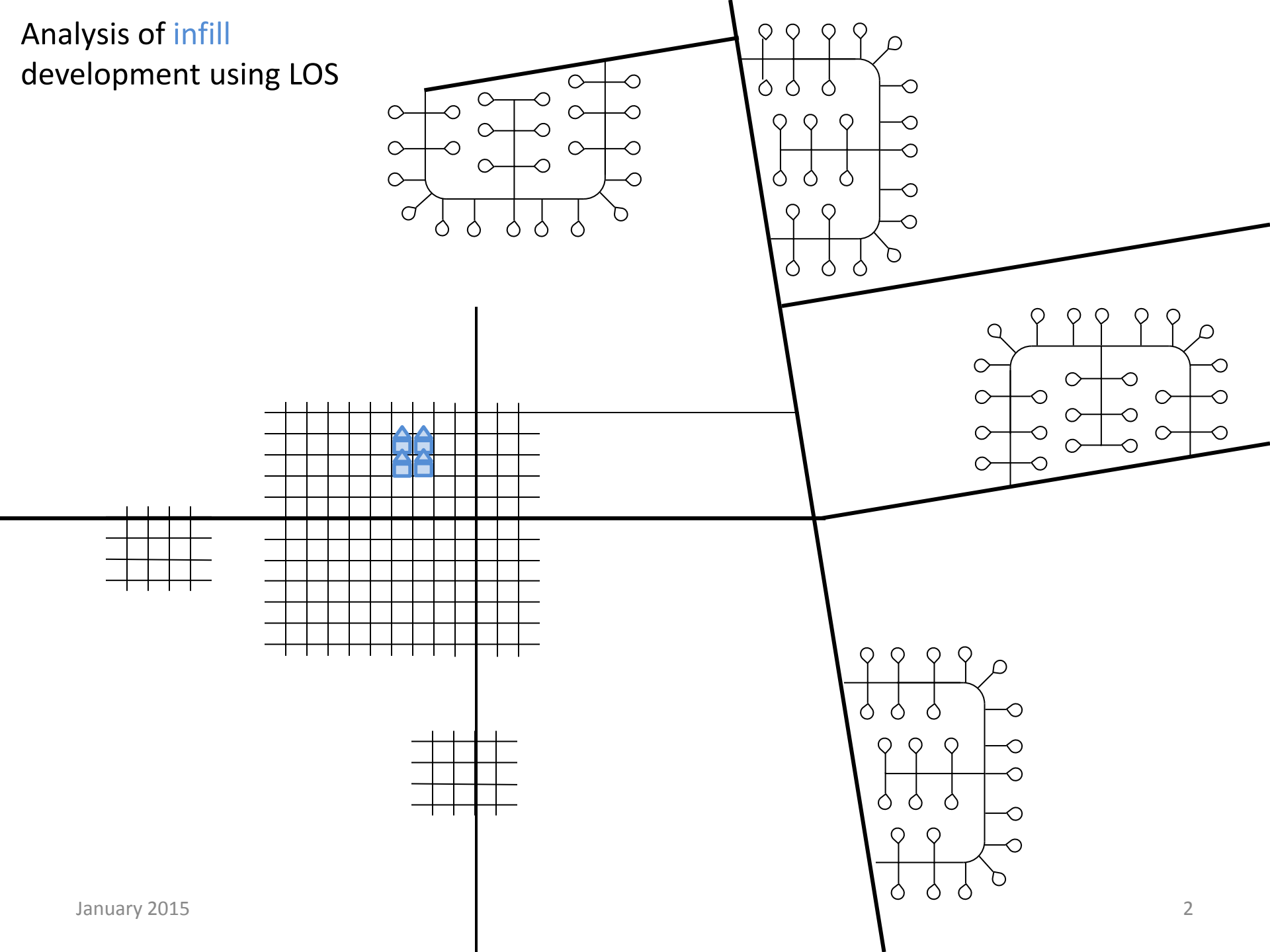
Replacing LOS with VMT in CA

