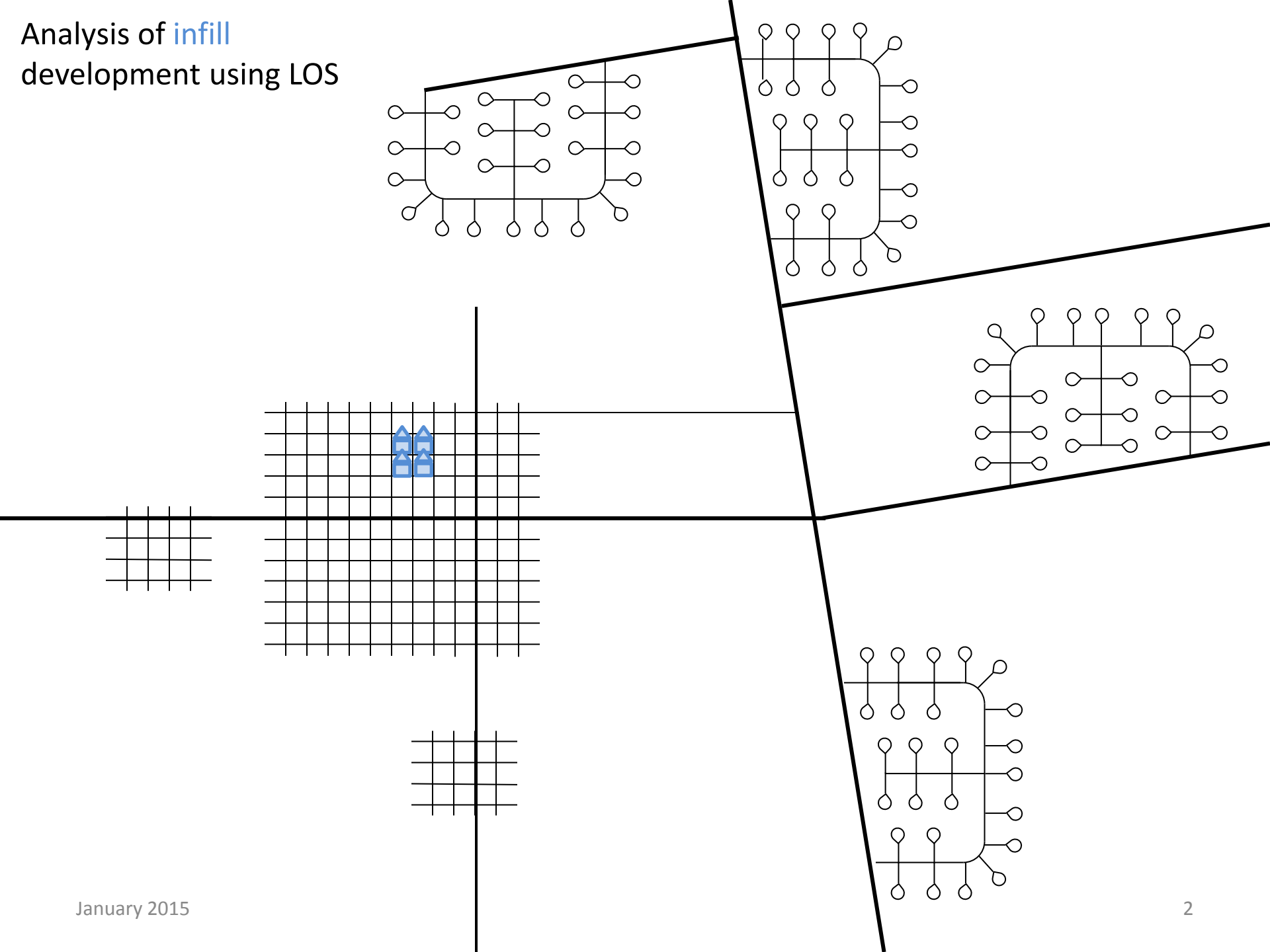


Replacing LOS with VMT in CA

Chris Ganson

