Use of Microsimulation to Convey Access Management Techniques

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Challenges to Implementing Access Management

- Convincing the Public that Access Management Techniques are the Right Thing to Do
- Providing a Clear Understanding of the Project
- Treating Everyone Fairly
- Gaining “Acceptance” of the Project

Microsimulation

- Visual Presentation of Ideas
  - No Engineering Jargon
- A Picture is Worth a Thousand Words
  - A Video is Priceless

What's The Best Simulation Software?

- Synchro/Sim Traffic
  - Signal Optimization
  - Detailed Data Analysis
- VISSIM
  - Freeway Modeling
  - Network Applications
  - Visual Presentations

Calibration

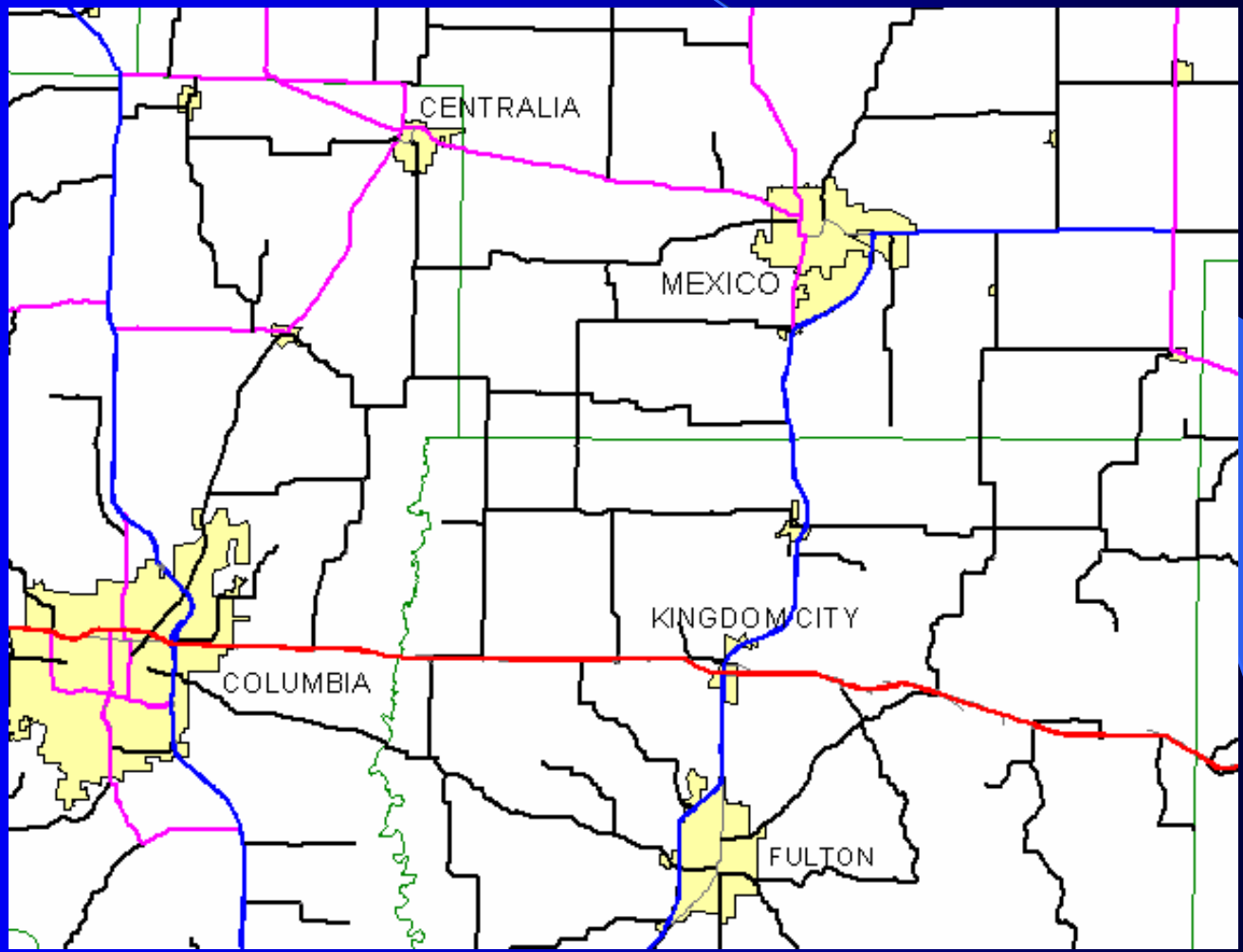
- Existing Scenario
  - Accurately Represent Conditions in the Field
- Proposed Scenarios
  - The Public Will Begin to “Trust” the Model

