

MANAGING THE NEXT REVOLUTION IN URBAN TRANSPORTATION

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Florida Clean Cities ACES Mini-Conference

Wed. Nov. 20th 1:00 PM

THE TRANSPORTATION REVOLUTION

- Ride hailing
- Micromobility
- Shared mobility
- Vehicle electrification
- IT Connectivity
- Vehicle automation



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WHAT CAN WE LEARN FROM TRANSPORTATION HISTORY?

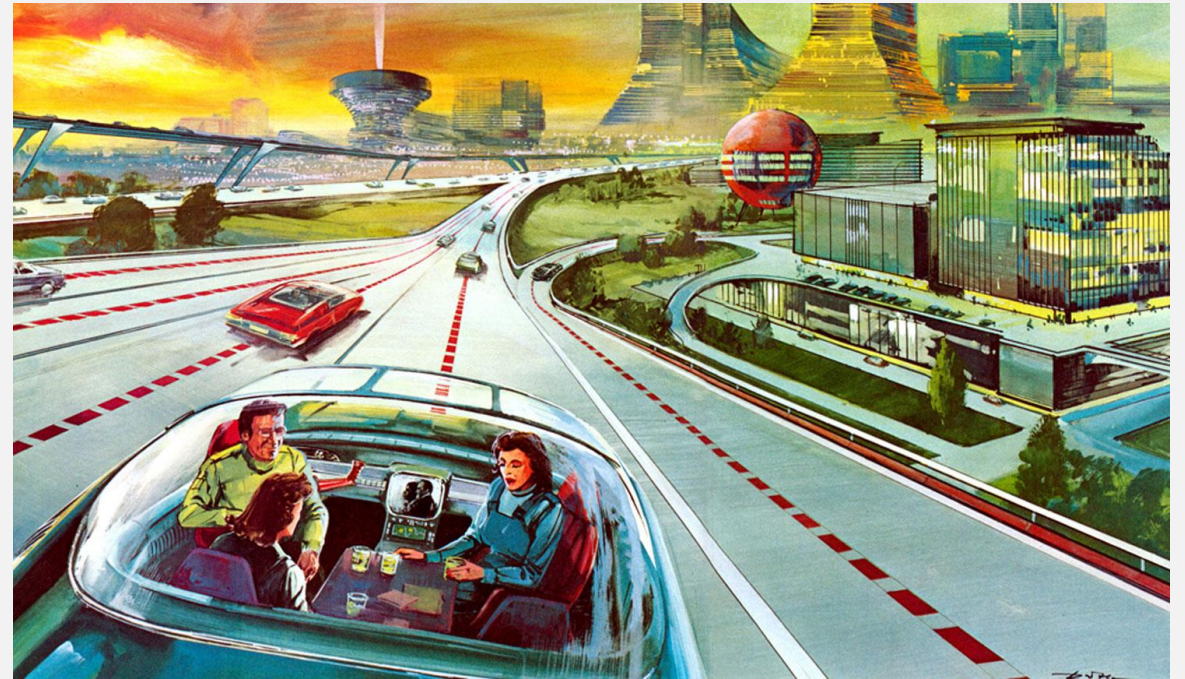
- Dramatic changes to transportation can happen quickly
 - Sailboat, steamship, railroad, car, airplane
- The public sector often lags the private sector
- Infrastructure lags vehicles
- New planning institutions are needed with new technologies
 - Institutions and finance play a huge role in what gets built and who decides
 - I.e.: the Highway Trust Fund

PLANNING PRINCIPLES FOR THE TRANSPORTATION REVOLUTION

1. Avoid techno-determinism
2. Place slow modes (the pedestrian) at the center
3. Focus on high-speed transit
4. Measure performance correctly
5. Require robust data sharing by all
6. Break down modal silos

AVOID TECHNO-DETERMINISM; START WITH VISIONS, VALUES, AND GOALS

- **Congestion:** The tail that wags the dog
- CAVs as the congestion silver bullet??
- Start with vision, goals, and values



Norton, Peter. "Going Faster in the Wrong Direction? History's Lessons for the Future of Roads and Streets," *Linking the Past to the Future: Lessons from History about Emerging Technology*, ed. Martin Wachs (Washington: Transportation Research Board, 2015), pp. 5-9

START PLANNING WITH VISIONS AND GOALS

Some important planning goals:

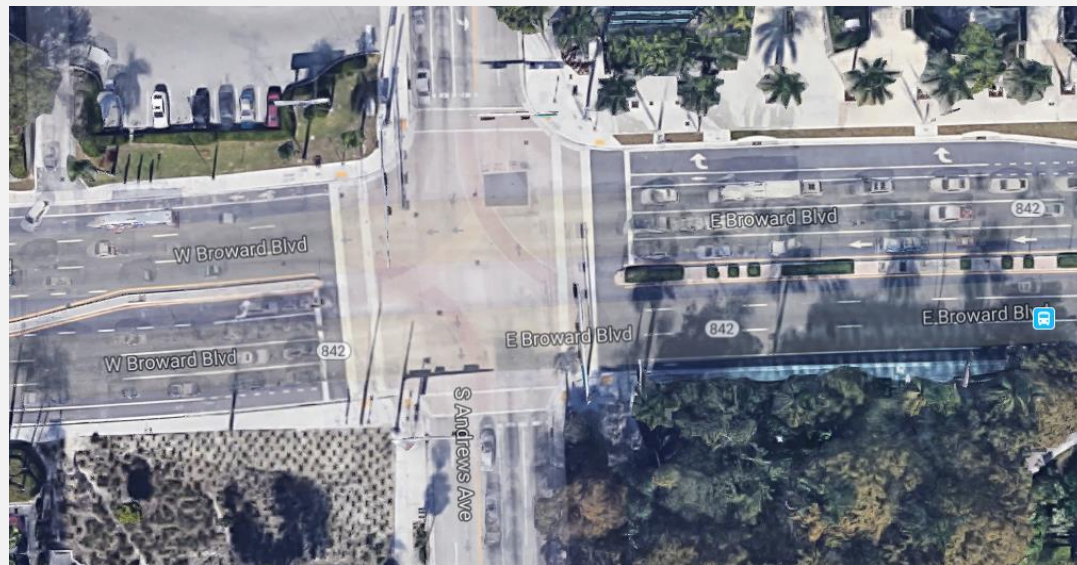
- Safety
- Equity
- Climate Change
- Health
- Congestion
- Place-making
- Economic development

PLACE SLOW MODES AT THE CENTER

- Slow modes: pedestrian, wheelchair, bicycle, electric scooter
- Allow a rich and flexible access to city life
- Facilitate equity
- Promote health
- Reduce environment impacts
- Raise property values



