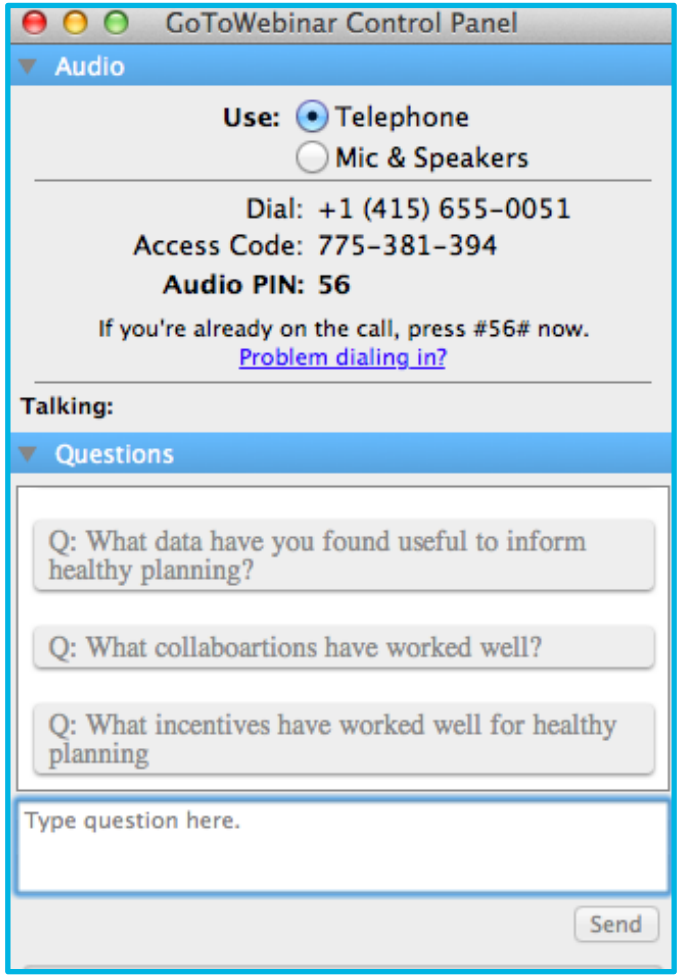
Shifting Gears in Transportation Analysis

Revised CEQA Guidelines Proposal
Implementing SB 743

Webinar Logistics

- Session is being recorded
- Muted lines
- Clarifying questions during the presentation
- Longer questions at the end
- Questions by text box
- If technical problems call: **(855) 352-9002**

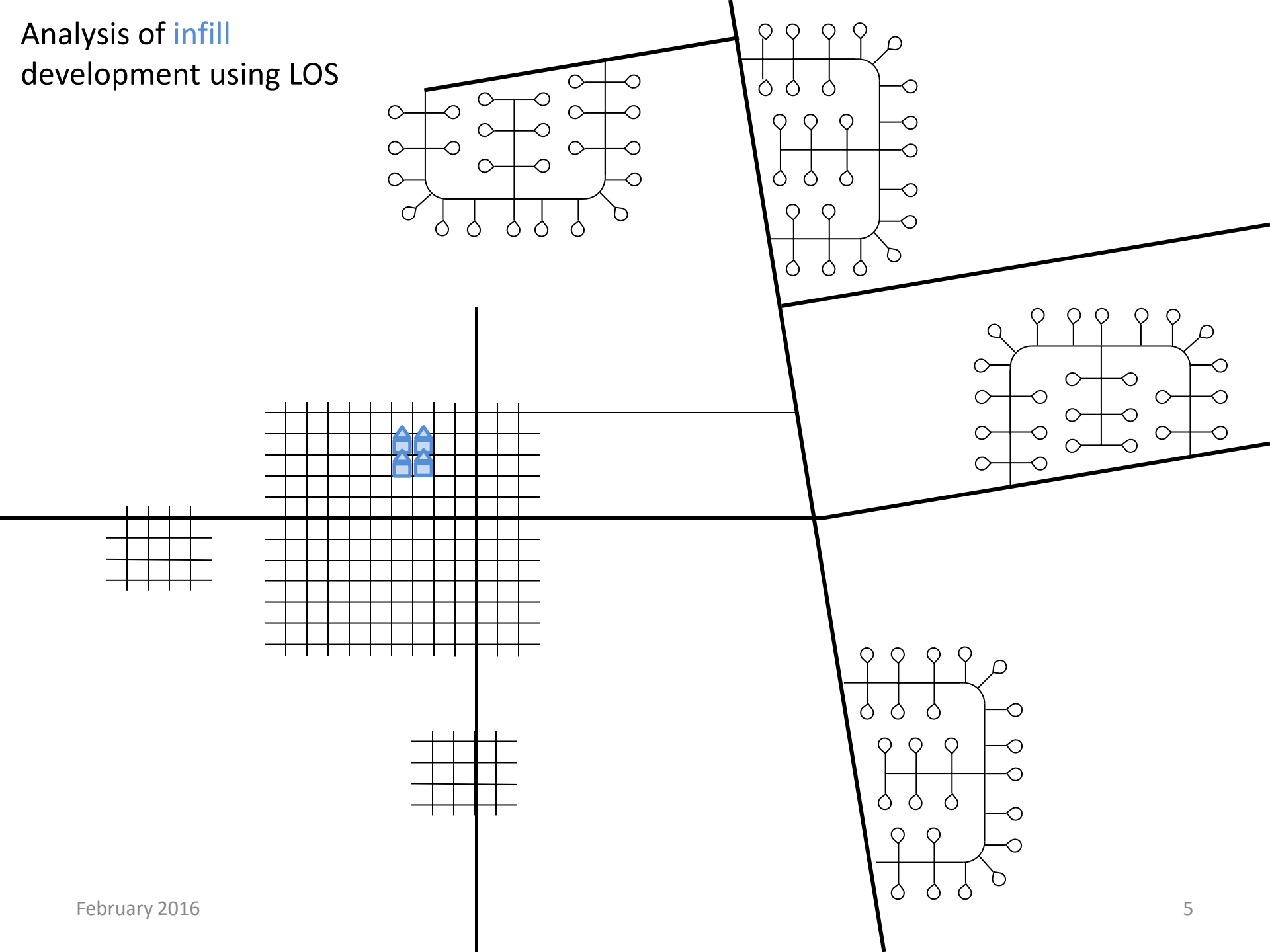


Agenda

1. Background
2. Updated draft
3. Case studies
4. Next steps
5. Related initiatives
    1. Caltrans TAG-TISG
    2. General plans and impact fees

