

Mobility as a Service (MaaS) Webinar: Understanding the Concept, Current Status and the Role of Data

July 11, 2019

Webinar & Audio Information

- The call-in phone number is: x-xxx-xxxx & enter xxxxxxxx# at the prompt
- Participants will be in "Listen Only" mode throughout the webinar
- Please press *0 to speak to an operator for questions regarding audio
- Please call Justin Ferri at xxx-xxxx for difficulties with the web or audio application
- This webinar will be recorded.
- Presentations will be posted to the I-95 Corridor Coalition website. Participants will receive a link to the presentations after they are posted.





- Please pose your questions using the chat box
- Questions will be monitored then answered by the speakers either at the end of their presentation or at the end of the webinar

Chat (Eve	eryone)	≣₹
Type yo	our question in the box, then click here	P
Everyone		



Welcome and Introductions



Denise Markow, PE
I-95 Corridor Coalition
TSMO Director

Agenda

1:00 pm to 1:05 pm	Welcome and Introductions	Denise Markow, I-95 Corridor Coalition
1:05 pm to 1:35 pm	MaaS: Understanding the Concept and Current Status	Carol Schweiger, Schweiger Consulting
1:35 pm to 2:05 pm	MaaS: TNCs & Data	Joe Castiglione, San Francisco County Transportation Authority
2:05 pm to 2:25 pm	Question & Answer Session	Led by Denise Markow, I-95 Corridor Coalition
2:25 pm to 2:30 pm	Wrap Up	Denise Markow, I-95 Corridor Coalition

I-95 Corridor Coalition Sponsored Event





16 states + **D.C**.

In the Corridor

2nd

Largest Economy in the World

\$4.7 Trillion 40% of US GDP

46

Major Seaports \$172 Billion Imports 34% of U.S. total 37%

Of America's population: 110 Million people

Boston, Massachusetts New York, New York Philadelphia, Pennsylvania Washington, D.C. Raleigh, North Carolina Charleston, South Carolina Savannah, Georgia Orlando, Florida Miami, Florida

Introductions



Carol Schweiger
Schweiger Consulting
President



Joe Castiglione

San Francisco County
Transportation Authority

Deputy Director for
Technology, Data and Analysis



Understanding the Concept & Current Status

Carol Schweiger Schweiger Consulting



MOBILITY AS A SERVICE (MAAS): UNDERSTANDING THE CONCEPT AND CURRENT STATUS

Carol Schweiger

President, Schweiger Consulting

1-95 Corridor Coalition Webinar

MaaS: Understanding the Concept, Current Status and the Role of Data

Thursday, July 11, 2019

PRESENTATION OUTLINE



What is MaaS? How is it different from Mobility on Demand (MOD)?

LA Metro

Dallas Area Rapid Transit

Greater Dayton Regional Transit Authority – Agency provides MaaS

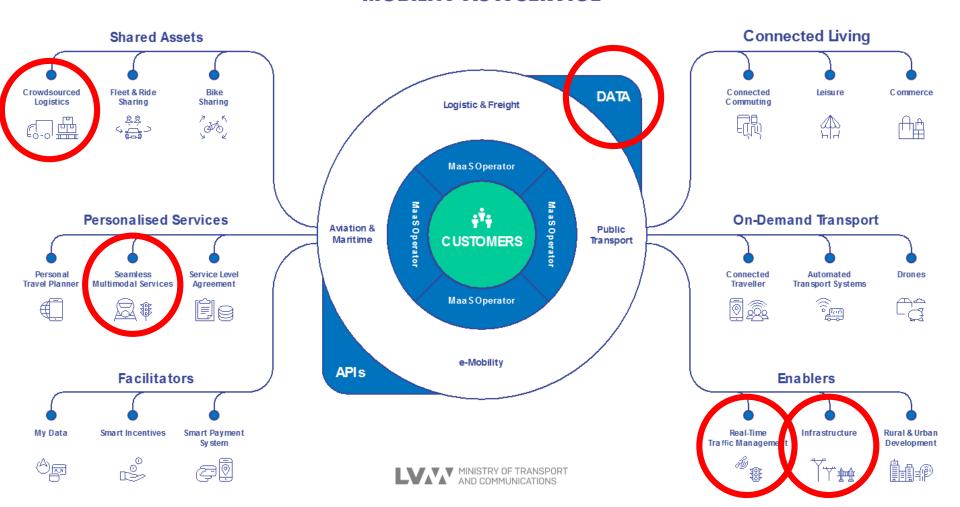
Tompkins County, NY

Where is the US in the MaaS Topology?

