



College of Engineering

Urban Traffic Congestion

Austin District Congestion Management Projects



*Center for Transportation Research
The University of Texas at Austin*

Solutions Require A Comprehensive Approach



- **Increase** Transport System Capacity
- **Improve** Operational Efficiency
- **Modify** Travel Demand

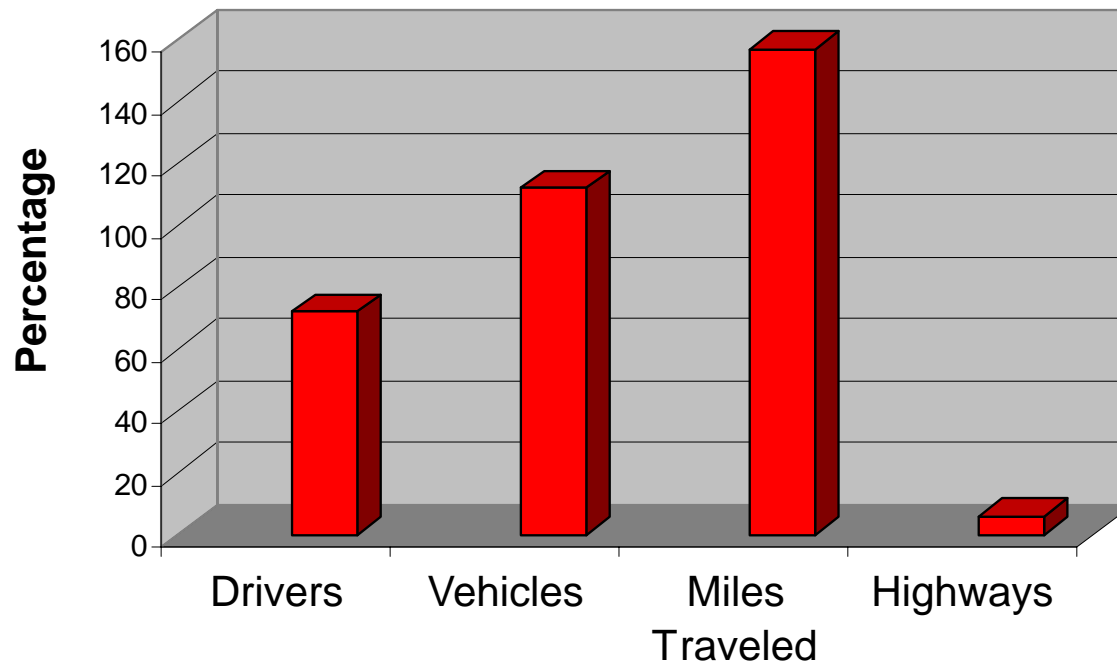
Increasing Transport System Capacity



- Two Elements Must **Both** BE Implemented
- Add new transportation system links
- Renovate existing system elements

Increasing Transport System Capacity

Changes Compared to 1970



Increasing Transport System Capacity



- **Add new system elements**
- New street lanes on existing streets
- New freeway lanes on existing freeways
- New freeways
- New Transit concepts
- New Transit Modes

Increasing Transport System Capacity



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Increasing Transport System Capacity Dallas Rail System



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Increasing Transport System Capacity



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Increasing Transport System Capacity: Financing Issues



Toll based financing:

Highway projects

Design-Build-Operate Concepts:

Highway and transit
projects

Increasing Transport System Capacity: Trans-Texas Corridor



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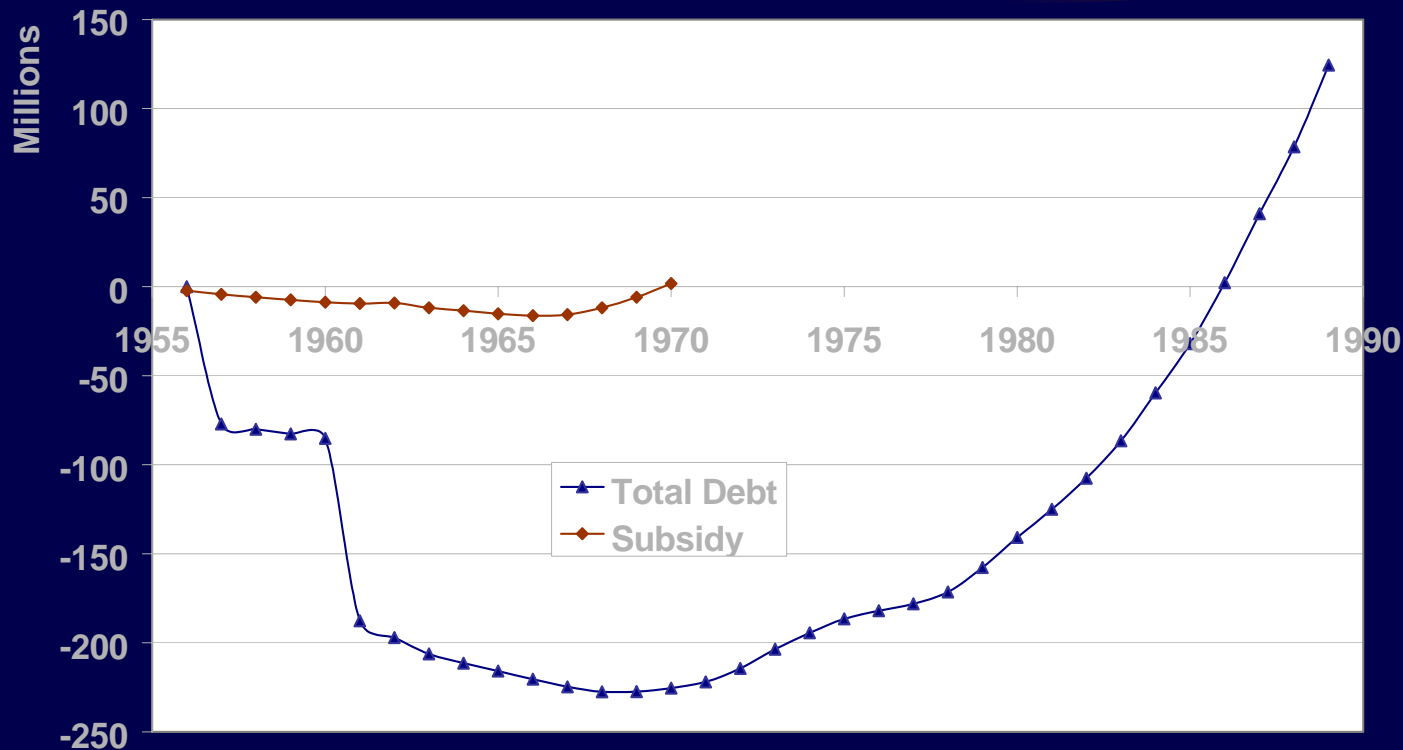
Increasing Transport System Capacity: Monorail



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Increasing Transport System Capacity: Toll Based Financing