PLACE SLOW MODES AT THE CENTER



Broward Boulevard, Downtown Fort Lauderdale



Source: NACTO Urban Street Design Guide

FOCUS ON HIGH-SPEED, HIGH-QUALITY TRANSIT

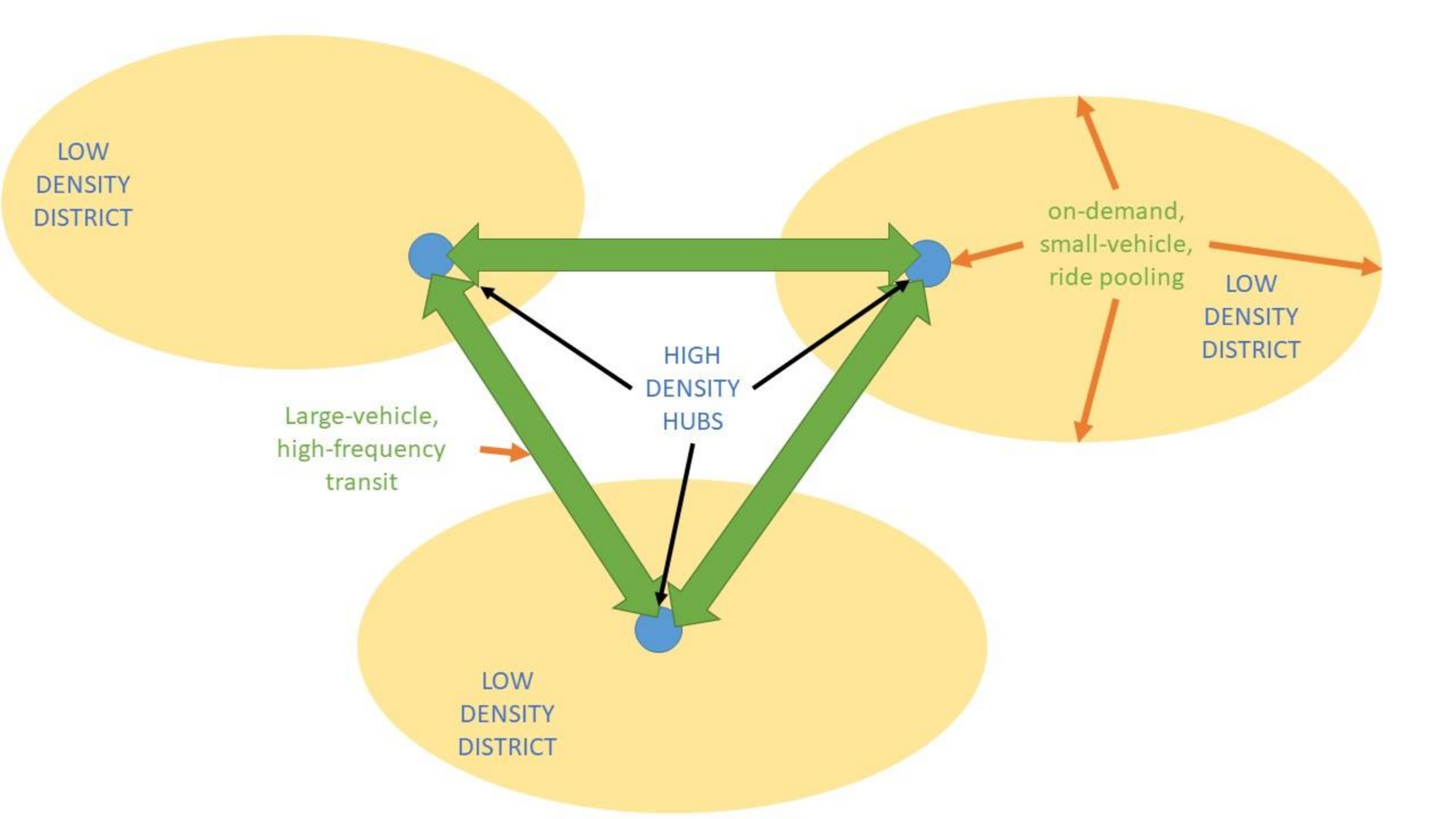
- Currently transit is split between two goals: **coverage** and **frequency**
- Coverage aspects of transit routes can be replaced by slow mode access and/or ride-hailing access
- Transit succeeds where transit has a dedicated lane! (Los Angeles, Seattle)
- **Only high-capacity vehicles can solve congestion!!**
- Transit amenities are important – Wi-Fi, arrival times, shelters



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LOS ANGELES BUS VIDEO

- <https://twitter.com/i/status/1153807208229957632>
- <https://www.fastcompany.com/90383070/a-simple-17-second-video-makes-an-unequivocal-case-for-bus-only-lanes>



MEASURE PERFORMANCE CORRECTLY

PMT/VMT

- Person Miles of Travel / Vehicle Miles of Travel
- More people in fewer vehicles
- Indicator of both climate change mitigation and congestion reduction
- **Mode neutrality** - Compares public transit, microtransit, ride-hailing, and private vehicles on an equitable basis

MEASURE PERFORMANCE CORRECTLY

TRIPS/VMT

- Total Trips by All Modes / Vehicle Miles of Travel
- Longer trips are not necessarily more valuable than shorter trips
- Any trip – including slow modes – is a signal of transport system success

REQUIRE ROBUST DATA SHARING

- Facebook, Google, and Amazon show us that data = power = money!
- Right now the government gives data away for free, while the private sector monetizes data
- In transportation, efficiency of operations and coordination across operators and infrastructure requires open data
- Arguably anyone who uses public streets has an obligation to share some of their data with the public

REQUIRE ROBUST DATA SHARING: SAFETY

- Post-crash, require that CAVs share the last minute of Basic Safety Message Data
- We do not have to be experts in software to determine if a CAV is responsible for a crash
- If an attentive, experienced human driver could have avoided the crash, then a CAV should avoid a crash

Basic Safety Message:

- Vehicle size
- Position
- Speed
- Heading
- Acceleration
- Brake system status
- Transmitted 10x per second

REQUIRE ROBUST DATA SHARING: TRAVEL PATTERNS

- From all transportation service providers (all modes):
 - Vehicle miles traveled; passenger miles traveled; trips
 - Curb usage, such as parked scooters, or ride-hailing pickups, by hour
 - Origin-destination flows, to understand travel demand (aggregated)
 - Origins and destinations, to measure service equity, (aggregated)

