

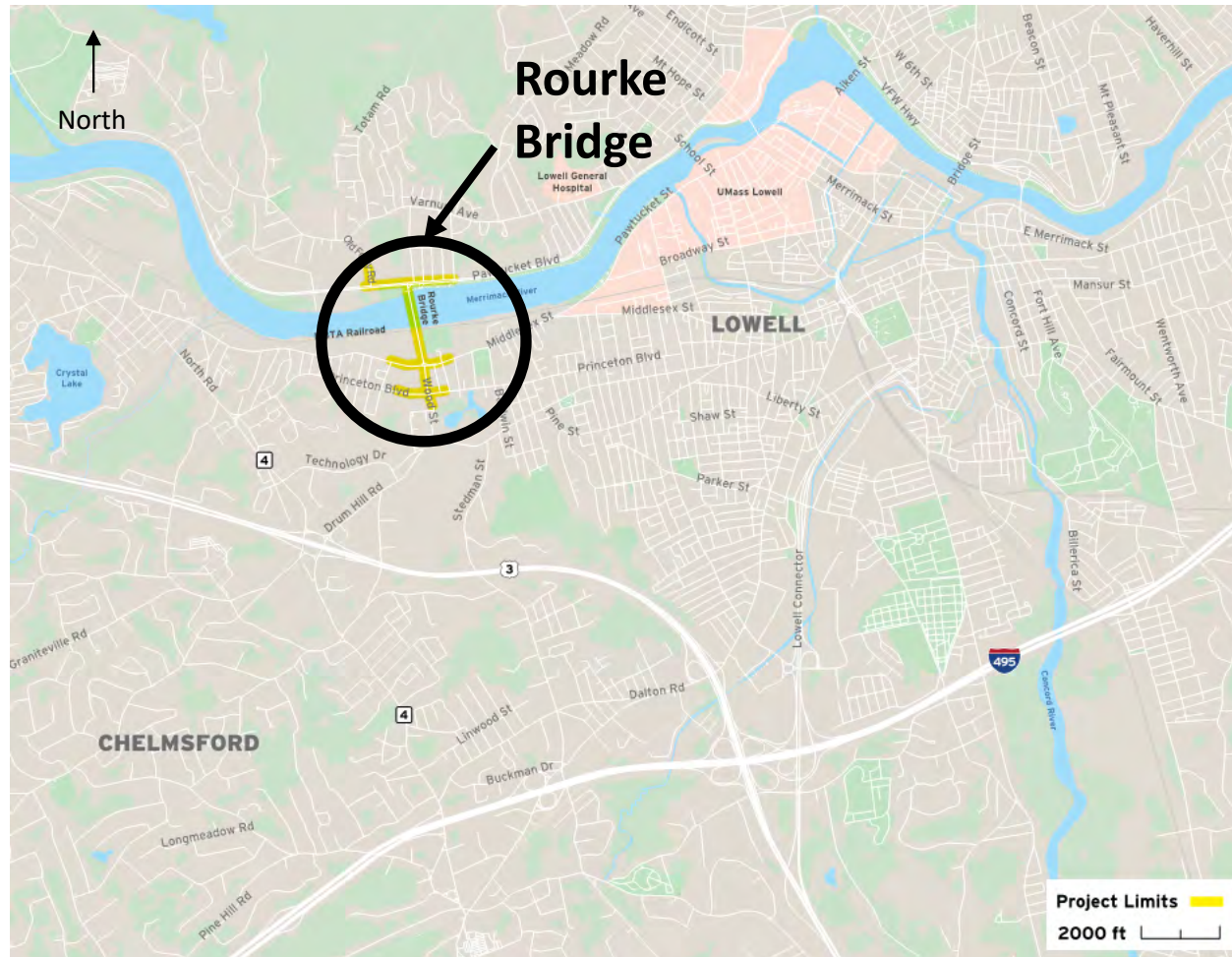


Welcome!

Rourke Bridge Replacement Project
Lowell, MA
MassDOT #607887

Lowell City Council Update February 23, 2021

Project Location



Project Purpose & Need



Bridge Replacement



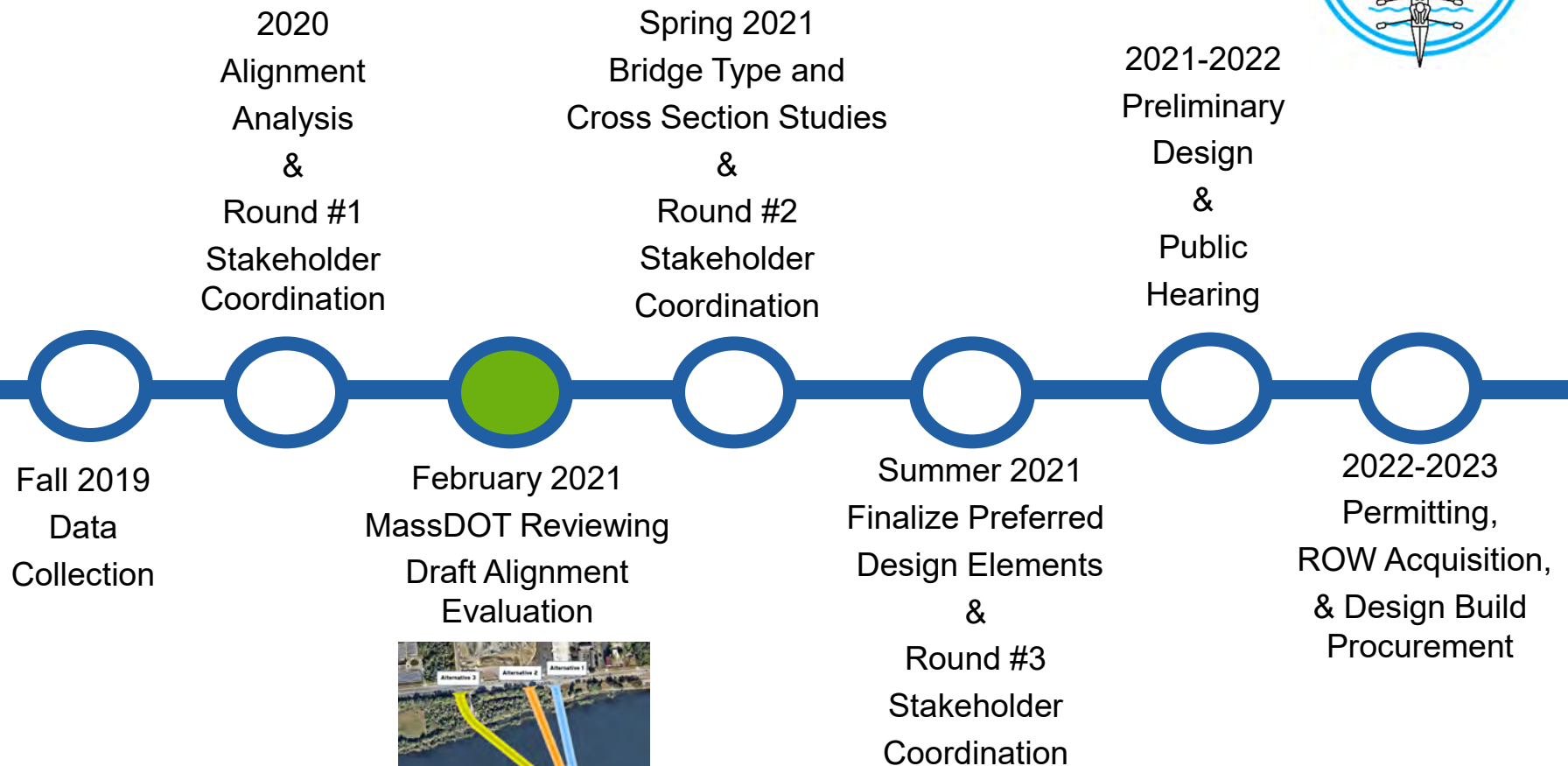
Enhance safety and connectivity for Pedestrians, Bicycles, Emergency Vehicles and Watercraft



Improve Traffic Operations at the Wood Street intersections with Pawtucket Boulevard, Middlesex Street, and Princeton Boulevard



Schedule





3 Alternative Alignments



**Pawtucket Blvd
Intersections**

Dual 3-Leg

VS.

Single 4-leg w/ Old Ferry Rd

Bridge Length

Alt 1 & 2 – 1,050 FT

Alt 3 – 1,250 FT (+1 pier)

**MBTA Railroad
Shared Use Path
30" Watermain**

Legend

- Core Study Area Intersection
- Extended Study Area Intersection

Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), Mapbox, Swg, © OpenStreetMap contributors, and the GIS User Community



Traffic Analysis

STUDY AREA

- 14 Local Intersection
- 17 Regional Intersections

CRASH ANALYSIS

- Reviewed Crash Data 2014-2016
- Calculated Crash Rates
- Identified Crash Clusters/Patterns
- Reviewed Road Safety Audits

TRAFFIC VOLUMES

- Collected Count Data
- AM & PM Peak Hour Traffic Flow by Mode
- Projected 2039 Traffic Volumes
 - Background Growth
 - Special Generators
- Travel Patterns
 - Origin-Destination

