Route 1 Multimodal Alternatives Analysis

Executive Steering Committee

October 2, 2014

Agenda

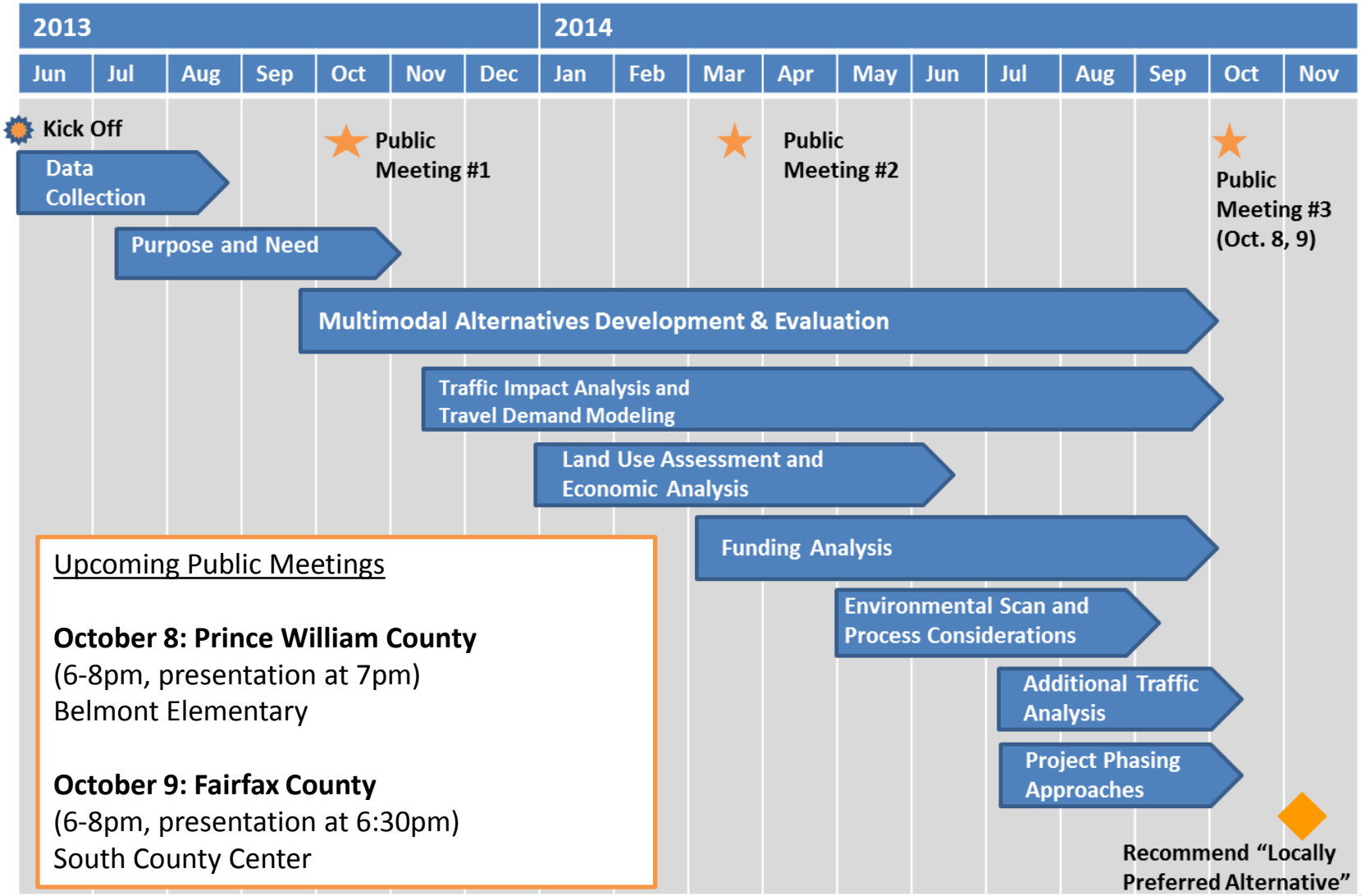
1. Study Overview

2. Preliminary Recommendation

3. Project Feasibility and Timing
   - Phasing
   - Population and Employment Growth
   - Traffic Capacity
   - Funding

4. Next Steps

Study Schedule: Major Activities



Upcoming Public Meetings

October 8: Prince William County
(6-8pm, presentation at 7pm)
Belmont Elementary

October 9: Fairfax County
(6-8pm, presentation at 6:30pm)
South County Center

Where We've Been and Upcoming Meetings

ESC Meeting #1 (Summer2013)	• Study introduction • Existing Conditions • Goals and Objectives
ESC Meeting #2 (Fall 2013)	• Initial alternatives • Evaluation measures • Land use analysis
ESC Meeting #3 (Spring 2014)	• Evaluation of alternatives • Preliminary Findings • *Action item: Phasing and implementation plan* • *Action item: Financial analysis* • *Action item: Additional traffic analysis*
ESC Meeting #4 (Today)	• Present results of phasing exercise and financial feasibility • Discuss public meeting #3
ESC Meeting #5 (Oct 27, 4:30-6:30pm)	• Endorse final recommendations

Alternatives Under Evaluation

1. Identified a preferred bike/ped facility design: ***10-foot shared use paths on both sides of street***

2. Identified number of vehicular lanes (2035): ***3 general purpose travel lanes in each direction***

3. Identified 4 refined transit configurations to study in detail; each assumed two 10-foot multiuse paths and six vehicular travel lanes

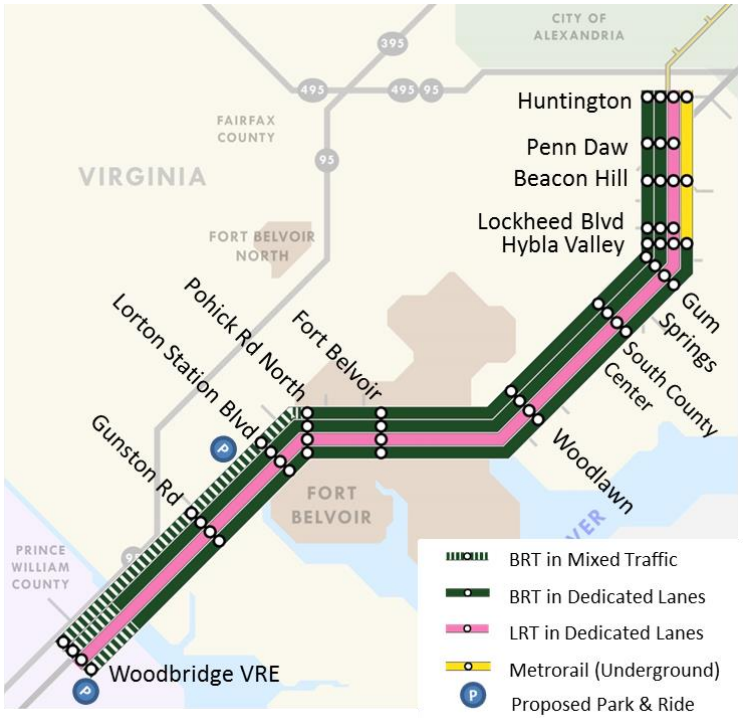
<u>Four Transit Alternatives (which include recommendations from above):</u>

Alternative 1:
Bus Rapid Transit 1- Curbside

Alternative 2:
Bus Rapid Transit 2- Median

Alternative 3:
Light Rail Transit

Alternative 4:
Metrorail- BRT Hybrid



Alternatives Evaluation Process

Ability to Meet Goals & Objectives

Implementation and Funding Considerations

1. **Corridor growth**
2. **Roadway infrastructure**
3. **Funding plan**

Four Multimodal (Transit, roadway, bike/ped) Alternatives

↓

Evaluation of Alternatives

↓

Recommendation and Action Items

Summary of Key Indicators

Based on Scenario 1 Land Use (COG 2035 Forecast)

	Alt 1: BRT- Curb	Alt 2: BRT- Median	Alt 3: LRT	Alt 4: Metro/BRT Hybrid
Average Weekday Ridership (2035)	15,200	16,600	18,400	26,500 (BRT 10,600; Metro 22,900)
Conceptual Capital Cost	$832 M	$1.01 B	$1.56 B	$2.46 B* (Metro $1.46B; BRT $1 B)
Annual O&M Cost (Each Alternative includes $5 M annual cost for Ft. Belvoir shuttle service)	$18 M (BRT $13M; Ft Belvoir Shuttle $5M)	$17 M (BRT $12M; Ft Belvoir Shuttle $5M)	$24 M (LRT $19M; Ft Belvoir Shuttle $5M)	$31 M** (Metro $17M; BRT $8M; Ft Belvoir Shuttle $5M)
Cost Effectiveness (Annualized capital + operating cost per rider)	$19	$20	$27	$28** (Metrorail: $28; BRT: $29)

* This figure represents full BRT construction between Huntington and Woodbridge, then Metrorail extension from Huntington to Hybla Valley

** These figures assume operation of Metrorail between Huntington and Hybla Valley, and BRT between Hybla Valley and Woodbridge

