

# Operational Analysis for Interstate Access Modifications I-405 Corridor Experience

August 15, 2006  
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# I-405 Corridor Today

- Seattle, WA
- 3+ Million Population
- 30-Mile Corridor
- 200,000+ ADT
- 1 HOV and 2 GP Lanes
- HOV's Used Extensively





# Improvement Project

- Separated HOV Lanes
- HOV Direct Access Interchanges
- 5,000 New Park-and-Ride Spaces
- Two Additional Lanes of Capacity
- Multiple Implementation Phases
- Rebuild/Construct 25-30 Interchanges





# Interstate Access Changes

- FHWA Additional Interchanges to the Interstate System
  - 8-Point Access, Interchange Justification Report, Access Point Decision Report
  - Requires Detailed Operational Analysis
  - Traditionally Highway Capacity Manual Based Calculations
  - **Understand Implications of Access Modifications**





# Traditional Analysis Issues

- Traditional Approach Has Challenges
  - 4,200 Separate Capacity Calculations Required With HCS
  - HOV and HOT Lane Modeling Difficulties
  - Ramp Meter, Complex Weaving Difficulties
  - Bottleneck Relocation Not Realized
  - Results Difficult to Explain

# New Capacity Analysis

- Vissim Microsimulation Model
- 6 Hour Peak Periods
- Entire 30-Mile Corridor Modeled
  - 25-30 Interchanges
  - 170+ Intersections
  - 6 Additional Freeways
- Largest Vissim Model in U.S.



# New Analysis Issues

- FHWA Comfort Level
- Not HCS
- Local Street-Freeway Interfaces
- Data Presentation



# New Analysis Solutions

- FHWA Comfort Level
  - Access Analysis for FHWA
  - Over the Shoulder Review of Modeling
  - FHWA National Expertise Involvement
  - Strictly Followed FHWA Microsimulation Guidelines





# New Analysis Solutions

- Not HCS
  - Comparison Made Between HCS and Vissim Results
  - HCS Similar in Simple Freeway Areas
  - HCS Similar in Basic Weaves, Merges/Diverges
  - Vissim Better in Complex Weaves, Merges/Diverges, HOV-HOT Lanes



# New Analysis Solutions

- Local Street Freeway Interfaces
  - Not Possible/Practical to Model Freeway Corridor and Intersections In Vissim
  - Intersections Modeled in Corsim
  - Linked Input/Output
  - Able to Demonstrate Operational Changes of New Access Points



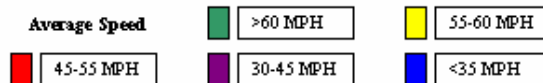
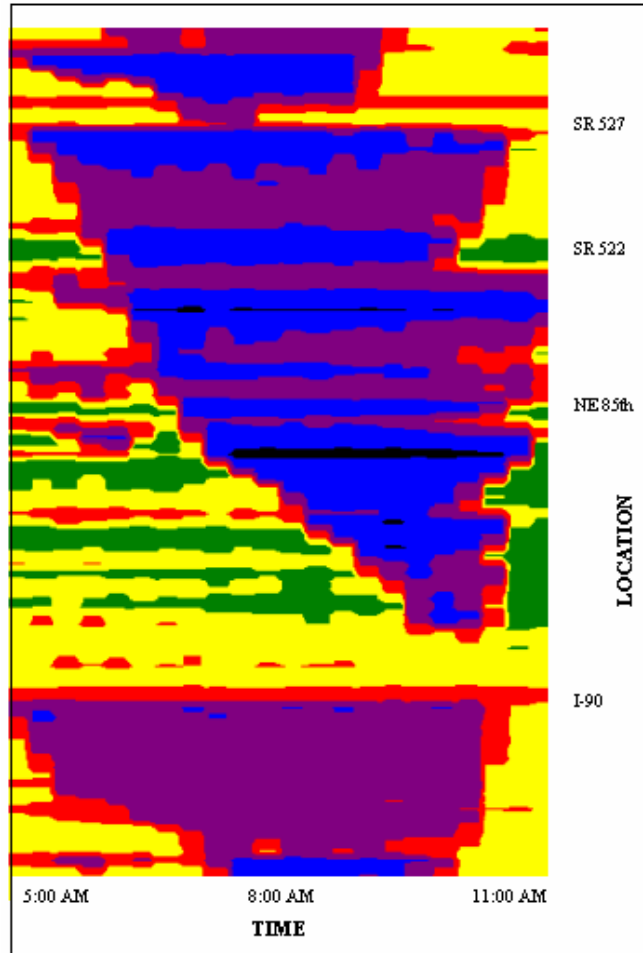
# New Analysis Solutions

