

Chapter 3

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3. WRTA RIDERSHIP AND RIDERSHIP TRENDS

3.1 Service Overview

The Worcester Regional Transit Authority (WRTA) provides transit service to over half a million people. The service area spans 37 communities and 866 square miles. WRTA provides fixed-route service to the following 17 communities: Auburn, Brookfield, Charlton, East Brookfield, Grafton, Leicester, Millbury, Northbridge, Oxford, Paxton, Shrewsbury, Southbridge, Spencer, Webster, Westborough, West Boylston, and Worcester. WRTA also provides paratransit service to eligible individuals. All routes operate to and from Worcester, with the majority of the routes serving the Union Station Hub.

WRTA runs four types of service: fixed-route, ADA paratransit, non-ADA paratransit, and elder shopper service. WRTA operates 34 routes: 25 local fixed-route, 4 community services, 4 community shuttles², and 1 elder shopper service. Of the 30 routes that have been in operations for over a year, 28 run on weekdays, 22 run on Saturdays, and 13 run on Sundays. WRTA maintains a fleet of 51 vehicles. WRTA’s peak operation occurs at noon with 42 vehicles in use. The Elder Shopper Shuttle operates three days a week, connecting different senior communities with different daily needs each day. Route 80 – Downtown Hub Loop and Route 99 – White City Shuttle are special services that provide mobility for passengers in downtown Worcester and to White City Shopping Center in response to detours and construction projects. Table 2 provides an overview of the services operated by WRTA.

Table 2. WRTA Route Overview

Route	Service Type	Description	Days Operated	Weekday Service Span	Weekday Frequency
1	Fixed-route	Union Station Hub - Mount St. Ann via Providence St.	Daily	6:00 AM – 8:00 PM	60
2	Fixed-route	Union Station Hub - Tatnuck Square Airport	Daily	6:15 AM – 9:15 PM	60
3	Fixed-route	Union Station Hub - Worcester State University via Highland St.	No Sundays	5:00 AM – 11:30 PM	60
4	Fixed-route	Union Station Hub - The Shoppes at Blackstone Valley via Millbury St.	Daily	8:15 AM – 8:45 PM	60
5	Fixed-route	Union Station Hub - Southwest Commons via Grafton St.	Daily	5:15 AM – 8:45 PM	30
6	Fixed-route	Union Station Hub - West Tatnuck via Chandler St.	No Sundays	6:15 AM – 8:30 PM	60
7	Fixed-route	Union Station Hub - Washington Heights Apts.	Daily	5:15 AM – 11:30 PM	30
8	Fixed-route	Union Station Hub - Greendale Mall via Shore Drive	Weekdays only	5:30 AM – 7:00 PM	60

² The four community shuttles are the Westborough, Paxton, Northborough and Grafton shuttles. All four are less than a year old and are thus too new to analyze in the same manner as the other routes. They will be examined separately for trends and growth to determine if improvements to the service are needed. A quick synopsis of this analysis will be in the alternatives and recommendations.



11	Fixed-route	Union Station Hub - The Fair Plaza via Vernon Hill and Greenwood St.	Daily	5:00 AM – 11:30 PM	30
12	Fixed-route	Webster Square to Lincoln Plaza Cross Town	Weekend only	N/A	N/A
14	Fixed-route	Union Station Hub - Showcase Cinemas via Burncoat St.	No Sundays	6:00 AM – 9:00 PM	60
15	Fixed-route	Union Station Hub - Shrewsbury Center via Shrewsbury St & Route 9	No Sundays	5:30 AM – 10:45 PM	60
16	Fixed-route	Union Station Hub – Lincoln Plaza via Hamilton St.	No Sundays	6:00 AM – 8:45 PM	60
18	Fixed-route	Quinsigamond Community College	Weekdays only	8:00 AM – 7:30 PM	60
19	Fixed-route	Union Station Hub - Webster Sq. - Clark University via Main St.	Daily	5:00 AM – 11:30 PM	30
22	Community	Union Station Hub - Shoppes at Blackstone Valley via Millbury Ctr.	No Sundays	6:00 AM – 6:30 PM	60
23	Fixed-route	Union Station Hub - East Mountain St. via Lincoln St.	Daily	5:30 AM – 11:30 PM	30
24	Fixed-route	Union Station Hub - UMass Med. Center via Belmont St.	No Sundays	5:45 AM – 11:15 PM	30
25	Fixed-route	Union Station Hub - Auburn Industrial Park via Canterbury & Southbridge St.	No Sundays	6:30 AM – 8:30 PM	65
26	Fixed-route	Union Station Hub - Great Brook Valley via Lincoln St.	Daily	5:15 AM – 11:30 PM	30
27	Fixed-route	Union Station Hub - Auburn Mall via Main St.	Daily	5:30 AM – 9:15 PM	30
29	Community	Worcester - Southbridge - Charlton	Weekdays only	5:30 AM – 6:30 PM	120
30	Fixed-route	Union Station Hub - W. Boylston Walmart via Grove St.	Daily	5:45 AM – 11:30 PM	30
31	Fixed-route	Union Station Hub - Lincoln Plaza via Grove St. & West Boylston St.	No Sundays	5:00 AM – 7:30 PM	65
33	Community	Worcester - Spencer- Leicester - Brookfield	Weekdays only	4:45 AM – 8:00 PM	60
34	Fixed-route	Union Station Hub - UMass Med. Center via Belmont St.	Sundays only	N/A	N/A
42	Community	Worcester - Oxford - Webster	No Sundays	6:00 AM – 6:45 PM	120
80	Fixed-route	WRTA Downtown Loop	Weekdays only	7:00 AM – 8:00 PM	20
99³	Fixed-route	White City Shuttle	Weekdays only	10:00 AM – 1:15 PM	40
ESS	Fixed-route	Elder Shopper Special (ESS) - Worcester	Tues-Thurs only	Varies	Varies

³ The route 99 was a temporary shuttle instituted as part of remediation efforts during the reconstruction of the Quinsigamond Bridge. It operated for approximately a year and service was discontinued during the summer of 2014 with the completion of the bridge.