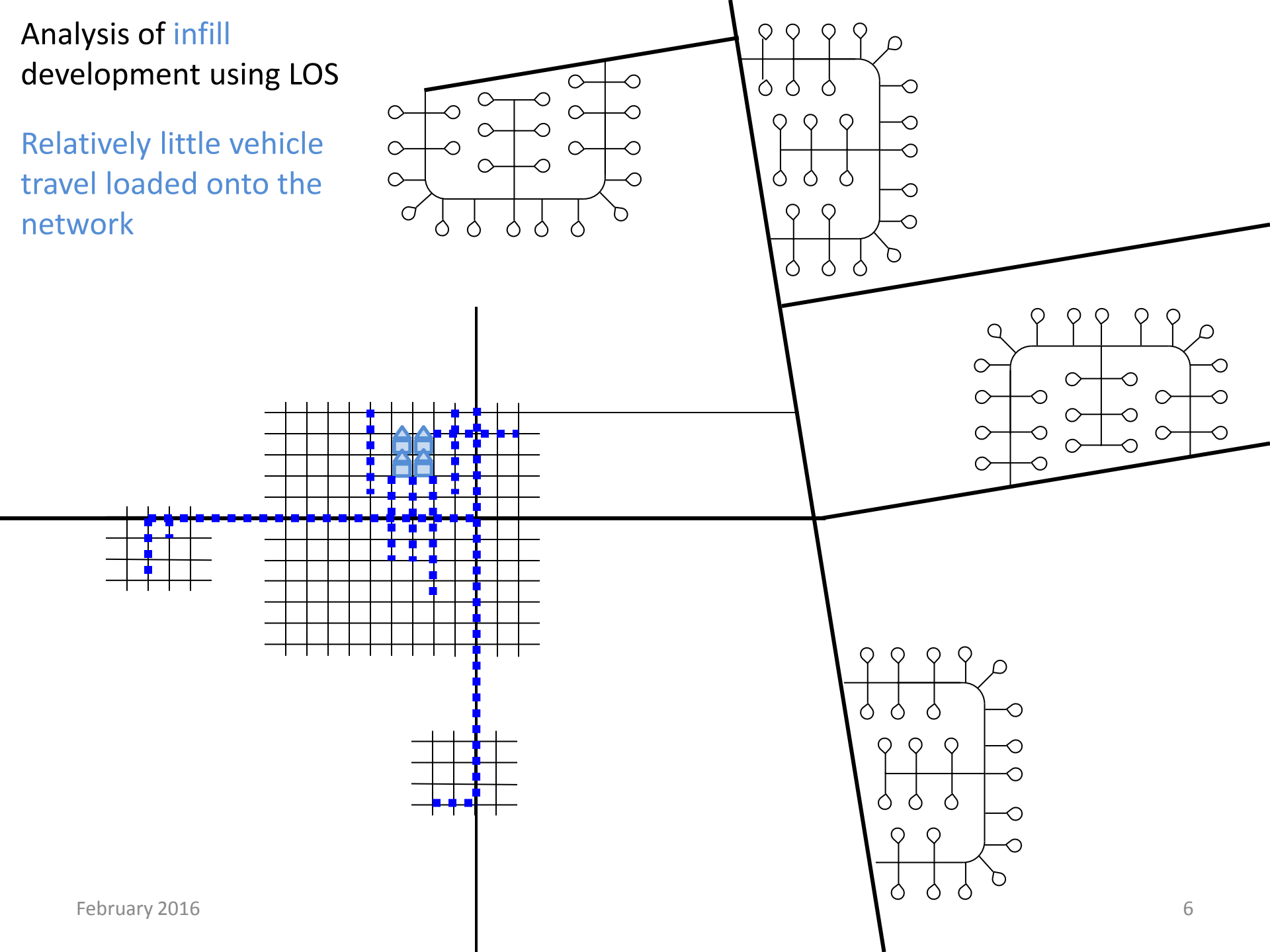
Background

Analysis of infill development using LOS



Analysis of infill development using LOS

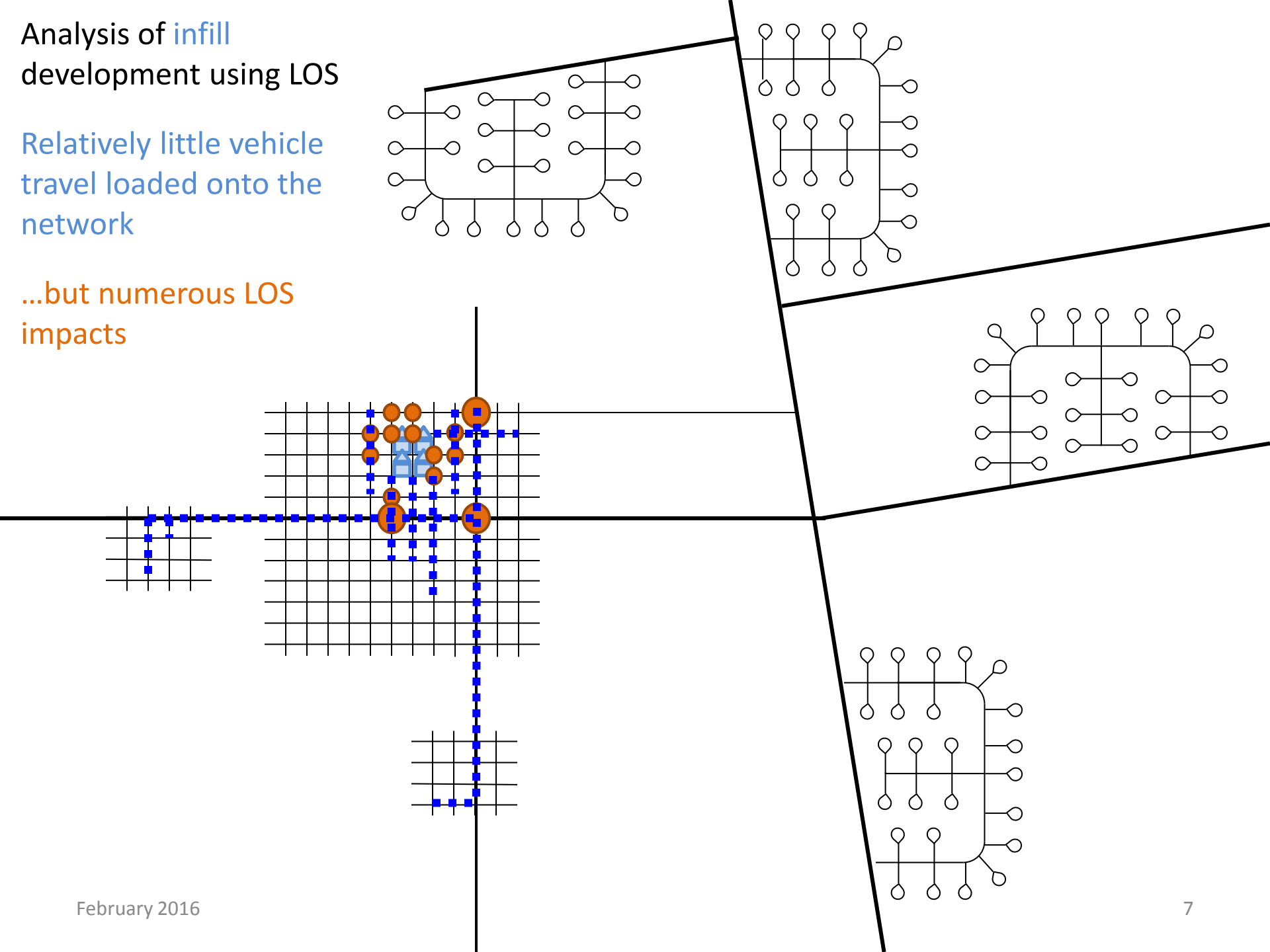
Relatively little vehicle travel loaded onto the network



