GEORGE WASHINGTON REGION
TRANSIT POLICY PLAN

Service Design
Working Paper 1
Transit Peer Review

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FAMPO
Fredericksburg Area Metropolitan Planning Organization

GEORGE WASHINGTON
REGIONAL COMMISSION

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CHAPTER 1: INTRODUCTION

The JEK/Nelson Nygaard team has prepared this peer analysis to provide insights into the relative performance of transit services in the George Washington Region as compared to public transportation services in areas other areas that share similar characteristics. We approached this task with the understanding that the George Washington region is experiencing rapid population growth and that this growth will influence the types and sizes of transit systems and regions which should be considered peers. We structured the peer review to compare public transportation systems that correspond with population and employment in the George Washington Region for both current and future year forecasts. In particular, we examined regions where existing demographic characteristics are similar to forecast population in the George Washington region in 2017 and 2035.

It should be also noted that the George Washington Region is unique in many ways and shaped by different geography, history and development patterns than the peer areas. As a result, the comparisons presented in this document are, at best, indictors. In this peer review, we have tried to identify meaningful indicators of future trends and needs, but have not attempted to make definitive judgments.

Methodology and Evaluation Criteria

To conduct the peer review, we identified four to five transit agencies that shared key demographic and/or transit service characteristics for each of three time periods; 2007, 2017 and 2035. Peers were selected based on a number of factors including service area characteristics (population, density and distance from a large metropolitan area) and system characteristics (number of routes and modes operated and fleet size).

For 2007, we identified peers that match the current characteristics of the George Washington Region. For future years, we selected areas that were within 50% of population forecasts for the GWR region. Table 1-1 lists the approximate population bounds that satisfy the criteria. Data to support the peer review included U.S. Census data and the Federal Transit Administration's (FTA) National Transit Database (NTD).

Table 1-1: George Washington Region Regional Population: Current and Forecast

Year	GWR Population	Lower Bound	Upper Bound
2007	309,483	150,000	450,000
2017	390,000	220,000	540,000
2035	593,000	530,000	796,000

Source: George Washington Region Planning Commission

In some cases, peer regions contained multiple transit agencies. For the purposes of this analysis, we combined data from all local public transit services operating in a peer region and used this combined service as our comparison data. In some cases, smaller localized services do not report to NTD and therefore, were not included in our analysis. Additionally, we did not include data from regional service providers.

The peer review is based on data associated with both fixed-route and complementary paratransit service,[1] and thus represents the total amount of transit service that is provided. The key quantitative measurements we used to compare and contrast agency service included:

- **Transit Density** – defined as vehicle revenue hours per square miles – supports comparison of geographic service coverage;
- **Usage** – the number of unlinked passenger trips per square miles – allows a relative comparison of ridership based on system coverage;
- **Service Productivity** – unlinked passenger trips per vehicle revenue mile – provides a comparative tool to understand system ridership exclusive of cost data;
- **Cost Efficiency** – defined as operating cost per vehicle revenue hour - shows how much a system spends to operate an hour of service, exclusive of ridership;
- **Cost Effectiveness** –operating costs per passenger trip – supports comparison of system costs inclusive of ridership; and
- **Transit Investment** – transit operating costs per capita – provides an indication of regional spending on transit.

For the peer areas and systems, the primary source of data was the 2006 National Transit Database (NTD). For FRED, the primary source of data was its FY 2008 budget and associated statistics. The use of 2008 data for FRED was necessary to reflect the significant FRED service expansion that has occurred

[1]Note that most areas provide ADA service with separate complementary services. In the George Washington Region, FRED provides ADA-required service through deviations of its regular services, rather than with a separate complementary service.

between 2006 and 2008. As described in this document, even with the expansion that has occurred, FRED provides less service than most of the peer systems, and the use of 2006 data would have made these differences appear larger than they actually are. However, the use of more recent data for FRED does mean that there is a mismatch in cost comparisons in that cost inflation between 2006 and 2008 is not included for the peer systems. In spite of this, FRED's operating cost structure is very low, and even with a comparison of 2008 FRED operating costs to 2006 peer system costs, FRED's costs are still lower than nearly all of peer systems. Still, it should be noted that FRED's actual performance in terms of cost comparisons is somewhat better than indicated.

Finally, note that all of the figures that are presented in this document are presented in FY 2006 or FY 2008 dollars, as described above. The "2017" and "2035" peer reviews compare existing (2008) FRED service with the existing (2006) services that are provided in areas that are similar to what the George Washington Region is projected to become in 2017 and 2035. They do not reflect projections of what cost and services could or may actually be in the future.

Report Organization

This document is organized into six chapters immediately following this introductory section, including:

Chapter 2: Overview of George Washington Region – Describes the region's existing and future population and employment characteristics. The chapter also includes an overview of regional transit services.

Chapter 3: 2007 Peer Review – Compares and contrasts the Fredericksburg Regional Transit service with agencies that have similar existing regional conditions as the George Washington Region.

Chapter 4: 2017 Peer Review – Presents a peer review with transit agencies operating in regions that have socio-economic characteristics similar with those forecast for the George Washington in 2017.

Chapter 5: 2035 Peer Review – Presents a peer review with transit agencies operating in regions that have socio-economic characteristics similar with th0se forecast for the George Washington in 2035.

Chapter 6: Lessons Learned – Summarizes key lessons learned from the peer review.

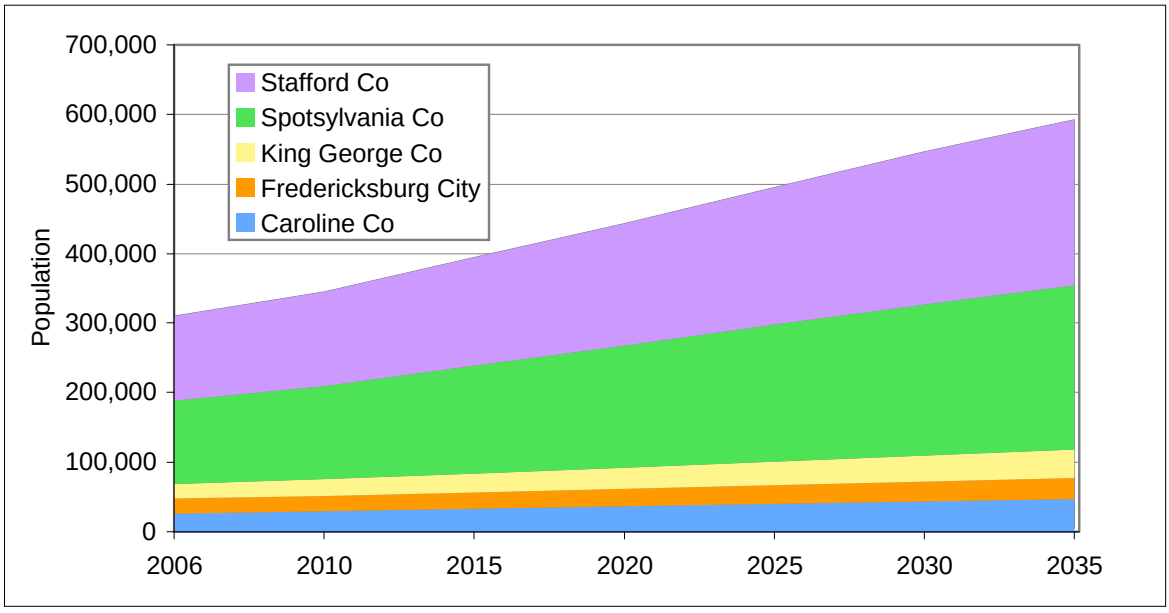
CHAPTER 2: GEORGE WASHINGTON REGION

The George Washington Region includes a single small urbanized area (Fredericksburg City) and four counties (Stafford, Spotsylvania, King George, and Caroline). The land area is nearly 1,400 square miles, encompassing a traditional city center, suburbs and suburban sprawl, as well as agricultural areas and historic sites. Among the region's unique features is its strategic location nearly halfway between the Washington DC and Richmond metropolitan areas. Indeed, the location between these larger metropolitan areas has been a primary cause of the region's growth. As reported in the 2007 State of the Region, proximity to jobs and relatively low housing costs has encouraged in-migration of new residents from the larger, more expensive metropolitan regions (especially Washington DC) that are increasingly considered within commuting distance.

Population

Between 1990 and 2006, the region's population grew from approximately 170,000 to 310,000 residents (see Figure 2-1), an increase of 82%, making it the fastest growing region in Virginia. Forecasts suggest that the trend of rapid population and employment growth will continue with the region expected to

Figure 2-1: George Washington Region Population Growth

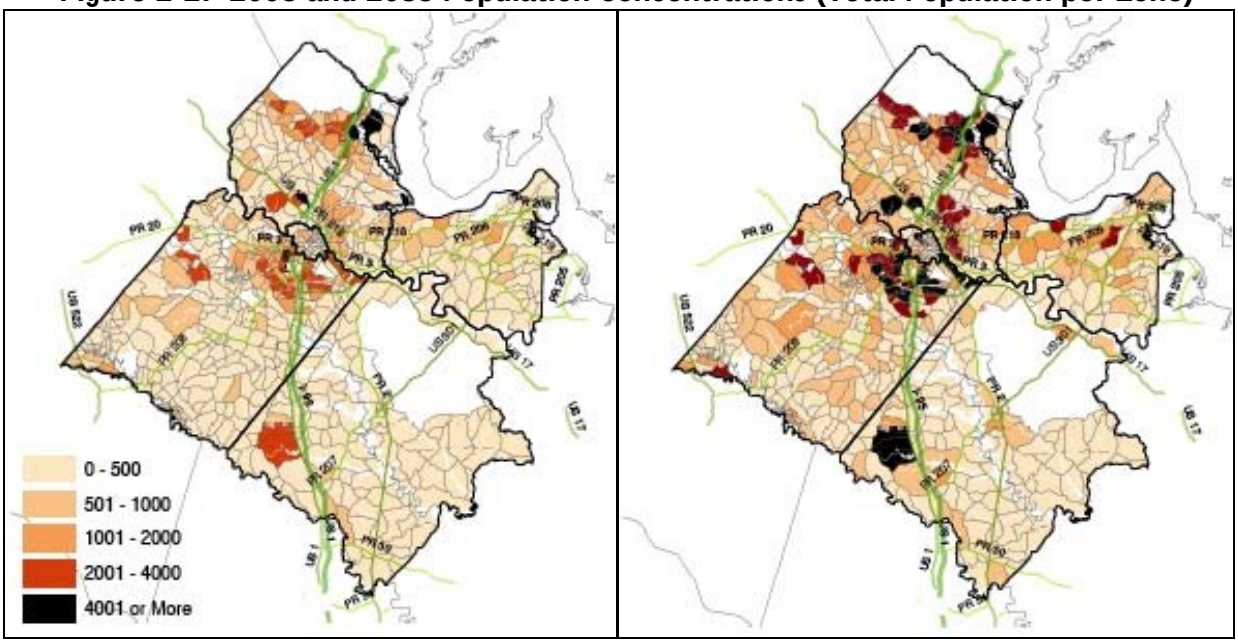


Source: George Washington Regional Commission

to increase in population on by another 27% to 394,000 residents by 2015. Long range population forecasts suggest that by 2035, the region's population may reach 593,000.

