

ANATOMY OF TOLLING



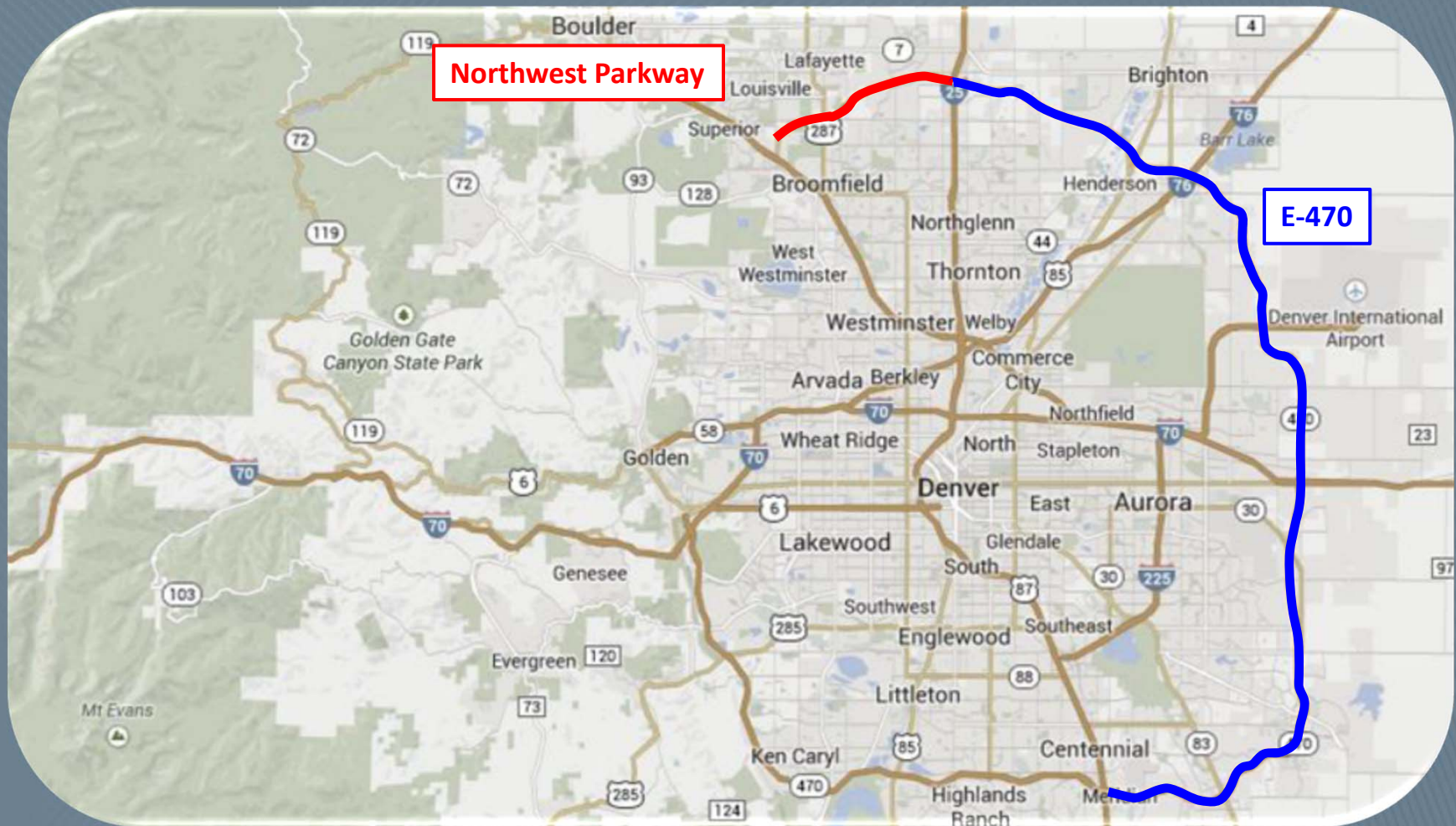
Lou Davenport, PE, PTOE

apexdesign

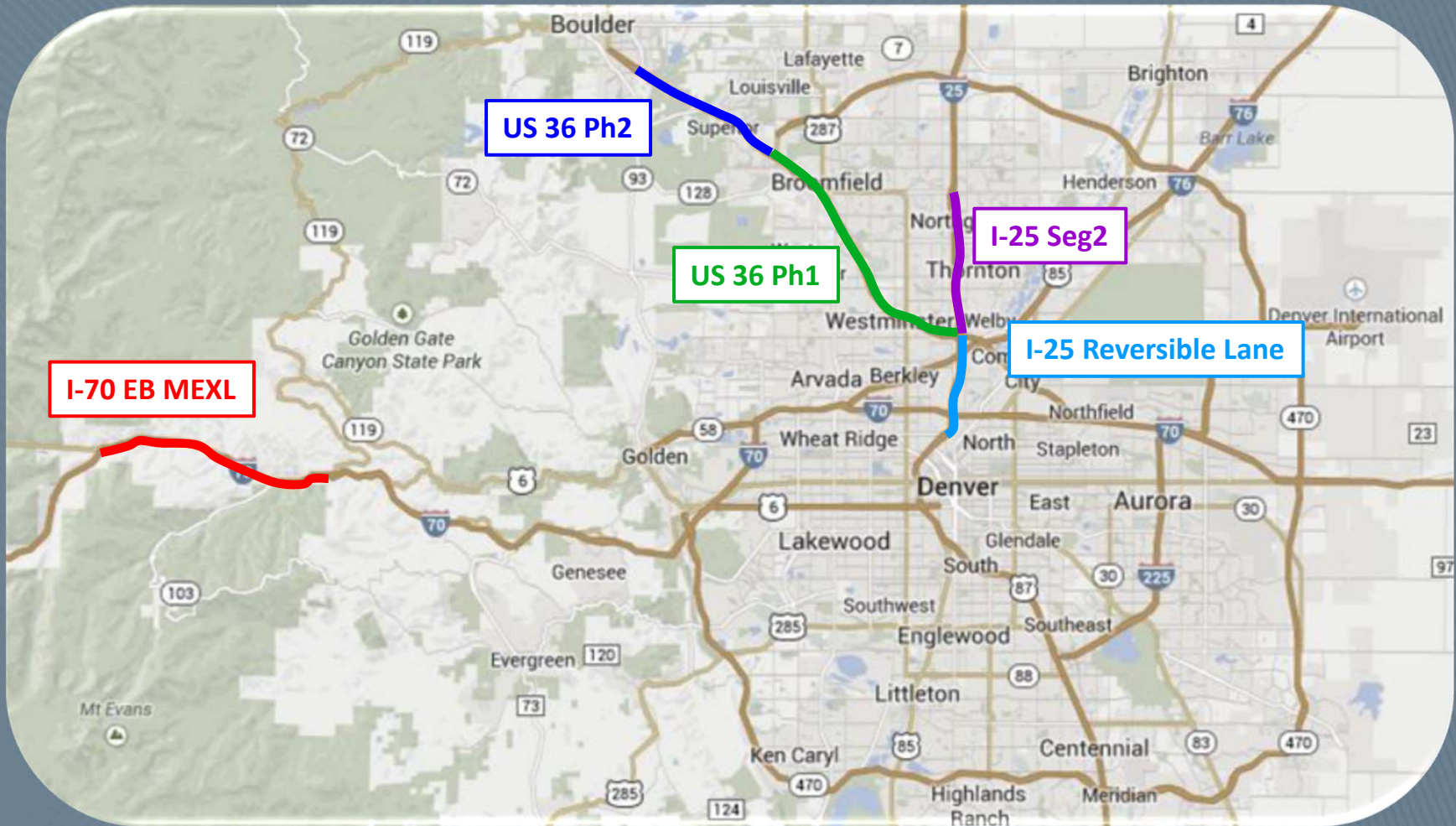
TOLL SYSTEMS IN COLORADO

Overview

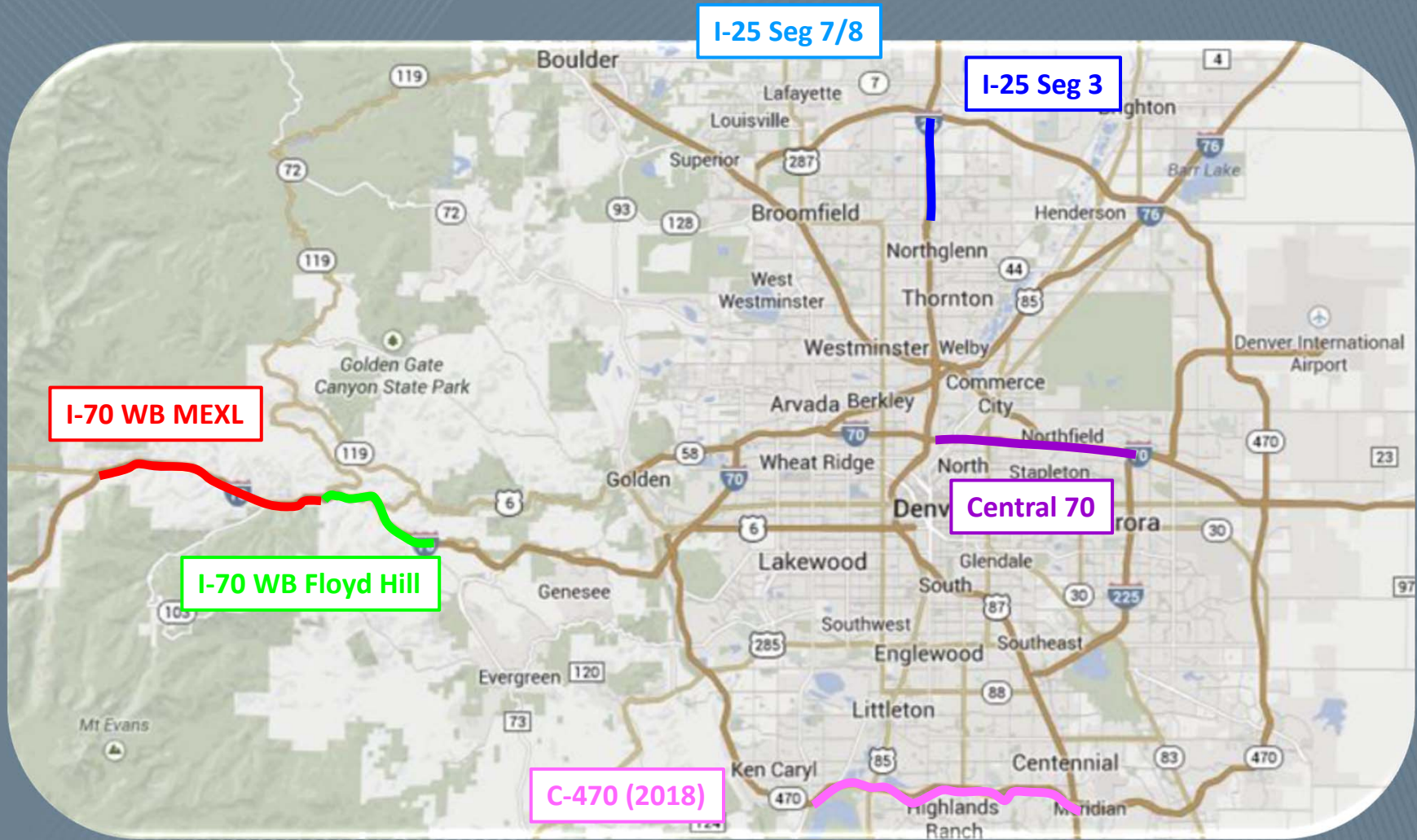
Dedicated Toll Roads