Evaluation of Alternatives: Findings

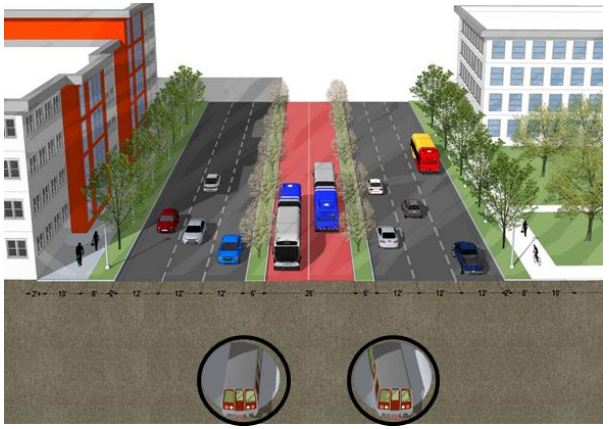
Evaluation Factors (Goals)	Alternative 1: BRT-Curb	Alternative 2: BRT-Median	Alternative 3: LRT	Alternative 4: Metrorail-BRT (Hybrid)
Goal 1: Local and Regional Mobility	0.7	0.8	0.8	**1.00**
Goal 2: Safety and Accessibility	0.7	**0.8**	**0.8**	**0.8**
Goal 3A: Economic Development	0.6	0.6	0.6	**0.7**
Goal 3B: Cost Effectiveness	**1.0**	0.9	0.7	0.5
Goal 4: Community and Health Resources	0.7	0.7	0.7	**0.8**
Ability to Meet Project Goals Average	**0.7**	**0.8**	**0.7**	**0.8**

Draft Recommendation

Evaluation results suggest:

- Median running **Bus Rapid Transit (BRT)** in the **near-term** would provide a cost effective transportation solution to support economic development plans.

- **Metrorail extension** to Hybla Valley in the **long-term** has potential to provide a higher level of local and regional mobility and support long-term corridor development, contingent upon increased future land use density.



Hybla Valley with BRT

Hybla Valley with BRT and Metrorail

Project Phasing

Bus Rapid Transit elements – schedule considerations

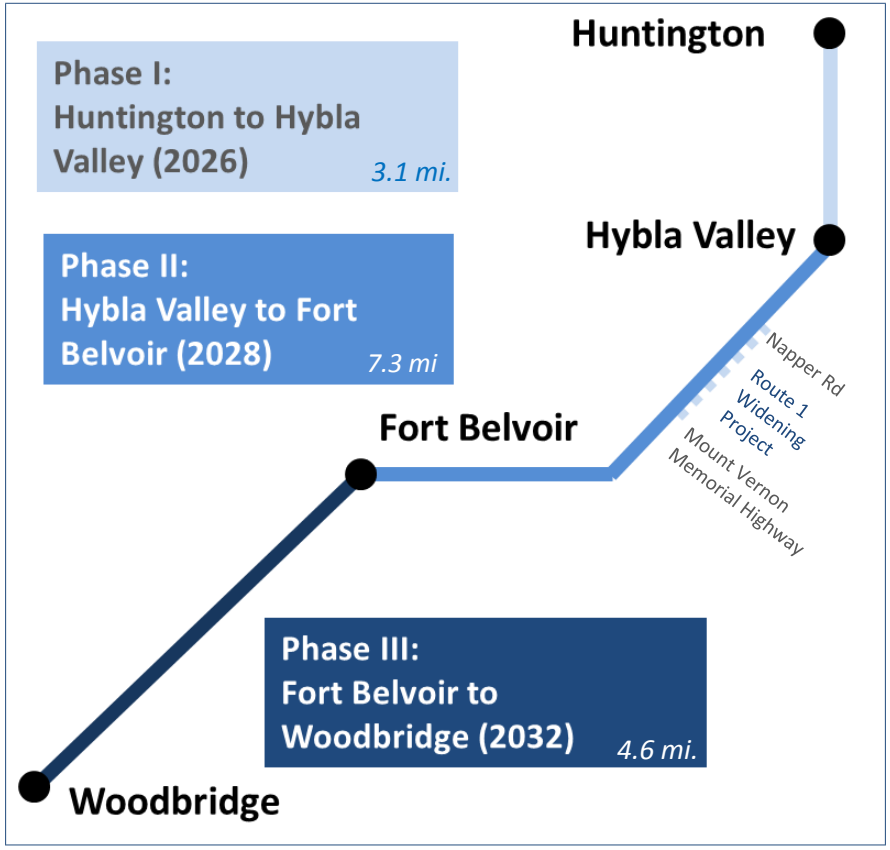
Metrorail extension – indicators of readiness

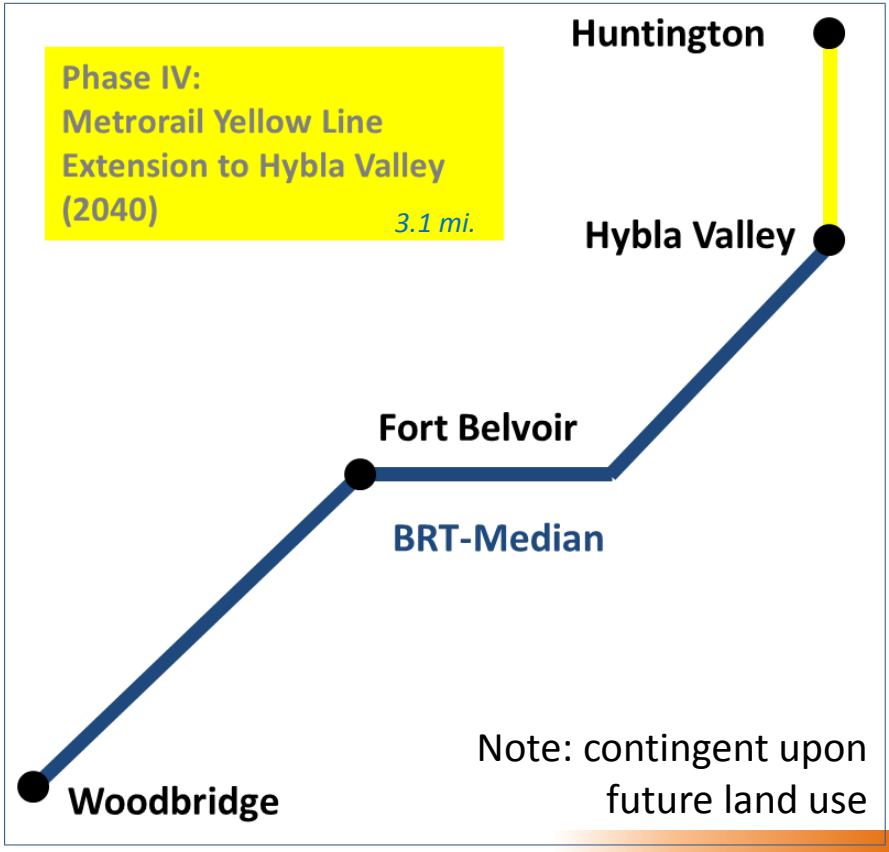
Potential implementation schedule

Phasing Approach

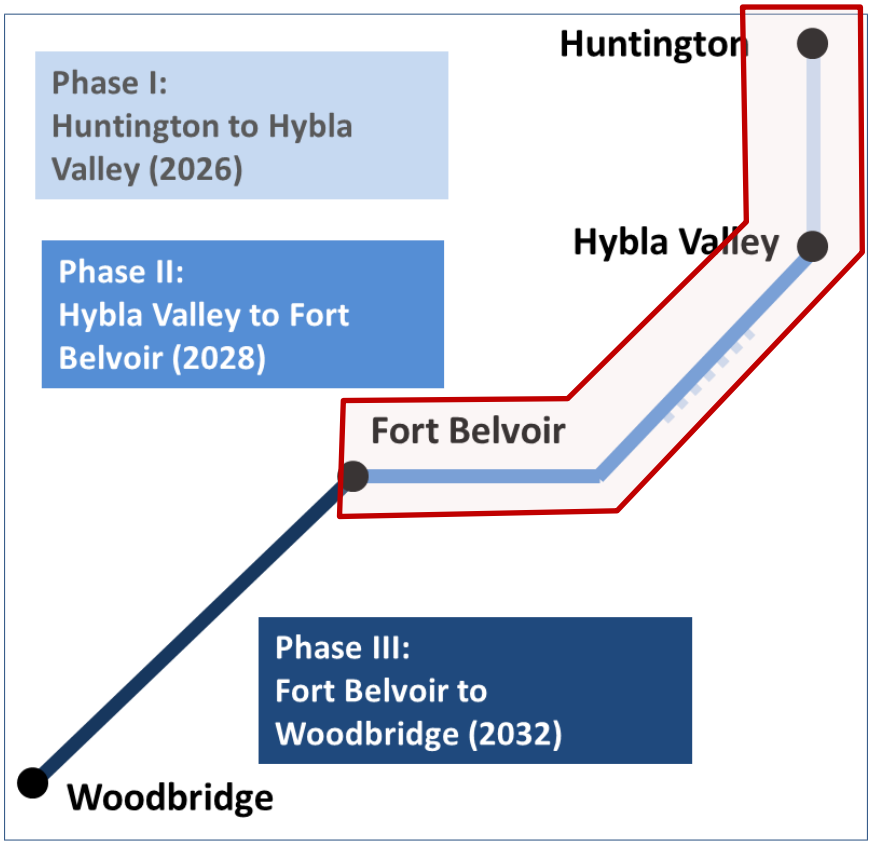
Phase I-III: Implement Multimodal Improvements and BRT (Median Running)