Case Study 1
Kingdom City

- Population – 112
- IS 70 Exit 148
- Diamond Interchange with US 54
- 2 Major Truck Stops
- Several Hotels/Motels
- Fast Food restaurants (including McStop)
- Gas Stations

Location Map

Location Map



Aerial Photograph

Simulation

- Each model has its strengths and weaknesses (Corsim, Vissim, SimTraffic, etc.)
- SimTraffic/Synchro
  - Traffic Signal timing was critical for evaluation

Methodology

- Created Existing conditions
- Projected Volumes for 2010 and 2030

Existing Conditions

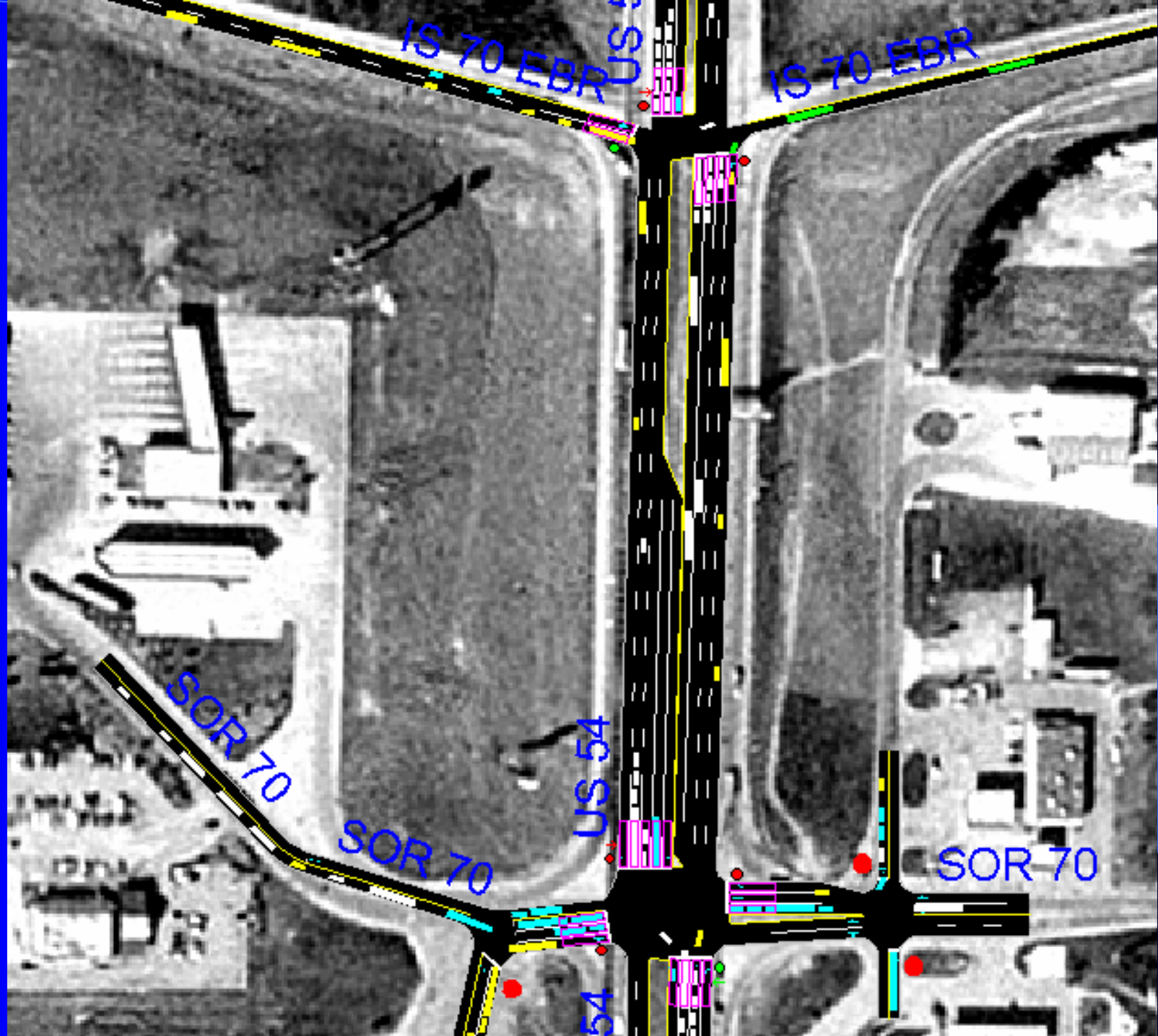
- Used Actual Turning Movement counts (12 hour) from the signalized intersections
- Used existing signal timing and phasing
- Field observation/counts to determine percent trucks on entry nodes
- Calibrated the model to replicate existing conditions