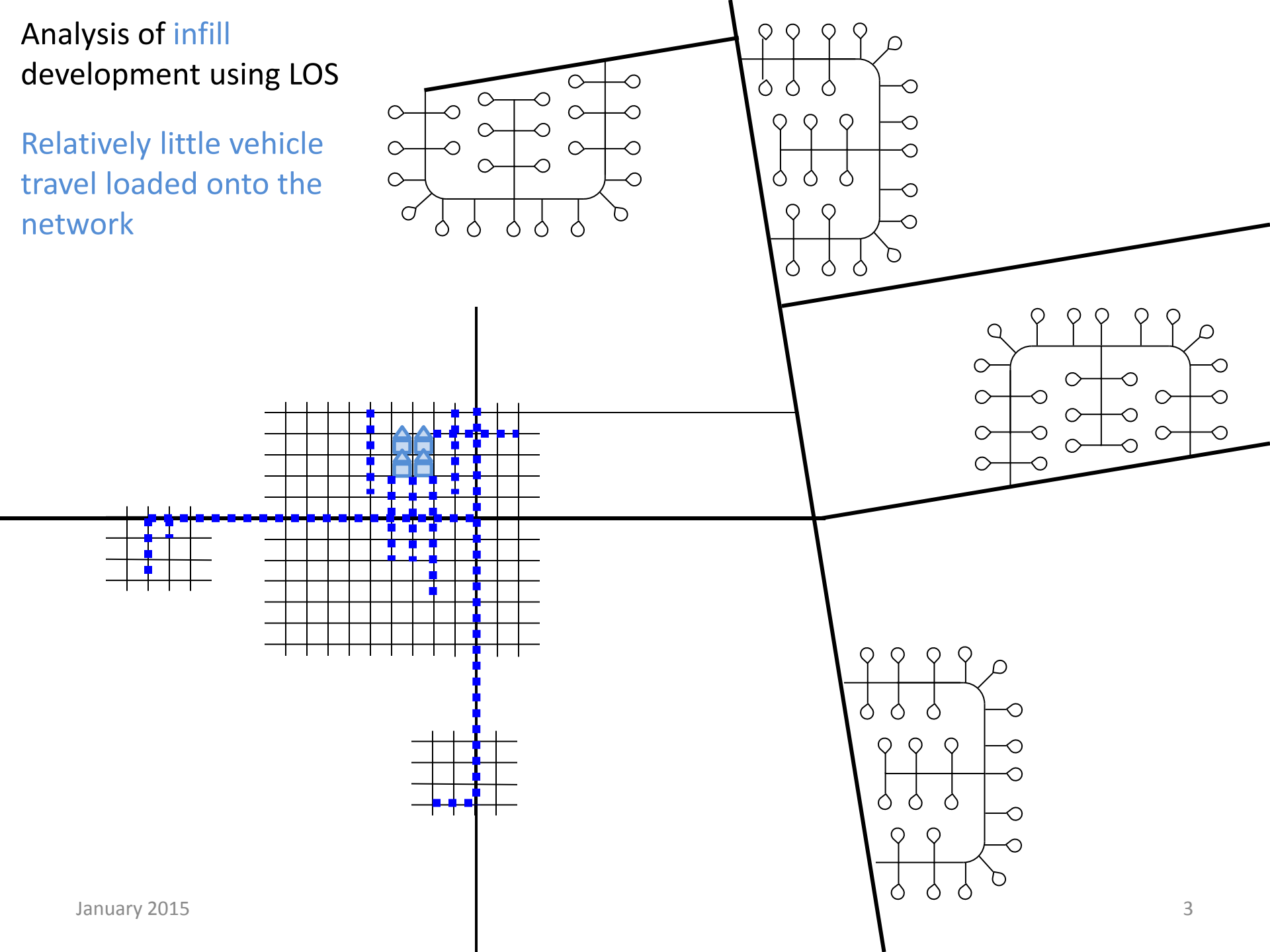
California Governor's Office of Planning and Research