Importance of Data

Balancing Customer Needs, City Goals & Private Sector Opportunities

MOBILITY AS A SERVICE



DEFINITIONS



MaaS

Integration of various forms of transport services (and their fares) into a single mobility service accessible on demand

Mobility on Demand

Multimodal, integrated, automated, accessible, and connected transportation system in which personalized mobility is key feature. – **Not MaaS**

New mobility services

Ridesourcing, carsharing, bikesharing, microtransit, etc. See SAE J3163 – **Not MaaS**

Transportation
Demand
Management

Service offerings and incentives to get commuters out of single-occupant vehicles. – **Not MaaS**

Mobility Management

Provide viable alternatives for non-drivers. – **Not MaaS**

Source: Jeremy Dalton, "What is "New Mobility" Anyway?" Method City, July 6, 2018, https://method.city/what-is-new-mobility-anyway-581cbabb55a4

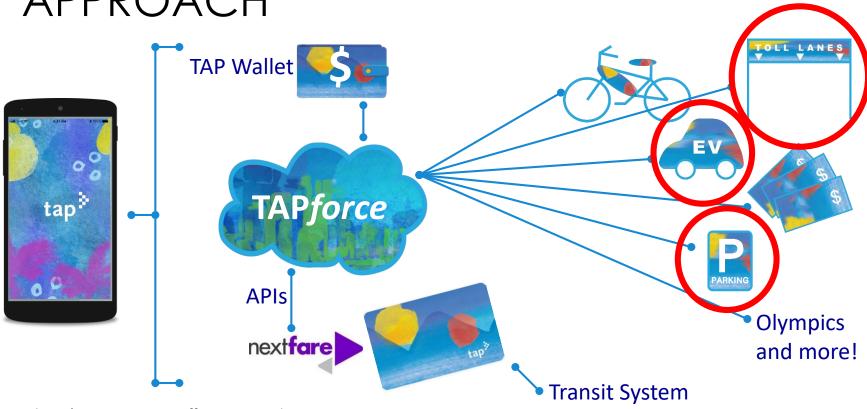


MOBILITY ECOSYSTEM

Public Transit	Taxis	Car Rental
Microtransit	Bikesharing	P2P Carsharing/Rental
Ridesourcing	Carsharing	Shared Ride Services
Automated Vehicles	Scooter Sharing	Electric Scooter Sharing
Private Automobile	???	

LA METRO'S MULTI-SYSTEM APPROACH





Courtesy Robin O'Hara, Executive Officer, Regional TAP Customer Experience, LA Metro

BENEFITS

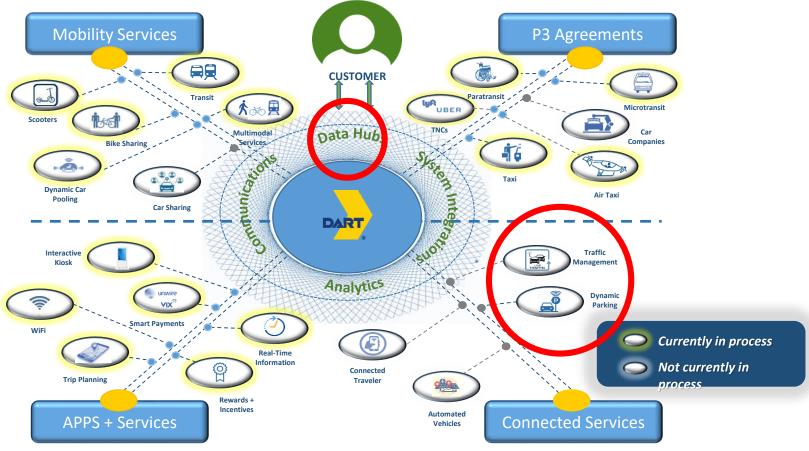


- Offer account loading choices:
 - Different options for Mobile App, Computer, Call Center and Retail Locations
 - Connected by APIs to the programs
- Offer rewards:
 - Alternative to transfers
 - Let the customer choose



- Incentivize behavior:
 - Bad Air Day?
 - Offer easily configurable discounts that incentivize transit and get people off the freeways
- Cross-Program Discounts: Provides discounts across multiple programs
 - One sign-up for customers
 - Easy customization
 - Configurable by programs such as Metro's Low Income Subsidy Program (LIFE)

