Agenda

Wednesday, May 13, 2020
2:00 – 3:30pm Eastern
Zoom webinar (link emailed to you)

Welcome from co-chairs
Welcome to Minnesota DOT
Webinar agenda overview
AVS and 2020 update

Presentations (10-15 minutes each)
Effects of COVID-19 on AVs, current and future
Annie Chang, SAE International
Ed Straub, SAE International

Effects of COVID-19 on shared mobility, current and future
Susan Shaheen, UC Berkeley

Time for a new transportation paradigm?
Tim Papandreou, Emerging Transport Advisors

Responses (5 minutes each)
Academic
Steve Shladover, UC Berkeley

Public
Paul Ajegba, Michgan DOT

Private
Sandra Larson, Stanley Consultants

Group discussion, facilitated by chairs

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

TRB
AV/SM FORUM
AUTOMATED VEHICLES + SHARED MOBILITY

Webinar: Impacts of COVID-19

Wednesday, May 13, 2020

Webinar Protocol

- Participants are automatically muted
- Ask questions anytime using Q&A box
- After presentations, Forum members can raise hands and ask questions aloud once unmuted
- Non-Forum members can ask questions via Q&A box and we will address as many as we can

TRB AV/SM FORUM
AUTOMATED VEHICLES + SHARED MOBILITY

Mission

Bring together public, private, and research organizations to share perspectives on critical issues for deploying automated vehicles and shared mobility. Discuss, identify, and facilitate fact-based research needed to deploy these technologies how and when it will inform policy to meet long-term goals:

- Increase safety
- Reduce congestion
- Enhance accessibility
- Increase environmental and energy sustainability
- Encourage economic development and equity

Public Agency Participants

- U.S. Department of Transportation
- U.S. Department of Energy
- Transport Canada
- Local Agencies
  - Maricopa County DOT
  - Maricopa Council of Governments
- State Agencies
  - Caltrans & California DMV
  - Florida DOT
  - Michigan DOT
  - Minnesota DOT
  - Ohio DOT
  - Virginia DOT
  - Washington State Transportation Commission
  - Washington State DOT

Academic Research Participants

- AAA Foundation for Traffic Safety
- Southwest Research Institute
- Texas A&M Transportation Institute

Private Sector Participants

- Alliance for Automotive Innovation
- Toyota
- Econolite
- Stanley Consultants

TRB Committee Participants

- TRB Executive Committee
- TRB Standing Committees
  - Vehicle-Highway Automation
  - Intelligent Transportation Systems
  - Emerging Technology Law
  - Emerging and Innovative Public Transport and Technologies
  - Travel Analysis Methods Section
  - Subcommittee on Emerging Ridesharing Solutions

Partner Liaisons

- National Academies' Divisions/Boards (4)
- Partner Associations
  - AASHTO
  - APTA
  - ITE
  - ITS America
  - SAE International
  - I-95 Corridor Coalition

Forum Co-Chairs

Jane Lappin
Retired Director, Government Affairs & Public Policy, Toyota Research Institute

Cathy McGhee
Director, Virginia Transportation Research Council

Greg Winfree
Agency Director, Texas A&M Transportation Institute

Forum Products

- TRB e-Circular “Preparing for Automated Vehicles & Shared Mobility”
- Directory of Information Resources, continuously updated
- Interactive sessions at TRB Annual Meeting and the Automated Vehicles Symposium

Critical Research Needs

- Listed approximately 150 critical research needs, with annual updates
- Ranked top 10 research issues
- Developing white papers listing state of each research topic and remaining research gaps

2020 Workshops & Reports

- Vision(s) for a “fully evolved” future
- Importance and role of connectivity
- Potential impacts on government & private sector
- Financing, funding, and economic implications
- Potential impacts on our traditional research processes & programs

Welcome to New Members

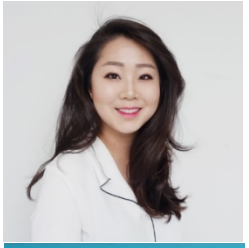
Kristin White

CAV Executive Director, Minnesota DOT

Daniela Bremmer

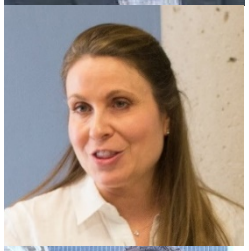
Cooperative Automated Transportation Development Manager, Washington State DOT

Today's Presentations

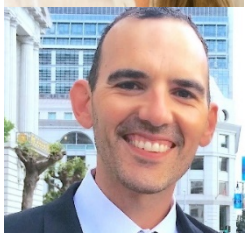


Effect of COVID-19 on AVs
Annie Chang
SAE International

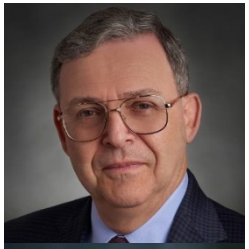
Effect of COVID-19 on AVs
Ed Straub
SAE International



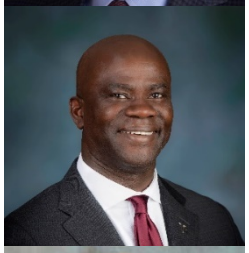
Effect of COVID-19 on Shared Mobility
Susan Shaheen
UC Berkeley



COVID-19 and New Paradigms?
Tim Papandreou
Emerging Transport Advisors



Steven Shladover
UC Berkeley PATH



Paul Ajegba
Michigan DOT

Sandra Larson
Stanley Consultants

Research Needs Express

As all aspects of transportation deal with the unfolding effects of the COVID-19 pandemic, there are research needs, gaps and potential ways to leverage innovation revealing themselves across all modes, systems and disciplines in transportation. In keeping with the mission of the National Academies of Sciences, Engineering and Medicine to provide trusted, timely, impartial and evidenced-based information exchange and research, we are issuing an urgent and directed call for **Research Needs Statements specific to Transportation and Pandemics**.

In order to expedite the capture of these more specific Research Needs Statements, we have provided a survey to enable our volunteers to contribute to this body of knowledge rapidly and easily. Once these statements are quickly vetted by TRB staff, we plan to make them publicly available for researchers, institutions, and funding agencies to view, build on, and consider as part of future projects.

Please note, there is no funding available through TRB associated with this call for research needs.

http://www.trb.org/main/CallforRNSTransportationAndPandemics.aspx

TRB AV/SM FORUM
AUTOMATED VEHICLES + SHARED MOBILITY

trb.org/AVSMForum

Katherine Kortum (kkortum@nas.edu)
Mark Norman (mnorman@nas.edu)

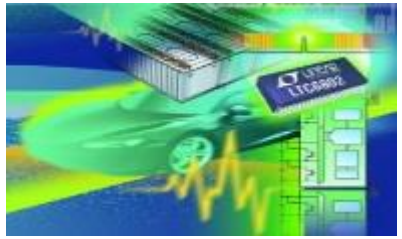
EFFECT OF COVID-19 ON AUTOMATED VEHICLES