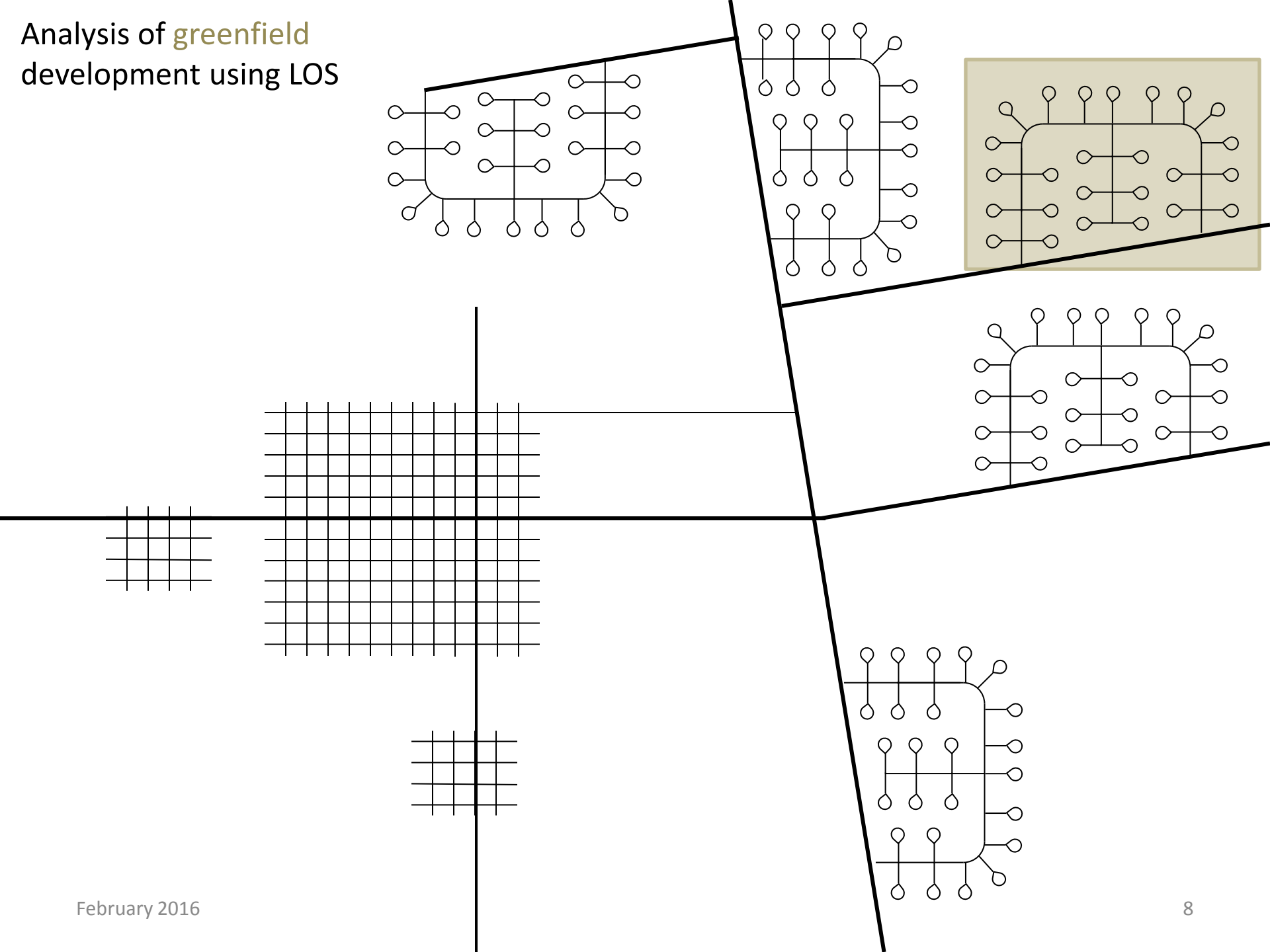
Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network

