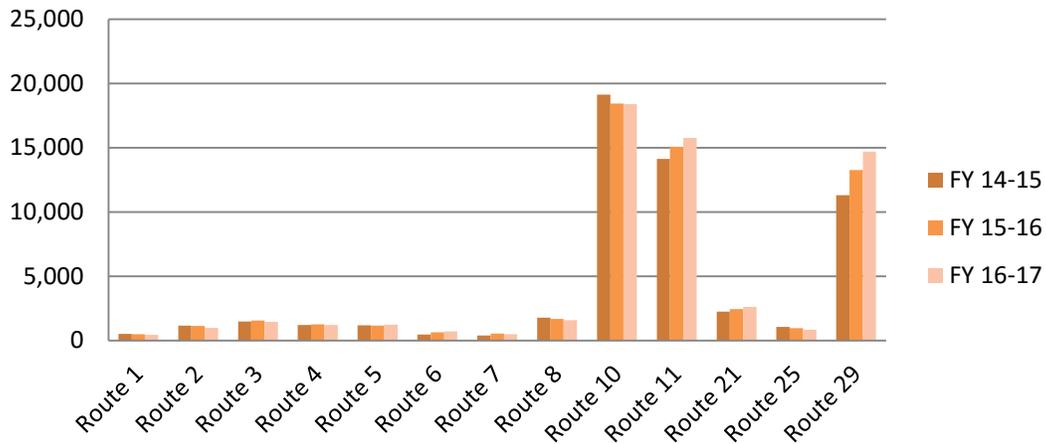
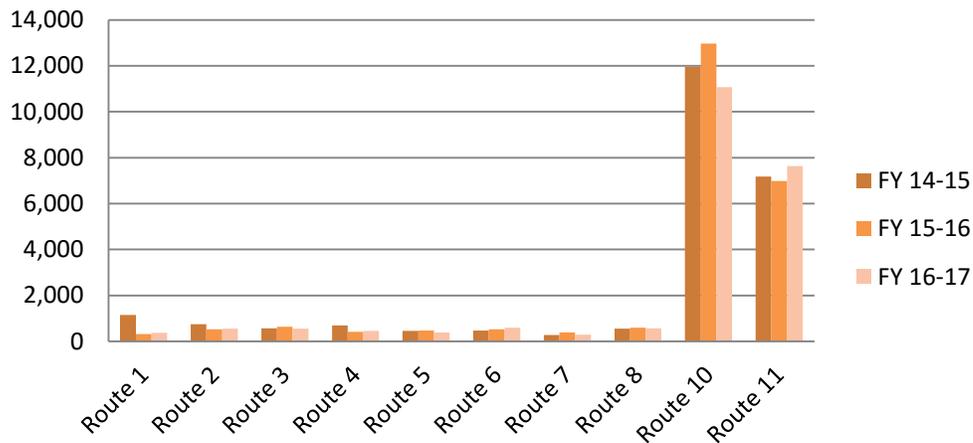


Figure 4.7.2: Passenger Miles Travelled by Route, Saturdays



4.7 Passenger Miles Travelled by Route (FY 2014-15 – FY 2016-17)

The metric passenger miles travelled is the cumulative sum of miles travelled by passengers on each route. The graphs in this section show this disparity between short (local) and long (regional) Vine service.

4.7.1 Weekdays

The majority of passenger miles travelled are incurred on weekdays. Year over year there has been little fluctuation on local service as the trips on these routes are often short. Regional service shows more variability year over year. The passenger miles on Route 10 follow the same trend as its ridership, going down year over year. Despite the downward trend the route still retains the highest number of passenger miles travelled. This could be due to many passengers traveling the entire length of the route from Calistoga to the City of Napa and vice versa. Route 11 also

had a decrease in ridership base but passenger miles travelled has increased. This could be attributed to a change in travel patterns with people opting to use the bus instead of their car in more congested corridors.

4.7.2 Saturdays

Saturdays have not shown much change year over year on local service. Route 10 is the primary contributor to systemwide passenger miles travelled despite seeing a larger drop between FY 2015-16 and FY 2016-17.

Figure 4.7.3: Passenger Miles Travelled by Route, Sundays

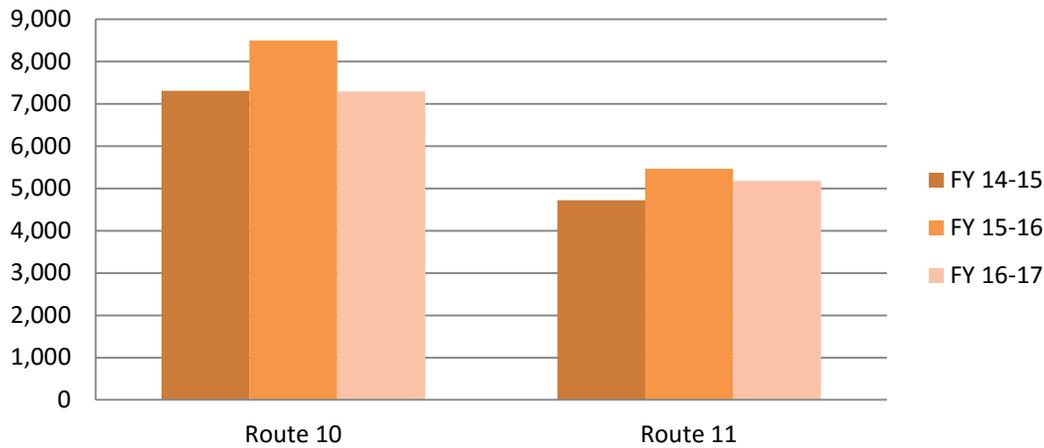
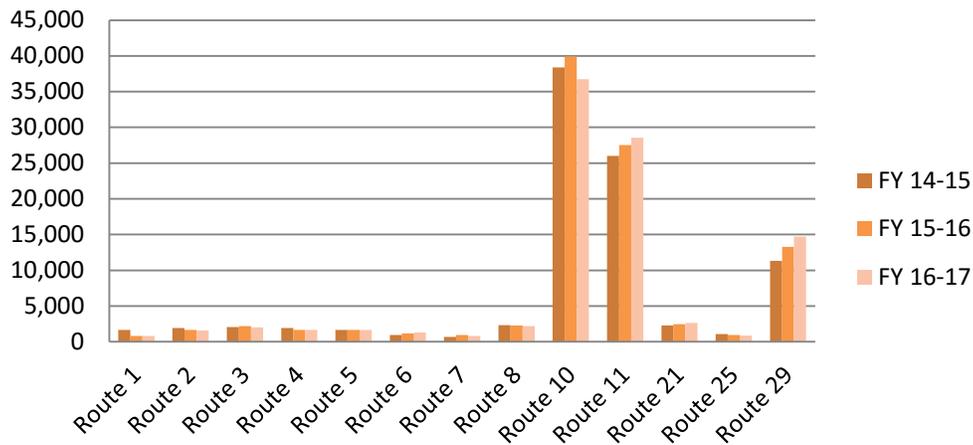


Figure 4.7.4: Passenger Miles Travelled by Route, Total



4.7.3 Sundays

Sundays show the same trend as Saturdays for the Route 10. Sundays are the only day of the week the Route 11 showed a decrease between FY 2015-16 and FY 2016-17.

4.7.4 Total

Total passenger miles travelled follow an identical trend to weekdays. This is not surprising as weekdays make up the bulk of the trips taken on the Vine.

Figure 4.8.1: Average Trip Length by Route, Weekdays

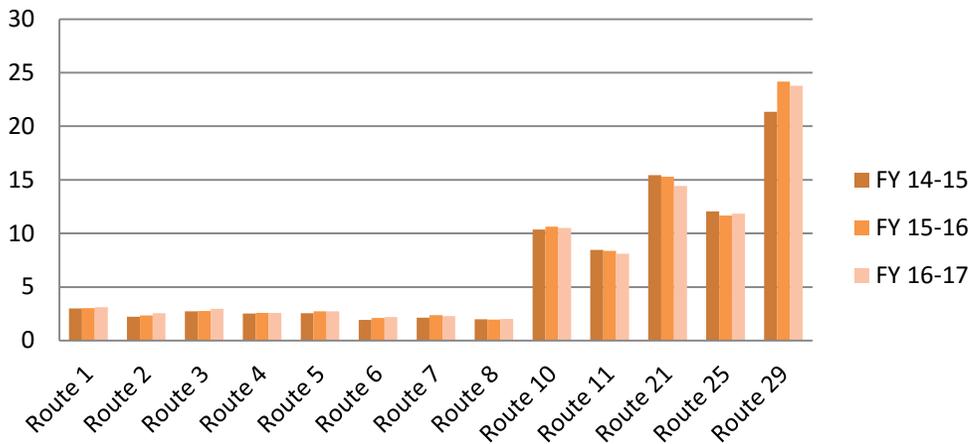
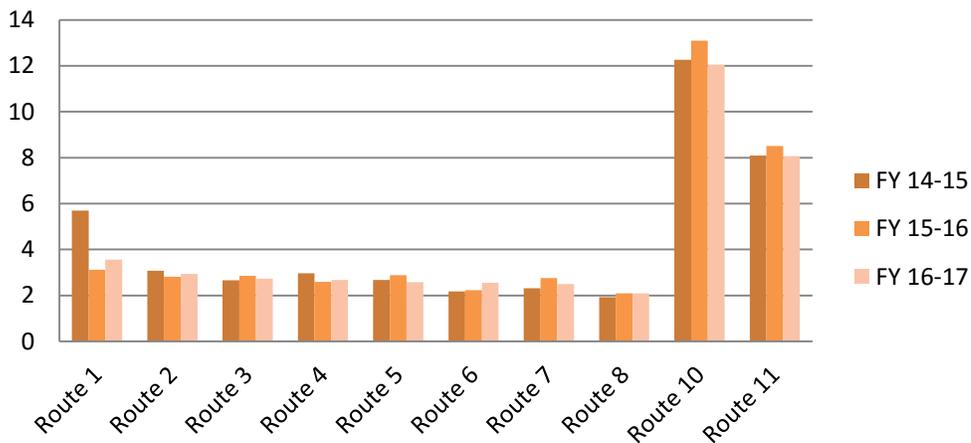


Figure 4.8.2: Average Trip Length by Route, Saturdays



4.8 Average Trip Length by Route (FY 2014-15 - FY 2016-17)

Average trip length is the average length of all passenger trips for a particular route. As shown in the graphs for each day of the week the average length of trips fluctuate very little from weekdays, to Saturdays, and to Sundays. As one would assume shorter trips are taken on local service while regional services produce longer trip lengths. Looking specifically at Route 10, the trips are longer which is likely because the majority of the trips being taken are between the Up Valley communities and the City of Napa. Route 11 also produces long trips but the route is also used for shorter trips which differ from the trips taken on the Route 10.

Figure 4.8.3: Average Trip Length by Route, Sundays

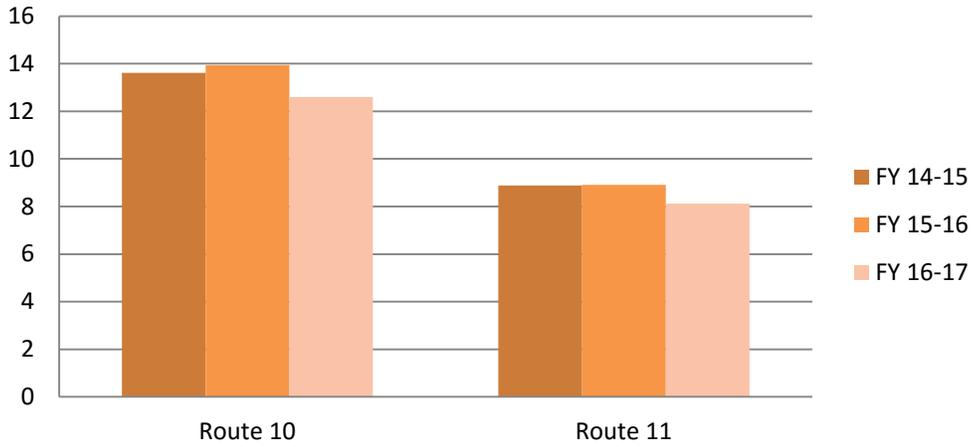
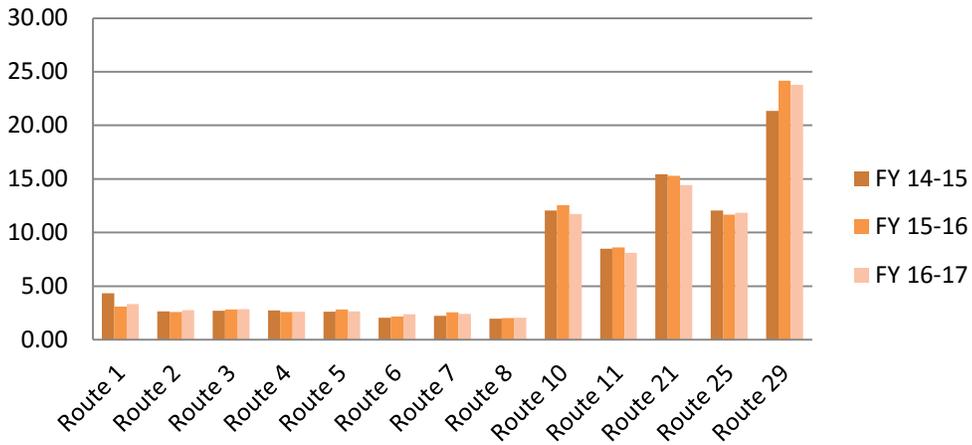


Figure 4.8.4: Average Trip Length by Route, Total





5.

Ridership Patterns

5.1 Overview

The Ridership Patterns section provides detailed analysis for the Routes 1 – 8, 10 and 11. This analysis includes the number of boardings at each stop, load factor (the number of riders onboard the vehicle at a given point in the route), and the total number of riders on each trip throughout the day. The section also provides a review of transfer activity among all of the Vine routes. For further information on stop by stop activity please see Appendix A. This appendix contains maps with visualizations of all stop activity (on/off) for each Vine route.

Section 5 Transfer Matrix (FY 2016, Quarter 3)

ROUTE ISSUED FROM	Routes:													TRANSFERS ISSUED	TRANSFERS USED
	1	2	3	4	5	6	7	8	10	11	21	25	29		
Route 1	0	11	11	15	29	0	1	40	2	2	0	1	0	394	113
Route 2	12	0	35	64	293	0	1	313	4	6	0	1	1	1,363	731
Route 3	13	58	0	30	78	4	0	167	4	8	2	1	2	938	368
Route 4	13	53	106	0	48	1	0	291	3	4	0	0	0	1,250	520
Route 5	20	51	101	202	0	8	23	57	1	4	0	1	0	1,065	467
Route 6	0	1	2	2	18	0	8	43	0	1	0	0	0	280	76
Route 7	0	1	1	0	27	17	0	66	0	4	0	0	0	341	116
Route 8	39	155	284	249	61	45	63	0	2	11	13	7	0	1,799	930
Route 10	28	103	80	88	57	30	60	161	0	1	6	7	2	1,328	623
Route 11	59	135	133	131	81	35	50	117	1	0	8	7	0	2,326	759
Route 21	0	0	2	1	2	0	0	8	0	0	0	2	0	184	15
Route 25	0	0	2	0	2	0	0	4	0	1	1	0	1	94	11
Route 29	7	9	16	11	14	3	3	13	1	0	0	1	0	363	78
TOTAL	190	578	773	794	709	143	209	1,281	21	43	31	28	7	11,725	4,808

5.2 Transfer Matrix

Transfers facilitate the link some passengers must make to complete a whole trip. Understanding which routes have the most transfers between them allows staff to better understand travel patterns. Having a better understanding of these patterns can result in the creation of routes that facilitate a single bus trip or in cases where that is not feasible, a timed transfer.

The transfer matrix includes the daily transfers used throughout the Vine system for the Third Quarter of Fiscal Year 2016-17. The matrix contains data on transfers issued and transfers used. A transfer counts as used only when a customer boards a second bus within the one-hour transfer window. Many drivers issue transfers on reflex without being asked, or passengers are unable to use the transfer within the one hour window. The total number of transfers issued (11,725) in the third quarter, is more than double the number of transfers used (4,808). Instances like these result in a large difference between transfers issued and transfers used. The analysis will focus on transfers used, since they represent completed trips using two separate routes. The 4,808 passengers who used transfers during this time period represented 2% of the trips taken.

The y-axis of the transfer matrix lists the first route that the customer rides and the x-axis is the route that the customer boards second. For example, the matrix shows that 313 riders boarded the Route 2 and then transferred to Route 8. This pattern represents the highest transfer rate seen in the system. The second highest transfer rate is from the Route 2 to the Route 5 at 293 transfers. This pattern shows that riders on the west side of town are making this transfer from the Route 2 to the Routes 5 and 8 to reach destinations in north Napa. Major destinations in this area include Napa High School (Routes 5 and 8), Queen of the Valley Hospital (Route 5), Clinic Ole (Route 5), Kaiser Medical offices (Route 8), and major shopping centers on Trancas (Route 8). On some routes, such as Route 7 to Route 4, no transfers were used during the third quarter.



Figure 5.3.1: Route 1, Stop by Stop Activity

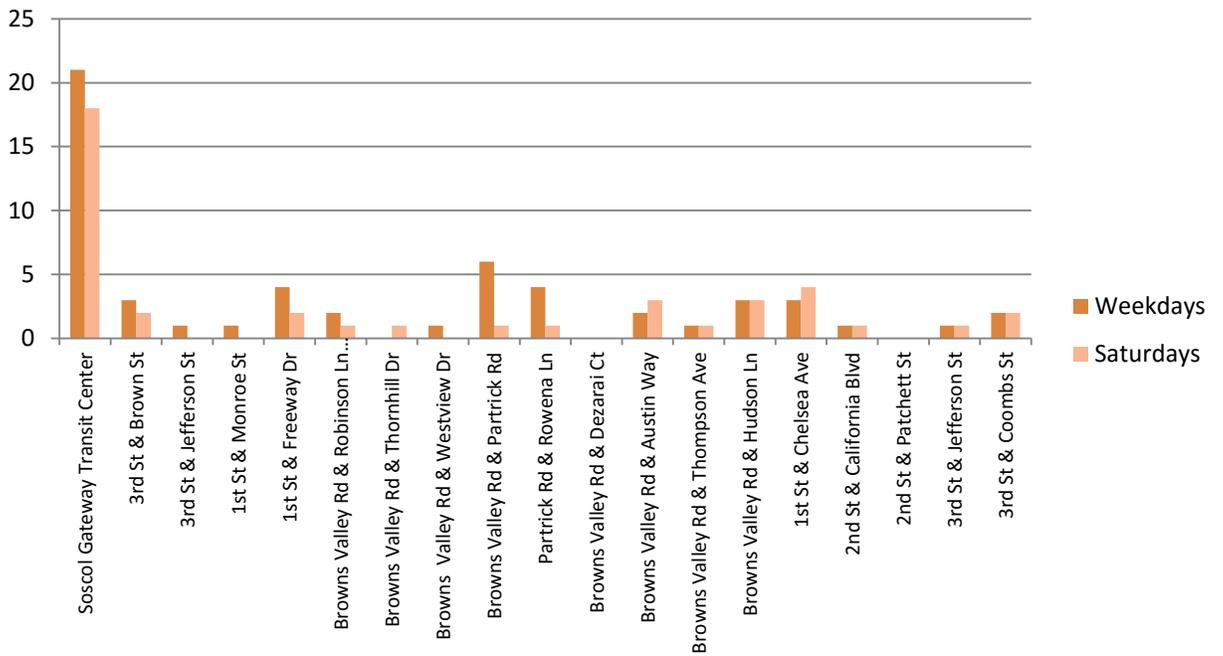


Figure 5.3.2: Route 1, Load Factor

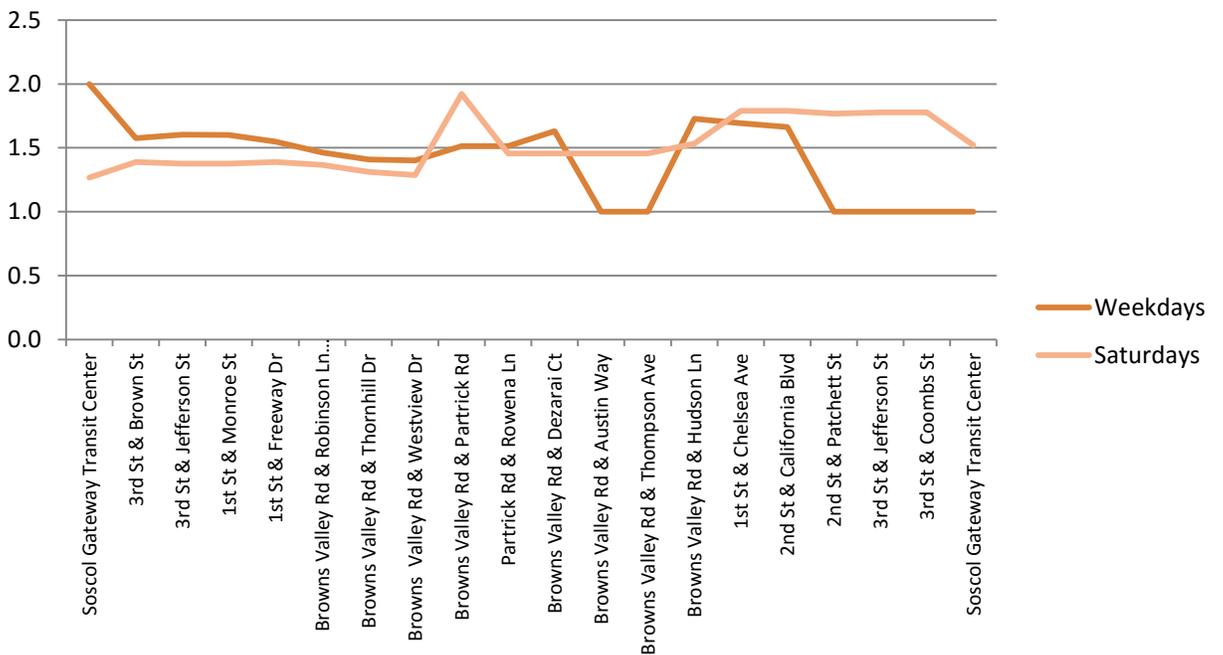
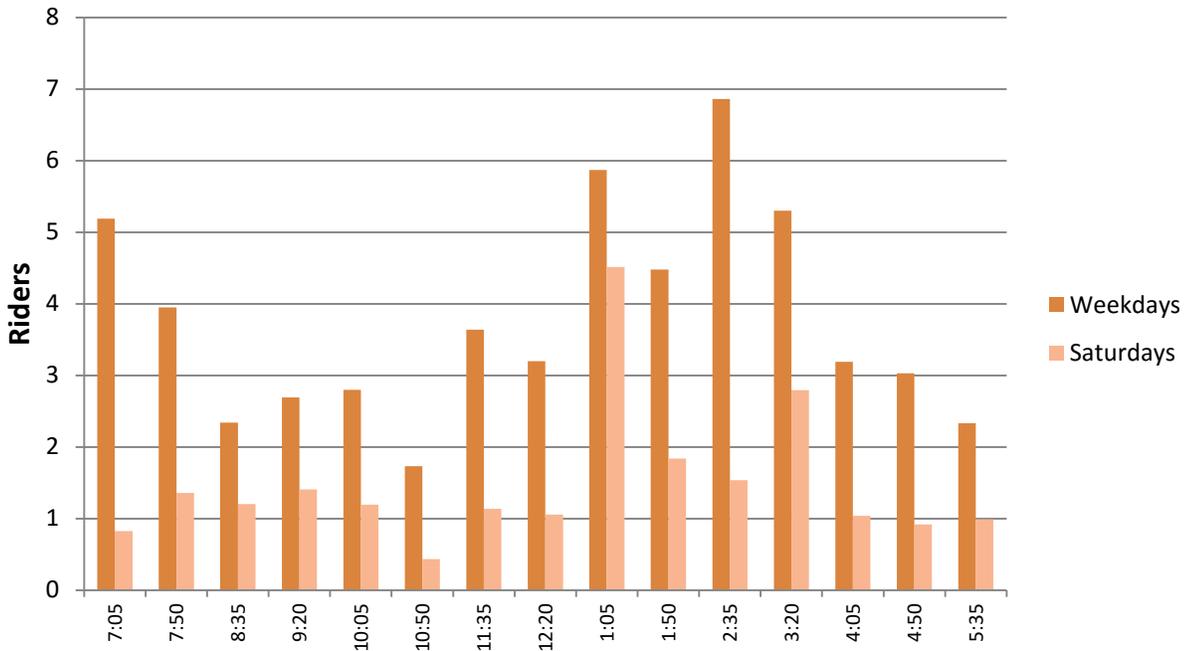