Analysis of **infill**
development using LOS



Analysis of **infill**
development using LOS

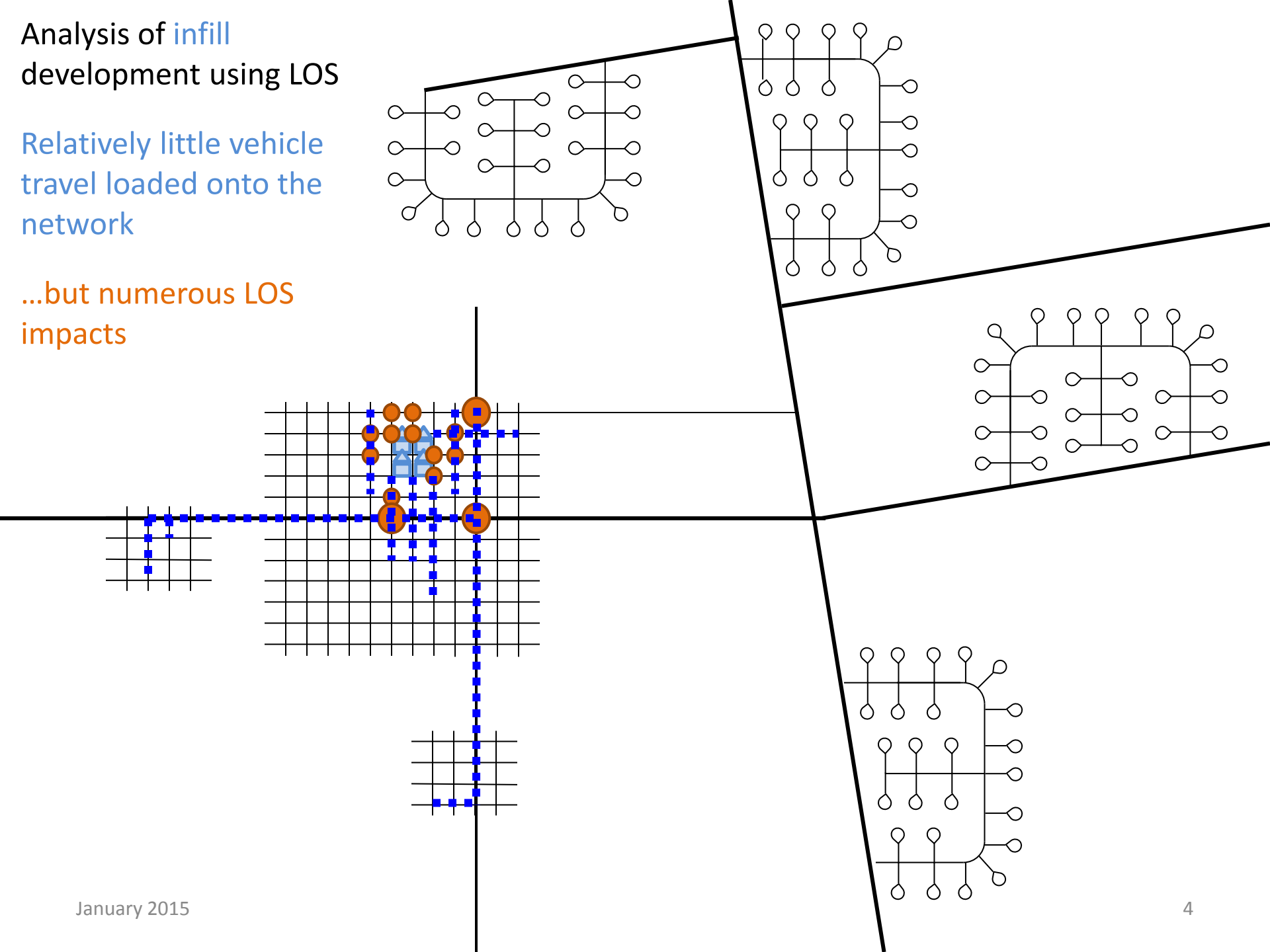
Relatively little vehicle
travel loaded onto the
network