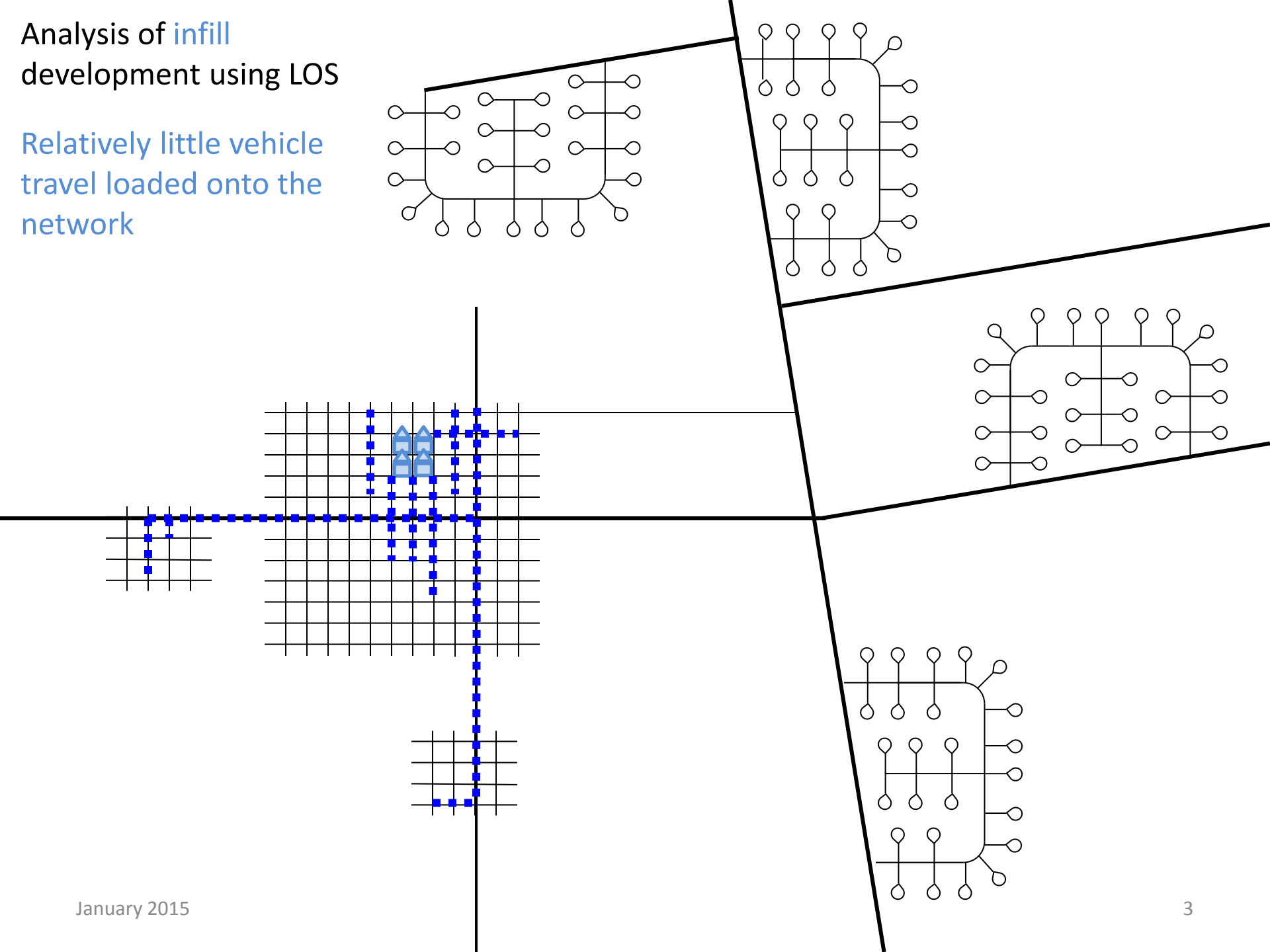
Chris Ganson
California Governor's Office of Planning and Research