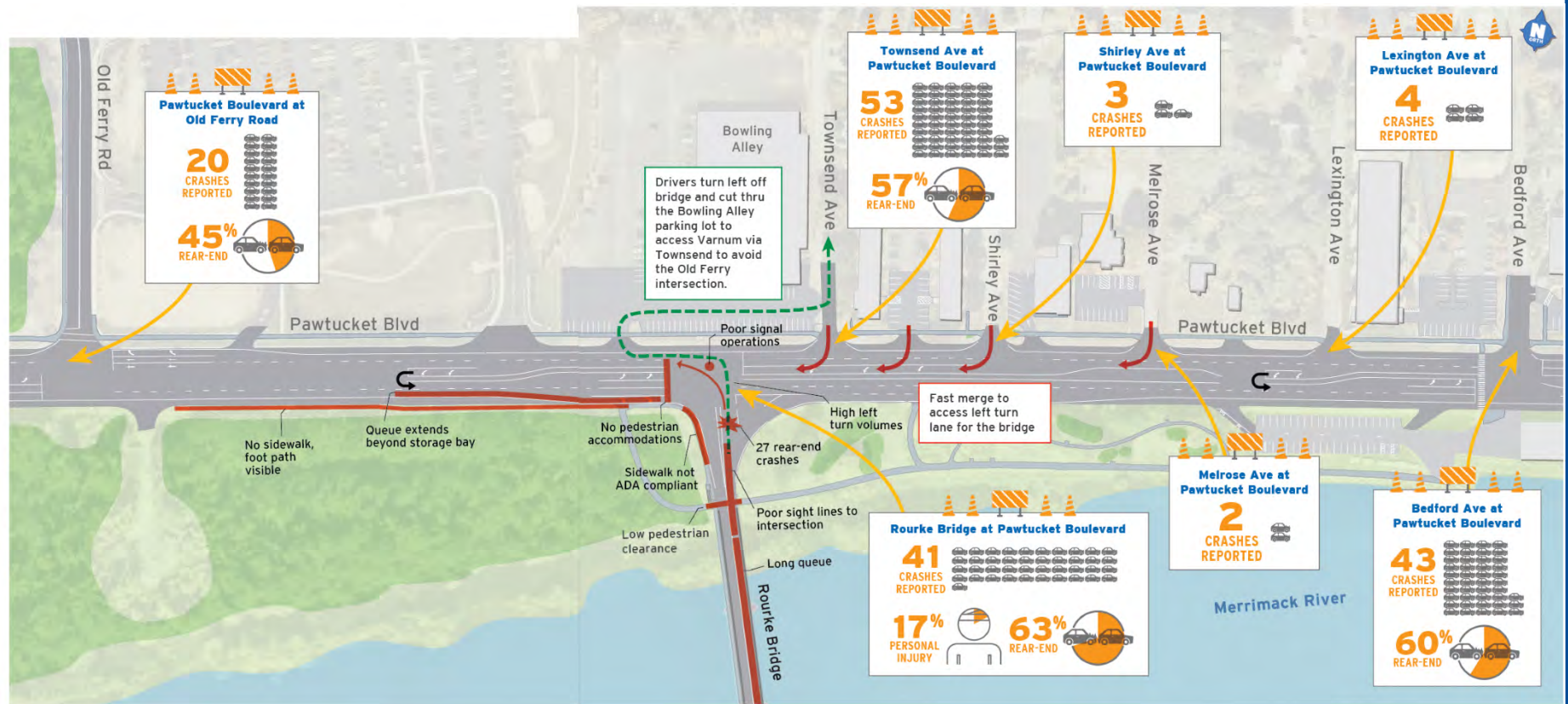
ALTERNATIVES EVALUATIONS

- Trip Assignments/Distribution
- Operation Analysis by Mode
- Safety Evaluation
- Comparison



Safety Analysis

PAWTUCKET BOULEVARD SAFETY AND ACCESS MANAGEMENT ISSUES



Traffic Analysis Future 2039



Regional Travel Times

Safety & Operations:

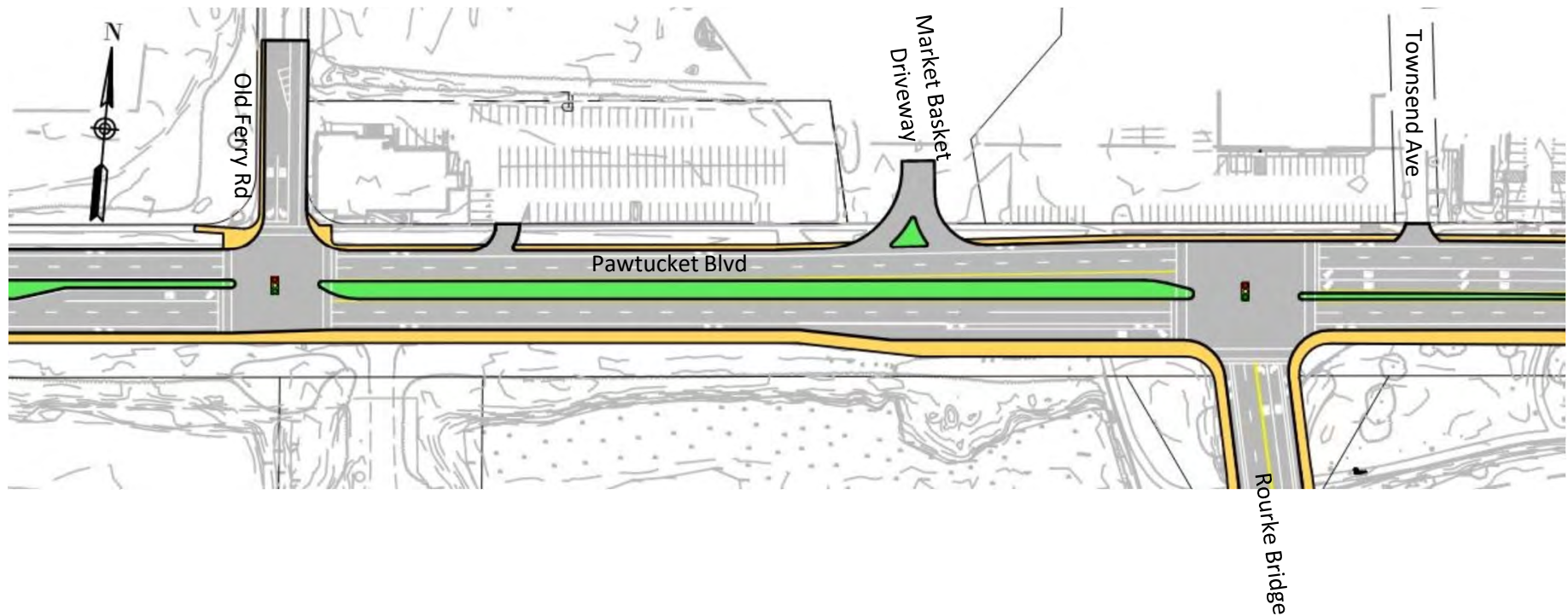
- **Vehicles**
- **Pedestrians**
- **Bicyclists**
- **Intersections**

