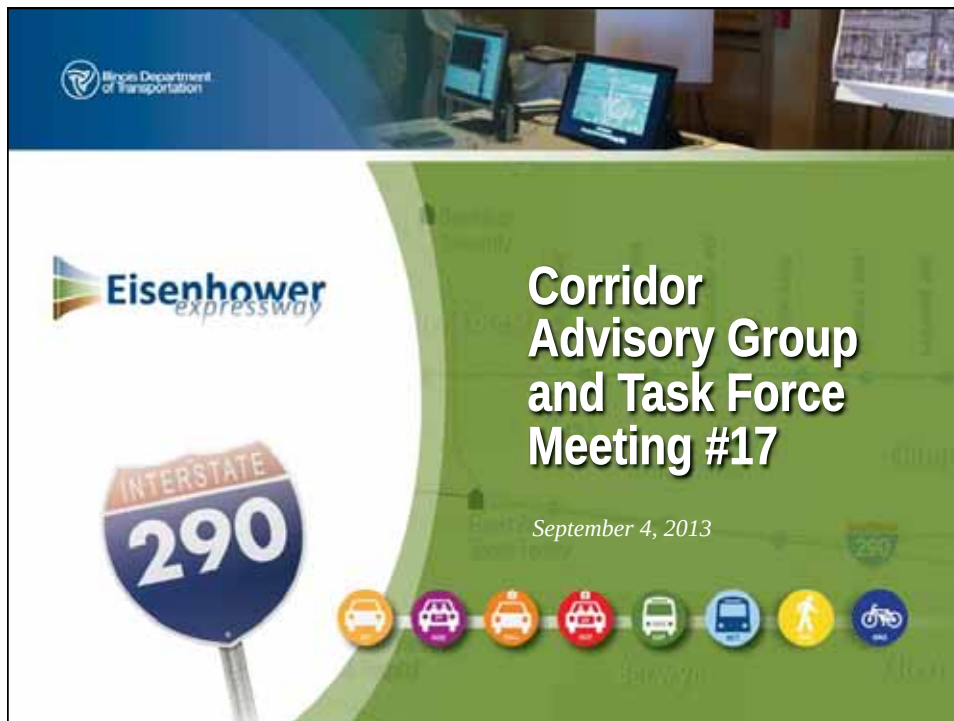




Virginia Department of Transportation

Corridor Advisory Group and Task Force Meeting #17

September 4, 2013

Eisenhower Expressway

INTERSTATE 290

Agenda

- Recap of CAG #16 – 9:00 am
- CTA Blue Line Vision Study Update – 9:10 am
- Geometrics Overview – 9:20 am
- Air Quality Overview – 10:20 am
- Aesthetics Overview – 10:50 am
- HSM & Bike and Pedestrian Safety – 11:05 am
- Next Steps/Public Meeting #3 Preview – 11:35 am
- Geometric Exhibit Review – 11:45 am



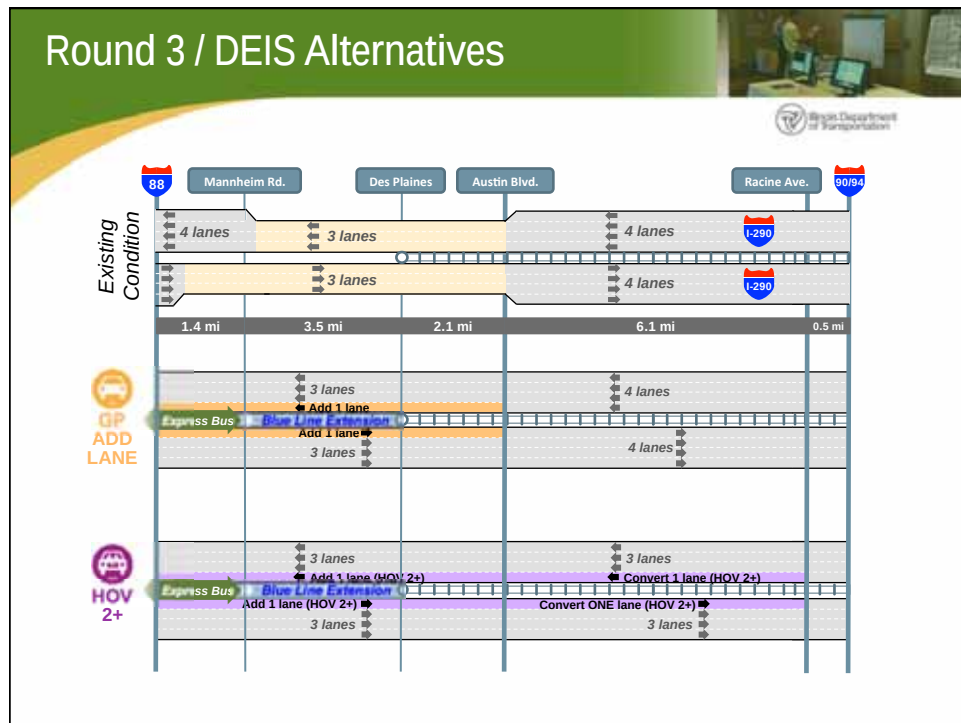
CAG/TF Meeting #16 Recap

A background image showing hands writing on a document is visible behind the list. The Virginia Department of Transportation logo is in the top right corner.