Figure 5.3.3: Route 1, Ridership Volume by Trip



5.3 Route 1

5.3.1 Stop by Stop Activity

An evaluation of Route 1 stop by stop activity indicates most passengers begin their trip at the Soscol Gateway Transit Center. On a typical weekday, about twenty people board the bus at the Transit Center. Stop activity for the remainder of the route is dispersed, with no more than six riders boarding the bus at the other stops.

In addition, activity on the weekdays is generally higher than or equal to activity on Saturday. The only exceptions are the stops at Brown’s Valley Road and Thompson Avenue, where there is a shopping center, and at Browns Valley Road and Chelsea Avenue at the First Christian Church of Napa.

5.3.2 Load Factor

The load factor is between 1.0 and 2.0 passengers on both weekdays and Saturdays. This is one of the lower load factors among the Vine routes.

5.3.3 Ridership Volume by Trip

The ridership volume by trip is only higher than five riders on the 7:05am, 1:05pm, 2:35pm and 3:20pm trips. The volume is even lower on Saturdays as compared to weekdays.

Figure 5.4.1: Route 2, Stop by Stop Activity

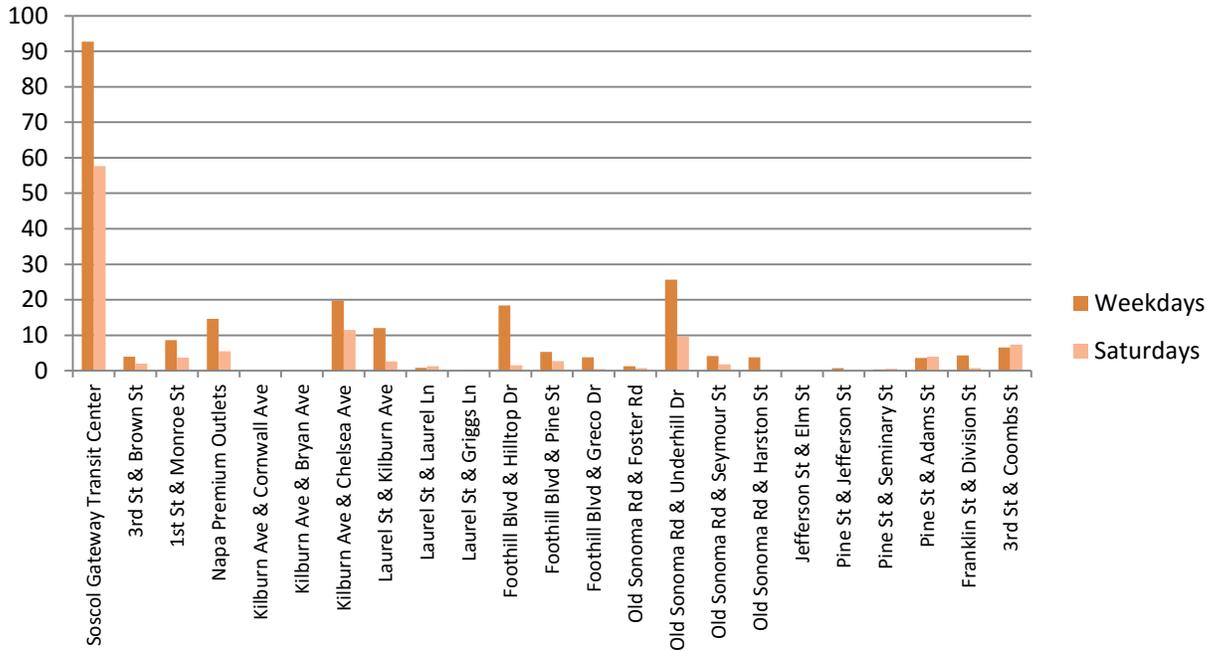


Figure 5.4.2: Route 2, Load Factor

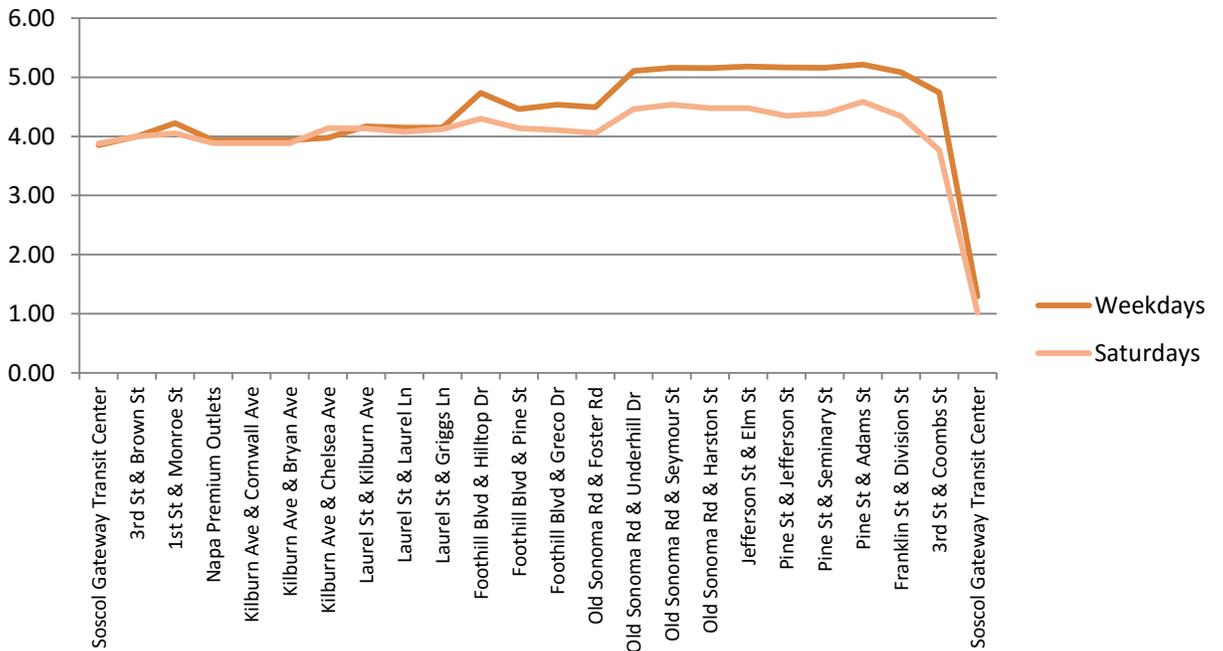
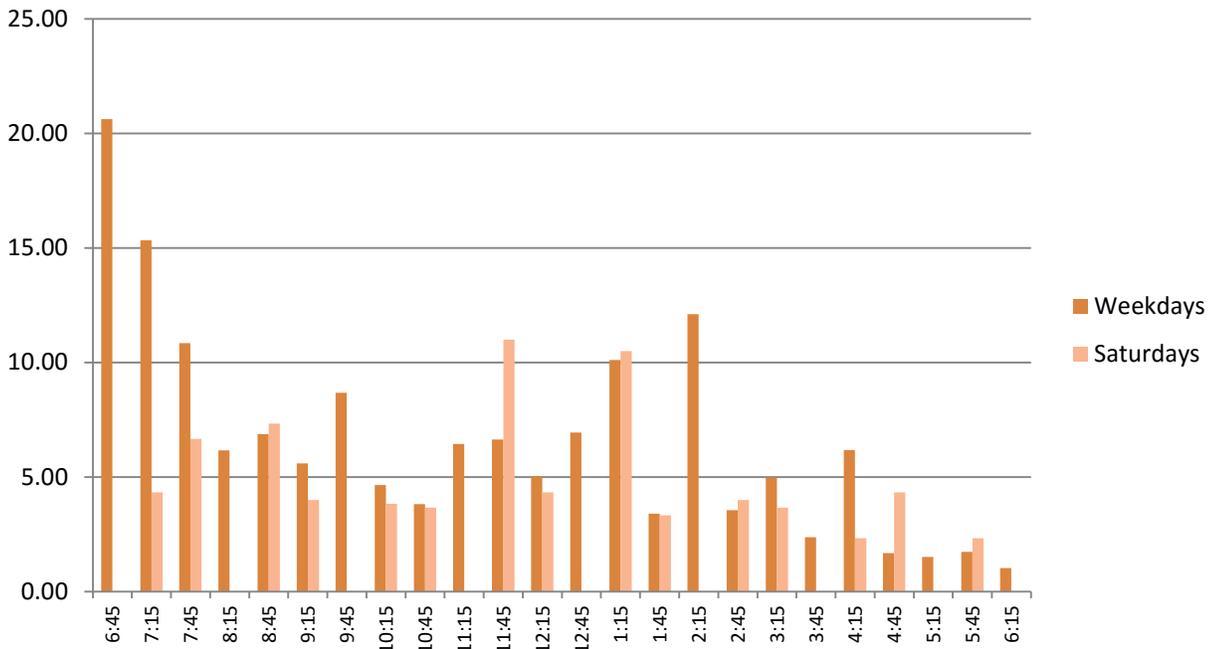


Figure 5.4.3: Route 2, Ridership Volume by Trip



5.4 Route 2

5.4.1 Stop by Stop Activity

Stop by stop activity on the Route 2 indicates that a customer’s main origin or is the Soscol Gateway Transit Center where they transfer to other routes. On a typical weekday, ninety plus riders board the bus at the Transit Center. The remainder of the stop activity is concentrated at five stops: Napa Premium Outlets, Kilburn Avenue & Chelsea Avenue (near First Christian School), Foothill Boulevard and Hilltop Drive (residential), Laurel and Kilburn (residential) and Old Sonoma Road & Underhill Drive (near Harvest Magnet Middle School and Homeless Shelter Napa Valley). The remaining stops have less than 10 riders daily boarding or exiting the bus.

On average the activity on the weekdays is higher than on Saturday, the exception being the stop at 3rd and Coombs.

5.4.2 Load Factor

At approximately 5.0 passengers on the weekday and about 4.0 on Saturdays the load factor on the Route 2 is about average as compared to the rest of the system.

5.4.3 Ridership Volume by Trip

The ridership volume peaks between ten and twenty-one riders in the early morning weekday trips at 6:45am, 7:15am and 7:45am and again hits a high point at around twelve riders at 2:15pm on the weekdays. On Saturdays, the pattern changes with greater trip volume at midday, specifically at 11:45am and 1:15pm.

Figure 5.5.1: Route 3, Stop by Stop Activity

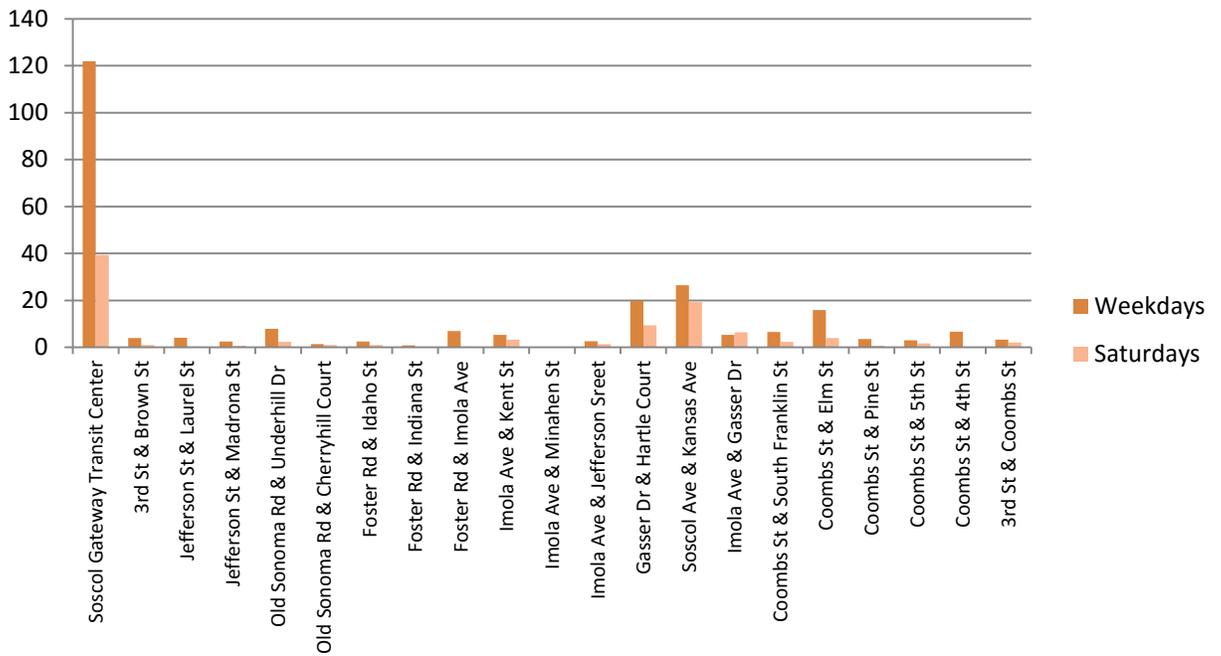


Figure 5.5.2: Route 3, Load Factor

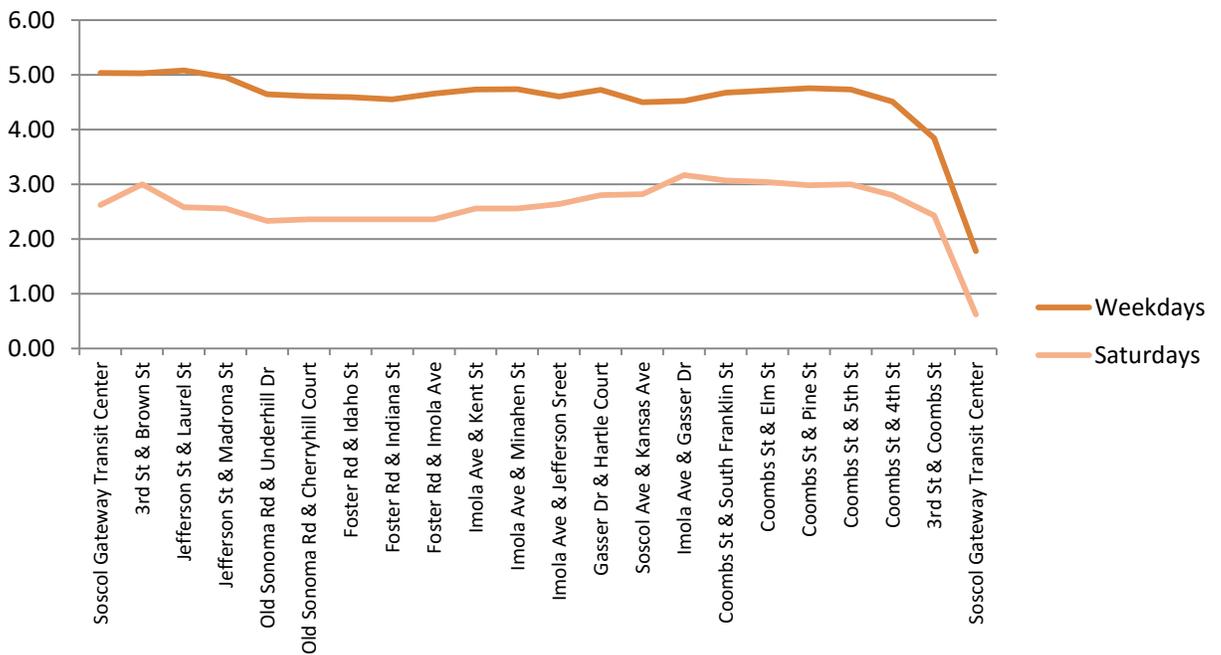
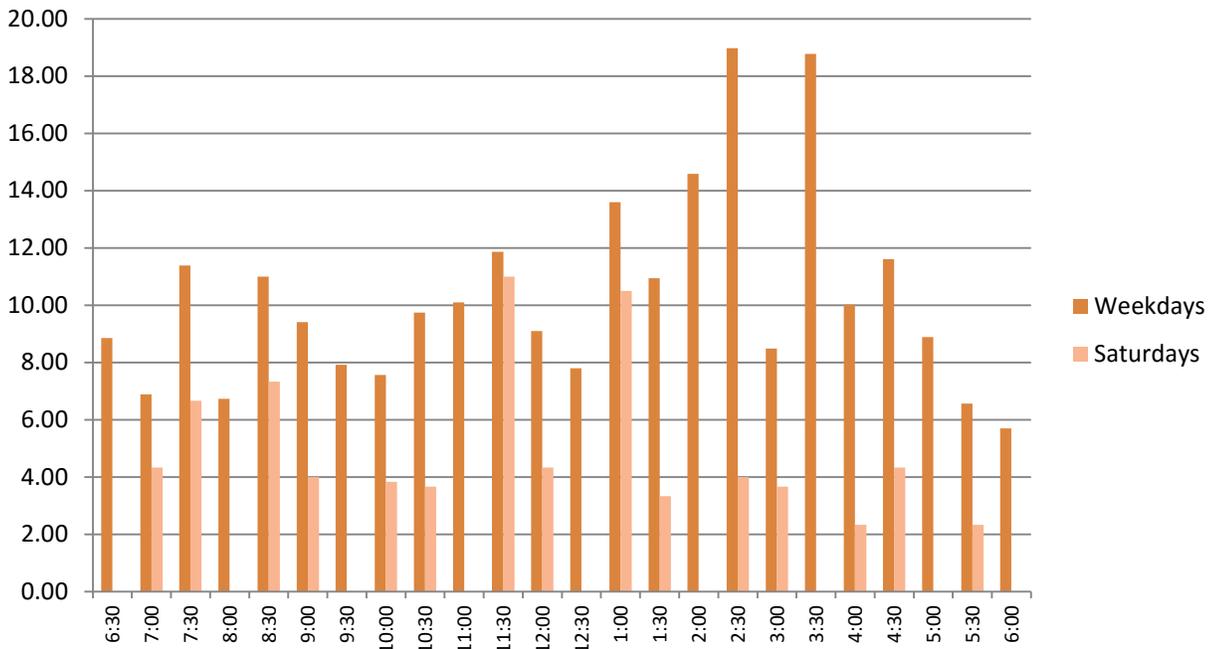


Figure 5.5.3: Route 3, Ridership Volume by Trip



5.5 Route 3

5.5.1 Stop by Stop Activity

Upwards of 120 riders on weekdays start their trip at the Transit Center making it the most used stop on the route. Other popular stops along the route include Gasser Drive and Hartle Court, Soscol Avenue and Kansas Avenue and Coombs Street and Elm Street. Land uses adjacent to these stops include both residential and industrial, signifying a diverse range of trip purposes. The remaining stops have less than ten riders boarding the bus on a daily basis.

