# Future of Transportation Planning and Modeling

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## Future Challenges and Opportunities

More Complex Environment

- Hetergenous fleet mix, unlike today
- Autonomous, semi-autonomous, and legacy vehicles
- Variety of Power sources

Greater availability of tools and data

- More sophisticated computer models
- Greater access to data
- Real-time tools

# Challenges

## Why Does This Matter?

20-year or greater fleet turnover

20,30,50-year life span on roadway infrastructure

Retrofitting infrastructure costly and difficult

Limited resources affect our ability to implement large scale changes in our transportation network

**So- If we don't start thinking about the future, we may build facilities that will not work and can not be fixed**

## I Wish They Had Not Done That?

Transportation planners and engineers are often being asked to fix problems or issues from the past

- Lack of right-of-way to widen roadways
- Adjacent development limiting the ability to reconstruct an interchange
- Closely spaced signals at off-ramps

**We are trying to avoid the planners and engineers of 2035 from saying "I wish they had not done that" when it comes to autonomous vehicles**

## Future Vehicle Performance

Autonomous vehicles could provide

- Closer following distances (almost bumper to bumper)
- Platooning
- Uninterrupted flow of traffic

Implications

- Higher capacity
- Potential doubling of capacity for dedicated lanes
  - 2,000 to 4,000 vehicles per lane per hour

