Updating Our Metric of Transportation Impact

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Analysis of infill development using LOS

March 2015
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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
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Typically three to four times the vehicle travel loaded onto the network relative to infill development
Analysis of greenfield development using LOS

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...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.
Problems with LOS as a Measure of Transportation Impact

1. Punishes last-in, inhibits infill, pushes development outward
2. “Solves” local congestion, exacerbates regional congestion
3. Inhibits transit
4. Inhibits active transport
5. Measures mobility, not access; shows failure when we succeed
6. Measures mobility poorly; fails to optimize network even for autos
7. Forces more road construction than we can afford to maintain
8. Hard to calculate and inaccurate
9. Leads to costly, unhelpful solutions
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<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>
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<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>
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</tbody>
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Braess’s Paradox
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Benefits of VMT as a Measure of Transportation Impact

1. Removes barriers to infill
2. Easier to model
3. Already used (e.g. for GHGs)
4. More accurate
5. Sees the big picture
6. Mitigation doesn’t undo itself by inducing more car travel
7. Mitigation reduces long run maintenance burden
8. Mitigation forwards other environmental and human health factors
# Impacts of High VMT Development

## Environment
- 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

## Health
- Collisions
- Physical activity
- Emissions
  - GHGs
  - Regional pollutants
- Mental health

## Cost
- Increased costs to state and local government
  - Roads
  - Other infrastructure
  - Schools
  - Services
- Increased private transportation cost
- Increased building costs (due to parking costs)
- Reduced productivity per acre due to parking
- Housing supply/demand mismatch → future blight
Where Should the Change Be Implemented?

Urban
• Streamline infill
• Streamline transit and active transportation projects
• Lots of mitigation options, greatest percent VMT reduction

Suburban
• Problems with LOS, benefits of VMT apply here too
• Many mitigation options; greatest absolute VMT reduction

Rural
• Again, problems with LOS, benefits of VMT apply here too
• Many mitigation options at the plan level, some at the project level
• VMT mitigation helps maintain small town character, equity

All: Benefits to environment, health, public cost, private expenditures
How to Plan For Automobile Capacity

**Bad**

Use Ad-hoc, LOS-triggered mitigation (*highly problematic*)

Use LOS to plan roadway capacity; use number of units or square footage to estimate project impact (*not ideal*)

Use LOS to plan roadway capacity; use VMT to estimate project impact (*okay*)

**Good**

Use accessibility/connectivity metric to plan network; use VMT to estimate project impact (*ideal*)
Thanks!

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