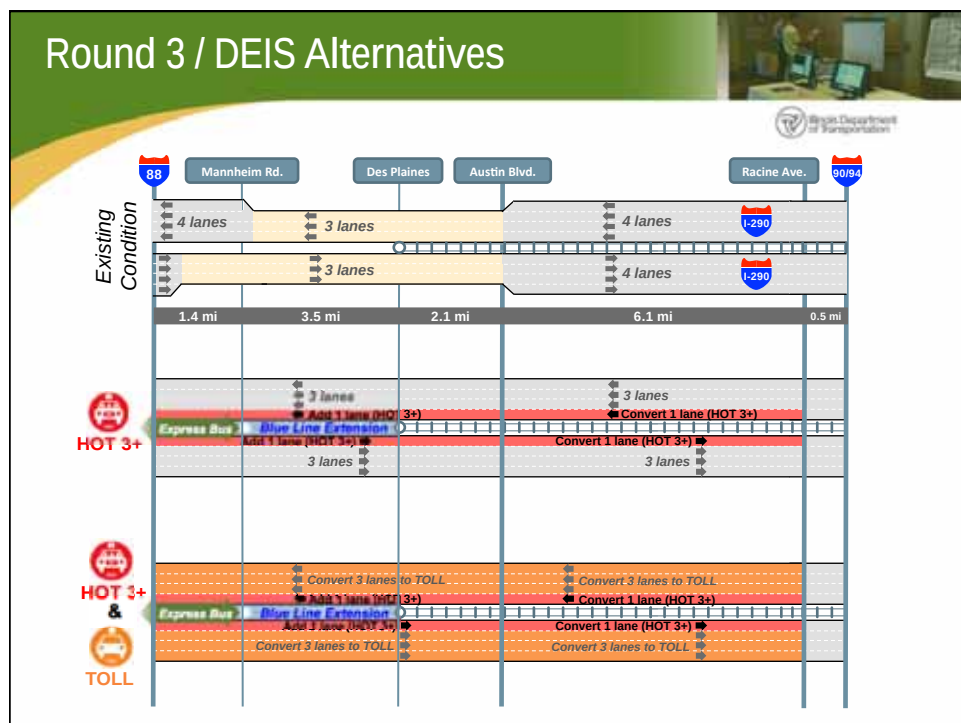
- Round 2 Comments and Wrap Up
- 4 Advancing Alternatives
- CTA Blue Line Vision Study Update
- Next Steps
- Bicycle/Pedestrian Workshop

The slide includes the Eisenhower Expressway logo in the bottom right corner and a small number "4" in the bottom left corner.

Round 3 / DEIS Alternatives



Round 3 / DEIS Alternatives



Bike & Pedestrian Workshop Summary



-  Improved connections to Parks
-  Improved N-S connections: Widen bridges/sidewalks
-  DIVVY Location
-  Better connections between hospitals
-  E-W connection: Convert RR ROW to Trail
-  On street E-W connections
-  Improved safety at interchanges
-  Improved signage (existing routes)

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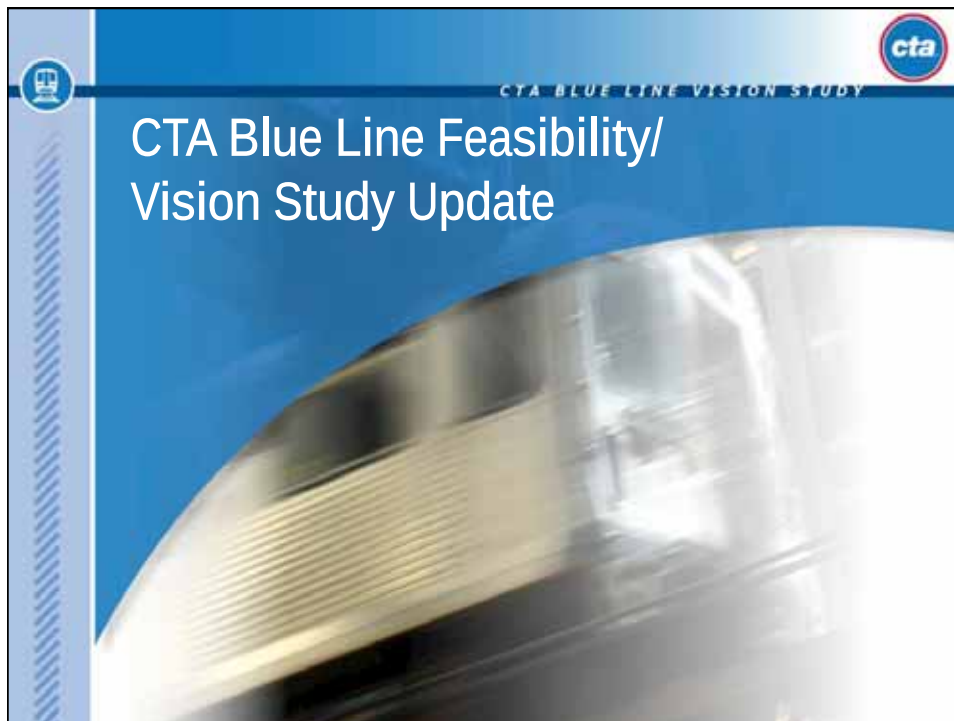
Bike & Pedestrian Workshop Summary

- Suggested concepts will be considered as geometry developed, and
- Stakeholder and agency coordination advances



