

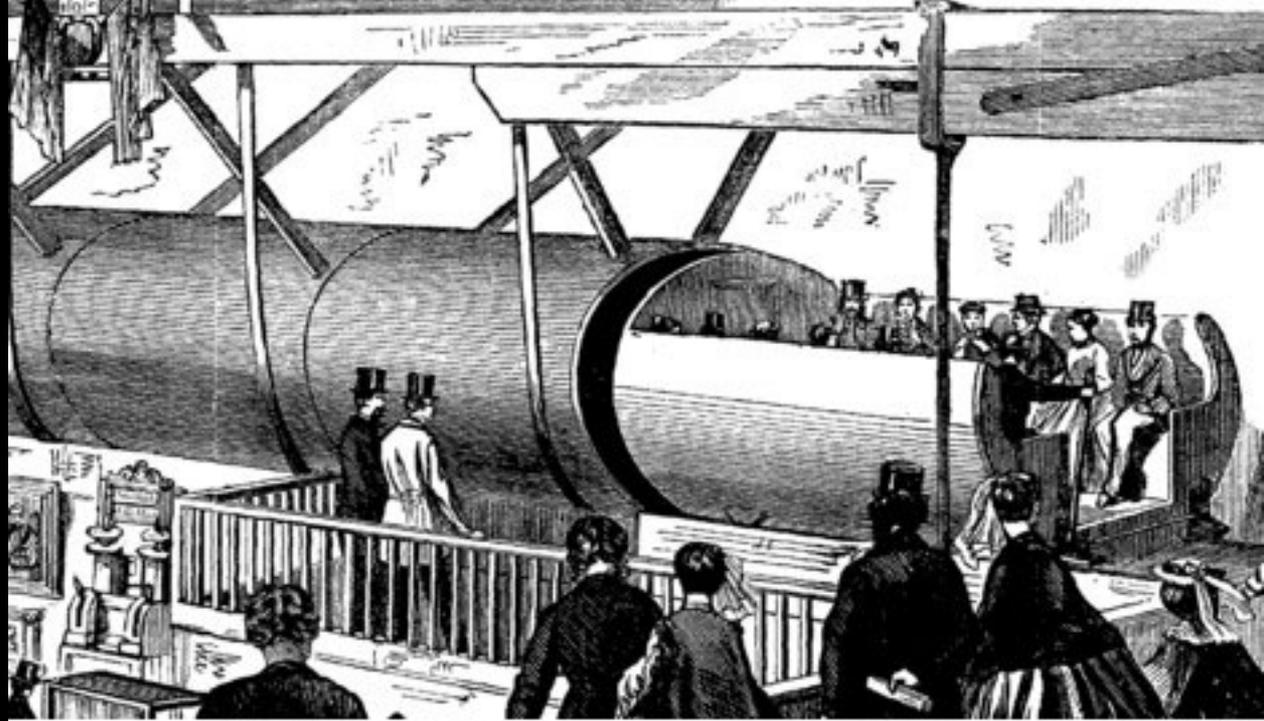
Mobility For a more Sustainable Future

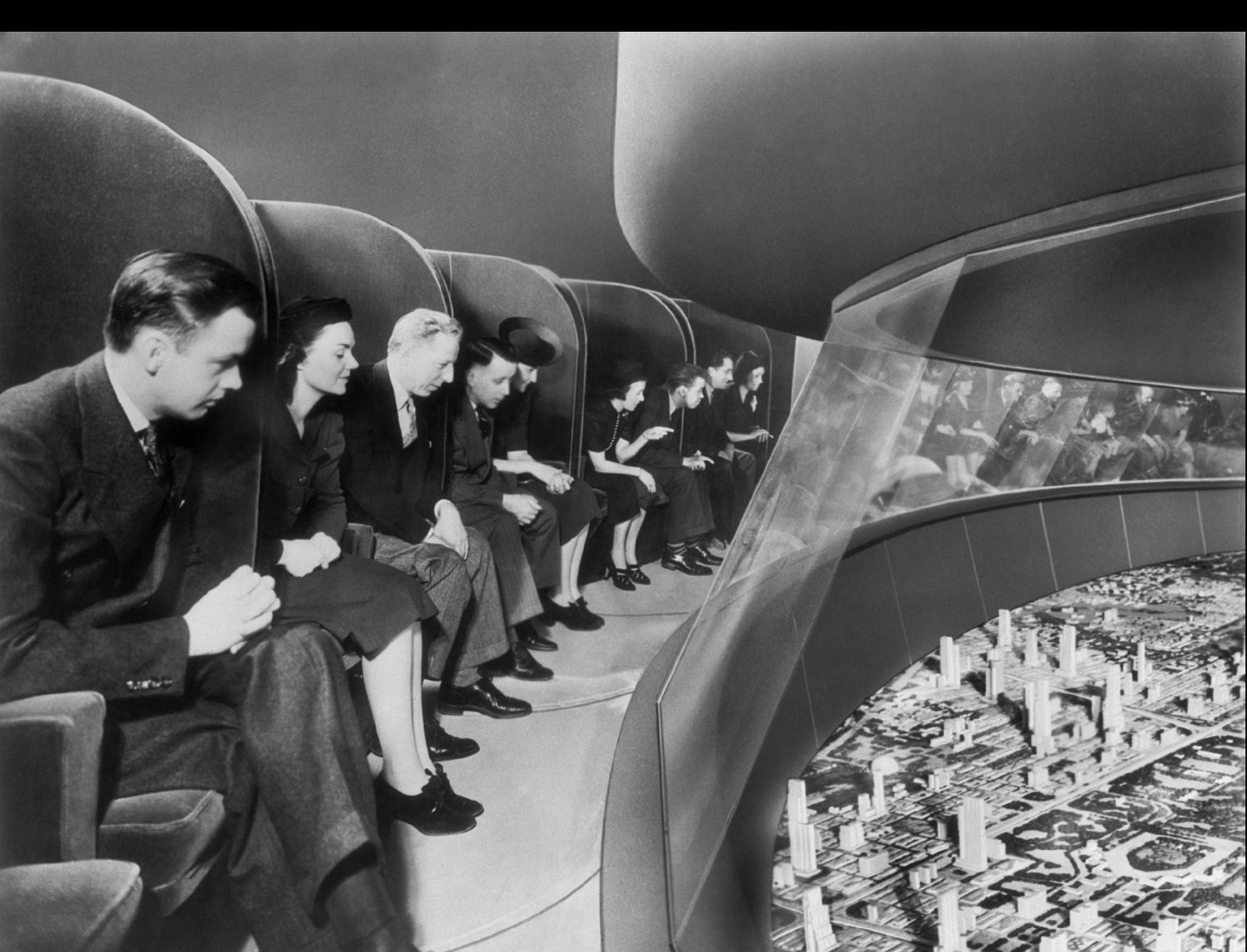


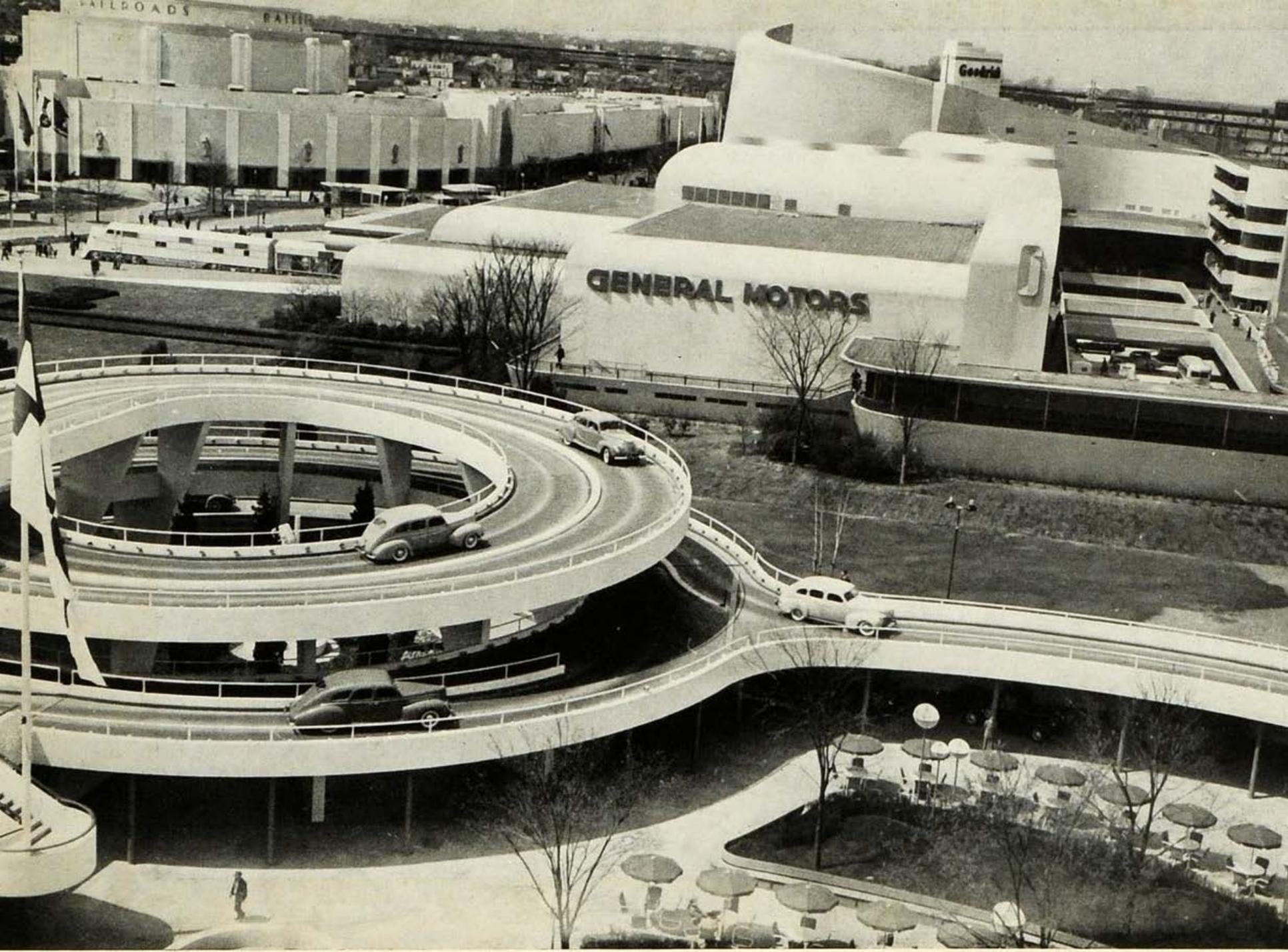
Jeffrey Tumlin
