



Mid- and Long-Term Transit Concepts

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Outline



- Timeframes
- Mid/Long-Term Justification
- Menu of Concepts
- Transit Packages and Discussion

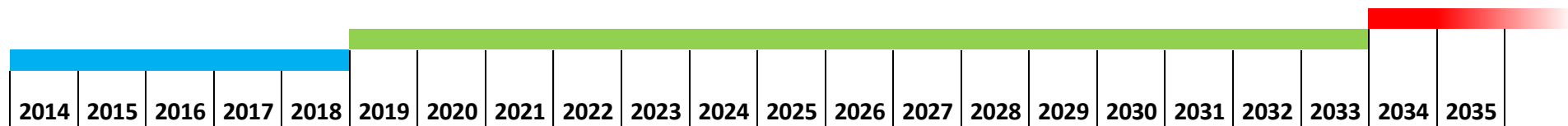
MTTF Timeframes



Short-Term – Dec 2013 through completion of NNYB

Mid-Term – 15 years following completion of NNYB

Long-Term – Over 15 years following completion of NNYB



Why Mid- and Long-Term?



- Planning obligations
- Environmental review (NEPA process)
- State, federal approval
- Public outreach
- Engineering (traffic, civil, structural)
- Cost
- Funding complexities

Full Menu



Category	Concept
Primary Transit	BRT
	LRT
	CRT
	Monorail
Transit Components	Infill Stations along Proposed BRT Routes
	Enhanced BRT Infrastructure
	TOD - Interchanges 10, 12, 14; Route 119; Platinum Mile
	HOV/HOT/XB Lanes on I-287
	In-line Bus Station at Palisades Center
	Interchange 10 Reconstruction
	White Plains Station Improvements
	Tarrytown Connector
Other Transit Ideas	West-of-Hudson Rail Improvements
	Gateway Tunnel with Bergen Loop
	Interchange 14X
	Ferry Service
	Transit Connection to Stewart Airport (assuming bus)

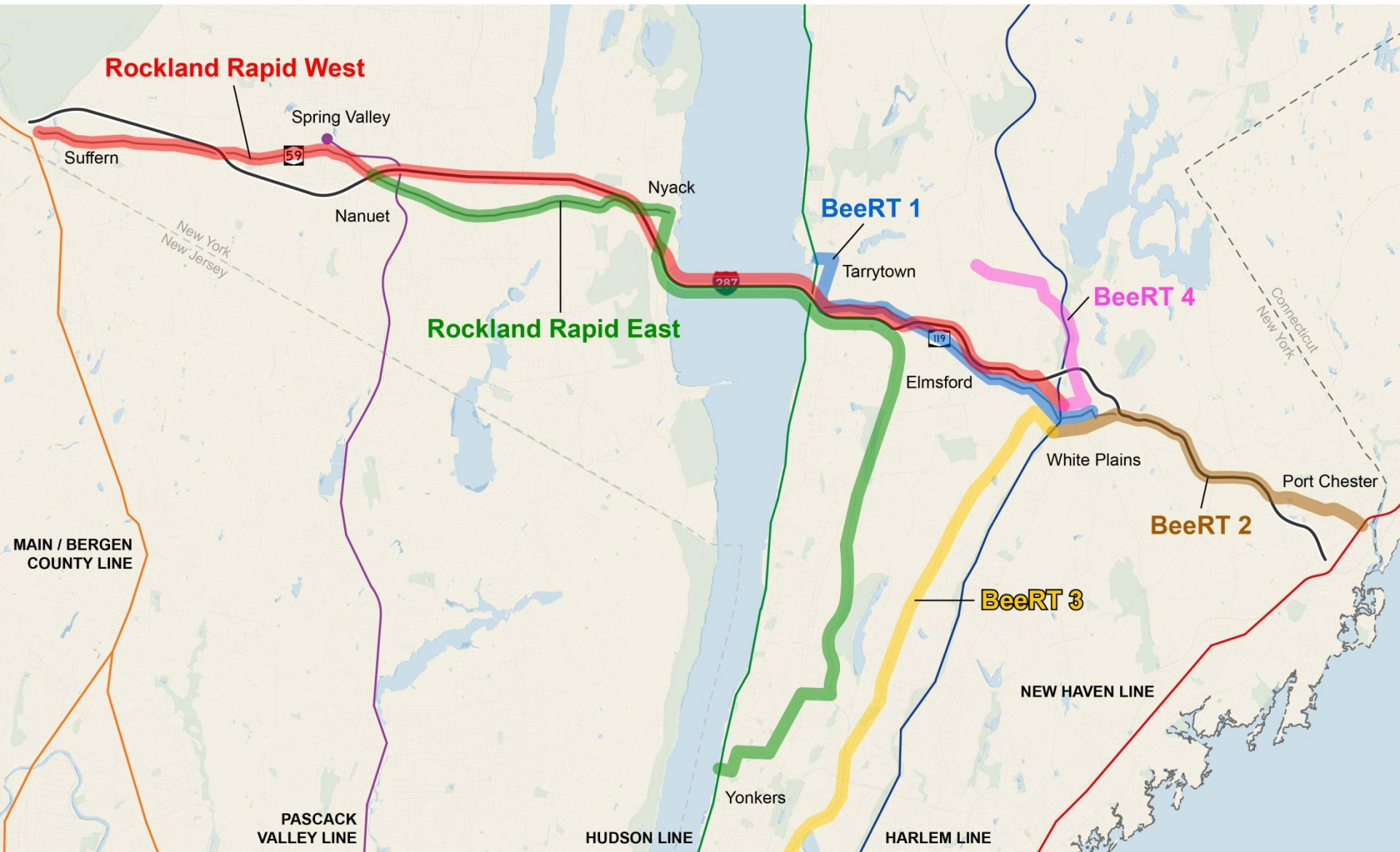


Primary Transit Modes

Bus Rapid Transit (BRT)



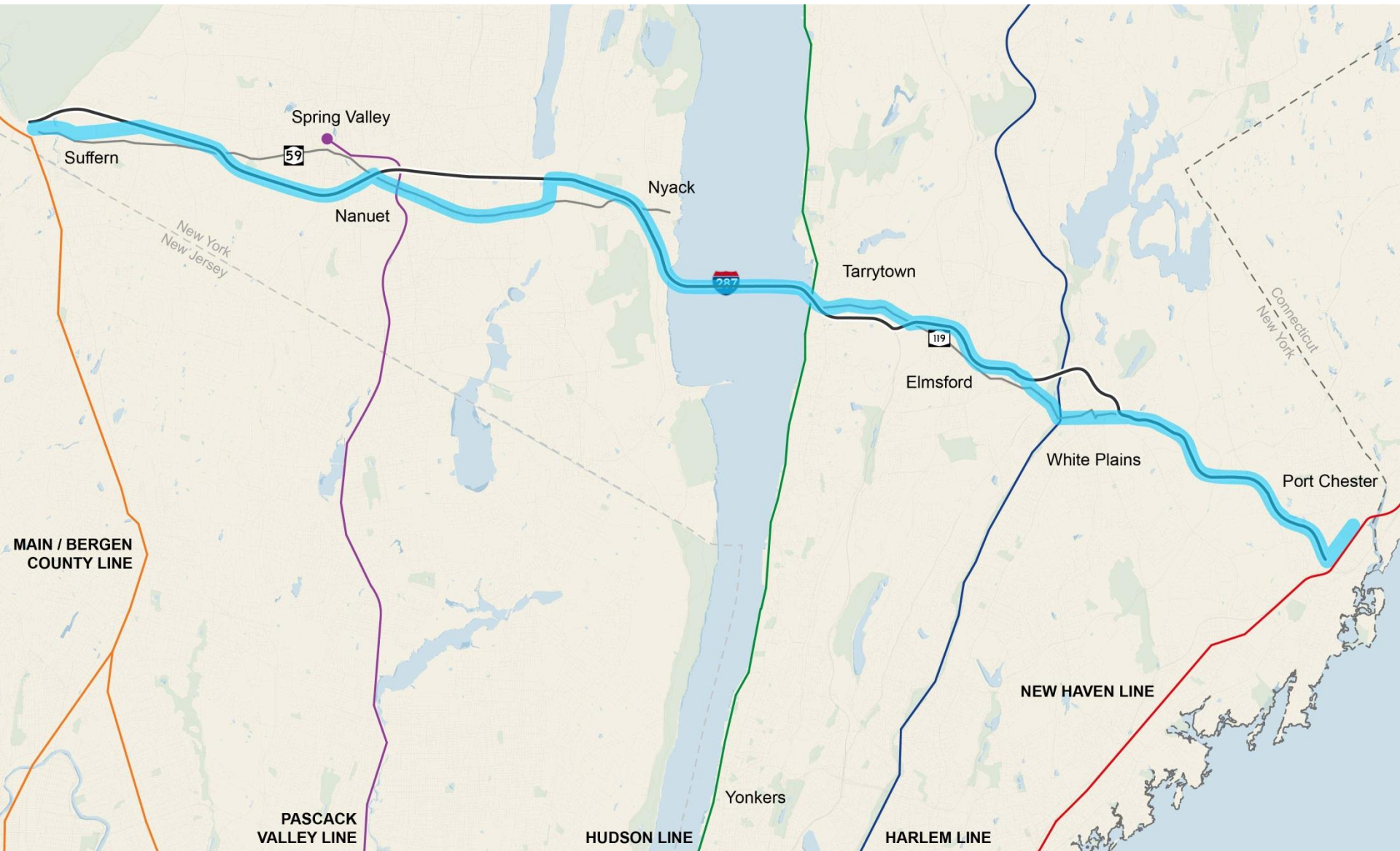
BRT Routing



Light Rail Transit (LRT)



