Federal Transit Administration
U.S. Department of Transportation

Office of Budget and Policy

2019

National Transit Database

National Transit Summaries & Trends

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
AR	Alaska Railroad
CARTA	Chattanooga Area Regional Transportation Authority
CC	Cable Car
CCTA	Cambria County Transit Authority
CY	Calendar Year
FG	Fixed Guideway
FTA	The Federal Transit Administration
FY	Fiscal Year
HIB	High Intensity Busway
HOV	High Occupancy Vehicle
IP	Inclined Plane
MB	Motorbus
MG	Monorail/Automated Guideway
Mph	Miles per Hour
NTD	The National Transit Database
NTST	National Transit Summaries and Trends
PAAC	Port Authority of Allegheny County
PB	Público
PMT	Passenger Miles Traveled
ROW	Right-of-Way
TR	Aerial Tramways
ULB	Useful Life Benchmark
UPT	Unlinked Passenger Trips
USOA	Uniform System of Accounts
UZA	Urbanized Area
VRH	Vehicle Revenue Hours
VRM	Vehicle Revenue Miles

Introduction

General Information

The Federal Transit Administration (FTA) is pleased to publish the 2019 National Transit Summaries and Trends (NTST). This report is one of the National Transit Database's (NTD) annual data products. The NTST provides an overview of public transit in the United States (U.S.) in an easy-to-read format.

This 2019 NTST discusses data from 2010 to 2019. Except for the exhibits in the "Rural Service" section, all data included in the NTST are from agencies operating within an Urbanized Area (UZA) and reporting to the urban module of the NTD. Throughout this document we will refer to such entities as "urban operators," "urban services," or "urban agencies."

The exhibits only include data reported to the NTD. FTA is not aware of any FTA-funded U.S. public transportation operators who do not report to the NTD and whose data would affect the national trends presented in the NTST.

What is the National Transit Database (NTD)?

The NTD is the primary source for information and statistics on transit systems in the U.S. Congress requires FTA to collect financial and service information annually from public transportation agencies that benefit from FTA grants. FTA also requires larger urban transit providers (Full Reporters) to submit monthly operating and safety data. Each year, FTA uses NTD data to apportion over $13 billion to UZAs and States under funding programs such as §5307 (Urbanized Area Formula Grants), §5311 (Formula Grants for Rural Areas), §5329 (Transit Safety & Oversight Grants), and §5337 (State of Good Repair Grants). For more information, visit the NTD website.

Who reports data to the NTD?

§5307 Program Recipients

Recipients or beneficiaries of FTA's Urbanized Area Formula Program (§5307) must file annual reports, monthly ridership and safety and security reports with the NTD. The recipients or beneficiaries reporting this data are also called **Urban Reporters**. Beginning

in Fiscal Year (FY) 2011, transit agencies with 30 vehicles or less became eligible for reduced reporting requirements, including reporting exemptions for passenger miles, mode-specific capital and operations costs, employee counts, maintenance performance, energy consumption, monthly ridership, and safety data.

Some agencies that do not operate transit service report to the NTD. **Build Reporters** are agencies that benefit from Federal funding and are in the process of building transit infrastructure but do not yet operate service. **Planning Reporters** do not operate transit service but instead use the Federal funding for planning and programming transit projects.

§5311 Program Recipients

Recipients or beneficiaries of FTA's Formula Grants for Rural Areas Program (§5311) must file annual reports to the rural module of the NTD. These agencies are known as **Rural Reporters**. States and Indian Tribes submit rural reports directly to the NTD. States file reports on behalf of their subrecipient rural transit agencies, who do not report directly to the NTD.

Voluntary NTD Reporters

FTA accepts voluntary NTD reports from other transit systems, both public and private, that serve both UZAs and non-UZAs. **Voluntary Reporters** must provide public transportation services and meet the same reporting obligations as mandatory reporters.

What are the modes of transit?

Public transit includes buses, trains, ferryboats, paratransit services, and much more. Certain transportation services are specifically excluded, such as Intercity Bus service, Intercity Rail service, intra-facility transport (e.g., airport people movers,) and sightseeing rides.

Different types of vehicles, technologies, and operational characteristics distinguish the modes of transit. Public transit modes are defined in a table in the “Introduction” section of the Policy Manual.

What is an Urbanized Area (UZA)?

The U.S. Census Bureau defines UZAs based on incorporated places (e.g., cities, towns, villages) and their adjacent areas. For more information, visit the U.S. Census website.

For the purpose of transit grants, FTA also designates the Virgin Islands and Lake Tahoe as UZAs.

In the NTD, transit providers indicate the primary UZA of service operations as their "primary UZA" along with any secondary UZAs they serve. For analysis purposes, the NTST groups UZAs into the following categories:

- **Small UZAs:** population of 50,000 to 200,000.
- **Medium UZAs:** population of 200,000 to 1 million.
- **Large UZAs:** population over 1 million.

Of all Urban Reporters, approximately 35 percent agencies primarily serve a small UZA (35 percent), 26 percent primarily serve a medium UZA, and 39 percent primarily serve a large UZA.

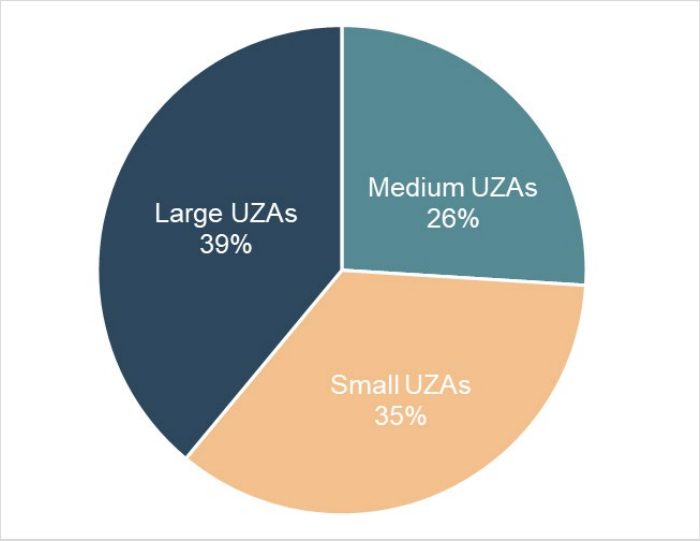


Exhibit 1. ***Agencies' Primary UZA by Urbanized Area Category***

What is Safety and Security reporting?

NTD Safety and Security reporting requires all reporters to provide the number of safety and security events that take place or involve transit system property and the resulting fatalities and injuries. (Only fatalities or injuries that meet any one of several criteria listed in the *NTD Safety & Security Policy Manual* need to be reported.)

Rounding and Inflation

Rounding may lead to minor variations in total values from one exhibit to another within this analysis or may lead to instances where percentages do not add up to 100. Due to rounding, percent changes may not exactly match the values calculated using the formatted figures shown in the exhibits.

The NTD has adjusted all exhibits involving dollar amounts to 2019 constant dollar values, or dollar amounts adjusted in terms of constant purchasing power using the Consumer Price Index.

Transit Service Providers: Organization Type

Transit providers report their organization type in the NTD Annual Report. City and county organizations are departments of local government. They make up 53 percent of urban transit providers. Transit authorities are independent public agencies led by boards, focused on providing public transit. Transit authorities make up 29 percent of urban transit providers. City/county organizations and transit authorities comprise approximately 82 percent of urban transit providers.

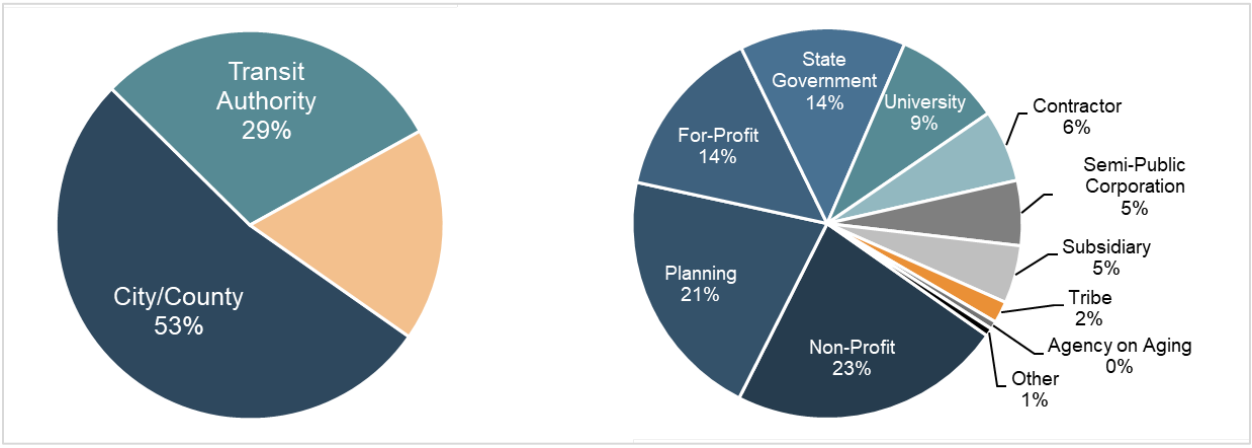


Exhibit 2. ***2019 Transit Provider Organization Types***

Total urban transit ridership has decreased slightly from 2010 to 2019, going from about 9.84 billion passengers to 9.75 billion passengers. However, there were differences in the ridership trends between rail and non-rail services. Rail ridership increased from 4.58 billion to 4.94 billion unlinked passenger trip (UPT). Non-rail ridership decreased from 5.26 billion to 4.82 billion UPT.

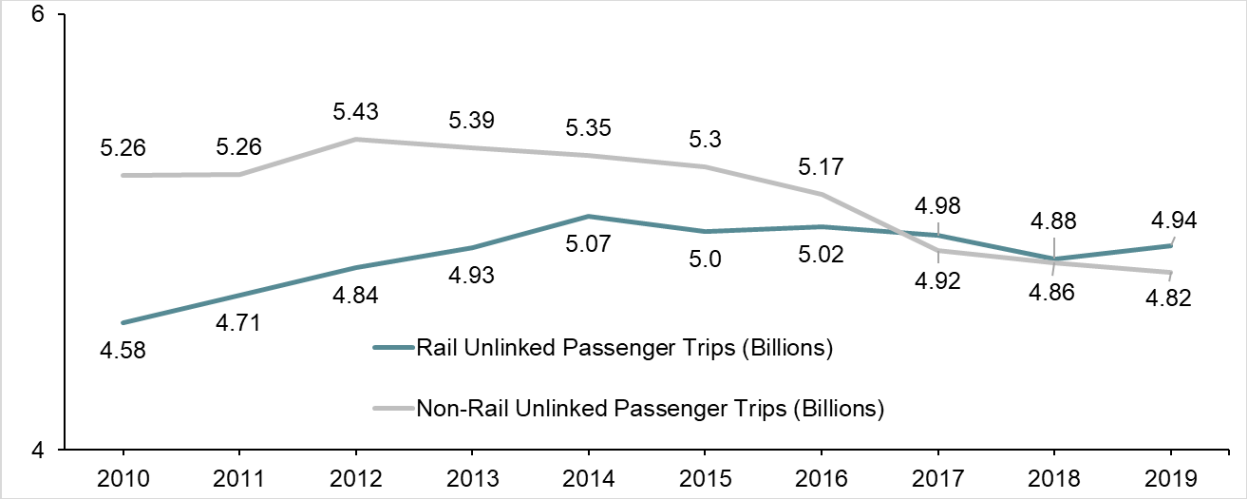


Exhibit 3. ***Unlinked Passenger Trips: Time Series***

Urban Transit Funding

Operating Expense Funding Sources

On average, directly generated revenues, including passenger fares, fund about one third (35.7 percent) of public transit operating expenses for urban agencies in the U.S. Local and State sources together fund more than 57 percent of operating expenses, at 34.2 percent and 23.0 percent respectively. Federal Government sources fund less than 10 percent (7.1 percent) of total operating expenses.

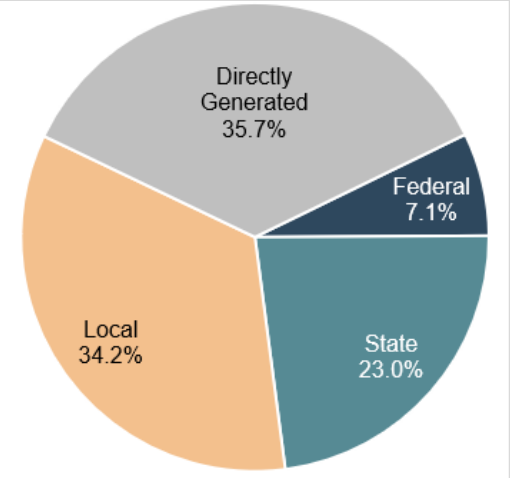


Exhibit 4. ***2019 Funding Sources for Transit Operating Expenses***

Capital Expense Funding Sources

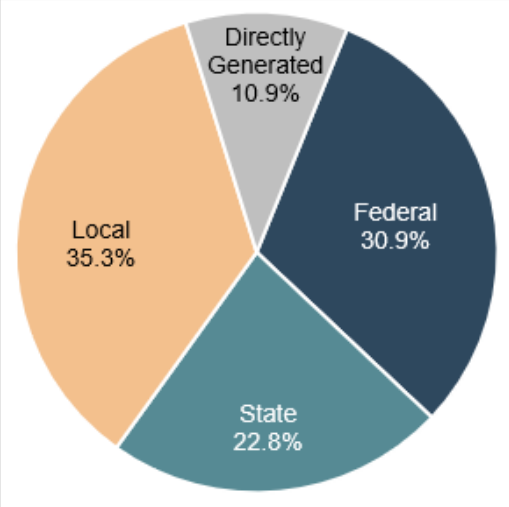


Exhibit 5. ***2019 Funding Sources for Capital Expenses***

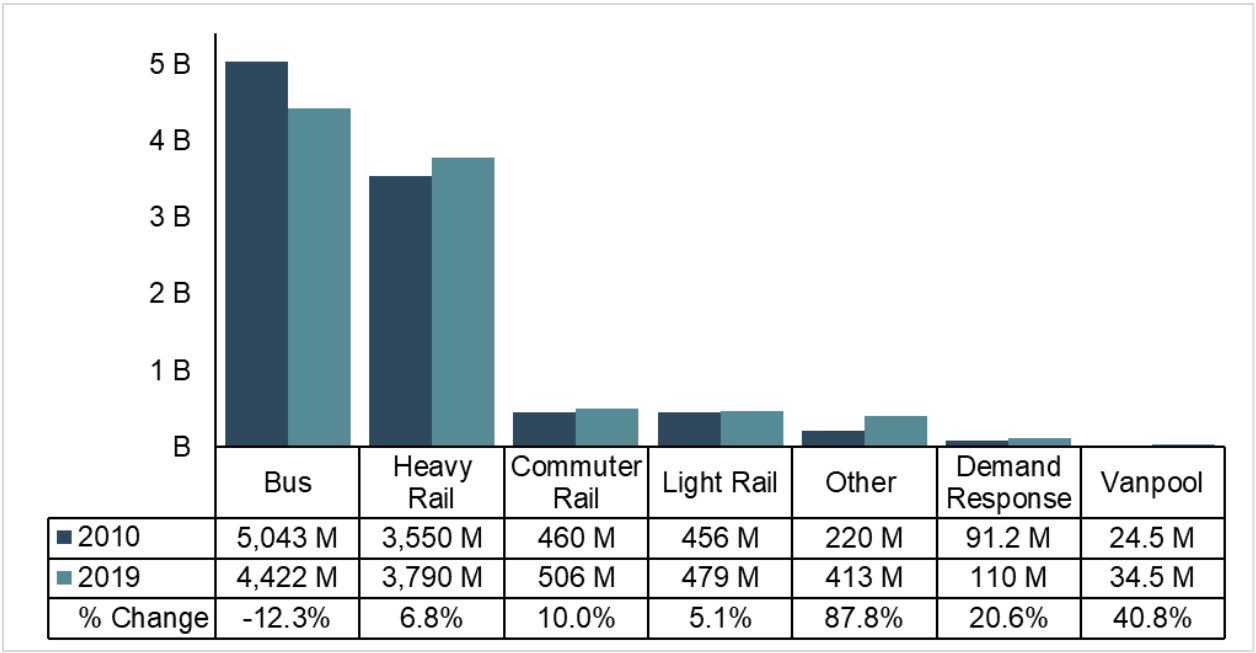
Urban transit operators spend resources not only on operations but also on constructing, acquiring, and improving the systems and equipment used to operate transit service. These improvements are called Capital Expenses.

The funding support for Capital Expenses differs from operational expenditures. In 2019, about 31 percent of all capital funds came from Federal sources. Directly generated funds from transit agencies, including fares, account for about 10 percent of all capital expenditures. As with operating expenses, local and State governments fund almost 60 percent of capital funding.

Urban Transit Service Provided and Consumed

Service is provided and consumed differently for every transit mode. Service factors and expenses depend on the operating costs, travel demands, and passenger-carrying capacities of the different modes. These factors greatly affect the relative cost-effectiveness of the different modes. The exhibits in the following section reflect transit operating statistics across the most common modes of service.

Service Consumption



	Bus	Heavy Rail	Commuter Rail	Light Rail	Other	Demand Response	Vanpool
2010	5,043 M	3,550 M	460 M	456 M	220 M	91.2 M	24.5 M
2019	4,422 M	3,790 M	506 M	479 M	413 M	110 M	34.5 M
% Change	-12.3%	6.8%	10.0%	5.1%	87.8%	20.6%	40.8%

Exhibit 6. ***Unlinked Passenger Trips, 10 Year Snapshot***

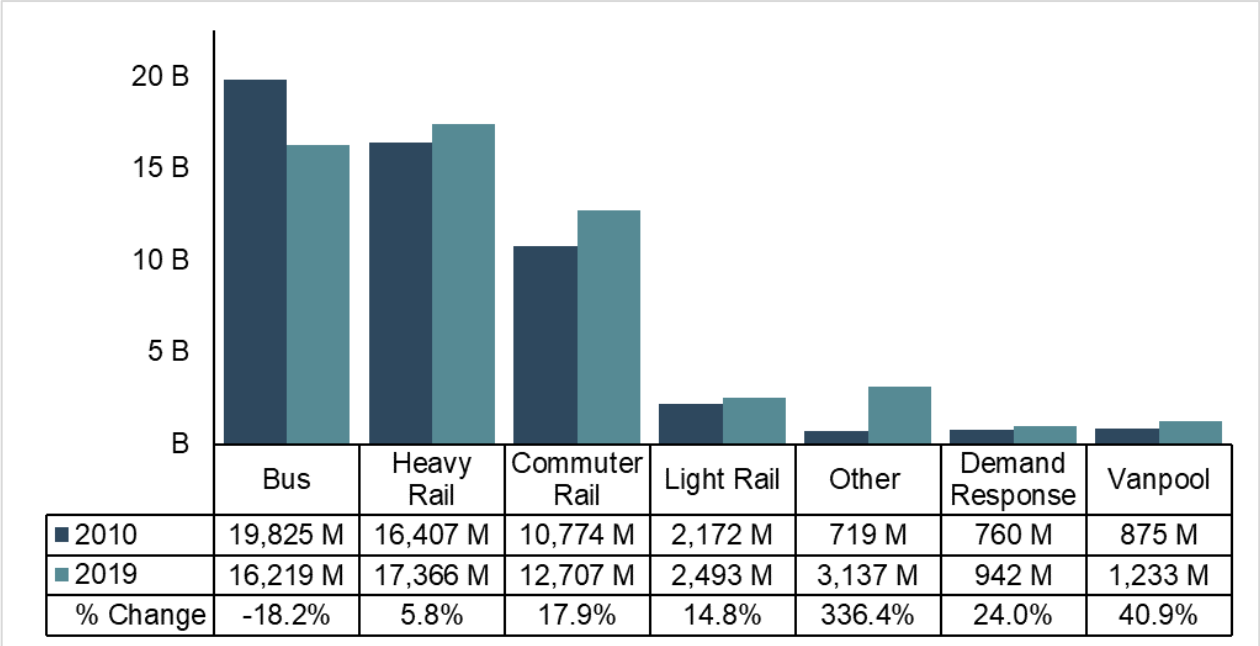
Approximately 84 percent of urban agency public transit ridership occurs on Bus and Heavy Rail services. Total urban transit ridership across all modes decreased 0.92 percent over the ten-year period.

At the mode level, the ridership trends were more dramatic. Bus ridership for Urban Reporters declined 12.9 percent, while ridership on other modes increased. Over that ten-year period, the following modes experienced increases in ridership:

- Alaska Railroad – 89.1 percent
- Commuter Rail – 10.0 percent

- Demand Response – 17.5 percent
- Ferryboat – 42.6 percent
- Heavy Rail – 6.8 percent
- Light Rail – 5.1 percent
- Monorail/Automated Guideway – 52.7 percent
- Vanpool – 40.4 percent

Passenger Miles Traveled (PMT) is the total number of miles traveled by all passengers on a service. Similar to the UPT data, most transit ridership occurs on Bus and Heavy rail. Over 60 percent of urban transit is on Bus (30.0 percent) and Heavy Rail (32.2 percent) services. We also see that over 20 percent of total passenger miles is consumed on Commuter Rail services.



	Bus	Heavy Rail	Commuter Rail	Light Rail	Other	Demand Response	Vanpool
2010	19,825 M	16,407 M	10,774 M	2,172 M	719 M	760 M	875 M
2019	16,219 M	17,366 M	12,707 M	2,493 M	3,137 M	942 M	1,233 M
% Change	-18.2%	5.8%	17.9%	14.8%	336.4%	24.0%	40.9%

Exhibit 7. ***Passenger Miles Traveled, 10 Year Snapshot***

While there was a decrease in urban transit ridership across this ten-year period, PMT reflects a 5.0 percent increase from 2010 to 2019. Like UPT, the trends at the modal level were more dramatic. PMT on Bus declined 18.2 percent, while total PMT on the other modes increased 19.5 percent.

Service Characteristics

Average Revenue Speed reflects the average speed at which vehicles are traveling while in revenue service carrying passengers. This is calculated by dividing Total Actual Vehicle Revenue Miles (VRM) by Total Actual Vehicle Revenue Hours.

The exhibit below shows that the two modes with the highest average revenue speed are Vanpool (36.9) and Commuter Rail (30.7). These high speeds reflect long distance travel with widely spaced stops. The lower speeds on modes such as Streetcar, Motorbus (MB), Bus Rapid Transit, and Trolleybus closely reflect spaced stops on city streets.