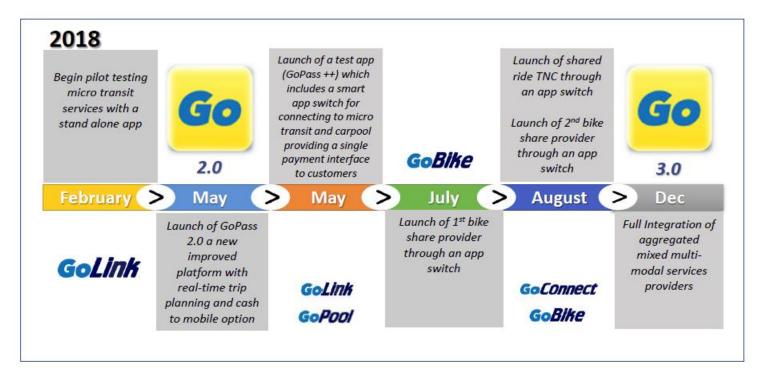
DART's Mobility as a Service Framework



Source: Tina Mörch-Pierre, Assistant Vice President, Payment Systems & Statistical Reporting, Dallas Area Rapid Transit, "Building MaaS: Technology Challenges and Solution," Shared-Use Mobility Center Summit, March 2019, Chicago

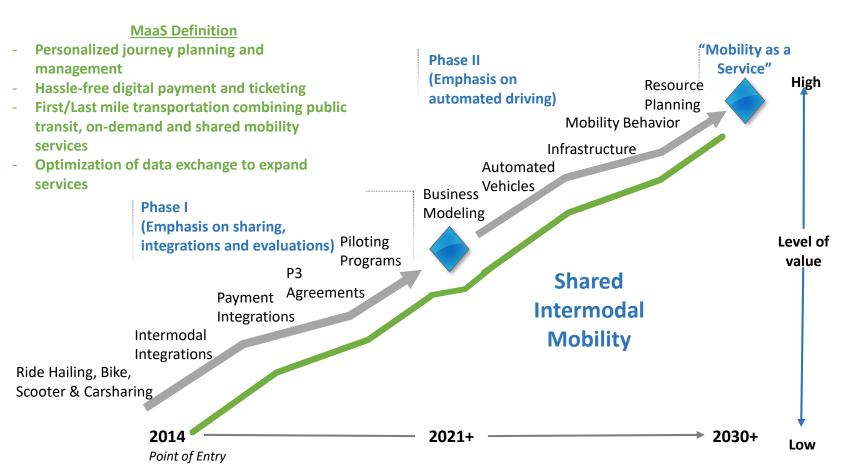


DART'S PATH TO LEVEL 3



Source: Gary Thomas, President/Executive Director, Dallas Area Rapid Transit, "Mobility as a Service: DART Case Study," June 18, 2018 TRB Webinar, Handouts, pages 84-104

DART's Mobility as a Service Development Cycle







Service Overview

- Montgomery and western Greene counties
- Fixed route, demand response and first/last mile services
- 300 vehicles; 29 routes; 3,000 stops
- 5 transit centers, RTA Connect transfer points, PnR lots
- 9 million annual passengers
- Planned service expansion to 9+ counties

Goals

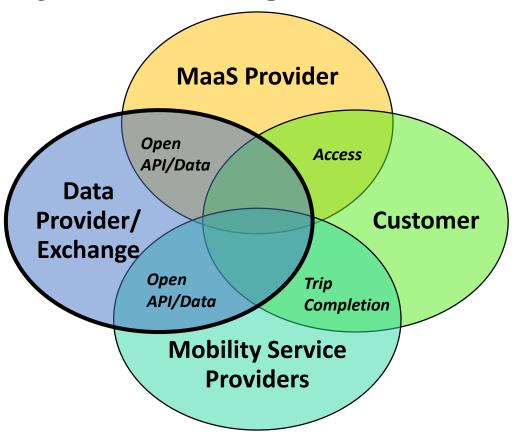
- Seamless Regional Mobility Ecosystem
- Equitable Access
- Open Data
- Integrated Payment

"All mobility providers will collaborate with us delivering one unified mobility network via Dayton MaaS platform"

Source: Santosh Mishra, IBI Group and Nick Mantia, RTA, "Mass Transit to MaaS Transit: Are We Ready?" presentation to 2018 APTA Fare Collection/Revenue Management & TransITech Conferences, https://www.apta.com/resources/mobility/Documents/DaytonRTA FarePaymentSolsSys.pdf