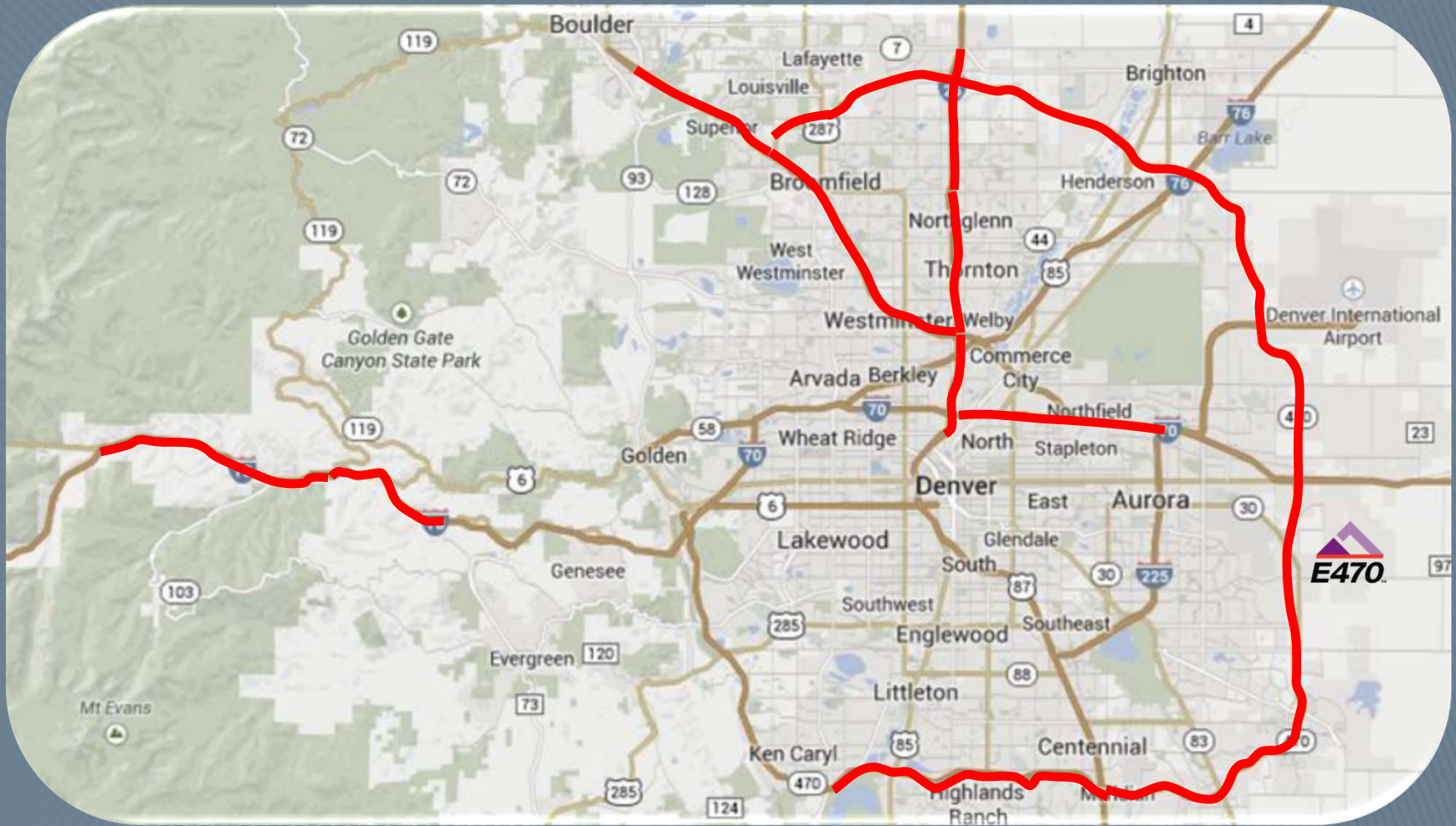
CDOT Express Lanes - Live



CDOT Express Lanes – In Process



Colorado Toll Systems



All Electronic Tolling



- **ExpressToll**

- ExpressToll customers prepay their accounts
- 73% of E-470 Net Toll Revenue in 2016