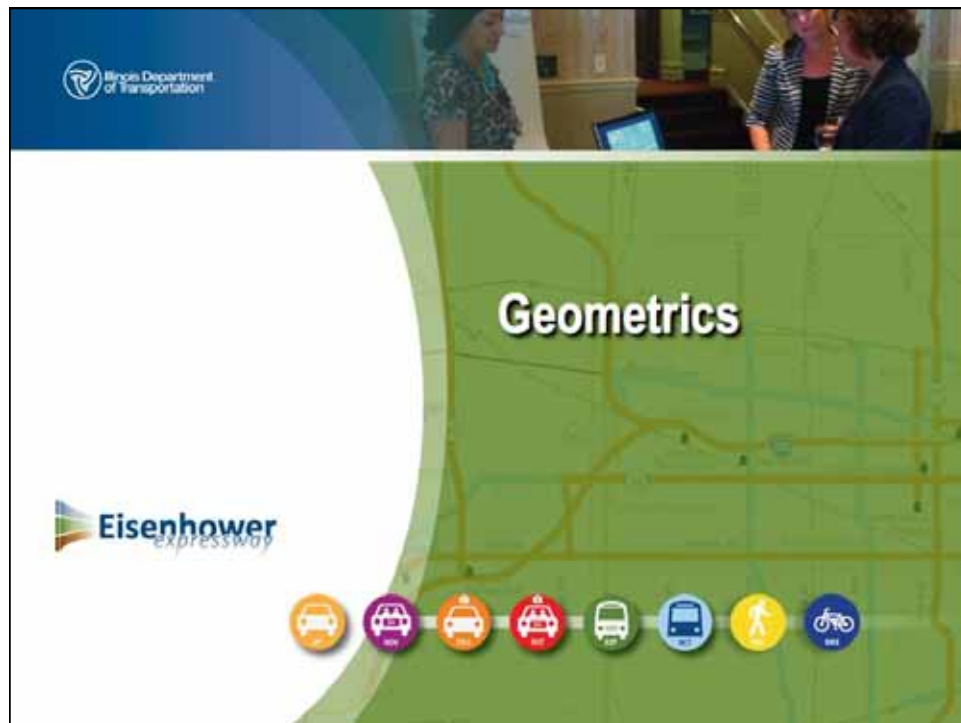
8

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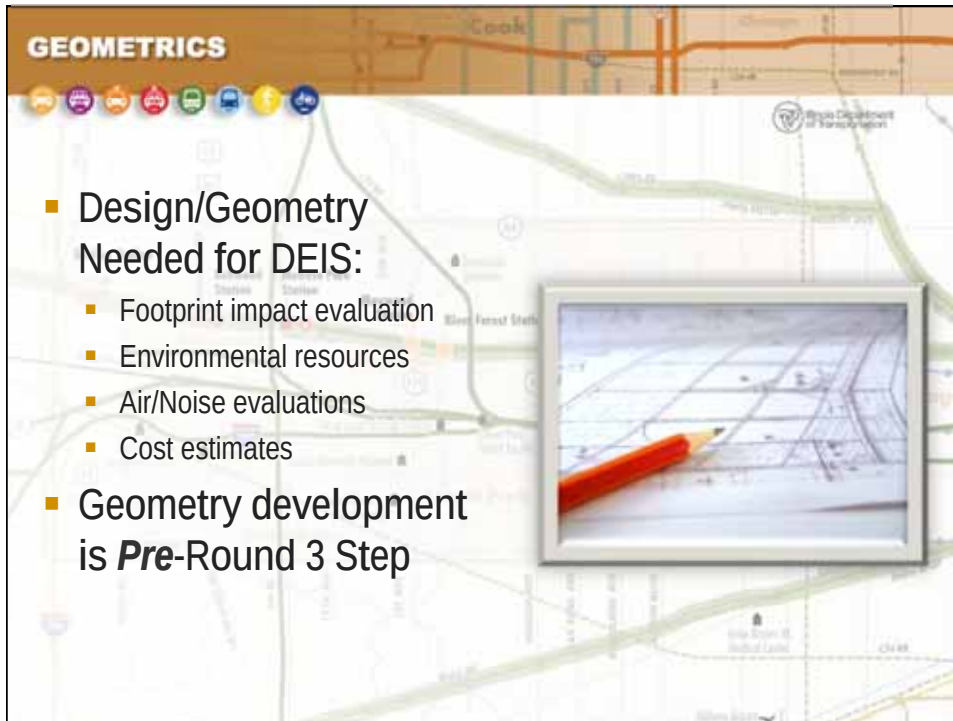


This slide has a blue header with the CTA logo in the top right corner. The title "Blue Line Vision Study Update" is in white text. The background is a photograph of a train station platform with a blue-tinted overlay. A list of study components is presented in white text on the left side.

- Existing Conditions Assessment
 - Final draft under review
- Transit Market Analysis
 - Final draft under review
- Station Prototype Concepts
 - Access alternatives under review
- Conceptual Service Pattern Analysis
 - In development



GEOMETRICS



- Design/Geometry Needed for DEIS:
 - Footprint impact evaluation
 - Environmental resources
 - Air/Noise evaluations
 - Cost estimates
- Geometry development is **Pre-Round 3 Step**

ENGINEERING DESIGN STANDARDS



- Study design is following established standards:
 - AASHTO – National roadway standards
 - IDOT BDE – Illinois roadway standards (Based on AASHTO)
 - Pace / CTA – Bus and commuter rail
 - AREMA – Freight & passenger rail
 - Others as applicable...

ENGINEERING DESIGN STANDARDS




- Design standards consider:
 - Facility type – Highway, arterial, commuter rail, freight rail
 - Design vehicle – Truck, bus, car, bike
 - Design speed – Highway speeds, local streets
- Design standards apply to (examples):
 - Lane & shoulder widths
 - Sidewalk widths
 - Horizontal curves and superelevation
 - Profile grade and curves
 - Vertical clearances
 - Mobility

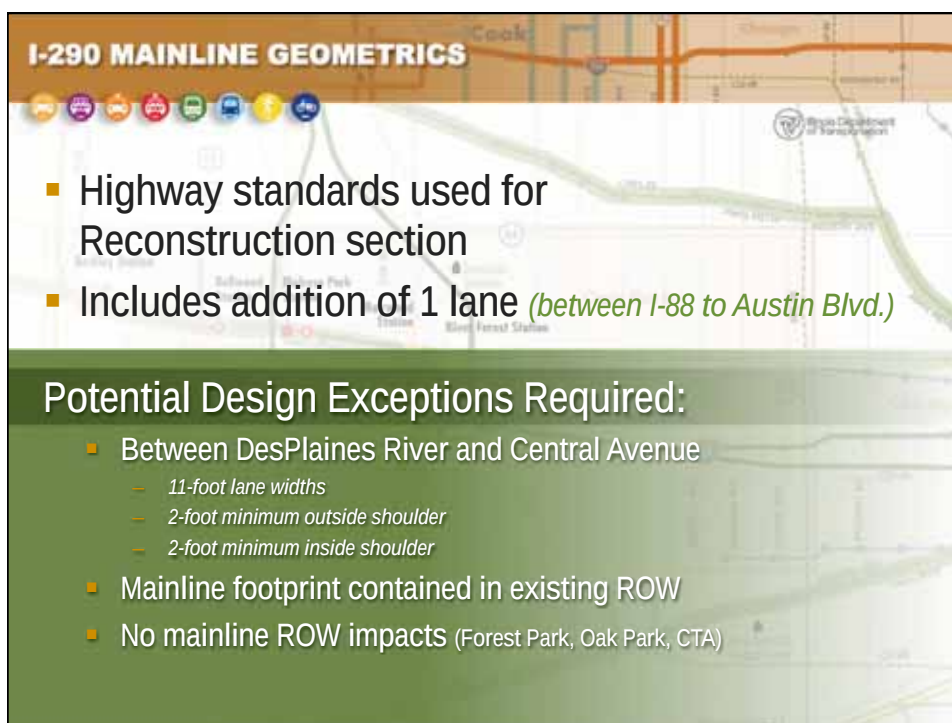
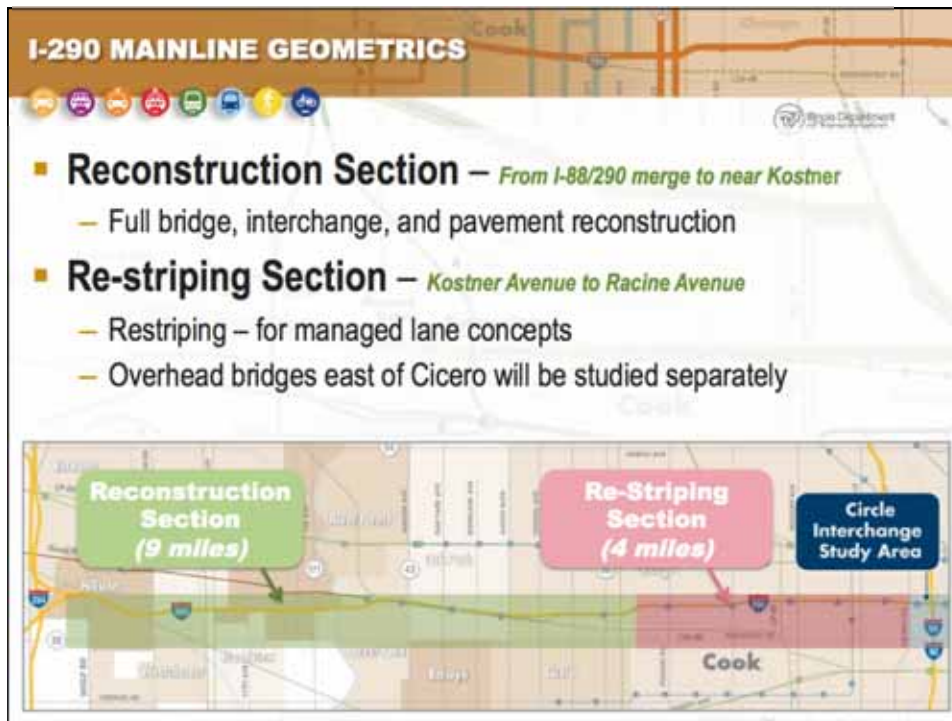


