

3 FIXED ROUTE SERVICE EVALUATION

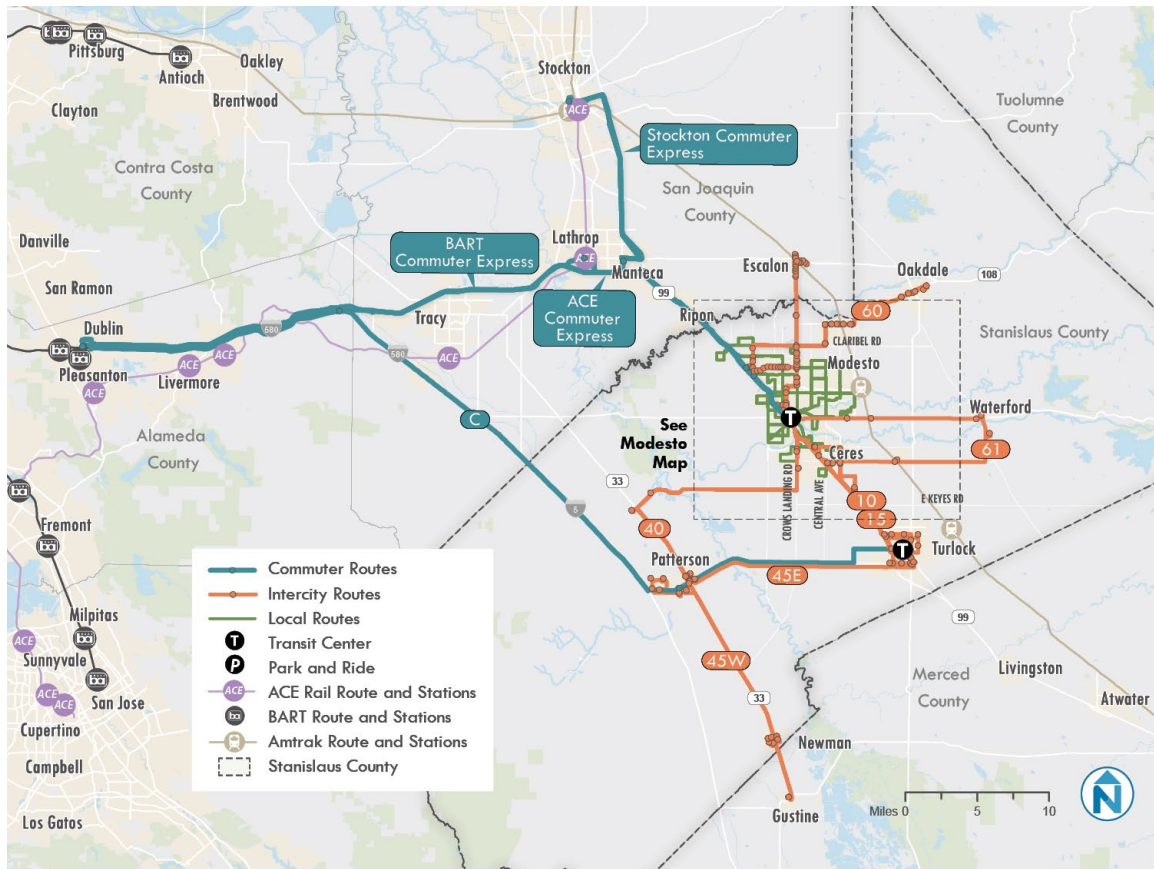
The Ride the S network consists of 18 local routes, 8 intercity routes², and 4 commuter routes. The local routes provide service within the communities of Modesto, Ceres, and Salida. The intercity routes provide connections between Modesto and other communities. The commuter routes are peak-only services designed to provide connectivity to other regional operators such as BART and ACE.

The regional map with all the routes is shown in Figure 2. Figure 3 provides a zoomed in map for Modesto, given the large number of routes converging in that area.

² The intercity routes include Route 35, which is a unique service operated by Ride the S. It operates three scheduled round trips on Monday through Friday as a deviated fixed route. When it is not operating fixed route service, it operates as a demand response service. Most of the Route 35 data is included in this chapter but any demand response data is presented in Chapter 4.

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Figure 2 Fixed Route Network, 2021



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Figure 3 Fixed Routes in Modesto, Weekdays



SERVICE CHARACTERISTICS

Level of Service

Average daily revenue hours for the system are highest on weekdays (779.6) followed by Saturdays at 393.8. Sundays see the least service with an average of 157.6 daily revenue hours. Figure 4 shows revenue hours, revenue miles, and operating costs for FY 2020/2021.

Figure 4 FY 2020/2021 Summary of Fixed Route System Operating Characteristics

	MAX	StaRT
Annual Revenue Hours	192,965	44,242
Annual Revenue Miles	2,228,854	849,426
Annual Operating Costs	\$20,683,018	\$3,293,683

Source: Ride the S, State Controller Reports

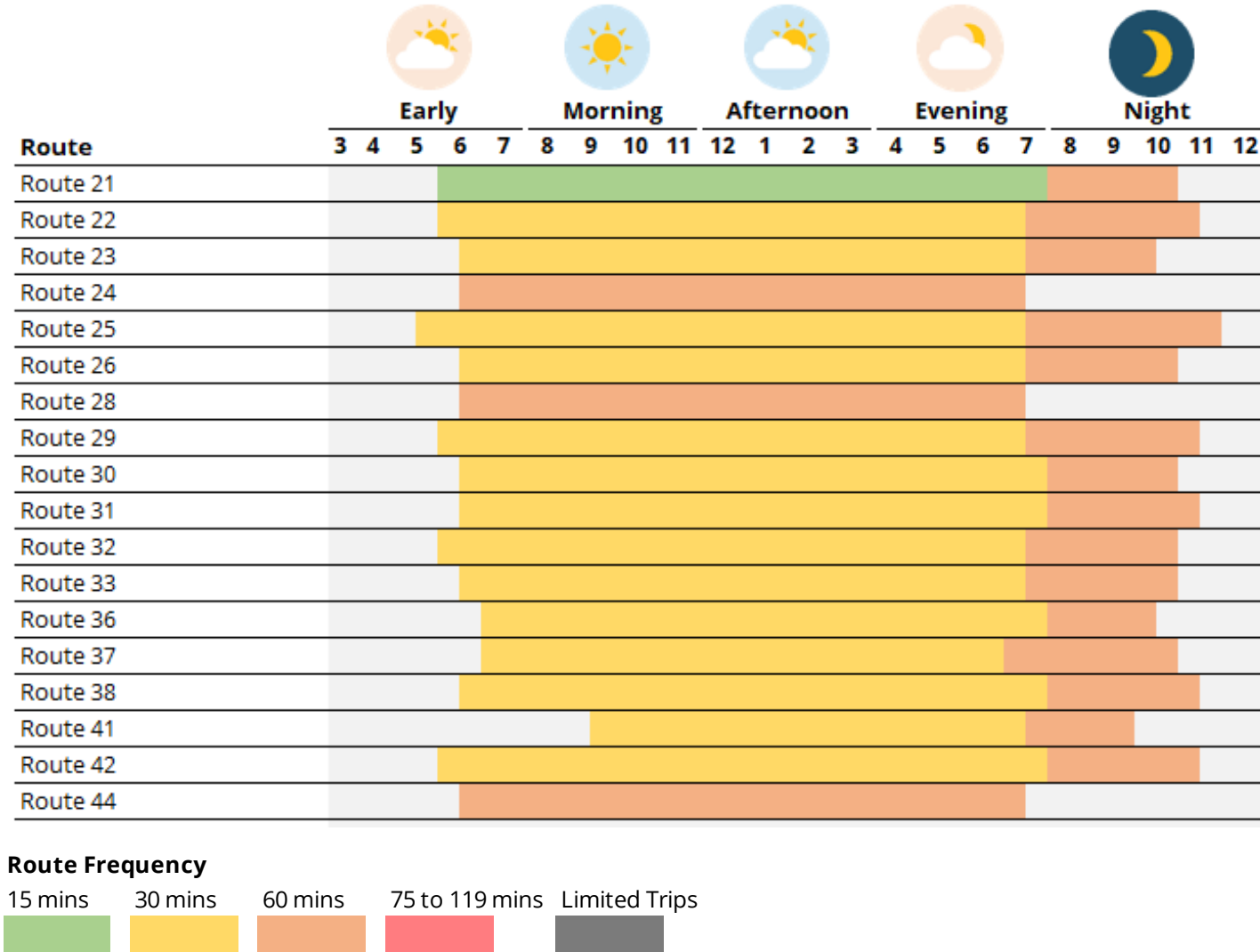
Span of Service and Frequency

Ride the S operates seven days a week between 3:40 AM and 11:20 PM on weekdays, 6:15 AM and 10:30 PM on Saturdays, and 8:45 AM and 8:45 PM on Sundays. Figure 5 through Figure 10 show the span of service and frequency for each group of routes (local, intercity, and commuter) for weekdays, Saturdays, and Sundays.

Out of the 30 routes in the system, 9 routes operate only on weekdays, 6 operate Monday - Saturday, and the remaining 15 operate seven days a week. Weekdays are when routes have the most frequent and longest hours of service. On weekends, the service often starts later and comes less frequently.

