



# **Fairfax County Countywide Transit Network Study**

## **Briefing to the Transportation Advisory Commission (TAC)**

Tuesday, December 18, 2012  
Fairfax County Department of Transportation





## Study objectives:

- Establish a ***connected rapid transit system*** to meet demands through the year 2050
- Define transit corridor functions, station locations, modes and rights-of-way to guide subsequent comprehensive plan amendments and development review processes that protect needed right-of-way for ultimate transit network
- Coordinate with other regional, state, and local jurisdictional plans
- Identify policies, programs, and actions to support phased implementation and expedite delivery of priority elements in the near term

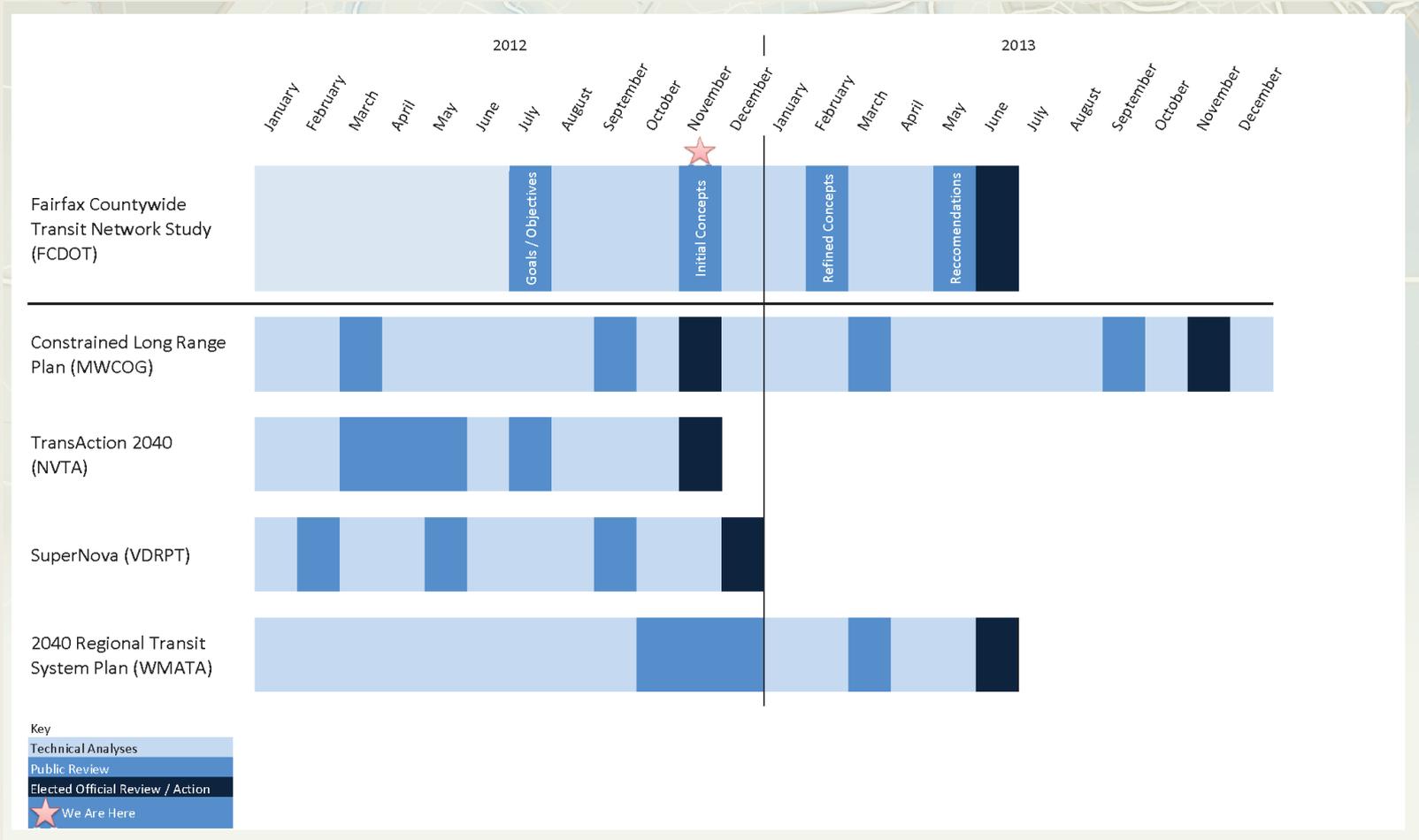




## Study schedule:

- Goals and objectives (spring 2012)
- Public input milestones
  - Goals and objectives (summer 2012)
  - Initial concepts (fall 2012)
  - Refined concepts (winter 2013)
  - Recommended concepts (spring 2013)
- Board endorsement of study recommendations, with subsequent comprehensive plan amendments as warranted

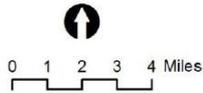
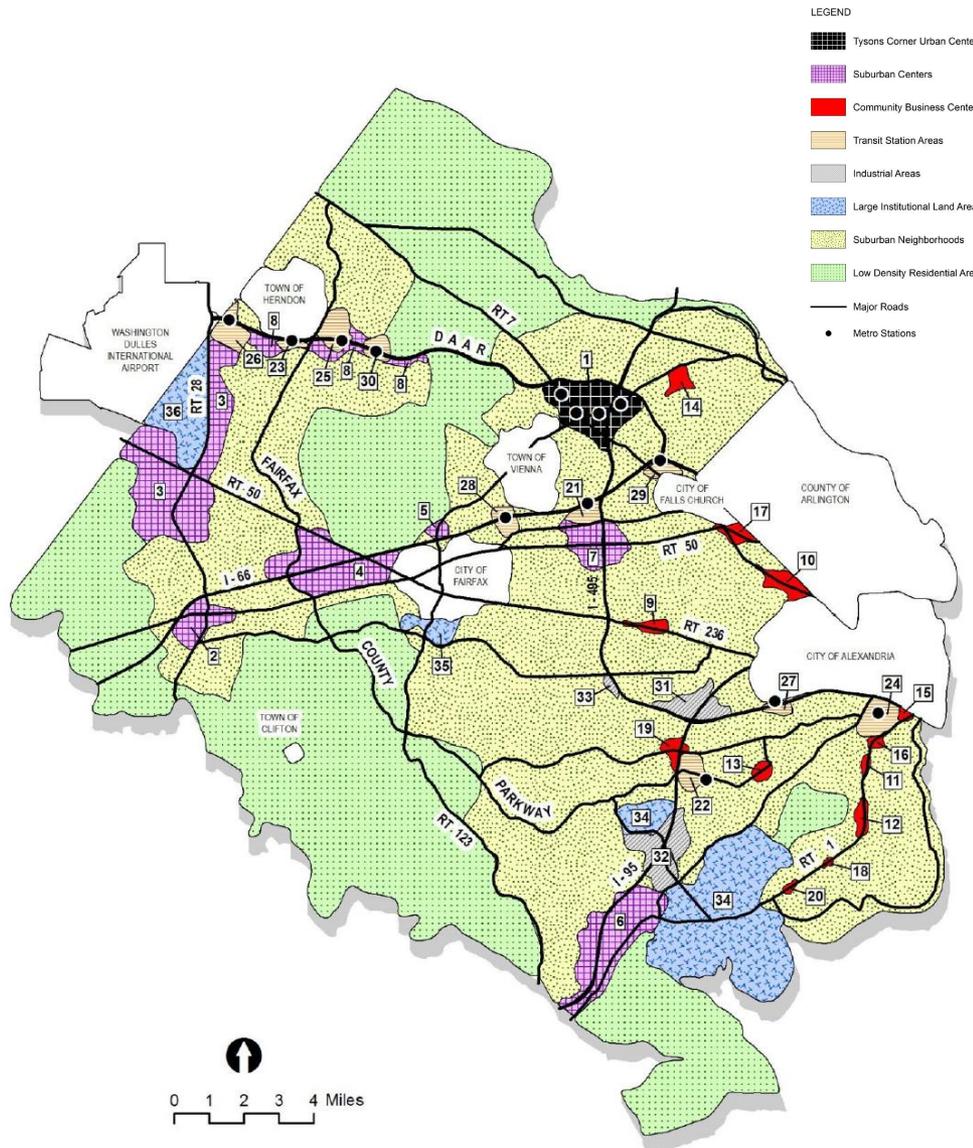