GEOMETRICS, NEPA, AND CSS




- Geometrics following NEPA & CSS
- Used to evaluate direct & indirect impacts
- Design flexibility to avoid / minimize impacts
- Concepts shaped by stakeholder input and community context





Interchange Concepts

■ Interchange concept development:

- Initially presented at CAG #13
- Identified existing deficiencies & constraints
- Developed & presented initial concepts:
 - One on One stakeholder coordination meetings
 - CAG #14 – Interchange Workshop
- Preferred concept identified for each interchange

■ Round 2 Revisited – Main-Line Alternatives



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25th Avenue Diverging Diamond Interchange (DDI)



25th Avenue – Diverging Diamond Interchange (DDI)



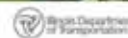
- Three concepts evaluated
- Diverging Diamond Interchange (DDI):
 - Most efficient operations (LOS A & B)
 - Consolidates all ramp movements at 25th Avenue
 - Good Pedestrian accommodations
 - Opportunity to accommodate transit extension connection
 - Locally preferred concept



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25th Avenue Footprint/ROW Requirements

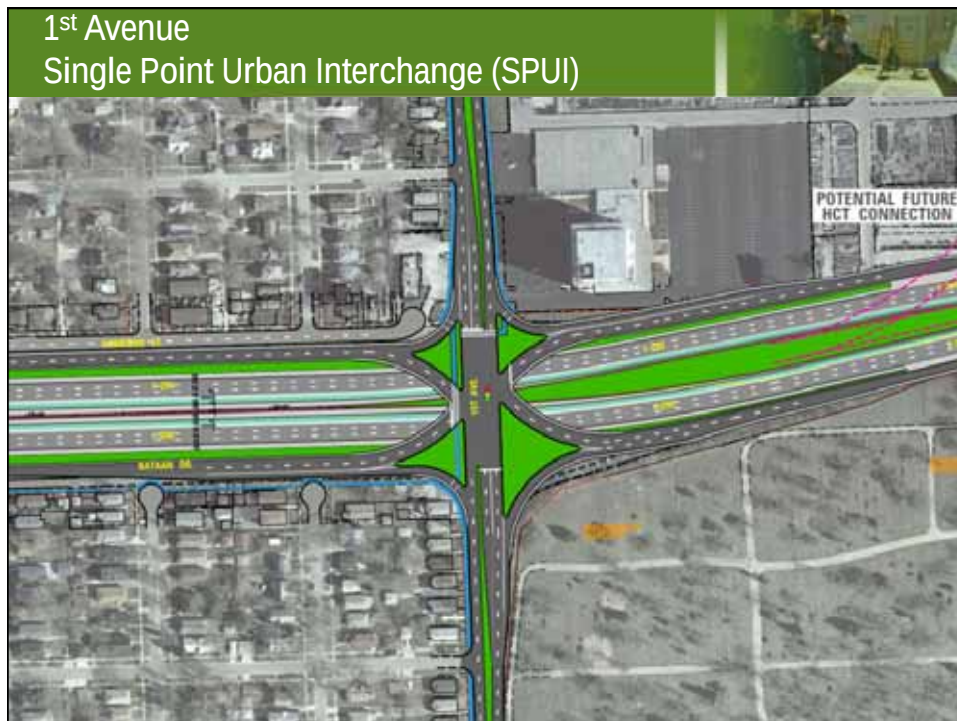


- Additional ROW needed:
 - Northeast quadrant
 - Corner impact due to:
 - » 25th Ave. off-ramp Alignment
 - » I-290 Median transit extension accommodation
 - Bellwood School District 88
 - » Building currently vacant
 - » Coordination in progress



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1st Avenue - SPUI



- Three concepts evaluated
- Single Point Urban Interchange (SPUI):
 - Compact design minimizes impacts
 - One signal controls entire intersection
 - Eliminates through movement to frontage road
 - Improved operations (LOS from E&F to B&C)
 - Provides for left-turn lane storage
 - More ramp storage = improved green time on 1st Avenue
 - Locally preferred concept



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1st Avenue Single Point Urban Interchange (SPUI)

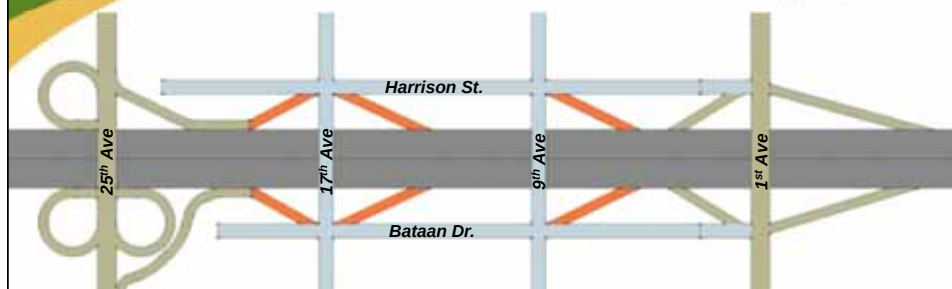
- Additional ROW needed:
 - Northeast quadrant
 - ComEd & Eisenhower Tower
 - Longitudinal impact due to:
 - » Westbound off ramp alignment
 - » I-290 Median widening for future transit extension