Emergency vehicle access

Traffic Analysis



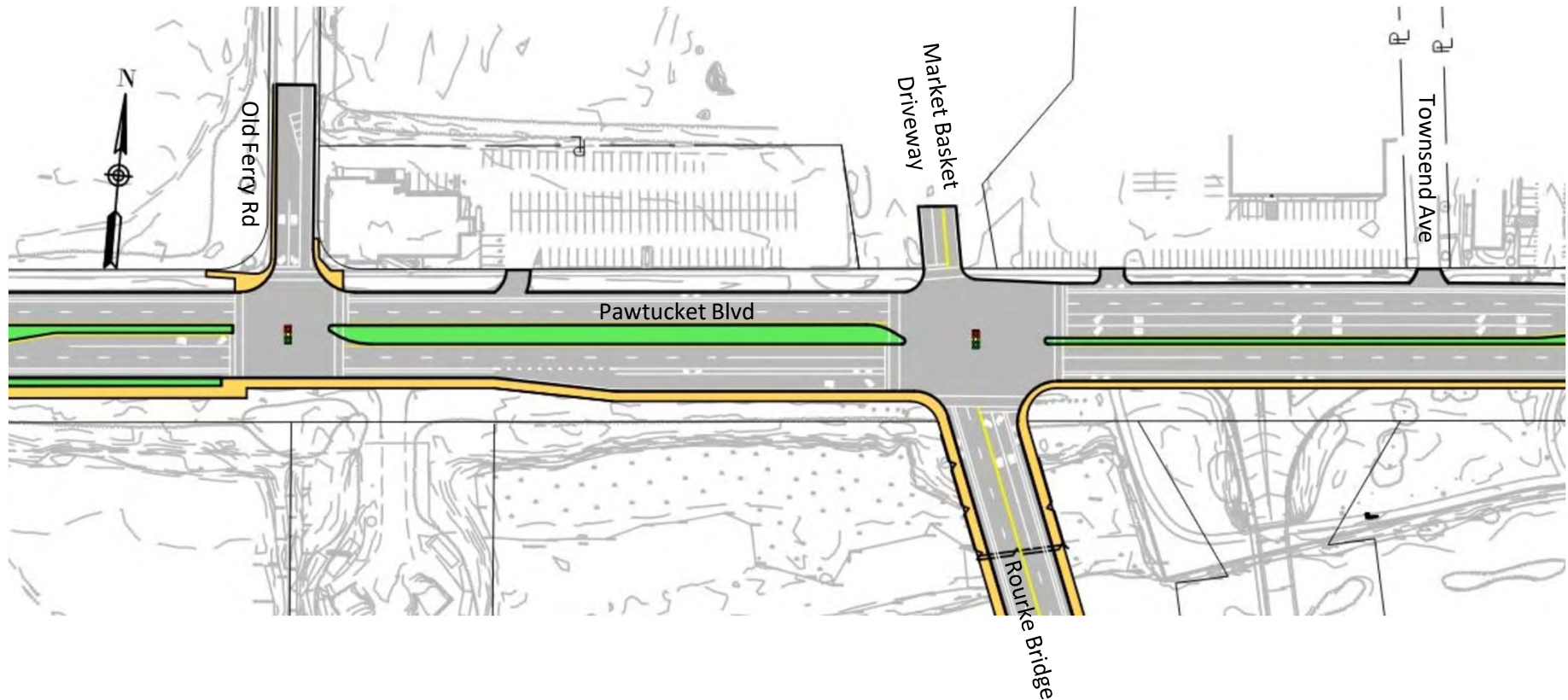
ALIGNMENT 1 SIGNALIZED INTERSECTION



Traffic Analysis



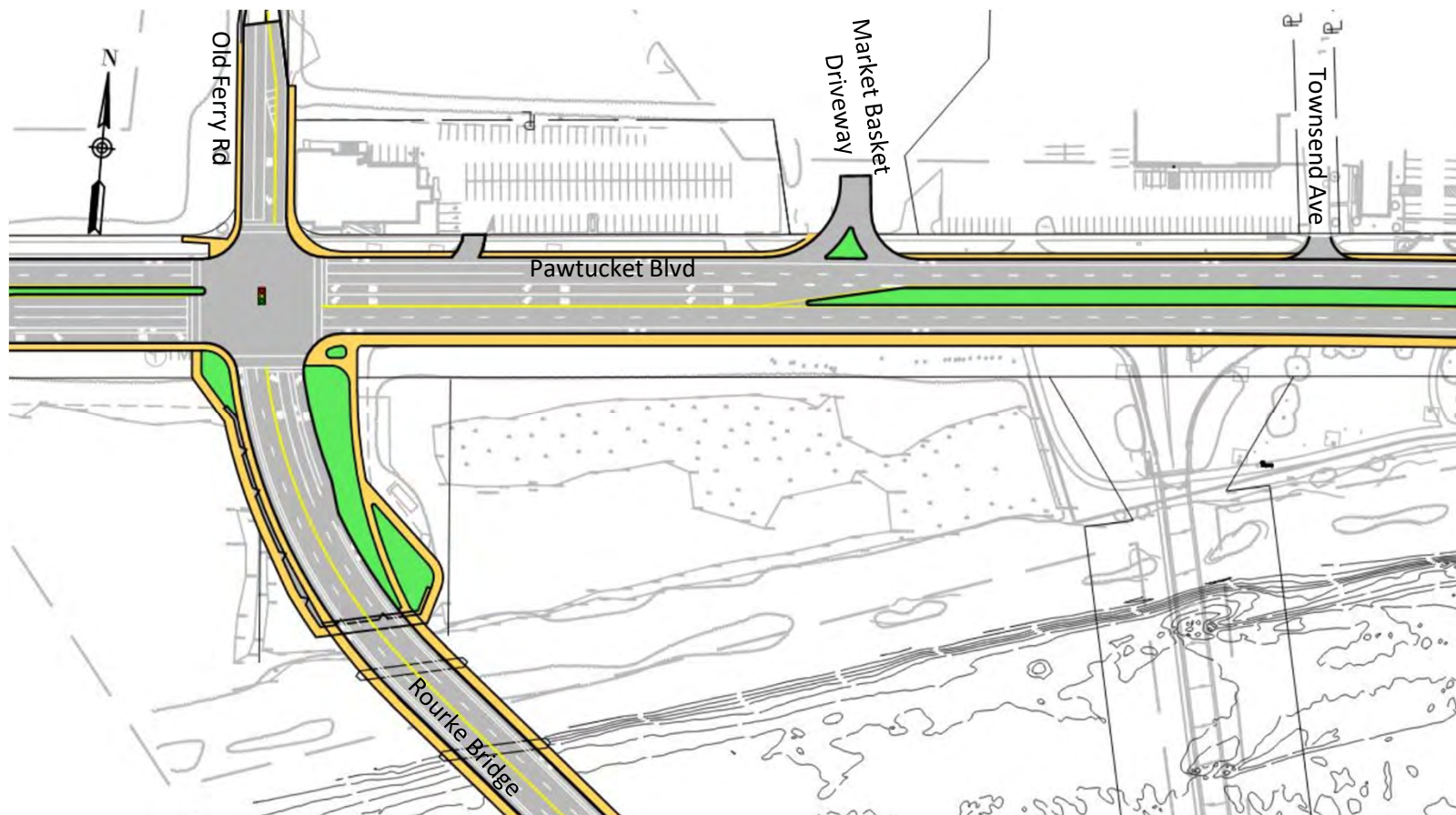
ALIGNMENT 2 SIGNALIZED INTERSECTION



Traffic Analysis



ALIGNMENT 3 SIGNALIZED INTERSECTION





Safety & Operations

Improvements at Rourke Bridge @ Pawtucket Blvd



Rourke @ Pawtucket (Build 1 & 2)



CARS:

- All movements under capacity.
- Added capacity to major movements (WB LT, NB)
- Improved signal timings to accommodate the peak hour directional traffic flows.
- Updated clearance intervals as needed.
- Overall LOS C and D
- $v/c > 1.0$



PEDS:

- Addition of crosswalks to all approaches.
- Addition of exclusive pedestrian phasing.
- Removal of channelized right turn lanes to reduce the number of pedestrian crossings per approach.



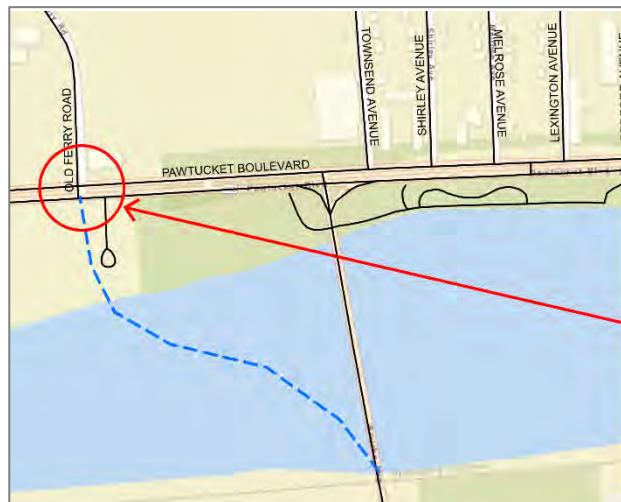
BIKES:

- Addition of bike lanes on Pawtucket Blvd. & Rourke Bridge.



EMERGENCY VEHICLES:

- All improved signals would be equipped with pre-emption.



Old Ferry @ Pawtucket (Build 3)



CARS:

- Reduced delay along Pawtucket Blvd with consolidation of signalized intersections.
- Improved signal timings to accommodate the peak hour directional traffic flows.
- Updated clearance intervals as needed.
- Overall LOS D
- $v/c > 1.0$



PEDS:

- Addition of crosswalks to all approaches.
- Addition of exclusive pedestrian phasing.



BIKES:

- Addition of bike lane on Pawtucket Blvd. & Rourke Bridge.



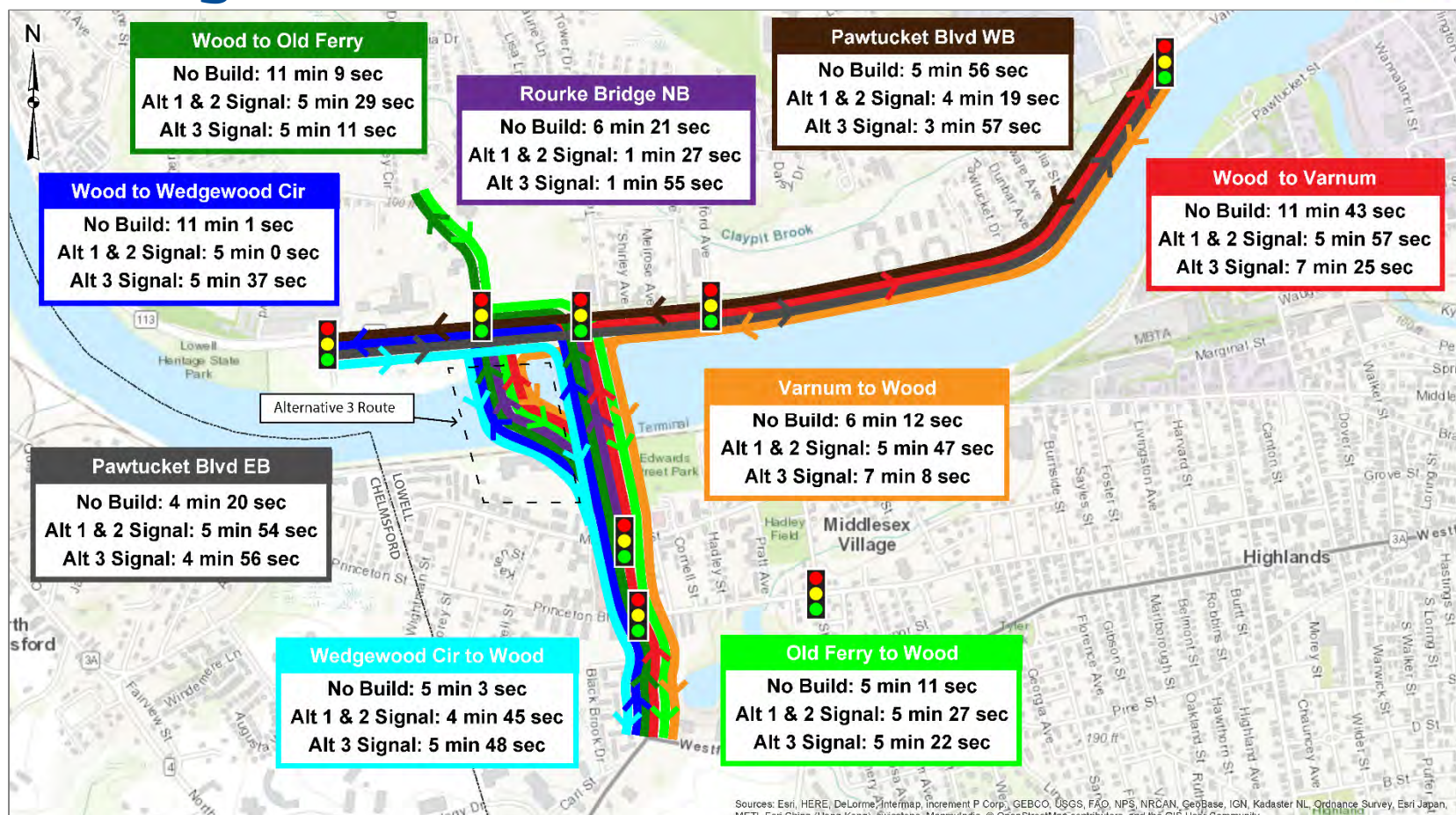
EMERGENCY VEHICLES:

- All improved signals would be equipped with pre-emption.



