Use of HCS Streets and CORSIM/VISSIM

US 25 in London, KY

US 31W in Elizabethtown, KY

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Using HCS Streets, CORSIM, and VISSIM

US 25, Laurel County
US 31W, Hardin County
Two Projects

- High Density Commercial Areas
- High Crash Frequency
- High Levels of Congestion
Similar Project Goals

- Project Goals
  - Improve Safety
  - Improve Mobility
  - Improve Capacity
US 25
Laurel County
Existing Conditions – Laurel County

- **US 25 – KY 1006**
  - 2 Lanes
  - TWLTL

- **KY 229**
  - 2 Lanes
  - Narrow Shoulders
Previous Studies – Laurel County

- Planning Study
- DNA Study
Proposed Improvements – Laurel County

- Relocated US 25
  - 4-Lane Connection Between US 25 and KY 229
  - Raised Median with Turn Lanes
  - Defined Access Points and Median Openings
  - U-Turns Permitted
Proposed Improvements – Laurel County

- Existing US 25
  - Widen to 4-Lanes
  - Raised Median with Turn Lanes
  - Defined Median Openings and Access Points
  - U-Turns Permitted
Proposed Improvements – Laurel County

- Truck Circulation Routes
- Frontage and Backage Roads
Proposed Improvements – Laurel County

- HCS Streets
- VISSIM
- Citizens Advisory Committee
US 31W
Hardin County
Existing Conditions – US 31W, Hardin County

- US 31W Bypass to Wilson Road Overpass
- Near Fort Knox Military Base
- Existing Multi-Lane Roadway with Turn Lanes
Previous Studies – US 31W, Hardin County

Proposed Improvements – US 31W, Hardin County

- Modifying & Consolidating Median Openings
- Redistributing Existing Lanes
- Lengthening Existing Turn Lanes
- Adding Turn Lanes
- Modifying Signal Timing
- Providing U-Turns
Proposed Improvements – US 31W, Hardin County

• HCS Streets and CORSIM
  - Evaluate Existing Conditions
  - Evaluate Proposed Improvements
Access Management Plans

US 25, Laurel County – Developing in Phase I
US 31W, Hardin County – Validating
Access Management Plan
Laurel County

▲ Developed in Phase I Design

- Citizens Advisory Committee
- Project Team
- Public Meetings
- Eliminate Conflict Points
- Operational Analyses
Access Management Plan
US 31W, Hardin County

- HCS Streets
- CORSIM
- Validate Proposed Access Management Plan
Operational Analyses

US 31W Hardin County

US 25 / KY 229 Laurel County
Analysis Tools

- HCS Streets Accounts for:
  - Multiple Signalized Intersections
  - Effect of Access Points on Flow of Traffic
HCS Streets & US 31W

- HCS Streets Beta Test Project
- Used in Conjunction with CORSIM
- Worked Closely with McTrans
  - Develop & Refine US 31W Models
  - Software Enhancements
US 31W

- 9.5 Mile Segment
- 19 Signalized Intersections
- Coordinated and Uncoordinated Systems
- 393 Unsignalized Access Points
Initial Data Collection

▲ Multiple-Period Analysis

- PM Peak (4:00 PM - 5:30 PM)
- Six-15 Minute Periods
- Accounts for Unmet Demand
Effect of Access Points

- 393 Unsignalized Access Points
- HCS Streets
  - # Right-Hand Access Points
  - Mid-Segment Delay
- Combined Into 53 Active Access Points
- Trip Generation Rates
Field Visits

▲ Volume Surveys at Representative Access Points
Field Visits

- Travel Times
- Queues
- Saturation
- Headway
- Speeds
Travel Times
Southbound US 31W Corridor

Travel Time (Minutes)

Intersection

HCS Streets
Field Measured
Travel Times
Northbound US 31W Corridor

Travel Time (Minutes)

Intersection

HCS Streets
Field Measured
HCS vs. Field Measured Results

- **Travel Time**
  - SB within 2%
  - NB within 6%

- **Average Speed by Segment**
  - Within 5 mph

- **Queues Consistent with Field Observation**
Beta Testing Conclusions

- Accurately Modeled Baseline Conditions

- Key Factors
  - Obtaining Existing Signal Timing
  - Calculating Saturation Flow Rate
  - Using Multiple-Period Analysis
Example Modifications to Access Management Plan

- Adds NB & SB Dual Lefts
- Revises EB From Shared Thru/RT to Exclusive RT
US 25

- 2.2 Mile Segment
- 4 Signalized Intersections
- Uncoordinated Systems
- 150 Unsignalized Access Points
VISSIM – Laurel County Operational Analyses
Laurel County Operational Analyses

▲ Travel From KY 1006, Across KY 192, To KY 229

- Today: ~5 to 6 Minutes
- 2040: 10+ Minutes
- 2040 With Improvements: 5 to 6 Minutes
Applications

- HCS Streets
  - Corridor Level Analyses
  - Multiple Signalized Intersections
  - No Public Involvement
  - Provides Travel Time
  - Provides Typical HCS Results
  - Level of Service
Additional Applications

- VISSIM
  - Public Involvement / 3D Animation
  - Complex Geometry
  - Common MOE’s Except LOS
Where Are We Today?

US 25, Laurel County
US 31W, Hardin County
Where Are We Today?
Laurel County

- Completing Phase I Design
- Finalizing Access Management Plan
- Advancing to Phase II Design
- Anticipated Construction – Spring 2015
Where Are We Today?
US 31W Hardin County

Project Continuation Pending:
- Travel Demand
  - Elizabethtown to Radcliff Connector
  - Bullion Blvd Connector
- Future Public Involvement
Thank You

Questions?