The mobility revolution for people and the planet...and other coming disruptions in cities
“New mobility” is a loose term for business models using technology to deliver transport in new ways.
MORE THAN JUST UBER

New mobility start-ups by region and type

- **Commuter experience** refers to business models that support an improved experience for users, often via information sharing that helps people make better decisions.

- **Product innovation** refers to business models that modify or improve transportation assets, like electric vehicles.

- **Data-driven decision-making** refers to business models that use technologies such as sensors and GPS to provide additional insight to drivers and planners.

- **Shared mobility** refers to business models where transport options are shared among users, from cars to bicycles.

Source: WRI Ross Center
IN 2018, 84 MILLION TRIPS WERE TAKEN ON SHARED MICROMOBILITY IN THE US...

IT’S HAPPENING …FAST(ER)

MANY COMPANIES ARE PROVIDING MICROMOBILITY SERVICES ACROSS THE WORLD
The Mobility Ecosystem is Changing

Communities need to define their mobility priorities, and the role modes play in a balanced ecosystem.

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<thead>
<tr>
<th>Mode</th>
<th>Short</th>
<th>Medium</th>
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<td>Cars</td>
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THIS WILL NOT ONLY CHANGE HOW PEOPLE TRAVEL IN CITIES...
This will not only change how people travel in cities...

It will change cities themselves.
THE IMPACTS ARE FAR-REACHING

MOBILITY DISRUPTIONS

- Car sharing
- Ride sharing
- Transit apps
- On-demand consumption
- Electric batteries
- Connected & autonomous vehicles

Source: WRI
We’ve seen rapid transformation in cities before, we know what’s possible…
5TH AVE, NEW YORK, 1913

We’ve seen rapid transformation in cities before, we know what’s possible…
OUR MOBILITY FUTURE

HELL

- Massive sprawl
- Single occupancy modes
- Pollution
- Unsafe streets
- Historic job losses
- Sudden drop in tax revenues
- Unjust, unsustainable cities

HEAVEN

- Compact and accessible
- Shared modes
- Decarbonized
- Complete streets
- Retrained labor
- New (and fair) revenue streams
- Just, sustainable, livable cities
We need to move with greater urgency and impact

NUMO is a global alliance that channels tech-based disruptions in urban transport to create joyful cities where sustainable & just mobility is the new normal.

NUMO is an outgrowth of the Shared Mobility Principles and its allies are ready to align actions and investments to achieve transformational change on the ground.
How are Cities Preparing for the Coming Changes?
Prioritize **People** Movement, Not Vehicles

- Walking
- Bicycling
- Shared Scooters, other Micromobility
- Transit
- Fleets of electric, multiple passenger vehicles
- Other shared vehicles
- Taxi/commercial transit/shared vehicles
- Low or no occupancy vehicles, fossil-fueled non-transit vehicles
- Zero emission vehicles
- Other single-occupant vehicles

*Municipal leaders in Massachusetts want to advance complete streets*

Source: Massachusetts Complete Streets Funding Program
Address fear of change

- Rethink infrastructure and regulation
- Co-design the future
- See innovation as a brand for cities/communities
- Articulate/increase the benefits
- Manage the negatives
Re-imagine and Reallocate the Right of Way

• About 30% of every city is city-owned ROW, including on street parking.

• Cars:
  • NOW Used 5%; Parked 95%
  • FUTURE: Used + 50%; Parked to recharge, service

• Travel and Parking lanes

A reimagining of 19th Street in San Francisco; with fewer cars on the road due to the efficiency of autonomous driving, more space is left...
Key Questions:

• What data should cities request from micromobility providers?

• What data should they request from other modes, including incumbent modes?

• How often should the requested data be provided and in what format?

• How will that data be managed and stored?

• Will there be any privacy guidelines for its collection, storage and usage?
Municipality: New Brunswick, NJ

Traditional measures of housing affordability ignore transportation costs. Typically a household's second-largest expenditure, transportation costs are largely a function of the characteristics of the neighborhood in which a household chooses to live. Location Matters. Compact and dynamic neighborhoods with walkable streets and high access to jobs, transit, and a wide variety of businesses are more efficient, affordable, and sustainable.

Map of Transportation Costs % Income

Location Efficiency Metrics
Places that are compact, close to jobs and services, with a variety of transportation choices, allow people to spend less time, energy, and money on transportation.