# Simulations- Existing Vehicle Types

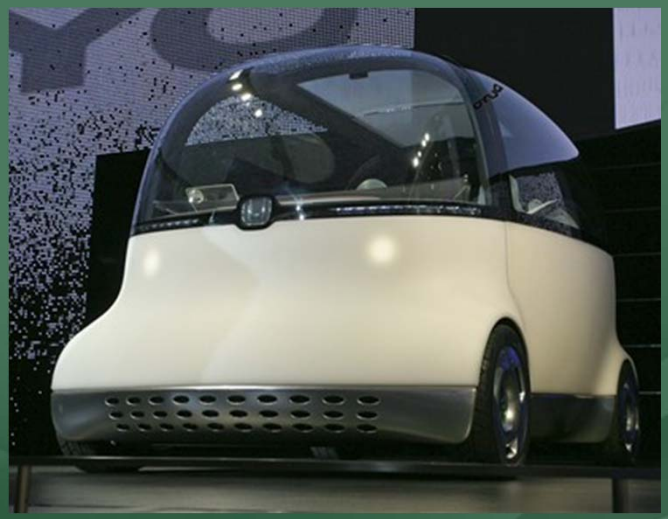
# Simulations- Autonomous Vehicles

# Problem #1- Vehicle Mix

**Toyota Cressida- Last Sold in 1992**

**Picture Taken in May 2012**

# Problem #1- Vehicle Mix

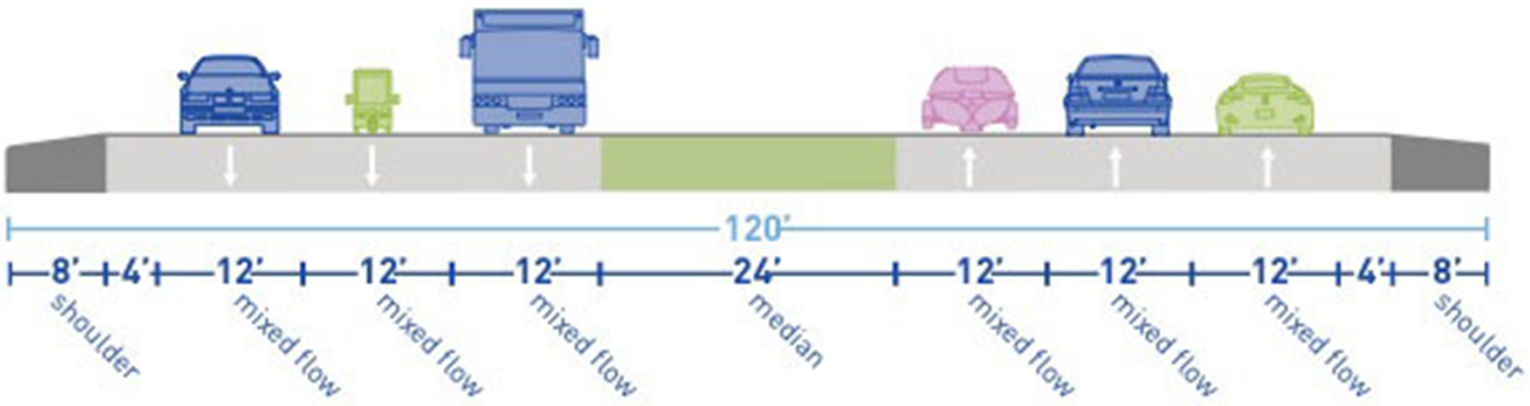


# Problem #2- Limits on Infrastructure

Cost of adding lanes?

Getting into/out of autonomous lanes?

Public outcry if you remove lanes from general use?