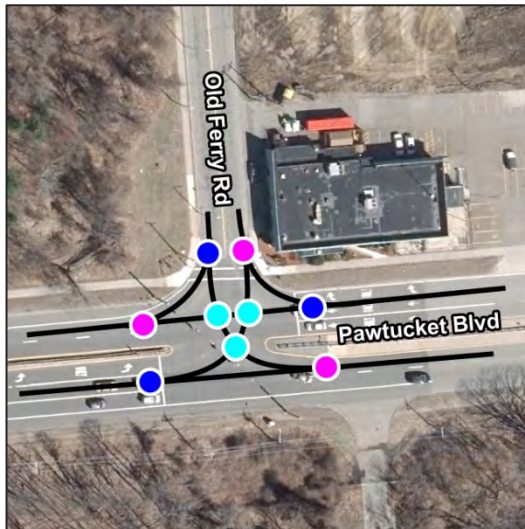
Travel Times

Signalized AM Peak Hour Travel Times

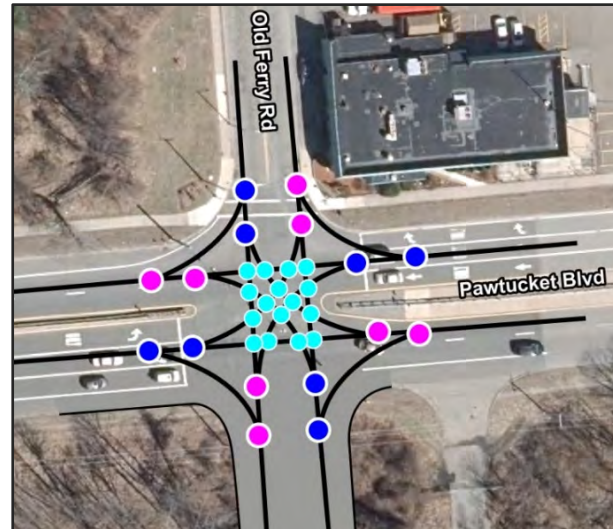


Safety Analysis

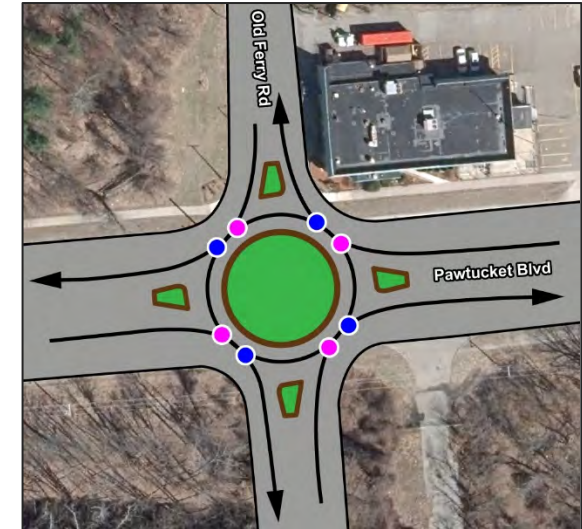
Conflict Points



T-Intersection



4-Legged Intersection



Roundabout

Legend



Diverging



Merging

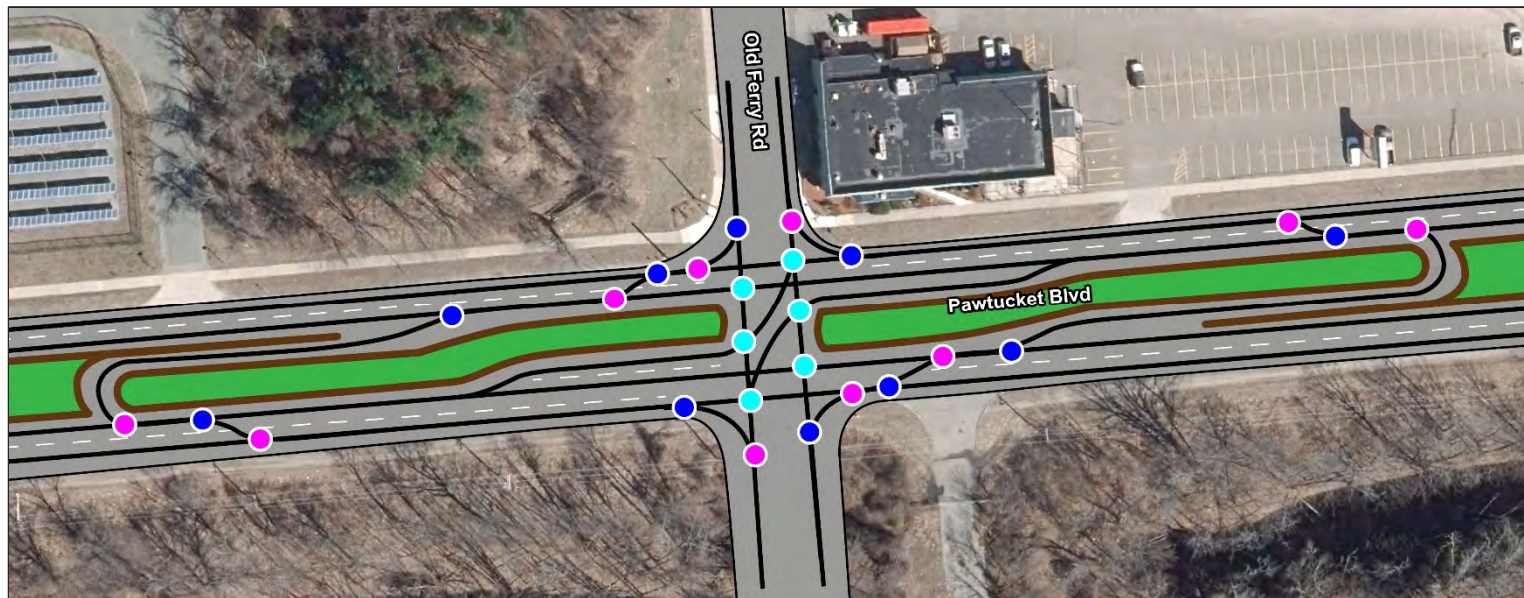


Crossing



Safety Analysis

Conflict Points



Michigan LT

Legend



Diverging



Merging

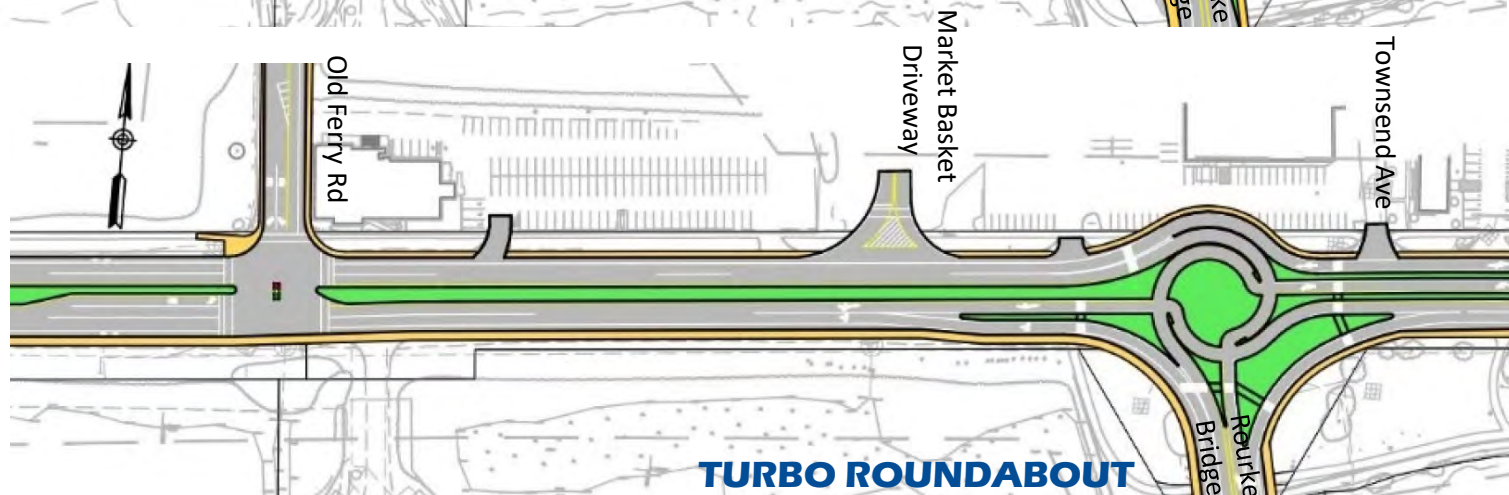
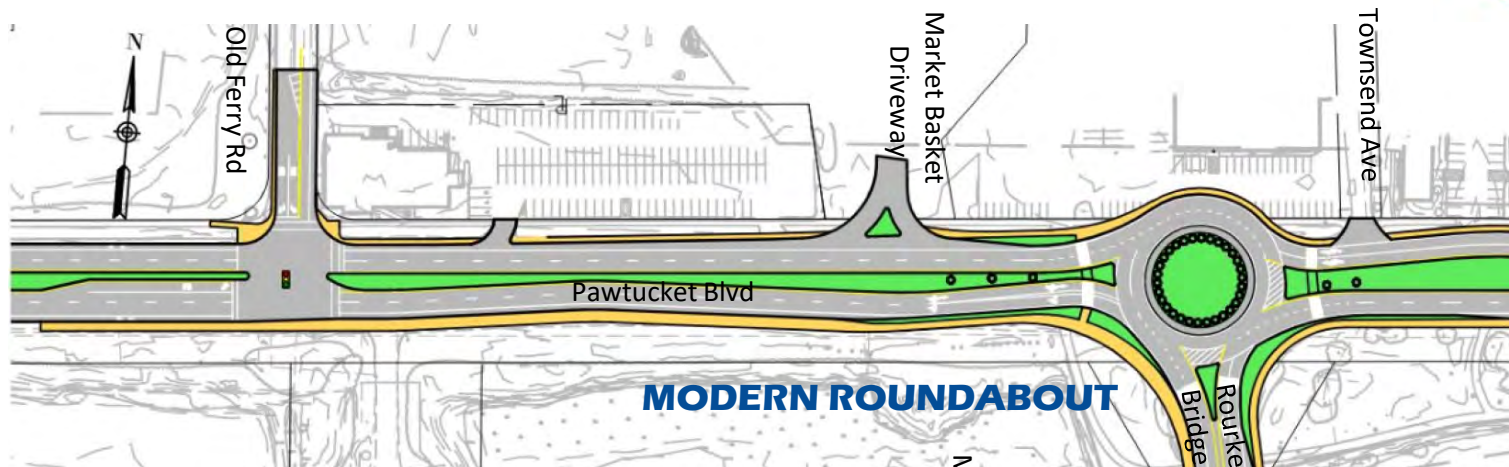