35% Percent of location efficient neighborhoods

Neighborhood Characteristic Scores (1-10)
As compared to neighborhoods in all 955 U.S. regions in the Index

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<tr>
<td>8.9</td>
<td>7.2</td>
<td>8.6</td>
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Average Housing + Transportation Costs % Income
Factoring in both housing and transportation costs provides a more comprehensive way of thinking about the cost of housing and true affordability.

- Housing
- Transportation
- Remaining Income

- $10,401 Annual Transportation Costs
- 1.42 Autos Per Household
- 15,582 Average Household VMT

BENCHMARK

Municipality: Washington, DC

Traditional measures of housing affordability ignore transportation costs. Typically a household's second-largest expenditure, transportation costs are largely a function of the characteristics of the neighborhood in which a household chooses to live. Location Matters. Compact and dynamic neighborhoods with walkable streets and high access to jobs, transit, and a wide variety of businesses are more efficient, affordable, and sustainable.

Map of Transportation Costs % Income

Location Efficiency Metrics
Places that are compact, close to jobs and services, with a variety of transportation choices, allow people to spend less time, energy, and money on transportation.

100% Percent of location efficient neighborhoods

Neighborhood Characteristic Scores (1-10)
As compared to neighborhoods in all 955 U.S. regions in the Index

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Average Housing + Transportation Costs % Income
Factoring in both housing and transportation costs provides a more comprehensive way of thinking about the cost of housing and true affordability.

- Housing
- Transportation
- Remaining Income

- $8,700 Annual Transportation Costs
- 1.20 Autos Per Household
- 12,329 Average Household VMT

BENCHMARK
How the Media Sees Scooters

The New York Times
Opinion
Scooter Madness
Cities are swarming with electric scooters. But this is not the ‘micro-mobility revolution’ we need.

The Washington Post
Gridlock
D.C. proposal aims to ‘control’ e-scooters

Bloomberg
Business
You Tube Star’s Death Renews Concerns About E-Scooters’ Safety

THE VERGE
Nashville is banning electric scooters after a man was killed
The mayor will only allow them to return with ‘strict oversight for numbers, safety, and accessibility’

USA TODAY
E-scooters now seem less likely to run people off sidewalks

CITYLAB
A Lawyer Explains Why Electric Scooter Laws Don’t Work
Bird, Lime, and other shared micromobility services are disrupting the legal landscape, too.
Cities and micromobility providers have aligned priorities

CITIES ARE ALREADY ACTING TO:

• Prioritize People over Vehicles
• Build Safe Infrastructure for Micromobility
• Vision Zero/Lower Auto Speeds/Safety
• Change Land Uses to encourage Short Trips
  • Density
  • Mixed Use
  • Transit-orientation
• Reduce Cars/Traffic in Cities
Automobiles are sticky
What cities and micromobility providers *have to gain*

- Car Traffic
- GHGs emissions
- Car Ownership
- Retail “Foot” traffic
- Barriers to > density
- Equitable Low Cost Access
- Market Share

- Ability to Reallocate Parking Spaces, Street ROW to other uses
- Ways to Fill First-Mile, Last-Mile needs, Gaps in Transit Service
INNOVATION IS A BRAND FOR CITIES

Succeed

Fail

Innovate
SmartBike: DC’s First Bikeshare
• **Regional bike transit** system

• Over **5,700** bikes at over **500** stations

• *DC; Arlington, Fairfax County & Alexandria, VA; Prince Georges County & Montgomery County, MD*

32,000 Annual Members

410,000 Casual members

- 80% said they bicycle more often
- 40% said they drive less
- $819/year saved per member ($15 million total)
Encourage a culture of experimentation and learning to meet the needs of all residents.
What other Big Disruptions are coming?

Transportation and Mobility
- Opportunity for Disruption
- Technology-enabled options

Changing Economy/Disparity
- Existence, Habitability
- Information/Action/Choice?

Climate Change/Resilience

Demographics

Technology-enabled options
What other Big Disruptions are coming?