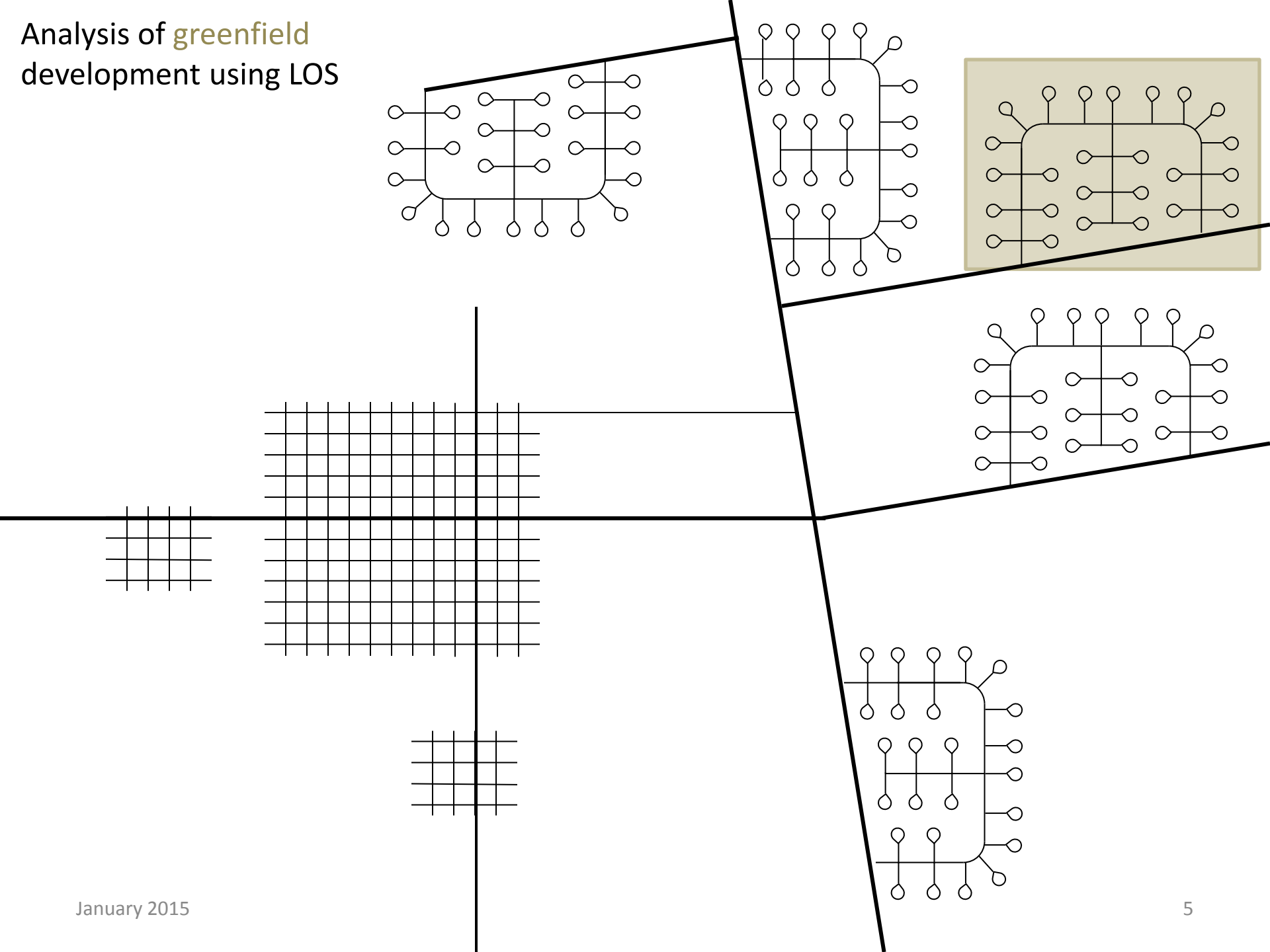
Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network