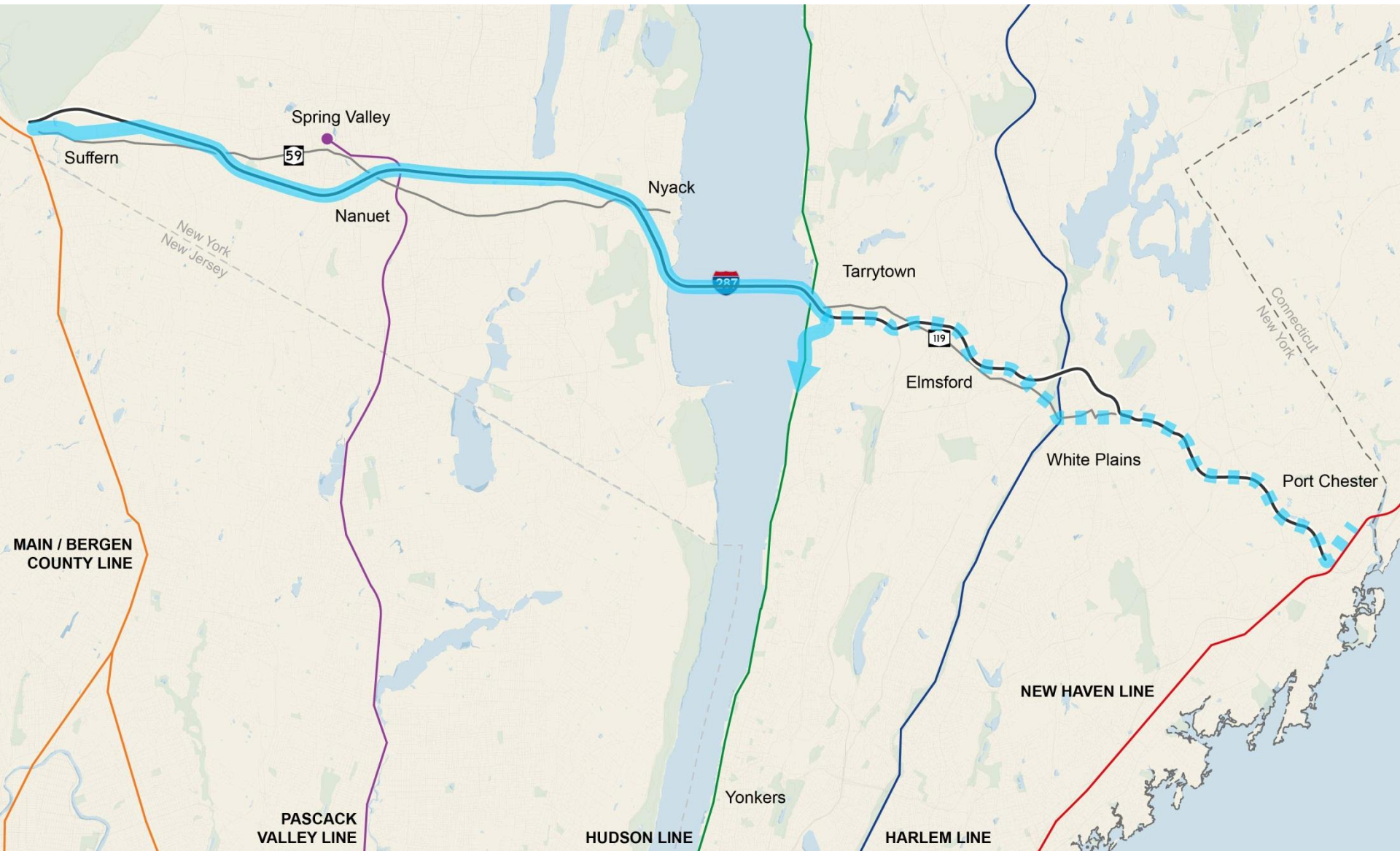
LRT Alignment



Commuter Rail Transit (CRT)



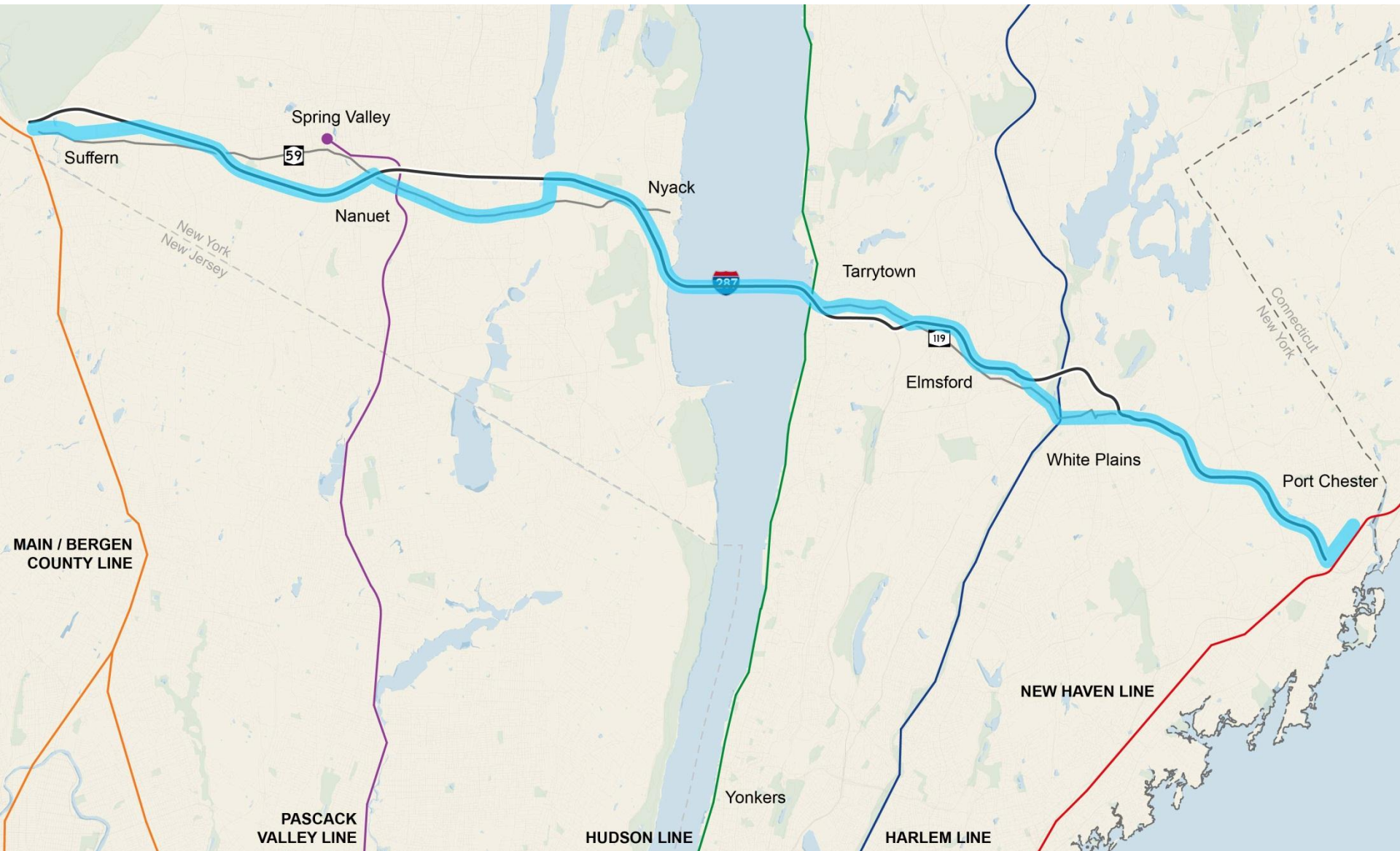
CRT Alignment



Monorail



Monorail Alignment

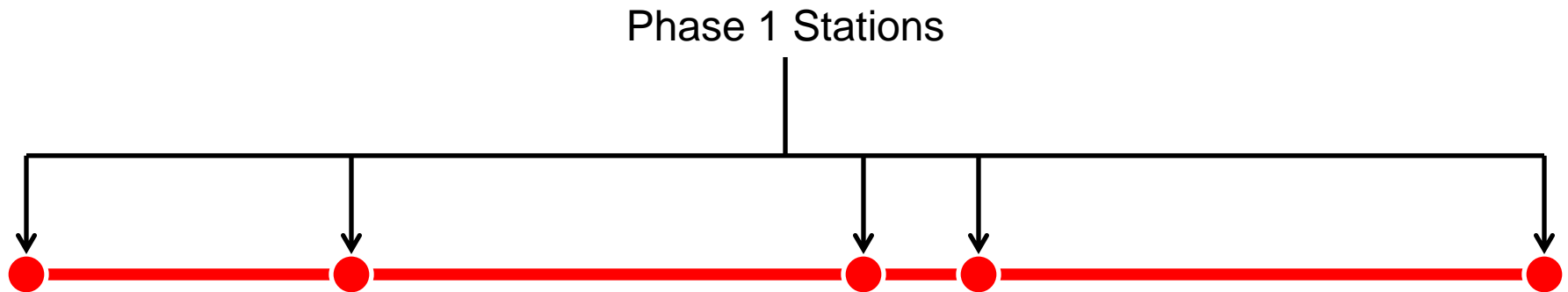




Transit Components

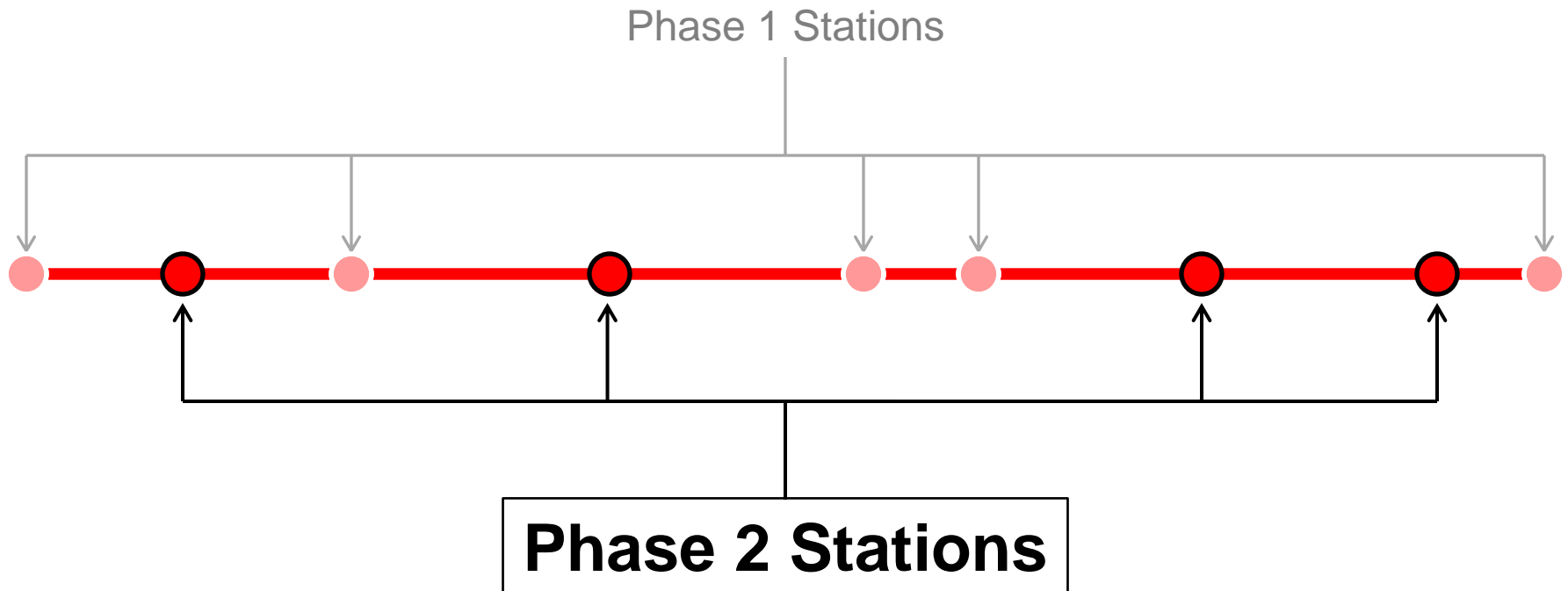
BRT Infill Stations

- New BRT stations that come online in response to demand and/or changing land use patterns