The Countywide Transit Network Study phases are scheduled to facilitate coordination with other regional transportation studies







- LEGEND**
- Tysons Corner Urban Center
  - Suburban Centers
  - Community Business Centers
  - Transit Station Areas
  - Industrial Areas
  - Large Institutional Land Areas
  - Suburban Neighborhoods
  - Low Density Residential Areas
  - Major Roads
  - Metro Stations

**LOCATIONS OF MIXED-USE CENTERS**

**Urban Center**  
1. Tysons Corner Urban Center

- Suburban Centers**
2. Centreville
  3. Dulles (Route 28 Corridor)
  4. Fairfax Center
  5. Flint Hill
  6. Lorton-South Route 1
  7. Merrifield
  8. Reston-Herndon

- Community Business Centers**
9. Annandale
  10. Baileys Crossroads
  11. Beacon/Groveton
  12. Hybla Valley/Gum Springs
  13. Kingstowne
  14. McLean
  15. North Gateway
  16. Penn Daw
  17. Seven Corners
  18. South County Center
  19. Springfield
  20. Woodlawn

- Transit Station Areas**
21. Dunn Loring
  22. Franconia/Springfield
  23. Herndon-Monroe
  24. Huntington
  25. Reston Parkway
  26. Route 28/CIT
  27. Van Dorn
  28. Vienna
  29. West Falls Church
  30. Wiehle Avenue

**LOCATIONS OF LARGE INSTITUTIONAL AND INDUSTRIAL AREAS**

- Industrial Areas**
31. Beltway South
  32. I-95 Corridor
  33. Ravensworth

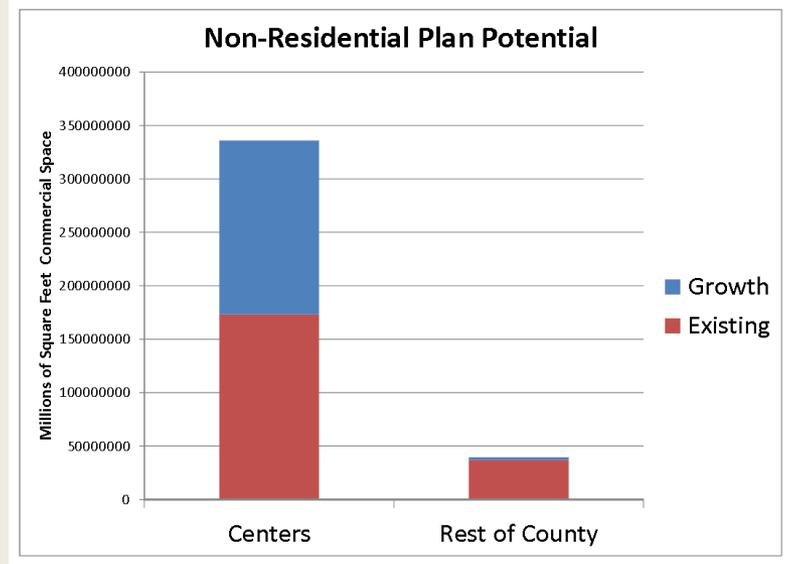
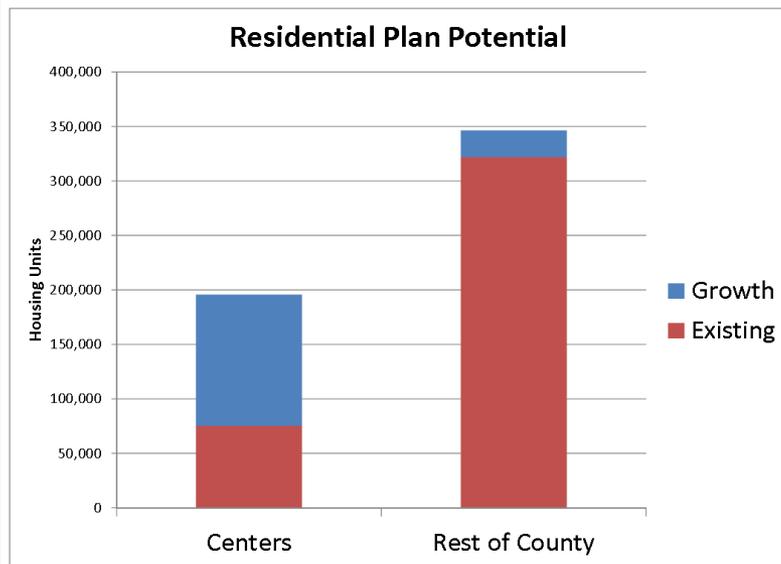
- Large Institutional Land Areas**
34. Fort Belvoir (Main Post and North Area)
  35. George Mason University
  36. Washington Dulles International Airport

**Fairfax County Future Development Concept**





Most of the County's growth potential lies **within** these established activity centers



Housing units:

Existing: 19% in centers

Growth: 83% in centers

Total: 36% in centers

Commercial space:

Existing: 82% in centers

Growth: 99% in centers

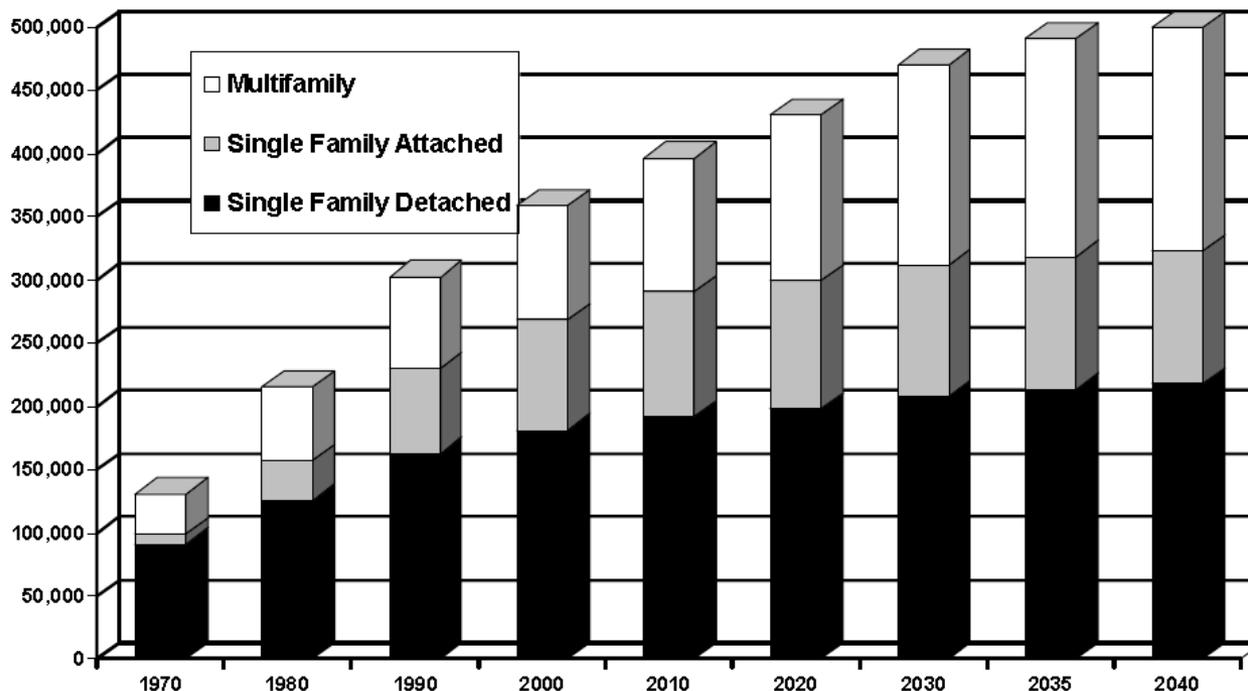
Total: 89% in centers





About 70% of the County's residential growth through 2040 will be in multifamily housing units.

**Historical and Forecast Housing Units  
by Type of Structure  
Fairfax County, 1970 through 2040**



Sources: U.S. Census Bureau, 1970 and 1980; Fairfax County Department of Neighborhood and Community Services, 1990 through 2040, 2010 Integrated Parcel Lifecycle System (IPLS).

Note: Single family detached category includes single family detached units and mobile homes; single family attached category includes townhouses, duplex and multiplex units; multifamily category includes garden, mid-rise and high-rise units.





## Why a High Quality Transit Network?

At least two-thirds of study survey respondents believe it is either *important* or *very important* for the Washington DC region to invest in transit in order to:

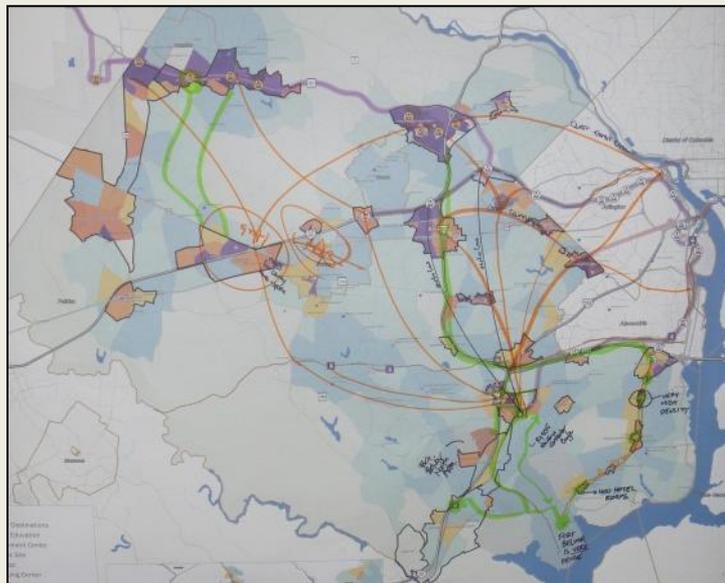
- Reduce time spent traveling (86%)
- Provide travel options (choice riders) (83%)
- Take cars off the road (81%)
- Increase economic development (79%)
- Provide travel options (non-drivers) (78%)
- Reduce carbon footprint (76%)
- Create attractive mixed-use centers (68%)





Public outreach in summer 2012 is incorporated in our initial analyses

“Setting the Stage” helped us identify and refine study objectives through the online survey and comments on the draft goals and measures

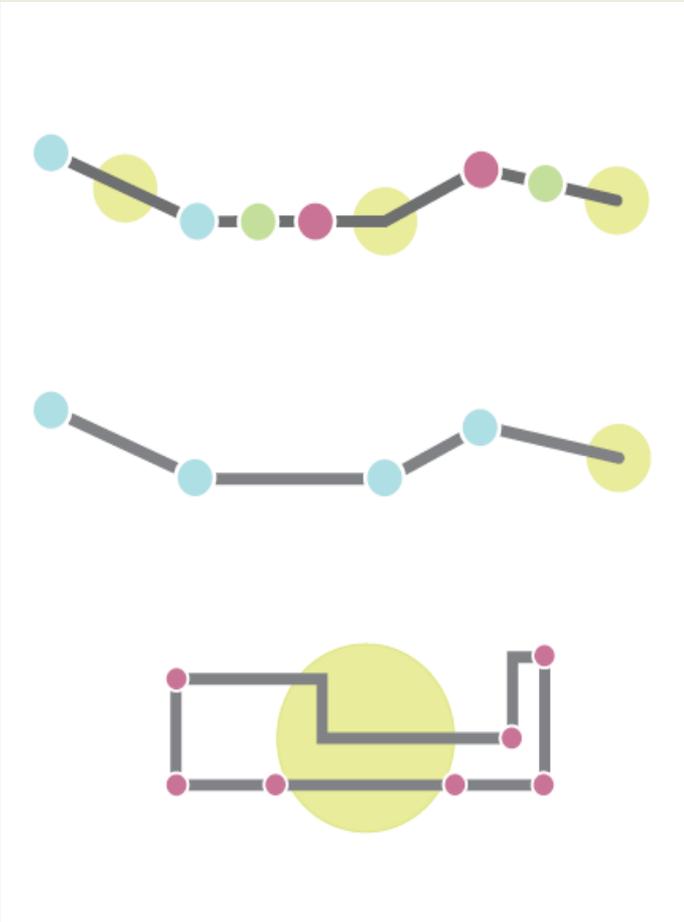


“Mapping Your Future” helped us identify connections that should be considered for premium commuter, connector, or destination transit corridors





The type of premium transit service appropriate for each corridor will reflect the traveler needs and land use context in that corridor.



**Destination corridors**, like the Orange Line in Arlington, connect neighborhoods to multiple activity centers, functioning primarily to provide access.

**Commuter corridors**, like Virginia Railway Express, primarily serve one major activity center and tend to focus on journey-to-work trips and function primarily to provide mobility.

**District circulators**, like the planned Tysons Corner Circulator, enhance mobility within an activity center or group of adjacent centers.