The stop activity on Saturdays is significantly lower than on weekdays with only about forty riders boarding at the Transit Center and no more than twenty riders boarding at any one stop along the route. The Saturday pattern, like the weekday pattern, centers on the South Napa Marketplace which is a major shopping and entertainment destination.

5.5.2 Load Factor

The Route 3 load factor averages 5.0 passengers the weekday and drops to around 3.0 on Saturdays. These load factors are on par with other Vine routes.

5.5.3 Ridership Volume by Trip

The ridership volume remains steady throughout the day. The highest volumes are on the 2:00pm and 3:30pm trips. The route does not follow normal commute patterns because people are using it to reach shopping and entertainment destinations like Home Depot, Target, and the movie theater. Ridership can get close to, but tends not to exceed, the buses seating capacity. On Saturdays, the pattern changes with greater trip midday volume, including trips at 11:30am and 1:00pm with very few trips later in the day.

Figure 5.6.1: Route 4, Stop by Stop Activity

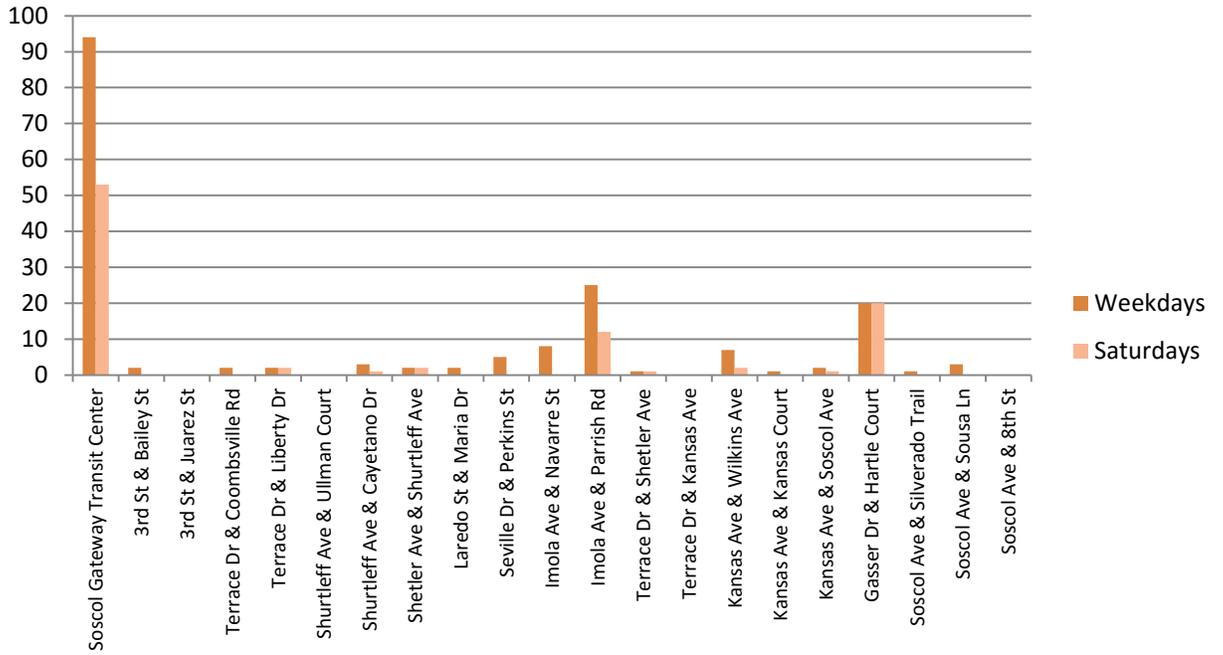


Figure 5.6.2: Route 4, Load Factor

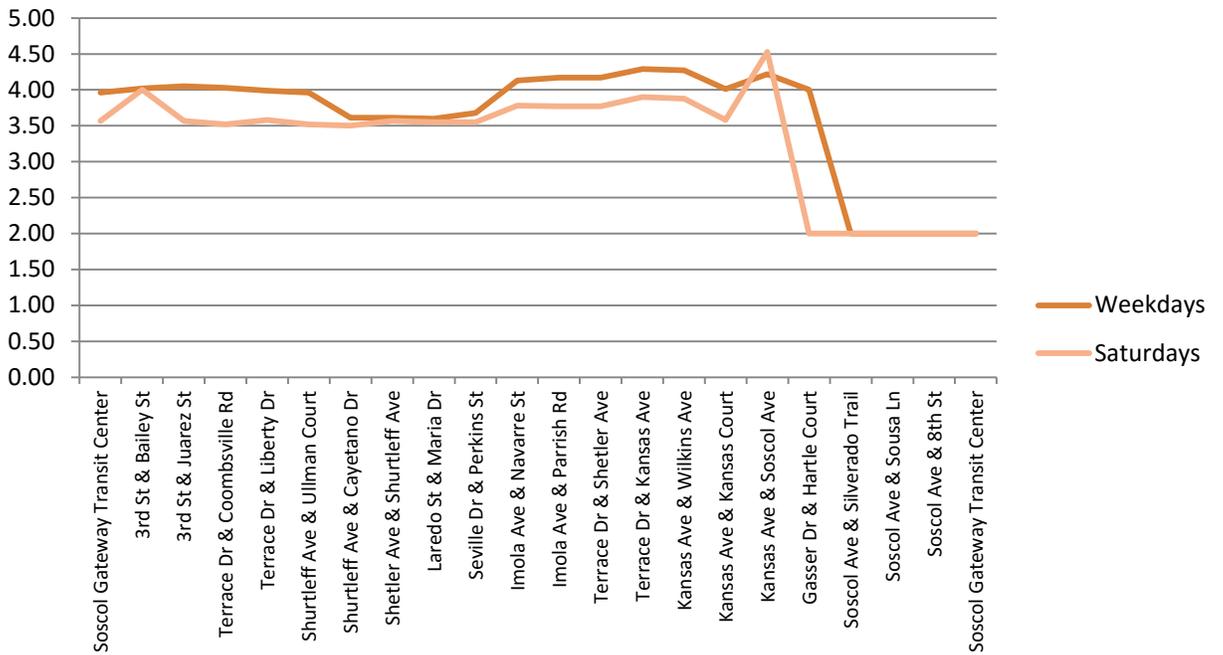
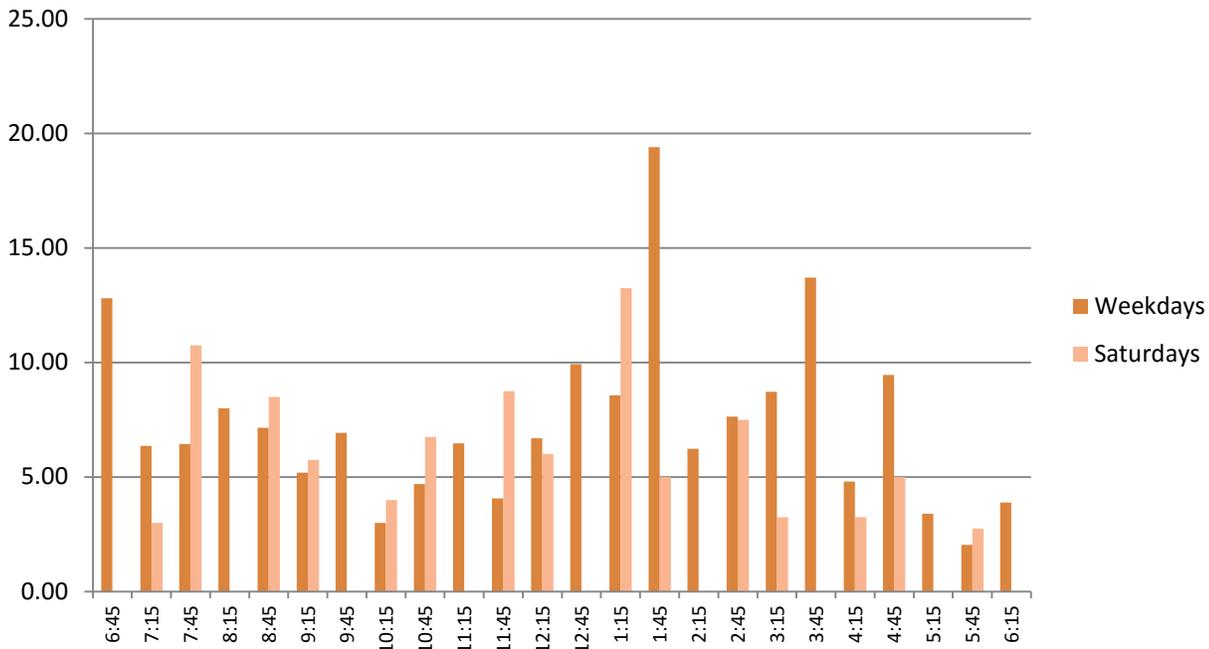


Figure 5.6.3: Route 4, Ridership Volume by Trip



5.6 Route 4

5.6.1 Stop by Stop Activity

The majority of Route 4 riders board the bus at the Soscol Gateway Transit Center. On a typical weekday, an average of ninety plus riders start or continue their trip at the Transit Center. The remainder of boardings are concentrated at the stops located at Imola Avenue and Parrish Road (near small retail establishments, apartments, and Chamberlain High School) and Gasser Drive and Hartle Court (South Napa Marketplace). All other stops have a few riders each day, with some stops having zero riders.

Only about fifty riders board the bus at the Transit Center on Saturdays and no more than twenty-five riders board at any other stop. The Saturday pattern, like the weekday pattern, centers on the South Napa Marketplace and the stop at Imola Avenue & Parrish Road.

5.6.2 Load Factor

The Route 4 load factor follows a unique pattern because it is very similar on both the weekdays and the weekends where it stays between 3.5 and 4.5 passengers up until the stop at Kansas Avenue and Soscol Avenue where it drops to 2.0 as riders alight presumably to do their shopping at the South Napa Marketplace. The load factor on the Route 4 is slightly below the average for the Vine.

5.6.3 Ridership Volume by Trip

Like the Route 3, the Route 4 serves retail and entertainment destinations. These types of destinations lead to ridership volumes remaining steady throughout the day as people do their shopping or go to work. The highest volume trips are on the 1:45pm and 3:45pm trips.

On Saturdays, the pattern changes with greater trip volume in the morning and again at midday, specifically the trips at 7:45am and 1:15pm, with very few riders later in the day. The early Saturday trips may be attributable to the Napa Farmer’s Market which is at the South Napa Marketplace.

Figure 5.7.1: Route 5, Stop by Stop Activity

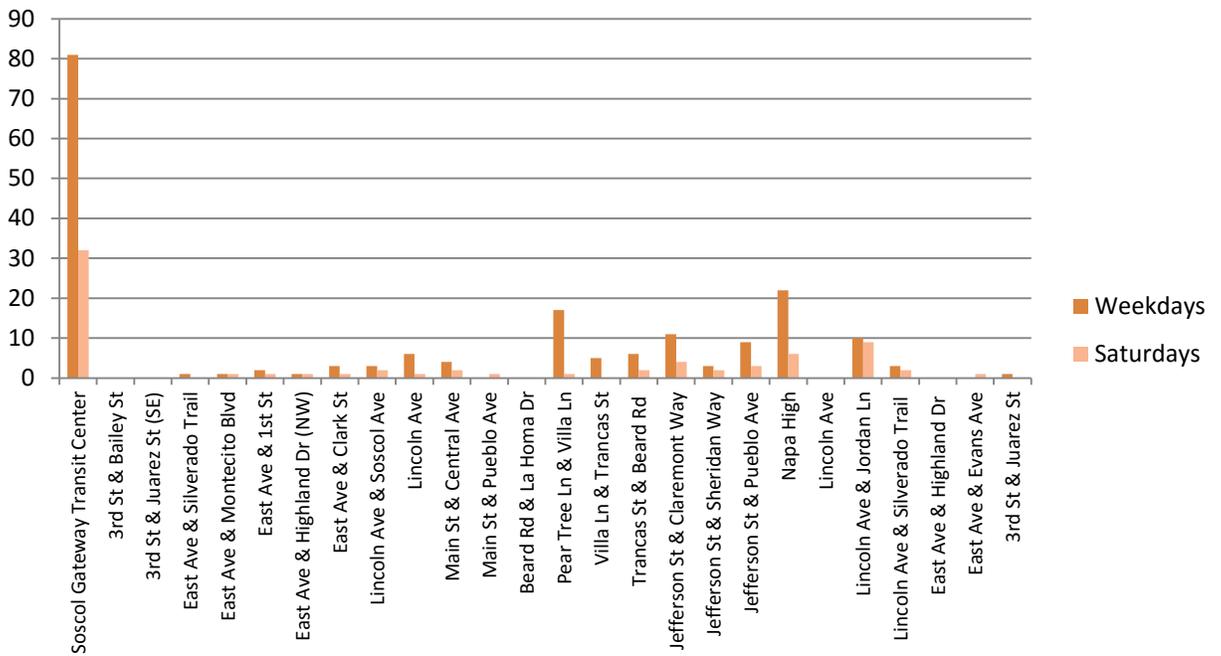


Figure 5.7.2: Route 5, Load Factor

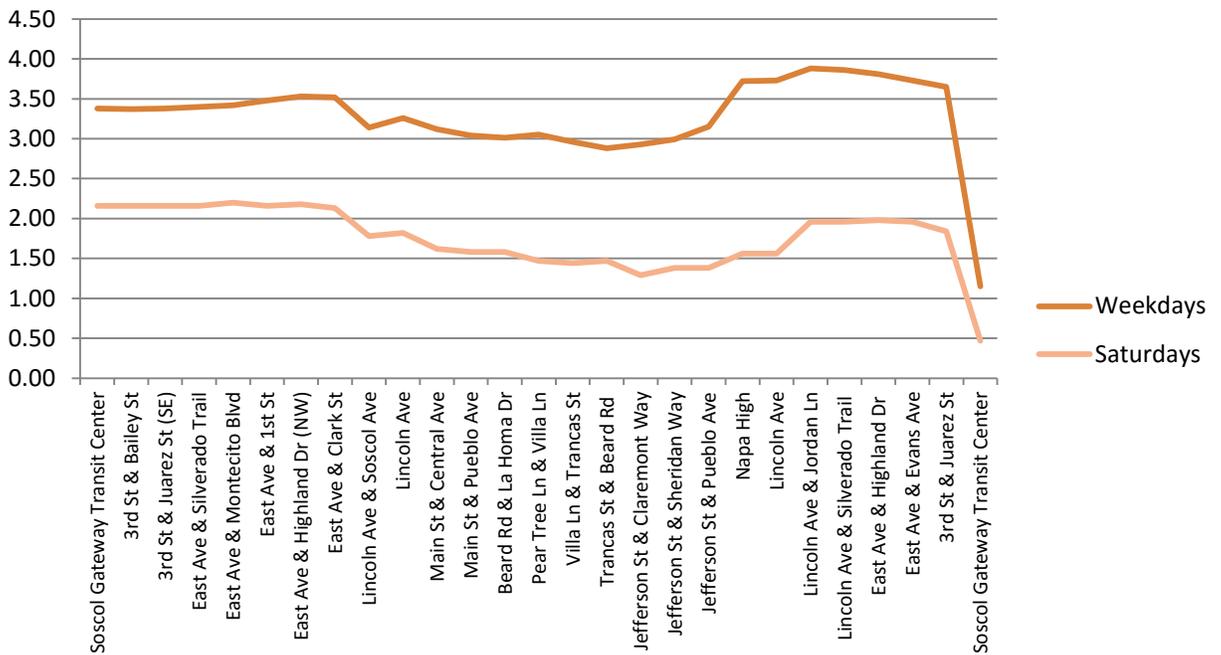
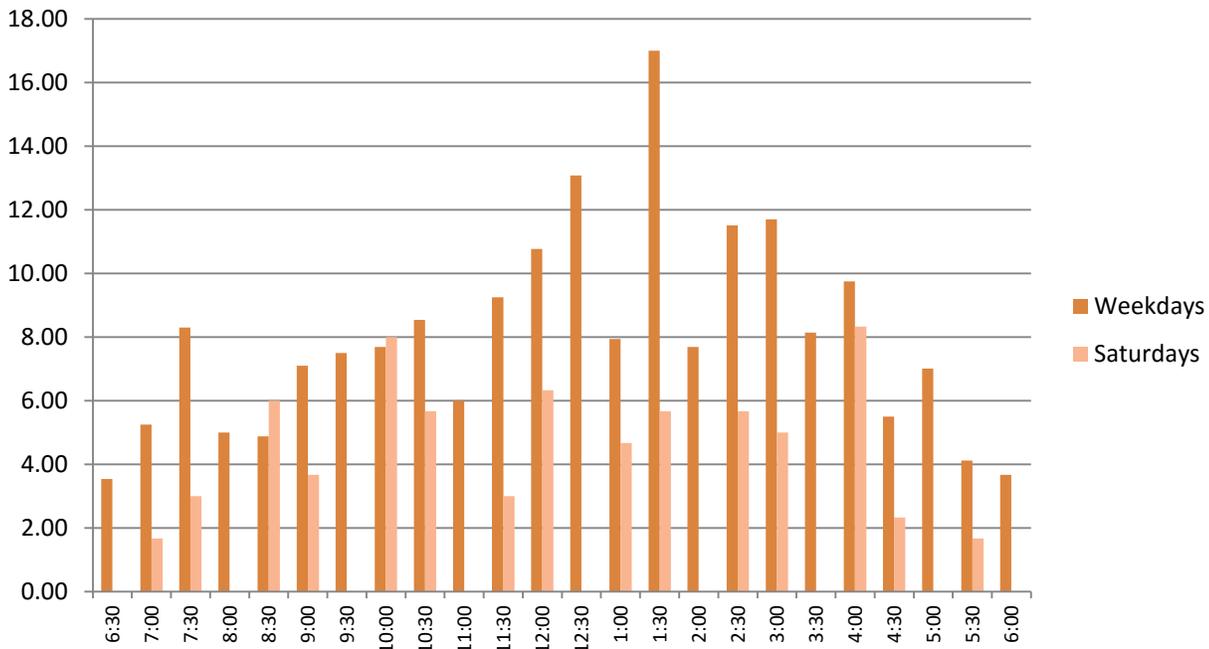


Figure 5.7.3: Route 5, Ridership Volume by Trip



5.7 Route 5

5.7.1 Stop by Stop Activity

On a typical weekday, an average of eighty riders start or continue their trip at the Transit Center. Concentrations of boardings can be seen at the Pear Tree Lane & Villa Lane stop (near an assortment of medical and office buildings), Jefferson Street & Claremont Way stop (near retail, medical, and banking) and the stop at Napa High. There are ten or less riders at all the other stops, with no rider activity at four stops.

On Saturdays, boardings at the Transit Center are around thirty passengers which is less than half the weekday volume. Less than ten riders board at any other stop. The weekend pattern, centers on the stop at Lincoln Avenue and Jordan Lane adjacent to Walmart.

5.7.2 Load Factor

Load factor for the Route 5 peaks at around 4.0 passengers on the weekday and 2.25 passengers on Saturdays. The curve is the same for both weekdays and Saturdays with the higher loads at the beginning of route, dropping off in the middle, picking up at the tail end, and then a large drop upon arriving at the transit center.

5.7.3 Ridership Volume by Trip

Major trip attractors on the route are Clinic Ole located on Pear Tree, the retail centers and Kaiser Clinical offices at Claremont and Jefferson, and Napa High School. These attractions cause ridership to be steady throughout the day. Ridership on the 7:30am and 3:00pm trips on the weekdays is driven by students going to Napa High. Peak ridership also occurs on the midday runs at 12:30pm (13 riders) and 1:30pm (17 riders) as riders complete their retail, medical, and banking trips.

The ridership volume on the Saturdays is generally lower than on weekdays with the exception of the 10:00am trip on Saturday.

