

**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



LO5C_Cam3

Isolated vs. System-wide Analysis



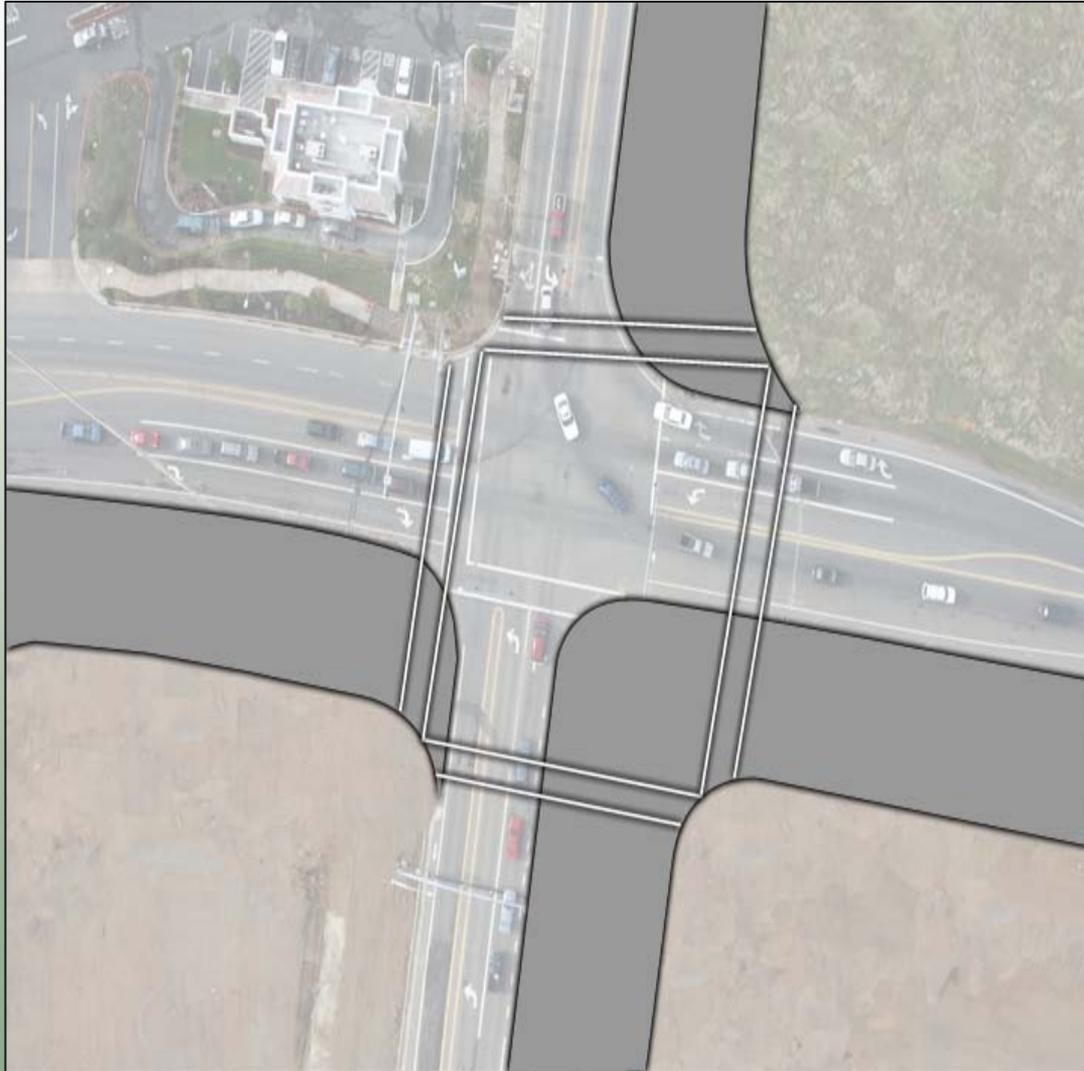
25pm_split

Consequences of Current Practice



Existing Conditions: **LOS E**

Consequences of Current Practice