Source: Center for Transit Oriented Development



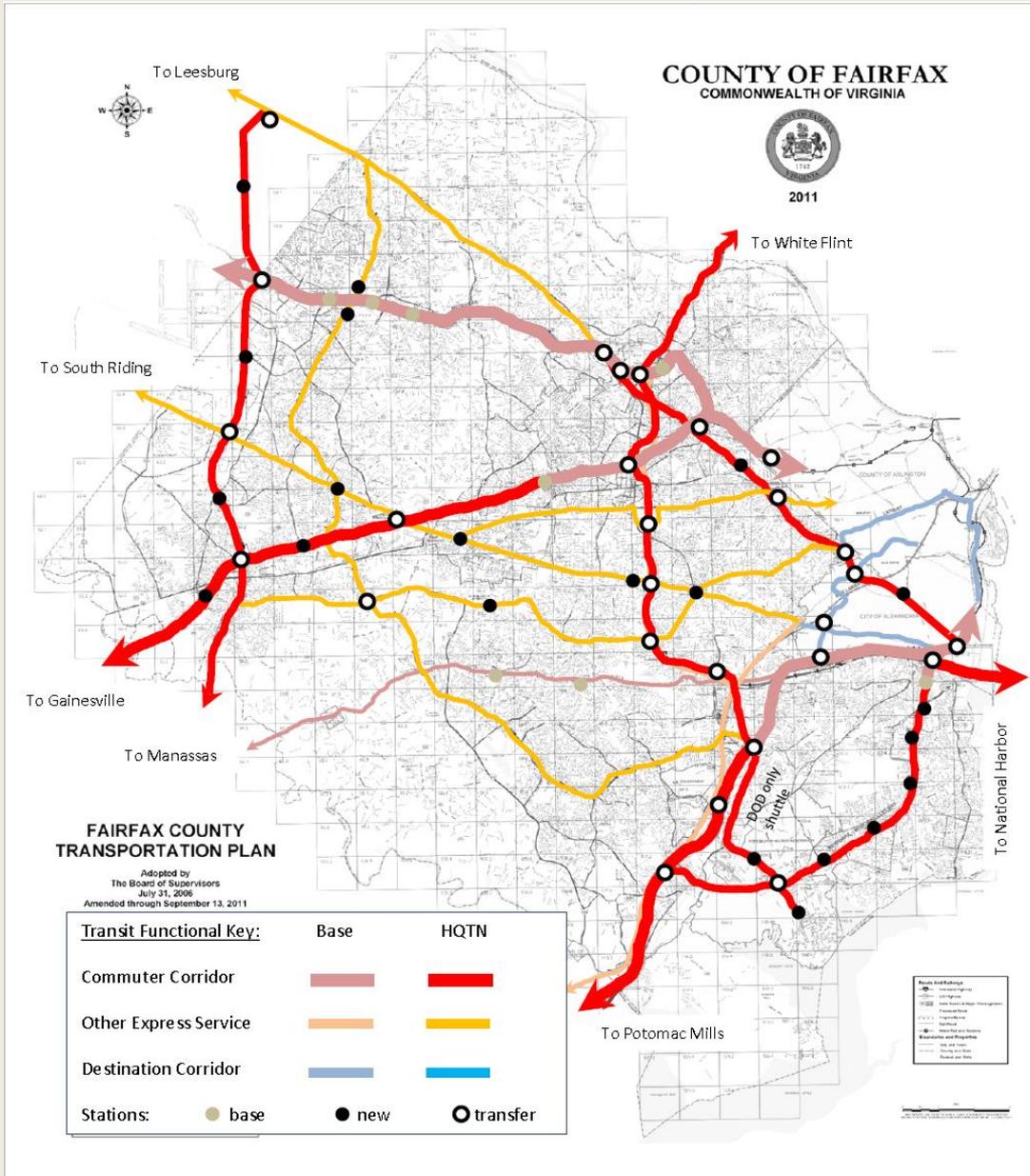


# Function, context, technology

High quality transit technologies span a wide range of transit guideway and vehicle types. The selection of a particular transit technology for any corridor depends first upon the travel market, corridor function, and land use context.

Transit Technology	Commuter rail	Heavy rail	Express Bus	Light rail transit (LRT)	Bus rapid transit (BRT)	Streetcar
Example	 Virginia Railway Express	 Metrorail	 Omni Ride	 The Tide (Hampton Roads)	 EMX (Eugene, OR)	 Portland Streetcar
Average operating speed	31-40 MPH	25 MPH	15 MPH (arterial) 25-50MPH(freeway)	15-25 MPH	12-20 MPH	8-12 MPH
Maximum operating speed	80 MPH	70 MPH	55 MPH	70 MPH	50 MPH	45 MPH
Typical station spacing	5 to 10 miles	1/2 to 5 miles	1 to 5 miles	1/2 to 2.0 miles	1/2 to 2.0 miles	1/10 – 1/4 miles
Typical capital cost per mile	\$5M - \$8M	\$60M - \$250M	Up to \$2M	\$50-\$150M	\$2M - \$10M	\$10M - \$30M
Typical peak hour person capacity in peak direction	1,500 – 8,000	11,500 - 23,000	< 300 per route	4,000 - 18,000	2,000 - 12,000	1,500 - 7,500
Alignment access	Fully controlled for safety concerns (shares characteristics of freight rail)	Fully controlled for safety and high voltage power concerns (crossing must be grade-separated)	Based on roadway alignment (freeway or arterial lane)	May be either controlled or uncontrolled	May be either controlled or uncontrolled	Typically runs on street in mixed traffic
Typical Functions	<b>Commuter</b>	<b>Commuter</b>	<b>Commuter</b>	<b>Commuter</b> or <b>destination</b>	<b>Commuter</b> or <b>destination</b>	<b>Destination</b> or <b>circulator</b>

