Hard Shoulder Running
THE Ohio Planning Conference

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• ODOT History:
  • ODOT is wrapping up an Active Travel Demand Management (ATDM) study of all of our congested freeway corridors.

• Goal is to identify lower cost ATDM strategies than traditional widening to improve system operations.
Potential ATDM Strategies Considered

- Hard Shoulder Running
- Contra Flow Lanes
- High Occupancy Vehicle Lanes
- Bus Only Lanes
- Priced Lanes
- TMC Improvements
- Incident Response
- Integrated Corridor Management

- Truck Only Lanes
- Speed Harmonization
- Dynamic Message Signs providing real-time traffic information
- Dynamic Route Planning
- Ramp Metering
- Dynamic Lane Assignment
- Queue Warning
ATDM Strategies Can Assist With

**Application**
- Expands capacity
- Shifts demand
- Meters traffic

**Outcome**
- Restored travel speeds
- Improved safety
- Travel time reliability
- Long term Return on Investment
I-35W (Minneapolis, MN)
- Inside shoulder was converted to a Priced Dynamic Shoulder Lane
- Utilizes variable speed limits
- MnDOT states that the facility is operating safely and more efficiently

I-66 (between Merrifield, VA and Washington D.C.)
- Outside shoulder used as a HSR
- Signs are placed strategically
- Shoulder lane is also paved with red pavement material to distinguish
- double white lines were placed to indicate areas where merging and diverging is allowed
ATDM Examples in Other States

I-110/I-10 L.A. Metro Expresslanes
- Congestion Reduction Pilot Project
- Originally a 1 year demonstration project
- Conversion of the existing HOV to HOT
- Increased speeds in the general purpose lanes

I-595 Reversible Expresslanes
- Opened March 2014
- 10 mile E.B./W.B. commute
- Utilizes a series of gate at entry
- Enhanced signage (digital and static)
From the ATDM Study – one of the strategies that we have chosen to pilot is Hard Shoulder Running (HSR)

HSR provides an additional lane via the shoulder for use during peak (congested) travel hours. In the non-peak hours the shoulder reverts to it’s normal function.

Can be tolled (HOT Lane) or non-tolled (our pilots will be non-tolled)
Candidate Pilot Corridors

<table>
<thead>
<tr>
<th>Location</th>
<th>Direction</th>
<th>HSR Length (mi.)</th>
<th>$ Additional Work</th>
<th>$ Construction</th>
<th>$ ITS</th>
<th>$ Total M</th>
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<td>I-275</td>
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</table>
I wonder what HSR might look like in Ohio............
Washington DOT Example HSR
Hard Shoulder Running

Washington DOT (WsDOT)

• Static Hard Shoulder Running (HSR) installation that is open at fixed times (3p-7p).

• Regulated only by static signs.

• No ability for DOT to dynamically alter, change or manage the freeway operation.

• Lowest complexity and operational abilities
Hard Shoulder Running

Passive Time of Day Operation:

• Static Signs Only
• No ability by DOT to open or close lane dynamically

Approximately 1.8 Miles
Hard Shoulder Running

- Entering HSR Operation
Hard Shoulder Running

- Inside HSR Operation
Minnesota DOT Example HSR
Minnesota DOT (MnDOT)

• Dynamic Hard Shoulder Running (HSR) for select vehicles (car pools, busses, motorcycles) that is available based on traffic conditions (congestion). Open when indicated by green arrow.

• System can also provide lane use information for adjacent lanes to indicate that a closure is impending, to merge, etc.

• Provides the most operational abilities but is complex and requires the most long term operations and maintenance effort.
Hard Shoulder Running

- Dynamic Control:
  - Requires extensive operation
  - Requires extensive infrastructure
  - Requires significant manpower
  - Allows for dynamic control and use of all lanes based on conditions including lane closures due to accidents as shown on video.
Hard Shoulder Running
In terms of complexity and capability, the system contemplated by ODOT is between WsDOT and MnDOT.

Our operation will be time of day but we can vary based on need. Speed harmonization may be part of the system.
Hard Shoulder Running

• What Now:
  • Decide which locations will be pilots;
  • Coordinate with MPO’s;
  • Get Funding

Questions???