EDWARD STRAUB, DM
Director, SAE Office of Automation
edward.straub@sae.org

SAE Standards in advanced technology areas

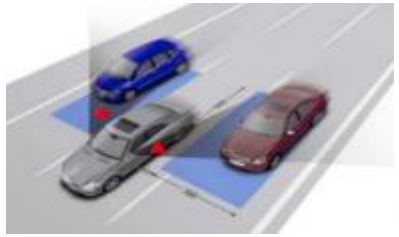
Wireless Charging

Driver-Vehicle Interface



Electronics System Reliability

Driving Automation Systems



Active Safety

Functional Safety

Connected Vehicles

Shared Mobility

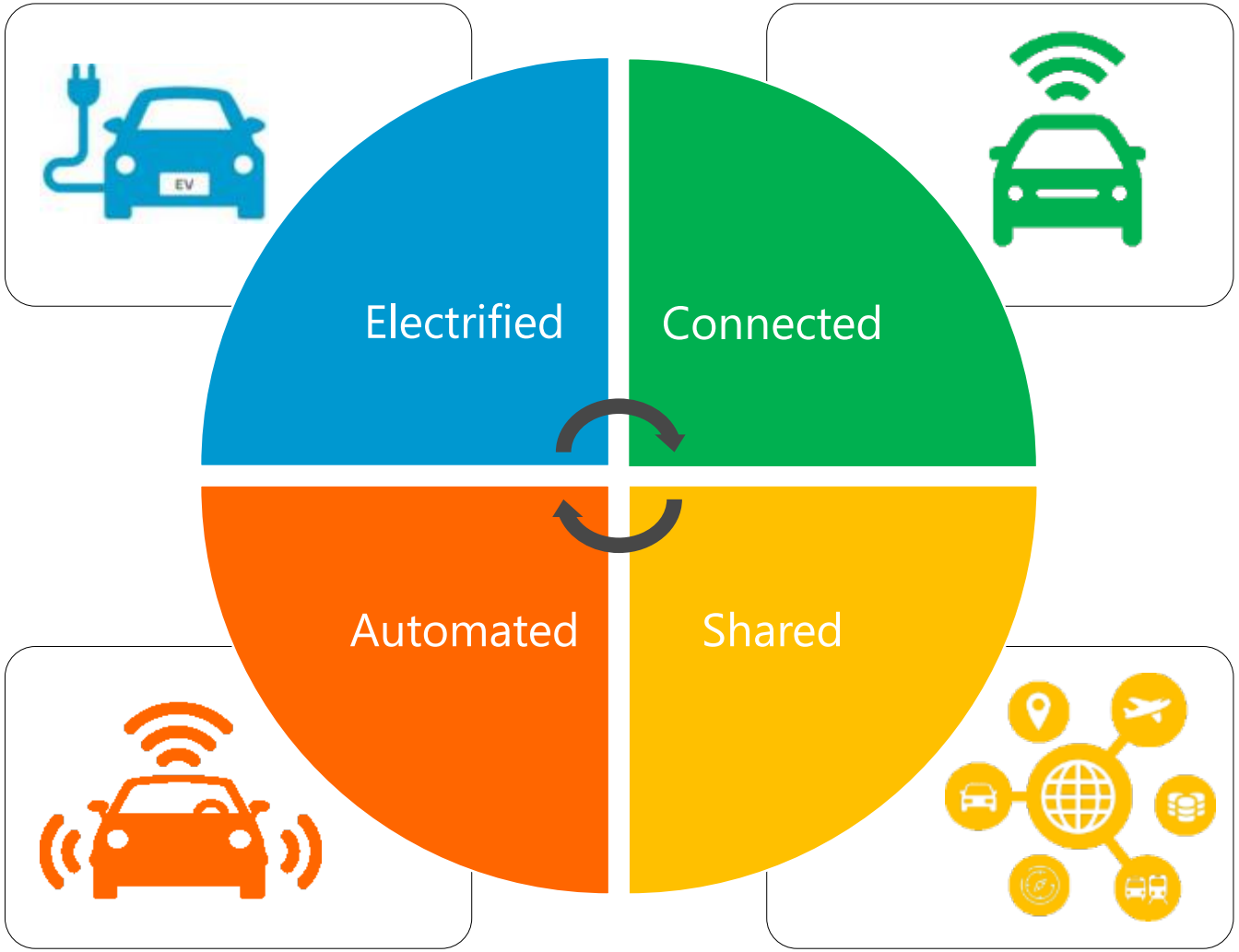
EV/Hybrid/FC Vehicle & Battery

Vehicle Electronics Cyber Security

Intelligent Transport Systems

Mobility for Persons with Disabilities

4 major trends in mobility



Effect of COVID-19 on Automated Vehicles

AV Technology Development

- Fundamentals
- Component performance & development
- System level simulation
- Physical testing protocols
- Investment

AV Deployment

- Rethinking use cases
  - Design
- User behaviour and preferences
- Personal use / Transit
  - Riskier driver behaviour compared to pre-stay-home orders [Zendrive]
  - Decreased use of transit and rideshare
  - Protocols / risk mitigation measures

Considerations for a possible future…

Test & Development

1-2 years

- Simulation
- Fundamentals
  - Components
  - Behaviours
- Physical test protocols

Use cases & Niches

1-5 years

- Evaluate business case forecasts
- Deliveries
- User / consumer preferences
- Social interaction
- Infrastructure modification

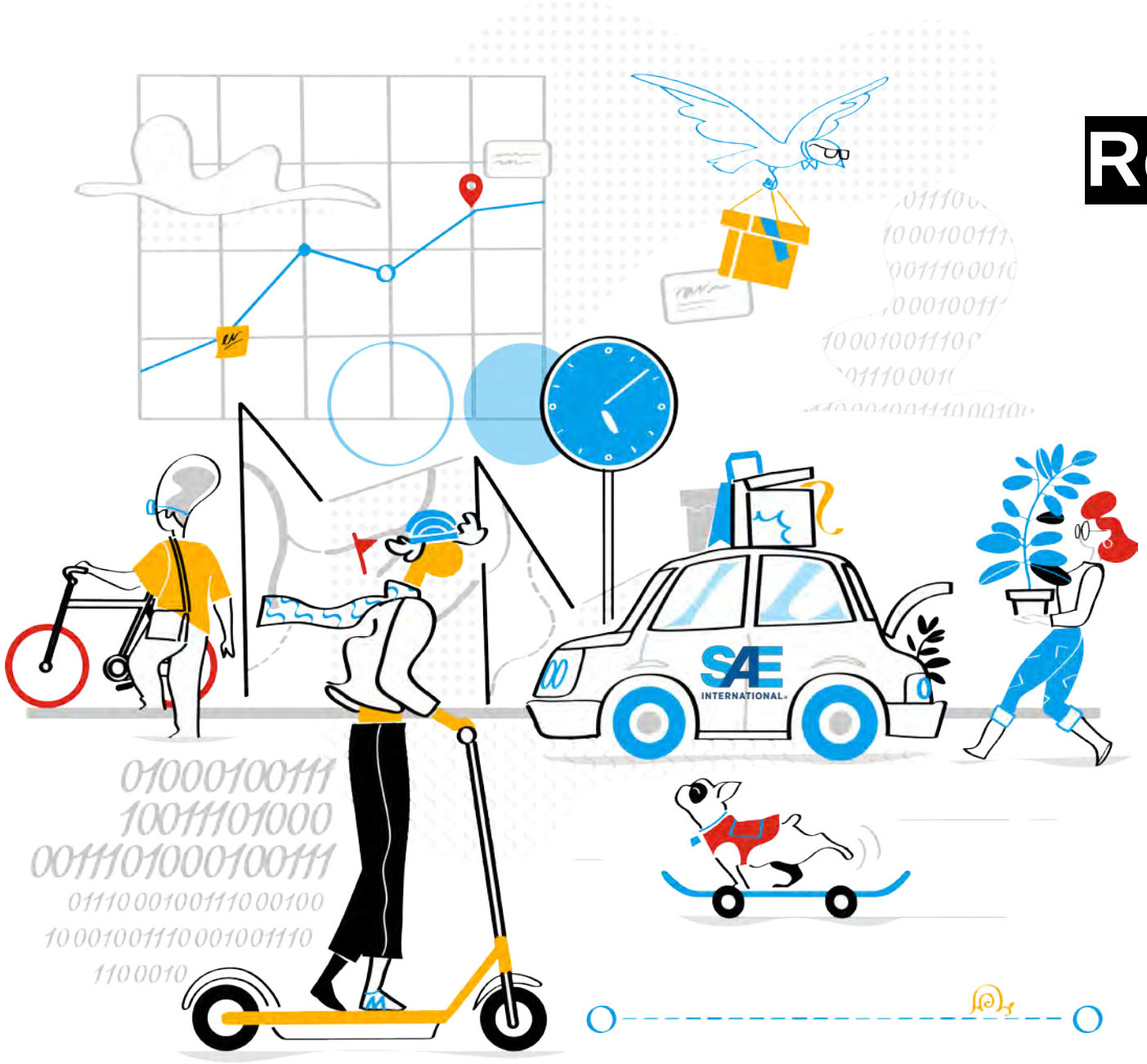
Growth & Consolidation

1-5+ years

- Response to evolving environment
- Solidified business cases
- Maturing technologies
- Normalizing interactions