Crossing



Traffic Analysis

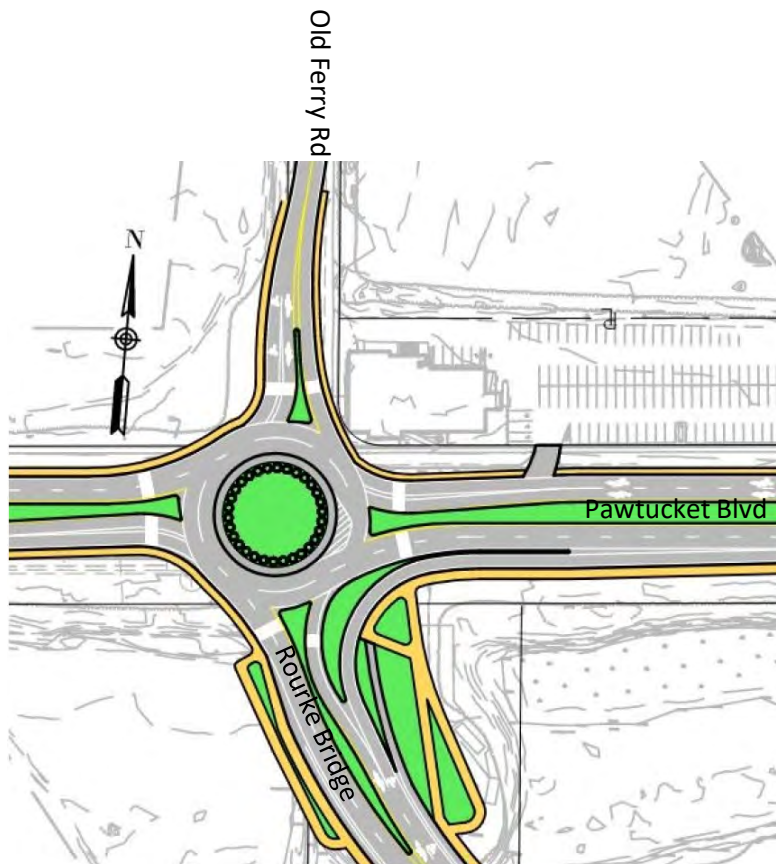
ALIGNMENTS 1 & 2: MODERN AND TURBO ROUNDABOUT OPTIONS



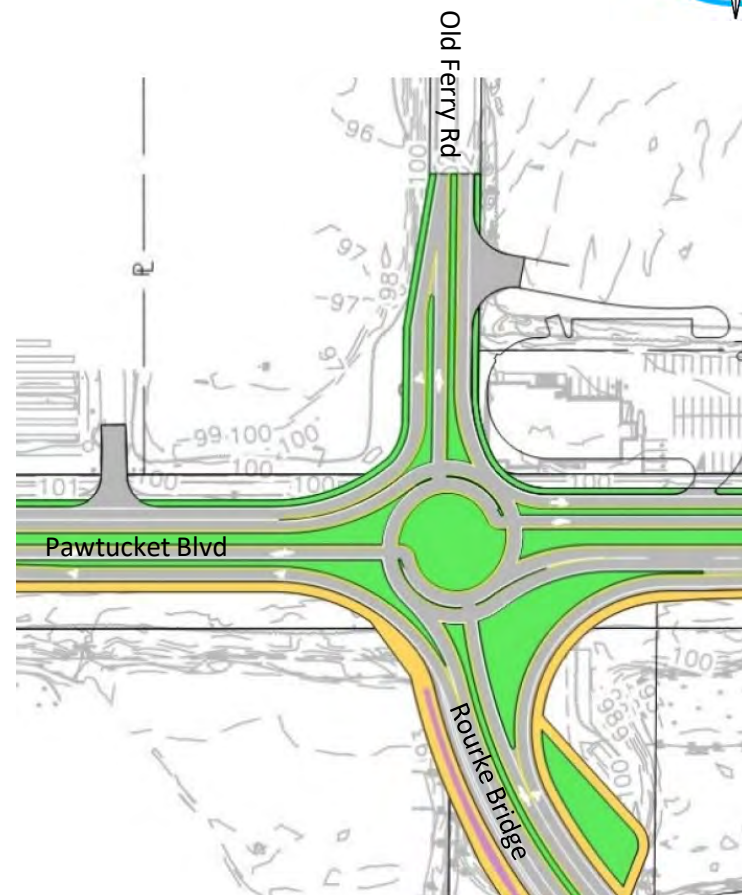


Traffic Analysis

ALIGNMENT 3: MODERN AND TURBO ROUNDABOUT OPTIONS



2 LANE MODERN ROUNDABOUT

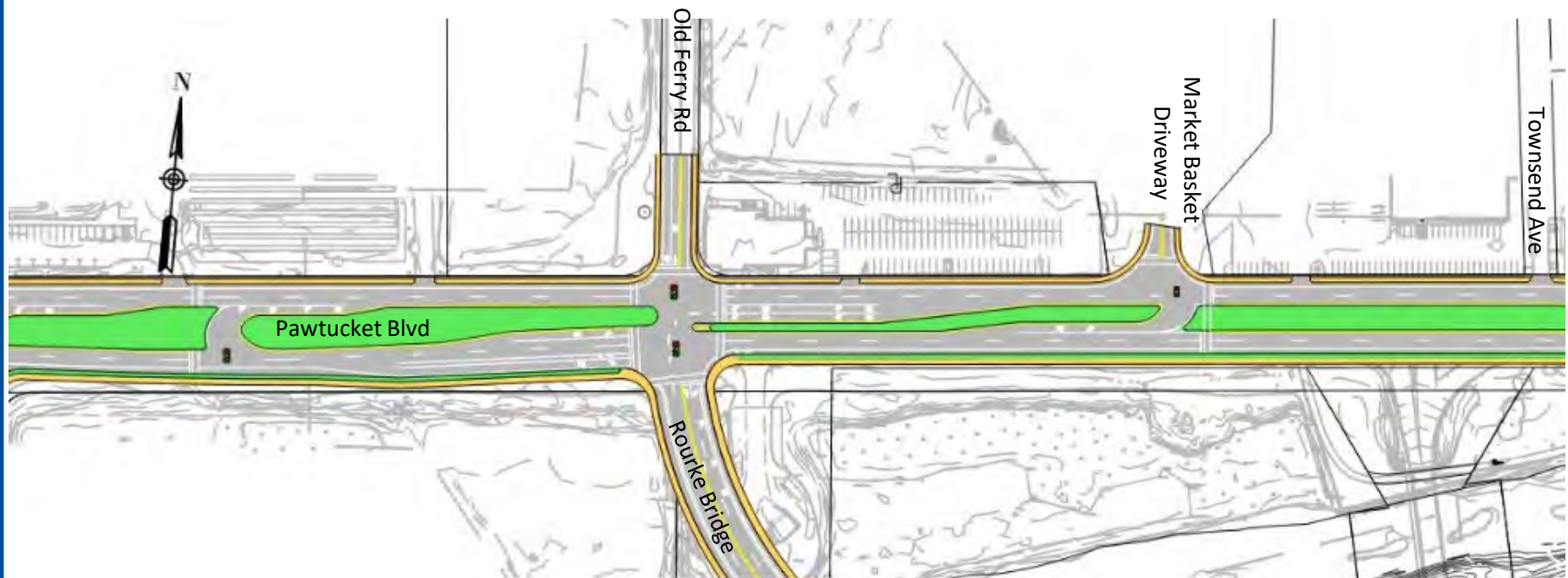


TURBO ROUNDABOUT



Traffic Analysis

