Ohio Department of Transportation

GRE-35-4.30
SuperStreets

PID 102421
October 25, 2016

John R. Kasich,
Ohio Governor

Jerry Wray,
ODOT Director
Project History

• Access Ohio 2040 – US 35 is designated as a Statewide Highway Corridor, a corridor with statewide significance for Ohio’s economic vitality.

• Travel efficiency is the predominant transportation issue in the project area.

• US 35, with five at-grade intersections within the project area, does not have enough capacity to serve existing transportation demands.

• The levels of service are at or close to failing at the US 35/Factory Road intersection. By 2030, US 35 at Factory, Orchard Lane, and Valley-Trebein are forecast to be Level of Service (LOS) F.

• Final component of a long term program to upgrade US 35, between Dayton and into West Virginia.

• This component and overall project has been highly supported by Local and State Officials.
Community Involvement

- Conceptual Alternatives Studies - 2009
- Assessment of Feasible Solutions - 2011
- Community Stakeholder Groups
- Business Owner Groups
- Public Involvement Meetings
- Selection of Preferred Alternative - 2013
Ultimate Solution

• Split Diamond Interchange at Factory Road to Orchard Lane and Folded Diamond Interchange at Valley Trebein Road
  • Environmental Studies Complete
  • Stage 1 Plans Developed
  • Right of Way Plans Under Development
  • $120M Total Construction
Split Diamond Interchanges
Half Folded Diamond Interchange
Chasing the Money

• $120M Construction Cost
• TRAC Funding Limited
• Local Partners Phasing
• ODOT Safety Funding
Planned Projects

• **Shakertown Road Relocation**
  • City of Beavercreek is developing the Shakertown Road Relocation as an effort to advance safety measures. Sale 2019 $3.4M

• **Valley Trebein Road**
  • ODOT Safety funds are being utilized to add a southbound right turn lane to reduce congestion on Trebein Road. Sale 2018 $500K
What about us?
Project Area Needs

- Congestion
- Safety
- Freight Movement
Congestion

• No Build Travel times
  • 203 seconds EB
  • 166 seconds WB

• Total Delay
  • 126 seconds/vehicle EB
  • 91 seconds/vehicle WB
Freight

• 23,700 Tons of Freight per day
• $71.75 Million per day
• 20 hours of delay per peak hour for trucks
• 100 hours of delay for trucks per day
Interim Solution for Factory / Orchard

• Superstreets
  • Performance Based Practical Design
  • Preliminary Plans in Progress
  • Smaller Environmental Footprint
  • Right of Way Acquisition Summer 2017
  • Design Build Contract Sale 2018
  • Estimated Construction Cost - $13.7M
Interim Solution – Superstreets

• Meets Project Purpose and Need
  • Improve Congestion & Safety

• Fundable Solution
  • Approximately $6M per intersection construction
  • Project funded through ODOT, Local and MVRPC funding sources
  • Will perform better than the existing signals for many years while interchange development and construction funding is pursued.
What is a Superstreet

- It is a non-traditional signalized intersection that can provide more capacity than a traditional traffic signal (like the one at Factory Road).
- It does not allow side street traffic to turn left or go straight through the main intersection – these movements turn right and do a u-turn at a nearby signal to get to their desired path.
Superstreets Operation

- Cross street (minor road) traffic turns right, then accesses U-turn to proceed in desired direction.

- Main and U-turn intersections can be either signalized (“Superstreet”) or not (“J-Turn”)
Why Superstreets

• Higher Capacity - Breaks movements of a traditional 8 phase intersection (like at Factory Road) into several smaller 2 phase intersections. This allows more GREEN time to be directed to heavy movements (higher capacity compared to a traditional signal).

• Coordination - You can coordinate both mainline directions independent of each other – this is only possible with a Superstreet.

• Safety – fewer conflict points.

• Reduced Delay
### Higher Capacity Than Traditional Signal

**Signal Capacity** – Maximum is 1,900 vehicles/hour/lane IF approach gets 100% of the green time (i.e., 3800 vehicles per hour for a 2 lane signalized approach)

<table>
<thead>
<tr>
<th>Existing Signal at Factory Rd. PM Eastbound</th>
<th>Proposed Superstreet at Factory Rd. Signal PM Eastbound</th>
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<tbody>
<tr>
<td>• EB US35 Currently Gets approx. 60% of the green time</td>
<td>• Proposed Superstreet could give approx. 82% of the green time to EB US35</td>
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<td>• 60% x 3,800 = <strong>2,280</strong> veh./hr. for EB US35 (approx.)</td>
<td>• 82% x 3,800 = <strong>3,116</strong> veh./hr. for EB US35 (approx.)</td>
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Proposed Superstreet signal can process 836 (3,116 – 2,280) more vehicles per hour for EB US35 compared to the existing signal/timing.

For Comparison – a FREEWAY lane (i.e., interchange instead of intersection) can process approximately 2,300 veh/hr/lane (2 lanes = **4,600** veh/hr/lane approx.)
Safer Compared to Traditional Signals

- Less chance of severe angle crashes
- Fewer conflict points

![Diagram of conventional intersection conflict points with 32 total conflict points compared to a superstreet conflict points diagram with 14 total conflict points.](image)
Reductions in Delay

- Reduction in Travel time by up to 23%
- Reduction in Total Delay by up to 51%
Additional Community Outreach

• Stakeholders Meeting
• City of Beavercreek Council Meeting
• City of Beavercreek Public Involvement Meeting
• Multiple Press Releases
• Individual Stakeholder Meetings
Public Concerns

• More Signals?

• Bike/Pedestrian Movements
Timing is Everything

• Higher Capacity - Breaks movements of a traditional 8 phase intersection (like at Factory Road) into several smaller 2 phase intersections. This allows more GREEN time to be directed to heavy movements (higher capacity compared to a traditional signal).

• Coordination - You can coordinate both mainline directions independent of each other – this is only possible with a Superstreet.
Pedestrian “z” crossing
Pedestrian-vehicle conflict points

RCUT Intersection
8 conflict points

Conventional Intersection
24 conflict points
Next Steps

• Preliminary Plans in Progress
• Smaller Environmental Footprint
• Additional Public Outreach 2017/2018
• Right of Way Acquisition Summer 2017
• Design Build Contract Sale 2018
Questions

The quality of a question is not judged by its complexity but by the complexity of thinking it provokes.

Joseph O’Connor