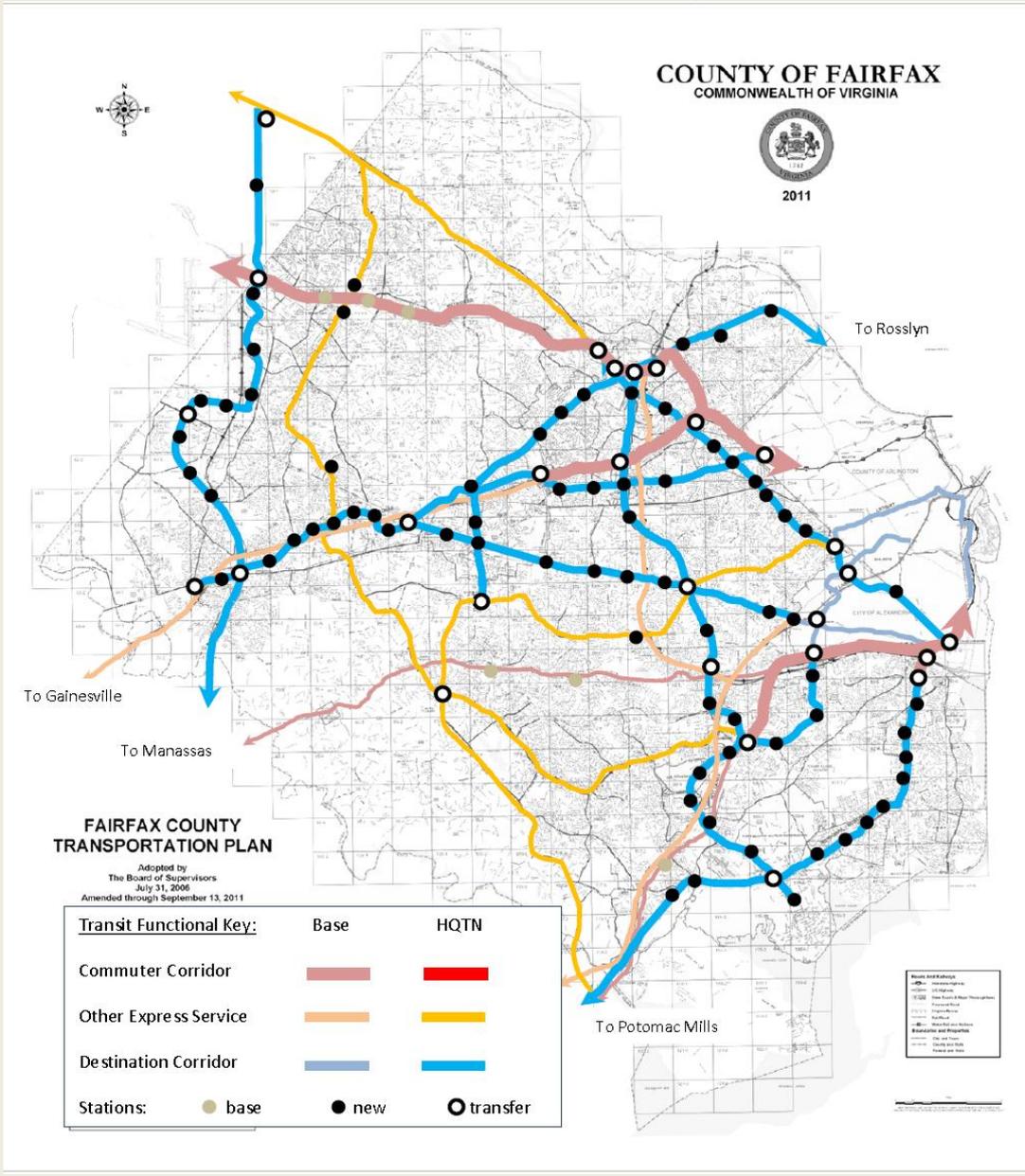




## Mobility focus

Connect activity centers within Fairfax County and adjacent jurisdictions with **high speed commuter corridors** that best serve **longer-distance** trips.

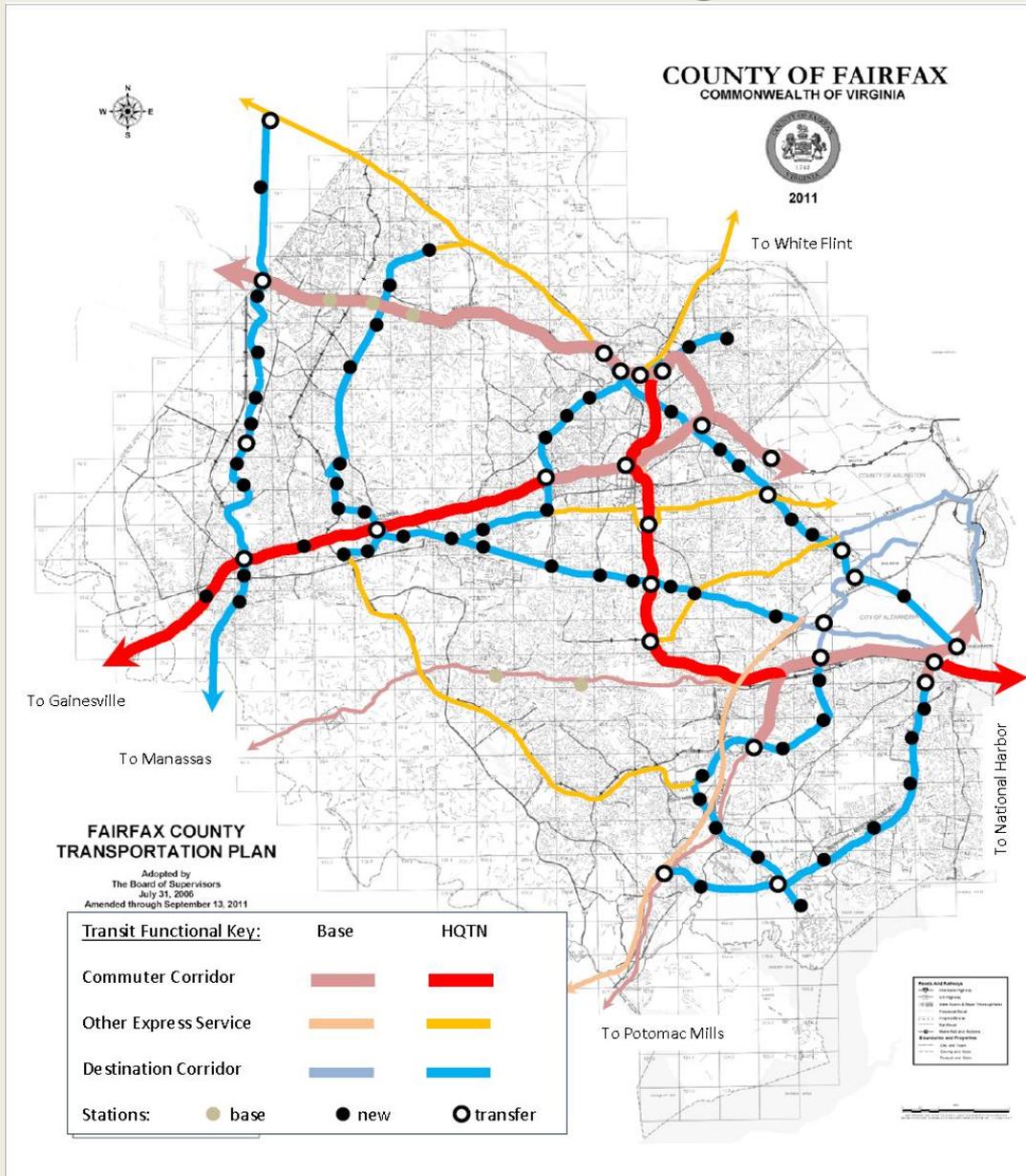




## Accessibility focus

Connect activity centers within Fairfax County and adjacent jurisdictions with **high access** transitways (light rail or bus rapid transit) **destination corridors** that best serve **shorter-distance** trips