Uncertain future in transportation

- Public-transit ridership (70 - 90 percent drop in major cities) [McKinsey]
- Ride sharing (60 - 70 percent drop) [McKinsey]
- 17% less likely to use ridesharing going forward [Axios]
- Regulatory uncertainty influences investments
  - Balancing new technologies or traditional infrastructure?
- Hygiene and distancing requirements
- Changes to street and sidewalk usage



Road safety in our "new normal"

TRB AV/SM Forum
Webinar on Effect of COVID-19

May 13, 2020

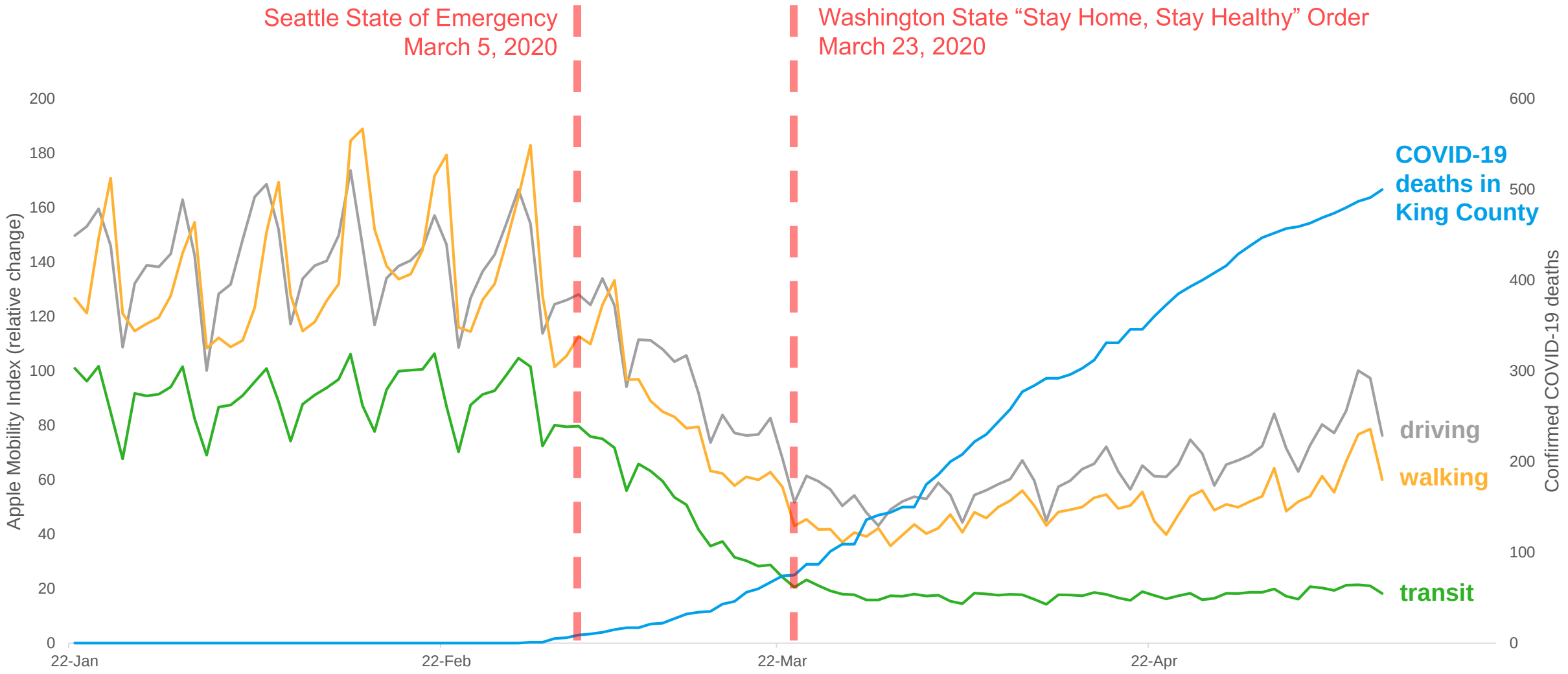
Annie Chang
Head of New Mobility
SAE International
annie.chang@sae.org

HELLO
my name is

ANNIE CHANG
Head of New Mobility

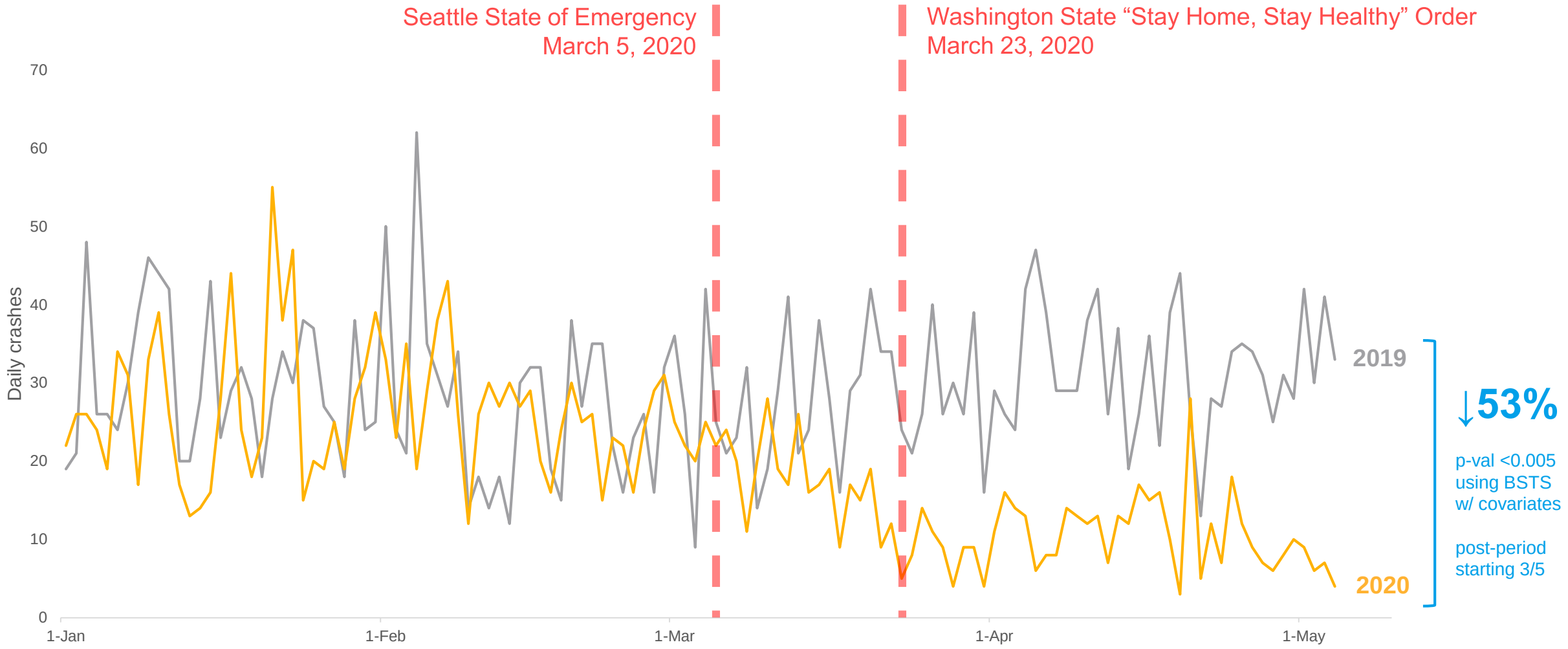
SAE International

Mobility & COVID - Seattle



Analysis by Chang & Miranda-Moreno, 2020; data from Apple Mobility Index & data.world