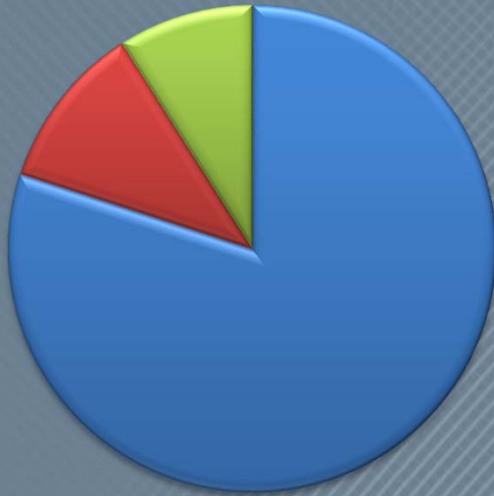
- **License Plate Toll (LPT)**

- Front and rear image taken of license plate
- Registered owner of vehicle receives monthly statement
- LPT customers pay a 25% premium over ExpressToll
- 27% of E-470 Net Toll Revenue in 2016

Toll Transponders

■ Interoperable Transponders

- All transponders can be used on all toll facilities in the state
- One transponder per vehicle
- Multiple vehicles per account accepted

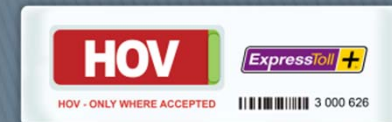


■ 6c Tags - 80%