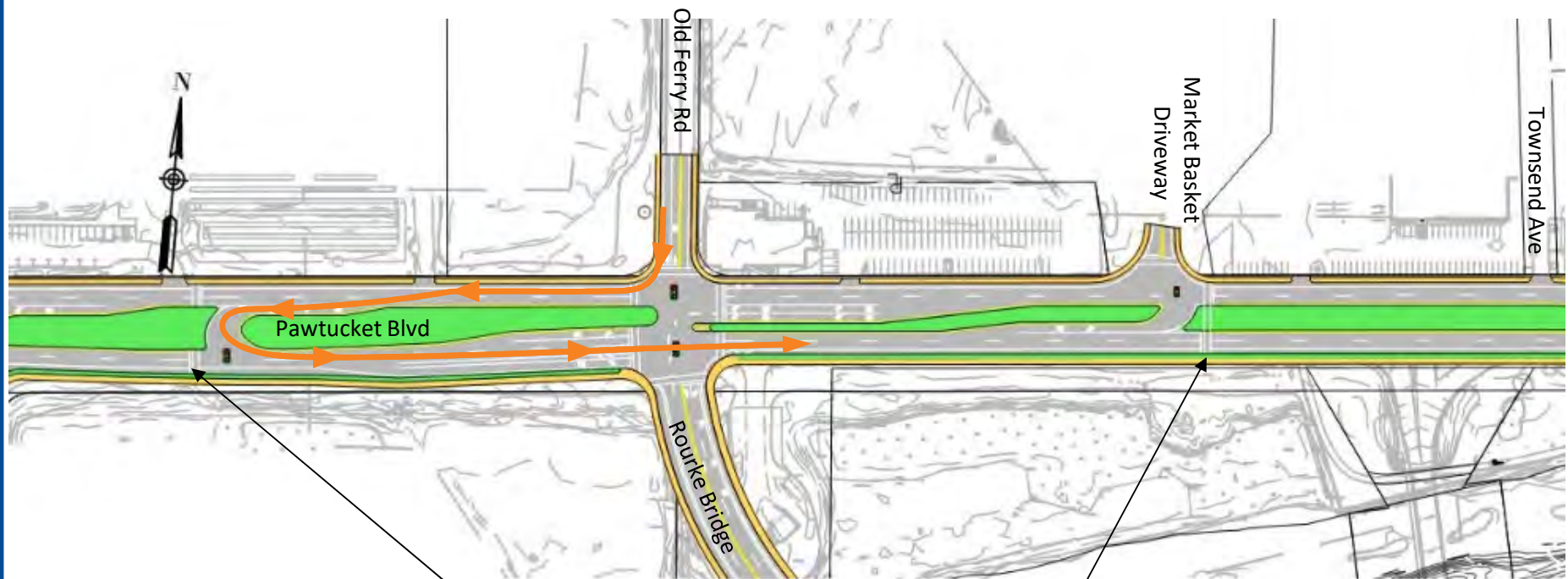
ALIGNMENT 3 MICHIGAN LEFT





Traffic Analysis

ALIGNMENT 3 MICHIGAN LEFT

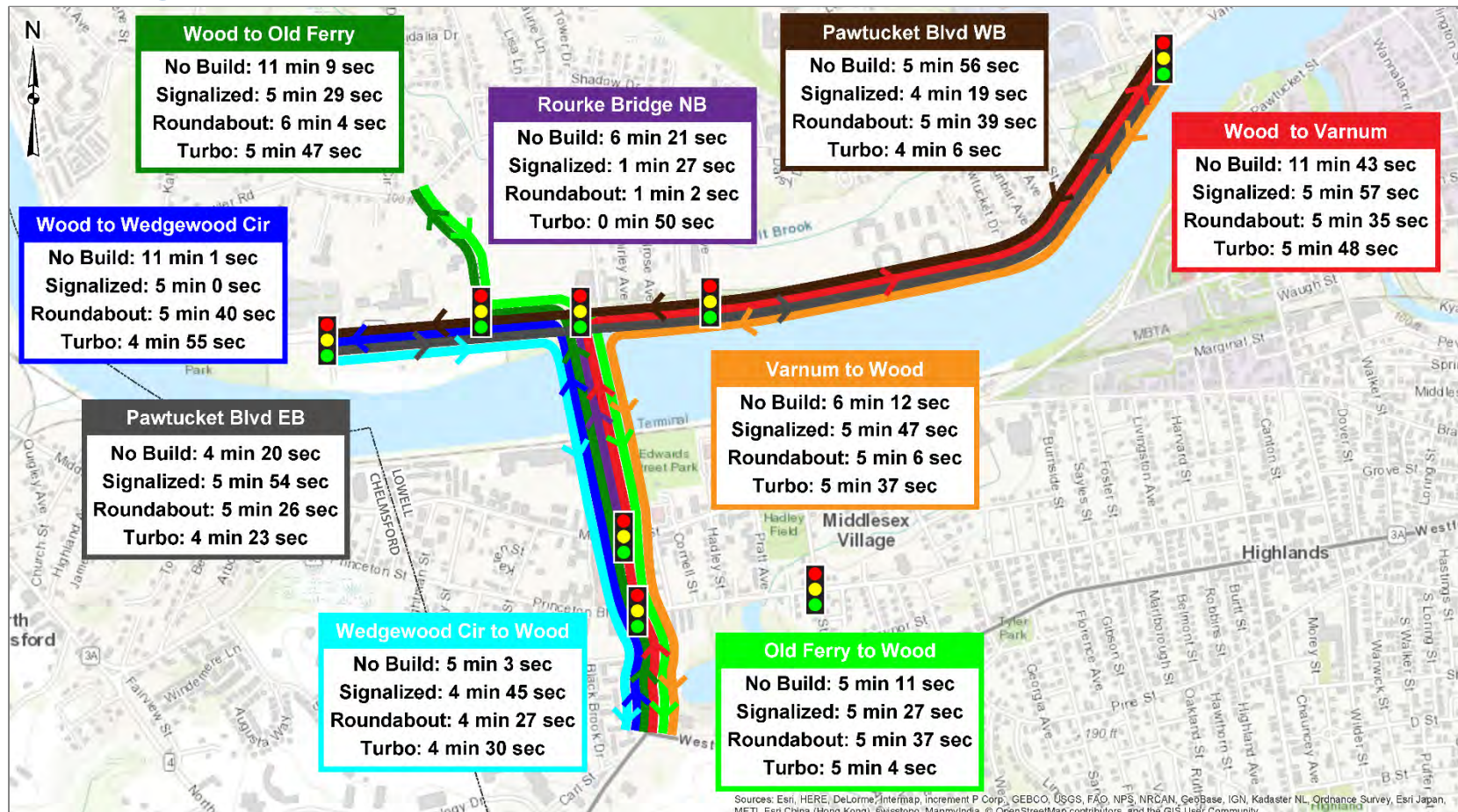


Shorter signal cycle length and
opportunity for additional crosswalks



Travel Times

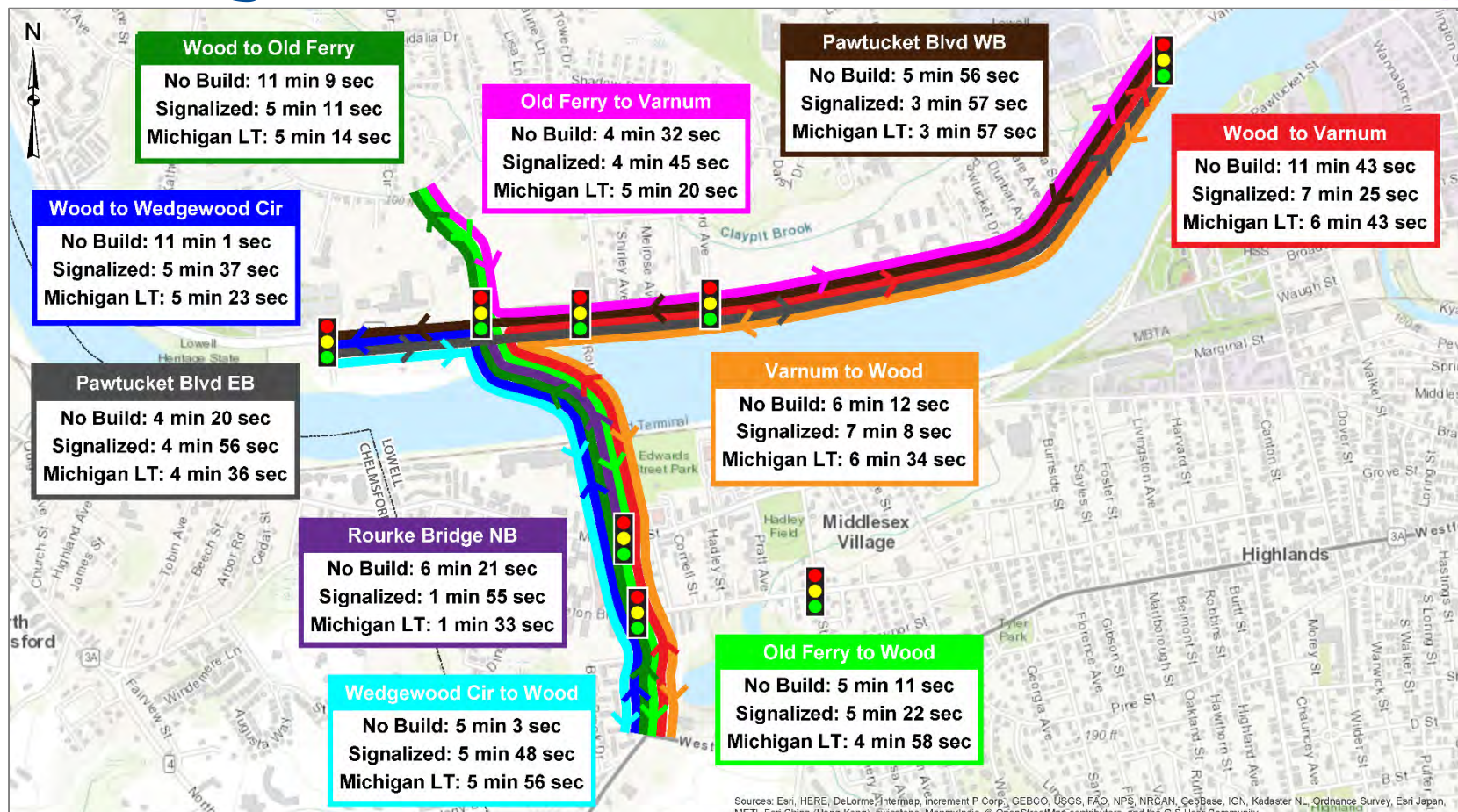
Alignments 1 & 2 AM Peak Hour Travel Times