…but numerous LOS impacts

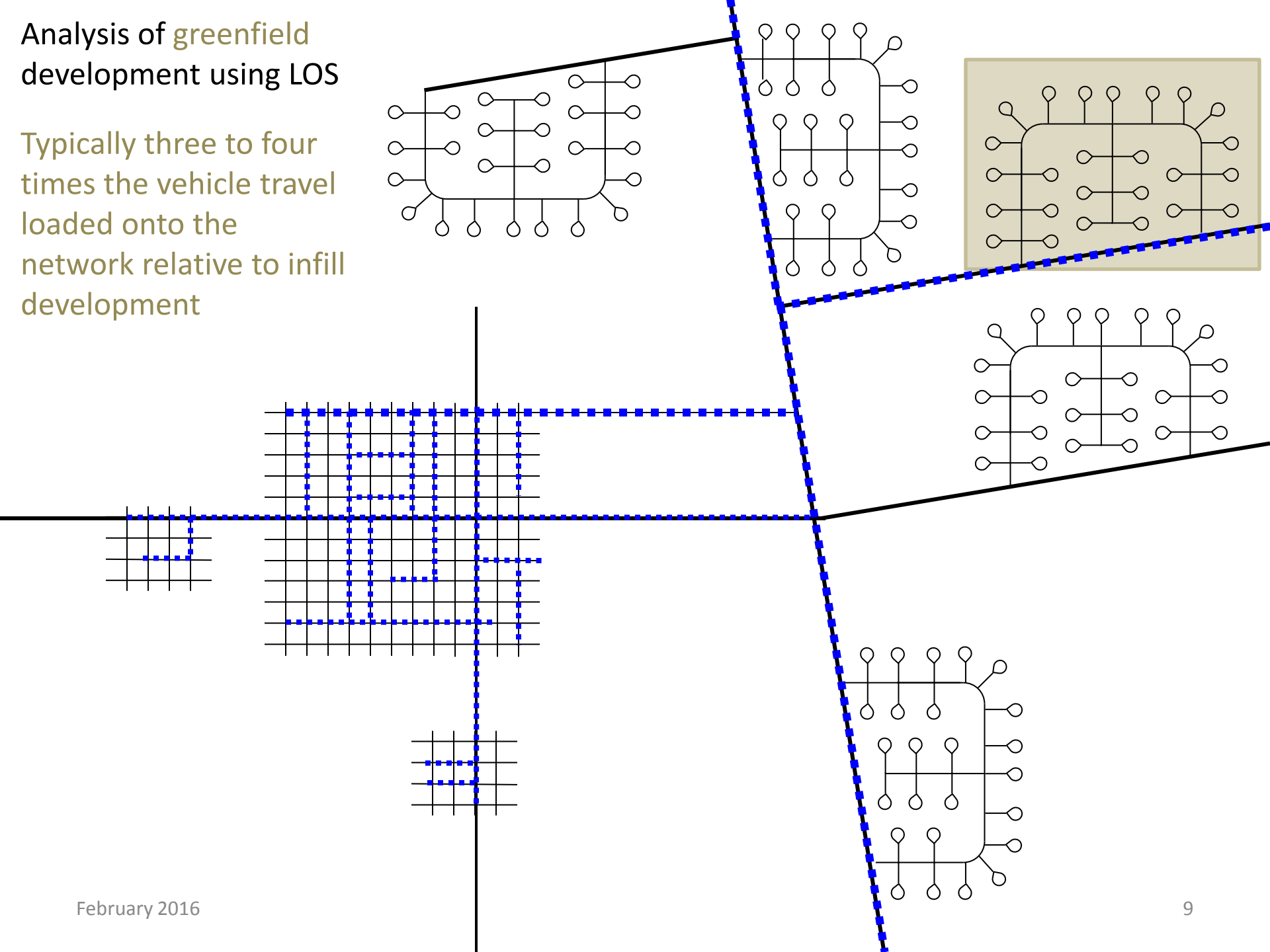


Analysis of greenfield development using LOS



Analysis of greenfield development using LOS

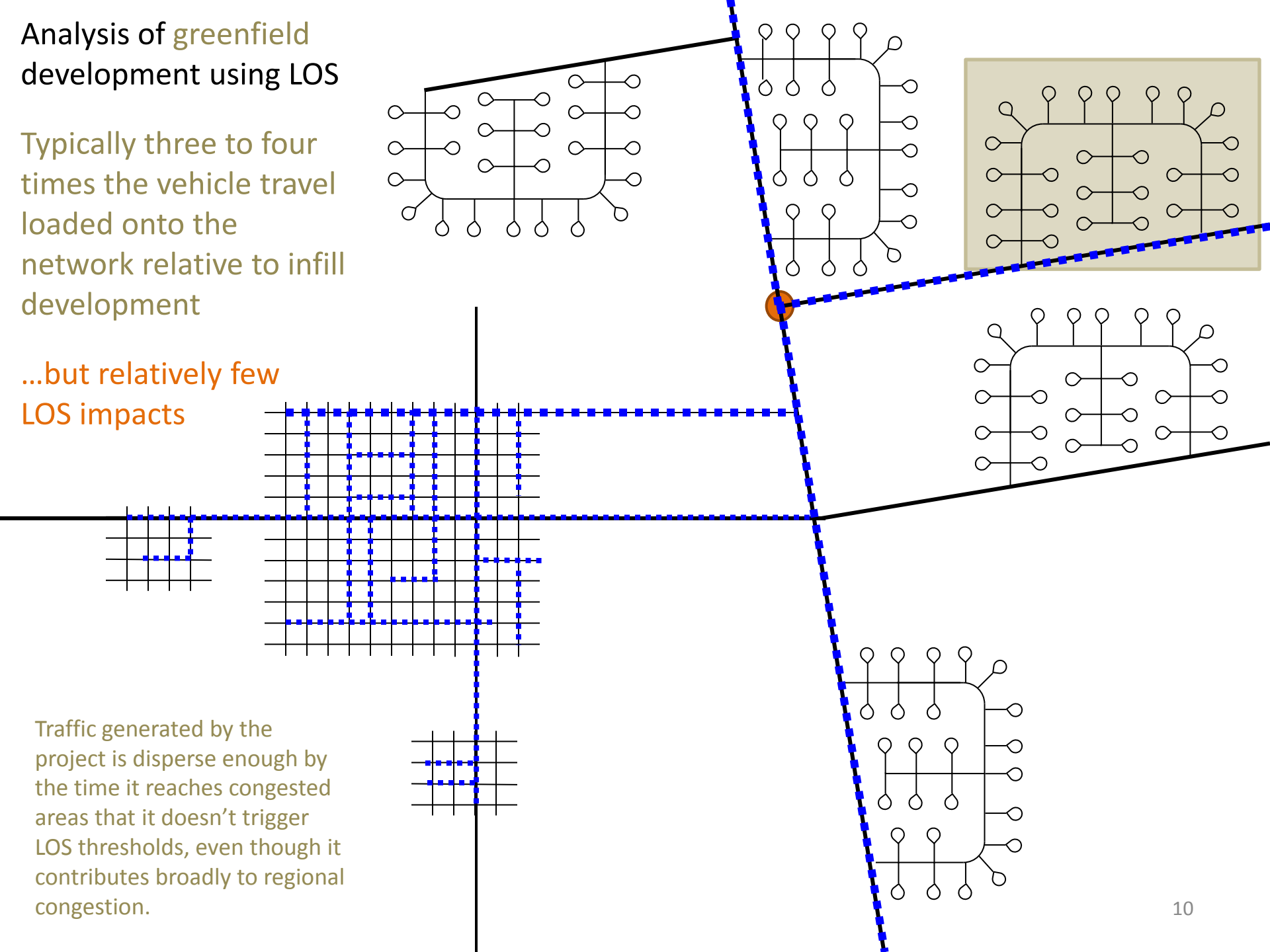
Typically three to four times the vehicle travel loaded onto the network relative to infill development



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.

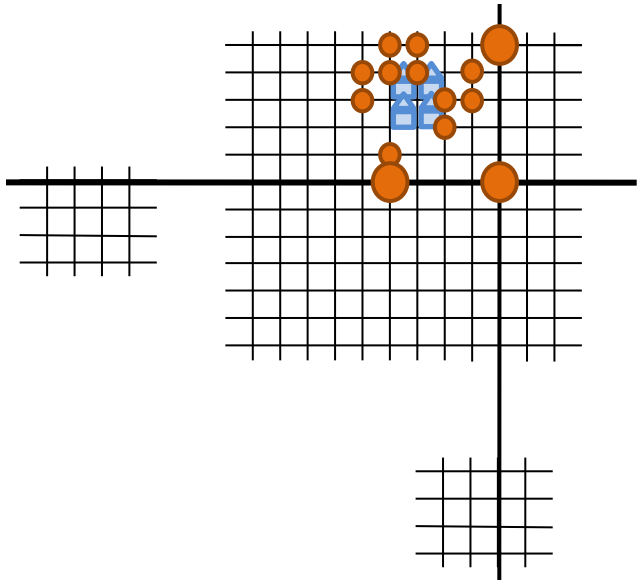
Level of Service A

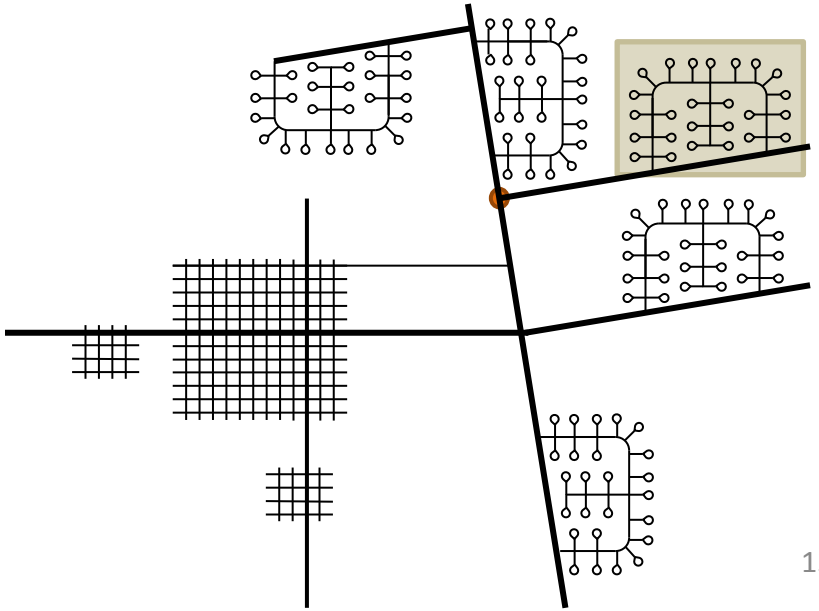
Level of Service F

Source: Neighborhoods.org

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





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David Paul Morris / SFC

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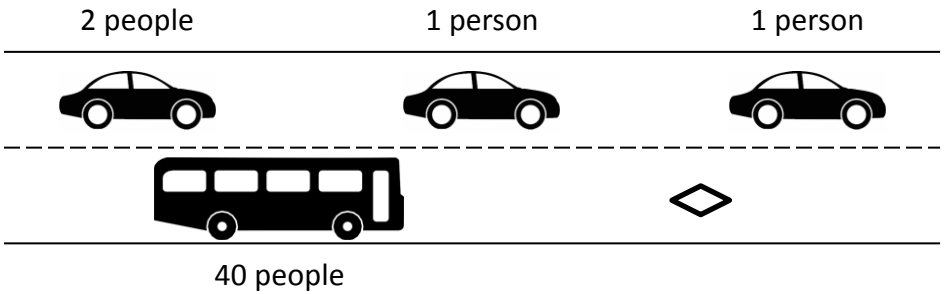

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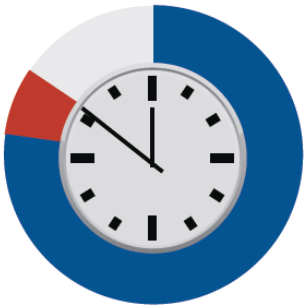
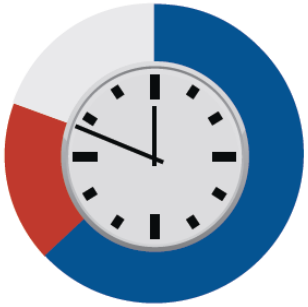
Denver 1982		Denver 2007
1.09	Travel Time Index	1.31
50.6 minutes	Average travel time	49.6 minutes
46.4 mins	Travel time without traffic	37.9 minutes
4.2 mins	Extra rush hour delay	11.7 minutes





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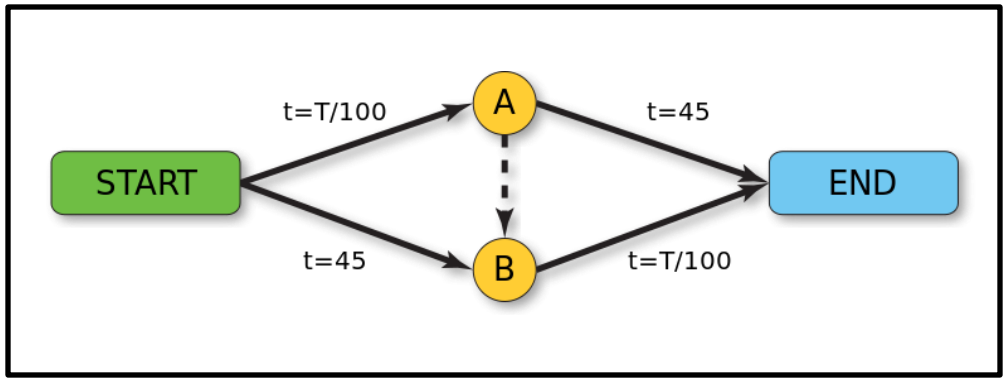