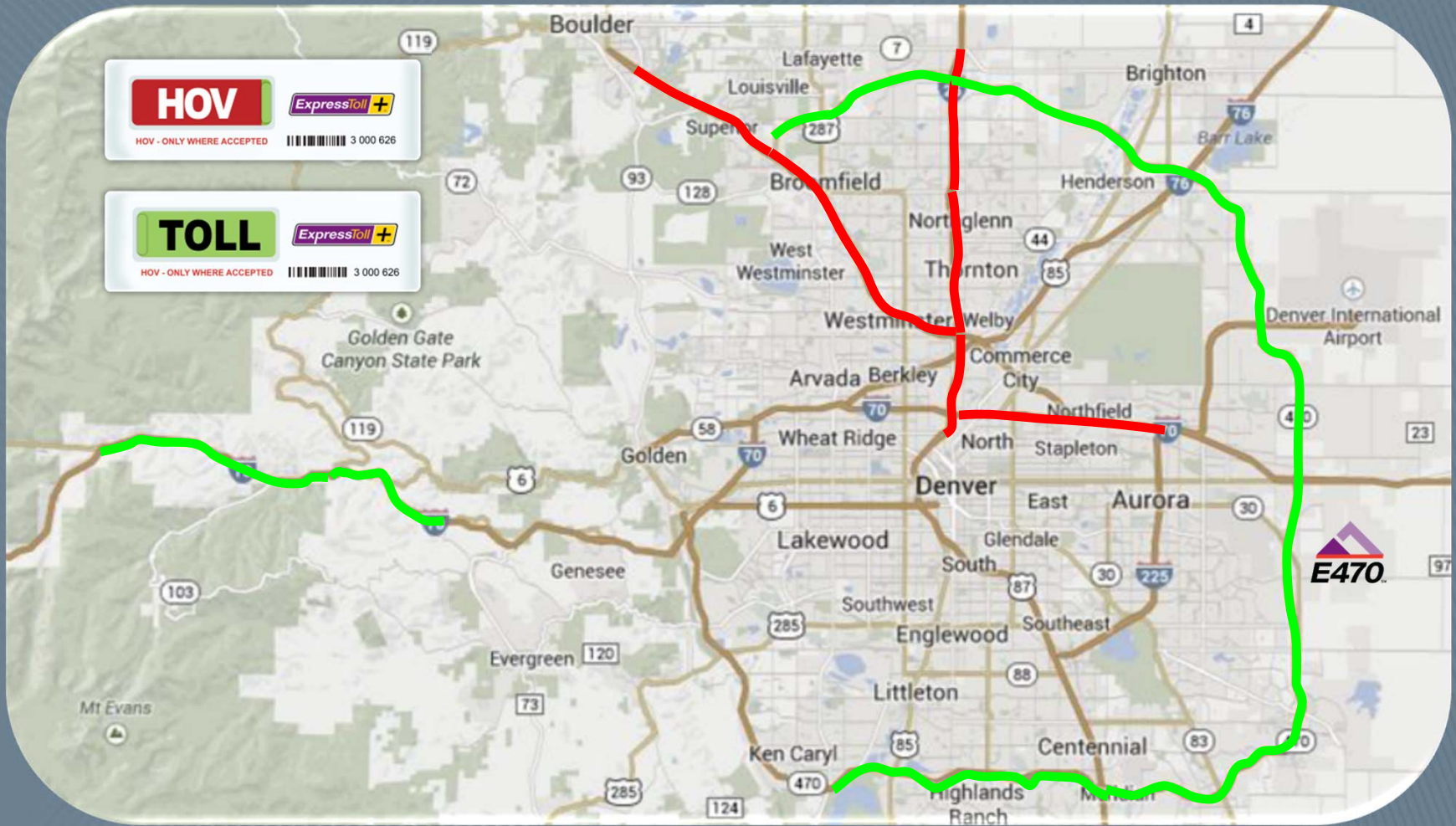
■ T21 Tags - 11%

■ Switchable HOV Tags - 9%

Total Issued Transponders: **1,550,000**



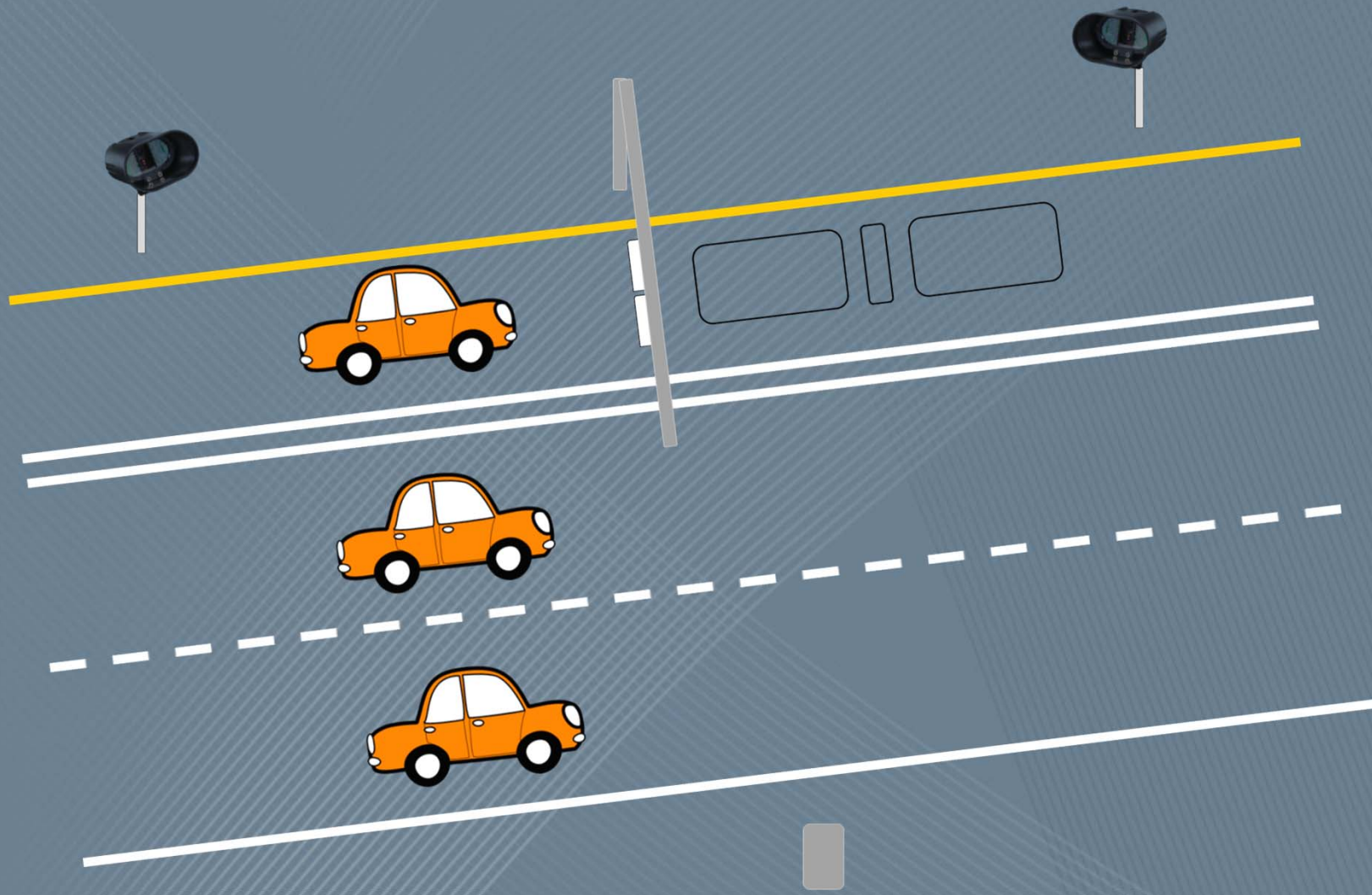
HOV 3+



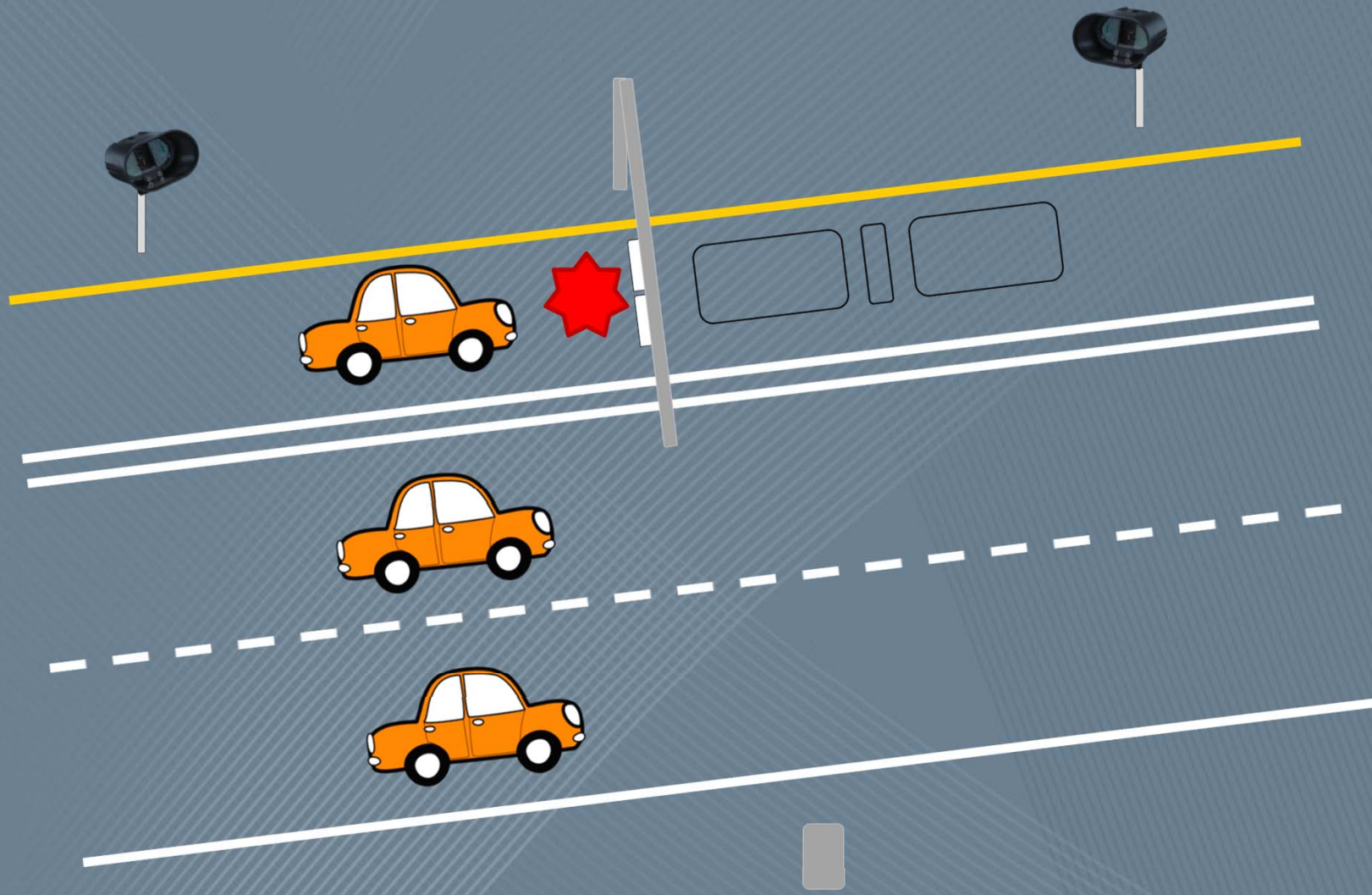
TOLL POINTS

The Anatomy

Lane Systems