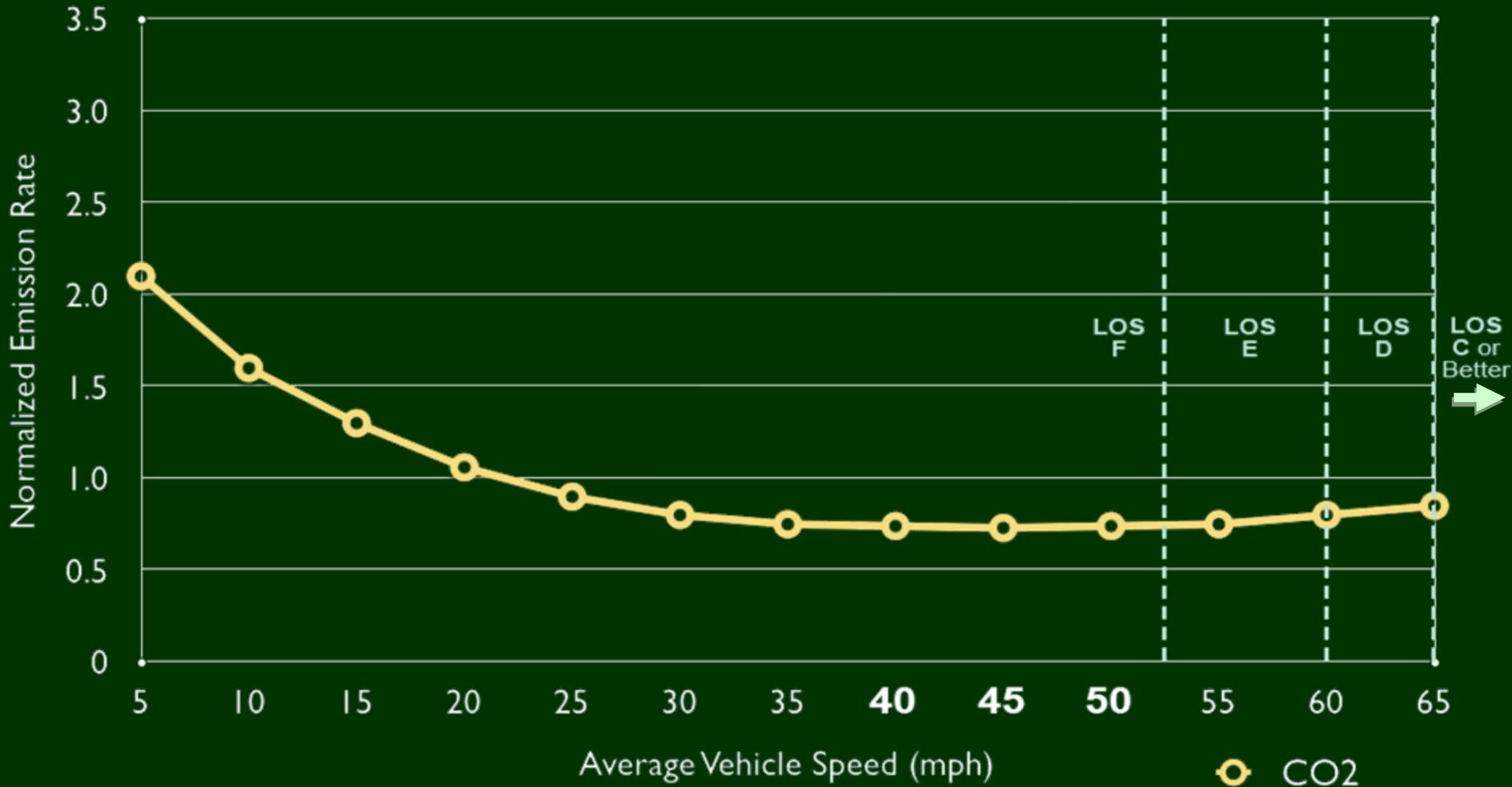


Widening for LOS C

- Longer crosswalks
 - Loss of riparian habitat
 - Increased impervious surface
 - Can't build half a lane
- *Higher vehicle speeds*
 - *Greater consumption of physical space*