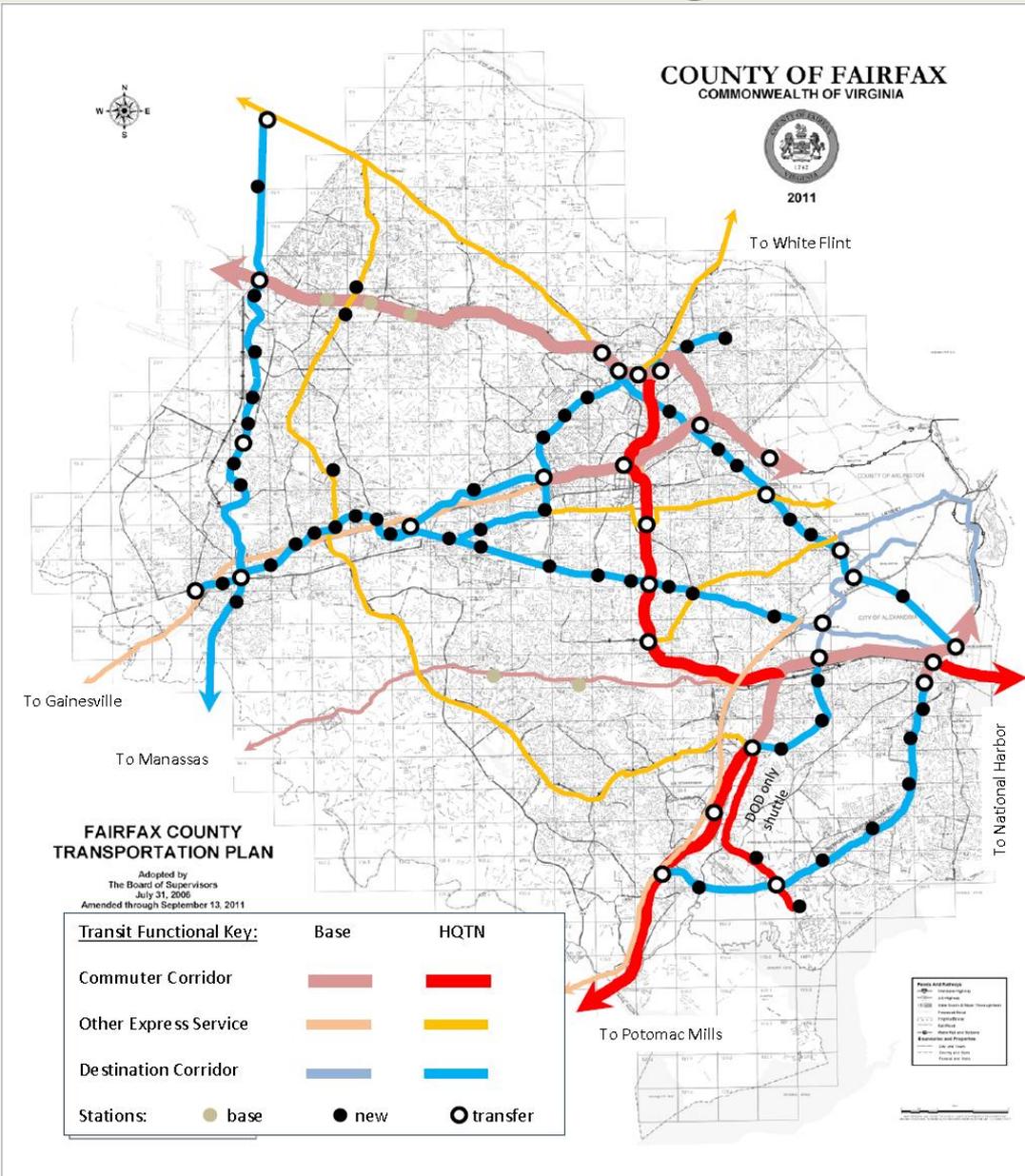




## Blended approach *Orange Line* *Extension*

Blend **mobility** and **accessibility** approaches with Orange Line Metrorail extension in I-66 corridor as envisioned in Comprehensive Plan





## Blended approach

### *Blue Line Extension*

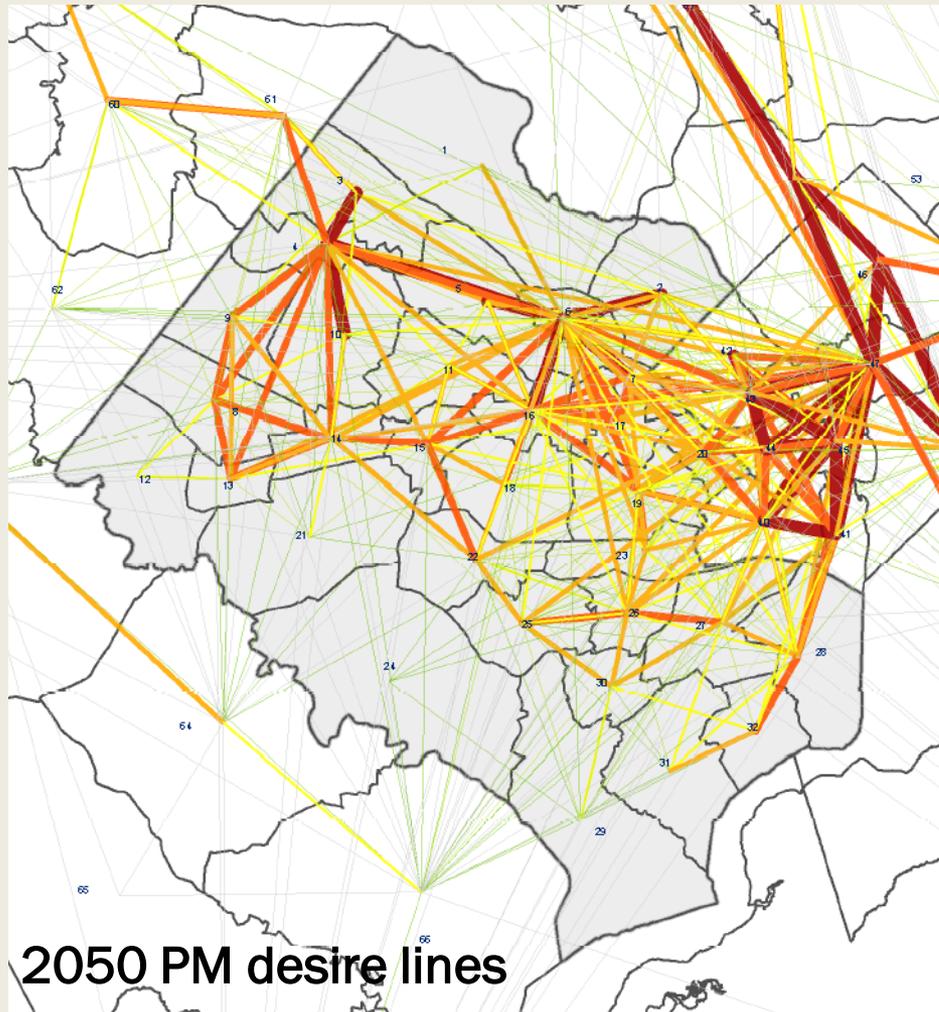
Blend **mobility** and **accessibility** approaches with Blue Line Metrorail extension in I-95 corridor in contrast to Comprehensive Plan





## Travel desire lines

Travel to, from, within, and through Fairfax County comprises many overlapping travel patterns. These lines show the dispersed desires for person-travel intensity during the 2050 weekday evening peak period between places in Fairfax County and the region.



One study objective is to determine how to most effectively establish premium transit corridors to help serve these demands.

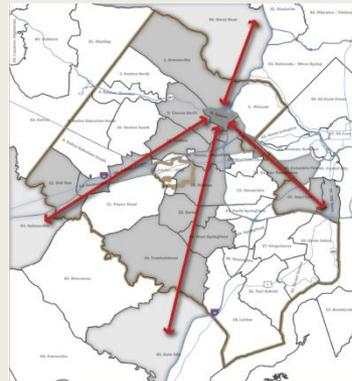
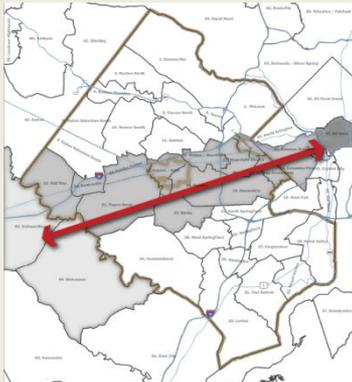
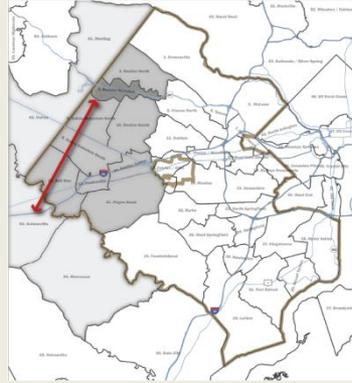
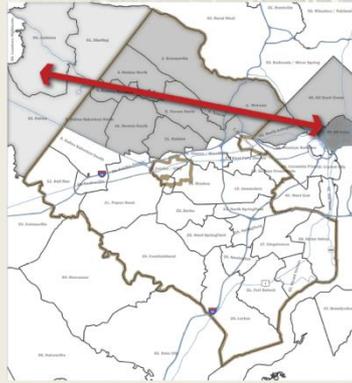




# Travel Markets

The straight lines on these maps demonstrate the organization of travel desire lines into key travel markets connecting travelshed pairs with the highest number of person trips in the 2050 weekday evening peak period.