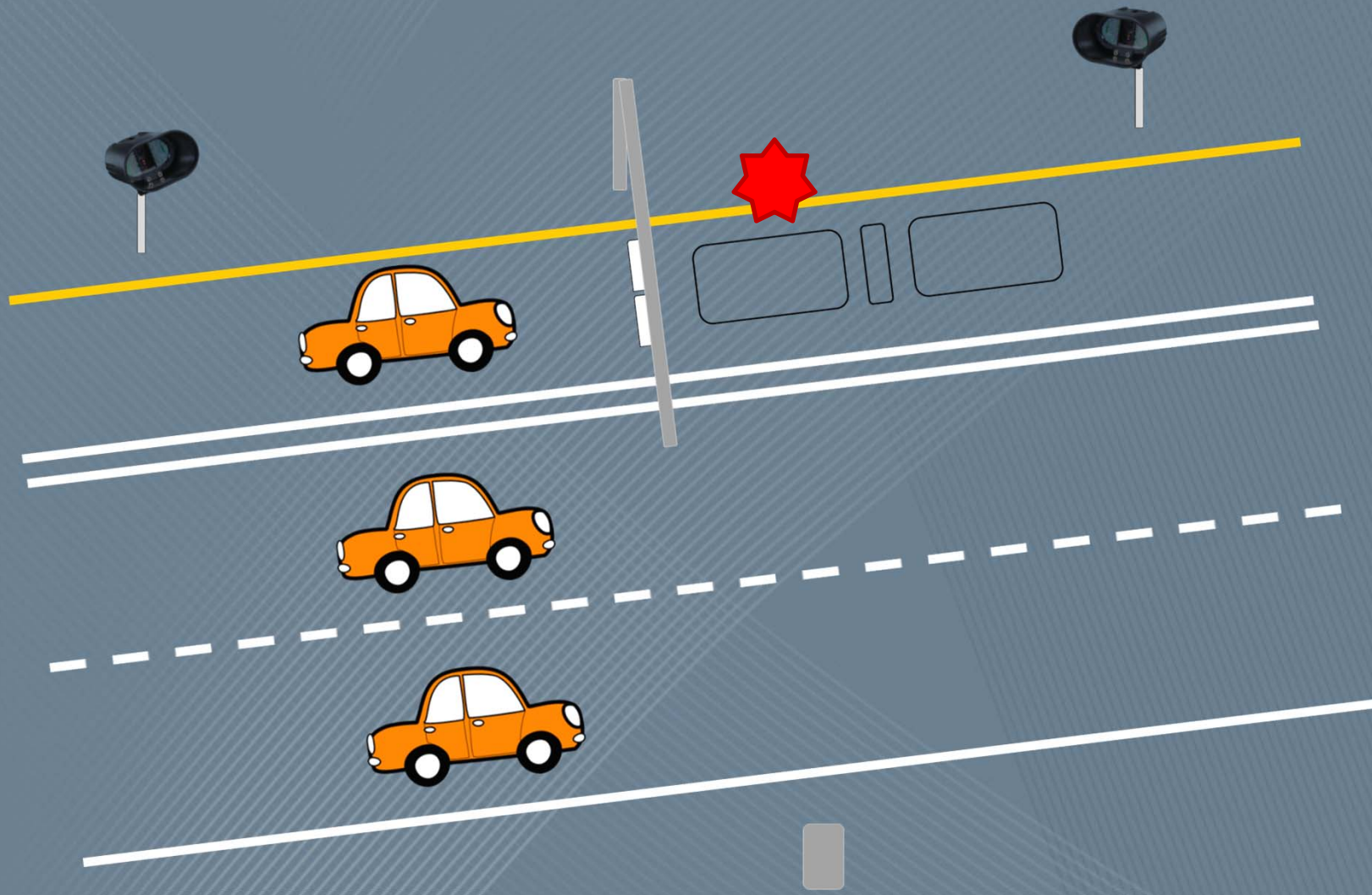
Lane Systems



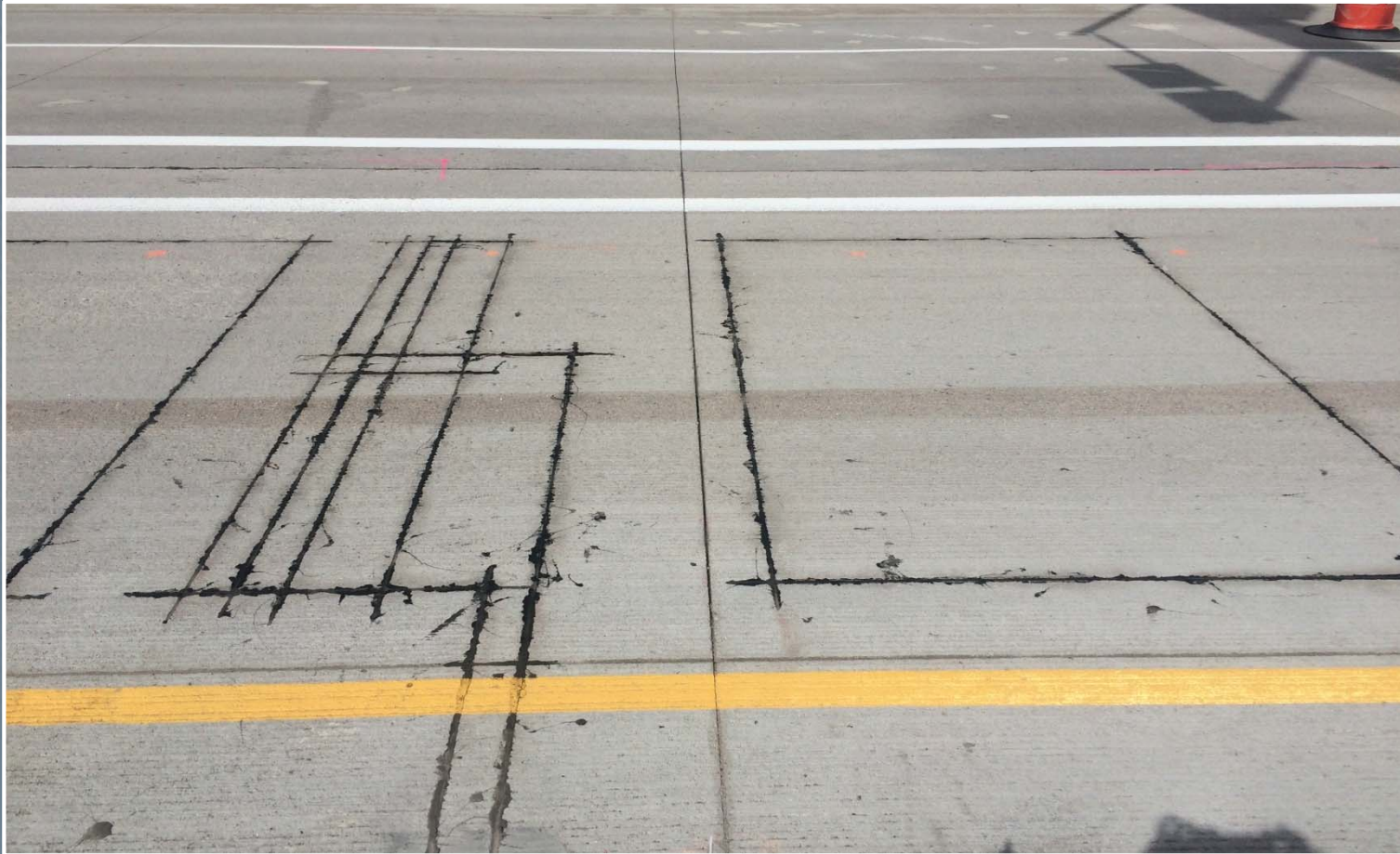
Toll Tag Antennas



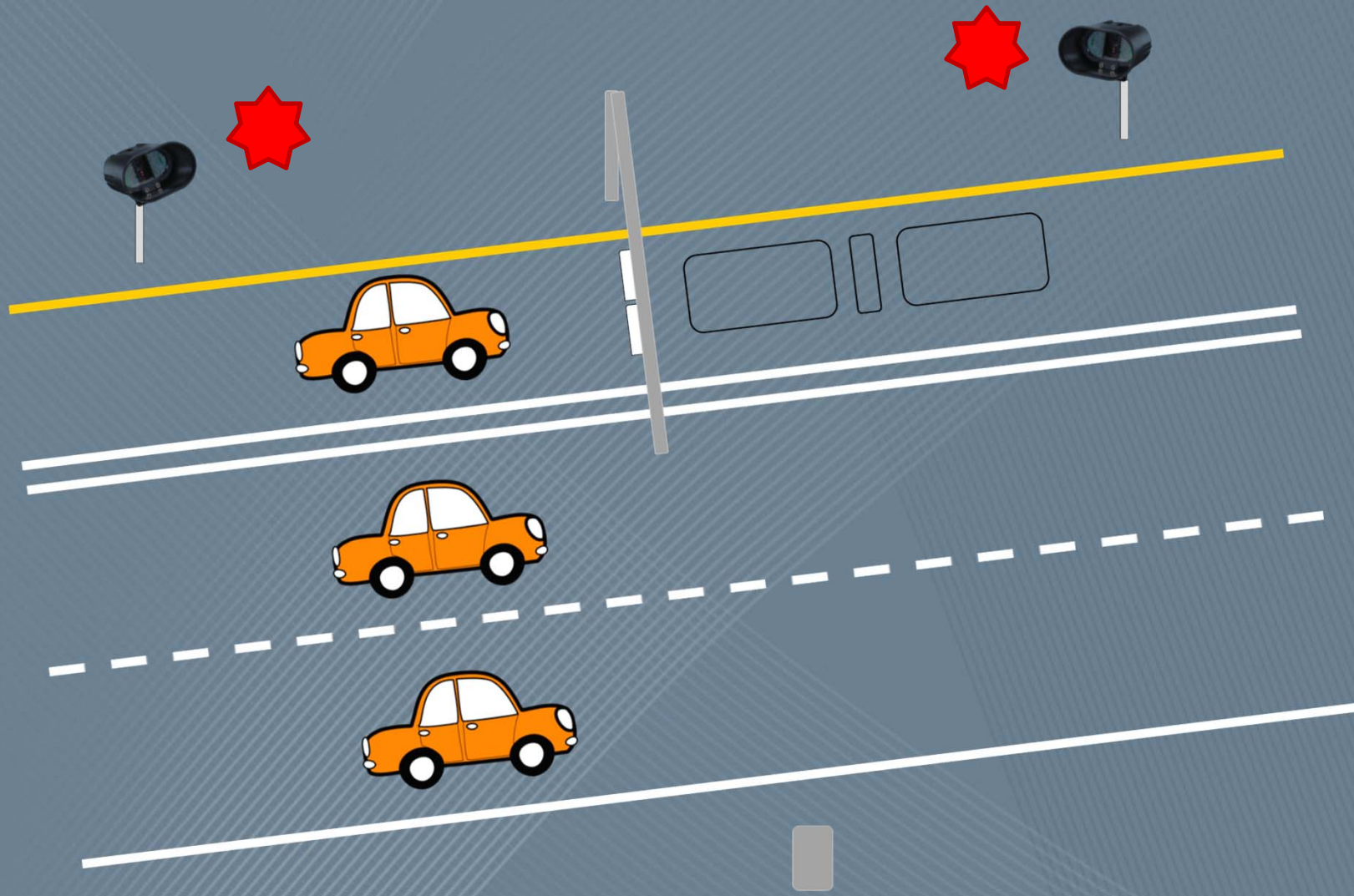
Lane System



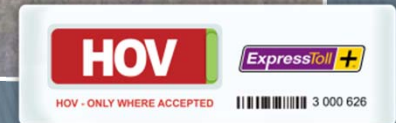
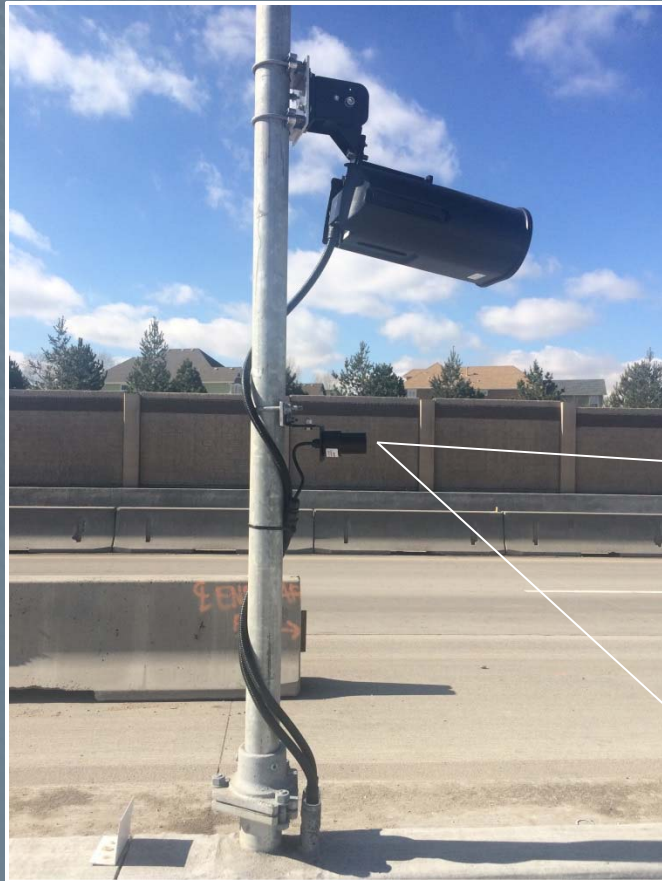
Loops