Figure 5.8.1: Route 6, Stop by Stop Activity

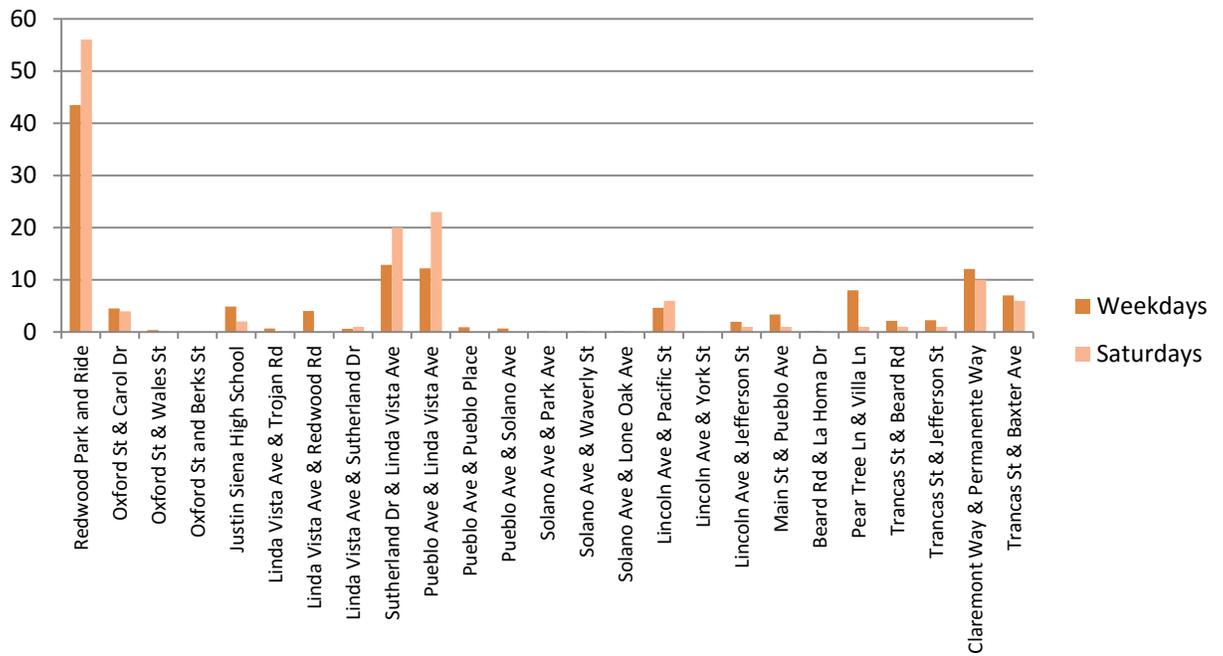


Figure 5.8.2: Route 6, Load Factor

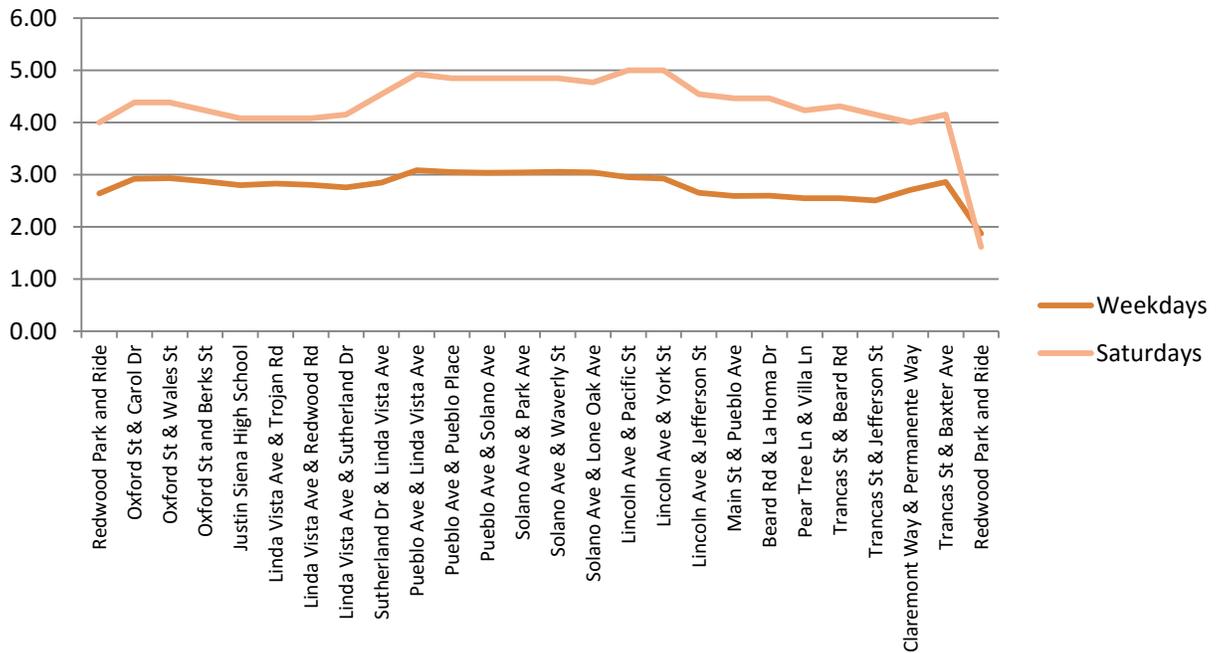
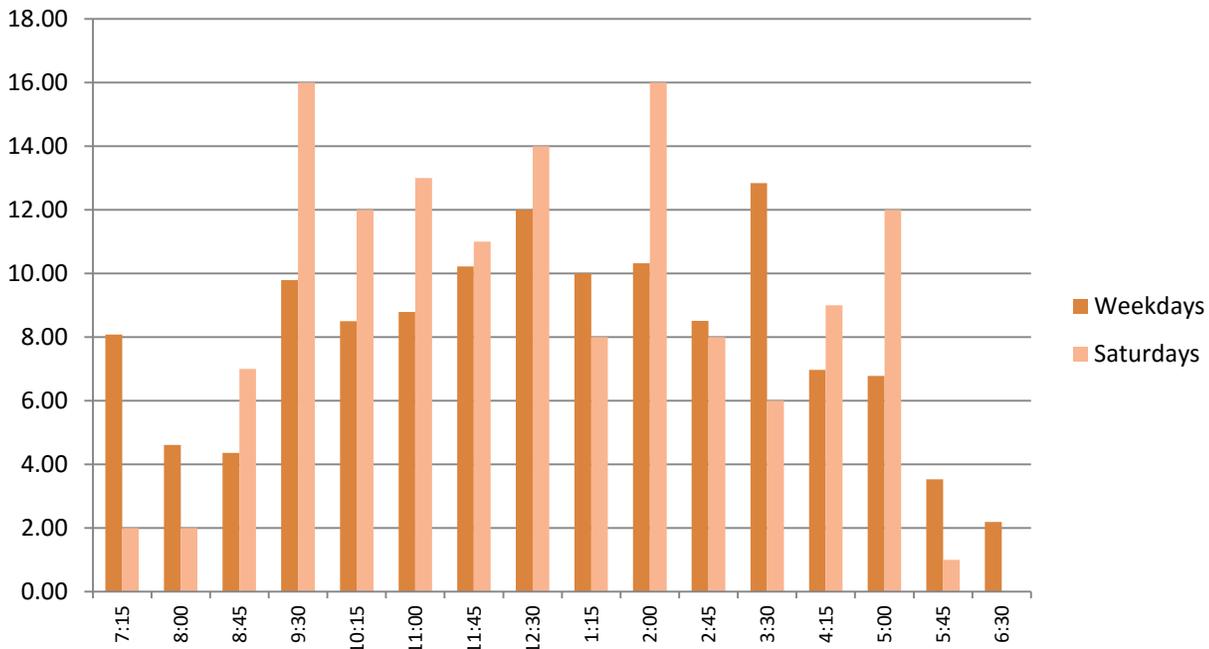


Figure 5.8.3: Route 6, Ridership Volume by Trip



5.8 Route 6

5.8.1 Stop by Stop Activity

The Route 6 does not stop at the Soscol Gateway Transit Center. Its primary boarding location is the Redwood Park and Ride which acts as the transfer hub for north Napa. On a typical weekday, the stop activity at the Redwood Park and Ride averages a little over forty riders. Stops showing the greatest number of boardings are the Sutherland Drive & Linda Vista stop (near Pueblo Vista Magnet School), the Pueblo Avenue & Linda Vista Avenue stop (near Rohlff’s Manor Senior Apartments) and the Claremont Way & Permanente Way stop (near retail and the Kaiser Clinical offices). There are ten or fewer riders at all the other stops, with no rider activity at four stops.

Route 6 does not follow the same weekday and Saturday travel patterns as other Vine routes. All other routes in the Vine system have more boardings on weekdays than Saturdays while the Route 6 has more boardings on Saturday. Saturday boardings at the Redwood Park and Ride are approximately fifty-five passengers. The remainder of the Saturday pattern follows that of the weekday, with the highest rates of boarding at Sutherland Drive & Linda Vista

(near Pueblo Vista Magnet School) and Pueblo Avenue & Linda Vista Avenue (near Rohlff’s Manor Senior Apartments).

5.8.2 Load Factor

The load factor is higher on Saturdays than on the weekdays, hovering between 4.0 and 5.0 passengers on Saturdays and drops around 3.0 on weekdays. The weekday load factor is slightly below average when compared with other Vine routes, but the Saturday load factor is higher than average.

5.8.3 Ridership Volume by Trip

Between the hours of 7:15am and 5:00pm the Route 6 ridership per trip varies between four riders to thirteen riders on the weekdays. Ridership then drops on the last two trips at 5:45pm and 6:30pm.

On Saturdays the ridership by trip, like the stop by stop activity, is higher than on the weekdays. The ridership volume by trip starts a little later on Saturdays with a high of sixteen riders on the 9:30am trip and remains high until 5:00pm, after which ridership drops for the last trip of the day.

Figure 5.9.1: Route 7, Stop by Stop Activity

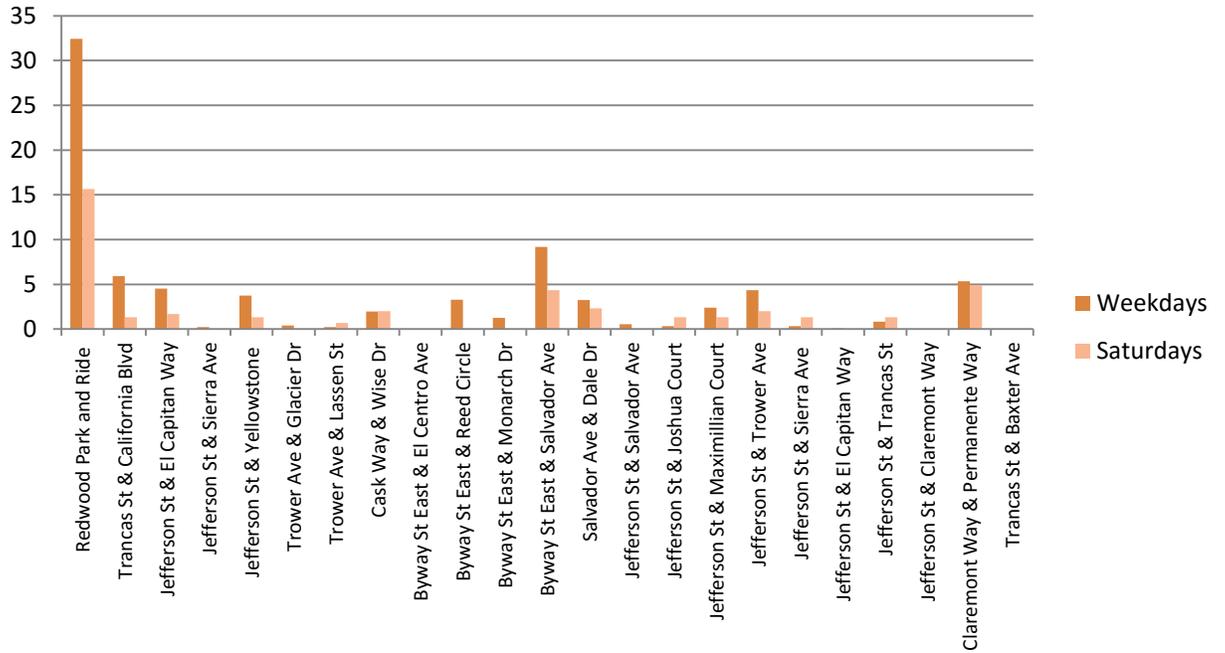


Figure 5.9.2: Route 7, Load Factor

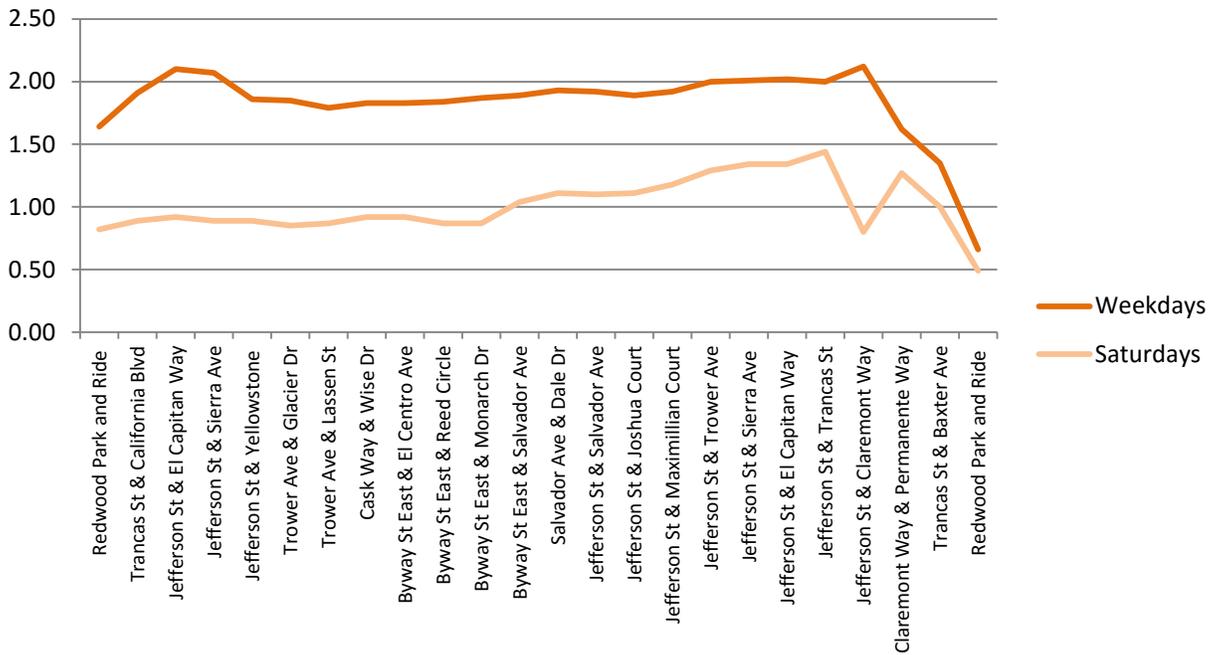
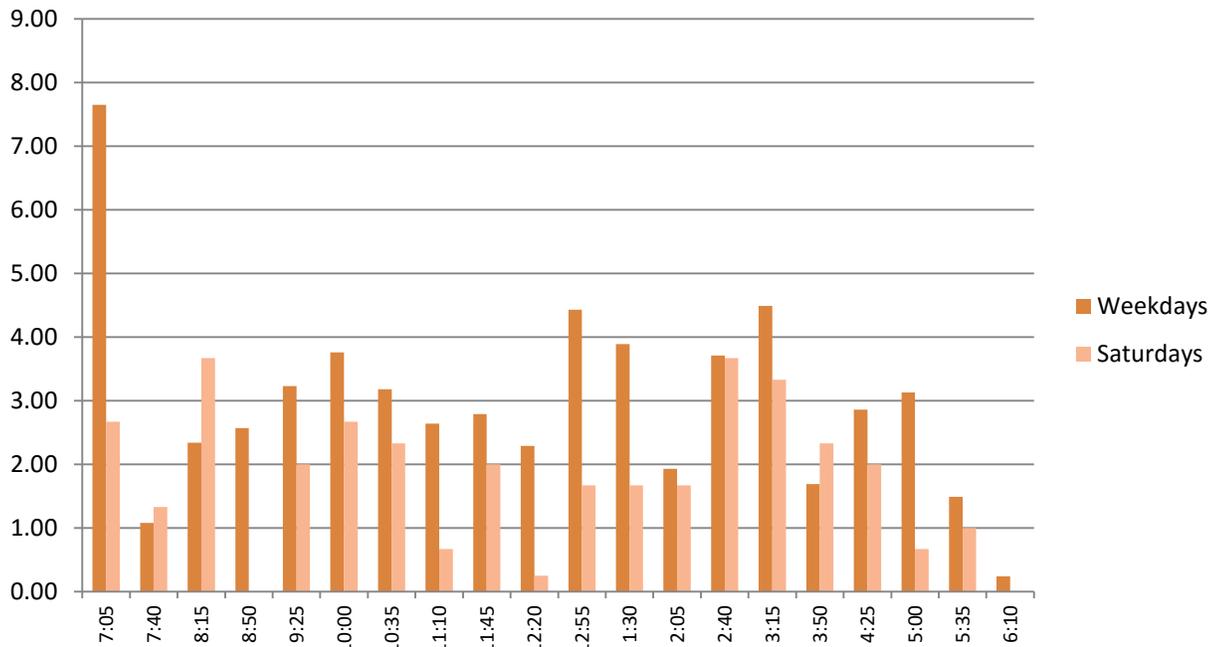


Figure 5.9.3: Route 7, Ridership Volume by Trip



5.9 Route 7

5.9.1 Stop by Stop Activity

Like the Route 6, the Route 7 does not serve the Soscol Gateway Transit Center. The primary source of stop activity is at the Redwood Park and Ride. On a typical weekday, an average of 32 riders start or continue their trip at the stop. Stop by stop activity on the Route 7 is very spread out with no more than nine riders boarding the bus at any one stop. The highest activity is at the Byway East & Salvador Avenue (Salvador Elementary School) stop with nine riders. All other stops have only a few riders each day, with four stops having zero riders.

The Saturday ridership on the Route 7 is almost nonexistent with a total of 15 people boarding or exiting the bus at the Redwood Park and Ride.

5.9.2 Load Factor

Route 7 weekday and weekend load factors follow roughly the same curve. The one obvious difference is the activity at Jefferson and Claremont Way. On weekdays there is more boarding activity at the stop while on the weekends the load drops. The weekend drop can most likely be attributed to people using that stop to access the shopping center while on the weekdays there is a more balanced on, off pattern due to greater variability in trip purpose.

5.9.3 Ridership Volume by Trip

The Route 7 ridership on weekdays peaks on the 7:05am trip with just over seven riders and then never gets above five riders on average on any other trip.

On Saturdays, the ridership by trip is about 3.5 riders during the 8:15am and 2:40pm trips, but is less than three riders during all other trips.

