



SHASTA
Regional Transportation Agency



Sunday Transit Demonstration Project



Market Research
Working Paper # 1

Submitted to:
**Shasta Regional
Transportation Agency**

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1. Introduction and Background

Study Purpose

The primary purpose of the Shasta Regional Transportation Agency (SRTA) sponsored study is to "develop an implementation plan for SRTA for an 'on-demand' transit service demonstration project that will run on Sundays."

In the kick-off meeting with SRTA and in subsequent phone calls, there is an emphasis on shared ride on-demand services. There is a desire by SRTA to reduce vehicle miles travelled in the Shasta Region and an important project selection criterion for Sunday service will be the degree of shared ride services provided.

There has been a significant amount of input on Sunday service from both the 2014 Short Range Transit Plan and the ongoing annual Unmet Transit Needs process that the Shasta Regional Transportation Agency (SRTA) conducts on an annual basis. The input received from those efforts is summarized below.

Overview of Existing Public Transportation Services

Redding Area Bus Authority

The Redding Area Bus Authority (RABA) is the primary public transportation provider in Shasta County. It is the Joint Power Authority of the City of Redding, City of Anderson, City of Shasta Lake and Shasta County. RABA provides both fixed route and demand response service to a population of about 117,000 covering an area of approximately 100 square miles.

RABA fixed route service consists of eight core routes, four inter-city routes, and three express routes. The local routes operate 12 or 13 service hours per day, Monday - Friday, starting between 5:35 and 7:20 am, and ending between 7:15 and 7:30 pm. Saturday service commences three hours later than the Monday - Friday start time, but ends at the same times. There is no Sunday service.

According to the 2015-16 Performance Report prepared by RABA in January 2017, for fixed route services there were a total of 664,010 annual passengers trips provided with 40,683 revenue hours of service, at an operating cost of \$3.6 million. A total of \$681,039 was collected in fare revenue, representing a farebox recovery ratio of 18.85%.

The demand response service is called Paratransit and is in compliance with Americans with Disabilities Act. The service is an origin-to-destination, shared ride, advanced reservation service that is comparable to fixed route service, including service area and hours of operation. According to the 2015/16

performance report there were a total of 52,744 Paratransit trips provided with 17,169 revenue hours of service. \$196,898 in passenger fares were collected for a farebox recovery ratio of 13.05%.

Burney Express

The County of Shasta contracts with RABA to provide express service to the outlying community of Burney. The service operates Monday to Friday only with three round trips each day and makes four stops between Redding and Burney. The service is generally for commuters for both work and school trips. Shasta College serves as the transfer location between this route and RABA routes 6 and 7. According to the RABA 2015/16 Performance report, the Burney Express provided 5,969 annual trips at an annual cost of \$211,824. There were \$26,560 in fares collected for a farebox recovery ratio of 12.54%.

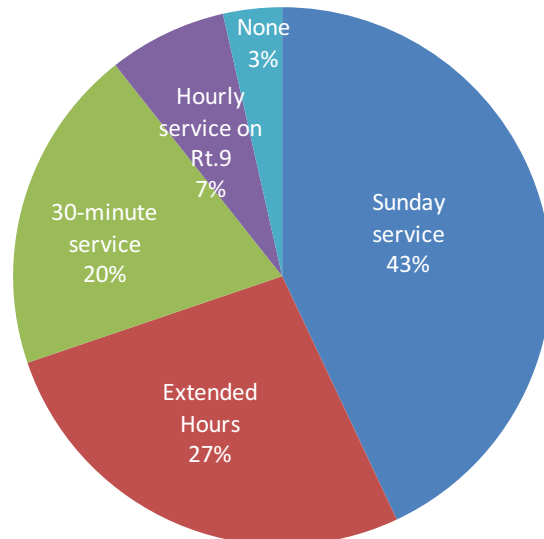
As described above, there are no public transportation services with Sunday operation in the RABA service areas. There have been consistent requests through both the Short Range Transit Plan and Unmet Transit Needs Process to provide Sunday service. These points of input are discussed below.

2012 RABA Short Range Transit Plan: Sunday Service

An onboard survey was conducted by Mobility Planners LLC for the RABA Short Range Transit Plan. During the two-day survey period in November 2012, every trip on all RABA routes was surveyed once. Trained surveyors distributed and collected a self-administered questionnaire that was available in Spanish as well as English. A total of 1,230 questionnaires were completed and collected.

Respondents to the survey were asked to rate the importance of potential service improvements. When asked to select only one from the potential improvements in service, 43% selected Sunday service for the top improvement. The next choice was extended hours with 27%.

Most Important Improvement



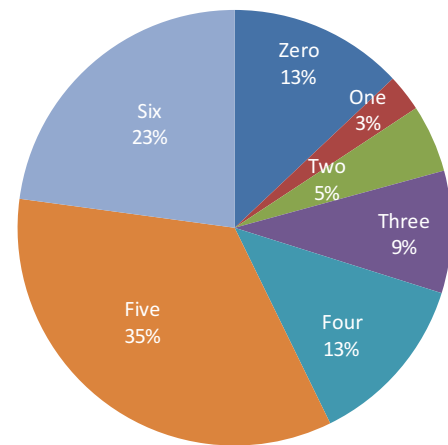
Needs of Employed Riders

The strong desire for Sundays and expanded evening service often relates to the need to get to retail and service jobs with non-traditional hours. Riders were asked about their work schedules and their use of RABA to commute.

Among riders who are employed, most (71%) use RABA to get to work 4-6 days per week. The pie chart at the right shows the distribution of answers to this question (asked only of employed riders).

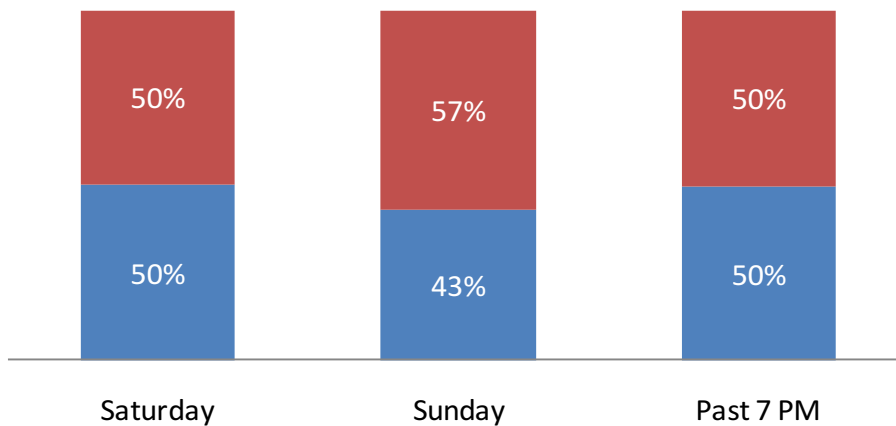
About half (50%) of all employed riders must work on Saturday and must work past 7 PM at least one day a week. Forty-three percent (43%) of employed riders work on Sunday.

**Ride RABA to Work
(Days per Week)**



Do you work...? (Employed Riders)

■ Yes ■ No



The need for Sunday service options was not just from the onboard survey results. It also surfaced strongly during the stakeholder interview of agencies that work with transit dependent populations in the RABA service area. The CalWorks manager and focus group participants felt that for many jobs, RABA “does not work for the working poor.” Service doesn’t start early enough, ends at 7:00 pm, and Sunday service is not offered. For getting to work, the system just doesn’t work for many of the jobs the working poor might be able to get to, according to key stakeholders.

SRTA Unmet Needs Process: Requests for Sunday Service

Sunday transit services have been a long-standing unmet transit need identified in the unmet transit needs process. According to the SRTA 2017/18 Transit Needs Assessment, since 2002 a request for Sunday service has been asked for at least once during 10 of the unmet transit needs cycles. In the SRTA unmet transit needs process, there are three important considerations for a transit service suggestion:

1. Is it an unmet transit need?
2. Is it reasonable to meet?
3. Is funding available?

The process is sequential. If a transit suggestion is not an unmet need, then the unmet needs process does not consider if it is reasonable to meet. If the transit suggestion is considered to be an unmet transit need that is reasonable to meet, then the question of available funding is addressed. If all three questions are answered in the affirmative, then the transit service suggestion is funded and implemented.

The following is a discussion of how Sunday service has been evaluated in the unmet transit transit needs process.

1. Is Sunday Service an Unmet Transit Need?

An unmet transit need is defined by SRTA Board of Directors Resolution 16-14, consistent with Transportation Development Act statutes. An unmet transit meet shall be found to exist under the following conditions:

1. A population group in the proposed transit service area has been defined and located which has no reliable, affordable, or accessible transportation for necessary trips. The size and location of the group must be such that such a service to meet their needs is feasible within the definitions of “reasonable to meet”.

2. Necessary trips are defined as those trips which are required for maintenance of life, education, access to social service programs, health, and physical and mental well-being, including trips which serve employment purposes.

Requests for Sunday service have consistently been found to be an unmet transit need.

2. Is Sunday Service Reasonable to Meet?

The meaning of reasonable to meet is also defined by SRTA Board of Directors Resolution 16-14, consistent with Transportation Development Act statutes. The definition is summarized here:

1. The proposed transit can be operated with a minimum farebox recovery of 20% in urbanized areas and 10% in non-urbanized areas. Exceptions may apply where anticipated farebox revenue from proposed services don’t meet minimum requirements. These exceptions include:
 - a. Transit services that are funded entirely with grants.
 - b. Transit services that are funded entirely by a local agency at the agency’s discretion.
 - c. Urban transit services that represent a critical or essential service, as determined by the SRTA Board of Directors, providing such services do not result in farebox penalties for the transit system as a whole.
 - d. Pilot project and new services for up to two years.
 - e. When a transit service primarily serves urban areas but also includes non-urban areas, a pro-rated farebox recovery standard based on the ratio of urban and non-urban in-service transit vehicle miles may be used.
2. The proposed expenditure of TDA funds required to support the transit service, in a city or the county, does not exceed the authorized amounts available to that jurisdiction.
3. The proposed expenditure shall not be used to support or establish a service in direct competition with an existing private service, or to provide 24-hour service.
4. Inter-agency cost sharing shall be equitable.
5. Transit services shall be coordinated with transit services currently provided, either publicly or privately.

In the annual unmet transit analysis reports, Sunday service has historically not been found to be reasonable to meet. An example is from the FY 2011-12 annual Unmet Needs Report:

“Based on the methodology used to determine transit demand, the number of passenger trips on Sunday is projected to be half of passenger trips on Saturday; Saturday is half of weekday trips.

The project farebox recovery ratio is expected to be less than 5%, falling below the 19% farebox recovery requirement. The SCRTPA (former name of SRTA) has identified these unmet needs as not “reasonable to meet.”

In more recent annual transit needs report, there has been a recognition that alternatives need to be explored for Sunday service. In the 2015/16 Annual Unmet Transit Needs Report it was stated that Sunday service is an unmet transit need, but whether or not it was reasonable to meet was pending further analysis, providing the following recommendation/comment:

“In light of the public’s request of Sunday service, more frequent buses, and expansion of service in RABA’s Short Range Transit plan, as well as annually being recognized as unmet transit needs in SRTA’s Transit Needs Assessments over the last 11 years, it is recognized that SRTA and RABA meet to explore way of meeting these needs in the next Short Range Transit Plan. It is unlikely that changes could be made system-wide initially, but a pilot program could be introduced in high-use transit areas.”

Funding was secured to provide this study of on-demand Sunday service and explore options for providing Sunday service in the RABA service area.

Overview of Working Paper

The next chapter provides a review of expected Sunday transit demand and resulting productivity as measured by passengers per vehicle revenue hour and farebox recovery ratio. This includes a review of peer agencies with existing Sunday services.

Chapter 3 provides the results of the onboard survey of 219 RABA riders on Sunday service options. This provides important market research input that is utilized to select the alternatives that will be fully evaluated in the next phase of the study. In addition, the results from 41 respondents to an online survey and 35 respondents to a Dignity Health Connected Living Adult Day Care survey are summarized.

Chapter 4 is a review of potential service providers for a Sunday service in the RABA service area.

Chapter 5 is a review of potential service delivery options for Sunday service in the RABA service area. The chapter provides recommendations of service delivery options for additional study in in Task H, Sunday Service Sketch Plan in the next phase of the study.

2. Sunday Service Transit Demand

This chapter is a review of existing service performance for both weekday and Saturday services. Utilizing a peer analysis, projections are made for Sunday service transit demand if the status quo fixed route services are continued. This provides a baseline of Sunday service demand for utilization in Chapter 3 that provides an overview of service delivery options for a Sunday demonstration project.

As previously cited in the 2011/12 Unmet Transit Needs analysis, demand for transit service on Sunday is normally significantly less than on the average weekdays. In order to provide a reasonable analysis of what the demand for Sunday service might be, two sources of data were evaluated:

- 2015/16 RABA Performance Report provides a breakdown of performance of weekday and Saturday service by route.
- The National Transit Database (NTD) provides average daily ridership and average revenue hour hours provided for weekday, Saturday and Sunday service, for those agencies that provide Sunday service.

2015/16 RABA Fixed Route: Weekday Versus Saturday

In FY 2015/16, there was an average of 2,190 daily weekday riders on the applicable 10 RABA routes. Overall, Saturday ridership was about 61.4% of weekday average daily ridership as shown in Exhibit 2-1.¹

There was significant variance among routes ranging from 40.9% of Saturday average daily ridership compared to average weekday ridership for Route 3 to 81.3% for Route 9. Route 4 also had relatively high Saturday ridership when compared to weekday average ridership.