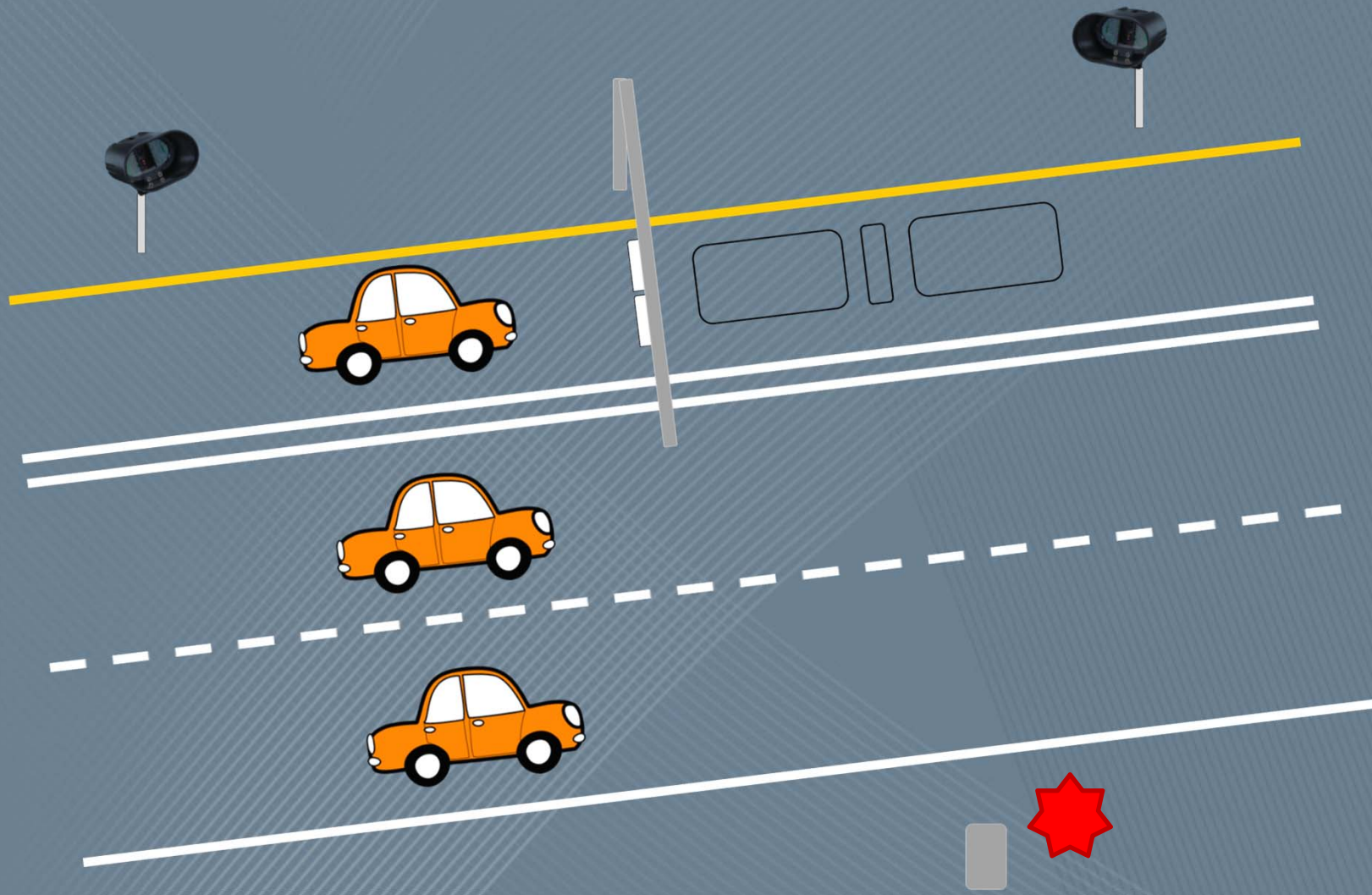
Lane System



ALPR Cameras

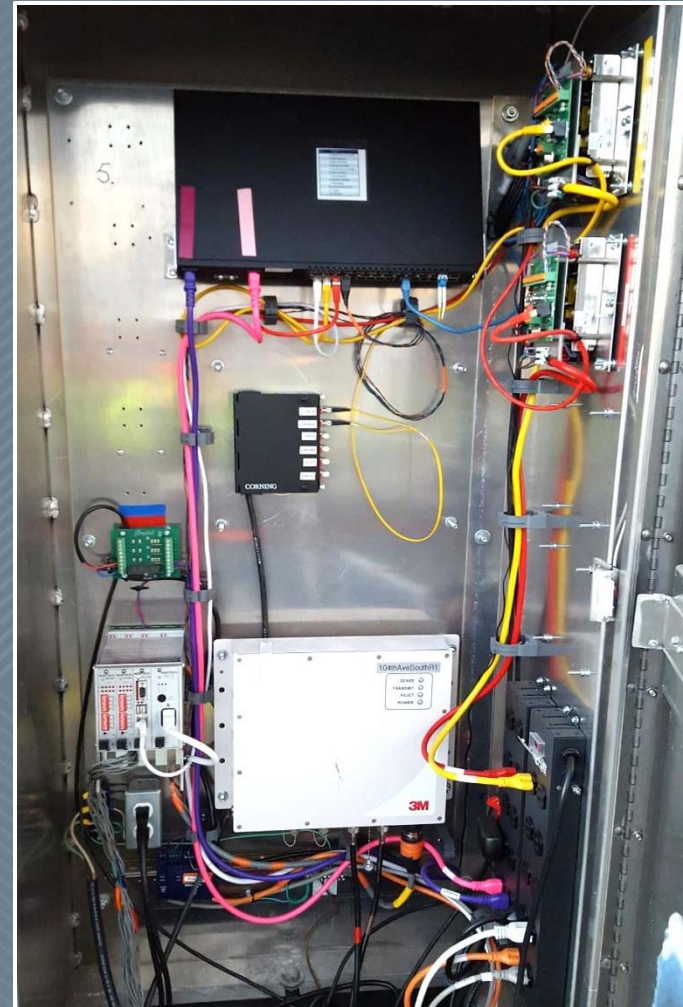


Lane System

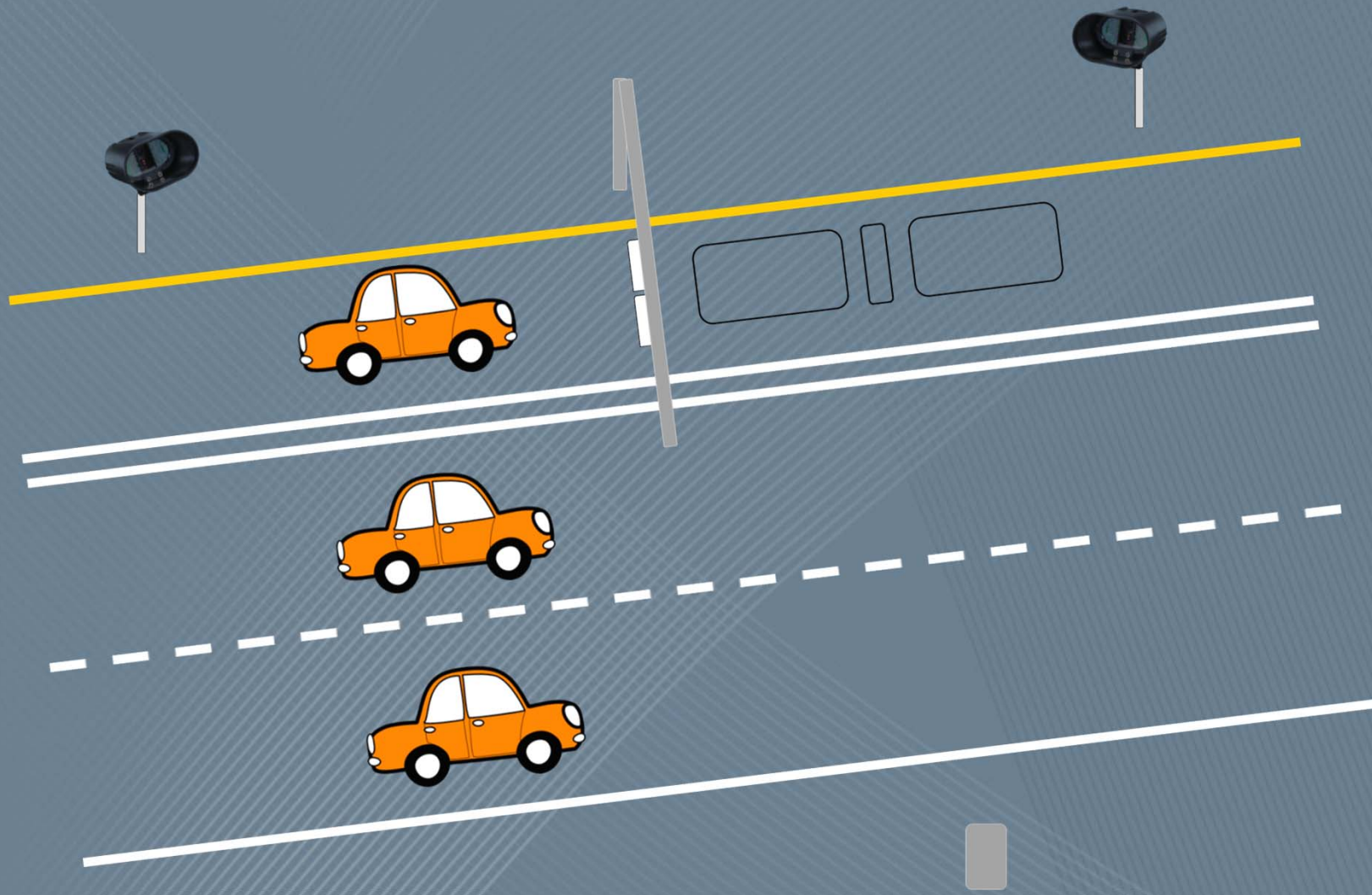


Lane Controller Cabinet

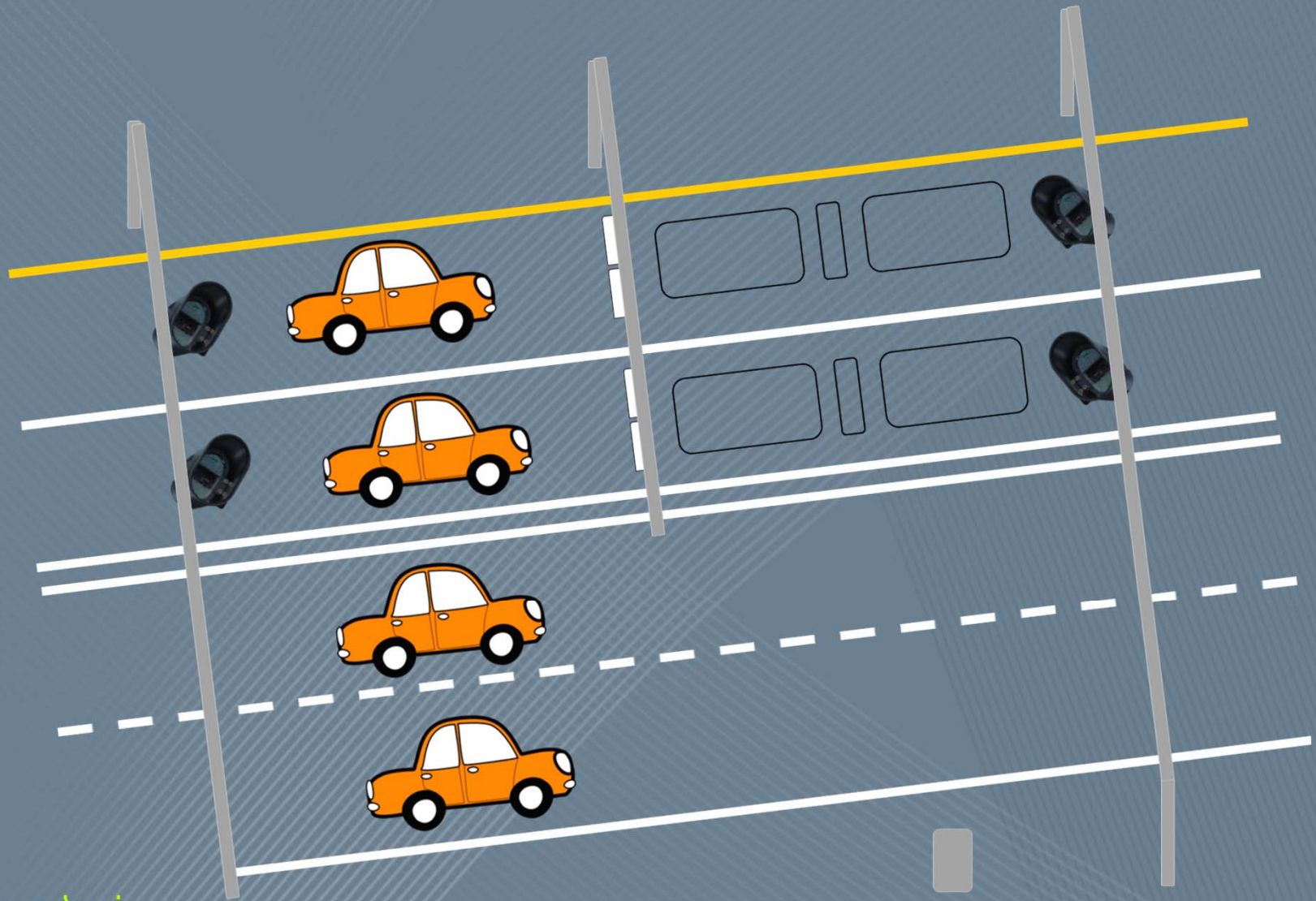
- Antennas
- ALPR
- Loops
- Lane Controller
- Network Switch
- Fiber Patch Panel



