Transportation Impact Analysis Gets a Failing Grade When it Comes to Climate Change and Smart Growth
What is Level of Service (LOS)?

- Defined in the Highway Capacity Manual (HCM)
- Description of Operating Conditions
- Most Often Used to Describe Delay to Vehicles at Intersections
- *Typically Reported for the Peak Hour*
- *Peak Hour Measured for the Peak 15 Minutes*
- Acceptable Thresholds set Locally, Usually for Peak Hour
What is LOS?

To a driver: LOS A
To an economist: LOS F

To a driver: LOS F
To an economist: LOS A
This is LOS C
Consequences of Current Practice

Existing Conditions: LOS E
Consequences of Current Practice

Widening for LOS C

- Longer crosswalks
- Loss of riparian habitat
- Increased impervious surface
- Can’t build half a lane

- Higher vehicle speeds
- Greater consumption of physical space
Relationship of *Freeway* LOS, Speed, and CO2 Emissions Factors

- Normalized Emission Rate
- Average Vehicle Speed (mph)
- LOS F
- LOS E
- LOS D
- LOS C or Better

*CO2*
Relationship of Arterial LOS, Speed, and CO2 Emissions Factors
Physical Space

Auto Space
Physical Space

Person Space in Auto
Physical Space

Person Space in Bus
Physical Space
Proximity vs. Speed

Urban Form

Proximity

Speed
Early 20th Century

Area dedicated to driving and parking = 21.5%
Early 21st Century

Area dedicated to driving and parking = 37.5%
Case Study: Davis, CA

Study Location
• **Alternative 1:** Provide all pedestrian/bicycle signal phase
• **Alternative 2:** Provide exclusive phase only for southbound (SB) and westbound (WB) cyclists who travel on a Class I bicycle bath. Cyclists traveling on other approaches would travel with vehicles using the regular vehicle signal phase.
• **Alternative 3:** Traditional design (no exclusive bicycle and pedestrian phases)
• **Alternative 4:** Provide five-second “head-start” phase for SB and WB cyclists traveling on Class I bicycle path.
• **Alternative 5:** Provide grade-separated bicycle crossing connecting SB and WB Class I bicycle paths
Case Study: Davis, CA

Seconds of person delay

- Vehicle: 28.7 seconds
- Buses: 29.8 seconds
- Pedestrian: 64.2 seconds
- Bicycle: 15.1 seconds
- Average: 28.1 seconds