



Response to Questions on the 2016 LOBs

Request By: Supervisor Herrity

Relevant LOB(s): LOB #384

Question: Provide five years of cost per passenger mile and other efficiency data, as well as metrics compared to other bus systems.

Response:

The Fairfax Connector conducted a peer review of other transit systems as part of the 2015 Transit Development Plan (TDP) to compare Fairfax Connector's key performance indicators with other bus transit agencies of similar size and character. This peer review analysis allows staff to identify areas for improvement, and contributed to development of service recommendations in the TDP.

Peer Agency Selection Process

The National Transit Database (NTD), which is managed by the Federal Transit Administration, was used to create a list of peer agencies whose service provision is similar to the Fairfax Connector system. Six quantitative metrics were used to identify public transportation agencies which operate a similar level of bus service as Fairfax Connector:

- Service Area Population Density;
- Fleet Size;
- Vehicle Revenue Miles;
- Vehicle Revenue Hours;
- Passenger Trips; and,
- Passenger Miles Traveled.

All public transit agencies that provide fixed-route bus service were ranked in each metric according to how closely they compared to the Fairfax Connector system. A composite ranking was then calculated by adding the rankings for each metric. To score highly on the composite metric, it was necessary to be similar to the Fairfax Connector system in each of the six metrics (i.e., serve an area with a similar population density, similar number of buses in fleet, similar number of revenue hour and miles, etc.). Preference was given to local transit agencies, as well as agencies which operated in suburban jurisdictions located directly outside of major metropolitan areas.

The following agencies were selected as peers:

- Ride-On, Montgomery County, MD
- Hampton Roads Transit, Hampton Roads, VA
- North County Transit District, San Diego, CA



The table below outlines metrics for Fairfax Connector and the selected peer group.

Comparison of Selected Metrics with Peer Group

	Fairfax Connector	Ride-On	Hampton Roads Transit	North County Transit
Service Area Size (sq. mi.)	399	495	515	403
Service Area Pop.	1,056,435	971,000	1,439,666	896,787
Pop. Density (per sq. mi.)	2,648	1,962	2,795	2,225
Peak Buses	207	281	234	137
Vehicle Revenue Miles	9,515,092	12,322,456	9,932,136	5,720,095
Vehicle Revenue Hours	619,656	971,060	781,983	447,578
Unlinked Passenger Trips	10,650,401	26,603,229	16,217,920	8,347,213
Passenger Miles Traveled	80,190,090	96,519,501	86,543,203	39,705,582

Source: National Transit Database, FY2013.

Peer Analysis Caveats

It is important to note the limitations of using NTD data to compare transit systems. Each agency collects and reports its data in different ways, even with FTA’s efforts to ensure standardized data reporting. Also, data are not normalized for the agency’s geographic region, so fundamental financial metrics such as operating costs are difficult to compare. For example, the cost of living, and therefore bus operator salaries, varies widely depending on the region. However, despite these shortcomings in the NTD dataset, it is the best dataset available that allows for comparative analyses between transit agencies.

In addition each region has its own characteristics that make it unique. As such, it is difficult to draw conclusions from differences in service provision between peer agencies. Regions vary widely in terms of their built environment, presence of trip generators, demographic makeup, and economy. All of these variables affect transit ridership, and yet they are difficult to control for when making comparisons across regions. For example, many of the Fairfax County’s highest ridership routes are operated by WMATA’s Metrobus service, so the Connector system does not benefit from these trips as reflected in the NTD data. Even within the same region, differences occur: much of Montgomery County developed earlier and more densely than Fairfax County. As a result, Ride-On has had more time to establish a ridership base and serves areas that are more conducive to generating transit ridership. Furthermore, Montgomery County’s growth is somewhat constrained through the presence of its agricultural reserve, while Fairfax County’s suburban development is more evenly spread throughout the County. Finally, jurisdiction and agency policy toward provision of transit service can have an impact on the performance of each system. For example, Fairfax County has made a conscious effort, through the policies of its



Board, to provide broad transit coverage throughout the county, whereas other systems may choose to focus resources on high ridership corridors.

Peer Agencies Overview

Ride-On, Montgomery County, MD

Montgomery County's Ride-On bus system and Fairfax Connector both operate in the Washington, D.C. metropolitan region. Montgomery and Fairfax counties are somewhat comparable in size, demographics, and built environment. Both counties are densely developed inside the Capital Beltway (I-495), more suburban just outside of the Beltway, and relatively rural/ex-urban in the parts of the county furthest from Washington, D.C. Each county has office and retail activity centers located throughout its area (e.g., Bethesda and Silver Spring in Montgomery County, and Tysons, Reston, and Bailey's Crossroads in Fairfax County), but also has large portions of the county characterized by single-use residential housing development. On the whole, however, most of Montgomery County is denser and less car-dependent than Fairfax County, making it better suited for the provision of bus transit. Both Ride-On and Fairfax Connector coordinate operations with the Washington Metropolitan Area Transit Authority (WMATA) Metrorail and Metrobus systems.