Braess's Paradox

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Table V.M-13
Intersection Critical Movement Analysis (CMA) and Level of Service (LOS) Summary
Existing (2001) and Future (2005) Conditions

No.	Intersection	Peak Hour	Existing CMA	Existing LOS	Without Project CMA	Without Project LOS	With Project CMA	With Project LOS	With Project Impact	With Project + Mitigation CMA	With Project + Mitigation LOS	With Project + Mitigation Impact
1.	Sunset Boulevard &	AM	0.894	D	1.038	F	1.037	F	-0.001	1.036	F	-0.002
	Beverly Glen Boulevard (E.)	PM	1.023	F	1.225	F	1.216	F	-0.009	1.215	F	-0.010
2.	Sunset Boulevard &	AM	1.189	F	1.385	F	1.388	F	0.003	1.385	F	0.000
	Beverly Glen Boulevard (W.)	PM	1.062	F	1.264	F	1.251	F	-0.013	1.249	F	-0.015
3.	Wilshire Boulevard &	AM	0.868	D	1.030	F	1.030	F	0.000	1.029	F	-0.001
	Beverly Glen Boulevard	PM	0.884	D	1.140	F	1.133	F	-0.007	1.133	F	-0.007
4.	Santa Monica Boulevard (N.) &	AM	0.861	D	1.076	F	1.080	F	0.004	1.078	F	0.002
	Overland Avenue	PM	0.814	D	1.082	F	1.054	F	-0.028	1.054	F	-0.028
5.	Santa Monica Boulevard (S.) &	AM	0.478	A	0.358	A	0.358	A	0.000	0.358	A	0.000
	Overland Avenue	PM	0.428	A	0.465	A	0.465	A	0.000	0.465	A	0.000
6.	Santa Monica Boulevard (N.) &	AM	0.849	D	1.099	F	1.107	F	0.008	1.104	F	0.005
	Beverly Glen Boulevard	PM	0.823	D	1.139	F	1.130	F	-0.009	1.128	F	-0.011
7.	Santa Monica Boulevard (S.) &	AM	0.849	D	0.464	A	0.464	A	0.000	0.464	A	0.000
	Beverly Glen Boulevard	PM	0.884	D	0.575	A	0.575	A	0.000	0.575	A	0.000
8.	Santa Monica Boulevard (S.) &	AM	0.325	A	1.006	F	1.007	F	0.001	1.005	F	-0.001
	Century Park West	PM	0.397	A	0.984	E	0.969	E	-0.015	0.966	E	-0.018
9.	Santa Monica Boulevard (N.) &	AM	0.613	B	0.213	A	0.213	A	0.000	0.213	A	0.000
	Club View Drive	PM	0.707	C	0.408	A	0.408	A	0.000	0.408	A	0.000
10.	Santa Monica Boulevard (N.) &	AM	0.825	D	1.191	F	1.205	F	0.014 *	1.199	F	0.008
	Avenue Of The Stars	PM	0.755	C	0.967	E	0.956	E	-0.011	0.955	E	-0.012
11.	Santa Monica Boulevard (S.) &	AM	0.506	A	NA		NA			NA		
	Avenue Of The Stars	PM	0.544	A	NA		NA			NA		
12.	Santa Monica Boulevard (N.) &	AM	0.759	C	0.950	E	0.955	E	0.005	0.953	E	0.003
	Century Park East	PM	0.666	B	0.846	D	0.805	D	-0.041	0.804	D	-0.042
13.	Santa Monica Boulevard (S.) &	AM	0.771	C	NA		NA			NA		
	Century Park East	PM	0.648	B	NA		NA			NA		
14.	Santa Monica Boulevard (N.) &	AM	1.096	F	1.261	F	1.263	F	0.002	1.263	F	0.002
	Wilshire Boulevard	PM	1.046	F	1.294	F	1.288	F	-0.006	1.287	F	-0.007

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Opportunities/benefits in shift from LOS to VMT

1. Remove a key barrier to infill, TOD
2. Streamline transit and active transportation projects
3. VMT is easier to model
4. VMT is already in use
5. Reduction in infrastructure capital and maintenance costs
6. Attack regional congestion more effectively
7. Health benefits (active transport & transit trips)
8. GHG reduction

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

Estimating *tour-based* VMT

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Estimating *tour-based* VMT

1. Residence to Coffee Shop
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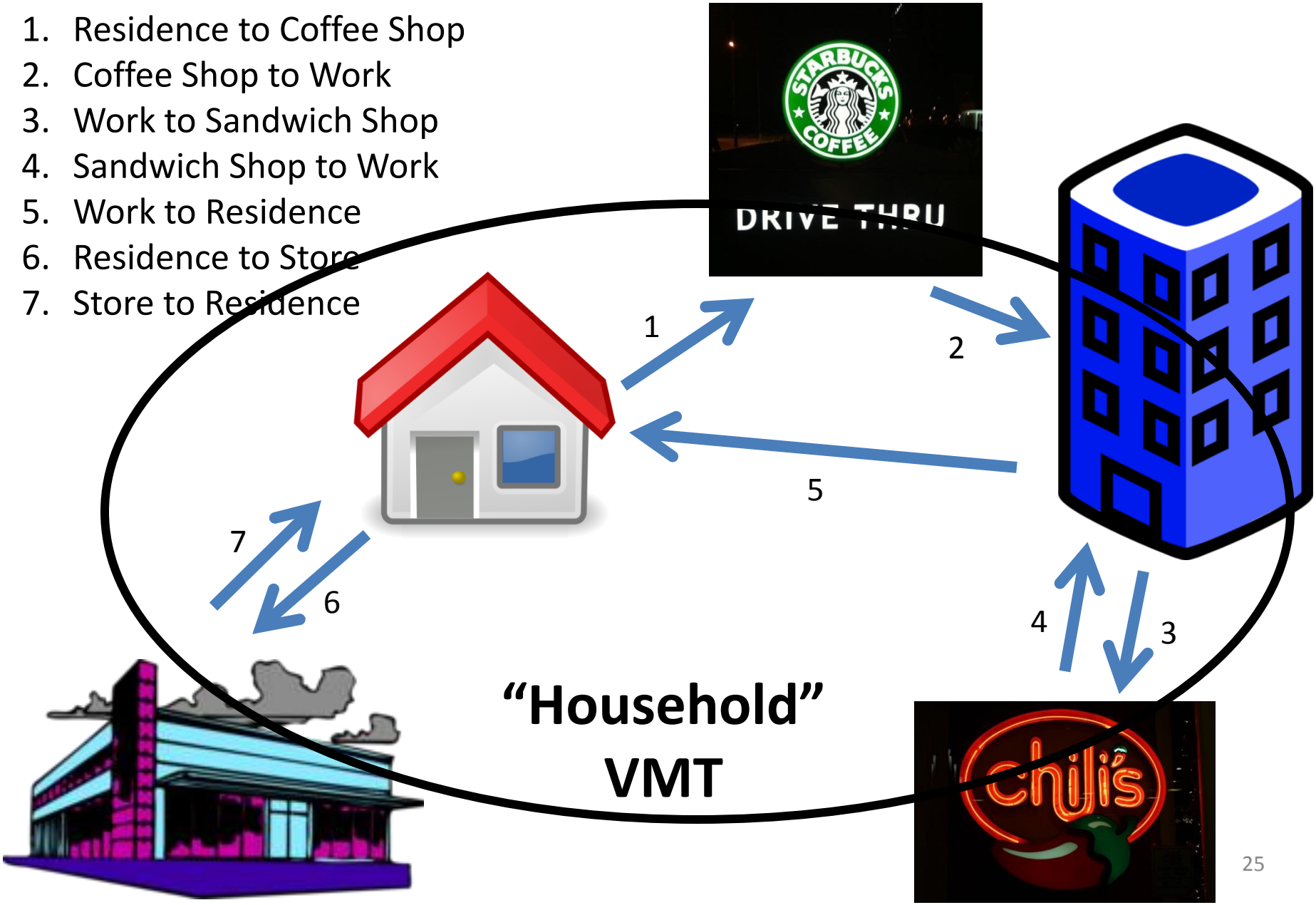