Figure 5.10.1a: Route 8 North, Stop by Stop Activity

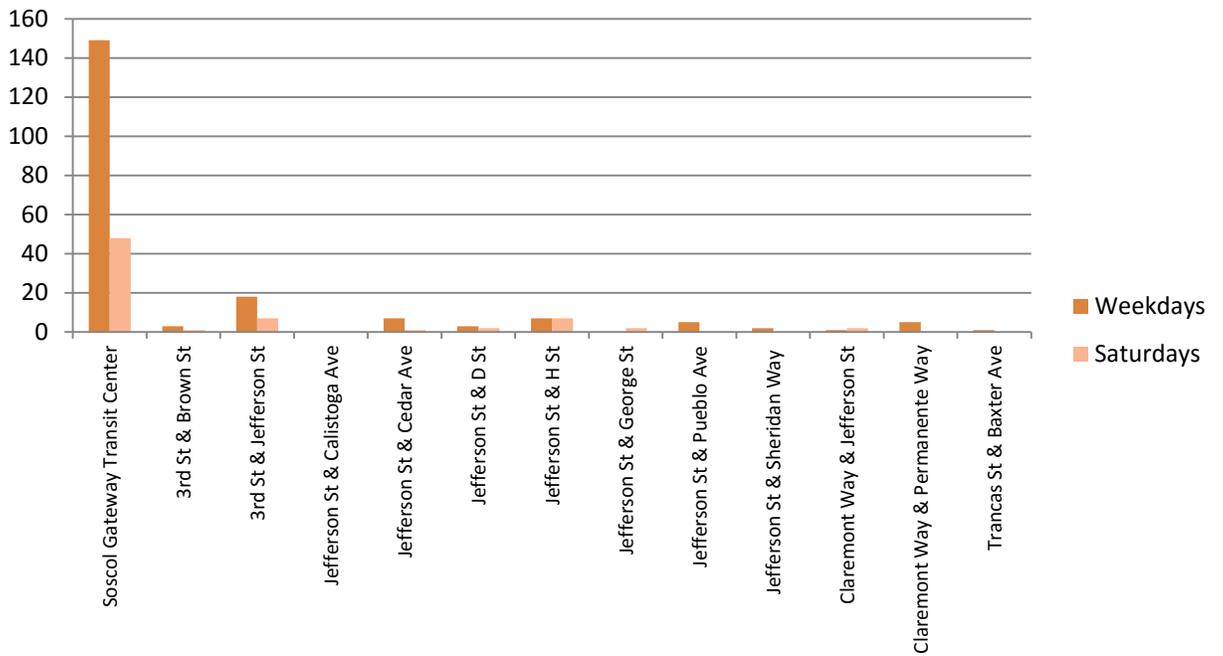


Figure 5.10.2a: Route 8 North, Load Factor

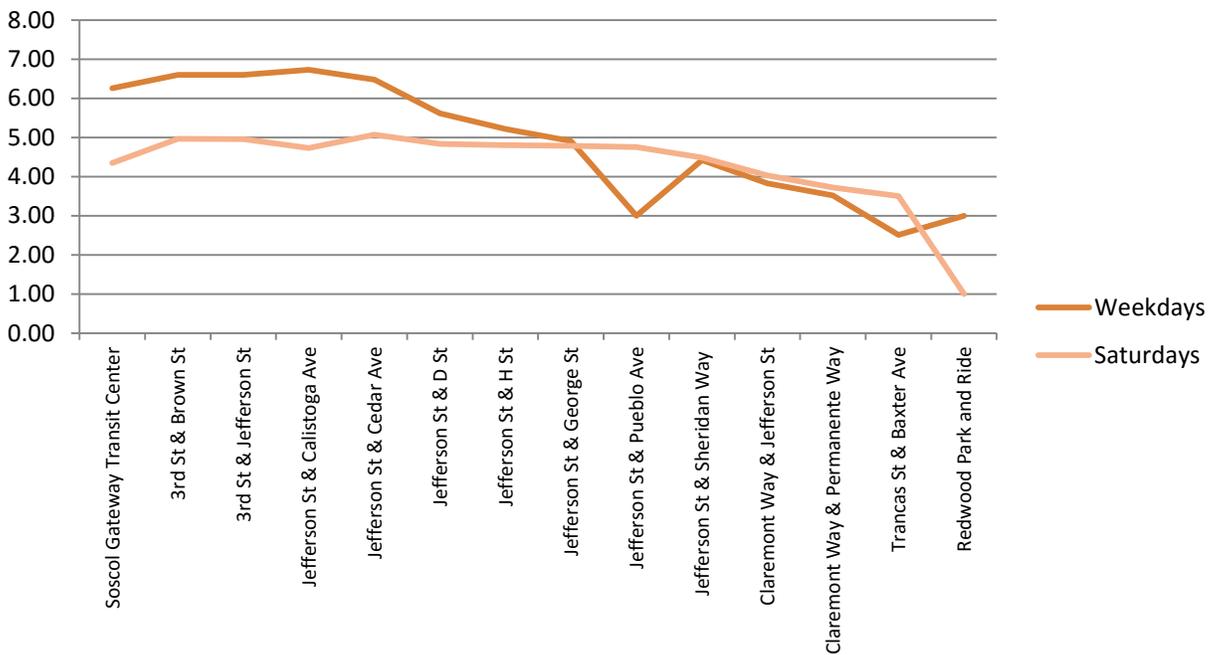
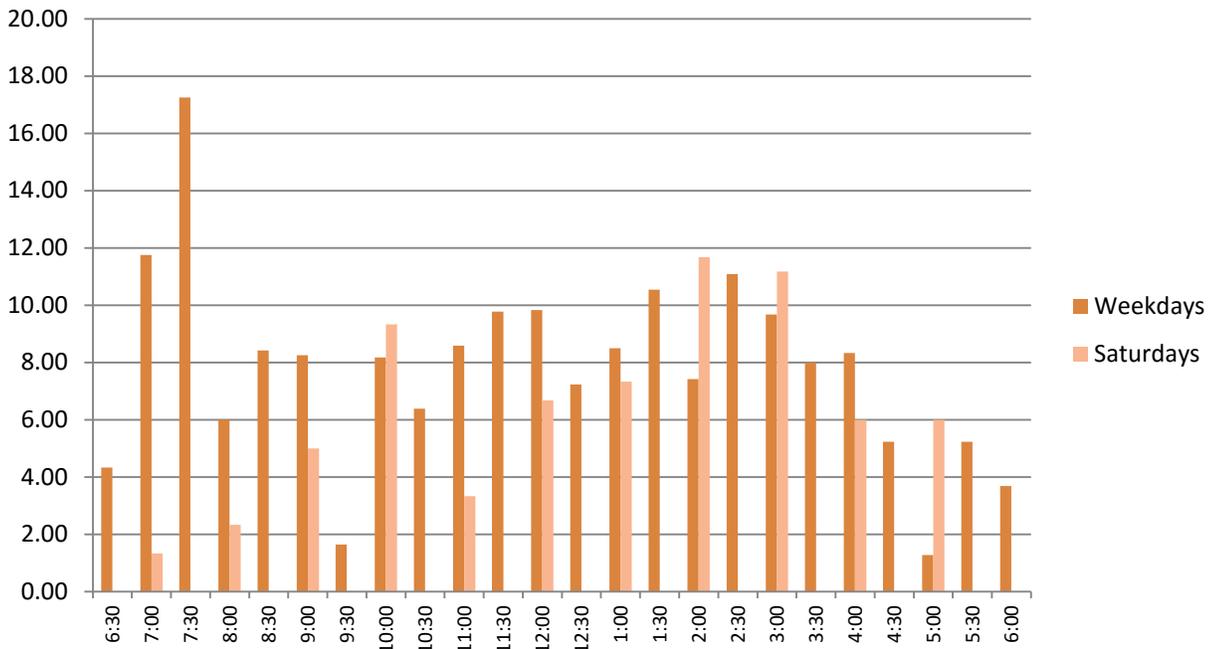


Figure 5.10.3a: Route 8 North, Ridership Volume by Trip



5.10 Route 8

5.10.1 Stop by Stop Activity

The Route 8 is a north and south route that travels from the Soscol Gateway Transit Center to the Redwood Park and Ride and back. On a typical weekday the northbound trip, as shown in *Figure 5.10.1a*, an average of 150 passengers begin or continue their trip at the Soscol Gateway Transit Center. The rest of the route has comparatively low boarding activity as it makes its way north.

On an average weekday the southbound trip, *Figure 5.10.1b*, has an average of 60 riders start or continue their trip at the Redwood Park and Ride. Unlike the northbound trip, boardings are more evenly dispersed among the stops. Napa High is one of the locations showing a higher than average number of boardings almost rivaling the Redwood Park and Ride. This is unsurprising as high school students make up a large number of the Vine’s ridership.

5.10.2 Load Factor

On Route 8 North, *Figure 5.10.2a*, the load factor on weekdays hits a high point of just under 7.0 at the beginning of the route and falls to about 3.0 by the end of the route. Going north on Saturdays, the load factor is between 5.0 and 4.0 until the second to last stop when it begins to drop. The weekday and Saturday load factor is above average when compared with other Vine routes. While these numbers represent the average throughout the day there is certainly a spike in the morning where buses are completely full with high school students. The stop at Jefferson and Pueblo is the high school stop which explains the very discernable dip on weekdays in load as students alight the bus to get to school.

On Route 8 South, *Figure 5.10.2b*, the load factor on weekdays has an opposite trend to the northbound route. The load increases the further the route gets from its origin point where as northbound the load decreases.

Figure 5.10.1b: Route 8 South, Stop by Stop Activity

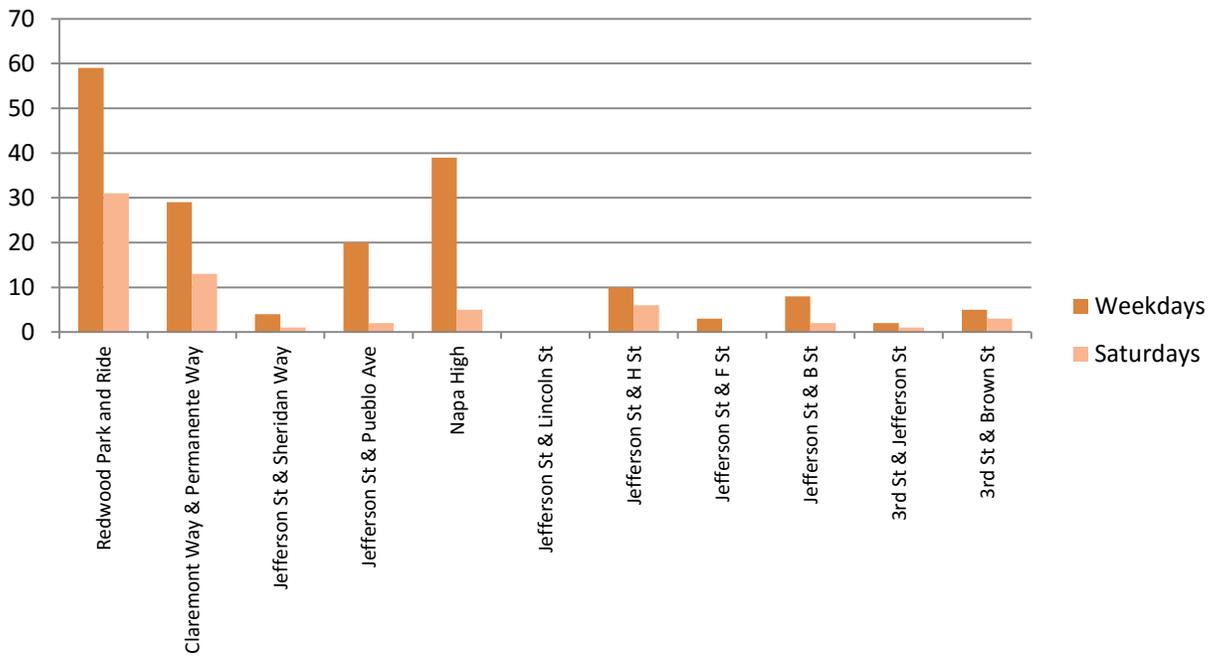


Figure 5.10.2b: Route 8 South, Load Factor

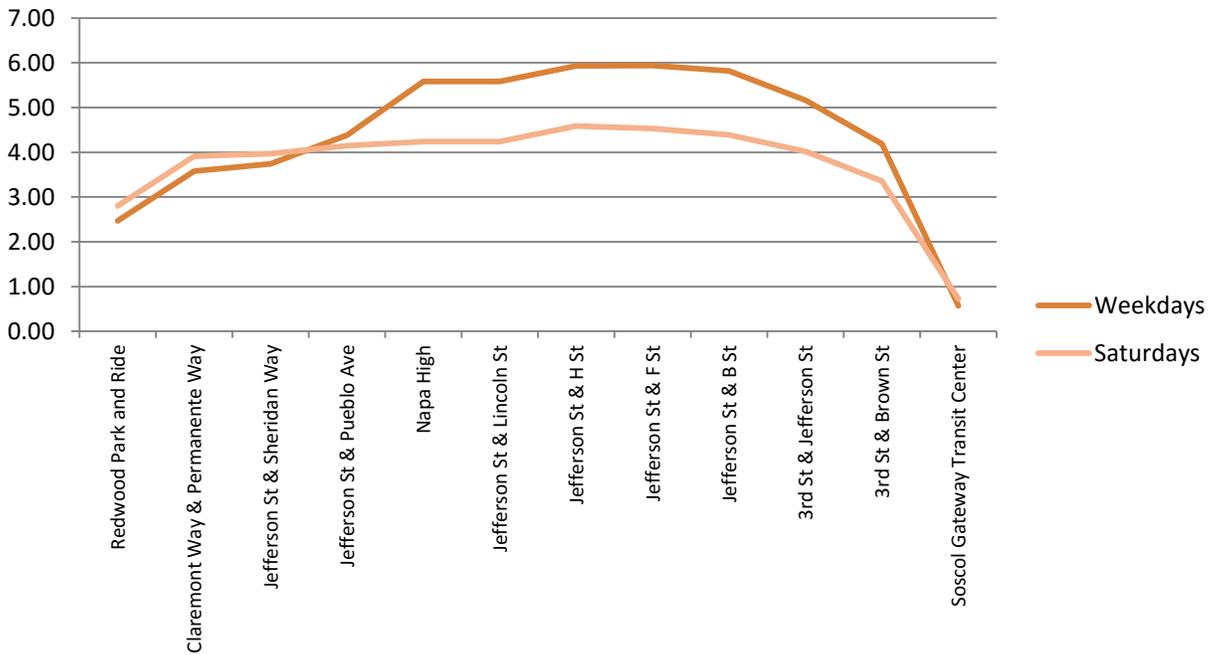
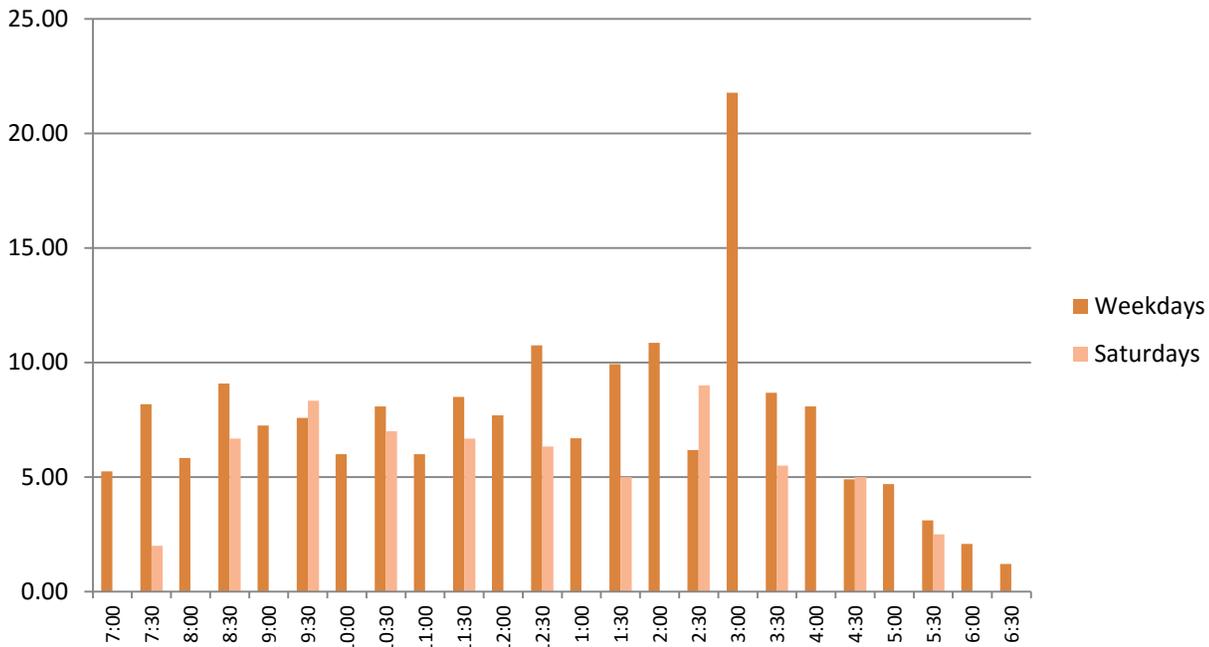


Figure 5.10.3b: Route 8 South, Ridership Volume by Trip



5.10.3 Ridership Volume by Trip

Figure 5.10.3a, shows ridership is highest in the morning during the 7:00am and 7:30am (approximately 17 passengers) trips on weekdays when high school students are traveling to school. Ridership then ranges from two riders to eleven riders for the rest of the day. On the northbound trips on Saturdays, the ridership ranges from two riders to eleven riders as well, but the higher ridership is focused on midday service between 10:00am and 3:00pm, as opposed to early in the morning.

Figure 5.10.3b indicates that the highest ridership on weekdays is at the end of the school day at 3:00pm with about 22 riders. Throughout the rest of the day on weekdays, ridership is between two riders and eleven riders, similar to the northbound trips. On Saturdays the pattern also mirrors that of the northbound trips with lower ridership than on the weekdays and the higher ridership trips at midday.

Figure 5.11.1a: Route 10 North, Stop by Stop Activity

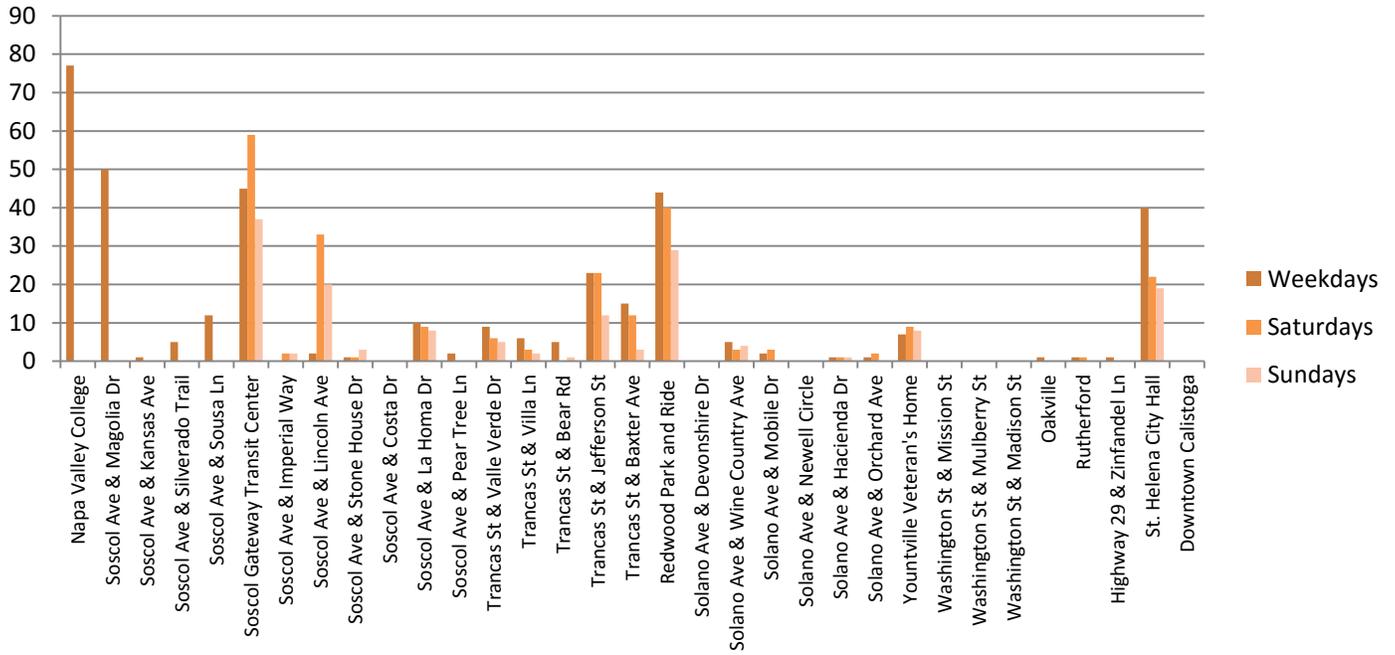


Figure 5.11.2a: Route 10 North, Load Factor

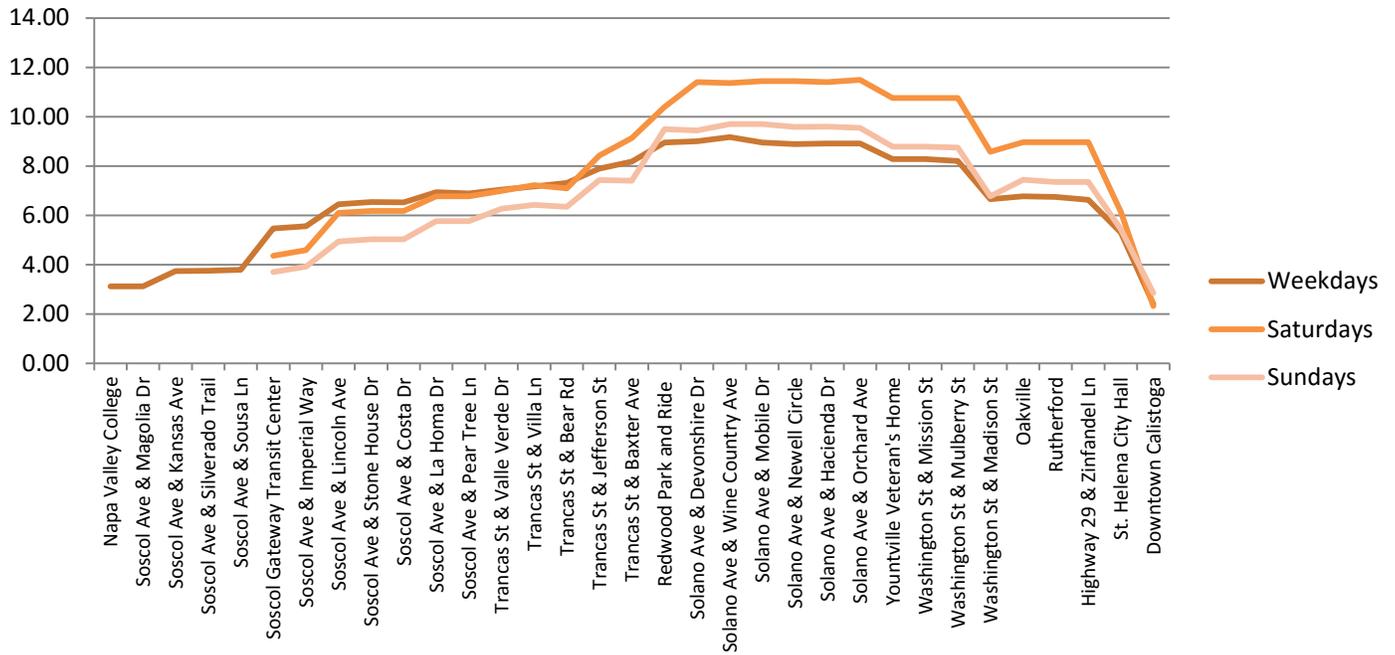
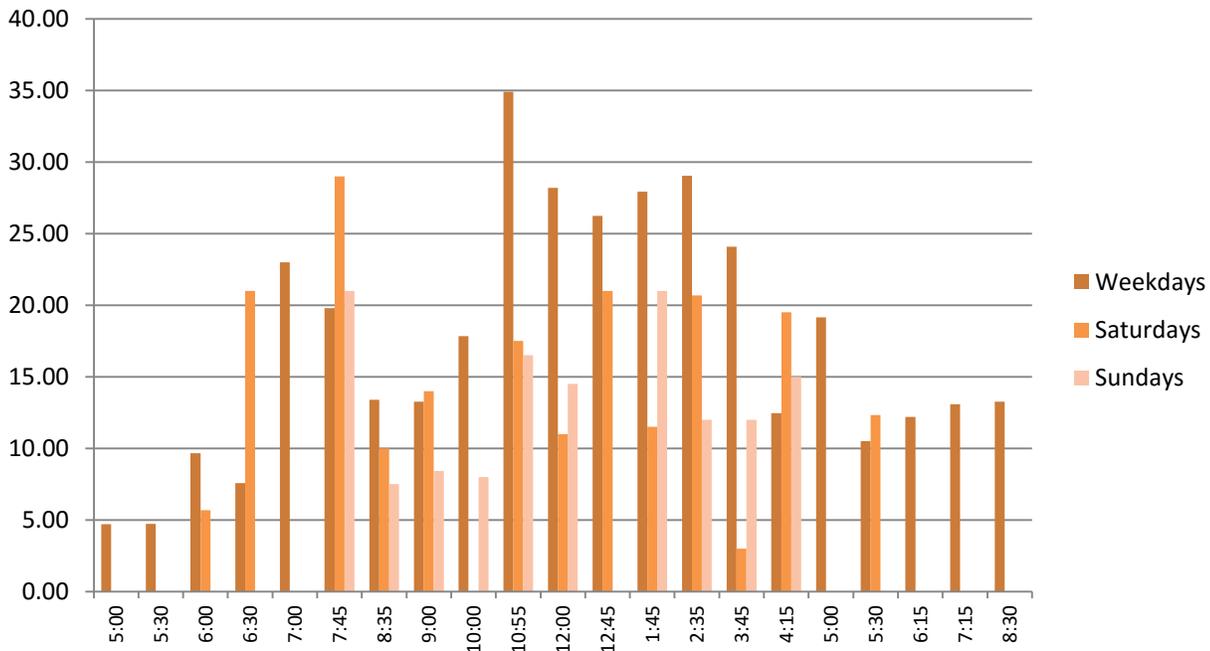


Figure 5.11.3a: Route 10 North, Ridership Volume by Trip



5.11 Route 10

5.11.1 Stop by Stop Activity

The Route 10 is a north and south route that travels from Napa Valley College to Downtown Calistoga and back. It overlaps with the Route 11 between the Redwood Park & Ride and Napa Valley College to provide more frequent service in the center of Napa.