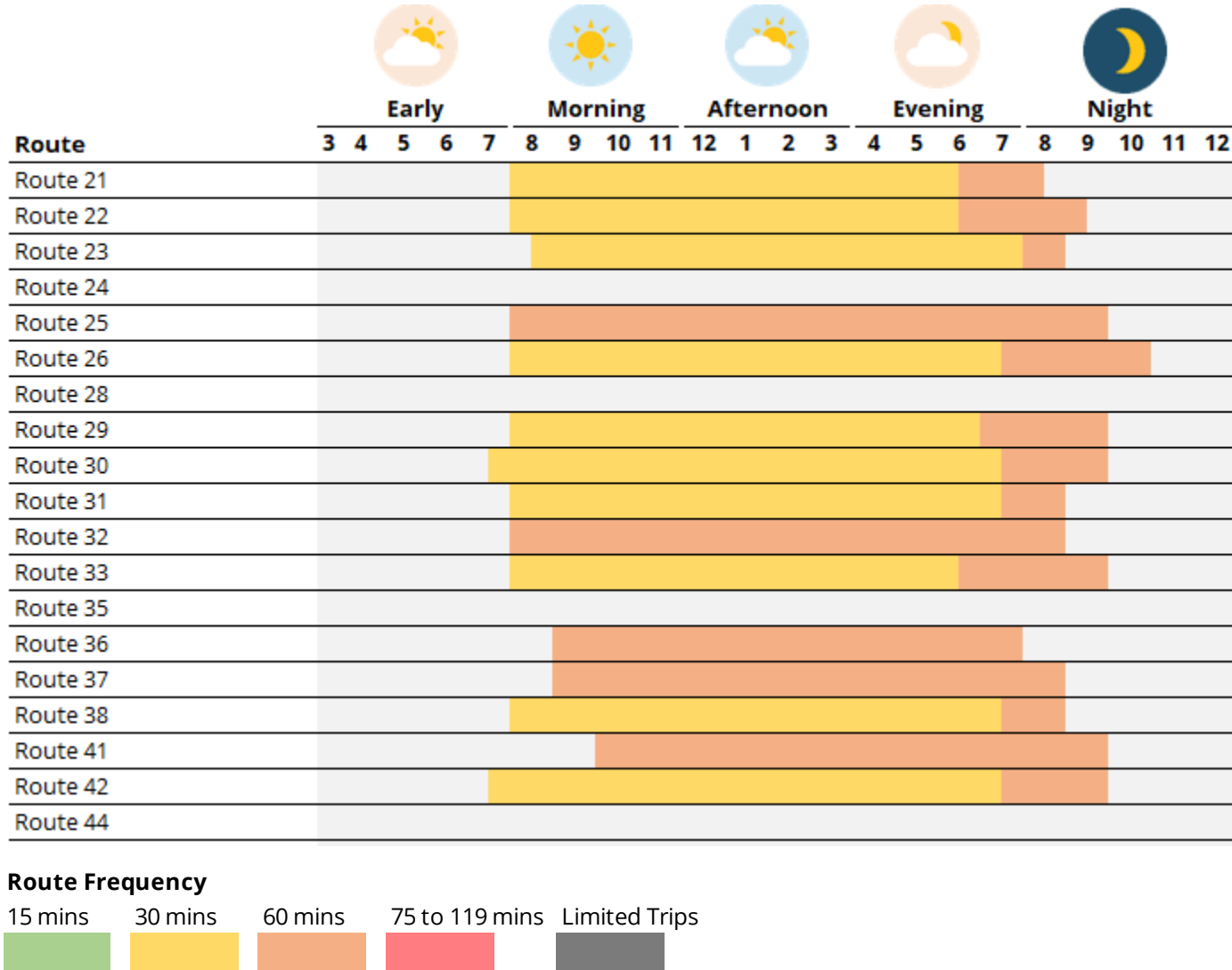
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Figure 5 Local Route Service Span and Frequency, Weekdays



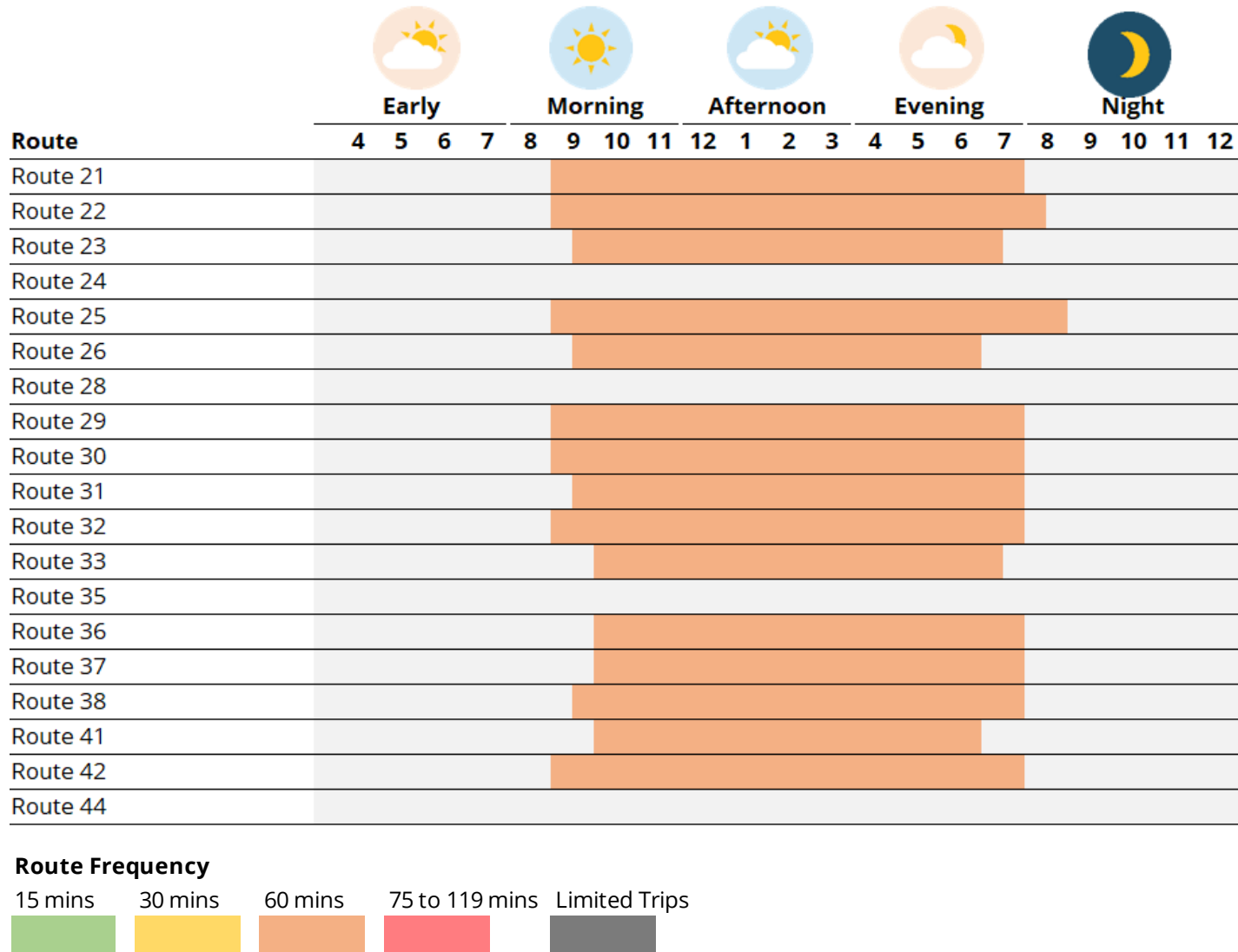
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Figure 6 Local Routes Span and Frequency, Saturday



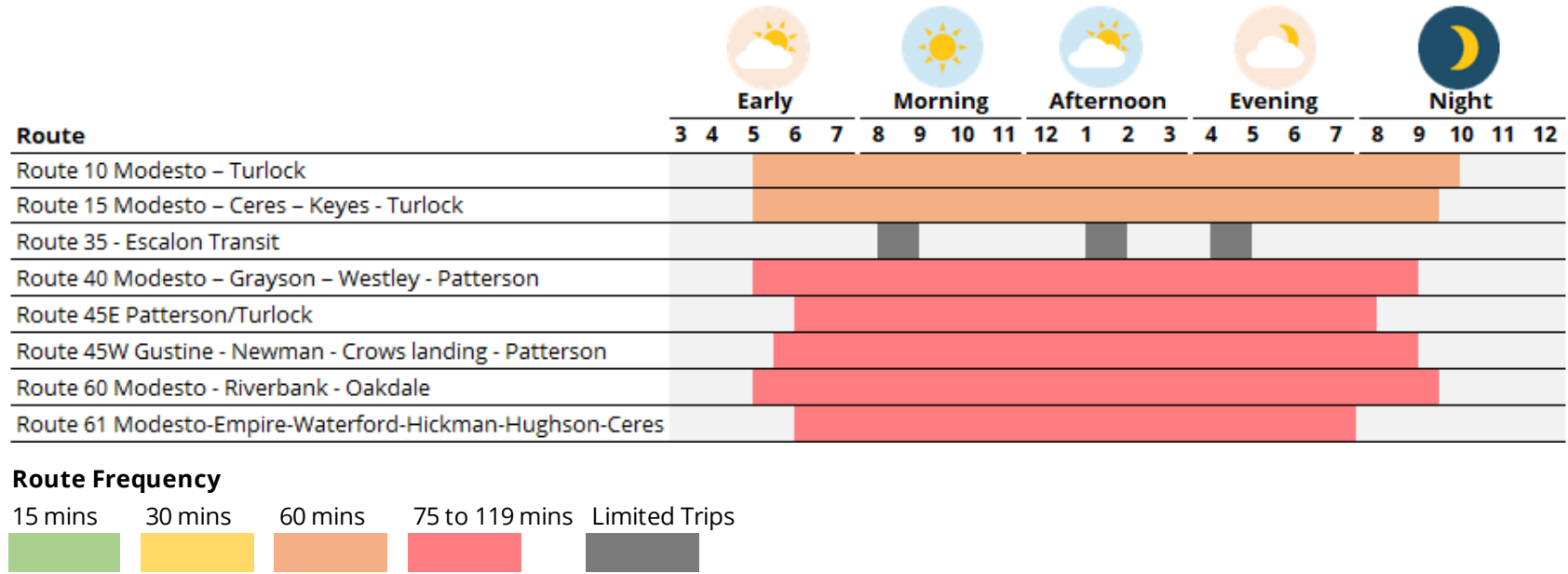
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Figure 7 Local Routes Span and Frequency, Sunday



