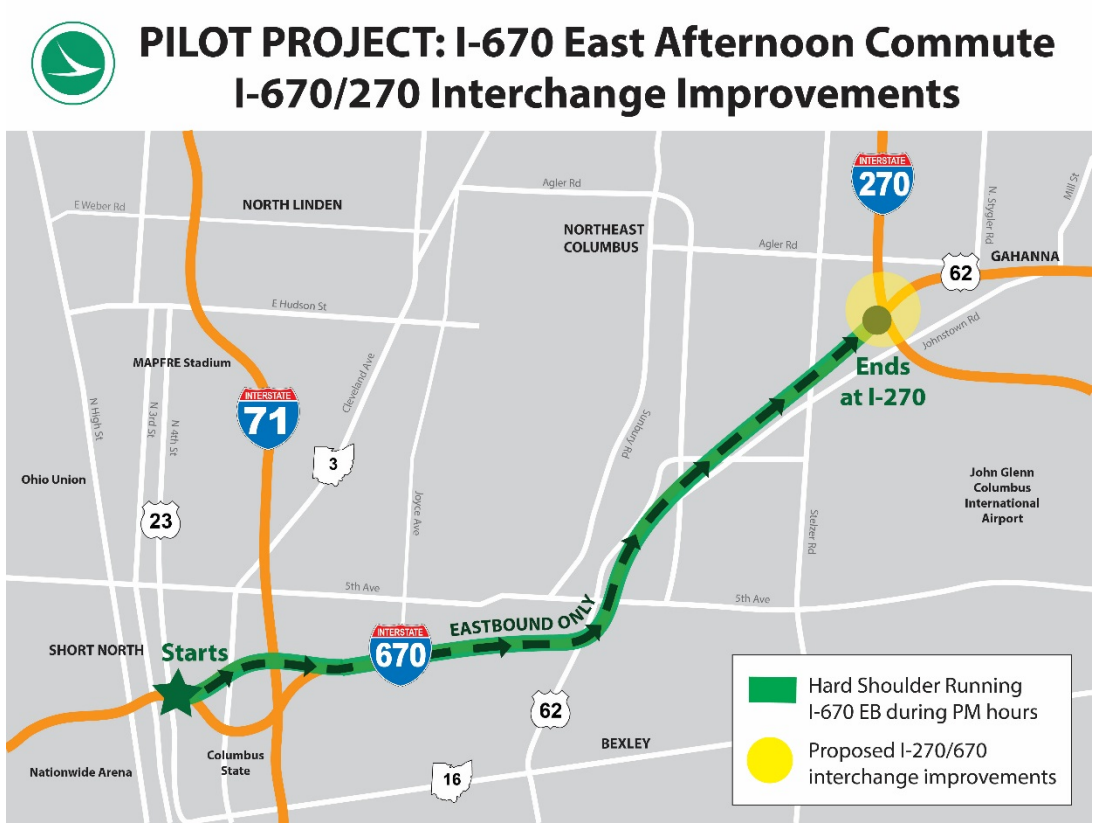
670 SmartLANE Implementation



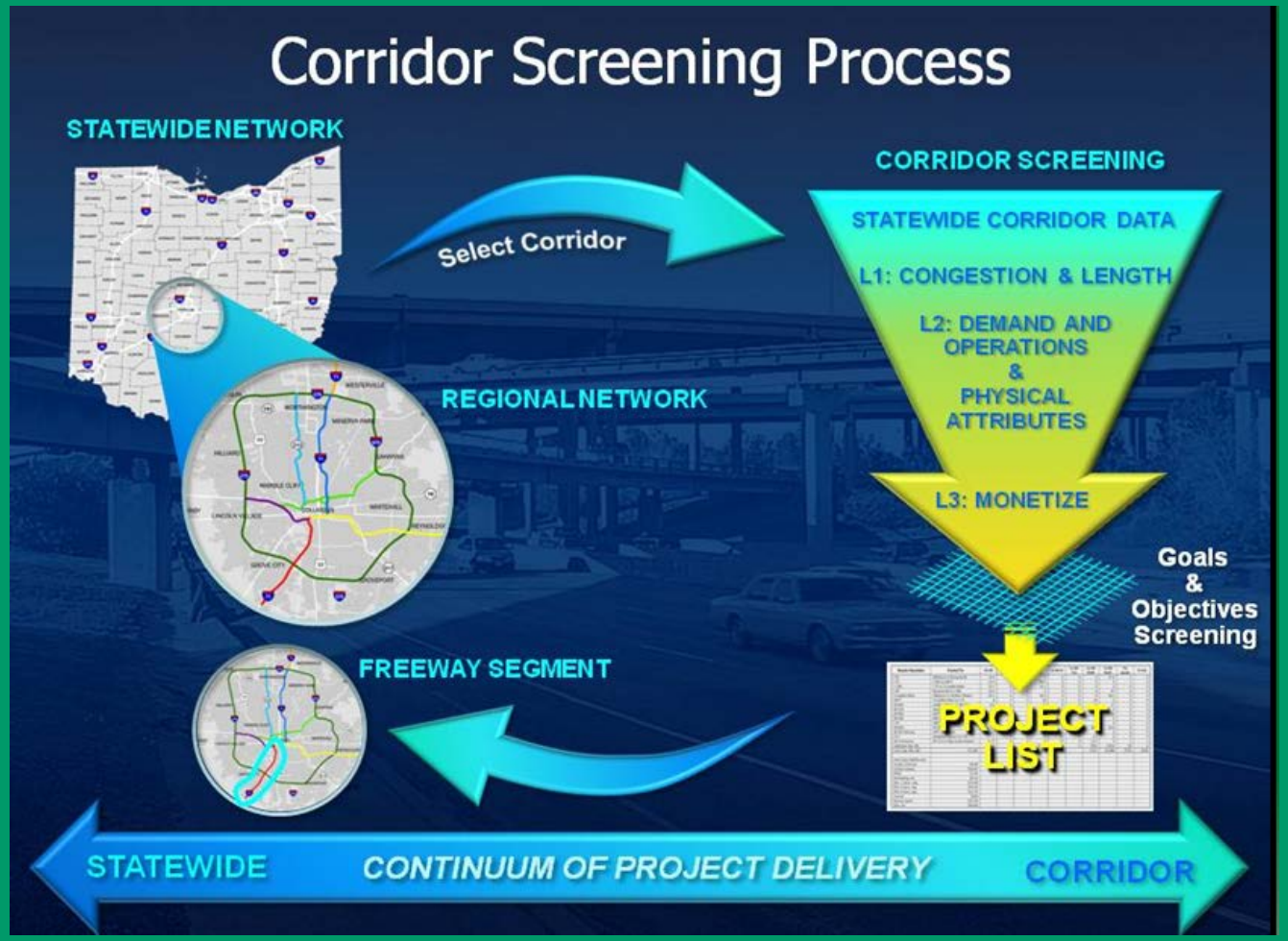
9/28/17

Dave Holstein, P.E., Office of Roadway Engineering

John R. Kasich, *Governor* • Jerry Wray, *Director*

How We Got to HSR

ODOT Conducted State Wide ATDM Study of All Freeway Corridors:

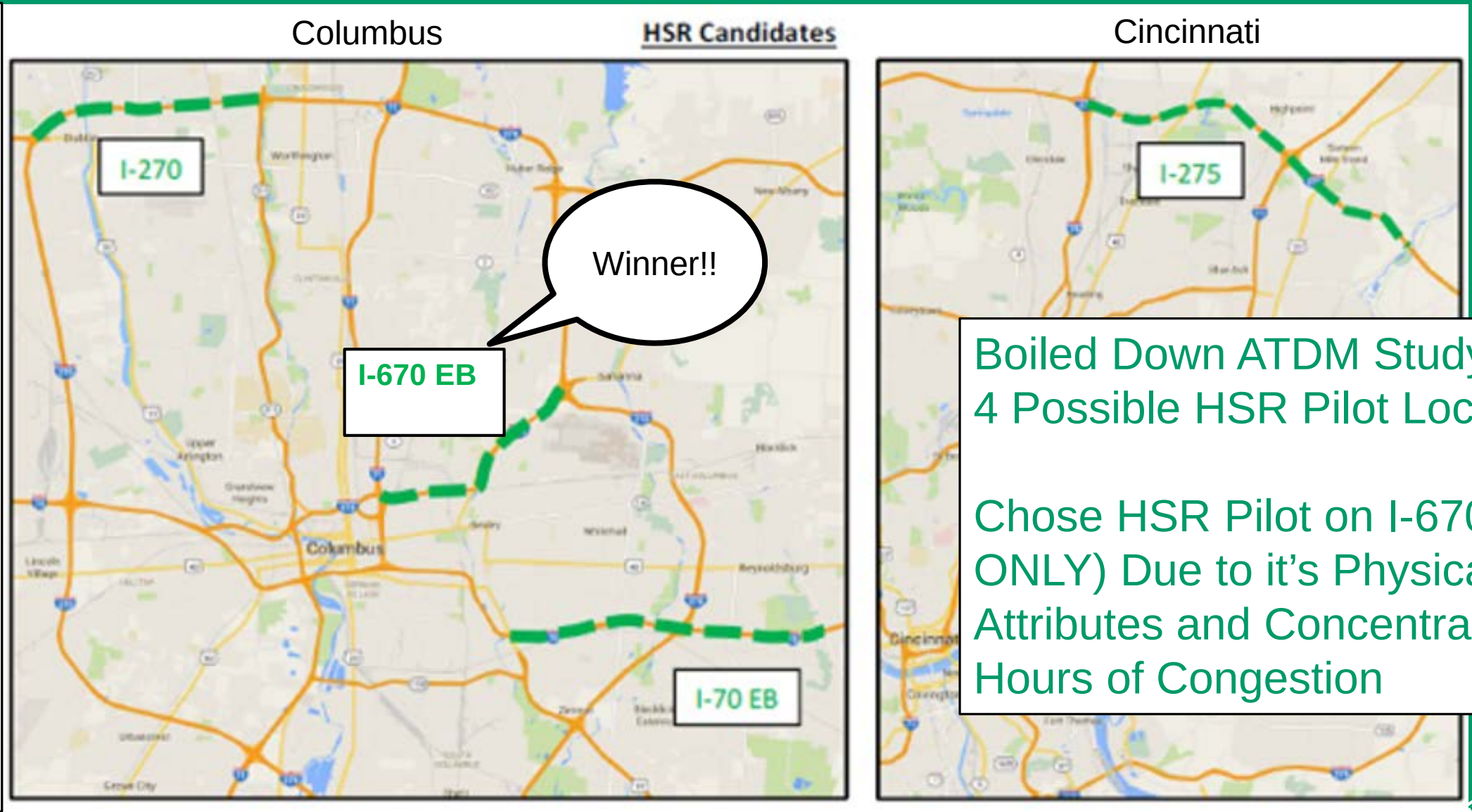


How We Got to HSR

ATDM Strategies Considered for Each Corridor:

- Ramp Metering
- Hard Shoulder Running (HSR)– Busses Only
- Hard Shoulder Running (HSR) – Mixed Traffic
- Dynamic Merge Control
- Variable Speed Limits/Speed Harmonization
- Choice Lanes
- HOV Lanes
- HOT Lanes
- Dynamic Lane Assignment
- Contra-flow Lanes