...but numerous LOS impacts

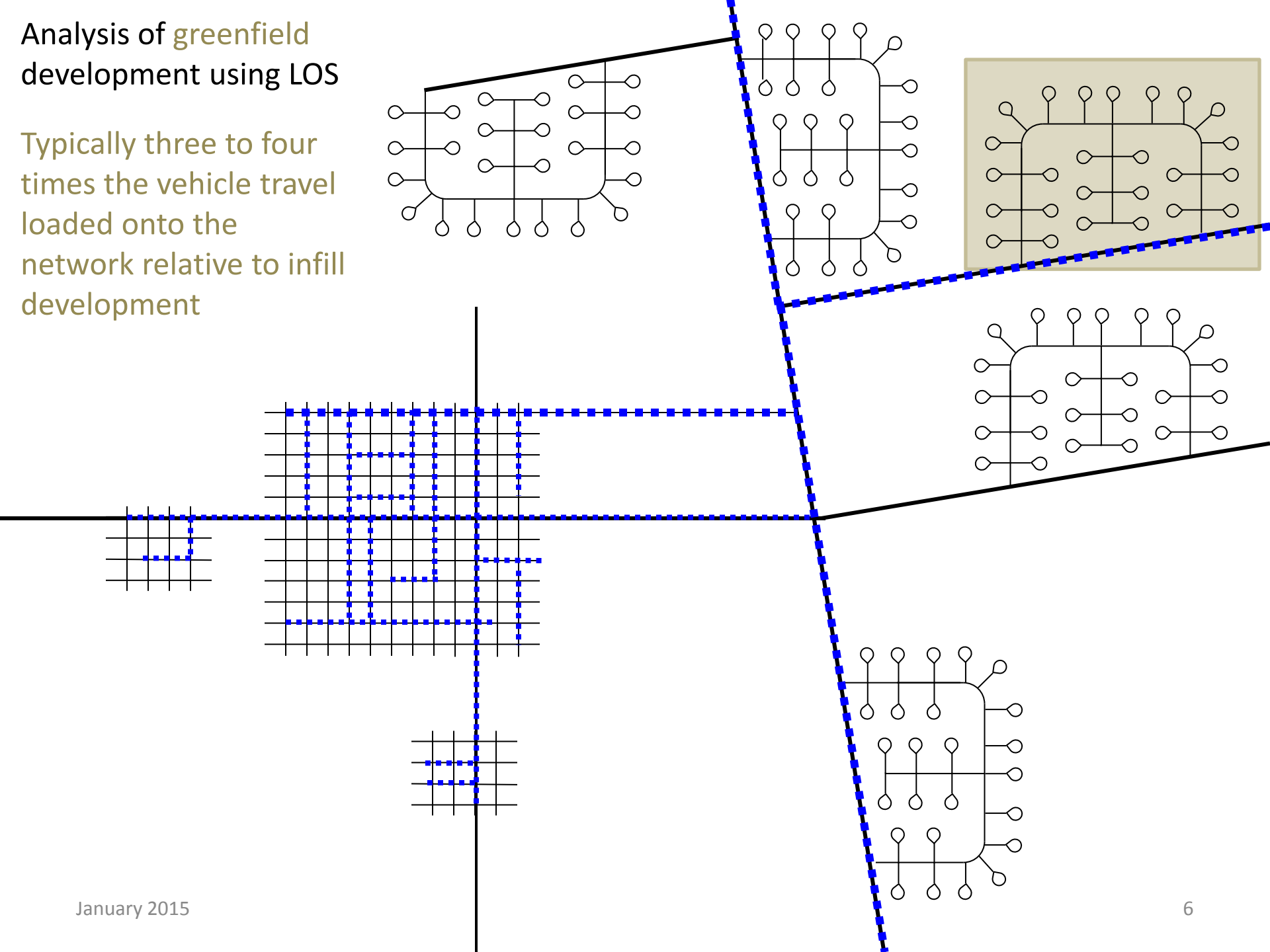


Analysis of greenfield
development using LOS



Analysis of greenfield development using LOS

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

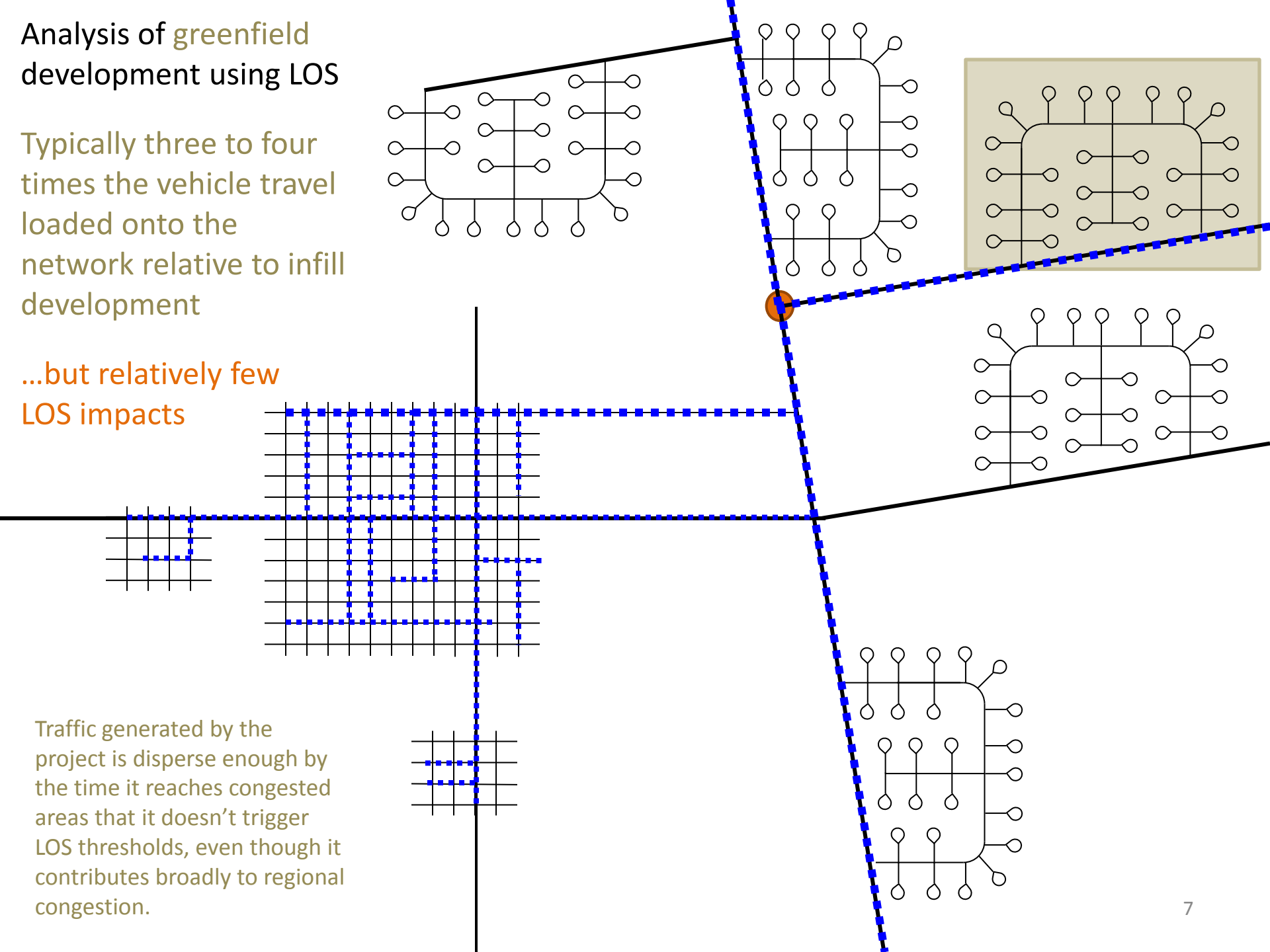


Analysis of greenfield development using LOS

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