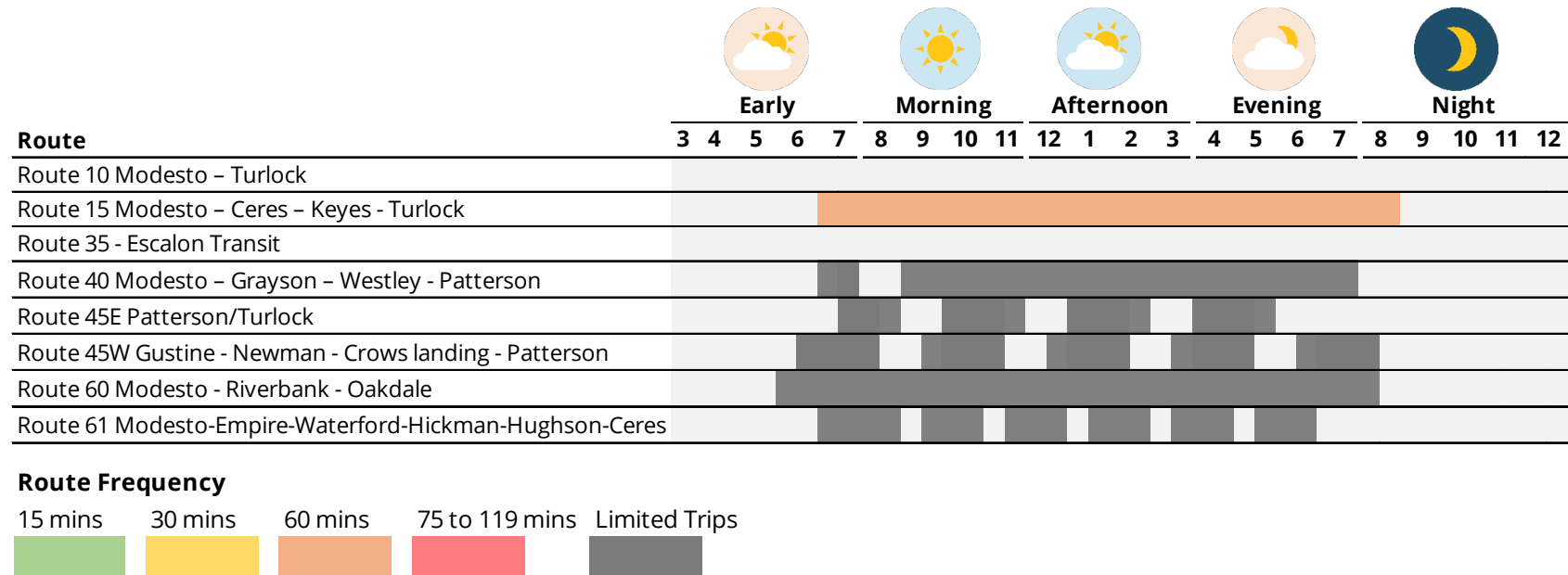
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Figure 8 Intercity Routes Span of Service and Frequency, Weekday



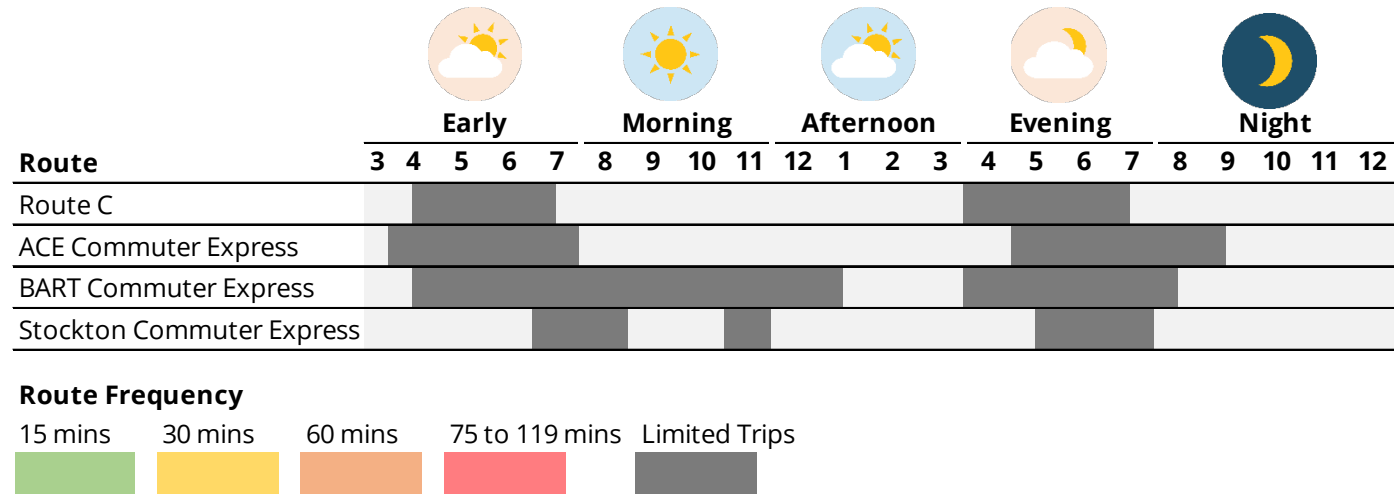
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Figure 9 Intercity Routes Span and Frequency, Saturday



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Figure 10 Commuter Routes Span and Frequency, Weekday



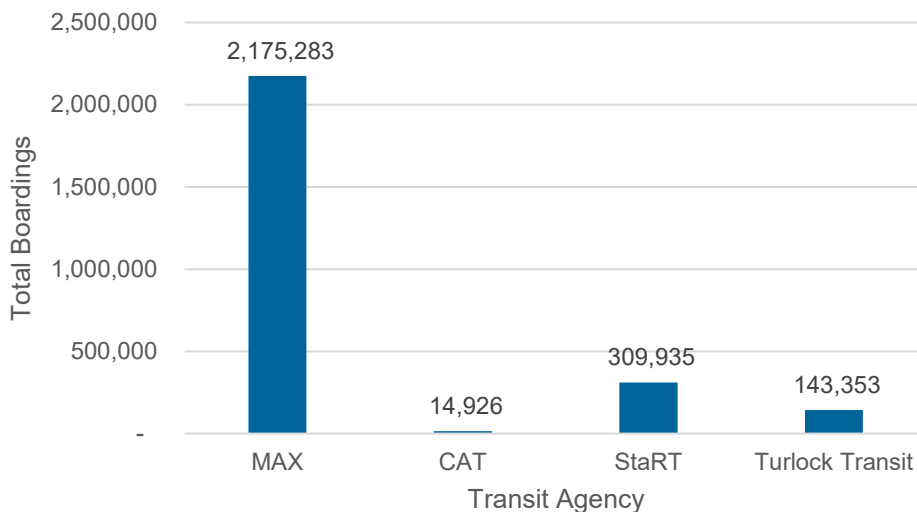
PERFORMANCE

COVID-19 impacted the use of transit across the country. This analysis used pre-COVID data (before March 2020), and during COVID data (August and September 2021) for comparison purposes. It should be noted that the pre-COVID data was before the establishment of Ride the S and includes references to the legacy systems MAX and StaRT. Data between March 2020 and August 2021 was not used because of the constantly changing travel patterns caused by the pandemic.

Annual Ridership

Figure 11 shows the pre-pandemic annual ridership. With over 2 million boardings in FY 2017/2018, MAX attracted the bulk of the ridership pre-COVID. Since this data was taken, MAX, CAT, and StaRT have been combined into a single, new agency: Ride the S.

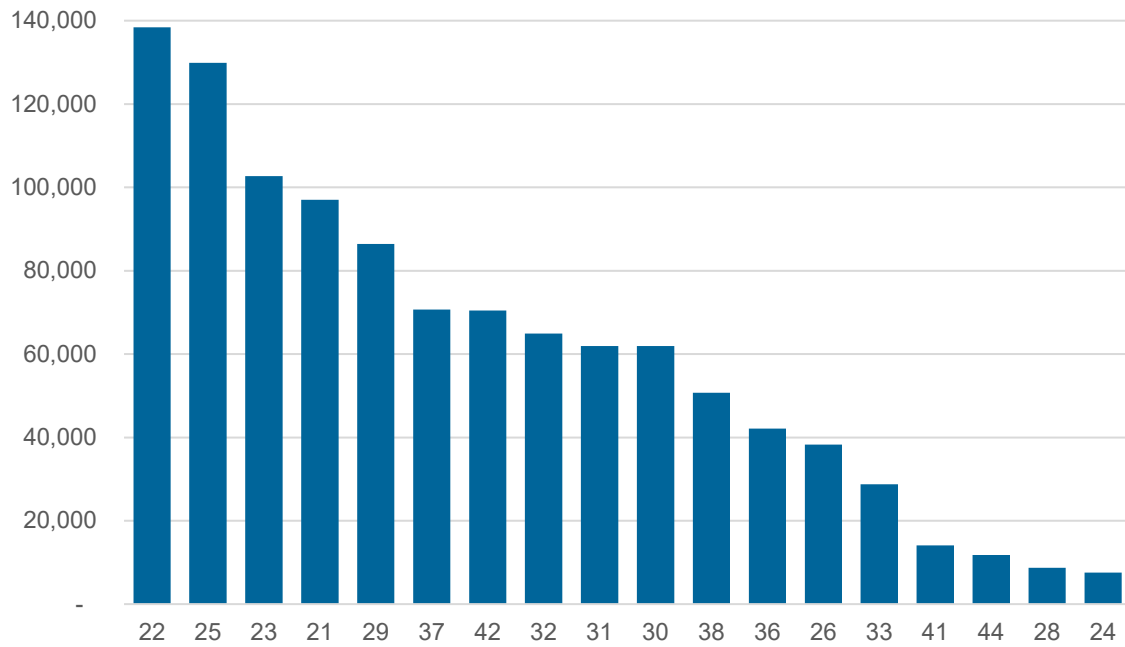
Figure 11 Ridership by Transit Agency FY 2017/2018



Source: Transit Efficiency and Innovation Study, 2019

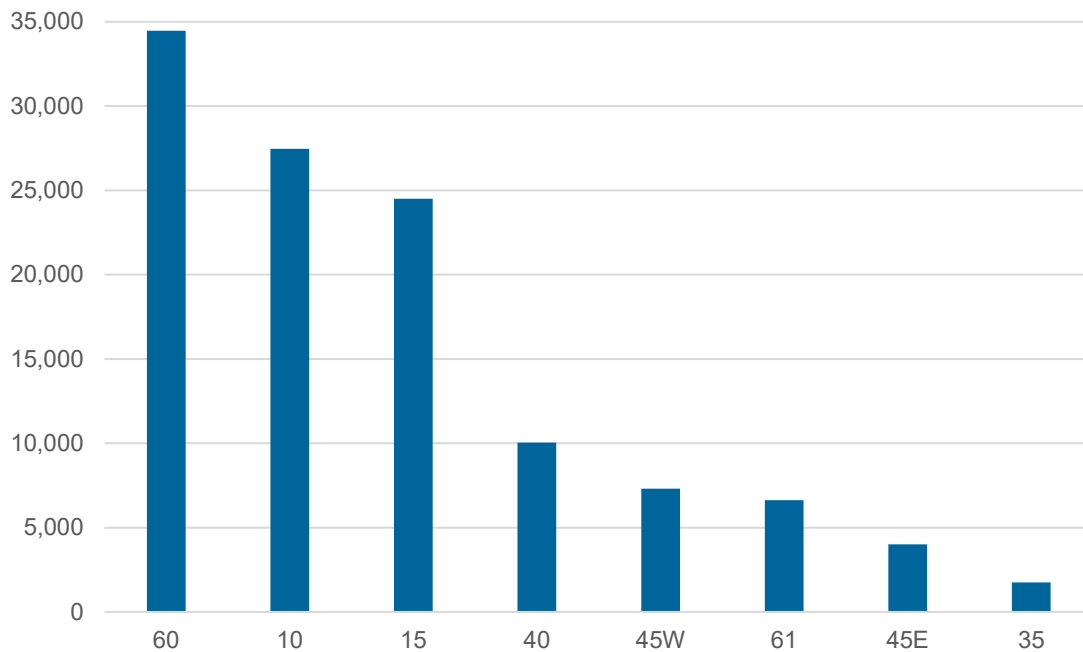
Figure 12 to Figure 14 provide a breakdown of during COVID ridership by route for the local, intercity, and commuter route groups.