Traffic crashes - Seattle



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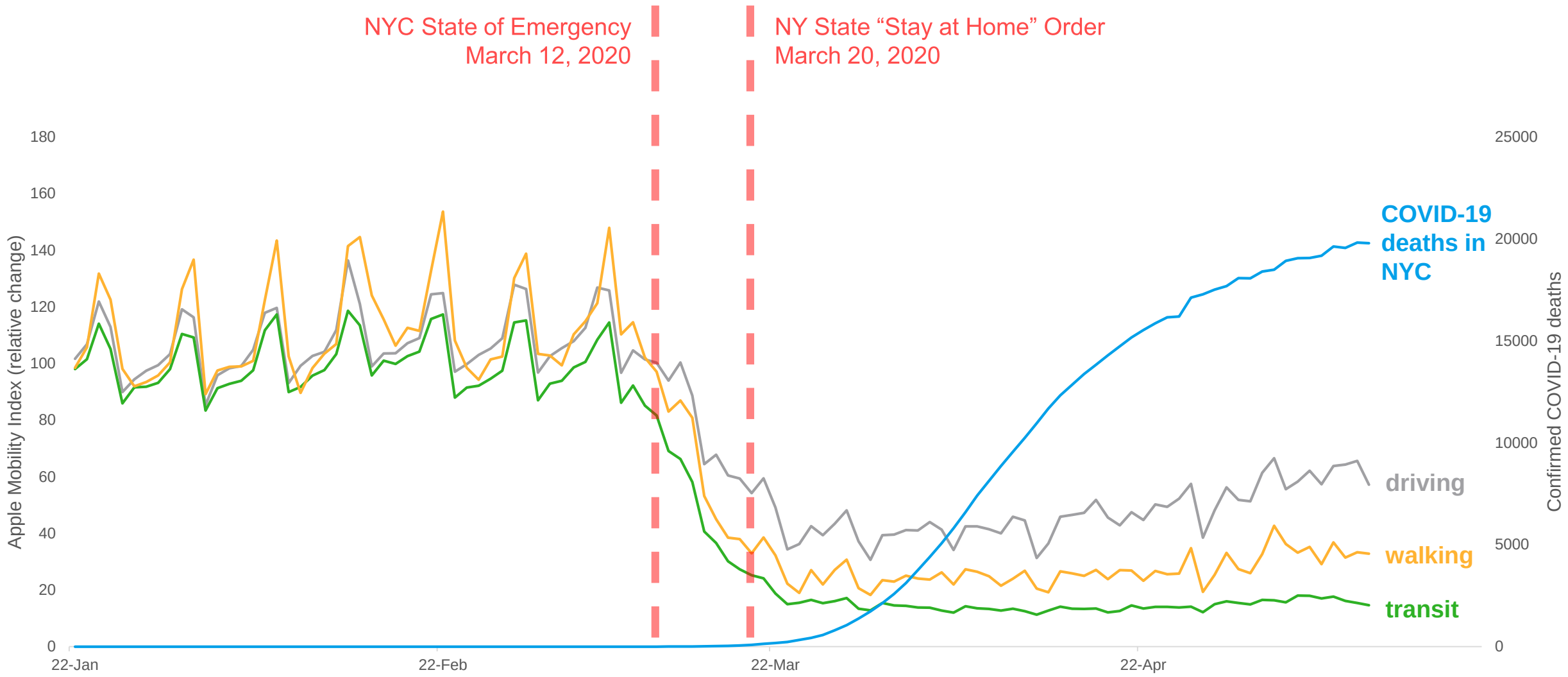
Mobility & COVID - NYC



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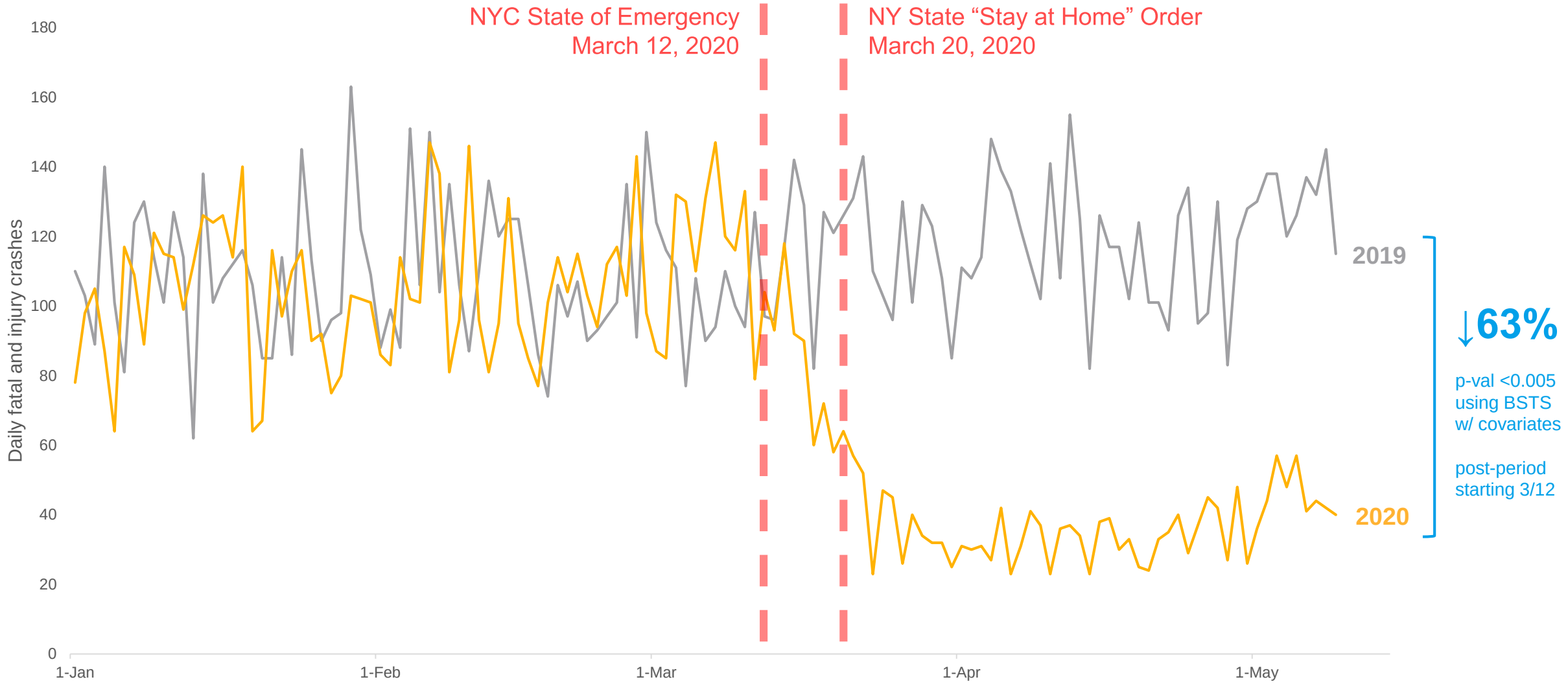
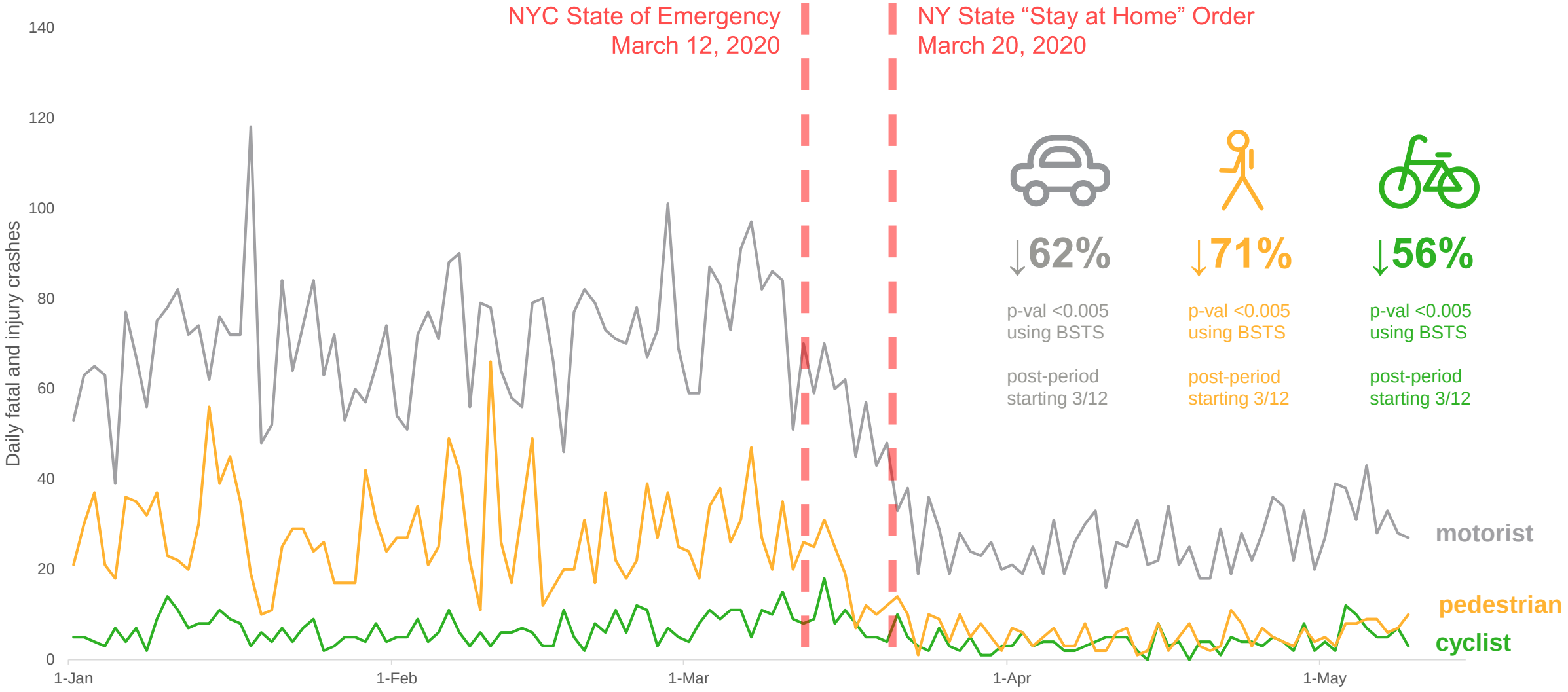
Fatal & injury crashes - NYC