Future Conditions

- Used historic growth factors on IS 70 to project volumes (approximately 2% per year)
- Turning percentages at the intersections were kept the same
- Truck percentages kept the same
- Signal timing was optimized using Synchro

Results

- Presented at meeting with local stakeholders
- Model helped visually present the problems we had identified with existing geometrics
- The aerial photograph available in SimTraffic was very helpful for the stakeholders
- Demo


IS 70 EBR
US 54
IS 70 EBR
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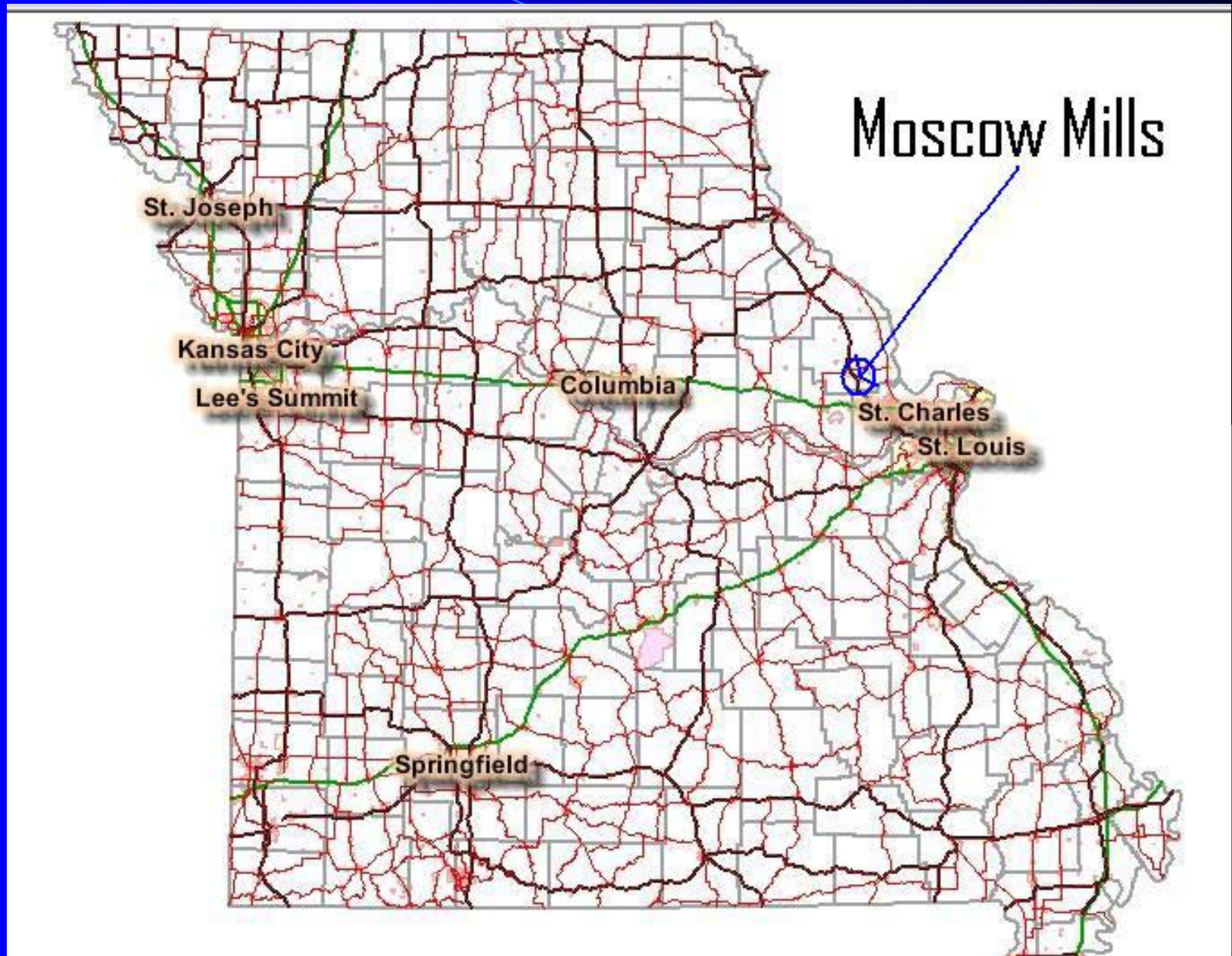
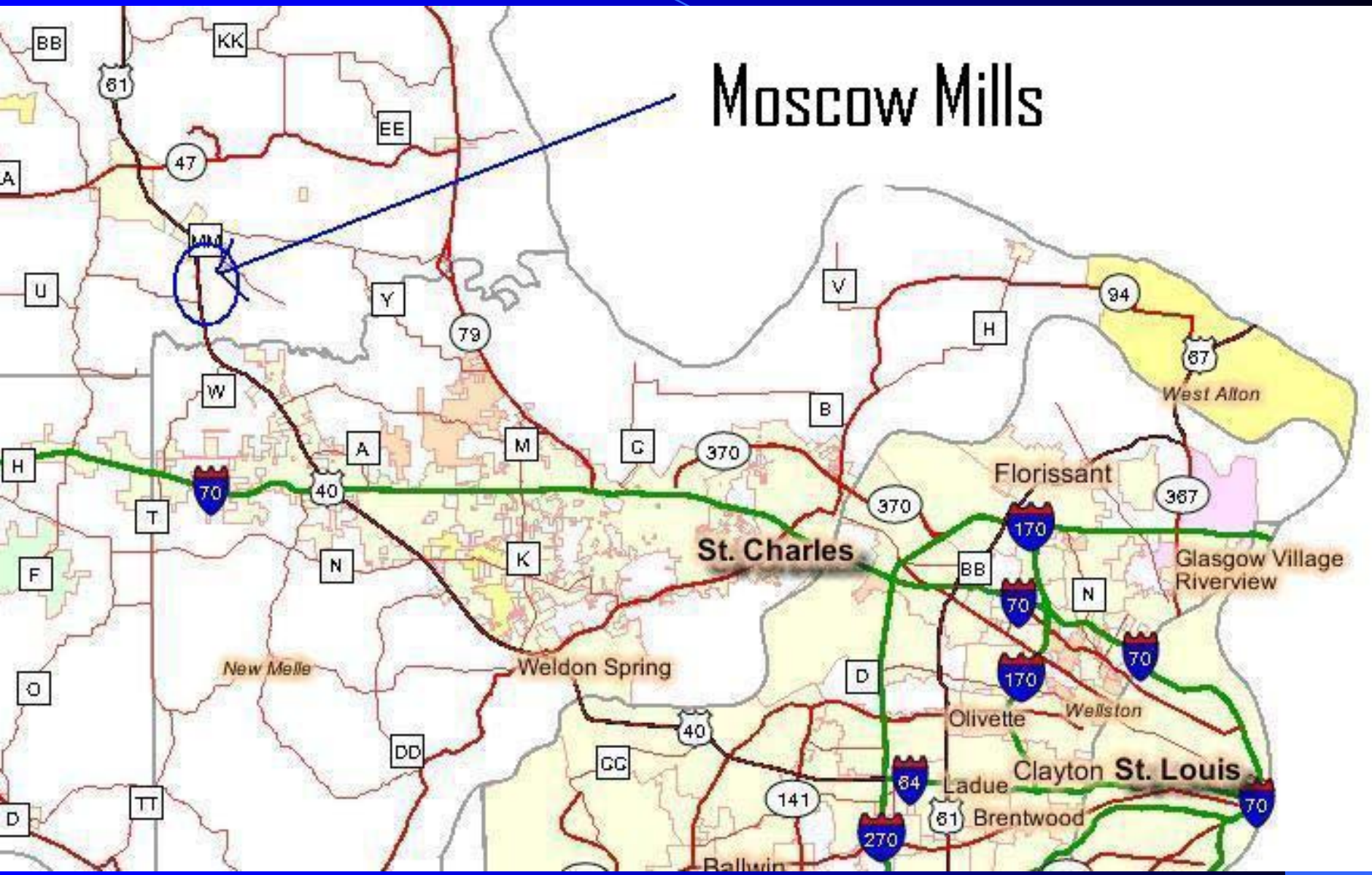
Case Study 2
Moscow Mills