Boulder, March 21 2018

**Why
Transportation?**

Hyperloop: 1867







GENERAL MOTORS

Goodrich

RAILROADS PATER



THE *Jetsons*



Dallas Morning News <http://www.dallasnews.com/news/transportation/20121125-plan-ahead-then-navigate-lbj-freeway-construction.ece>

**What is
Sustainable
Mobility?**

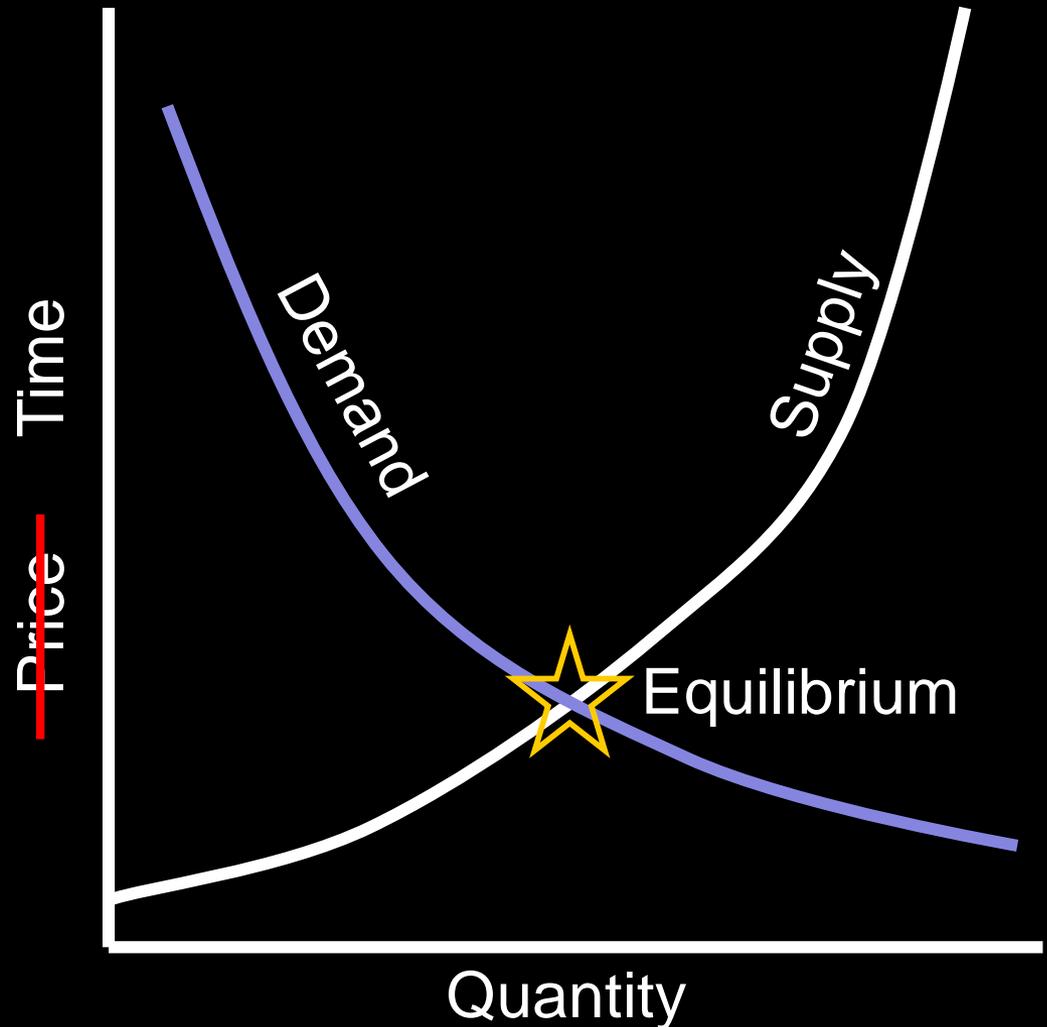
Personal Mobility: Most Inefficient Sector