Figure 12 FY 2021 Annual Ridership: Local Routes



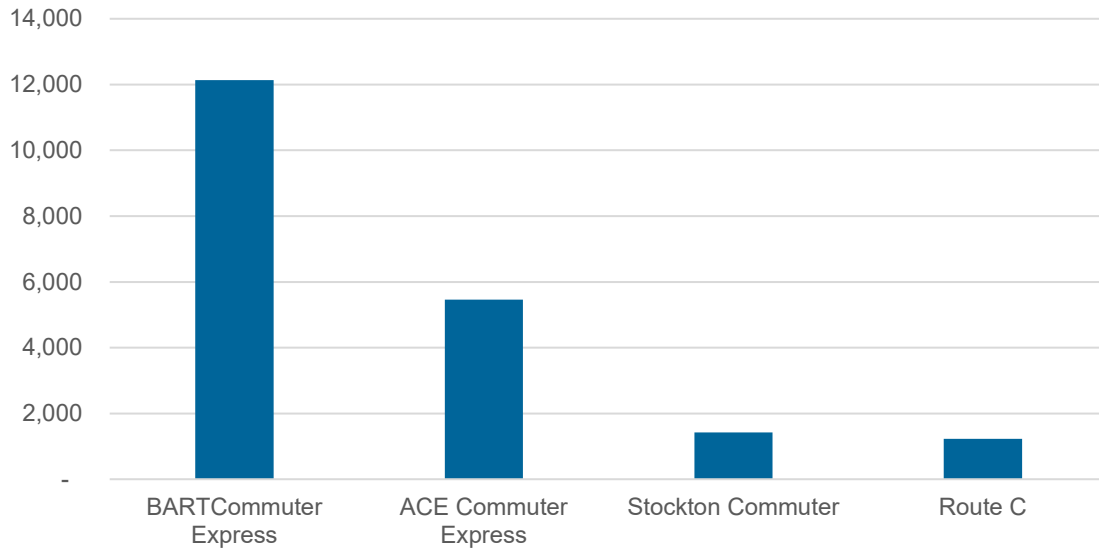
Source: Ride the S

Figure 13 FY 2021 Annual Ridership: Intercity Routes



Source: Ride the S

Figure 14 FY 2021 Annual Ridership: Commuter Routes

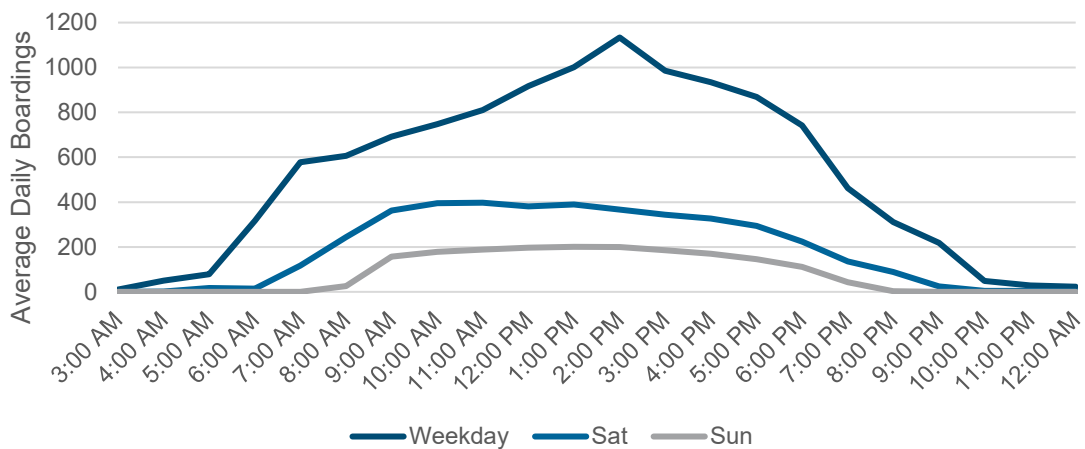


Source: Ride the S

Ridership by Time of Day

Examining ridership by time of day is useful in identifying the periods when transit service is being utilized (see Figure 15). On weekdays, ridership in the system peaks around 2 PM. On weekends, ridership is generally stable between the hours of 8 AM and 6 PM.

Figure 15 Systemwide Ridership by Time of Day and Week



Source: Ride the S, Aug-Sep 2021 data

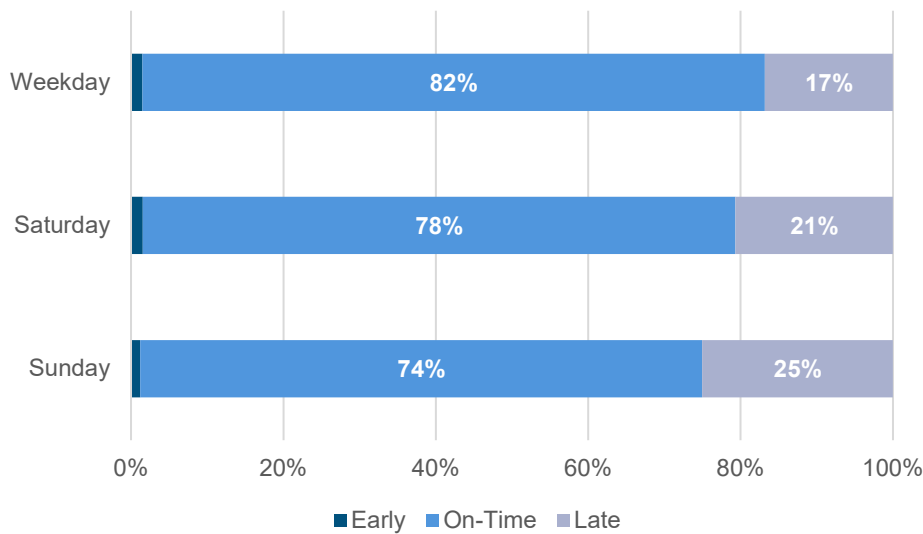
Reliability

Reliability, or having buses arrive on-time, is an important operating practice. Ride the S measures on-time performance for all routes by comparing timepoints on the schedule with the actual time the bus departs. A bus is considered on-time if it departs up to one minute before and five minutes after the scheduled time. Buses that depart earlier or later than that window are not considered on-time.

Ride the S does not currently have a systemwide reliability target. An outcome of this study will be to determine what an appropriate target would be.

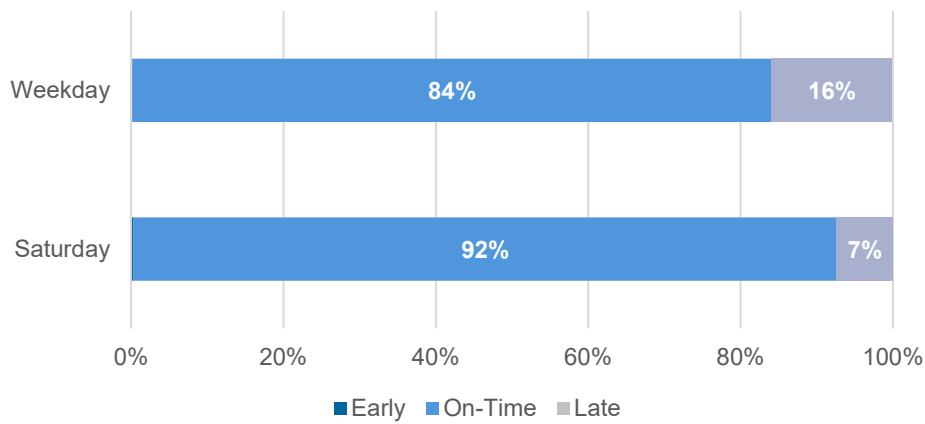
Figure 16 through Figure 18 break down the on-time performance for local, intercity, and commuter routes. The results show generally good on-time performance. There are some noticeable differences between weekday, Saturday, and Sunday for the local and intercity routes that could warrant further examination. For the commuter routes, while 62% on-time is low, the early departures could arguably be added to the on-time percentage because most of these early departures presumably occur at drop off-only stops at the end of the route.