Analysis by Chang & Miranda-Moreno, 2020; data from NYC Open Data

Fatal & injury crashes by mode - NYC



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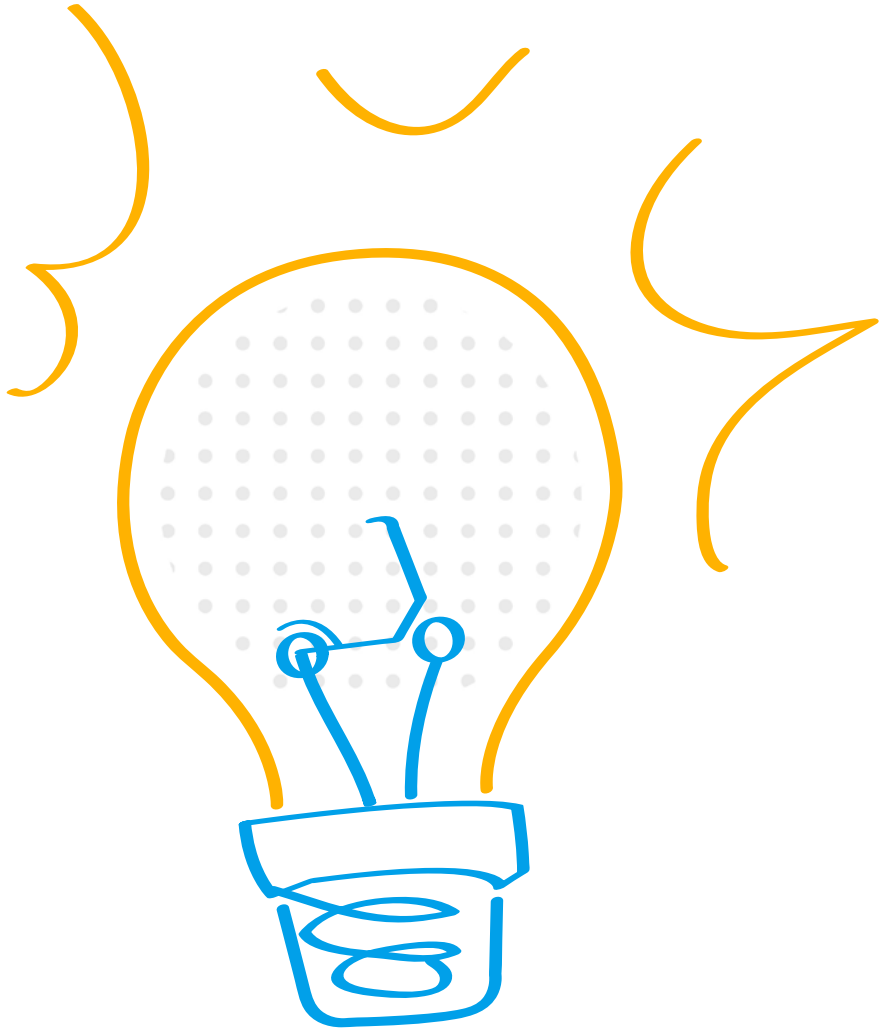
Road safety in our “new normal”



WHAT WE KNOW

- Mobility & crashes have decreased
- Travel speeds have increased (in some cities)

WHAT WE DON’T KNOW

- Will we continue to travel less?
- Will our travel mode preferences evolve?
- How long will our “new normal” last?

OPPORTUNITY

- Rethink our travel behavior & streets

COVID-19 Impacts: Public Transit, Shared Mobility & Social Equity

Susan Shaheen, Ph.D.
Director, Resilient and Innovative Mobility Initiative
UC Institute of Transportation Studies
Professor, Civil and Environmental Engineering,
UC Berkeley

CALIFORNIA RESILIENT AND INNOVATIVE MOBILITY INITIATIVE

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Presentation Overview

- COVID-19 Challenges/ Opportunities
- Social Equity Considerations
- Public Transportation & Shared Mobility
- Rights-of-Way & Curbs
- Trends: Current & *Possible* Future
- Navigating a New Normal