A comparison of annual or daily ridership between weekday and Saturday service is misleading because Saturday service has 3 hours less hours of service than weekday service hours. A more accurate comparison is passengers per revenue hour of weekday versus Saturday ridership. This tends to normalize the differences.

¹ The source for all of the data in the section is from the RABA 2015/16 System Performance, January 2017. Data from FY 2016/17 was not available at the time of this working paper preparation.

Exhibit 2-1 Daily Weekday and Saturday Passengers

	Weekday Passengers Daily	Saturday Passengers Daily	Saturday Percentage of Weekday
Core Routes			
2	220	130	59.1%
3	237	97	40.9%
4	171	135	78.9%
5	192	88	45.8%
6	185	115	62.2%
7	149	83	55.7%
11	321	201	62.6%
14	341	235	68.9%
Intercity Routes			
1	251	161	64.1%
9	123	100	81.3%
Total	2,190	1,345	61.4%

Source: RABA 2015/16 System Performance

Overall, comparing weekday and Saturday passengers per revenue hour in Exhibit 2-2, passenger productivity on Saturdays was 78% of average weekday productivity. Routes 4 and 9 actually have higher average productivity on Saturday than they do on weekdays.

Exhibit 2-2 Weekday and Saturday Productivity

	Weekday Pass/ Revenue Hour	Saturday Pass/ Revenue Hour	Saturday as Pct. Weekday Pass./Hour
Core Routes			
2	17.0	13.0	76%
3	18.3	9.7	53%
4	13.3	13.5	102%
5	14.8	8.9	60%
6	14.9	11.6	78%
7	12.5	8.3	66%
11	24.9	20.1	81%
14	26.4	23.5	89%
Intercity Routes			
1	18	14.7	82%
9	10.9	11.1	102%
Total	17.2	13.5	78%

Source: RABA 2015/16 System Performance

The average farebox recovery ratio on Saturdays is 15.3% compared to 19.4% for weekday service. Overall Saturday service is 79% of weekday farebox recovery ratio. Exhibit 2-3 compares weekday and Saturday farebox recovery ratios in FY 2015/16 by route.

Exhibit 2-3 Weekday and Saturday Farebox Recovery Ratio

	Weekday Farebox Rec. Ratio	Saturday Farebox Rec. Ratio	Saturday as Pct. of Wkdy FBR
Core Routes			
2	17.0%	13.0%	76.2%
3	19.9%	10.5%	52.9%
4	14.6%	14.9%	102.1%
5	16.3%	9.8%	60.1%
6	18.2%	14.2%	77.9%
7	14.6%	9.8%	66.9%
11	25.8%	20.8%	80.8%
14	26.8%	23.9%	89.0%
Intercity Routes			
1	21.9%	17.9%	81.6%
9	17.8%	18.0%	101.2%
Total	19.4%	15.3%	78.8%

Source: RABA 2015/16 Performance Report

On Routes 4 and 9, the farebox recovery ratio is higher on Saturdays than it is on weekdays.

As demonstrated above, the service levels and hours of operation explain a lot about the differences in ridership between average weekday ridership and average Saturday ridership. In evaluating available data from the NTD 2016 raw data files, the productivity as measured by passengers per vehicle revenue hour of several peer transit agencies that have weekday, Saturday and Sunday service were compared. It should be noted that the majority of small urbanized areas similar to the RABA service area do not have Sunday service. We chose two larger transit systems and five small urbanized areas that are not part of a larger urbanized area. Overall, most transit agencies provide significantly less service supply of service on Saturdays and Sundays.

Exhibit 2-4 Peer Agency Average Weekday, Saturday and Sunday Productivity

	Passengers/Revenue Hour			Percentage Sunday of Sat. Svc.
	Weekday	Saturday	Sunday	
Motorbus				

Larger Transit Agencies with Similar Saturday and Sunday Service Levels

Gold Coast Transit	19.3	15.7	14.4	92.0%
Fresno Area Express	32.2	28.8	23.2	80.5%

**Small Urbanized Areas With Saturday
and Sunday Service**

Visalia	13.8	11.4	9.4	82.1%
Santa Maria Area Transit	15.1	9.2	6.9	75.1%
Yolo Transit District	15.1	13.7	14.3	104.8%
Napa Valley	15.1	12.6	11.1	88.8%
City of San Luis Obispo	37.0	28.2	25.5	90.3%

Source: 2016 NTD Data File: Service_0

The productivity of peer agencies ranges from 75% to 104.8% when comparing Sunday service productivity to Saturday service productivity. We have therefore utilized a conservative figure of 80% to determine the potential Sunday ridership if all RABA fixed routes were operated on Sunday.

Exhibit 2.5 provides a breakdown of expected Sunday ridership demand, productivity, and farebox recovery ratio if all RABA routes were operated on Sunday.

Exhibit 2-5 Projected Sunday Fixed Route RABA Ridership with Status Quo Service Delivery

	Saturday			Sunday		
	Annual Ridership	Passengers/Rev. Hr	Farebox Rec. Ratio	Annual Ridership	Passengers/Rev. Hr	Farebox Rec. Ratio
Core Routes						
2	6,621	13.0	13.0%	5,304	10.4	9.5%
3	4,935	9.7	10.5%	3,958	7.8	7.7%
4	6,908	13.5	14.9%	5,508	10.8	10.8%
5	4,531	8.9	9.8%	3,631	7.1	7.2%
6	5,909	11.6	14.2%	4,733	9.3	10.3%
7	4,250	8.3	9.8%	3,386	6.6	7.1%
11	10,264	20.1	20.8%	8,201	16.1	15.1%
14	11,985	23.5	23.9%	9,588	18.8	17.4%
Intercity Routes						
1	8,227	14.7	17.9%	6,597	11.8	13.0%
9	5,107	11.1	18.0%	4,076	8.9	13.1%
Total	68,737	13.5	15.3%	54,982	10.8	12.2%

Key Assumptions:

1. Sunday productivity is 80% of Saturday ridership productivity
2. Service levels on Sunday are the same as Saturday
3. Average fare on Sunday is the same as Saturday service

The best estimate is that Sunday annual ridership would be approximately 55,000 annual trips if all RABA routes were operated, with the simple assumption that Sunday ridership would have 80% of Saturday ridership. Assuming Sunday service is operated 51 days a year, this equates to 1,078 daily passenger trips each Sunday.

The expected cost for Sunday fixed route service is the same as Saturday service, which was \$453,156 in FY 2015-16 dollars. Adding in required Paratransit costs at approximately \$139,000 per year, the total Sunday costs would be approximately \$592,000 annually in 2015/16 dollars. This estimate is based on an interview with the RABA contractor.

The above baseline demand estimate and costs are based on the FY 2015/16 actual weekday and Saturday performance utilizing actual performance of peer agencies to project potential demand for Sunday service utilizing the status quo service delivery model.

A survey was conducted onboard RABA buses to solicit input on existing travel patterns on Sundays and preferences for how services could be provided. The results of the onboard survey plus two supplemental survey samples are provided in the next chapter.

3. Sunday Feasibility Survey

A questionnaire was prepared for the Sunday Feasibility Study primarily to receive RABA rider input on the potential features of a Sunday demonstration project. SRTA staff also provided an online survey option for the general public and provided a supplementary survey to Dignity Health Connected Living Adult Day Care participants. The methodology of each survey segment is explained below.

Methodologies

The consulting team in collaboration with SRTA staff developed a questionnaire that was designed to solicit input from RABA passengers on 1) existing use of RABA services; 2) how passengers currently travel on Saturday; 3) potential utilization of Sunday service; 4) potential trip purposes on Sunday and the span of service needed for different trip purposes; 5) preferences for three service delivery and fare options; and 6) demographics and types of cell phone ownership of respondents. The questionnaire is provided in Appendix A.

For the onboard survey of RABA riders, surveyors included three SRTA staff, one Caltrans Planner, one Caltrans intern and one City of Shasta Lake planner. Surveyors distributed the questionnaires onboard RABA buses starting on October 30, 2017 during weekdays, with a combination of hard copy questionnaires in English and Spanish and a tablet version of the questionnaire. All routes were surveyed at least once. Surveyors worked for at least two hour shifts or the equivalent of two full loops on most routes. Surveyors were trained to engage with every rider on the buses during the survey period. Onboard survey operations were completed on November 8, 2017.

SRTA staff entered data utilizing quicktapsurvey.com. The consulting team was responsible for tabulating and analyzing the survey results. A total of 219 completed questionnaires were received.

SRTA staff provided an electronic version of the survey on the SRTA’s website. The link was shared on the SRTA Facebook and Twitter through a target marketing of the social media posts. A total of 41 respondents completed the online survey.

Dignity Health Connected Living (formerly known as Shasta Senior Nutrition Program and Golden Umbrella) provides Adult Day Health Care services. SRTA wanted to capture the unique needs of the Adult Day Health Care participants to determine if they would need or want a Sunday transit service.

Because each of the samples are unique, they were analyzed separately and the results are reported in separate sections below.

RABA Onboard Survey

This section reports on onboard survey results of RABA passengers. A total of 219 completed questionnaires were received and analyzed.

Demographics

The onboard sample of passengers included 81.5% who lived in the City of Redding. The sample included 9% or 18 respondents who live City of Shasta Lake and and another 5% who live in the City of Anderson.

Q8. What community do you live in?

	Count	Percentage
Redding	163	81.5%
Shasta Lake	18	9.0%
Anderson	10	5.0%
Cottonwood	3	1.5%
Burney	2	1.0%
Other	4	2.0%
Total Valid Responses	200	100.0%
No Response	19	

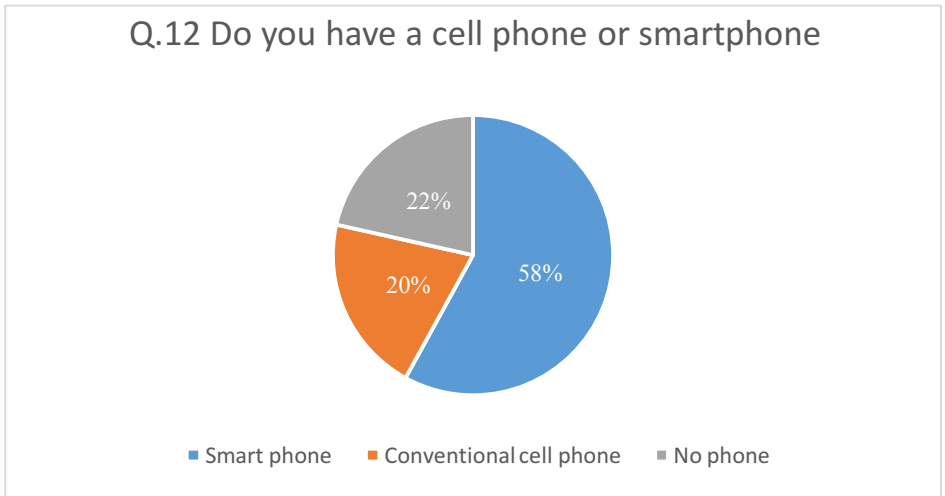
The sample of passengers is relatively young, with 37.2% being between the ages of 18 and 24 and another 16.6% between 25 and 34. Just 6% were 65 or older. Only 5.5% were under 18.

Q9. How old are you?

	Count	Percentage
Under 18	11	5.5%
18 thru 24	74	37.2%
25 thru 34	33	16.6%
35 thru 44	20	10.1%
45 thru 54	23	11.6%
55 thru 64	26	13.1%
65 thru 74	7	3.5%
75 or older	5	2.5%
Total Valid Responses	199	100.0%
No Response	20	

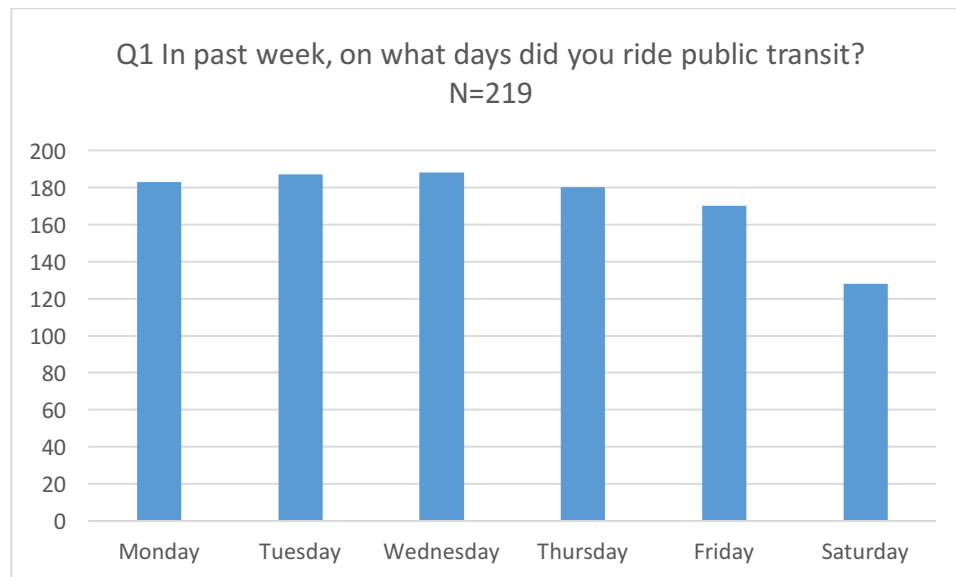
Riders surveyed mostly rely on public transportation for their mobility with 63% not having a valid drivers license and 79.1% not having the availability of a car for the trip they needed to make.