Analysis of infill development using LOS



Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network



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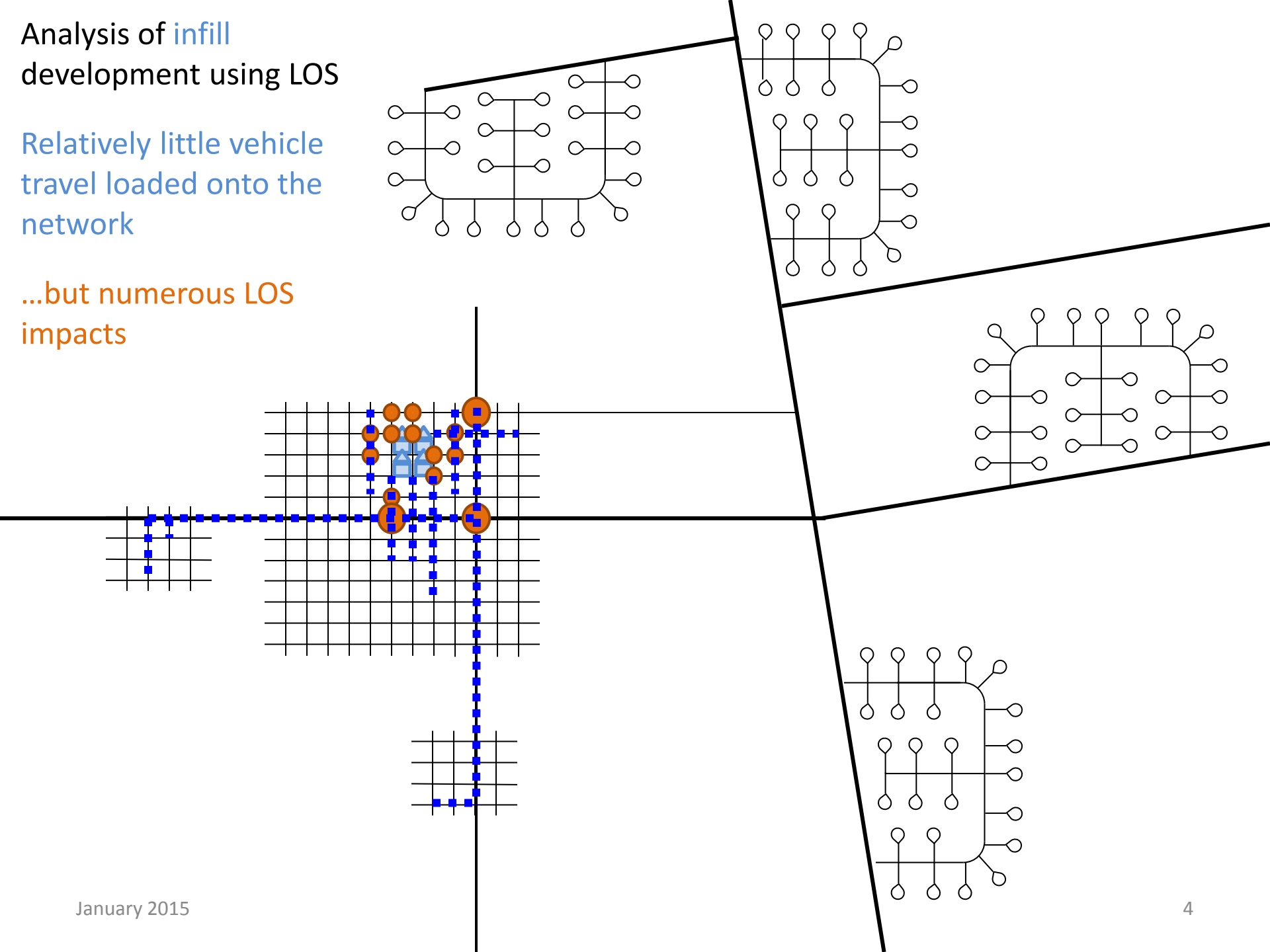
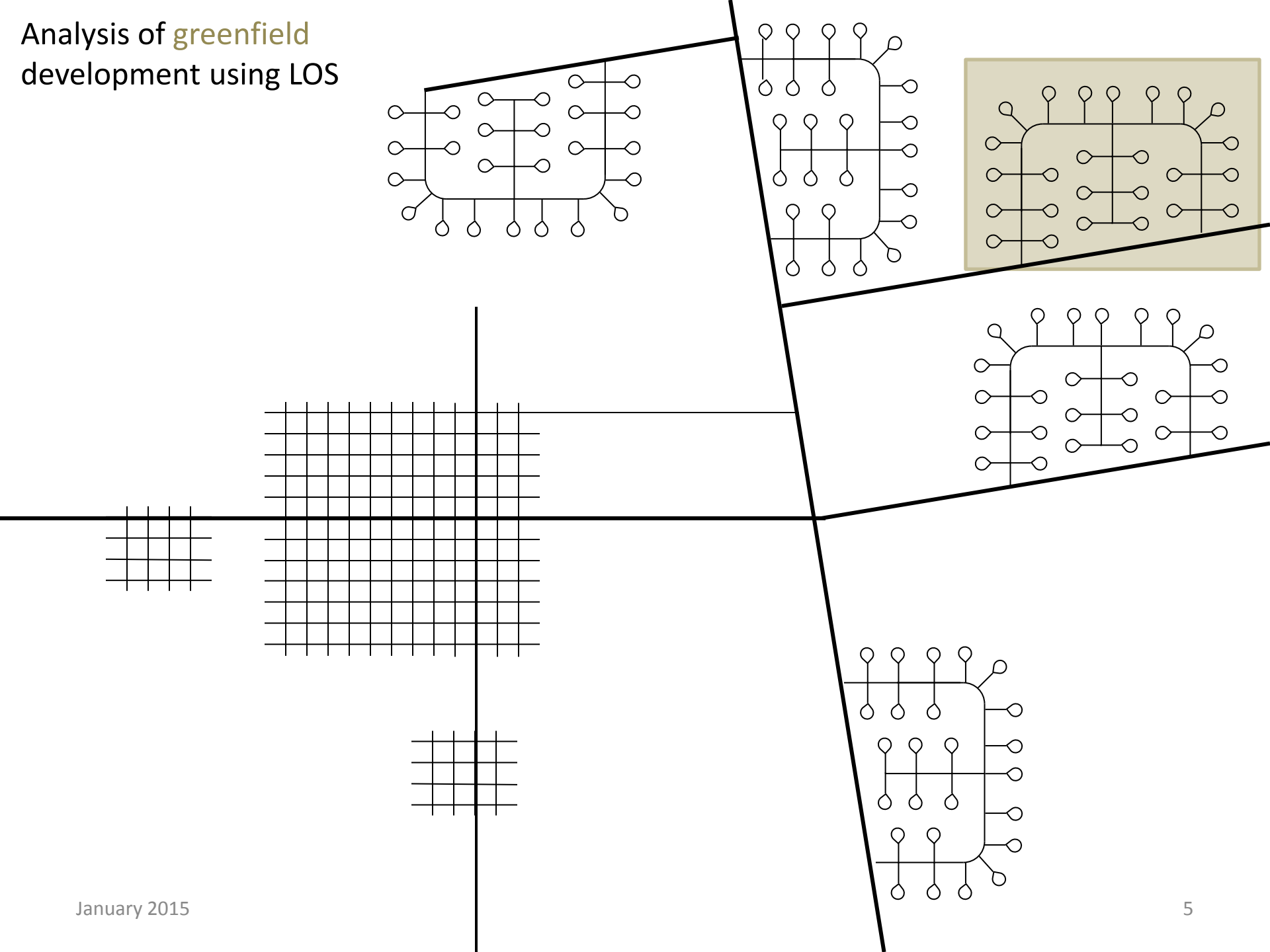
Relatively little vehicle travel loaded onto the network