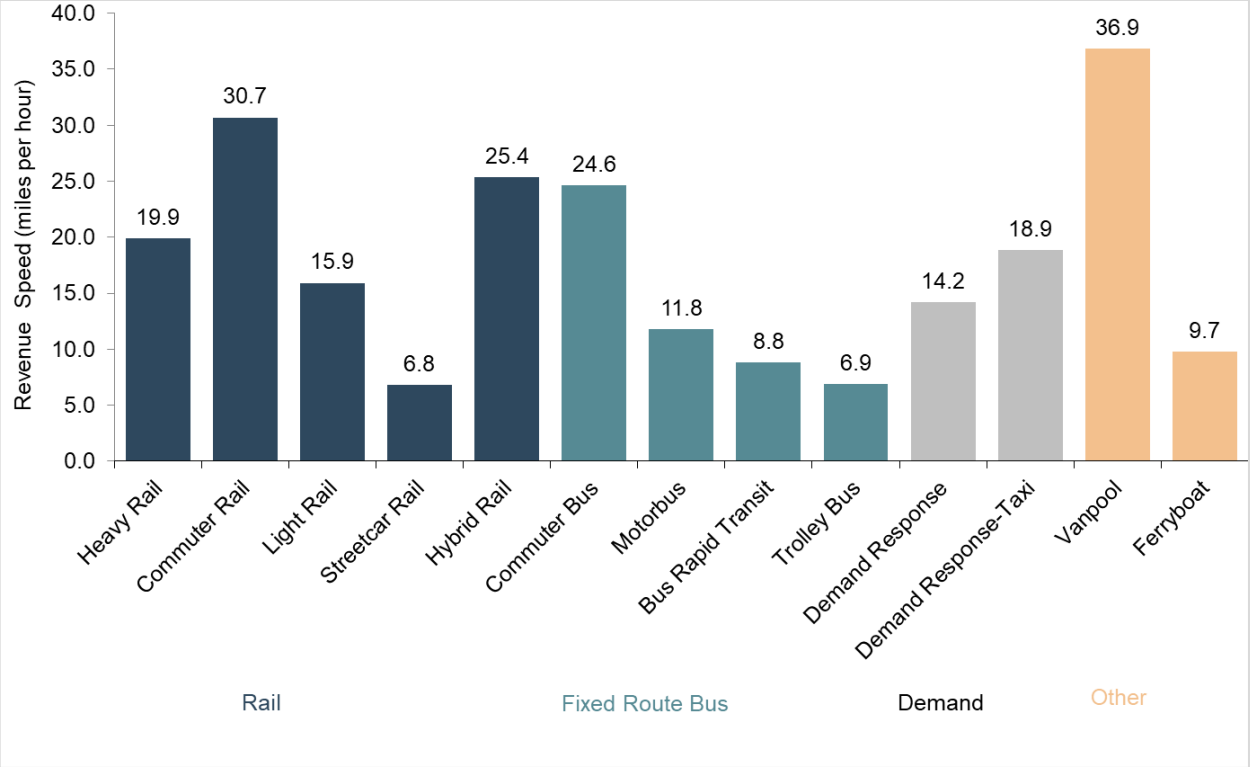


Exhibit 8. ***2019 Average Revenue Speed (Mph)***

Average Trip Length reflects the average distance traveled by a single passenger on public transit. This average is calculated by dividing the total PMT by the total UPT.

The exhibit below shows that the three urban transit modes with the longest average trip length are Vanpool (35.9 miles), Commuter Rail (25.1 miles), and Commuter Bus (23.7 miles). All three of these services focus on daily commuting over long distances from suburban areas to central cities. In contrast, the bus and rail modes typically serving travel within central cities have much shorter average trip lengths.

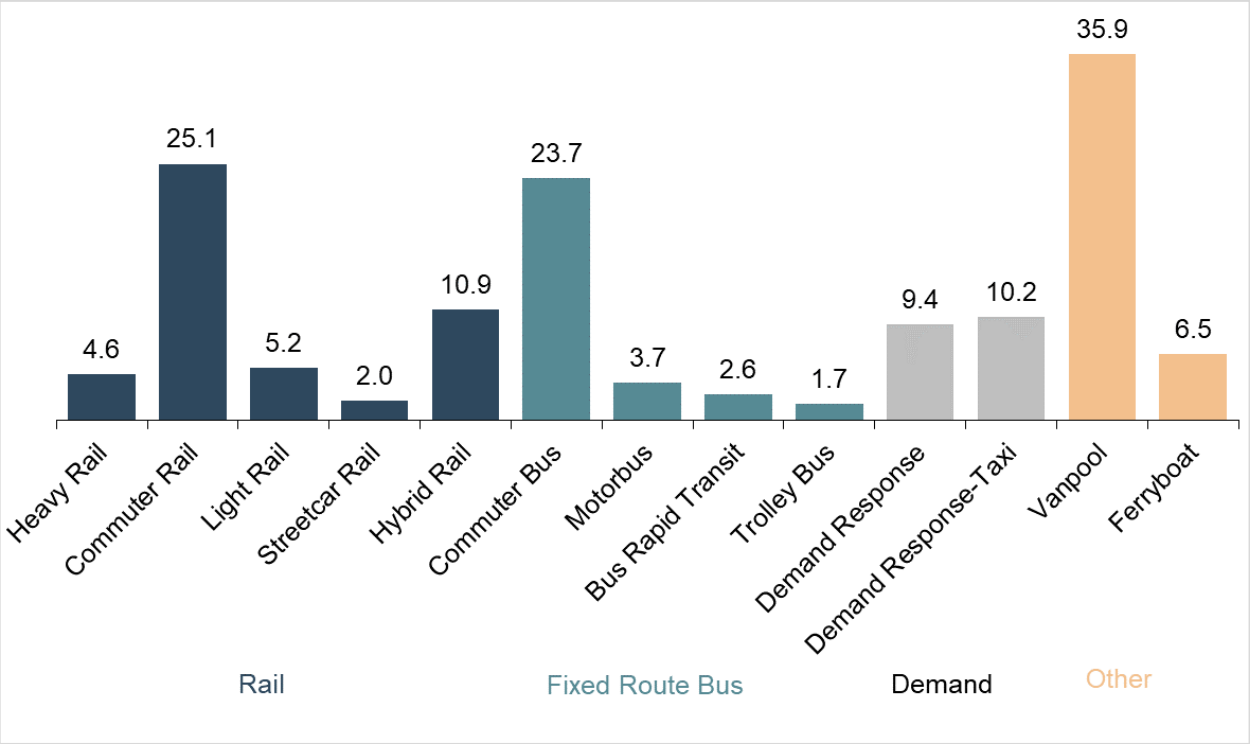


Exhibit 9. ***2019 Average Trip Length (Miles)***

Average Vehicle Capacity reflects the average number of passengers a transit vehicle could potentially carry at one time. This figure includes both seating and standing capacity. The NTD calculates this figure by adding the seating and standing capacity numbers together and dividing that total by the sum of active vehicles.

The exhibit below illustrates that the Ferryboat mode has a much larger capacity than other modes (602.1). Rail modes have the next largest vehicle capacity and are typically used on high-density travel corridors. Bus modes have moderate vehicle capacities and typically serve moderate density travel markets. The demand response and vanpool modes have relatively low vehicle capacities and typically serve point-to-point travel markets with low ridership.

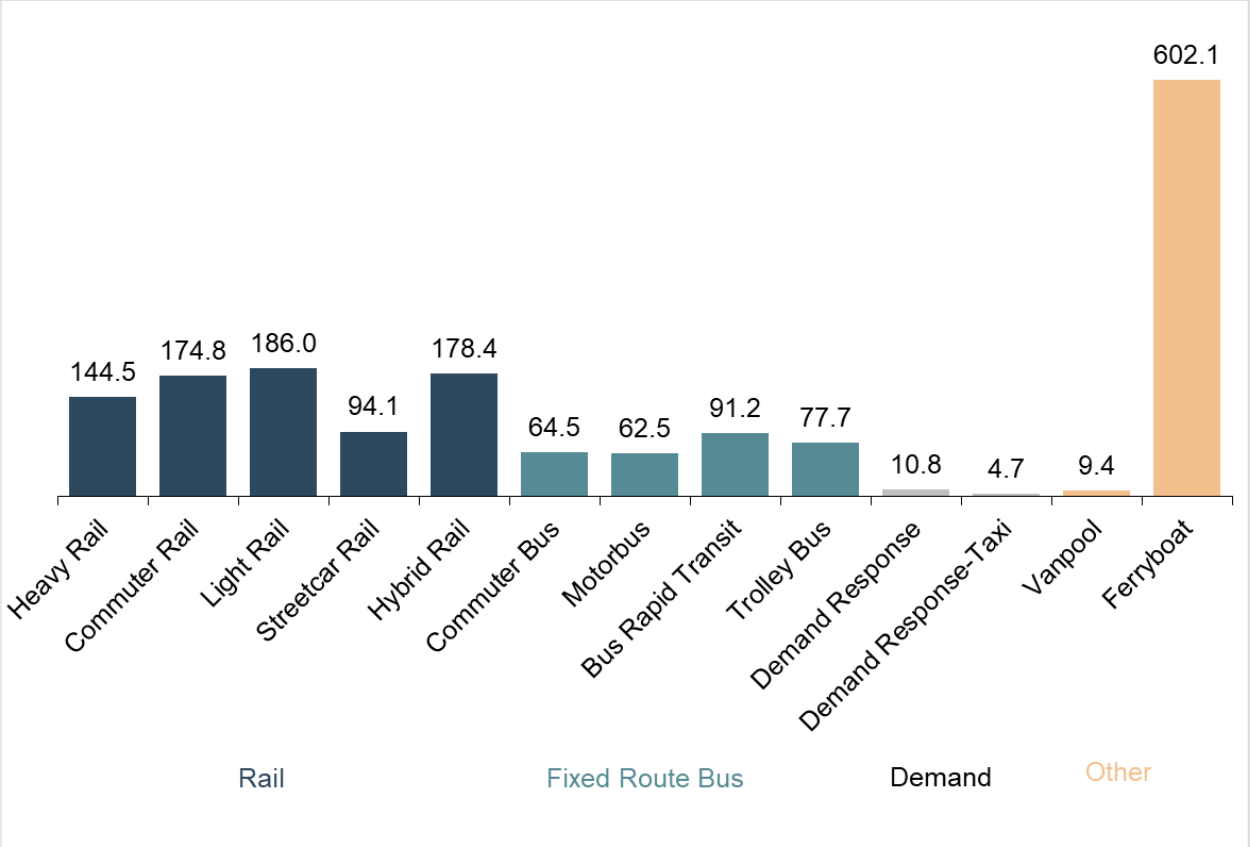


Exhibit 10. ***2019 Average Vehicle Capacity***

Service Effectiveness

One way to look at service effectiveness is to calculate passengers per hour—this reflects how many passengers per vehicle are riding during a single hour of revenue service. **Passengers per hour** is calculated by dividing UPT by Vehicle Revenue Hours (VRH).

The exhibit below shows that urban Ferryboat services report the highest number of passengers per hour (167.5), followed closely by Heavy Rail (108.1). Demand-based modes (Demand Response and Demand Response-Taxi) reported significantly lower passengers per hour (1.8 and 2.5, respectively). These results are consistent with vehicle capacities of the different modes shown in the exhibit above.

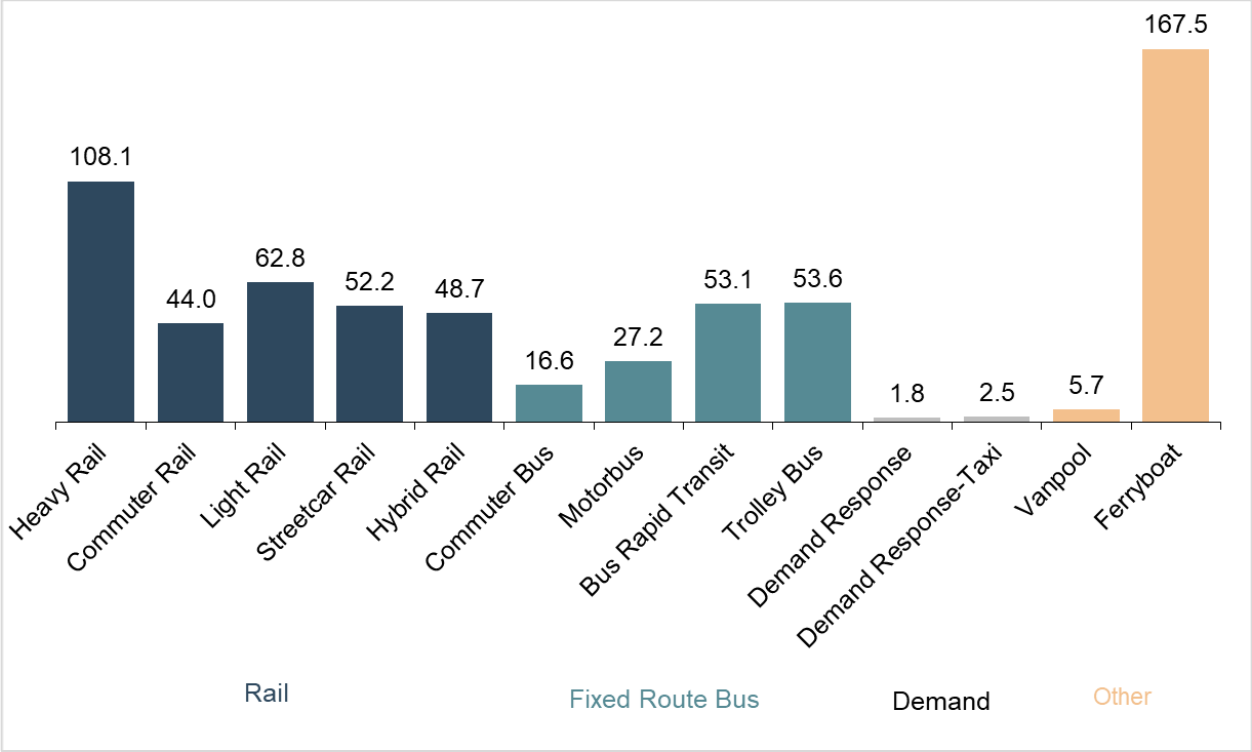


Exhibit 11. *2019 Passengers per Hour*

Another way to compare service effectiveness is to examine the average passengers on board. This is commonly referred to in the NTD as Load Factor. **Average passengers on board** is calculated by dividing PMT by VRM.

Rail modes typically carry more passengers than bus modes because rail modes have higher vehicle capacities and typically serve high-density travel corridors. Likewise, bus modes carry more passengers than demand response and vanpool modes because of their higher vehicle capacities and because they typically serve medium-density travel

markets. Ferryboat services carried far more passengers at one time (112.4) than any of the other modes.

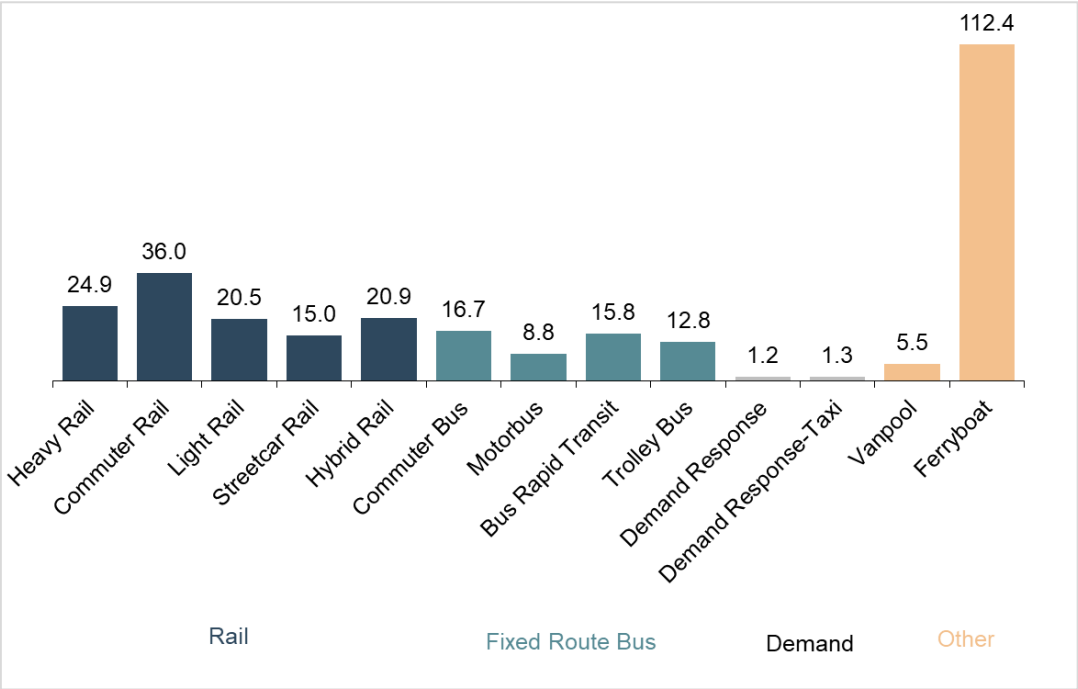


Exhibit 12. ***2019 Average Passengers on Board***

Vanpool services fill the highest percentage of the seating capacity (59.0 percent), mainly because they typically operate only one round trip per day. Heavy Rail also has a high percentage of seating capacity, primarily because many rail cars are designed to maximize standing capacity.

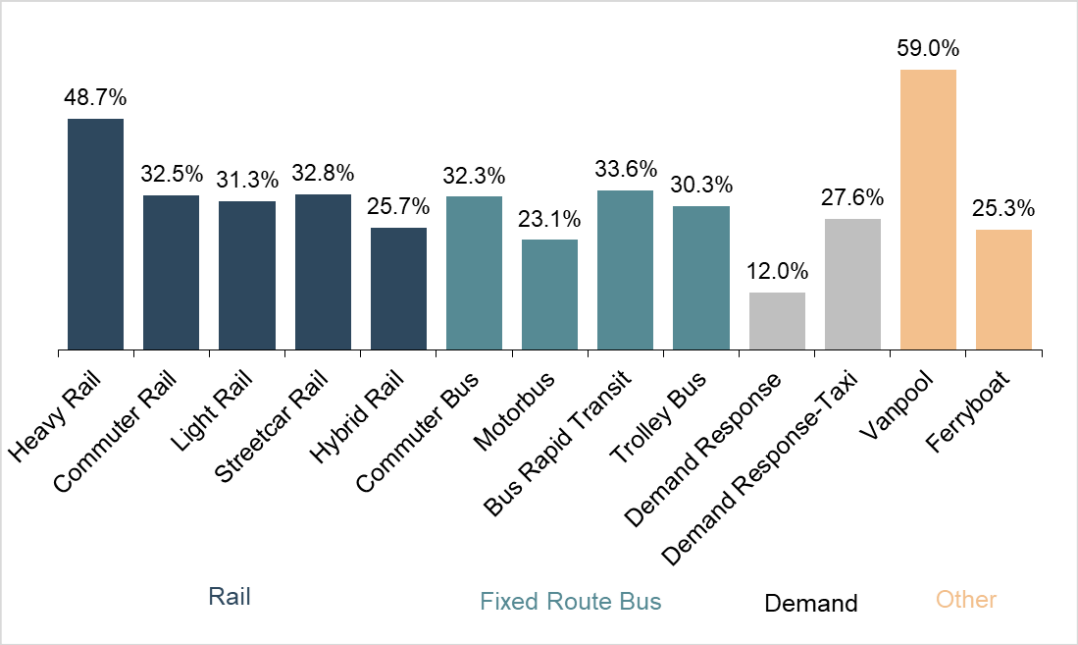


Exhibit 13. ***Average Passengers on Board as a Percent of Vehicle Seating Capacity***

Service Efficiency

One way to look at service efficiency is to calculate the cost per hour for each mode. **Cost per hour** is calculated by dividing Total Operating Expenses by VRH. The cost per hour represents the cost of operating for one single hour of revenue service at an agency.

The exhibit below shows that Ferryboat service cost the most to operate per hour ($1,615.65), while Vanpool cost the lowest to operate per hour ($28.43). Vanpool services operate with passengers driving the vehicles as opposed to paid drivers, which is a major reason for the low vanpool costs compared to the other modes.

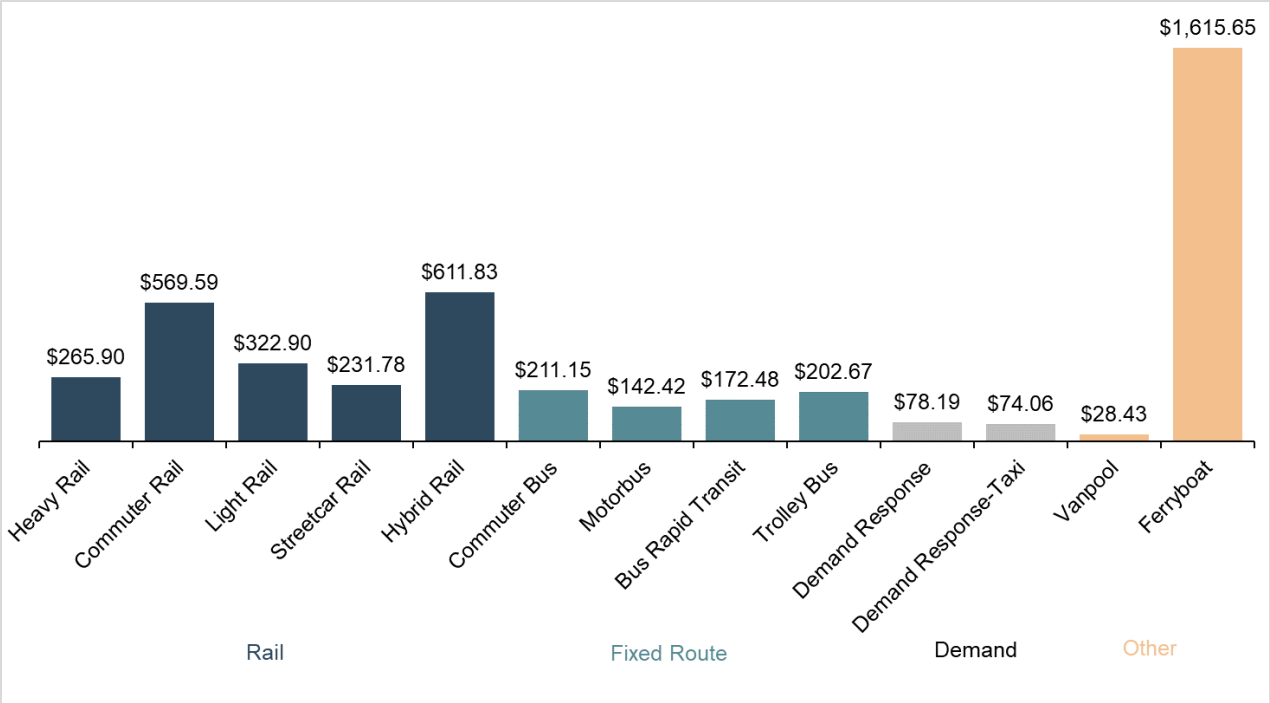


Exhibit 14. ***2019 Cost per Hour***

Cost Effectiveness

UPT is one way to measure service consumed by the riding public. It gives equal weight to passengers making short and long trips. PMT, however, gives more weight to longer trips than shorter trips.