"Household" VMT

Estimating *trip-based* VMT

1. Residence to Work
2. Work to Residence
3. Home to Coffee Shop
4. Coffee Shop to Store
5. Store to Home

1

Home-Based-Work trip

2

3

Home-Based-Shopping trip

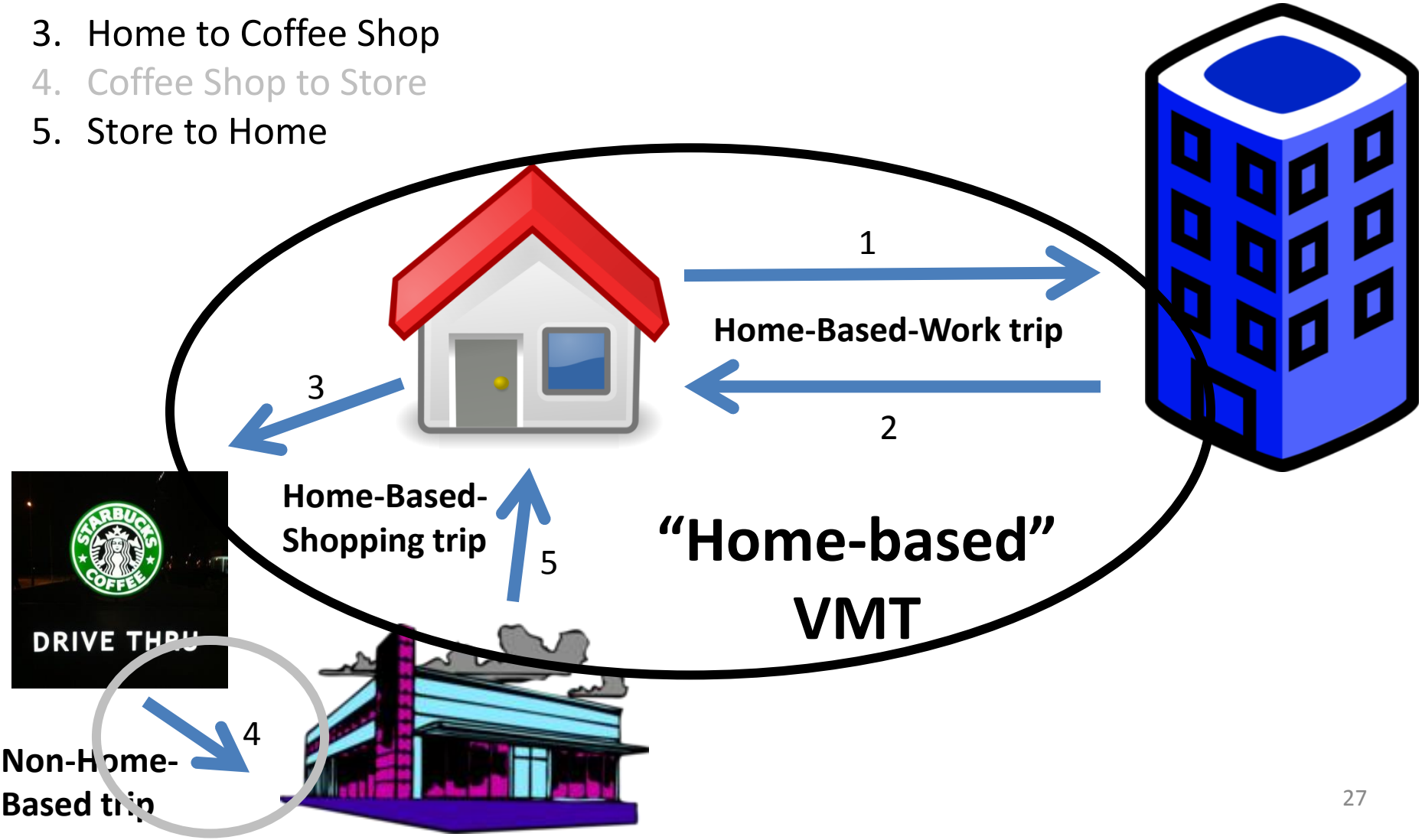
5

4

Non-Home-Based trip

Estimating *trip-based* VMT

1. Residence to Work
2. Work to Residence
3. Home to Coffee Shop
4. Coffee Shop to Store
5. Store to Home



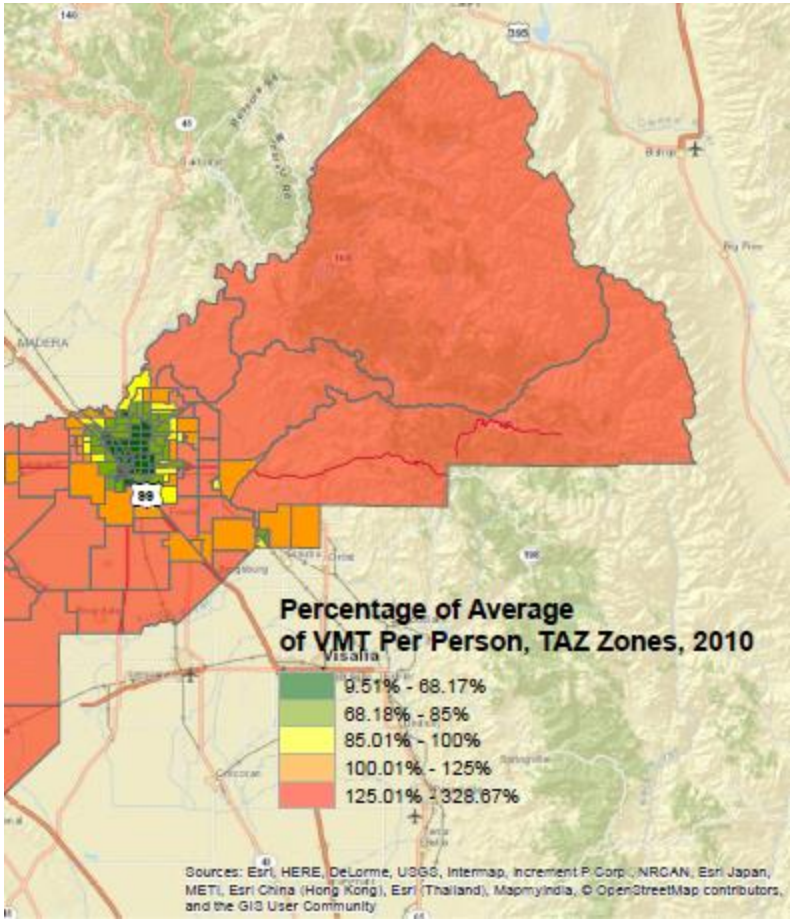
Maintained from previous draft

Continue to recommend:

- Primary metric of transportation impact statewide is VMT
- Use VMT screening maps for residential and office projects
- Presume development near transit leads to a less than significant impact*
- Recommendation that transit, active transportation projects presumed less than significant
- More stringent thresholds may be applied at lead agency discretion

*exceptions:

- FAR > 0.75
- Parking > minimum requirements
- Inconsistent with SCS



VMT Map of Fresno COG, generated by the California Statewide Travel Demand Model

Updated from previous draft

General Comment:

- Technical advice is better given in a Technical Advisory

Update:

- Technical advice moved from Guidelines into a Technical Advisory

Updated from previous draft

*Comments on recommended **residential project threshold**:*

- Need flexibility in threshold setting
- Average not good enough for state goals such as GHG reduction

Updated residential threshold recommendation:

- **<u>15 percent below</u> regional <u>or city</u> VMT/cap**

Updated from previous draft

*Comment on recommended **office project threshold**:*

- Average not good enough for state goals such as GHG reduction

Updated office threshold recommendation:

- **<u>15 percent below</u> regional VMT/cap**

Updated from previous draft

Why 15 percent?

