The Future of Mobility --
Anticipating Change in Regional Planning
A “metropolitan planning organization” for New York City, Long Island & the Lower Hudson Valley

A regional council of governments consisting of nine voting & seven advisory members

An organization required by Federal legislation which authorizes funding for transportation

An organization responsible for the mandated metropolitan transportation planning process

WHAT IS NYMTC?
Metropolitan Transportation Planning Process

- **Regional Transportation Plan** (defines long-range needs)
- **Unified Planning Work Program and Members' Planning** (defines the improvements)
- **Transportation Improvement Program** (defines schedule and funding)
- **Congestion Management Process and Regional Emissions Analysis** (analyzes impacts)
- **Project Planning and Implementation** (implements improvements)
WHAT IS THE REGIONAL TRANSPORTATION PLAN?

The basis for federal transportation funding in the NYMTC planning area

A blueprint that helps guide federal investments in the planning area

NYMTC members’ shared strategic vision for the planning area

GUIDED BY FORECASTS OF GROWTH, DEVELOPMENT AND TRAVEL
Anticipating Change is One of Plan 2045’s Key Challenges

Potential changes that could significantly transform *when, how and why* people are traveling and goods are being moved

Critical drivers of potential change:

- Information & communication technologies
- Operational & safety technologies
- Alternative fuels & vehicle technologies
- Employment & economic transformation
- Generational changes
- Land development patterns
- Extreme weather events & resiliency
Categories of Change Anticipated in Plan 2045
1) Changes in Mobility

- **Personal mobility** is likely to evolve from vehicle ownership toward increased use of shared (Shared Mobility), on demand, possibly connected/autonomous vehicles (CAVS).

- **Goods movement** is likely to be impacted by technological changes, including:
  - Distributed additive manufacturing (also known as 3D printing),
  - Vehicle automation and automated delivery, and
  - The further automation of goods production and distribution
Elements of “Shared Mobility”

- Carsharing
  - Roundtrip
  - One-Way
  - Personal Vehicle Sharing (PVS)
    - P2P Carsharing
    - Hybrid P2P-Traditional Carsharing Model
    - P2P Marketplace
    - Fractional Ownership

- Scooter Sharing

- Bikesharing
  - Public Bikesharing
  - Closed Campus Bikesharing
  - P2P Bikesharing

- Alternative Transit Services
  - Shuttles
  - Microtransit

- Ridesharing
  - Carpooling
  - Vanpooling

- On-Demand Ride Services
  - Ridesourcing/TNCs
  - Ridesplitting
  - E-Hail

- Courier Network Services (CNS)
  - P2P Delivery Services
  - Paired On-Demand Passenger Ride and Courier Services

Figure 1: Key Areas of Shared Mobility
Development of Connected & Autonomous Vehicles (CAVs)

SAE AUTOMATION LEVELS

0: No Automation
- Zero autonomy; the driver performs all driving tasks.

1: Driver Assistance
- Vehicle is controlled by the driver, but some driving assist features may be included in the vehicle design.

2: Partial Automation
- Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment.

3: Conditional Automation
- 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.

4: High Automation
- The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.

5: Full Automation
- The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.
2) New Types of Data

- The availability of new types of data will likely result in new approaches to:
  - Providing and using transportation services,
  - Managing the transportation system,
  - New organizational arrangements for service provision and facility management, and
  - New approaches to financing services and infrastructure.

*Personal and organizational access to data is already driving change.*
Metropolitan regions worldwide are and will continue to face unprecedented challenges from the impacts of major global trends including:

- Climate change,
- The future availability and cost of fuels,
- The development of new technologies and energy sources, and
- Changing demographics and lifestyle expectations, changes in land use patterns, and limitations in current transportation finance methods.

3) Major Global Trends
Implications for Transportation?