Figure 16 On-Time Performance of Local Routes



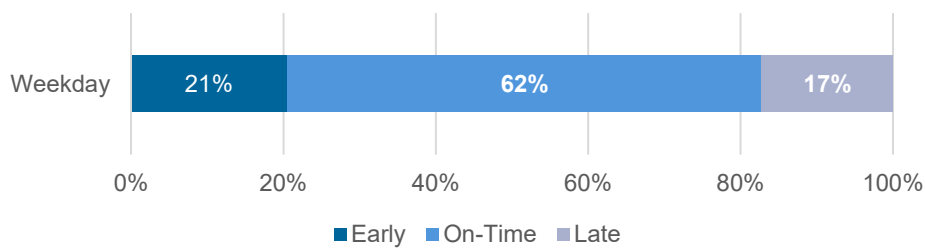
Source: Ride the S, Aug-Sep 2021 data

Figure 17 On-Time Performance of Intercity Routes



Source: Ride the S, Aug-Sep 2021 data

Figure 18 On-Time Performance of Commuter Routes

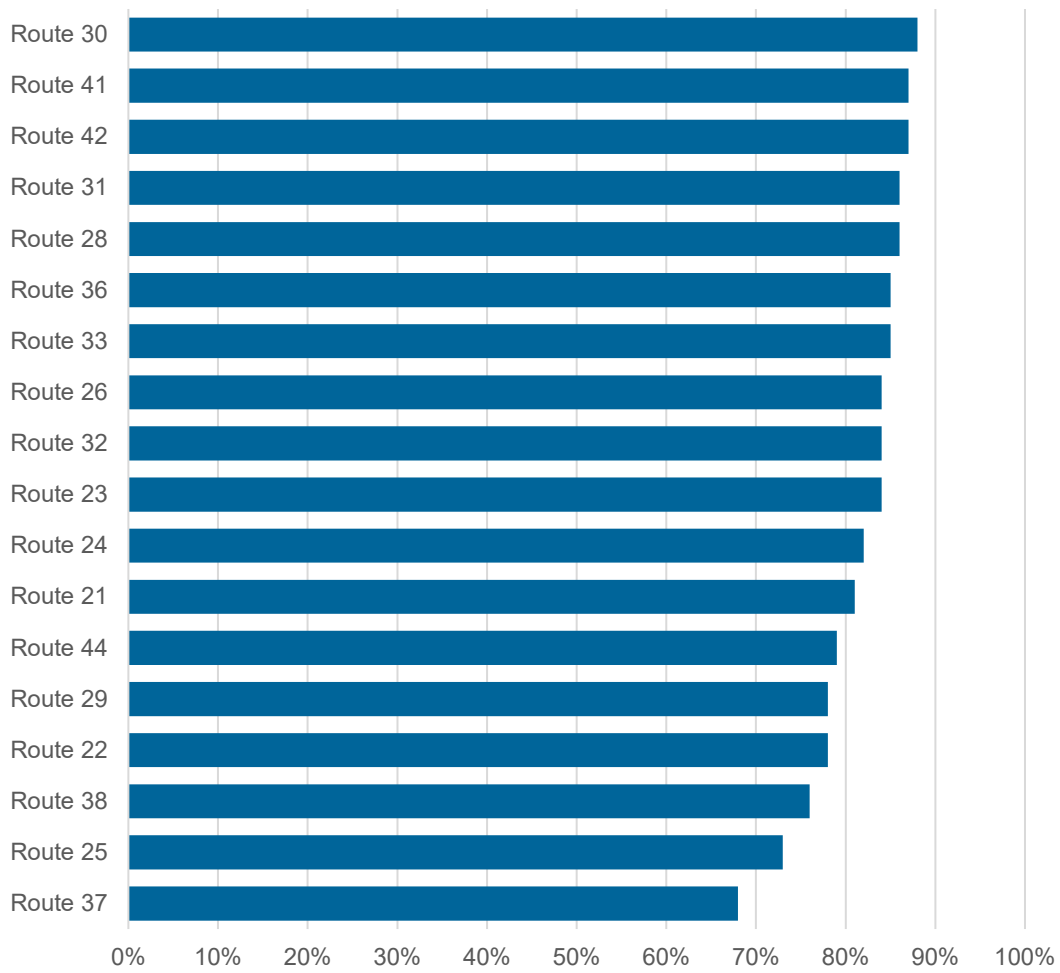


Source: Ride the S, Aug-Sep 2021 data

On-time performance by route is shown in Figure 19 to Figure 24, broken down by weekdays, Saturdays, and Sundays. The next phase of this project will examine this data further to identify possible causes for delays and opportunities for improvement.

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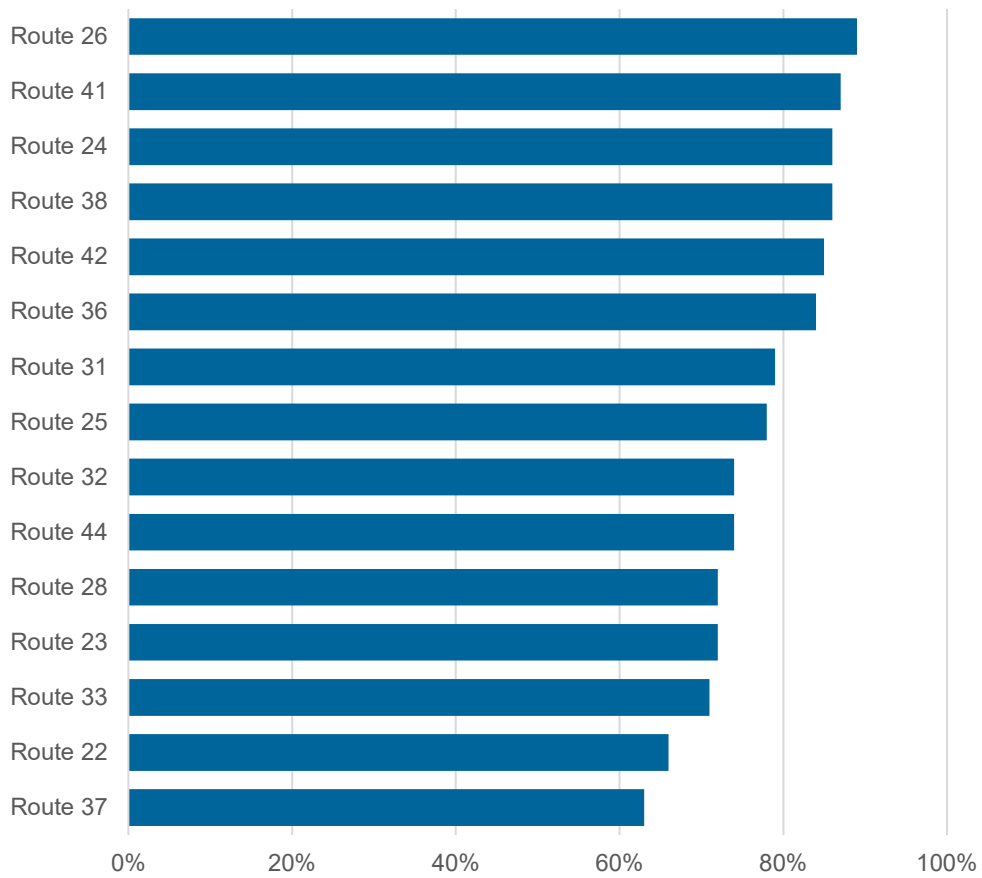
Figure 19 On-Time Performance for Local Routes by Weekday



Source: Ride the S, Aug-Sep 2021 data

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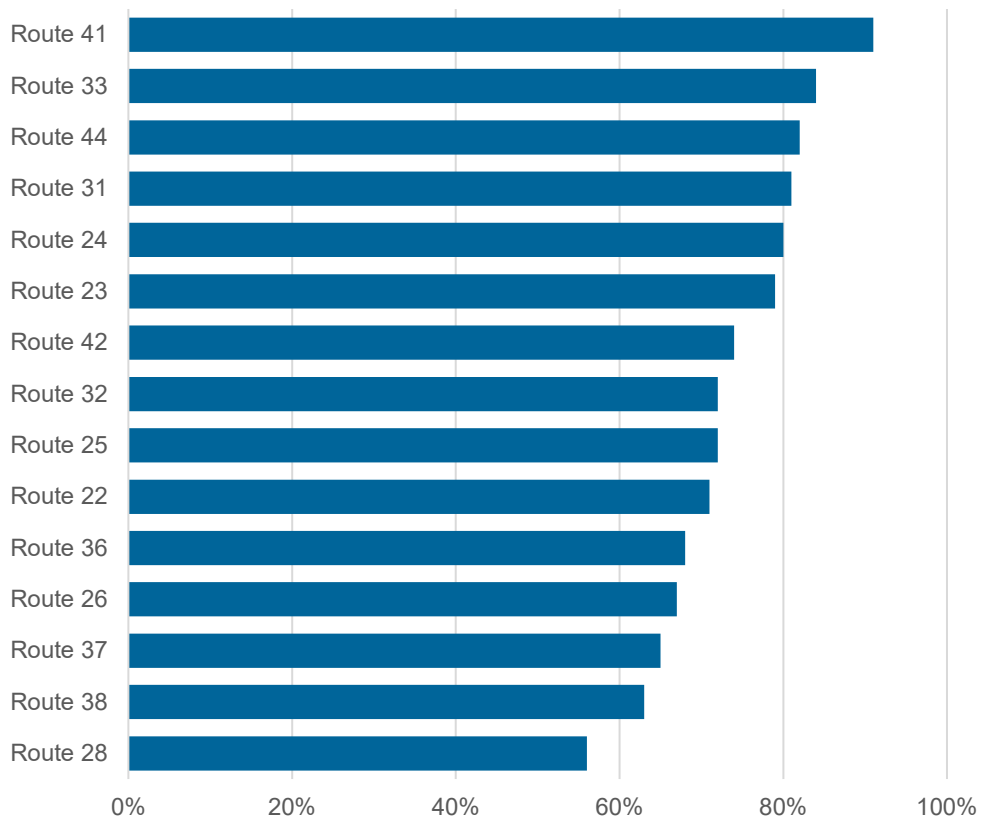
Figure 20 On-Time Performance for Local Routes by Saturday



Source: Ride the S, Aug-Sep 2021 data

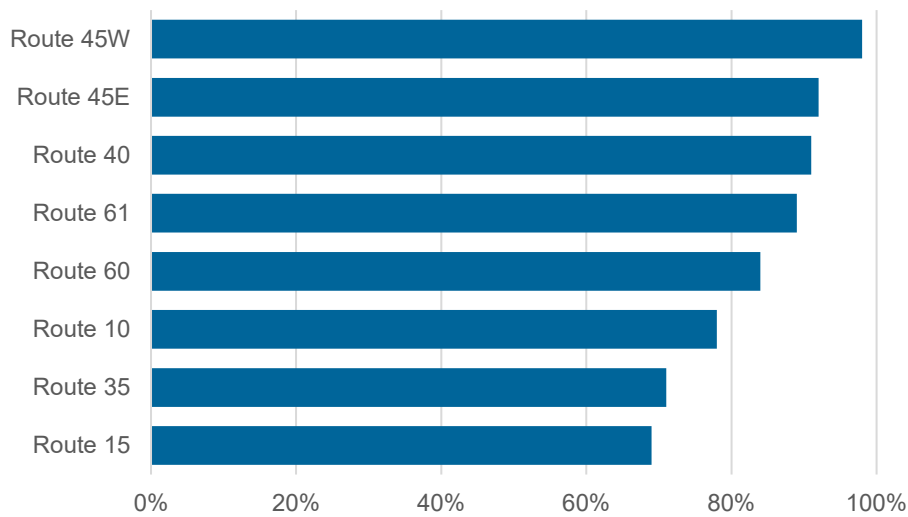
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Figure 21 On-Time Performance for Local Routes by Sunday