- Data Presentation
  - Temporal Congestion Charts
    - Doppler Charts
    - Brain Scans
  - Ability to Relay Large Amounts of Information in One Chart
  - Well Received by FHWA, Agencies, General Public

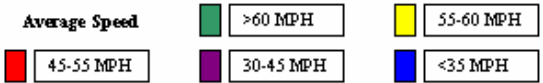
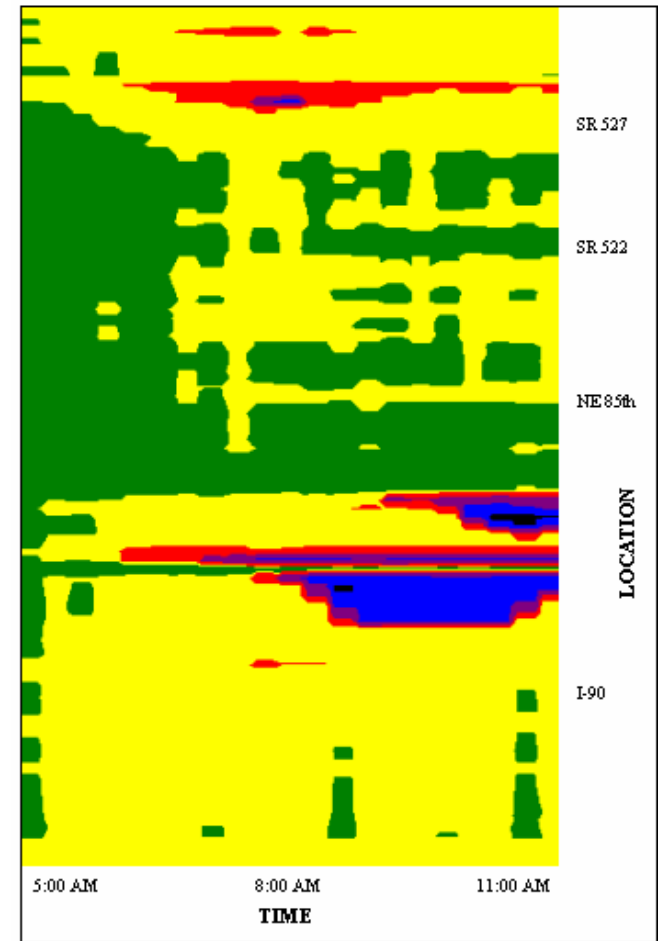


# Congestion Charts - Speed

No Action

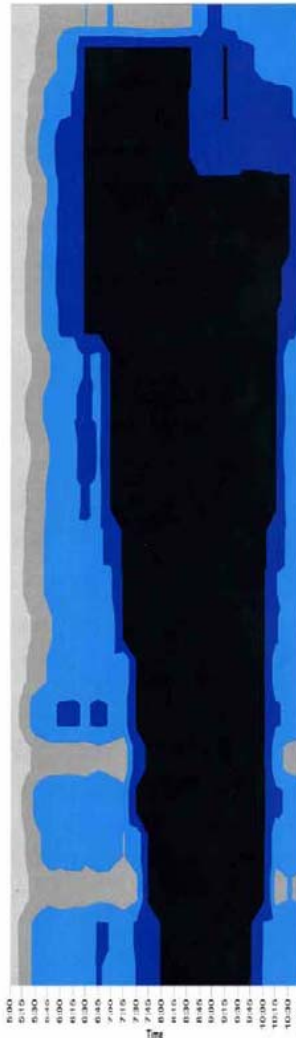


Improvement



# Congestion Charts - LOS

No Action



@ 1-40

N. OF COAL CREEK PKWY

N. OF 112TH AVE SE

N. OF NE 44TH ST

N. OF N 30TH ST

N. OF PARK DR

N. OF SUNSET BLVD

N. OF SR 169

N. OF SR 167

Improvement



# Congestion Charts

- Only Operational Data Presented in Master IJR Document
- Easy to Understand Local and Corridor Impacts of Access Changes Including New Access Points
- Ability to Deal With Real Issue of Bottleneck Relocation.



# Long Term Results

- New Way of Modeling Corridor Operations for Access Management Plans
- Better Understanding of Access and Operations Linkages
- Better Tools for Relaying Complex, Large Corridor Performance to Make Informed Decisions



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