When you consider these two different measures of service consumption, the respective average operating cost by mode is sometimes markedly different. The cost per UPT on Commuter Rail service ($12.94), for example, is one of highest rates among the bus and rail modes. However, the average trip length of 23.7 miles for Commuter Rail was high compared to the other bus and rail modes (Exhibit 9). Therefore, the cost per PMT ($0.53) is one of lowest rates among the bus and rail modes.

The opposite is true of Bus (MB), which had relatively low cost per UPT ($5.24). However, it has a relatively low average trip length (3.7 miles) and thus a relatively higher cost per PMT ($1.40).

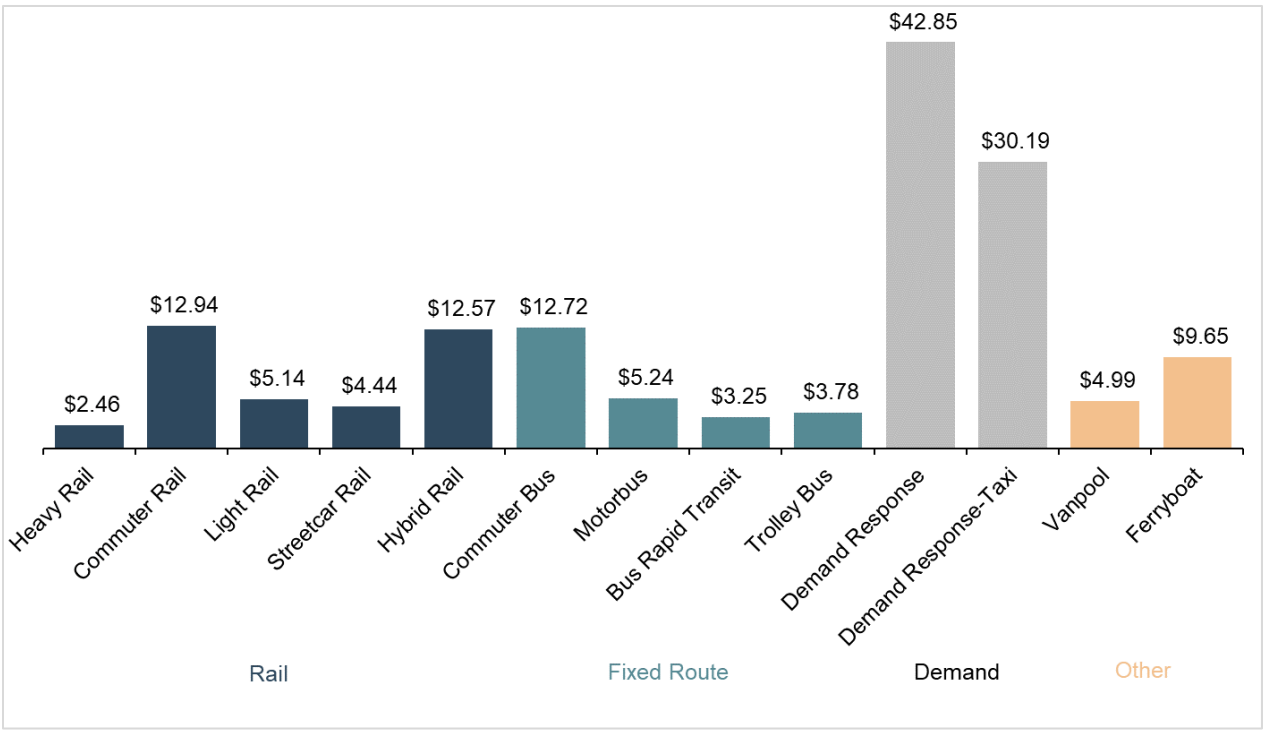


Exhibit 15. ***2019 Operating Expense per Passenger***

Farebox Recovery

Transit agencies do not set passenger fares based on the cost of each trip. For each dollar spent on operating costs per trip across all modes and all transit systems, 32.3 cents are recovered through fares.

The fare box recovery ratio is the percentage of a trip's operating costs recovered through passenger fares. This ratio varies by mode. The low recovery ratios on Demand Response services (and Demand Response–Taxi) is due to a lower average passengers per hour compared to other modes. The low ratios are also due to the Americans with Disabilities Act (ADA) fare regulations, which prohibit ADA fares from being more than twice the cost of regular transit fares.

Commuter services such as Commuter Rail, Commuter Bus, and Vanpools have relatively high farebox recovery ratios. These services are often scheduled based on passenger demand and limited service or no service is scheduled during off-peak, low-passenger-demand periods. Vanpool transit also has a high ratio because the drivers are not paid (usually one of the passengers drives), and because Vanpool service has traditionally been funded by rider fees, with limited or no government subsidies.

In contrast, other bus, light rail, and streetcar modes typically schedule service based on passenger demand during commuting hours and on policy guidelines during off-peak periods (midday, evenings, and weekends). The resulting farebox recovery ratios are, therefore, lower than other modes. Heavy Rail typically serves high-density travel corridors with passenger demand throughout the day, which yields relatively high farebox recovery ratios.

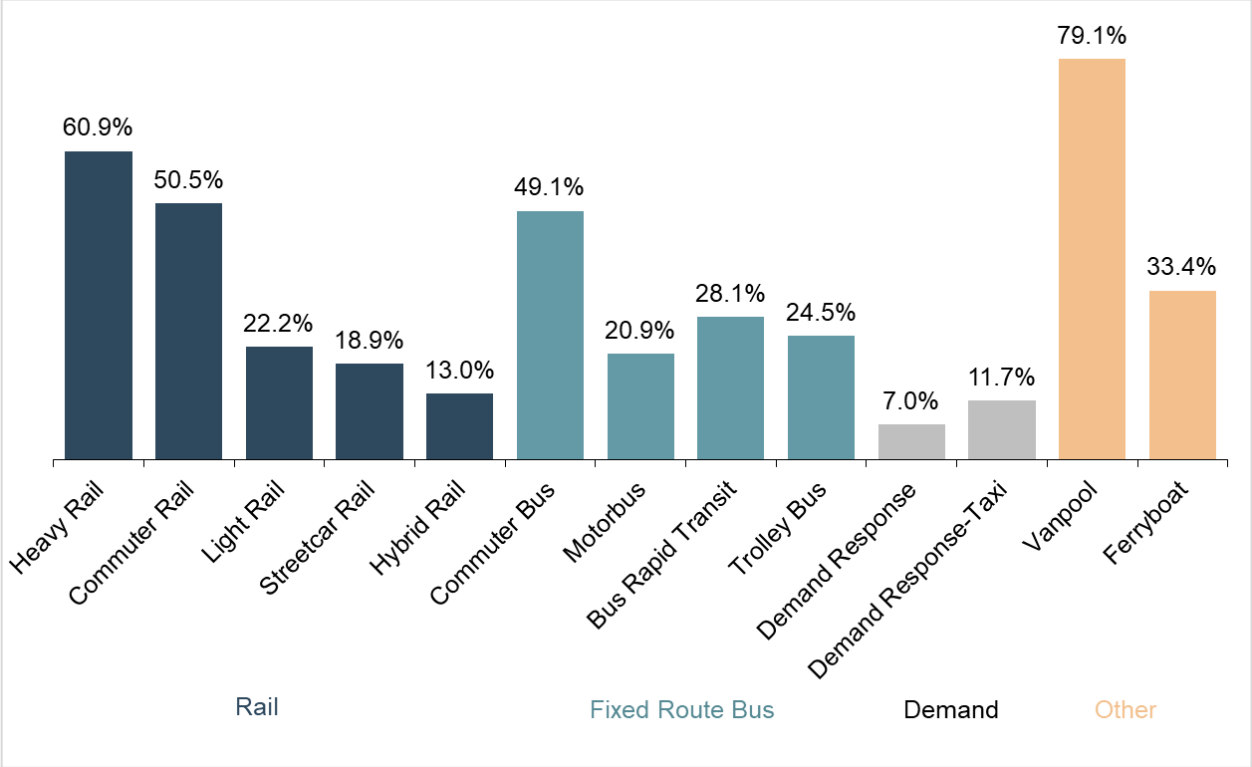


Exhibit 16. ***2019 Fares as a Proportion of Operating Expense***

Urban Transit Assets

Capital assets are a crucial aspect of public transportation. Over the years, the NTD has expanded the amount of information collected on the assets supporting public transportation.

Average Fleet Age

The average fleet age reflects the design and useful life of the vehicles used in each mode. Vanpool has a lower average fleet age of 2.65 years, which is consistent with a typical service life of four to five years. Motorbus has an average fleet age of 7.43 years, which is consistent with typical useful service life ranging from 10 to 12 years. Finally, rail vehicles are designed to have a service life ranging from 25 to 35 years, which explains their higher average fleet ages.

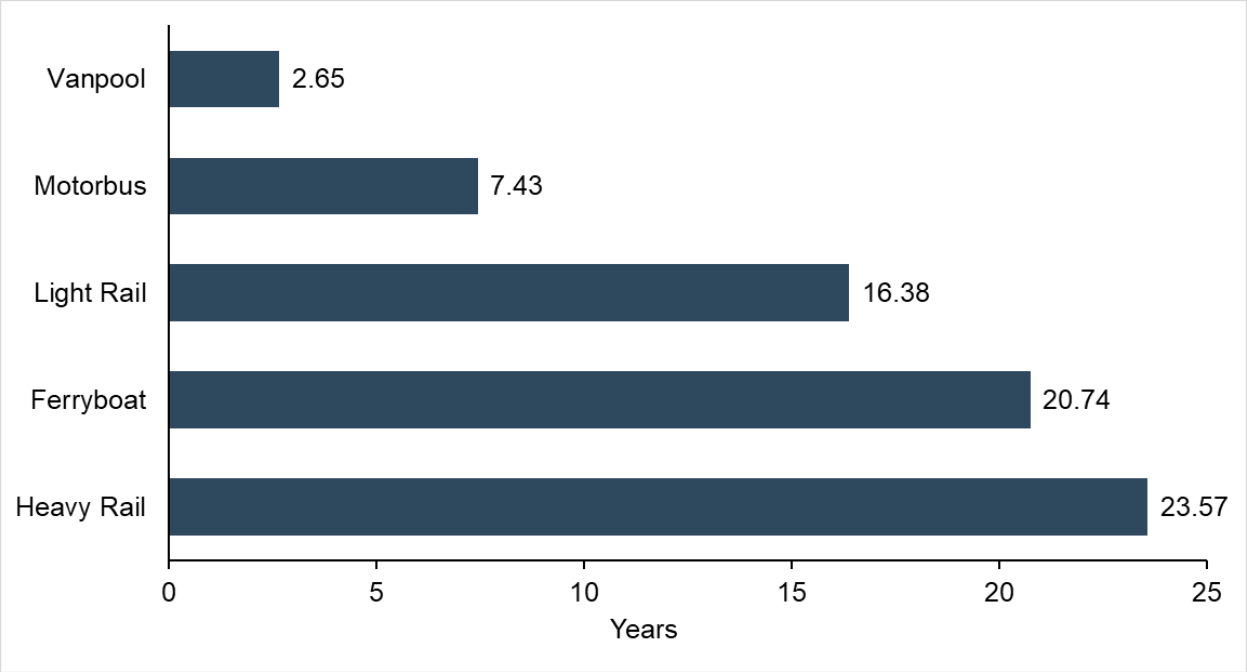


Exhibit 17. ***Average Fleet Age by Mode***

Bus Alternative Fuel Usage

Diesel and gasoline are the traditional bus fuels. Alternative fuels have been introduced to address concerns about air quality and fuel efficiency. Alternative fuels include compressed natural gas, electric battery, ethanol, liquefied petroleum gas (propane),

liquefied natural gas, kerosene, biodiesel, and other fuels. The charts below include fuel usage for buses fully dedicated to transit service.

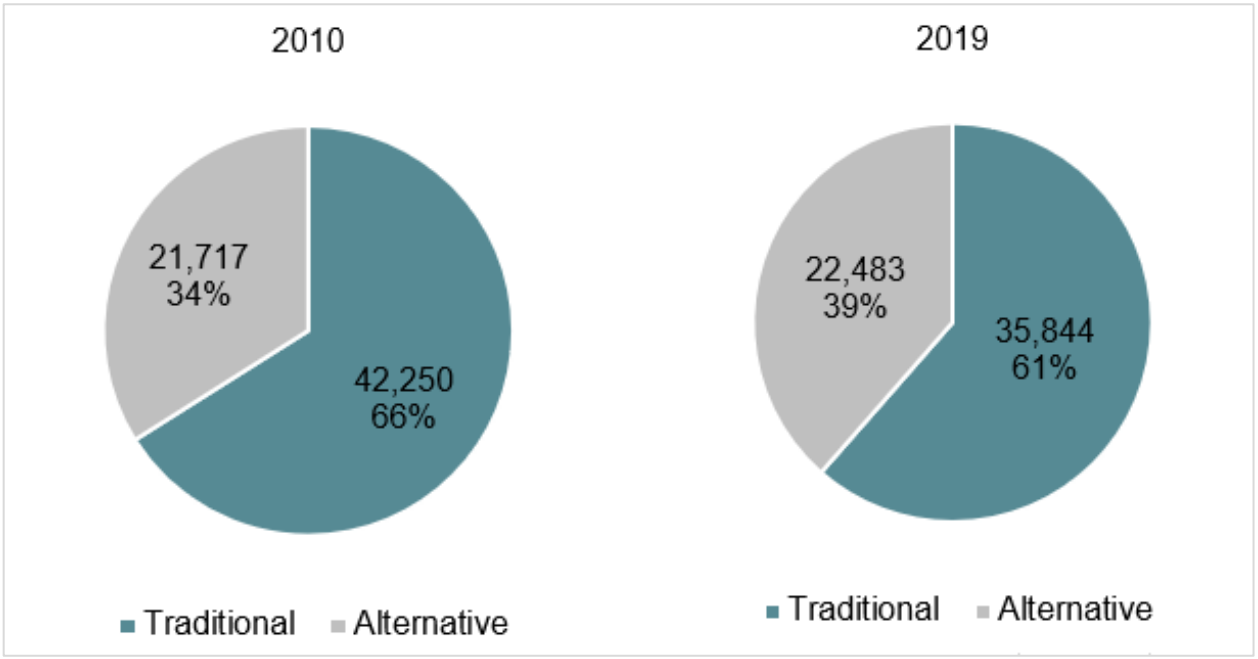


Exhibit 18. ***Percent of National Bus Fleet Using Alternative Fuels***

The share of the national bus fleet using alternative fuels rose from 34 percent in 2010 to 39 percent in 2019. Alternative fuel consumption increased from 18 percent in 2010 to 23 percent in 2019.

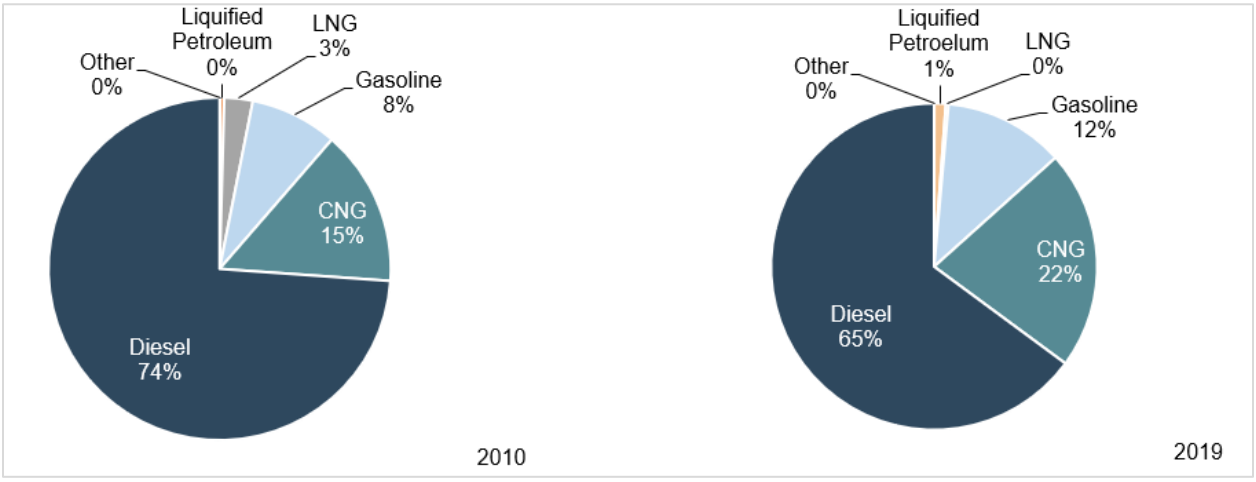


Exhibit 19. ***Percentage of Fuel Consumption for Non-Electric Modes***

ADA Lift or Ramp-Equipped Buses

The ADA requires transit agencies to provide public transportation that follows specific requirements. These requirements specify that vehicles do not restrict access, are usable, provide allocated space and/or priority seating for individuals who use wheelchairs, and that the space or seating is able to be accessed using lifts or ramps. As shown in the exhibit below, 98.5 percent of all bus vehicles are ADA-compliant.

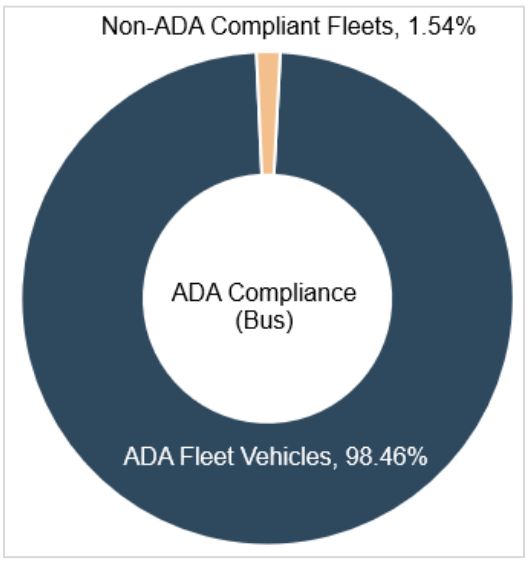


Exhibit 20. ***2019 ADA Compliance (Bus)***

Fixed Guideway and High Intensity Busway

Public transit often operates on restricted guideway. FTA separates restricted guideway into two categories: Fixed Guideway (FG) and High Intensity Busway (HIB).

FG is a facility that uses separate right-of-way (ROW) or rail exclusively for public transportation. FG may be a fixed catenary system useable by multiple forms of public transit (e.g., trolleybus, light rail, etc.). All rail, catenary, and ferryboat systems operate over FG.

HIB can be two types of roadway. HIB can either be: 1) exclusive to transit vehicles at some times and open to the general public at other times, or 2) restricted to high occupancy vehicles (HOV) at least part of the time.

Bus systems may operate over FG, HIB, or publicly available roadway (mixed traffic ROW).

The NTD collects directional route miles for FG, HIB, and mixed traffic. The total mileage in each direction on a public transportation route is directional route miles. For example, if a transit provider operates one mile of revenue service in two directions, the NTD counts this as two directional route miles.

Fixed Guideway and High Intensity Busway Route Miles

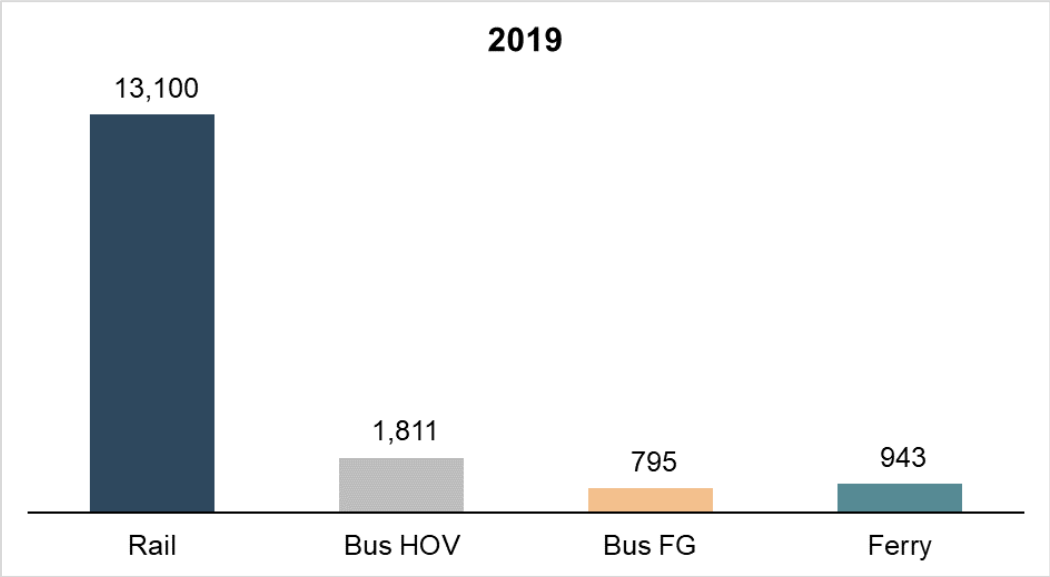


Exhibit 21. ***2019 Fixed Guideway and High Intensity Busway Route Miles***

Rail transit modes operate 76.4 percent of the total FG and HIB directional route miles. Bus HOV and FG now collectively account for 18.2 percent of all directional route miles of fixed guideway. Ferryboat FG comprises 5.4percent of total FG and HIB directional route miles.

Fixed Guideway Concentration

Building separate infrastructures for public transit is costly. Dedicated rail transit only makes sense in high density areas with congested transportation and a high demand for travel alternatives.