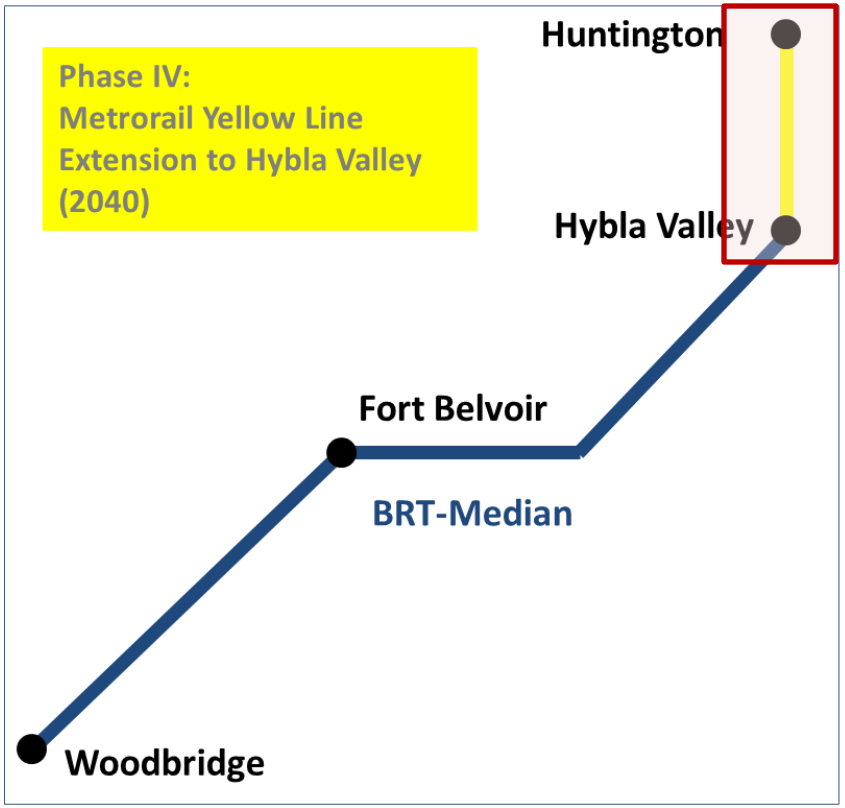
Phase IV: Extend Metrorail to Hybla Valley, contingent upon future land use





Phasing Approach





Phase I +II:

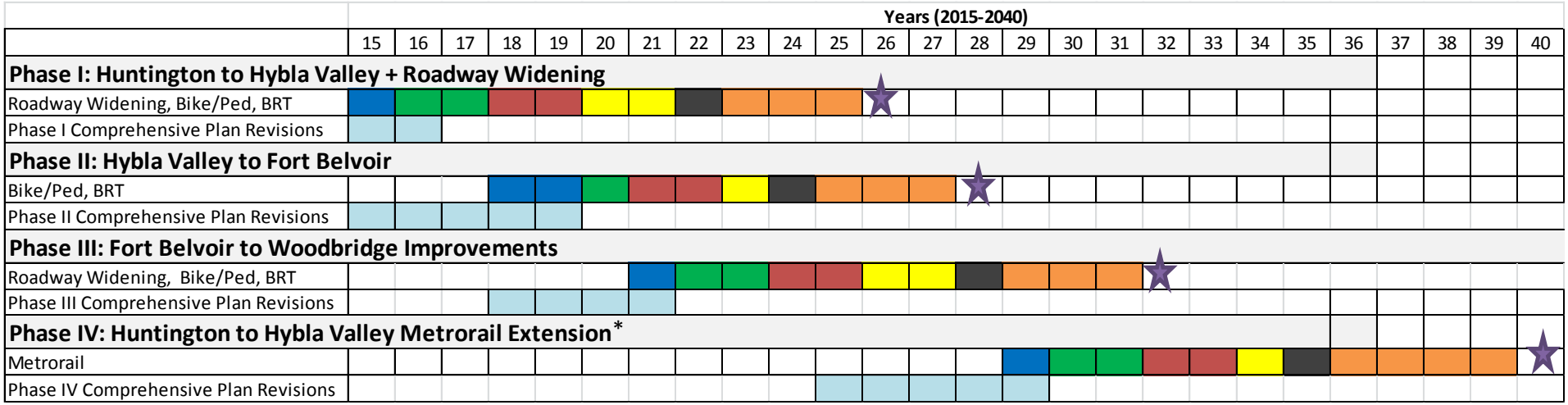
- **Potentially competitive for federal New Starts/Small Starts funding**
- Highest population and employment
- Highest ridership potential

Phase IV:

- **Potentially competitive for federal New Starts/Small Starts funding in 2040**
- Requires significant population and employment growth, development density, and higher ridership

Potential Implementation Timelines

Approach: BRT and Long-Term Metrorail Implementation (2040)

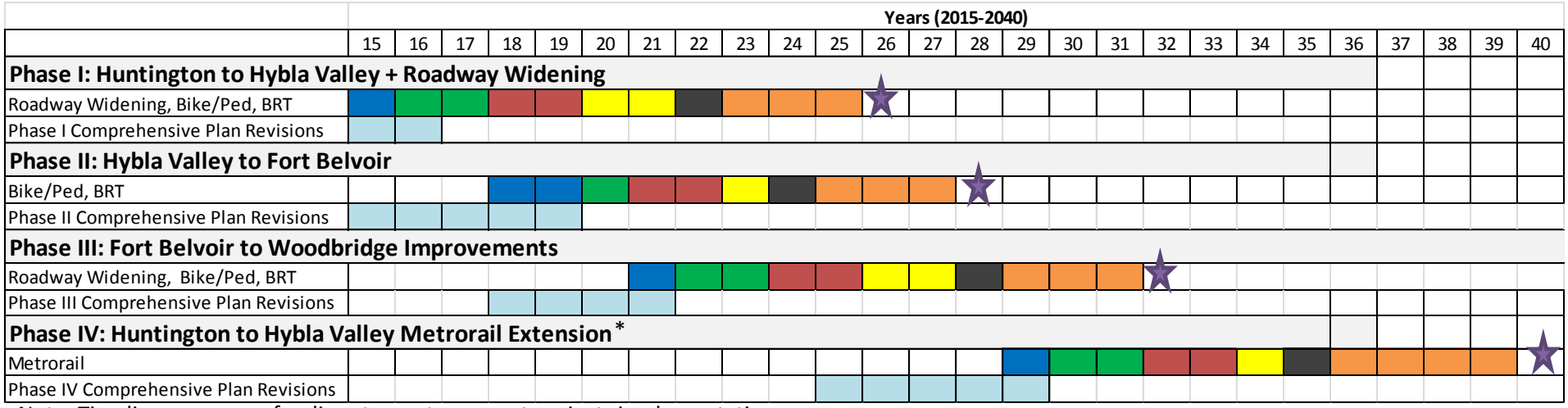


Note: Timelines assume a funding stream to support projects implementation.
*Contingent upon increased future land use density.

Legend: General Project Development Sequence

Comprehensive Plan	Planning	Scoping/ NEPA PE	Final Design	Right of Way	Utilities Relocation	Construction	Operation

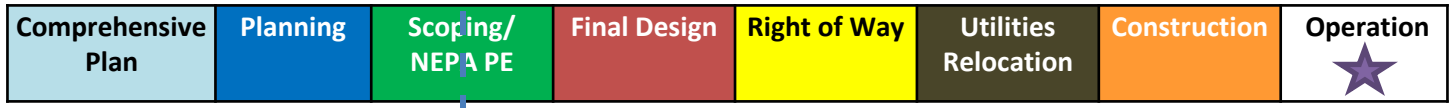
Potential Implementation Timelines



Note: Timelines assume a funding stream to support projects implementation.

*Contingent upon increased future land use density.

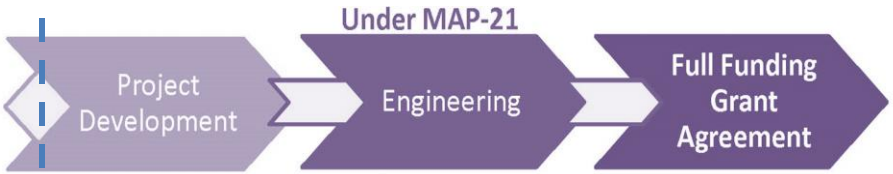
Legend: General Project Development Sequence



Typical New Starts Funding Steps/Sequence:

FTA SMALL STARTS PROJECT DEVELOPMENT PROCESS

FTA NEW STARTS PROJECT DEVELOPMENT PROCESS



Key Schedule Elements for Project Development

Implementation Steps	Duration	Schedule Considerations
1a. Comprehensive Plan Updates	2+ years	• *Add specific station locations* • *Assess density levels* • *Include supporting infrastructure*
1b. Environmental Clearance (NEPA)	2+ years	• *Procurement* • *Class of Action* • *Public involvement*
2. Right of Way Acquisition	2 years	• *Property impacts* • *Relocations*
3. Utility Relocation	1-2 years	• *Third party agreements* • *Modernize infrastructure*
4. Design	2 years	• *Procurement* • *Coordinate transit and roadway*
5. Construction	3+ years	• *Procurement* • *Phase to keep Route 1 open*
Total	**10+ years**	

Recent Experience:

- **Metroway BRT:** 10 years from planning to operation
- **Purple Line LRT:** 10 years from planning to expected opening
- **Silver Line Metro:** 10 years since NEPA Clearance (25+ years total development)

Strategies to Expedite Process

Secure funding for environmental phase of work

Initiate conversations with landowners early

Evaluate alternative delivery methods

BRT: Steps Toward a Competitive Project by 2026-2028

BRT (Phases I+II) potentially competitive for 50% Federal grant

1. **Plan adoption in local and regional plans**

2. **Evaluate Comprehensive Plans and update as necessary**

   - Transit Oriented Development (TOD) station area planning (finalize station locations)

   - Continue strong economic development and affordable housing policies

   - Supporting infrastructure (streets, schools, parks, etc.)