- US Rt. 61 and Rt. U, Lincoln County
- Proposed Mixed-Use Development
  - Several Retail Sites, Hotels, Gas Stations and Restaurants
- Roadway Improvements
  - Interchange Construction
  - Signal Installation

Location Map



Location Map



Aerial Photograph

Proposed Scenario

- Outer Road Spacing of only 600’
  - Queues from the Outer Road back into the Ramp Terminal Intersections
  - Queues have potential to spill onto US 61
  - Coordinated Signals Unevenly Spaced
- Modeled with Synchro and VISSIM
  - Synchro used for Signal Timing
  - VISSIM used for Network Analysis and Visual Demonstration

Suggested Improvements

- Increase Spacing of First Signalized Intersection
- Provide More Evenly Spaced Signals
  - Minimized Total Number of Signals

Results

- Better Progression along Route U
- No Queues Backing into the Ramp Terminals
- No Negative Effects to US 61
- Synchro Provided Signal Timings for both Scenarios
- VISSIM showed effects of Outer Road Spacing on the Entire Network
- Operational Benefits of Access Management

Lessons Learned

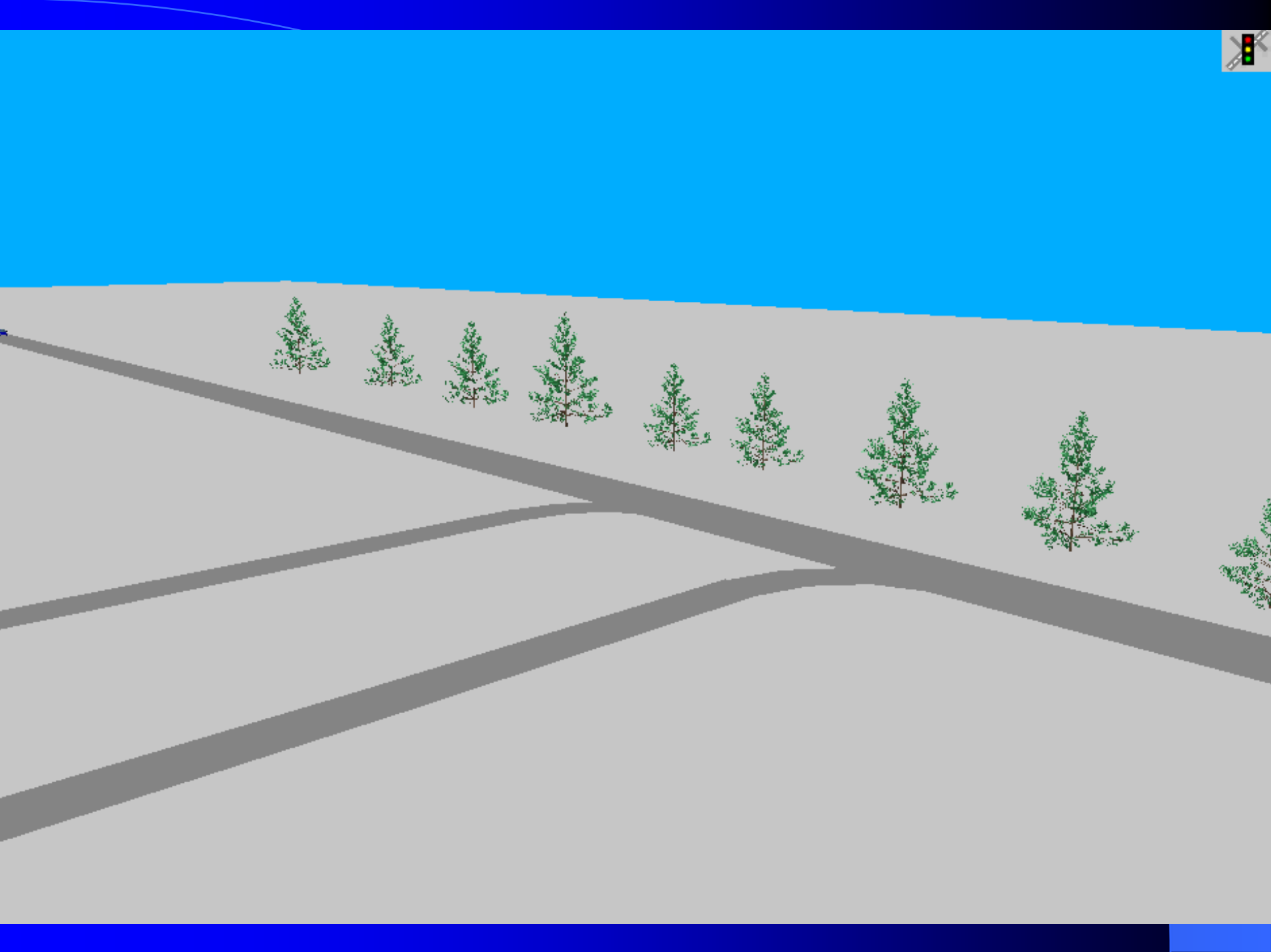
- Presenting to Large Groups can be Dangerous
  - Ring Leader can Influence Others
  - Be Prepared for Surprises and Unsatisfied Customers
- You Can’t Satisfy Everyone
- Be Truthful
  - If You’re Going to Negatively Effect Someone, Be Up-Front with Them