The most populous cities in the U.S. have built, and now operate, a large proportion of fixed guideway transit. In 2019, five UZAs accounted for over 43 percent (6,382.2 miles) of all fixed guideway route miles, an average of 1,276 fixed guideway miles per UZA. These UZAs (shown in the exhibit below) have all been among the top 15 in population in each census since 1860.

There are 87 other urbanized areas that have fixed guideway, which (along with rural Alaska) account for 8,233.9 miles of fixed guideway, or about 57 percent of all fixed guideway route miles. These UZAs have an average of 95 fixed guideway miles, less than seven percent of the average for the five largest UZAs.

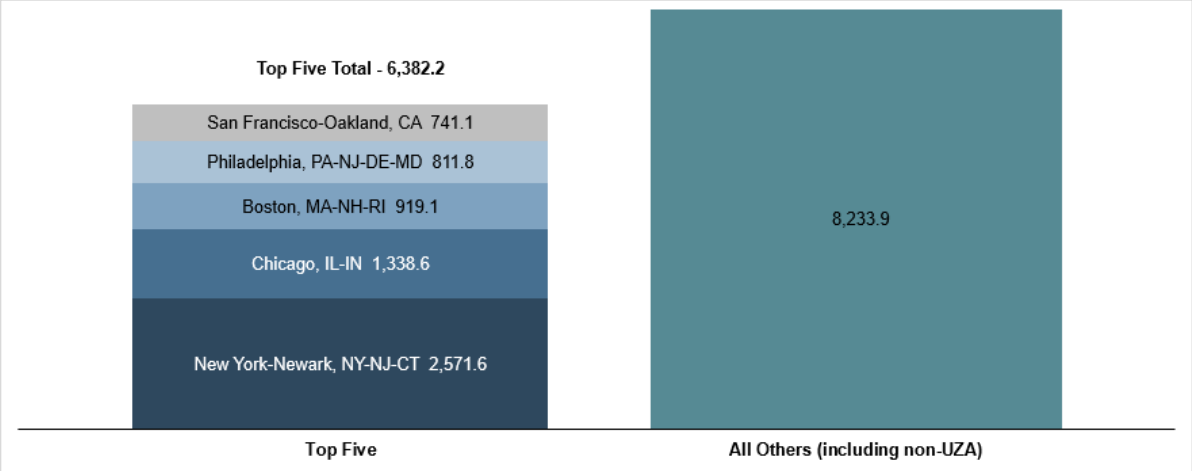


Exhibit 22. ***UZAs with Most Fixed Guideway Directional Route Miles***

Safety and Security for Urban Transit

Safety and Security reporting is a key element of NTD reporting. This reporting provides data that can measure service performance and identify areas for improvement. The following are important considerations regarding Safety and Security data reported to the NTD:

- All safety data presented are sourced from Calendar Year (CY) 2019 NTD major event reports. At the time of this document's publication, NTD reporters could still add, modify, and delete major event data for CY 2019. As such, these data are considered "preliminary" and numbers may change based on ongoing validation activity.
- The analyses in this document use CY service data to calculate safety rates. These data are sourced from the NTD's Monthly Ridership data collection.
- The Federal Railroad Administration (FRA) oversees safety for Commuter Rail systems and a select set of Hybrid Rail and Heavy Rail systems. These agencies do not report safety data to the NTD and are therefore excluded from any safety analyses in this document.

Injury Statistics

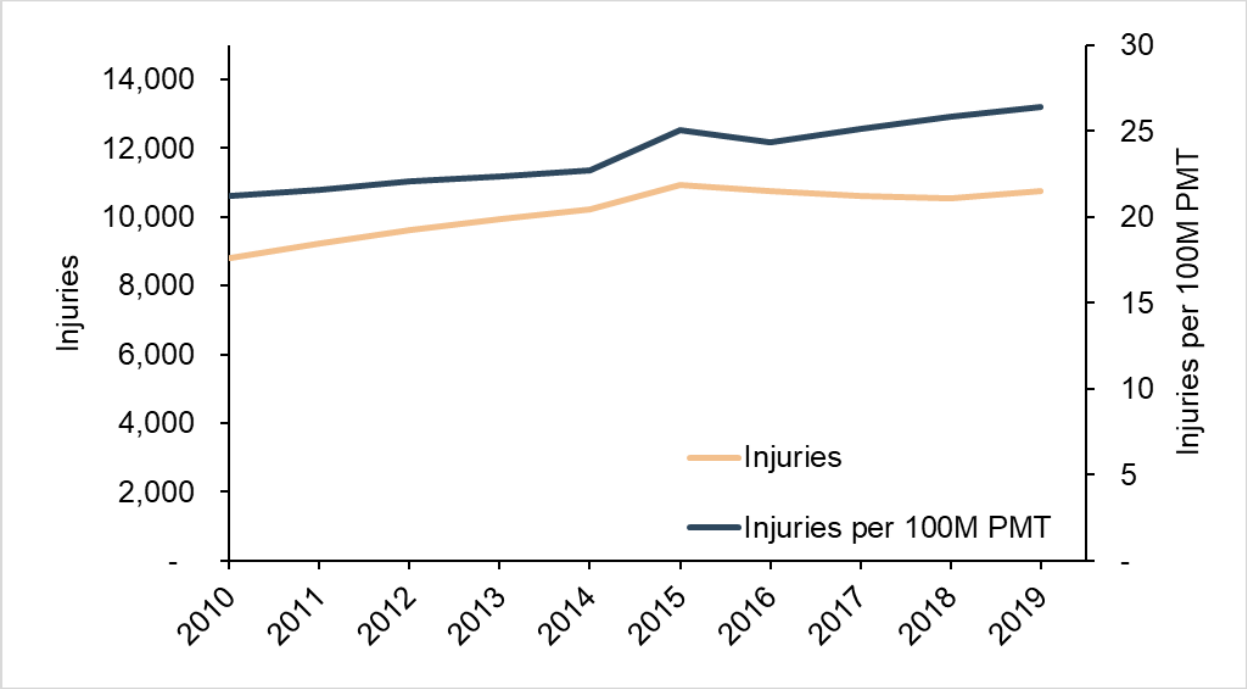


Exhibit 23. ***Injuries (and per 100 Million Passenger Miles Traveled)***

The exhibit above compares total injuries reported to the rate of injuries per 100 million PMT between 2010 and 2019. It is important to recognize that the reporting requirements for Other Safety Occurrences Not Otherwise Classified events changed in 2015. Injuries for many of these events are now reported as major events. This change caused an increase in the number of reported injuries in 2015 to 2019, compared to the number of reported injuries before the change (from 2010 to 2014).

With an understanding of the 2015 reporting change, the total number of injuries and injuries per 100 million PMT has remained stable between 2015 and 2019. Assuming that the total difference in reported injuries between 2014 and 2015 is related to the reporting change, it appears that the number of reported injuries has remained relatively stable since 2010.

Below is a modal representation of injuries per 100 million PMT during 2019. The three highest rates are from Streetcar Rail, Bus Rapid Transit and Demand Response. These higher injury rates appear reasonable because modes that operate in central cities, like Streetcar Rail, make more stops and have a higher chance of injury compared to modes that travel longer distances between stops, like Commuter Rail and Commuter Bus. Demand response modes would also be expected to have higher injury rates because these modes often are used to provide complementary ADA service for users with limited mobility.

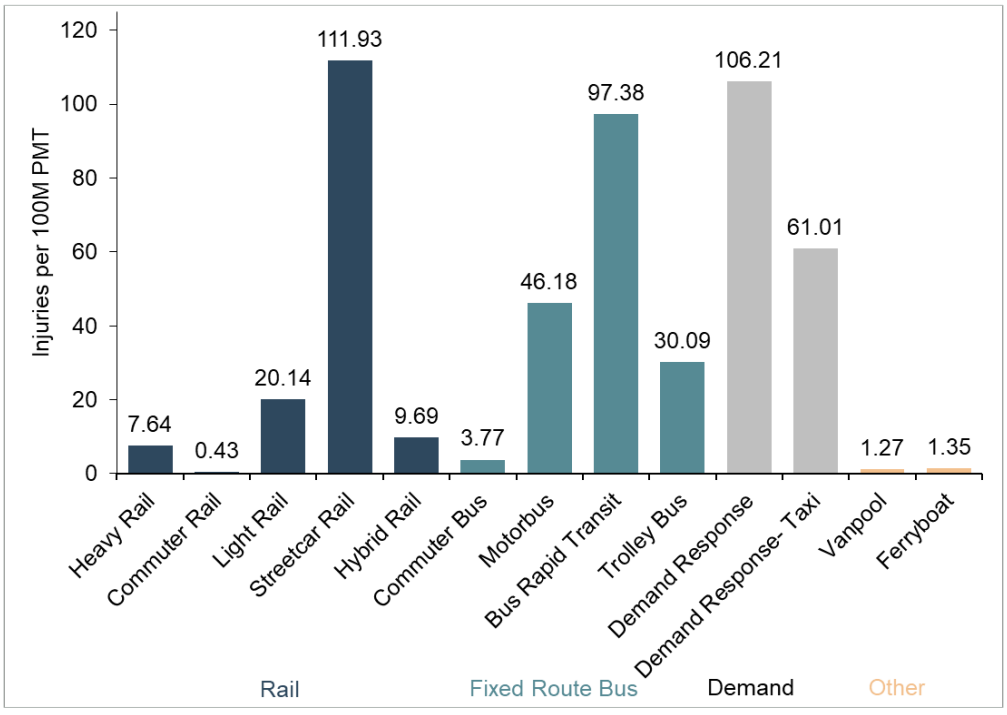


Exhibit 24. ***2019 Injuries per 100 Million Passenger Miles Traveled by Mode***

Fatality Statistics

The graph below compares the number of reported fatalities to the rate of fatalities per 100 million PMT between 2010 and 2019. During this time frame, the number of fatalities was reasonably stable at about 250 annual fatalities. The year-to-year variation was less than 50 total fatalities. The fatality rate also remained very stable at about 0.6 fatalities per 100 million PMT.

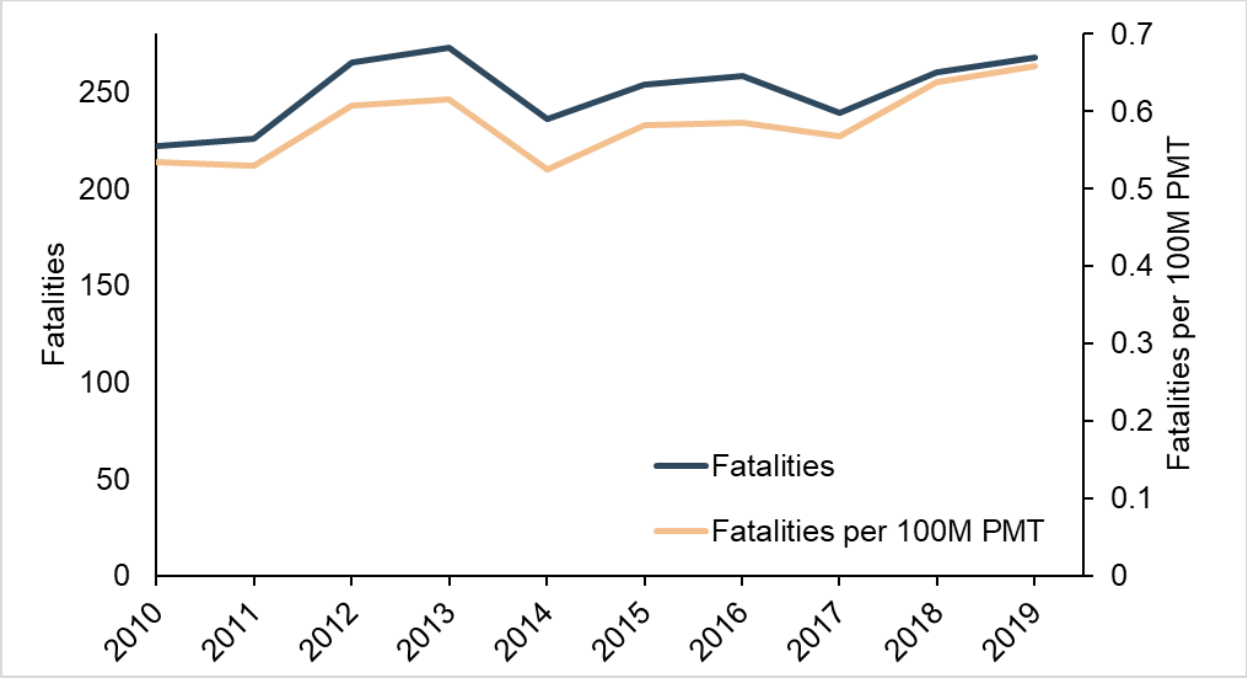


Exhibit 25. ***Fatalities (and per 100 Million Passenger Miles Traveled)***

The graph below reflects the rate of fatalities per PMT for 2019. This graph contains fewer modes than the 2019 injuries per PMT graph, as some modes did not report any fatalities for 2019. In 2019 rail modes had higher fatality rates, in part because suicides are much more common on rail modes than non-rail modes.

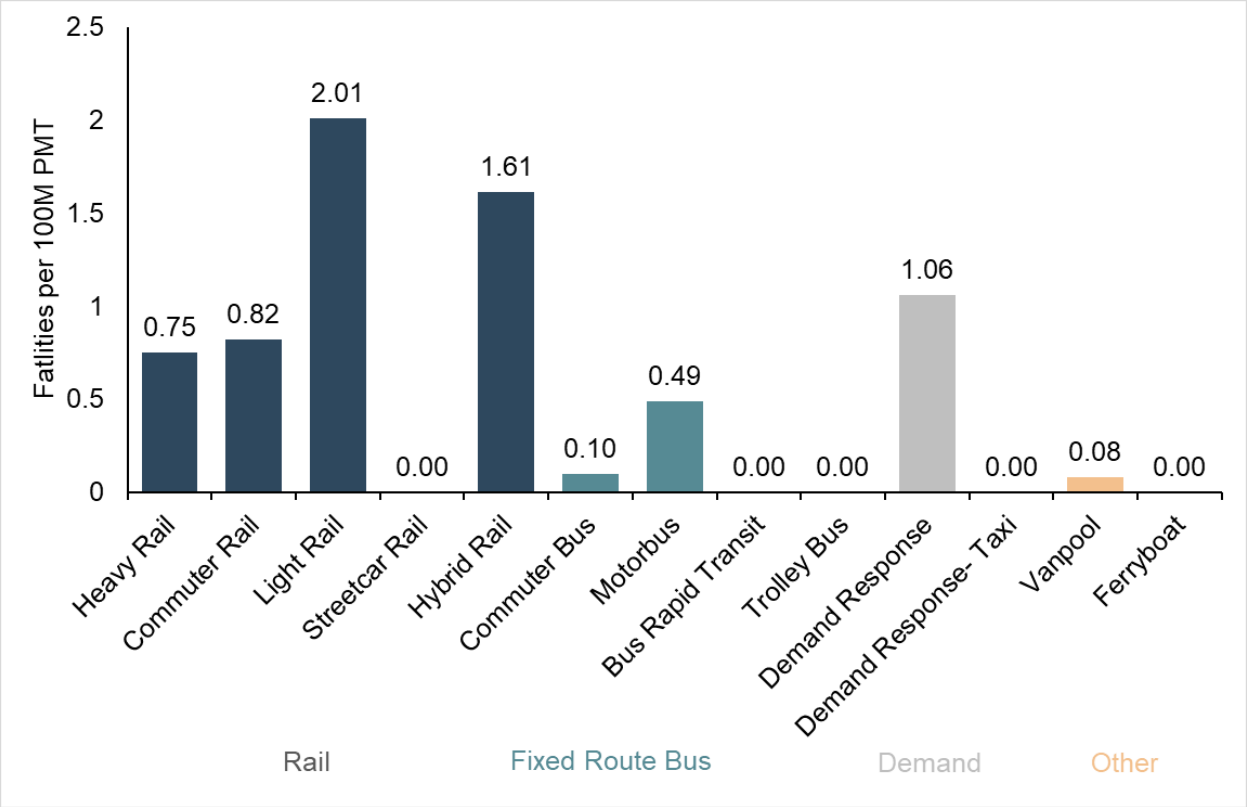


Exhibit 26. ***2019 Fatalities per 100 Million Passenger Miles Traveled by Mode***

Reduced Reporter Safety Data

Unlike Full Reporters, Reduced Reporters (small transit systems) only report the total number of events which meet a major event threshold and fatalities and injuries resulting from such events for the entire Fiscal Year of that agency, rather than submitting a separate report for each event. Most Urban Reduced and Rural Reporters (80.9 percent) reported zero major safety and security events in 2019. Of the agencies that did report events, 3.1 percent experienced fatalities.

Data Points	Fatalities	Injuries	Reportable Incidents
Total Safety Incidents	4	253	369
Number of Agencies	4	97	130
Number per Agency	0.006	0.371	0.541
Number per 10M UPT	0.475	30.048	43.825

Exhibit 27. ***2019 Safety Events, Reduced Reporting Transit***

Urbanized Areas

In the NTD, transit providers indicate the primary UZA of service operations as their "primary UZA" along with any secondary UZAs they serve. For analysis purposes, the NTST groups UZAs into the following categories:

- Small UZAs: population of 50,000 to 200,000.
- Medium UZAs: population of 200,000 to 1 million.
- Large UZAs: population over 1 million.

Service Performance

Large UZAs reported 81 percent of urban agency VRM. Only 14 percent of miles occurred in medium UZAs and 5 percent in small UZAs, respectively.

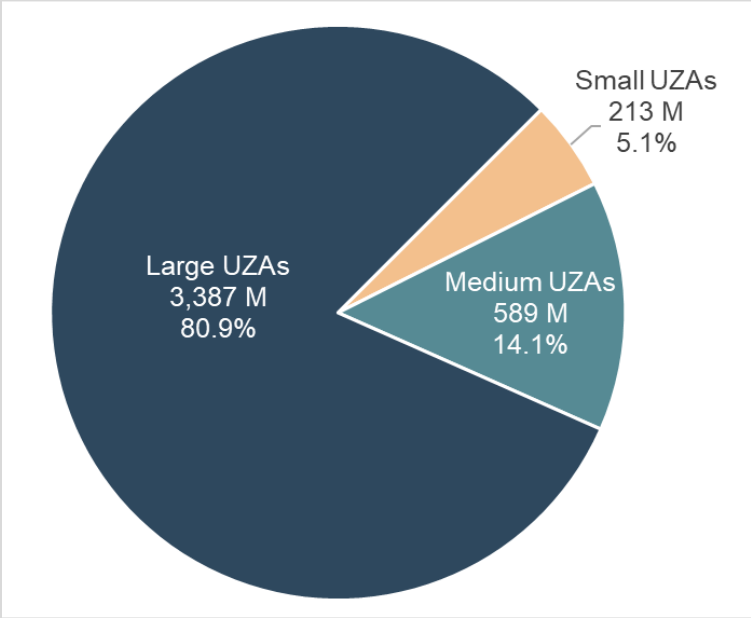


Exhibit 28. ***Vehicle Revenue Miles by Urbanized Area Size***

Small UZAs provide less varied services, mostly made up of bus and demand response service. In the charts below, you will see more modes listed for the larger UZAs (mainly rail).

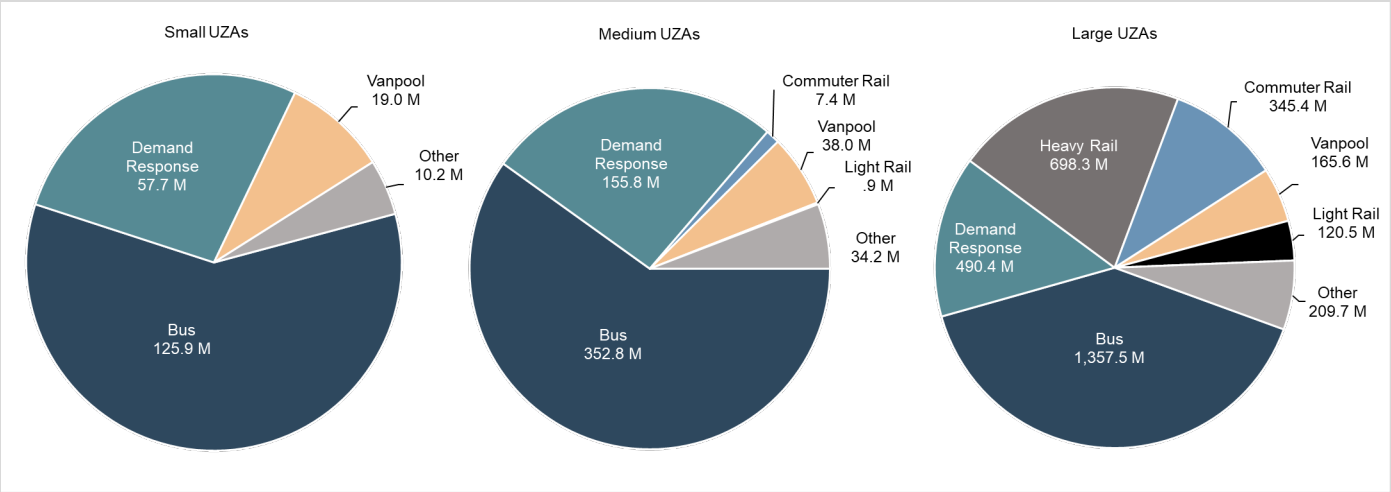


Exhibit 29. ***Vehicle Revenue Miles by Mode***

Large UZAs operate about 85 percent of all fixed guideway directional route miles. Typically, each directional route mile is a mile of transit operation space where private transportation cannot operate. For example, the New York City Subway operates on rail track unavailable to Amtrak, CSX, and any other private trains. The Boston Silver Line is Bus Rapid Transit with dedicated ROW, meaning that it operates similarly to rail transit: car traffic cannot trespass on the roadway reserved exclusively for Boston's Silver Line.