About 58% of passengers surveyed owned a smartphone. Another 20% owned a conventional cell phone. 22% did not own or use a cell phone or smart phone.



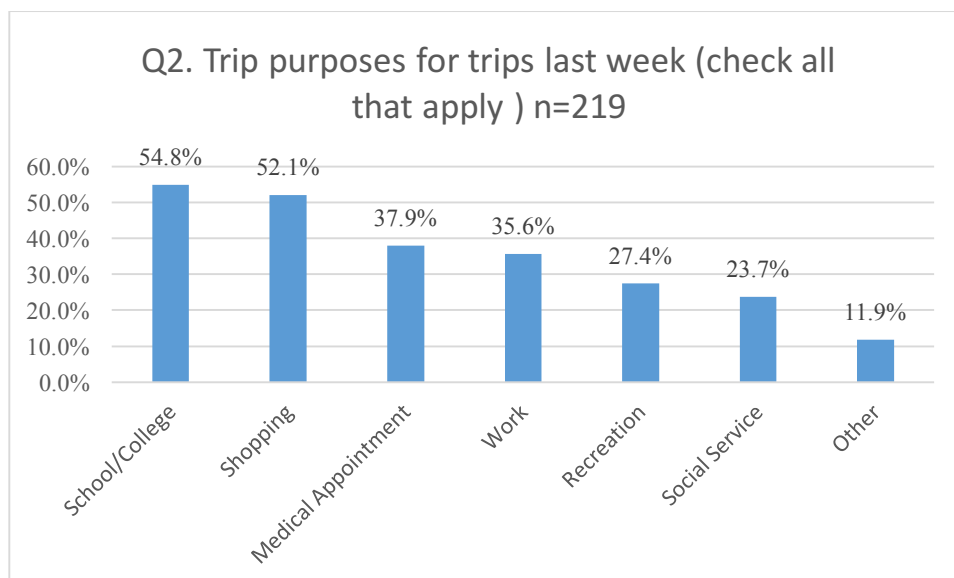
Current Mobility Mode Usage

The average RABA rider surveyed utilizes public transit 4.7 days a week. Utilization is pretty steady from Monday to Thursday, with Friday ridership falling off slightly. Saturday utilization from the weekday-only sample was 70.5% of weekday ridership. The sample is slightly higher than the 61.4% of Saturday riders compared to weekday ridership counts for FY 2015/16, cited in Exhibit 2-1 above.



Respondents were asked to check all of the different trip purposes they utilized in the past week. Over half of the respondents utilized RABA for both school/education and shopping during the past week. Because respondents could check all trip purposes that apply, the 54.8% for school/college means that 120 or 54.8% of the 219 respondents included school and college as one of their responses. Work trips were taken by slightly over one-third of the passengers. About 38% of passengers utilized RABA for

medical appointments. Overall, regular RABA riders depend on the bus service for mobility to access normal daily routines. The average respondent said they had utilized RABA for 2.4 different trip purposes.



About 86% of the respondents do not require the use of a mobility device. However, 21 or 11.6% required a walker, four used a wheelchair, and one had a motorized scooter. Three respondents brought a service animal onboard the bus.

Survey respondents were asked if they had utilized Uber, Lyft, or a taxi within the past six months. 59% had utilized one of these alternative modes of transit during the past six months. About 50% of the respondents had utilized Lyft, Uber, or both. Of the 129 respondents utilizing one or more of these ride hailing services, Uber was utilized by 64% of the respondents, followed by taxi with 45.7%. Lyft was a distant third with 17.8% of the respondents.

14. Have you used any of the following in Redding or another city within the last six months? (check all apply)

	Count	Percentage
Uber	82	63.6%
Lyft	23	17.8%
Taxi	59	45.7%
Total Valid Responses	129	127.1%
No Response	90	

Projected Sunday Utilization

Almost 59% of respondents said they would utilize Sunday service every week. About 90% said they would utilize Sunday service at least once a month, if not more frequently. Overall, there was a very strong interest among RABA riders for Sunday service. This strong interest validates the previous RABA survey for the Short Range Transit Plan and the unmet transit needs process requests for Sunday service.

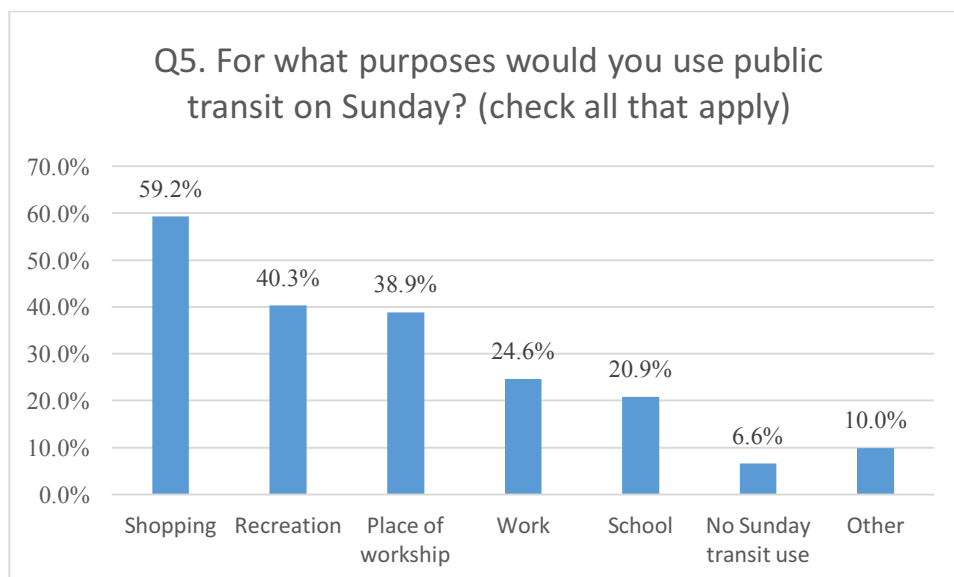
Q4. If public transit were provided in the Redding Area on Sunday, realistically how often would you utilize it?

	Count	Percentage
Every Sunday	126	58.6%
2-3 Sundays Per week	51	23.7%
One Sunday per month	17	7.9%
I would not use Sundays	21	9.8%
Total Valid Responses	215	100.0%
No response	4	

Shopping, recreation and place of worship were the three most popular responses when respondents were asked the trip purposes they would utilize with Sunday services. There were about three trip purposes that each respondent listed. Almost 60% of all respondents list shopping as one the trip purposes they would utilize. Work trips ranked 4th among the trip purposes included. Surprisingly, 21% said they would attend school. It is assumed that many of these responses were for church school.

There was little correlation of projected frequency of Sunday use and other variables in the survey. One predictable correlation is car availability and projected Sunday transit usage. As stated above, 79.1% of all survey respondents did not have a car available for the RABA trip they were making. Not surprisingly, there is correlation of projected higher frequency of Sunday utilization for those individuals who do not have a car available. For the 126 individuals who said they would utilize Sunday service every Sunday, 87% did not have a car available. Conversely, for the 21 individuals who said they would not utilize Sunday service, 66% of those individuals who had a car available and just 33% without a car available.

There were 21 individuals who said they would not utilize Sunday service, and 18 answered both the questions on age and Q4 on the projected frequency of Sunday use. 14 of 18 individuals who answered both questions and said they would not utilize Sunday service were 18 to 24 years olds, and three were in the 25 to 34-year-old age cohort. So it is the younger individuals who make up most of the individuals who say they would not utilize a Sunday service.



The questionnaire asked a series of questions for those who desire Sunday bus service on their travel patterns for worship services on Sundays, work on Sunday, and for other trips on Sunday. The questionnaire asked the location and the times they need to travel for each of the three different trip purposes.

For travel to and from worship service, the start and end time had a very broad span of services. According to the survey respondents, there were four respondents who had worship services start before 6 am and four respondents who have worship services start after Noon. As you can see from the table below, the start times are quite variable between 6 am and Noon. The most concentrated worship start times were between 8 am and 10 am, but this only represents 30 respondents out of 219 surveyed.

Q5A Place of Worship Start Times

	Count	Percentage
Before 6 am	4	6.0%
6:00-6:59 am	6	9.0%
7:00-7:59 am	7	10.4%
8:00-8:59 am	13	19.4%
9:00-9: 59 am	17	25.4%
10:00 to 10:59 am	11	16.4%
11:00 to 11:59 pm	5	7.5%
Noon and after	4	6.0%
Total Valid Responses	67	100.0%
No Response	152	

The place of worship end times is even more dispersed with end times before 10 am and ending at 9 pm. The two main concentrations of end times were between 12:00 and 1:00 pm and between 6 and 7 pm.

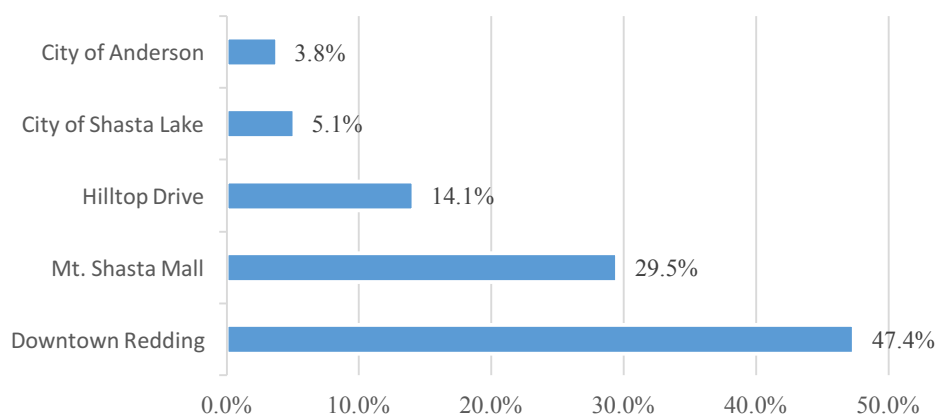
Place of Worship End Times

	Count	Percentage
10 am and before	6	7.3%
10:00 to 10:59 am	11	13.4%
11:00 to 11:59 pm	5	6.1%
12:00 to 12:59 pm	21	25.6%
1 pm to 1:59 pm	5	6.1%
2:00 to 2:59 pm	3	3.7%
3:00 to 3:59 pm	8	9.8%
4:00 to 5:59 pm	1	1.2%
6:00 to 6:59 pm	13	15.9%
After 7 pm	9	11.0%
Total Valid Responses	82	100%
No Response	137	

60 respondents shared their church name/location on the questionnaire. The main Bethel location had 24 of the 60 respondents. The only other places of worship with 3 or more responses were Twin View Bethel (5), Risen King (3), and City Church (3).

For work trips on Sundays, over 75% of the work trips are to the downtown Redding area, followed by the Shasta Mall area.

Q5b If you work, in what area is your work location? n=78



The span of service for work trips is also quite dispersed on Sundays with four respondents reporting start times before 6 am and nine reporting start times after 11 am. The most concentrated time period for work start times is between 7 am and 9 am, but this only represents 43% of the work start times.

If you work, work start time

	Count	Percentage
Before 6 am	4	6.3%
6:00-6:59 am	9	14.3%
7:00-7:59 am	11	17.5%
8:00-8:59 am	16	25.4%
9:00-9:59 am	5	7.9%
10:00 to 10:59 pm	9	14.3%
After 11 am	9	14.3%
Valid Response N=	63	100.0%
No Response	156	

Work end times range from before Noon to 11 pm, with 39% of workers leaving Sunday work between 5:00 and 7:00 pm.

If you work, what is your work end time

	Count	Percentage
Before 3 pm	11	17.5%
3:00 to 3:59pm	7	11.1%
4 pm to 4:59pm	6	9.5%
5 :00 to 5:59 pm	11	17.5%
6:00 to 6:59 pm	14	22.2%
7:00 to 7:59 pm	5	7.9%
8:00 to 8:59 pm	5	7.9%
After 9 pm	4	6.3%
Total Valid Responses	63	100.0%
No Response	156	

For the other trip purposes, such as highly ranked shopping and recreation, trip start and end times were dispersed pretty much equally between 6 am and 9 pm, with no significant peaking of demand.

Preferred Sunday Service Mode

Survey respondents were asked to provide input on the type of Sunday service they would prefer. The exact wording of the question and responses is repeated below. There was extensive discussion between SRTA staff and the consulting team on the wording and content of the question before releasing it for public input.

"6. If a Sunday transportation service were provided in the Redding area, which of the following would you prefer? (check only one, seniors and eligible disabled individuals would have half fares).

- a. **A limited fixed route bus service** with special Sunday-only routes connecting major neighborhoods, shopping and church destinations. This would likely be 2-3 routes running on major corridors and serving only key destinations. The routes would run hourly and the fare would be \$1.50-2.00 per trip.
- b. **An on-demand 6-12 passenger bus service** that would pick you up and take you to your destination within the Redding area, sharing rides with other passengers. You would be able to make advance reservations or request an immediate trip. The fare would \$3.00-\$4.00 per trip.
- c. **A Taxi, Uber, or Lyft-type of service,** that would include sharing rides with other passengers along the way to your destination. You would call or use a smartphone app to request a ride. The fare would be between \$3.00 for short trips and \$6.00 for longer trips."

