



High Congestion Intersections

Based on Model

- Plymouth Rd at Barton Dr
- M-14 at Barton Dr Interchange
- Dhu Varren Rd at Pontiac Trail
- Division St at Catherine St

Based on Observation

- Barton Dr at Pontiac Trail
- Maiden Ln/Broadway St/Moore St
- Maiden Ln at Fuller Rd

Barton at Pontiac Alternatives

- Operational Deficiencies
 - On-street parking at intersection
 - EB approach in AM peak (35 seconds of delay)
- Improvement Alternatives
 - Add dedicated EB right-turn lane (cut delays in half)
 - Modern Roundabout (cut delays by more than 50%)

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Barton at Pontiac Alternatives

- Improvement Alternatives
 - Restrict on-street parking on EB approach
 - Temporary bump-out with option to make permanent

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Barton at Pontiac Recommendations

- Remains signalized
- Restrict on-street parking on EB approach
- Add on-street bike lanes for EB and WB on Barton west leg
- Existing AM LOS C / 2040 LOS F
- Existing PM LOS C / 2040 LOS D
- Ex vs. 2040 AM SB volume = 628 v 996
- V/C ratio = 1.34 for 2040 SB thru lane

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Barton at Pontiac Recommendations

- Mini Roundabout
- Bikes can leave roadway onto path or circulate in roundabout
- Pedestrians cross one lane at a time
- Ex overall LOS B for AM/PM
- 2040 LOS D for AM/PM (with SB F in AM and WB F in PM)

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Broadway / Division / Beakes Alternatives

- Operational Deficiencies
 - High number of crashes [73 in 5 years, including 10 with injuries]
 - High number of conflict points [39, of which 14 are with pedestrian crossings]
 - High speeds coming down Division
 - Many streets coming together [7]
 - Pedestrian crossing on curve
 - On-street bike lane abruptly terminates 350' south of Carey
- Improvement Alternatives
 - Options to reduce number of conflict points [from 41% to 64% fewer conflicts]

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Broadway / Beakes / Division Recommendation

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Broadway / Division / Beakes Recommendation

- Continue x-section of Division up to Detroit, allows for 2-lanes, bike lane and parking
- Continue NB bike lane up to bridge, providing ramp onto bridge (bridge rail mod needed)
- Eliminate left turn lane onto Detroit, provide taper
- Incorporated alternative that provided least conflict points (other options can work too)
- Add pedestrian crossing in more visible location
- WB off Broadway Bridge, continue wide path for bikes and provide ramp into bike lane

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Pontiac at Dhu Varren Alternatives/Recommendation

- Operational Deficiencies
 - EB/WB under stop control
 - High speeds on Pontiac Tr
 - WB Dhu Varren delays in AM peak (LOS E, 36+ seconds of delay)
- Improvement Alternatives
 - Analyzed for signal (all approaches 20 seconds or less delay)
 - Recommend** - Analyzed for roundabout (LOS A, less than 8 seconds of delay per approach)
 - Reduces Speeds

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Barton at EB M-14 Ramp Alternatives

- Operational Deficiencies
 - All way stop intersection under MDOT jurisdiction
 - Off ramp approach failing in AM (55+ seconds of delay)
 - WB Barton fails in PM (59+ seconds of delay)
- Improvement Alternatives
 - Performed signal warrant analysis
 - Signal option could reduce delays (needs to be reviewed as part of an MDOT interchange treatment)

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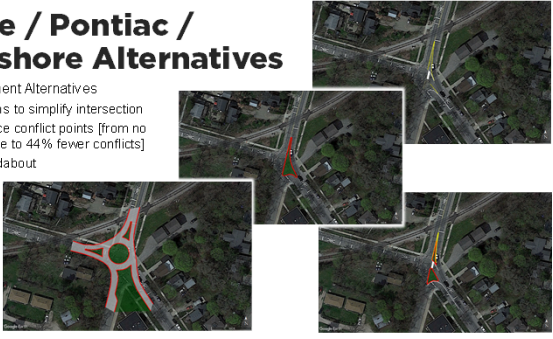
Moore / Pontiac / Longshore Alternatives

- Operational Deficiencies
 - One-way pair south of intersection
 - Pedestrian crossing issues - north leg
 - Confusing geometry
 - Speeds
 - Train track near intersection
 - Bike lanes north of intersection

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Moore / Pontiac / Longshore Alternatives

- Improvement Alternatives
 - Options to simplify intersection
 - Reduce conflict points [from no change to 44% fewer conflicts]
 - Roundabout



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Moore / Pontiac / Longshore Recommendation



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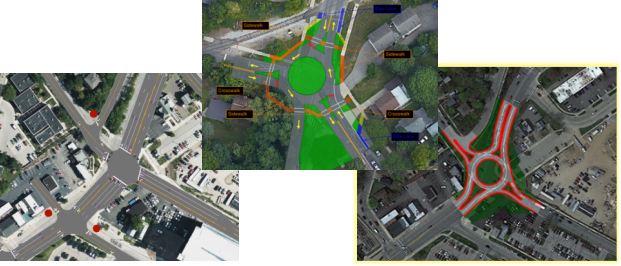
Moore / Pontiac / Longshore Recommendation

- Roundabout
 - Simplifies the intersection
 - Improves pedestrian safety for crossing
 - Reduces speeds
 - Maintains all movements
 - Bikes, provide multi use paths to get around roundabout