BRT Infill Stations

- New BRT stations that come online in response to demand and/or changing land use patterns



BRT Infill Stations

Opportunities	Challenges
Increased ridership	Additional stops
Greater access	Slower travel times
New development opportunities	

Enhanced BRT Infrastructure

- Infrastructure that will facilitate the evolution of the short-term system into “true” BRT
 - Dedicated lanes
 - Exclusive running ways
 - Queue jump lanes
 - Stations
- I-287
- Route 59
- Route 119
- Westchester Ave
- Central Ave



Enhanced BRT Infrastructure



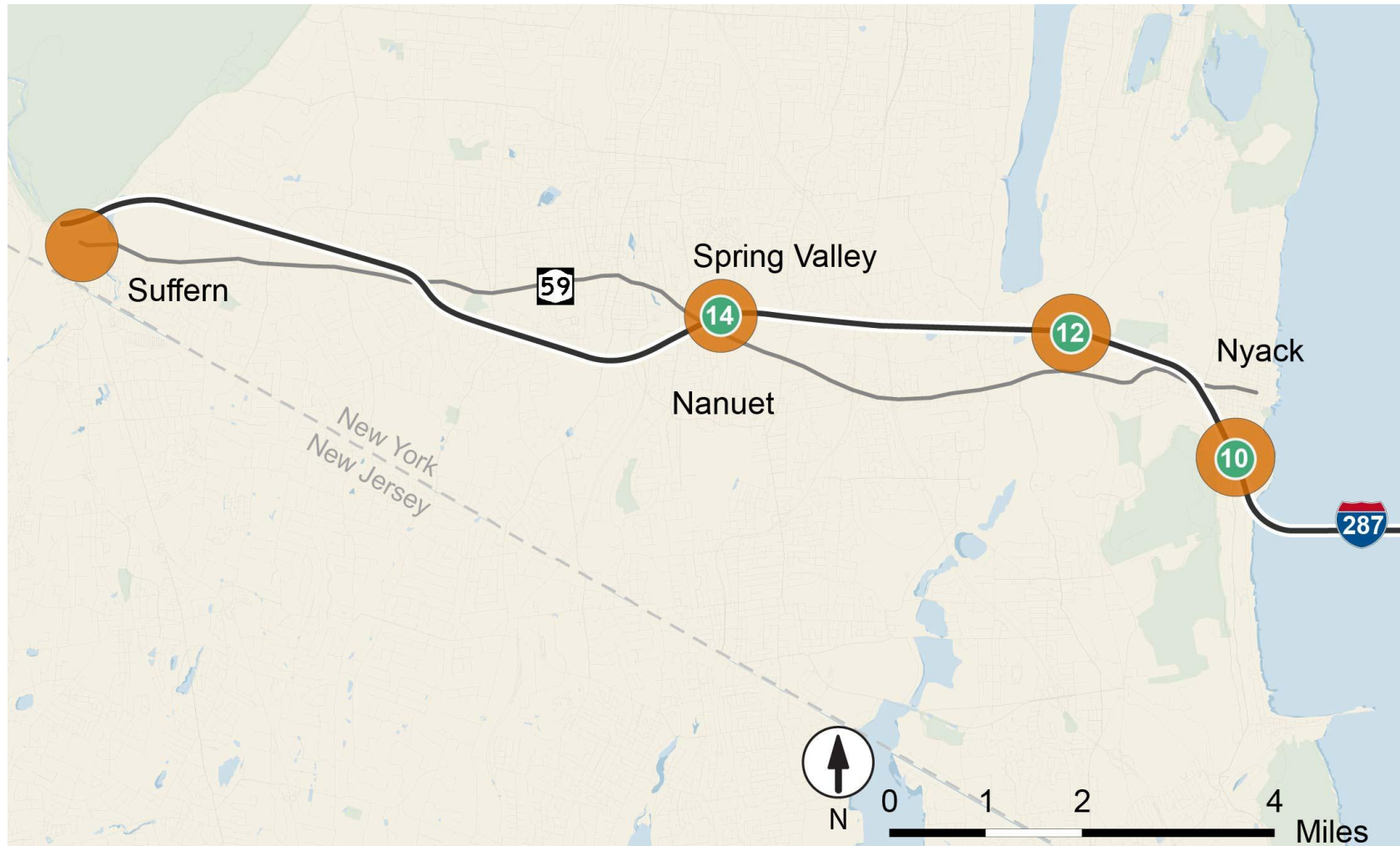
Opportunities	Challenges
Improved speeds	Traffic impacts
Enhanced passenger experience	ROW impacts
Increased ridership	Cost

Transit-Oriented Development

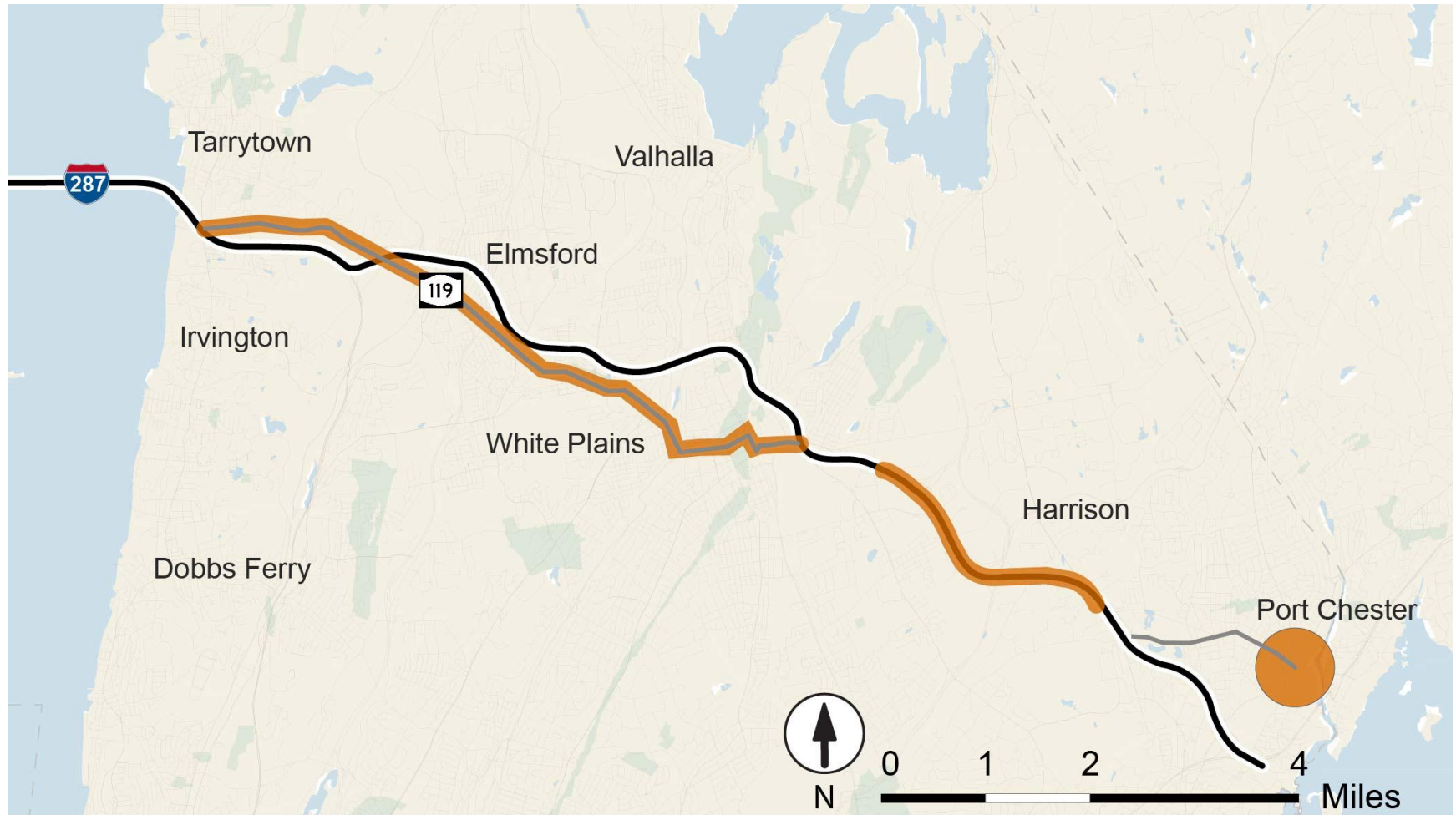
- Transit-supportive, compact, mixed-use development



Transit-Oriented Development



Transit-Oriented Development



Transit-Oriented Development

Opportunities	Challenges
Activity centers support transit investment and drive economic investment	Local buy-in required
New housing and employment opportunities	Lack of TOD precedent in region
New community types that align with generational trends	

HOV / HOT / XB Lanes on I-287

- Phased high-occupancy vehicles lanes from Interchange 14B in Suffern to Interchange 5 in White Plains