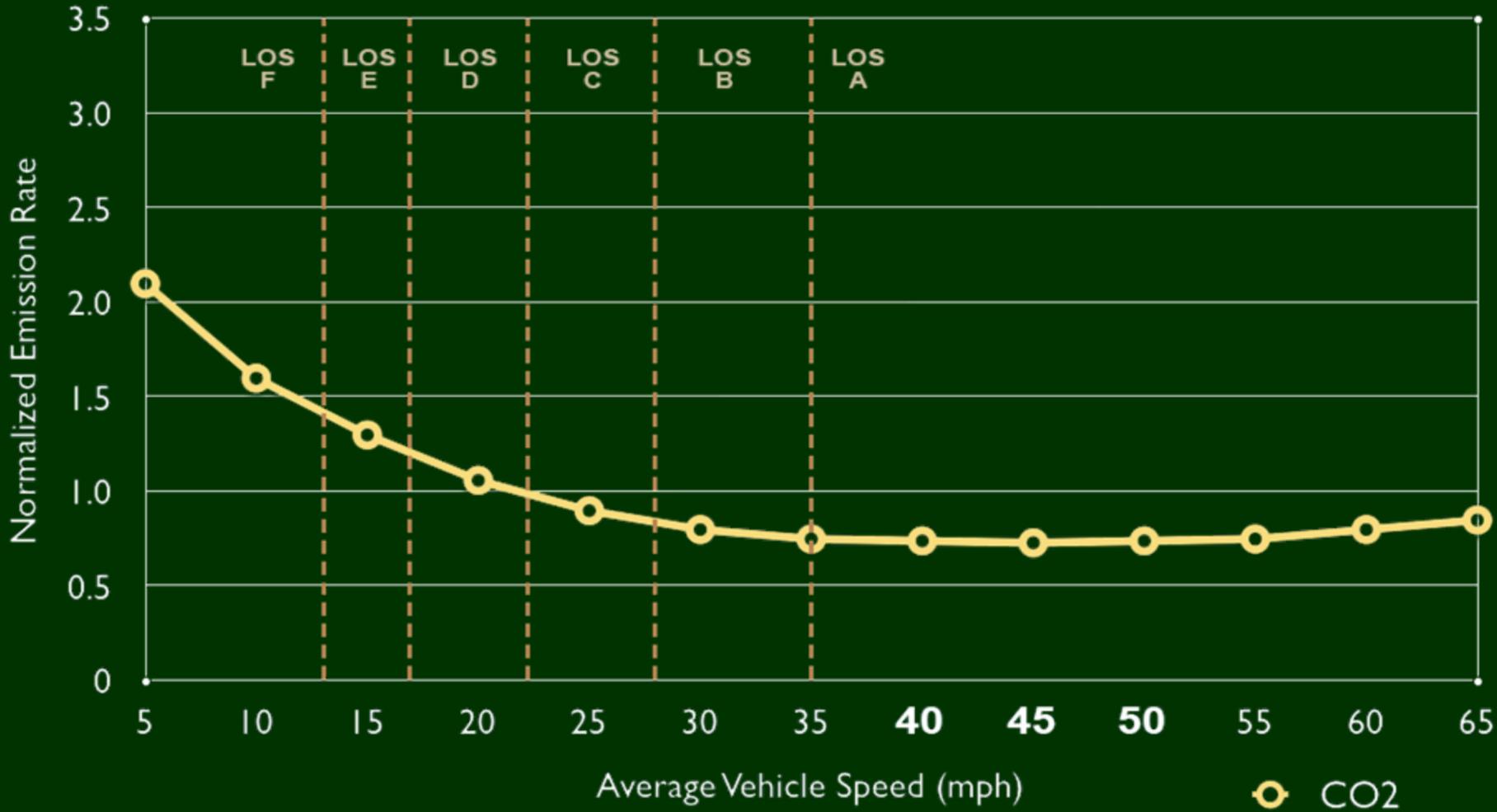
LOS, Speed, and Emissions

Relationship of Freeway LOS, Speed, and CO2 Emissions Factors



LOS, Speed, and Emissions

Relationship of Arterial LOS, Speed, and CO2 Emissions Factors



Physical Space



Auto Space

Physical Space



**Person Space
in Auto**

Physical Space

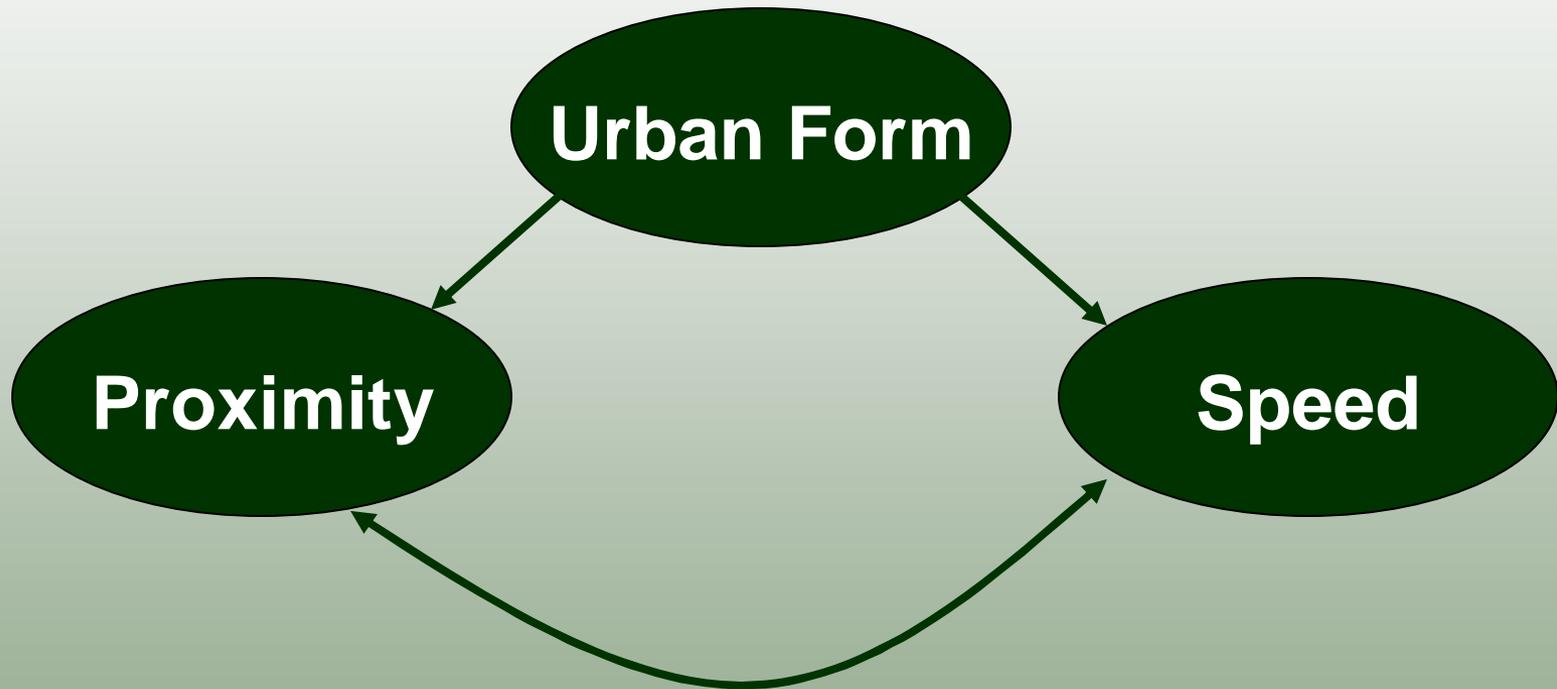


**Person Space
in Bus**

