APA Transportation Planning Division

2018 State of Transportation Planning Webinar

July 20, 2018

How LA is using technology to deliver urban mobility

APA Transport

State of Transportation Planning 2018 Webinar

July 20, 2018

Presenters

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A TRANSPORTATION TECHNOLOGY STRATEGY FOR LOS ANGELES

Urban MOBILITY in a Digital Age

LADOT

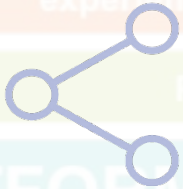
LADOT Technology Strategy Framework

LADOT

Implementing LA's Transportation Technology Strategy

Build a solid data foundation.

Collected trip data from housing & mixed use sites in our City

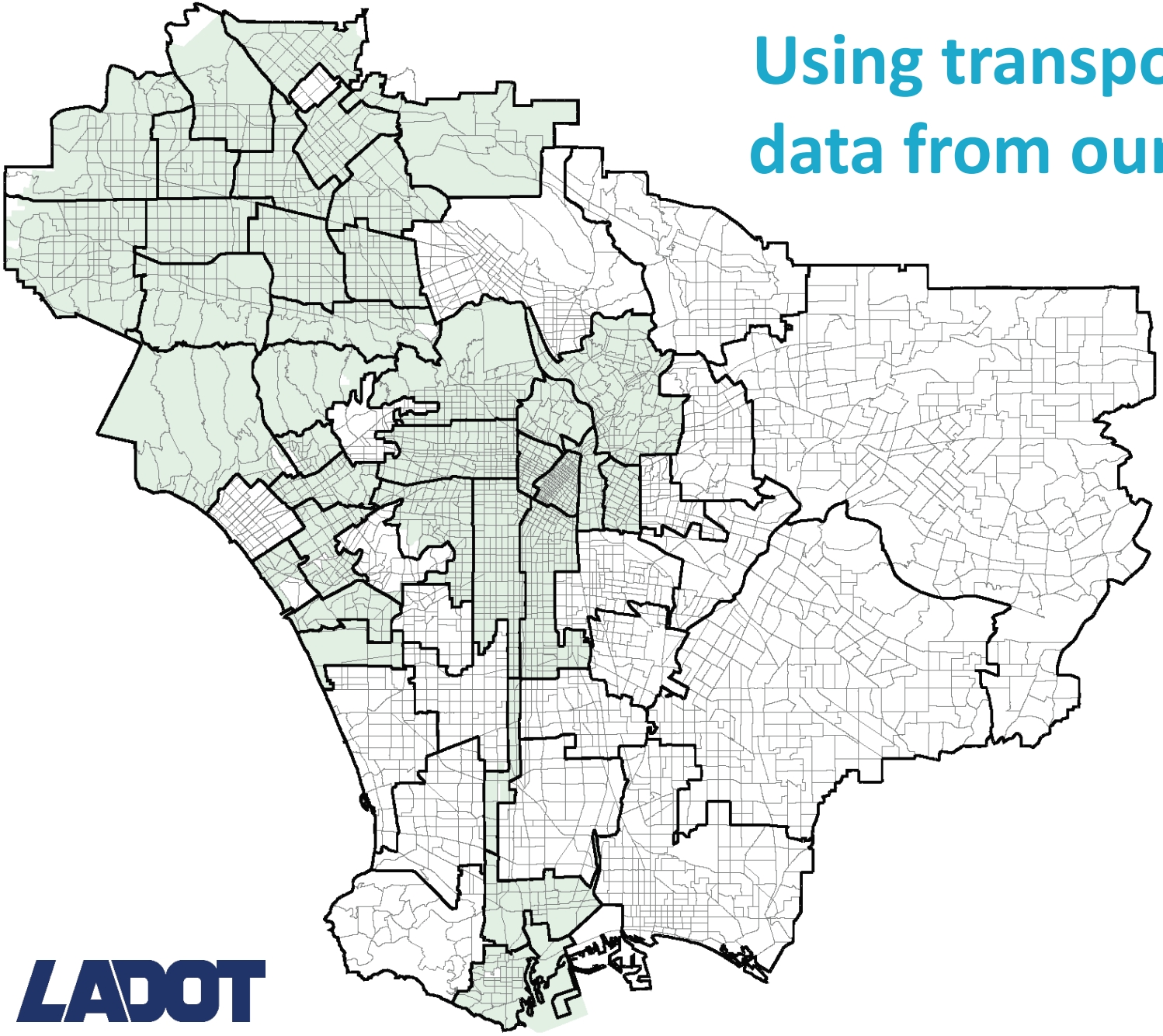


Updated Travel Demand Forecasting (TDF) Model

Defined localized trip generation rates & vehicle miles traveled (VMT) estimates

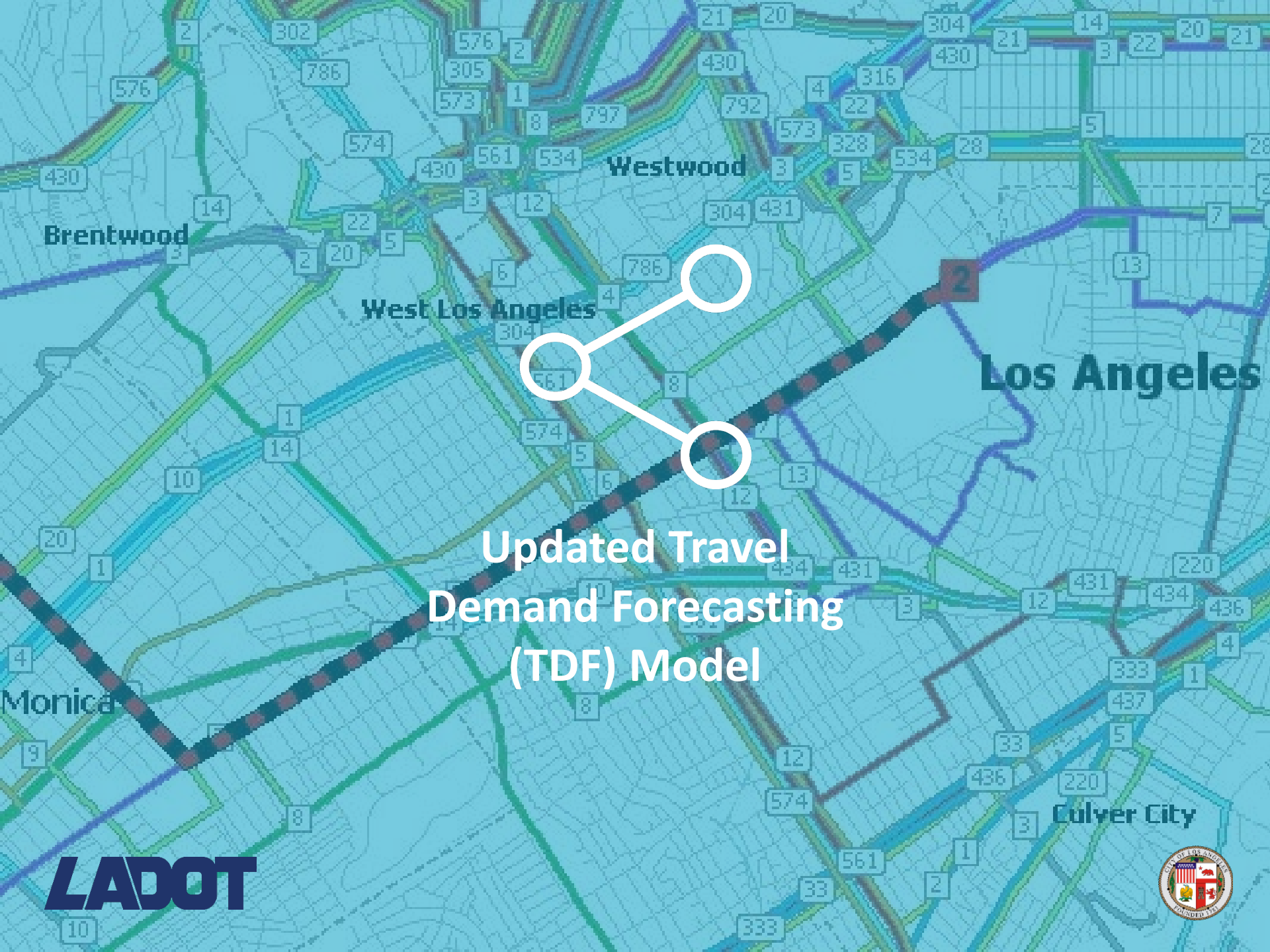
LADOT

Using transportation data from our region



LADOT

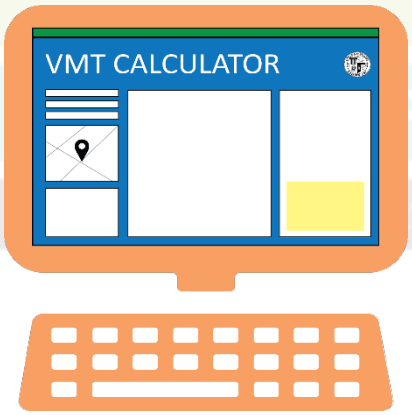
Trip data from housing & mixed use sites in our City