Key facts

- Operates approximately 65 local routes, the majority of which run with headways between 15 and 30 minutes during peak hours and 30 to 60 minutes during non-peak hours. Most routes operate on a limited schedule over the weekend.
- Ride-On directly operates its service and does not contract out to a third party.
- Like Fairfax County, many of Montgomery County's most productive routes are regional routes operated by WMATA. Much of Ride-On's service is designed to connect riders with the region's Metrorail system by starting and ending trips at various stations in the county.

Hampton Roads Transit. Hampton Roads, VA

Hampton Roads Transit (HRT) serves a population of 1.4 million in six large cities that make up the Hampton Roads metropolitan region: Hampton, Newport News, Norfolk, Portsmouth, Chesapeake, Suffolk and Virginia Beach, as well as a number of smaller jurisdictions. Although the Hampton Roads metropolitan area lacks as strong of an urban downtown equivalent to Washington, D.C., the overall development pattern in HRT's service area is similar to Fairfax County, with several core activity centers throughout the service area.

Key facts

- Operates 56 local routes, eight express routes, and seven commuter routes. Frequency of service is typically 15 to 30 minute headways during peak hours within urban areas and 30 to 60 minute frequency during non-peak periods and in suburban areas.



- In addition to fixed route bus service, HRT also operates paratransit, ferry, and light rail service, which differentiates it from the Fairfax Connector system.
- The Tide, the only light rail system in Virginia, operates on a single 7.4 mile corridor between downtown Norfolk and the Norfolk / Virginia Beach border.

HRT directly operates its service and does not contract out to a third party.

North County Transit District. San Diego, CA

North County Transit District (NCTD) provides transit service to the Northern portion of San Diego County. The greater San Diego metropolitan area has 1.4 million residents, approximately 897,000 of whom live in the NCTD service area. North San Diego County is larger and development is generally less dense than portions of Fairfax County, but North County's proximity to an urban downtown and relative affluence to Fairfax County makes it an appropriate peer.

A primary function of NCTD local bus service is to connect riders to both the light rail and commuter rail networks. Although Fairfax Connector plays an important role in linking riders to Metrorail and VRE Commuter Rail service, it differs from NCTD service insofar as more routes are designed to move riders to locations within the county as well as provide feeder services to rail.

Key facts

- Operates 37 local routes, four flex zones (deviated fixed-route areas), paratransit, light rail, and commuter rail service. Headways range from 20 to 60 minutes, with the majority of service every 20 to 30 minutes during the peak period. Local buses have more limited weekend service.
- NCTD's light rail system, "Sprinter", runs east-west from the Pacific coast to Escondido and is marketed as an alternative to driving on the congested CA-78 highway. It operates every 30 minutes between 4:00 a.m. and 9:00 p.m., with extended service on Friday and Saturday nights. The system has an average weekly ridership of 8,300 trips, 22 miles of track, and 15 stations, all of which provide connections to local bus service.

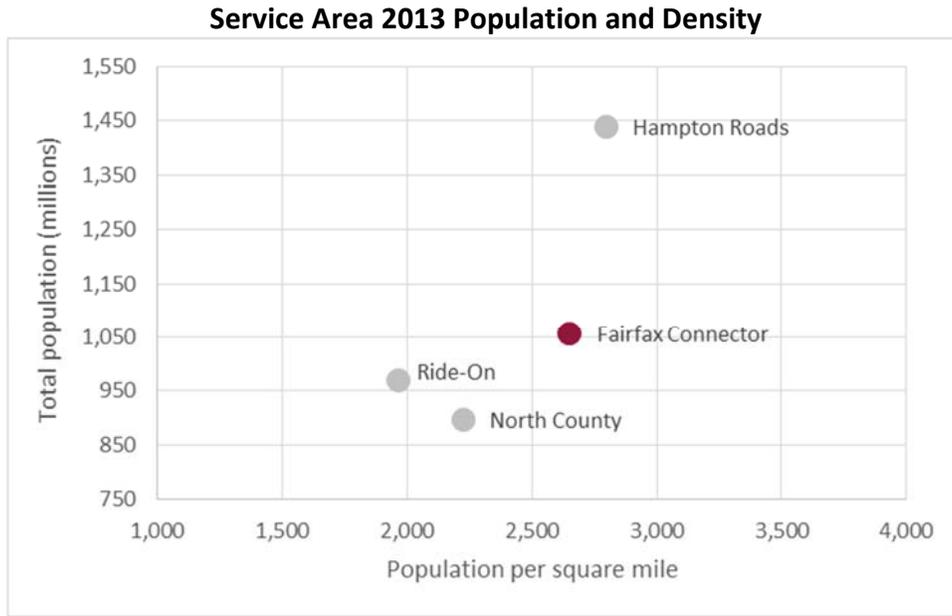
NCTD recently converted from a system that was previously directly-operated to one that is contracted out to a third party contractor, First Transit.