Physical Space



Proximity vs. Speed



Physical Space – Design Standards

Early 20th Century

Area dedicated to
driving and parking
= 21.5%



Physical Space – Design Standards

Early 21st Century

Area dedicated to
driving and parking
= 37.5%



Case Study: Davis, CA

Study Location



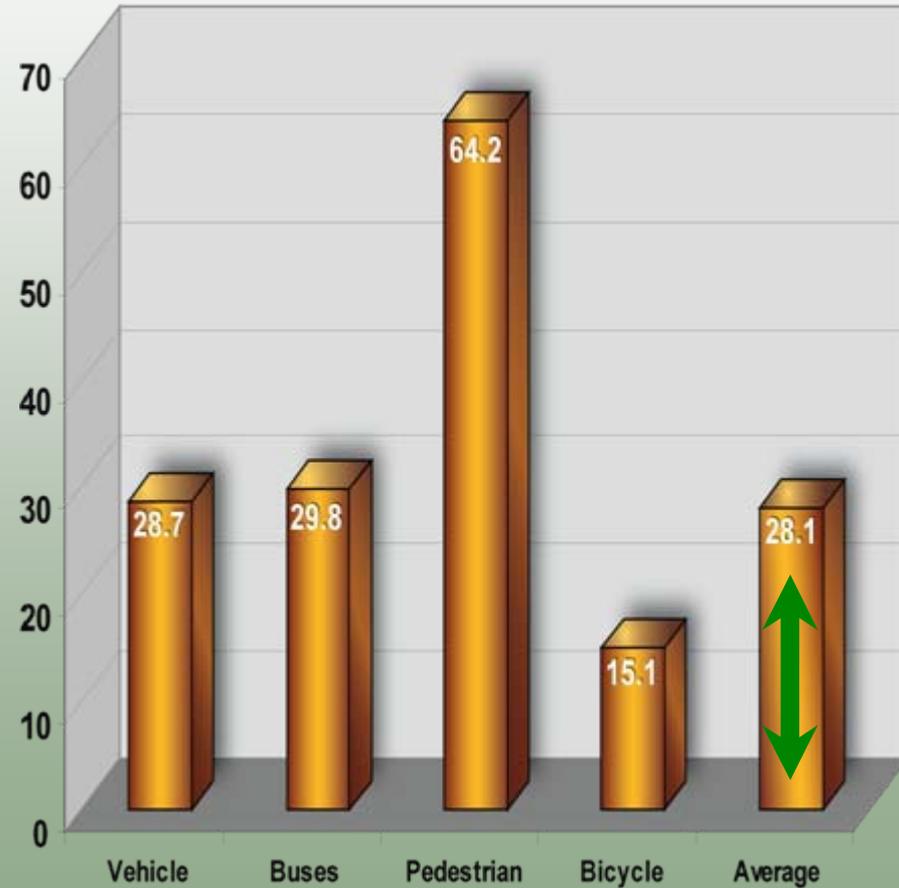
Case Study: Davis, CA