Figure 5.11.1a shows the bulk of the route’s boardings on the weekdays take place at Napa Valley College, Soscol Avenue & Kansas, Soscol Gateway Transit Center, Redwood Park and Ride, and St. Helena City Hall stops. The trip patterns are similar on Saturday and Sunday, except there is no service to Napa Valley College on Saturdays and Sundays and the route starts at the Soscol Gateway Transit Center. The activity on Saturdays tends to be lower than on the weekday and the Sunday activity tends to be lower than the Saturday activity.

For an average weekday, *Figure 5.11.1b*, shows that southbound trips have a high number of boardings in the Up Valley communities and through the City of Napa. Although the volume of boardings decreases the pattern remains roughly the same through the weekend.

5.11.2 Load Factor

On Route 10 North, *Figure 5.11.2a*, the load factor on weekdays is actually lower than on Saturday or Sunday. This pattern seems odd but makes sense when we take into account Route 10 represents the bulk of the service operated on the weekends, specifically Sundays when it is one of the two routes in operation. On weekdays the load factor starts at about 3.0 and rises to approximately 9.0 through the City of Napa and Yountville before dropping for the remainder of the trip. The pattern is similar on Saturdays, but peaks at just over 11.0 through the City of Napa and Yountville before falling. The same pattern holds true on Sundays, but the height of ridership is just under 10.0.

On Route 10 South (*Figure 5.11.2b*) the load factor on weekdays is generally below that of weekends. On weekdays the highest load factor is along the route from Yountville to the City Napa at around 8.0 and then it drops off after the Soscol Gateway Transit Center. The pattern is similar on Saturdays, but has a peak of over 9.0 through the City of Napa and Yountville before falling. The same pattern holds true on Sundays, when peak ridership is just over 8.0.

Figure 5.11.1b: Route 10 South, Stop by Stop Activity

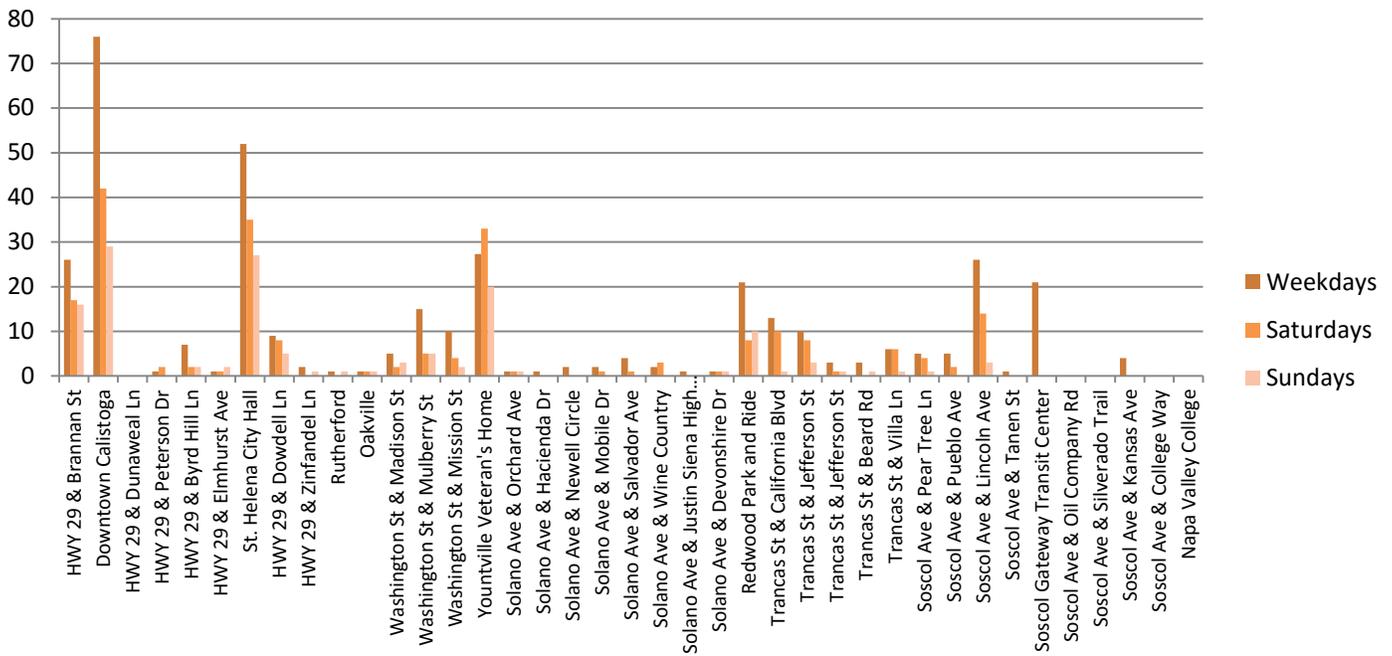


Figure 5.11.2b: Route 10 South, Load Factor

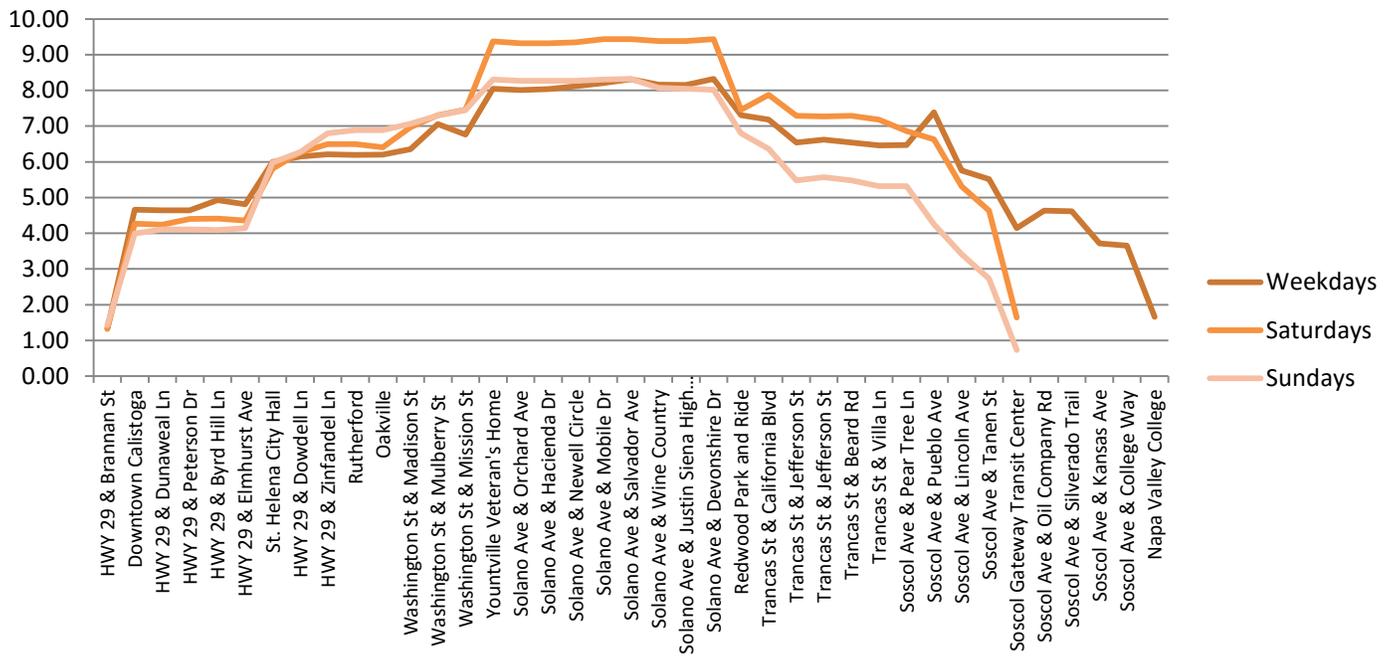
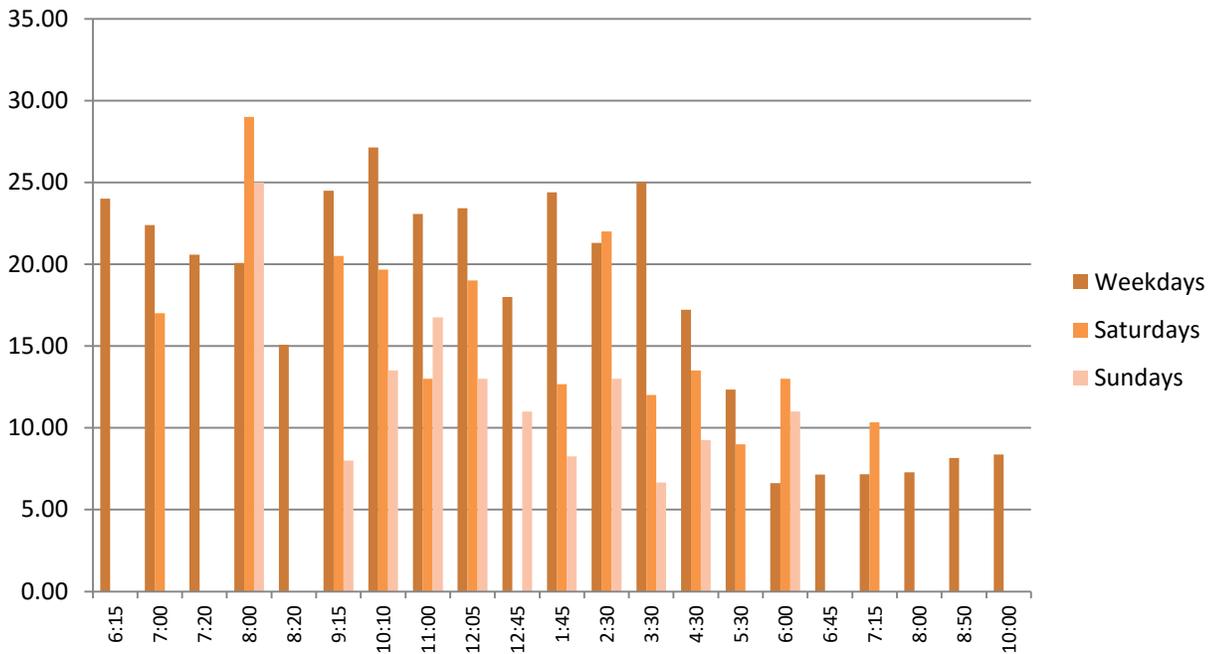


Figure 5.11.3b: Route 10 South, Ridership Volume by Trip



5.11.3 Ridership Volume by Trip

Figure 5.11.3a, indicates that the highest ridership on the weekdays for the Route 10 North are trips between the hours of 10:55am (35 riders) and 3:45pm (about 24 riders), while the lowest ridership is on the early morning trips at 5:00am and 5:30am. The Route 10 is not well utilized during standard commute hours of 9am to 5pm. One reason for this could be that many of the jobs Up Valley are service jobs that start before the dinner hour and last late into the evening past the time when the Route 10 operates.

Figure 5.11.3b shows southbound trips are most popular among riders on weekdays between the hours of 6:15am and 4:30pm with all 13 of these trips having at least 15 riders. On Saturdays, ridership is at its highest between the 7:00am and 2:30pm trips with at least 12 riders per trip, dropping off later in the day.

Figure 5.12.1a: Route 11 North, Stop by Stop Activity

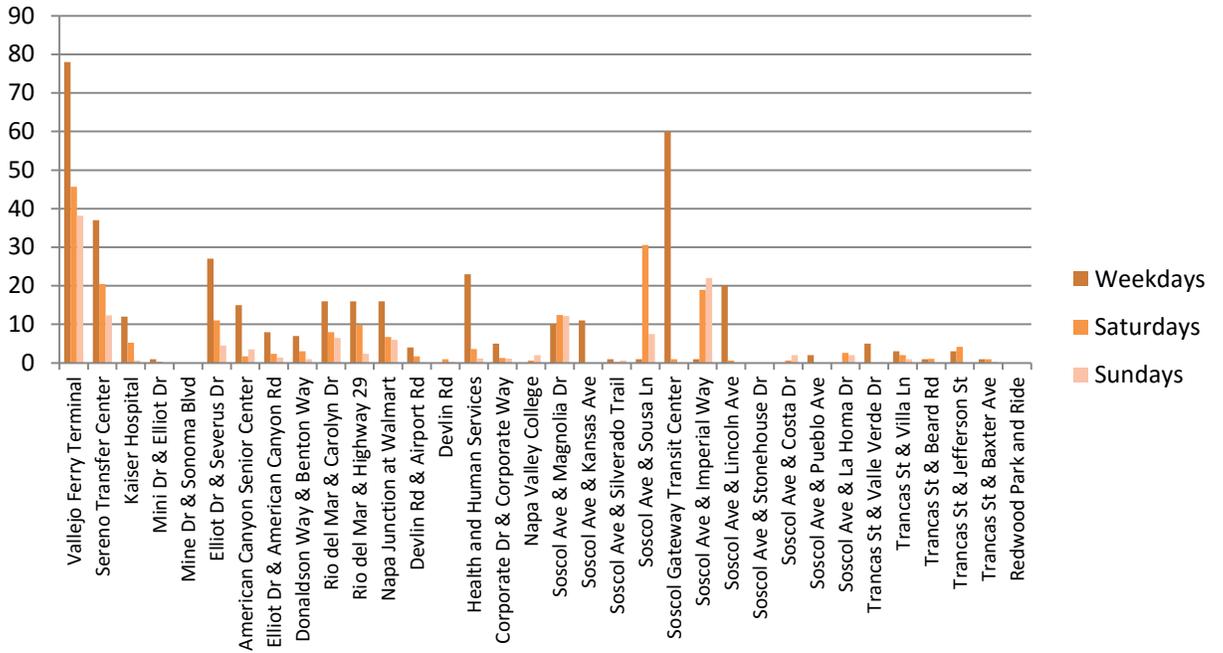


Figure 5.12.2a: Route 11 North, Load Factor

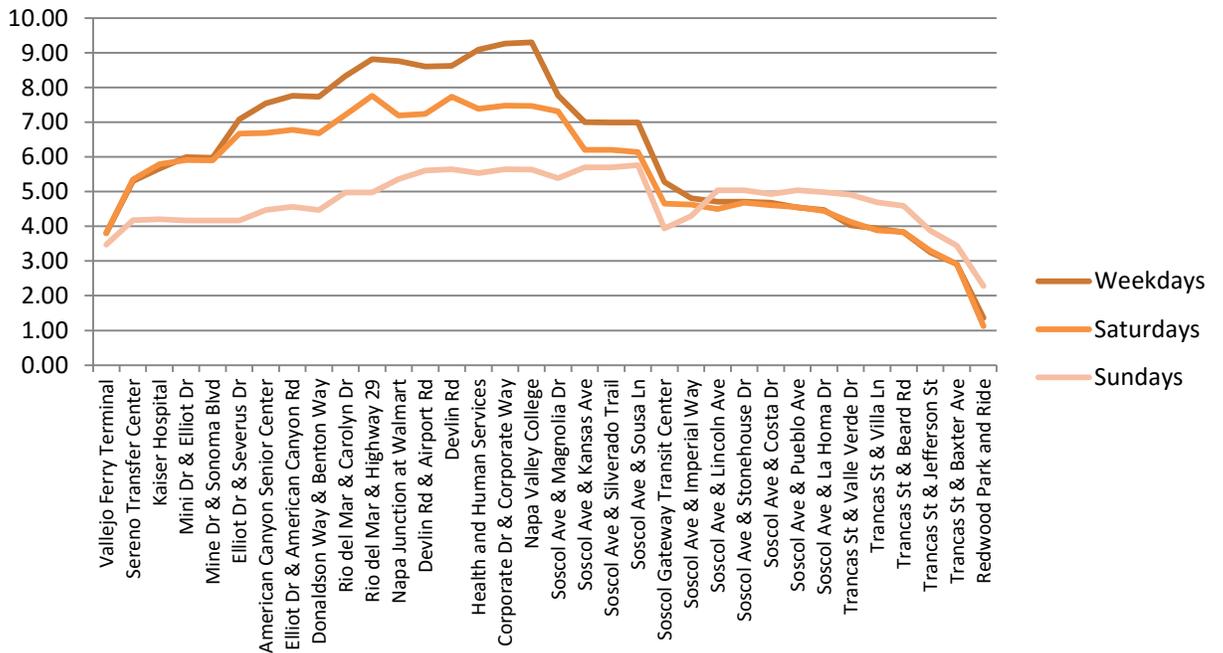
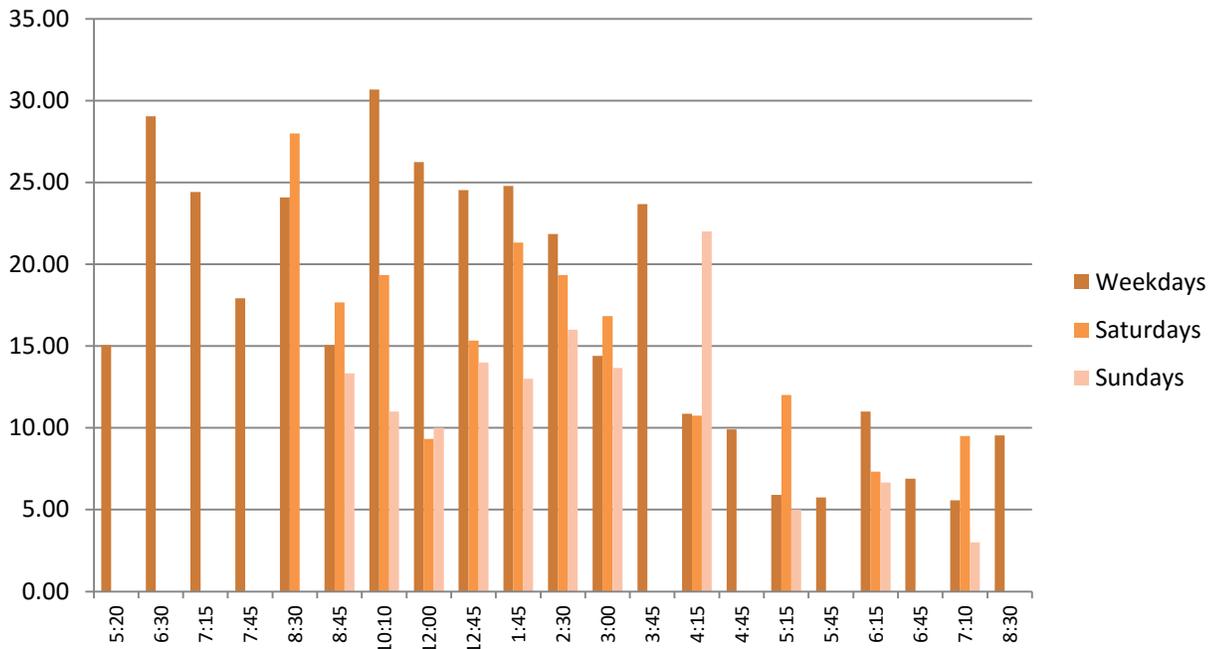


Figure 5.12.3a: Route 11 North, Ridership Volume by Trip



5.12 Route 11

5.12.1 Stop by Stop Activity

The Route 11 is a north and south route that travels between the Vallejo Ferry Terminal and the Redwood Park and Ride. It overlaps with the Route 10 between the Redwood Park & Ride and Napa Valley College to provide more frequent service in the center of Napa.

Figure 5.12.1a shows that on a typical weekday stop activity is highest between the Vallejo Ferry Terminal (approximately 78 riders), the Sereno Transfer Center (approximately 38 riders), and the Soscol Gateway Transit Center (60 riders). Thereafter, there is a limited number of riders boarding or exiting the bus for the rest of the weekday stops. This same pattern holds true on Saturdays and Sundays, albeit at lower volumes. On Saturdays and Sundays the stop activity at the Vallejo Ferry Terminal is around 45 and 38 riders, respectively, with minimal stop activity after the Soscol Gateway Transit Center on either day.

On a typical weekday southbound Route 11 stop activity peaks at the Redwood Park and Ride, the Soscol Gateway Transit Center, Soscol Avenue & Kansas Avenue (South Napa Marketplace), and Napa Valley College.

The data indicates the primary use of the Route 11 is travel between Vallejo and the City of Napa. American Canyon also shows notable demand most likely from trips to and from Walmart.

5.12.2 Load Factor

As show in Figure 5.12.2a the high point for the load factor is over 9.0 at Napa Valley College. The load factor closely aligns with that of the Route 10 North. The load factor is around 4.0 at the Vallejo Ferry Terminal and rises throughout American Canyon and then falls off at is travels toward the Redwood Park and Ride. On Saturdays the load factor pattern is similar to the weekdays, but peaks at just under 8.0. On Sundays the load factor is flatter and stays between 3.0 and 6.0.