…but numerous LOS impacts

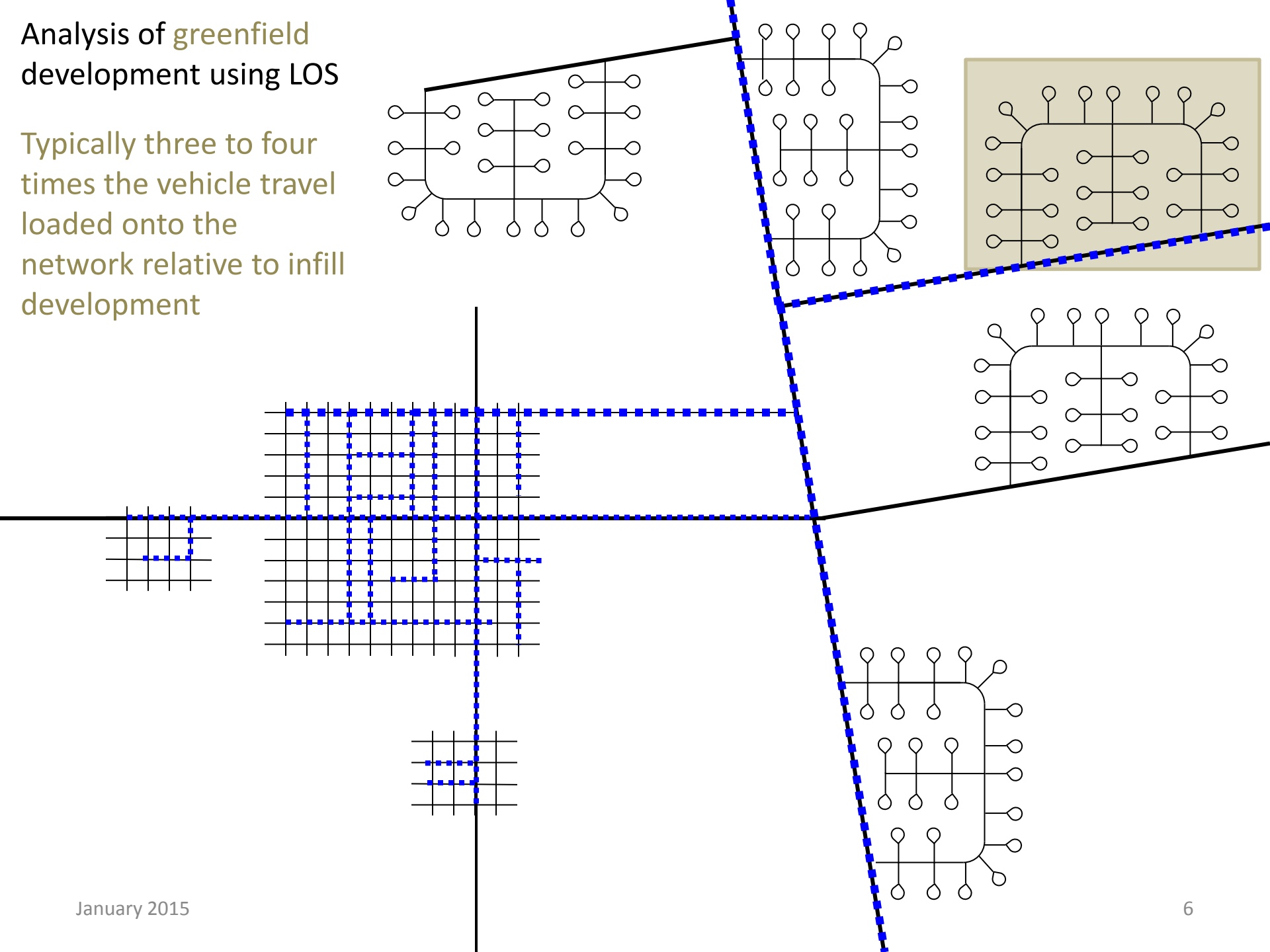


Analysis of greenfield development using LOS



Analysis of greenfield development using LOS