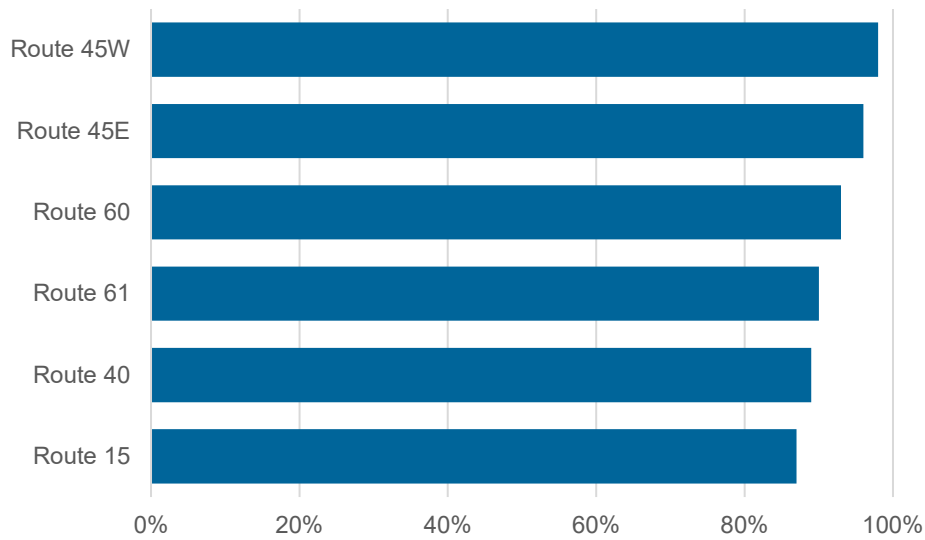
Source: Ride the S, Aug-Sep 2021 data

Figure 22 On-Time Performance for Intercity Routes by Weekdays



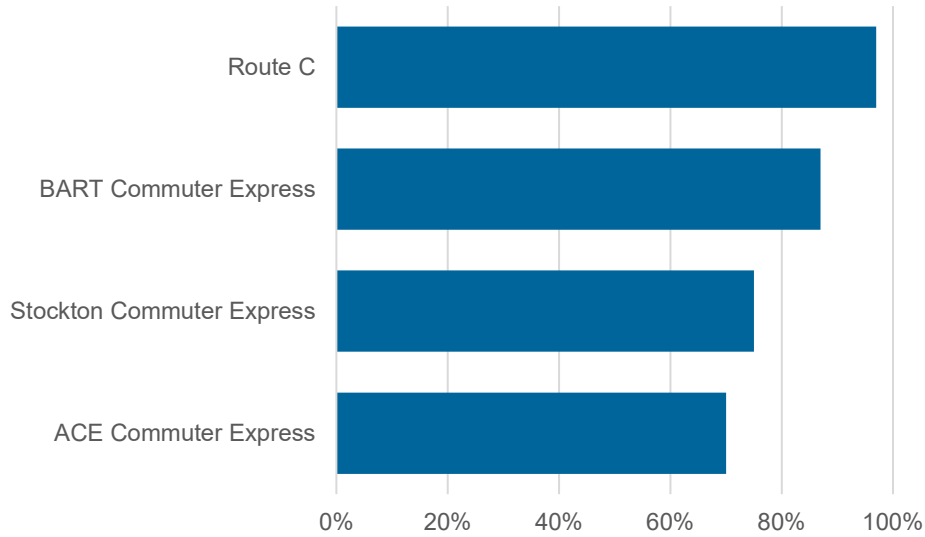
Source: Ride the S, Aug-Sep 2021 data

Figure 23 On-Time Performance for Intercity Routes by Saturdays



Source: Ride the S, Aug-Sep 2021 data

Figure 24 On-Time Performance for Commuter Routes by Weekdays



Note: Commuter routes do not operate on Saturdays and Sundays

Source: Ride the S, Aug-Sep 2021 data

PRODUCTIVITY

This section details the productivity metrics examined for the Ride the S fixed route system. Route scheduling efficiency, and ridership by day, trip, and hour, are presented in the following sections.

Route Efficiency

Efficiently deploying existing vehicles and drivers is a key component to a successful Comprehensive Operations Analysis. One way to examine efficiency is by looking at how trips are scheduled. Before diving into the analysis, below are some key definitions:

- **Running time** is the time it takes for a bus to go from the first stop to the last stop on a trip.
- **Recovery time** is the scheduled time between trips at the end of the route to allow for operator breaks and to provide a buffer so that a late arriving trip does not cause cascading late departures on a route for the rest of the day.
- **Cycle time** is the time it takes for a bus to go from the first stop to the last stop and back to the first, including the recovery time.

Although there are exceptions, recovery times generally should be around 10% of the total cycle time. Very short routes may not need recovery on each trip, while routes in areas with greater variability throughout the day may need more time.

- **Interlining** is a scheduling technique used when cycle times are not efficient. As an example, if a route has a cycle time of 30 minutes and the bus is scheduled to come every 30 minutes, there is a need for one bus. But if the route has a cycle time of 35 minutes, the route will require two buses, and there would be a lot of down time between trips for each bus. Interlining allows one bus to be scheduled in conjunction with another route, so that the vehicle is not sitting out of service for a long period of time.

While efficient utilization of resources could be handled with scheduling software programs, it is only one tool in the toolkit. Talking to drivers about where they feel they must rush to stay on schedule or drive slower to not be early can provide information that a scheduling program could not know. On-time performance can also offer clues.

Routes with excessive recovery time are candidates for interlining with other routes, while cycle times with too little recovery are candidates for modification. Ride the S interlines various routes depending on day of the week, as shown in Figure 25.

Weekday cycle times are shown in Figure 26. Recovery as a percentage of total cycle time is shown in Figure 27. This table excludes routes that do not have trips with regular cycle times, such as Route 35 and the commuter routes.

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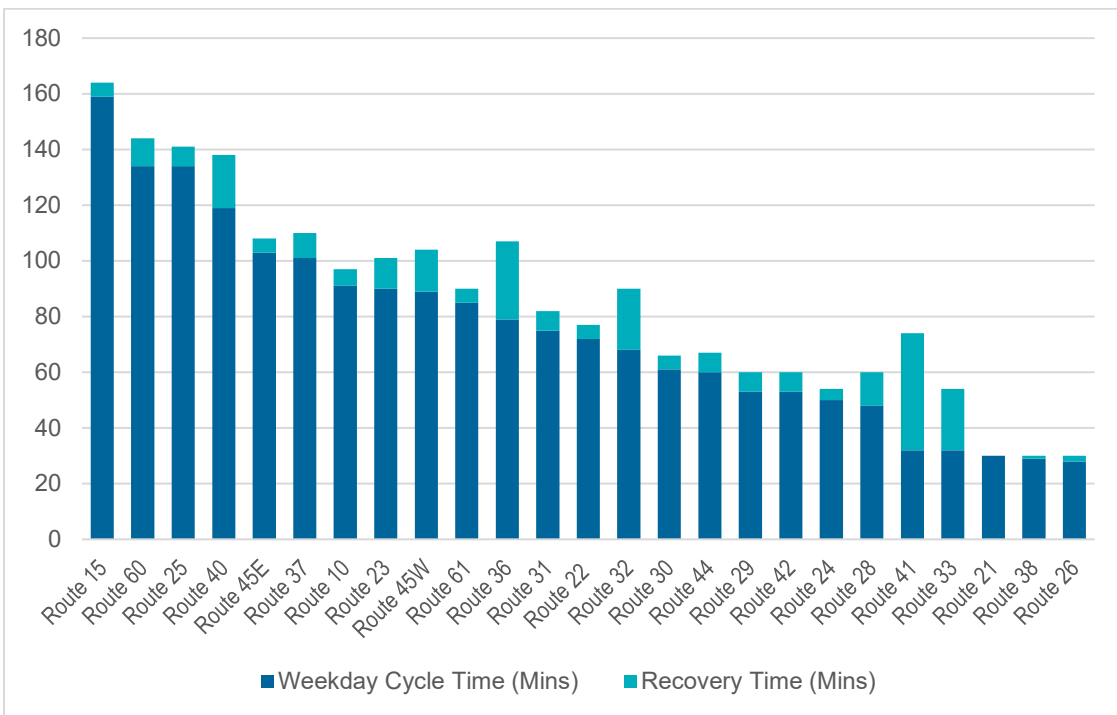
The analysis shows four routes have over 30% recovery time built into their schedules and another five routes have 5% or less recovery time built into their schedules. Figure 28 shows the peak vehicle requirements associated with the scheduled cycle time, assuming buses do not interline.

Figure 25 Interlined Routes by Day of the Week

Weekday	Saturday	Sunday
Routes 26 and 33	Routes 21, 25, and 38	Routes 22 and 38
Routes 28 and 31	Routes 22 and 32	
Routes 30 and 32	Routes 30 and 33	
Routes 38 and 41	Routes 26 and 41	
Routes 40, 45E, and 45W	Routes 29 and 36 (one block is not interlined)	

Source: Transdev March 2022 Runcut

Figure 26 Weekday Cycle Times



Source: Current published schedules as of 1/19/22

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Figure 27 Weekday Recovery Time

Route	% Recovery to Cycle Time
Route 41	131%
Route 33	69%
Route 36	35%
Route 32	32%
Route 28	25%
Route 45W	17%
Route 40	16%
Route 29	13%
Route 42	13%
Route 23	12%
Route 44	12%
Route 31	9%
Route 37	9%
Route 30	8%

Route	% Recovery to Cycle Time
Route 24	8%
Route 60	7%
Route 26	7%
Route 22	7%
Route 10	7%
Route 61	6%
Route 25	5%
Route 45E	5%
Route 38	3%
Route 15	3%
Route 21	0%

Note: Route 35 and the commuter routes are not included.