3.2 Historical Overview

The WRTA service has faced many challenges in providing service for the past decade and a half. Beginning in the early 2000s, the state of Massachusetts, which funds a large percentage of operating costs, began to face more fiscal constraints, causing the need for service reductions. Following a high point in ridership and productivity, FY 2002, FY 2003 and FY 2004 saw service reductions and subsequent reductions in ridership and productivity. Additionally, there was a 2-month strike in FY 2005 that continued to erode ridership, and the pattern of ridership loss continued for several more years.

In FY 2007 as a result of a Comprehensive Service Analysis (CSA), the WRTA undertook a plan to restructure services to increase core service productivity and eliminate or restructure underperforming routes. As a result, ridership and productivity improved up through FY 2012.

In FY 2013, the state of Massachusetts began to increase funding to RTAs, and the WRTA began to execute expansion of its fixed-route service area, particularly to Southbridge, which was identified as having a dense but isolated population center. As an RTA expands service, hours and miles are immediately added, but ridership takes time to grow and reach its full potential; thus, productivity suffers over the short term.

The WRTA moved operations to a central transfer hub just prior to the start of FY 2014. With the move came a complete re-routing of every route in downtown, many of them along newly-opened roadways and intersections. The re-routing brought significant challenges to on-time performance, particularly because the timing of the trip from City Hall to the new hub varied between two and eight minutes. More hours and miles of service needed to be added to account for the operational issues experienced by the move to the hub and the opening of new streets.

In addition, as part of the WRTA's continued expansion efforts, community shuttles for Northbridge, Paxton, Westborough, and Grafton were initiated mid-year. These new services are gaining ridership but will take a while to reach top performance. WRTA expects that services outside the core will not reach the performance of the core service because of the distances that need to be traveled and lower surrounding population and employment densities. Still, these regional services are an integral part of the network as they allow communities to connect to jobs and services in the hub.

3.3 Ridership

3.31 Weekday Ridership

WRTA carried over 3.7 million riders in FY 2014, averaging 310,000 riders per month. Average daily weekday system ridership is 13,132 passengers. The average for local fixed-routes is 521 passengers per route. Average ridership for community routes is 290 passengers⁴. Routes 11, 26, 27, 19, and 30 have

⁴ The ESS only operates 3 days a week. It runs between housing complexes and local shopping centers. It will go from one housing complex to the shopping facility, then to another complex and facility and then the same in reverse. By NTD standards it is a fixed route because there is a published schedule but it operates more like a demand response than fixed route.



the highest ridership and account for 41 percent of system weekday boardings. Figure 4 shows the average weekday ridership by route for FY 2014.

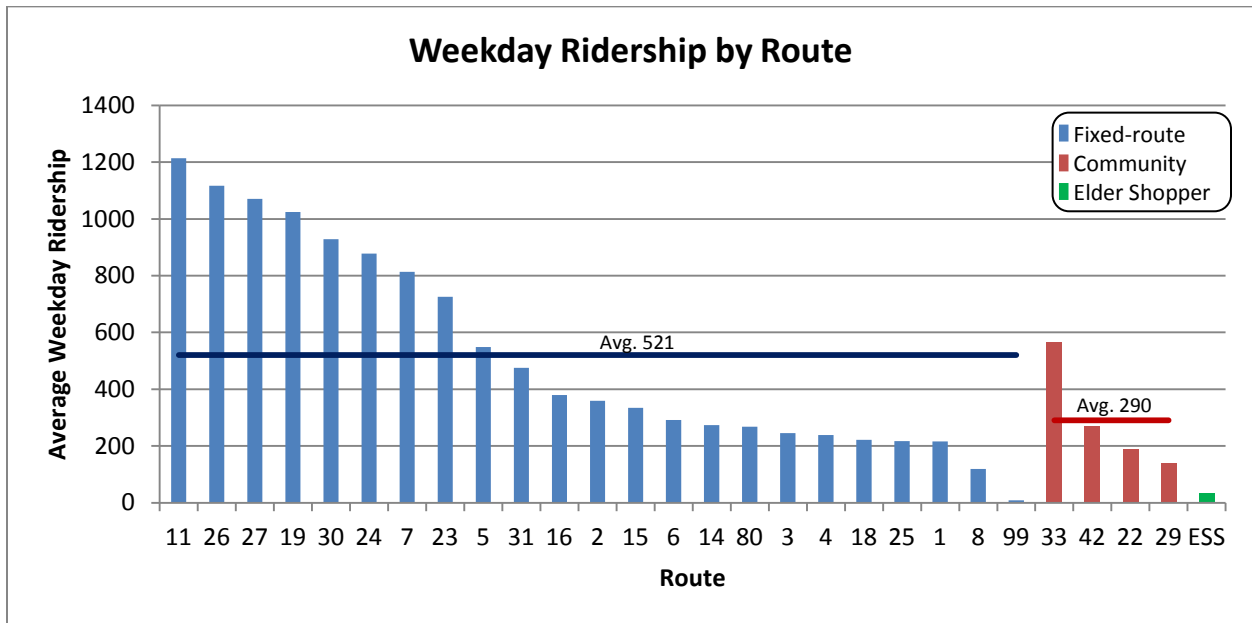


Figure 4. WRTA Weekday Ridership by Route

3.32 Weekend Ridership

Ridership drops significantly on weekends. It is important to note that WRTA runs less service on weekends than on weekdays, contributing to lower weekend ridership. Saturday ridership is 5,753 passengers with an average of 277 passengers per local route and 108 passengers per community route. Sunday ridership is 2,025 passengers with an average of 156 passengers per local route. As on weekdays, Routes 26, 27, 19, 11, and 30 carry the most riders. These five routes account for 53 percent of ridership on Saturdays and 57 percent on Sundays. Figure 5 shows average Saturday ridership by route and Figure 6 shows average Sunday ridership by route⁵.

