1: The Need to Evolve
2: The San Francisco Evolution
3: Evolution Outside of San Francisco
The Need to Evolve: Past Planning Can’t Keep Up

JOB GROWTH

![Job Growth Chart](image)

4,000,000

JOBS in 2018
The Need to Evolve: State Regulations

Chapter 1: The Need to Evolve
At the same time, how we travel is changing rapidly

Chapter 1: The Need to Evolve
How do we plan for these changes?
SF Transportation Impact Guidelines

OLD 2002 Guidelines
- 1990's travel behaviors
- Automobile level of service
- Pedestrian and bicycle crowding
- Transit vehicle crowding
- Parking and freight loading

NEW 2019 Guidelines: New Process and Data
- 2016+ travel behaviors
- Accessibility and Hazards
- Public transit delay
- Parking and loading
- Vehicle miles traveled

Chapter 2: The San Francisco Evolution
SF Travel Behavior Update

Average Weekday Trips by Mode

- **Muni**: 716,000
- **New Forms of Mobility**: 21,000
- **Bike**: 95,000
- **BART trips within SF**: 45,000
- **Taxi**: 9,000
- **TNC**: 170,000

Private auto trips are not included

Source:
San Francisco Mobility Trends 2018, SFMTA

Chapter 2: The San Francisco Evolution

FEHR & PEERS
Accessibility

Chapter 2: The San Francisco Evolution
Hazardous Conditions

Chapter 2: The San Francisco Evolution
Public Transit Delay

Chapter 2: The San Francisco Evolution
30 Otis Example
Conclusions

Tested several driveway locations, resulted in relocated driveway to 12th Street
Parking and Loading

- Parking – Very rarely evaluated
- Loading – New: Curb loading to supplement traditional off-street freight loading
  - Calculate amount of white and yellow curbs
Planning for Shared Mobility

1. Vehicle Trips: 10-60% increase in vehicle trips
2. Parking Demand: 10-25% decrease in parking demand
3. Curbspace Demand: 2-12x increase in curbspace demand

www.fehrandpeers.com/curbspace+

Chapter 3: Evolution Outside of San Francisco
Evolution Outside of San Francisco

- **Old** – Automobile level of service – Each jurisdiction will need to remove from CEQA by July 1, 2020
  - However, jurisdictions may keep LOS in General Plan (e.g., similar to parking code consistency)

- **New** – Vehicle Miles Traveled (VMT)

- **Potential Changes**
  - Evaluation of safety (e.g., hazards) and transit
  - TDM requirements
What is VMT?

- 1 VMT = 1 mile
- 40 VMT = 10 miles
Vehicle Miles Traveled
San Francisco

Residential VMT

- Bay Area Regional Average = 17
- Significance threshold = 15

Chapter 3: Evolution Outside of San Francisco
Vehicle Miles Traveled
Rest of the Bay Area

Residential VMT

- Bay Area Regional Average = 17
- Significance threshold = 15

Chapter 3: Evolution Outside of San Francisco
Key Considerations

- VMT = Number of Trips x Trip Length
  - Increase trip generation accuracy
  - Determine trip lengths
  - Reduce traffic through TDM
Increase Trip Generation Accuracy

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Chapter 3: Evolution Outside of San Francisco
Determine Trip Length

Chapter 3: Evolution Outside of San Francisco
How to Mitigate a VMT Impact?

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Chapter 3: Evolution Outside of San Francisco
Thank You

Questions?

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AVs

80% of vehicles will be autonomous

AV operating costs will decline 25%

Leisure travel will increase 33%

Expert Panel on AV Effects

Travelers will be 40% less sensitive to time

Parking costs will decrease 50%

Transit speeds will increase 30%

Chapter 4: The Key Considerations for the Future
Over What Time Horizon Will They be Adopted?

Autonomous Vehicles (AVs)

Potential Growth in Autonomous Vehicles as Percent of Vehicle Fleet

Chapter 4: The Key Considerations for the Future
Predicted Changes in Vehicle Use: 10 Regional Models

Chapter 4: The Key Considerations for the Future
Predicted Changes in Transit Use: 10 Regional Models
Research Findings: Chauffeur Experiment
(Harb et al., 2017)

- 13 San Francisco Bay Area subjects
- More auto travel
  - 76% increase in VMT
  - 22% of increased VMT were ghost trips
- Change in activity patterns
  - 94% increase in # longer trips (over 20 miles)
  - 80% increase in # evening trips (after 6 pm)
- Bimodal impact on miles walked
  - Half decreased (-28% on average), half increased (+49% on average)
- Virtually no biking, transit, TNC use in the sample

Cohorts: 4 Millennials, 4 Families, 5 Retirees
Retirees increase most
Consistent across cohorts
Consistent across cohorts
Consistent across cohorts

Chapter 4: The Key Considerations for the Future