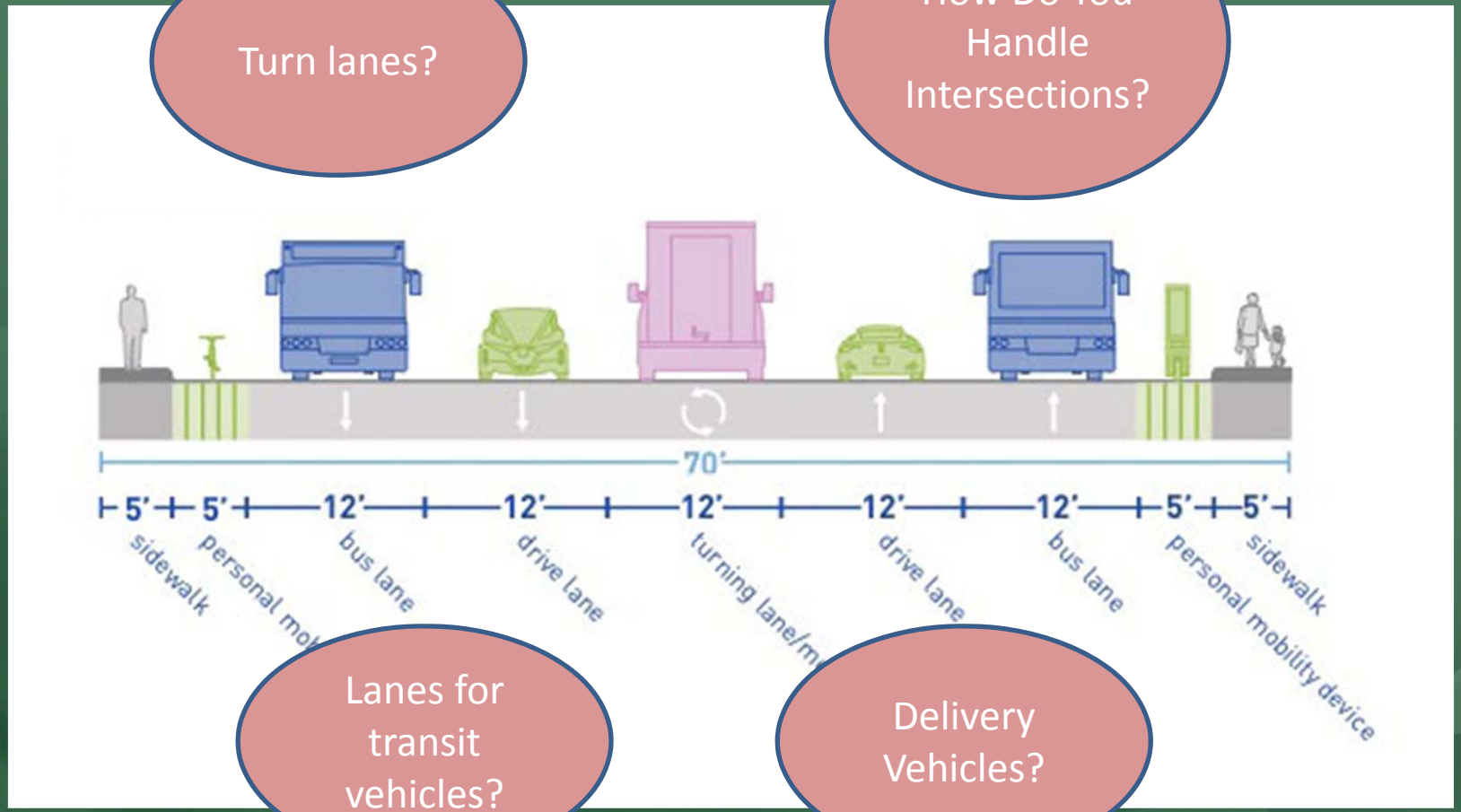

Lanes for transit vehicles?

Potential Toll lanes?

# Problem #2- Limits on Infrastructure

Turn lanes?

How Do You Handle Intersections?




Lanes for transit vehicles?

Delivery Vehicles?

## Problem #3- Public Opinion

HOV= High Occupancy Vehicle

HOT= High Occupancy Toll (SR-91 Express Lanes)

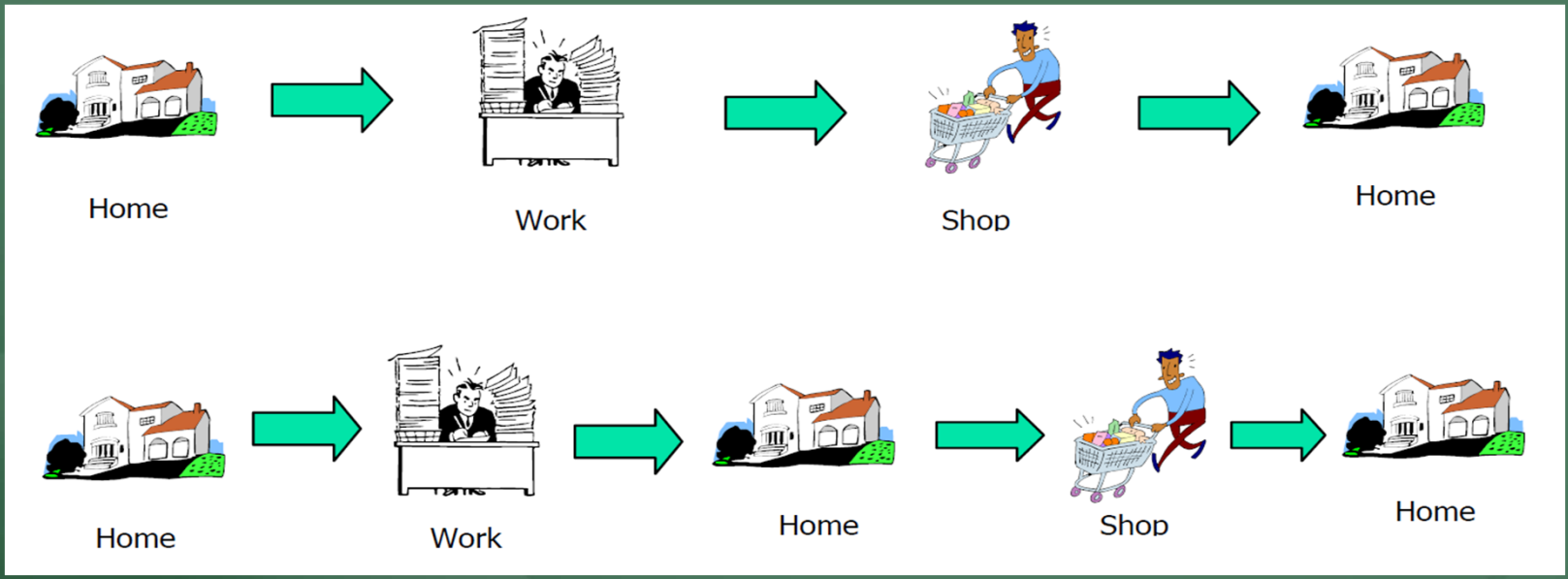
Proposals for these projects sometime get negative publicity including:

- "Lexus Lanes"
- Rich people paying to avoid congestions

Imagine potential negative publicity if you took an existing lane and converted it to autonomous vehicle use

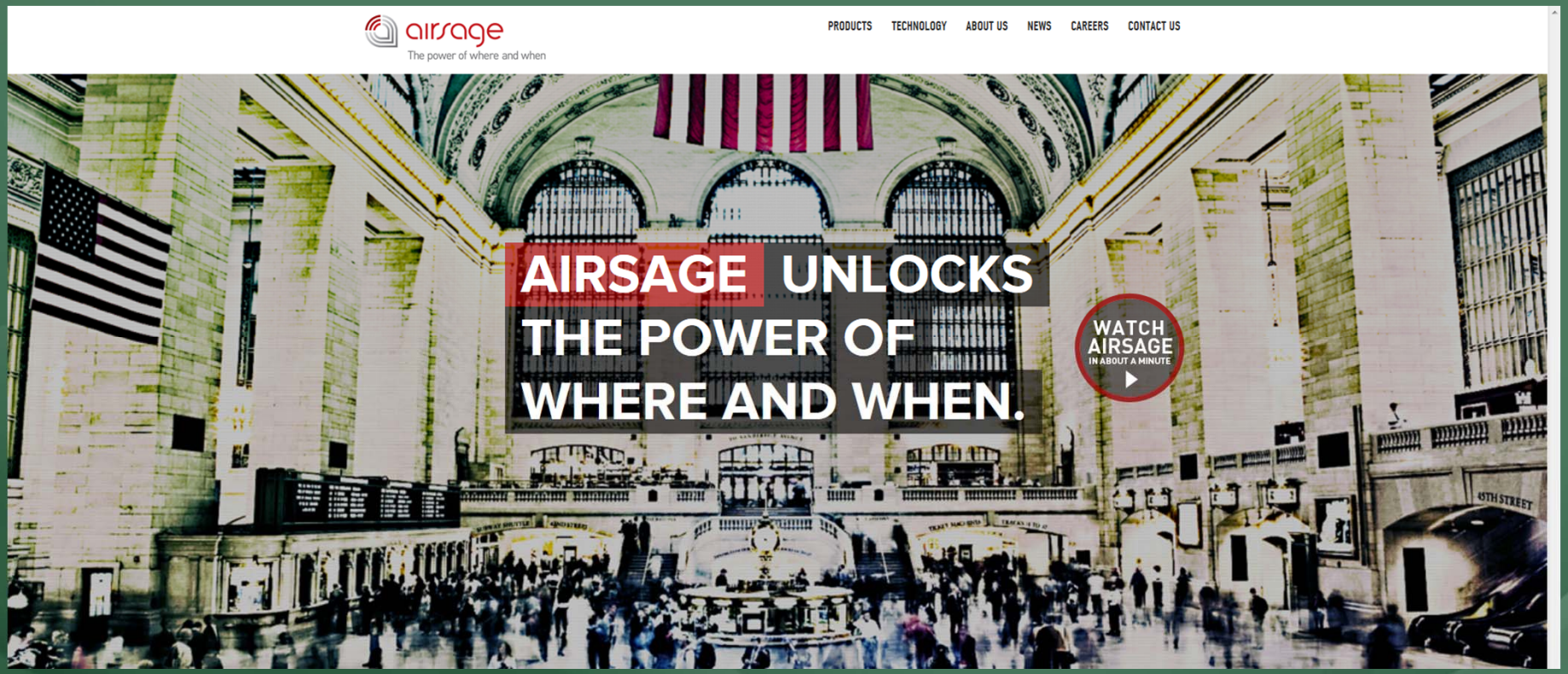
# Opportunities

# More Advanced Computer Models



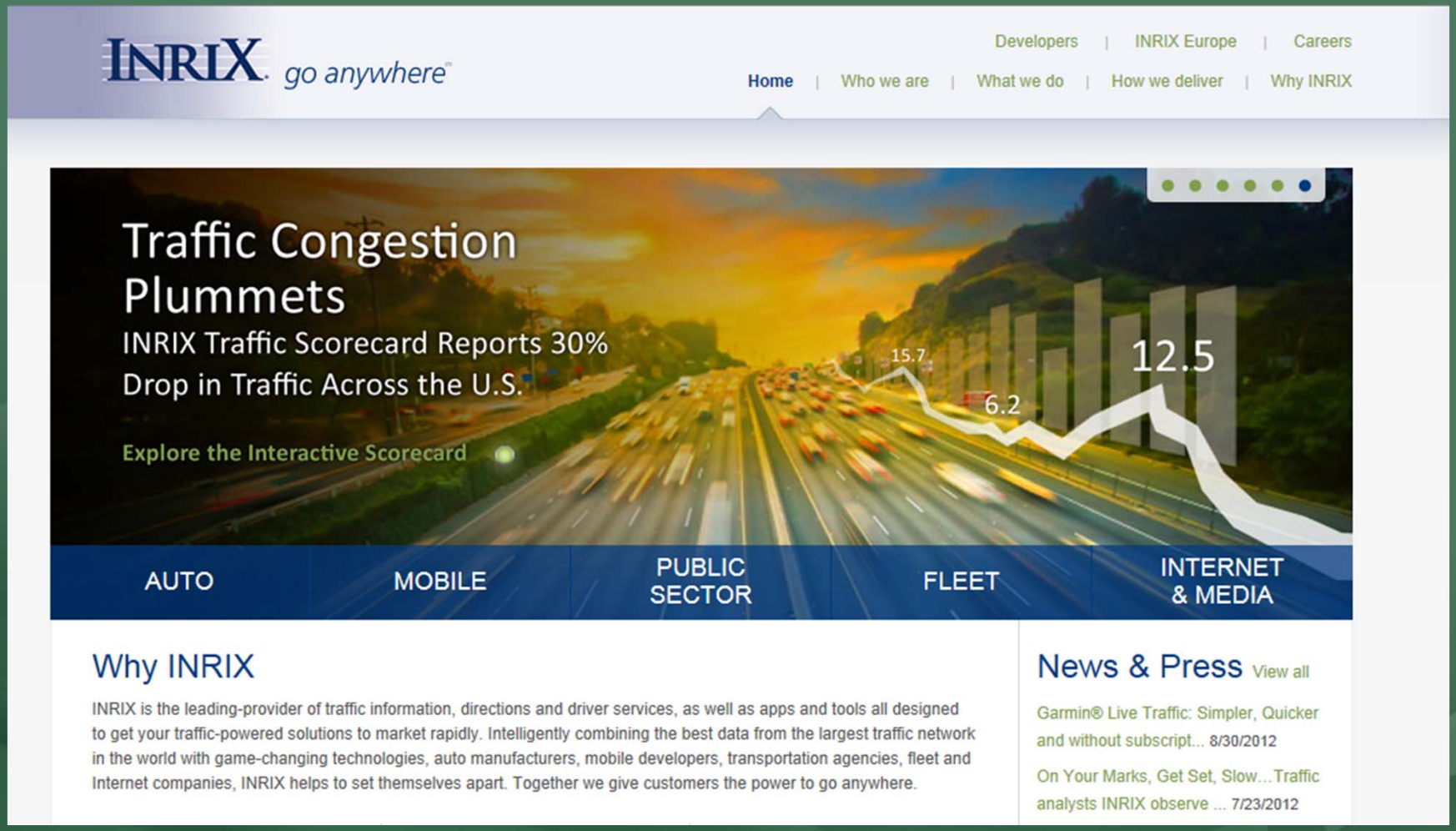