RTA MAAS FRAMEWORK





Adapted from Santosh Mishra, IBI Group and Nick Mantia, RTA, "Mass Transit to MaaS Transit: Are We Ready?" presentation to 2018 APTA Fare Collection/Revenue Management & TransITech Conferences, https://www.apta.com/resources/mobility/Documents/DaytonRTA_FarePaymentSolsSys.pdf

Mobility Coordination Center Intercity Car Bus Rental Bikes Taxis Carshare Integrated Community Trip Reservation Service Mobility-as-a-Service Mobility Public Managment Transit Mobility Education Public Supports One Call/One Click Center Paratransit Volunteer Driver Rideshare Local TNC. Guaranteed Ride Dwight Mengel, Chief Transportation Planner Tompkins County, NY

Tompkins County, NY MaaS Vision

MaaS as Customer Service Integrator

"... shift from selling features & benefits to building relationships with consumers..."

VALUE PROPOSITION



- Mobility Education
- Member Organization
 - Member recruitment
 - Governance/Operations
- Financial Services
 - Individual Mobility Plans, estimates of annual use & budget
 - Monthly Budget Billing or Single Payments
 - Coordinate Fare Payment with mobility operators & customers
 - Streamline how Public agencies purchase travel for clients
 - Credit volunteer driver mileage reimbursements as revenue
 - Credit employer subsidies as revenue

Customer Service

- Concierge Service 24/7 & Guaranteed Ride
- Feedback to mobility operators
- Business Co-Marketing & Discounts
- Capacity to adapt & innovate: Increase supply of volunteers & rideshare drivers

Dwight Mengel, Chief Transportation Planner, Tompkins County Dept of Social Services, Ithaca, NY, 607-274-5605, dwight.mengel@dfa.state.ny.us

Your Everyday Transportation Options Within Tompkins County







Need help finding help? 211tompkins.ora 1-877-211-8667

Borrow a bike at Cornell 24/7

bike.zagster.com/cornell

✓ Zagster



Learn how we can help you or your organization way2go.org 607-272-2292

Specialized Transportation

HAIL A RIDE



& For seniors (60+) and people with disabilities gadaboutbus.org 607-273-1878

TAXI

and ridehailing apps

RETIRED **EDUCATORS** DRIVE SCHOOL RIDES For ICSD students and families to attend school events and activities schoolsuccesstc.weebly.com REDSchoolRides@amail.com



Let someone else take you there

ASAP Cab Company - 607-272-7222

Collegetown Cab & - 607-588-8888

Volunteer transportation service to in-county medical appointments fishoftc.org 2-1-1 or 1-877-211-8667



There are other non-emergency medical transportation options available way2go.org/medical 2-1-1 or 1-877-211-8667

Additional Support

Ithaca Dispatch - 607-277-7777

T-Cab - 607-279-0137

AVRE – avreus.org or 607-724-2428 Travel training for people who are visually impaired

Catholic Charities - 607-272-5062 x27 Bus passes and gas cards for people who qualify

Challenge - 607-272-8990 x124

Travel training for people with disabilities and other barriers

County Office for the Aging – 607-274-5482 Referrals to people who can help seniors with transportation

Lvft - lvft.com

Uber - uber.com

MOBILITY MENU	Unit Cost	Unit
Annual Adult Bus Pass	\$450	Annual
Annual Youth Bus Pass	\$110	Annual
Ithaca Carshare "Its my car" Plan	\$8	Hour
Ithaca Carshare "Just in Case" Plan	\$11	Hour
Car Rental	\$55	Day
Taxi trip - City	\$8	Urban Trip
Taxi trip - Rural	\$20	Rural Trip
Bicycle Maintenance	\$50	Voucher
Electric Bike Purchase	\$2,000	HE Bike
Bike Purchase	\$700	Bike
Rideshare Driver – Miles	\$0.54	Mile
Rideshare Rider – Miles	\$0.15	Mile
GADABOUT Paratransit	\$4	Trip
Vanpool Membership	\$125	Month/Seat
Guaranteed Ride	\$30	Annual



Source: Dwight Mengel, Tompkins County Dept of Social Services

Small City Mobility Budget (1 car, 2 adults, 1 youth, Walkscore = 96)		
Carshare	\$	900
Annual Bus Passes (2)	\$	560
Taxi	\$	192
Bicycle Maintenance	\$	100
Guaranteed Ride	\$	30
Member Support	\$	178
Annual Total	\$	1,960
Monthly Payment	\$	163