The limited fixed route service with a fare of \$1.50 to \$2.00 was the preference of almost 78% of the RABA passengers surveyed.

**6. If a Sunday transportation service were provided,
which of the following would you prefer?**

	Count	Percentage
Limited fixed route, \$1.50-\$2.00 fare	144	77.8%
Shared ride, demand response \$3-\$4	34	18.4%
Shared ride, taxi, Uber, Lyft \$3-\$6	7	3.8%
Total valid responses	185	100.0%
No Answer	34	

In analyzing this data against other survey variables, the following observations can be made:

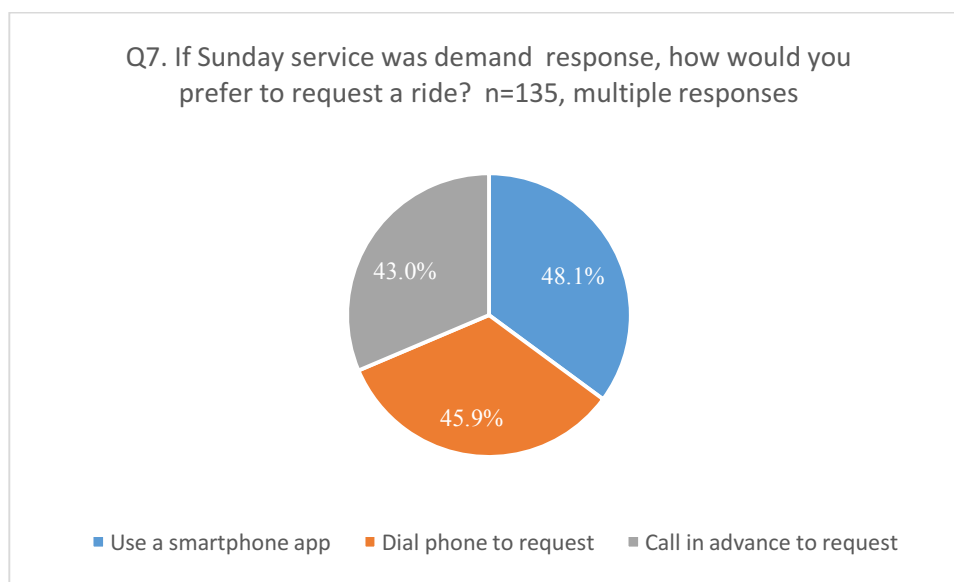
- Respondents 55 or older prefer the limited fixed route option by 67%, compared to 80% for 18 to 34 year olds. The shared demand response option was preferred by 30% of respondents 55 or older compared to 15% for 18 to 34 year olds. The taxi, Uber, and Lyft options were only preferred by 3-4% of both age cohorts.
- Of the 82 respondents who had utilized Uber in the past six months, the Uber users preferred the RABA limited fixed route option by 77% compared to just 5% for the shared ride taxi, Uber, or Lyft option.
- There were 37 respondents who responded to question 6 who do not have cell or smartphones. 34 (92%) of them preferred the limited fixed route option. For the 110 respondents with a smartphone, 75% preferred the limited fixed route option. For those with a smartphone, only 5 (4%) wanted the subsidized shared ride taxi, Lyft or Uber option.
- There was very little variation in responses based on car availability, having a driver's license, or trip purpose.

While household income was not included in the questionnaire, the fact that 79% do not have a car available is an indicator of the degree that RABA users are dependent on RABA for their daily mobility. In

the 2014 Short Range Transit Plan, the onboard survey conducted for the Short Range Transit Plan found that 74% of the RABA riders had incomes of less than \$15,000 per year. It is very likely that respondents were very price sensitive in responding to this question.

Preference for Requesting Demand Response Ride

Survey respondents were asked, "If the Sunday service was demand response service, how would you prefer to request a ride?" As the chart below indicates, the responses were pretty evenly divided among using a smartphone, dialing a phone to request a ride, and calling in advance to request the ride. All responses received in the 40% range as the question allowed for multiple responses.



Bicycles on Bus

If Sunday service were provided, about 29% would be riding a bike and would need a bike rack on board the bus.

15. If Sunday transit service were available, would you be riding a bike and need a bike rack on the bus?

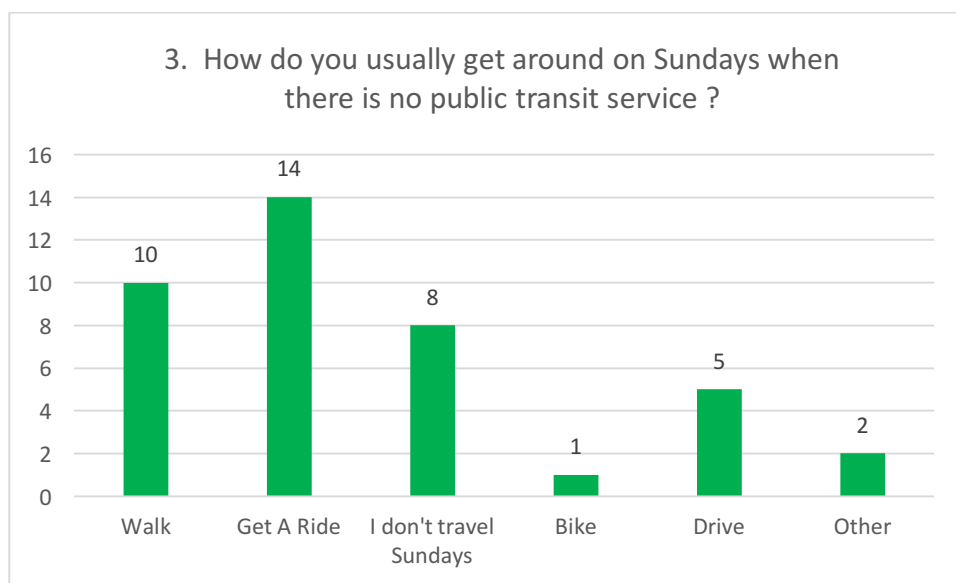
	Count	Percentage
Yes	57	28.9%
No	140	71.1%
Total Valid Responses	197	100.0%
No Response	22	

Online Survey

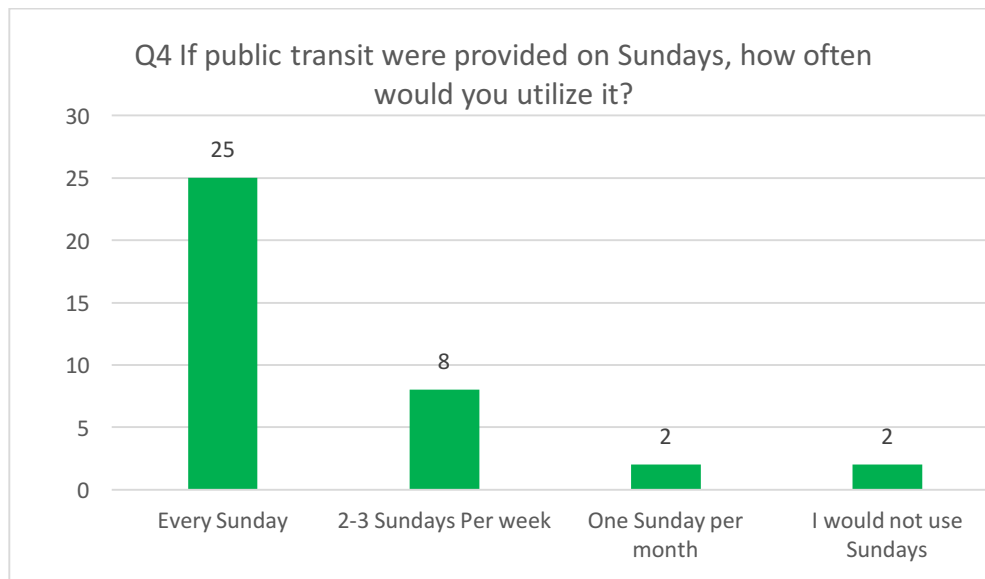
The online survey had 41 respondents. With this very small sample size, only the counts and no percentages are provided. Only the key findings relevant to the Sunday service are reported. To distinguish the results from above, the bar charts utilized are green while the above charts for the onboard survey are blue.

The online survey sample is less transit dependent and more technology savvy sample than the onboard survey. 25 of the 41 respondents had a car available for a trip compared to just 21% in the onboard survey. 34 of 41 (83%) had a smart phone, compared to 58% of the onboard passengers.

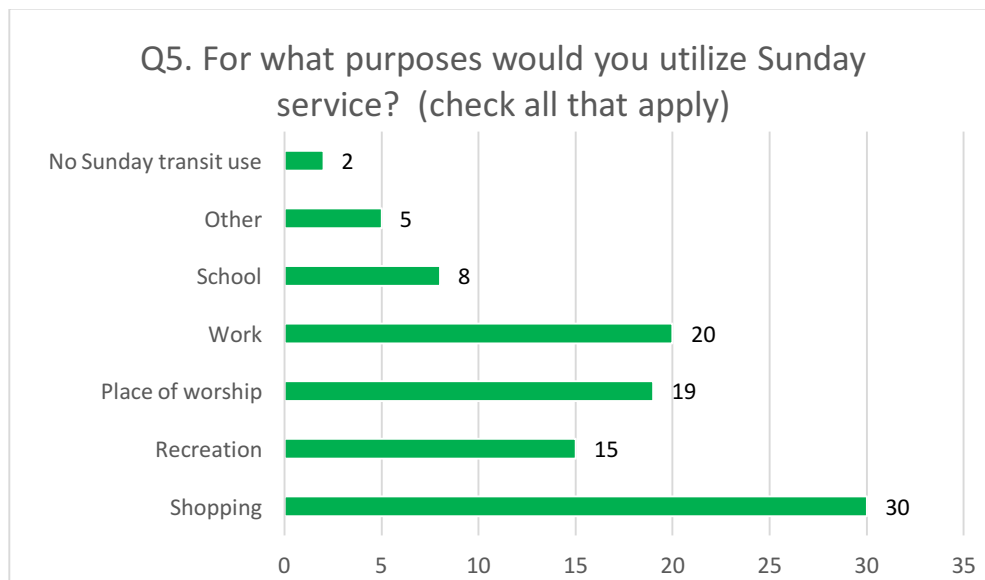
However, despite the availability of a car, on Sundays only five respondents drive by themselves, 14 get a ride with someone else and ten walk. Eight of 41 respondents don't travel on Sundays.



For the online survey sample, if public transit were provided on Sundays, 25 of 41 respondents would utilize the service every Sunday. Another eight would utilize the service 2-3 Sundays a week.



Like the onboard survey, shopping was the most cited trip purpose, with 30 of 41 respondents. For the online sample, work with 20 respondents and place of worship with 19 respondents were the next most popular trip purpose choices.



Very much like the onboard survey sample, a limited fixed route service was the most popular means of public transit provision with 30 of 39 respondents. Both the shared Ride Demand Response and the Shared Ride Taxi, Uber, and Lyft services had significantly less appeal with just five and four respondents, respectively.

**6. If a Sunday transportation service were provided,
which of the following would you prefer?**

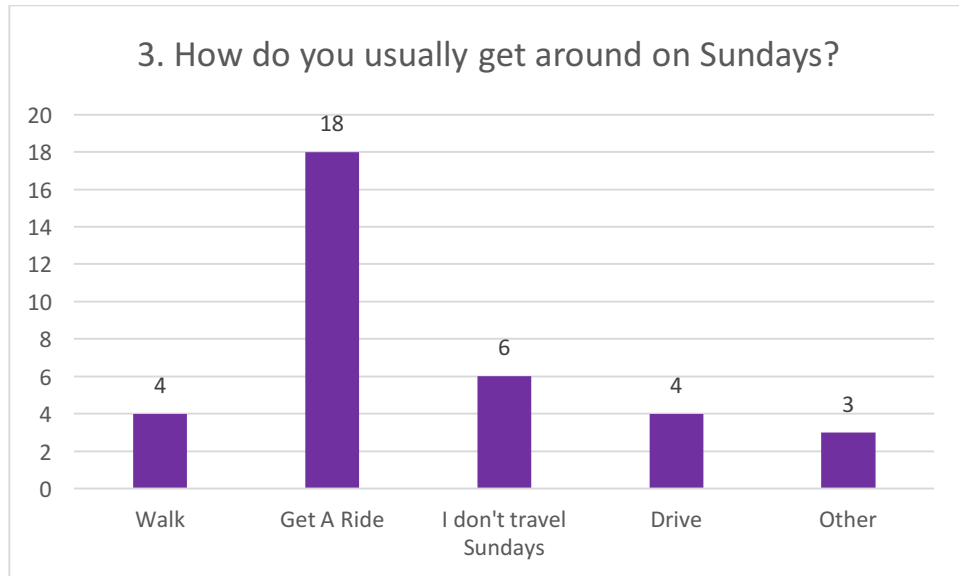
	Count
Limited fixed route, \$1.50-\$2.00	30
Shared Ride Demand response \$3-\$4	5
Shared Ride Taxi, Uber, Lyft \$3-\$6	4
Total valid responses	39
No Answer	2