The provision of new transit examined in the initial concepts provide transit time savings for many high-demand connections.



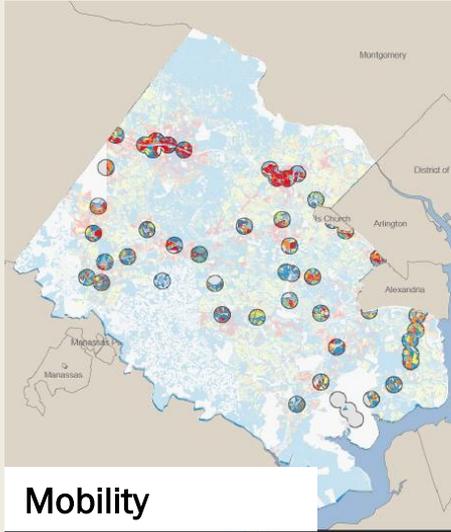
From	To	Person trips	TYPES OF HIGH QUALITY TRANSIT SERVING ORIGIN-DESTINATION PAIR					MINUTES OF TRANSIT TIME SAVINGS FROM BASE TO:					
			EXISTING	BASE	MOBILITY	ACCESS	BLENDED (ORANGE)	BLENDED (BLUE)					
6 Tysons Corner (FF)	66 Dale City (PW)	5880		i-495 HOT Express		i-495 HOT Express				7	0	0	0
6 Tysons Corner (FF)	16 Vienna / Merrifield (FF)	5385			Beltway/Blue Line Extended Metrorail	Gallows LRT/BRT	Beltway/Blue Line Extended Metrorail	Beltway/Blue Line Extended Metrorail		0	0	0	0
6 Tysons Corner (FF)	5 Vienna North (FF)	4740				Route 123 LRT/BRT	Route 123 LRT/BRT	Route 123 LRT/BRT		0	15	14	14
6 Tysons Corner (FF)	2 McLean (FF)	4500				Route 123 LRT/BRT	Route 123 LRT/BRT	Route 123 LRT/BRT		0	3	0	0
6 Tysons Corner (FF)	67 MD north (MD)	3870			Beltway Metrorail		Beltway Express	Beltway Express		29	0	20	20
6 Tysons Corner (FF)	68 MD East (MD)	3870			Beltway Metrorail		Beltway Metrorail	Beltway Metrorail		0	0	0	0
20 Ballies Crossroads (FF)	40 West End (AL)	3120			Route 7 Metrorail	Route 7 LRT/BRT	Route 7 LRT/BRT	Route 7 LRT/BRT		0	26	26	26
16 Vienna / Merrifield (FF)	6 Tysons Corner (FF)	3080			Beltway/Blue Line Extended Metrorail	Gallows LRT/BRT	Beltway/Blue Line Extended Metrorail	Beltway/Blue Line Extended Metrorail		0	0	0	0
40 West End (AL)	20 Ballies Crossroads (FF)	2830			Route 7 Metrorail	Route 7 LRT/BRT	Route 7 LRT/BRT	Route 7 LRT/BRT		0	26	26	26
2 McLean (FF)	6 Tysons Corner (FF)	2730				Route 123 LRT/BRT	Route 123 LRT/BRT	Route 123 LRT/BRT		0	5	0	0
6 Tysons Corner (FF)	19 Annandale (FF)	2640			Beltway Metrorail	Gallows LRT/BRT	Beltway / Route 236	Beltway / Route 236		15	19	27	27
5 Vienna North (FF)	6 Tysons Corner (FF)	2600				Route 123 LRT/BRT	Route 123 LRT/BRT	Route 123 LRT/BRT		0	15	14	14



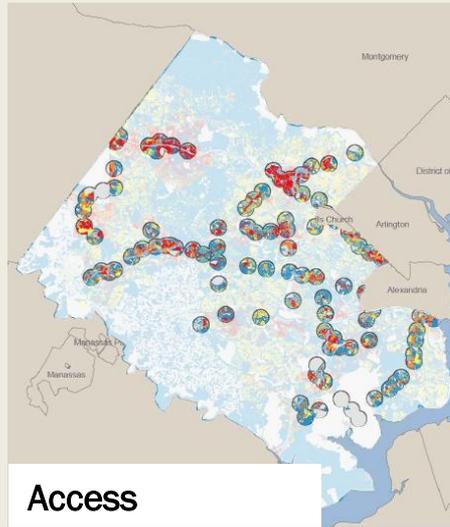


# Property values

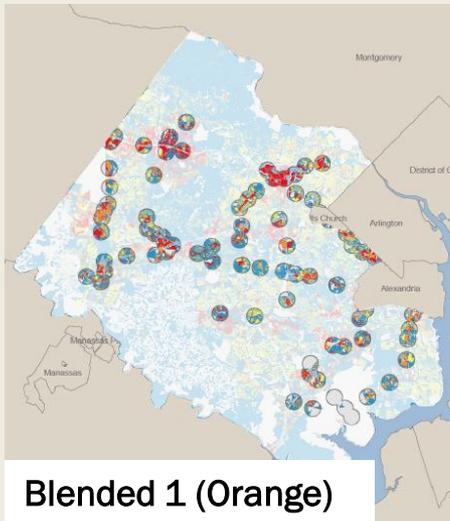
Properties near transit stations typically see an increase in property value near transit stations, with the **greatest** values associated with commercial properties. Increased property value generates increased tax revenues and is one indicator of the potential for Transit Oriented Development. The access oriented scenario has the greatest total potential increase in property values and the mobility oriented scenario has the greatest per-station average potential property value increase.



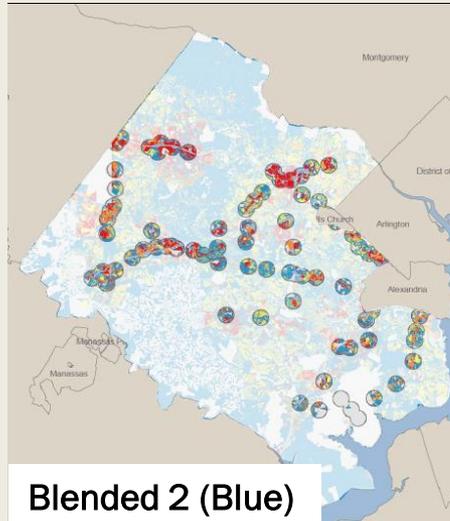
Mobility



Access



Blended 1 (Orange)



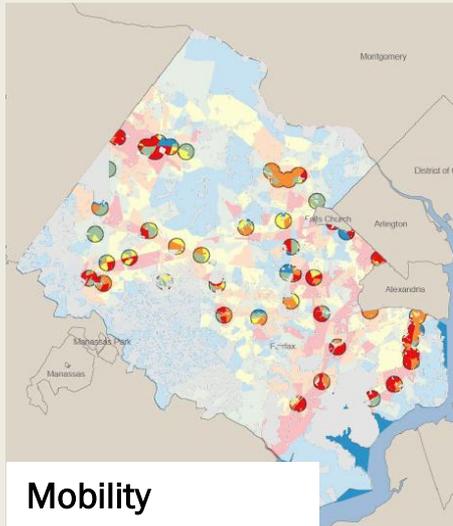
Blended 2 (Blue)