Population in the George Washington region is currently concentrated in Spotsylvania and Stafford Counties where over three-quarters of the current residents live. These areas are also slated for most of the future growth. The population of the Fredericksburg City is relatively small with about 26,000 residents. Caroline and King George Counties, the region's other two jurisdictions, are still quite rural. As shown in Figure 2-2, currently the most heavily populated areas in the region are along I-95 in Fredericksburg City, the Aquia/Garrisonville area along Route 610 in northern Stafford County, and Spotsylvania County just south of Fredericksburg. Also shown in Figure 2-2, as the region's total population grows, population increases are expected to occur throughout most of the region, and as this occurs, many of the region's rural areas will become more developed.

Figure 2-2: 2005 and 2035 Population Concentrations (Total Population per Zone)



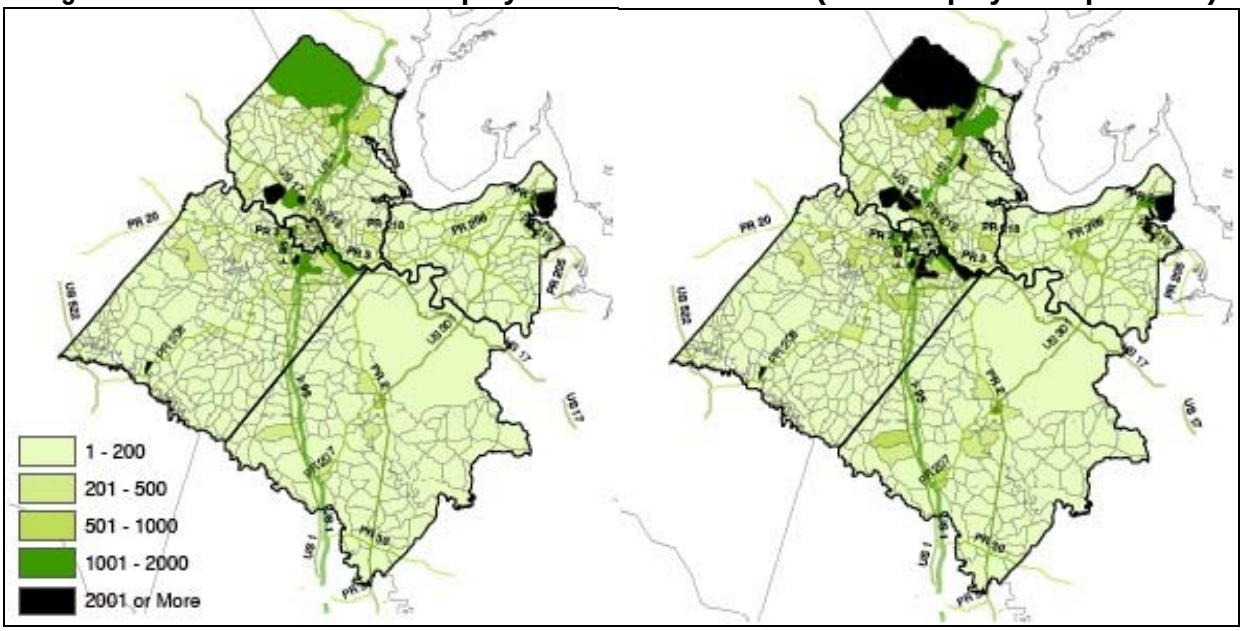
Source: George Washington Regional Commission

Employment

In 2006, there were 114,000 jobs in the region. As compared with population, employment is significantly more concentrated with most jobs located at the region's military facilities, areas of Stafford and Spotsylvania Counties that are just north and south of Fredericksburg, and along I-95 (see Figure 2-3). Nearly 68% of the region's jobs are located in Spotsylvania and Stafford counties, while only 22% are located in Fredericksburg.

By 2015, employment is projected to increase by 26% (approximately the same rate as population) to 144,061; by 2035 employment is forecast to increase by another 63,800 jobs for a total of 207,841, an increase of 44% (George Washington Regional Commission State of the Region). Employment is expected to intensify in these existing areas, and continue to sprawl outwards from Fredericksburg and I-95 (see Figure 2-3).

Figure 2-3: 2005 and 2035 Employment Concentrations (Total Employment per Zone)



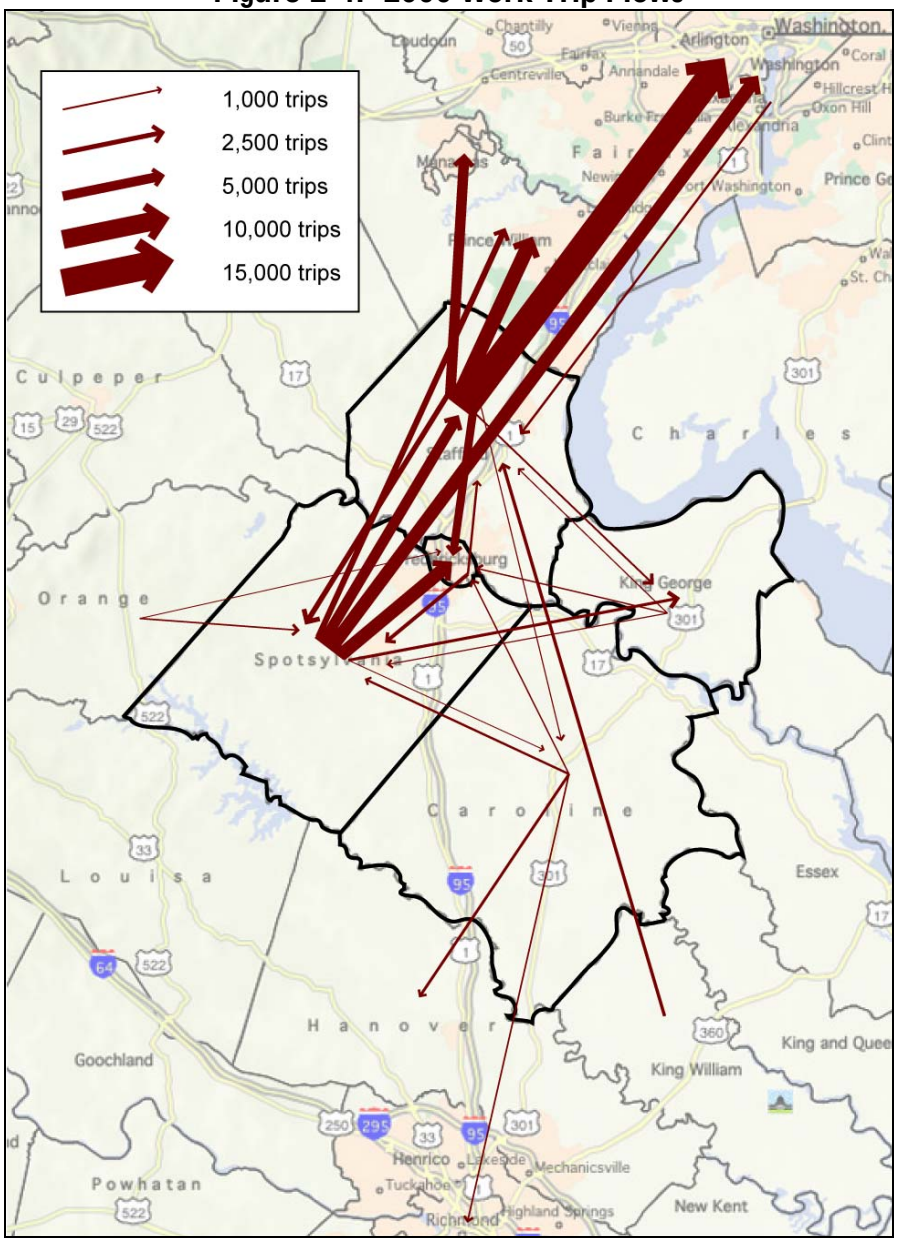
Source: George Washington Regional Commission

Regional Travel Patterns

Regional work trips are highly dispersed. More residents work outside of the region than within it, and the number of employees who commute from other areas to the George Washington Region is relatively

small. The largest work trip flows are from Stafford and Spotsylvania Counties to the north to Prince William County, Fairfax County, and the District of Columbia (see Figure 2-4). Work trip volumes within the region are much smaller, with the largest volumes from Spotsylvania and Strafford Counties to Fredericksburg.

Figure 2-4: 2000 Work Trip Flows



Source: Nelson\Nygaard Consulting Associates, US Census

Local and Regional Transit Service

Residents living in the George Washington Region have access to local transit and regional rail and commuter bus services:

Fredericksburg Regional Transit (FRED) - Local bus transit service is provided by the Fredericksburg Regional Transit (FRED), which operates a total of 18 routes serving the City of Fredericksburg and the four counties. FRED also operates three express routes and two feeder services to the Virginia Railway Express stations in Fredericksburg and Spotsylvania County.[2]

FRED operates year-round Monday through Friday and offers special, limited late night service Thursday and Friday and all day Saturday and Sunday during the University of Mary Washington school year. Adult fares on the service are 25¢ per one-way trip and 25¢ for a transfer within the system. Passes are also available provide a 25% discount. Fares for the feeder service to VRE stations are $1.00. FRED also allows ¾ mile (or two minute travel time) deviations from the fixed route service with a 24-hour advance reservation.

Virginia Railway Express (VRE) – VRE provides inter-city train services between the GW Region and the Washington DC metropolitan area. VRE runs six northbound and seven southbound trains departing Monday through Friday from four stations in the George Washington Region, located in the City of Fredericksburg and Falmouth (Leeland Road), Brooke and Quantico in Stafford County. The departure times focus around commuter travel patterns with most northbound trains leaving in the morning and most southbound stations departing from Washington DC in the afternoon. Travel time from Fredericksburg to Union Station in Washington DC is approximately 90 minutes in each direction; the one-way fare is $8.80, although passes offer lower per trip costs.

Passengers can also travel by Amtrak between Fredericksburg and Washington DC's Union Station. This service is part of a longer distance service connecting Savannah, Georgia with Boston, Massachusetts. Amtrak trains share the track with VRE. There are five northbound and five southbound Amtrak trains daily that operate between from Fredericksburg and Union Station. These trains stop only at the

[2] The VRE feeder services are new services, and the peer review does not reflect the costs or performances of these services.

Fredericksburg and Quantico stations in the GW region and operate throughout the day. Travel time on Amtrak from Fredericksburg to Union Station is 70 minutes; the one-way fare is $21.00.

Commuter Bus – Two private carrier bus companies, Martz Virginia and Quick's, provide commuter bus service between the George Washington Region and the Washington, DC, area. Martz provides 13 round trips per weekday. These trips operate between park and ride lots in the George Washington area and a number of locations in the DC area, most of which are in downtown. Most trips operate with different patterns. Martz's fares are $21.50 one-way or round-trip, or $190 per month.

Quick's operates 16 round trips per weekday between park and ride lots in the George Washington Region and locations in downtown Washington, Crystal City and the Pentagon, Rossyln, the Navy Annex, Baileys Cross Roads, and the Washington Navy Yards. Quick's fares are $12 one-way, $22 round-trip, or $60 per week.

The Greater Richmond Transit Commission (GRTC) also operates two round trips per weekday to and from Fredericksburg Station that are timed to meet VRE trains.

CHAPTER 3: 2007 PEER REVIEW

To understand how transit services provided by FRED compare with transit agencies operating in similarly sized areas, we identified four regions that shared similar socio-economic and demographic characteristics with the George Washington region and examined the transit agencies that served these regions. The identified peers include:

- Monroe County, Michigan;
- Hagerstown-Martinsburg, Maryland, West Virginia region;
- Marion County and Salem, Oregon; and,
- The Vallejo-Fairfield region in Solano County, California.