On Route 11 South, Figure 5.12.2b, the top load factor is around 10.0 at Napa Valley College and the next stop at Health and Human Services, which is very similar to the northbound load factor patterns. The load factor peaks at just less than 8.0 on both Saturdays and Sundays around the midpoint of the trip.

Figure 5.12.1b: Route 11 South, Stop by Stop Activity

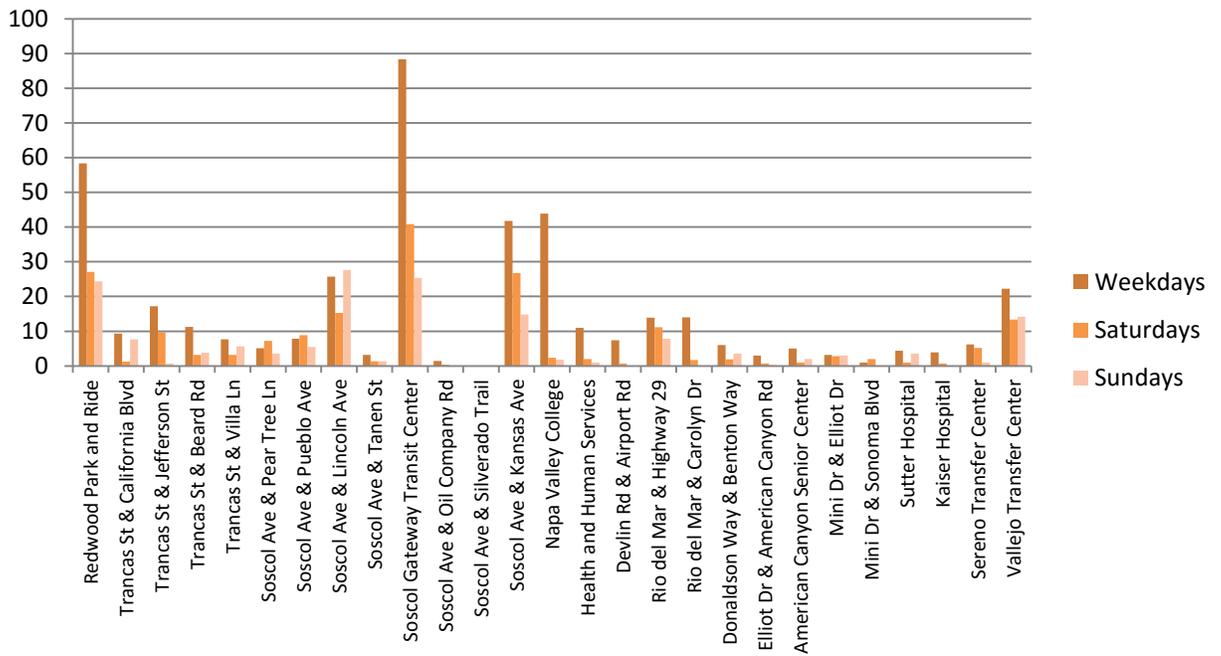


Figure 5.12.2b: Route 11 South, Load Factor

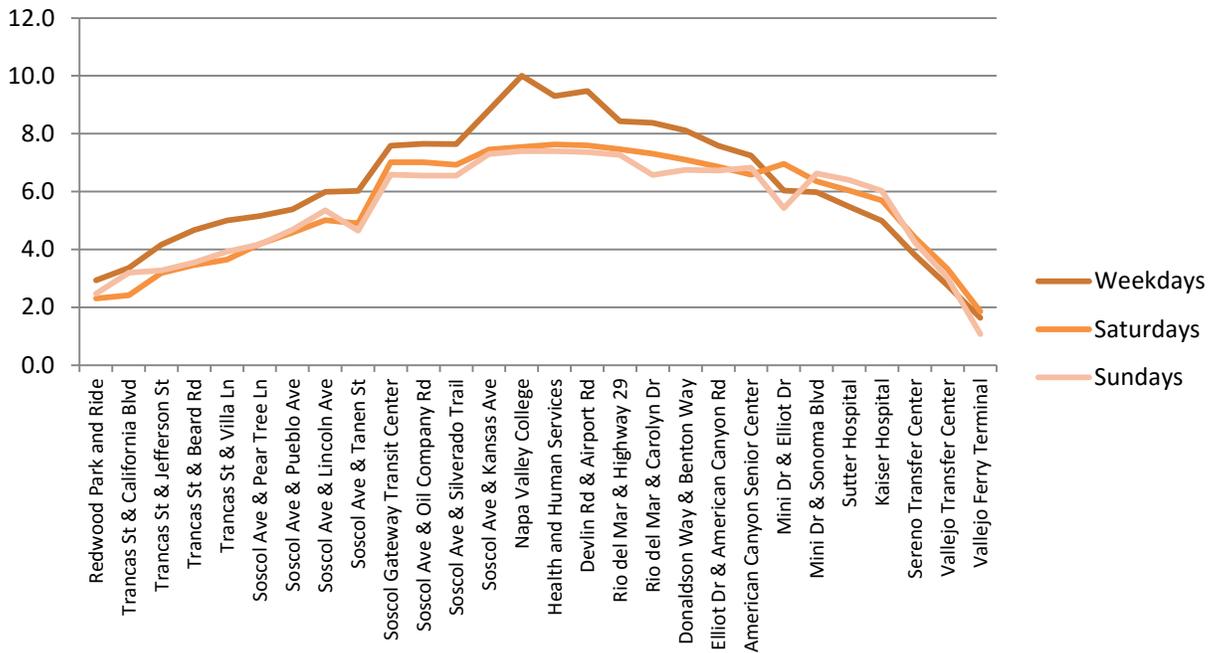
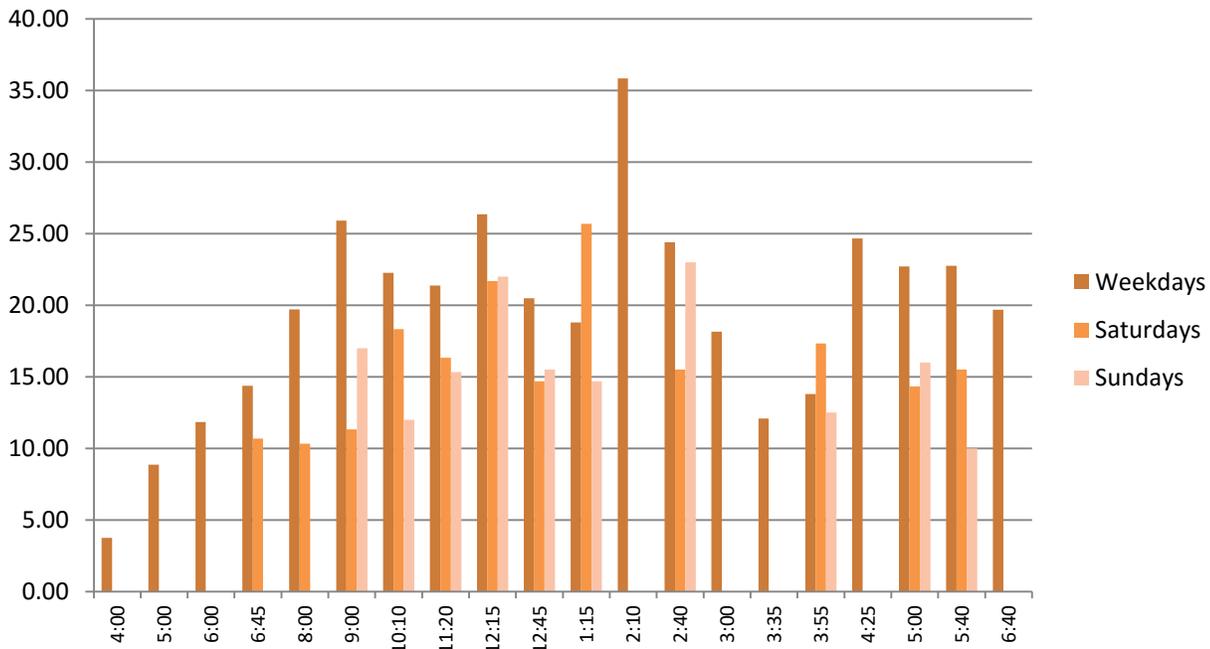


Figure 5.12.3b: Route 11 South, Ridership Volume by Trip



5.12.3 Ridership Volume by Trip

Figure 5.12.3a, shows the trip volume is generally above 14 riders per trip between 5:20am and 3:45pm and then around five to 11 riders for the remainder of the trips. The 10:10am trip has the greatest ridership at above 30 passengers per trip. On Saturdays and Sundays trips start later and end earlier with most of the trips with the highest volume of passengers being 8:30am and 4:15pm.

On weekdays the ridership going south is below 20 riders per trip until 9am and hits a system-wide peak of over 35 riders during the 2:10pm trip and remains relatively strong for the rest of the day. On Saturdays and Sundays trips start later and end earlier with most of the highest volume trips between 9:00am and 5:00pm.



6.