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17th & 9th Avenue Slip Ramps Existing Configuration

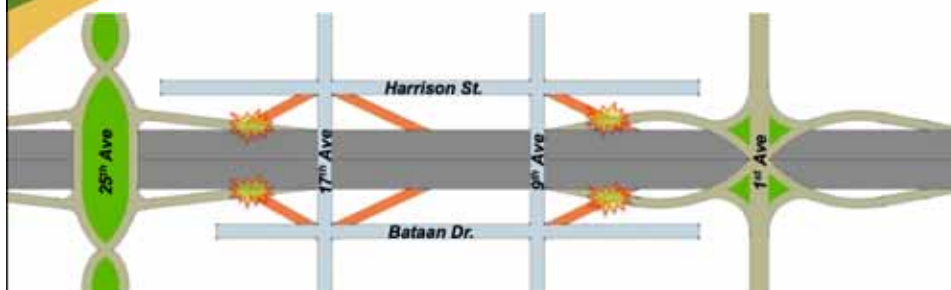


- Closely Spaced Entrance/Exits (5 in 1.5 miles)
 - Substandard weaving distances
 - Elevated crash rates
- Substandard Ramp Design (departure angle, length)

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17th & 9th Avenue Slip Ramps

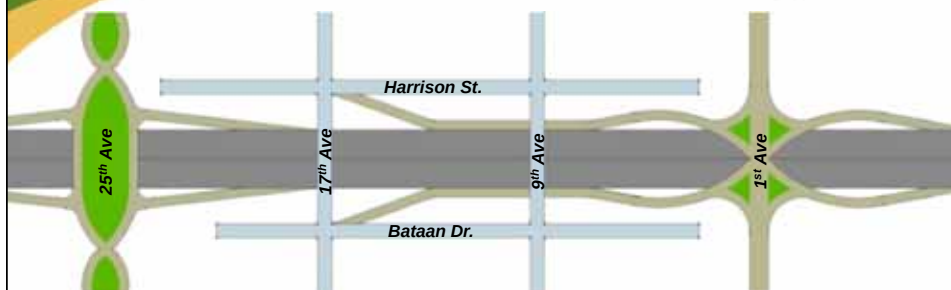


- 25th and 1st Avenue Proposed Ramp geometry conflict with existing slip ramps

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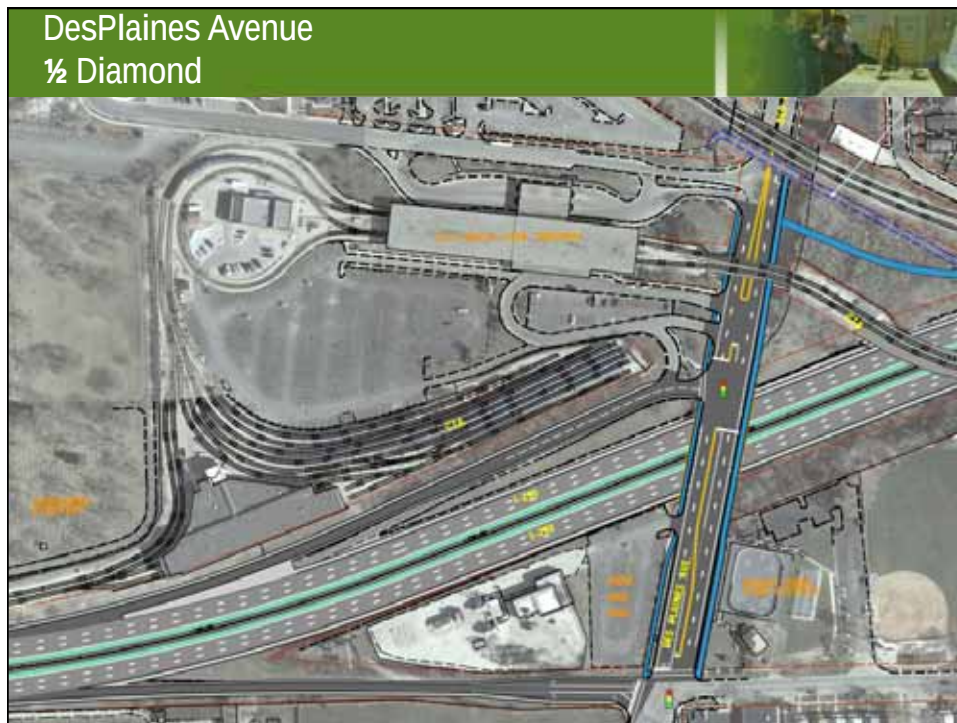
17th & 9th Avenue Slip Ramps



- 17th Avenue Ramps to remain with improvements
 - Longer ramp
 - Meets current standards
 - Auxiliary lane connection to 1st Avenue

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DesPlaines Avenue - 1/2 Diamond

- Three concepts evaluated
 - Horizontally Constrained (CTA Terminal, Park, Cemetery)
 - Vertically Constrained (I-290 under, CSX & CTA RR bridges over)
- 1/2 Diamond Interchange:
 - Maintains existing ramp configuration
 - Improved signing and striping
 - Wider sidewalk & Path connection over I-290 to park
 - Potential bus viaduct connection
 - Locally preferred concept





Harlem Avenue – Modified SPUI

Metropolitan Department of Transportation

- **Goals:**
 - Maintain existing intersection location
 - Stay within the ROW
- **Modified Single Point Urban Interchange (SPUI):**
 - Ramps re-configured to right side
 - Additional ramp storage permits better signal timing
 - Improved pedestrian crossing phase
 - Longer north-south signal green times
 - Pedestrian refuge islands between ramps – added safety
 - Improved/wider sidewalks – ADA accessible
 - Improved Bus and Pedestrian connections to transit
 - No ROW impacts (stays within existing footprint)
 - Accommodates one or two CTA head stations

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Austin Boulevard – Modified SPUI