Updated Travel Demand Forecasting (TDF) Model

Localized trip generation rates & VMT

Status of LA's Transportation Technology Strategy Implementation



Built a customized VMT Calculator

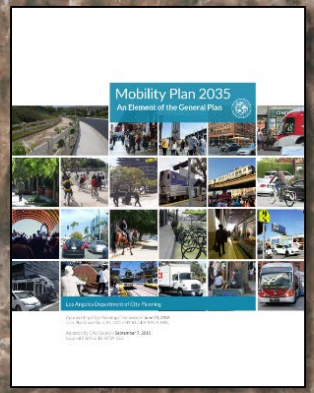
Emphasis on **local vehicle delay** has encouraged development far away from frequented destinations

Creating tools to support sustainable transportation outcomes

- California Assembly Bill 32
- California Senate Bill 375
- California Senate Bill 743
- Caltrans Strategic Management Plan
- Caltrans Bicycle & Pedestrian Plan
- LA Metro Countywide Sustainability Planning Policy

LADOT

Creating tools to support sustainable transportation outcomes



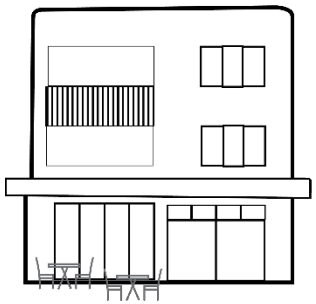
* Promote clean mobility options to reduce criteria pollutants and greenhouse gas emissions
* Deliver options and inform choices for more sustainable travel
* Provide clean environments & healthy communities

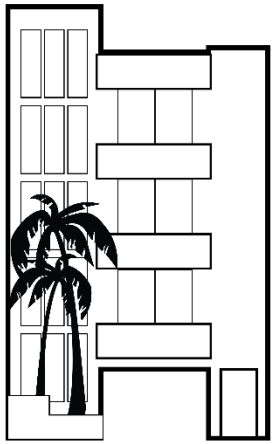
LADOT

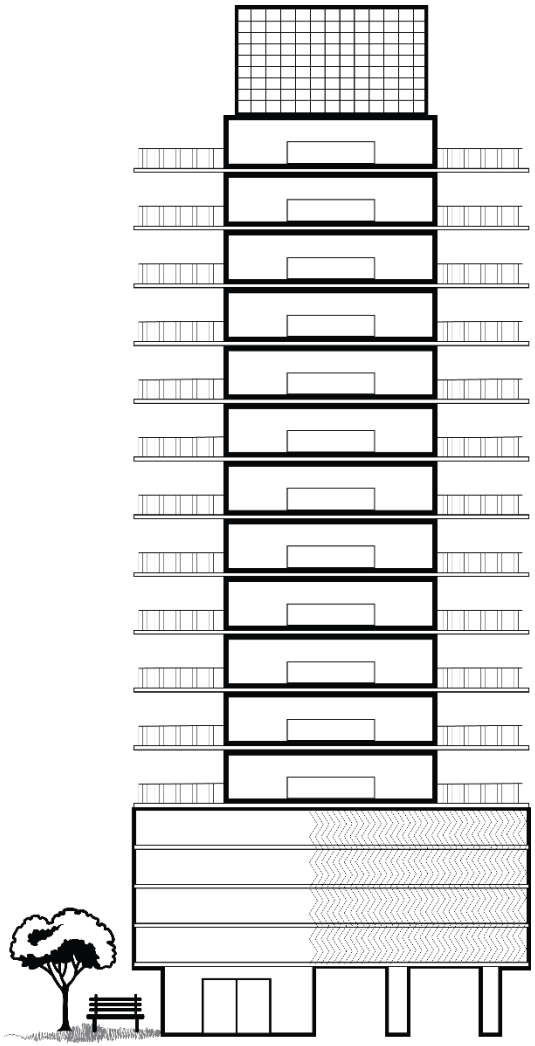
LA' Planned Project Review Process

Step 1

Project Screening Criteria will describe the types of projects that are not required to submit a technical analysis