⁵ Route 12 was eliminated during the summer of 2014 for both Saturday and Sunday due to perceived low productivity

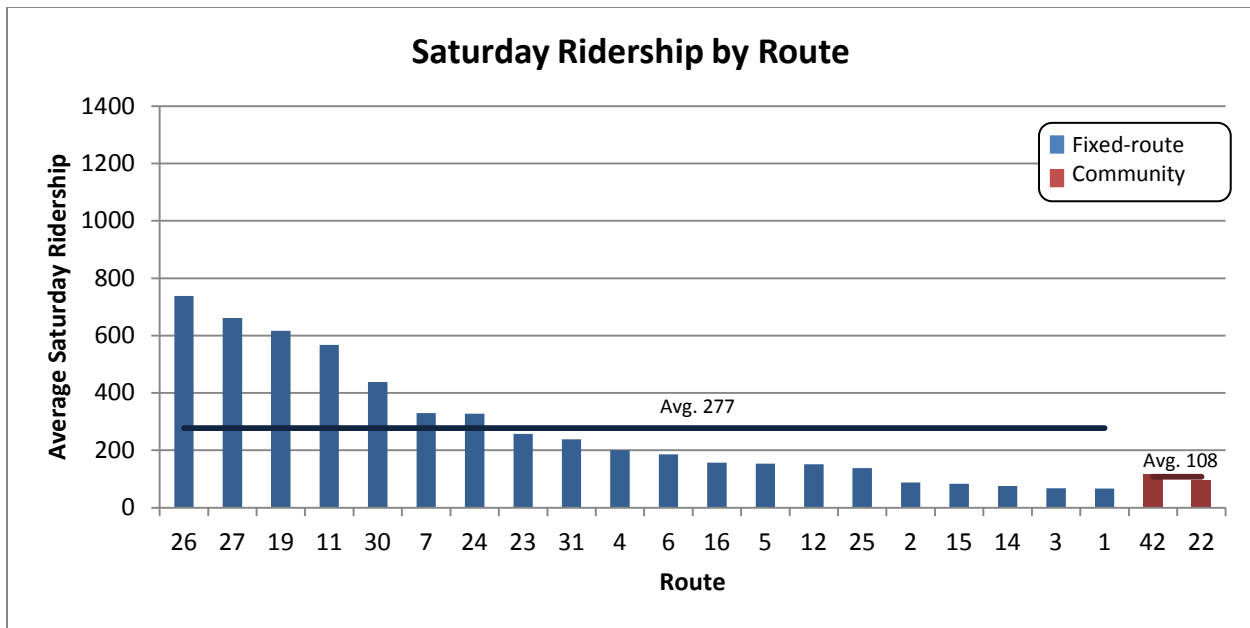


Figure 5. WRTA Saturday Ridership by Route

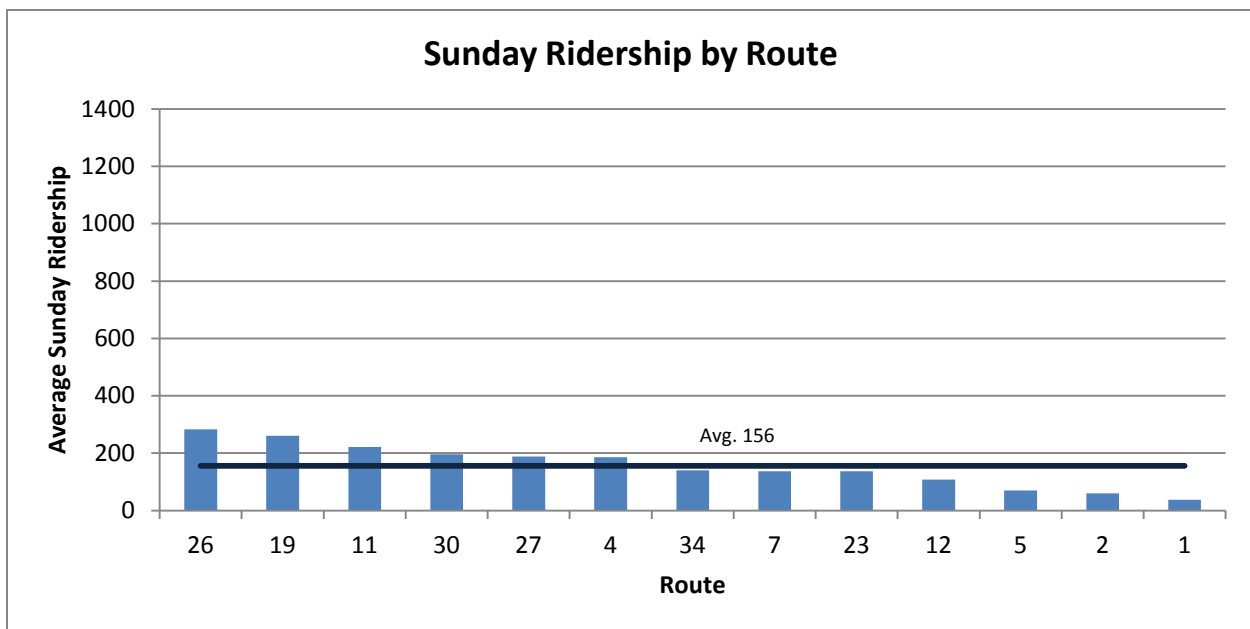


Figure 6. WRTA Sunday Ridership by Route

3.4 Service Operations

WRTA operated over 155,000 revenue hours and 1.8 million revenue miles in FY 2014. Operations cost around \$17.3 million. WRTA has an hourly operating cost of \$109.50 per revenue hour, according to the most recent NTD report from 2012.



3.5 Service Productivity

3.51 System Productivity

Productivity measures the ridership generated per unit of service (revenue hours or revenue miles) and provides an understanding of the effectiveness of a route or transit network.

System-wide productivity for FY 2014 was 23.6 passengers per revenue hour. As defined in the December 2012 Service Standards, WRTA’s system wide productivity target is 30.0 passengers per revenue hour, and current service does not meet this target. On an individual route levels, Routes 26, 27, and 19 exceed the 30.0 passengers per revenue hour with an annual productivity of 31.0, 34.2, and 31.0, respectively.

3.52 Weekday Productivity

The system has an average weekday productivity of 23.5 passengers per revenue hour, with a productivity of 24.1 on local routes and 19.1 on community routes⁶. WRTA routes exhibit a wide range of performance as shown in Figure 7. The route with the highest performance is Route 26 with 34.3 passengers per revenue hour while the route with the lowest performance is Route 99 with 2.7 passengers per revenue hour. The top three performing routes (Routes 26, 19, 27) were all in the top five routes by ridership. Routes 11 and 30 were also in the top five routes by ridership but they rank lower in productivity.