- Caltrans Strategic Plan: Reduce VMT/cap 15% by 2020
- SB 375 targets ≈ 15% collectively statewide
- AB 32 Scoping plan recommends local governments set GHG reduction targets at 15% below existing by 2020
- Research shows 15% VMT mitigation is generally achievable (see CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures*)

Updated from previous draft

*Comment on recommended **retail project methodology and threshold**:*

- New retail tends to redirect trips, rather than generate new trips

Updated recommendation:

- Assess retail with "Net VMT" approach
- Retail which increases VMT compared to previous shopping patterns may be considered significant
- Local-serving retail presumed less than significant

Updated from previous draft

Mixed-use development

- Can consider each use separately, compare to threshold for that use
- Each use should take credit for internal capture due to proximity of other uses in project

Example: Residential-retail—if near transit, locally serving retail, recommend presumed less than significant

Updated from previous draft

*Recommendation for **land use plans**:*

- *Specific plans: Same as land use projects*
- *General plans: Consistency with SCS (aggregate across jurisdiction)*

*Recommendation for **RTP-SCSs**:*

- *Sufficient VMT reductions to achieve ARB-specified GHG target*

Updated from previous draft

*Comment on **transportation project methodology**:*

- Analysis may be burdensome for small transportation projects
- Project type problematic as a significance threshold

Updated recommendation:

- Clarification of project types which might induce measurable/substantial VMT (and which wouldn't)
- VMT threshold rather than project type threshold
- Fair share threshold, considering VMT allowable to achieve 2030 GHG reduction target
- Simple method using researched elasticities

Updated from previous draft

Comment: Rural is different

- *Update:* Recommendation that rural projects choose thresholds on a case-by-case basis

Comment: Might trigger EIR for very small projects

- *Update:* Recommend a small projects screening threshold – 100 Vehicle trips

Comment: Concerns about impacts to transit

- *Update:* Addition of riders not an impact; blocking stations or routes may be an impact

Updated from previous draft

Recommendations for addressing **traffic safety:**

1. Reduce motor vehicle speeds
2. Increase driver attention
3. Protect vulnerable road users
4. Reduce overall VMT and sprawl

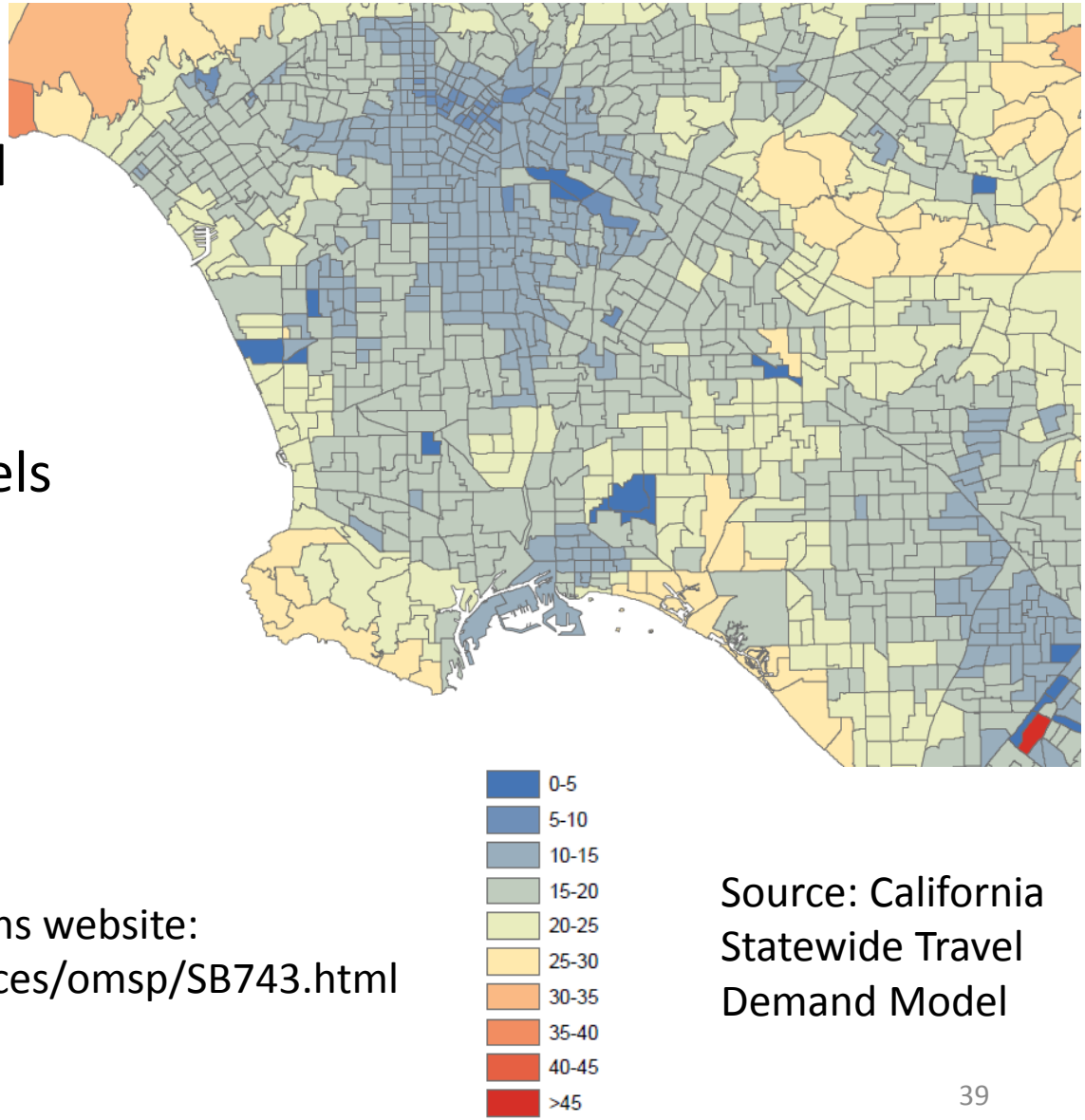
Use caution:

- Avoid attributing cumulative safety impacts to last-in development
- Focusing on increasing automobile throughput as a safety solution
- Be mindful of tradeoffs that compromise vulnerable road user safety

VMT Data

California Statewide Travel Demand Model is up and running

- Assistance with trip lengths for sketch models
- Assistance with setting thresholds
- Assistance generating VMT screening maps



Source: California Statewide Travel Demand Model

Data and TAZ map posted on Caltrans website:
http://www.dot.ca.gov/hq/tpp/offices/omsp/SB743.html

Case Studies

1. Residential-retail mixed use (Stockton and T)
2. Office building (Mission Viejo Medical Center)
3. Roadway expansion (Hypothetical project)

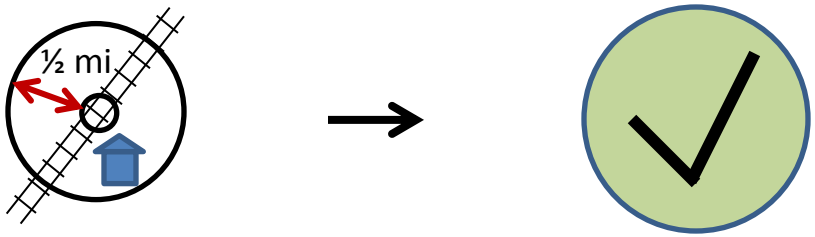
Residential-retail mixed use VMT calculation