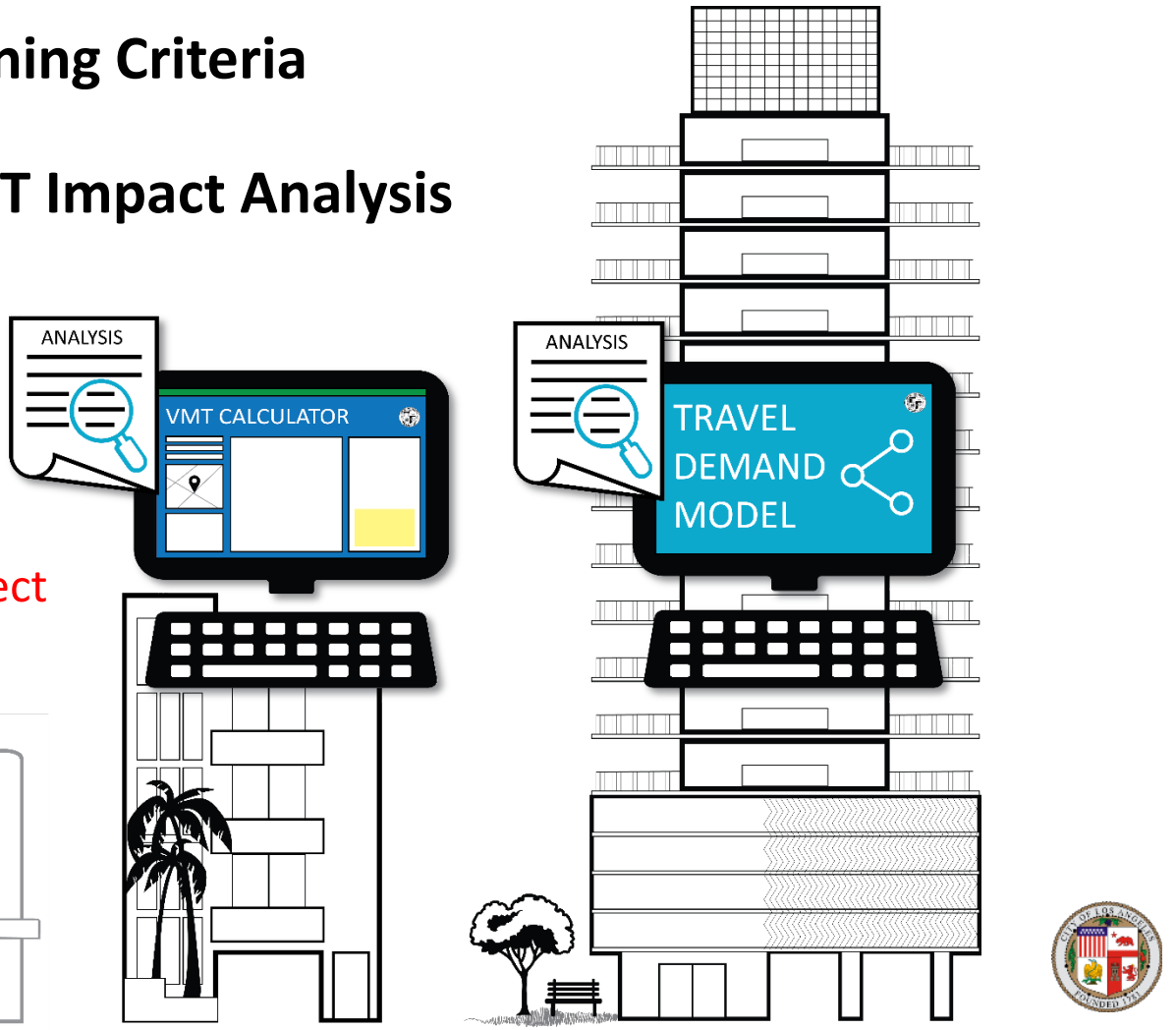




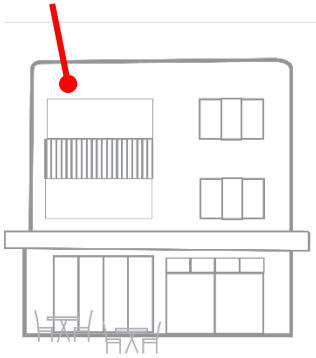
LA' Planned Project Review Process

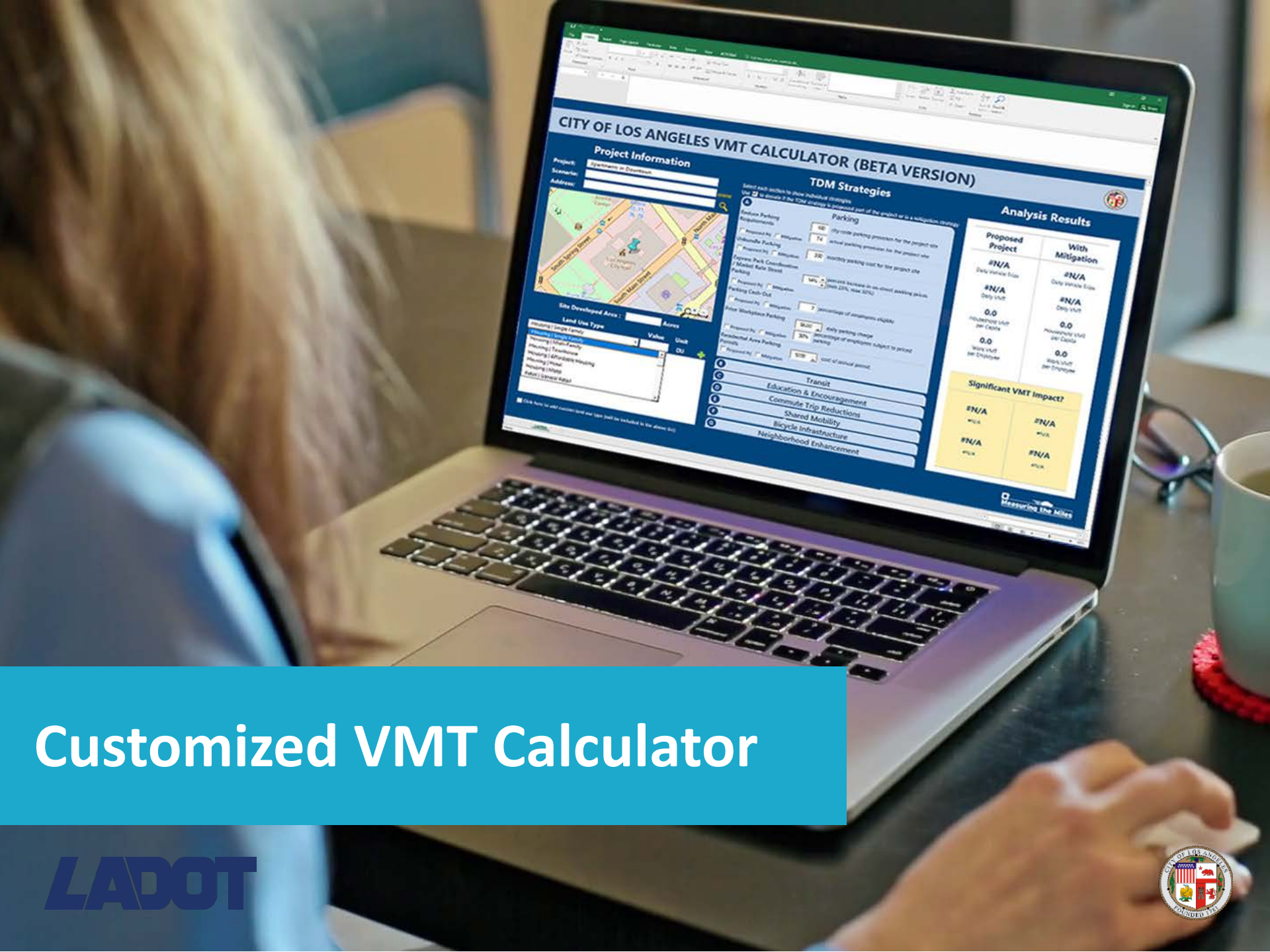
Step 1 **Project Screening Criteria**

Step 2 Prepare a **VMT Impact Analysis**



Does **not** meet project screening criteria

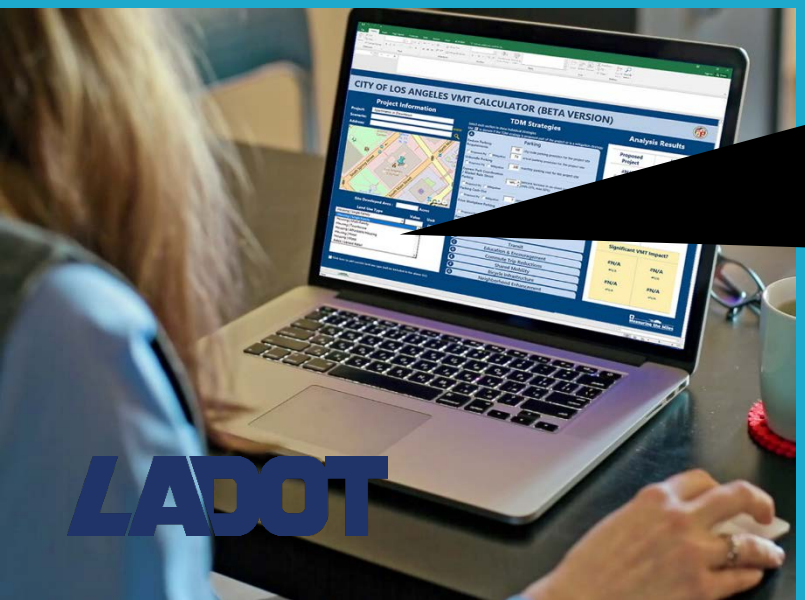




Customized VMT Calculator

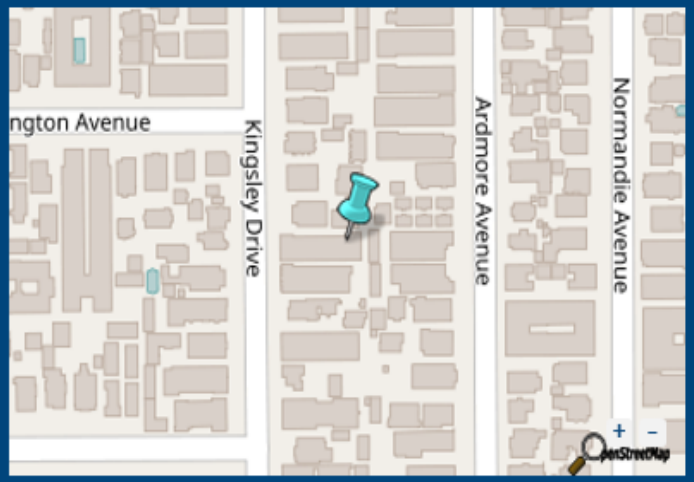
VMT Calculator

requires a project description



Project Information

Project:	3900 Figueroa Street v2
Scenario:	Scenario 12
Address:	34.092794, -118.301990