Key Considerations for Metrorail Extension

- **Metrorail Core Capacity:** Metro has significant core capacity constraints that need to be addressed before any potential extension (est. completion: **2025**)

- **Competitiveness for Federal Funding:** Currently, a Metrorail extension would not be competitive for federal funding until:
  - Ridership increases
  - Population and employment increase and land use changes

- **County Land Use and Infrastructure Planning:**
  - Identify Comprehensive Plan updates
  - Assess and develop infrastructure (streets, schools, parks, etc.) to accommodate increased population and employment
  - Attract growth through developer incentives and public investment

Competitiveness for Federal Funding

- The Project would need an additional 40,000 to 60,000 daily riders to receive a medium Cost Effectiveness rating

- In FY15, a 3.9 mile subway extension in Los Angeles was granted entry into New Starts Project Development. The average population of a station area is 14,000; Route 1 averages 4,300. In LA, parking averages $9 a day.

- Station area and growth planning will only strengthen Economic Development and Land Use ratings

Metrorail: Steps Toward a Competitive Project by 2040

Metrorail extension requires 50% Federal grant (New Starts)

1. **Plan adoption in local and regional plans**

2. **Increase population and employment densities**
   - Assess market absorption rate
   - Attract additional County growth to the Route 1 corridor

3. **Evaluate and update Comprehensive Plans**
   - Tie project development milestones to density thresholds
   - Transit Oriented Development (TOD) station area planning (finalize station locations)
   - Supporting infrastructure (streets, schools, parks, etc.)

Project Context and Readiness

Population and employment growth

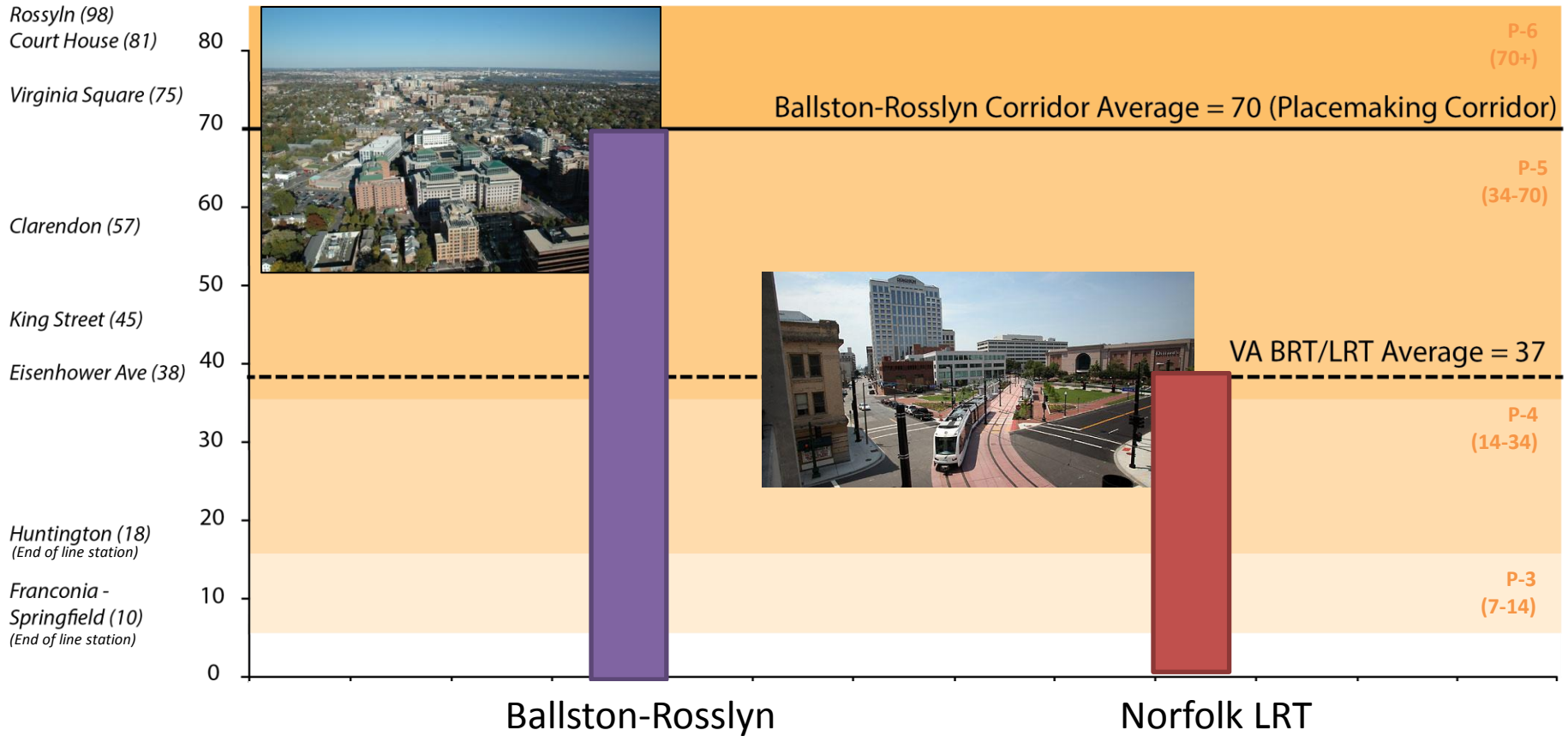
Traffic capacity

Project funding

Population and Employment Growth

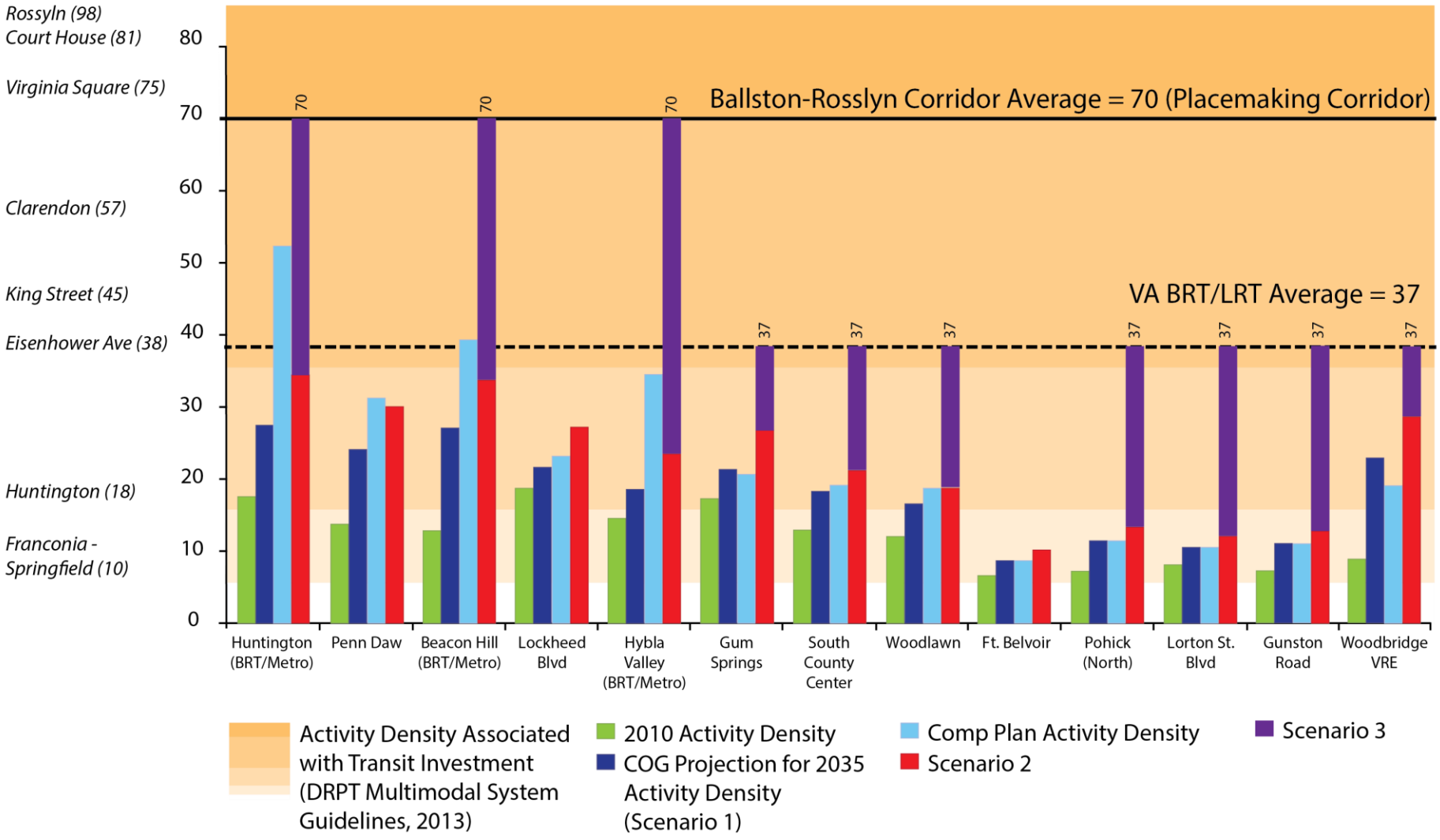
Development Densities Supportive of Transit and other infrastructure requirements