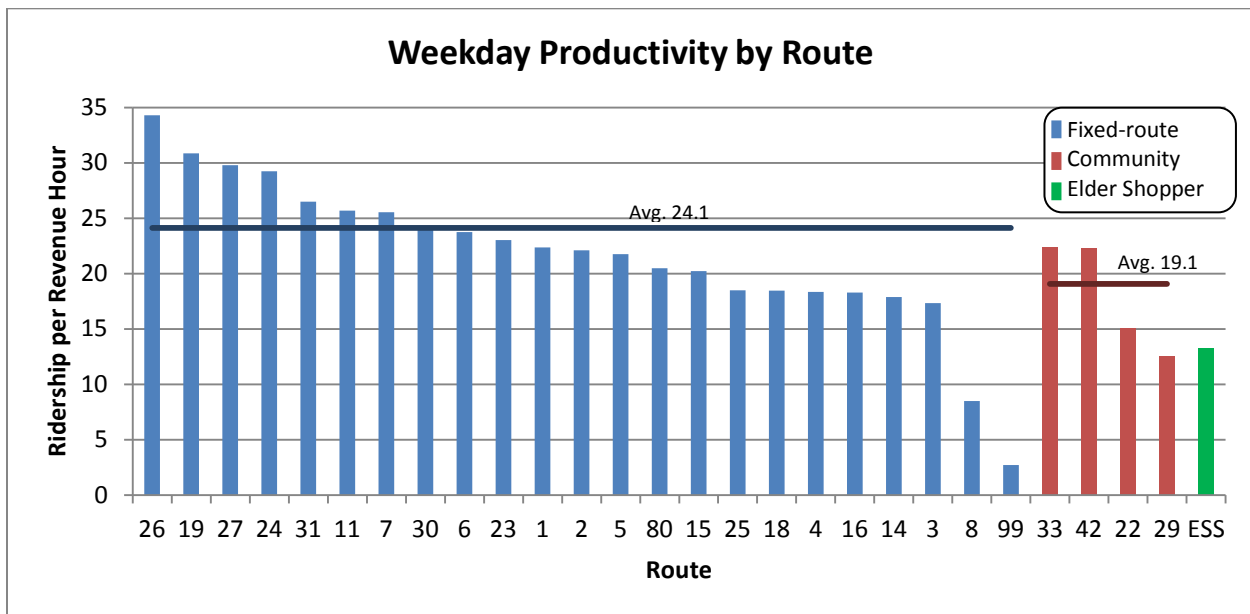


Figure 7. WRTA Weekday Productivity by Route

⁶Due to the way the ESS operates there can be a lot of recovery time on the route which skews the ridership per revenue hour to be low. The ESS will go to a residential complex to transport passengers to shopping facilities, if there are no passengers at the complex the vehicle moves on to the next complex and does not go to the shopping facility associated with that residential area. A measure showing Ridership per revenue hour might prove that the route is more efficient then it appears at the onset.

3.53 Weekend Productivity

Saturday routes have stronger performance than weekday routes. Average Saturday productivity is 24.7 passengers per revenue hour. Route 27 has the highest productivity with 42.1 while Route 22 has the lowest with 12.1 passengers per revenue hour. Figure 8 shows average Saturday productivity by route.

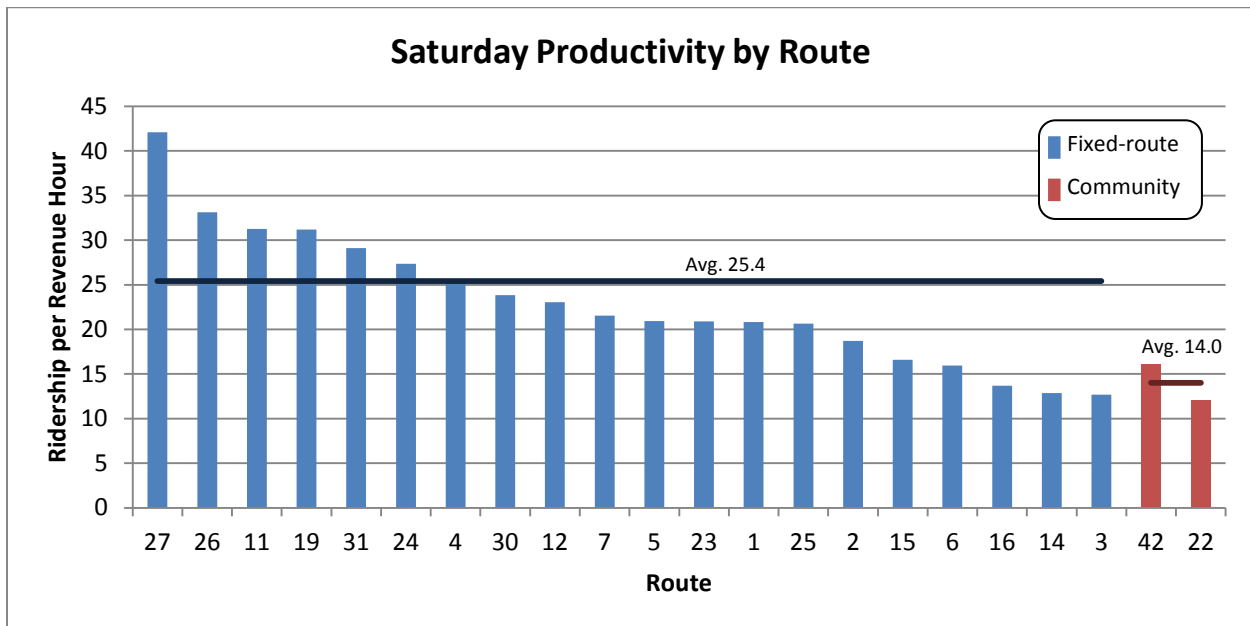


Figure 8. WRTA Saturday Productivity by Route

Sunday productivity is also strong, with an average of 24.3 passengers per revenue hour. There is a large difference between Saturday and Sunday ridership, but average productivity on these days is almost the same. This suggests that WRTA has done a good job varying service levels on Sundays to reflect the lower demand for service. Out of all the day types, only on Sundays are the top five routes by boardings also the top five highest performing routes. Route 27 has the highest productivity on Sundays with 37.5 and Route 1 has the lowest with 11.5 passengers per revenue hour. Figure 9 shows average Sunday productivity by route in FY 2014.