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



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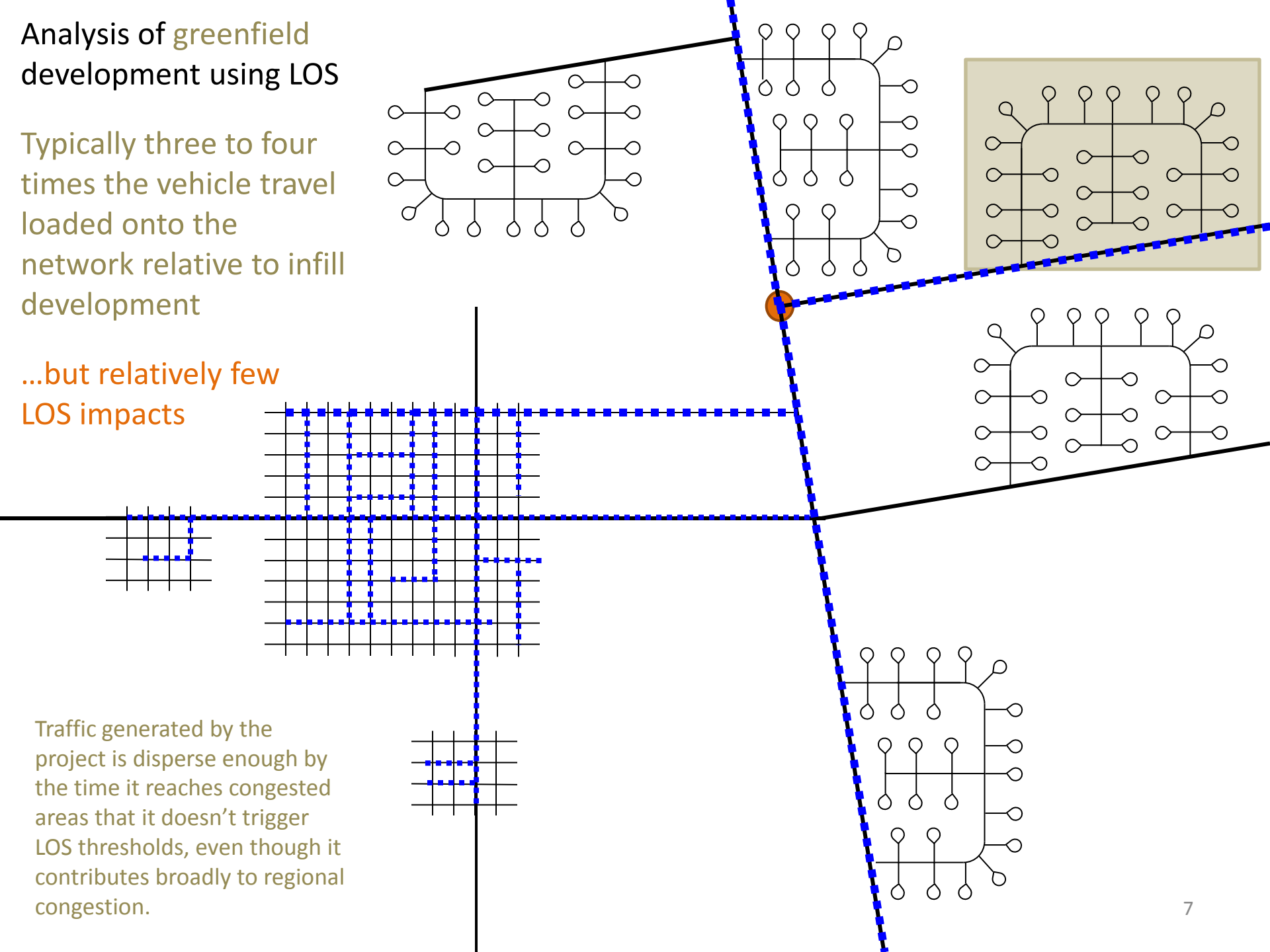