Station Activity Density
(Population + Employment per Acre)



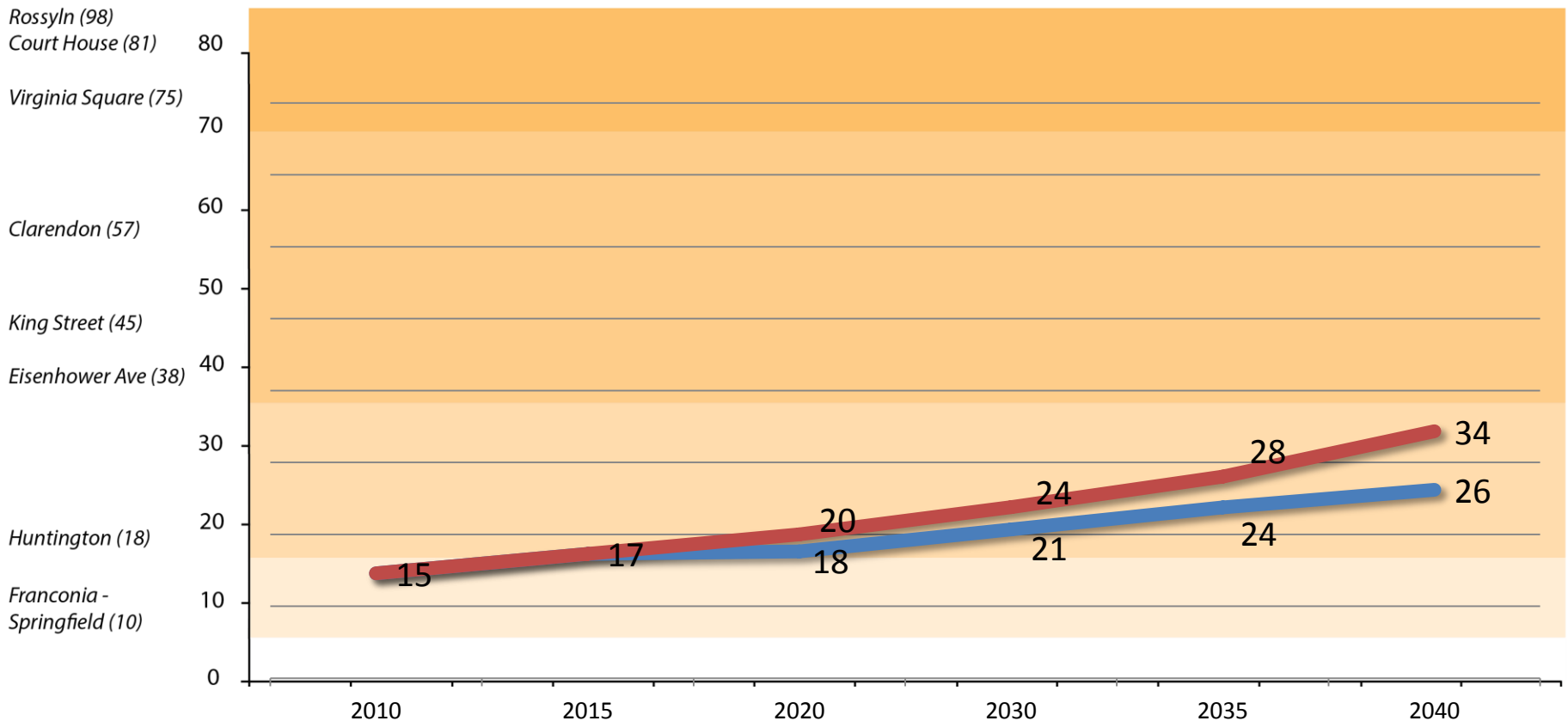
Activity Density Associated with Transit Investment (DRPT Multimodal System Guidelines, 2013)

Station Activity Density Levels
(Population + Employment per Acre)



Land Use: Population and Employment Forecast

(Population + Employment per Acre)



3 Proposed Metro stations,
Assuming 3.0- 3.5% growth rate
(Ballston-Rosslyn Corridor Growth Rate Average over 30 years)

Regional (COG) Projection for 3 Proposed Metro Stations along Route 1

Traffic Capacity

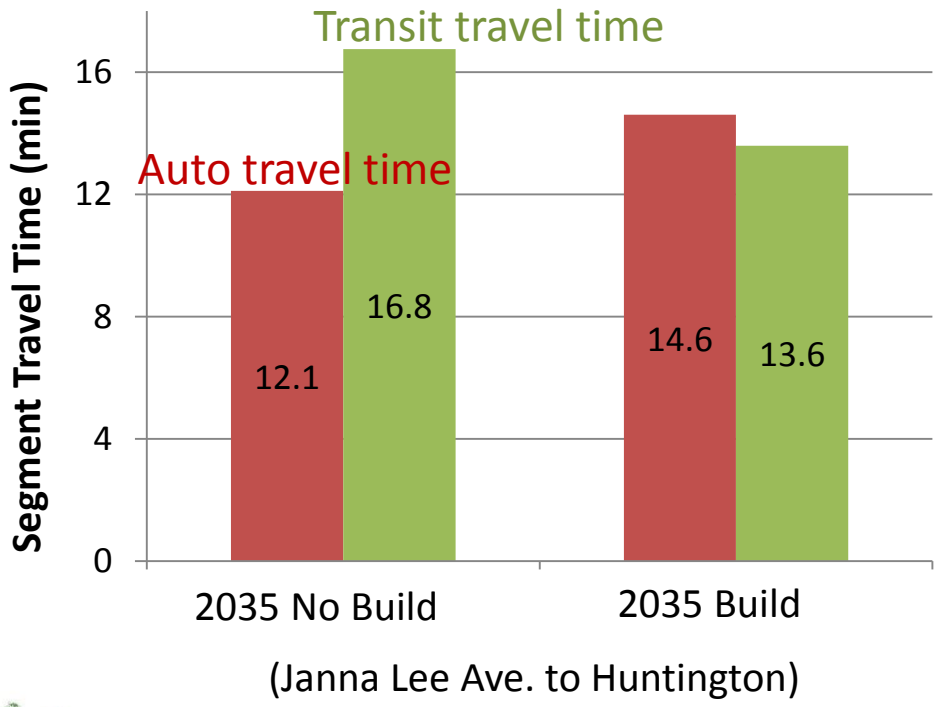
Growth Scenarios and Roadway Requirements

Traffic Analysis Approach: Growth Scenarios

- Purpose:
  - Assess potential “worst case” traffic impacts and define need for roadway and intersection capacity
- Measures:
  - Intersection Level of Service (LOS)
  - Theoretical additional roadway capacity needed
  - Theoretical local street capacity + increased transit share + walk and bike trips

Traffic Analysis Findings: **Scenario 1**

- Addition of median transit lanes:
  - Improves transit travel time
  - Increases automobile travel time
  - Does not degrade overall intersection performance
  - Left turns impacted

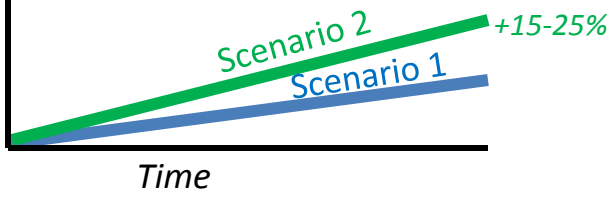


Traffic Analysis Findings: **Scenarios 2 and 3**

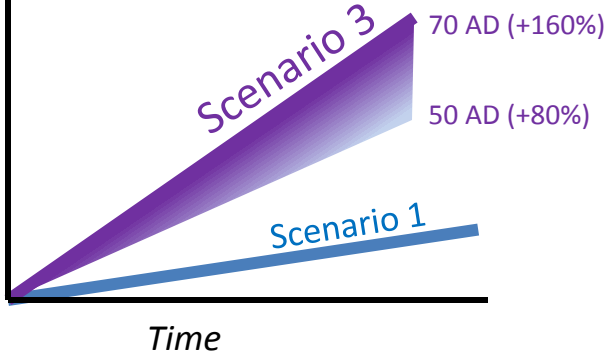
Street Infrastructure Required to Accommodate Growth

For highest density proposed station areas: Beacon Hill and Hybla Valley		
Scenario 2		
Share of trips: transit, walk, bike, internal, and peak spreading	***20%***	***25%***
Widen Route 1	**From 6 lanes to 8 lanes**	**From 6 lanes To 8 lanes**
OR		
Add parallel local streets	**One new 2-lane street**	**One new 2-lane street**
Scenario 3		
Share of trips: transit, walk, bike, internal, and peak spreading	***25%***	***40% to 50%***
Widen Route 1	**From 6 lanes to 12 lanes**	**From 6 lanes to 10 lanes**
OR		
Add parallel local streets	**Six new 2-lane streets**	**Three new 2-lane streets**

