

GEORGE WASHINGTON REGION TRANSIT POLICY PLAN

Future Transit Service Scenarios (v12)

DRAFT



Prepared by



May 8, 2008

Transit Objectives

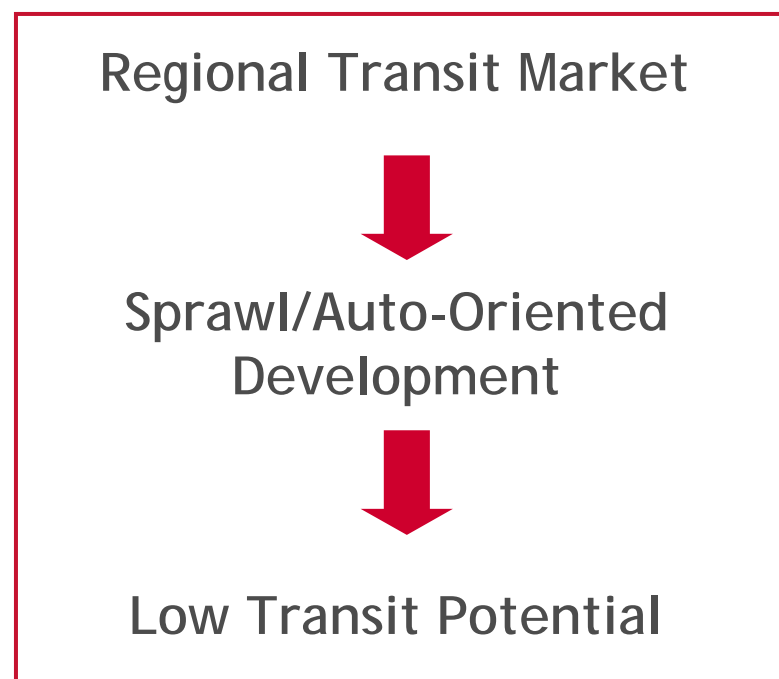
- Make transit a more integral component of the region's transportation system.
- Make transit a more viable option for more residents.
- Provide better choices.
- Attract "choice" riders – those who currently drive for most trips.
- Integrate transit with other modes – auto access, pedestrian, bicycle.
- Improve the livability of the area.
- Reduce automobile congestion.

Transit Challenges

- The effectiveness of transit is closely related to land use patterns and commute patterns.
- Transit is most effective:
 - In densely developed areas with concentrated development.
 - Where there are large concentrated commuter volumes.
- Transit is far less effective in low density auto-oriented environments.
 - Nearly all transit riders are also pedestrians (to and from the bus).
 - If the walking environment is unpleasant (no sidewalks, wide roads to cross, large parking lots between bus stops and stores, etc.), people who have cars will drive instead of using transit.

Transit Challenges

The George Washington Region's transit markets can be characterized as follows:



Approach

Scenarios designed to provide a mix of service that were appropriate to the areas and markets served:

Transit Facilities	Transit Services
Downtown Transit Centers	VRE
Outlying Transit Hubs	Express Bus
Transit Stations	Local Fixed-Route Bus
Park and Ride Lots	Flexible-Services
	Specialized Services
	Part-Time (limited days per week)
	Seasonal
	Volunteer Driver
	Subscription
	Vanpools/Carpools

Transit Scenarios

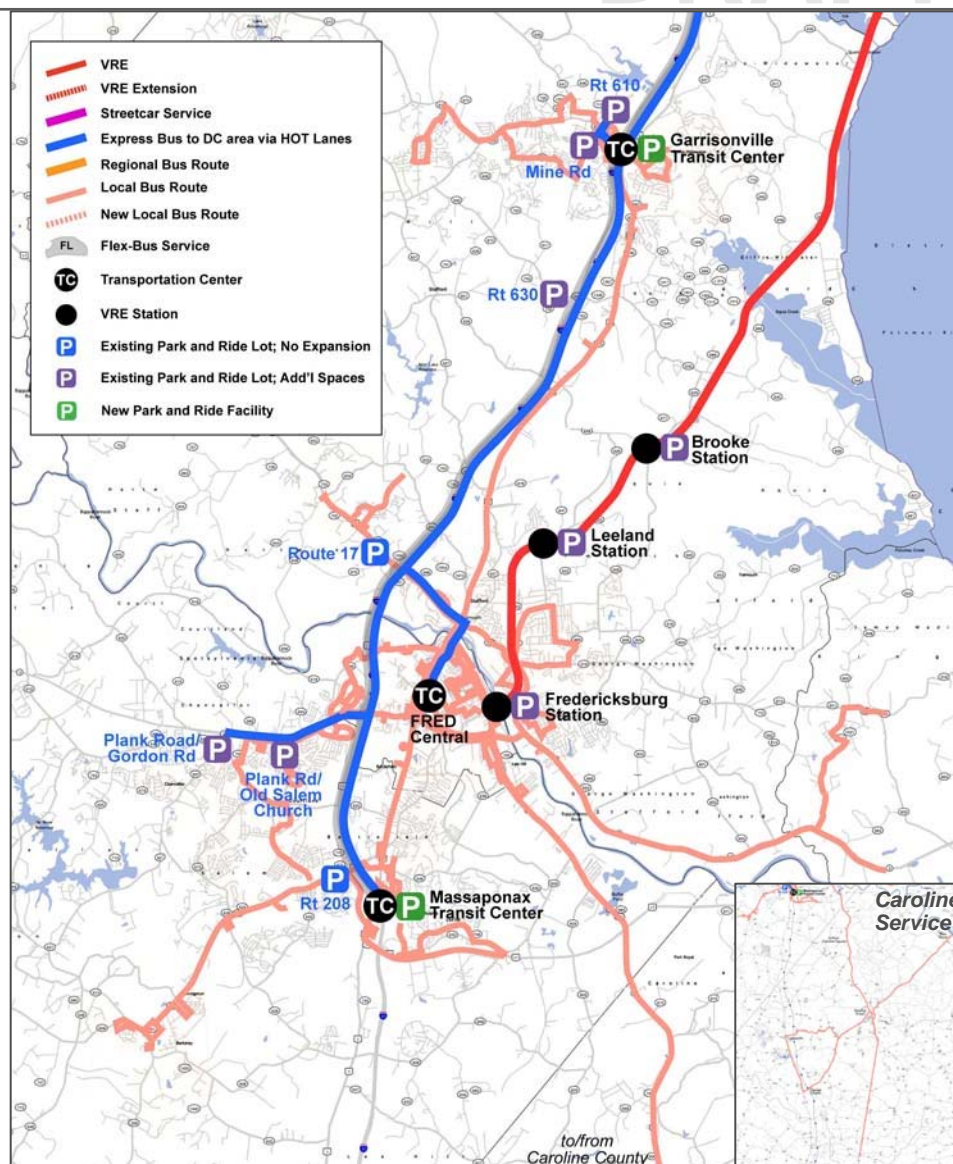
- 2017 and 2035
- Low, Medium, and High Scenarios for each horizon year.
- Represent choices that the Region can make:
 - Low: Modest improvements – Region continues auto-oriented approach.
 - Medium: Stronger emphasis on transit to provide convenient service between residential areas and activity centers, and to and from DC.
 - High: Very strong emphasis on transit, including the provision of evening and weekend service in most served areas.