Travel Times

Alignment 3 AM Peak Hour Travel Times



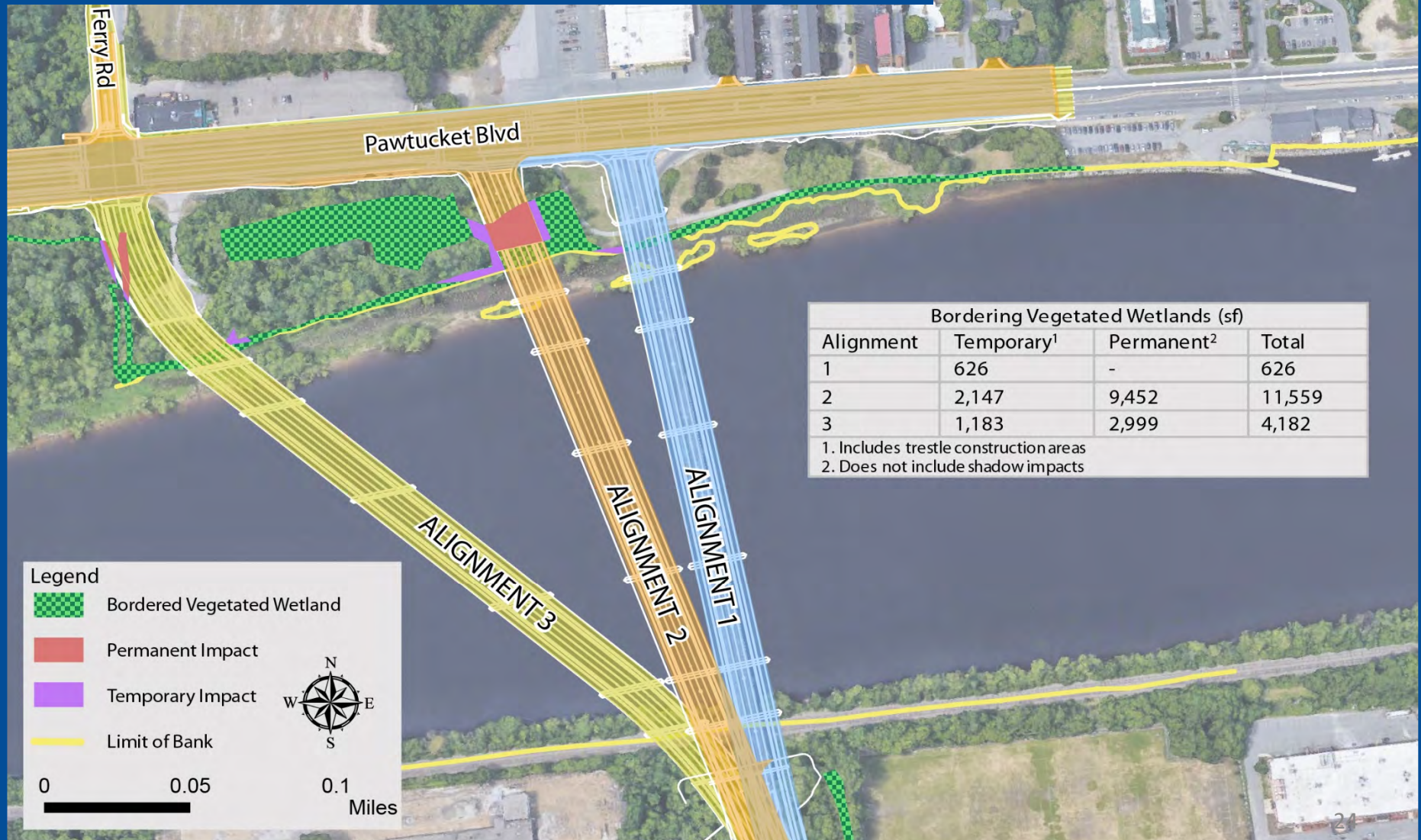


Environmental Considerations

- **Preliminary environmental impact analysis**
- **Preliminary regulatory implications**



Wetland Impacts



Open Space Impacts





Avoid Minimize Mitigate

- **Section 4(f) of the US Department of Transportation Act**
 - **FHWA must determine that there is no feasible and prudent alternative that avoids the Section 4(f) properties and that the project includes all possible planning to minimize harm to the Section 4(f) properties**
- **Section 6(f) of the Land and Water Conservation Fund Act**
 - **NPS must determine that practical measures to avoid the conversion of a 6(f) resource have been evaluated and no feasible alternative exists**

Preliminary Impact Summary

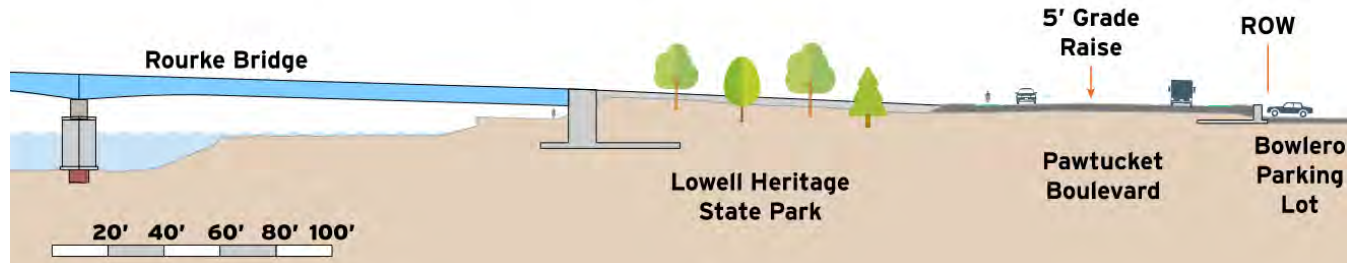


Impact Area	Alignment 1	Alignment 2	Alignment 3
Wetlands (WPA, CWA)	626 sf	11,559 sf	4,182 sf
Lowell Heritage State Park (Sections 4(f) & 6(f))	Yes	Yes	No
Wang Soccer Field (Section 4(f))	No	No	Yes
Opportunity for State Park Betterment	Least	Better	Best