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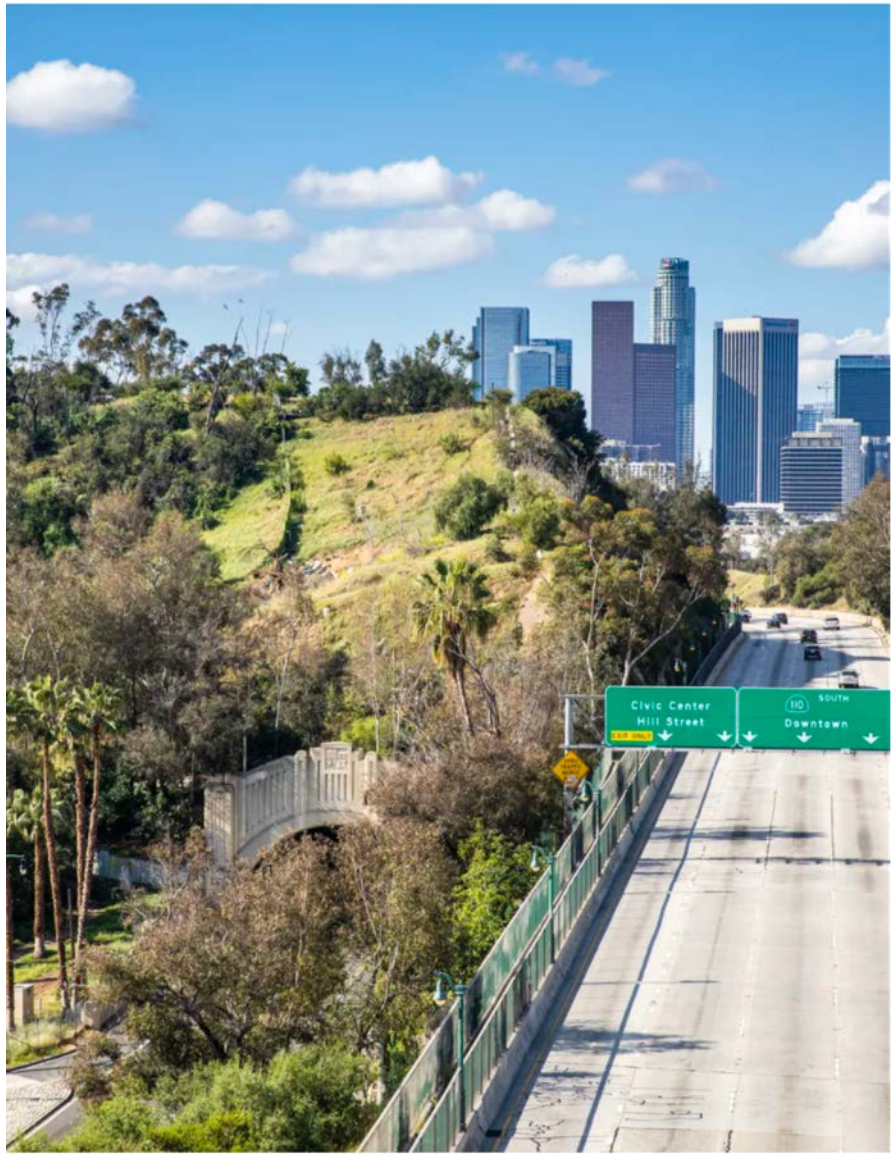


COVID-19 Crisis …

- Economic recession causing devastating impacts on employment & transportation
- Gas tax revenue reductions
  - VMT down: 39% in Detroit, 39% Miami, 44% in Los Angeles, 49% in Dallas, 52% Seattle
- Public transit operators reduce schedules, routes, and operating hours
- Many drivers getting more reckless
- Shared mobility companies redirecting service, closures, and layoffs
- Need to quickly address immediate job and transportation impacts & restore safe / healthy mobility

Social Equity Considerations

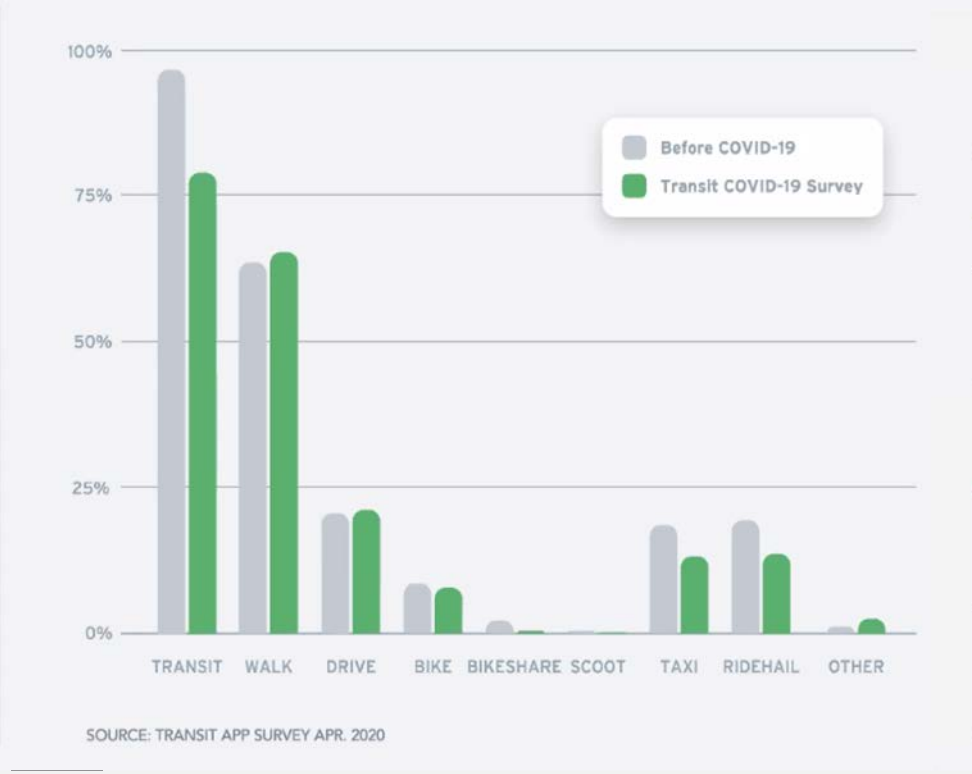
- Critical to understand inter-relationships among job and food access, housing, public health, and mobility
- Need to ensure lack of mobility does <u>not</u> exacerbate poverty and homelessness
- Opportunities for public transit operators, cities, and private companies to advance mobility needs and strengthen economic resilience, particularly for most vulnerable populations

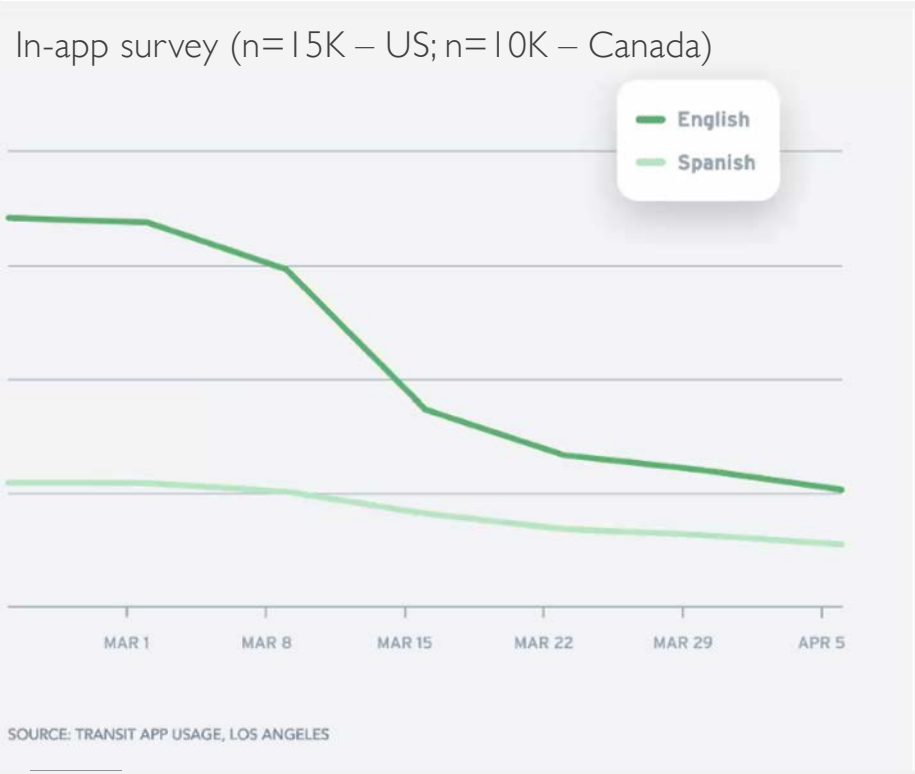
COVID-19 Opportunities…

- 6% drop in CO2 emissions predicted in 2020
- VMT and number of car crashes down
- Active transport policies:
  - Milan announces 22 miles of streets to be converted to pedestrian / bicycle space
  - Buenos Aires expanding active transportation infrastructure
- Opportunities for slow streets, telecommuting, shared mobility & public transit options
- Focus on policy, partnerships & people
- Create more equitable, innovative, sustainable & resilient transportation

Public Transit Impacts

- APTA forecasts reduction in farebox revenue of 75% over next 6 months
- Public transit reducing schedules, routes, operating hours; social distancing, free transit/suspended fares
- Some increasing off-peak/low-density service gaps (e.g., Miami Metrobus/Go Nightly)
- Public transit agencies eligible to receive $25B in emergency funding (CARES Act)





TRANSIT APP SURVEY

- Active public transit users skewed toward low-income households
- Food service & healthcare represent greatest percentage of travelers
- Very little mode shift for those still traveling (U.S. and Canada)
- Spanish speakers more likely to continue using public transit (i.e., Los Angeles)

Rebuilding Trust in Public Transportation

– PUBLIC TRANSIT DECLINE

- Public transit likely slower to recover as travelers exercise social distancing & fear higher-occupancy modes
- More likely if COVID-19 has multiple waves (e.g., resurgence in infections, new viral strands, etc.)