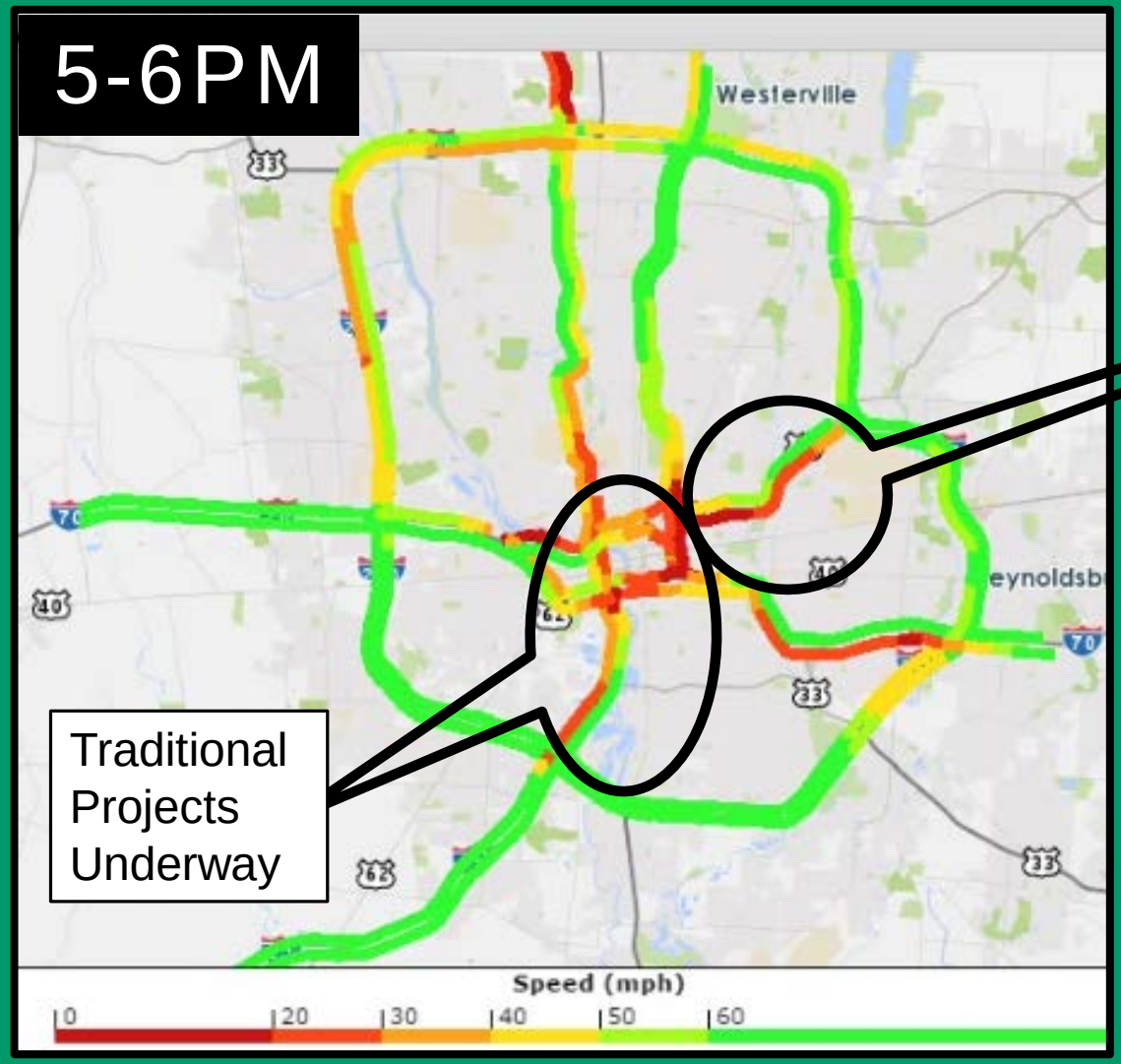
Potential Hard Shoulder Running Corridors

