Transportation to What Ends?

Chris Ganson
Governor’s Office of Planning and Research

March 2017
Old metric:
Transportation impact = **Level of Service (LOS)**

<table>
<thead>
<tr>
<th>LOS</th>
<th>Signalized Intersection</th>
<th>Unsignalized Intersection</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≤10 sec</td>
<td>≤10 sec</td>
</tr>
<tr>
<td>B</td>
<td>10–20 sec</td>
<td>10–15 sec</td>
</tr>
<tr>
<td>C</td>
<td>20–35 sec</td>
<td>15–25 sec</td>
</tr>
<tr>
<td>D</td>
<td>35–55 sec</td>
<td>25–35 sec</td>
</tr>
<tr>
<td>E</td>
<td>55–80 sec</td>
<td>35–50 sec</td>
</tr>
<tr>
<td>F</td>
<td>≥80 sec</td>
<td>≥50 sec</td>
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</tbody>
</table>
Analysis of *infill* development using LOS
Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network
Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network

...but numerous LOS impacts
Analysis of greenfield development using LOS
Analysis of greenfield development using LOS

Typically three to four times the vehicle travel loaded onto the network relative to infill development
Analysis of greenfield development using LOS

Typically three to four times the vehicle travel loaded onto the network relative to infill development

...but relatively few LOS impacts

Traffic generated by the project is disperse enough by the time it reaches congested areas that it doesn’t trigger LOS thresholds, even though it contributes broadly to regional congestion.
Which is better?

45 min commute, including 5 min from congestion

Good LOS Grade
Bad Accessibility

20 min commute, including 10 min from congestion

Bad LOS Grade
Good Accessibility
Transportation Impact Analysis Today: Problems

1. Good grade in LOS ≠ Success in Transportation

<table>
<thead>
<tr>
<th></th>
<th>Denver 1982</th>
<th>Denver 2007</th>
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<tbody>
<tr>
<td>Travel Time Index</td>
<td>1.09</td>
<td>1.31</td>
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<tr>
<td>Average travel time</td>
<td>50.6 minutes</td>
<td>49.6 minutes</td>
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<tr>
<td>Travel time without traffic</td>
<td>46.4 mins</td>
<td>37.9 minutes</td>
</tr>
<tr>
<td>Extra rush hour delay</td>
<td>4.2 mins</td>
<td>11.7 minutes</td>
</tr>
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</table>

1. Good grade in LOS ≠ Success in Transportation

Osman, Thomas, Mondschein, Taylor – MTC Area
Transportation Impact Analysis Today: Problems

1. Good grade in LOS ≠ Success in Transportation

Figure 1 The Relationship Between Proximity To Jobs And Job Accessibility (left) and Local Area Traffic Speeds And Job Accessibility (right)

Mondschein, Osman, Taylor, Thomas – SCAG Area
Transportation Impact Analysis Today: Problems

1. Good grade in LOS ≠ Success in Transportation

“...time lost to commuter traffic delays is more than off-set by the greater opportunities to reach destinations over shorter distances to which high development densities gives rise.”

“...myopic focus on the traffic impacts of new developments is misguided and may actually decrease accessibility and economic activity in an effort to protect traffic flows.”

Mondschein, Osman, Taylor, Thomas
Transportation Impact Analysis Today: Problems

1. Good grade in LOS ≠ Success in Transportation
2. Calculating LOS is expensive and inaccurate
Transportation Impact Analysis Today: Problems

1. Good grade in LOS ≠ Success in Transportation
2. Calculating LOS is expensive and inaccurate
3. “Fixing” LOS simply moves congestion elsewhere


Braess’s Paradox
1. Punishes last-in, inhibits infill, pushes development outward

Transportation Impact Analysis Today: Problems

1. Punishes last-in, inhibits infill, pushes development outward

2. Inhibits transit and active transportation

Transportation Impact Analysis Today: Problems

1. Punishes last-in, inhibits infill, pushes development outward
2. Inhibits transit and active transportation
3. Forces more road construction than we can afford to maintain

Transportation Impact Analysis Today: Problems

1. Punishes last-in, inhibits infill, pushes development outward
2. Inhibits transit and active transportation
3. Forces more road construction than we can afford to maintain
4. Generates an array of environmental impacts