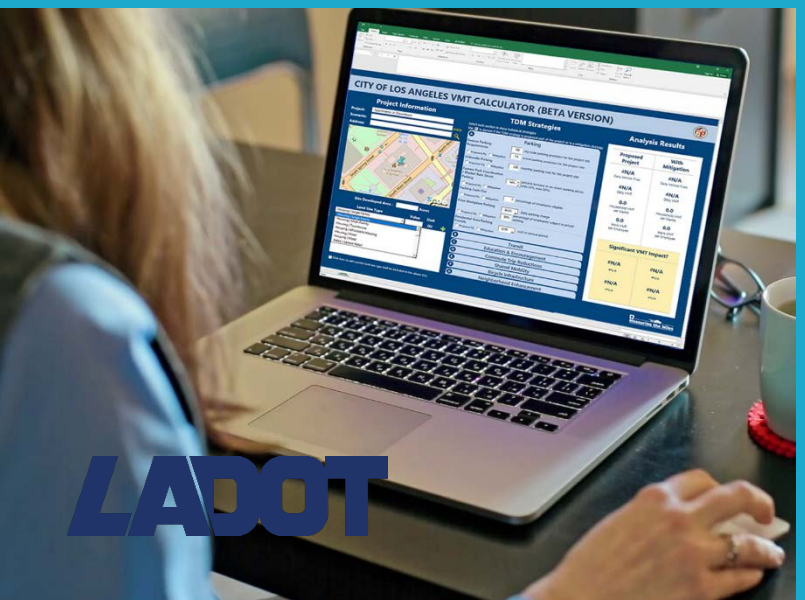
Site Developed Area : 6.477 Acres

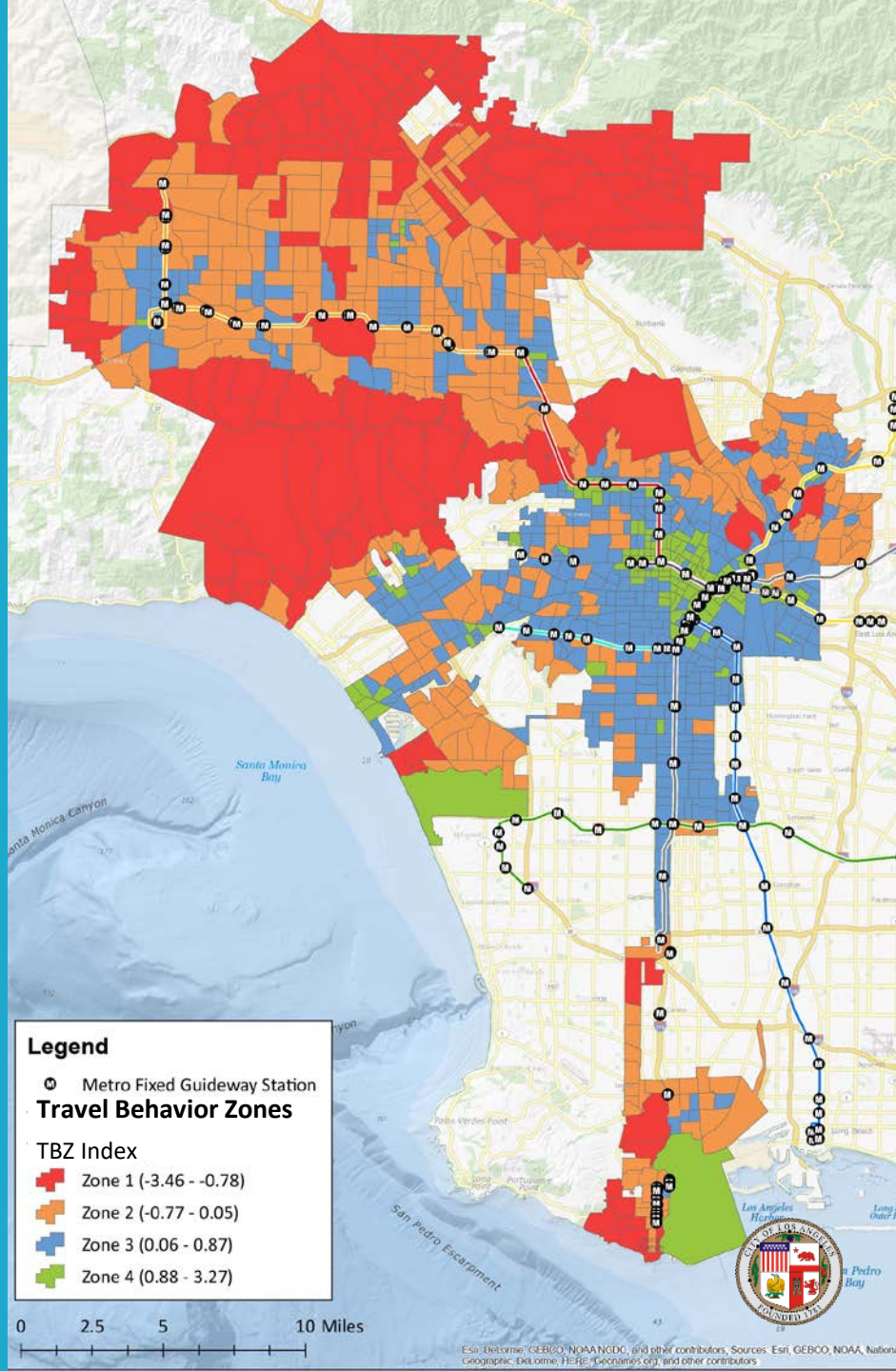
Land Use Type	Value	Unit
Housing | Single Family		DU
Housing | Multi-Family	408	DU
Housing | Hotel	160	Rooms
Housing | Motel	138	Rooms
Retail | General Retail	37	ksf
Retail | High-Turnover Sit-Down Restaurant	11.6	ksf
Retail | Quality Restaurant	10.8	ksf
Office | General Office	20.4	ksf

Click here to add custom land use type (will be included in the above list)

VMT Calculator

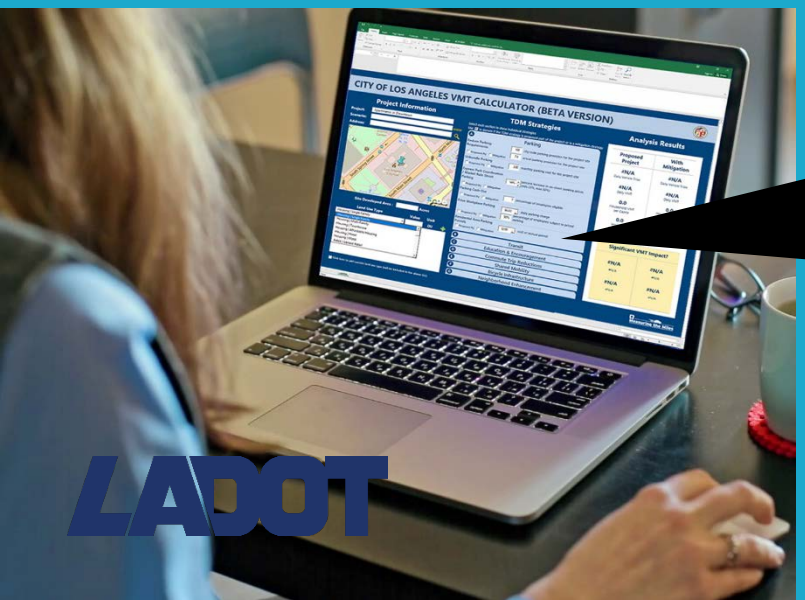
estimates effectiveness of VMT reduction strategies based on place





VMT Calculator

provides many VMT reduction strategies to choose from



TDM Strategies

Select each section to show individual strategies

Use ☑ to denote if the TDM strategy is proposed part of the project or is a mitigation strategy

A Parking

Reduce Parking Requirements	40	city code parking provision for the project site
☐ Proposed Prj ☐ Mitigation	30	actual parking provision for the project site
Unbundle Parking	300	monthly parking cost for the project site
☐ Proposed Prj ☐ Mitigation		
Express Park Coordination / Market Rate Street Parking	14%	percent increase in on-street parking prices (min 25%, max 50%)
☐ Proposed Prj ☐ Mitigation		
Parking Cash-Out	7	percentage of employees eligible
☐ Proposed Prj ☐ Mitigation		
Price Workplace Parking	$6.00	daily parking charge
☐ Proposed Prj ☐ Mitigation	50%	percentage of employees subject to priced parking
Residential Area Parking Permits	$200	cost of annual permit
☐ Proposed Prj ☐ Mitigation		

B Transit

C Education & Encouragement

D Commute Trip Reductions (CTR)

E Shared Mobility

F Bicycle Infrastructure

G Neighborhood Enhancement

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Apply TDM Measures to Reduce VMT

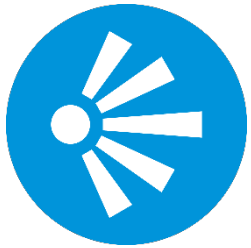
Parking management

Transit incentives

Education + marketing

Commute trip sharing

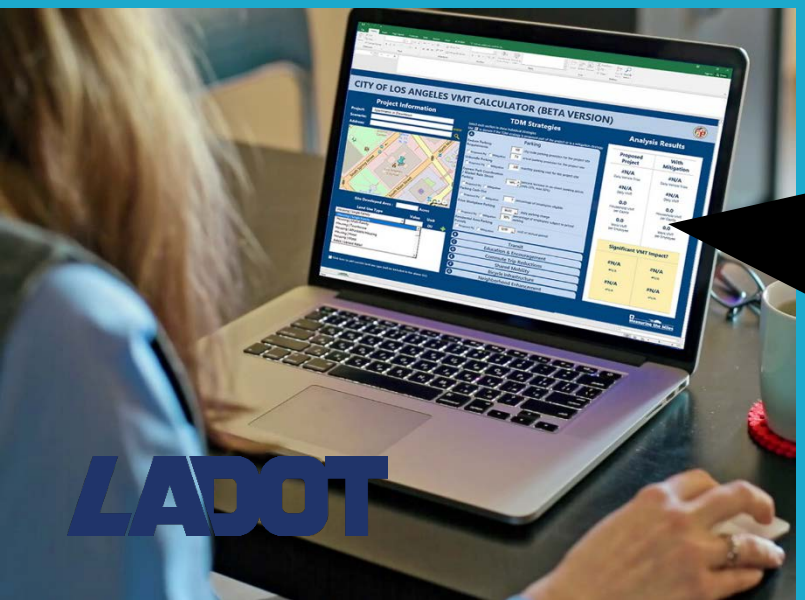
Neighborhood connectivity



Shared mobility services

VMT Calculator

estimates proposed project VMT impact



Analysis Results

Proposed Project	With Mitigation
6,042 Daily Vehicle Trips	3,891 Daily Vehicle Trips
44,799 Daily VMT	28,845 Daily VMT
7.4 Household (HH) VMT per Capita	4.8 Household (HH) VMT per Capita
11.3 Work VMT per Employee	7.2 Work VMT per Employee
20,796 Retail VMT	13,390 Retail VMT

Significant VMT Impact?