Population and employment Growth +15-25% over Scenario 1



Population and employment growth up to 160% over Scenario 1

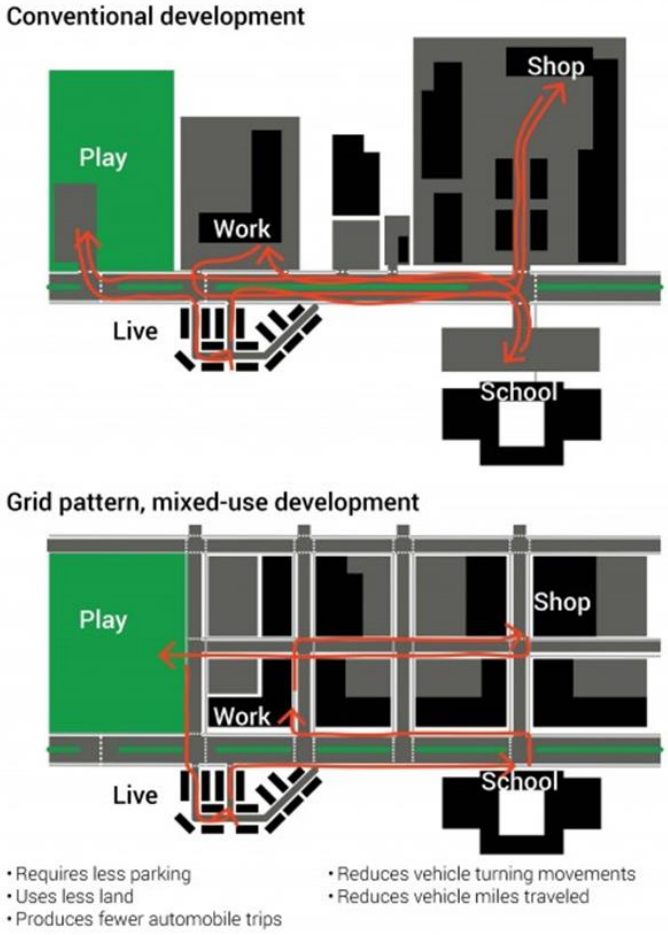


Traffic Analysis Conclusions

- Major growth is anticipated in the Route 1 corridor in all scenarios, including COG 2035 forecast

- To accommodate growth, recommended Route 1 transportation investment must be complemented by other major features (streets, schools, public safety, parks):
  - Network of local streets
  - Mixed use development
  - Walkable, pedestrian friendly environment

- Metrorail supportive growth levels require significantly more infrastructure investment than BRT levels



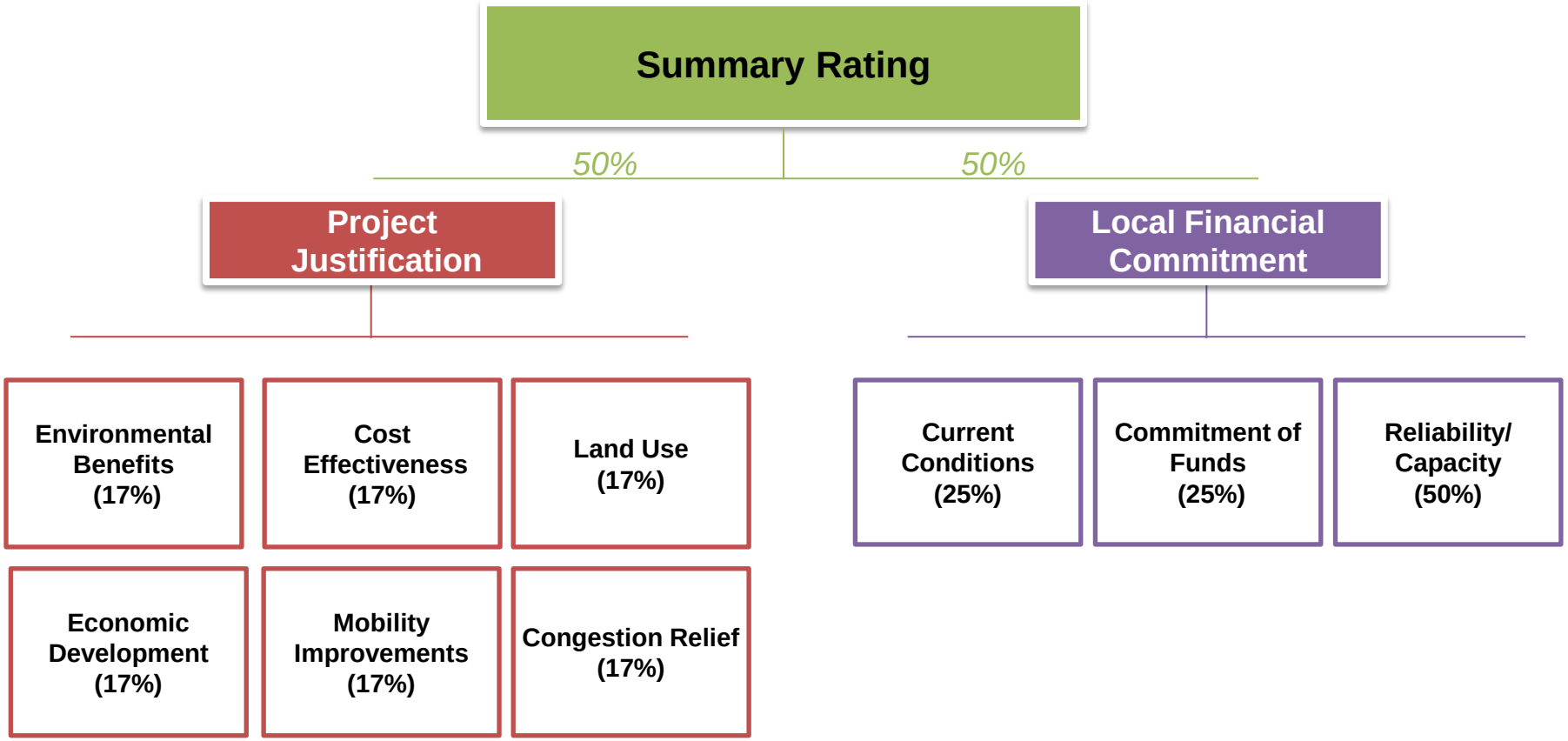
Project Funding

Financial Feasibility Analysis

Discussion: Funding Analysis

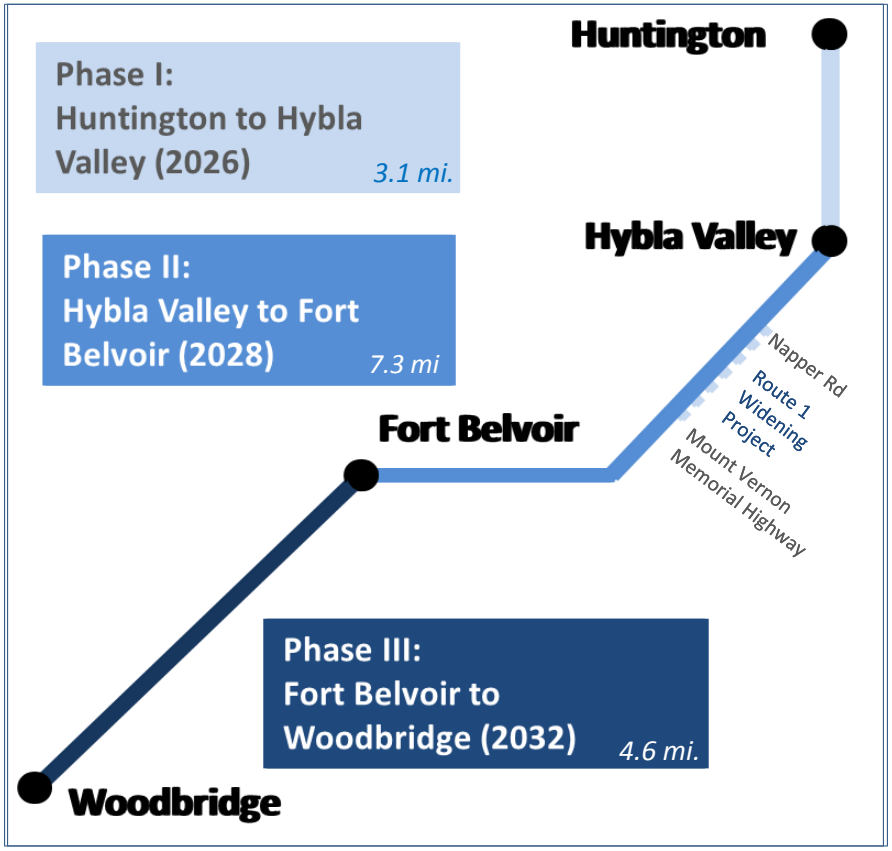
- Early assessment; considered broad range of potential funding sources
- Funding levels assume:
  - Route 1 continues to be a high priority for local, regional and state investment
  - Major segments of Route 1 corridor could be competitive for Federal transit grant funding
- Need to further assess capacity of each funding source, given other priority corridors and projects
  - Evaluate absorption rate and potential for major private land development
  - Seek “new” sources, such as private financing through P3