Source: Current published schedules as of 1/19/22

Figure 28 Weekday Peak Vehicle Requirements

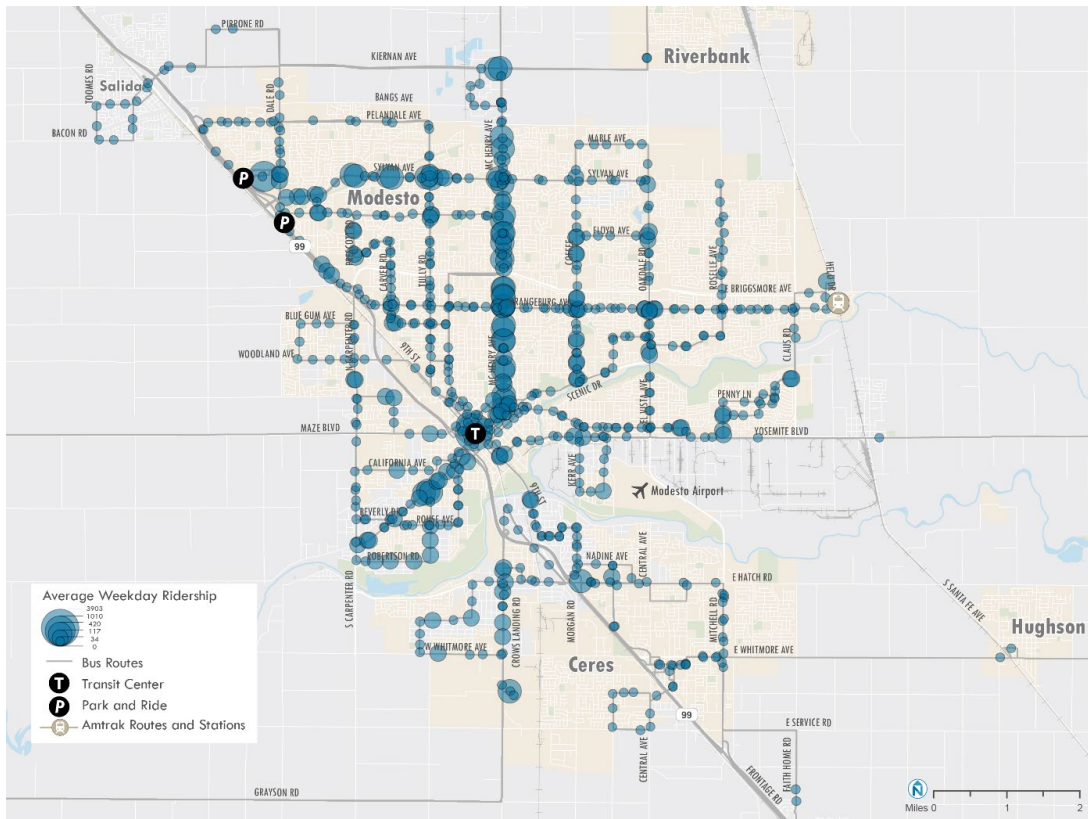
Route	Peak Vehicle Requirement	Route	Peak Vehicle Requirement
Route 10	2	Route 33	2 (Interlined with Route 26)
Route 15	3	Route 35	1
Route 21	3	Route 36	3
Route 22	3	Route 37	4
Route 23	3	Route 38	2
Route 24	1	Route 40	2
Route 25	5	Route 41	2
Route 26	2 (Interlined with Route 33)	Route 42	2
Route 28	1	Route 44	1
Route 29	2	Route 45E	2
Route 30	2 (Interlined with Route 32)	Route 45W	1
Route 31	3	Route 60	2
Route 32	2 (Interlined with Route 30)	Route 61	1

Source: Ride the S, Current driver run cuts

Average Boardings by Day

Average weekday ridership by stop for routes serving the Modesto area are shown in Figure 29. As can be seen, the McHenry Avenue corridor has the strongest ridership demand in Modesto.

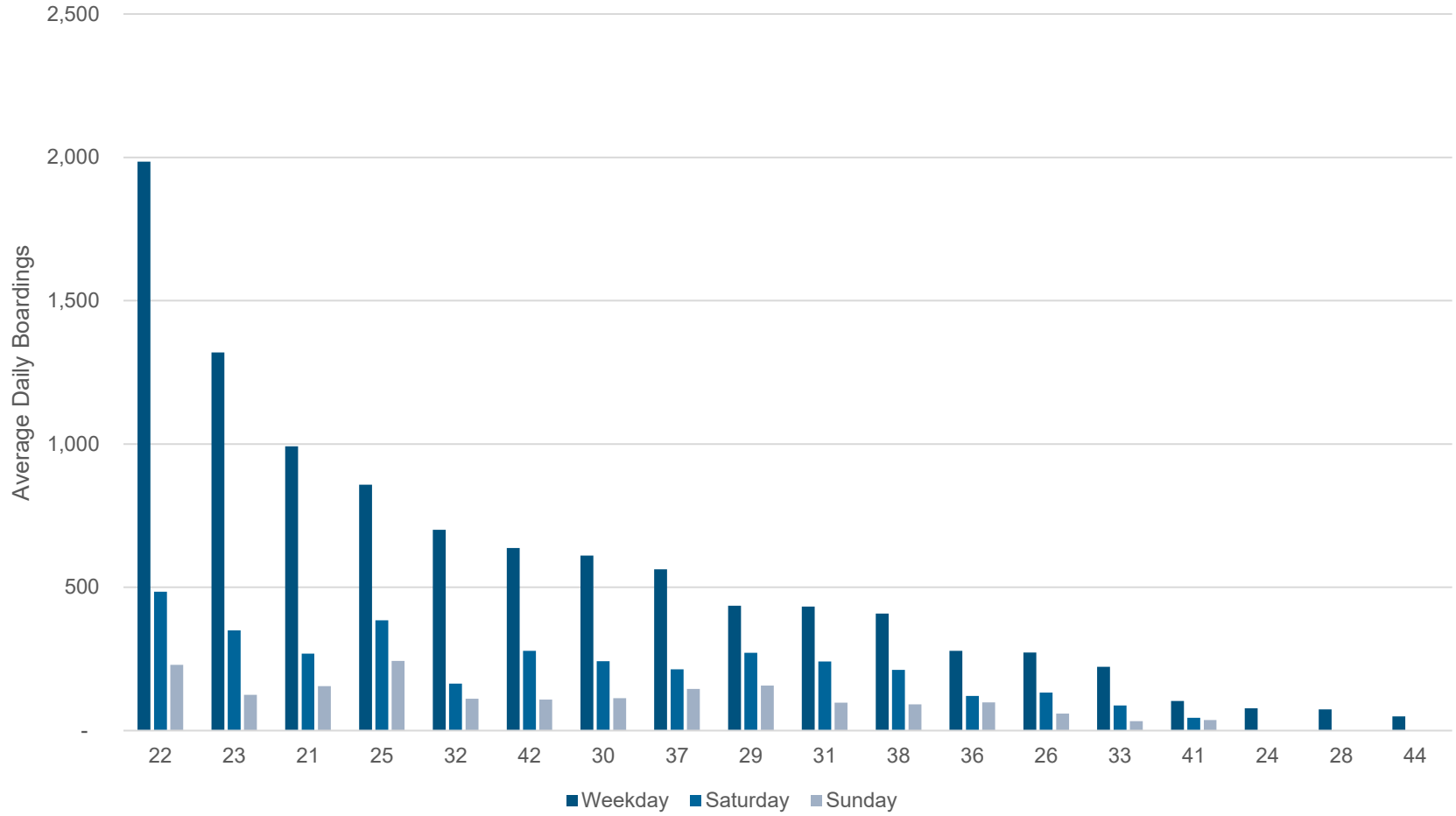
Figure 29 Average Weekday Ridership, Modesto Area



Source: Ride the S, Aug-Sep 2021 data

Ridership by route was also examined for each of the different groups: local, intercity, and commuter routes. Figure 30 shows the average daily boardings for the local routes. The data shows a very large variation between routes with high and low ridership. Some of the lower ridership routes (Routes 24, 28, and 44) carry less passengers than some intercity routes, indicating there may be opportunities for improvement.

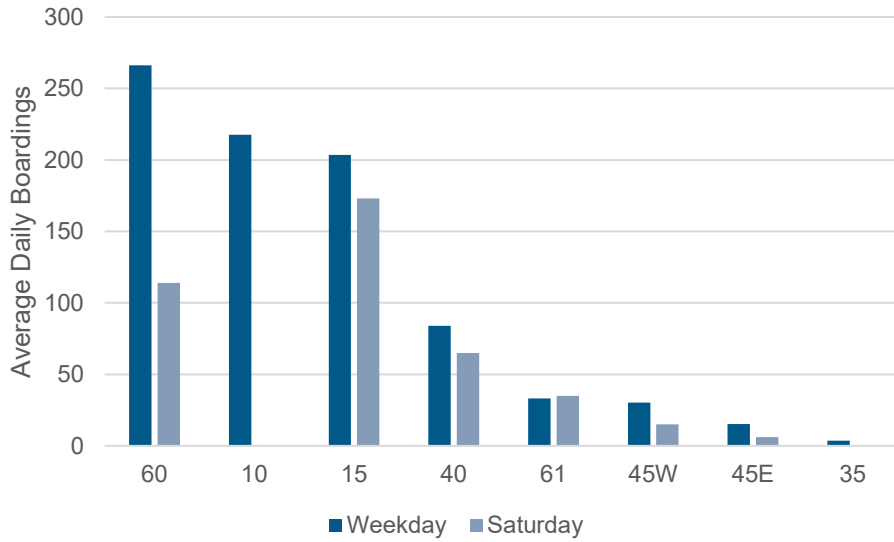
Figure 30 Average Daily Boardings: Local Routes



Note: Routes 24, 28, and 44 do not operate on Saturdays and Sundays

Source: Ride the S, Aug-Sep 2021 data

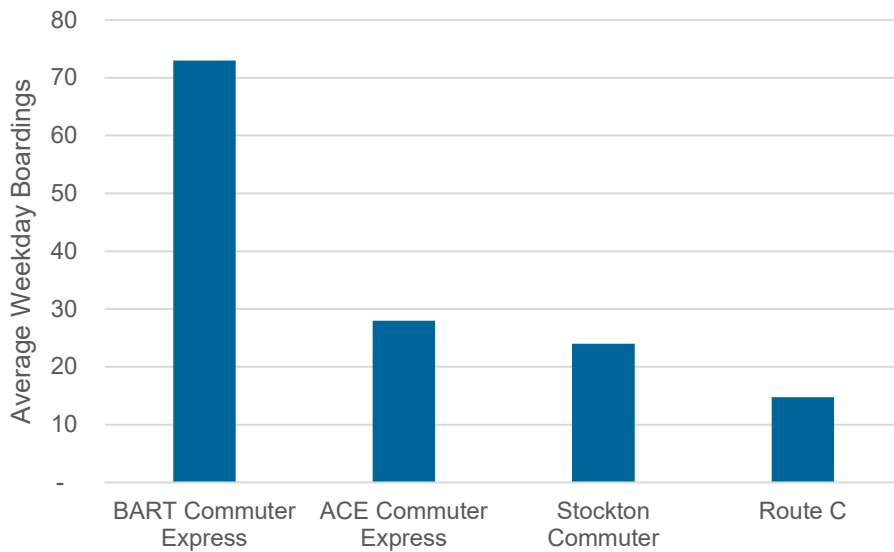
Figure 31 Average Daily Boardings: Intercity Routes



Note: All intercity routes do not operate on Sundays. Route 10 does not operate on Saturdays. Data for Route 45E is missing.