These agencies were selected as peers because, in many respects, their current operating environments are similar to FRED and the GW Region. Note, however, that the George Washington Region is fairly unique in that its central city is very small relative to the region's total population, and that of the 2007 peer areas, only Monroe County, Michigan has a central city as small as Fredericksburg. Because transit is typically is more effective in urban areas, the provision of transit in an area whose major city is not the economic hub of the area presents unique challenges. With that said, an overview of the peer transit agencies is presented below; regional characteristics are summarized in Table 3-1:

Monroe, Michigan is both a county and city (county seat) in southeastern Michigan. The area is located along Lake Erie, 38 miles from Detroit and is on the outer edge of the Detroit metropolitan area. The City of Monroe has approximately 22,000 residents (2000 US Census), making it essentially the same size as Fredericksburg. The county population included about 154,000 people. Local public transportation services are provided by **Lake Erie Transit**. Lake Erie Transit operates eight fixed-routes, which are primarily concentrated around the City of Monroe. The service also includes Dial-A-Ride, ADA Complementary Paratransit and additional "on-call" demand response transit service.

Table 3-1: Overview of 2007 Transit Agency Peers

Urban Area	Fredericksburg	Monroe MI	Hagerstown-Martinsburg MD-WV	Salem OR	Salano County, CA (2)
Transit Provider	**FRED**	**Lake Erie Transit**	**County Commuter, PanTran**	**Cherriots**	**Vallejo Transit and Suisun Transit**
Metropolitan Area Population	309,483	153,935	223,000	375,560	458,614
Metropolitan Area (square miles)	1394	680	1008.26	1938	1,576
Density (Population/square miles)	222.0	226.4	221.2	193.8	291.0
Nearest Major Metro Area	Washington DC	Detroit	Baltimore	Portland	San Francisco, CA
Distance to Metro Area	54	38	75	50	33
Number of Routes	17	8	9	29	13
Fleet Size	21	25	8	61	70
Number of Local Transit Agencies in Region	1	1	2	1	2
Connecting Transit to Metro Area	Commuter Rail (VRE) and Amtrak	None	Commuter Rail (MARC) and Amtrak	Bus service (indirect) to Portland and Amtrak	Bus connections to regional rail (BART)

Source: 2000 US Census; 2006 National Transit Database

The Hagerstown-Martinsburg MD, WV metropolitan area includes three counties and two states (Washington County in Maryland; and Morgan and Berkeley Counties in West Virginia). The region is roughly equidistant (75 miles away) from Baltimore, Washington DC and Harrisburg, Pennsylvania. The area has two core cities (Hagerstown, MD and Martinsburg, WV), the largest of which is Hagerstown, with 39,000 residents. The regional population in 2000 was 223,000 residents. Similar with the George Washington Region, the Hagerstown-Martinsburg region is the fastest growing metropolitan area in Maryland and West Virginia with much of the growth attributable to immigration from the Washington DC area. The area is served by two transit agencies, the **Eastern Panhandle Transit Authority (PanTran)** in West Virginia and **County Commuter** in Maryland. The region also has regional rail connections to Washington DC provided by the Maryland Rail Commuter Service (MARC) and inter-city rail service provided by Amtrak.

- Pan Tran operates in Martinsburg and Berkeley Counties in West Virginia. It operates four fixed-routes, plus service from the train station to Shepherd University, a loop shuttle at Shepherd University and limited demand response service. Pan Tran does not report to the NTD, therefore, partial information on this system was collected by telephone interview.
- County Commuter is operated by the Washington County Public Transportation Department. The service includes 10 fixed-routes. These routes are focused around the City of Hagerstown but serve the entire county. County Commuter also provides paratransit and a new flex-service that serves a major employment corridor.

Salem, Oregon is the Oregon state capital as well as the county seat for Marion County. The City of Salem has a population of approximately 153,000 residents, and the greater metropolitan area has 375,000 residents (2000 US Census). The area is similar in terms of its total regional population, and its distance from Portland (50 miles), which is the state's major metropolitan area. However, it is also different in that the central city—Salem—is nearly seven times larger than Fredericksburg. Salem is also unique in that it has implemented an urban growth boundary to encourage urban development, preserve agricultural land and limit low-density, high consumptive land uses. Consequently, the urbanized area is more densely populated as compared with other regions with similarly sized areas.

Local transit service is provided by Salem-Keizer Transit, known as "Cherriots", operates a regional bus system that includes 25 fixed routes, two bus routes to park and ride bus lots and complementary ADA paratransit services. Inter-city express service is available through another regional provider

(SMART); this services links downtown Salem with Portland via Wilsonville, Oregon. Amtrak provides rail connections between Salem and Portland.

Vallejo and Fairfield, California are in Solano County, northeast of San Francisco and just south of Napa Valley. The region is approximately 40 miles from San Francisco and Sacramento, making it on the outer edge of the San Francisco Bay Area. In 2000, Vallejo had a population of 108,000 residents and Fairfield had just under 100,000 residents. However, while the city populations are significantly larger than Fredericksburg, neither have strong core downtowns.

The regional population is just over 411,000 residents. Residents in the Vallejo-Fairfield region are served by two municipal transit agencies that provide local transit and access to BART, which provides rail service to San Francisco. There is also express bus service to Sacramento. Intercity rail service is available via Amtrak. The municipal transit systems include:

- **Vallejo Transit** currently operates nine fixed-routes plus complementary ADA paratransit service. The fixed-routes include local services as well as inter-city service to Fairfield and connections to BART train stations.
- **Suisun Transit** is managed by the City of Fairfield. It operates a total of 11 routes and complementary ADA paratransit service with the majority of the service focused around the City of Fairfield. It also runs intercity routes that provide connections to the areas larger communities, including Sacramento and BART train stations.

2007 Peer Review Summary

Our analysis of system operating measurements is summarized in Table 3-2. Key points include:

- FRED provides significantly less service than is provided in the peer areas.
- The George Washington Region spends much less on transit than its current peer areas.
- FRED's operating cost structure is low.
- Transit ridership in the George Washington Region is lower than in peer areas, and the productivity of FRED service (in terms of passengers per service revenue hour) is low.

Table 3-2: Summary of 2007 Transit Agency Peer Analysis

Service Characteristics	George Washington Region	Monroe County MI	Hagerstown-Martinsburg, MD, WVA	Marion County/Salem OR	Fairfield-Vallejo, CA
Service Area (square miles)	1,394	680	1,008	**1,938**	**1,576**
Density (persons per square mile)	222.0	226.4	221.2	193.8	**291.0**
Transit Density (vehicle revenue hours per square mile)	53.5	85.5	31.4	**134.2**	**158.9**
Usage (unlinked passenger trips per square mile)	1.3	1.9	1.5	**15.6**	**8.9**
Productivity (unlinked passenger trips per vehicle revenue hour)	5.5	5.0	10.4	**22.6**	**16.3**
Cost Efficiency (operating cost per vehicle revenue hour)	$55.77	$63.65	$48.97	**$87.19**	**$123.35**
Cost Effectiveness (operating cost per passenger trip)	$10.15	**$12.76**	$4.70	$3.86	**$7.55**
Transit Investment (operating cost per capita)	$13.44	$24.04	$6.95	**$60.37**	**$67.35**

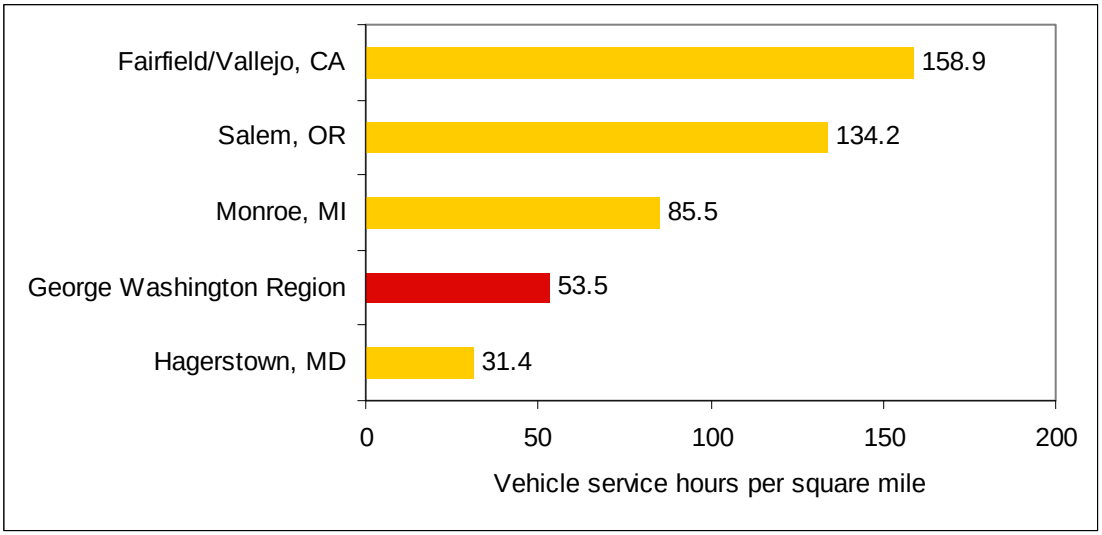
Note: Data from 2005 NTD operator profiles

Transit Service and Use

Compared to the 2007 peer group, the George Washington region has comparable levels of population density (persons per square mile) but fewer transit services. Of the four peer areas, only one (Hagerstown-Martinsburg) has less transit service than the George Washington region.

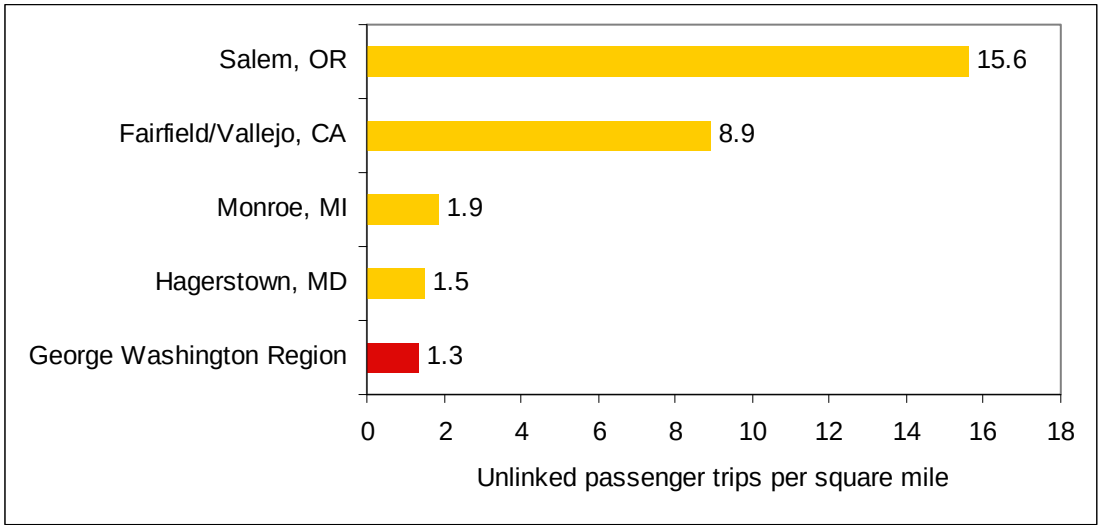
FRED provides 53.5 vehicle revenue hours of service per square mile (see Figure 3-1). Only the Hagerstown area provides less service (31.4 vehicle revenue hours per square mile), while the other areas provide much more (85.5 to 158.9).