- Cars used only
5% of useful life
- Only 25% of
capacity used

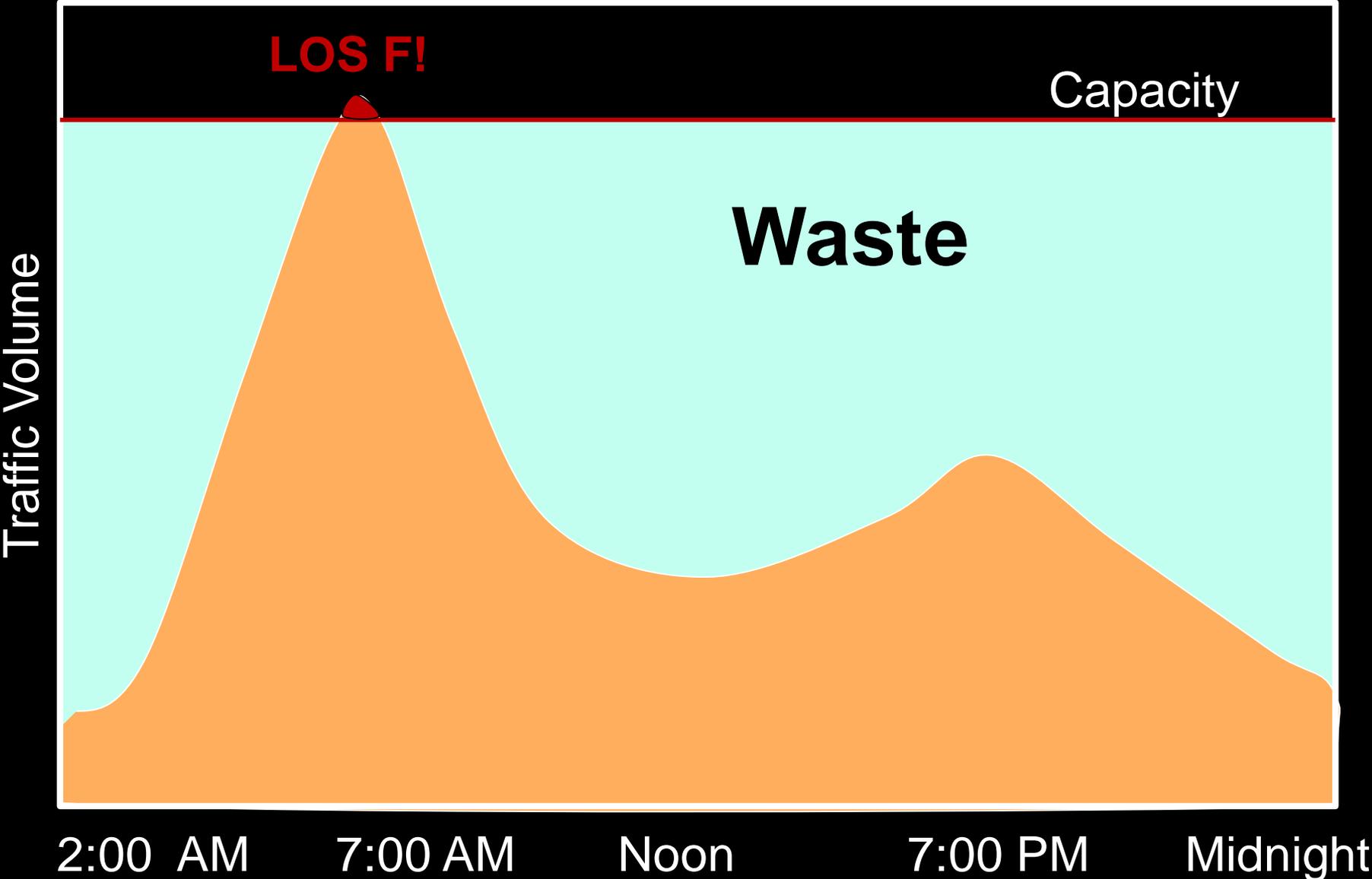


Transportation Demand Management

- Making more efficient use of existing infrastructure
- Making sure mobility is always available, whenever needed