Traffic generated by the project is disperse enough by the time it reaches congested areas that it doesn't trigger LOS thresholds, even though it contributes broadly to regional congestion.

Problems with LOS

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
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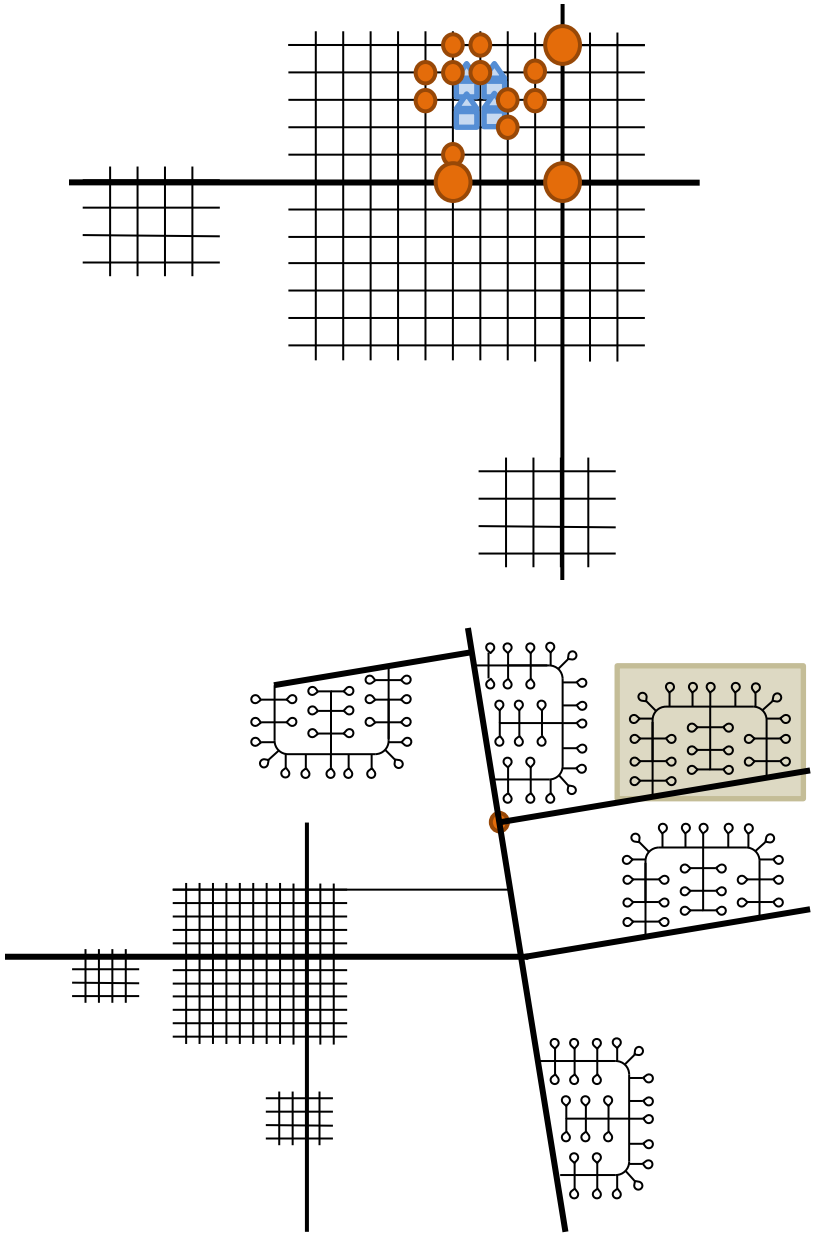
7. Forces more road construction than we can afford to maintain
8. Hard to calculate and inaccurate
9. Leads to costly, unhelpful solutions