➔ *These scenarios could be implemented in total or in part. Different services from different scenarios can be “mixed and matched” to develop an approach that balances the Region’s needs with fiscal abilities.*

➔ *Service improvements can also be implemented earlier than the timelines used in this analysis.*

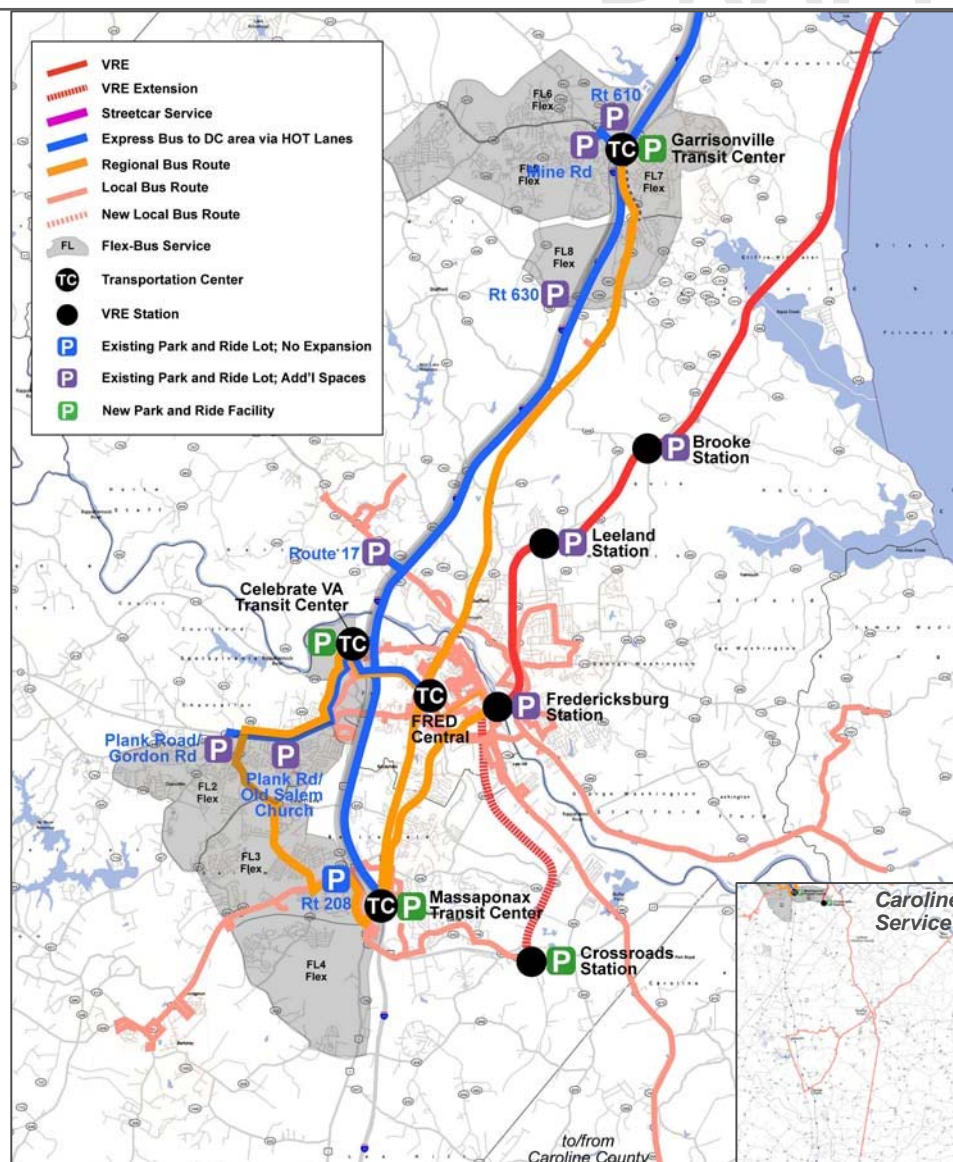
2017 Low Scenario

- Improvements focused on HOT Lane funded improvements:
 - New Transit Centers
 - Rt 610 In-Line Station
 - Massaponax
 - New peak hour express bus service:
 - Fred - Downtown DC
 - Fred - Pentagon/Crystal City
 - Massaponax - Downtown DC
 - Parking Expansion
 - 4,100 new commuter spaces
 - TDM program expansion
- FRED service expanded to include:
 - Some evening service
 - Some Saturday service



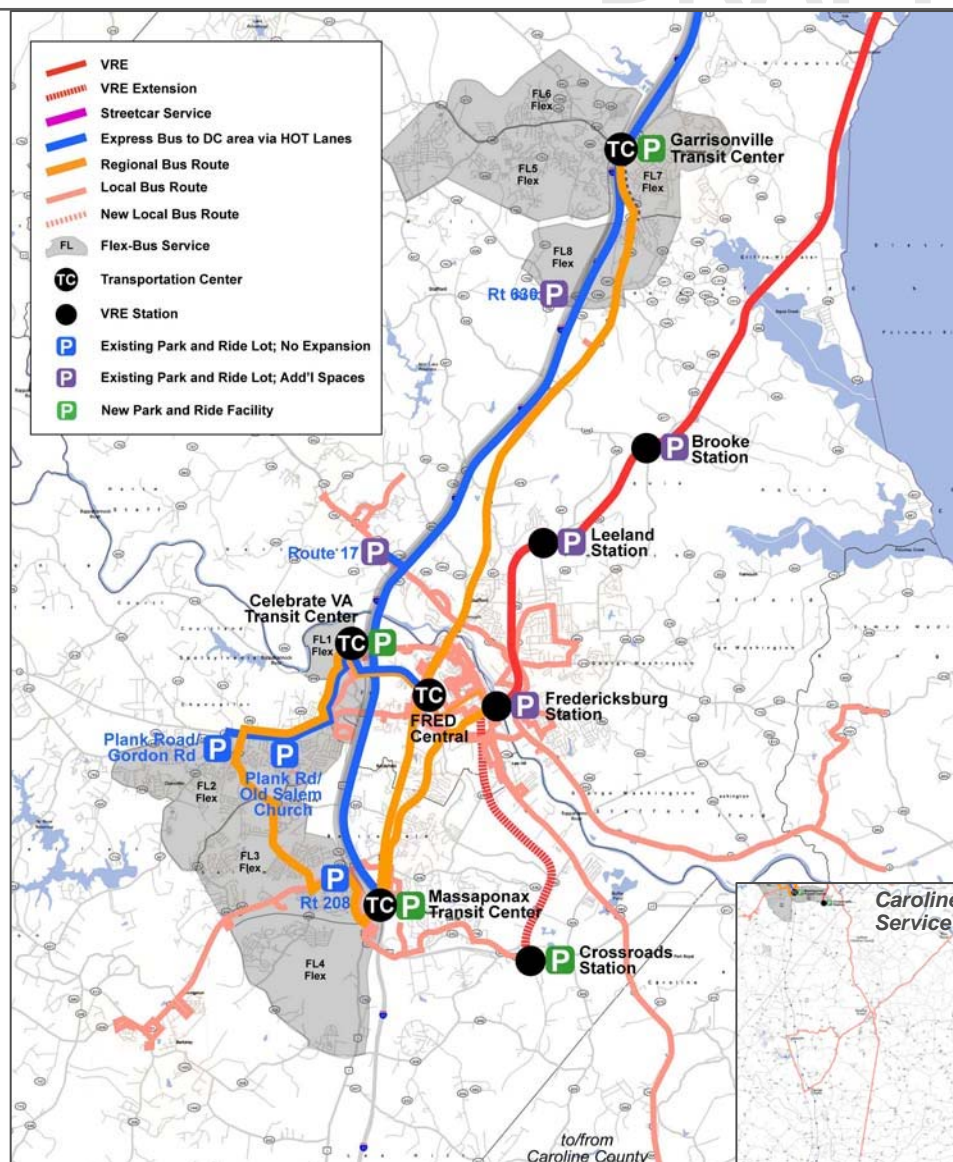
2017 Medium Scenario

- Low scenario improvements plus:
 - Additional Facilities:
 - Celebrate VA Transit Center
 - Higher level of Park & Ride Expansion (5,600 new spaces)
 - Improved DC Service
 - VRE extension to Spotsylvania
 - 8.5 VRE round trips
 - Expanded express bus
 - Improved FRED service:
 - New regional routes
 - New Flex-Routes
 - More frequent peak service
 - Earlier start to weekday service
 - Saturday service
 - Volunteer Driver service (E&D)
- TDM program expansion (25% more)