Adult Day Care Responses

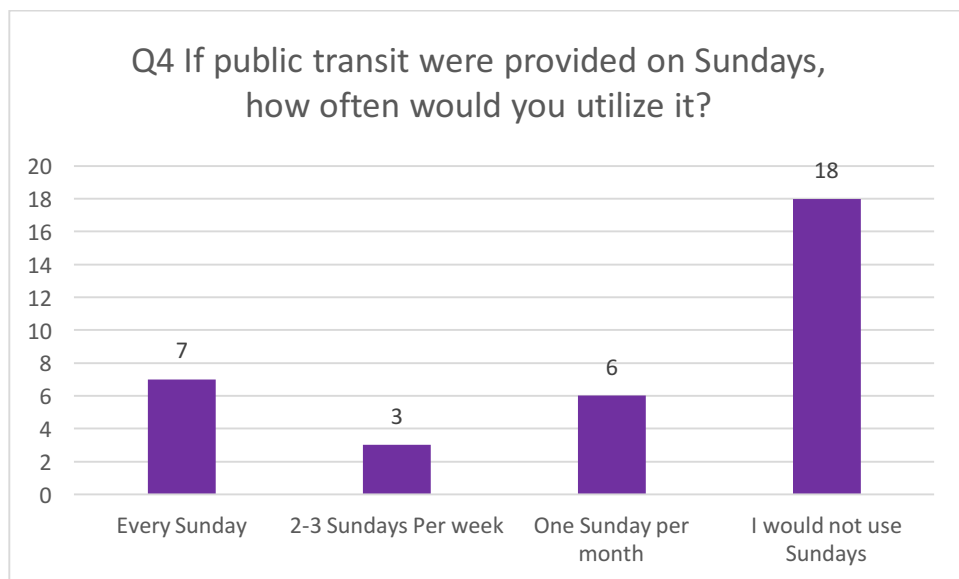
The survey of the Dignity Health Connected Living Adult Day Care attendees had 35 respondents. With this very small sample size, only the counts and no percentages are provided. Only the key findings relevant to the Sunday service are reported. To distinguish the results from above, the bar charts utilized are purple while the above charts for the onboard survey are blue.

Despite being attendees at an Adult Day Care program, the sample shows a slightly higher level of having driver’s licenses and a car available for the trip compared to the onboard survey sample. 14 of the 35 (40%) respondents had a car available for a trip compared to just 20% in the onboard survey. As might be expected, there is lower ownership of smart phones with of 8 of 34 (23.5%) respondents owning a smart phone, compared to 58% of the onboard passengers. 14 of the 34 respondents have no phone and 12 of 34 had a conventional cell phone.

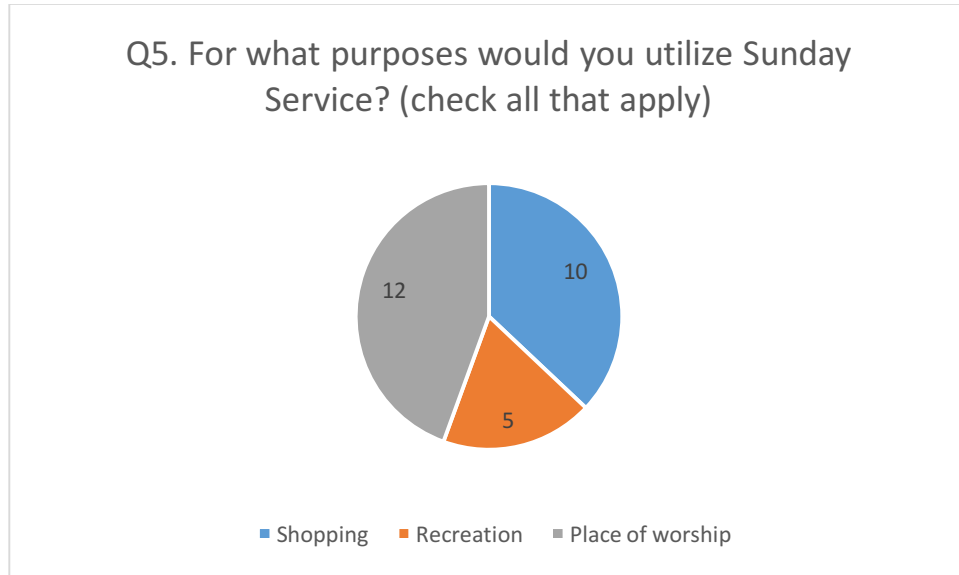
Most of the respondents get around on Sundays when there is not public transit service by getting a ride with others (18 of 35 respondents). 6 of 35 respondents said they don’t travel on Sundays.



For the survey of adult day care participants, a majority of respondents indicated they would not utilize a Sunday service (18 of 34 respondents). Only seven respondents said they would utilize a Sunday service every week.



Respondents from adult day care would only utilize Sunday service to attend a place of worship, shopping, or recreation trip purposes. Place of worship was the most popular response with 12 respondents, followed closely by shopping with 10 respondents.



The shared ride demand response service was favored by the 13 of 21 respondents to question 6. If a Sunday transportation service were provided, which of the following would you prefer? Only two of the 21 respondents wanted a shared ride taxi, Uber, or Lyft services.

**6. If a Sunday transportation service were provided,
which of the following would you prefer?**

	Count
Limited fixed route, \$1.50-\$2.00	6
Shared Ride Demand Response \$3-\$4	13
Shared Ride Taxi, Uber, Lyft \$3-\$6	2
Total valid responses	21
No Answer	14

4. Review of Potential Service Providers

The candidate service providers are broken into four main categories:

- Taxi services
- Paratransit service providers
- Ride-hailing services
- Micro-Transit services

Taxi Service Providers

During the consulting team's site visit on May 2-3 2017, we contacted all of the taxi companies that serve the Redding area and explored the openness and fleet availability for providing Sunday service. Based on this initial screening we interviewed two taxi companies.

ABC Cab

ABC Cab is a locally owned taxi company that has been in business since 1991. They have a fleet of eight minivans, with one of the minivans being wheelchair accessible. In general, they reported that having an accessible vehicle is not economical for them. However, they would be interested in exploring options for receiving assistance to operate an accessible taxi. They have 20 drivers for their taxi fleet.

They have their own dispatchers on duty from 8 am - 5 pm Monday to Friday and from 5 pm to 3 am on Friday and Saturdays. They recently added evening dispatch service the first week of the month. After hours they utilize a phone service which can text drivers on as needed basis.

ABC has several contracts for ongoing services. They currently have a contract with Mercy Hospital to provide patient transportation home. Mercy provides them with an approved voucher. They travel within the Redding area but also Eureka and the coast on a regular area, and occasionally to distant destinations in Oregon and Bakersfield, to mention a few. They also subcontract with non-emergency medical transportation companies to provide medical transportation, including MTI. They also have a contract with Foothill Distributing and bill the company for each free cab card received. Finally, they have agreements with the school districts for transporting about eight students a day from ages 5 to 16, for transporting students from home to school.

The fares are based on \$3.75 drop and \$2.70 per mile. The average fare is in the \$15 range.

ABC Cab currently does some Sunday service, but it generally is not a busy day for them. The currently available on-demand service is through their dispatch operations.

The owner also owns a car repair shop, Bryant Automotive. Maintenance of all taxis are performed at Bryant Automotive.

Yellow Cab

Yellow cab has been in business for 37 years with a peak of six vehicles. It operates five Lincoln Town cars and one Lincoln Grand Marquis.

They serve both the Redding and Red Bluff areas and any other city without entry restrictions. Dispatching is done through Redding Answering Service utilizing cell phones.

Fares are \$2.75 drop plus \$3.00 per mile and 73 cents per minute for waiting time. There is a minimum fare of \$6.00; however, the average fare is also approximately \$15.00.

Yellow cab currently does not have ongoing contracts, but historically has had contracts with senior housing complexes as well as medical facilities.

Yellow Cab management is quite frustrated with Uber and Lyft as they feel that taxis have significantly more restrictions that ride hailing companies do not have.

Paratransit Service Providers

Transdev

Transdev is the contractor for operating the RABA service. TransDev is a global company with operations in 19 countries. Transdev contracts with cities, counties, universities and transit districts to both operate and maintain their transit systems. In addition to Redding, Transdev operates paratransit and non-emergency medical transportation contracts across the country including in Atlanta, Baltimore, Las Vegas, Phoenix, New Orleans, Long Island, Seattle, Kansas City, Greensboro, Washington, DC and Denver.

For RABA, Transdev also operates Americans with Disability Act (ADA) Complementary Paratransit Service for persons with disabilities who cannot ride or navigate RABA fixed route bus service. Individuals who ride the RABA Paratransit service must have ADA Paratransit certification. The ADA Paratransit service is operated in compliance with ADA Paratransit regulations in terms of service hours, service area, and fares.

Transdev operates services for RABA Paratransit beginning at 6:30 am Monday to Friday with 4 vans, and up to 7 vans during peak demand periods. On Saturdays, the peak demand is 5 vans. Transdev

operates approximately 25 to 30 revenue service hours in Paratransit service on an average Saturday. The trips are scheduled based on advanced reservations the same day.

Transdev currently utilizes Stategen software for its dispatching operations, and the dispatching is currently not set up to handle to general public demand response services.

The transit operator licensing and certification requirements are different for operating ADA Paratransit and operating general public Dial-a-Ride service. Transdev drivers do not have “General Public Paratransit Vehicle” or GPPV certifications for general public service that Sunday service would require. GPPV certification means any motor vehicle designed for carrying no more than 24 persons and the driver, that provides local transportation to the general public, including transportation of pupils at or below the 12th-grade level to or from a public or private school or school activity, under the exclusive jurisdiction of a publicly owned and operated transit system through one of the following modes: Dial-a-Ride, subscription service, or route-deviated bus service. Among other requirements, GPPV operators must present evidence that they have successfully completed a driver training course consisting of a minimum of 40 hours of instruction within the previous two years and a background check. The instruction shall have covered applicable laws and regulations and defensive driving practices, a minimum of eight hours of certified defensive driving, and a minimum of 20 hours of behind-the-wheel training in a vehicle to be used as a general public paratransit vehicle. A GPPV certificate is required to operate a GPPV vehicle.

If Sunday general public paratransit service were to be operated by Transdev, the following would be needed:

- GPPV certified drivers and vehicles;
- Dispatcher for the Sunday service; and
- Depending on scheduling of existing drivers, they may be a need to hire additional drivers to provide Sunday services.

Dignity Health Connected Living

Dignity Health Connected Living (formerly the Shasta Senior Nutrition Program (SSNP)) is the Consolidated Transportation Service Agency (CTSA) in Shasta County and has served in this capacity since 1995. A CTSA is designated by SRTA under the auspices of the Social Services Transportation Improvement Act to achieve the intended transportation coordination goals of that Act. Under Transportation Development Act regulations, the CTSA may receive up to 5% of available Local Transportation Funds. The CTSA can operate or contract for its own transportation services. SRTA has developed detailed policies to enhance coordination efforts in Shasta County.

Dignity Health Connected Living provides services to seniors 60+ and those with disabilities primarily for residents living outside the RABA service or to individuals who do not qualify for RABA services. Able-bodied seniors 60 and over, for example, are not eligible for Paratransit service unless they have a disability that makes them eligible for the Paratransit service. Dignity Health Connected Living has six vehicles and operates four vehicles in peak service.

Ride-Hailing Services

Ride-hailing services using smartphones got their start in 2010 with the early version of UberCab. The innovation was utilizing an iPhone app to hail a taxi in San Francisco. The app let travelers summon a taxi with a tap on the app and then to pay for the ride utilizing a credit card. During the 2012-13 period, Lyft, Uber and Sidecar developed apps that allowed drivers to utilize their own personal vehicles in a peer-to-peer based platform. According to Susan Shaheen from UC Berkeley, the Lyft and Uber "principal innovation was using computer algorithms that matched riders and drivers efficiently. Their apps removed the exchange of money from the rider-driver relationship, with fares automatically calculated and billed through the app."² Sidecar left the market in about 2015, leaving Uber and Lyft as the predominant service providers. The California Public Utilities Commission regulated these services as Transportation Network Companies or TNCs, but increasingly they are being called ride-hailing services. Today, ride-hailing services also include taxi services which have developed their own apps such as iCabbi to provide access to available taxi services.

Uber and Lyft started in more urbanized areas and slowly implemented services in small urbanized areas similar to Redding. Although it not known officially when Lyft and Uber started in Redding, when the consulting team utilized both Uber and Lyft during the team site visit, the drivers indicated that in 2016 it became a viable mobility service in the Redding area. About 50% of the RABA riders surveyed towards the end of 2017 had utilized Uber, Lyft or both. Similar to a taxi services, UberX and Lyft in Redding provide service from a single origin to a single destination.

Fares are typically significantly cheaper than a taxi. A 7 mile trip from City of Redding City Hall to Shasta College on Lyft, according to their fare calculator is \$13. A trip by taxi, utilizing the Yellow Cab fare information above would cost \$23.75 for the same 7-mile trip.