Simulations Related to General Access Management Techniques

- Egress Capacity
- Driveway Width

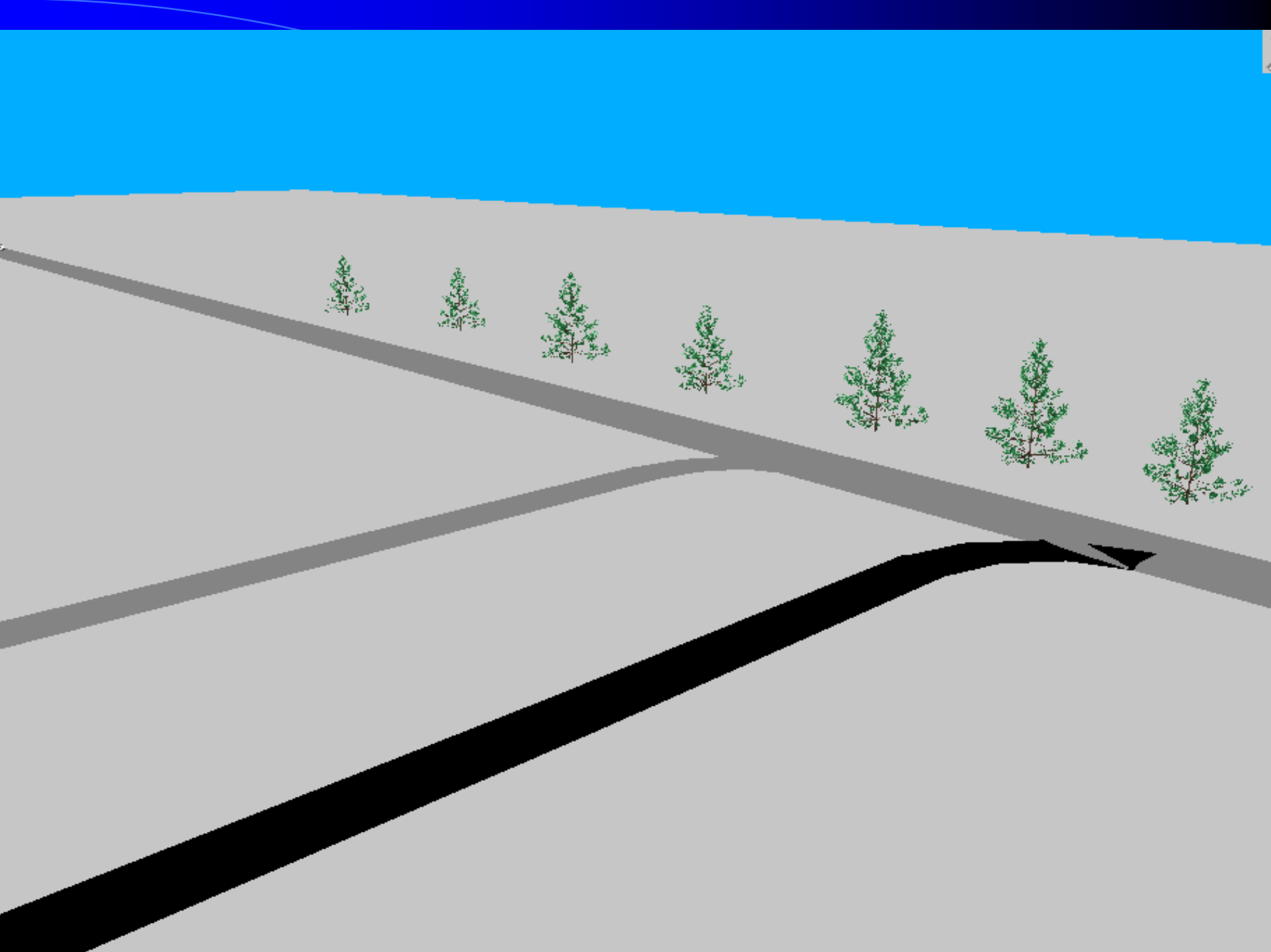
Egress Capacity

- Closely Spaced Driveways
- Consolidated Driveways
- Example is from MoDOT's Access Management Seminar
  - prepared by Vergil Stover