Traffic Economics



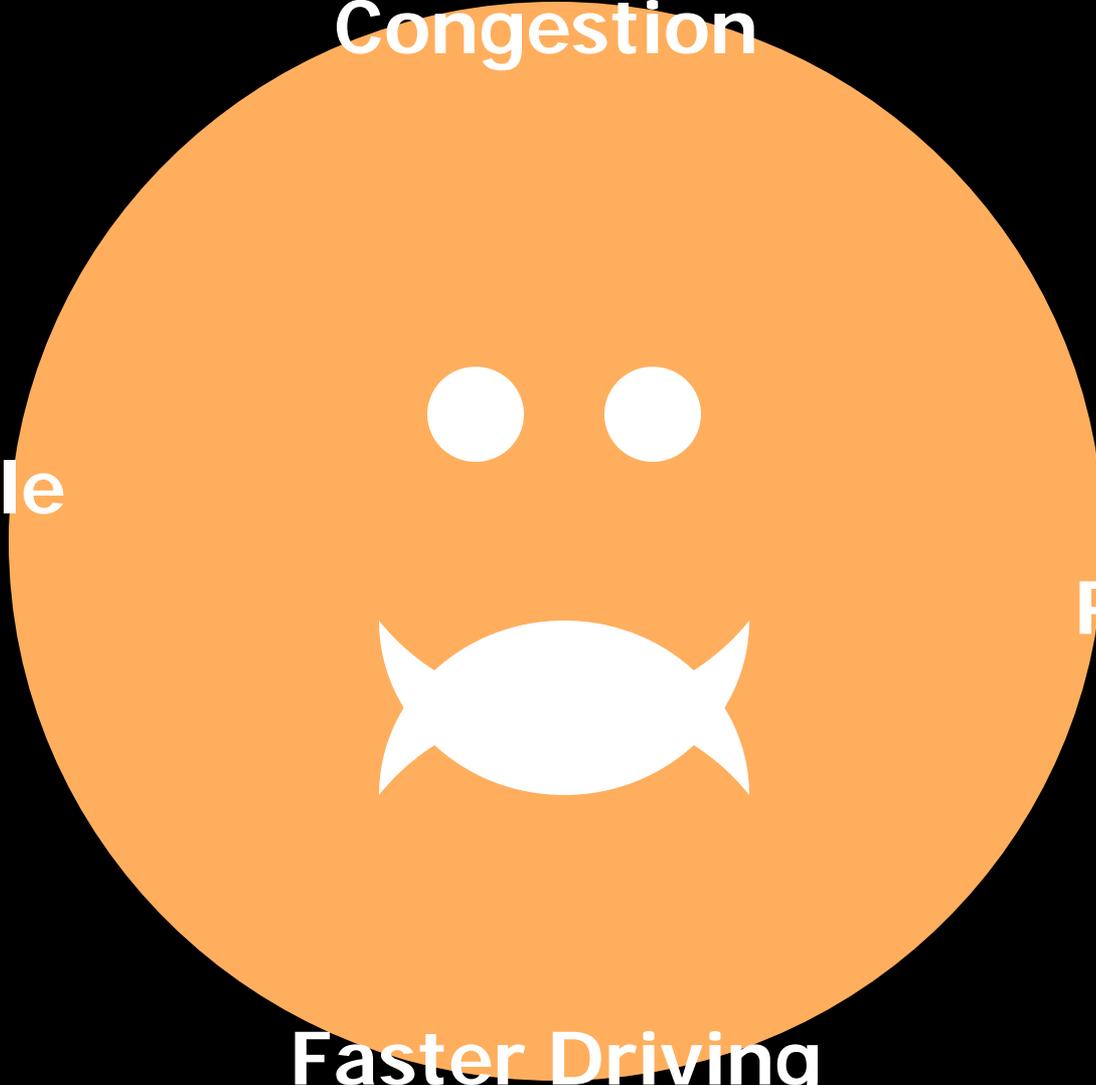
Induced and Latent Demand

Congestion

**More People
Drive**

**Widen
Roadway**

Faster Driving



Congestion

is an

economic problem,
not a technology or
infrastructure problem



Image source: Dinwiddie Monitor <http://dinwiddie-monitor.com/2016/01/heroin-addiction-affecting-communities-across-the-country/>

Geometry
Not Ideology

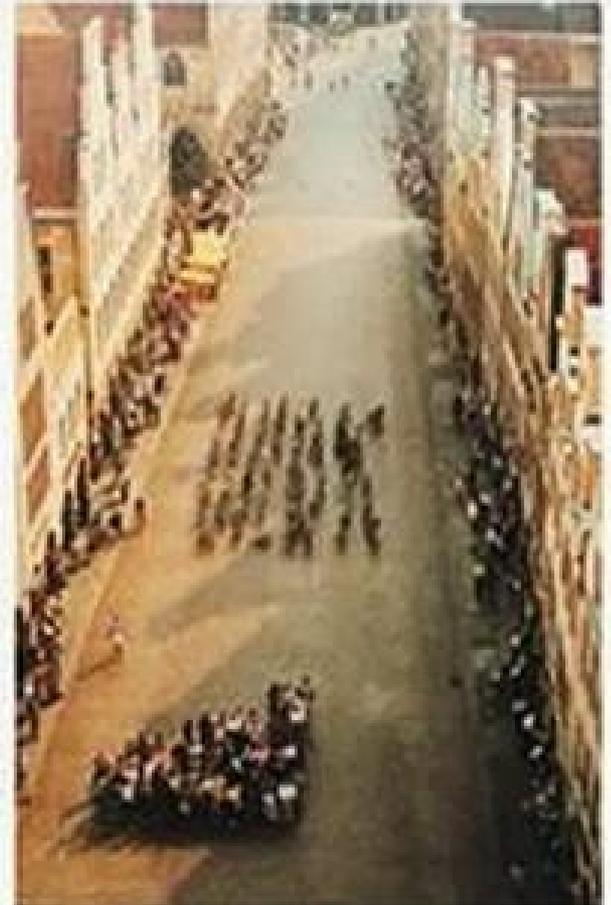
Space required to transport 60 People



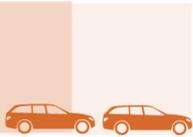
Car



Bus



Bike



PRIVATE MOTOR VEHICLES
600–1,600/HR



MIXED TRAFFIC WITH FREQUENT BUSES
1,000–2,800/HR



TWO-WAY PROTECTED BIKEWAY
7,500/HR



DEDICATED TRANSIT LANES
4,000–8,000/HR



SIDEWALK
9,000/HR



ON-STREET TRANSITWAY, BUS OR RAIL
10,000–25,000/HR

As cities grow, they have no choice but to reallocate space to more space efficient modes.