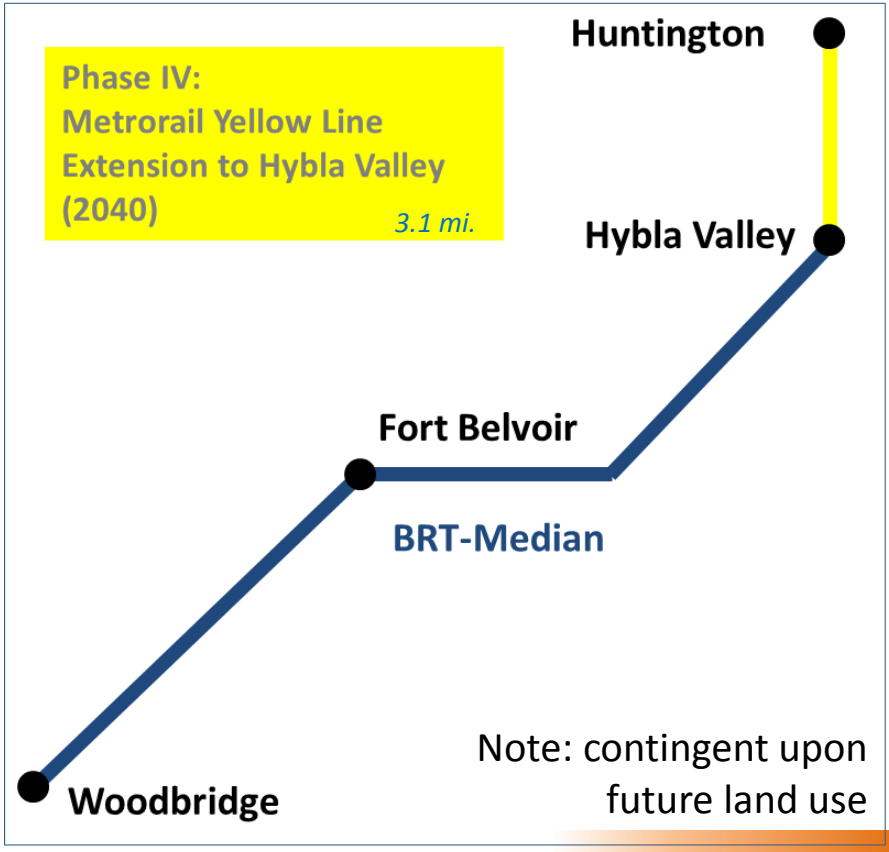
FTA Evaluation Criteria for New Starts/Small Starts



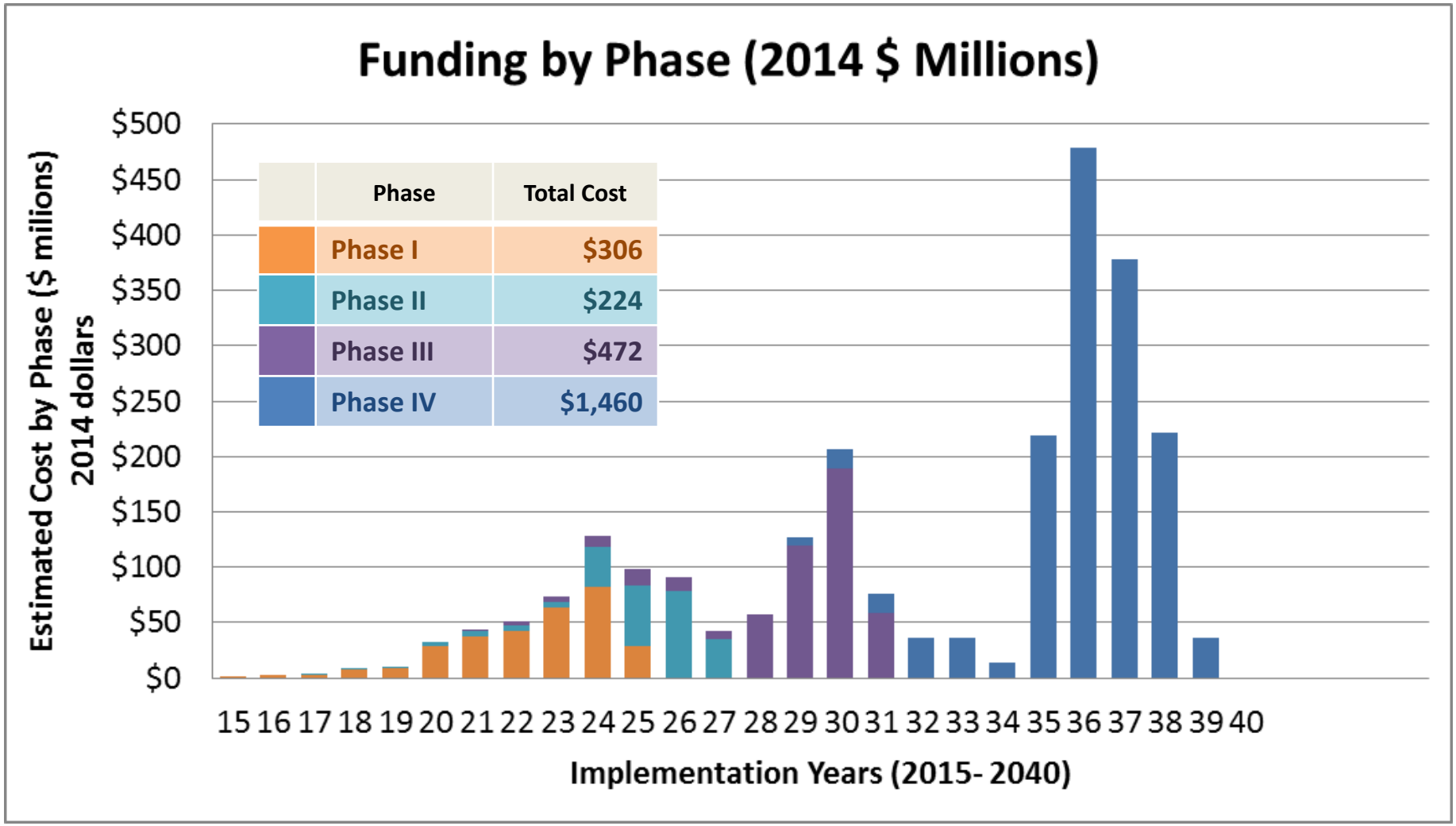
Phasing Considerations

- Expedite segments that are most competitive for federal funding
- Reflect County and VDOT plans for Route 1 widening
- Reflect County funding priorities





Funding by Phase



Discussion: Potential for P3 Project Delivery and Financing

- Several current major transportation projects are being financed and implemented using public-private partnerships
  - MTA Purple Line - DBOM with finance payments using a statewide transportation-specific fund
  - VA I-95 HOT lanes, I-495 - toll facilities
  - Denver Eagle P3

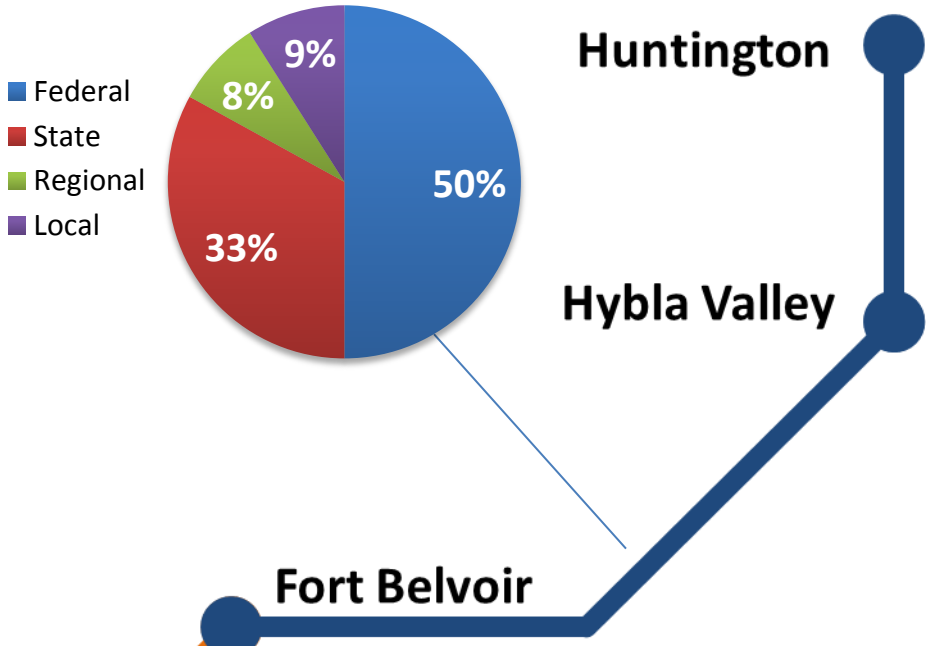
- With expanded access to private capital and private sector efficiencies, P3 approaches can expedite project delivery

- P3 capital is effectively a “loan”, to be repaid over time through some stream of revenue (or more literally, it is equity with the expectation of a return on investment)