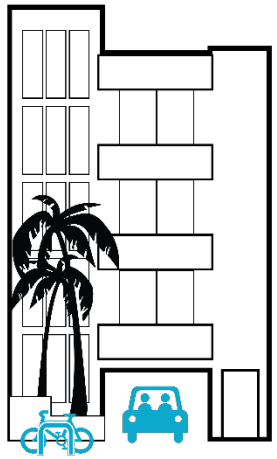
HH: Yes Threshold = 6.2 15% Below APC	**HH: No** Threshold = 6.2 15% Below APC
Work: No Threshold = 11.8 15% Below APC	**Work: No** Threshold = 11.8 15% Below APC

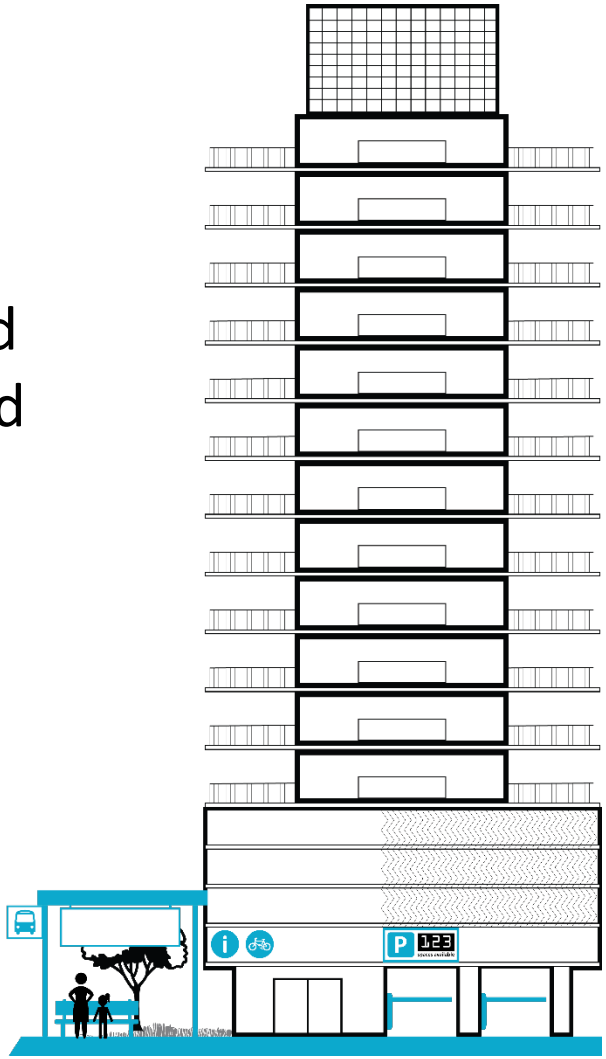
LA' Planned Project Review Process

Step 1 **Project Screening Criteria**

Step 2 **VMT Impact Analysis**

Step 3 **Project implements TDM** and reduces vehicle miles traveled





Outcomes Angelenos care about

New
Transportation
Study Procedures

Affordable Housing
& Mixed Use Vehicle
Trip Adjustments

Localized Trip
Generation Rates
& VMT

Area-Specific VMT
Impact Criteria

New Evaluation Process

LADOT

New Transportation Study Procedures

Affordable Housing & Mixed Use Vehicle Trip Adjustments

Localized Trip Generation Rates & VMT

Area-Specific VMT Impact Criteria

Credit System & Monitoring for TDM

New Evaluation Process

LADOT

New Transportation Study Procedures

Affordable Housing & Mixed Use Vehicle Trip Adjustments

Localized Trip Generation Rates & VMT

Area-Specific VMT Impact Criteria

Credit System & Monitoring for TDM

Updated Tools for Evaluation

New Evaluation Process

LADOT

PLANNING FOR AUTONOMOUS VEHICLES

Distilling Reality from Fantasy

State of Transportation Planning 2018
July 20, 2018

David Heller, AICP/PP
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South Jersey Transportation Planning Organization

South Jersey Transportation Planning Organization

American Planning Association
Making Great Communities Happen.

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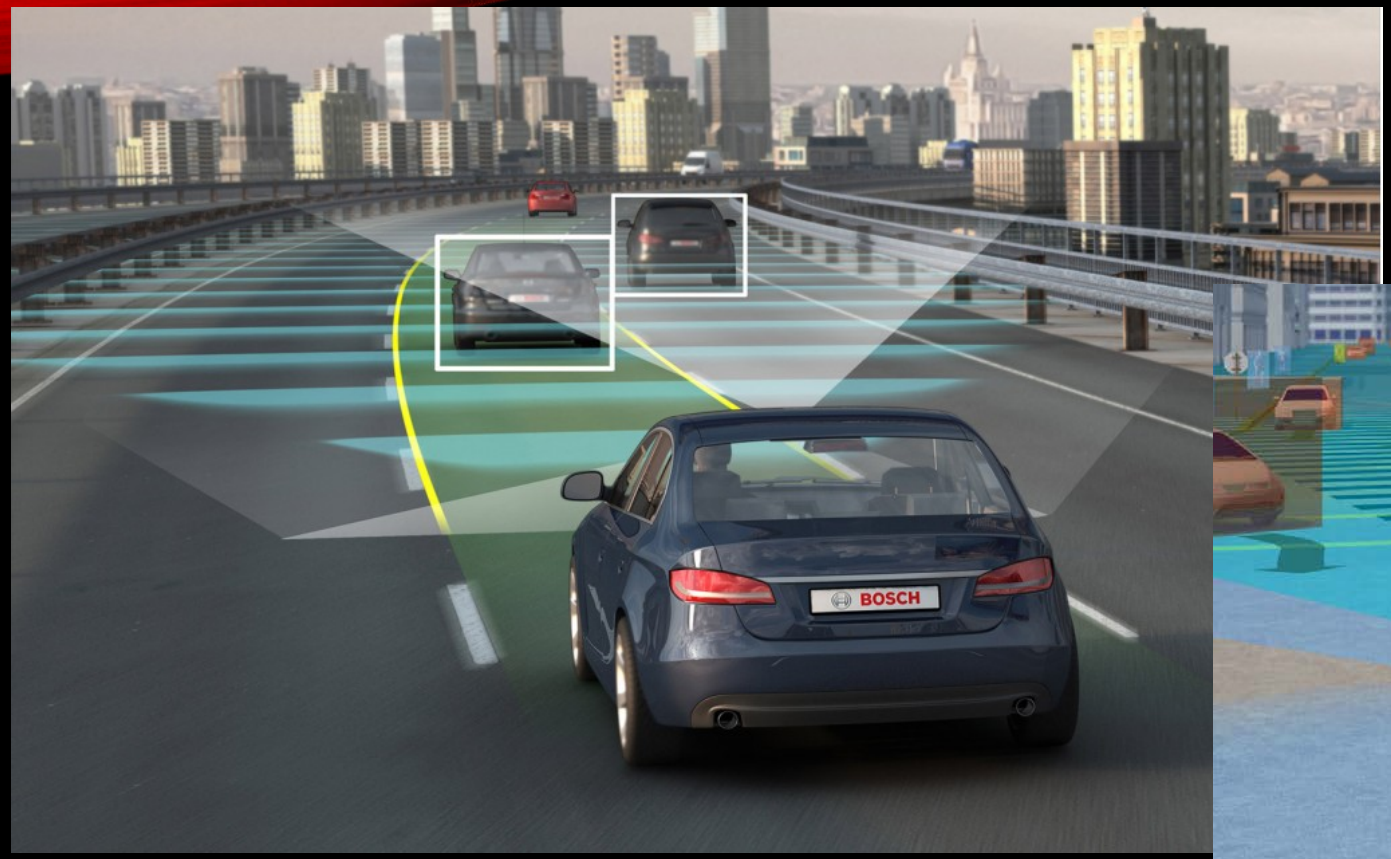
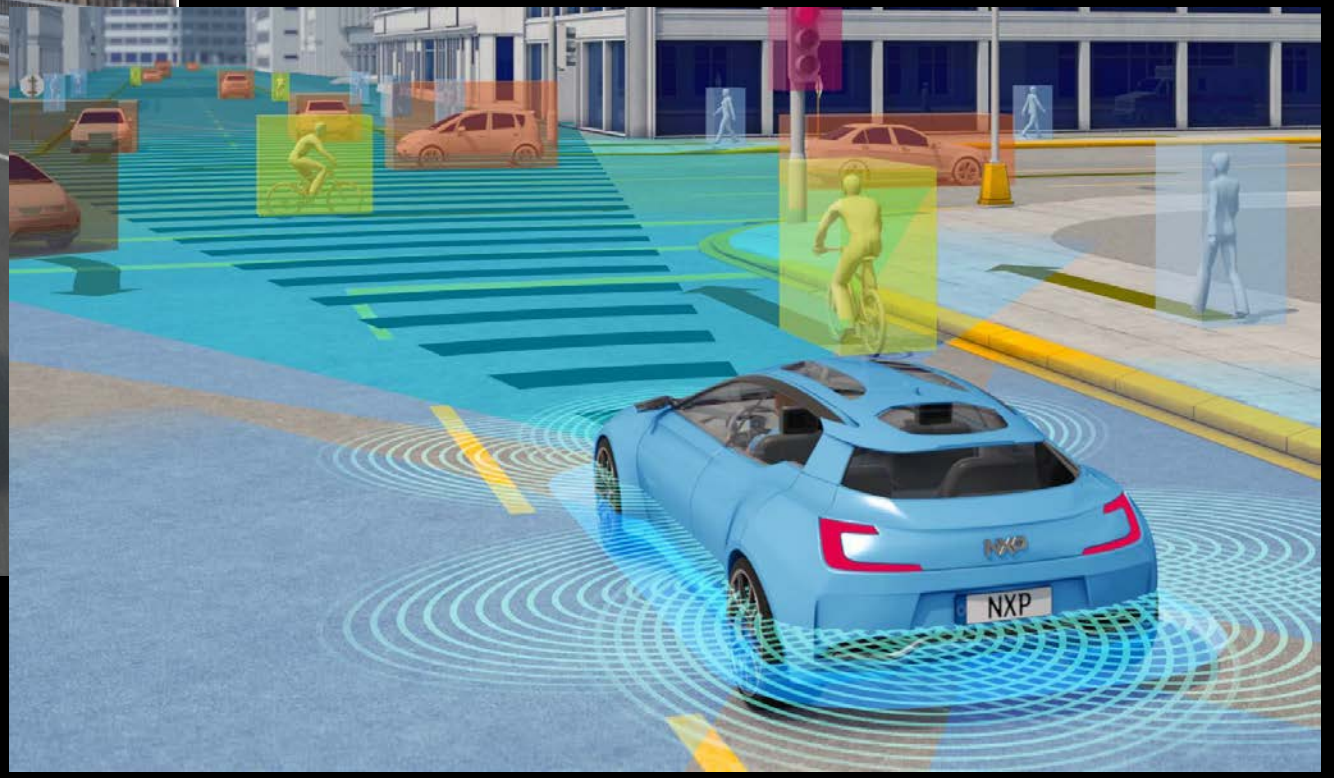
WHAT IS AN AUTONOMOUS VEHICLE?