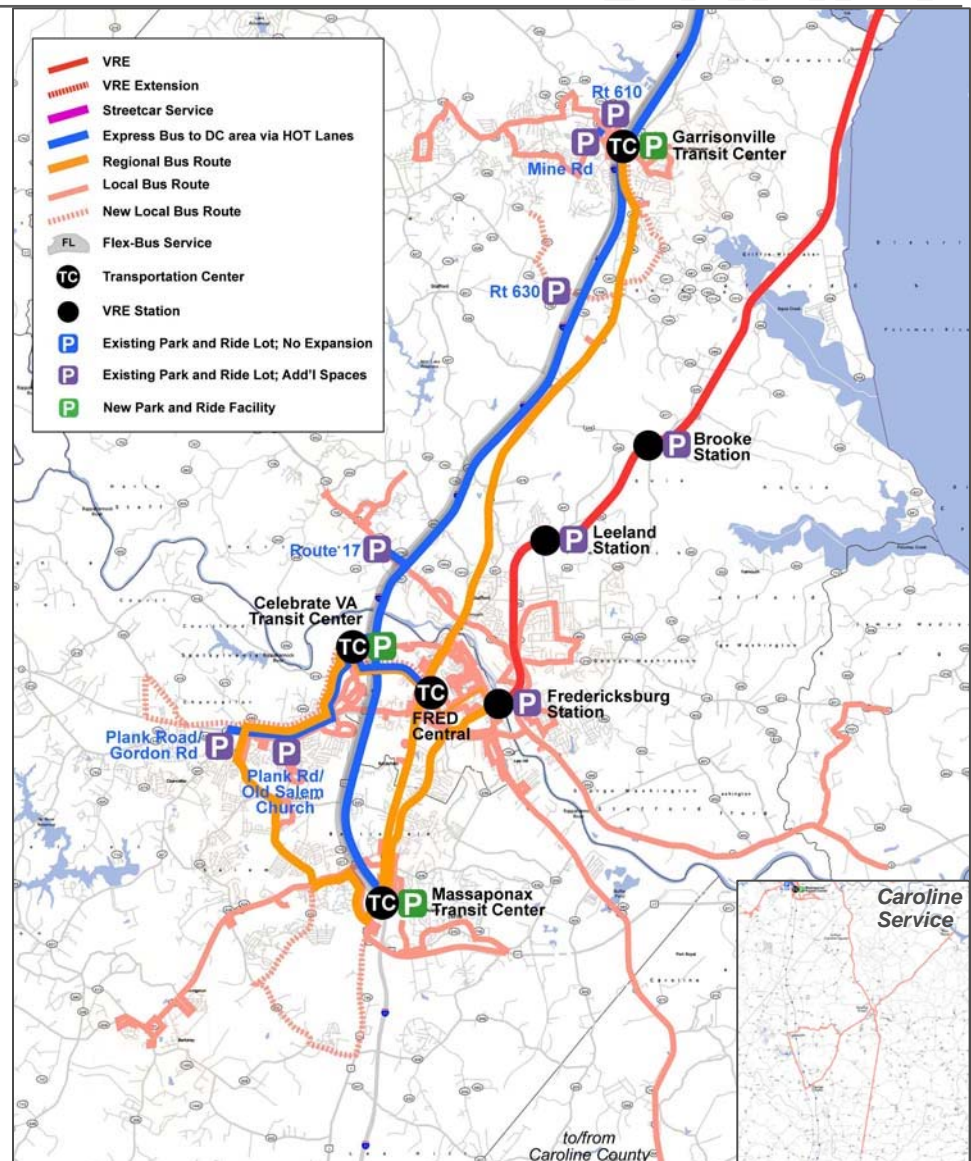
2017 High Scenario

- Medium scenario plus:
 - Facility improvements:
 - Relocate Rt 610 Park & Ride spaces to HOT Lane Station
 - Relocate Rt 208 Park & Ride spaces to Massaponax TC
 - Higher level of Park and Ride expansion (5,700 new spaces)
 - Improved DC Service
 - VRE extension to Spotsylvania
 - 14 VRE round trips
 - All day express bus service
 - Improved FRED service:
 - Evening service
 - More frequent off-peak service
 - Sunday service
 - Volunteer Driver service (gen public)
- TDM program expansion (50% more)



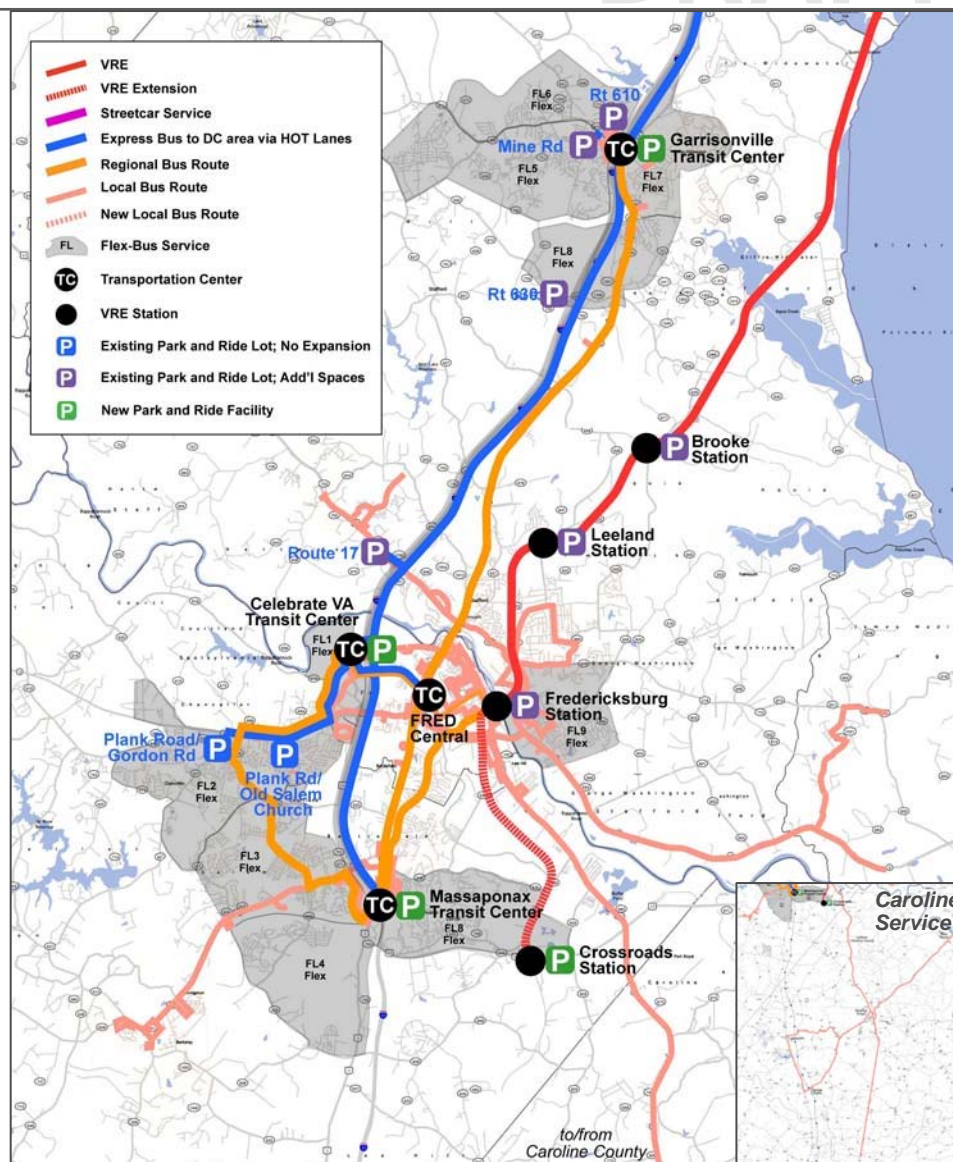
2035 Low Scenario

- 2017 Low Scenario plus:
 - Additional Facilities:
 - Celebrate VA Transit Center
 - Higher level of Park & Ride Expansion (8,200 new spaces)
 - Improved DC Service
 - 8.5 VRE round trips
 - More frequent express bus
 - Improved FRED service:
 - New regional routes
 - Earlier start to weekday service
 - Saturday service
 - New local routes to newly developed areas
- Same TDM program as 2017 Low Scenario