[Forthcoming National Center for Sustainable Transportation literature review]

Peer-reviewed research on environmental impacts from high VMT projects:

- Emissions
  - GHG
  - Regional pollutants
- Energy use
  - Transportation energy
  - Building energy
- Water
  - Water use
  - Runoff – flooding
  - Runoff – pollution
- Consumption of open space
  - Sensitive habitat
  - Agricultural land
Transportation Impact Analysis Today: Problems

1. Punishes last-in, inhibits infill, pushes development outward
2. Inhibits transit and active transportation
3. Forces more road construction than we can afford to maintain
4. Generates an array of environmental impacts
5. Worsens public health and safety

[Forthcoming National Center for Sustainable Transportation literature review]
Auto-mobility remains of fundamental importance to transportation in California for the foreseeable future.

Our current approach slows development, harms the economy, renders other modes unviable, harms health, harms the environment, is unaffordable…and fails to deliver auto mobility.
New Metric:
Transportation impact = \textbf{Vehicle Miles Traveled (VMT)}
Benefits of VMT as a Measures of Transportation Impact

1. Streamline TOD

- ½ mi
Benefits of VMT as a Measures of Transportation Impact

1. Streamline TOD
2. Streamline infill
Benefits of VMT as a Measures of Transportation Impact

1. Streamline TOD
2. Streamline infill
3. Streamline transit projects

- 2 people
- 1 person
- 1 person

40 people

Massive public health improvements
Reduction in GHG and other emissions
Benefits of VMT as a Measures of Transportation Impact

1. Streamline TOD
2. Streamline infill
3. Streamline transit projects
4. Streamline active transportation projects
5. Streamline locally-serving retail
6. Streamline modeling for remaining projects
7. Attack regional congestion more effectively
8. Reduce future pavement maintenance deficits
9. Massive public health improvements
10. Reduction in GHG and other emissions
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http://www.caleemod.com/
Benefits of VMT as a Measures of Transportation Impact

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7. **Attack regional congestion more effectively**

Benefits of VMT as a Measures of Transportation Impact

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7. Attack regional congestion more effectively
8. **Reduce future pavement maintenance deficits**

Benefits of VMT as a Measures of Transportation Impact

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8. Reduce future pavement maintenance deficits
9. Massive public health improvements

> 23,000 deaths/y attributable to physical inactivity in California

Achieving CA’s mode share targets:
- 2,095 fewer deaths annually
- $1 billion-$15 billion/y prevented premature deaths and disability

Benefits of VMT as a Measures of Transportation Impact

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Benefits of VMT as a Measures of Transportation Impact

Picturing a low-VMT future

Image Credits- Urban Advantage, Roma Design Group, City of Dana Point
Benefits of VMT as a Measures of Transportation Impact

Picturing a low-VMT future

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March 2017
Stop using LOS for Transportation Impact Studies

Thinking/Visioning: what kind of city (region, etc.) do we want?

What transportation infrastructure forwards that vision?

Replace Ad-hoc, LOS-based charges with impact fee program based on VMT
Plan Transportation for the Wellbeing of Your City (Not Vice Versa)

What transportation infrastructure forwards that vision?

Direct measures of access, e.g.
- **Sugar Access** (Citilabs) tool
- Rails to Trails Low-Stress Bikeways tool

Use LOS as a stopgap metric to inform planning, *not* to assess impacts

Weigh your jurisdiction’s transportation interests alongside livability, safety for bikes and pedestrians, fiscal viability, land consumption, energy/water use, GHG emissions, etc.
Thanks!

Chris Ganson: chris.ganson@opr.ca.gov
Possible Effect of Driverless Vehicles

<table>
<thead>
<tr>
<th>VMT</th>
<th>GHG</th>
<th>Easy to go by car</th>
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<td>Replacement of bike and walk trips</td>
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<tr>
<td>~</td>
<td>✆ or ✅</td>
<td>Right-sizing of vehicles</td>
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What do we need? Synthesis of current thinking

- Shared use
- Shared ride
- Zero emissions
- Right-priced
- Transit-supportive
- Equitable
- Well-behaved
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