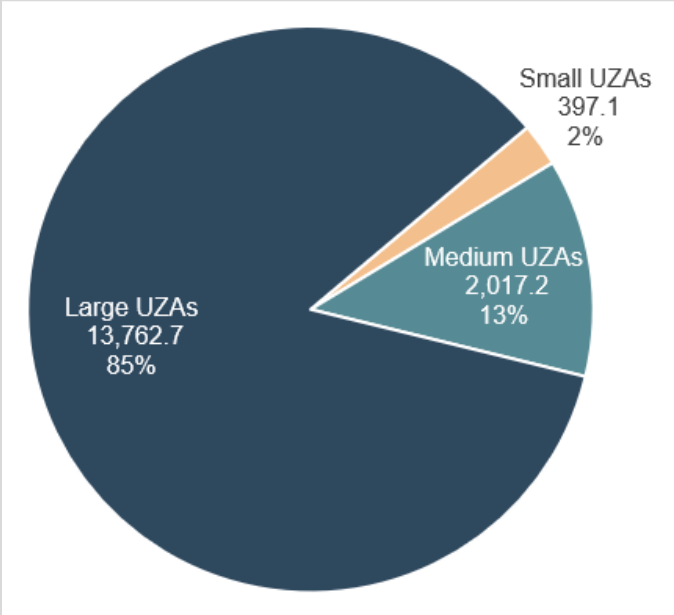


Exhibit 30. ***Fixed Guideway Directional Route Miles by Urbanized Area Size***

Public transit service depends on population density to function efficiently. In the U.S. there are 42 UZAs with a population greater than 1 million. These 42 UZAs consume 88.8 percent of all public transit, as measured by PMT.

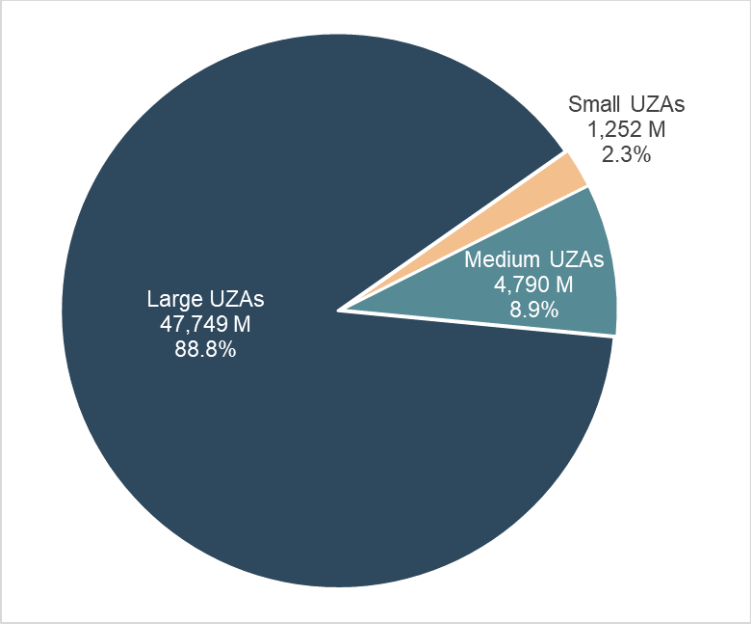


Exhibit 31. ***Total Passenger Miles Traveled by Urbanized Area Size***

Large UZAs experience more trips on public transit per capita than other UZAs. The ridership density for large UZAs in 2019 was 35.6 trips per capita, whereas the ridership density for small and medium UZAs was 8.7 and 11.8, respectively.

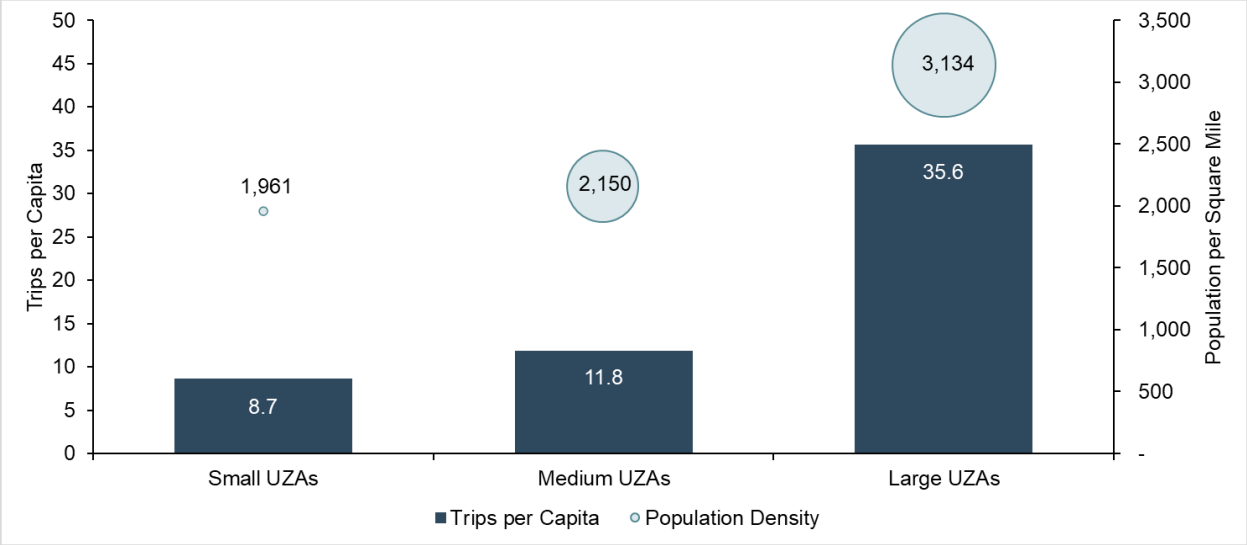


Exhibit 32. ***2019 Passenger Trips per Capita and Population Density***

In 2019, large UZAs experienced 248.87 reportable safety and security events per 100 million VRM. Medium UZAs and small UZAs experienced safety and security events at lower rates, 194.51 and 93.97 events per 100 million VRM, respectively.

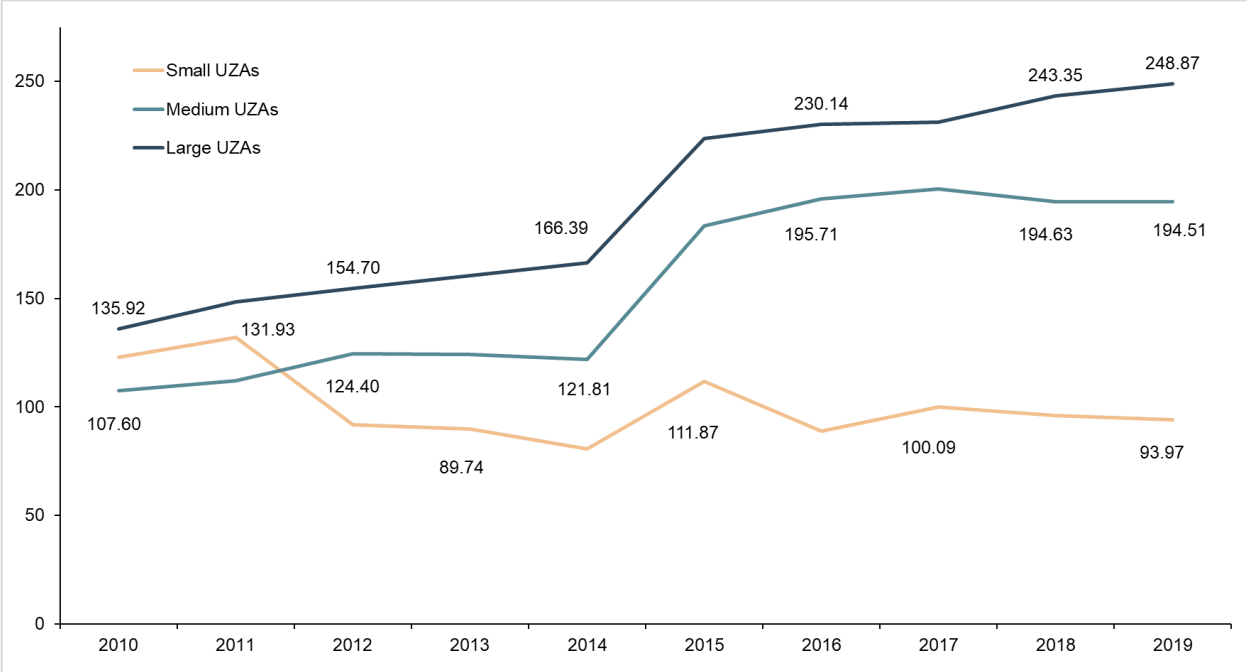


Exhibit 33. ***Total Reportable Safety and Security Events per 100 Million Vehicle Revenue Miles by Urbanized Area Size***

Sources of Funding by UZA Size

For urban transit agencies in large UZAs, directly generated revenues made up 37.7 percent of operating funding in 2019. Small and medium UZAs are more dependent upon operating subsidies than large UZAs. Directly generated revenues accounted for only 20.2 percent and 21.0 percent, respectively, for these UZAs in 2019.

Capital funds are funds from Federal, State, and local governments, as well as directly generated sources that transit agencies apply to purchases such as equipment or other assets. Directly generated sources include any funds generated or donated directly to the transit agency. This includes passenger fares, advertising revenues, donations, and grants from private entities.

For urban transit agencies operating in small UZAs, Federal sources of funds accounted for 49.9 percent of the total capital expenditures. Medium UZAs reported that 36.3 percent of their capital funding sources were Federal, with another 41.7 percent being State funding sources. Large UZAs rely less on Federal funding than on other sources for capital expenditures.

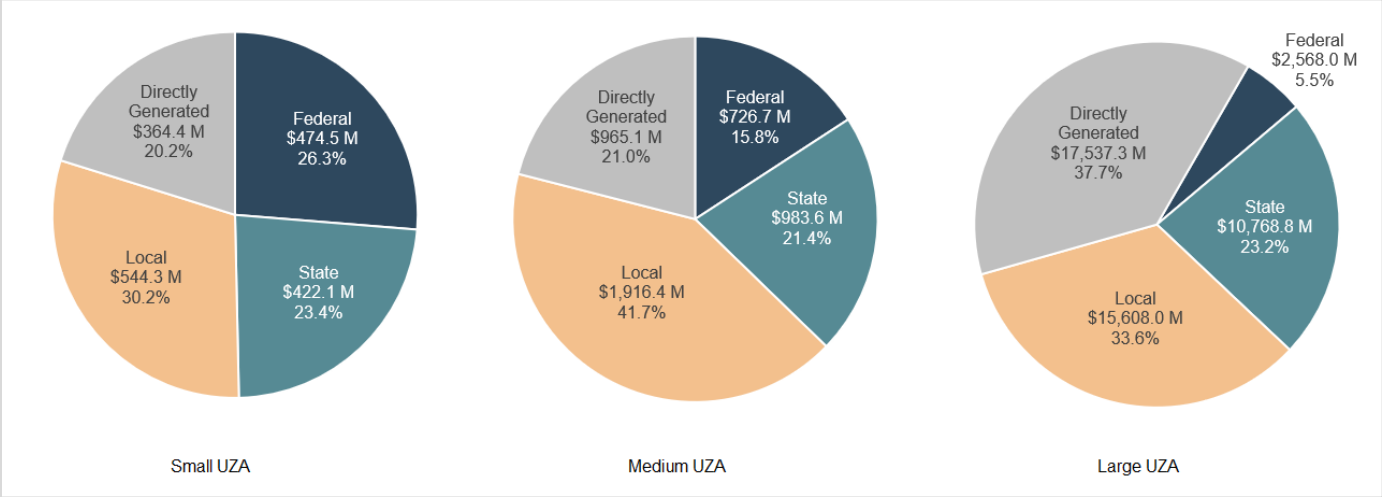


Exhibit 34. ***Operating Funding Sources by UZA Size***

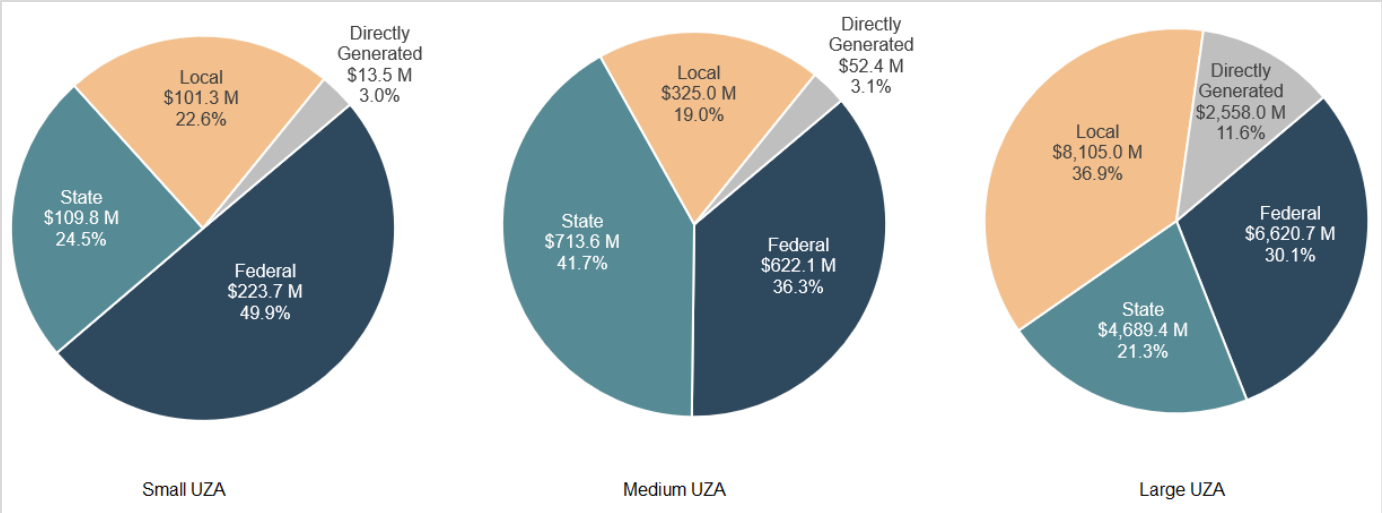
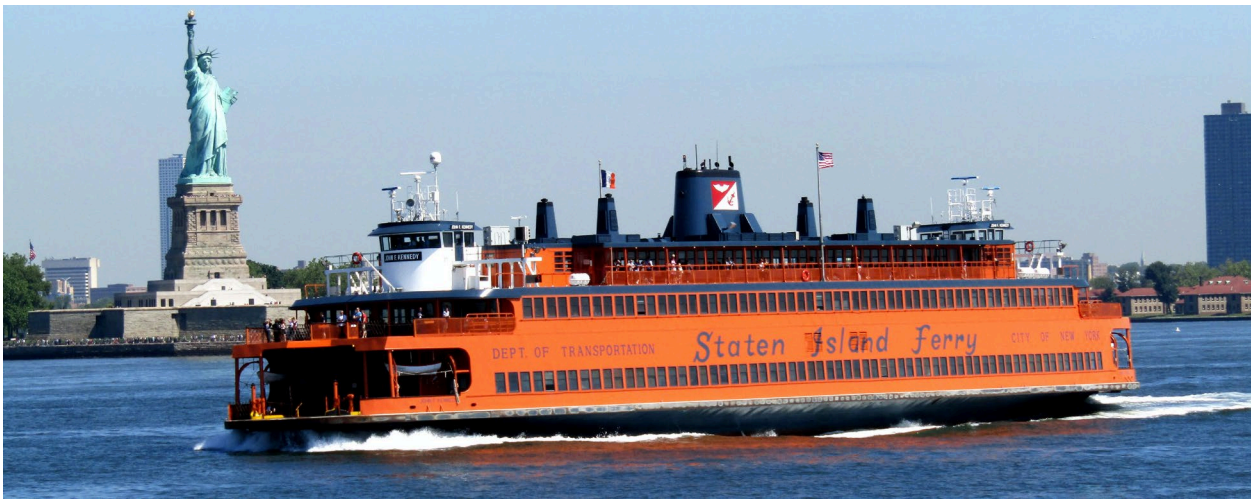


Exhibit 35. ***Capital Funding Sources by UZA Size***



Modal Spotlight: Ferryboat

Ferryboat is a unique mode operating large passenger vessels over waterways. There are currently 28 ferryboat operations reporting public transit to the urban module of the NTD.

Since 2010, agencies have reported 14 new ferryboat services to the NTD. There were 54 percent more ferryboat VRH reported to the urban module of the NTD in 2019 than in 2010 and 43 percent more passengers reported.

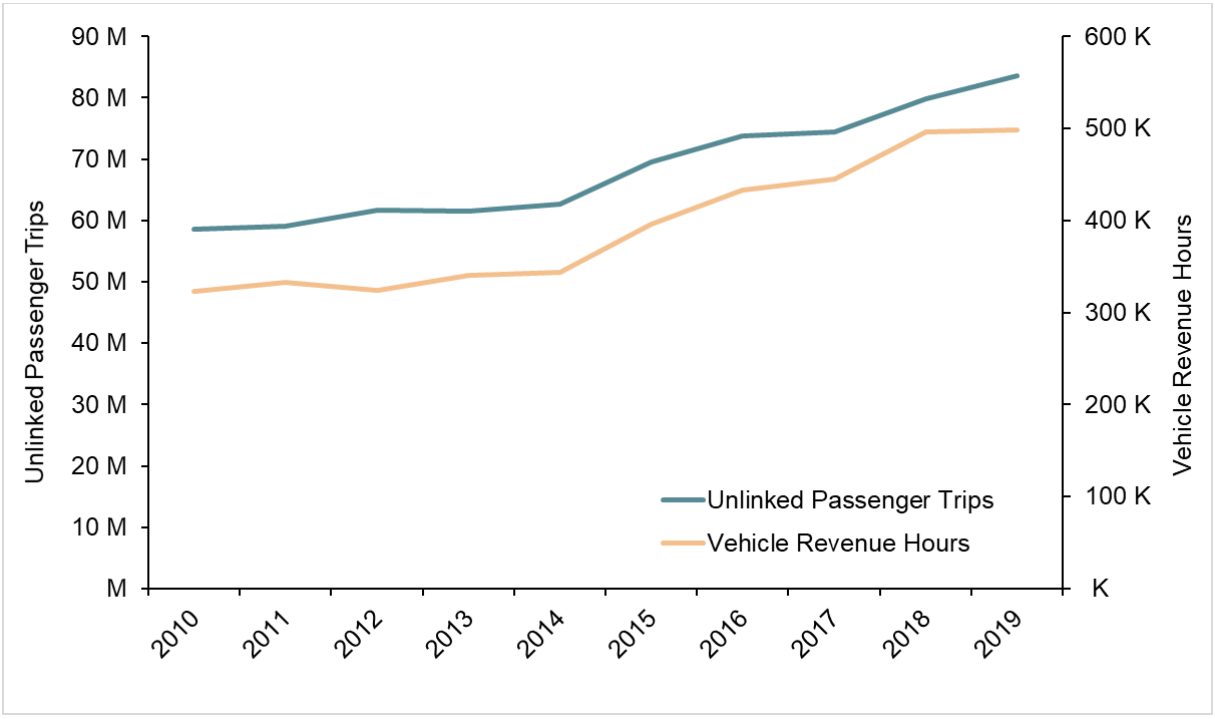


Exhibit 36. ***Increase in Ferryboat Ridership and Revenue Hours***

Generally, ferryboat services are operated in coastal cities near large bodies of water. The New York and Seattle UZAs carry the largest number of ferryboat passengers per year, as shown in the exhibit below.

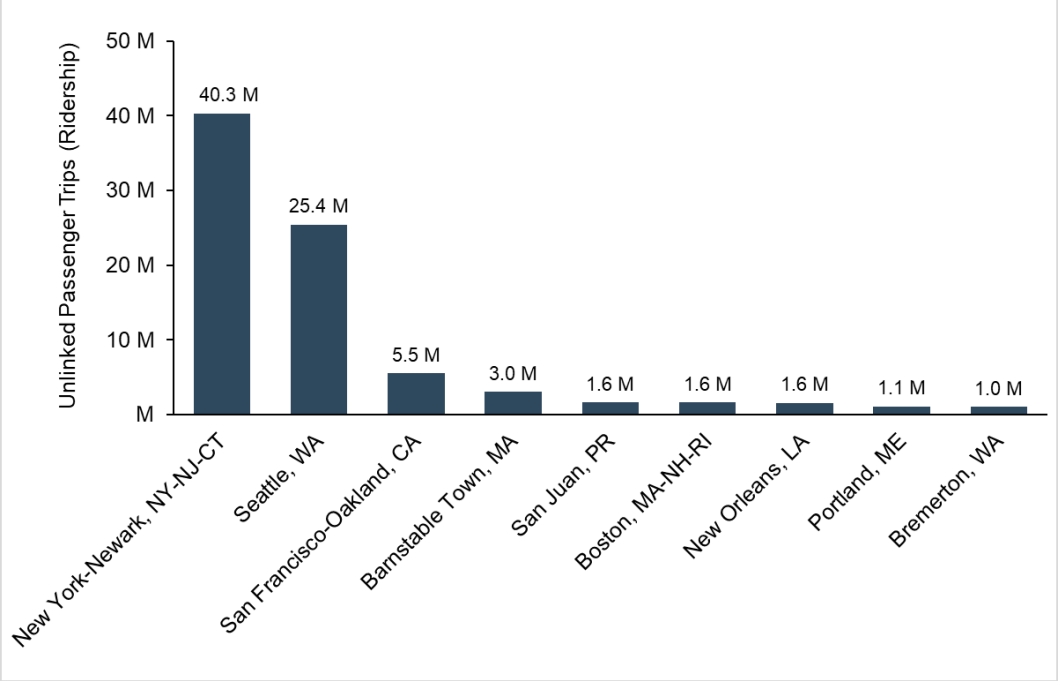


Exhibit 37. ***Urbanized Areas with Ferryboat Ridership Over 1 Million***

Ferryboat modes typically cost more to operate per revenue hour.

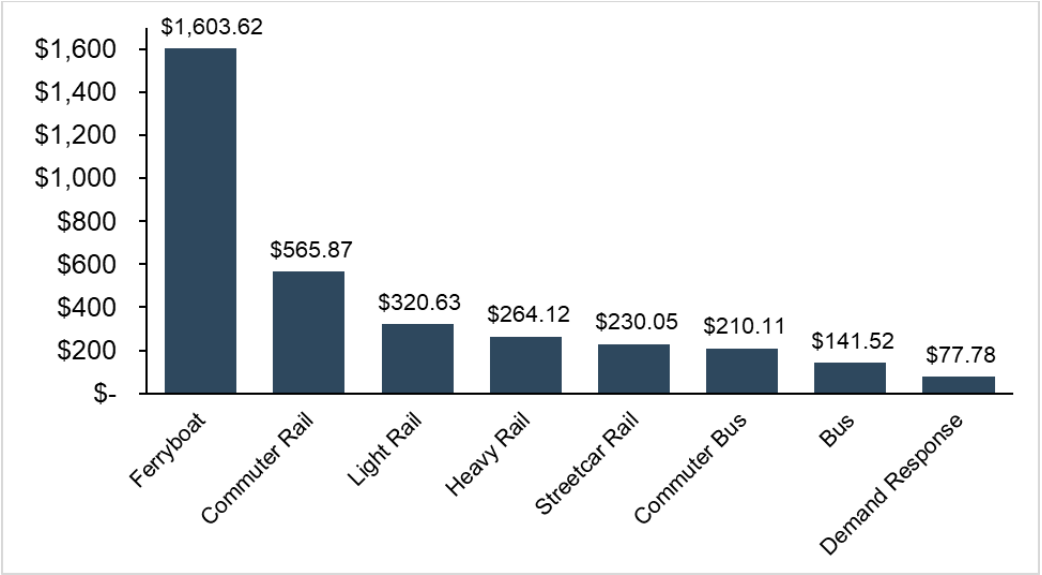


Exhibit 38. ***Operating Expenses per Vehicle Revenue Hour***

The breakout of operating expenses by cost function shows that 62 percent of the operating costs for ferryboat services are related to Vehicle Operations, almost double the percentage for heavy rail.