In dense urbanized areas like San Francisco, pooling services LyftLine and UberPool were first launched in 2014. These services bring together riders like a carpool with similar origins and destination. The driver's app algorithms assign additional passengers to drivers in real time. The computer software updates the routing as new passengers are picked up. In return for the out of direction travel and extra

² Susan Shaheen, "Shared Mobility: The Potential of Ridehailing and Pooling," in *Three Revolutions, Steering Automated, Shared and Electric Vehicles to a Better Future*. Island Press, 2018

time between origin and destination, the passenger discount is typically 40 to 50% of the regular fare. UberPool and LyftLine were not available in the Redding area at this writing.³

Lyft and Uber have been partnering with local cities to provide discounted rides. Since most riders in the onboard survey were with Uber, discussions were held with an Uber representative. There are essentially two ways that Uber structures financial partnerships with public agencies. The first is a fixed dollar subsidy, where the transit agency pays the first \$5.00, for example, for the ride. If the Uber total ride cost were \$10.00, the passenger would pay \$5.00 and the transit agency would pay \$5.00.

The second typical financial arrangement is the “Variable Percentage-Based Discount” according to discussion and materials received from Uber. In this financial arrangement, the transit agency subsidizes, for example, a “50% subsidy up to \$7.00.” If the Uber total fare was \$8.00, then the passenger would pay \$4.00 and the transit agency would pay \$4.00. If the Uber total fare was \$20.00, then the transit agency would pay \$7.00 and the passenger would pay \$13.00. Uber then invoices the transit agency monthly for the balance due.

Demand Response Services with an App

There are new software vendors that have been promoting a software platform to essentially enable general public Dial-a-Ride utilizing the transit agency’s own vehicle or a vehicle provided by the vendor where booking, vehicle tracking to pick-up and payment for the trip is completed through an app. These demand response service with a modern app are typically called Micro-Transit services.

There are several vendors that provide these types of services. TransLoc’s software for its MicroTransit product originated from the many universities it serves with a safe ride home program from the university to home late at night. TransLoc provides a service whereby their software enables passengers to essentially have an Uber or Lyft ride, but with transit agency owned vehicles. Their app enables passengers to book a ride by inputting their requested pickup time, with the choice of the next available time or a future date and time. The passenger selects the pickup location by typing in the address or utilizing the GPS “Your location”. The passenger then chooses the drop off destination and then orders the ride and confirms it. There is the option of scheduling or cancelling the ride by phone. The app will then provide a notice to the rider when the vehicle will arrive. They provide the software for a turnkey

³ A personal note from the author of the working paper is that along the San Francisco Peninsula where LyftLine and UberPool are available, the majority of times that I have utilized LyftLine, I am the only rider and there are no other riders, but I still get the 40 to 50% discount.

operation for a typical six-month pilot project. They utilize Stripe for fare payment processing. An example of this service is the recent launch of service in Citrus Heights in the Sacramento Regional Transit District. Service is being provided from 7 am to 7 pm Monday through Friday. The basic fare is the same as the Sacramento RT. Trip origins and destinations are limited to Citrus Heights.

A second potential vendor for this service is through VIA. VIA is best known for its shared ride service in New York City. VIA will provide its software for transit agencies to operate their own Micro-Transit service with the use of agency vehicles. In Austin, Texas, the Capital Metropolitan Transportation Authority operates the Pickup service utilizing the VIA Platform. According to VIA, ridership grew by 60% and vehicle utilization improved by over 60%. They are also operating a similar service in Arlington, Texas. VIA is in the process of launching a new Micro-Transit service for local trips within West Sacramento.

Examples of a flex route utilizing Micro-Transit software are two areas in the AC Transit service area: in Newark and Castro Valley. In this AC Transit Flex service, the service is offered in a designated service area that includes a BART station. The cost to ride Flex is the same as any other local AC Transit local bus service. For example, in Newark, pick up and drop off locations are at selected bus stops within the service zone, including the Union City BART station. The stops are clearly marked by the Flex logo. Newark Flex leaves the Union City BART station every 30 minutes and passengers are dropped off at one of the designated stop locations, depending on the passenger destination. While reservations are required for all other trips, passengers can board the Flex route without a reservation at the BART station. Passengers book their trip utilizing DemandTrans software. When booking the trip, passengers select their arrival and departure times to and from designated Flex bus stops. Passengers can also ride from one bus stop to another bus stop in the service area or to and from the BART station. The software notifies the passenger ten minutes in advance by email or text when the vehicle will arrive at the pick-up bus stop location.

5. Sunday Service Delivery Options

The purpose of this chapter is to provide a review of industry practices that could be utilized to provide Sunday service in all or part of the RABA service area. It must be stressed that this is an overview to help the selection of alternatives that will receive more detailed analysis in the next phase of the study in Task H, Sketch Planning Sunday service options.

The second purpose is to provide some preliminary discussion and input on the performance criteria that will be utilized to recommend a service delivery option at the end of the next phase. The following are the preliminary list of evaluation criteria. The first five are quantitative and the sixth is qualitative.

1. Farebox recovery: 20% for urban only service, 10% for rural only services and 15% for blended rural and urban area services.
2. Total Sunday Service subsidy costs. This is the total cost minus the projected farebox revenues.
3. Shared ride potential. This is measured in passengers per vehicle service hour.
4. Average daily ridership.
5. Vehicle miles travelled.
6. Responsive to Sunday service needs as captured in the onboard survey and stakeholder interviews.

The following is an overview of options that include a basic description, service features, service area, span of service, ADA Paratransit Service requirements, fares, accessibility, potential partnership and opportunities, preliminary assessment of potential performance and a recommendation on whether the service delivery alternative should receive more detailed analysis in Task H, Sketch Planning of Sunday Service Alternatives.

The service delivery options are provided in three categories:

- Fixed Route Options
- Taxi and Ride Hailing Options
- Dial-a-Ride and Micro-Transit Options

Fixed Route Options

This is the traditional approach to providing Sunday service. The following are the three alternatives with two being proposed for more detailed analysis in Task H. For all three of the alternatives, the existing RABA contractor Transdev would operate Sunday service similar to the current operation of Saturday service.

1. Sunday Service on all fixed RABA routes that operate on Saturdays.

This is the baseline alternative that extends Sunday service the same as Saturday service.

Fixed Routes Included: Routes 1, 2, 3, 4, 5, 6, 7, 9, 11 and 14 would provide service on Sundays.

ADA Paratransit Service Area: Would remain the same as the ADA Paratransit service area for weekday and Saturday service.

Fares: The existing fares for the fixed route service would be maintained with \$1.50 for One Zone and \$0.75 for each additional zone. The senior and disabled fares would be maintained at \$0.75 and \$0.35.

Span of Service: The span of service on Sunday would be the same as Saturday service for this base case scenario, operating from 9:20 am to when the weekday service ends on most routes at 7:15 pm.

Accessibility: All RABA buses have at least two wheelchair securement positions. Bus stops are mostly up to ADA standards for getting on and off the buses utilizing a wheelchair.

Potential partnership opportunities: In order to offset the difference between the weekday and expected Sunday farebox recovery, partnerships with key churches and other activity centers could be provided as a local contribution. The pending agreement between RABA and Bethel may provide a future revenue source for this purpose

Market Research Input: 78% of the onboard survey respondents preferred to have a fixed route service with the same fares as currently exist. Based on the stakeholder interviews and the onboard survey, the span of service from 9:15 am to 7:15 pm would not meet the span of service needs of existing RABA passengers. Based on the onboard survey results, Sunday service should have a span of service that is more similar to weekday service.

Preliminary Review of Performance Criteria:

- Farebox Recovery Ratio: Fixed route between 13.0% and 17.0%. Paratransit between 9.0% and 12.0%.
- Sunday Service Subsidy Costs: Between \$525,000 and \$550,000.

- Shared Ride Potential: Fixed route passengers per vehicle revenue hour of between 11.5 and 14.5. Paratransit productivity between 2 and 3 passengers per vehicle revenue hour.
- Average Daily Ridership: Between 1,200 and 1,600 that includes both fixed route and Paratransit ridership.
- Vehicle Miles Travelled: Very low compared to other non-fixed route alternatives. The vehicle miles travelled are essentially the vehicle service miles on each of the routes operated.
- Responsive to Sunday Needs: Survey respondents are used to Saturday service and have a high preference for Sunday service similar to the Saturday service according to the results of the onboard survey. However, also based on the survey results, the 9:20 am start time would not meet many of the needs for worship services and work.

Recommendation: Operating all RABA routes the same as Saturday service is not recommended for inclusion in the sketch planning analysis in Task H. Based on the survey results, the 9:20 am start time would not be sufficient to meet many of the Sunday service needs. A more limited route structure would have a higher probability of meeting farebox recovery requirements.

2. Sunday Service on a limited set of RABA routes.

This is the fixed route alternative that was tested in the Sunday Feasibility surveys.

Fixed Routes Included: In this alternative, the five routes that retain the 80% or more of the productivity on Saturday compared to weekday service are operated. This includes Routes 1, 4, 9, 11 and 14. This would potentially maximize the productivity and farebox recovery for a Sunday service.

ADA Paratransit Service Area: The ADA Paratransit Service Area would be limited to $\frac{3}{4}$ mile around Routes 1, 4, 9, 11 and 14.

Span of Service: The span of service on Sunday would be different than the Saturday service based on stakeholder input and results of the onboard survey. The recommended span of service would be the same as existing weekday service, from 6:20 am to 7:15 pm.

Accessibility: All RABA buses have at least two wheelchair securement positions. Bus stops are mostly up to ADA standards for getting on and off the buses utilizing a wheelchair.

Potential partnership opportunities: In order to offset the difference between the weekday and expected Sunday farebox recovery, partnerships with key churches and other activity centers could be provided as local contribution. The pending agreement with Bethel may provide a revenue source for this purpose.

Market Research Input: 78% of the onboard survey respondents preferred to have a fixed route service with the same fares as currently exist. The proposed span of service would meet more of the needs

identified in the onboard survey of RABA passengers, although it very likely the early morning service will have significantly lower productivity, and would likely degrade the farebox recovery ratio.

Preliminary Review of Performance Criteria:

- Farebox Recovery Ratio: Fixed route between 14.0% and 18.0%. Paratransit between 9.0% and 12.0%.
- Sunday Service Subsidy Costs: Between \$457,000 and \$482,000.
- Shared Ride Potential: Fixed route passengers per vehicle revenue hour of between 13.0 and 16.0. Paratransit productivity between 2.1 and 2.8 passengers per vehicle revenue hour.
- Average Daily Ridership: Between 1,225 and 1,500 included for both fixed route and Paratransit services. The ridership could be similar to the first option due to the longer span of service.
- Vehicle Miles Travelled: Very low compared to other non-fixed route alternatives. The vehicle miles travelled are essentially the vehicle service miles on each of the routes operated.
- Responsive to Sunday Needs: Survey respondents are used to Saturday service and have a high preference for Sunday service similar to the Saturday service. The early start times, similar to the weekday service, would enable Sunday riders to both access work and worship service, as expressed in the onboard survey.

Recommendation: Include this alternative for further analysis in Task H, Sunday Service Sketch Planning. The focus on the core routes with the highest Saturday ridership should offset the expected lower productivity in the mornings between 6:00 am and 9:00 am.

3. Four core RABA routes and three new circulator routes from Canby, Masonic and Downtown Transit Centers.

Routes Included: In this alternative, the Routes 1, 9, 11, and 14 would provide the backbone of the fixed route service. Utilizing information from the onboard survey, three new Sunday circulator routes would provide service to and from the Canby, Masonic and Downtown Transit Center. A new fixed route and schedule would be developed for these three routes in the Business Plan if this was the preferred alternative in Task H.

The results of the RABA onboard survey would be utilized to plan the three new Sunday circulator routes. For example, Bethel Church had by far the highest place of worship responses and the circulator would serve Sunday Church services at College View Dr. site in both directions for the 8:00 am, 10:30 am and 1:00 pm services, with service to the 6:00 pm service, but not the return trip. It would also service at the Twin View Bethel site for the 9:30 am and Noon start time, but only in one direction for the 6:00 pm service. Other worship, shopping and recreation sites would also be served by the circulator routes.

ADA Paratransit Service Area: The ADA Paratransit Service Area would be limited to $\frac{3}{4}$ mile around Routes 1, 9, 11 and 14 as well as the three new circulator fixed routes.

Span of Service: The span of service on Sunday would be different than the Saturday service based on stakeholder input and results of the onboard survey. The proposed start time at 6:20 am would enable passengers to arrive for 7:30 am and 8:00 work and worship start times.

Accessibility: All RABA buses have at least two wheelchair securement positions. Bus stops are mostly up to ADA standards for getting on and off the buses utilizing a wheelchair.

Potential partnership opportunities: In order to offset the difference between the weekday and expected Sunday farebox recovery, partnerships with key churches and other activity centers could be provided as a local contribution. The pending agreement with Bethel may provide a revenue source for this purpose.

Preliminary Review of Performance Criteria:

- Farebox Recovery Ratio: Fixed route between 15.0% and 18.6%. Paratransit between 9.0% and 12.0%.
- Sunday Service Subsidy Costs: Between \$368,000 and \$395,000.
- Shared Ride Potential: Fixed route passengers per vehicle revenue hour of between 12.0 and 15.5. Paratransit productivity between 2.1 and 2.8 passengers per vehicle revenue hour.
- Average Daily Ridership: Between 835 and 1,100 included for both fixed route and Paratransit services.
- Vehicle Miles Travelled: Very low compared to other non-fixed route alternatives. The vehicle miles travelled are essentially the vehicle service miles on each of the routes operated.
- Responsive to Sunday Needs: Survey respondents are used to Saturday service and have a high preference for Sunday service similar to the Saturday service. The early start times, similar to the weekday service, would enable Sunday riders to both access work and worship service, as expressed in the onboard survey. The three circulator routes would be specifically designed to meet Sunday service needs.