Source: Ride the S, Aug-Sep 2021 data

Figure 32 Average Weekday Boardings, Commuter Routes



Source: Ride the S, Aug-Sep 2021 data

Average Passengers by Hour or Trip

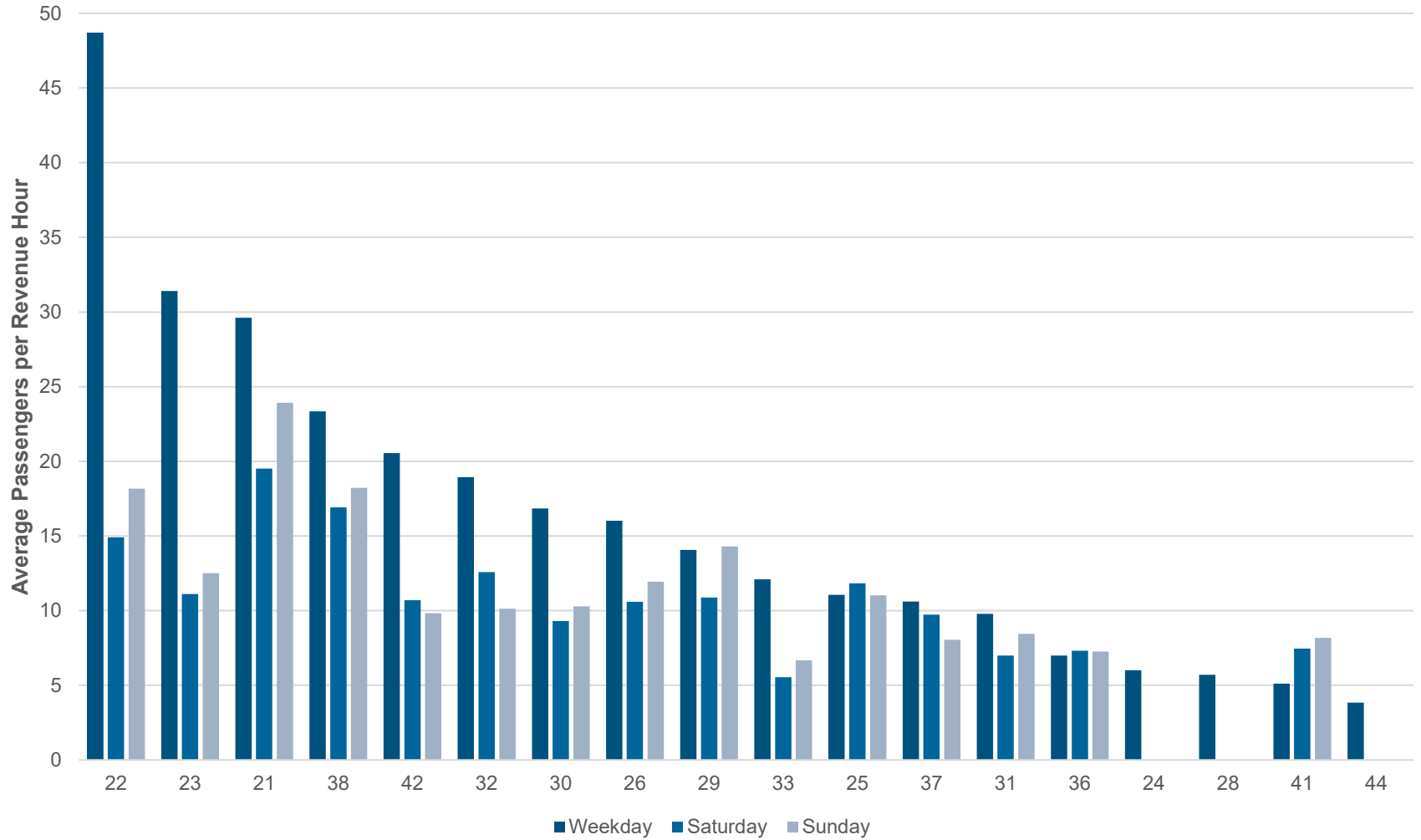
Productivity is measured differently depending on the type of service. Routes with regular, all-day service can be measured based on the hours of service provided. Routes with infrequent service (less frequent than one trip an hour) or just a few trips a day are measured based on the number of trips provided.

Local routes are measured using boardings per hour, as shown in Figure 33. For intercity connector and commuter routes, boardings per trip is used, shown in Figure 34 and Figure 35.

For the local routes, productivity ranges from 4 to 49 passengers per revenue hour. Some of the highest performing local routes are Routes 21, 22, and 23. Not surprisingly, Route 21 is also the most frequent route in the system, operating every 15 minutes throughout most of the day on weekdays. Some of the lower productivity routes, such as Routes 28, 41, and 44, provide coverage service but represent potential opportunities for changes to improve productivity.

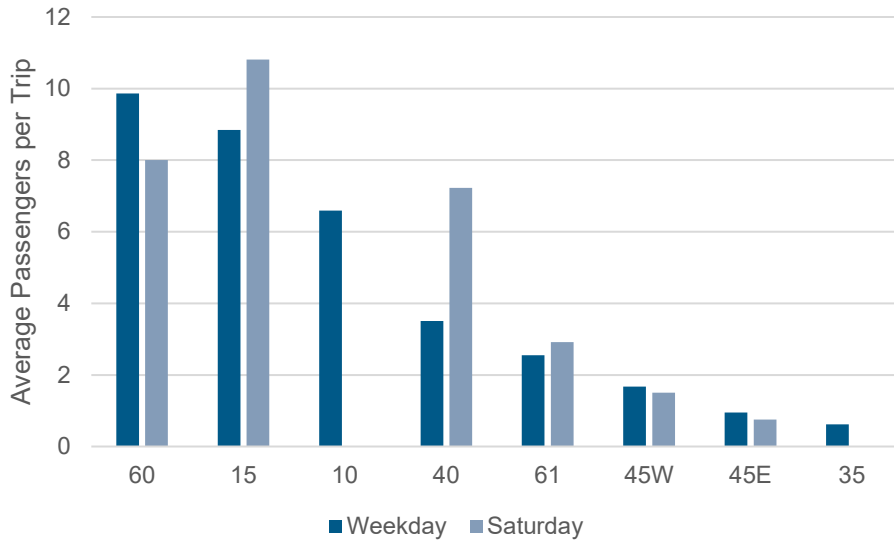
The intercity and commuter routes have low weekday productivity, with fewer than 10 passengers per trip on all routes; however, this is not surprising as the pandemic continues to suppress demand for regional commuting. While some intercity routes have higher boardings per trip on Saturdays, that is most likely an artifact of less service being provided on Saturdays, resulting in ridership being concentrated on fewer trips.

Figure 33 Average Passengers per Revenue Hour, Local Routes



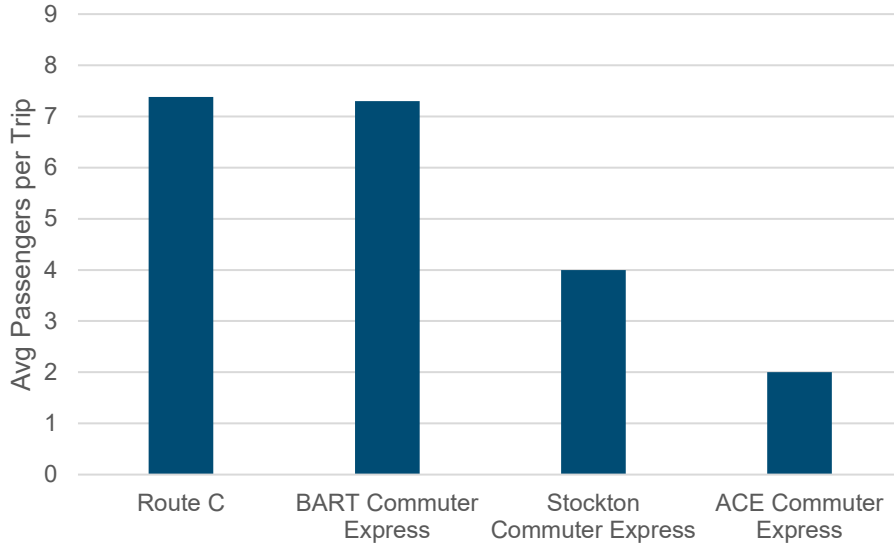
Source: Ride the S, Aug-Sep 2021 data

Figure 34 Average Passengers per Trip, Intercity Routes



Source: Ride the S, Aug-Sep 2021 data

Figure 35 Average Passengers per Trip, Commuter Routes



Source: Ride the S, Aug-Sep 2021 data

ROUTE PROFILES

Each of the 30 routes operated by Ride the S were evaluated on a variety of metrics. Each line is highlighted in its own two- or three-page line profile. Sheets are presented chronologically by group (local routes, intercity routes, and commuter routes). The route profiles can be found in Appendix A.