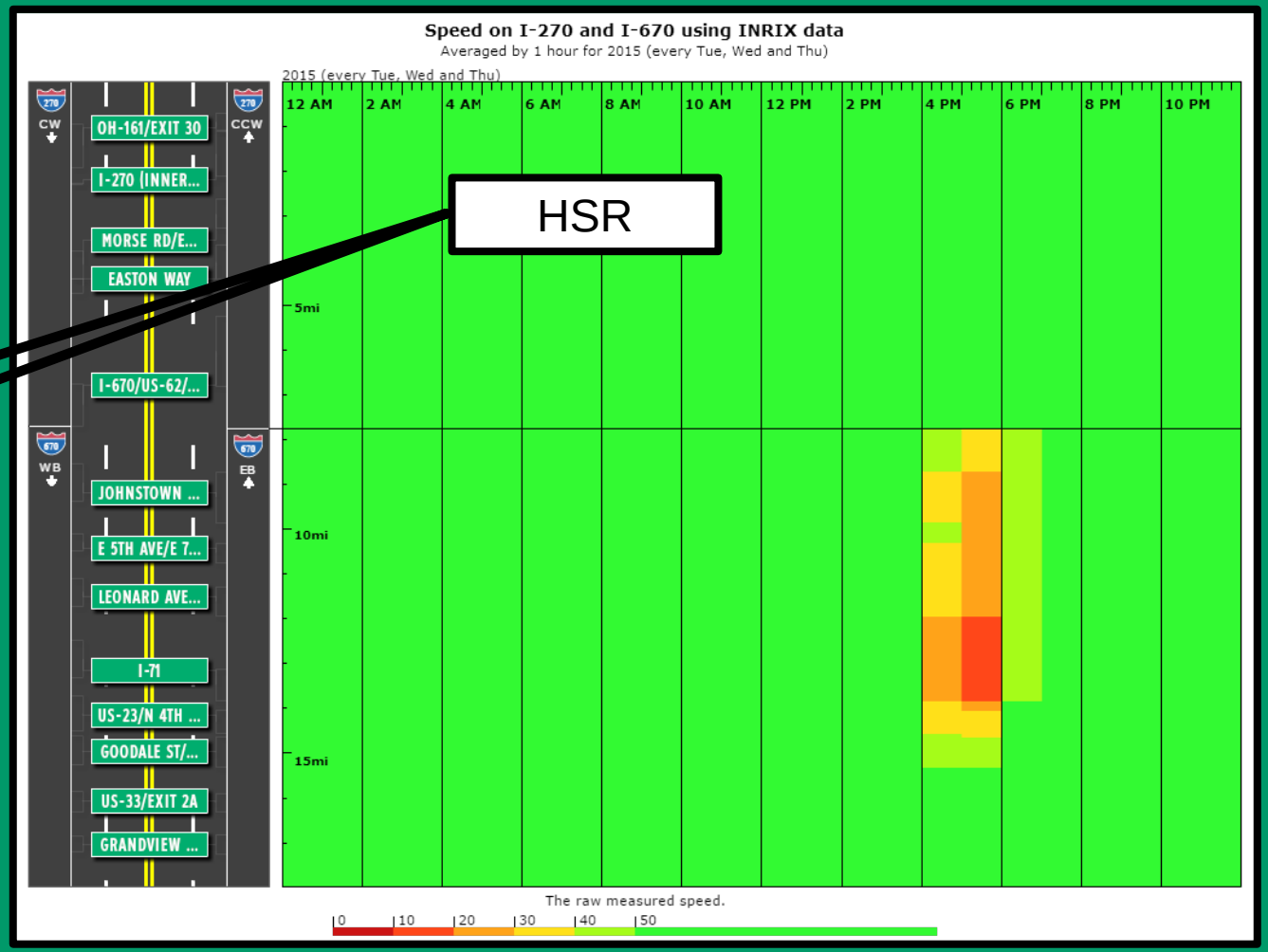


Boiled Down ATDM Study Into 4 Possible HSR Pilot Locations:

Chose HSR Pilot on I-670 (EB ONLY) Due to it's Physical Attributes and Concentrated Hours of Congestion

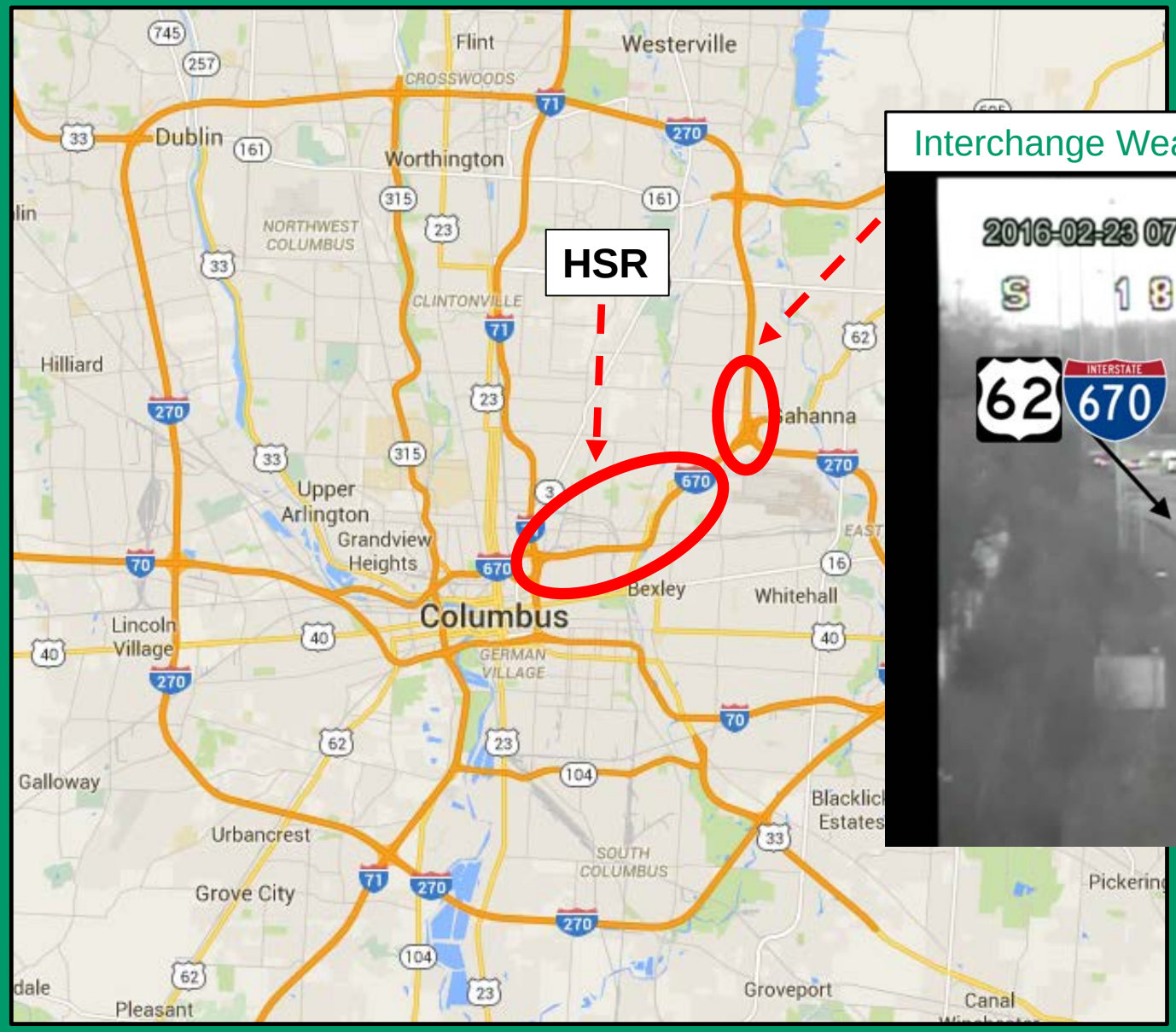
May-October 2015 (Tues-Thurs), Average Speed of All Lanes