Service Area Characteristics

The size of the peer service areas are relatively similar, with a range of approximately 400 to 500 square miles. Service area population varied somewhat more, with 1.4 million people living in Hampton Roads and only approximately 897,000 residents in North County. Population density, a key factor in transit ridership levels, was relatively consistent across peers, with Hampton Roads being the densest and Montgomery County being the least dense; Montgomery County has lands designated as agricultural reserve with little development, and some areas of development that



are far more intense than what is typical of the Hampton Roads region. Fairfax County's development patterns are more suburban and closer to those of the Hampton Roads region, with 2,648 persons per square mile.



Source: National Transit Database, FY2013 data.

Performance Metrics

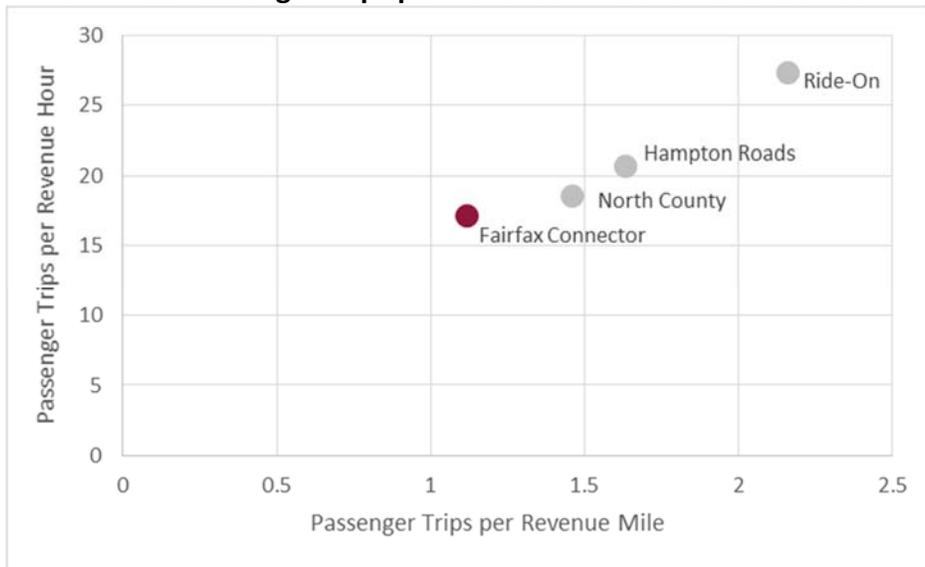
Unlinked Passenger Trips per Revenue Mile and Revenue Hour

The analysis compares total annual ridership per revenue mile in lieu of comparing ridership levels alone to control for the different levels of service among the peer agencies. The result, is that Fairfax Connector averages approximately 1.1 passengers per revenue mile, similar to NCTD's 1.5 passengers per revenue mile and Hampton Roads Transit's 1.6 passengers per revenue mile. In addition to its Express routes, Fairfax Connector also operates 13 longer local routes in the I-66 corridor which travel on highways and interstates. While many of these routes are productive, the large number of closed-door miles ultimately impacts the system-wide average.

Fairfax Connector averages 17 trips per revenue hour, which is very comparable among the peers when compared to 19 trips per revenue hour for NCTD and 20 trips per revenue hour for Hampton Roads Transit. Ride-On has 27 trips per revenue hour, a level of performance that is likely driven by the higher level of population density in activity centers in Montgomery County vis-à-vis Fairfax County.