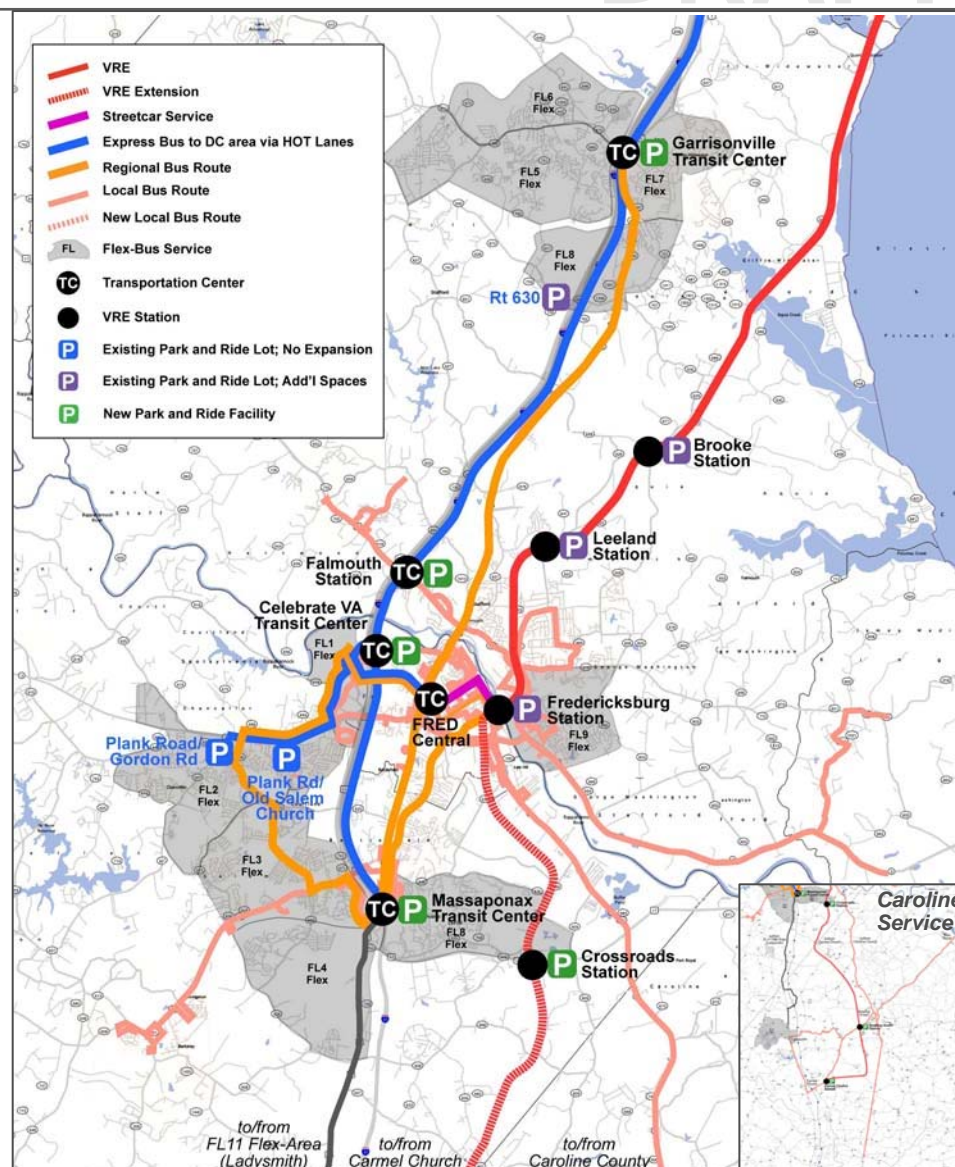
2035 Medium Scenario

- 2017 Medium Scenario plus:
 - Facility improvements:
 - Relocate Rt 208 Park & Ride spaces to Massaponax TC
 - Higher level of Park and Ride expansion (10,600 new spaces)
 - Improved DC Service
 - VRE extension to Spotsylvania
 - All day VRE service (25 round trips)
 - Expanded express bus service
 - Improved FRED service:
 - Flex-Routes replace local routes in many areas
 - New Flex-Routes to newly developed areas
- Same TDM program as 2017 Medium



2035 High Scenario

- 2017 High Scenario plus:
 - Facility improvements:
 - Relocate Rt 610 Park & Ride spaces to HOT Lane Station
 - Develop Celebrate VA TC as HOT Lane Station
 - Develop HOT Lane Station at Rt 17/Falmouth
 - Relocate Rt 208 Park & Ride spaces to Massaponax TC
 - 13,200 new park & ride spaces
 - Improved DC Service
 - VRE extension to Carmel Church
 - 4 new VRE stations
 - All day VRE service
 - All day express bus service
 - Improved FRED service:
 - Fredericksburg Streetcar
 - More frequent service
 - Longer span of service



Summary of Scenarios: Services

		Existing	2017 Scenarios			2035 Scenarios		
			Low	Med	High	Low	Med	High
VRE	Route Days WD RTs	DC-Fred M-F 7.5	DC-Fred M-F 7.5	DC-Spots M-F 8.5	DC-Spots M-F 14	DC-Fred M-F 8.5	DC-Spots M-F 25	DC-Caroline M-F 25
Express Bus	No. Routes Days WD RTs	8 routes M-F 21	11 routes M-F 30	12 routes M-F 40.5	10 routes M-F 75	11 routes M-F 30	9 routes M-F 63	10 routes 7 days 91
FRED (Regional/Local/Flex) (excluding FredEx)	No. Routes Days WD RTs	20 routes M-F 167	20 routes M-Sa 193	21 routes M-Sa 385	24 routes 7 days 431	22 routes M-Sa 300	24 routes M-Sa 422	23 routes 7 days 429
Volunteer Driver	Days Available to	-- --	-- --	M-F E&D	M-F Gen Public	-- --	M-F E&D	M-F Gen Public
Streetcar	Days WD RTs	-- --	-- --	-- --	-- --	-- --	-- --	7 days 72

Notes: WD RTs = Weekday Round Trips; E&D = Elderly and Disabled Residents.

Summary of Scenarios: Facilities and P&R Spaces

	Existing	2017 Scenarios			2035 Scenarios		
		Low	Med	High	Low	Med	High
VRE							
Brooke	431	631	631	631	651	651	651
Leeland Rd	652	1,152	1,152	1,152	1,103	1,103	1,103
Fredericksburg	702	1,502	702	702	2,028	1,053	702
Crossroads	--	--	1,000	1,000	--	1,500	1,000
Stonewall Jackson/Rt 606	--	--	--	--	--	--	200
Milford	--	--	--	--	--	--	200
Carmel Church	--	--	--	--	--	--	500
Transit Centers/Park & Ride							
Rt 610 Garrisonville Rd							
Stafford & Mine Roads	1,577	1,577	1,577	0	3,066	3,066	0
In-Line HOT Lane Station	--	2,125	2,125	5,154	2,869	3,669	8,082
Rt 630	523	523	650	650	914	914	650
FRED Central	0	0	0	0	0	0	0
Rt 17							
Stanford Road	1,000	1,000	1,000	1,000	1,281	1,281	
In-Line HOT Lane Station	--	--	--	--	--	--	1,281
Celebrate Virginia TC							
Near New Interchange	--	--	--	1,407	--	1,084	--
In-Line HOT Lane Station	--	--	--	--	--	--	3,670
Rt 3 at Rt 639 & Rt 627	1,279	1,279	1,279	0	1,974	1,974	0
Rt 208 at Houser Drive	794	794	0	0	0	0	0
Massaponax Transit Center	--	475	1,000	1,000	1,244	1,244	1,244
Total	6,958	11,058	12,513	12,697	15,109	17,518	20,114

Ridership, Cost, and Productivity

- The potential service scenarios would increase transit ridership significantly—from 1.5 million passenger trips per year to up to 7.1 million.
- However, transit would still carry a very small share of regional travel.
- This is primarily because regional development patterns are not conducive to the provision of effective transit.
- Operating costs would increase from \$12 million per year to up to \$98 million per year.
- Capital costs would range from \$108 million to over \$700 million.
- In most cases, passengers per vehicle hour would increase, meaning that the unit effectiveness of transit would improve.
- Operating costs per passenger would be lower for the Low Scenarios, but higher for the Medium and High Scenarios.
- This would be because the Medium and High Scenarios would add much more evening and weekend service, when ridership would be lower.