HOV / HOT / XB Lanes on I-287

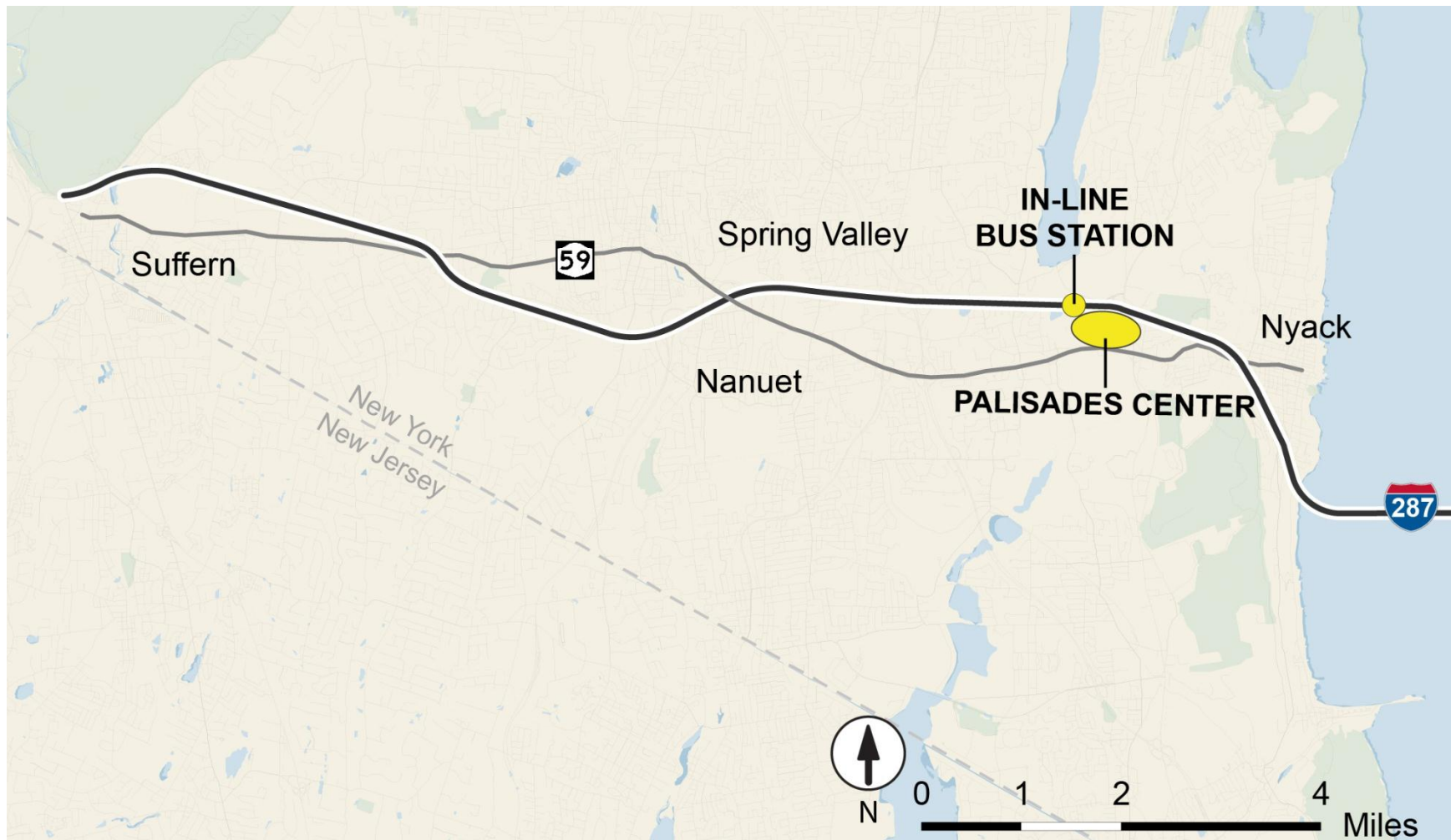


HOV / HOT / XB Lanes on I-287

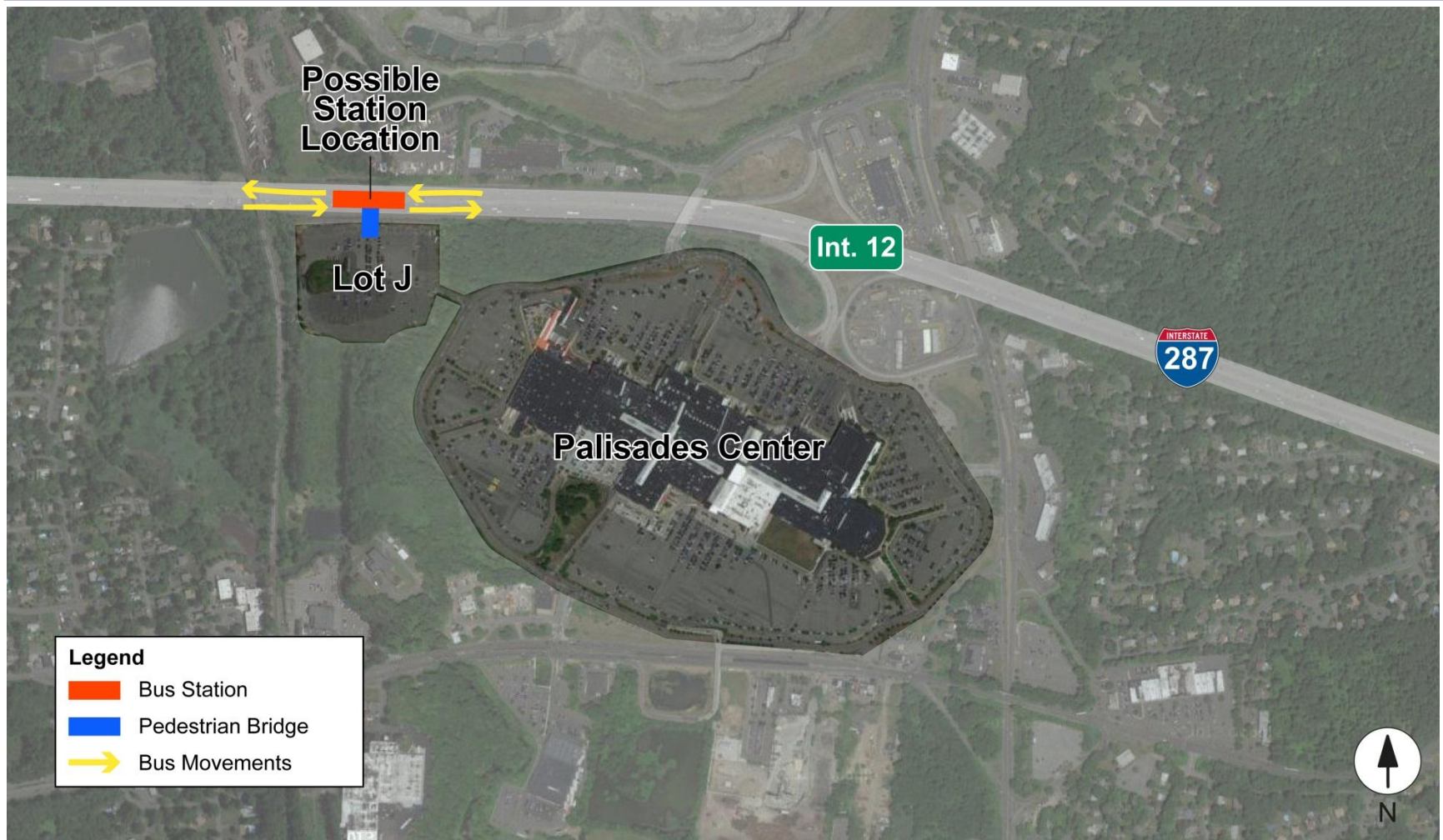


Opportunities	Challenges
Improved bus travel times	Cost
Congestion relief at choke points	ROW impacts
HOT lanes could generate additional revenue	Bridge replacement