Recommendation: Include this fixed route option in Task H, Sunday Service Sketch Planning.

Taxi and Ride-Hailing Options

Taxi User-Side Subsidy Option

Taxi user-side subsidies program have been utilized in the public transportation industry for many years to supplement public transportation services. The most common model is that an agency contracts with

one or more taxi providers in the service area. In most user-side subsidy programs, the passengers pays the driver for half of the subsidized amount and the taxi company invoices the agency for the 50% subsidized amount each month. For a typical half-fare, or 50% user-side subsidy program, for a \$20.00 taxi ride, the passenger would pay \$10.00 and the taxi company would invoice the agency for the other \$10.00.

Service Delivery Description: On Sundays, passengers would request a trip from one of the eligible taxi companies that provide services in the RABA service area to provide a trip from an origin and destination.

Booking A Trip: Sunday passengers would be able to call taxi companies that have signed an agreement with SRTA to provide taxi rides on Sunday. They would also be able to access trips utilizing a smartphone app like Curb or iCabbi. Similar to Lyft or Uber, a passenger is able to put in their pick-up location and destination and then hit the Book Trip button. The closest available taxi responds to the request and the smart phone user can watch the taxi as it approaches the passenger’s trip origin location. The feasibility and costs of such a service to the taxi company will be evaluated in Task H Sunday Service Sketch Planning.

Service Area: The service area on Sundays would be a trip origin and destination within the boundaries of the current Paratransit service area.

Fares: There are a number of fare alternatives available. One would be a flat fare of \$3.00 for origins and destinations in the pilot service area up to a designated amount, say \$15.00. The other alternative is a percentage that the passengers pay. A common percentage for user-side subsidy programs is where the passenger pays 50% and the public agency like SRTA subsidizes the other 50%. Given the price sensitivities learned from the onboard survey, another alternative would be for passengers to pay 20% of the Sunday service fare, up to \$30 taxi fare for a one-way trip. For a \$10.00 fare, the passenger would pay \$2.00. For a \$20 taxi fare, the passenger would pay \$4.00. For the maximum \$30 taxi fare, the passenger would pay \$6.00. Anything beyond \$30.00 taxi ride, the passenger would pay 100% of the cost. While the details would need to be worked out, to encourage shared rides a flat fare could apply to up to 4 passengers from a common origin to a common destination. It would need to be explored further with the candidate provider taxi companies, but if the meter is on, could passengers picked up at different locations with a common destination such as church pay the same flat fare? Such an arrangement could encourage shared rides.

Span of Service: The Sunday service pilot would operate for 24 hours, from 12:01 am Sunday morning to 11:59 pm Sunday evening.

Accessible Vehicle: None of the taxi companies that were interviewed in the stakeholder interviews currently have an accessible vehicle. The potential costs of leasing an accessible vehicle for the demonstration project would be evaluated in Task H Sunday Service Sketch Planning.

Eligible Taxi Companies: An agreement would be signed by existing taxi providers and SRTA making them eligible for the program. The parameters of the agreement for the demonstration program would likely include provisions for a subscription to an app similar to Curb that would enable arrangements for a ride utilizing a app. The second provision would be the utilization of a leased wheelchair accessible vehicle during the demonstration project period.

Mobile App Options: There are a number of subscription services for taxis to utilize an app on which passengers can book, track the vehicle, and make payment. Two examples are iCabbi and Curb. If the potential barriers of accessible vehicles and fare incentives for shared rides can be overcome, then the mobile platform options will be explored further in Task H.

Preliminary Review of Performance Criteria:

- Farebox Recovery: This will depend on the recommended pricing and the degree of shared rides. For alternative pricing of a \$3.00 flat fare up to \$15.00, we would expect to have a 24% farebox recovery ratio. This assumes a single passenger and drops to 12% if the flat fare is applied to an average of 2 passengers. If a 50% fare subsidy was provided, then an average of 1 passenger per trip would have a farebox recovery of 50% or 25% with 2 passengers.
- Total Sunday Service Subsidy Costs: Subsidy cost for the rides would be between \$75,000 and \$150,000 depending on the subsidy levels and market penetration. The maximum market penetration compared to fixed route bus service is projected to be between 10% and 20%, depending on the pricing. This is consistent with the results of the onboard survey.
- Shared Ride Potential: The typical taxi model is a single trip and there would be incentives for shared rides to share the flat fare or percentage costs. Compared to other alternatives, the shared ride potential would be expected to be quite low.
- Average Daily Ridership: Very preliminary projections are between 120 and 240 daily trips depending on the pricing, market penetration, and incentives offered for shared rides.
- Response to Sunday Service Needs: Based on the onboard survey results, the use of taxis was not a popular option for Sunday service. However, if reliable service were provided at an affordable price, the user-side subsidy program has the potential of meeting Sunday needs at a reasonable cost.
- Vehicle Miles Traveled: At an average of 4 miles per trip, the preliminary estimate of vehicle miles travelled would be between 24,000 and 48,000 annual miles.

Recommendation: Include this alternative for further analysis in Task H, Sunday Service Sketch Planning.

Ride-Hailing TNC Option

Service Delivery Description: This alternative is similar to the user-side subsidy for taxis, but instead utilizes Uber or Lyft. Private individuals who drive independently for Uber, Lyft or both, would pick up and drop off passengers on Sundays.

Booking a Trip: For those individuals with a smart phone, a passenger enters in an origin and destination in an app and requests a ride. The closest Uber or Lyft driver responds and the phone app gives the passenger the arrival time of the vehicle, when the trip is expected to be completed, and the estimated fare. The apps for Uber and Lyft are available for iPhone and Android phones. If a person does not have a smartphone, there are services such as GoGo Grandparent that can be utilized with a flip phone and this service arranges the ride with either Uber or Lyft for a small fee per ride.

Service Area: Both Uber and Lyft can geofence an area and apply a trip within the designated pilot area. Both the origin and destination would need to be in the service area. Similar to the taxi option, the service area would be in the RABA paratransit service area.

Span of Service: Similar to the taxi option, the Sunday service would be from 12:01 am to 11:59 pm.

Accessible Vehicles: Although Uber has UberAssist to provide service to those with disabilities, because this is a peer-to-peer service, the UberAssist program does not have a good reputation in major cities. It would not work well in Redding.

Shared Ride Potential: In very dense urban areas, UberPool and LyftLine provide carpooling options. This carpooling or shared ride option is not available in the Redding Urbanized Area.

Recommendation: Do not include this option in Task H, Sunday Service Sketch Planning. The lack of accessible vehicles and limited potential for shared rides are the primary reasons this alternative has eliminated it for further consideration.

Paratransit and Micro Transit Options

Micro-Transit

Description of Service Option: “Micro-transit” is a term without an accepted and common meaning that has recently come into use. In general, it refers to transit services delivered in small vehicles—mini-bus size or smaller—in which the service itself has some type of demand responsive or flexible element. Most importantly, the route of each vehicle is determined at least in part by explicit requests for service. Those requests may be of a somewhat fixed nature, such as a person who is making a work trip each day, or they may be completely dynamic, such as a person wanting to make a trip from their home to the grocery store 15 minutes from now. In the former case, the service would have the character of a vanpool or buspool, in which specific locations are served but the vehicle may not stop at intermediate locations enroute to its final destination; in the latter case, the service has more of the characteristics of a general public Dial-a-Ride (DRT) or is commonly called a Flex service. The services operated by Bridj in the Boston area (now terminated) and Chariots in San Francisco are among the most widely publicized micro-transit services.

Micro-transit service itself is a hybrid type service combining fixed, flex, and demand responsive elements. As envisioned for the SRTA Sunday pilot demonstration project, each Micro-Transit “route” would operate on a cyclic basis, leaving from and returning to the same location, in most cases the Downtown Transit Center. Each vehicle cycle will have a small number of locations—most likely 3 to 5—that the vehicle will visit on a time window schedule, with the time windows being no more than 5 minutes. These “scheduled checkpoints” form the backbone of the service. In addition, passengers may request service at other locations via a web and/or smartphone application. These other locations—the “unscheduled” checkpoints—will be dynamically generated by the technology used to manage the Micro-Transit service. RABA may choose to restrict the unscheduled checkpoints to be existing RABA bus stops or they could be dynamically generated street intersection locations. However, the vehicle will not pickup and drop-off passengers at individual addresses unless they are ADA certified. In addition, a passenger whose pickup location is served by one “route”, but whose drop-off location is in a completely different part of the RABA service zone, will need to transfer to another Micro-Transit vehicle at the Downtown Transit Center (or one of the other transfer locations) to complete their trip. This is not different from current RABA fixed route service.

The service provider selected for this scenario would have the option of allowing passengers who appear at the “scheduled checkpoints” not to have to make a booking for their trip, but to simply tell the driver where they want to go. This will only work if the technology platform used for the Micro-Transit Service has the capabilities to support these “spontaneous” boarding trips by being able to dynamically schedule them at point of passenger boarding. Otherwise, all passengers will need to book their trips in advance of their travel.

It is likely that the Micro-Transit Service described here would not require the operation of complementary paratransit services. Micro-Transit service would provide the same accessibility to passengers with disabilities as a general public checkpoint DRT service. It could also provide door-to-door services for ADA eligible customers upon request. Whether it is desirable to do so with the Micro-Transit Service rather than a separate ADA paratransit service will largely depend on the volume of ADA trips on Sunday. If there are a significant number of ADA trips, it will likely reduce the effective operating speed of the Micro-Transit Service too much for the latter to operate efficiently. If that were to be the case, there would be the need for a supplemental ADA service sized appropriately to Sunday demand levels.

Service Area: The Micro-Transit Service Area would be defined to include primary trip origins and destinations in the core RABA service area. It is proposed that four Micro-Transit “routes” be established, with some overlapping coverage of these routes. The nominal length of these routes would be 12 to 17 miles, depending on what operating speeds were deemed appropriate for Sunday service when traffic is reduced from normal conditions, and the routes would be configured in such a way that the entire length would only be driven if there were demand for the service in the different route segments. All routes could begin and end at the Downtown Transit Center, although one or more routes

could also be focused on the Canby and/or Masonic transfer centers. It may be desirable to have routes that include 2 of the RABA transfer/transit centers. The nominal cycle of the vehicle would be 60 minutes, although if demand patterns warrant, it might be feasible for two vehicles to operate on 30 or 45 minute cycles.

Span of Service: Micro-Transit service would be provided during the hours when the community has expressed desire for fixed route-style transportation for church, shopping and recreation trips. This would be essentially from 6:30 AM to 7:15 PM. The amount of service to be provided could vary during the day. A baseline service with four vehicles is being proposed for further analysis in Task H, but there may be periods during the day when only three vehicles would be operated if demand does not warrant the 4th vehicle.

Accessibility: Micro-Transit service would need to be operated with ADA accessible vehicles to ensure their accessibility by all riders. The required accessible vehicles could either be provided by a contract operator or by the sponsoring public agencies. Since these vehicles would only be needed one day each week for this service, it is important that existing vehicles be identified rather than proposing the acquisition of dedicated vehicles, which would be cost-prohibitive.

The Micro-Transit service will not necessarily follow existing bus routes, but can be designed so that it only picks up ADA eligible passengers at existing RABA bus stops. This will ensure the accessibility of the designated stops since RABA bus stops are mostly up to ADA standards for boarding and deboarding of wheelchairs and other mobility devices. However, it may be much more convenient for ADA eligible passengers to be picked up at non-bus stop locations, provided that they are on streets with paved sidewalks and curb cuts. This can only be determined by a more in-depth assessment after candidate Micro-Transit routes are generated.

Potential partnership opportunities: As mentioned with other service options, partnerships with key churches and other activity centers are a possibility to offset the difference between the weekday and expected Sunday farebox recovery.

Market Research Input: Micro-Transit Service is essentially a hybrid between fixed route and demand responsive service, with the latter typically operating in a checkpoint service modality. By offering fixed stop service similar to regular RABA service, Micro-Transit Service would at least partially respond to the expressed preference of 78% of the onboard survey respondents to have a fixed route service with the same fares as on existing RABA fixed route service. Micro-Transit Service will not cover all of the existing RABA fixed routes, one fare alternative is a \$1 increase in regular fares and \$0.50 increase in senior fares for the service on Sunday. This fares structure recognizes the hybrid nature of the service, and would be higher than the regular fixed route cash fare for a single zone of \$1.50, but lower than the cash fare of \$3.00 for demand response service. This would mean a 67% increase in the fare level compared to current fares. The other alternative given the price sensitivity of passengers from the onboard survey is to set the price at the fixed route rate of \$1.50 for a single zone. Since the service area for the pilot

program would the core area of Redding for the proposed pilot project, there would only be a single zone fare.