- **Goals:**
 - Maintain existing intersection location
 - Stay within the ROW
- **Modified Single Point Urban Interchange (SPUI):**
 - Ramps re-configured to right side
 - Additional ramp storage permits better signal timing
 - Improved pedestrian crossing phase
 - Longer north-south signal green times
 - Pedestrian refuge islands between ramps – added safety
 - Improved/wider sidewalks – ADA accessible
 - Improved Bus and Pedestrian connections to transit
 - No ROW impacts (stays within existing footprint)
 - Accommodates one or two CTA head stations



Austin Boulevard / Central Avenue Stacked Ramps



Austin Boulevard & Central Avenue Stacked Ramp Concept

- **Issue:**
 - Only ½ mile Austin Boulevard and Central Avenue
 - Insufficient distance to provide required ramp lengths
 - Austin right hand ramps and Central ramps overlap
- **Stacked Ramps Concept**
 - Grade separate ramps
 - Utilize existing cross-road and mainline elevation differences
 - Central Avenue ramps enter/exit I-290 under Austin Blvd. Ramps
 - Eliminates ramp weaving conflict
 - Stays within existing ROW



Central Avenue – Conventional Diamond

- Conventional Diamond Interchange
 - Maintains existing interchange configuration
 - Improved lane channelization and lane markings
 - Improved signal operations
 - Improved mainline ramp connections

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 Eisenhower Expressway



Laramie and Cicero Avenue Reverse Diamond with U-Turns



Laramie and Cicero Avenue Reverse Diamond with Slip Ramps



- Reverse Diamond with Slip Ramps
 - Ramp directions reconfigured – Off-ramps followed by on-ramps
 - Eliminates mainline ramp weaving
 - Weave between ramps relocated onto low speed / low volume frontage roads
 - Frontage road U-turns added as left turn bypass lanes
 - Improved operations
 - Improved sidewalks
 - Improved transit access
 - Accommodates CTA station on one or both sides

Non-Interchange Cross Roads

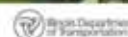


- Initial cross road concepts developed (non-interchange)
See CAG corridor exhibit at today's meeting
- **Goals:**
 - Accommodate future transit extension (east of DesPlaines River)
 - Improve horizontal and vertical geometry where needed
 - Improve pedestrian environment / north-south connectivity
- Stakeholder input sought

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Cross Roads over Freight Railroad



- Bridges between DesPlaines Avenue and Austin Blvd.
- **Design Challenges:**
 - Existing crossroad profiles sub-standard – should be flatter
 - Existing clearances - between 19 and 21 feet
 - Required clearance over Freight Rail - 23 feet



Cross Roads over Freight Railroad



■ *Range of solutions:*

- Raise crossroad profiles – potential impacts to community (not acceptable)
- Lower CSX profile – Freight rail max grade limitations, drainage, retaining wall
- Thin cross-road structure depths – non-standard design, maintenance concerns, cost
- Negotiate reduced clearance requirements with CSX / FRA
- Combination solution
- Freight railroad coordination in progress
- Crossroad profiles development & evaluation – On going



Geometry



■ *Preliminary geometric concept exhibit:*

- I-290 Mainline concept from I-88 to Racine Avenue
- Interchange and ramp concepts
- Frontage road modifications
- Non-interchange crossroad concepts

■ *Additional refinements anticipated:*

- Design reviews & feasibility evaluations
- Stakeholder & transportation agency input
- Safety evaluations
- FHWA input





NEPA Context - Air

- Not used to select an alternative but used to identify impacts
- Advanced design information required
- "Build" Alternative traffic volumes required
- Existing Corridor
- CMAP Regional Analysis

46

 The slide includes a blue header with the title "NEPA Context - Air". The main content area is white with a blue and green curved border on the left. A list of five bullet points is centered on the slide. In the bottom right corner, there is a graphic of the Eisenhower Expressway logo and a large Interstate 290 shield. The slide number "46" is in the bottom left corner.

National Ambient Air Quality Standards

Set by US EPA, Developed for 6 Criteria Pollutants



- Particulate Matter
- Carbon Monoxide
- Sulfur Dioxide
- Ozone
- Nitrogen Oxides
- Lead

Pollutants of concern for transportation

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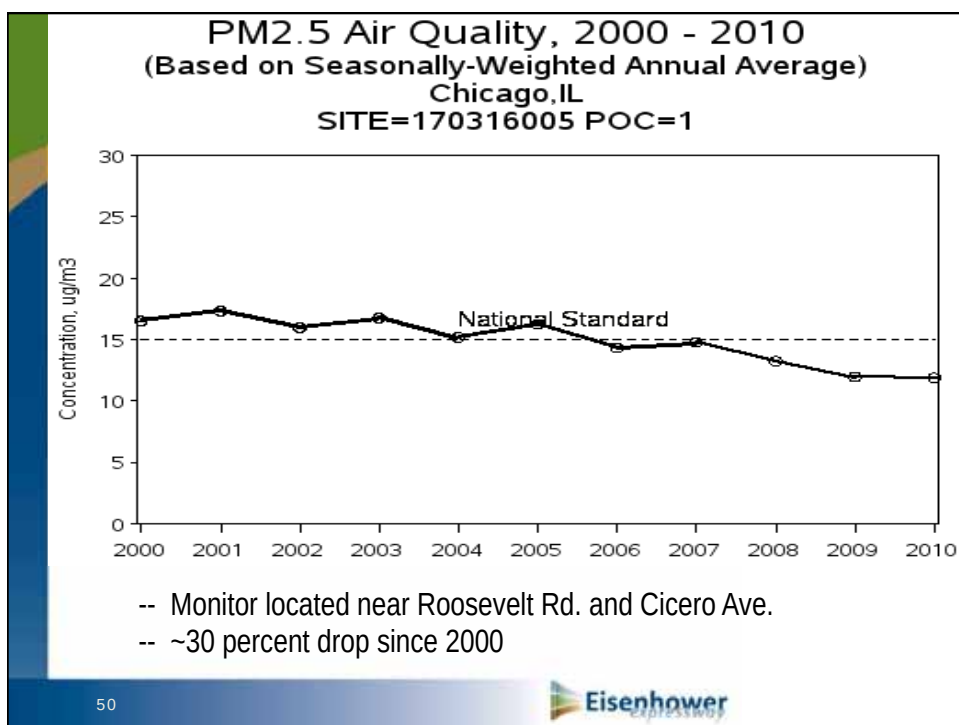
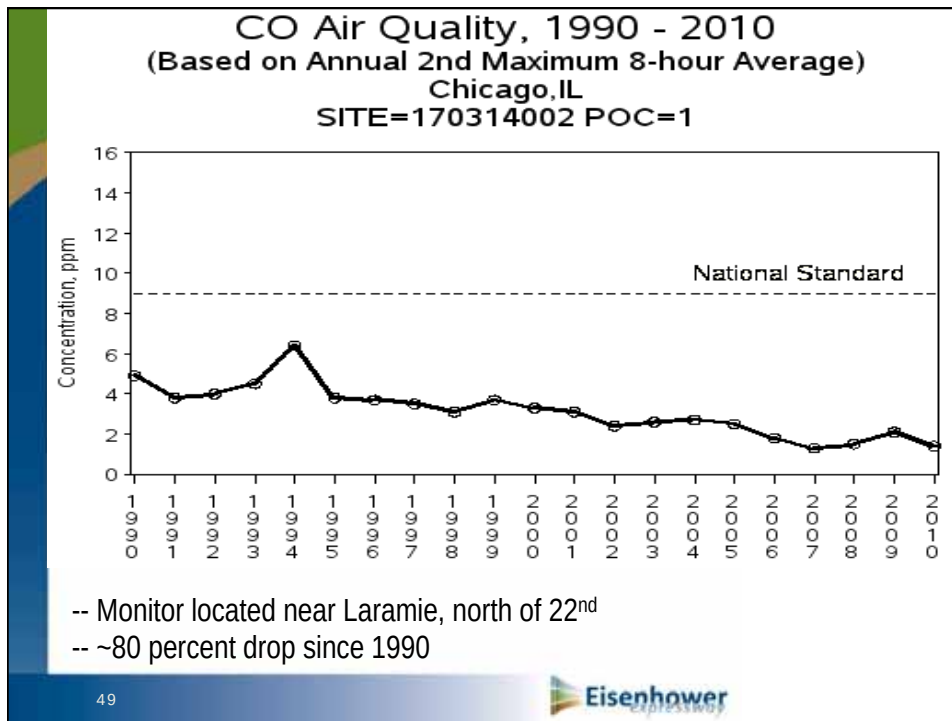
Attainment versus Non-Attainment Areas