In order to make it possible to drive for those who need to, make it easy to not drive for those who don't.

But

Autonomous Vehicles

Will save us, right?





Pop Quiz:

Who's investing the most in autonomous vehicle technology?

Pop Quiz:

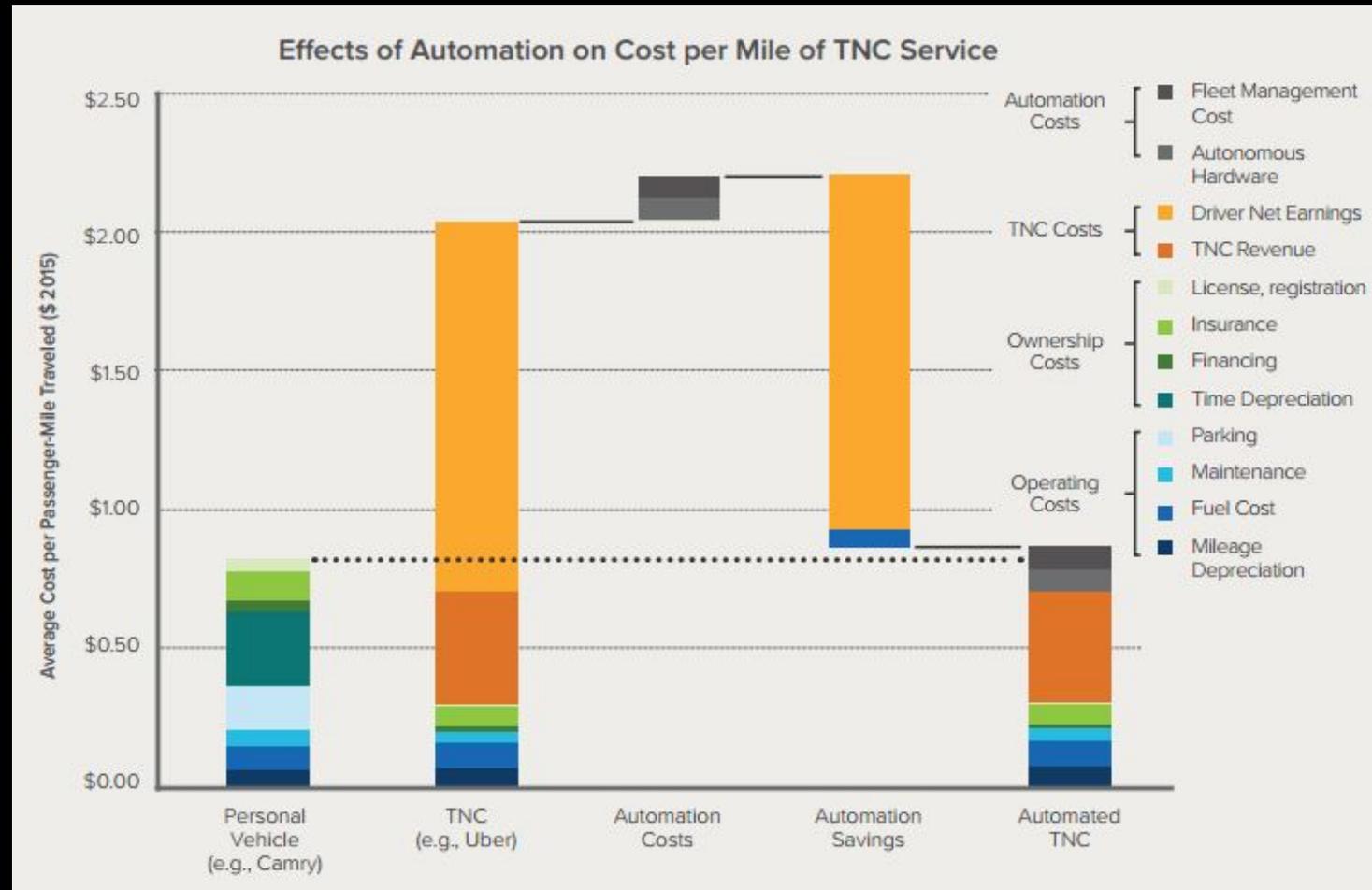
**What's
Google/Alphabet/Waymo's
revenue model? Selling
information, right?**

~ 96%
of Google's revenue is
Advertising

Cost Models

FACTORS THAT MAY DETERMINE ADOPTION MODEL

- Cost per ride: \$1 threshold vs. traditional autos
- Cost of AVs: Too costly for vast majority of people?