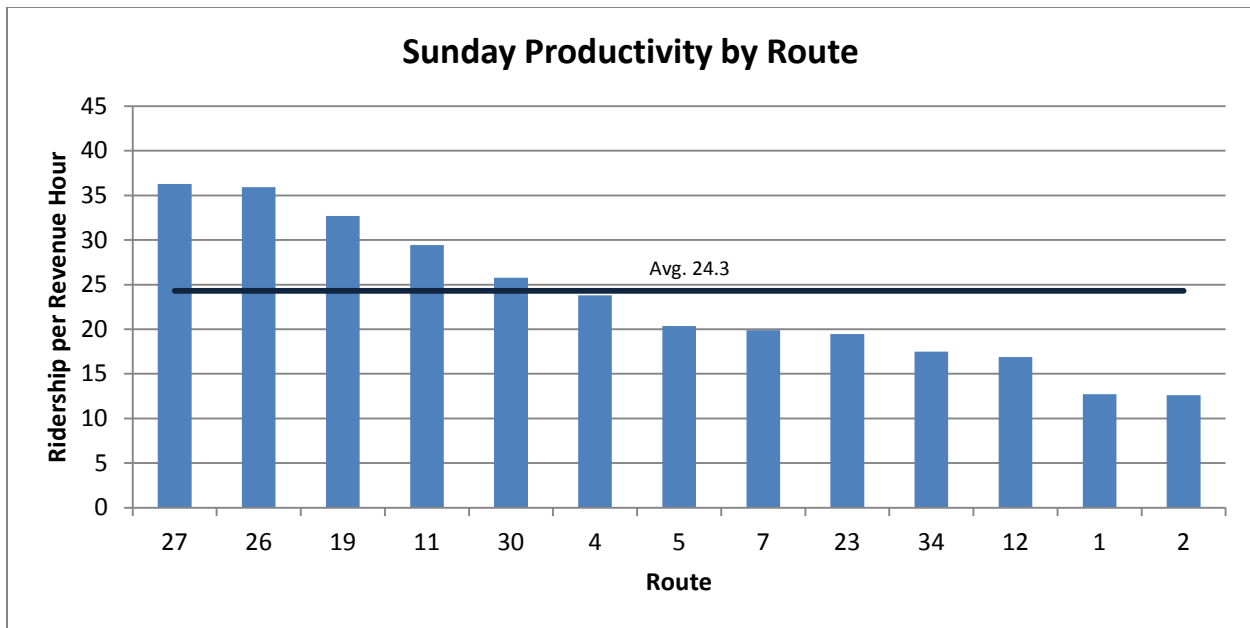


Figure 9. WRTA Sunday Productivity by Route

3.5 Financial Performance

3.5.1 System Farebox Recovery Ratio

The farebox recovery ratio is the ratio of fare revenue to operating costs. Higher ratios indicate higher cost-effectiveness and measure the portion of operating costs covered by passenger fares. The higher the farebox ratio, the lower the subsidy a route needs to operate, leaving more funding available to operate more service.

WRTA’s farebox recovery ratio in FY 2013 was 21.7 percent. WRTA’s performance standard for farebox recovery is 20 percent. 20 percent is a nationwide standard for farebox recovery. Service in FY 2013 met WRTA’s farebox recovery standard overall, while 10 of the 28 routes in service for FY 2013 met or exceeded WRTA’s 20 percent target.

3.5.2 System Subsidy per Passenger

Subsidy per passenger measures how much it costs to operate a route on a “per passenger” basis. It is calculated by subtracting passenger revenue from operating cost and dividing by the total number of passengers. Lower passenger subsidy values indicate that a greater portion of operating costs are recovered through passenger fares, and are more desirable for financial sustainability.

WRTA’s performance measure for subsidy per passenger measures the ridership cost for each route compared to average for all routes. In the case of route subsidy, a higher percentage is a negative thing because it means it costs more for WRTA to provide service on a per passenger basis. Routes that perform equal to or less than 100 percent of the average for all routes require no further action to be taken. Routes performing between 100-200 percent of the average are reviewed to determine potential for performance improvement. Routes performing above 200 percent of the average are reviewed for



discontinuation, or continuation in six month intervals. However, if a poor-performing route requires few resources, it may be continued despite its low performance if its costs can be offset by high-performing routes. Routes that fall under this category are identified in the individual day type sections.

3.53 Weekday Subsidy per Passenger

Average weekday subsidy per passenger in FY 2013 was (\$3.42) with an average of (\$3.29) for local fixed-routes and (\$4.62) for community services. Route 27 had the lowest subsidy of (\$2.14). Of local fixed-route service, Routes 8 and 99 stand out with the highest subsidies of (\$26.36) and (\$97.23) per passenger, respectively. Six routes fall under the 200 percent of system average standard for subsidy (\$6.84): Routes 3, 8, 99, 22, 29, and ESS. Figure 10 shows average subsidy per passenger by route on weekdays.