Source: Dwight Mengel, Tompkins County Dept of Social Services



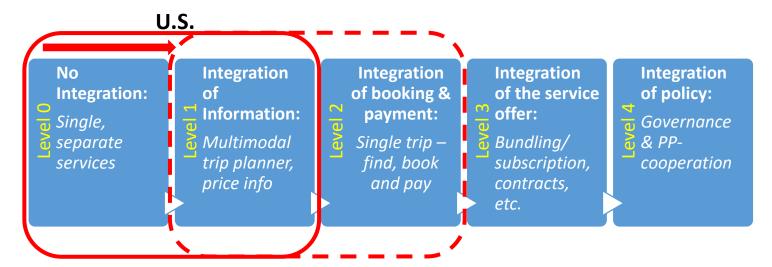
Rural Household Mobility Budget (1 car, 2 adults, 1 youth, Walkscore = 0)

(1 car, 2 addits, 1 youth, warkscore = 0)			
Vanpool Membership	\$	1,500	
Carshare (Discount Plan)	\$	480	
Taxi	\$	200	
Guaranteed Ride	\$	30	
Member Support	\$	121	
Volunteer Driver Revenue	\$	(400)	
Vanpool Program Subsidy	\$	(600)	
Annual Total	\$	1,331	
Monthly Payment	\$	111	

Source: Dwight Mengel, Tompkins County Dept of Social Services



MAAS TOPOLOGY: US MARKET



Source: Jana Sochor, Hans Arby and MariAnne Karlsson, "The topology of Mobility as a Service: A tool for understanding effects on business and society, user behavior, and technical requirements," Paper No. EU-SP1013, 2017 ITS World Congress, Montreal





- 1. Access to dynamic, high-quality data
- 2. Access to mobility services
- 3. Access to integration:
 - a) Technical bottlenecks Harmonized APIs
 - b) Market bottlenecks Sharing best practices and experiences

 MaaS Alliance Data Vision "Data Makes MaaS Happen" https://maas-alliance.eu/wpcontent/uploads/sites/7/2018/11/Data-MaaS-FINAL-afterplenary-1.pdf



USE CASES TO DEMONSTRATE MAAS DATA FLOWS

- MaaS Operator Use Case
- Public Transport Use Case
- Fleet Management For Car/Bike/Scooter sharing Operations
- Traffic Management Use Case
 - Traffic management has been mostly one way
 - Traffic **optimization measures** can also be provided by mobility service providers and used to enable some advanced services to end-users
 - Traffic management data flow key actors: content (=data) providers, transport authorities, transport service providers, traffic management operators, service providers, MaaS operators and travelers





Travelers choose mobility services

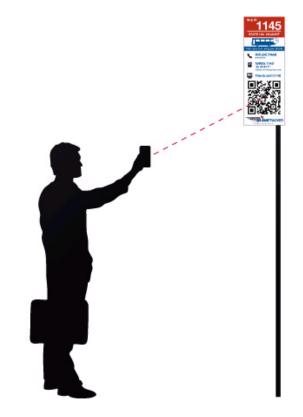
Private Sector provides mobility services or technology to access services

The City or Region tries to attain specific goals and objectives



THANK YOU!

Carol Schweiger
President
Schweiger Consulting LLC
781-424-2208
carol@tech4transit.com



TNCs & Data

Joe Castiglione San Francisco County Transportation Authority

TNCs & Data

I-95 Corridor Coalition





Outline



- What is the SFCTA?
- What questions do we want to answer?
- How did the SFCTA get data to answer these questions?
- What did we find?
- How should agencies get and manage data?

What is the SFCTA?





- Congestion Management Agency for San Francisco County
- Required by state law to:
 - Monitor congestion
 - Adopt plans for mitigating traffic congestion
 - Program and allocate federal, state and local funds
 - Prepare a bi-annual Congestion Management Program
 - Develop San Francisco's long-range transportation plan
- Manage ½ cent sales tax revenues for transportation projects

2009 PM Peak Level of Service



2017 PM Peak Level of Service

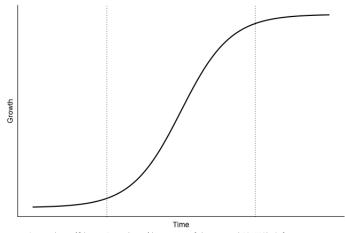


Why does the SFCTA need data?