https://www.geospatialworld.net/news/elon-musk-wont-use-lidar-in-upcoming-tesla-autopilot-update/.



https://www.geospatialworld.net/videos/peter-hawkins-shares-recent-innovations-of-here-technologies/

WHO'S DEVELOPING THEM?

- TESLA Model S
- Ford Fusion
- Google Waymo
- GM Cruise LV
- Daimler-Bosch

LEVELS OF AUTOMATION

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE) AUTOMATION LEVELS

Full Automation

0	1	2	3	4	5
No Automation	**Driver Assistance**	**Partial Automation**	**Conditional Automation**	**High Automation**	**Full Automation**
Zero autonomy; the driver performs all driving tasks.	Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.	Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.	Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.	The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.	The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety

CHALLENGES

- Combining heavy equipment plus complex software difficult
- Liability
- Cost
- Full benefits may not be realized for a while
- Limited Market Penetration initially
- Economic impacts

WHAT IS BEING DONE NOW

http://larson.psu.edu/about/test-track.aspx

http://www.businessinsider.com/university-of-michigan-builds-city-for-self-driving-cars-2015-7.

AV IMPACTS OVER TIME

Impact	Functional Requirements	Planning Impacts	Time Period
Become legal	Demonstrated functionality and safety	Define performance, testing and data collection requirements for automated driving on public roads.	2015-25
Increase traffic density by vehicle coordination	Road lanes dedicated to vehicles with coordinated platooning capability	Evaluate impacts. Define requirements. Identify lanes to be dedicated to vehicles capable of coordinated operation.	2020-40
Independent mobility for non-drivers	Fully autonomous vehicles available for sale	Allows affluent non-drivers to enjoy independent mobility.	2020-30s
Automated carsharing/taxi	Moderate price premium. Successful business model.	May provide demand response services in affluent areas. Supports carsharing.	2030-40s
Independent mobility for lower-income	Affordable autonomous vehicles for sale	Reduced need for conventional public transit services in some areas.	2040-50s
Reduced parking demand	Major share of vehicles are autonomous	Reduced parking requirements.	2040-50s
Reduced traffic congestion	Major share of urban peak vehicle travel is autonomous.	Reduced road supply.	2050-60s
Increased safety	Major share of vehicle travel is autonomous	Reduced traffic risk. Possibly increased walking and cycling activity.	2040-60s
Energy conservation and emission reductions	Major share of vehicle travel is autonomous. Walking and cycling become safer.	Supports energy conservation and emission reduction efforts.	2040-60s
Improved vehicle control	Most or all vehicles are autonomous	Allows narrower lanes and interactive traffic controls.	2050-70s
Need to plan for mixed traffic	Major share of vehicles are autonomous.	More complex traffic. May justify restrictions on human-driven vehicles.	2040-60s
Mandated autonomous vehicles	Most vehicles are autonomous and large benefits are proven.	Allows advanced traffic management.	2060-80s

SOURCE: Todd Litman. "Autonomous Vehicle Implementation Predictions." Victoria Transport Policy Institute. 8 September 2017.

CONSIDERATIONS FOR PLANNERS

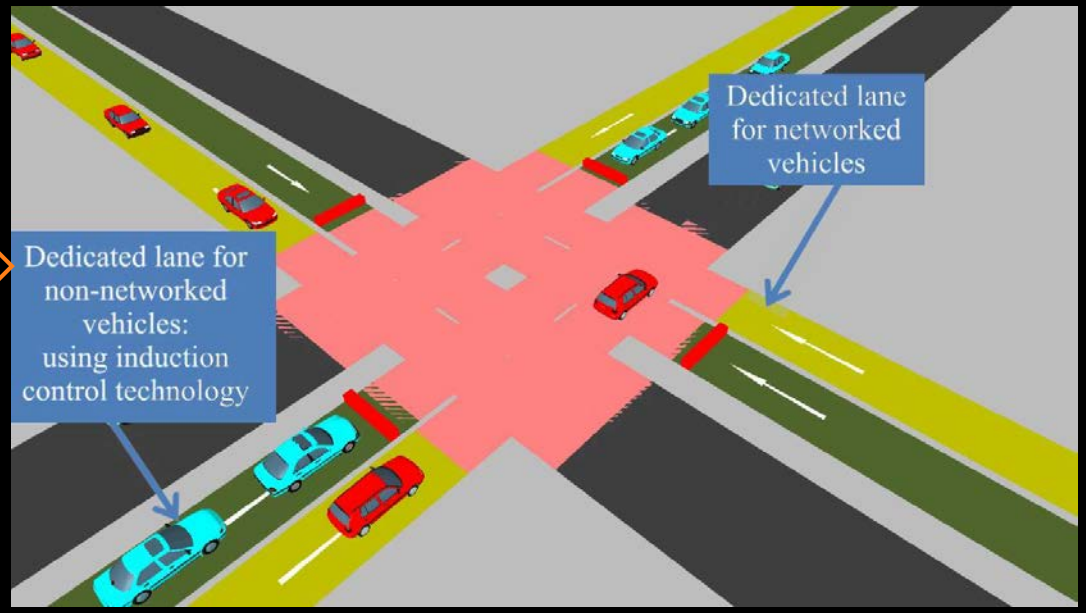
1. Increase public investment in research and development in technology
2. Paradigm shift: "Mobility as a Service"
3. Continue incentivizing alternative modes; especially ride-sharing
4. Trade-offs between reduced parking and increased congestion.
5. Cultural shift in travel behavior.

CONSIDERATIONS FOR PLANNERS (continued)

6. Land Use Strategies to accommodate AV operation

7. Legal Issues

8. Plan for mixed traffic



https://www.youtube.com/watch?v=sB3vXYr4kL4

9. Time to begin planning is NOW!

10. Planning must account for uncertainty.

QUESTIONS

- For Further Information, contact

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Making Great Communities Happen

State of Transportation Planning

Advances in Automated Bicycle & Pedestrian Counting

Nathan Hicks, AICP

07/20/2018

CDM Smith

Advances in Automated Bicycle & Pedestrian Counting

- What is most often used now?
  - Infrared (Passive and Active)
  - Pneumatic Tubing
  - Manual Methods

- Pros and Cons?
  - Cheap/easy to install
  - Difficulties with data

Advances in Automated Bicycle & Pedestrian Counting

- CDM Smith completed a non-motorized transportation data collection study for the Florida Department of Transportation.
  - We utilized the most common methods for counting bicyclists and pedestrians, but found there were limitations.
    - Nature and the built environment can influence the data.

Advances in Automated Bicycle & Pedestrian Counting

- Where is the field progressing?
  - Significant research in the field of “Computer Vision”. This is influencing not only autonomous vehicles, but is opening doors in other fields as well.

Advances in Automated Bicycle & Pedestrian Counting

- What can “Computer Vision” allow?
  - The ability to count bicyclists and pedestrians in different environments.
  - Not only is it important that bicyclists and pedestrians are counted, but these advances could allow for additional types of analyses.

Advances in Automated Bicycle & Pedestrian Counting

- What can “Computer Vision” allow?
  - It can also determine direction, speed, classification, helmet usage and potential conflicts between users.
  - Safety analyses at intersections are one example, furthering the goal of “Vision Zero”.
  - Behavior analyses is another potential use.