Route by Route Performance Analysis



Figure 6.1: Route 1 Performance Analysis



Figure 6.2: Route 2 Performance Analysis

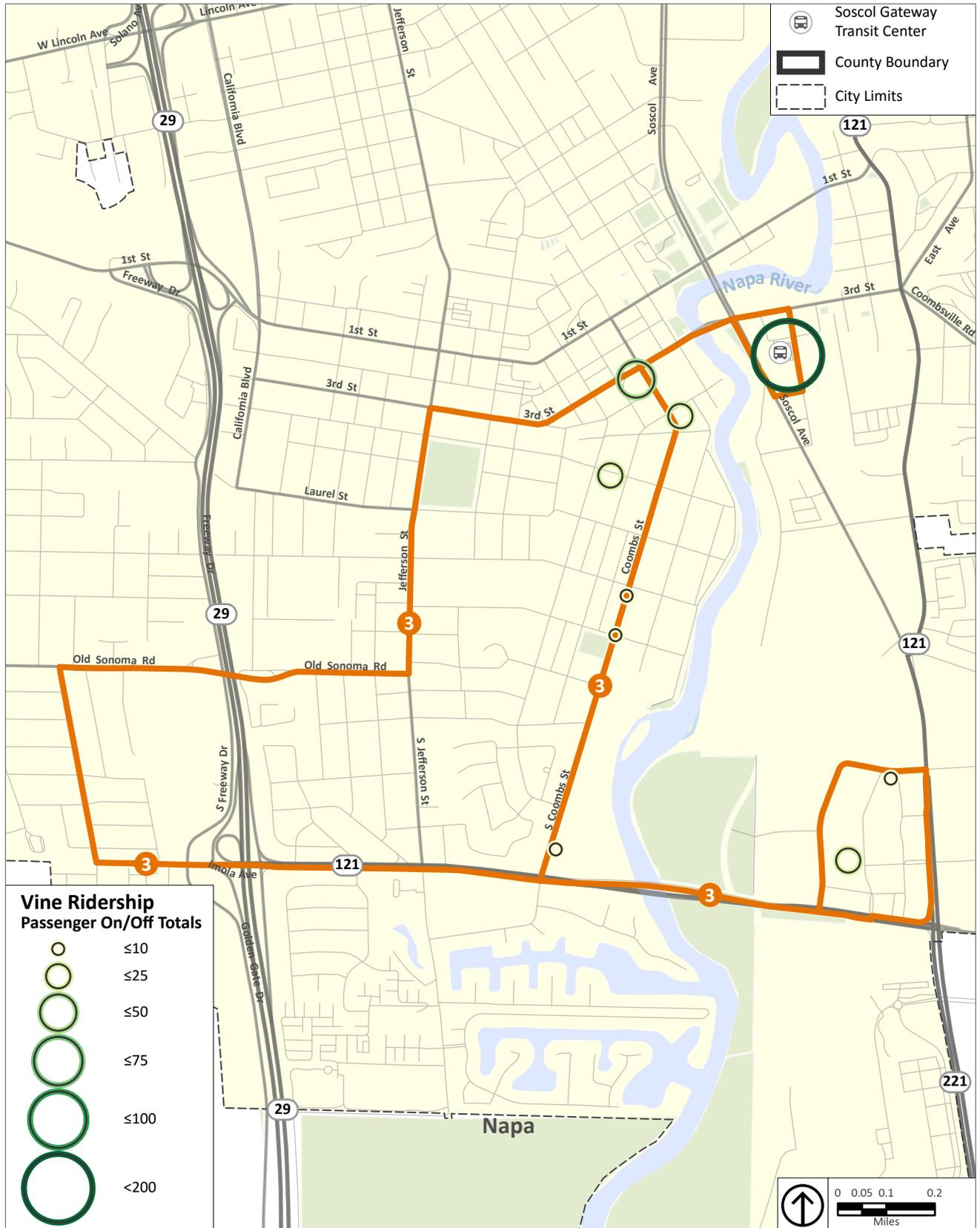


Figure 6.3: Route 3 Performance Analysis

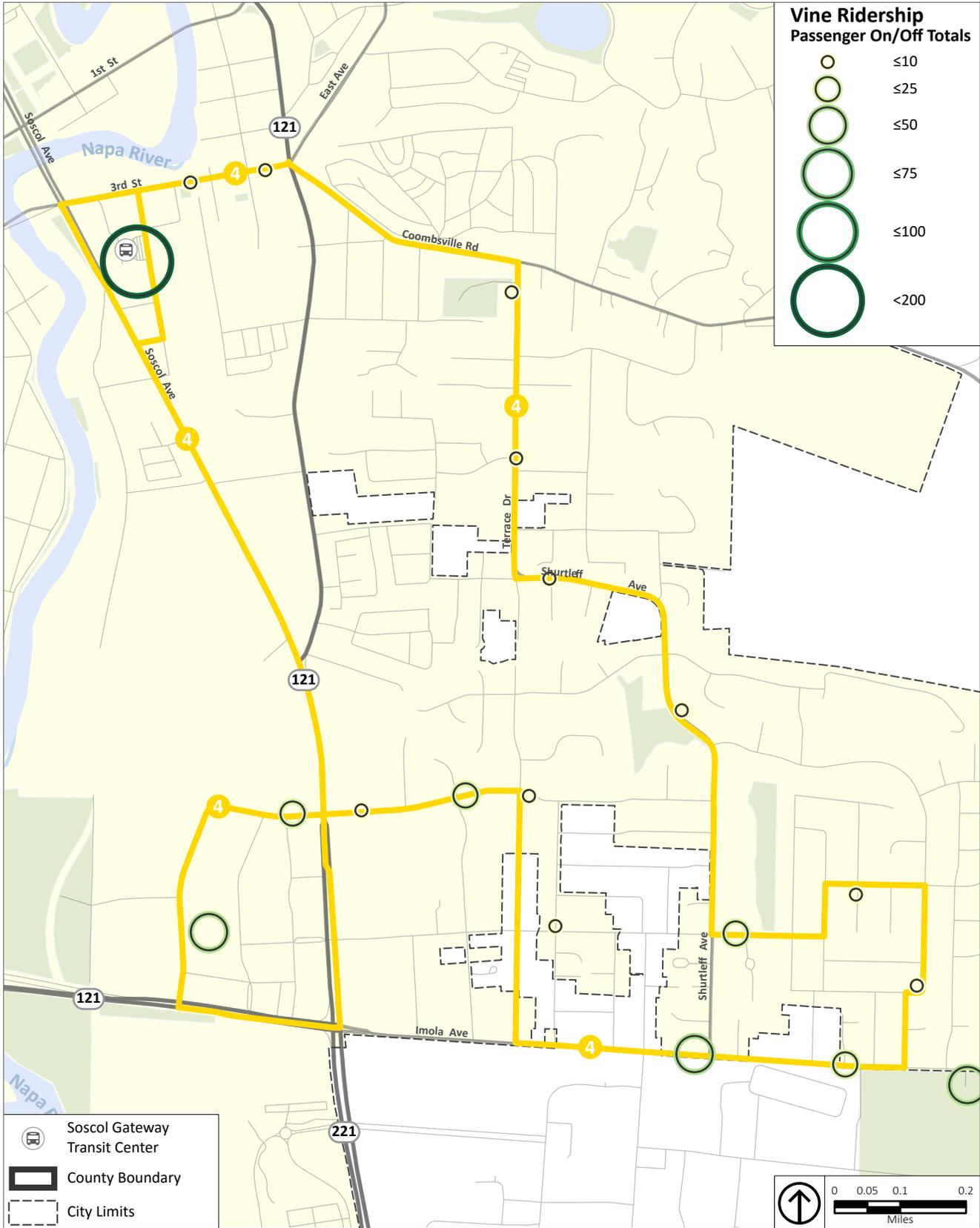


Figure 6.4: Route 4 Performance Analysis

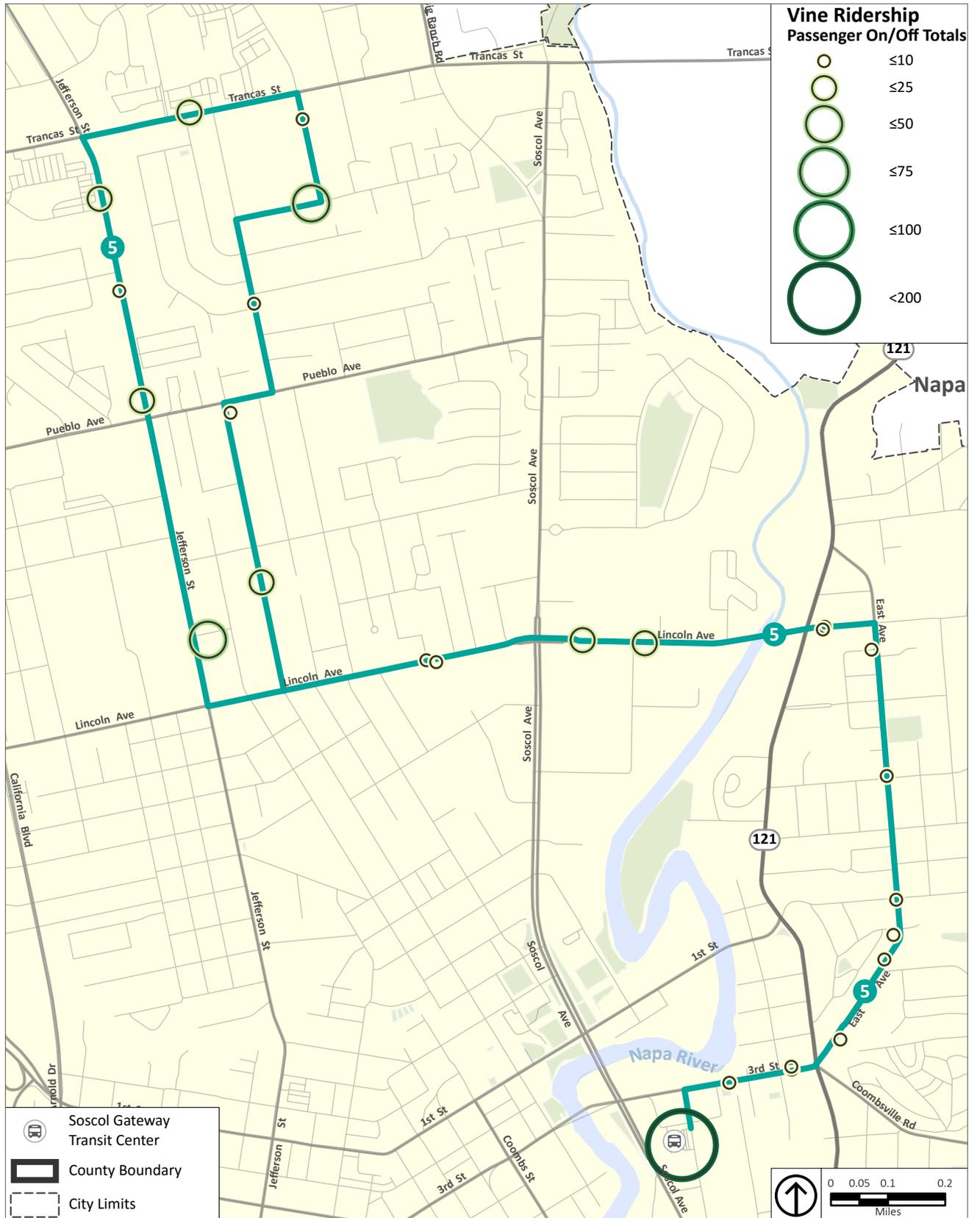


Figure 6.5: Route 5 Performance Analysis



Figure 6.6: Route 6 Performance Analysis

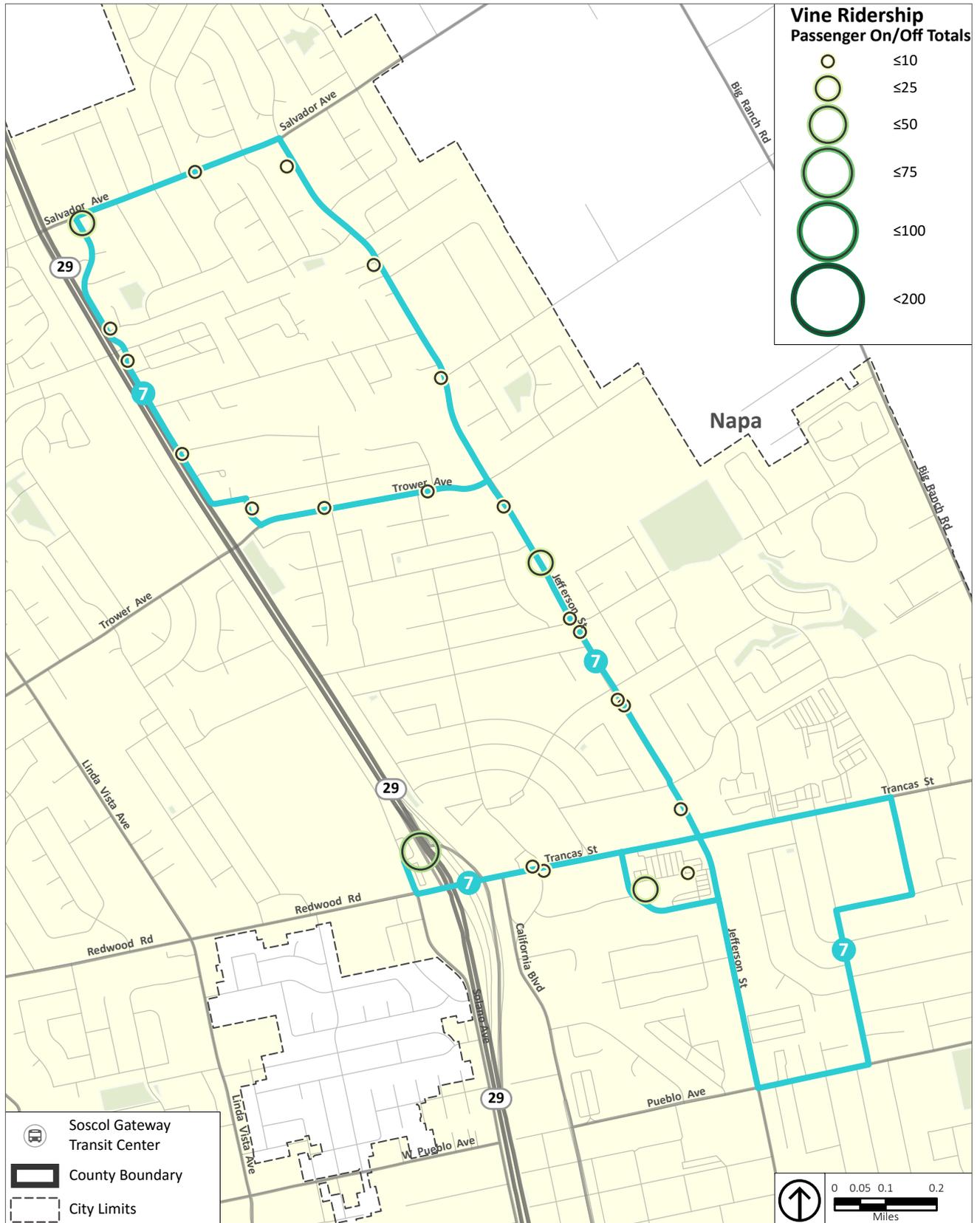


Figure 6.7: Route 7 Performance Analysis

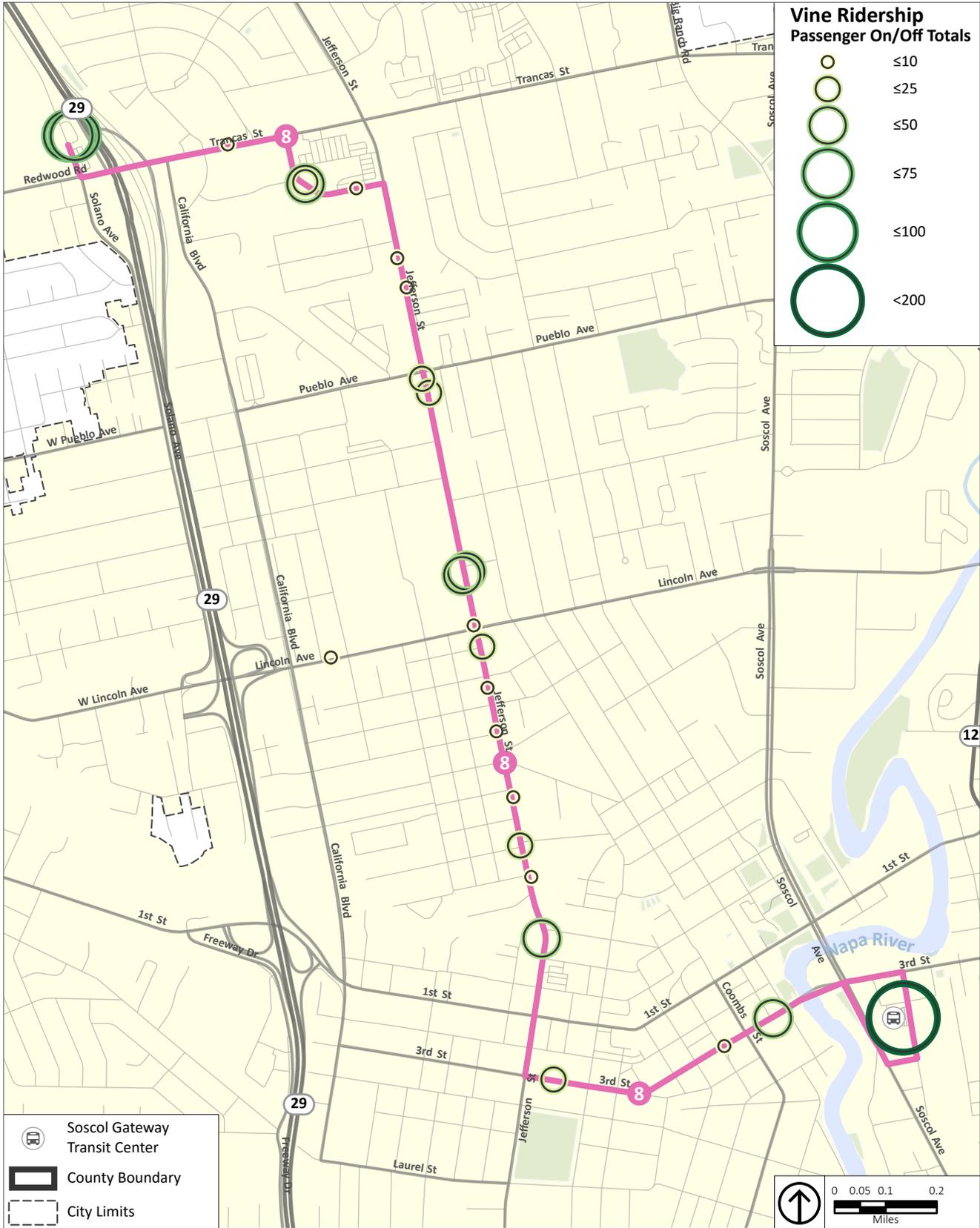


Figure 6.8: Route 8 Performance Analysis

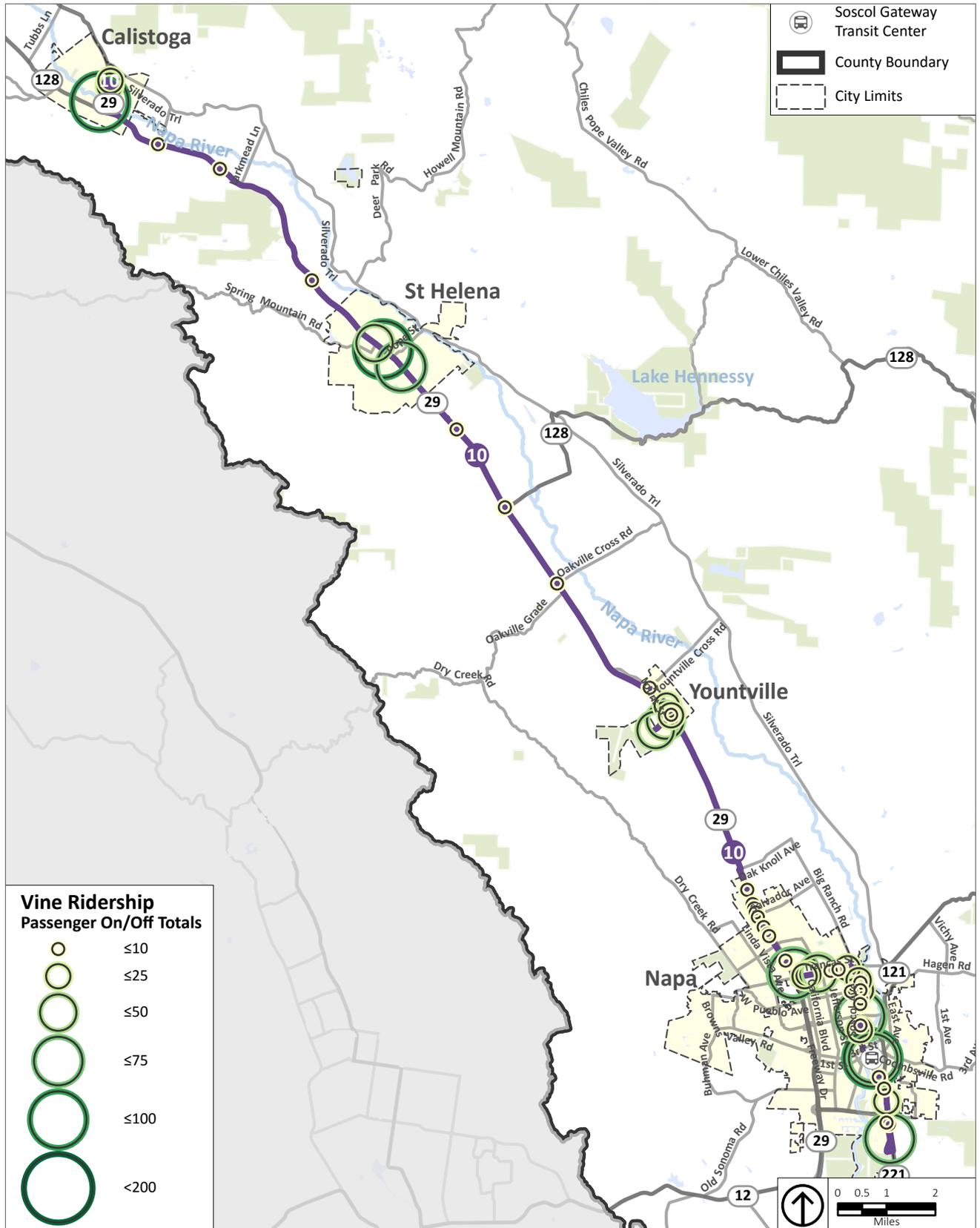


Figure 6.9: Route 10 Performance Analysis

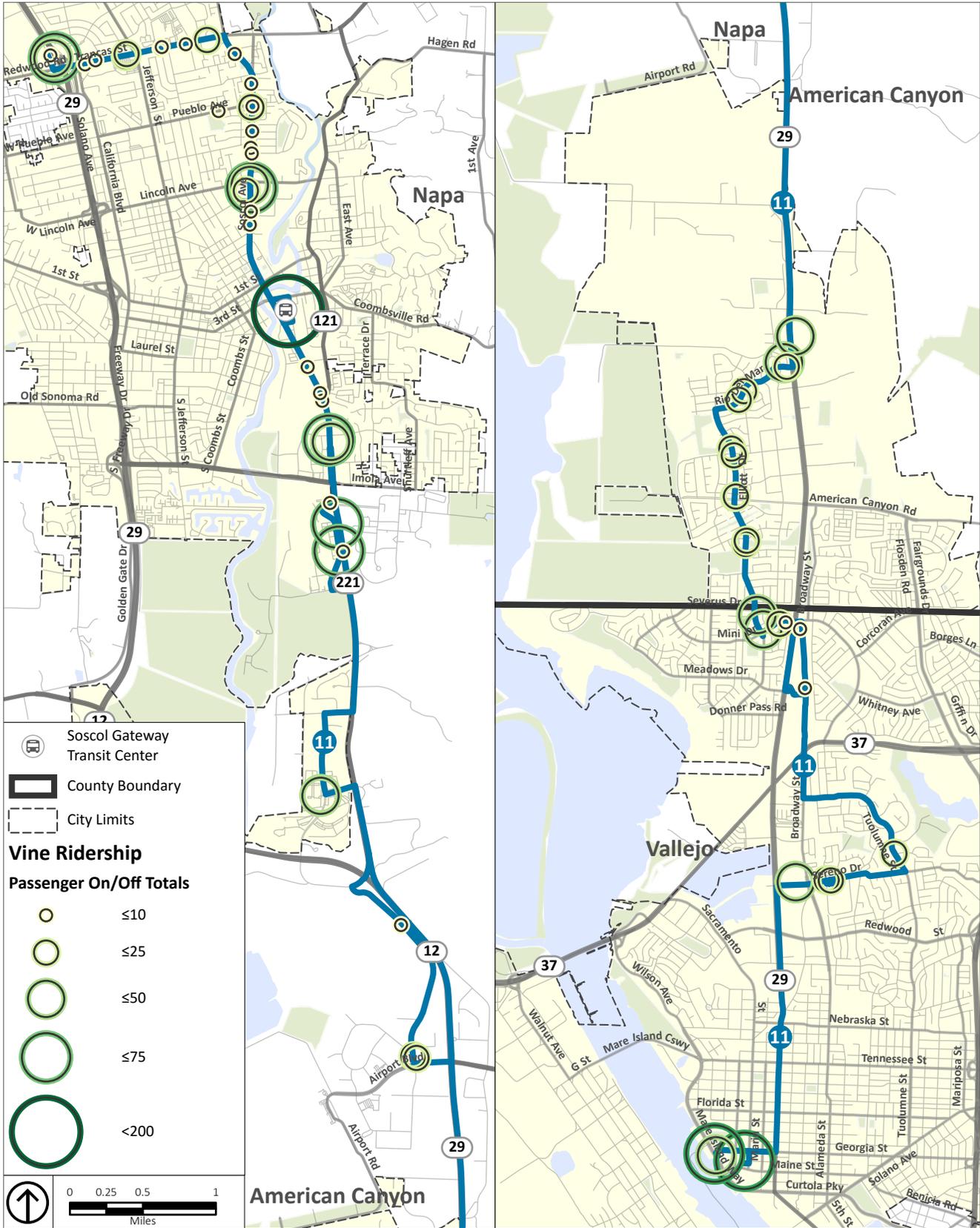


Figure 6.10: Route 11 Performance Analysis

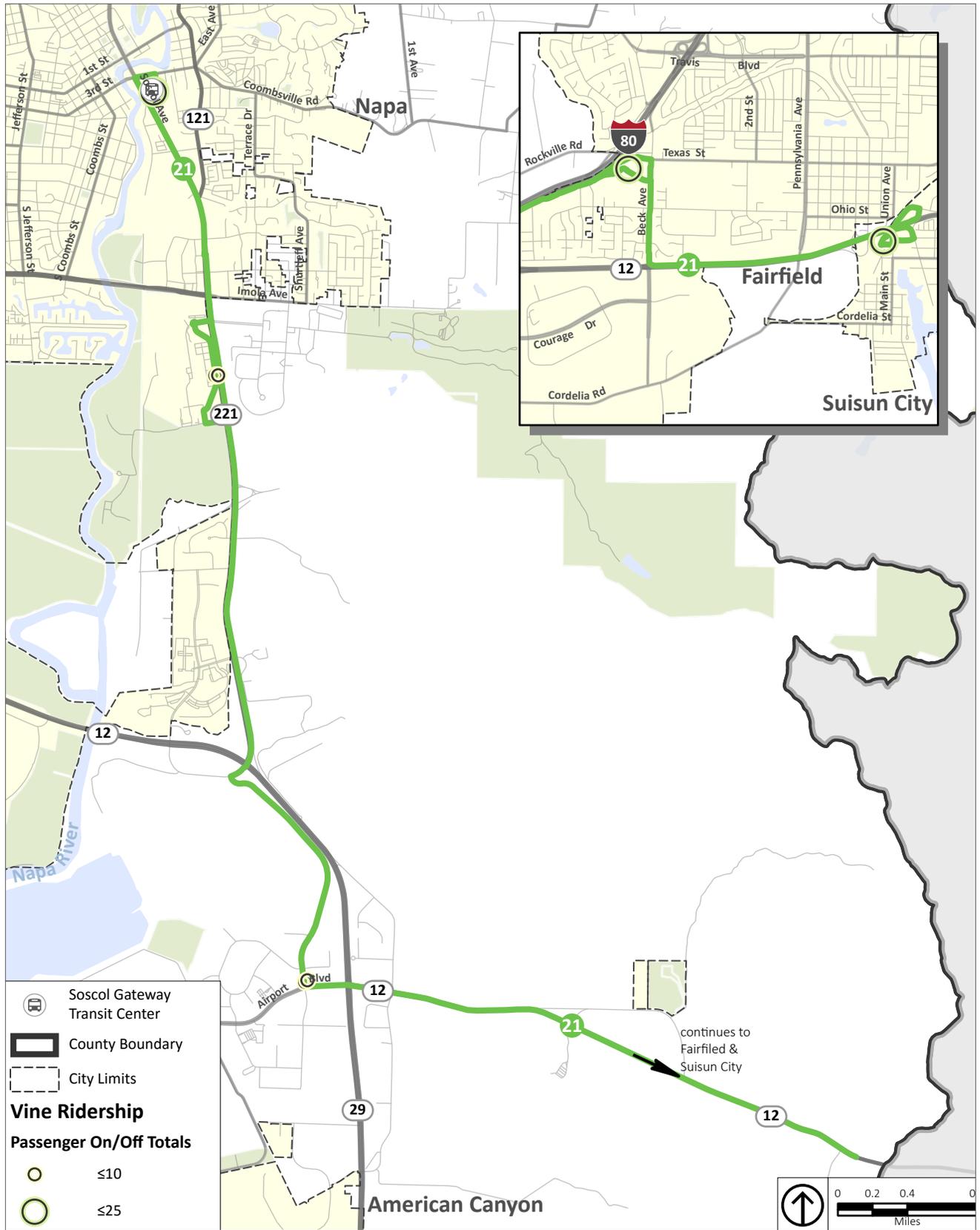


Figure 6.11: Route 21 Performance Analysis

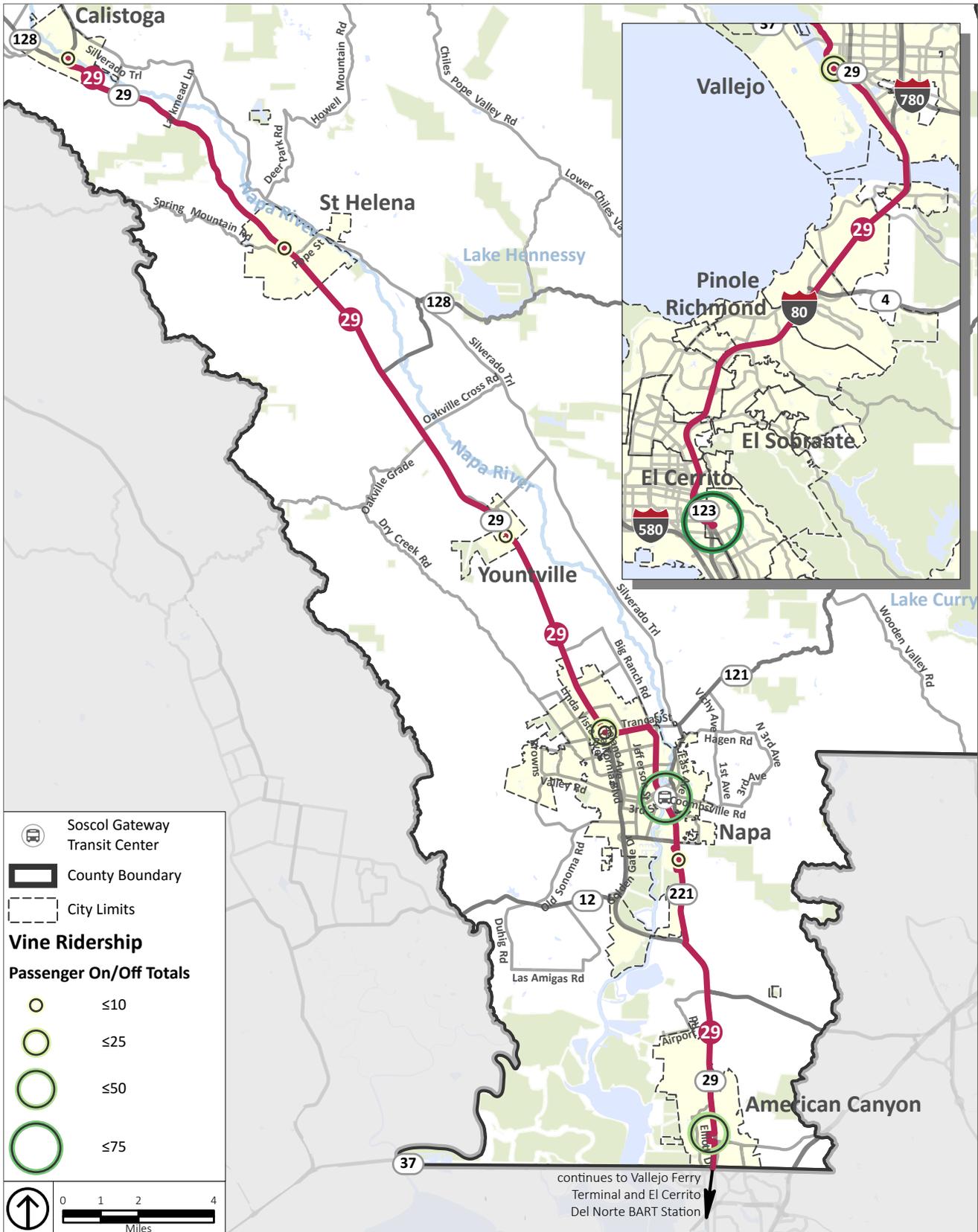


Figure 6.12: Route 29 Performance Analysis



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