Project characteristics:

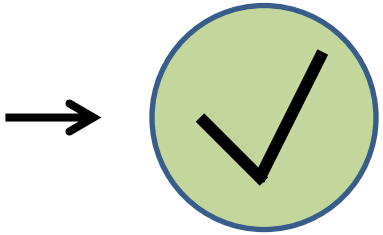
- 214 multifamily d.u.
- 24 single family d.u.
- 6000 s.f. locally-serving retail
- 0.27mi from light rail station
- Surrounding residential exhibits 12.1 VMT/cap, compared to recommended threshold 14.2 VMT/cap

Residential-retail mixed use VMT calculation

- 0.27mi from light rail station
- Surrounding residential exhibits 12.1 VMT/cap, compared to recommended threshold 14.2 VMT/cap



In location where existing residences exhibit VMT below the recommended threshold



Residential-retail mixed use VMT calculation

<u>Threshold calculation</u>: Use CSTDM Data

<u>VMT Analysis for Project, including Mitigation:</u>
Follow AHSC Greenhouse Gas Quantification Methodology (GGQM), using CalEEMod, plus input trip lengths from the CSTDM

CSTDM *home-based* VMT data provide common data source across

- **Project VMT calculation**
- **Project VMT mitigation calculation**

Project VMT mitigation is calculated within CalEEMod as a percent reduction

Office VMT calculation

Project characteristics:

- 110,000 square feet of office space located west of Medical Center Road, between Crown Valley Parkway and Marguerite Parkway, Mission Viejo, CA

Office VMT calculation

<u>Threshold VMT calculation</u>:
Use CSTDM Data

<u>Project VMT calculation</u>:
Use CSTDM Data

<u>Mitigation VMT calculation</u>:
Use CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures*

Mitigation Measure	*Percent Reduction*	*Substantial Evidence*
Implementation a 9/80 workweek for 10 percent of employees	0.7%	CAPCOA TRT-6
Provide a transit subsidy to all employees of 1.49/day	7.3%	CAPCOA TRT-4
Implement car sharing program	0.4%	CAPCOA TRT-9
Provide an employee vanpool program	2%	CAPCOA TRT-11
Implement a $6 daily employee parking charge	6.8%	CAPCOA TRT-14
Total	17.2%	

Source: Quantifying Greenhouse Gas Mitigation Measures, CAPCOA

CSTDM *home-based* VMT data provide common data source across

- **Project VMT calculation**
- **Threshold VMT calculation**

Project VMT mitigation is calculated as a percent reduction

Roadway expansion project VMT calculation

Threshold calculation: Use ARB Vision Model estimate of VMT we can have in the state and still meet our 2030 GHG goals. Divvy that VMT between the total number of transportation projects in the state.

Project VMT calculation:

- Use elasticities supplied by the academic literature on induced travel
- Use PEMS lane mile and VMT data

Roadway expansion project VMT calculation

Project Characteristics: Hypothetical highway expansion, adding 2.2 lane miles to a highway in Kern County

Elasticity = [% Change in VMT] / [% Change in Lane Miles]

or

VMT Impact = [% Change in Lane-Miles] * [baseline VMT on those lane-mi] * [elasticity]

Plugging in data from Kern County and Duranton and Turner (2011):

VMT Impact = 0.328% * 2,333,940,000 existing VMT * 1.0 = **7,658,312 VMT/year**

Roadway expansion project VMT calculation

Calculation of transportation project fair-share significance threshold:

California Statewide VMT (2014)	185,320,000,000 VMT/year
Allowable increase by 2030 (4 percent)	7,412,800,000 VMT/year
Estimated total transportation projects in California, expected completion date 2015-2030	3,572 Projects[8]
Fair share VMT per transportation project	2,075,220 VMT/year

Roadway expansion project VMT calculation

Project VMT > Threshold VMT

(7,658,312 VMT/year > 2,075,220 VMT/year)

So the project would lead to a significant impact

Mitigation might include:

- Tolling on new or existing lanes
- Management of new or existing lanes
- Provide park and ride facilities
- Provide a vanpool program

Next Steps

- Public review ends February 29, 2016
- Finalize proposal
- Natural Resources Agency formal rulemaking process
- SB 743 effective late 2016 or early 2017
- 2 year opt-in period
- Implementation required statewide late 2018 or early 2019

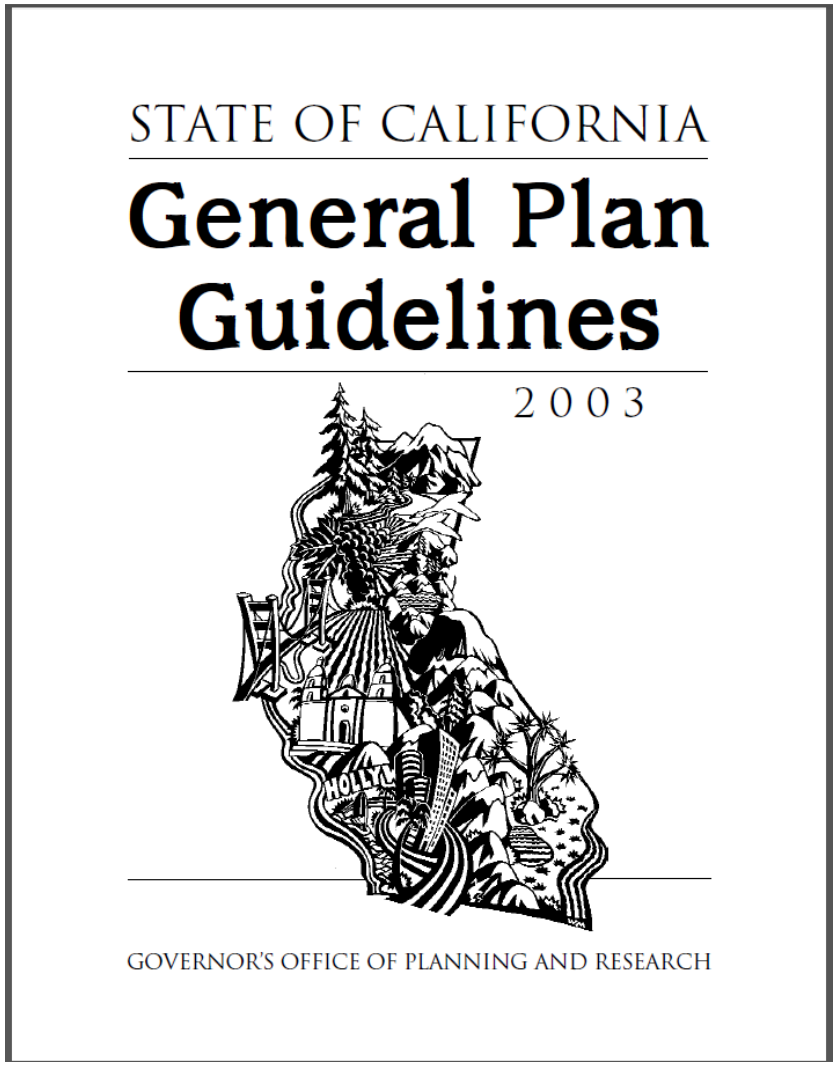
Caltrans updates pursuant to SB 743

Transportation Analysis Guidelines and Transportation Impact Study Guidelines (TAG-TISG)

- Caltrans is developing
  - New methods for analyzing the effects of transportation projects (TAG)
  - New approaches to characterize land use project impact on the state highway system (TISG)
- Will benefit from broad stakeholder involvement

General Plans and Impact Fees

- SB 743 leaves existing impact fee programs in place
- Local governments can develop VMT-based to ease the CEQA burden and broaden the types of improvements that could be funded



General Plans and Impact Fees

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)

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

Good

Balance auto mobility with other interests, e.g. cost, neighborhood vibrancy, air quality, GHGs, human health, etc.

General Question & Answer

Thanks!

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