Advances in Automated Bicycle & Pedestrian Counting

- There is ongoing and future research!
  - Robotics Institute at Carnegie Mellon University.
  - UBC Bureau of Intelligent Transportation Systems and Freight Security.

- Both organizations have completed research using Computer Vision and counting bicyclists and pedestrians.
  - Accuracy of bicyclists and pedestrian counting ranged from 90.1% to 95.1%.

Advances in Automated Bicycle & Pedestrian Counting

- What can be expected in the coming years?
  - Additional research and refinement is needed. Accuracy is good, but needs to be improved.
  - As new modes come into play, models will need to be adjusted (Dockless scooters).

Transportation Agencies Adopt a Scenario Planning Approach for the Uncertain Road Ahead

Summary Presentation

Presented by: Tim Storer (ICF)

July 20, 2018

Driving Change

- **Los Angeles**
  - 1920s: one of the worlds largest transit systems and busiest pedestrian crossings
  - Decades of auto-centric actions contributed to reversing this trend
  - Today: routinely ranks among the most traffic congested cities in the world (INRIX)
- **Portland**
  - Similar decision making trajectory; by 1970s, much of downtown devoted to parking
  - 1980s: forward-thinking policies directed growth towards key corridors, facilitated density, and helped revitalize the economy
  - Today: Routinely ranks as one of the best cities in the US for bicycling, walking and transit

Downtown Los Angeles in 1920s (Source: KCET)

Downtown Portland in 1970s (Source: Portland Architecture)

Setting the Stage: A Changing Landscape

The role, function, and behavior of automobile travel has been reasonably stable established pattern in prior decades… but that is changing rapidly.

New technologies change the paradigm:
- Vehicle automation
- Connectivity advancement
- New modes (e.g. Hyperloop)

Uncertain policy and behavioral contexts:
- Regulations
- Industry agreements
- Standards and partnerships

→

Emergent Phenomenon
- Ride-hailing
- Higher vehicle utilization
- Multi-modalism
- Electrification
- ???

→

Outcomes
- VMT & Congestion
- Emissions
- Land-Use
- Safety
- Car Ownership
- Parking
- Accessibility
- Affordability
- & more!

Planning for Uncertainty

- **Scenario planning offers a systematic approach to:**
  - Survey past and present transportation developments
  - Explore possible trajectories of change and their underlying drivers
  - Assess opportunities and risks associated these trajectories
- **State of Technology Readiness Planning**
  - National League of Cities (2015): 6% of agencies incorporated AVs
  - National League of Cities (2018): 36% of cities planning for AVs
  - Early adopters include Jacksonville Transportation Authority, Maryland DOT, Washington State DOT

Jacksonville Transportation Authority

Literature Review

Analyze Plans
- Future population distribution/composition
- Planned/programmed investments

Workshop (2017)
- Convene peer agencies
- Form scenarios

Determine Goals
1. Promote itself in the community.
2. Improve service
3. Pursue tech and partnerships
4. Identify tech-enabled efficiency improvements
5. Be involved with land development process

Conceptual Rendering of Jacksonville's Ultimate Urban Circulator (Source: JTA)

FHWA's Scenario Planning for CVs and AVs: Project Goals

Purpose:

- Equip agencies to deal with uncertainty
- Reduce burden on state and local agencies in addressing CV/AV risks and opportunities

Project Outcomes and Deliverables

- Develop **5-6 descriptive scenarios** of potential futures related to CV/AV deployment, adoption, use and likely impacts through a collaborative approach with FHWA, invited stakeholders and subject matter experts
- Conduct **2 workshops** to validate, refine, and test the descriptive scenarios
- **Final report** including (1) Methodology for creating the scenarios and (2) high-level qualitative assessments of scenario impacts to planners and to society
- **Practitioner Guidance** document to serve as a stand-alone resource for planners to conduct their own scenario planning exercises

Scenario Development Process

Drivers and Levers

Technological Developments
- 5G and/or DSRC advancement
- Rapid sensorization
- Growth in mobile platforms
- Cybersecurity Standards
- New smartphone applications
- Big Data analytics
- New vehicle designs
- Declining EV prices

Consumer Preferences
- Car Ownership
- Acceptance of new tech
- Security vs Convenience
- Eco-Consciousness
- Bike/ped preferences

Socio-Economic Factors
- Demographics
- Urbanization
- New business models (e.g. TNCs)

Government Actions
- Technology mandates or bans
- Federal tax incentives
- International/national climate policy
- VMT/congestion pricing
- Transit investment

Key Uncertainties

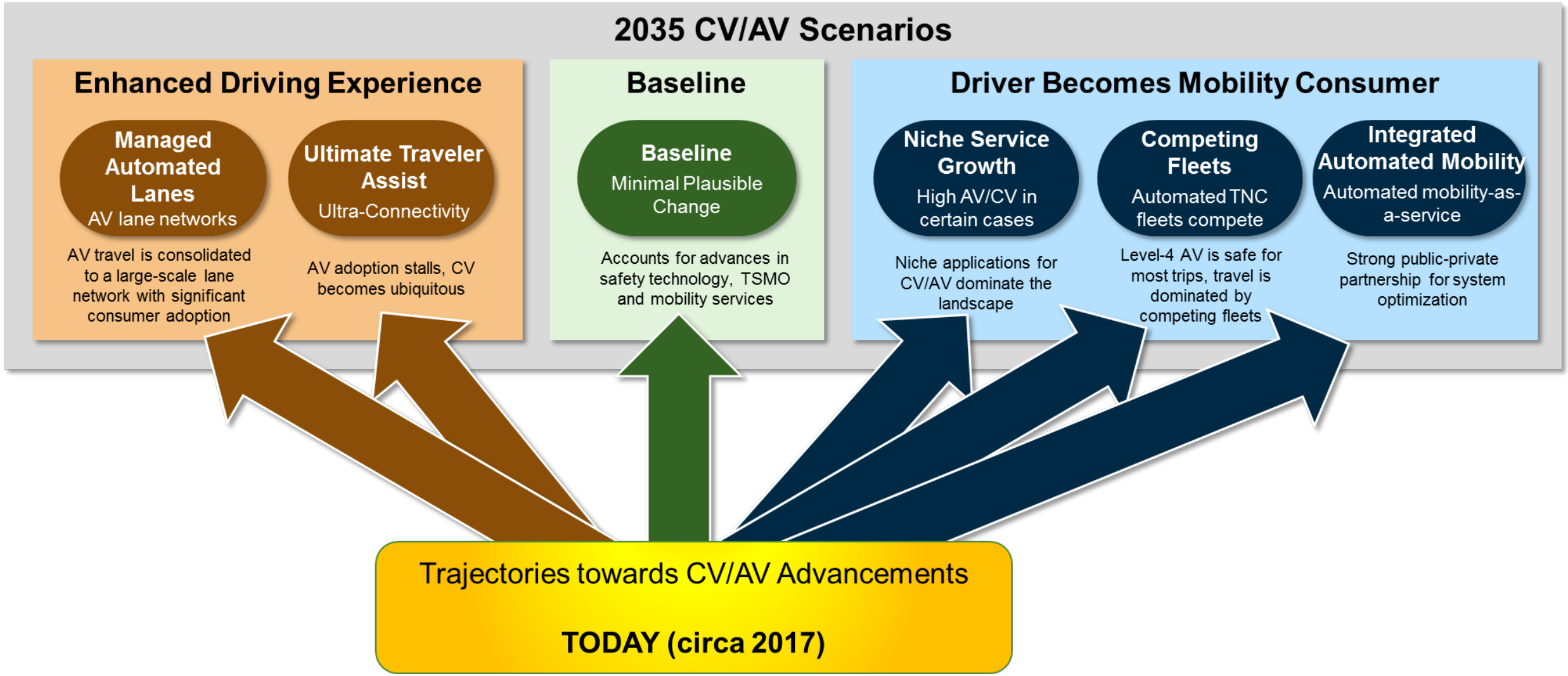
n surrounding vehicle movements, and what kind of information ar

SAE levels of automation are available and affordable, and in what areas can they operate?