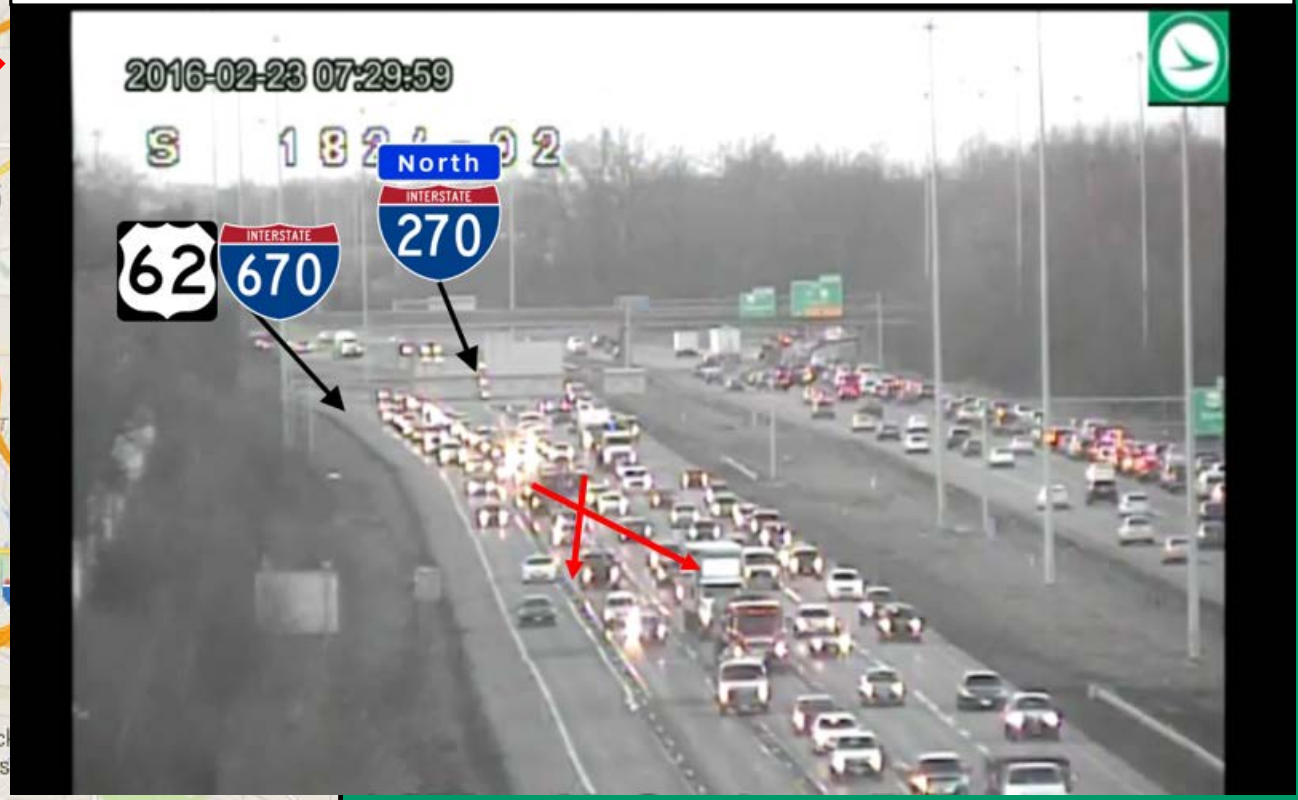




Acute Congestion – Only 2 Hours Per Day

Interchange Weave Needs Fixed for I-670 EB HSR to Work Best



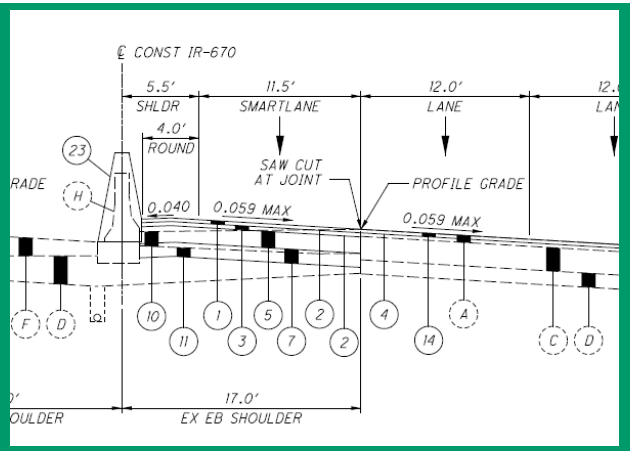


Hard Shoulder Running

9 full matrix signs – Variable Speed Limits – Controlled by TMC

Hard Shoulder Running

Geometrics & Considerations



New Typical Section

- Reduced Outside Shoulder from 12’ to 10’ in places. Shifted ex. lanes out;
- Resurfacing to provide new lane location striping (no grinding of markings);
- Resurfacing to relocate pavement crown to accommodate lane shift;

Checks/Challenges

- Super elevation correction putting traffic on former inside shoulder;
- Truck tracking of narrower lane;
- Drainage/hydraulic spread on reduced shoulder area (we added 16 inlets);
- How is best way to get OUT of the HSR lane!!!!! (more on that later);
- Gantry Placement – cohabitation with existing signs

Cost

Costs: $52M

- **$35M – Interchange Weave (Separate but related problem that needed fixed)**
- **$3.5M – Bridges (Unrelated to HSR – Coincidentally Needed Maintenance Work)**
- **$11M – ITS**
- **$2.5M – Resurfacing/Drainage**

HSR Specific Costs

Total = $52M

Cost to provide traditional widening for extra lane + shoulder at least $25M additional compared to the HSR option (R/W, Structures, Interchanges).