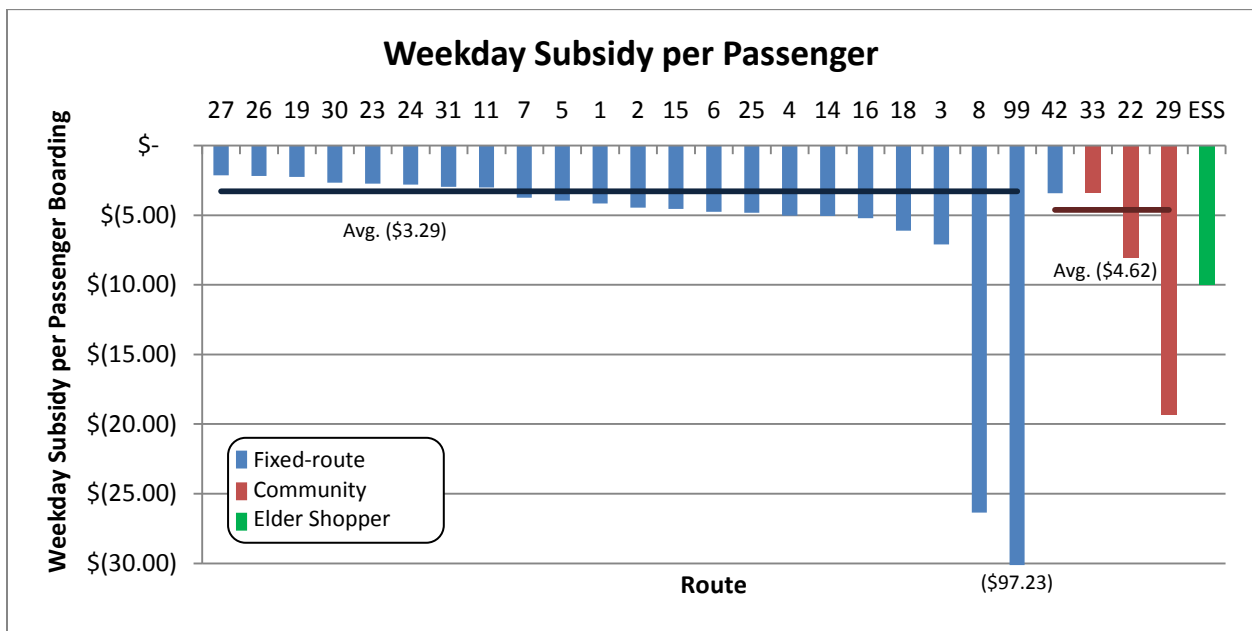


Figure 10. WRTA Weekday Subsidy per Passenger

3.54 Weekend Subsidy per Passenger

Average system-wide Saturday subsidy per passenger is (\$3.55). Average subsidy is (\$3.46) for local routes and (\$10.80) for community routes. Although many individual routes have higher subsidies on Saturdays than on weekdays, overall, the average subsidy per passenger is lower on Saturdays. Route 27 has the lowest subsidy of (\$1.78) and Route 22 has the highest subsidy of (\$11.64). Routes 16, 6, 15, 3, 42, and 22 fall below the 200 percent standard (\$7.10) on Saturdays. Figure 11 shows average Saturday subsidy per passenger by route in FY 2013.

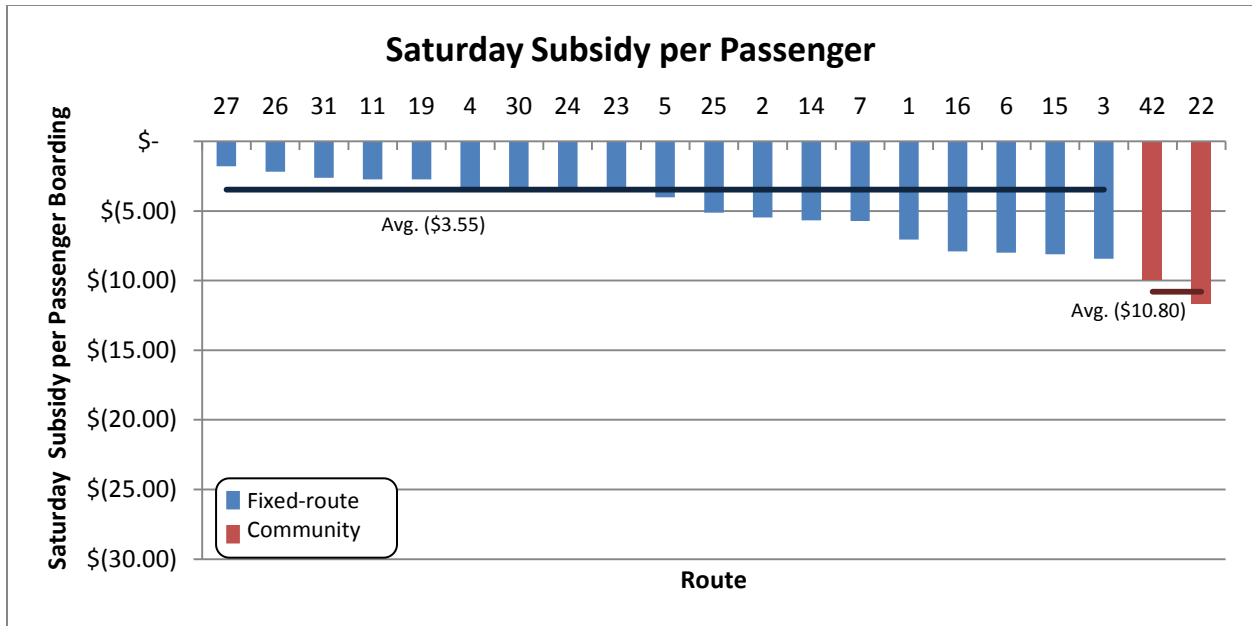


Figure 11. WRTA Saturday Subsidy per Passenger

Average Sunday subsidy per passenger is \$(9.19). Route 26 has the lowest subsidy of \$(5.15) and Route 7 has the highest subsidy of \$(19.19). Only Route 7 falls below the 200 percent service performance standard. Figure 12 shows average Sunday subsidy per passenger by route in FY 2013.