- In SF, seemed like lots of TNCs, but...
 - How many?
 - What are the effects?
- In a period of rapid change, data is more important than ever
 - Planning
 - Policy-making
 - Accountability



Source: https://blog.usejournal.com/the-tyranny-of-the-s-curve-b791772ba8af

Risk: public policy-making without transparent data

What questions does SF want to answer?





Existing Conditions

- How many TNCs operate in SF?
- How many TNC trips are occurring in SF?
- When are TNC trips occurring in SF?
- Where are TNC trips occurring in SF?
- How much VMT do TNCs generate in SF?
- Do TNCs provide good geographic coverage throughout the entire city?





What questions does SF want to answer?





Congestion

How do TNCs affect roadway congestion?

Transit Ridership

How do TNCs complement or compete with public transit?

Equity

Can TNCs be accessed by all San Francisco residents?

Street Safety

How do TNCs affect the safety of people who use the roads?

Policy

What is the role of government in regulating TNCs?



What data does the SFCTA need?





Inventory

Assets, networks

Network performance

Volumes, speeds, reliability

Demand

Trips by mode, location, time-of-day

Demographic

Income, race/ethnicity, auto ownership

Behavior

How do people make tradeoffs between modes?



What data was available to the SFCTA?







July 11, 2019

How did the SFCTA get data?





Data "scraped" from Uber & Lyft APIs

- GPS Telemetry data ("breadcrumbs")
- Sampled every 5 seconds for 6 weeks
- Mid-November to Mid-December 2016
- Northeastern University collaboration
- Impute trips from changes in supply

Limitations

- Trips not directly observed
- No info on TNC trip purposes, travel party size, fares paid, traveler attributes



What are the existing conditions?

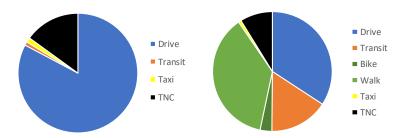




- At least 170,000 TNC intra-SF vehicle trips on typical weekday
 - 15% of intra-SF vehicle trips
 - 13 times the number of taxi trips
 - Conservative estimate (excludes trips with one or both ends outside SF)
 - At least 9% of intra-SF person trips
- Generate 570,000 vehicle miles of travel (VMT) on a typical weekday
 - 6.5% of total weekday VMT
 - 20% of intra-SF weekday VMT

Vehicle Trips by Mode





Vehicle Miles Traveled by TNCs & Taxis in SF

	TNCs	Taxis
Trips	170,400	14,400
VMT	569,700	65,900
Average Total Trip Length	3.3	4.6
Average In-service Trip Length	2.6	2.6
Average Deadhead Trip Length	0.7	2.0
% Deadhead Trips Length	21.0%	43.6%

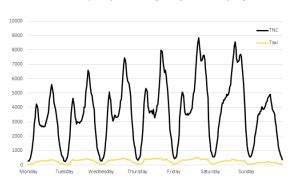
Where and when are TNC trips in SF?





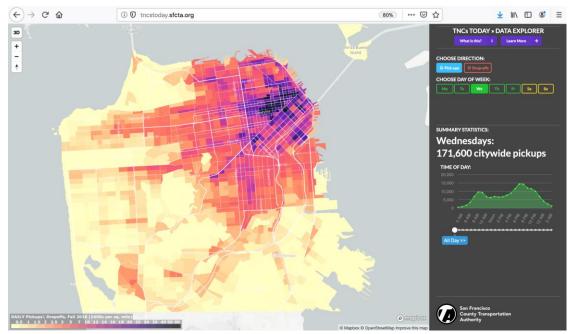
- Most congested areas of the city
- Most congested times of day

TNC & Taxi Trips by Time-of-Day and Day-of-Week



TNC Trips by Travel Analysis Zone (TAZ)

tncstoday.sfcta.org



Do TNCs Affect Congestion?





How could TNCs decrease congestion?

- Increased vehicle occupancy
- Mode shift to transit due to easier access (<u>first/last mile</u>)
- Mode shift away from auto due to <u>reduced auto ownership</u>

How could TNCs increase congestion?