Benefits

- **“Extra” capacity only when needed (4-6P). Other 22 hours retain use of shoulder;**
- **Travel time reduction of 33%-45%**
- **Avoids impacts to neighborhoods and interchanges;**
- **Faster project delivery than widening**

WsDOT Crash Experience on US-2 HSR

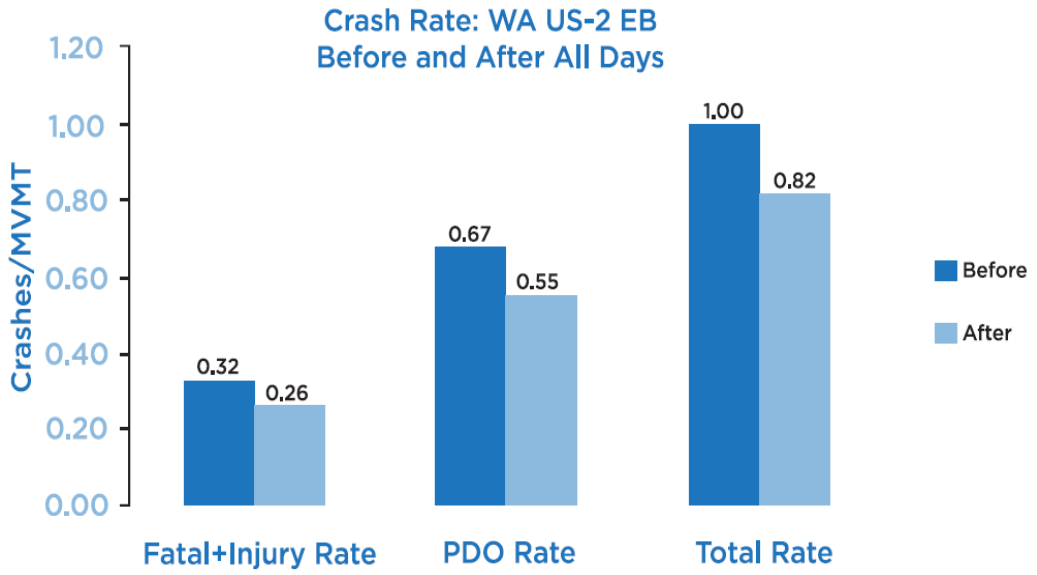
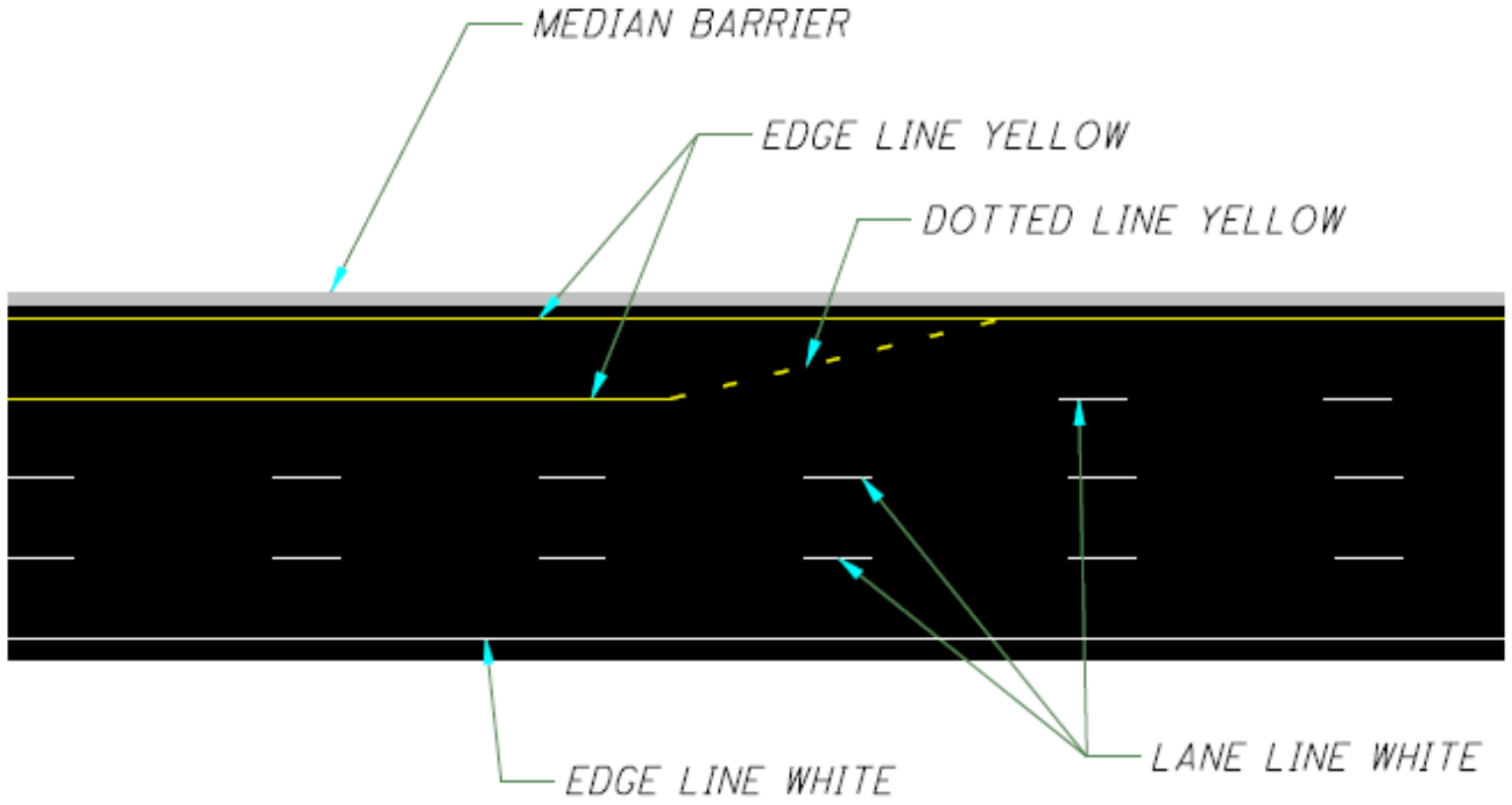