In-line Bus Station at Palisades Center



In-line Bus Station at Palisades Center

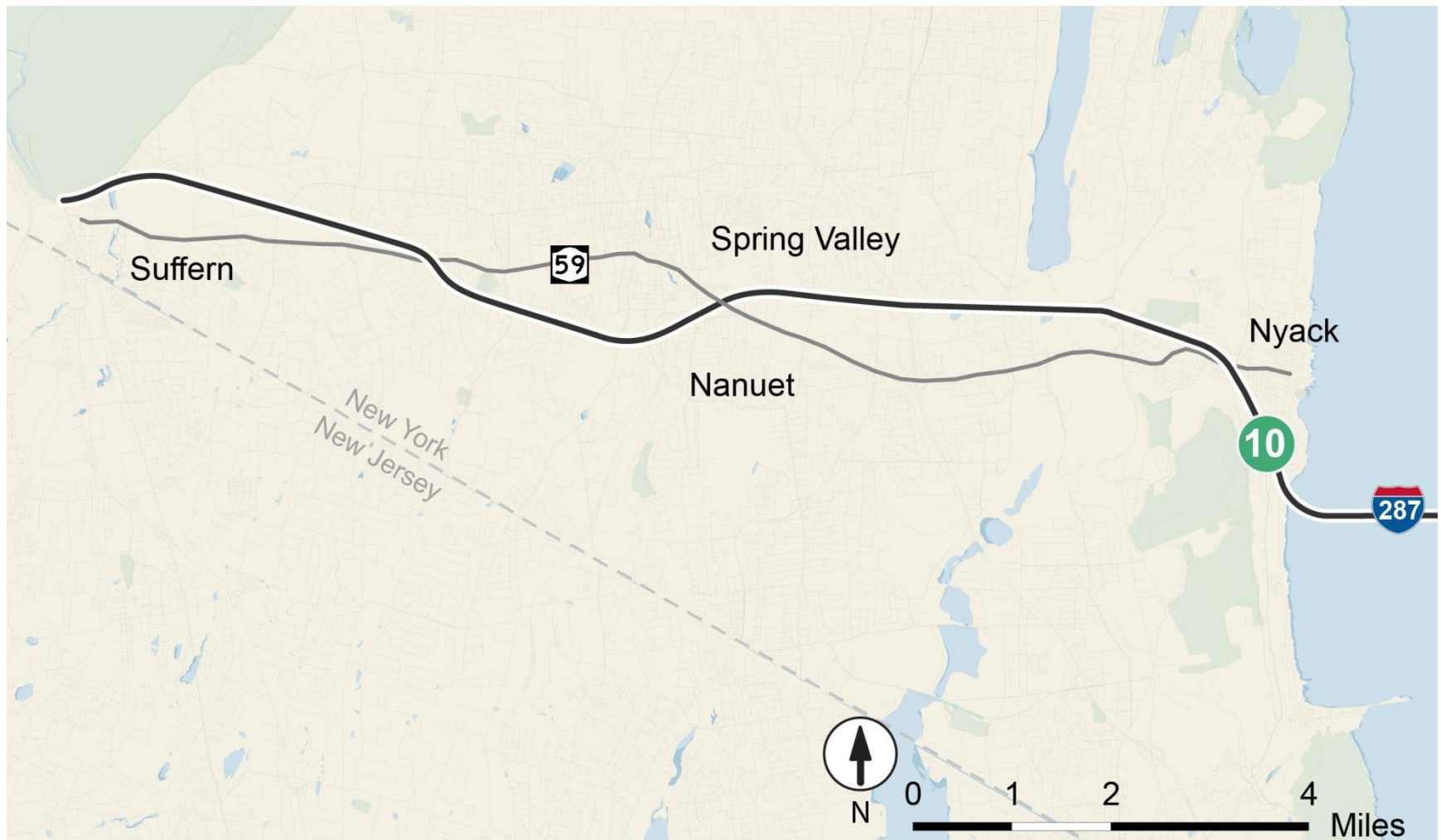


In-line Bus Station at Palisades Center



Opportunities	Challenges
Quick access to I-287	Geometry; conflicts with existing Interchange 12 ramps
Could cut 5 min from travel time	ROW impacts
TOD opportunity	

Interchange 10 Reconstruction



Interchange 10 Reconstruction

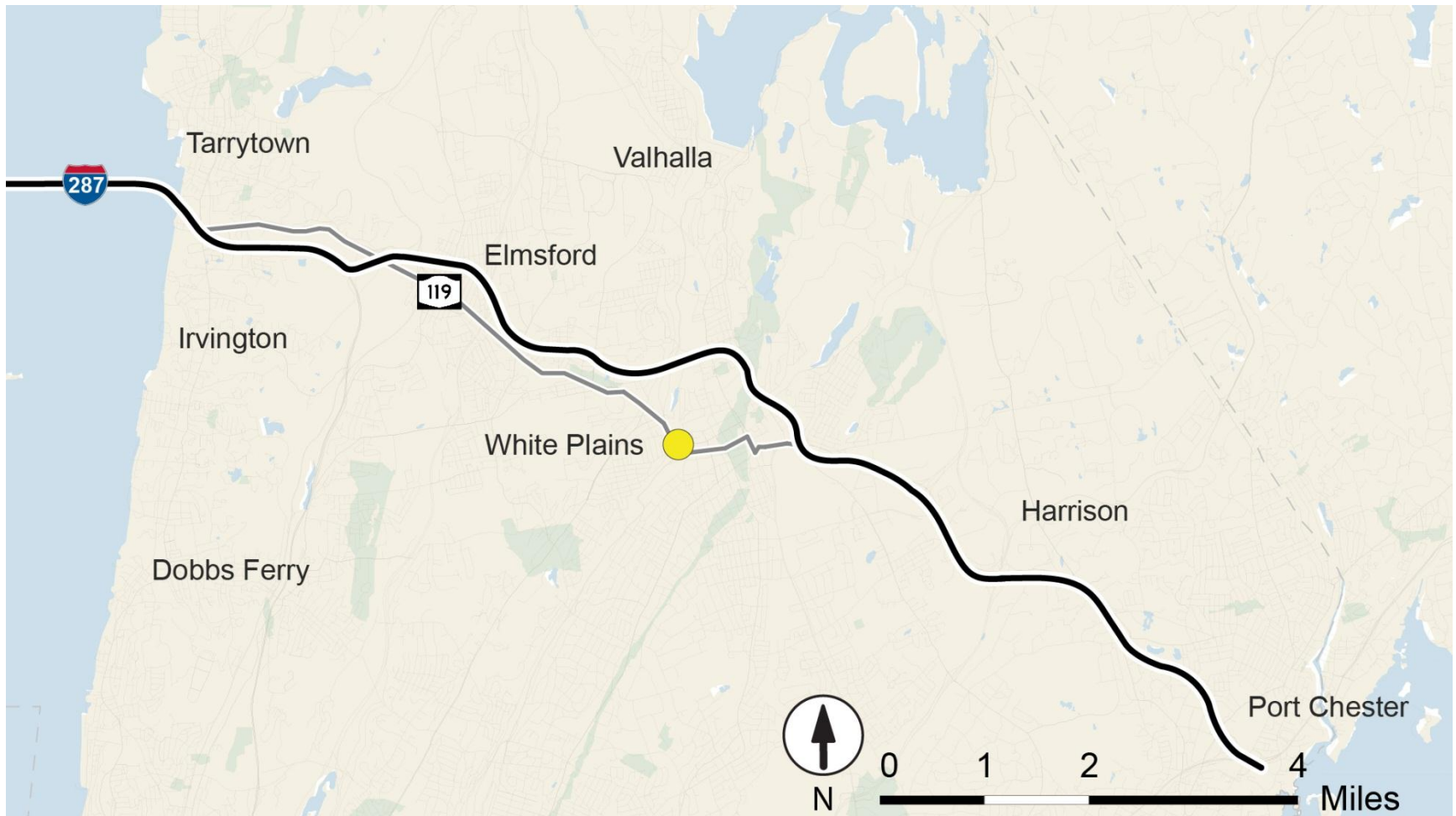


Interchange 10 Reconstruction



Opportunities	Challenges
Simplified Thruway access	Little transit benefit without in-line station
New in-line BRT station	Station placement
Development opportunities	

White Plains Station Improvements



White Plains Station Improvements

- Station reconstruction coordinated with station-area redevelopment



White Plains Station Improvements



Opportunities	Challenges
Enhanced city gateway	Maintenance of operations
Station/downtown connection	Phasing
More functional transit hub	
Catalyst for development	
New housing and employment opportunities	
More productive land uses	
Ratables	

Tarrytown Connector

- Physical means of transferring passengers between E/W transit on 287 and N/S rail on Hudson Line
 - Ramp
 - “Drop-down” station
 - Moving sidewalk



MLK Busway
Pittsburgh, PA

Tarrytown Connector



Opportunities	Challenges
More direct connection to Hudson Line	Visual, environmental impacts
Would remove buses from local roads	High cost
	Use may not justify costs and impacts
	Drop-down station not recommended in 2009 report
	Moving walkway does not provide time savings



Other Transit Ideas

West-of-Hudson Rail Improvements

- Service and infrastructure improvements to existing rail lines plus introduction of passenger service to West Shore Line



West-of-Hudson Rail Improvements



West-of-Hudson Rail Improvements



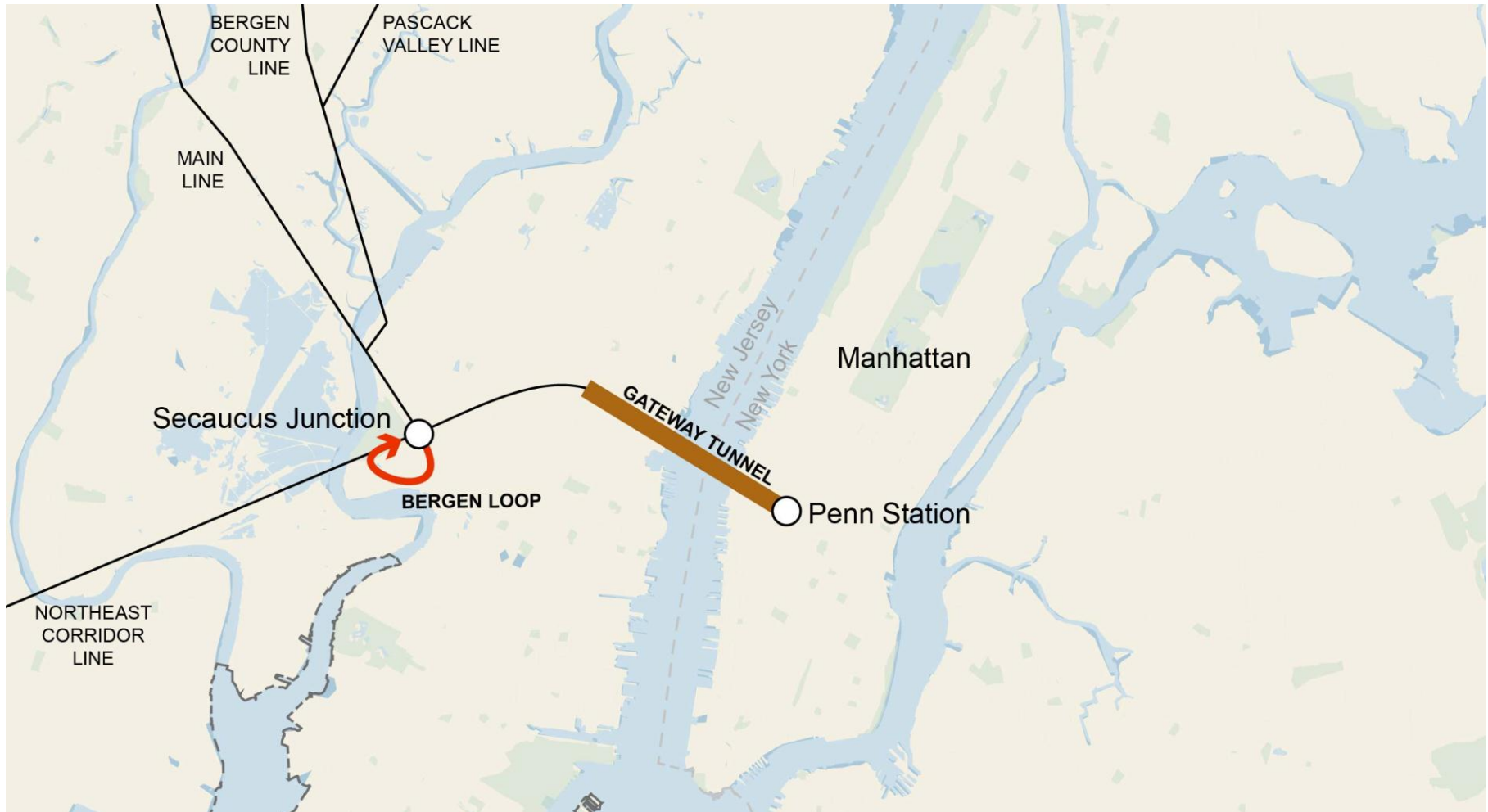
Opportunities	Challenges
Higher-frequency rail service	Cost
Reduced travel times	MNR / NJT negotiations
West Shore Line would introduce new East Rockland rail service	MNR / CSX negotiations
Aligns with current north/south travel patterns	Many improvements in NJ
	Gateway Tunnel with Bergen Loop