- Add <u>dead-heading</u> or out-of-service vehicle miles
- Mode shift away from transit and non-motorized modes
- Disrupt traffic flow due to <u>pickups and drop-offs</u>

Background traffic and roadway performance

- Network changes (roadway capacity)
- Population changes
- Employment changes

Other

2009 PM Peak Level of Service



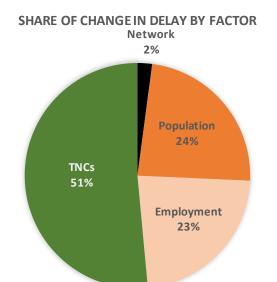
2017 PM Peak Level of Service

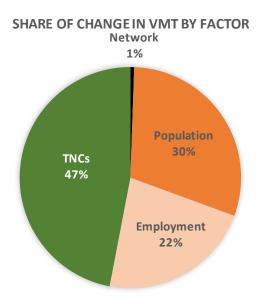


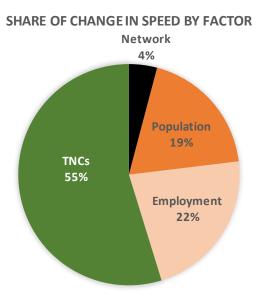
Cause of Changes in Congestion (2010-2016)









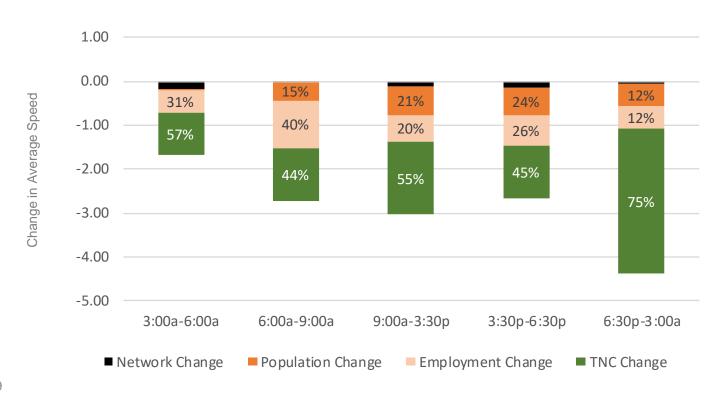


Factors Affecting Speed by Time Period





SHARE OF CHANGE IN SPEED BY FACTOR



Do TNCs Affect Transit Ridership?

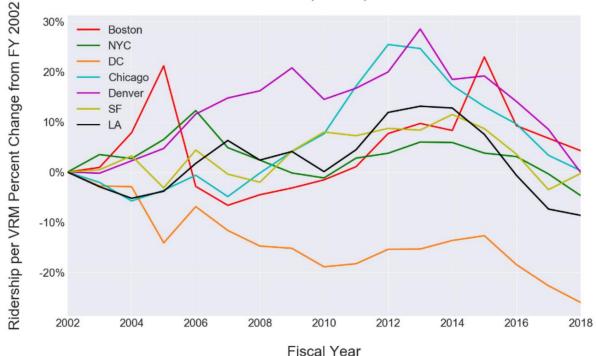




% Change in Ridership per Vehicle Revenue Mile from FY2002

Bus (MB+TB)

- TNCs have significant negative effect on bus and heavy rail ridership
- TNCs have insignificant positive effect on commuter and light rail ridership

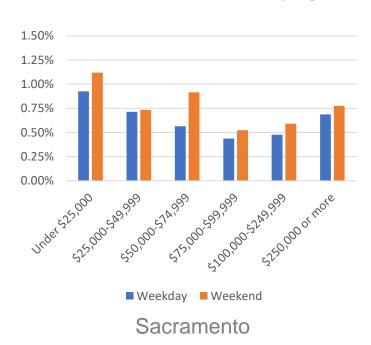


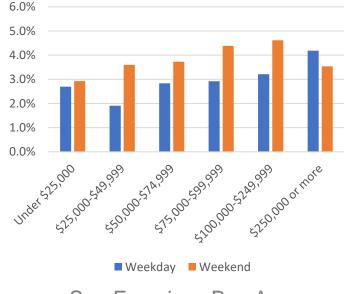
What about equity?





Mode Share by Region, Income Class, and Day-of-Week





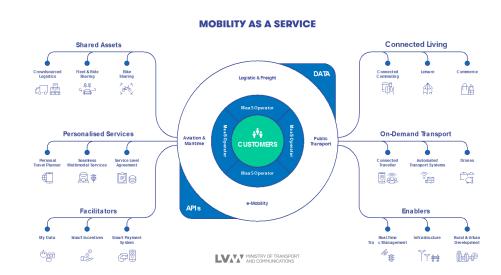
San Francisco Bay Area

What we don't know...