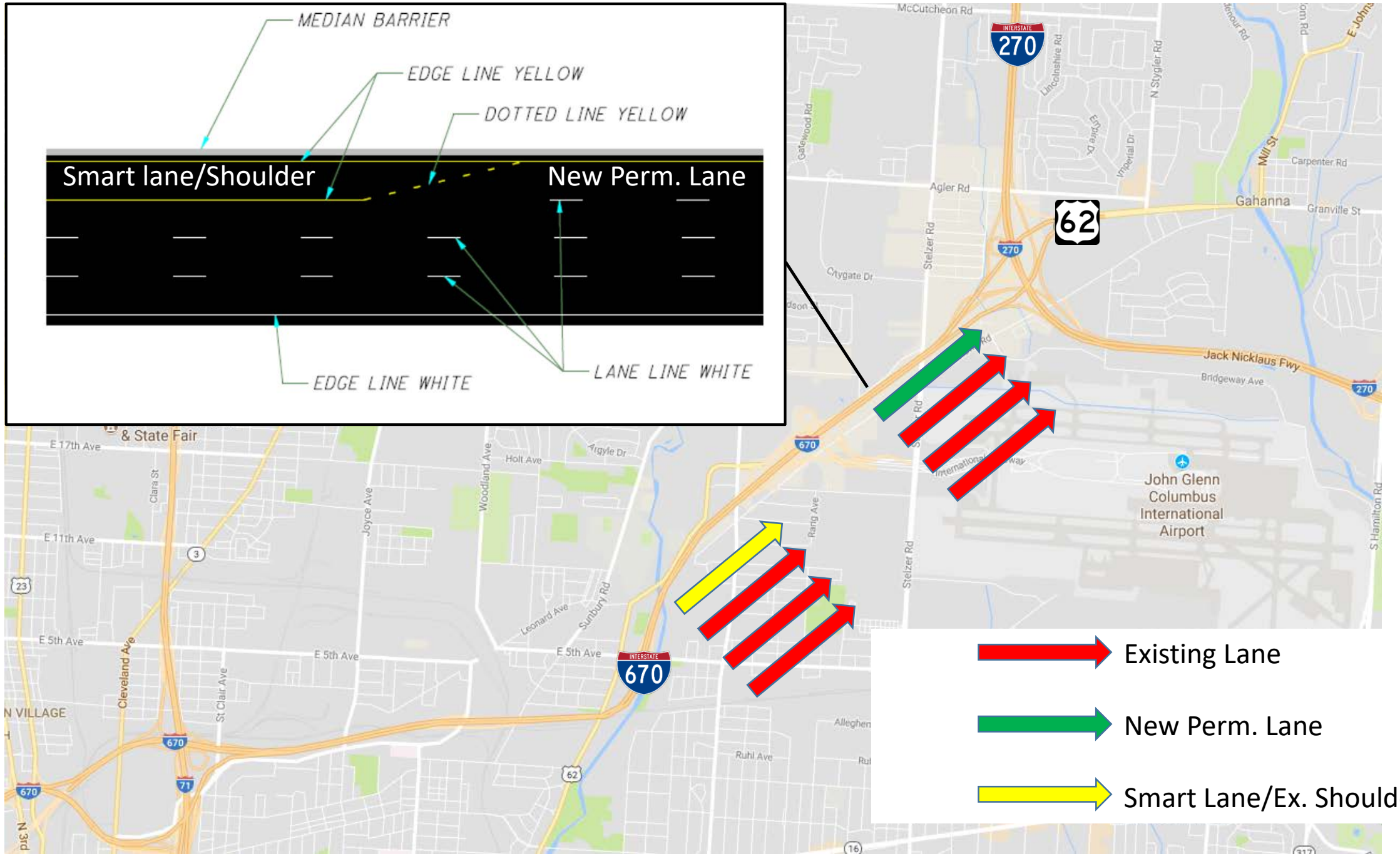
Figure 11. Graph. Change in Crash Rate On US-2 in Washington State.