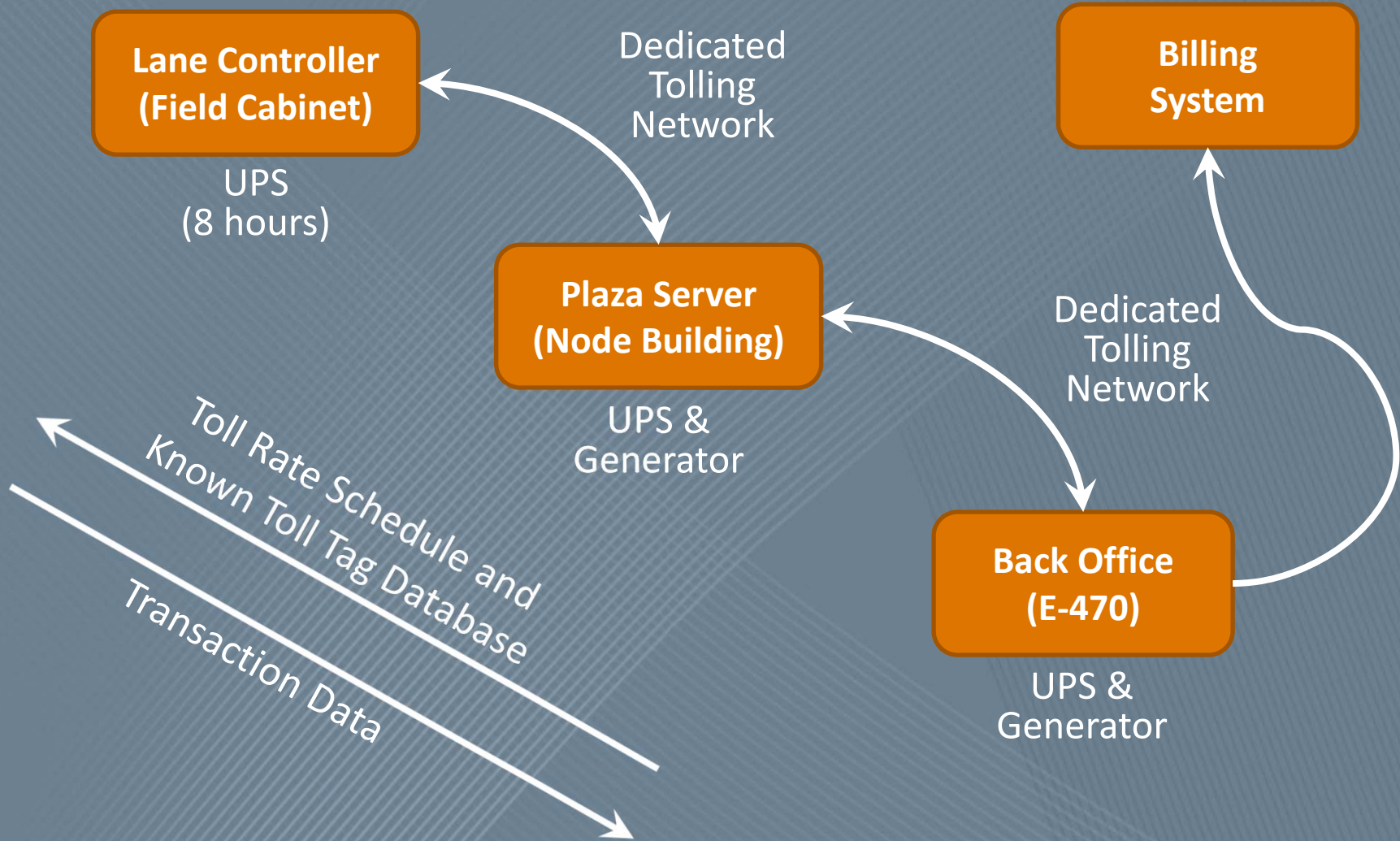
Single Lane



Dual Lane





Communications



Posting Toll Rates

VTMS

EXPRESS LANE	
	TOLL TO
DESTINATION X	\$XX.XX
DESTINATION Z	\$XX.XX
HOV 3 + USE	

Toll Point



Anatomy of Tolling

Questions?



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