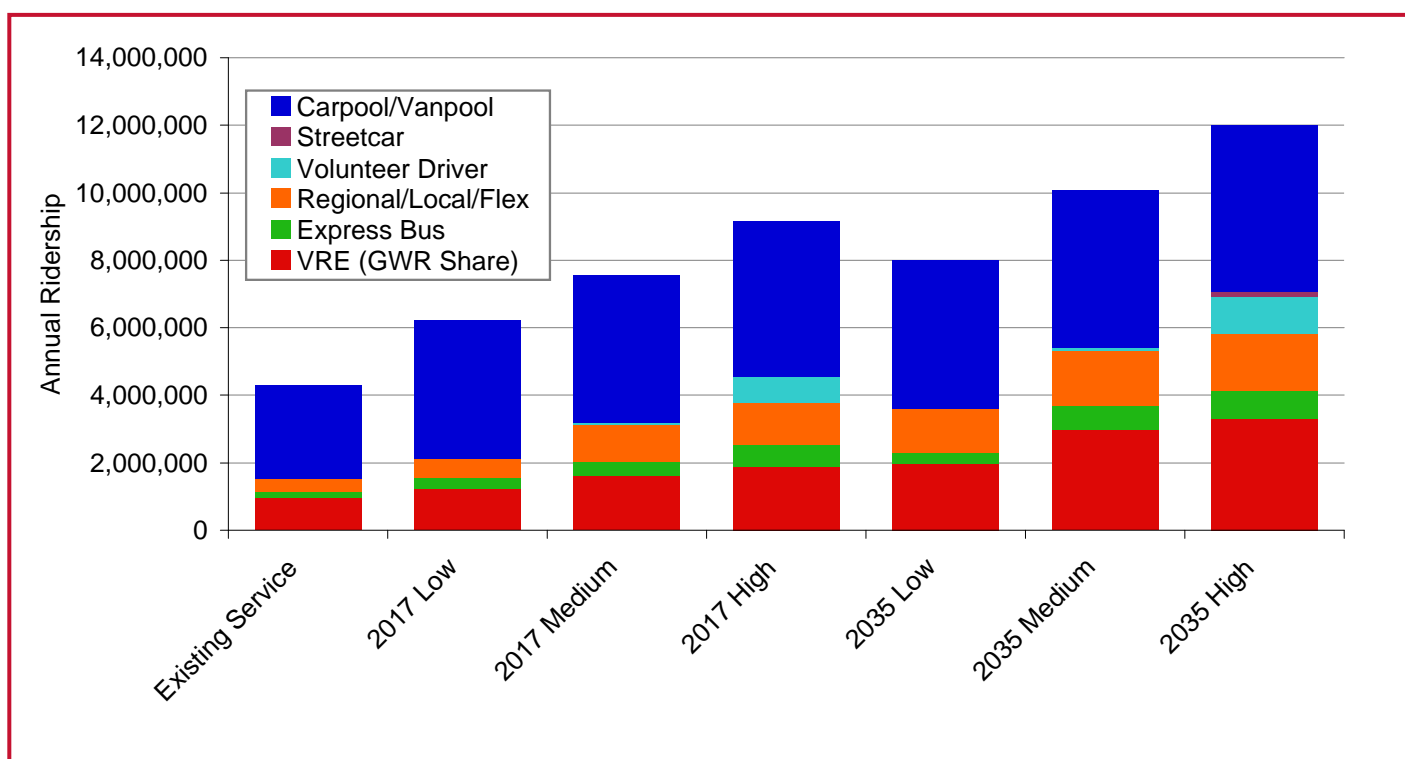
Ridership, Costs, and Productivity

- The potential transit improvements would increase ridership and productivity.
- Operating costs would increase by \$3 to \$86 million per year.
- Capital costs would range from \$108 to \$716 million.

<i>Ridership and costs in millions</i>	Existing	2017 Scenarios			2035 Scenarios		
		Low	Med	High	Low	Med	High
Annual Transit Ridership	1.5	2.1	3.2	4.5	3.6	5.4	7.1
Annual Ridesharing Trips	2.8	4.1	4.4	4.6	4.4	4.6	4.9
Net Annual Operating Costs	\$11.5	\$14.1	\$27.6	\$46.4	\$18.1	\$57.7	\$97.5
Total Capital Costs		\$107.8	\$239.2	\$347.7	\$217.0	\$345.3	\$716.4
Passengers per Revenue Vehicle Hour	15.9	19.5	15.9	14.1	24.4	21.6	18.5
Net Operating Cost per Transit Passenger	\$7.12	\$6.34	\$8.38	\$10.02	\$4.81	\$10.50	\$13.64
Net Cost per Ridesharing Trip	\$0.16	\$0.18	\$0.18	\$0.19	\$0.17	\$0.17	\$0.18

Transit Ridership & Ridesharing

- Transit ridership would increase from 1.5 to up to 7.1 million trips per year.
- Ridesharing trips would increase from 2.8 to up to 4.9 million trips per year.
- Ridership, and potential increases, would be the highest in the GWR - DC market (VRE and express bus).
- Local ridership increases would be significant, but smaller.



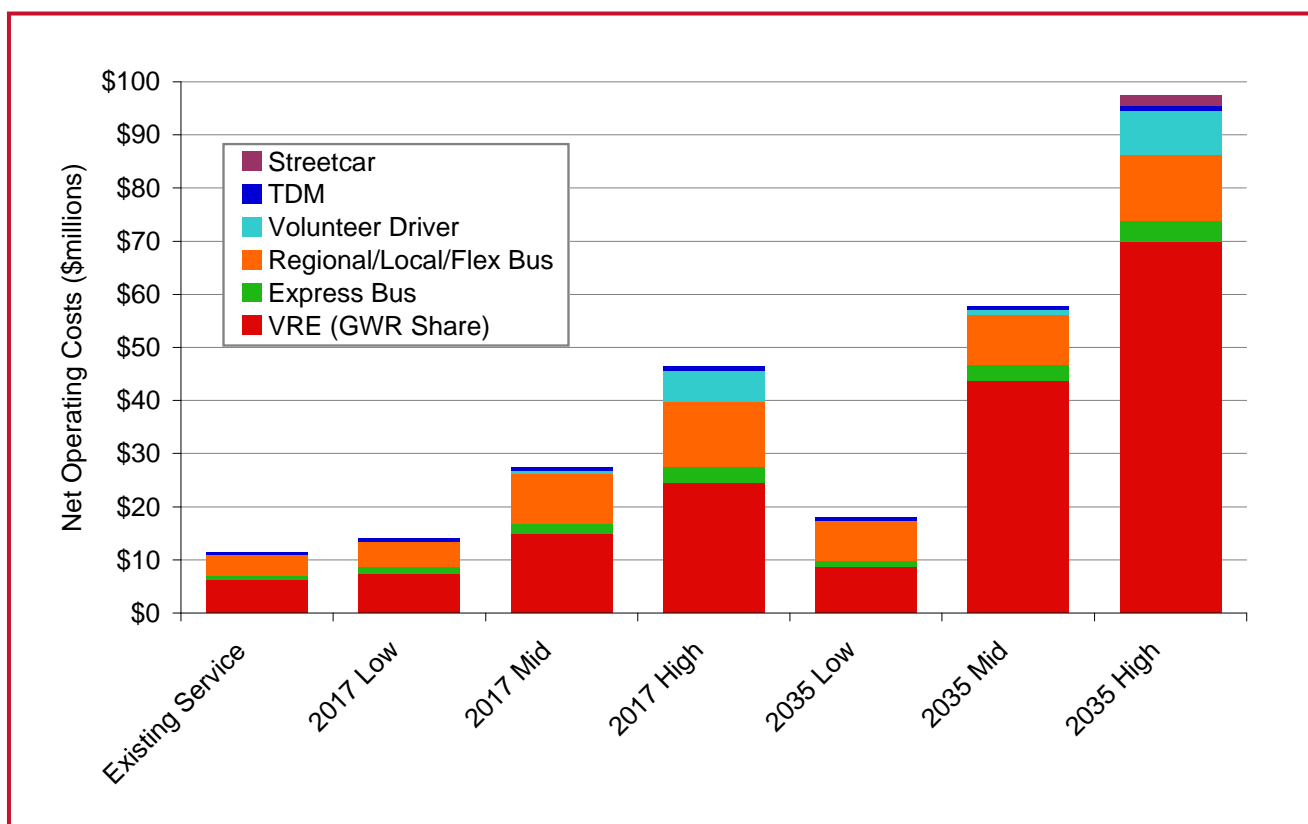
Ridership

- Considering the region’s size, the transit numbers are relatively low.
- Low ridership is due to the sprawling character of the region’s development, which does not provide sufficient densities for the provision of attractive transit.