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David Paul Morris / SFC

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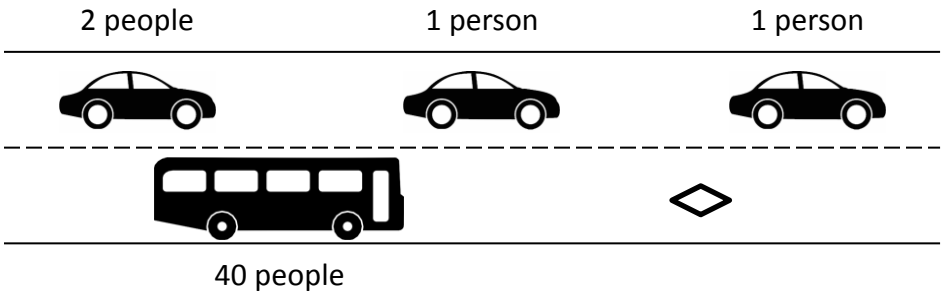

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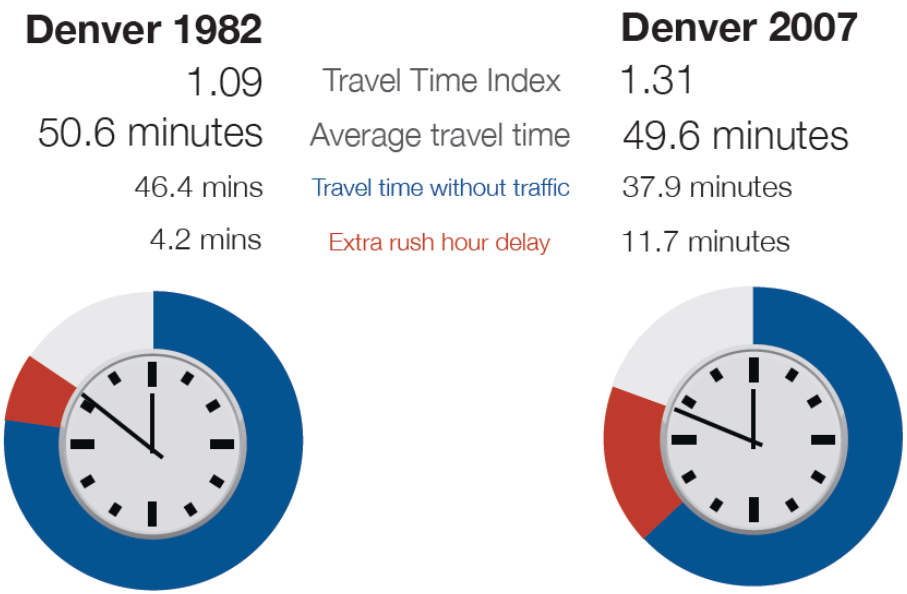

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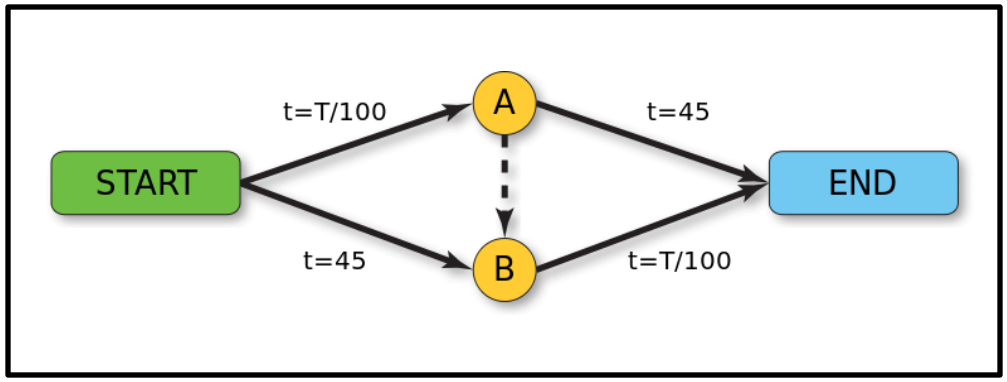