Florida Debt History



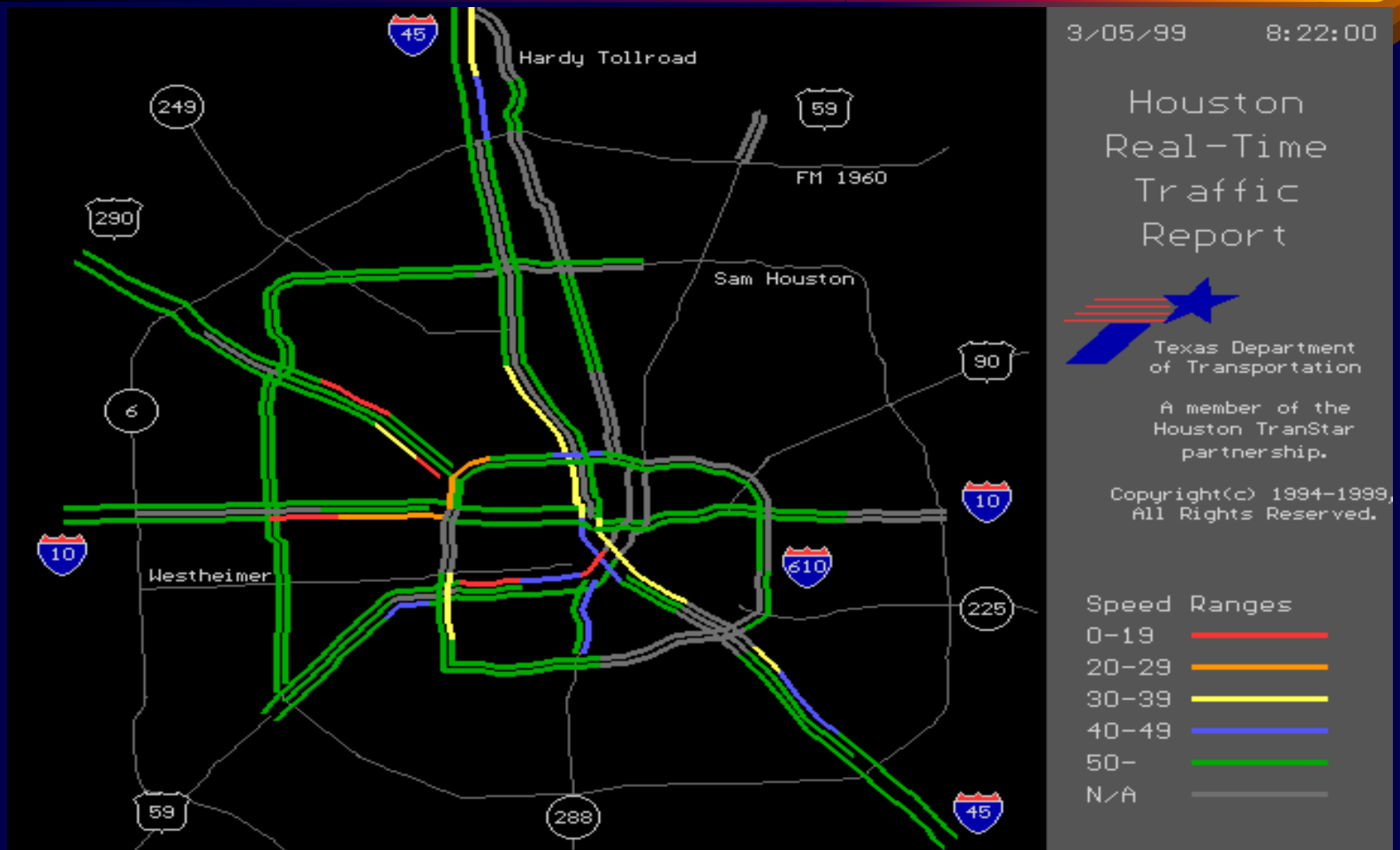
Improve Operational Efficiency



- Implement ITS concepts
- More robust operational monitoring
- More flexible control methods
- Improve incident management procedures