Figure 3-1: Transit Service Density:
Vehicle Revenue Hours per Square Mile (2007 Peer Group)



Transit usage in the George Washington Region is lower than in any of the 2007 peer areas. The highest levels of use are in Vallejo-Fairfield and Salem (see Figure 3-2). However, both of these areas have larger regional populations and greater concentrations of residents living in urbanized areas. These factors make transit more productive and partially explain increased transit density and increased usage. However transit use in the two smaller areas (Hagerstown and Monroe) is also significantly higher.

Figure 3-2: Transit Usage: Transit Trips per Square Mile (2007 Peer Group)

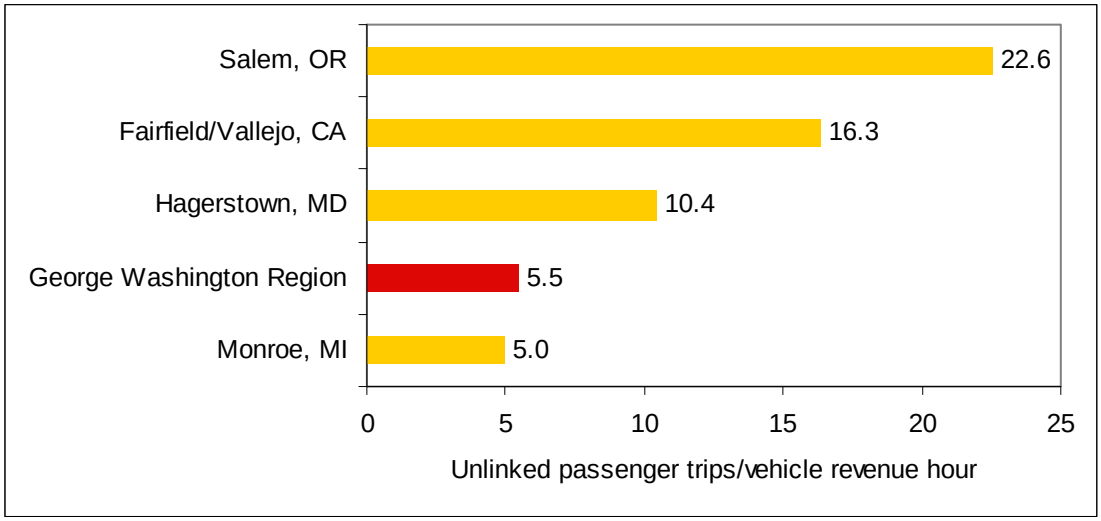


Service Productivity

FRED currently carries approximately 5.5 passengers per hour (see Figure 3-3). This is only slightly lower than the 2007 peer average of 6.2 passengers per hour, which is heavily influenced by the two systems that operate in regions with more urbanized areas (Salem, with 22.6 passengers/hour, and Vallejo-Fairfield, with 16.3 passengers/hour). However, FRED's service productivity is also lower than in Hagerstown-Martinsburg, which, like the George Washington region, does not have a significant urban population.

To a certain extent, productivity levels reflect local and regional priorities. For example, FRED operates low productivity services to and from Caroline County at the request of the County. However, this finding still suggests that transit services in the George Washington region could attract more riders and become more productive.

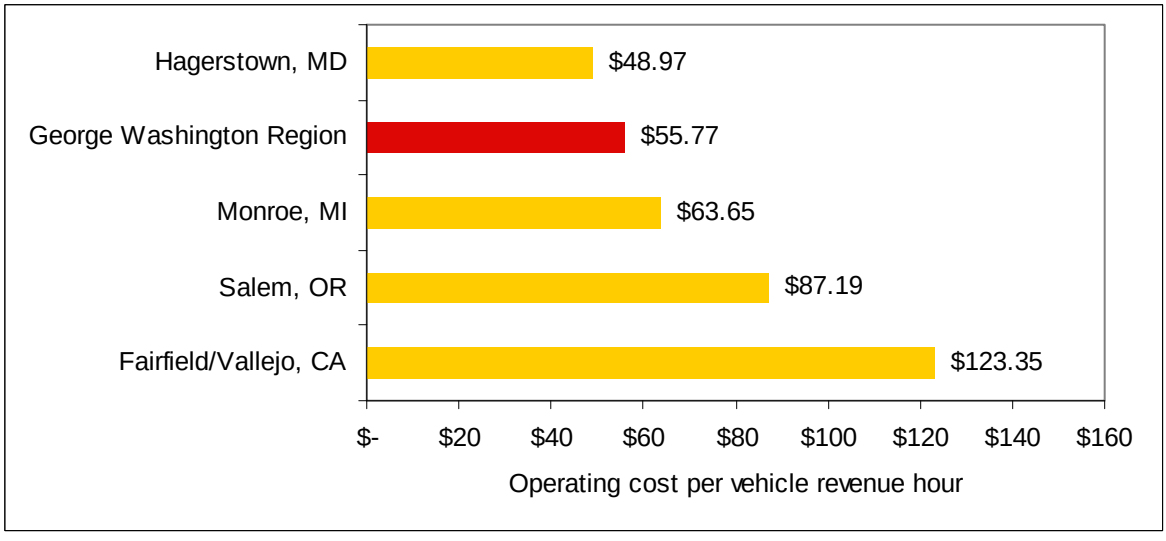
Figure 3-3: Service Productivity: Passenger Trips per Vehicle Revenue Hour (2007 Peer Group)



Cost Efficiency and Effectiveness

FRED's current operating costs are approximately $55.77 per hour, which is the second lowest among the peer group (see Figure 3-4). The only system with lower operating costs per vehicle revenue hour is County Commuter, at $48.97 per hour. FRED's low operating costs per hour are attributable to the fact

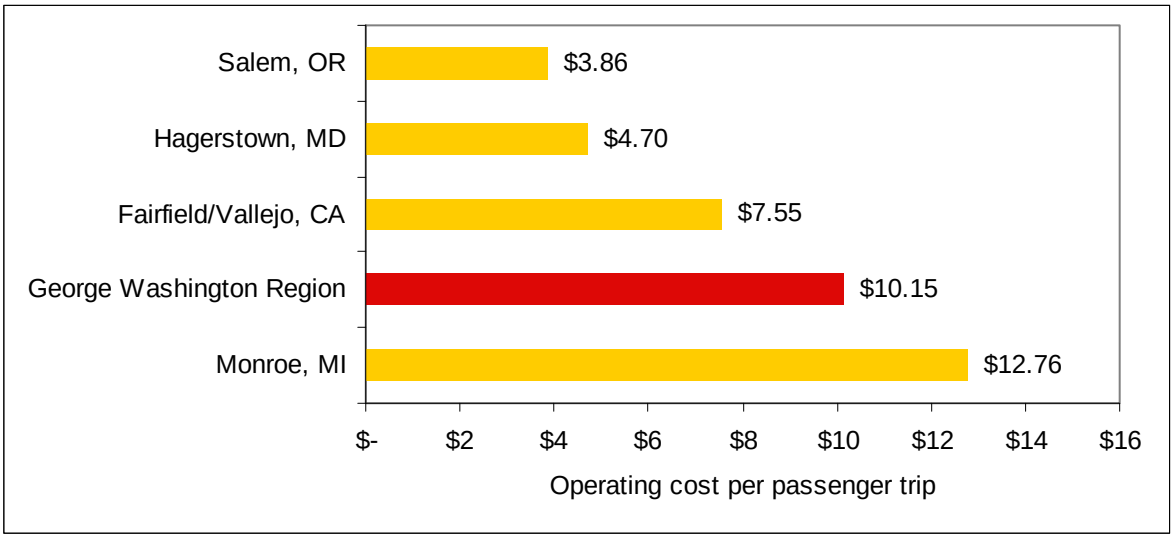
Figure 3-4: Cost Efficiency: Operating Cost per Vehicle Revenue Hour (2007 Peer Group)



that it is a small system with low overhead and that it receives city-provided services that are not reflected in the FRED operating budget. In addition, much of its staff is part-time and do not receive benefits.

In terms of expenditures per passenger trip, FRED compares less favorably. FRED's cost per passenger trip is $10.15, which is the second highest of the peer systems (lower than only Lake Erie Transit in Monroe County) (see Figure 3-5). Overall, low ridership on FRED results in a relatively high cost per passenger trip.

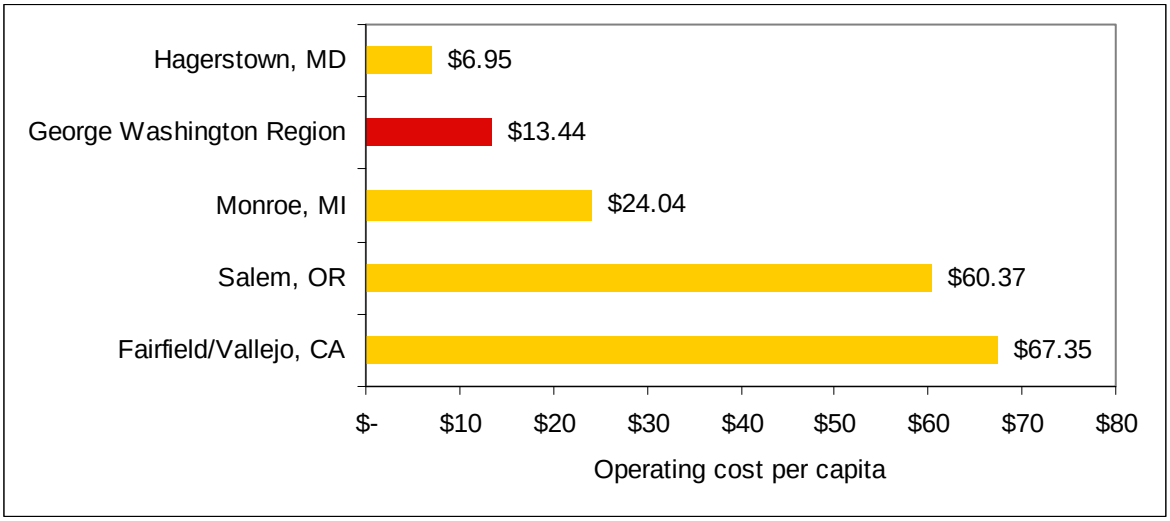
Figure 3-5: Cost Effectiveness: Operating Cost per Passenger Trip (2007 Peer Group)



Transit Investment

In 2008, FRED will spend approximately $4.2 million on transit operations. With the Region's current population of 309,000, this translates to transit operating expenditures of $13.44 per capita. This is the second lowest transit investment figure among the peer group and is one third of the average peer group transit expenditure of $32.50 per capita. Overall, the George Washington Region invests significantly less per capita in local transit service than the peer group—if the Region spent the peer group average, transit expenditures would be over twice as high at $8.6 million per year.

Figure 3-6: Transit Investment: Operating Expenditures per Capita (2007 Peer Group)



CHAPTER 4: 2017 PEER REVIEW

By 2017, the George Washington Region is forecast to grow from approximately 310,000 to nearly 400,000 residents. Current projections suggest that this growth will primarily be in Stafford and Spotsylvania Counties. The City of Fredericksburg is also forecast to grow, albeit at a slower rate as compared with the suburban counties. The City will, however, continue to be the largest urbanized area in the region.

With this growth, the George Washington Region will become more similar to larger regions than to its current peers. Regions that are currently a similar size and with similar characteristics as is projected for the George Washington Region in 2017 (large suburban population, small urban centers and approximately 50 miles of a large metropolitan area) include:

- Thurston County and the City of Olympia, Washington;
- Fort Collins-Loveland metropolitan area, Colorado;
- Sonoma County including Santa Rosa and Petaluma, California; and
- Metropolitan Modesto (Stanislaus County), California.