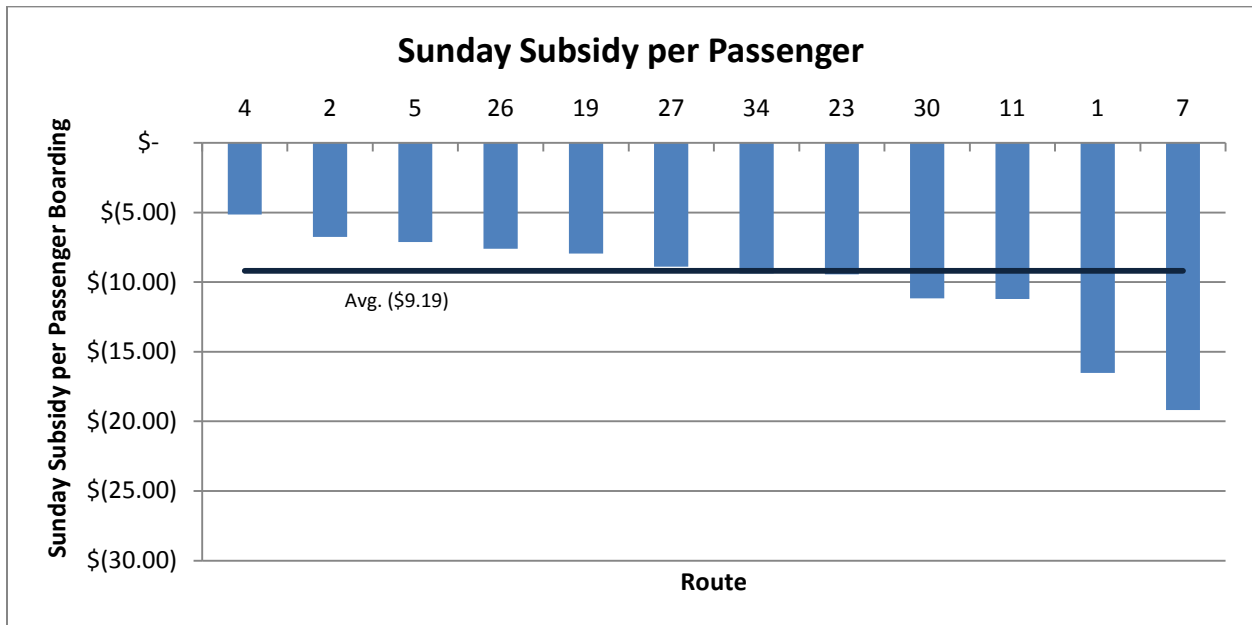


Figure 12. WRTA Sunday Subsidy per Passenger

3.6 Service Frequency

Frequency refers to how often a bus serves a particular route. Service frequencies affect how passengers use the system and the flexibility they can have when making travel plans. WRTA routes run every 30 or 60 minutes, with only a few exceptions.

Figure 13 shows the strong relationship between service frequency and performance. Overall, routes with 30 minute frequency have much higher productivities than routes with 60 minute frequency. Routes 31 and 42 stand out as having high productivities despite their low frequencies, suggesting they may be strong candidates for increased service investment.

WRTA has a performance standard that routes should have clock-face headways (15, 30, 60) and that headways on regular, non-specialized services, should not exceed 60 minutes. All but two routes meet this standard. Routes 25 and 31 have frequencies at 65 minutes, which both exceeds 60 minutes and is not a clock-face headway.

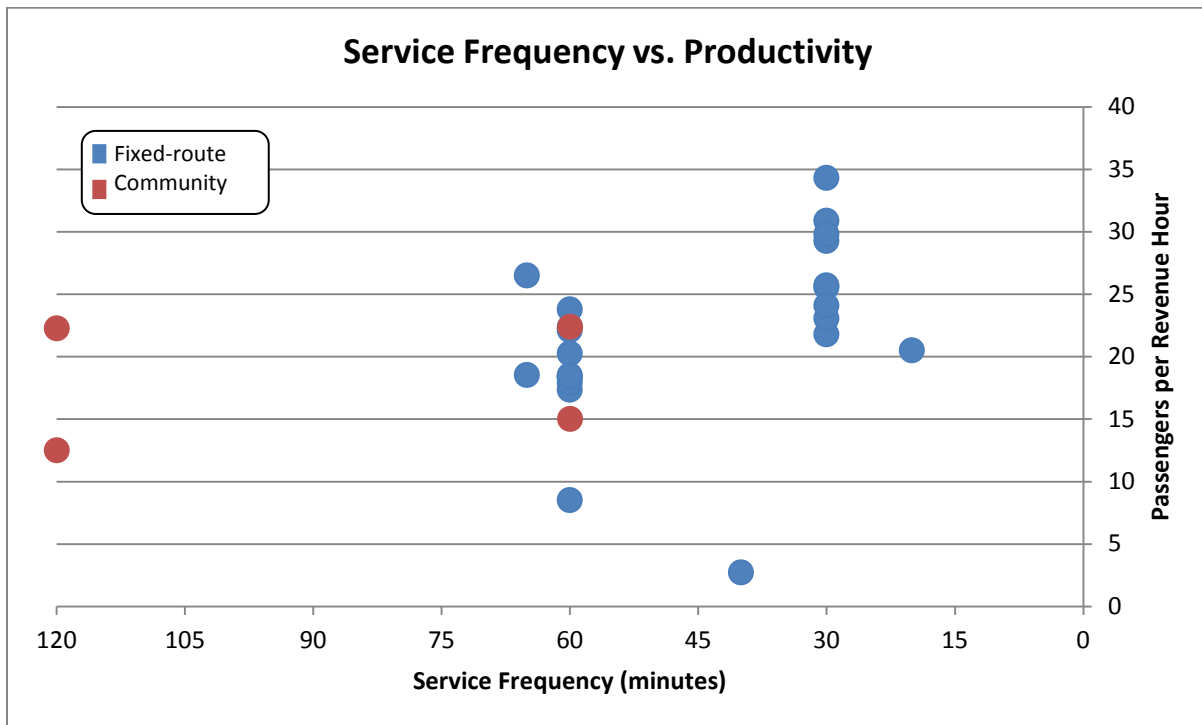


Figure 13. WRTA Service Frequency vs. Productivity



3.7 On-Time Performance

WRTA defines an on-time trip as one that arrives less than one minute early and zero to ten minutes late. The goal for on-time percentage of all trips is 90 percent during peak hours and 95 percent during off-peak hours. WRTA’s system average on-time percentage from January to June 2014 was 86.4 percent, with 6.5 percent of trips arriving early and 7.1 percent of trips arriving late. On-time performance was measured at the Hub and at the end of the line. Figure 14 shows on-time trip percentages by route. Routes 29, 33, 14, 16, 1, 34, 30, 3, and 26 all meet the goal of 90 percent on-time performance. Route 12 has the lowest performance with 72.6 percent of trips arriving on time.