- There is little doubt that some combination of these drivers will have an impact on either or both:
  - Demand for transportation
  - Transportation service provision

**CHANGES ARE ALREADY OCCURRING DUE TO THESE DRIVERS**
What has already happened?

Current Impacts on Mode Choice

UC Davis report* (October 2017) on the adoption and use of ride-hailing:

- Uber and Lyft attract passengers away from public transit, biking, and walking, in addition to serving as a complementary mode (e.g., for commuter rail).
- The research (and ride-hailing firms themselves) suggest that ride-hailing can be complementary to public transit.
- However, this study finds the net effect across the entire population is an overall reduction in public transit use and a shift towards lower occupancy vehicles (i.e. more cars).

*The UC Davis Institute of Transportation Studies research is the first-ever study with representative data from major cities across America on ride-hailing and its impact on travel decisions.
Schaller Consulting’s February 2017 report provided a detailed analysis of the growth of app-based ride services in New York City from 2014-2016.

- **Ride-hailing ridership tripled** between June 2015 and the fall of 2016.

- In 2015 and to an even greater extent in 2016, *growth in taxi and ride-hailing ridership outpaced growth in transit (subway and bus) ridership* and to become the leading source of growth in non-auto travel in New York City.

- Total vehicular mileage of ride-hailing, yellow cabs, black cars and car services combined *increased from 14 percent to 19 percent of total citywide mileage* during the period in question.

- Ride-hailing accounted for the *addition of 600 million miles of vehicular travel to the city's roadway network* during the period in question, after accounting for declines in yellow cab mileage and mileage in personal vehicles.
Ride-hailing services have been able to take advantage of the pent-up demand consumers have placed on access to urban centers.

- A strong correlation exists between high parking rates in urban metros and ride-hailing market penetration.

- Strong markets for ride-hailing services are found in dense urban centers with a bigger pool of potential customers and in places where parking costs become prohibitive.

- Impacts to parking will vary based upon geographic size and location, density or lack thereof, transit ridership, car ownership rates and costs, ride-share access and costs, demographics and other variables.

-- Walker Consultants, a leader in providing parking consulting and parking design services.
Ride-Hailing and Land Use – what we know so far . . .

What about the converse??

Dr. Giovanni Circella
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Institute of Transportation Studies, University of California, Davis

Land-use mix and population+job density impact the frequency of use of ridehailing.
Plan 2045’s Bottom Line

There is great potential for transformative change.

Future impacts are currently unpredictable.

This argues for a degree of sensitivity testing for the period **beyond the first ten years** of Plan 2045.
Adapting the Planning Approach

- **TOOLS**
  - Optimal use of “big data”
  - Adapting forecasting tools

- **TECHNIQUES**
  - Sensitivity testing
  - Alternate futures
  - Broader geographic scale

- **COLLABORATION**
  - Monitoring trends & emerging concepts
  - Research & benchmarking/networking
  - Vertical integration of planning
  - Topical integration & planning gaps
  - Pilot testing
An Evolving Timeline . . .

A speculative look “down the road”

WILD CARDS:
- Commercial vehicle automation
- Waterborne automation
- Railroad & transit automation
- Distributed manufacturing
- E-commerce

Present to 2025
- CAVs becoming legal & testing/ piloting continues
- Continued evolution of Shared Mobility

2020s
- CAVs introduced in services where drivers are a cost factor
- Increasing levels of automation in the privately-owned vehicles
- Shared Mobility increasingly impacts private vehicle ownership

2030s
- Fully automated CAVs become a significant portion of private vehicle fleet
- Private vehicle fleet remains mixed with varied levels of automation
- Continued evolution of Shared Mobility and away from away from private vehicle ownership
- Level of automation likely insufficient for advanced traffic management

2040s
- Major share of vehicles are fully autonomous
- Level of automation may be sufficient for advanced traffic management and higher levels of Shared Mobility
Discussion

• Are we focused on the optimal mix of potential changes?
• What changes will be most influential in the next ten years? Beyond the next ten years?
• Are we undertaking the optimal approaches in planning for change?
• Are there any potential changes that we’ve missed or that we haven’t fully defined?