(Source: Washington State Department of Transportation)

HSR Lane – Termination



INSET A - HSR TRANSITION SECTION


MEDIAN BARRIER
EDGE LINE YELLOW
DOTTED LINE YELLOW
Smart lane/Shoulder
New Perm. Lane
EDGE LINE WHITE
LANE LINE WHITE
McCutcheon Rd
INTERSTATE 270
Agler Rd
62
Gahanna
Granville St
Carpenter Rd
Mill St
Jack Nicklaus Fwy
Bridgeway Ave
John Glenn Columbus International Airport
Stelzer Rd
Gatewood Rd
Lincolnshire Rd
N Stygler Rd
Imperial Dr
Citygate Dr
670
& State Fair
E 17th Ave
E 11th Ave
E 5th Ave
Clara St
Joyce Ave
Woodland Ave
Holt Ave
Argyle Dr
Rang Ave
Leonard Ave
Sunbury Rd
Cleveland Ave
St Clair Ave
N VILLAGE
Ruhl Ave
71
Existing Lane
New Perm. Lane
Smart Lane/Ex. Shoulder

Public Involvement

1
- Targeted Outreach & Feedback
- Law Enforcement, Local Govt., ODOT Operations

2
- NEPA Public Involvement
- Public Education on Concept

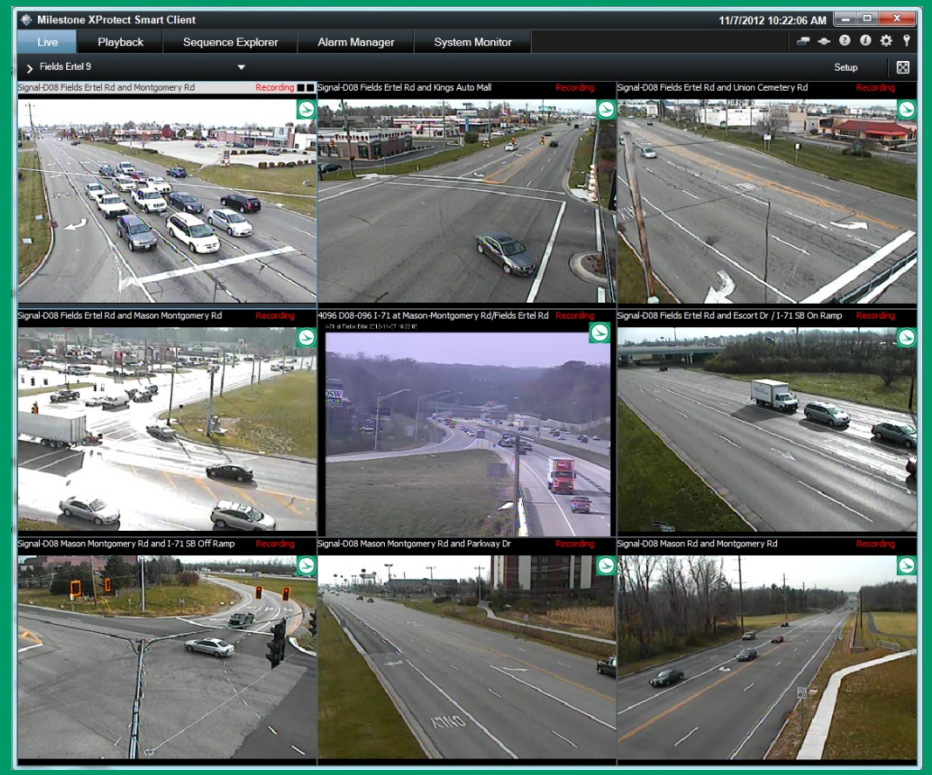
3
- Construction Outreach – MOT & Continuing Reinforcement after Opening Day

Operations

- **System Startup**
- **Variable Speed Limit**
- **Maintenance**
  - Inclement Weather
- **Law Enforcement**
- **Incident Management**

System Startup

Daily Sweep Prior to Opening – Visual & Physical



THE OHIO TRIP
Towing & Recovery Incentive Payment Program

TRIP
Incentivizing tow companies for quick clearance of heavy vehicle incidents

Variable Speed Limit

Table 1: Speed Reductions for Variable Speed Limit Zones

Severity Level	Warranting Conditions					Resulting Variable Speed Limit (VSL)				
	Weather			Incidents	Congestion	Original 70 mph	Original 65 mph	Original 60 mph	Original 55 mph	Original 50 mph
	Pavement Conditions "Measured" (or Visual)	Visibility	Precip Conditions							
0	"Dry" or "Trace" (Dry) "Wet" or "Chemically wet" (wet)	Good; ≥ 0.5 miles	"Light" Precip	No lanes and/or Shoulder blocked	If measured speeds fall below the resulting VSL for a given severity level for a minimum of 5 minutes, then post for that severity level.	70	65	60	55	50
1		Fog; < 0.5 miles	"Moderate" Precip			60	60	55	55	50
2	"Ice Watch" (Snow Covered Road, Wet road <33 Deg)	Poor; < 0.25 miles	"Heavy" Precip	Lanes blocked & traffic > 50MPH		50	50	50	50	45
3	"Ice Warning" (Blowing/Drifting Snow, Icy pavement)	Poor; < 0.1 miles		Lanes blocked & traffic < 50MPH		40	40	40	40	40
4	Full road closure or other high impact situation*					30	30	30	30	30

*Verify with District personnel before posting for Level 4 Severity

Maintenance & Inclement Weather

- **Shoulder will be treated as a lane.**
  - Plow/brine frequency will be increased
  - Snow storage may require closure of shoulder until gang plowing can move it
- **Signs have rear catwalk access.**

Law Enforcement

- **Speed limit changes will be logged**
- **Maintaining the right shoulder will be important for enforcement, incident access**
- **Ongoing discussion with CPD, Columbus Prosecutor**

Incident Management

A dedicated operator will have information collected by the CCTV and other sensors, and will work with Law Enforcement to open/close lanes and slow traffic in advance of an incident.

Questions?

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