- **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 path. 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



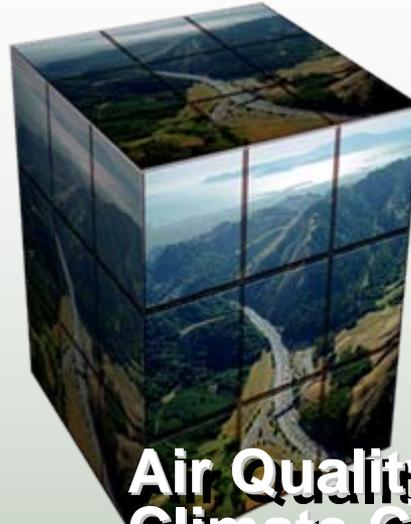
Seconds of person delay



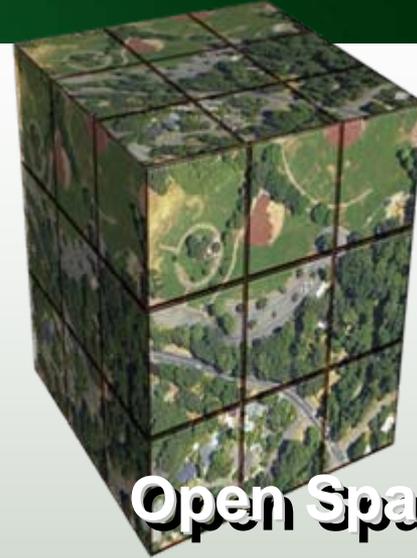
LOS Threshold Trade-offs



Other Modes



**Air Quality/
Climate Change**



Open Space



**Transit-Oriented
Development**



Infill Development



Costs