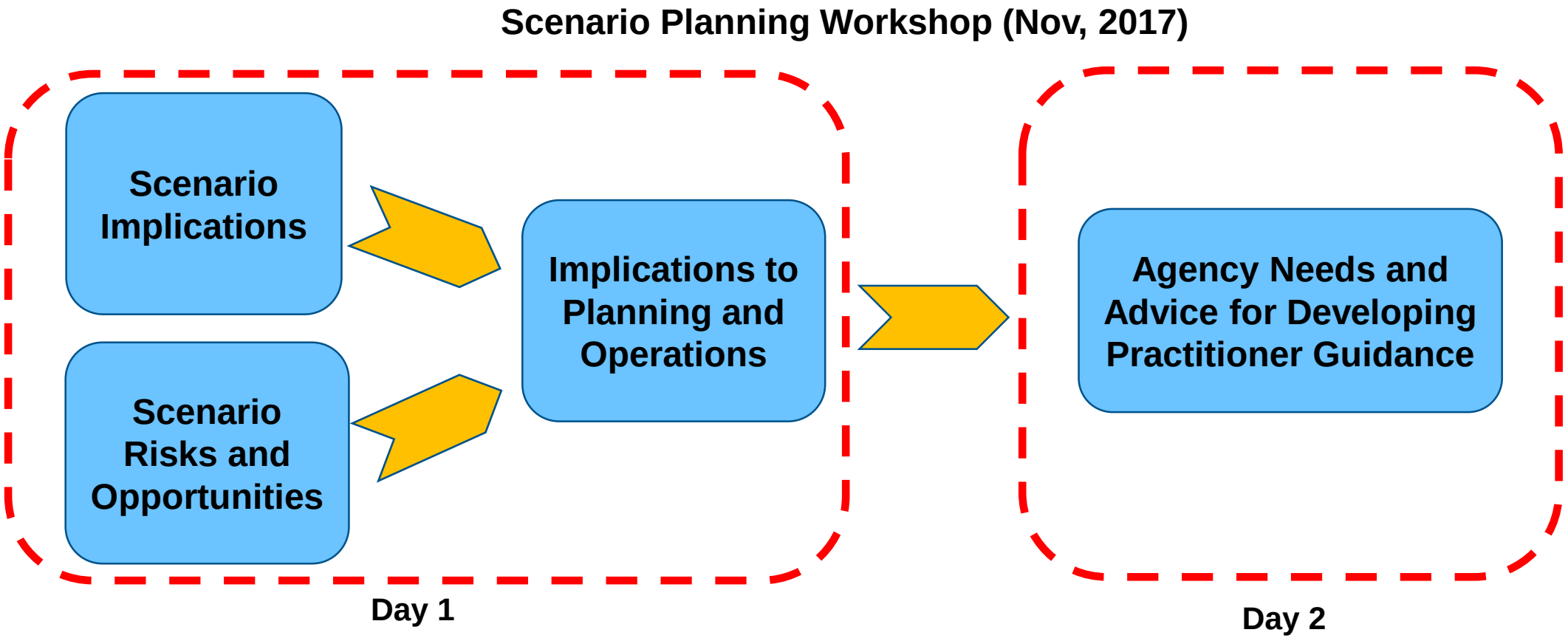
Cooperation

To what extent do agencies and companies adjust their operational practices and policies in accordance with other entities? Is there integrated payment, synchronization in schedules, multi-modal infrastructure development, etc.?

	Overall System			innovation proliferates, but only in special purpose or "niche" applications
	Niche Service Areas			
Ultimate Traveler Assist				CV technology progresses rapidly, but AV stagnates
Managed Automated Lanes				
	Overall System			Certain lanes become integrated with CV and AV
	AV lanes			
Competing Fleets				TNC-like services proliferate rapidly, but do not operate cooperatively
Automated Integrated Mobility				On-demand shared services proliferate and integrate with other modes via cooperative data sharing, policies, and infrastructure


2035 CV/AV Scenarios
Enhanced Driving Experience
Managed Automated Lanes
AV lane networks
AV travel is consolidated to a large-scale lane network with significant consumer adoption
Ultimate Traveler Assist
Ultra-Connectivity
AV adoption stalls, CV becomes ubiquitous
Baseline
Baseline
Minimal Plausible Change
Accounts for advances in safety technology, TSMO and mobility services
Driver Becomes Mobility Consumer
Niche Service Growth
High AV/CV in certain cases
Niche applications for CV/AV dominate the landscape
Competing Fleets
Automated TNC fleets compete
Level-4 AV is safe for most trips, travel is dominated by competing fleets
Integrated Automated Mobility
Automated mobility-as-a-service
Strong public-private partnership for system optimization
Trajectories towards CV/AV Advancements
TODAY (circa 2017)

How do we maximize usefulness of the scenarios?

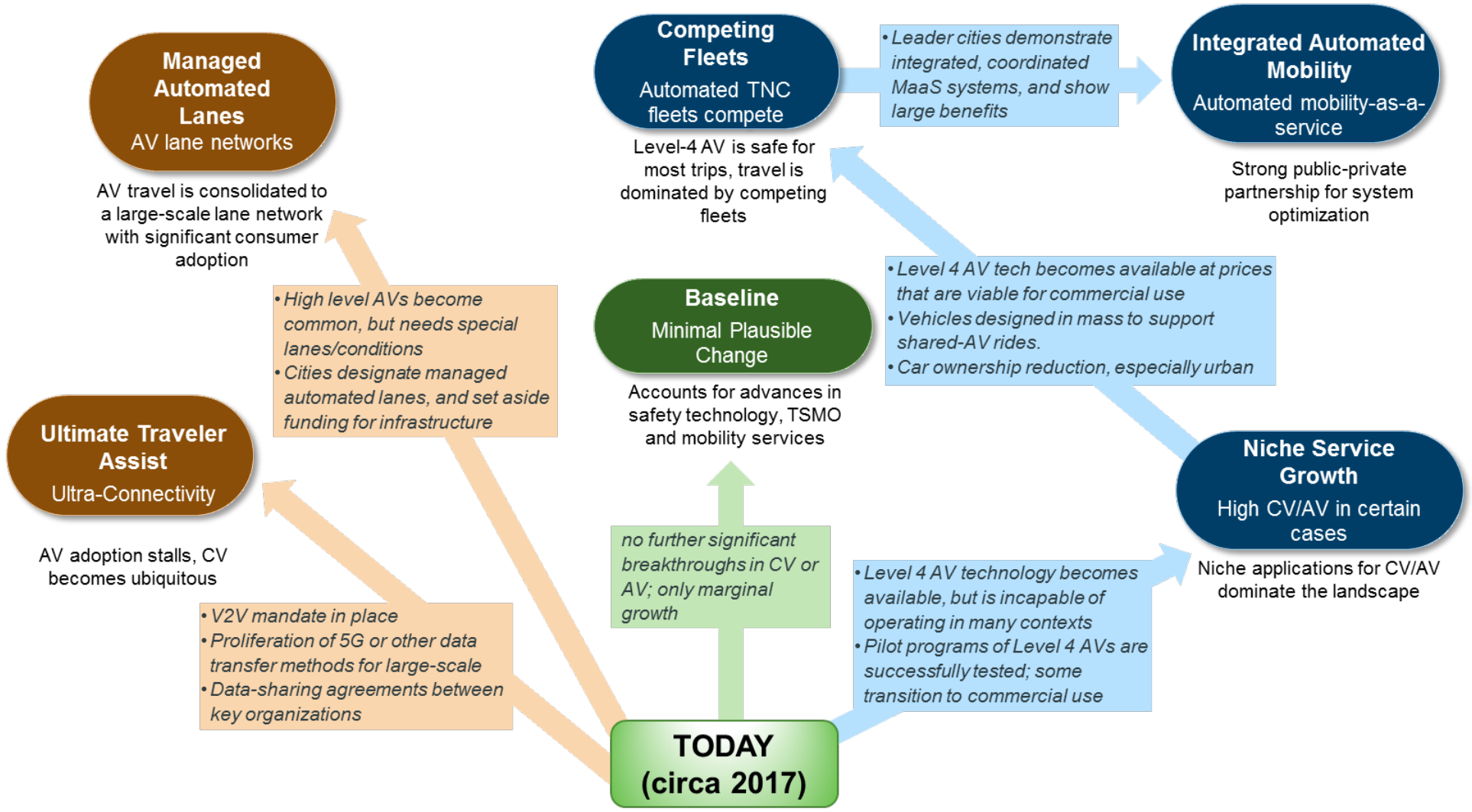


Common Risks in the Scenarios

Common Risks (Sample)	Relevant Scenarios					
	Slow Roll	Niche Service Growth	Ultimate traveler assist	Managed Automated Lanes	Competing Fleets	Automated Integrated Mobility
Decreased value of roadway capacity expansion			X	X	X	X
Equity - benefits felt only by certain groups	X	X	X	X	X	X
Inadequate EV charging					X	X

Commonly Valuable Agency Actions (Sample)	Relevant Scenarios					
	Slow Roll	Niche Service Growth	Ultimate Traveler Assist	Managed Automated Lanes	Competing Fleets	Automated Integrated Mobility
Begin piloting and testing V2I systems	X	X	X	X	X	X
Digitize road signage, speeds, markings	X	X	X	X	X	X
Incentives for CV retrofits	X	X	X	X	X	X

Causal Relationships and Tipping Points of the Scenarios



Practitioner Guidance Components

1. Define and Understand CV/AV

2. Determine goals and stakeholders in your planning process

3. Understand Driving Forces and Scenario Origins

4. Frame and Tailor the Scenarios

5. Incorporate Scenario Results into Decision-Making

6. Monitor industry and policy developments

Done iteratively

Conclusions

- **Scenario planning has been and will continue to be a valuable tool for state and local planners**
- **There is no one-size-fits-all approach to scenario planning**
  - Different contexts, resources, goals, and perspectives
  - Normative and exploratory

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