Unlinked Passenger Trips per Revenue Mile and Revenue Hour

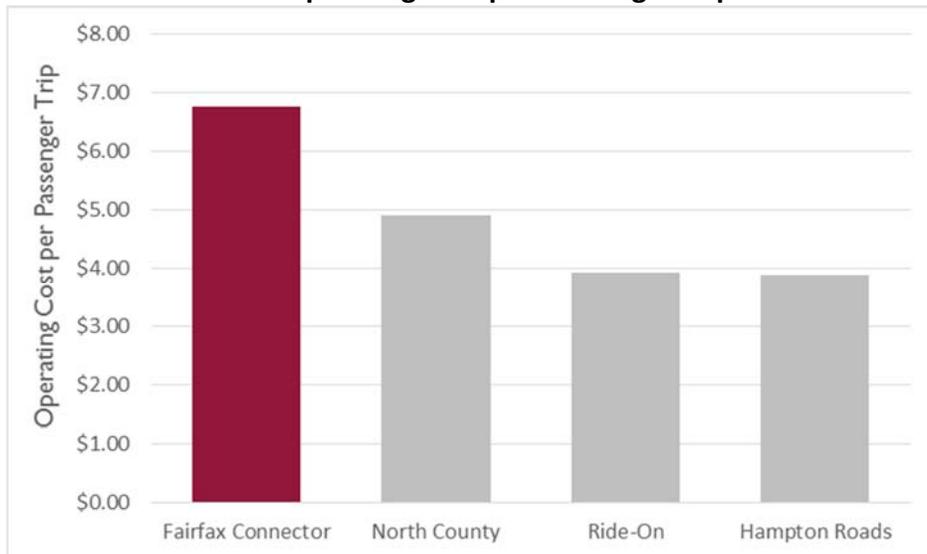


Source: National Transit Database, FY2013 data.

Operating Cost per Passenger Trip

Fairfax Connector spends approximately \$6.76 per passenger trip, compared to a peer group average of \$4.87, not including passenger revenue. One contributing factor to Fairfax Connector’s higher operating expenses is the relatively higher cost-of-living in the National Capital region, including higher operator salaries. This contributes to the slightly higher operating expenses per passenger trip experienced by Fairfax Connector compared to Hampton Roads Transit and NCTD.

2013 Operating Cost per Passenger Trip



Source: National Transit Database, FY2013 data.



Summary

Fairfax Connector provides robust transit services to a large, diverse population across a service area which varies greatly in the density of its built environment. Comparing Fairfax Connector to peer agencies that operate in similar service areas in terms of geographic size, population size, and development, can provide Fairfax Connector with a benchmark to measure its provision of service and service efficiency.

The use of NTD data to compare transit systems has some limitations. First, the collection and reporting of operating and financial data may not be consistent for all agencies. Secondly, the cost of living, and therefore bus operator salaries, varies widely depending on the region. NTD data are not normalized for an agency's geographic region. This makes difficult comparisons of fundamental financial metrics, such as operating costs. These issues suggest that comparing differences in service provision among peer agencies, while illustrative and useful, may not be suitable for drawing conclusions.

This peer analysis revealed that Fairfax Connector provides a similar level of service as its peers, as measured by the number of revenue miles and hours. Fairfax Connector is slightly more expensive to operate and appears to generate fewer trips than the peer average. Increasing passengers would reduce the cost per passenger trip. These discrepancies are largely result from the fact that regions can vary widely in terms of their built environment, presence of trip generators, demographic makeup, and economy. Factors affecting these comparisons include:

- Some of Fairfax County's highest ridership routes are operated by WMATA's Metrobus service, and include regional service into neighboring jurisdictions. Trips on these services are reported to NTD as Metrobus ridership.
- Much of Montgomery County developed earlier and more densely than did Fairfax County. As a result, Ride-On has had more time to establish a ridership base, and serves areas that are more conducive to generating transit ridership.
- Montgomery County's growth is somewhat constrained through the presence of its agricultural reserve, while Fairfax County's suburban development is more evenly distributed throughout the County.
- In addition, Montgomery County has more Metrorail stations, especially before the opening of Silver Line Phase 1.
- Fairfax County has made a conscious effort, through the policies of its Board of Supervisors, to provide broad transit coverage throughout the County at affordable rates, while other systems may choose to focus resources on high ridership corridors.



In addition to the above peer comparison, the table below outlines five years of Fairfax Connector performance measures. **Note-All peer agencies used in this analysis show similar increases in total operating costs and costs per passenger trip for FY-2014. Source 2014 National Transit Database.*

Fairfax Connector	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
Revenue Miles	7,714,381	8,195,479	8,667,419	9,515,092	9,993,953
Revenue Hours	528,481	560,087	583,876	619,656	639,987
Unlinked Passenger Trips	9,629,993	10,283,313	10,895,833	10,650,401	10,655,021
- per revenue mile	1.2	1.3	1.3	1.1	1.1
- per revenue hour	18	18	19	17	17
Passenger Miles Traveled	78,925,974	78,317,936	75,708,839	80,190,090	80,209,004
Operating Cost	\$58,123,839	\$62,730,890	\$67,916,358	\$72,033,351	\$76,305,161
- per passenger trip	\$6.04	\$6.10	\$6.23	\$6.76	\$7.16

Other performance metrics presented during LOBS included measures related to safety and reliability of services. The data used for these purposes is not necessarily available as open source and similar care should be used in comparing and interpreting the data to account for variability in reporting standards and policies. Connector staff will work to produce further analysis with peers in key areas such as on time performance and mean distance between road failures (reliability measure), preventable accidents and claims (safety measure), and customer comments and suggestions (customer satisfaction measure).