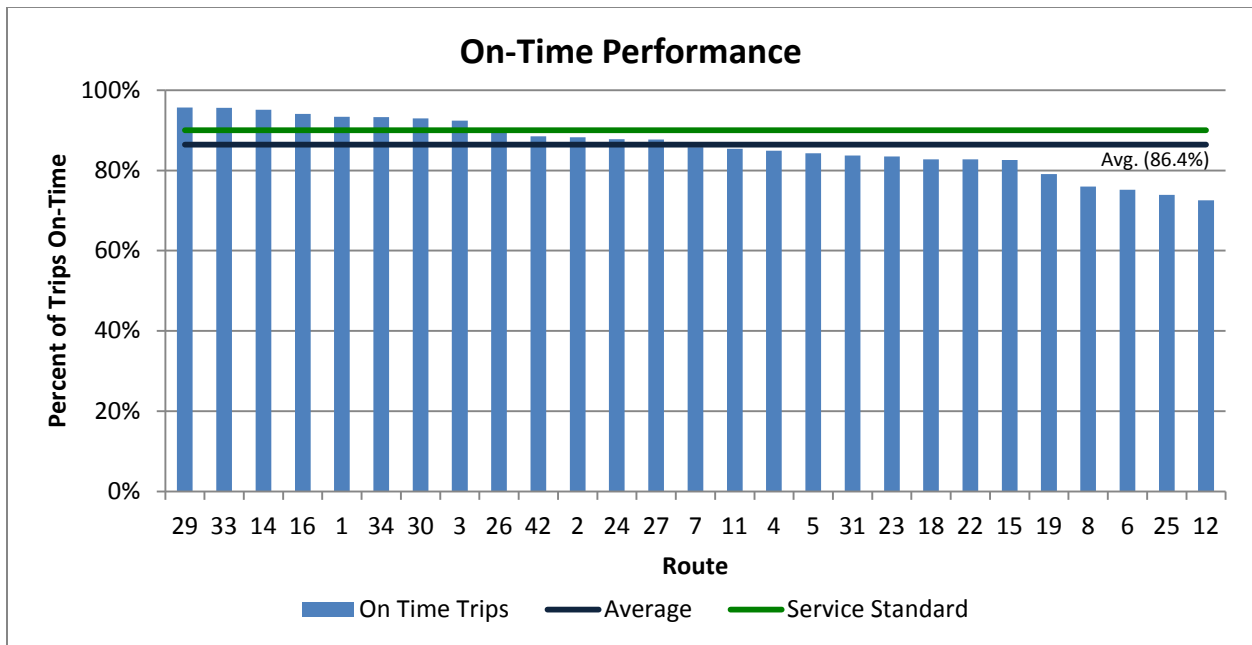


Figure 14. WRTA On-Time Performance by Route



3.8 Ranking of Weekday Route Performance

In order to evaluate investment priorities, the routes were given a score based on how their performance compared with system averages, regardless of service type. Routes were scored based on ridership, passengers per revenue hour, and subsidy per passenger. For each route, each performance indicator was evaluated as a percentage of the system average. For example, if the system average was 100 passengers and a given route has 200 passengers, it would score 200% for that category. The composite score was calculated by taking the averages of the percentages for each category. The routes were then divided into four tiers based on their composite score: Highest performers (150% or greater), above average performers (149%-100%), below average performers (99%-50%), poor performers (49% or lower). Table 3 shows each route in WRTA and its composite score and ranking.

Table 3. WRTA Weekday Route Performance Ranking

Rank	Route	Route Description	Score
1	27	Auburn Mall via Main St.	187%
2	26	Great Brook Valley via Lincoln St.	186%
3	19	Webster Square – Clark University via Main St.	178%
4	11	Fair Plaza via Vernon Hill and Greenwood St.	164%
5	30	W. Boylston Walmart via Grove St.	162%
6	23	East Mountain St. via Lincoln St.	152%
7	24	UMass Medical Center via Belmont St.	147%
8	31	Lincoln Plaza via Grove St. & West Boylston St.	126%
9	7	Washington Heights Apts.	118%
10	33	Worcester-Spencer-Leicester-Brookfield	107%
11	5	Southwest Commons via Grafton St.	101%
12	42	Worcester-Oxford-Webster	91%
13	2	Tatnuck Square Airport	85%
14	15	Shrewsbury Center via Shrewsbury St & Route 9	76%
15	16	Lincoln Plaza via Hamilton St.	76%
16	1	Mount St. Ann via Providence St.	72%
17	14	Showcase Cinemas via Burncoat St.	69%
18	6	West Tatnuck via Chandler St.	69%
19	25	Auburn Industrial Park via Canterbury & Southbridge St.	67%
20	4	The Shoppes at Blackstone Valley via Millbury St.	66%
21	3	Worcester State University via Highland St.	49%
22	18	Quinsigamond Community College	43%
23	22	Shoppers at Blackstone Valley via Millbury Center	43%
24	ESS	Elder Shopper Special	38%
25	29	Worcester-Southbridge-Charlton	15%
26	8	Greendale Mall via Shore Drive	11%
27	99	White City Shuttle ⁷	3%

⁷ The White City Shuttle Route was a temporary route due to a construction project. The route has ended.



Investment strategies for routes will vary based on their performance tier. The six routes with the highest performances are top priorities for service investment and may benefit from increased service frequencies or service spans. The other routes that perform above average are candidates for further service investment as resources become available.

For routes that perform below average, further analysis is required to determine what is causing the routes to have low performance. More in depth analysis could look at inefficiencies in route alignments, service frequencies and spans, and duplicity with other routes. Routes with exceptionally low performance may be candidates for discontinuation of service and will be examined in later sections.

3.9 Key Findings

- Routes 11, 19, 26, 27, and 30 have the highest ridership across all day types and account for nearly half of the system's ridership.
- Daily average weekend ridership is significantly lower than daily average weekday ridership.
- Daily average service performance is stronger on weekends than on weekdays.
- Route 19, 26, and 27 are consistently the top three routes, across all day types and performance indicators.
- Routes with higher frequencies typically have higher productivities.
- WRTA's average on-time performance is 86.4 percent, very close to the goal of 90 percent.

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