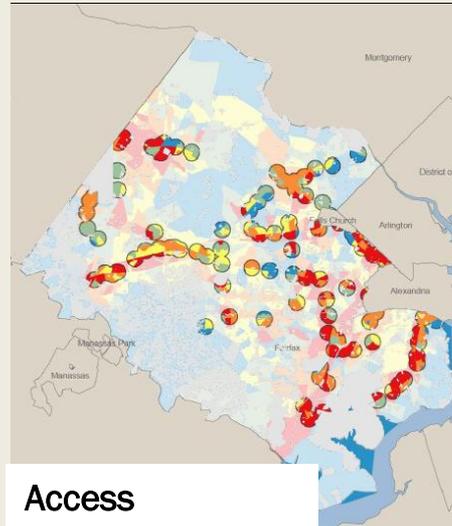


# Transit Dependency

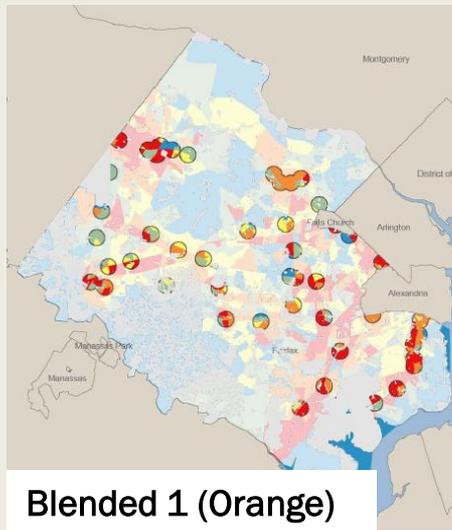
Transit service can be particularly valuable to those with fewer mobility choices; including those with lower incomes, education levels, and vehicle ownership, as well as those with disabilities. The areas where underserved and transit-dependent populations are **highest** are generally in the areas with higher development densities. All four scenarios provide improved access to populations with high transit dependency.



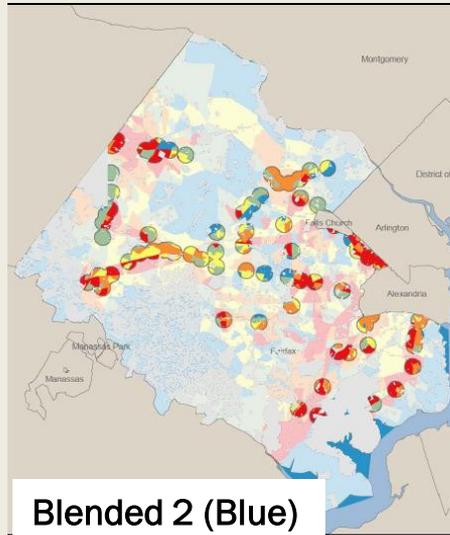
Mobility



Access



Blended 1 (Orange)



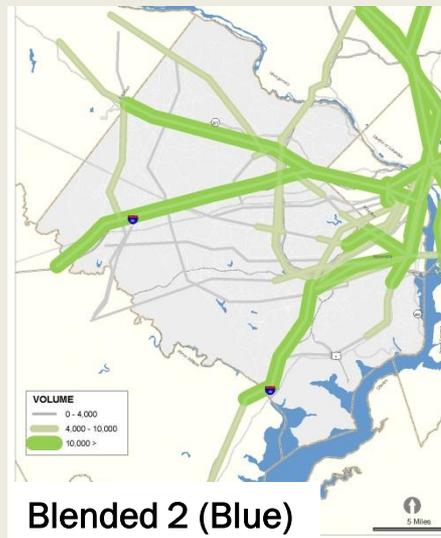
Blended 2 (Blue)





## Ridership potential

In each of the initial scenarios, the Silver Line, Orange Line Extension and Blue Line Extension show the **highest levels** of travel demand. Other corridors; including Route 28, the Capital Beltway and Route 1; also show **high levels** of travel demand in all scenarios. The level of potential ridership on corridors such as Route 7, Route 50, and Route 236 are more variable depending upon the function each corridor serves in a given network.





### Comparison of Fairfax High Quality Transit Network Initial Concepts 2050 System Level Measures of Effectiveness

	Mobility Focused Concept	Blended Approach (Orange Line Ext)	Blended Approach (Blue Line Ext)	Access Focused Concept	Comments
<b>CONNECT</b>					
Increased County jobs/housing units with 1/2 mile of transit	331000	601000	578000	794000	Shorter station spacing in Access Focused concept increases number of jobs and housing units within walking distance of transit
Median # jobs accessible within 45 minutes by transit	256000	185000	176000	140000	Higher speeds in Mobility Focused concept increase number of regional jobs available within 45 minutes.
Reduction in average transit trip travel time (minutes)	17	15	14	12	Higher speeds in Mobility Focused concept attract longer trips with greater time savings
Average intersections within 1/2 mile of transit station	109	103	96	103	All four concepts serve similar areas as measured by number of intersections within 1/2 mile of stations
Increased regional daily transit ridership	Medium	Medium	Medium	High	Proximity of Access Focused concept is of greater value than speed associated with Mobility Focused concept in attracting transit riders
Connections between activity centers	High	High	High	High	All four concepts provide direct connections between activity centers.
Capital cost per weekday passenger	Medium/high	Medium	Medium	Low/Medium	Metro rail extensions have highest capital costs; high ridership levels needed to create cost effectiveness.
Operating agency efficiencies	High	Medium	Medium	Low/Medium	New LRT/BRT systems in Access Focused concept require greatest level of operability coordination
Complementarity with regional plans	Medium	Medium	Medium	Medium	All four concepts have some elements that would be new to local and regional plans.
<b>GROW</b>					
Increased potential land value in transit-oriented places	\$16B	\$22B	\$22B	\$26B	Total potential value increases with number of stations with only slightly diminishing returns per additional station
Areas most ready for redevelopment within 1/2 mile of transit	Low	Medium	Medium	High	Access Focused concept maximizes vacant land with sewer access and redevelopment areas within 1/2 mile of transit.
Service to planned mixed-use activity centers	Highest for designated centers	High	High	Highest in emerging centers	All four concepts are designed to connect the County's mixed-use centers
<b>THRIVE</b>					
Key destinations within 1/2 mile of transit	Low	Medium/high	Medium/high	High	Access Focused concept maximizes access to key community destinations such as retail centers and educational institutions
Proximity of disadvantaged populations to transit	High	Medium	Medium/high	Medium/high	All four concepts improve transit service to disadvantaged populations
Ease of use / quality of connections	High	Medium	Medium	Low	New LRT/BRT systems in Access Focused concept support areas without current Metro rail
Reduction in weekday PM peak period highway VHT	Medium	Medium	Medium	Medium	Access Focused concept results in higher modal shift for shorter trips so all concepts perform similarly
Potential to impact sensitive environmental resources	Low	Low	Low	Low	All four concepts rely primarily on use of existing transportation rights of way
Complementarity with Comprehensive Plan	High	High	Medium/high	Medium/high	All four concepts support County's future development concept