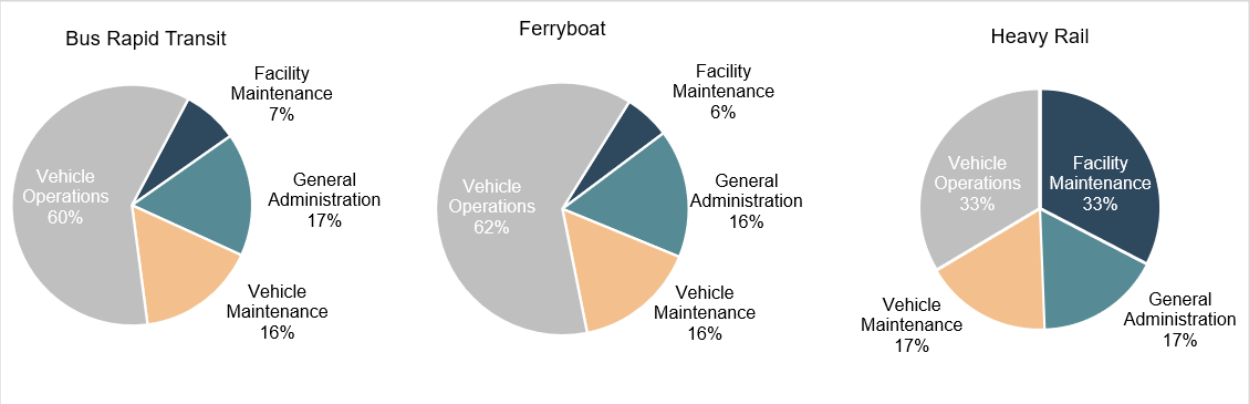


Exhibit 39. ***Ferryboat Operating Expense Breakout Comparable to Bus Rapid Transit***

With the larger capacity of the revenue vehicles accommodating more passengers per hour, the cost per UPT for ferryboat modes is similar to other public transit modes.

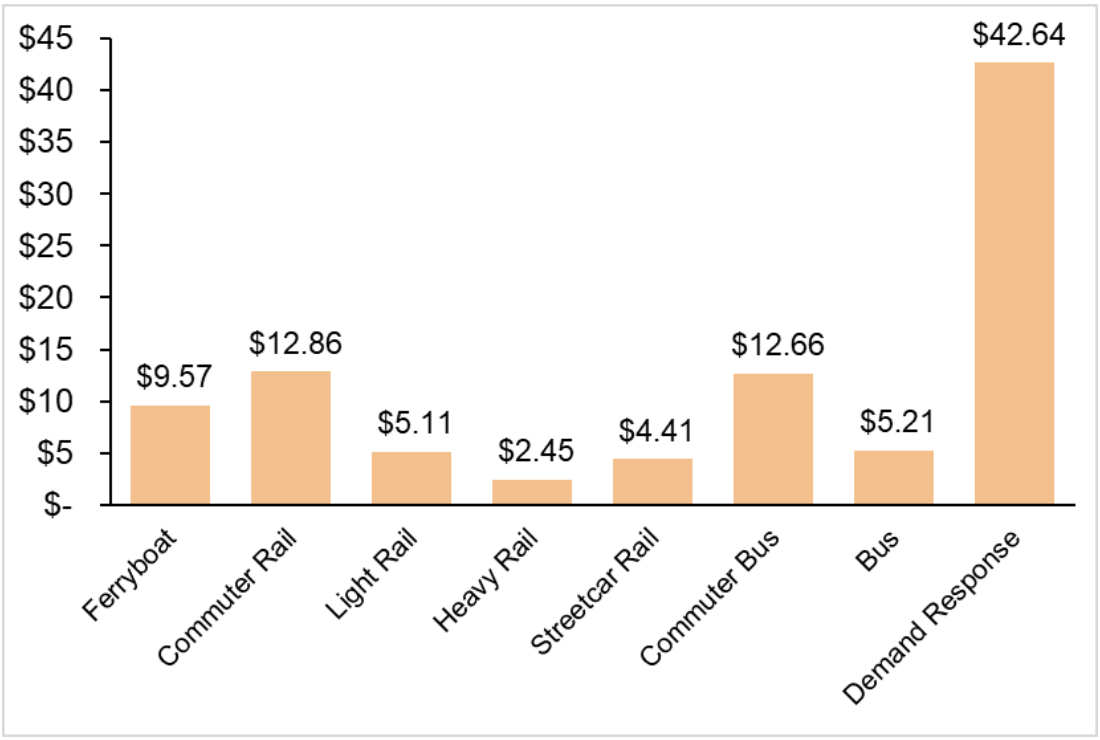


Exhibit 40. ***Operating Expenses per Passenger***

Ferryboat services carry the most passengers per vehicle revenue hour of any mode reporting to the NTD and have the highest average load factor.

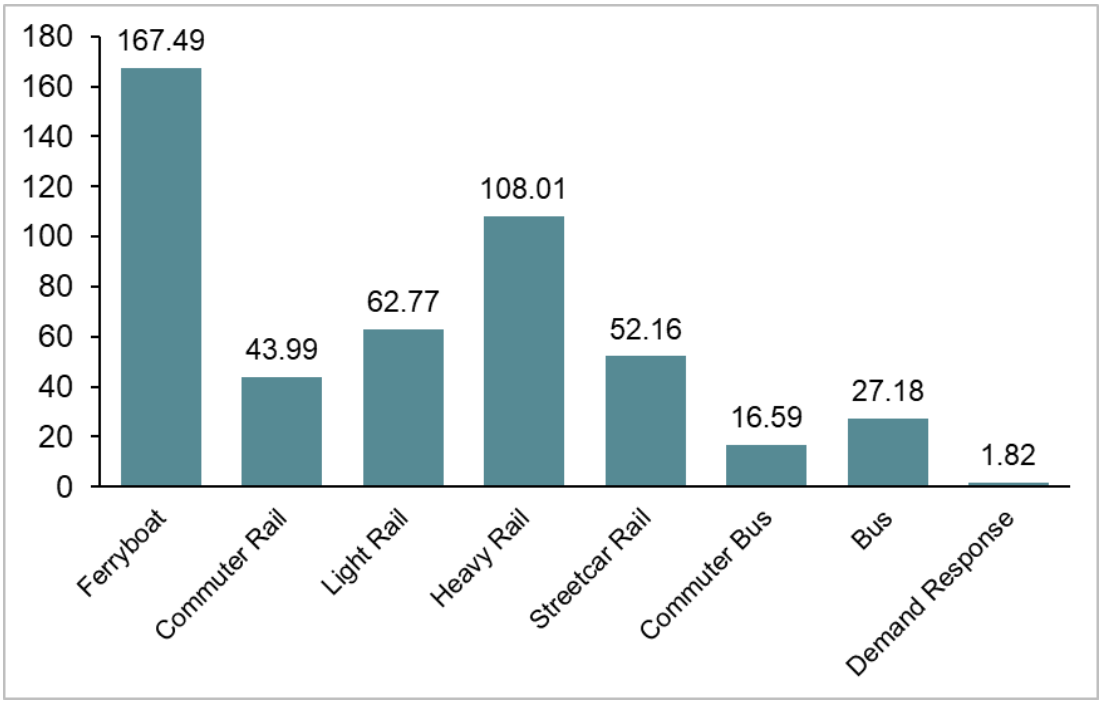


Exhibit 41. ***Passengers per Hour***

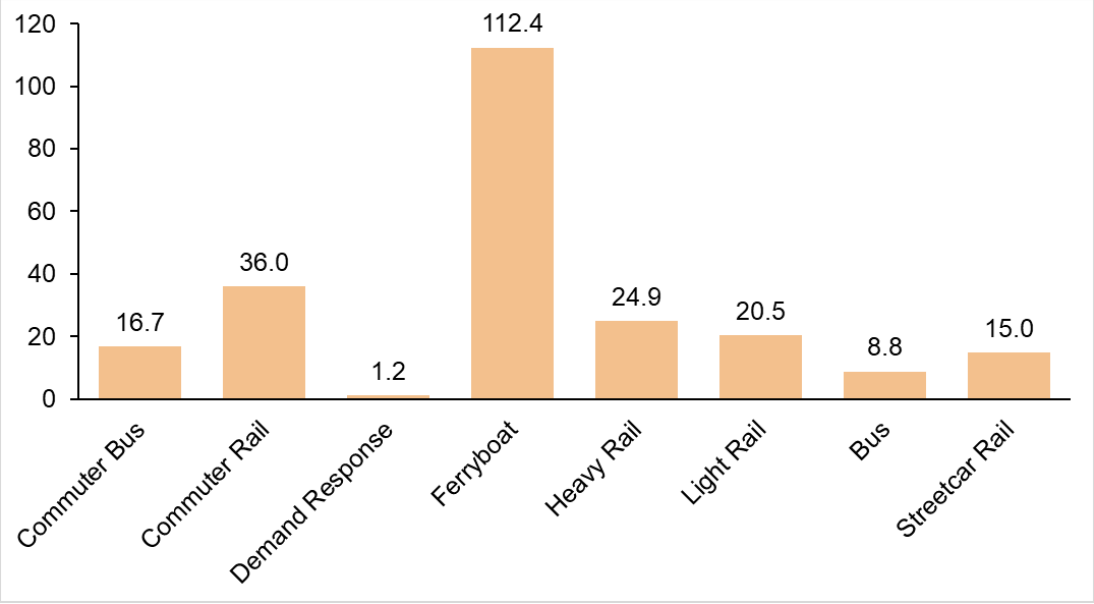


Exhibit 42. ***Average Passengers on Board***

While ferryboat services report the largest load factor of all modes, the load factor is only 25.3 percent of the seating capacity.

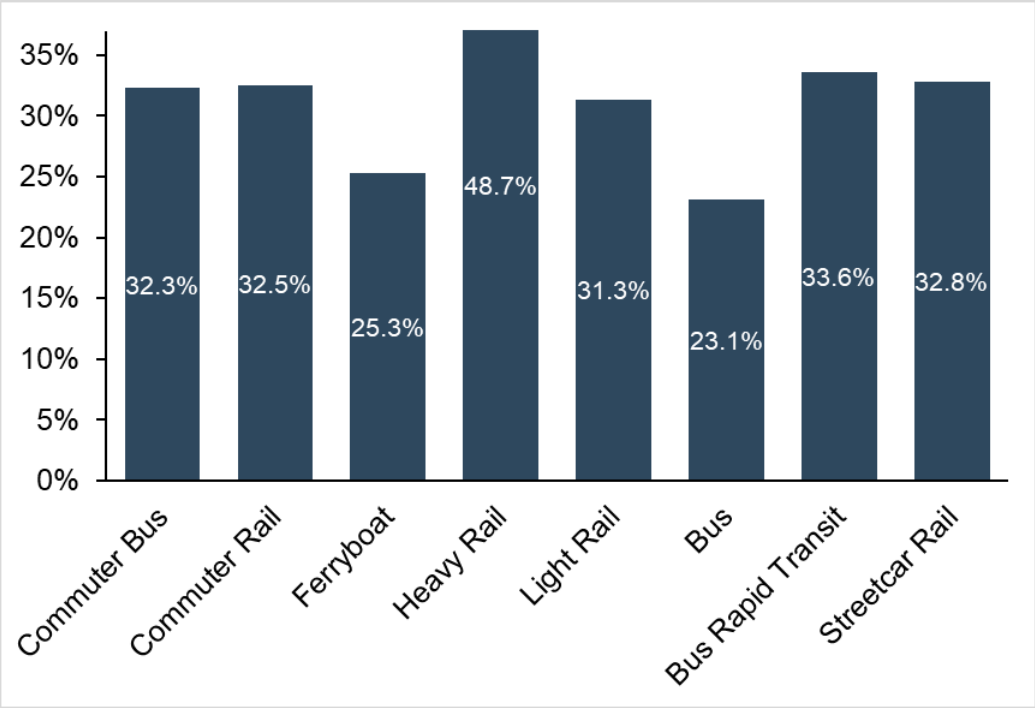


Exhibit 43. ***Average Passengers on Board as a Percent of Seating Capacity***

Ferryboat is a capital-intensive mode because of where the vehicles operate. However, the average capital expenditures are significantly less than many rail modes and are most like Bus Rapid Transit modes. The average annual capital expenditure for ferryboat service is $19.3 million and for Bus Rapid Transit is $18.5 million. The average annual capital expenditure for Heavy Rail is much greater, at $527.7 million.

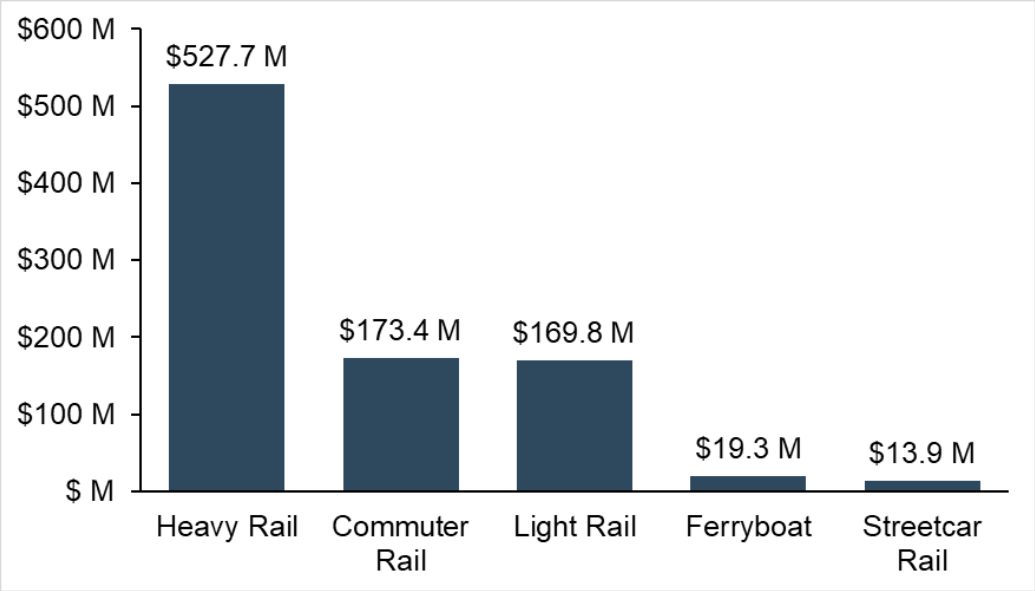


Exhibit 44. ***Average Capital Spending Per System – Ferryboat Compared to Rail Systems***

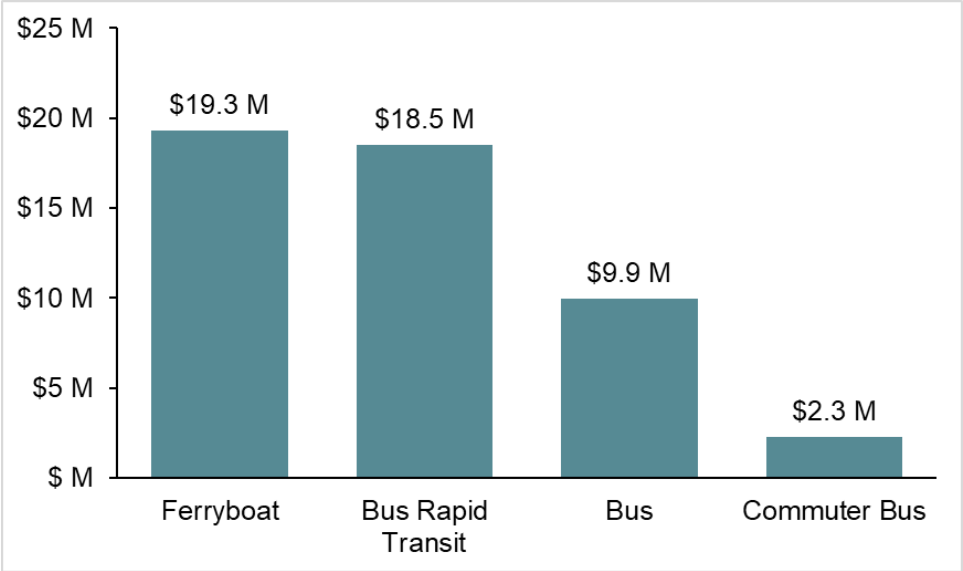


Exhibit 45. ***Average Capital Spending Per System – Ferryboat Compared to Bus Systems***

Many other fixed guideway modes require significant capital expenditure for physical infrastructure. However, capital expenditures for ferryboat services look a bit different because they operate on waterway, rather than physical guideway. The majority of the capital expenditures for a ferryboat system are applied to revenue vehicles, while that same category only makes up a small portion of the capital costs for rail modes. In this

way the average capital expenditures for ferryboat services are most similar to the Bus Rapid Transit capital expenses.

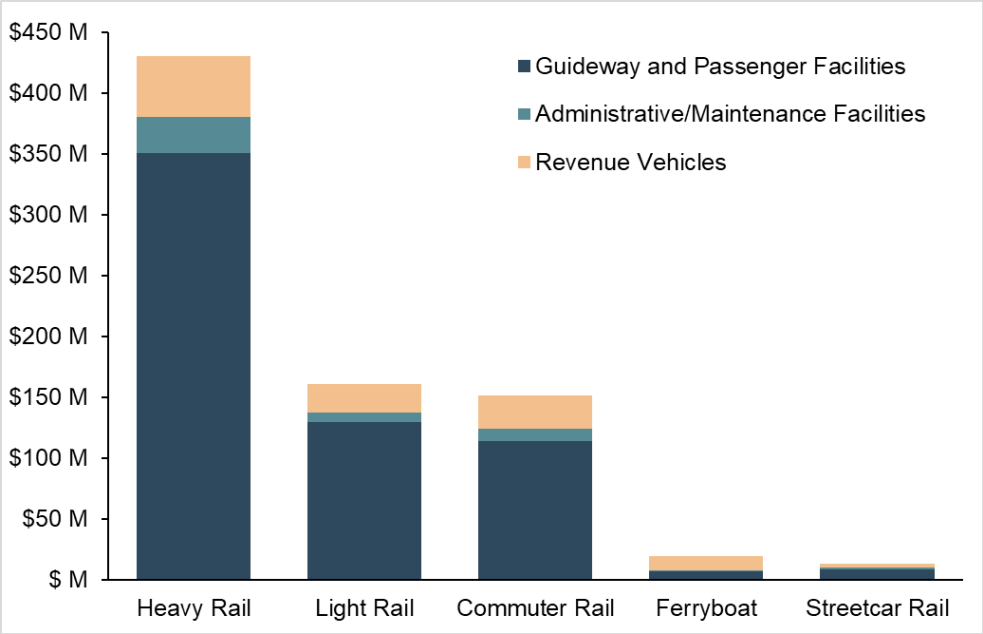


Exhibit 46. ***Capital Expenditure by System – Ferryboat Compared to Rail Systems***

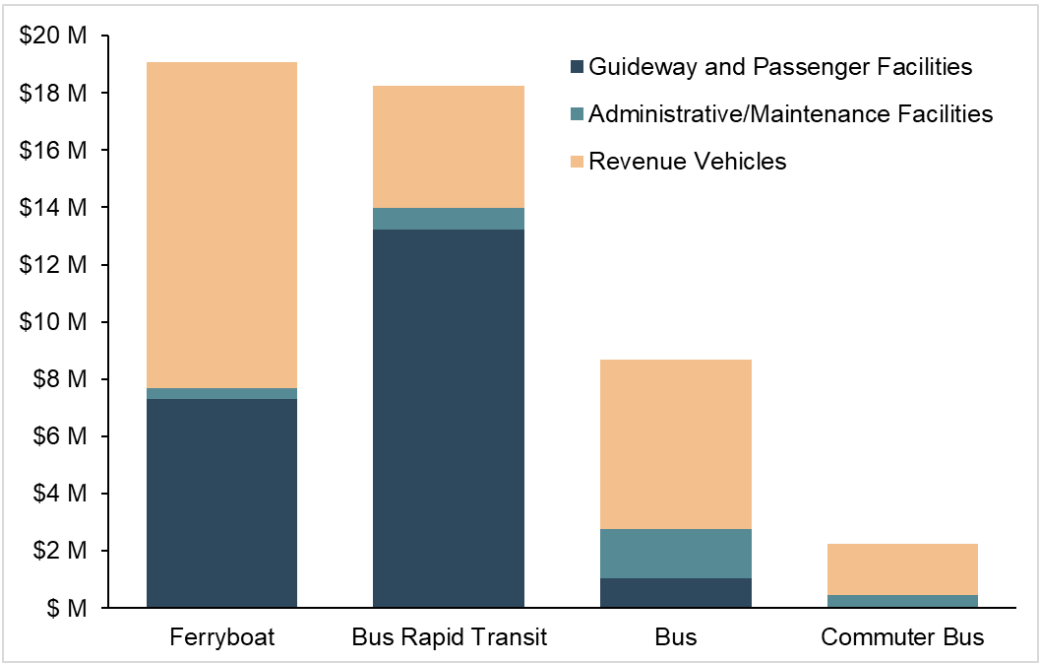


Exhibit 47. ***Capital Expenditure by System – Ferryboat Compared to Bus Systems***

Transit Asset Management Statistics

Facilities

By summarizing the primary mode served by each facility reported to both the urban and rural modules, we see that the modes with the largest number of facilities supporting the operations are Bus, Commuter Rail, Heavy Rail, and Light Rail.