An overview of the peer transit agencies and their regional characteristics are summarized in Table 4-1. Select, relevant information about each individual region includes:

Olympia, Washington in Thurston County is the capital of Washington State. While Olympia is the largest urbanized area in the region, it has a relatively small population of 42,500 residents (in 2000). The regional population is approximately 229,000 persons. Olympia and Thurston County are located approximately 60 miles from the City of Seattle. The regional transit system, **Intercity Transit** (IT) operates 23 fixed-routes and maintains a fleet of 53 vehicles. IT also provides complementary ADA paratransit services. Transit services are primarily oriented around bring people to/from Olympia, which is the regional employment center. There are no regional or express bus services connecting Olympia with Seattle, although there is limited rail service between the cities provided by Amtrak.

Figure 4-1: Overview of 2017 Transit Agency Peers

Urban Area	Fredericksburg	Olympia, WA	Fort Collins, CO	Sonoma County, CA	Modesto, CA
Transit Service	**FRED**	**Intercity Transit (IT)**	**Transfort, COLT**	**Sonoma County Transit, City Bus**	**MAX**
Metropolitan Area Population	309,483	228,867	271,927	466,477	505,505
Metropolitan Area (square miles)	1394	774	2,634	1,768	1515
Density (Metropolitan Area Population/square miles)	222.0	295.7	103.2	263.8	333.7
Nearest Major Metro Area	Washington DC	Seattle	Denver	San Francisco	Sacramento
Distance to Metro Area (miles)	54	60	64	40	75
Number of Routes (estimated)	19	23	19	22	22
Fleet Size (estimated)	21	51	20	65	37
Number of Local Transit Agencies in Region	1	1	2	5	3
Connecting Transit Service	Commuter Rail (VRE)	Vanpool connections	Planned	Express Bus	Express Bus Service

Source: 2000 US Census; 2006 National Transit Database

The **Loveland-Fort Collins, Colorado** region is located 63 miles north of Denver and is part of the Front Range area on the eastern face of the southern Rocky Mountains. The Loveland-Fort Collins metropolitan area had population of 272,000 residents in the US 2000 Census. The majority of the population is located in the region's core communities of the City of Fort Collins (119,000 in 2000) and Loveland (51,000). Fort Collins is home to Colorado State University (CSU). Rapid regional growth has meant the urban boundaries of Fort Collins and Loveland are increasingly closer. The area is served by two transit agencies, **Transfort** and **COLT.** Transfort is a municipal bus system. It operates 17 fixed-routes and ADA complementary paratransit services; additional routes are available when CSU is in session. COLT is also a municipal system with two routes that provide local connections. There are currently no regional bus or rail services linking the Loveland-Fort Collins are with Denver, but a local service, FoxTrot, operates between the two cities. FoxTrot is operated by Transfort.

Sonoma County is 60 miles northwest of San Francisco, and is on the northernmost fringe of the San Francisco Bay Area. The County's largest urban area is Santa Rosa, the county seat, which had 148,000 residents in 2000. The region's metropolitan area includes nearly 460,000 residents. Petaluma is the second largest city in the region, has 55,000 residents. The region is served by several public transportation services including:

- **Sonoma County Transit** is the countywide transit operator, providing services to most communities in Sonoma County.
- **CityBus** operates 17 fixed routes in and around the City of Santa Rosa.
- **Healdsburg and Petaluma** operate local bus service.
- **Golden Gate Transit** connects Santa Rosa with Marin County and San Francisco.
- **Mendocino Transit Authority** runs buses north from Santa Rosa to destinations along the northern California coast.

Data from Sonoma County Transit and CityBus are included in the peer review. Neither Healdsburg nor Petaluma report to NTD and Gold Gate Transit and Mendocino Transit provide regional service only in Sonoma County.

Modesto, California is a metropolitan area of approximately 505,000 residents. The region's largest metropolitan area is Modesto, which is also the county seat of Stanislaus County. In 2000 the city had a population of 189,000 residents. Modesto is about 80 miles southeast of Sacramento and 90 miles southeast of San Francisco. While technically outside of the San Francisco Bay Area, the region's central location has helped transform the region from a major agricultural location to a bedroom community for Sacramento, San Francisco and San Jose. Three public transit systems serve the region, including:

- **Modesto Area Express (MAX)** is the largest local service provider. It also operates regional connections to the Altamount Commuter Express train station in Lathrop and the Dublin/Pleasanton BART Station. MAX also provides Complementary ADA paratransit service.
- **Stanislaus Regional Transit (StaRT)** provides six fixed-route services that primarily consist of intercity connecting services to/from Modesto and smaller regional areas; three flexible shuttle services; and Dial-A-Ride services within three Stanislaus communities.
- **San Joaquin Regional Transit District** is primarily oriented around the Stockton, California area in San Joaquin County. Relevant services include fixed-route inter-city bus services between Stockton and Modesto.

Data from the MAX system is included in the peer review.

2017 Peer Review Summary

The 2017 peer group comparison reveals that the larger regions provide more service and attract higher ridership than the Region's current peers. At least some of these findings are driven by the fact that more urbanized areas better support transit productivity and ridership. As the George Washington Region grows, transit should be able to capture more trips and play a more significant role in regional transportation.

A summary of the peer analysis is shown in Table 4-2 and a description of the peer review is summarized in the following sections.

Figure 4-2: Summary of 2017 Transit Agency Peer Analysis

Service Characteristics	George Washington Region (Existing)	Olympia, WA	Fort Collins-Loveland, CO	Sonoma County, CA	Modesto, CA
Service Area (square miles)	1,394	774	2,634	1,768	1,515
Density (persons per square mile)	222.0	295.7	103.2	263.8	333.7
Transit Density (vehicle revenue hours per square mile)	53.5	370.3	48.6	128.0	108.7
Usage (unlinked passenger trips per square mile)	1.3	16.9	6.3	8.5	7.4
Productivity (unlinked passenger trips per vehicle revenue hour)	5.5	13.5	13.4	17.6	22.6
Cost Efficiency (operating cost per vehicle revenue hour)	$55.77	$73.96	$61.22	$88.35	$66.02
Cost Effectiveness (operating cost per passenger trip)	$10.15	$5.48	$4.58	$5.03	$2.92
Transit Investment (operating cost per capita)	$13.44	$92.62	$28.84	$42.86	$21.51

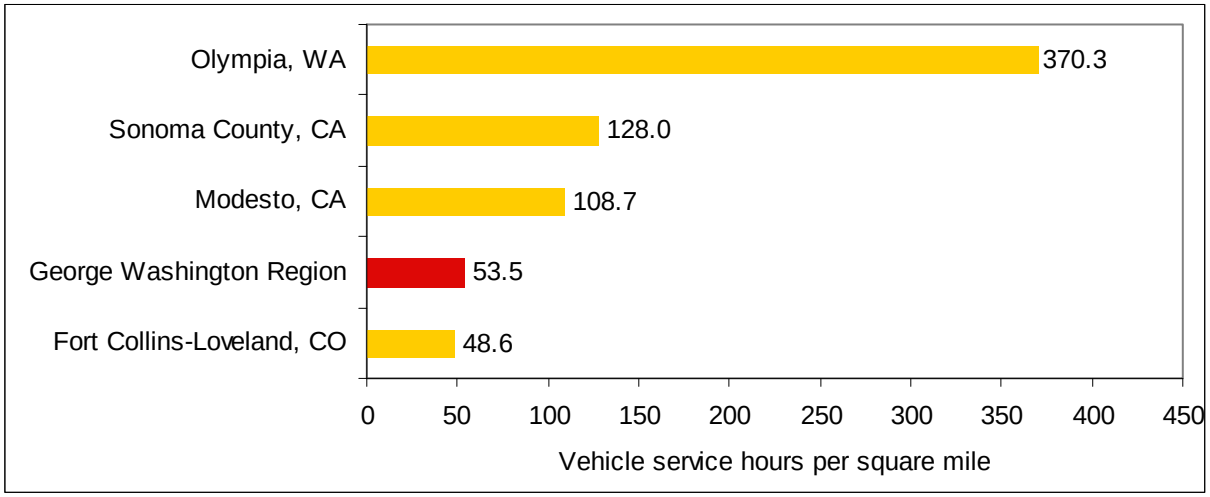
Source: 2005 NTD

Transit Service and Use

The areas in the 2017 peer group currently have populations, population densities, and other characteristics that are similar to what is expected for the George Washington Region in 2017 as it continues to grow. As would be expected, nearly all of these areas currently provide more service and have higher ridership than the George Washington Region. The transit characteristics of these areas provide an indication of what transit could accomplish in the George Washington Region in 2017, and what it could cost.

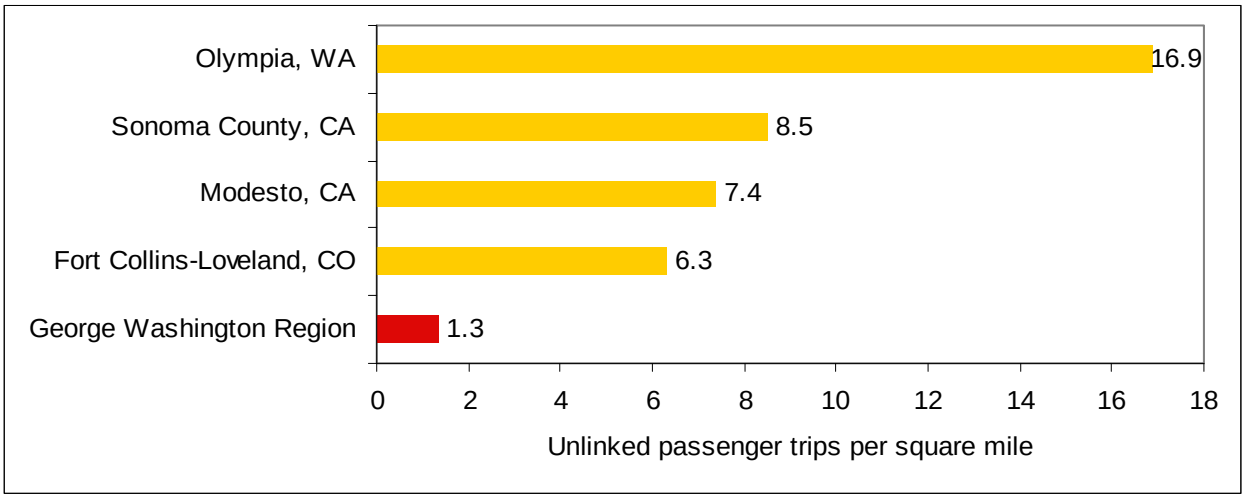
Compared to the 2017 peer group, FRED provides a low level of service in terms of vehicle revenue hours per square mile (see Figure 4-1), and attracts lower ridership per square mile (see Figure 4-2). This is true even when compared with agencies that operate in larger service areas and with lower population densities. For example, Fort Collins-Loveland has less service per square mile but considerably higher transit usage.

Figure 4-1: Transit Density: Vehicle Revenue Hours per Square Mile (2017 Peer Group)



The region with the greatest transit density and usage is Intercity Transit in Olympia, Washington. This is at least partially explained by Olympia's smaller service area and higher population densities, but also indicates that transit systems with greater service coverage and more attractive routes can attract significantly more riders.