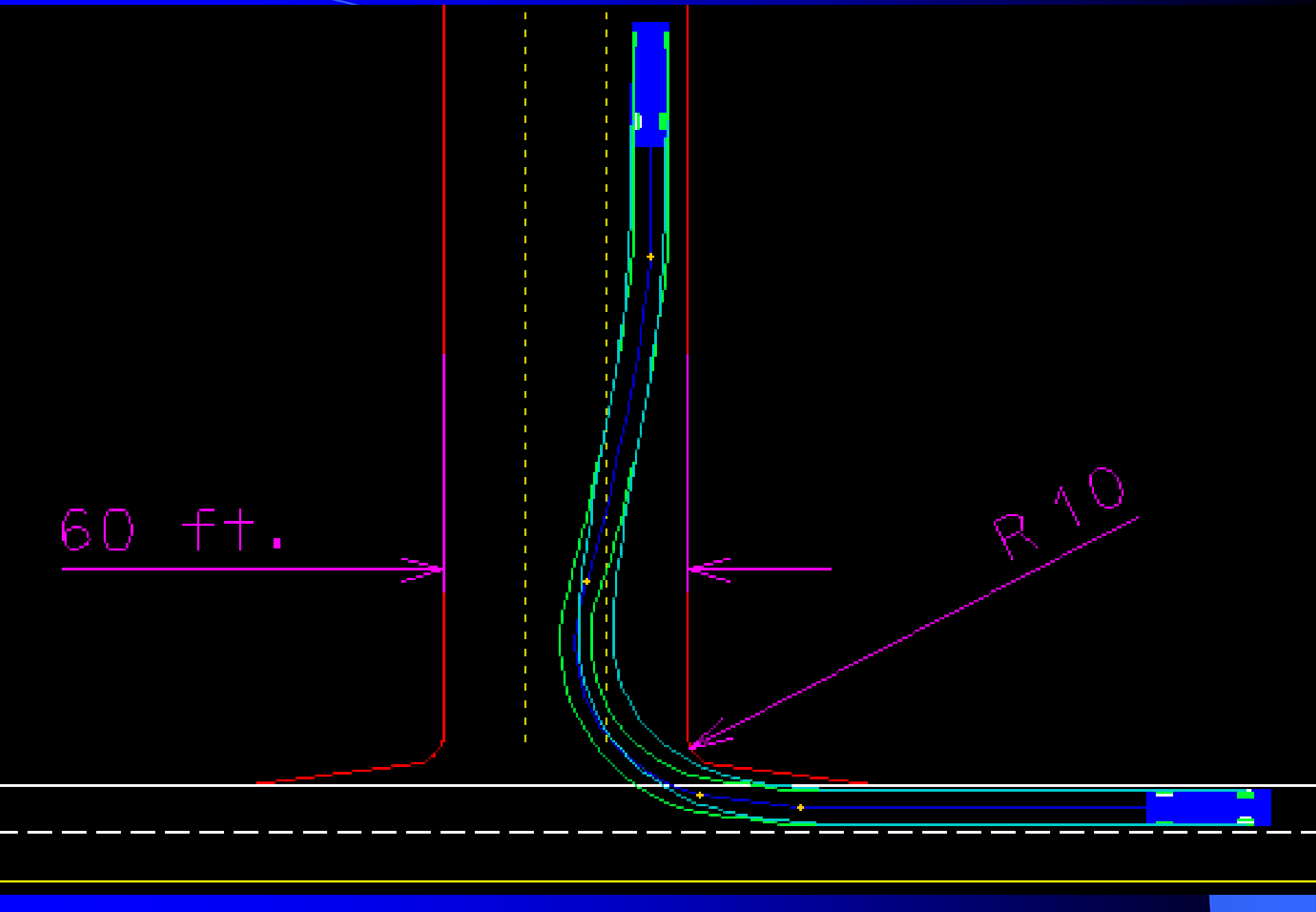
Consolidate Driveways

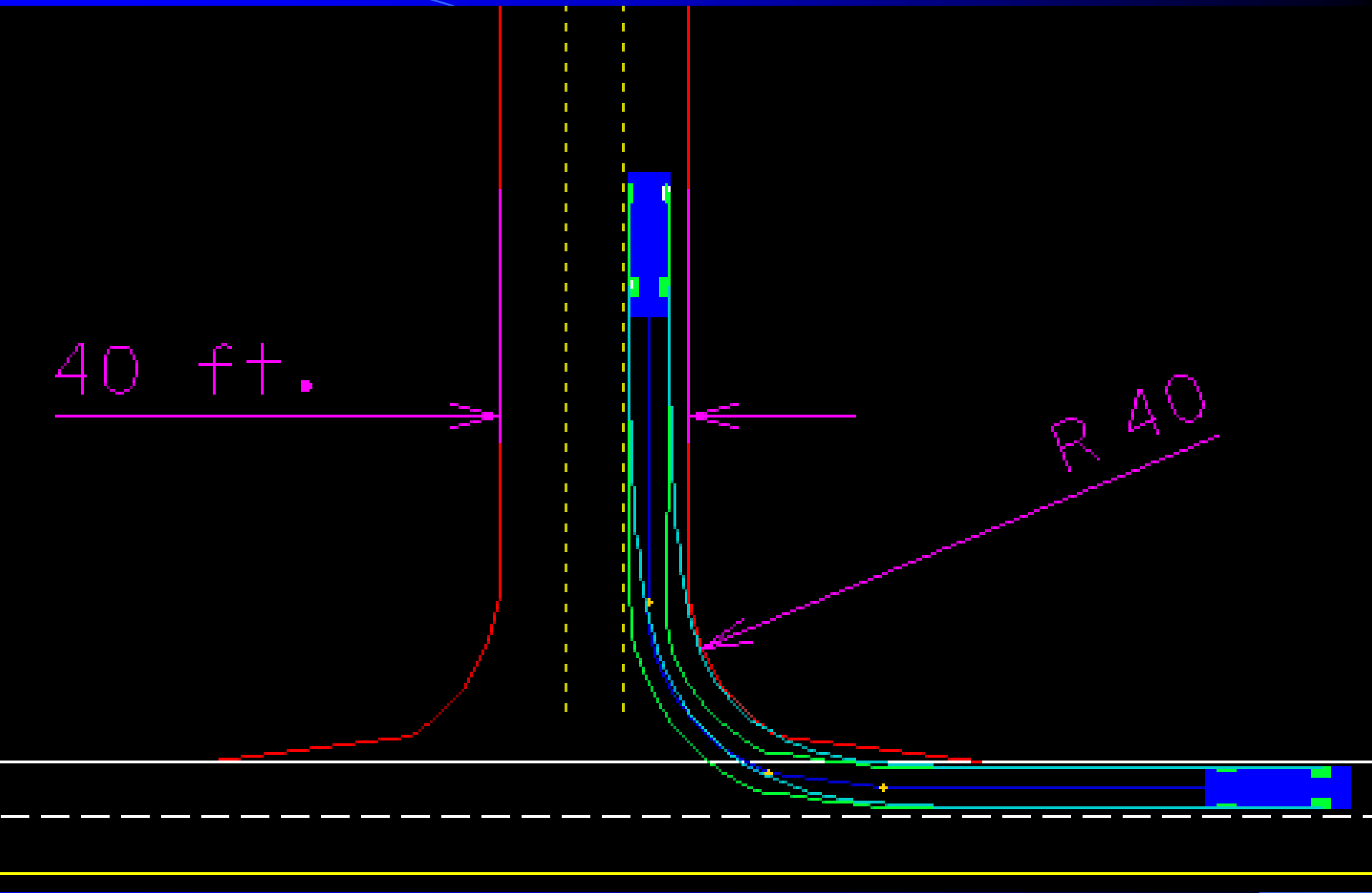
- Combine Two Closely Spaced Driveways Into One Joint-Use Driveway



Driveway Width

- Commercial Entrances
  - Property Owners Desiring Maximum Width
    - MoDOT Allows Maximum 60’
  - Convince Property Owners to use More Appropriate Widths


60 ft.
R10


40 ft.
R 40

Summary of Simulations in Access Management

- Who is your audience?
- What is your goal?

Questions and Comments