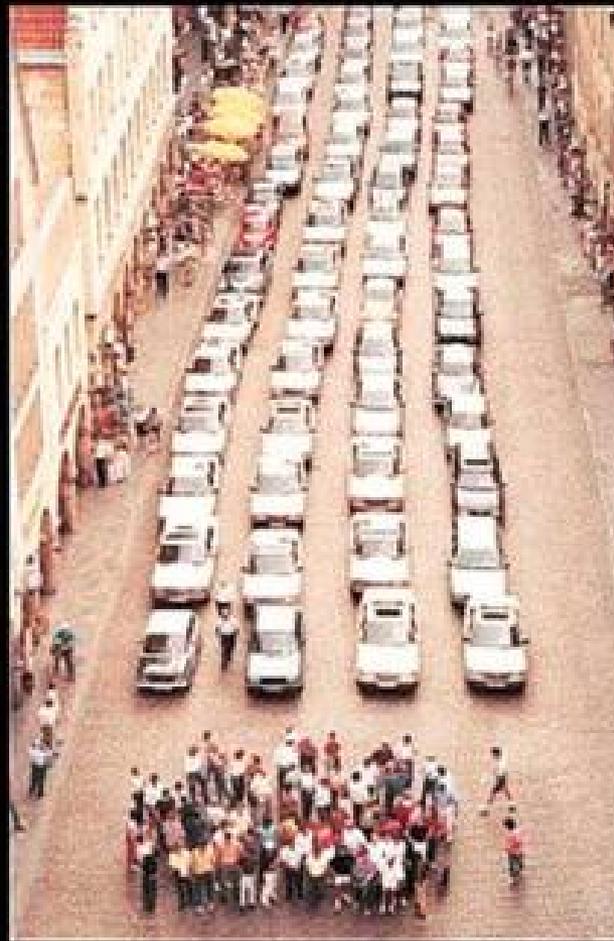
Minority Report



space required to transport 60 people



car



uber



autonomous car

**So What Should Boulder
be doing Now?**

Manage the street

- Manage public right-of-way for public good
- Dedicate space for most efficient modes
- Price congestion
- Price wasted space



Price Wasted Space for Efficient and Equity



Manage the curb

- Design standards for curbside dropoff
- Fees for curbside access
- Promote shared use
- Eliminate dropoff/bike conflicts



Build more compact, walkable housing

- The only good transportation plan is a good housing plan
- Boulder's lack of housing is the cause of its VMT and traffic problems

Objectives	Baseline	Progress	Trend
Reduce VMT in the Boulder Valley by 20% by 2035	1994 level of 2.44 million daily VMT for the Boulder Valley; target now 1.9 million daily VMT	VMT was last estimated at 2.49 million in 2016	<p>1994 2016</p>
Reduce SOV travel to 20% of all trips for residents and to 60% of work trips for nonresidents	1990: 44 percent SOV mode share for residents	Resident SOV mode share was 36% in 2015	<p>1990 2015</p>
	1991: 81 percent non resident SOV commute mode share	Non resident SOV mode share was 78% in 2017	<p>1991 2017</p>
Achieve a 16 percent reduction in GHG emissions and continued reduction in mobile source emissions of other air pollutants	423,892 million metric tons of transportation related GHG in 2012	448,994 million metric tons of transportation related GHG in 2016	<p>2013 2015</p>

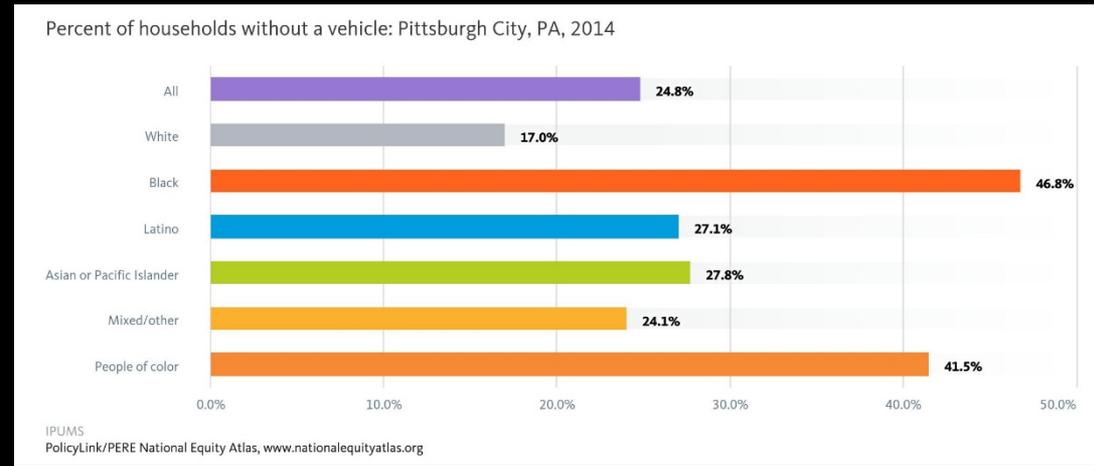
Modernize parking regulations

- Price for availability
- Eliminate minimums
- Establish maximums
- Unbundle
- Share
- Promote adaptability



Establish data protocols for public good

- Data should inform transportation system
- Barriers to flow of data between public and private sector
- Disaggregate data by race, income, and other demographic categories.
- Explain the problem that data will solve.