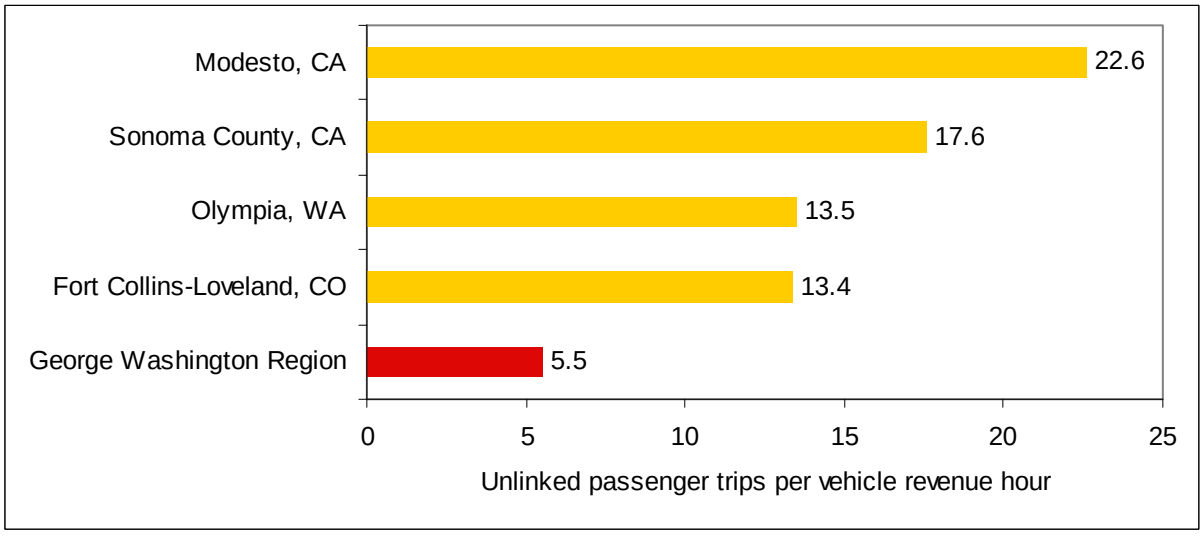
Figure 4-2: Transit Usage: Passenger Trips per Square Mile (2017 Peer Group)



Service Productivity

FRED's productivity, in terms of passengers per vehicle hour, is far lower than for the 2017 peer areas (see Figure 4-3). This is the case, in part, because transit generally works better in denser areas, and as the George Washington Region becomes more densely developed, transit can be expected to become more effective.

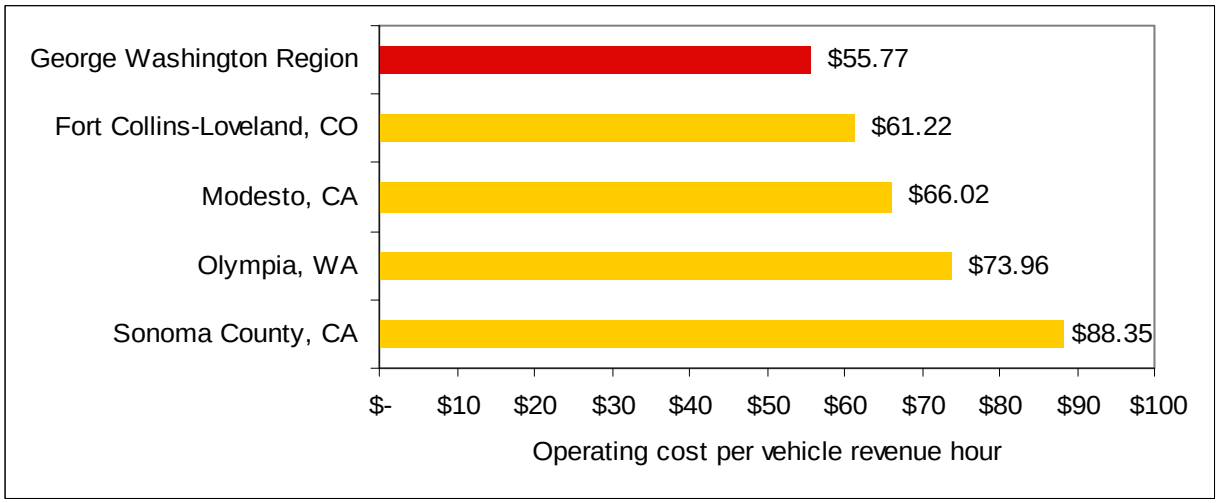
Figure 4-3: Service Productivity:
Passenger Trips per Vehicle Revenue Hour (2017 Peer Group)



Cost Efficiency and Effectiveness

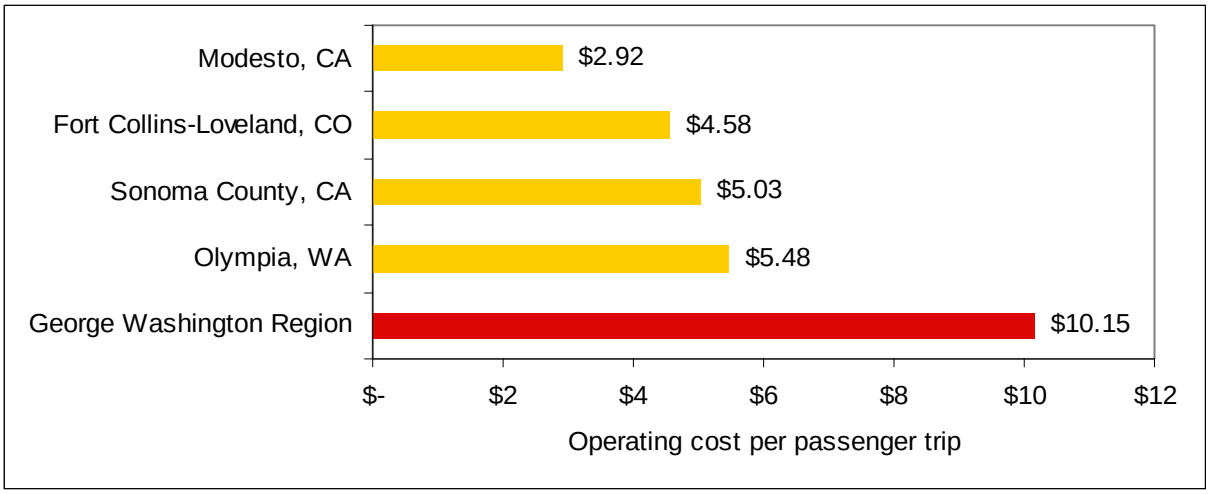
FRED's FY 2008 operating cost of $55.77 per hour is lower than for any of the areas in the 2017 peer group. As discussed previously, FRED's cost structure is low by most measures. This is partly due to due to low expenditures for functions such as planning and marketing, and other activities that can improve service and increase ridership. As the system and the region grow, the costs for the peer areas indicate that costs per unit of service in the George Washington Region will increase.

Figure 4-4: Cost Efficiency: Operating Cost per Vehicle Revenue Hour (2017 Peer Group)



Operating costs per passenger trip, however, are much (2 to 4 times) higher than for the peer systems (see Figure 4-5). FRED's cost per passenger trip is much higher because it carries many fewer passengers per vehicle revenue hour (as described in the previous section). However, as George Washington Region transit services are expanded and improved, more riders will be attracted, and the transit service should become more productive.

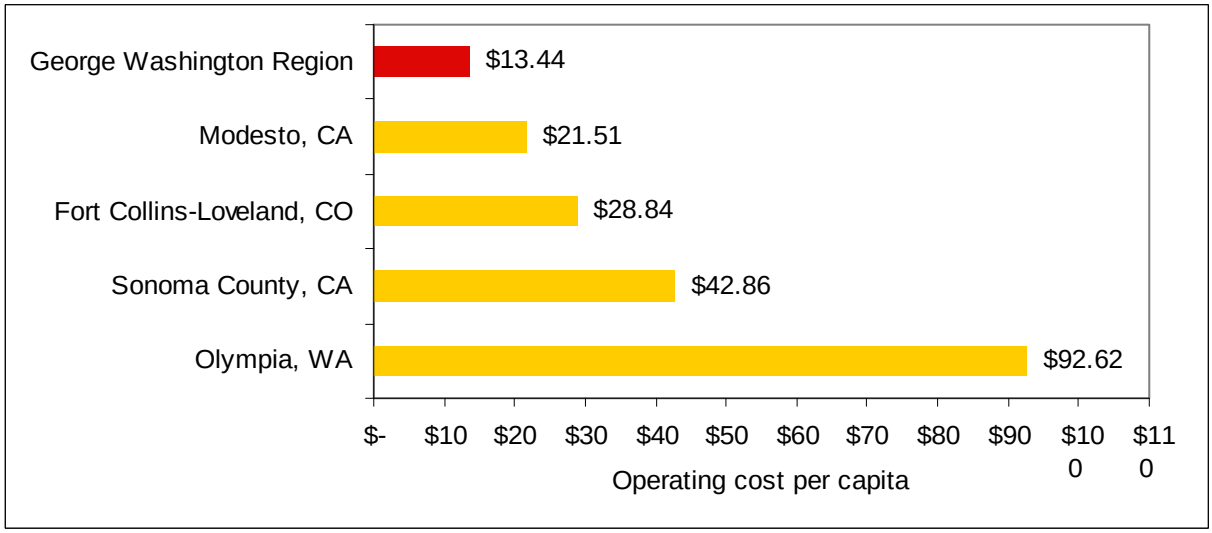
Figure 4-5: Cost Effectiveness: Operating Cost per Passenger Trip (2017 Peer Group)



Transit Investment

As described previously, FRED currently spends $13.44 per capita on transit operating costs. This level of investment is much lower than any of the 2017 peers, and less than half of the peer group average of $38.00 per capita, and indicates that regional spending on transit is low. If the George Washington Region were to invest in transit in a similar manner as its peers, transit operating expenditures would

Figure 5-6: Transit Investment: Per Capita Operating Cost (2017 Peer Group)



in 2017 would be approximately $10.7 million. An even greater focus on transit as in Sonoma County or Olympia would require that transit expenditures of $16 to $32 million.

CHAPTER 5: 2035 PEER REVIEW

By 2035, the George Washington Region is projected to nearly double in population to 593,000. With this population, it will become a medium-sized urbanized area similar to:

- Youngstown metropolitan area in Ohio;
- Stockton metropolitan area, California;
- Mid-Hudson Valley (Poughkeepsie-Newburgh-Middletown) metropolitan area, New York;
- Worcester metropolitan area, Massachusetts; and
- Ventura County, California.

As described below, in many respects, these areas are similar to what the George Washington Region will become (see Table 5-1).

Youngstown, Ohio is located in Mahoning County, approximately 65 miles southeast of Cleveland and 61 miles northwest of Pittsburgh, Pennsylvania. Similar with some of its peers, the region is home to large universities including Youngstown State University and Case Western Reserve University. Unlike other peers, however, Youngstown is not a growth area. The region is working to recover from an economic slump associated with the decline of the steel production. According to the US Census, Youngstown is its own metropolitan area, the Youngstown-Warren MSA, which includes Mahoning and Trumball counties in Ohio as well as Mercer County in Pennsylvania. The region has a population of 593,000 (in 2000). The City of Youngstown is the largest urban area in the region, and has 82,000 residents. The region is served by Western Reserve Transit Authority (WRTA), a bus service with 14 routes served with a fleet of 45 vehicles. Although Greyhound bus service stops in Youngstown, there are no other regional or intercity express bus or rail services connecting the region to the larger nearby metropolitan areas.