Vertical Geometry



Alternative 1 and 2

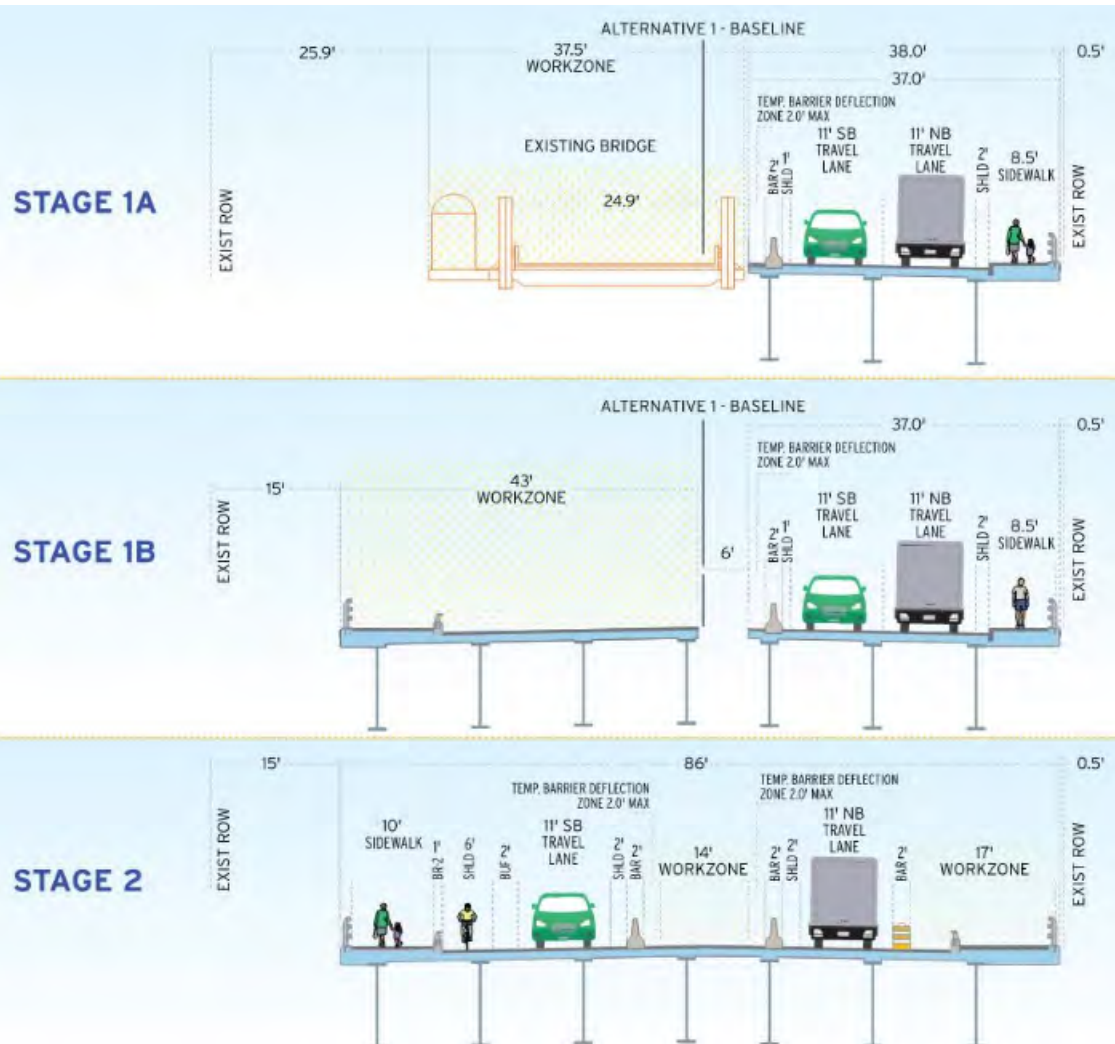


Alternative 3 - Old Ferry

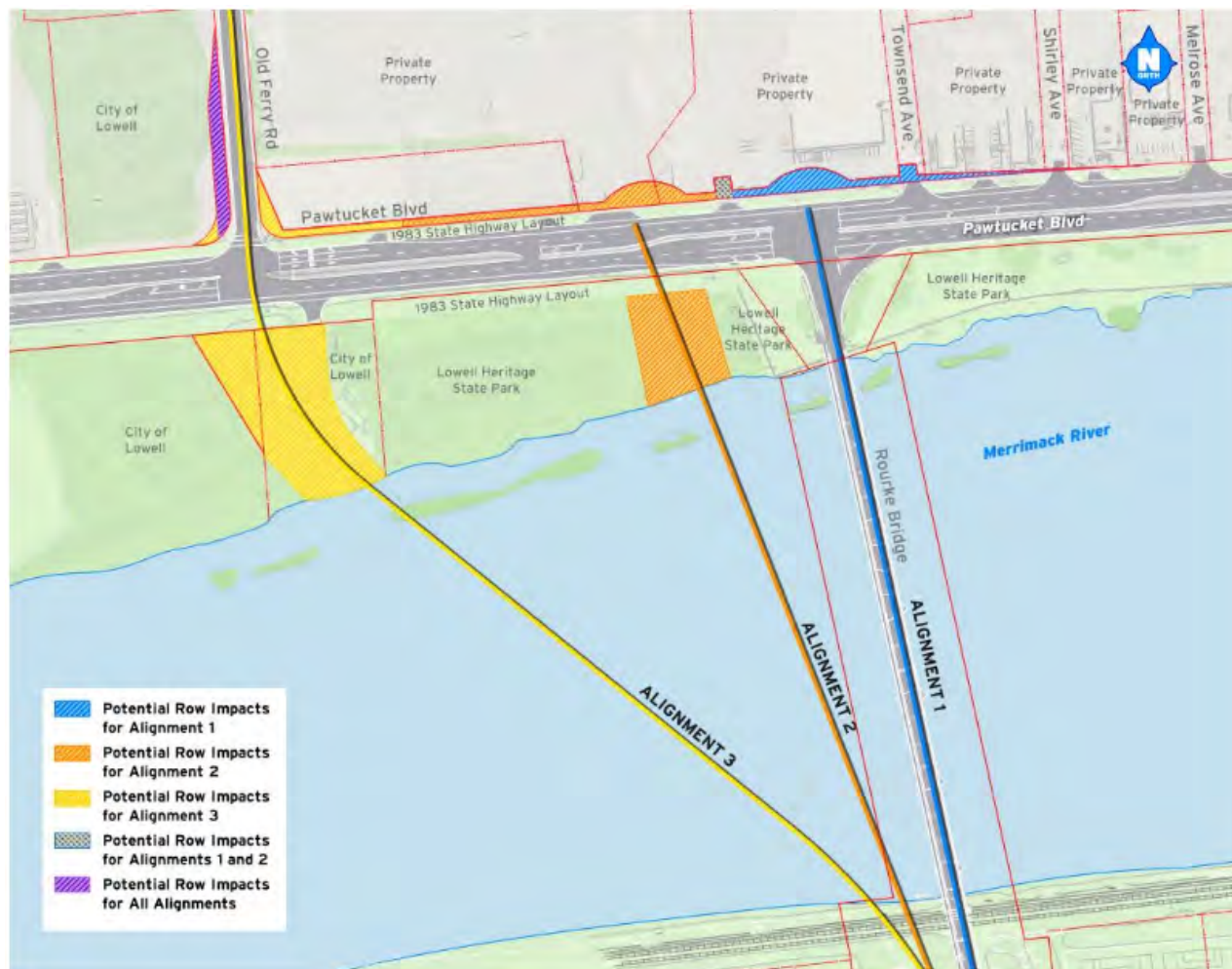




Constructability & Temporary Traffic Impacts



Right-of-Way Impacts

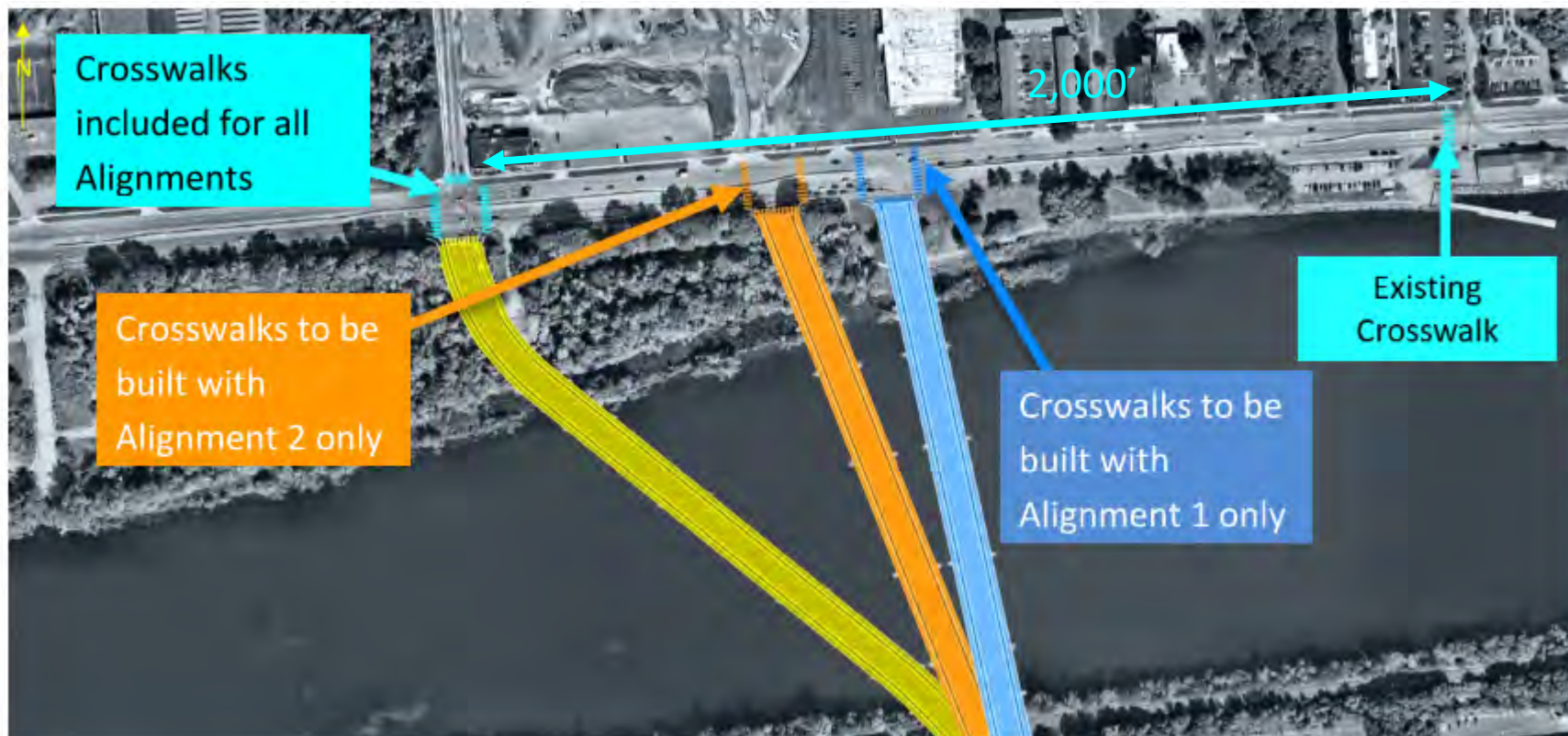


Walking Times



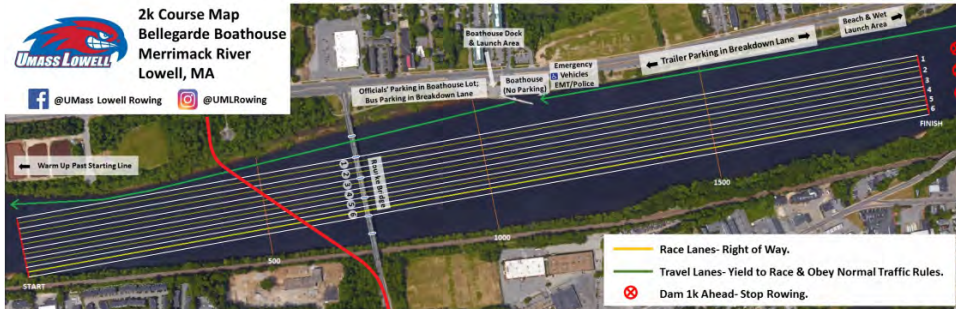


Pedestrian Connectivity





Watercraft Considerations





Schedule



TIMING OF BRIDGE OPENING

**Alignment 1: Add 1 year
(multi-stage construction)**

**Alignment 2: Add 2 years
(Potential Environmental Impact
Report & WPA Variance due to level
of impacts)**

**Alignment 3: Shorter
(single stage construction)**



Cost



Alignment 1: \$133M
includes 6 years escalation at 4%

Alignment 2: \$128M
includes 7 years escalation at 4%

Alignment 3: \$142M
includes 5 years escalation at 4%

Current Assumptions (subject to change):

84' wide structure

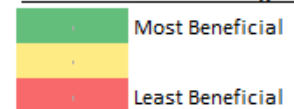
- 4 Travel Lanes
- Buffered Bike Lanes
- Sidewalks

Steel plate girder structure type

Summary



Scale relative to other alignments



Measure of Effectiveness Category	Rourke Bridge Alignments		
	Alignment 1	Alignment 2	Alignment 3
TRAFFIC OPERATIONS - SIGNALIZED INTERSECTION DESIGN	+	+	+
SAFETY - SIGNALIZED INTERSECTION DESIGN	+	+	+
MULTIMODAL CONNECTIVITY - SIGNALIZED INTERSECTION DESIGN	+	+	+
INTERSECTION DESIGN OPTIONS	+	+	+
TRAVEL TIME TO HOSPITAL	+	+	+
WATER RECREATION	+	+	+
HORIZONTAL BRIDGE ROADWAY GEOMETRY	+	+	+
VERTICAL BRIDGE ROADWAY GEOMETRY	+	+	+
WETLANDS, WATERWAYS AND FLOODPLAINS	+	+	+
PROTECTED OPEN SPACE IMPACTS	+	+	+
6(f) APPLICABILITY	+	+	+
OPPORTUNITY FOR BETTERMENT TO LOWELL HERITAGE STATE PARK	+	+	+
RIGHT-OF-WAY (ROW) IMPACTS	+	+	+
AESTHETIC OPPORTUNITY	+	+	+
MAINTENANCE AND UTILITIES	+	+	+
CONSTRUCTABILITY AND TEMPORARY TRAFFIC IMPACTS	+	+	+
SCHEDULE	+	+	+
PUBLIC FEEDBACK	+	+	+
CAPITAL COST (Dollars in millions)	\$133	\$128	\$142



Q&A

Thank You!
Please provide feedback online
via the link below:

<http://tiny.cc/RourkeBridge>