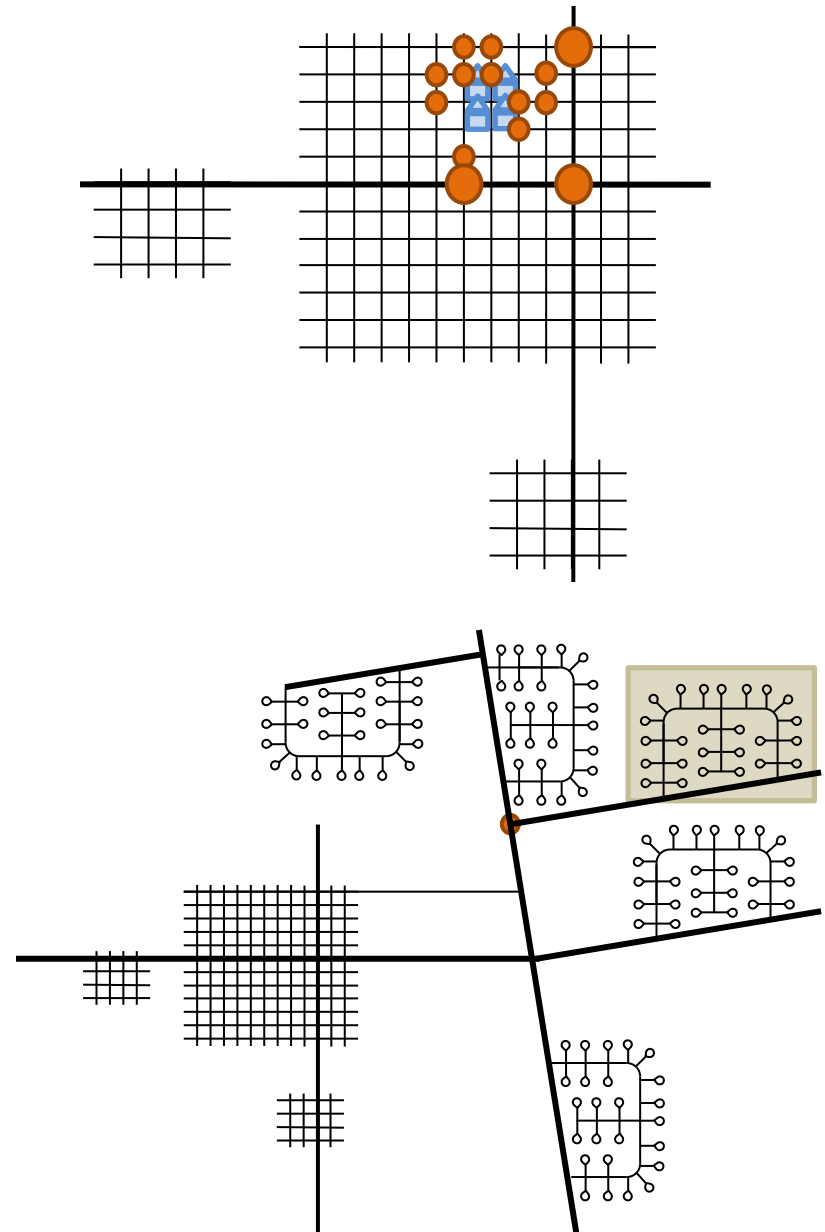
...but relatively few LOS impacts

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.



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
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



Problems with LOS

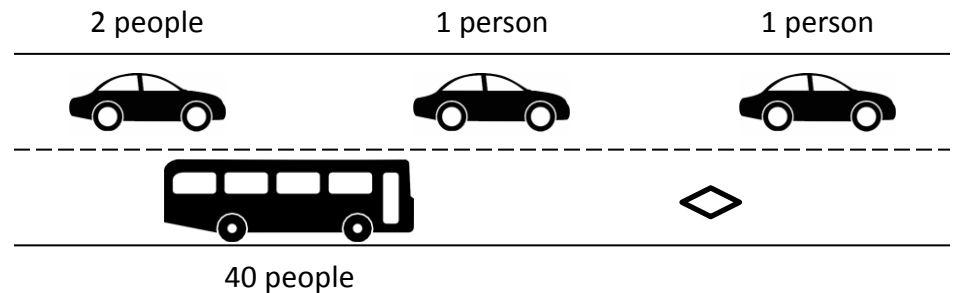
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David Paul Morris / SFC

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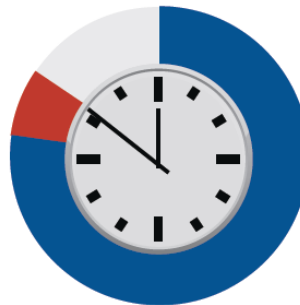
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Denver 1982

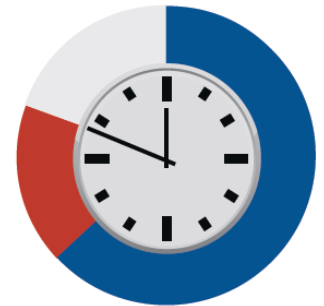
1.09
50.6 minutes
46.4 mins
4.2 mins

Travel Time Index
Average travel time
Travel time without traffic
Extra rush hour delay