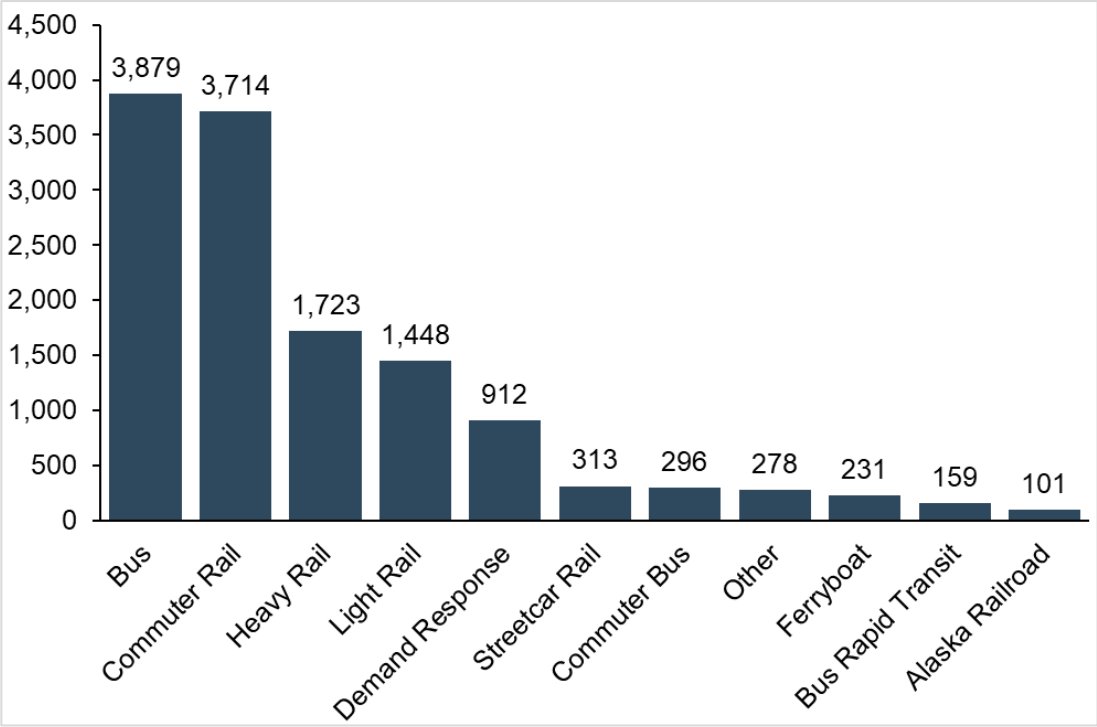


Exhibit 48. ***Total Facilities by Primary Mode Served***

Of those four modes with the highest numbers of facilities, passenger facilities make up the majority for each mode, except for Bus (MB). For Bus, the breakout between passenger facilities and administrative/maintenance facilities is almost equal, with slightly more administrative/maintenance facilities than passenger facilities. Since Bus is the largest mode at most transit agencies, if an agency has one administrative/maintenance facility serving all modes, Bus will usually be considered the “primary mode.”

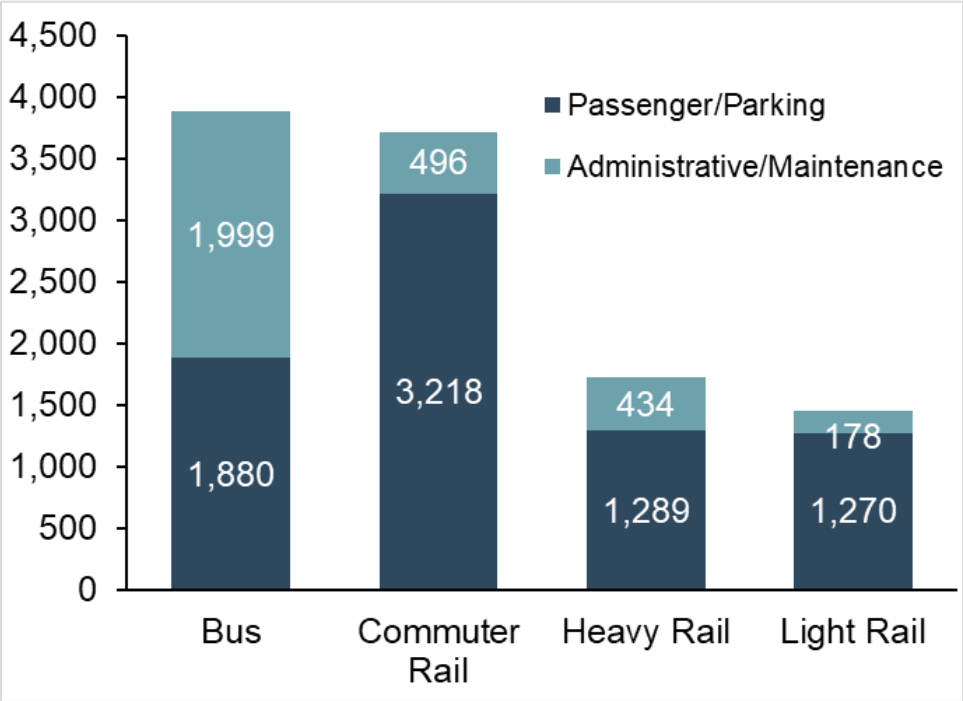


Exhibit 49. ***Type of Facilities Supporting Four Modes with Most Facilities***

The majority of reportable facilities supporting transit are Passenger Facilities (42 percent). Administrative and maintenance facilities made up 32 percent of facilities and the remaining facilities were parking facilities.

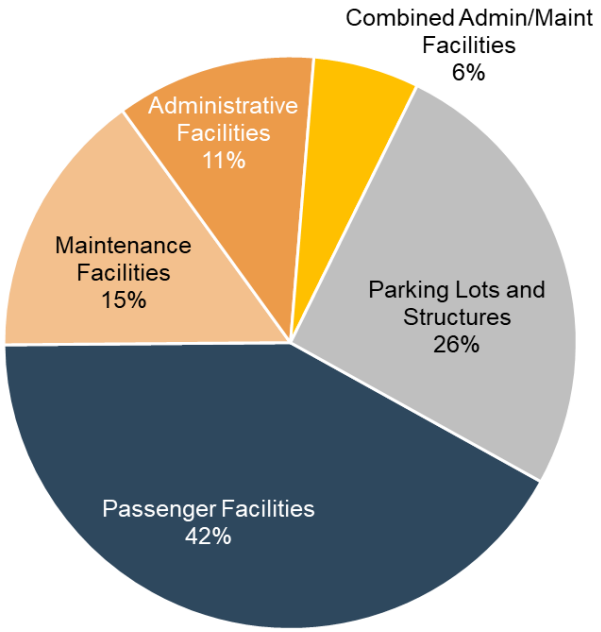


Exhibit 50. ***Facility Types System Wide***

Agencies are required to report a condition assessment for all facilities for which they have capital replacement responsibility. The condition assessment uses FTA's TERM scale, which is based on five values for assets:

- 5: Excellent
- 4: Good
- 3: Adequate
- 2: Marginal
- 1: Poor

FTA considers a facility in a state of good repair if it has a condition assessment of 3 or higher. Of the reported facilities with condition assessments, 88 percent are in a state of good repair, while 12 percent are not in a state of good repair. A small number (23 percent) of the reported facilities were not given a condition assessment, either because the agency does not have capital responsibility for that facility, or because the facility was not yet assessed[1].

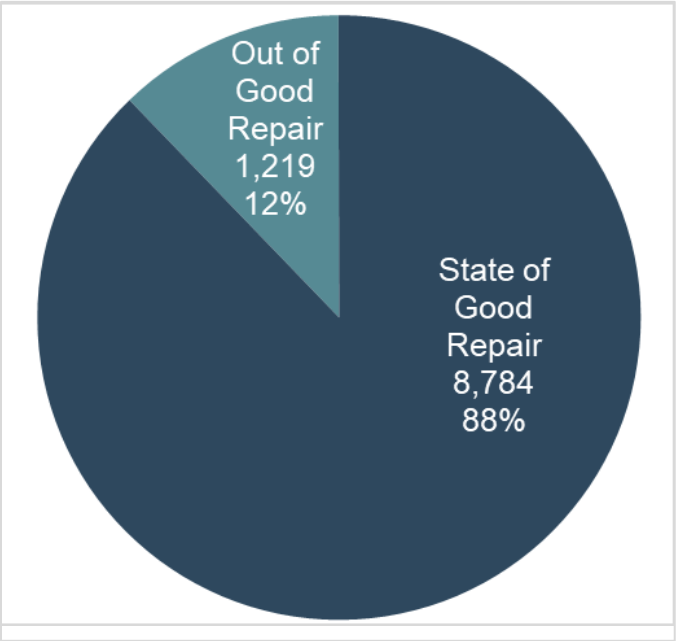


Exhibit 51. ***State of Good Repair – Facilities***

[1]With the graduated approach to condition assessments, only 50 percent of facilities for were required to have a condition assessment for Report Year 2019. In 2020, agencies are required to complete another 25 percent of the assessments, eventually reaching 100 percent of assessments completed by 2021.

Revenue Vehicles

A revenue vehicle is a vehicle used to carry passengers. A vehicle is considered to be in a state of good repair if it is within its useful life. For the passenger-carrying vehicles reporting a Useful Life Benchmark, 80 percent are within their useful life and 20 percent have met or exceeded their useful life. Of all passenger-carrying vehicles reported, 9.9 percent did not have a reported Useful Life Benchmark (ULB). Only vehicles for which the agency has capital responsibility have a Useful Life Benchmark recorded in the NTD. If the agency did not have capital responsibility for the vehicle, this typically means that the vehicle is leased or provided by a purchased transportation contractor.

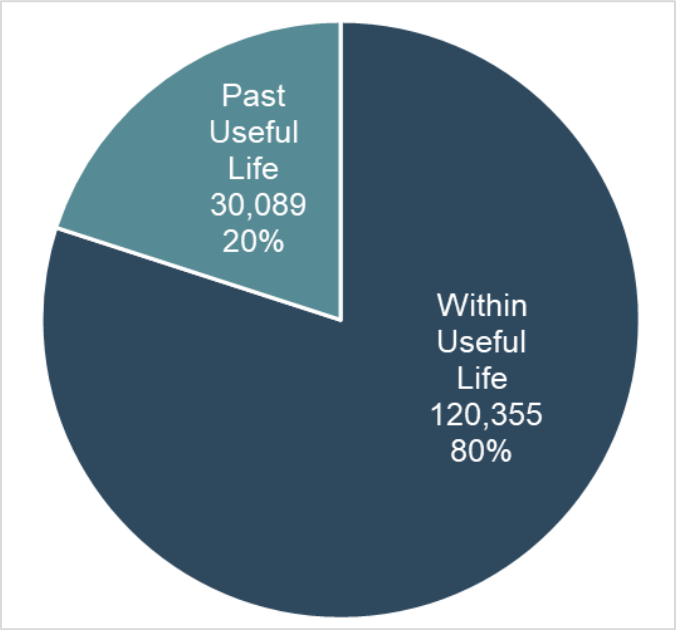


Exhibit 52. ***State of Good Repair – Revenue Vehicles***

Service Vehicles

Service vehicles are vehicles for which an agency has capital responsibility used to indirectly deliver transit service, maintain revenue vehicles, and perform transit-oriented administrative activities. There are three categories of service vehicles: automobiles, trucks and other rubber tire vehicles, and steel wheel vehicles. The average cost to replace Steel Wheel Vehicles is significantly more than the other service (non-revenue) vehicles types, however, those vehicles tend to have a significantly longer useful life. For example, FTA default ULB for steel wheel vehicles is 25 years, whereas the default ULB for Automobiles and Trucks/Other Rubber Tire Vehicles is 8 and 14 years, respectively.

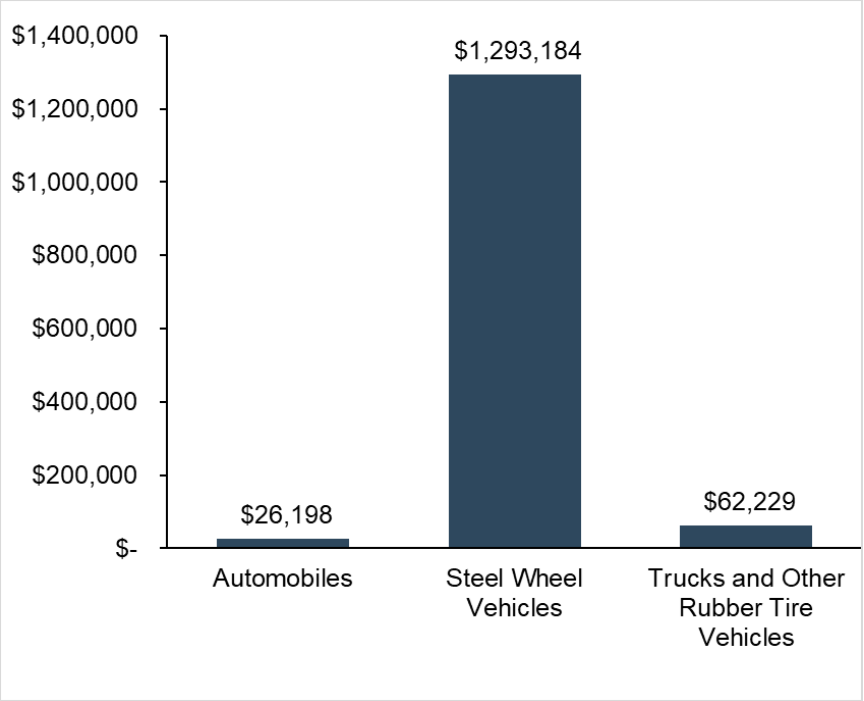


Exhibit 53. ***Average Replacement Cost by Vehicle Type***

The average age of service vehicles across all reported fleets is 8.6 years. 42 percent of the reported service vehicles are between 0–5 years old. The vehicles older than ten years only make up a cumulative 30 percent of the total.

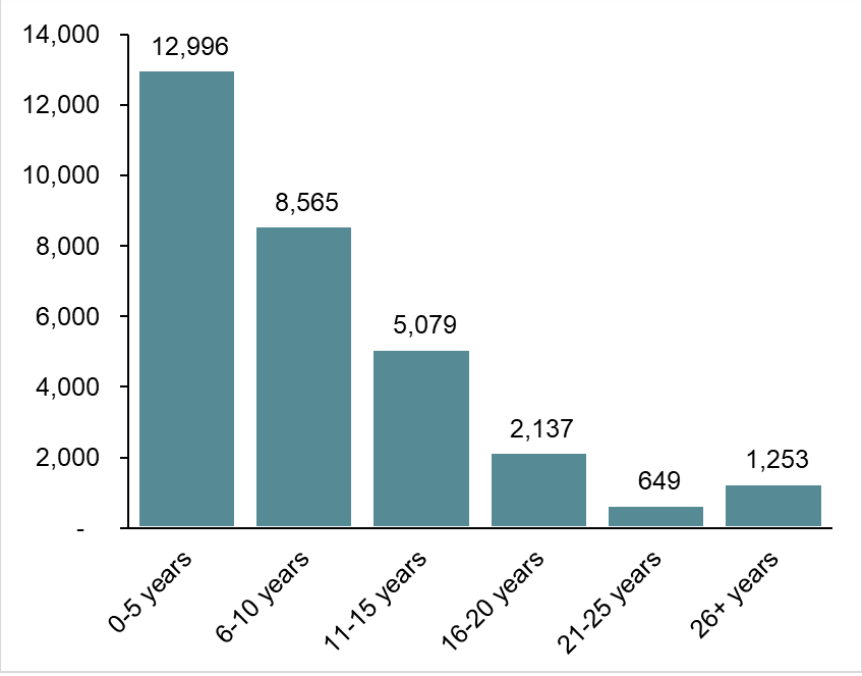


Exhibit 54. ***Average Age of Service Vehicles***

Similar to revenue vehicles, the majority of the service vehicles (63 percent) reported are within a state of good repair, meaning they have not met or surpassed their useful life.

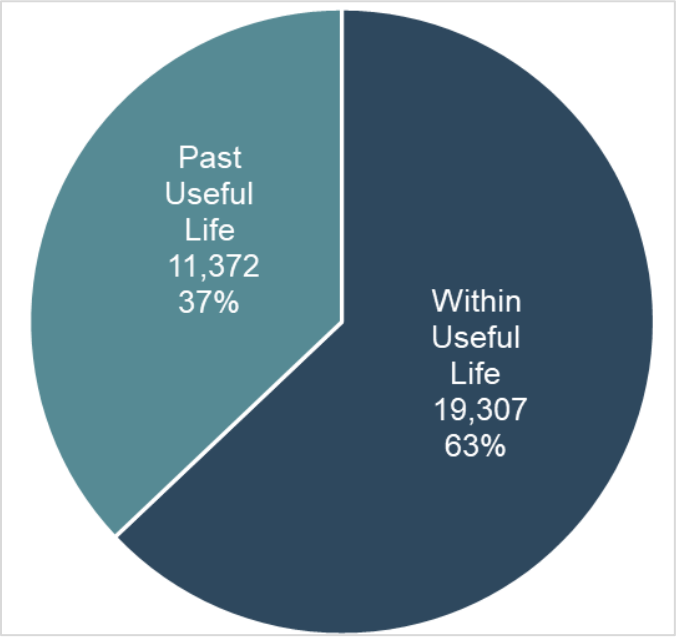


Exhibit 55. ***State of Good Repair – Service Vehicles***

Unique Transit Modes

One group of modes — the "unique" modes — are not included in the analyses of the previous sections. This is because a limited number of UZAs operate these modes. The "unique" modes include:

- Aerial Tramways (TR)
- Alaska Railroad (AR)
- Cable Car (CC)
- Inclined Plane (IP)
- Monorail/Automated Guideway (MG)
- Públicos (PB)

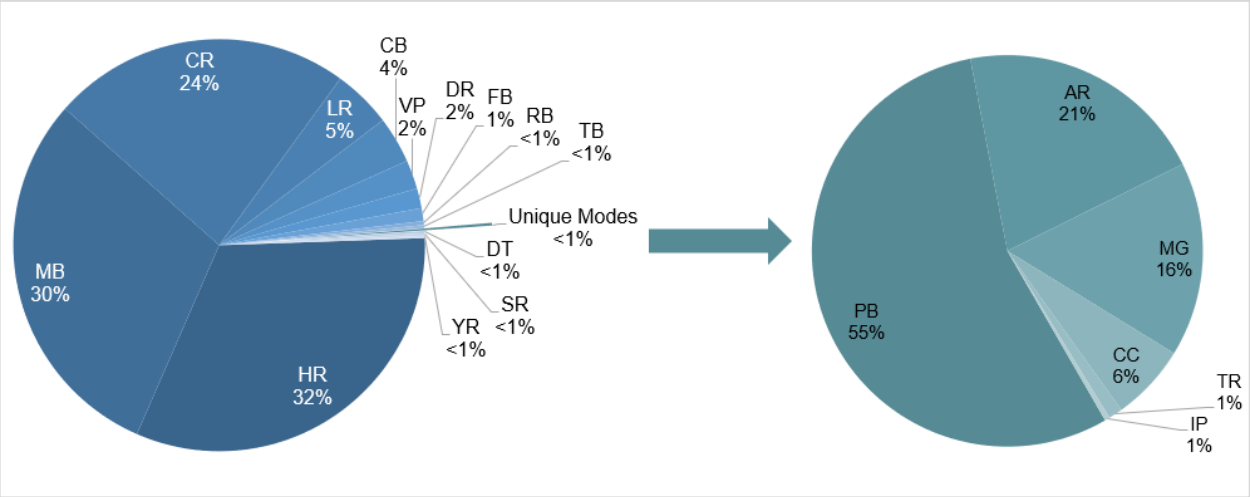


Exhibit 56. ***Full Reporters' Passenger Miles Traveled, 2019***

Collectively, these modes represent less than one percent of PMT, VRM, and Operating Expenses. The following sections examine these unique modes.

Aerial Tramway

Exhibit 57. *Portland Aerial Tram*

Aerial Tramway (TR) is a transit mode where vehicles shuttle along suspended cables between two tram terminals at differing heights. In most cases, one or two fixed cables support the vehicle while the vehicle's electrically powered wheels roll up and down a third cable, or haulage rope. This propulsion method and cable setup enables aerial trams to move forward or backwards as needed.

Different variations of tramways have been in use for hundreds of years, especially for industrial cargo and in mountainous regions (to carry ore in mining operations). As time passed, aerial trams began to carry passengers instead of exclusively cargo.

However, as electric power became more widely used in transit services in the 1930s – 1940s, aerial tramways became obsolete. Since then, tramways have been largely used for recreational purposes such as ski lifts. However, there has been a recent interest in operating tramways in the urban market. There now are two Aerial Tramways that provide mass transit service in the country. The Roosevelt Island Tramway connects Roosevelt Island to the upper east side of Manhattan in New York City, but does not report to the NTD.

The City of Portland is the only urban NTD reporter that reports Aerial Tramway service. The Portland Aerial Tram opened in 2006 and operates a two-vehicle line service that can carry 78 passengers per cabin. The tramway connects the Oregon Health & Science University campus with the South Waterfront district of Portland.

An Aerial Tramway does not operate on rails or roadway, it operates in exclusive air space. For the purposes of NTD reporting, the NTD considers Aerial Tramway a non-rail, fixed route mode operating exclusively on fixed guideway.

Alaska Railroad

Alaska Railroad (AR) is a transit mode designated solely for the Alaska Railroad Corporation. This railroad provides both freight and passenger services and uses more than 500 miles of track across the State of Alaska. This railroad has been in operation since the early 1900s. The Alaska Central Railway constructed the railroad to provide an all-weather route to take advantage of the natural resources in the interior of the Alaska Territory.

Exhibit 58. ***Alaska Railroad Corporation***

Alaska Central Railway began laying the first railroad in Seward, Alaska, in 1903, which eventually extended 50 miles north. In 1914, Congress approved the construction of 470 miles of track to Fairbanks that was completed in 1923.

In 1984, Governor Bill Sheffield signed legislation creating the Alaska Railroad Corporation. Shortly thereafter, the State of Alaska purchased the railroad from the Federal government. The Alaska Railroad continues to provide freight and passenger services today.

The Alaska Railroad Corporation provided 24.2 million passenger miles of service in Report Year 2019. This service accounted for approximately 20.7 percent of the total unique mode PMT.

Cable Car

Exhibit 59. ***San Francisco Cable Car***

The Cable Car (CC) mode operates on a railway propelled by underground cables. While several cities operated cable cars in the past, the San Francisco cable car system is the last system in operation in the country today and has received recognition as a National Historic Landmark. This system is one of two National Historic Landmarks that move — the other is New Orleans' St. Charles Streetcar line.