REQUIRE ROBUST DATA SHARING: TRAVEL PATTERNS

- For large providers or data aggregators:
 - Segment-level traffic volumes by hour
 - Segment-level speeds by hour
- Data can be aggregated over a month and reported by hour for each hour of a week

REQUIRE ROBUST DATA SHARING: REAL-TIME DATA

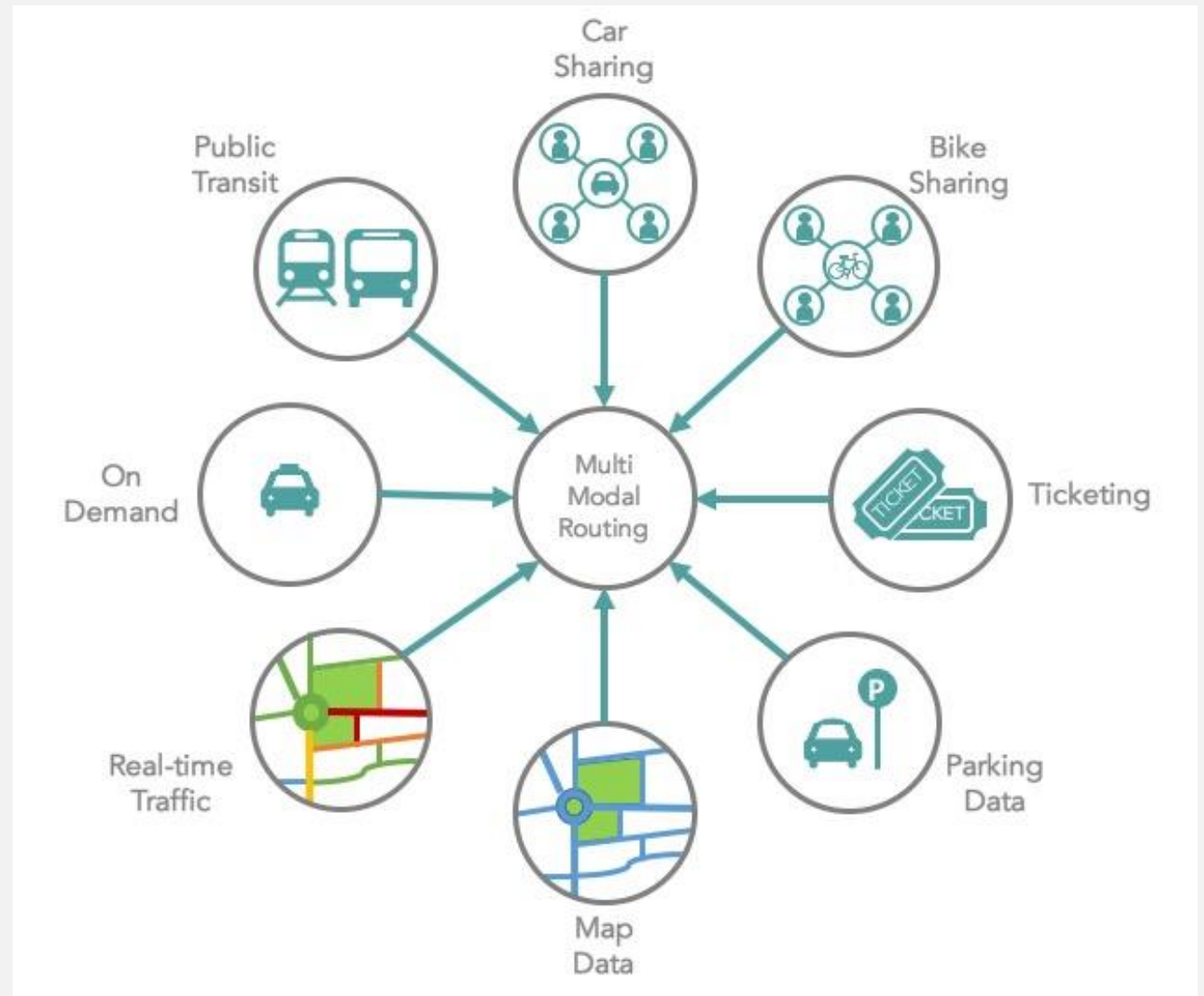
- Real-time data must be shared to:
 - Coordinate transfers
 - Facilitate mode choice
 - Manage parking
- Private sector hosting may pose moral hazard of manipulation or privatization
- Public sector hosting may pose privacy risks
- Third-party data transportation authority??