Braess's Paradox

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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 & Beverly Glen Boulevard (E.)	AM	0.894	D	1.038	F	1.037	F	-0.001	1.036	F	-0.002
		PM	1.023	F	1.225	F	1.216	F	-0.009	1.215	F	-0.010
2.	Sunset Boulevard & Beverly Glen Boulevard (W.)	AM	1.189	F	1.385	F	1.388	F	0.003	1.385	F	0.000
		PM	1.062	F	1.264	F	1.251	F	-0.013	1.249	F	-0.015
3.	Wilshire Boulevard & Beverly Glen Boulevard	AM	0.868	D	1.030	F	1.030	F	0.000	1.029	F	-0.001
		PM	0.864	D	1.140	F	1.133	F	-0.007	1.133	F	-0.007
4.	Santa Monica Boulevard (N.) & Overland Avenue	AM	0.861	D	1.076	F	1.080	F	0.004	1.078	F	0.002
		PM	0.814	D	1.082	F	1.054	F	-0.028	1.054	F	-0.028
5.	Santa Monica Boulevard (S.) & Overland Avenue	AM	0.478	A	0.358	A	0.358	A	0.000	0.358	A	0.000
		PM	0.428	A	0.465	A	0.465	A	0.000	0.465	A	0.000
6.	Santa Monica Boulevard (N.) & Beverly Glen Boulevard	AM	0.849	D	1.099	F	1.107	F	0.008	1.104	F	0.005
		PM	0.823	D	1.139	F	1.130	F	-0.009	1.128	F	-0.011
7.	Santa Monica Boulevard (S.) & Beverly Glen Boulevard	AM	0.849	D	0.464	A	0.464	A	0.000	0.464	A	0.000
		PM	0.864	D	0.575	A	0.575	A	0.000	0.575	A	0.000
8.	Santa Monica Boulevard (S.) & Century Park West	AM	0.325	A	1.006	F	1.007	F	0.001	1.005	F	-0.001
		PM	0.397	A	0.984	E	0.969	E	-0.015	0.966	E	-0.018
9.	Santa Monica Boulevard (N.) & Club View Drive	AM	0.613	B	0.213	A	0.213	A	0.000	0.213	A	0.000
		PM	0.707	C	0.408	A	0.408	A	0.000	0.408	A	0.000
10.	Santa Monica Boulevard (N.) & Avenue Of The Stars	AM	0.825	D	1.191	F	1.205	F	0.014 *	1.199	F	0.008
		PM	0.755	C	0.967	E	0.956	E	-0.011	0.955	E	-0.012
11.	Santa Monica Boulevard (S.) & Avenue Of The Stars	AM	0.506	A	NA		NA			NA		
		PM	0.544	A	NA		NA			NA		
12.	Santa Monica Boulevard (N.) & Century Park East	AM	0.759	C	0.950	E	0.955	E	0.005	0.953	E	0.003
		PM	0.666	B	0.846	D	0.805	D	-0.041	0.804	D	-0.042
13.	Santa Monica Boulevard (S.) & Century Park East	AM	0.771	C	NA		NA			NA		
		PM	0.648	B	NA		NA			NA		
14.	Santa Monica Boulevard (N.) & Wilshire Boulevard	AM	1.096	F	1.261	F	1.263	F	0.002	1.263	F	0.002
		PM	1.046	F	1.294	F	1.288	F	-0.006	1.287	F	-0.007

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Benefits of VMT

1. Removes barriers to infill
2. Easier to model
3. Already calculated (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?

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

Transportation Impact Fees

Bad

Ad-hoc LOS-triggered Transportation Impact Fees (very bad)

LOS used to size roadway capacity; unit or square footage-based Transportation Impact Fee (not so good)

LOS used to size roadway capacity; VMT-based Transportation Impact Fees (better)

Use accessibility/connectivity metric to design network; Use VMT based Transportation Impact Fee (best)

Good

Thanks!

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