Gateway Tunnel w/ Bergen Loop

- Two new tunneled rail tracks to New York Penn Station accommodating Amtrak (regional) and NJT (commuter) trains



Gateway Tunnel w/ Bergen Loop

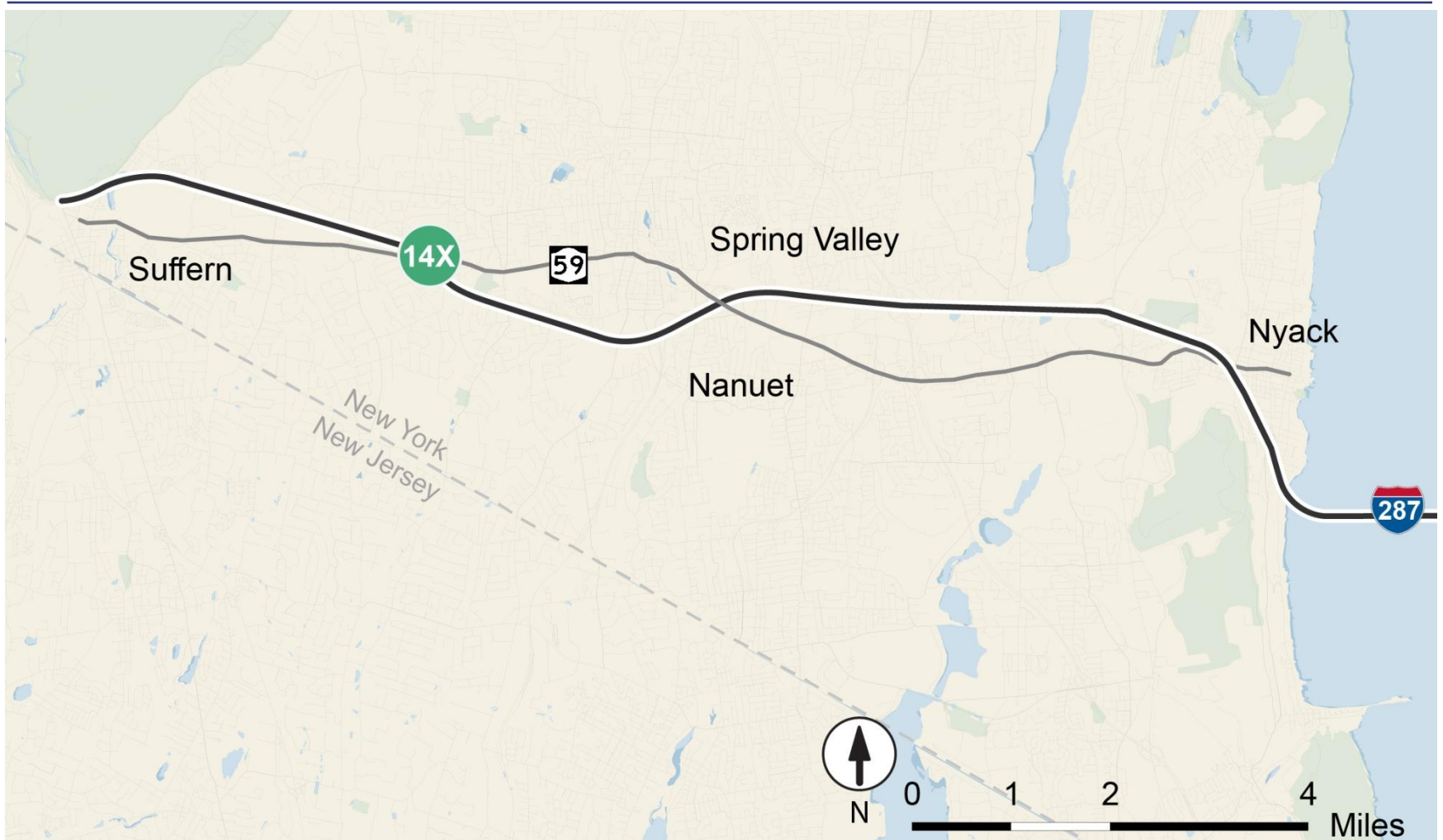


Gateway Tunnel w/ Bergen Loop

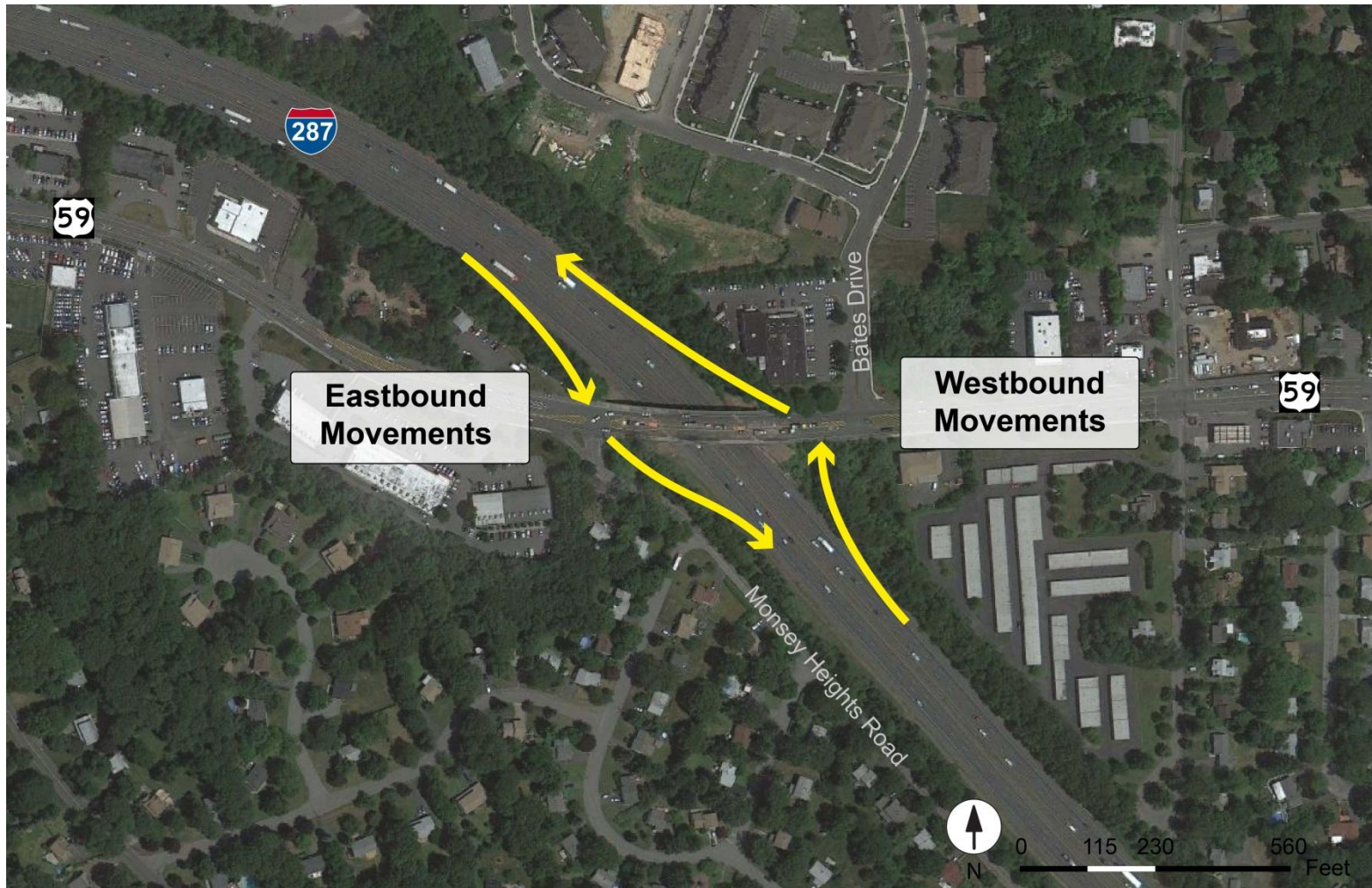


Opportunities	Challenges
Increased train frequencies into Penn Station	Cost
More one-seat rides	Political volatility
Trans-Hudson redundancy	Receiving capacity in NYC
Would allow upgrades to existing tunnels	Outside of MTTF scope?
Increased property values	

Interchange 14X



Interchange 14X



Interchange 14X

Opportunities	Challenges
New 287 access for growing communities	Not recommended in 2010 HIR
Less regional traffic on 59	Would divert traffic to Thruway
Access to/from new park-n-ride	Operating benefits not clear

Ferry Service

- New waterborne transit connecting Rockland County to Tarrytown or Manhattan



Nyack / Tarrytown Ferry



Nyack / Manhattan Ferry



Ferry Service

Opportunities	Challenges
New transit connection	Prior service failed
High-quality passenger experience	High operating costs
Waterborne (no traffic)	High fares
	May cannibalize TZx and/or Haverstraw-Ossining service
	Lack of waterfront parking in Nyack

Transit Connection to Stewart Airport



Transit Connection to Stewart Airport



Opportunities	Challenges
Transit access to regional gateway	Uncertainties <ul style="list-style-type: none">• Demand• Mode• Routing• Cost
	Outside of MTTF scope?