- What are the implications of TNCs for MaaS and MOD?
- Is the TNC business model sustainable?
- What are the effects of on-line shopping?
- What are the effects all the other emerging mobility technologies and services (e.g. courier networks)?



What data is reported to other cities?





NYC

- Automatically collected and transmitted to the Taxi & Limousine Commission
- All E-Hail requests and the outcome of those requests
- Data items include
 - Fulfillment status
 - Pickup & drop off locations (lat/long)
 - Fares / fees
 - Payments



 $Source: Global_Citizen_Festival_Central_Park_New_York_City_from_NYonAir_(15351915006).jpg$

What data is reported to other cities?





Seattle / King County

- Trip records
- Operational records
- Data items include
 - Total number of rides
 - Type of dispatch for each ride
 - Pickup and drop off ZIP codes of each ride.
 - % by ZIP code of rides that are requested but do not happen
 - Number of rides when an accessible vehicle was requested.



 $Source: https://commons.wikimedia.org/wiki/File: Seattle_from_Kerry_Park_(1).jpg$

What data is reported to other cities?





Boston

- Trip Records
- Annual Reports
 - Number of rides and origin and destination of each trip
 - Aggregated and anonymized trip route and length (miles and minutes)
 - Accident locations
- Monthly
 - Detailed driver/rider complaints and the actions to respond to complaints.



 $Source: Boston_skyline_from_Longfellow_Bridge_September_2017_panorama_2.jpg$

Can data & analysis affect policy?





- SF voters will likely have the opportunity to vote this year on imposing up to 3.5% tax on TNC trip fares
- Size of TNC market has prompted regional and local agencies to incorporate TNCs into their forecasting tools
- Transportation and land use development projects subject to more rigorous analysis of potential impacts
- City again looking at downtown pricing

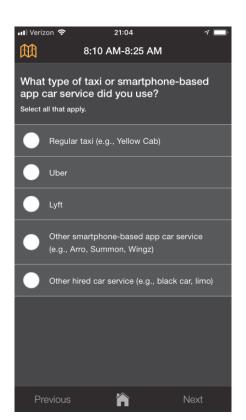


How should agencies get data?





- Need regulatory framework that reflects where impacts occur, and types of impacts
- Require data reporting
- Develop inter-agency data sharing guidelines that address privacy concerns
 - CA agencies are spending millions of dollars to collect relatively small samples of data because although data reported to CPUC, not shared with other agencies.



How should agencies manage data?





Aggregate data is less useful

- Can't say anything about first/last mile
- Can't say anything about congestion impacts
- Can't say anything about transit impacts
- Can't say anything about curb management impacts

Need to protect potentially personally identifiable information

- Public sector already does this effectively
- Should not be an excuse to avoid providing data
- Transparency / accountability are key

Where do we go from here?



- Identify key policy questions
- Require data reporting, using a common data standard (e.g. MDS) that can address these questions
- Adopt privacy protection and data sharing standards
- Encourage multi-jurisdiction / multi-agency collaborations (e.g. CA 4 big MPOs)

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Reports and Visualizations





TNCs & Congestion

- www.sfcta.org/tncsandcongestion
- tncsandcongestion.sfcta.org
- https://advances.sciencemag.org/content/5/5/eaau2670

TNCs Today

- www.sfcta.org/tncstoday
- tncstoday.sfcta.org

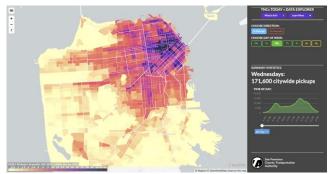
Future Reports

- TNCs & Transit (Sept 2019)
- TNCs & Equity (Dec 2019)

TNCs & Congestion Visualization



TNCs Today Visualization



Thank you.

Joe Castiglione
joe.castiglione@sfcta.org



Questions?



Remaining Questions from the CHAT Box



Wrap Up



Meeting information & presentations will be posted to the I-95 Corridor Coalition website. Participants will receive a link to the presentations after they are posted.

Contact Information

I-95 Corridor Coalition

 Denise Markow, PE, I-95 Corridor Coalition, TSMO Director dmarkow@i95coalition.org, 301-789-9088

Speakers

- Carol Schweiger, Schweiger Consulting <u>carol@tech4transit.com</u>
- Joe Castiglione, San Francisco County Transportation Authority joe.castiglione@sfcta.org





Thank You!