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Moore 2-way conversion



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Broadway at Maiden/Moore Alternatives/Recommendation


- Operational Deficiencies
 - Congestion on Broadway (overall LOS C, 25 and 32 avg delays for AM and PM existing)
 - AM SBL 50+ seconds of delay
 - PM NBL and NWL fail (68 and 56 seconds delay)
 - Discontinuity of ped/bike facilities
- Improvement Alternatives
 - Modern Roundabout (reduces approach delays to 12 seconds or less)
 - Optimize Signal Operations (potential Moore 2-way conversion)



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Speed Management Alternatives

- Operational Deficiencies
 - Corridors with noted high speeds (Broadway, Pontiac Tr, Division, Plymouth, Traver)
 - Pedestrian and Bike Safety
- Improvement Alternatives
 - Roundabouts
 - Median islands
 - Neckdowns
 - On street parking
 - Speed actuated signing
 - Gateway treatments
 - Bike Lanes



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Speed Management Recommendations


- Pontiac Trail
 - Roundabouts at Dhu Varren, Barton and Longshore, possible location between Barton and Dhu Varren at new developments
 - Additional radar speed signs
 - Marked pedestrian crossings
 - Gateway treatments
 - Lane reduction from 2 to 1 from Longshore to Swift with added bike lanes



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Speed Management Recommendations

- Plymouth
 - Incorporate median island as much as possible
 - Additional bus stop on north side, provide median refuge island
 - New plans provide reduced lane widths and north side bike lane (WB)
 - EB bikes can follow pathway on south side
 - Radar speed signs



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Speed Management Recommendations


- Traver
 - Additional speed humps
 - Fill in sidewalk gap



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Speed Management Recommendations

- Division to Broadway
 - Bump-outs
 - Radar speed signs
 - New signal west of river

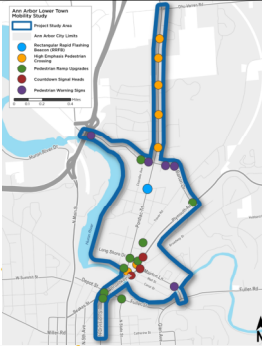


Existing	Proposed	
XX	XX	Radar Speed Sign
EG	EG	Enhanced Ped Crossing
EG	EG	Enhanced Ped Crossing with Gateway Treatment
—	—	Curb Extension (Bump-out)

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Pedestrian Findings Recommendations

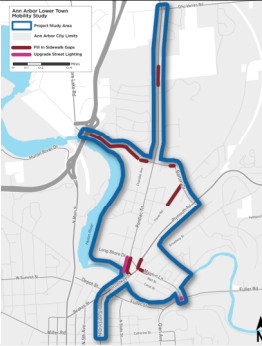
- Need for pedestrian crossing improvements
 - Rectangular Rapid Flashing Beacons (RRFBs)
 - High emphasis crossings
 - Ramp upgrades
 - Countdown signal heads
 - Install pedestrian warning signs



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Pedestrian Findings Recommendations

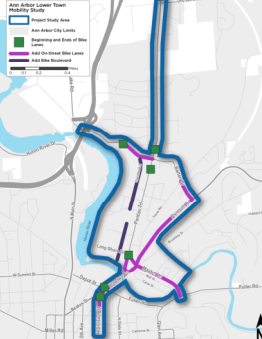
- Improve the Pedestrian Experience
 - Street trees and increased greenbelt
 - Fill in system gaps (sidewalk, fence, etc.)
 - Lighting
 - School improvements
 - Traffic reductions
 - Speed management



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Bicycle Findings Recommendations

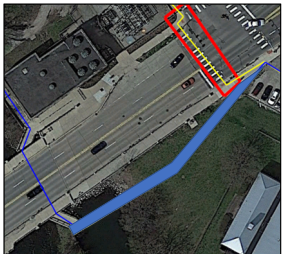

- Safety Features
 - Bike lanes blocked
 - Obstructions
 - Boardwalk
 - Bike boulevard
 - Lanes adjacent to parking



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Pedestrian/Bicycle Recommendation


- Cascades Access
 - Connection from south side of Broadway Bridge to Riverwalk
 - Reduces pedestrian/bicycle crossings of Broadway

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Transit Findings Recommendations

- Rider Amenities
 - Increase frequency and reliability
 - Upgrade bus stops for ADA compliance
 - Additional park and ride opportunities
 - Eliminate bus stop conflicts
 - Transit Signal Priority
 - Fixed bus route Barton to Main via M-14




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MV Findings

- Infrastructure Improvements
 - Pavement Markings
 - Sign Upgrades
 - Pavement Condition
 - Guardrail
 - Signal Modernization
 - EV Charging Stations
 - Intersection Specific






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MV Findings Recommendations

- Driver Technologies
 - Changeable Message Signs
 - Speed Management & Warning Systems
 - Transportation System Management
 - Transportation Demand Management





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Transportation Demand & System Management Alternatives (TDM & TSM)

- Operational Deficiencies
 - Congested peak periods of travel
 - Vehicle emissions
- Improvement Alternatives
 - Improved non-motorized conditions
 - Improve public transit, more Park & Ride options
 - Ridesharing programs
 - Incentives to give up parking
 - Flexible work times
 - Transit supportive development





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