# Activity Based Models vs. Trip-Based Models

# Better Data




## Cell Phone Based O/D Data

# Better Data

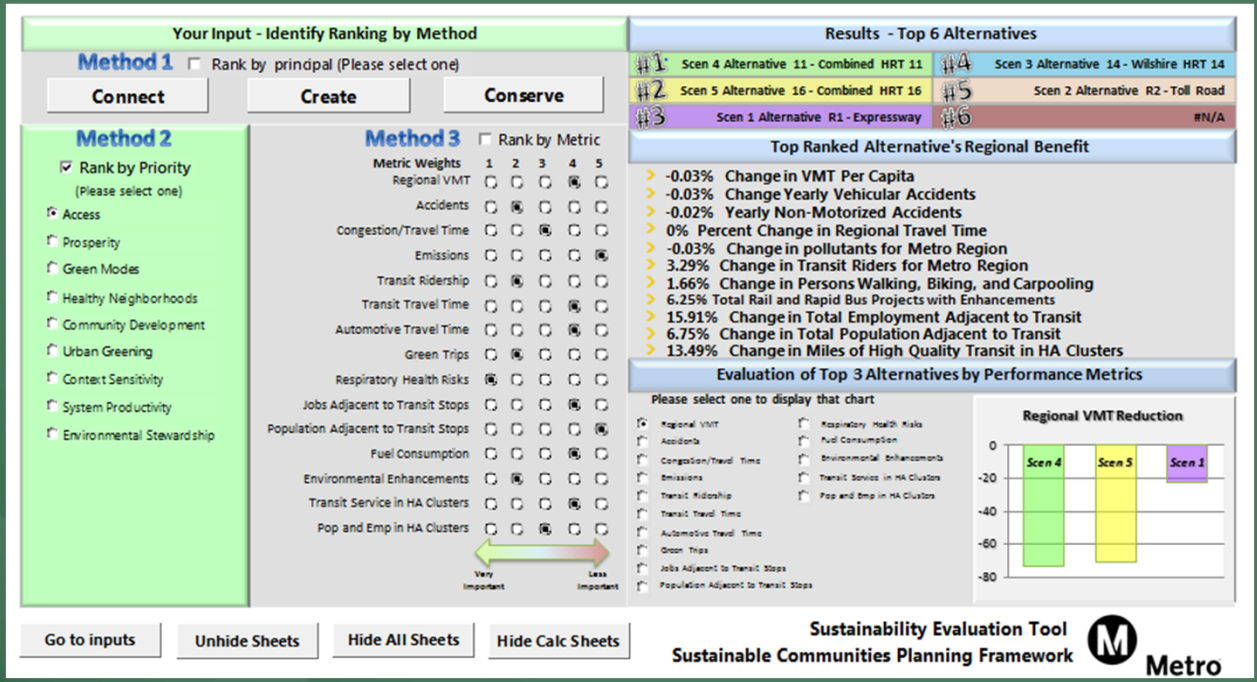


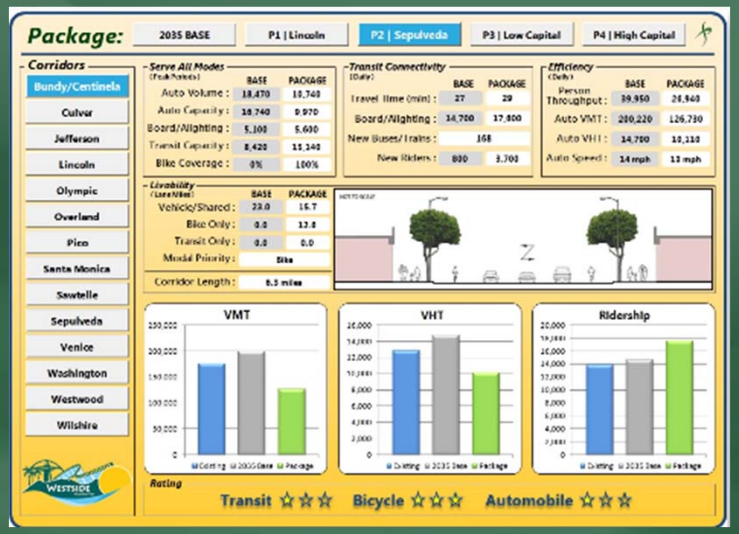

# Real Time Traffic Data

# Better Data

# Video Traffic Data Collection

# Real Time Planning and Forecasting Tools



## Summary

- Significant change coming
- Solutions will not be easy to implement
- We will have new tools and data available to answers these questions
- Never too early to start talking about these issues