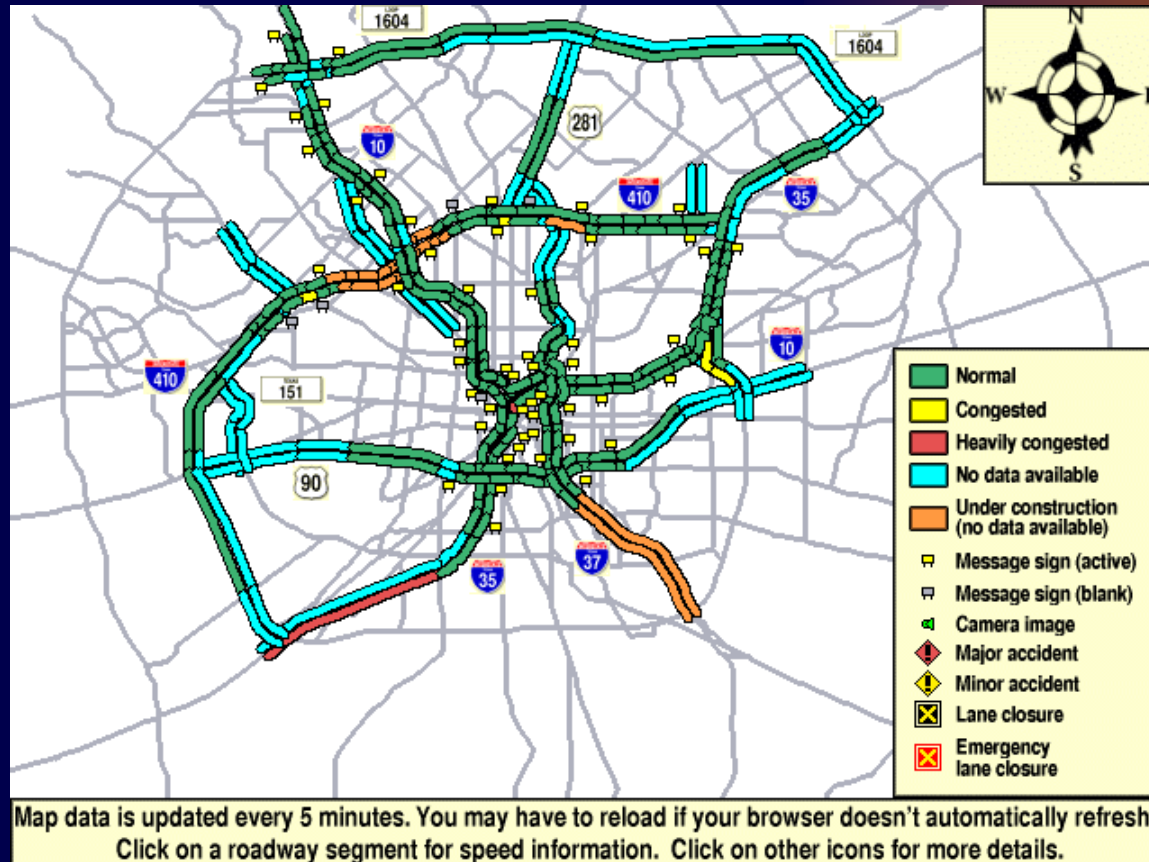
Improve Operational Efficiency

Houston Real Time Traffic Data



Improve Operational Efficiency

San Antonio WEB Based Traffic Information



Improve Operational Efficiency

Transguide Video Surveillance



Improve Operational Efficiency



- Streets
 - Flexible signal operation
 - Real time channelization
 - Bus Stop Locations, bus turn-outs
 - Pedestrian Facilities

Improve Operational Efficiency



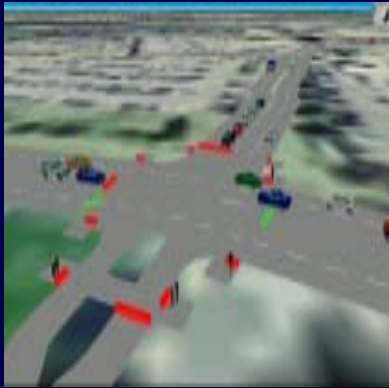
- Freeways
 - Bottleneck Resolution
 - Ramp Metering
 - HOV Lanes
 - Dedicated truck lanes

Improve Operational Efficiency



- New Generation Operational Analysis Tools
 - Computer Traffic Simulation Modeling
 - Optimization Capabilities

Improve Operational Efficiency: Traffic Simulation Models Require Calibration



VISSIM

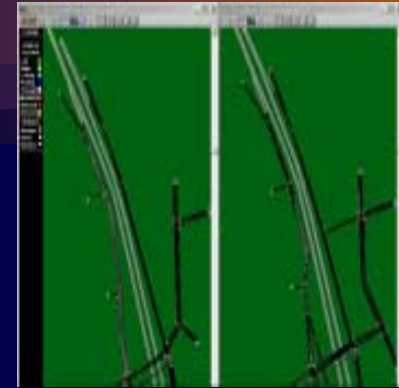
Texas Model



SimTraffic

WATSIM

Passer V



CORSIM

Transyt-7F

Modify Travel Demand



- Reduce demand
- Change peaking characteristics
- Change mode choices

Modify Travel Demand: Demand Reduction is Problematic



- More people mean more travel demand
 - Austin Metro Area is almost 1,000,000 people
 - CAMPO 2025 forecast is 2,335,037 people
- Per person travel demand may decrease
 - Trip rates may decrease as population increases
 - Congestion will limit the rate of increase
- The net result will be increased demand

Modify Travel Demand



- Travel reduction measures
 - Four day work weeks
 - Telecommuting
 - Home shopping
- Net impact has been 1-2 percent of all trips
- Why has the impact been so minimal?