BREAK DOWN MODAL SILOS

- Streets and congestion: traffic engineers
- Public transit: transit operators
- Micromobility: city planners
- Sidewalks: public works engineers
- New, multimodal planning institutions needed

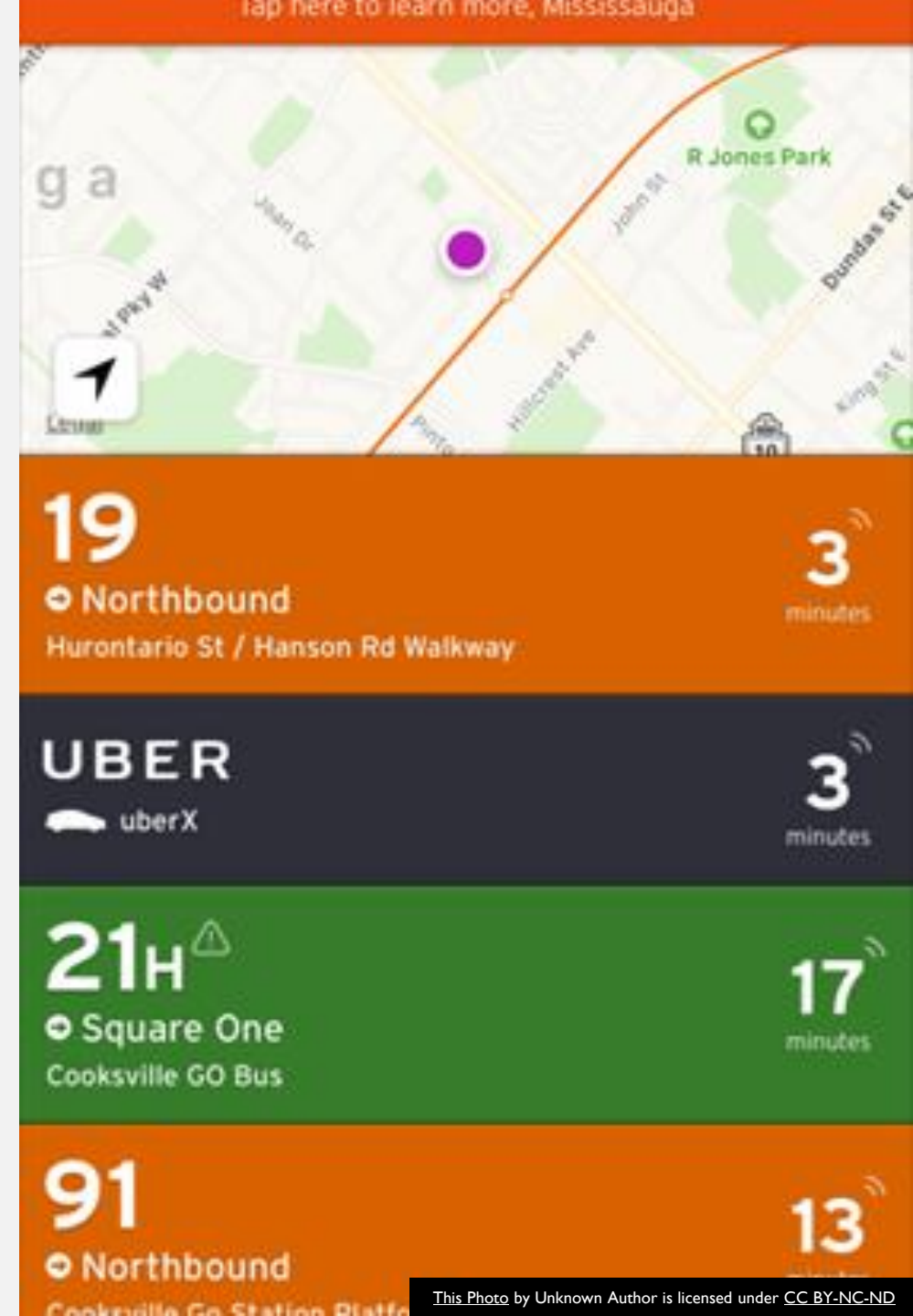
MOBILITY-AS-A-SERVICE (MAAS)