Annual Ridership	Existing Service	2017 Scenarios			2035 Scenarios		
		Low	Medium	High	Low	Medium	High
Transit							
VRE (GWR Share)	965,954	1,249,564	1,615,643	1,876,997	1,963,154	2,966,297	3,328,593
Express Bus	159,390	314,226	402,523	665,643	346,755	727,086	791,201
FRED	410,000	551,399	1,111,469	1,243,425	1,311,764	1,633,595	1,697,027
Volunteer Driver	0	0	65,582	758,466	0	93,585	1,087,962
Streetcar	0	0	0	0	0	0	175,000
Total Transit	1,535,344	2,115,189	3,195,217	4,544,530	3,621,673	5,420,563	7,079,783
TDM	2,787,000	4,092,241	4,358,551	4,624,862	4,398,241	4,664,551	4,930,862
Total	4,322,344	6,207,430	7,553,768	9,169,392	8,019,914	10,085,114	12,010,644

Net Operating Costs *(Total Operating Cost minus Fare Revenue)*

- Operating costs would increase from approximately \$12 million per year to \$97 million.
- The largest increases would be attributable to large-scale VRE increases in VRE service (up to 25 round trips per weekday and an extension to Caroline County).



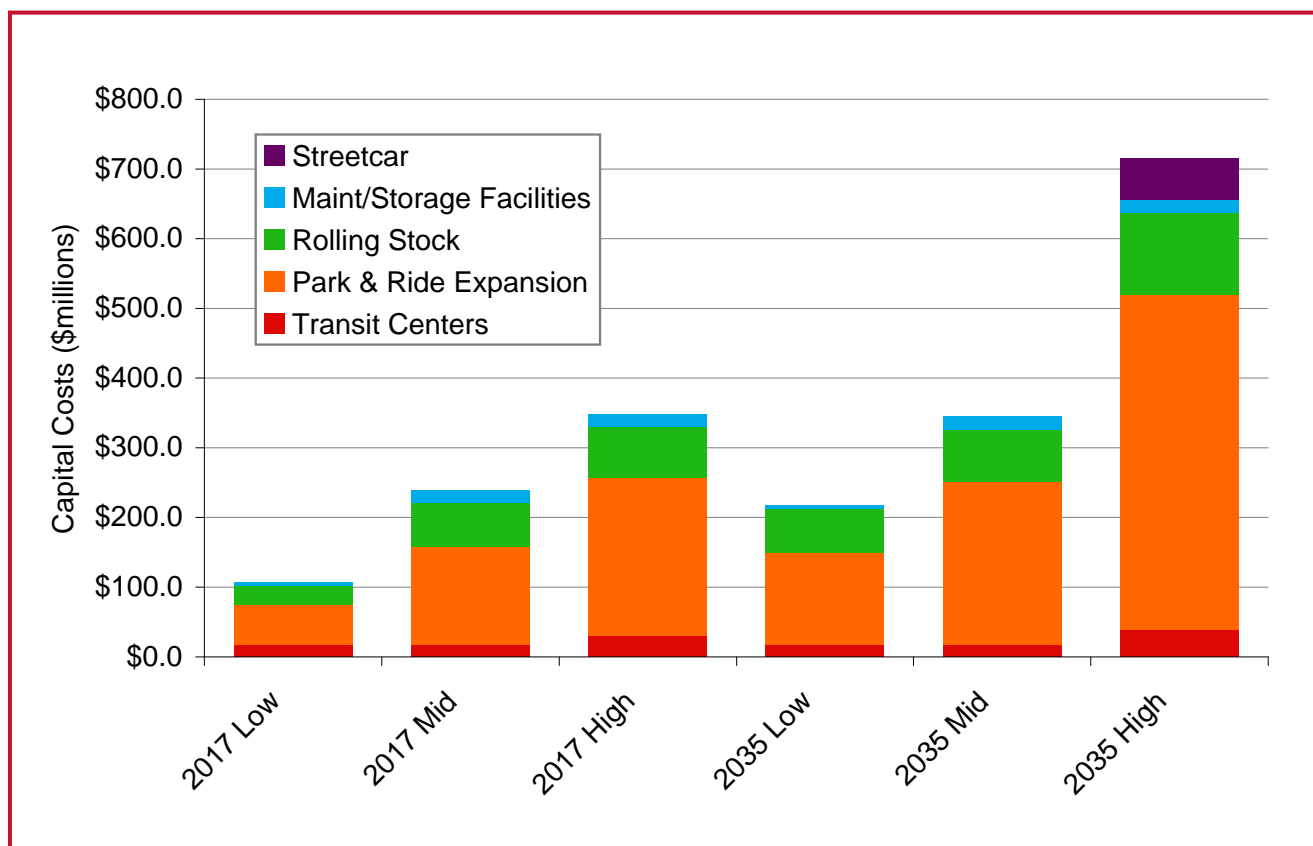
Net Operating Costs

- Increases in net operating costs for the Low Scenarios would be relatively small (\$3 million 2017 and \$7 million in 2035).
- Increases in most bus costs would be a relatively small proportion of the total increases (from \$1 million to \$9 million).

Net Operating Costs	Existing Service (in \$2008)	2017 Scenarios (in \$2008)			2035 Scenarios (in \$2008)		
		Low	Med	High	Low	Med	High
VRE (GWR Share)	\$6.3	\$7.3	\$14.9	\$24.5	\$8.6	\$43.7	\$69.9
Express Bus	\$0.7	\$1.3	\$1.8	\$3.1	\$1.4	\$2.9	\$3.8
FRED	\$4.0	\$4.8	\$9.6	\$12.2	\$7.5	\$9.6	\$12.6
Volunteer Driver			\$0.5	\$5.7		\$0.7	\$8.2
Streetcar							\$2.0
TDM	\$0.5	\$0.7	\$0.8	\$0.9	\$0.7	\$0.8	\$0.9
Total	\$11.5	\$14.1	\$27.6	\$46.4	\$18.1	\$57.7	\$97.5

Capital Costs

- Capital costs would range from \$107 million for the 2017 Low Scenario to over \$700 million for the 2035 High Scenario.
- The highest costs in all scenarios would be for park and ride expansion (for VRE and express bus riders, slug commuters, and car and vanpool commuters).