The **Stockton, California** metropolitan area includes the City of Stockton and most of San Joaquin County. In 2000, the City of Stockton had a population of approximately 244,000 residents with some 664,000 people living in the metro area. Stockton is strategically located 80 miles east of the San Francisco Bay Area and 40 miles south of Sacramento. In the past decade,

Table 5-1: Overview of 2035 Transit Agency Peers

Urban Areas	Fredericksburg	Youngstown, OH	Stockton, CA	Mid-Hudson Valley, NY	Worcester, MA	Ventura County, CA
Transit Service Provider	**FRED**	**WRAT**	**San Joaquin Regional Transit District**	**City Bus (Poughkeepsie) &Dutchess County Transit**	**RTA**	**Multiple (Ventura Intercity, Gold Coast Transit, Simi Valley, Thousand Oaks)**
Metropolitan Area Population	309,483	593,168	664,116	280,150	783,262	796,106
Metropolitan Area (square miles)	1394	1741	1426	1,664	1579	2,208
Density (Metropolitan Area Population/square miles)	222.0	340.7	465.7	168.4	496.0	360.6
Nearest Major Metro Area	Washington DC	Pittsburgh, PA	San Jose, CA	New York, NY	Boston, MA	Los Angeles, CA
Distance to Metro Area (miles)	54	66	55	84	45	62
Number of Routes (estimated)	19	14	49	25	28	15
Fleet Size (estimated)	21	38	88	32	40	73
Number of Local Transit Agencies in Region	1	1	1	2	1	7
Connecting Transit Service	Commuter Rail (VRE)	None	Rail to San Jose Altamount Commuter Express (ACE)	MetroNorth and Amtrak	Connections via MBTA	Commuter Rail via MetroLink

Source: 2000 US Census; 2006 National Transit Database

Stockton and the nearby communities of Tracy, Manteca and Lodi have experienced considerable population growth, primarily resulting from people leaving the San Francisco Bay Area in search of more affordable housing. Transit service is provided by the San Joaquin Regional Transit District (San Joaquin RTD) which operates 26 local bus routes, 4 Bus Rapid Transit (BRT) lines, and 19 express bus routes. The RTD provides connecting service to the Altamount Commuter Express (ACE) commuter rail in San Jose, which services the San Francisco Bay Area. It also operates several commute-oriented services including inter-city connections to smaller urban areas in the region, deviated fixed-routes, and subscription services that offer direct bus service to regional employers and employment centers such as BART stations, Lockheed Martin, Livermore Labs, Palo Alto and Sacramento.

Mid-Hudson Valley (Poughkeepsie-Newburgh-Middletown), New York is a metropolitan area located in the mid-Hudson Valley between New York City and Albany, New York. The region encompasses two counties (Dutchess and Orange) and three core cities: Poughkeepsie with 29,000 residents, Newburgh with 28,300 residents, and Middletown 25,400 residents. Newburgh is the closest to New York City, located 60 miles from New York City, while Poughkeepsie is the furthest north at 85 miles north of New York City. These communities are largely bedroom communities interspersed with some large employers, including IBM. Metro North provides rail connections with the New York metro area, although Orange County communities must transfer to get to New York City. Communities in Dutchess County are served by both Metro North and Amtrak, both of which provide rail connections both to New York City and Albany. Local transit services are available in Dutchess County only. Dutchess County operates county-based services while the City of Poughkeepsie runs a municipal bus system. The two services share a single garage but are funded and operated separately.

Worcester, Massachusetts is located 47 miles west of Boston, putting it on the periphery of the metropolitan Boston area. In 2000, the city had a population of 173,000 and a regional population of 783,000. The City is a former industrial town that has become a hub of higher education with 11 colleges and universities. Worcester is the last stop on one of the Massachusetts Bay Transportation Authority (MBTA) commuter lines and provides service from Union Station in Worcester and South Station in Boston. Amtrak also serves Union Station. Local transit services are provided by the Worcester Regional Transit Authority (WRTA). WRTA provides municipal and inter-city bus service, including shuttle services to regional universities organized as the Colleges of Worcester

Consortium and frequent service to Union Station. WRTA also provides complementary ADA paratransit service.

Ventura County, California is located 68 miles northwest of Los Angeles on the Pacific Coast. It is often referred to as the Gold Coast and has a reputation of being one of the most affluent regions in the country. In 2000, Ventura County had a population of 796,000 persons, about half of who lived in one of the three largest communities: Oxnard (200,000), Thousand Oaks (117,000) and Ventura (101,000). Commuter rail services are provided by Metro Link, which connects Ventura with Los Angles. Local and regional public transportation services are provided by a variety of operators, including:

- **Ventura Intercity Service Transit Authority (VISTA),** which provides intercity bus service between the larger Ventura County communities;
- **Gold Coast Transit** (formerly known as South Coast Area Transit – SCAT), a municipal bus operator serving western Ventura County, including the communities of Ventura and Oxnard (among others)

Three communities – **Camarillo, Moor Park City, Ojai City, Simi Valley and Thousand Oaks** – also have their own small municipal bus systems.

All of these systems, except for the City of Camarillo, Moor Park City and Ojai City (which are not included in the NTD), are included in the peer analysis.

2035 Peer Review Summary

Because they serve larger areas, the systems in the 2035 peer areas provide significantly more service and serve far more riders than FRED (see Table 5-2). The largest system in the peer group, Stockton California, operates 83 routes and maintains a fleet of some 130 vehicles. Ventura County, on the other hand, is the most complex system with 5 local municipal systems and two countywide services, plus access to regional commuter rail. As with the 2017 peer group, the 2035 peer group provides an indication of the role transit can play in the George Washington Region in 2035, as well as an indication of costs.

Table 5-2: Summary of 2035 Transit Agency Peer Analysis (needs to be updated)

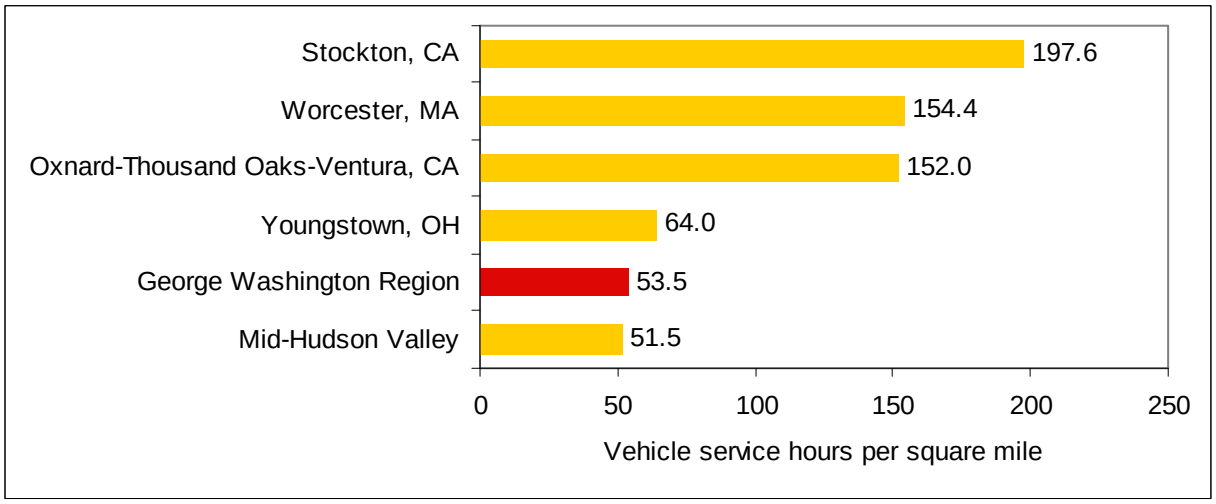
Service Characteristics	George Washington Region (Existing)	Youngstown, OH	Stockton, CA	Mid-Hudson Valley, NY (1)	Worcester, MA	Ventura County, CA
Service Area (square miles)	1,394	1,741	1,426	1,664	1,579	2,208
Density (persons per square mile)	222	340.7	465.7	168.4	496.0	360.6
Transit Density (vehicle revenue hours per square mile)	53.5	64.0	197.6	51.5	154.4	152.0
Usage (unlinked passenger trips per square mile)	1.3	2.6	6.0	4.0	4.4	6.2
Productivity (unlinked passenger trips per vehicle revenue hour)	5.5	13.8	14.2	13.1	14.1	14.7
Cost Efficiency (operating cost per vehicle revenue hour)	$55.77	$69.93	$101.28	$74.44	$77.85	$77.37
Cost Effectiveness (operating cost per passenger trip)	$10.15	$5.05	$7.11	$5.66	$5.53	$5.28
Transit Investment (operating cost per capita)	$13.44	$13.13	$42.98	$22.76	$24.23	$32.61

Source: 2005 NTD

Transit Service and Use

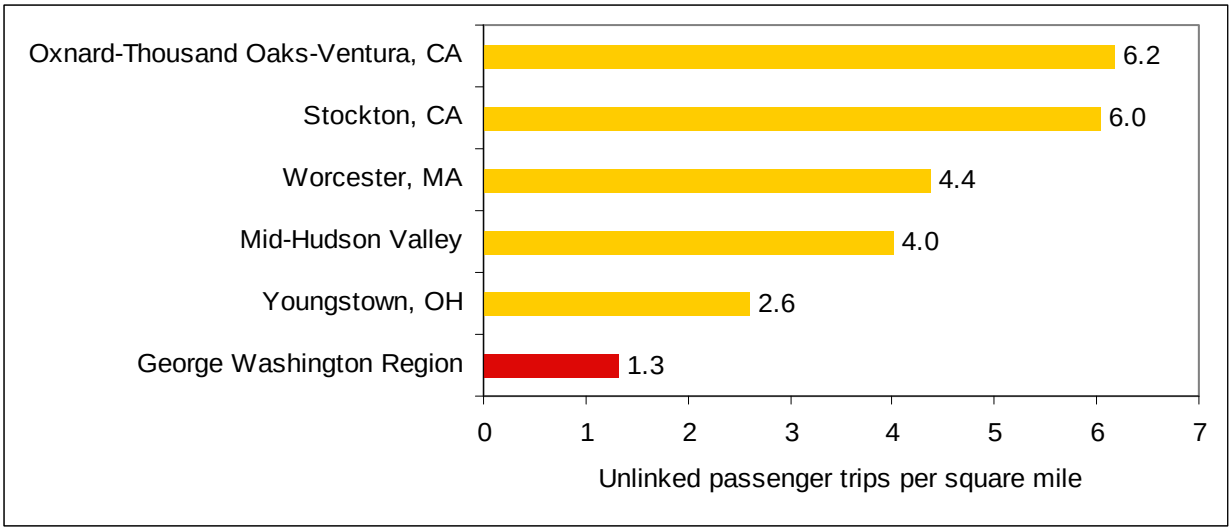
Three of the five 2035 peer areas (Stockton, Ventura County, and Worcester) provide far more service per square mile than FRED (see Figure 5-1). However, Youngstown provides only marginally more, and the mid-Hudson Valley provides less.

Figure 5-1: Transit Density: Vehicle Revenue Hours per Square Mile (2035 Peer Group)



However, all of the systems in the 2035 peer group attract far more riders per square mile than FRED (see Figure 5-2). This is likely the case for the same reasons as for the 2017 peer group: transit is typically more effective in larger and more densely develop areas, and larger systems generally provide a more attractive array of services.