Transit Packages & Discussion

Full Menu



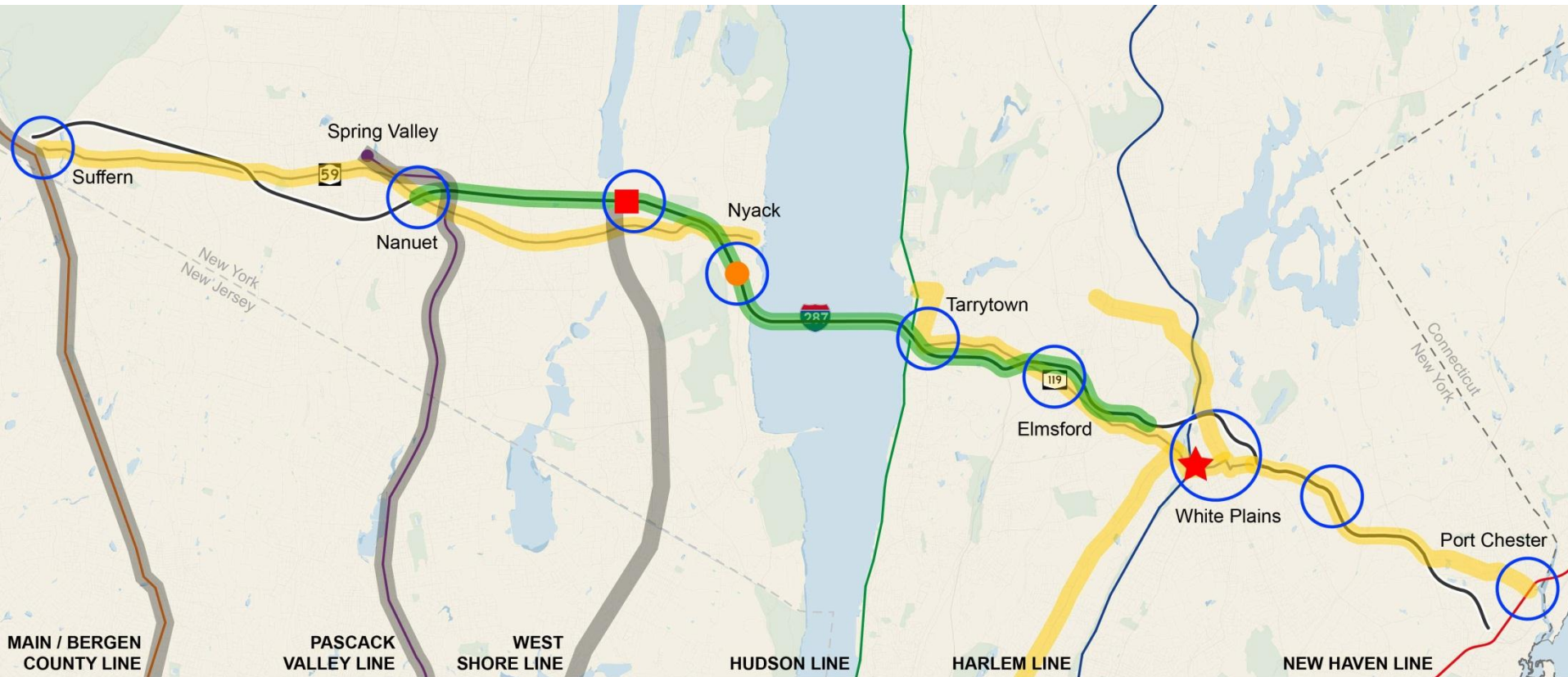
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Transit Packages – Overview



Category	Short-Term BRT	Long-Term BRT	LRT	CRT	Monorail
Transit Components	Transit Signal Priority	Infill Stations along Proposed BRT Routes	Infill Stations along Proposed BRT Routes	Infill Stations along Proposed BRT Routes	Infill Stations along Proposed BRT Routes
	Queue Jump Lanes	Enhanced BRT Infrastructure	Enhanced BRT Infrastructure	Enhanced BRT Infrastructure	Enhanced BRT Infrastructure
	Bus Lanes on Route 119 and in Downtown White Plains	TOD - Interchanges 10, 12, 14; Route 119; Platinum Mile	TOD - Interchanges 10, 12, 14; Route 119; Platinum Mile	TOD - Interchanges 10, 12, 14; Route 119; Platinum Mile	TOD - Interchanges 10, 12, 14; Route 119; Platinum Mile
	Metering on I-287 Ramps	HOV/HOT/XB Lanes on I-287	HOV/HOT/XB Lanes on I-287	HOV/HOT/XB Lanes on I-287	HOV/HOT/XB Lanes on I-287
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		Interchange 10 Reconstruction	Interchange 10 Reconstruction	Interchange 10 Reconstruction	Interchange 10 Reconstruction
		White Plains Station Improvements	White Plains Station Improvements	White Plains Station Improvements	White Plains Station Improvements
		Tarrytown Connector	Tarrytown Connector	Tarrytown Connector	Tarrytown Connector
Other Transit Ideas		West-of-Hudson Rail Improvements	West-of-Hudson Rail Improvements	West-of-Hudson Rail Improvements	West-of-Hudson Rail Improvements
		Gateway Tunnel with Bergen Loop	Gateway Tunnel with Bergen Loop	Gateway Tunnel with Bergen Loop	Gateway Tunnel with Bergen Loop
		Interchange 14X	Interchange 14X	Interchange 14X	Interchange 14X
		Ferry Service	Ferry Service	Ferry Service	Ferry Service
		Transit Connection to Stewart Airport (assuming bus)	Transit Connection to Stewart Airport (assuming bus)	Transit Connection to Stewart Airport (assuming bus)	Transit Connection to Stewart Airport (assuming bus)

Package 1 – BRT



 Infill Stations along Proposed BRT Routes
w/ BRT Infrastructure

 HOV / HOT / XB Lanes on I-287

 West-of-Hudson Rail Improvements
w/ Gateway Tunnel



TOD

 In-line Station at Palisades Center

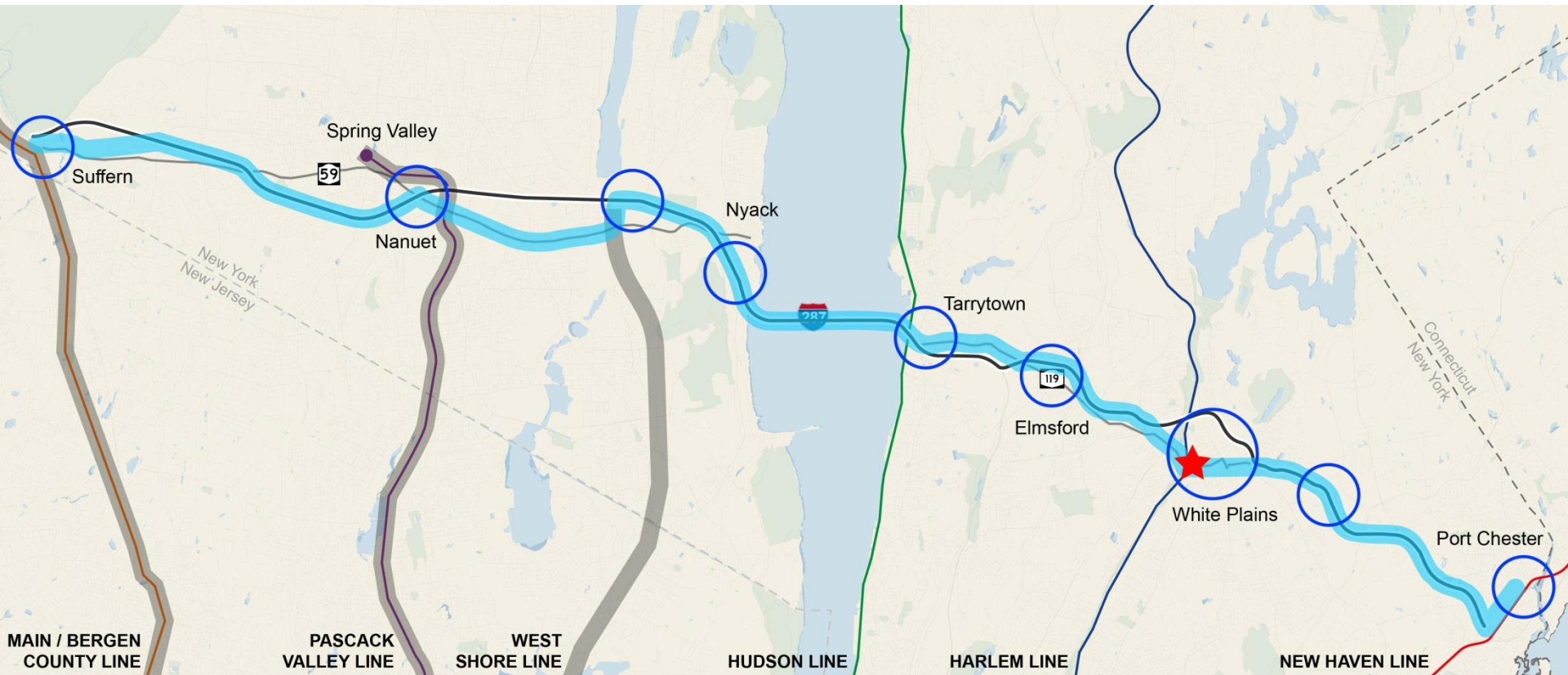
 Interchange 10 Reconstruction

 White Plains Station Improvements

Bus Rapid Transit (BRT)

Opportunities	Challenges
Accepted transit mode	Coordinating with land use plans
High-quality passenger experience	Inter-county service operator
Evolution from short-term proposal	
Flexible, phase-able	
Provides local access	
Integrates well with other modes	
Lowest capital costs	
Recommended in 2009 TMSR	