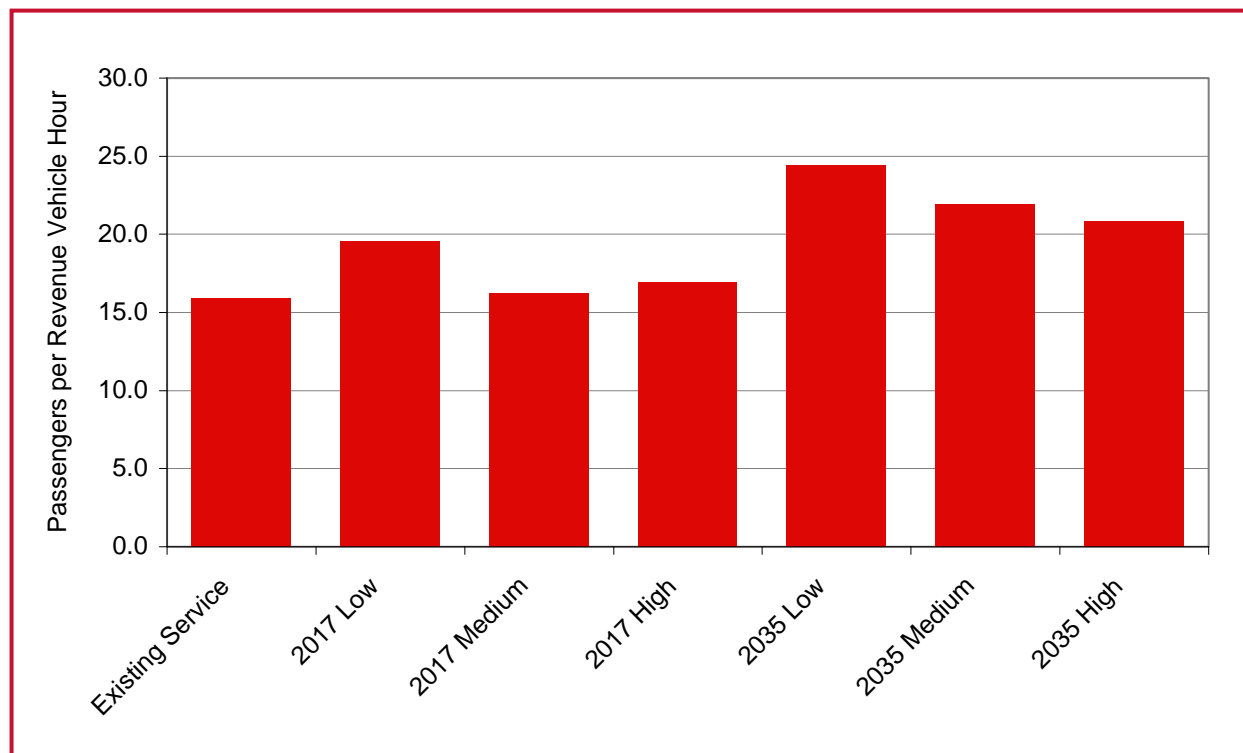
Capital Costs

- The highest cost items would be for structured parking at large lots (for example, Route 610) with direct ties into the planned HOT lanes.
- The GWR's share of rolling stock and parking expansion costs for VRE expansion would be the second highest expenses.

	2017 Scenarios (in \$2008)			2035 Scenarios (in \$2008)		
	Low	Medium	High	Low	Medium	High
Transit Centers (excluding parking)	\$17.5	\$17.5	\$29.5	\$17.5	\$17.5	\$39.5
Park & Ride Expansion						
At Transit Centers	\$39.0	\$108.6	\$190.7	\$39.0	\$144.7	\$370.9
At Park & Ride Lots		\$1.9	\$1.9	\$42.8	\$42.8	\$31.1
At VRE Stations	\$17.5	\$29.5	\$34.5	\$49.8	\$47.1	\$77.8
Rolling Stock						
VRE (GWR Share)	\$15.0	\$35.3	\$35.3	\$35.3	\$35.3	\$68.7
Express Bus	\$13.8	\$20.5	\$31.2	\$26.4	\$30.0	\$40.8
Regional Transit		\$8.0	\$6.8	\$1.1	\$8.1	\$8.0
Maintenance/Storage Facilities						
VRE		\$1.4	\$1.4	\$0.0	\$1.4	\$1.4
Regional Bus	\$5.0	\$16.6	\$16.4	\$5.0	\$18.4	\$18.2
Streetcar						\$60.0
Total	\$107.8	\$239.2	\$347.7	\$217.0	\$345.3	\$716.4

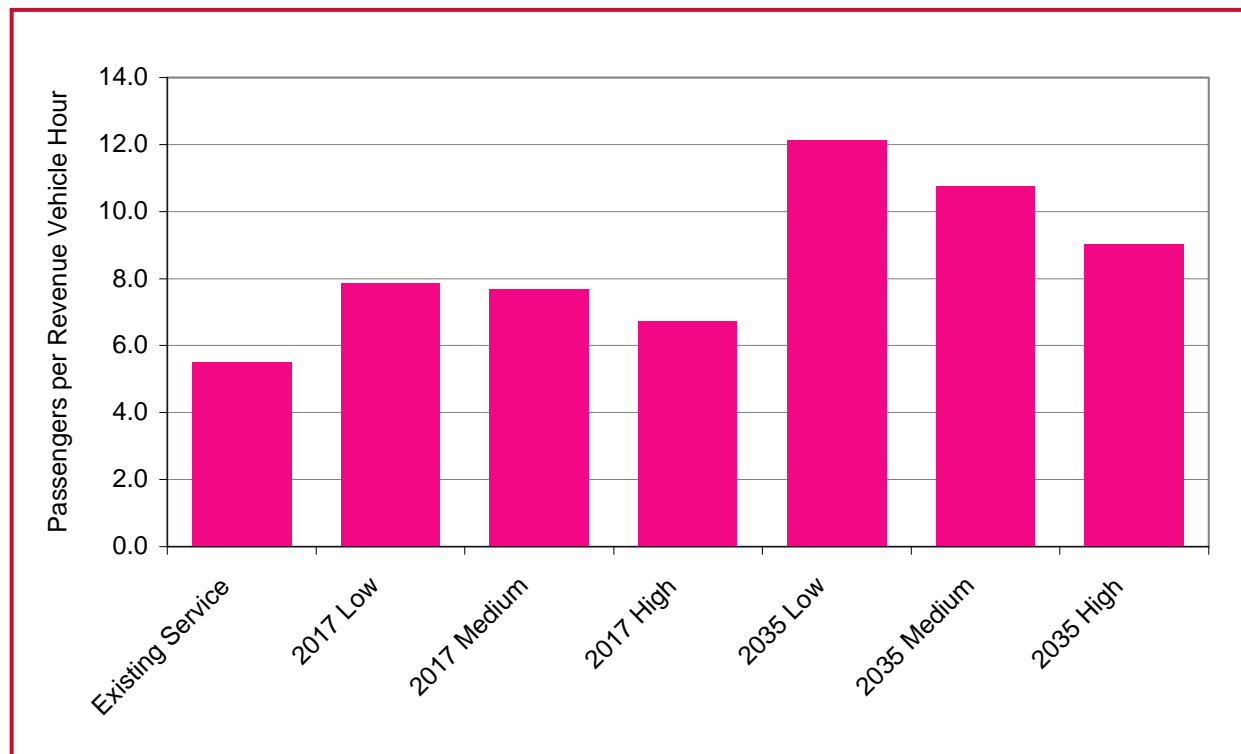
Passengers per Revenue Vehicle Hour: All Services

- Passengers per Vehicle Hour would increase slightly with all scenarios, and most significantly with the 2035 scenarios.
- The Medium and High Scenarios would have somewhat lower productivity because they would add more service on evenings and on weekends, when ridership would be lower.



Passengers per Revenue Vehicle Hour: FRED

- For FRED services, Passengers per Vehicle Hour would increase with all scenarios.
- As with all modes, Passengers per Vehicle Hour would increase most significantly with the 2035 scenarios.