+ PUBLIC TRANSIT RENAISSANCE

- Ridership increases due to economic hardship and restructured services
- Innovations and bold policy measures (e.g., free transit and subsidies, microtransit options)
- Flexible financial model to reinforce this

Micromobility Impacts Varied

- In NYC, Citi Bike ridership increased 67% compared to March 2019
- Washington, D.C.'s CaBi expanding low-income access to $5 annual memberships
- Notable layoffs (e.g. , Bird, Lime, Jump)
- In Mid-April, Lime suspends all service <u>except</u> South Korea
- Number of companies enhancing cleaning procedures (e.g., NanoSeptic handlebars)

Micromobility: Policy Response

Favorable Developments

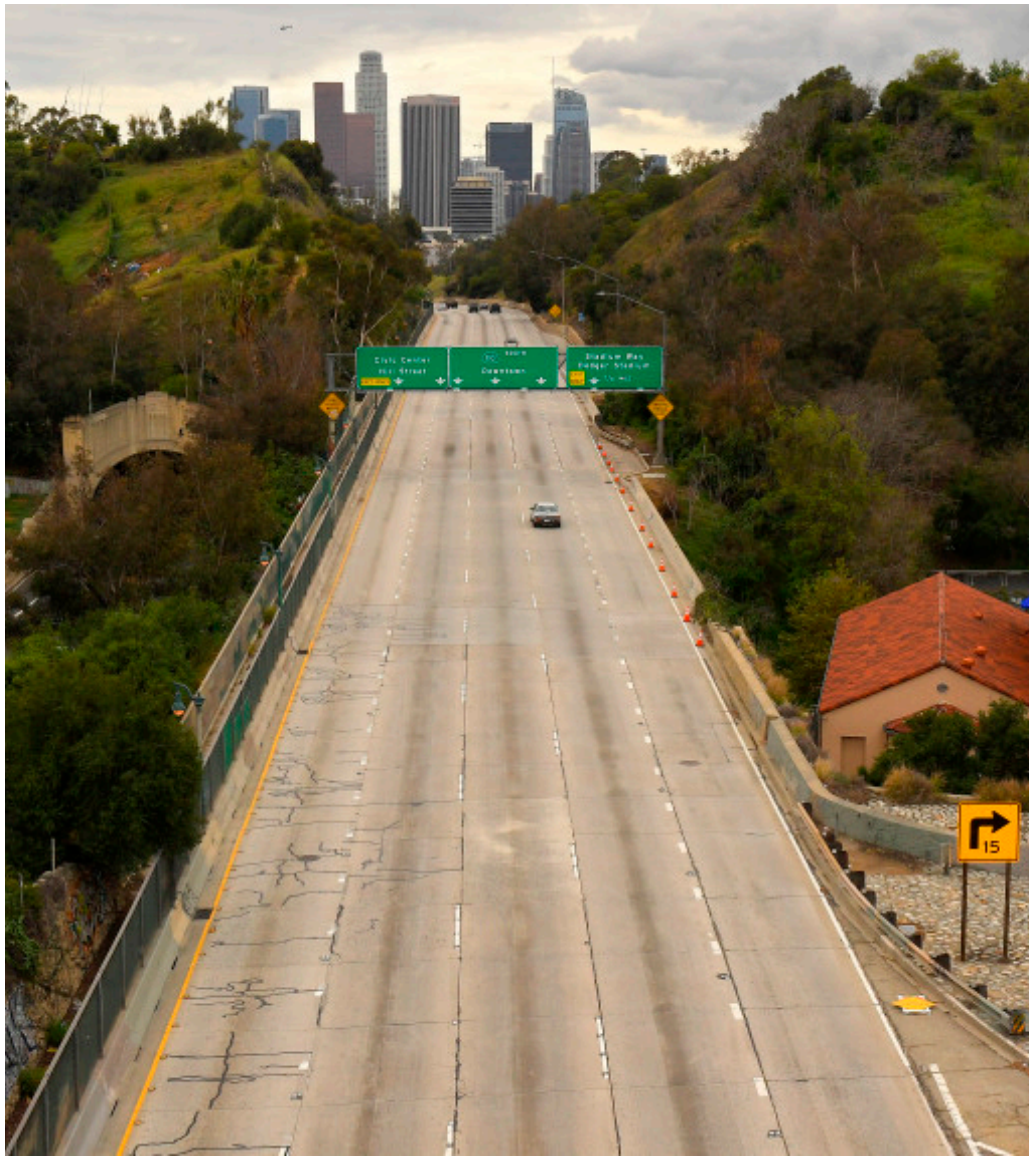
- Free/discounted memberships/use for *small businesses and/or public* (Kansas City, Memphis)
- Free/discounted memberships for *essential workers* (Boston, Brookline, Chicago, Salt Lake City, Washington DC)
- Shared micromobility service workers deemed *essential* (Baltimore)
- Used for *restaurant deliveries* (Syracuse)

Unfavorable Developments

- *Ban/ceased operations* due to COVID-19 transmission concerns (Miami, Sacramento)

TNCs & Pooling

- Dramatic usage declines
- Partnerships for essential workers and medical appointments
- In mid-March, Lyft and Uber suspend pooled ride options due to COVID-19 transmission concerns



Rights-of-Way and Curb Management

Goods Delivery

- Parking Conversion / Additional Loading Zones for Pick-Up/Delivery (e.g., Annapolis, Austin, Raleigh, Seattle, Washington, DC)
- Parking Fee Waivers for Pick-Ups (Hartford)
- Short-Term Pick-Up Zone Permits (Minneapolis)
- Curbside No Stopping Rules Suspended (Madison)
- Reduction in Parking Time Limits to Encourage Short-Term/Shared Use (Tucson)
- Signage for Designated Pick-Ups (South Bend)

Active Transportation

- Automatic Pedestrian Signals (e.g., Arlington, Kansas City, Los Angeles, Providence)
- Street closure to vehicle traffic during pandemic for active transportation/social distancing (Boston, New York City, Minneapolis, Oakland, Providence)

Trends: Current and *Possible* Futures

	Pandemic Response (6-24 Months)	Recovery (~2-3+ Years)	Mitigation	Preparation
Macroeconomic Environment	- Disruptions to supply chains and labor - Lower oil prices	- Stronger recovery in public transit and shared mobility service sectors (e.g., TNCs) - Oil prices return to pre-COVID ranges	- Auto and mobility sectors increase use of automation in supply chains - Monitor infectious diseases	- Enhanced cleaning protocols - Continuity of operations and continuity of mobility/delivery plans
Consumer Behavior	- Shifts away from higher occupancy modes; increases in deliveries and telecommuting	- Uncertain / depends on length/depth of pandemic and recession; policy levers	- Consumers continue social distancing and physical travel substitution	- Consumers prepared for future outbreaks (masks, gloves, social distancing, etc.)
Policy Environment	- Economic stimulus - Support for public transit, telecommuting	- Policies to reduce VMT/GHG emissions (e.g., telecommuting, HOVs, active transport)	- Transport sector implements practices to prevent infectious disease	- Transport sector implements practices to respond to infectious disease (e.g., increased cleaning, etc.)
Technology Response	- Testing AVs for contactless applications	- AV adoption delays due to virus and economic disruption	- Industry develops cleaning protocols for AVs (e.g., UV light)	- AVs ready for future infectious disease scenarios