Are Standards Met?

- Carbon Monoxide
 - 9 ppm (8-hour)
 - 35 ppm (1-hour)
- Particulate Matter
 - 12 $\mu\text{g}/\text{m}^3$ (annual)
 - 35 $\mu\text{g}/\text{m}^3$ (24-hour)
- Counties in Non-Attainment
 - In Chicagoland Area: Cook, DuPage, Kane, Lake, McHenry, and Will Counties, portions of Grundy and Kendall Counties for Particulate Matter
 - In St. Louis Area: Madison, Monroe, and St. Clair Counties, portion of Randolph county for Particulate Matter

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Projects of Air Quality Concern

- **COSIM: Analysis for Signalized Intersections**
- **MOVES: Particulate Emissions Determination**
 - **Input Factors**
 - Fleet composition
 - Fuel supply
 - Traffic volumes
 - Acceleration/braking/idle percentages, etc.
 - **Output**
 - Pollutant of concern (in lbs or grams)
- **Air Dispersion Modeling**



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Air Dispersion Modeling

Critical Inputs

- **Receptors** – Determination and location to roadways, large grid
- **Pollutant Levels** – as determined by MOVES
- **Geography** – elevations, distances from sources and building effects
- **Weather data** – hourly temperatures and wind strength/direction over five years



Modeling Results

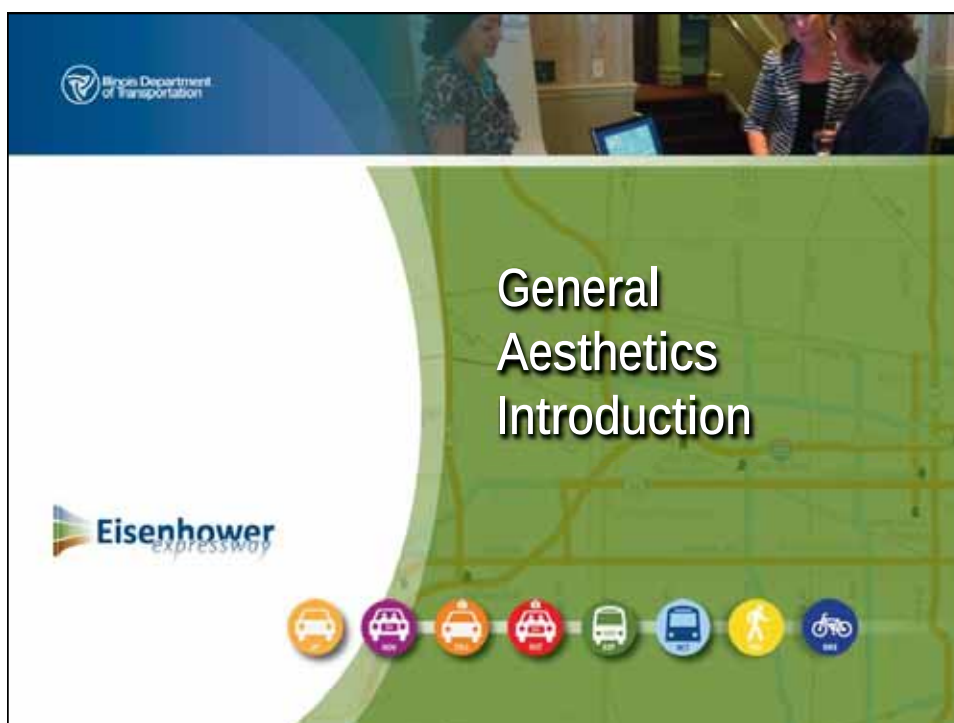
- For Build Condition
- Look at Worst-Case Receptors
- Include Background Pollutant Level for Area
- Check if NAAQS is exceeded

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Climate Change

- National Standards to be Determined
- MOVES Model Output– Vehicle-based greenhouse gases (e.g. carbon dioxide)
- *Better traffic flow = fewer greenhouse gases*
- Global problem, local solution – any decrease in fuel use (such as improved fuel efficiency) decreases greenhouse gas output

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General
Aesthetics
Introduction

Illinois Department of Transportation

Eisenhower
Expressway

Icons representing various transportation modes: car, carpool, car with 3+ people, car with 4+ people, bus, train, bicycle, and pedestrian.