Quantify and Promote Equity

- Focus on outcomes:
 - Health
 - Access to employment and services
 - Share of income and time spent on mobility
- Consider ethnicity, income, age, ability, gender
- Price least efficient modes to subsidize mobility for those with the fewest choices
- Private profit motive will ignore those with greatest need



Reorganize government around mobility

- Be decisive about public transit agency survival
- Realign taxation: replace gas and parking taxes with VMT and congestion fees
- Align public right of way ownership (state, county, local) with operations
- New regional mobility authorities?



Transit Must Lead

- Best contexts for AVs:
 - Long haul trucking
 - Bus Rapid Transit
- Cities must partner with transit operators:
Dedicated right of way in exchange for AV BRT, 24/7 every 2 minutes
- Begin process now to minimize any job loss

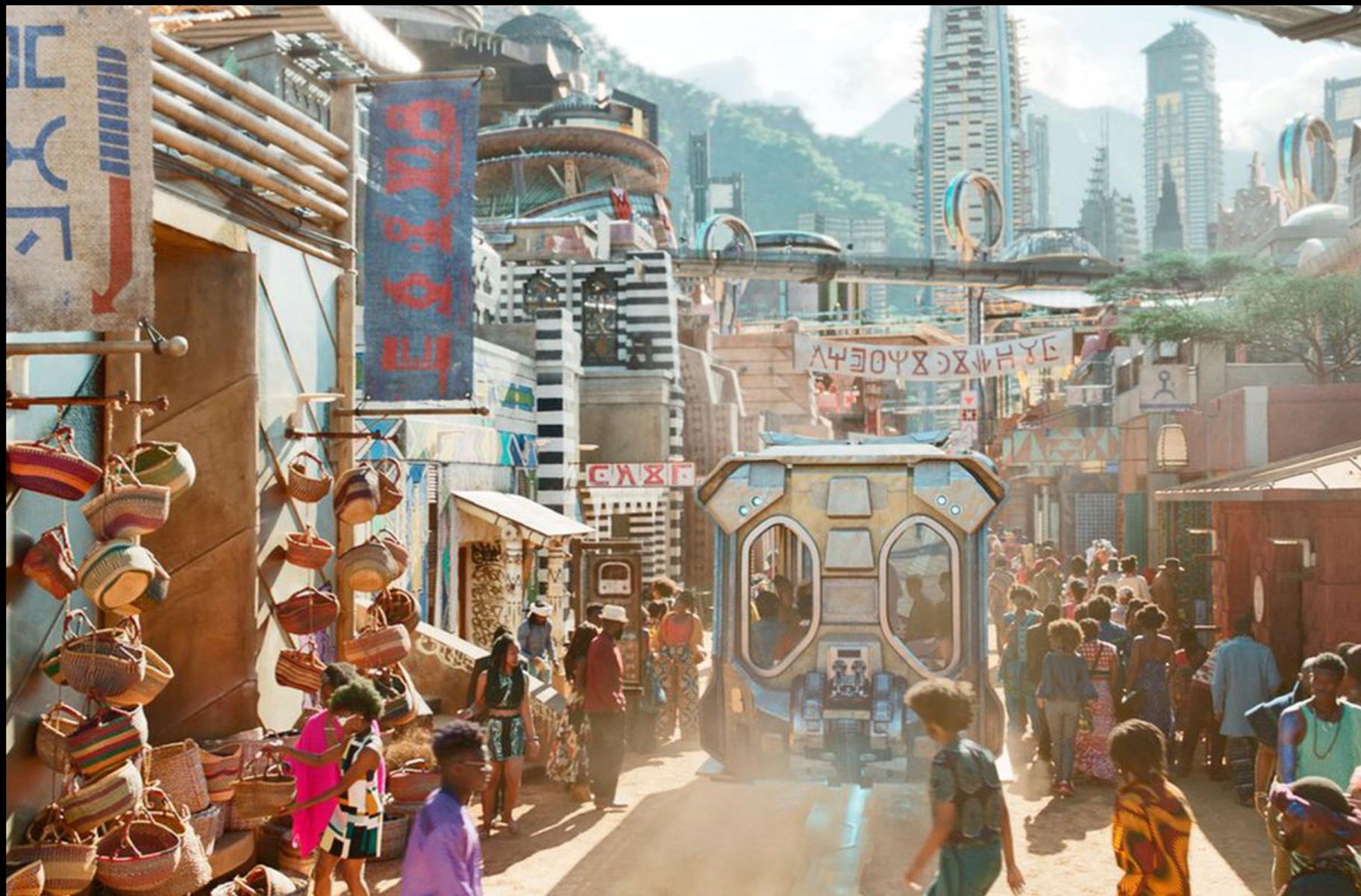


Provide a quality future of work

- 4.4 million American workers are drivers
- Partner with labor leadership now
- Future jobs require tech or customer service skills
- Current trajectory jeopardizes public sector pensions



Tell Better Stories



**It's not sustainable
if it's not beautiful**



Signspotting.com



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