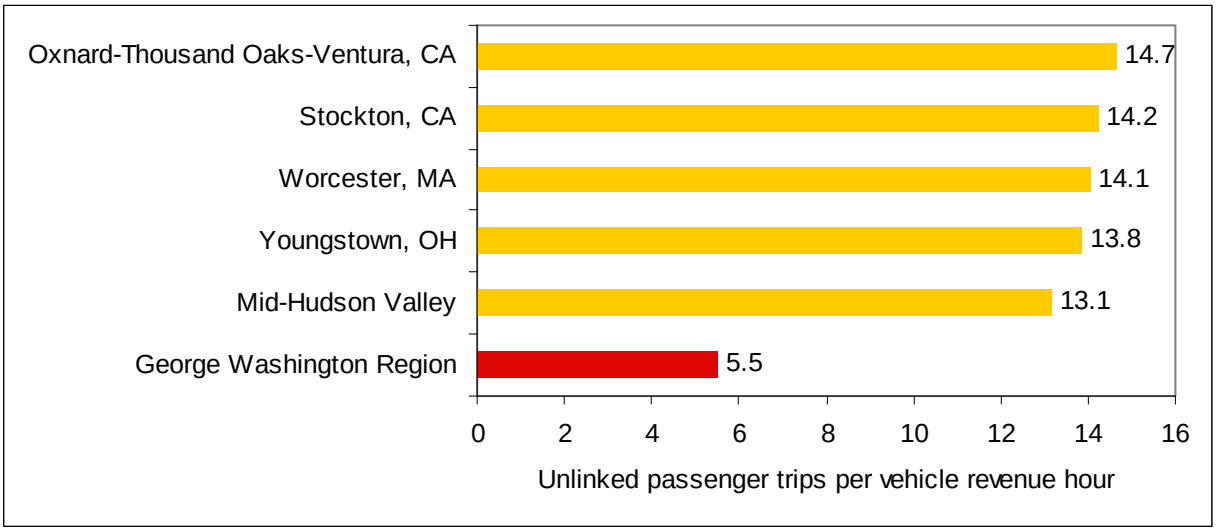
Figure 5-2: Transit Usage: Passenger Trips per Square Mile (2035 Peer Group)



Service Productivity

FRED's productivity, in terms of passengers per vehicle hour, is much lower than any of the peer areas (see Figure 5-3), and less than half of the peer group average of 11.9. As the George Washington Region grows, and transit services are improved, these figures indicate that the productivity of transit can increase significantly.

Figure 5-3: Service Productivity:
Passenger Trips per Vehicle Revenue Hour (2035 Peer Group)



Cost Efficiency and Effectiveness

As with the 2017 peer comparison, FRED's cost structure is lower than those of any of the larger systems in the 2035 peer group, but has the highest cost per passenger trip. As described for the 2017 peer group, these figures also indicate that as transit plays a broader role in the Region's transportation system, its cost structure will increase. However, as transit is improved and attracts more riders, the cost per passenger should decline.

Figure 5-4: Cost Efficiency: Operating Cost per Vehicle Revenue Hour (2035 Peer Group)

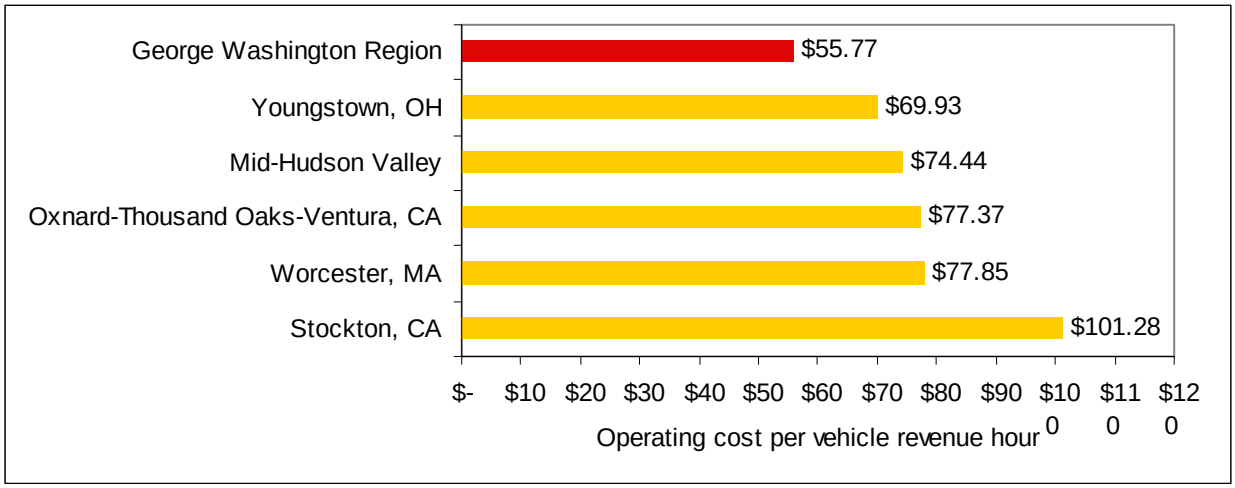
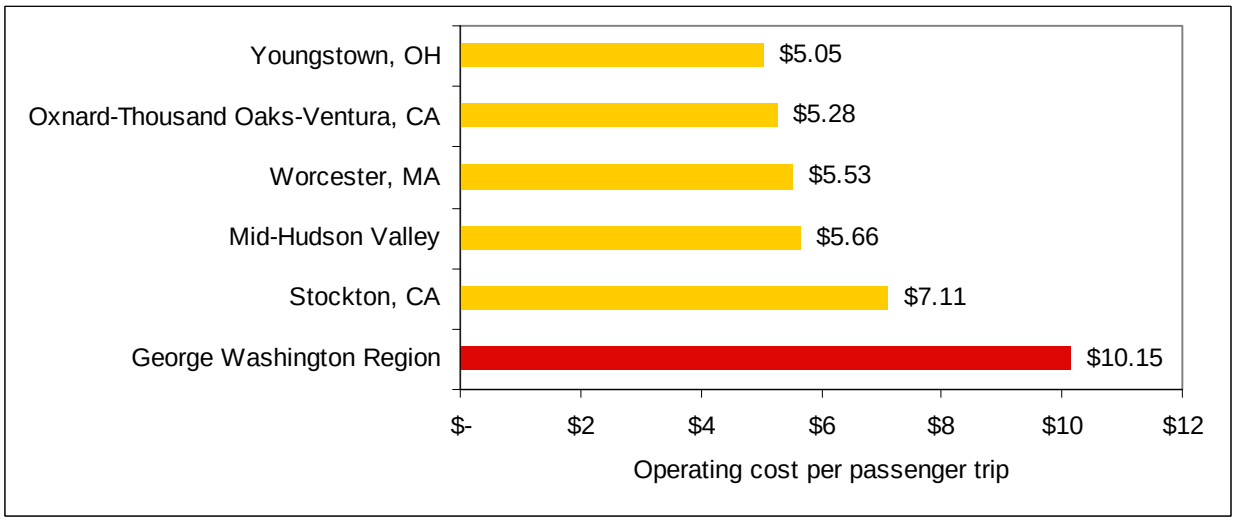


Figure 5-5: Cost Efficiency: Operating Cost per Passenger Trip (2035 Peer Group)

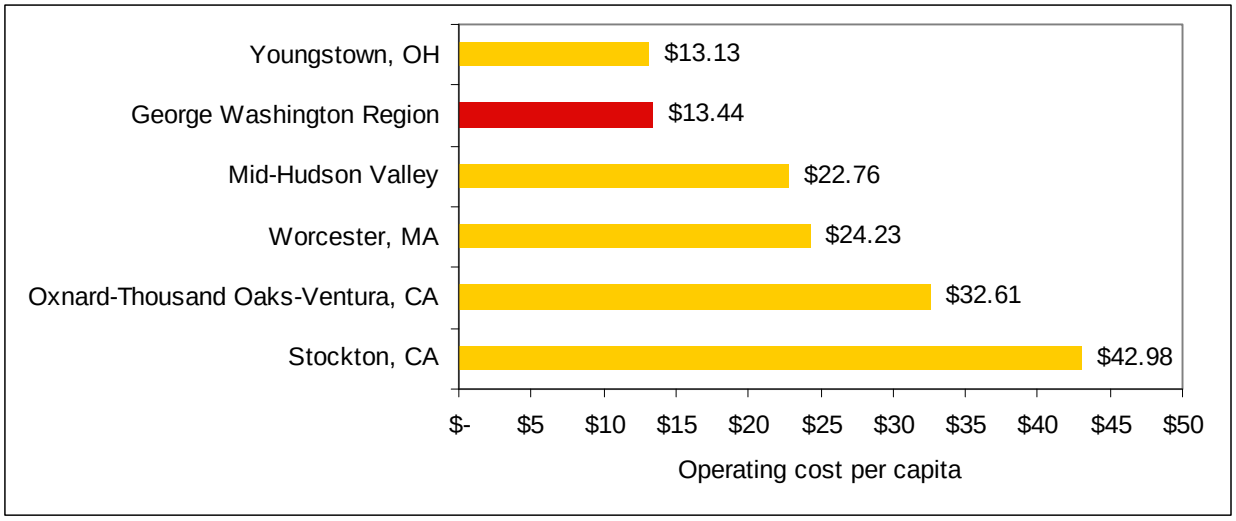


Transit Investment

As described in previous sections, FRED spends approximately $13.44 per capita on transit operating costs, which is lower than all of the 2035 peer areas except one (Youngstown). On average, the 2035 peer group spends $25.50 per capita, which is less than the 2017 peer average of $38.00. The lower per capita spending among the larger 2035 peer systems indicates that larger size can produce economies of scale, and that after a spike in per capital spending as George Washington Region transit is improved, per capita spending may decline.

The use of the $25.50 average per capita figure for 2035 indicates that to achieve similar levels of ridership as peer systems, spending would be $13.6 million in 2035. Higher per-capita, as in Ventura County or Stockton would translate into annual expenditures of $18 to $22 million.

Figure 5-6: Transit Investment: Per Capita Operating Expenditures (2035 Peer Group)



CHAPTER 6: LESSONS LEARNED

The intent of this peer review is to provide a context to help interpret FRED's performance and identify future directions. As described previously, FRED and the George Washington Region are unique in many ways and shaped by different geography, history and development patterns. As a result, unqualified quantitative comparisons between peer regions and transit agencies are difficult. Comparisons between transit agencies are, at best, indictors – few hard and fast comparisons can be made because of the myriad differences between agencies and operating environments. In this peer review, we have tried to identify meaningful indicators of future trends and needs. Through this process, we have identified a short list of lessons learned from the peer review that FRED and the George Washington Region may consider as they look for strategies to manage growth and improve local public transportation services.

FRED is a low-cost service provider, which results in a low operating cost per vehicle revenue hour. This is because the city provides many services that are not charged back to FRED, most employees are part-time workers who do not receive benefits, and FRED's overhead is low.

However, for transit to play a larger role in the George Washington Region's transportation system, it is likely that costs will increase. A larger system will need to hire more full time employees and provide greater benefits. In addition, greater planning and marketing efforts will be required. Also, more involvement in ancillary areas such as TDM, ridesharing, and coordination with cities and towns and other transit systems will also be needed.

Service productivity, in terms of passengers per vehicle hour, is low, even compared to current peers. There are a number of reasons for this, including service to many areas with low population densities, an emphasis on service coverage rather than a concentration of service in higher demand areas, widely dispersed employment locations, and the sprawling nature of the region's recent development. Still, for the future, the performance of transit in peer areas indicates that as improvements are made to George Washington Region transit services, ridership and productivity can increase significantly.

Transit spending in the George Washington Region is low. Transit spending in the George Washington Region, on a per-capita basis, is lower than in any of the current peer areas, and much

lower than in the areas that will be peers in the future. If transit is to become a more integral component of the region's transportation system, spending will need to increase significantly.