Passengers per Revenue Vehicle Hour

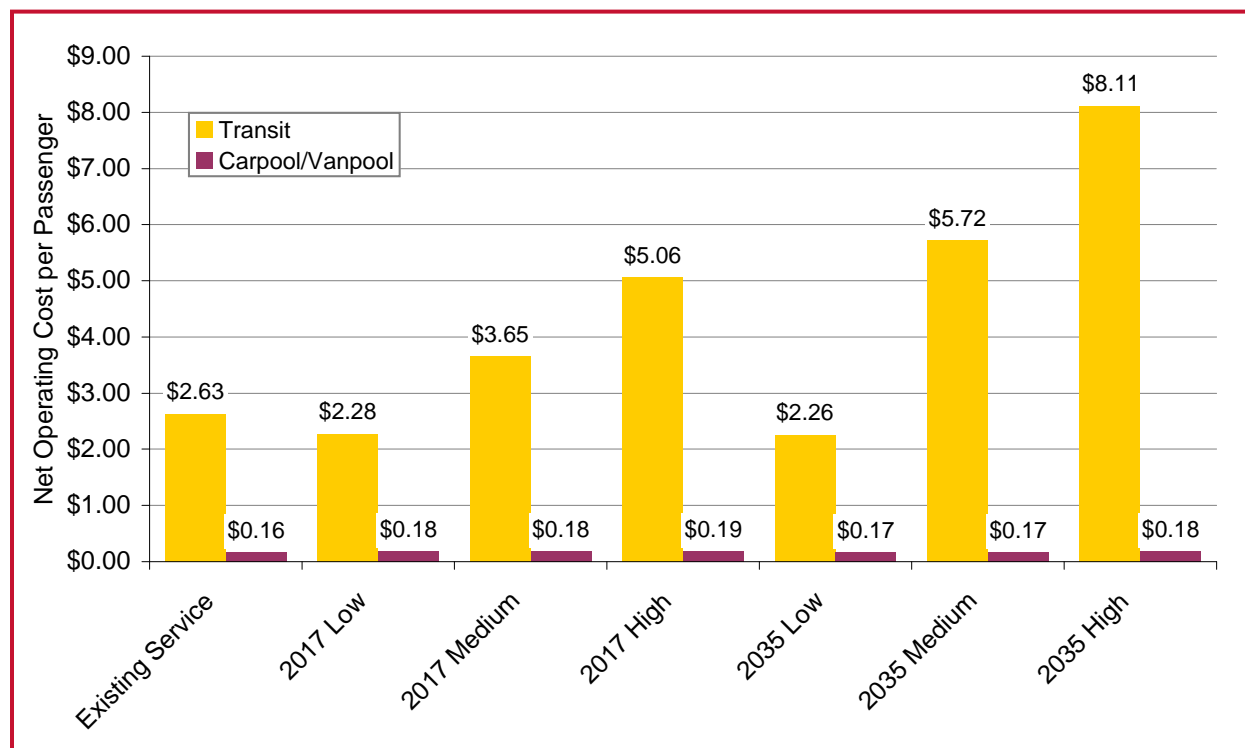
- In total, Passengers per Revenue Hour would increase in all scenarios.
- By type of service:
 - VRE productivity would decline with large increases in service.
 - Express bus productivity would remain relatively constant.
 - FRED productivity would improve with all scenarios.

Passengers per RVH	Existing Service	2017 Scenarios			2035 Scenarios		
		Low	Medium	High	Low	Medium	High
VRE (GWR Share)	140.0	159.8	165.1	116.4	221.5	103.0	86.3
Express Bus	10.5	10.4	9.6	9.9	11.1	11.1	9.0
Regional/Local/Flex	5.5	7.9	7.7	6.7	12.1	10.8	9.0
Streetcar							20.0
Total	15.9	19.5	15.9	14.1	24.4	21.6	18.5

Note: VRE figures are per Train Hour

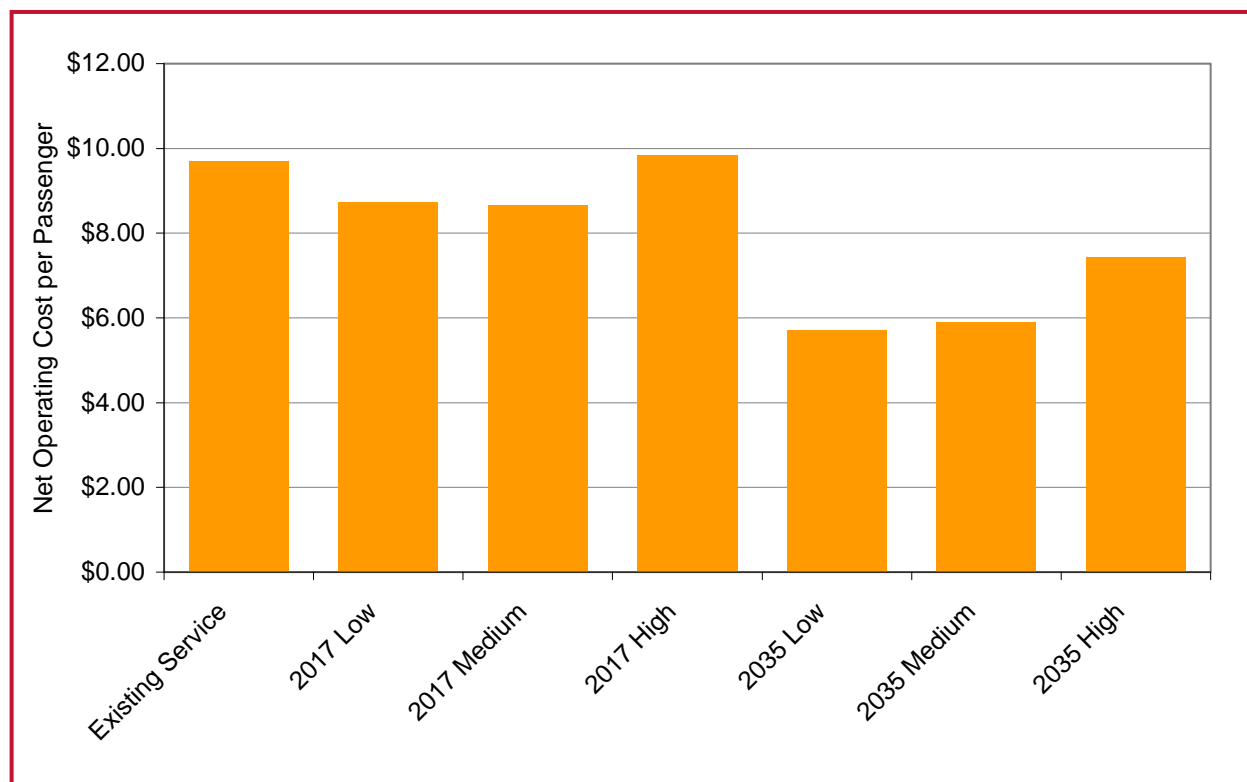
Net Operating Cost per Passenger: All Modes

- Net Operating Costs per Passenger would decline in the Low Scenarios as growth and service improvements would attract new riders.
- Operating Costs per Passenger would increase with the Medium and High Scenarios (because new evening and weekend services would not attract the same density of passengers as the weekday peak-oriented Low Scenarios).
- TDM costs for ridesharing would be very low.



Net Operating Cost per Passenger: FRED

- For FRED, Net Operating Costs per Passenger would decline in all scenarios except 2017 High, where there would be a slight increase.



Net Operating Cost per Passenger

- By mode, Net Operating Costs per Passenger would be:
 - Lowest for express bus.
 - Highest for VRE expansion.

Net Operating Cost per Passenger	Existing Service	2017 Scenarios			2035 Scenarios		
		Low	Medium	High	Low	Medium	High
Transit							
VRE (GWR Share)	\$6.53	\$5.83	\$9.20	\$13.05	\$4.37	\$14.74	\$21.00
Express Bus	\$4.13	\$4.19	\$4.51	\$4.65	\$3.90	\$3.92	\$4.83
FRED	\$9.69	\$8.72	\$8.64	\$9.82	\$5.70	\$5.89	\$7.43
Volunteer Driver			\$7.58	\$7.58		\$7.58	\$7.58
Streetcar							\$11.43
Transit Total	\$7.12	\$6.34	\$8.38	\$10.02	\$4.81	\$10.50	\$13.64
TDM	\$0.16	\$0.18	\$0.18	\$0.19	\$0.17	\$0.17	\$0.18
Total	\$2.63	\$2.28	\$3.65	\$5.06	2.26	\$5.72	\$8.11

Findings

Based on existing development and growth patterns:

- With improvements in transit service, transit can become more attractive and carry significantly more trips.
- This is especially true in the GWR - DC market.
- Within the Region transit ridership would grow significantly on a percentage basis, and become more productive, but transit use would remain low in absolute terms and relative to total travel.
- In summary:
 - ➔ *Transit can be very effective in the GWR - DC market.*
 - ➔ *Unless land development patterns change, transit can be improve but will not attract significant numbers of choice riders in the local market.*