Package 2 – LRT



LRT

West-of-Hudson Rail Improvements
w/ Gateway Tunnel

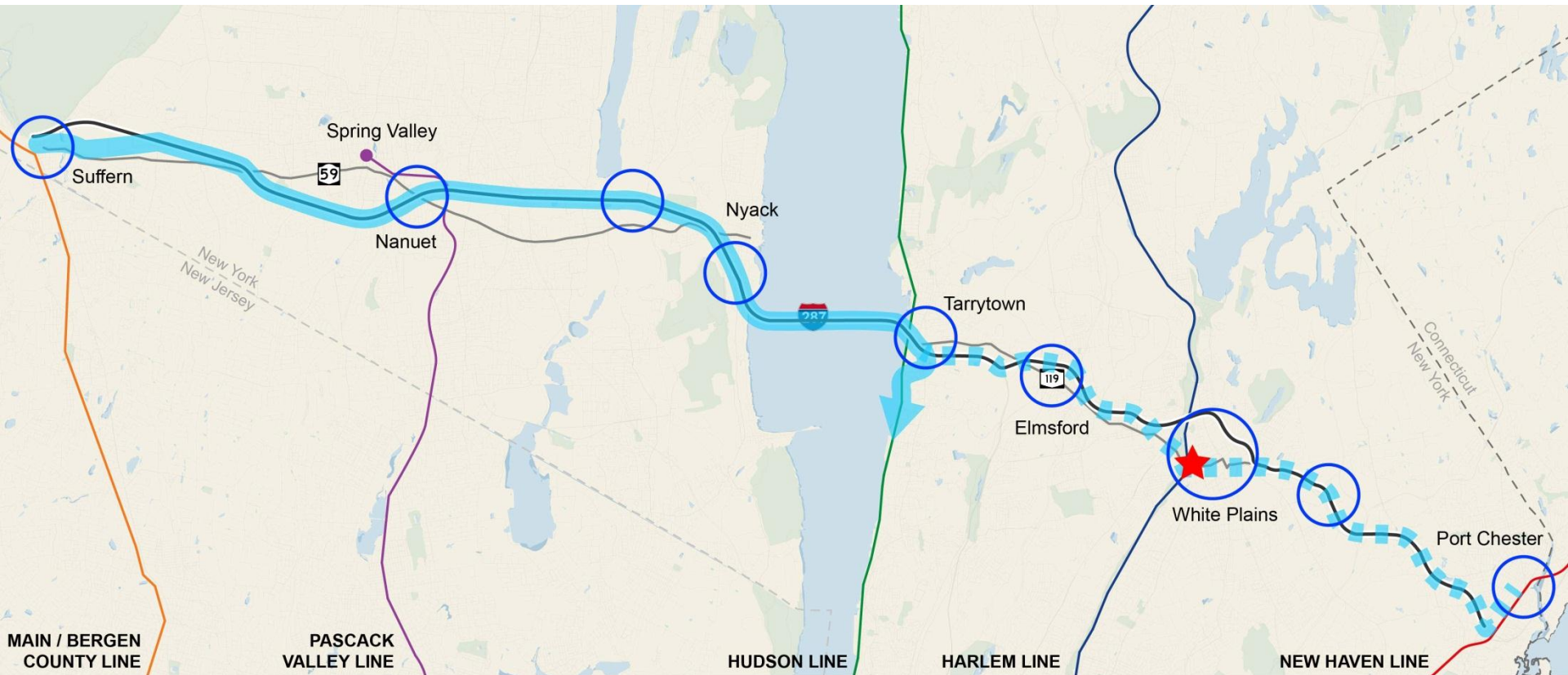
TOD

White Plains Station Improvements

Light Rail Transit (LRT)

Opportunities	Challenges
Accepted transit mode	Visual impact from overhead power lines
High-quality passenger experience	Typically employed in urban areas
Well-suited to urban environments	Typically designed for shorter trips
Provides local access	Topography
Integrates well with other modes	Inter-county service operator
Requires own infrastructure	Did not advance beyond 2009 TMSR
Range of types and deployment configurations	

Package 3 – CRT



CRT



TOD



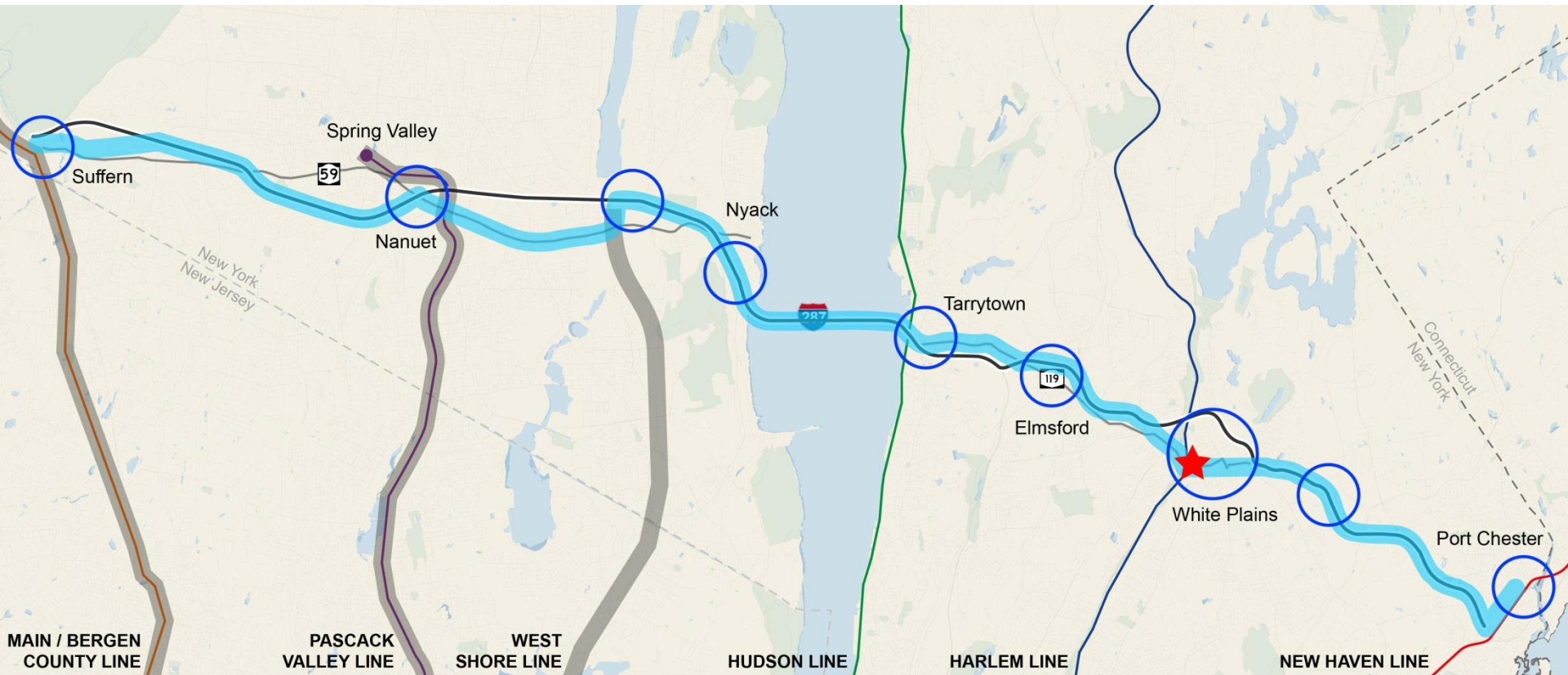
White Plains Station Improvements

Commuter Rail Transit (CRT)



Opportunities	Challenges
Accepted transit mode	Requires exclusive ROWs
High-quality passenger experience	Grade separation required
Highest capacity	Station footprint
High speed	High cost
New track can connect to existing rail	Topography
Serves regional travel well	Less local access
Influences land uses	Inter-county service operator
Recommended in 2009 TMSR	

Package 4 – Monorail



Monorail

West-of-Hudson Rail Improvements
w/ Gateway Tunnel

TOD

White Plains Station Improvements

Monorail

Opportunities	Challenges
Small footprint	Significant visual and physical impacts
Ample capacity	Fire / life safety consideration
Can operate quietly	Topography
	High cost
	Elevation complicates servicing and interface with other modes
	Not seriously considered in past planning efforts



Evaluation Criteria

Transit Packages – Summary



Category	Short-Term BRT	Long-Term BRT	LRT	CRT	Monorail
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		Interchange 10 Reconstruction	Interchange 10 Reconstruction	Interchange 10 Reconstruction	Interchange 10 Reconstruction
		White Plains Station Improvements	White Plains Station Improvements	White Plains Station Improvements	White Plains Station Improvements
		Tarrytown Connector	Tarrytown Connector	Tarrytown Connector	Tarrytown Connector
Other Transit Ideas		West-of-Hudson Rail Improvements	West-of-Hudson Rail Improvements	West-of-Hudson Rail Improvements	West-of-Hudson Rail Improvements
		Gateway Tunnel with Bergen Loop	Gateway Tunnel with Bergen Loop	Gateway Tunnel with Bergen Loop	Gateway Tunnel with Bergen Loop
		Interchange 14X	Interchange 14X	Interchange 14X	Interchange 14X
		Ferry Service	Ferry Service	Ferry Service	Ferry Service
		Transit Connection to Stewart Airport (assuming bus)	Transit Connection to Stewart Airport (assuming bus)	Transit Connection to Stewart Airport (assuming bus)	Transit Connection to Stewart Airport (assuming bus)

Evaluation Criteria



Connects to Local Destinations

- High – capable of serving multiple local destinations and a wide range of passengers
- Medium – serves some local destinations and passengers
- Low – serves few local destinations and a narrow range of passengers

Manhattan Market Served

- High – provides a potential one-seat ride to Manhattan
- Medium – provides service to Manhattan with one transfer
- Low – provides service to Manhattan with two or more transfers

Land Use Compatibility

- High – complements land use patterns
- Medium – disconnect in scale between land use and transportation projects
- Low – little to no connection or potential conflict between land use and transportation projects

Environmental and Community Impacts

- High – significant impact on surrounding communities and environment
- Medium – creates some disruption to surrounding communities and environment
- Low – fits within existing transportation footprints

Time to Implement

- Short – 5 to 10 years
- Medium – 10 to 15 years
- Long – >15 years

Evaluation Matrix

Category	Short-Term BRT	Long-Term BRT	LRT	CRT	Monorail
Connects to Local Destinations	High	High	Medium	Low	Medium
Manhattan Market Served	Medium	Medium	Medium	High	Medium
Land Use Compatibility	High	High	Medium	High	Low
Environmental and Community Impacts	Low	Low	Medium	Low/Medium	High
Time to Implement	Short	Medium	Long	Long	Long
Capital Cost/Mile	\$1 million	\$30 million	\$185 million	\$500 million	\$171 million*
Annual Operating Costs	TBD	\$75 million	\$80 million	\$294 million	\$21 million*

* Las Vegas Monorail



Discussion