I-75 / University Drive:

An Interchange Under Pressure Becomes a Diamond

OTEC 2016
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OHM Advisors
• Background and History
• Need for Improvement
• Act of God
• DDI Concept
• Design Build
• Branding

I-75/University DDI
23,000 residents
100,000 daytime population
1963: Farmland
Operation Problems:
• Bottleneck
• WB to SB
• No Ped facilities
• Chrysler ramps

1990s - 2000s:
• Chrysler
• Auburn Hills tech park
• Oakland University
• Others
Operational Problem:
Chrysler NB C-D road ends
Solution:

Reconstruct Parclo
  • Late 90s
  • Impacts
  • ROW
  • Cost
Reconstruct Parclo:

- Deferred in 2005
- Pavement/bridge conditions
- Operational issues

Now What?
2005 - 2008

City of Auburn Hills
• Frustration
• Poor Operations
• Ugly *Front Door*
• Economic Barrier

Other Solutions?
Developing Options

- SPUI
- Modified Parclo
- Roundabouts
- DDI
Developing Options

- **SPUI**: Bridge deck cost due to skew
- Modified Parclo
- Roundabouts
- DDI
Developing Options

- **SPUI**: *Bridge deck cost due to skew*
- **Modified Parclo**: *Highest cost and most ROW impacts*
- Roundabouts
- DDI
Developing Options

- Roundabouts: Lowest Cost ($12 million) and LOS B
Developing Options

- **SPUI**: Bridge deck cost due to skew
- **Modified Parclo**: Highest cost and most ROW impacts
- **Roundabouts**: Viable option?
- **DDI**
Developing Options

- **SPUI:** *Bridge deck cost due to skew*
- **Modified Parclo:** *Highest cost and most ROW needs*
- **Roundabouts:** *Viable option?*
- **DDI:** Innovative, no ROW, moderate cost, LOS B/C
Developing the DDI Option

- Coordination with Missouri DOT
- Developed understanding of the DDI
- Worked on traffic models
- Concluded DDI was a viable option
- Presented to the City of Auburn Hills
- DDI fit with Innovation/Hi Tech brand
2009: DDI Option is Pursued by the City of Auburn Hills

A Call for Action
A Call for Action

2009 - 2013:

- Auburn Hills aggressively pursues funding
  - MDOT program
  - Legislators
  - Regional coalition
  - Bring the $$$
  - Pursue TIGER Grant funding
For 4 years, we talked to *every leader we could find* in government and business about this project.

- Stephanie Carroll, City of Auburn Hills
A turn of events...

• City of AH streetscape project
• University Drive overlay
• Bridge deck overlay
• Bridge Load Rating
Polar Vortex of 2014

- Severe cracks in bridge beams
- Emergency closure
- Temp supports
Go Time?!

MDOT priority. Funding sources:

- $8M savings freeway project
- $4M from City of Auburn Hills
- $2M from TEDF
- $4M from Legislature
- $0.5M from TAP
- Looked at design phase
Go Time!!

Design-Build:

• Owner’s rep team
Go Time!!

Design-Build:

- Owner’s rep team
- RFP Phase (2014): Prelim design and bidding
Go Time!!

Design-Build:

• Owner’s rep team
• RFP Phase (2014): Prelim design and bidding
• Contractor Design Phase (2015): Reviewer
Go Time!!

Key Elements:

- ROW
- Traffic Modeling
- Geometry

*Challenges...*
- Queue sensitivity on west side
- Manage the curvature
- Avoid wetlands and poor soils
Challenges

Queue sensitivity on west side:

• PM Peak
• On-ramp to SB I-75
• Merging
Challenges

Queue sensitivity on west side (PM)

• X-over locations
• Minimize lanes on bridge

• Merge for SB on-ramp
• Opdyke Rd

Preliminary Design
Challenges

Manage the curvature

- 44 degree skewed bridge
- Lane discipline

- Driver expectation
- Speed control
Challenges

Avoid poor soils and wetlands

• Wetlands in SE and NE
• Soft clay and peat in SW
Challenges

Contractor’s Initial Geometry

- 26 degree skewed bridge
- Lowers bridge span

- Less wall and fencing
- $1 million in cost savings!
Challenges

Contractor’s Initial Geometry

- Queues on west side
- Avoid wetlands and bad soils

• Curvature and driver expectation concerns
Challenges

Contractor’s Initial Geometry

- Queues on west side
- Avoid wetlands and bad soils

- Curvature and driver expectation concerns
Challenges

Modifications

- Increase distance from x-overs to bridge
- Increase tangent lengths
- Promote lane discipline
Challenges

Final Geometry
A Brand

• Joint effort: Auburn Hills and Oakland U
• An *iconic* gateway
• Elevate the quality of the *arrival experience*
A Brand

• An identity *beyond an exit number*
• A sense of place
• You have arrived!
A Brand

• Engine for economic growth
• Reinvestment in land use
• High-tech research and college town
A Brand

• First of its kind in Michigan
An Identity
Iconic Gateway
Minimal Delay
Quality Arrival Experience
Economic Growth
Innovation