Andrew Smith Hallidie created the first cable railway in San Francisco, known as the Clay Street Hill Railroad. Clay Street provided the template for San Francisco's cable car system that exists today.

Prior to cable cars, people used horses to move passengers and supplies up and down San Francisco's steep streets. Throughout the late 1800s, San Francisco converted from horse operations to cable cars, reaching 23 operating lines by 1890. There are three cable car lines still in operation today: Powell-Mason, Powell-Hyde, and California.

San Francisco's cable cars move using centralized, powerful electric motors that replaced the original steam powered engines. These engines move large wheels that pull the underground cables through the streets. Each car requires two operators on board in order for the cable car to move safely and efficiently — a grip operator and a conductor.

The cable car system employs "grips" that extend through the vehicle and directly clench and release the cable underground. This gripping action is performed by grip operators, or gripmen, through a ratchet lever. This procedure allows the cars to coast over crossing cables and brake whenever necessary. Conductors are responsible for fare collection, boarding management, and control over the rear wheel brakes. The San Francisco Municipal Railway operates the cable cars and reports the data to the NTD. In Report Year 2019, cable cars provided 7.4 million passenger miles of service, making up 6.3 percent of total unique modes PMT.

Inclined Plane

An Inclined Plane (IP), also called a funicular railway, is a mode of transit that operates on a railway over steep slopes and grades. Moving cables power the vehicles, which have the ability to move both up and down the grade. An Incline Plane differs from a Cable Car in that the cable is permanently attached to the inclined plane vehicle.

Exhibit 60. ***Monongahela Incline***

Inclined Planes operate using two cars that attach to a cable. This cable runs through a pulley at the top of the grade. The two cars run simultaneously; one car moves up the incline while the other moves down. This procedure allows the cars to counterbalance, minimizing the energy required to propel the car going up the incline.

There are three NTD reporters that operate Inclined Planes: Cambria County Transit Authority (CCTA), Port Authority of Allegheny County (PAAC), and Chattanooga Area Regional Transportation Authority (CARTA).

PAAC owns and operates the Monongahela Incline, also known as the Mon Incline, which is the oldest continuously operating inclined plane in the country. John Endres built the inclined plane in 1870 in response to the rapid expansion of Pittsburgh. As the factories and mills grew on flats near the river, people built houses nearby, on top of Mount Washington. The construction of the incline facilitated further development and accessibility to the area.

CCTA owns and operates the Johnstown Inclined Plane, another transit service rich in history. This IP is 129 years old and carries nearly 66,000 riders each year.

Lookout Mountain Incline Railway is the inclined plane operated by CARTA. Located in Chattanooga, Tennessee, this IP began operation in 1895 and is now one of the world's steepest passenger railways.

Monorail/Automated Guideway

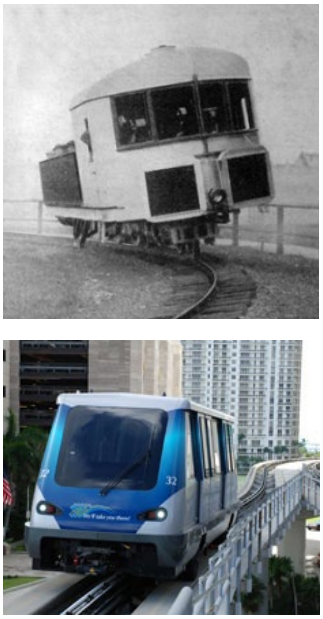


Exhibit 61. *Brennan's Gyrocar and Miami-Dade Metromover*

In 1903, Louis Brennan patented a gyroscopically balanced monorail, or gyrocar, as shown to the left in Exhibit 63. While Brennan intended to use this system for military purposes, it did not get past the prototype stage.

Automated Guideway (MG) is a type of public transit system where trains operate over a single electric rail. Automated guideway systems are typically above grade, or elevated, and may either operate over or suspend from the central beam. Many airports utilize automated guideway systems for transferring passengers to and from terminals, but these are not reported to the NTD because they do not meet the definition of public transportation.

Henry Palmer invented and patented one of the earliest monorail designs in 1821. Since that time, automated guideway has evolved as engineers experimented with a single rail system as an alternative to existing rail transport.

Today's automated guideway systems straddle center beams that support and guide the train and use air-filled, rubber tires. The electric motors use third rails or contact wires that power the straddle beam to propel the trains forward.

There are six agencies that reported data for automated guideway services to the NTD: Seattle Center Monorail Transit, Morgantown Personal Rapid Transit, Miami-Dade Transit, Detroit Transportation Corporation, Jacksonville Transit Authority, and San Francisco Bay Area Rapid Transit.

Público

The Público system (PB) is a transit mode unique to Puerto Rico and provides fixed route services predominantly in Puerto Rico's UZAs. The Público system is the largest public transportation system in Puerto Rico.

Exhibit 62. *Público*

Públicos are similar to informal transport systems operated in developing countries. The biggest distinction between the Público service and other transit modes is the way that Públicos operate.

Drivers of Públicos own their vehicle and are given exclusive rights to the route where they provide service. The drivers, or route owners, are responsible for their service and operate as independent business units. Besides maintaining the vehicles and routes, drivers must determine their schedule and supply the funds to run the service.

Puerto Rico Highway and Transportation Authority (PRHTA) manages the Público service and grants permission to potential drivers. PRHTA surveys the area and determines if there is a need for transit. If approved, PRHTA franchises the rights for that particular route to the prospective operator. Públicos account for 55.3 percent of the passenger miles traveled by unique transit modes in the U.S. This translates to 64.5 million out of the 116.6 million unique modes' PMT.[2]

[2] Photograph sources:
Aerial tramway: Wikimedia Commons, Another Believer (CC BY-SA 3.0)
Alaska Railroad: Alaska Railroad Corporation website
Cable Car: Wikimedia Commons, Fred Hsu (CC BY-SA 3.0)
Inclined Plane: Wikimedia Commons, S. Clery (CC BY-SA 3.0)
Miami-Dade Metromover: Miami-Dade County Metromover website

Rural Transit

The U.S. Census defines rural areas as geographic areas with a population of less than 50,000. For Report Year 2019, 1,245 subrecipients, 443 asset subrecipients and 54 States (the NTD considers Puerto Rico, American Samoa, Guam, and the Northern Mariana Islands as States for the purpose of rural data collection and funding) submitted data to the NTD in the rural reporting module.

Agencies report to the rural module if they receive §5311 funds but do not receive §5307 funds and do not operate exclusively urban trips. These Rural Reporters are made up of mostly city/county government reporters (44 percent), or private non-profit reporters (31 percent). The remaining recipients are made up of Tribes, independent authorities, private for-profit companies, and many others.

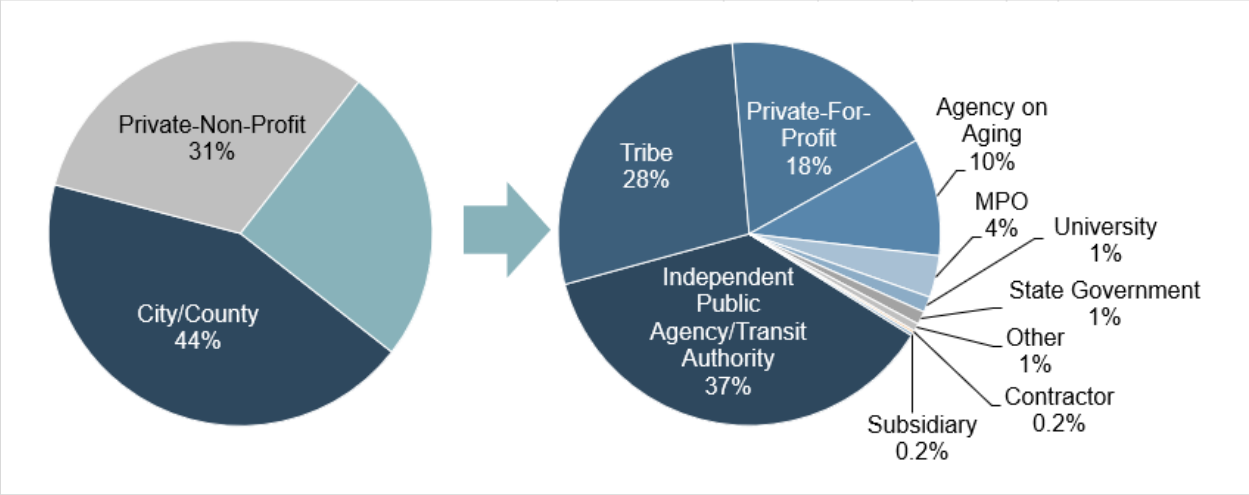


Exhibit 63. ***Rural Transit Service Providers by Organization Type***

The exhibit below shows that a majority of the service provided by these Rural Reporters is demand response (71 percent) due to the low population density of rural areas. The next largest service represented in these rural areas is bus (23 percent).

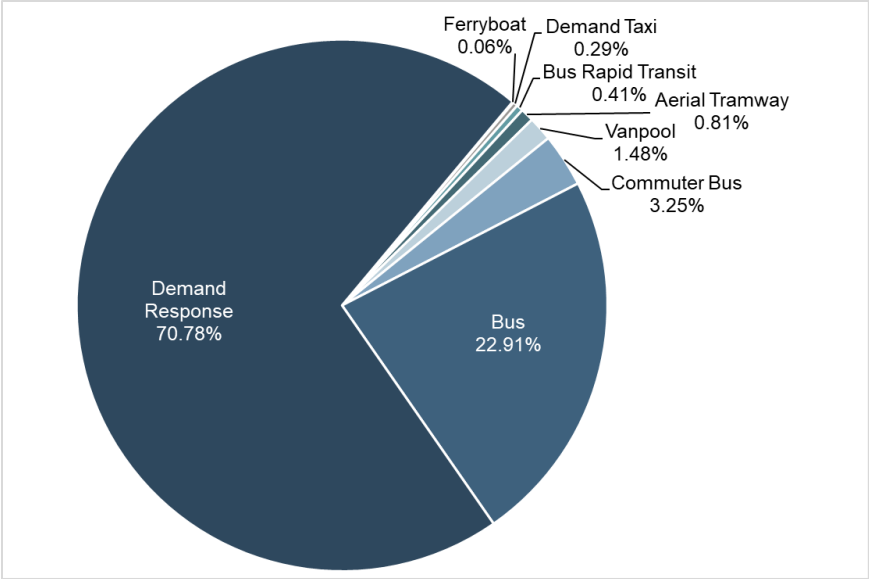


Exhibit 64. ***Rural Transit Service Providers by Mode***

Rural Services Operated and Consumed

The exhibit below reflects an increase in service provided and consumed, as well as the operating expenses across a ten-year period. VRM increased 17 percent from 2010, while ridership and operating expenses increased at a much higher rate of 31 percent and 55 percent, respectively.

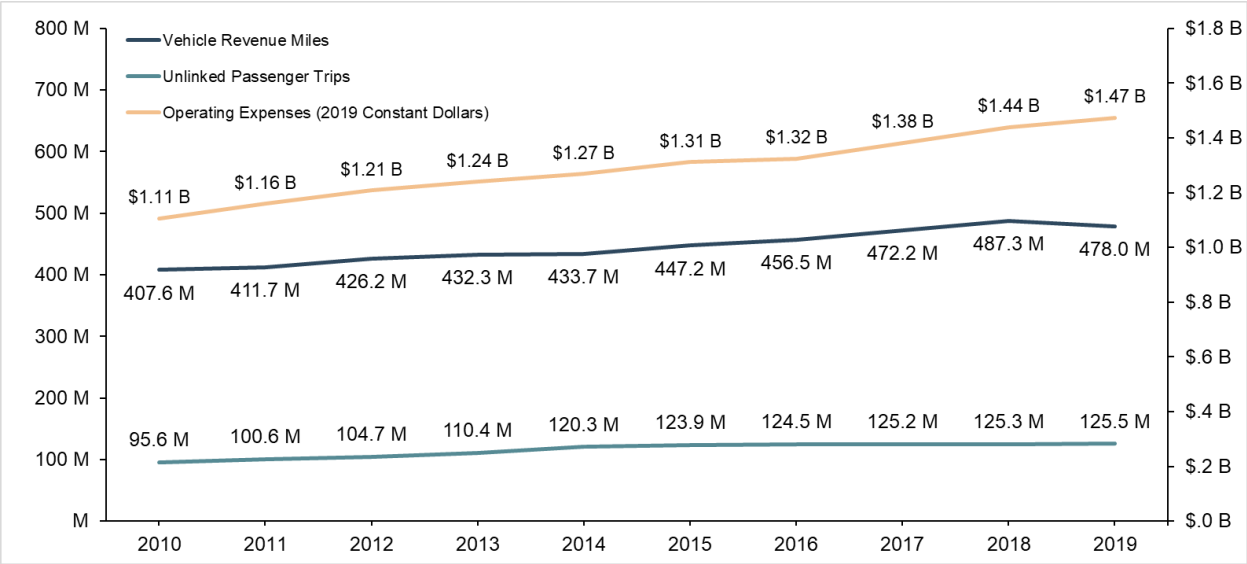


Exhibit 65. ***Service Operated, Consumed, and Operating Expenses***

Most of the service provided and consumed comes from the Rural General Public Transit reporters. Coordination with Intercity Bus operators and service provided by Tribes account for a smaller portion of overall rural service provided and consumed.

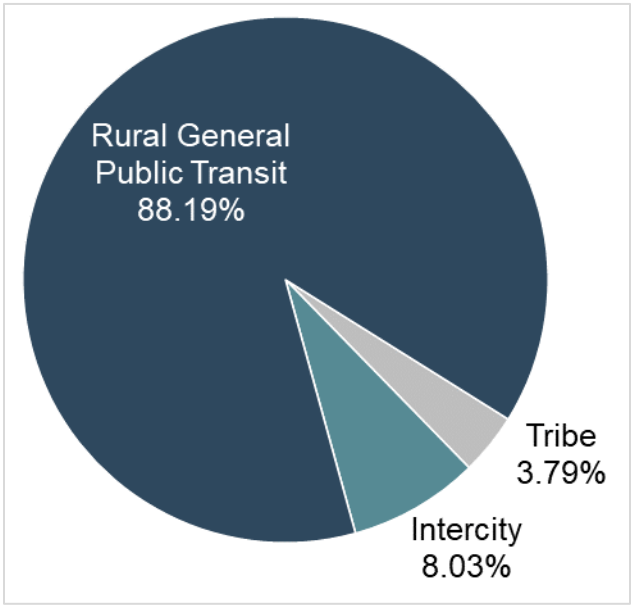


Exhibit 66. ***Service Provided: Vehicle Revenue Miles by Reporter Type***

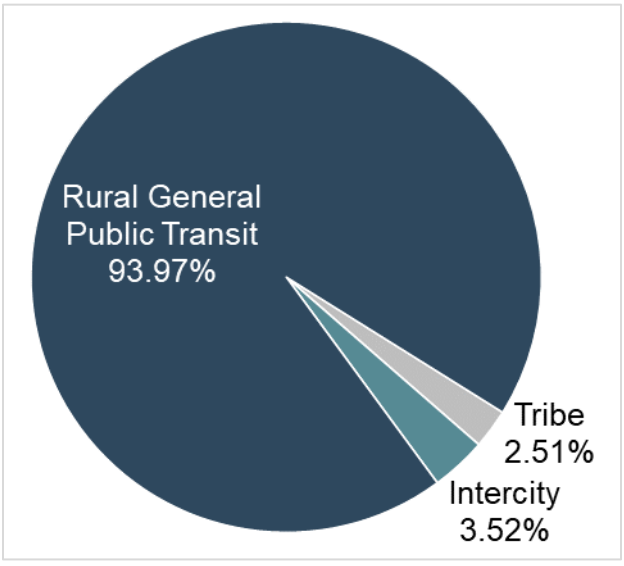


Exhibit 67. ***Service Consumed: Ridership by Reporter Type***

Rural Operating and Capital Funding

The sources of funds for rural areas (operating and capital) include local, State, and Federal government as well as funds generated by service providers (fares and contract revenues).

FTA funding categories available for Rural Transit include:

- Section 5309 – FTA Capital Program
- Section 5310 – Enhanced Mobility of Seniors & Individuals with Disabilities Program
- Section 5311 – FTA Formula Grants for Rural Areas Program

The Federal government provided 35.0 percent of the rural transit-operating budget. Fares and State and local funds made up another 55.2 percent of the budget, while the remaining 9.8 percent of funds came from contract revenue and other directly generated funds.

Source of Funding	Funds Expended on Operations	Percentage of Total
§5311 Rural Area Formula Program	$453,828,110	29.50%
Local Funds	$407,545,910	26.49%
State Funds	$306,014,800	19.89%
Fares	$136,015,572	8.84%
Other Funds	$129,937,589	8.44%
Other Federal Funds	$37,015,382	2.41%
§5311 Tribal Transit Funds	$25,594,349	1.66%
Contract Revenue	$20,741,545	1.35%
§5310 EMSID Formula Program	$16,021,227	1.04%
Other USDOT Funds	$3,070,982	0.20%
§5316 JARC Formula Program	$996,061	0.06%
§5317 New Freedom Program	$680,939	0.04%
Other FTA Funds	$499,051	0.03%
§5307 Urbanized Area Formula Program	$455,101	0.03%
§5337 State of Good Repair Program	$165,691	0.01%

Source of Funding	Funds Expended on Operations	Percentage of Total
§5339 Bus and Bus Facilities	$58,944	0.00%
§5309 Capital Investment Grants	$16,522	0.00%
Total	**$1,538,657,775**	

Exhibit 68. ***Funding Sources: Operating Expenses***

Rural transit capital budgets relied mostly on Federal assistance, accounting for 64.43 percent of all funds expended on capital.

Source of Funding	Funds Expended on Capital	Percentage of Total
§5311 Rural Area Formula Program	$78,654,740	27.82%
§5339 Bus and Bus Facilities	$68,796,629	24.34%
State Funds	$52,727,556	18.65%
Local Funds	$46,033,234	16.28%
§5310 EMSID Formula Program	$12,768,661	4.52%
§5311 Tribal Transit Funds	$6,310,315	2.23%
Other Federal Funds	$4,773,779	1.69%
Other USDOT Funds	$4,339,237	1.53%
§5309 Capital Investment Grants	$3,969,686	1.40%
Other FTA Funds	$1,924,803	0.68%
Other Funds	$1,688,621	0.60%
§5316 JARC Formula Program	$247,387	0.09%
§5317 New Freedom Program	$200,105	0.07%
Fares	$164,997	0.06%
§5337 State of Good Repair Program	$96,710	0.03%
Contract Revenue	$3,774	0.00%
Total	**$282,700,234**	

Exhibit 69. ***Funding Sources: Capital Expenses***

Rural Safety Data

Rural Reporters do not report the same safety and security data that Full Reporters in the urban module do. Instead, Rural Reporters report reduced safety data similar to a Reduced Reporter in the urban module. They only report a count of incidents, injuries, and fatalities for the year. This exhibit shows that Rural Reporters did not report a high number of fatalities but did report about 200 injuries for the year.

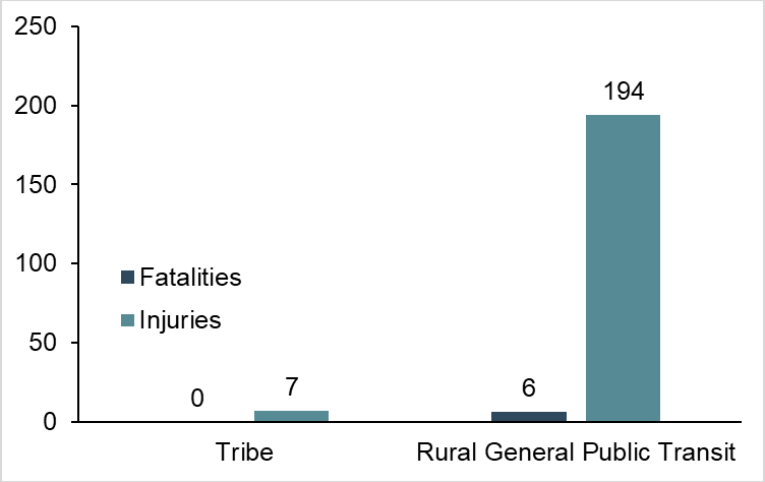


Exhibit 70. ***Injuries and Fatalities by Reporter Type***

Rural Assets

While rural agencies report limited asset data, the NTD does collect revenue vehicle manufacture year from rural operators. The ferryboats used in transit services are reported to have the oldest average fleet age of 26.9 years. On the other end of the spectrum, the articulated buses used in rural public transit only have an average age of 2 years.

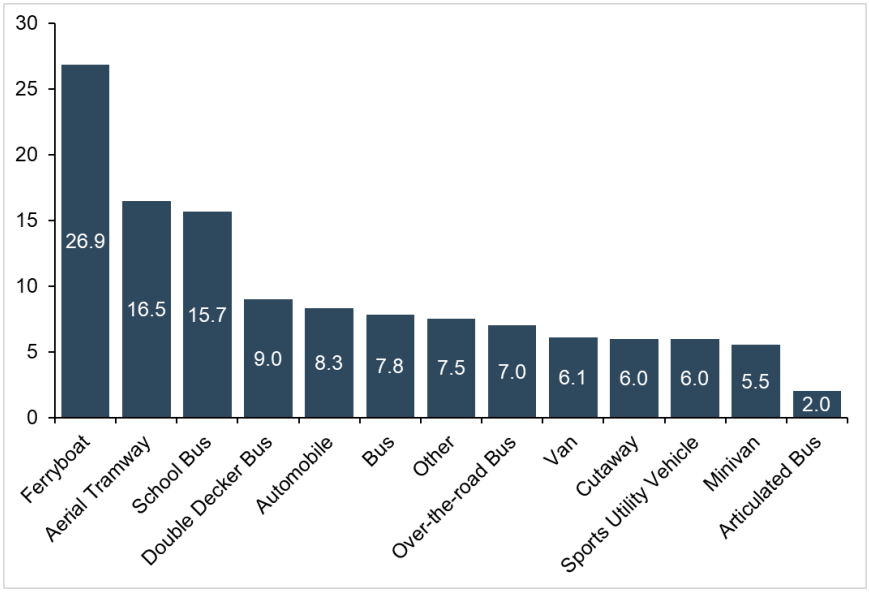


Exhibit 71. ***Average Fleet Age by Vehicle Type***