Aesthetics

- Aesthetics treatments:

- Integrate visual and physical factors
- May provide local, social and cultural, context



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Opportunities for Cohesive Design

- Aesthetics to be considered

- *At the expressway level*

- Consistent theme along mainline

- *Local street level*

- Community oriented
- May vary somewhat by community

- Aesthetic treatments may include:

- | | |
|-----------------|---------------------|
| ✓ Walls | ✓ Benches |
| ✓ Lighting | ✓ Landscaping |
| ✓ Railings | ✓ Public art |
| ✓ Fences | ✓ Surface finishes |
| ✓ Bicycle racks | ✓ Signals and signs |

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General Considerations

- State and federal guidelines
 - Safety, constructability
 - Feasibility
 - Maintenance responsibilities
 - Cost participation requirements

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Next Steps

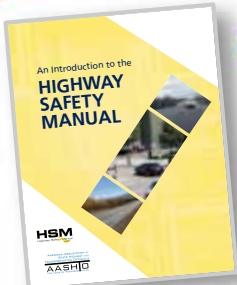
- Community/Stakeholder coordination on design aesthetics
 - Context Audits in 2009; changes since
 - General feedback on local aesthetics
 - Now have concepts
- Follow-up community meetings
 - Review today's handouts, interchanges
 - Revisit elements of Context Audits in more detail
- CTA coordination

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Highway Safety Manual



- Quantitative Approach
 - National Research
 - Predictive – based on empirical / observed data
 - Addresses crash experience & fluctuations
 - Measures effectiveness of:
 - individual treatments
 - overall design – combined effect of individual treatments



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Eisenhower
expressway

How does the HSM work?

- Establish Baseline (No Build)
 - Traffic volume
 - Roadway configuration
 - Available crash history
- Create and test alternatives
 - Proposed traffic volumes
 - Proposed roadway configuration
- Compare predicted crashes to baseline

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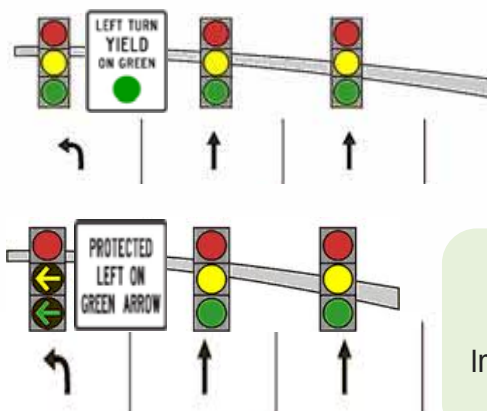
HSM – Illustrative Countermeasure

Left Turn Lane

- Permissive Left Turn

vs.

- Protected Left Turn



6 %
Safety
Improvement

Analysis: Combination of all improvements

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Pedestrian Safety - NHTSA Data



- Predominant Pedestrian Fatality Factors:
 - Urban areas
 - Non intersections
 - Roadways without crosswalks
 - Normal weather
 - Night
 - Higher speeds (over 35 mph)
 - Alcohol (by driver or pedestrian)

National Trend:
Fatalities decreasing over past 10 years

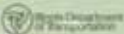
Four E's:

- Education
- Engineering
- Enforcement
- Emergency Response

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Pedestrian Safety - HSM



- Research Ongoing
- Positive data trends
 - Countdown signals
 - Bike/shared use paths
 - ADA improvements
 - Pedestrian refuge islands
 - High visibility pavement markings
 - No turn on red
 - Lighting
 - Beyond the roadway treatments

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Countdown Signals

- Provide information regarding amount of time remaining to safely cross street
- Easily understood

Crash Reduction Factor: 25%



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Expressway

Pushbutton Treatments

- Allows pedestrians to notify intent to cross street
- Pushing button requests that signal phasing be called



66

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Expressway

Bicycle/Shared Use Paths

- Off road facilities
- Provide defined locations suitable for bikes and pedestrians near roadways



Crash Reduction Factor: up to 89%

67



ADA Improvements

- Detectable warning tiles
 - Textured surfaces to notify the visually impaired
- Wheelchair ramps
 - Involve smooth transition from sidewalk to roadway



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Driveway Improvements

- Can include:
 - Closing
 - Restricting to right-in/right-out
 - Reducing radii
 - Narrowing
 - Provide medians



Wisconsin Department of Transportation

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Expressway

Pedestrian Refuge Islands

- Raised barrier medians provide place between two vehicular lanes of traffic
- Can wait for suitable gap
- Divides crossing length into shorter lengths
- Pedestrians can see turning traffic
- Drivers can clearly see pedestrians



Wisconsin Department of Transportation

Crash Reduction Factor: 56%

70

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Expressway

High Visibility Pavement Markings

- Delineate crossing areas
- Guide and inform pedestrians
- Alert motorists of presence or potential for pedestrian interaction
- Demarcate areas between vehicles and bicycles



290

71

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Expressway

No Turn on Red

- Signs used to prohibit certain movements at intersections and driveways
- Certain traffic movements may be regulated or controlled



Crash Reduction Factor varies

290

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Eisenhower
Expressway

Lighting

- Enhances security and provides safety and comfort for both pedestrians and motorists
- Improves ability for motorists to see pedestrians



Crash Reduction Factor varies

73



School Routes

- Adult crossing guards
- Proper use of signs/markings
- Child supervision
- Work with local agencies
- IDOT's Safe Routes to School Program



Crash Reduction Factor: up to 16%

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Beyond the Roadway

Techniques Off the Roadway or Behind the Curb Line

- Eliminate screening by physical objects
- Transit stop treatments
 - Safe, convenient access



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IDOT Existing Conditions Analysis

- Robust analysis of baseline conditions:
 - *Traffic data*
 - *Crash history*
 - *Physical Inventory*
- Provides platform for baseline HSM analysis

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HSM Insights



Highway Safety Manual:

- Output is used for relative comparisons, not absolute predictions
- Compliments other established design criteria

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Virginia Department of Transportation

Next Steps

Eisenhower Expressway



Next Steps

- Public Meeting #3 – early October 2013
- CAG #18 – December 2013



Public Meeting # 3 Overview

- Dates:
 - **October 7th and 8th**
- Topics:
 - Purpose and Need
 - Alternatives Evaluation
 - Concept Layout
 - CTA Vision Study
 - Open House Format





Corridor Concept Review

Please take a moment
after the meeting to review
the corridor geometry exhibit.

IDOT and Study team representatives will
remain after the meeting to answer your
questions and collect any additional input.