Navigating A New Normal

- Turn crisis into opportunity
- Key role for public policy (e.g., public transit finance, telecommuting, micromobility)
- Focus on *people's needs central to response*
- Maximize social & environmental benefits in transportation recovery, particularly *social equity*
- How can shared mobility help households that are no longer able to afford a personal vehicle?
- Understand impacts/opportunities for taxi and TNC drivers who have invested in car loans to generate income

SUSAN SHAHEEN

(510) 642-9168

sshaheen@ucits.org

SusanShaheen1

Susan Shaheen

THANK YOU

HTTPS://WWW.UCITS.ORG/RIMI/

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eta

emergingtransport.com

Timothy Papandreou

@tpap_


8762
CA49819
8762
Clean Air Vehicle
12 PACIFIC
Video, Phone & Conference Rooms.
Meet Happy | zoom

Key Phases

Trigger

Triage

Pivot

Recover

Transform

Concept: Timothy Papandreou ETA 2019
Icons: The Noun Project various artists

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New Work Normal

On Site

Off Site

Concept: Timothy Papandreou ETA 2019
Icons: The Noun Project various artists

eta

New Work Normal

On Site

Off Site

Concept: Timothy Papandreou ETA 2019
Icons: The Noun Project various artists

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Business Models

Own

Ride

Rent

Concept: Timothy Papandreou ETA 2019

Icons: The Noun Project various artists

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New Sharing Normal

Rider Protocols

Trusted Networks

Touchless Travel

Concept: Timothy Papandreou ETA 2019
Icons: The Noun Project various artists

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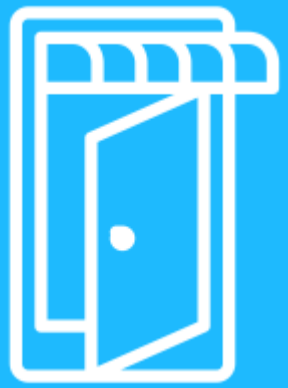
New Commerce Normal



In Store

Delivery

Pick-up

Concept: Timothy Papandreou ETA 2019
Icons: The Noun Project various artists

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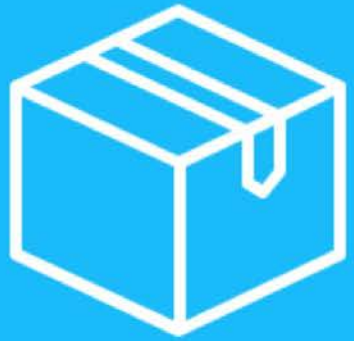
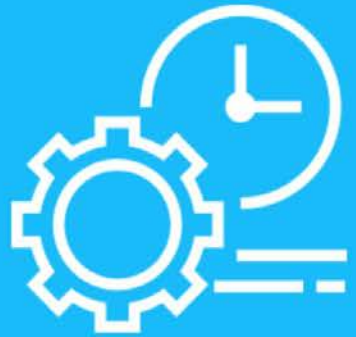
Automation

Passenger



Deliveries



Tasks

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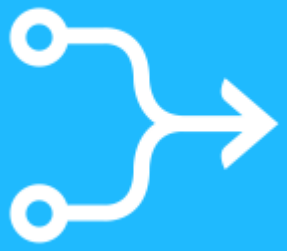
Concept: Timothy Papandreou
Icons: The Noun Project various artists

Transformative Resilience



Consolidation

Restorative Partnerships

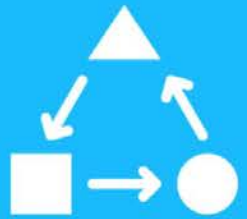
Digital Integration

Concept: Timothy Papandreou ETA 2019
Icons: The Noun Project various artists

Guardrails

safety

equity



interconnectivity

affordability

sustainability

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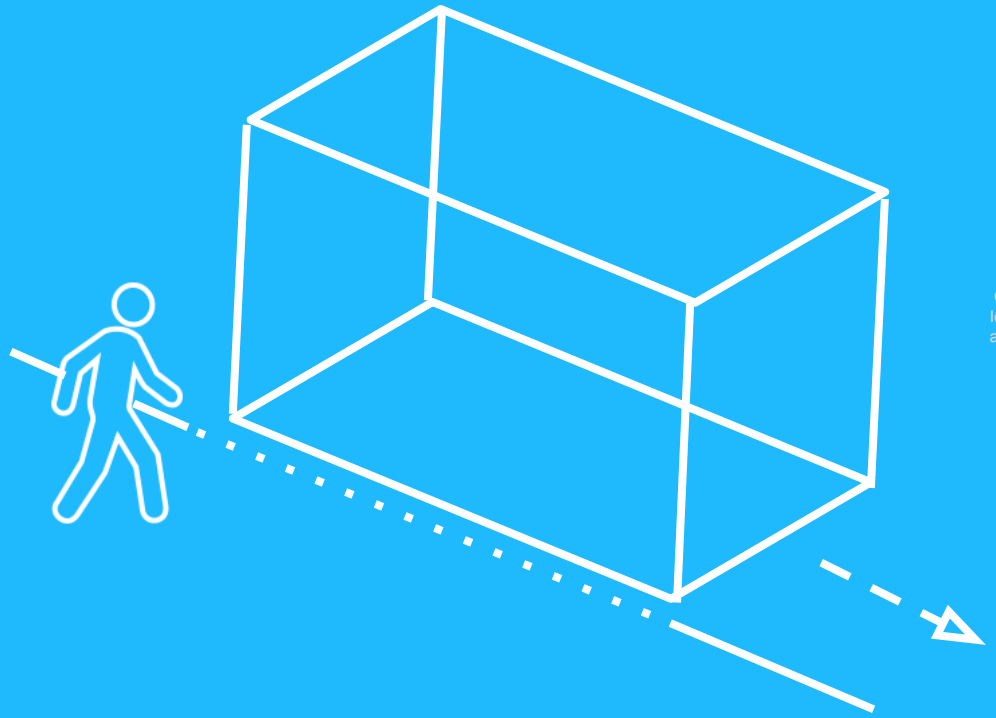
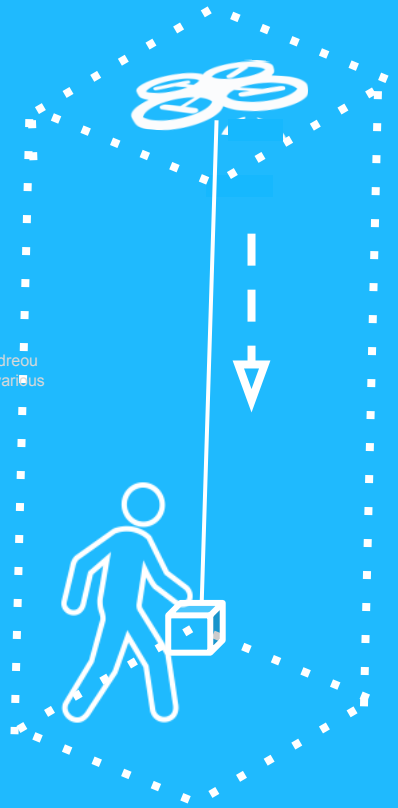
Emerging Transport Advisors 2018
Concept: Timothy Papandreou
Icons: The Noun Project various artists

New Pricing Model





Concept: Timothy Papandreou
Icons: The Noun Project various artists

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Government

Community

Companies

Research

eta

Concept: Timothy Papandreou
Emerging Transport Advisors 2018
Icons: The Noun Project various artists

emergingtransport.com/contact

Timothy Papandreou

@tpap_