Transportation and Mobility
- Opportunity for Disruption
- Technology-enabled options

Changing Economy/Disparity
- Housing
- Demographics
- Limned in the geography

Climate Change/Resilience
- Existence, Habitability
- Information/Action/Choice?
- Increasing disparities or shrinking ones?
Accumulated barriers to Housing Development: Significant costs to Households, Local Economies

Real Construction Costs and House Prices Over Time

Index, 1980=100

Source: Gyourko, Malloy (2015)

How Have Rents Changed Since 1960?

Median Rents Vs. Median Household Income, 1960-2014

Source: US Census, AC Calculations
Los Angeles – Zoned Residential Capacity Over Time

Source: Morrow (2016)
INEQUALITY IS RISING

• Inequality generally ticked upward throughout the East Coast.
• New Jersey’s income inequality grew at a faster rate than all but a few other states

The selected states below have some of the largest concentrations of wealth in the country. Click on a dot to see what state it represents (New Jersey is in red):

Rising income inequality on the East Coast
0 (equal) — 1 (less equal)

Source: U.S. Census Gini Index of Income Inequality

Numbers are based on a decade’s worth of 1-year estimates.
INEQUALITY IS RISING

- While Essex ranks as the most unequal county in New Jersey, there are high concentrations of wealth across the state.
- In the map at right, the darker areas are the more economically segregated.
It's not just the Knowledge Economy...

Where do we find jobs for everyone else?
The worst flooding ever. So far.

Homes near Silver Sands Beach in Milford were flooded by Hurricane Sandy in 2012. (MICHAEL McANDREWS / Hartford Courant)
Coastal Concentration of Risk

• In 2010, 123.3 million people, or 39 percent of US population lived in counties directly on shoreline.

• 1970 - 2010, population + 40%.

• + 10 million people or 8% by 2020

• 6X population density of inland communities
U.S. 2018 Billion-Dollar Weather and Climate Disasters

- Western Wildfires, California Firestorm Summer–Fall 2018
- Rockies and Plains Hail Storms August 6–7
- Southwest/Southern Plains Drought 2018
- Central and Eastern Tornadoes and Severe Weather July 19–22
- Northeast Winter Storm March 1–3
- Central and Eastern Severe Weather May 13–15
- Northeastern and Eastern Winter Storm January 3–5
- Hurricane Florence September 13–16
- Central and Northeast Severe Weather May 1–4
- Southern and Eastern Tornadoes and Severe Weather April 13–16
- Hurricane Michael October 10–11
- Southeastern Tornadoes and Severe Weather March 18–21

This map denotes the approximate location for each of the 14 separate billion-dollar weather and climate disasters that impacted the United States during 2018.
2018 Billion Dollar Disasters in Context

• 14 Separate billion-dollar disasters in 2018 represent the 4th highest total
• Behind:
  • 2017 (16 events)
  • 2011 (16)
  • 2016 (15)
• 3-year average of 15 disaster events / year, the highest on record, and well above the annual inflation-adjusted average of 6.2 events per year (1980-2018)

The month-by-month accumulation of billion dollar disasters for each year on record. The value for a given year for a given month shows the total number of billion-dollar events that had occurred by that month. Note that there is considerable overlap, and some years’ traces are obscured.
Assessing Shocks and Stresses

- High Frequency/Likelihood
- Low Frequency/Likelihood
- High Consequence
- Low Consequence

Assessment Key:

- Priority Shocks/Stresses

- Insect-Borne Disease
- Access to Education
- Infrastructure Failure
- Civil Unrest/Riot
- Gender Inequality
- Poverty
- Community Cohesion
- Hurricane
- Aging Infrastructure
- Flooding
- Aging Infrastructure
- Community Cohesion
- Poverty
- Gender Inequality
- Access to Education
- Infrastructure Failure
- Civil Unrest/Riot
- Insect-Borne Disease
MICROMOBILITY LANES + STORMWATER MGT + DISASTER EGRESS

- Complete streets definitions might need to expand
- We need MUCH more safe infrastructure in any event
- Can we try to solve these three challenges at the same time?
  - STORMWATER FEES, CSO PROJECT $
  - HAZARD MITIGATION $
  - DISASTER RECOVERY $
  - WATER REVOLVING LOAN FUND $?  
  - OTHER $?
Aren’t we doing Disaster Recovery and Resilience?

Reducing Disparities? Improving Transportation?

No, you are using Physical Planning and Investment to “Win the Economy (and all future economies)”
The future has already arrived. It’s just not evenly distributed yet.

William Gibson