- Provide a rich suite of mobility alternative to the private vehicle
- Make it possible to live without owning a private vehicle
- Integrate public transit, car share, ride-hailing, and micromobility



BREAK DOWN MODAL SILOS

- Provide access to all transportation services through a single app
- Ensure the app treats all service providers equally



BREAK DOWN MODAL SILOS



Start with an affordable monthly transit pass



Add an option for discounted bikeshare



Add an option for a few discounted ride-hailing rides per month



Add discount to car share



Create a full MAAS alternative to vehicle ownership

PLANNING PRINCIPLES FOR THE TRANSPORTATION REVOLUTION

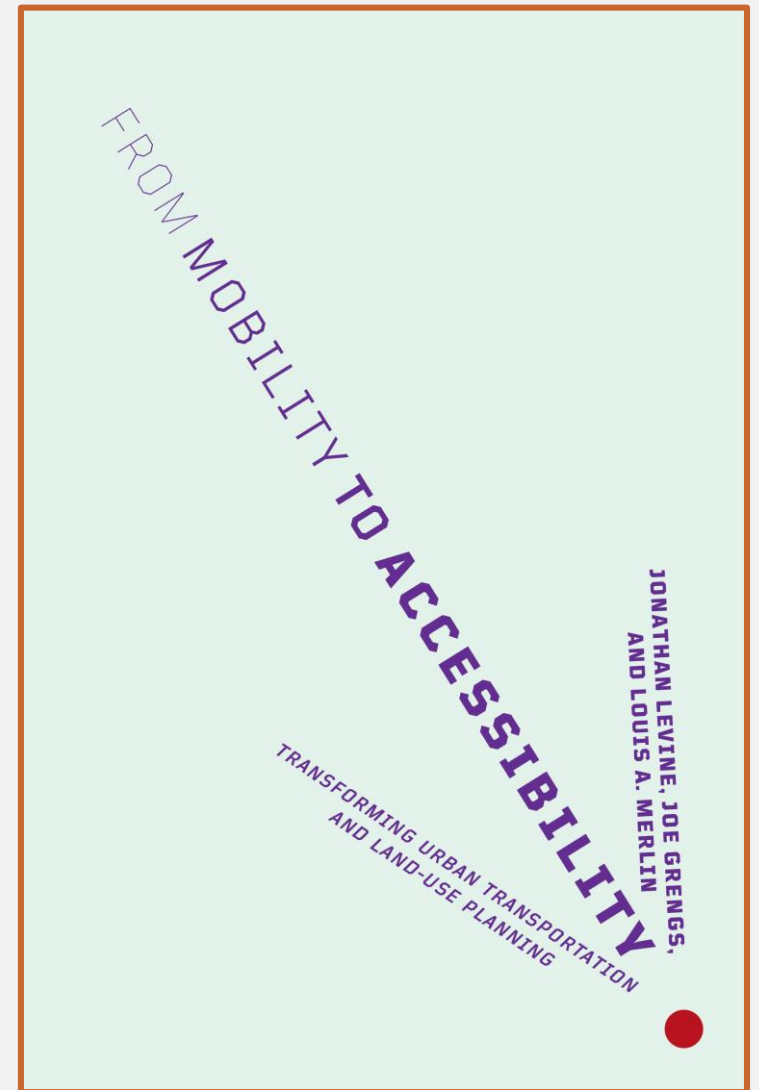
1. **Avoid techno-determinism**
2. **Place slow modes (the pedestrian) at the center**
3. **Focus on high-speed, high-quality transit**
4. **Measure performance correctly**
5. **Require robust data sharing by all**
6. **Break down modal silos**

KEY REFERENCES

- Merlin, L.A. (2019). Transportation Sustainability Follows From More People in Fewer Vehicles, Not Necessarily Automation. *Journal of the American Planning Association*, 1–10. <https://doi.org/10.1080/01944363.2019.1637770>
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- Jittrapirom, P., Caiati, V., Feneri, A.-M., González, M. J.A., Ebrahimigharehbaghi, S., & Narayan, J. (2017). Mobility as a Service: A critical review of definitions, assessments of schemes, and key challenges. *Urban Planning*, 2(2), 13. <https://doi.org/10.17645/up.v2i2.931>

QUESTIONS

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