Transit Funding Assumptions by Geographic Segment

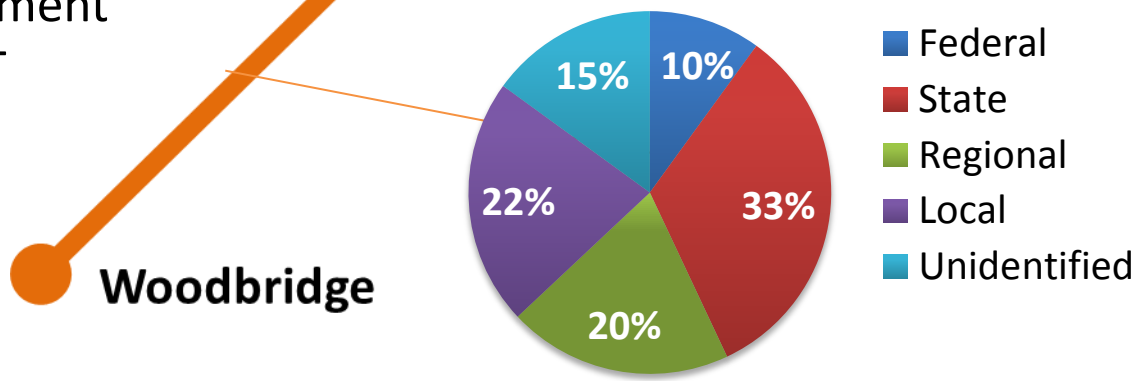
Phase I+II : Huntington to Fort Belvoir

- **Potentially competitive for federal New Starts/Small Starts funding**
- Highest population and employment
- Highest ridership potential



Phase III: Fort Belvoir to Woodbridge

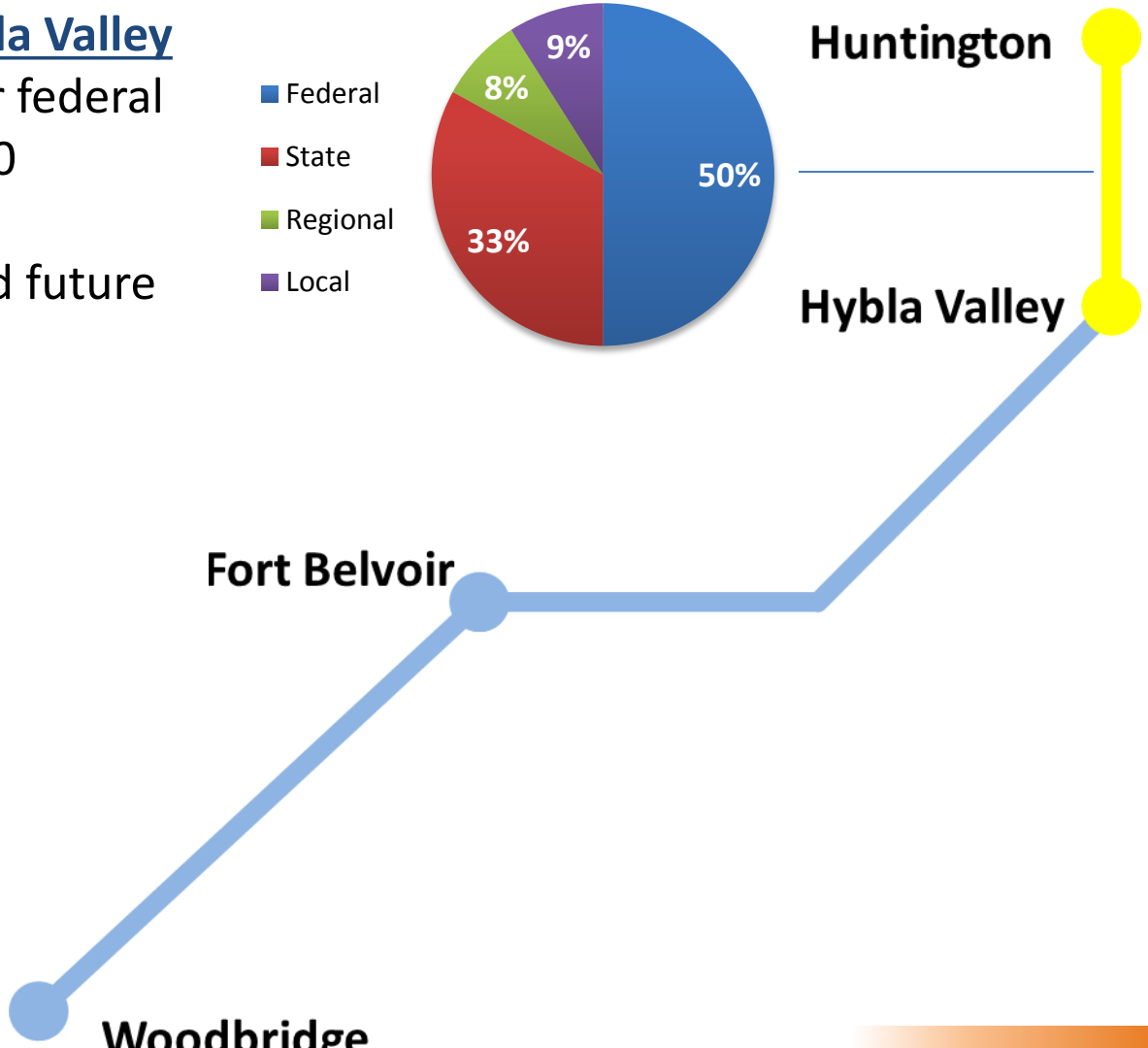
- Less competitive for federal funding
- Lower population and employment
- Consistent with planned VDOT widening



Funding by Geographic Segment

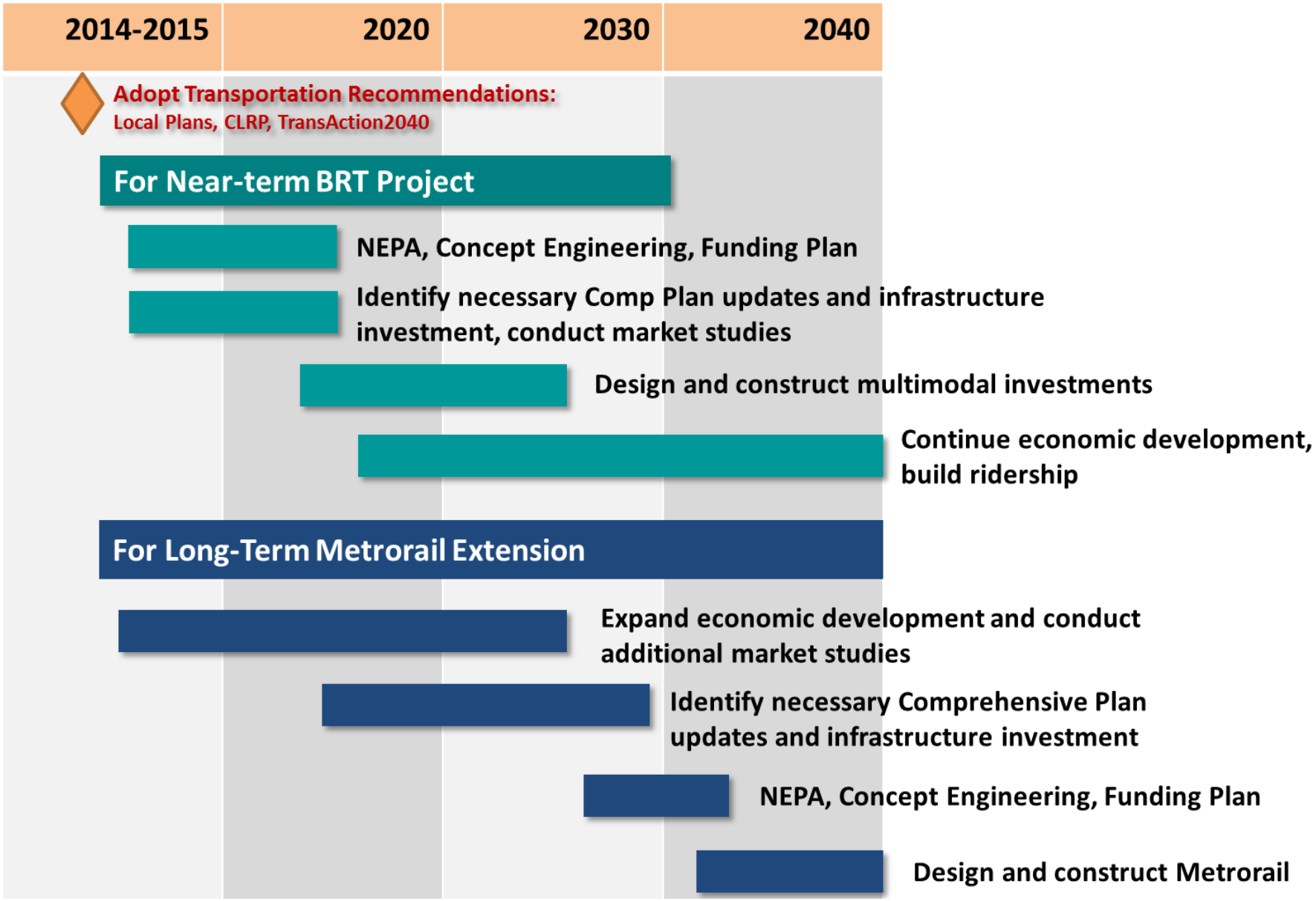
Phase IV: Huntington to Hybla Valley

- Potentially competitive for federal New Starts funding in 2040
- Contingent upon increased future land use density.



Next Steps

Action Plan for Implementation



Next Steps: Adopt Study Findings and Continue Toward Implementation

Coordination with public stakeholders and state and federal agencies

Process Overview

Study team completes Alternatives Analysis

We are here

Local and state officials adopt findings and recommendations

Conduct Market Studies, Identify Comprehensive Plan Updates

Project team completes environmental documentation and concept engineering

Project team refines cost estimates and funding plans