Modify Travel Demand



- Vehicle Occupancy
- Average Vehicle Occupancy During Peak Hours is
- Barely more than 1 person per car

Modify Travel Demand



- How would an **average** vehicle occupancy of **2 persons per car** effect our system?
- How could this be attained?
- Car pooling
- Van pooling

Modify Travel Demand: Peaking Characteristics



- Work Trip Travel Times
 - Does everybody really need to begin work at 8:00 AM???
- How would morning congestion be changed if-
 - 1/3 of us arrived at 6:00 AM,
 - 1/3 arrived at 10:00 AM
 - and the rest at 8:00??

Modify Travel Demand: *Change Mode Choices*



- Travel Modes
- What will convince me to use transit instead of my car for work trip travel??
- My perception of service with my car must decrease to that of transit . . . **or** . . .
- My perception of transit service must improve to that of my car

Modify Travel Demand:

Change Mode Choices



- Poorer auto service
 - No Parking at my destination
 - Congestion on my auto travel route
- Better transit service
 - Available transit service
 - Travel times competitive with my car
 - Bus rapid concepts

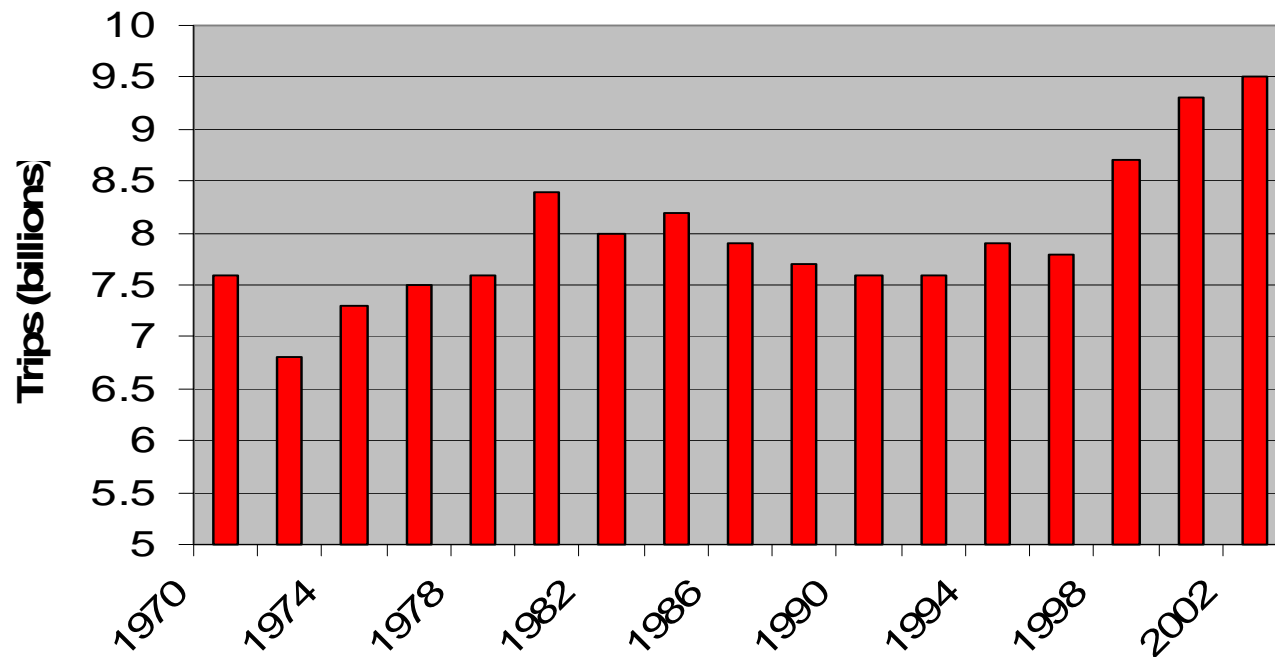
Modify Travel Demand:



- Washington Post, Sunday 30 April 2000
Headline:
 - *Mass Transit Popularity Surges in U. S.*
 - Biggest Demand in 40 Years
 - Last year ridership rose 4.5% compared to 2% for motor vehicle travel

Modify Travel Demand

**U.S. Annual Public Transportation
Ridership (Billions, source APTA)**



Modify Travel Demand: Possible Measures



- **Tolling:**
 - Acceptable if travelers perceive improved service
- **Congestion pricing:**
 - Technology for implementation is available



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