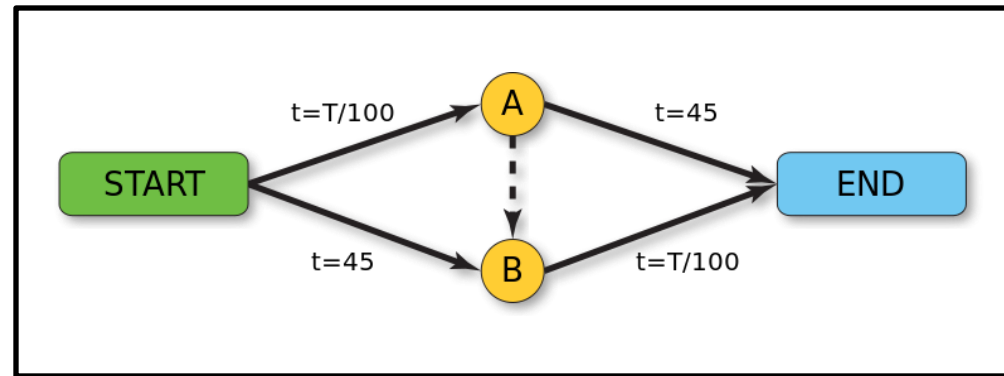
Denver 2007

1.31
49.6 minutes
37.9 minutes
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		Without Project		With Project		With Project + Mitigation	
			CMA	LOS	CMA	LOS	CMA	LOS	CMA	LOS
1.	Sunset Boulevard & Beverly Glen Boulevard (E.)	AM	0.894	D	1.038	F	1.037	F	1.036	F
		PM	1.023	F	1.225	F	1.216	F	1.215	F
2.	Sunset Boulevard & Beverly Glen Boulevard (W.)	AM	1.189	F	1.385	F	1.388	F	1.385	F
		PM	1.062	F	1.264	F	1.251	F	1.249	F
3.	Wilshire Boulevard & Beverly Glen Boulevard	AM	0.868	D	1.030	F	1.030	F	1.029	F
		PM	0.864	D	1.140	F	1.133	F	1.133	F
4.	Santa Monica Boulevard (N.) & Overland Avenue	AM	0.861	D	1.076	F	1.080	F	1.078	F
		PM	0.814	D	1.082	F	1.054	F	1.054	F
5.	Santa Monica Boulevard (S.) & Overland Avenue	AM	0.478	A	0.358	A	0.358	A	0.358	A
		PM	0.428	A	0.485	A	0.465	A	0.465	A
6.	Santa Monica Boulevard (N.) & Beverly Glen Boulevard	AM	0.849	D	1.099	F	1.107	F	1.104	F
		PM	0.823	D	1.139	F	1.130	F	1.128	F
7.	Santa Monica Boulevard (S.) & Beverly Glen Boulevard	AM	0.848	D	0.464	A	0.464	A	0.464	A
		PM	0.884	D	0.575	A	0.575	A	0.575	A
8.	Santa Monica Boulevard (S.) & Century Park West	AM	0.325	A	1.006	F	1.007	F	1.005	F
		PM	0.397	A	0.984	E	0.969	E	0.960	E
9.	Santa Monica Boulevard (N.) & Club View Drive	AM	0.613	B	0.213	A	0.213	A	0.213	A
		PM	0.707	C	0.408	A	0.408	A	0.408	A
10.	Santa Monica Boulevard (N.) & Avenue Of The Stars	AM	0.825	D	1.191	F	1.205	F	1.199	F
		PM	0.755	C	0.967	E	0.956	E	0.955	E
11.	Santa Monica Boulevard (S.) & Avenue Of The Stars	AM	0.508	A	NA	NA	NA	NA	NA	NA
		PM	0.544	A	NA	NA	NA	NA	NA	NA
12.	Santa Monica Boulevard (N.) & Century Park East	AM	0.759	C	0.950	E	0.955	E	0.953	E
		PM	0.666	B	0.846	D	0.805	D	0.804	D
13.	Santa Monica Boulevard (S.) & Century Park East	AM	0.771	C	NA	NA	NA	NA	NA	NA
		PM	0.648	B	NA	NA	NA	NA	NA	NA
14.	Santa Monica Boulevard (N.) & Wilshire Boulevard	AM	1.095	F	1.261	F	1.263	F	1.263	F
		PM	1.046	F	1.294	F	1.288	F	1.287	F

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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)

Good

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

Thanks!

Chris Ganson
chris.ganson@opr.ca.gov