Preliminary Review of Performance Criteria:

- Farebox Recovery: Micro-Transit Service operating in the core RABA service area for the entire day on Sunday is projected to have an annual Sunday ridership of approximately 10,600 to 20,000 passenger trips with a preliminary farebox recovery ratio of 8% to 15%.
- Total Sunday Service Subsidy Costs: A Micro-Transit Service would have an annual operating cost of approximately \$240,000 and, based on the projected farebox recovery above, a Total Subsidy Cost – or net cost – of \$200,000 to \$220,000. The Total Subsidy Cost would be greater if a separate ADA service was also necessary on Sunday. This will be evaluated further in Task H.
- Shared Ride Potential: This service option has a high opportunity for realizing shared riding due to the operation of fixed stop service in conjunction with on-demand trips between scheduled stops. Based on the experience of Micro-Transit Service elsewhere, the preliminary projection for this option is estimated at 4 to 7.5 passengers per vehicle service hour.
- Average Daily Ridership: Based on the mean projected average hourly productivity of 6 passengers per vehicle service hour on the Micro-Transit Service, this service option is projected to transport about 310 trips on an average Sunday and approximately 16,000 trips annually.
- Response to Sunday Service Needs: This service option accommodates most of the transportation needs expressed in the onboard survey and stakeholder interviews, including: preference for fixed route service, need for early morning and evening work trips, and provision of service to Downtown Redding, Hilltop Drive and Mt. Shasta Mall.
- Vehicle Miles Traveled: Based on an average operating speed on the Micro-Transit Service of 18 miles per hour, which is faster than RABA’s reported operating speed in FY2018 but appropriate for a service of this type with fewer stops and less passenger loading and unloading time, this service option is estimated to result in a total vehicle miles traveled of approximately 48,000.

Recommendation: Include this alternative for further analysis in Task H, Sunday Service Sketch Planning.

General Public Demand Response

Description of Service Option: Service would be provided throughout the defined Sunday service area through door-to-door, advance reservation and on-call demand response transportation, also known commonly as general public Dial-a-Ride services. This service could accept advance reservations for certain types of trips or operate entirely as an immediate-request, space available service. While a base level of service should be available from the start-of-service time to closing, the availability of service can be adjusted by adding and removing vehicles from service, thus matching service capacity to trip demand, though not generally on a daily or short-term basis due to staffing requirements and labor agreements.

One advantage of general public demand response service over the operation of fixed route transit is that complementary ADA Paratransit service would not be required. So long as individuals with disabilities have the same availability of fully-accessible service as that provided to non-disabled individuals, complementary ADA Paratransit would not be required. A provision of door-to-door service upon request would ensure the accessibility of these services to all riders.

Operation of these demand response services would need to be operated by a vendor who has available fully accessible wheelchair vehicles with a capacity of at least 10 passengers, GPPV licensing, and paratransit software or dispatching that can provide real time general public Dial-a-Ride services. It would be contracted through an open, competitive procurement to another private for-profit or private nonprofit operator. It should be pointed out in an interview with Transdev, the current operations vendor for RABA, they do not have GPPV licensing and their paratransit software is not set up for general public Dial-a-Ride services. Determining the feasibility and costs of potential vendors for this option would be further evaluated in Task H.

The provision of vehicles for this Sunday-only service would be prohibitive unless the prospective contractor entities already possess such vehicles for use in other programs.

Service Area: The Demand Response Service Area would be defined to encompass the primary trip origins and destinations in the core RABA service area. The service area could be operated as a single large area or divided into zones based on demand patterns. If a zonal approach were used, transfer of riders between zones could take place at the RABA Downtown Transit Center, the Canby Transfer Center or the Masonic Transfer Center. A zonal system has the advantage of providing more timely service to requests within a zone with the accompanying disadvantage of requiring transfers for any trip between zones.

Span of Service: Demand Response service would be provided during the hours when the community has expressed desire for transportation for church, shopping and recreation trips. This would be from 6:30 am to 7:15 pm. The amount of service to be provided could vary during the day. An average level of service equal to 3 vehicles has been proposed, but the number of vehicles actually in service would be expected to vary from 1 or 2 vehicles at very low demand periods to a "peak" fleet of five vehicles.

Accessibility: Demand Response service could be operated with a fleet of fully accessible ADA paratransit vehicles or with a mixed fleet of accessible vehicles and ambulatory-only vehicles such as sedans, so long as an individual requiring an accessible vehicle does not experience a longer wait time for a pick-up than any other passenger. Additionally, if the vehicles are purchased by a public entity, only fully-accessible vehicles could be purchased.

While it is recommended that this Demand Response service provide curb-to-curb service generally, door-to-door service could be offered to individuals who are ADA Paratransit certified to ensure the accessibility of this service.

Potential partnership opportunities: As mentioned with other service options, partnerships with key churches and other activity centers are a possibility to offset the difference between the weekday and expected Sunday farebox recovery.

Market Research Input: Demand Response Service does not directly respond to the expressed preference of 78% of the onboard survey respondents to have a fixed route service and fares similar to existing RABA services, but does offer accessible and convenient transportation across a larger portion of the RABA service area than the fixed route or checkpoint options. Fares for this Demand Response service are proposed at \$3 per trip for general public and \$2 for seniors for the service on Sunday. This does reflect an increase as compared to current fares.

Preliminary Review of Performance Criteria:

- Farebox Recovery: Demand Response service operating in the core RABA service area for the entire day on Sunday is projected to have an annual Sunday ridership ranging from about 17,500 to 29,000 annual passenger trips with a preliminary farebox recovery ratio of 12.5% to 20.8%.
- Total Sunday Service Subsidy Costs: A Demand Response service would have an annual operating cost of approximately \$350,000 and, based on the projected farebox recovery above, a Total Subsidy Cost – or net cost – of \$278,000 to \$307,000.
- Shared Ride Potential: This service option has a high opportunity for realizing shared riding during peak service hours, but can expect to experience many single, one-to-one trips during low demand periods. Incentives may be possible to encourage shared-riding by groups.
- Average Daily Ridership: Based on the mean projected average hourly productivity of 4 passengers per vehicle service hour on the Demand Response service, this service option is projected to transport about 459 trips on an average Sunday and approximately 23,000 trips annually.
- Response to Sunday Service Needs: This service option accommodates most of the transportation needs expressed in the onboard survey and stakeholder interviews with the exception of a preference for fixed route service. Specific travel needs that would be met by Demand Response service include: need for early morning and evening work trips and provision of service to Downtown Redding, Hilltop Drive and Mt. Shasta Mall.
- Vehicle Miles Traveled: Based on an average operating speed on the Demand Response service of 15 miles per hour, which is average for most demand response services, this service option is estimated to result in a total annual vehicle miles traveled of approximately 87,870.

Recommendation: Do not include this alternative for further analysis in Task H, Sunday Service Sketch Planning. The whole purpose of the on-demand Sunday service feasibility study is to study on-demand service delivery options. As will be discussed in the next section, since the general public Dial-a-Ride service with an app may (there is a high degree of uncertainty) have slightly better performance, it is recommended for further evaluation in the next phase.

General Public Demand Responsive Service with App

Description of Service Option: Service would be provided throughout the defined Sunday service area through door-to-door, advance reservation and on-call demand response transportation. This service would be available to customers to engage via a smartphone app, a web-based application, and via a call to an agent. The smartphone app would have features similar to an Uber or Lyft app in terms of a map-based interface to the customer to book the trip, plus the ability for the customer to see the vehicle approach their location when it is a few minutes away from picking them up. In concept, mobile ticketing could also be part of this app if RABA wished for that option to be available for customers. The customer could purchase their ticket at time of booking or later. The mobile ticket would be displayed on the smartphone screen within the app and the driver would visually verify it when the customer boards the vehicle.

In terms of how this service would operate, it is essentially the same as the General Public DRT service in which all service requests are taken via the telephone. This service could accept advance reservations for certain types of trips or operate entirely as an immediate-request, space available service. While a base level of service should be available from the start-of-service time to closing, the availability of service can be adjusted by adding and removing vehicles from service, thus matching service capacity to trip demand, though not generally on a daily or short-term basis due to staffing requirements and labor agreements.

One advantage of general public demand response service over the operation of fixed route transit is that complementary ADA Paratransit service would not be required. So long as individuals with disabilities have the same availability of fully-accessible service as that provided to non-disabled individuals, complementary ADA Paratransit would not be required. And provision of door-to-door service upon request would ensure the accessibility of these services to all riders.

Operation of these demand response services could be by the Redding Area Bus Authority as an extension of their current services or contracted through an open, competitive procurement to another private for-profit or private nonprofit operator. If RABA were the operator, this service could be operated using the existing fully-accessible Dial-a-Ride fleet, whereas contracted services would require the SRTA to provide suitable accessible vehicles or look to the contractor to provide such vehicles. The provision of vehicles for this Sunday-only service would be prohibitive unless the prospective contractor entities already possess such vehicles for use in other programs.

There are three important advantages to SRTA and its partners of this general public DRT option compared to the more conventional DRT outlined in the previous option. First, we believe that the service will be somewhat more attractive to customers due to the technology features that make it easy for customers to book trips themselves. We conservatively estimate that it will generate 5% more passenger usage than a service that does not have self-service booking including via a smartphone.

Second, the use of the app-based and web-based booking capability could induce as many as 70% of the customers to book the trips on their own based on experience at AC Transit, without the use of a call center agent. This means that perhaps a single agent, and no more than 2 agents, could handle all phone-based trip booking, thus reducing operations costs compared to the non-app based service. Third, some of these more advanced DRT technology platforms feature fully automated dispatching for small systems—and the Redding Sunday service would be of that size. This means that no dispatcher would be needed, only a supervisor (or a supervisor who could also act as a second phone agent when necessary). This would also reduce operating costs compared to the other general public DRT option. We estimate that these features could reduce operating costs by 5% compared to the DRT service without fully automated technologies for customer booking and vehicle/trip dispatching.

Please note that the Project Manager contacted both TransLoc and Via who are possible vendors for providing the software technology and app for such a service. Both were asked about the actual productivity and ridership potential compared to general public Dial-a-Ride. Both companies said the pilot programs they have launched in other areas are too new and they were not willing to share the productivity and performance of the pilot projects. Therefore, there a great deal of uncertainty on whether or not a 5% increase in ridership performance over traditional general public demand response service can be achieved.

Service Area: The Demand Response Service Area would be defined to encompass the primary trip origins and destinations in the core RABA service area. The service area could be operated as a single large area or divided into zones based on demand patterns. If a zonal approach were used, transfer of riders between zones could take place at the RABA Downtown Transit Center, the Canby Transfer Center or the Masonic Transfer Center. A zonal system has the advantage of providing more timely service to requests within a zone with the accompanying disadvantage of requiring transfers for any trip between zones. A more specific recommendation will be made after the analysis in Task H is completed.

Span of Service: Demand Response service would be provided during the hours when the community has expressed desire for transportation for church, shopping and recreation trips. This would be from 6:30 am to 7:15 pm. The amount of service to be provided could vary during the day. An average level of service equal to 3 vehicles has been proposed, but the number of vehicles actually in service would be expected to vary from 1 or 2 vehicles at very low demand periods to a “peak” fleet of 5 vehicles.

Accessibility: Demand Response service could be operated with a fleet of fully accessible ADA paratransit vehicles or with a mixed fleet of accessible vehicles and ambulatory-only vehicles such as sedans so long as an individual requiring an accessible vehicle does not experience a longer wait time for a pick-up than any other passenger. Additionally, if the vehicles are purchased by a public entity, only fully-accessible vehicles could be purchased.

While it recommended that this Demand Response service provide curb-to-curb service generally, door-to-door service could be offered to individuals who are ADA Paratransit certified to ensure the accessibility of this service.

Potential partnership opportunities: As mentioned with other service options, partnerships with key churches and other activity centers are a possibility to offset the difference between the weekday and expected Sunday farebox recovery.

Market Research Input: Demand Response Service does not directly respond to the expressed preference of 78% of the onboard survey respondents to have a fixed route service and fares similar to existing RABA services, but does offer accessible and convenient transportation across a larger portion of the RABA service area than the fixed route or checkpoint options. Fares for this Demand Response service are proposed at \$3 per trip for general public and \$2 for seniors for the service on Sunday. This does reflect an increase as compared to current fares.

Preliminary Review of Performance Criteria:

- Farebox Recovery: Demand Response service operating in the core RABA service area for the entire day on Sunday is projected to have an annual Sunday ridership ranging from about 18,500 to 31,000 annual passenger trips with a preliminary farebox recovery ratio of 14% to 23%.
- Total Sunday Service Subsidy Costs: A Demand Response service would have an annual operating cost of approximately \$333,500 and, based on the projected farebox recovery above, a Total Subsidy Cost – or net cost – of \$257,000 to \$287,500.
- Shared Ride Potential: This service option has a high opportunity for realizing shared riding during peak service hours, but can expect to experience many single, one-to-one trips during low demand periods. Incentives may be possible to encourage shared-riding by groups.
- Average Daily Ridership: Based on the mean projected average hourly productivity of 4.2 passengers per vehicle service hour on the Demand Response service, this service option is projected to transport about 480 trips on an average Sunday and approximately 24,600 trips annually.
- Response to Sunday Service Needs: This service option accommodates most of the transportation needs expressed in the onboard survey and stakeholder interviews with the exception of a preference for fixed route service. Specific travel needs that would be met by Demand Response service include: need for early morning and evening work trips and provision of service to Downtown Redding, Hilltop Drive and Mt. Shasta Mall.
- Vehicle Miles Traveled: Based on an average operating speed on the Demand Response service of 15 miles per hour, which is average for most demand response services, this service option is estimated to result in a total vehicle miles traveled of approximately 87,870.

Recommendation: Include this alternative for further analysis in Task H, Sunday Service Sketch Planning.