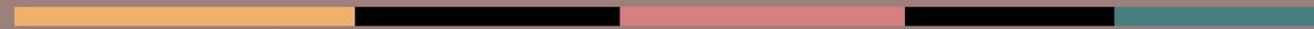


**DRAWDOWN
GA**

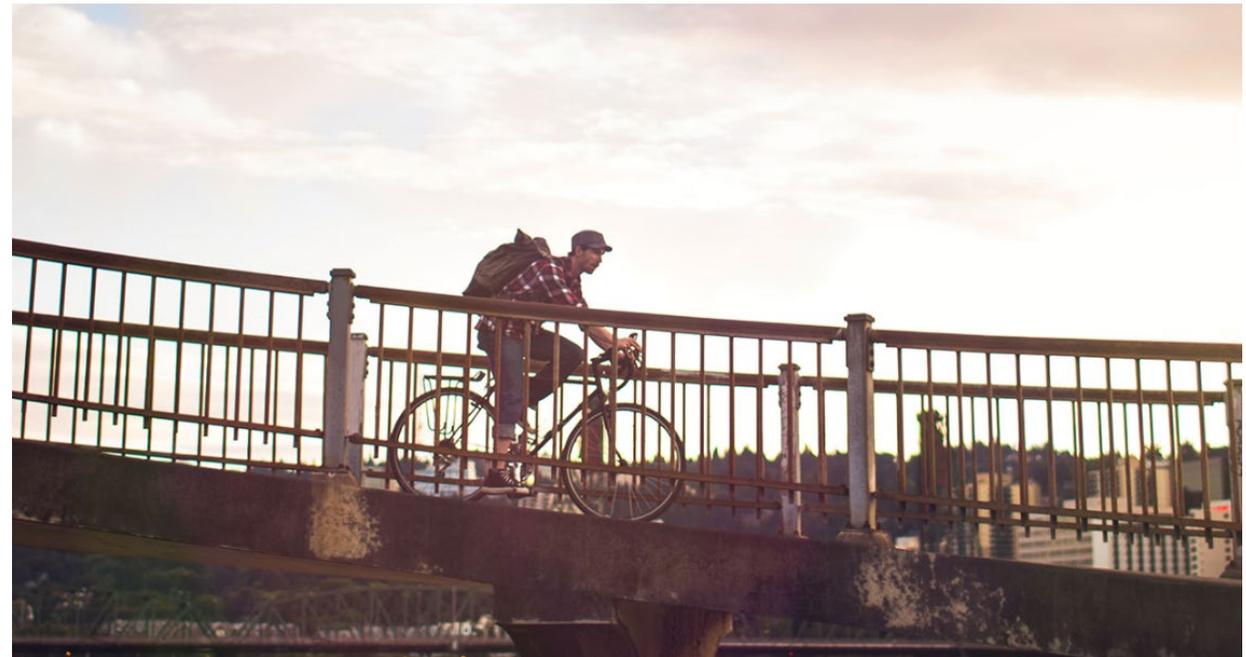
Alternative Mobility: A high impact solution for reducing carbon emissions in Georgia



Alternative Mobility

Replace emissions-intensive vehicle miles traveled with zero-carbon alternatives

- Cars dominate transportation in the U.S.
 - 204 million personal vehicles
 - 1 hr per day driving on average
 - 87% of daily trips in personal vehicles
 - 91% of commutes in personal vehicles
- Alternatives available
 - Bicycle infrastructure
 - Walkable cities
 - Telepresence



Potential for Carbon Reduction Estimation

Market penetration scenarios:

1. **Achievable potential:** estimated considering an additional 5% (low-achievable) or 10% (high-achievable) of urban vehicle trips under 4 miles (relative to the current levels) would be displaced by walking and cycling, and 10% (low-achievable) or 20% (high-achievable) additional telecommuting by 2030.
2. **Technical potential:** estimated considering 45% of all trips were taken by bike or walking, and 50% additional telecommuting by 2030.

Methodology:

1. Federal Highway Administration 2017 National Household Travel Survey
 - Data on Georgia vehicle miles traveled (excluding rural areas)
 - Distribution of trips by distance – GA percentages 20% higher than U.S. average
2. Emissions intensity of vehicles using registration data – 0.411 kg/mile
 - Decreased to reflect EIA 60% projected fuel economy improvement by 2050
3. Jobs with partial telework option – 50% of all non-farm jobs in GA – 2.33 million jobs
 - 20-mile average commuting distance = 10 billion vehicle miles traveled per year

Private Costs and Benefits Estimation - Achievable Potential

Assumptions

- Achievable potential would result in bike/walk share of trips increasing to 45-55% for <0.5 miles, 22-32% for <4 miles
- All eligible workers would telecommute 1 additional day per week for 20% increase
- Vehicle miles traveled will remain constant until 2030 (conservative assumption)
- Each additional mile of bike lane constructed increases bike ridership by 1% and costs \$500k
- Enabling more telework is cost-neutral and excluded from analysis
- Discount rate range from 3-7%, assuming government-led initiative
- Private benefits reflect annual savings from avoided VMTs - \$0.60 per mile

Results

PV Private Costs	PV Private Benefits
\$1.3 Billion – 1.7 Billion	\$7.4 Billion – 9.7 Billion

Current State of Alternative Mobility in Georgia

Mode share distribution in metro Atlanta by trip distance (2015)

Atlanta Regional Council (ARC) Plan 2040 Travel Demand Model

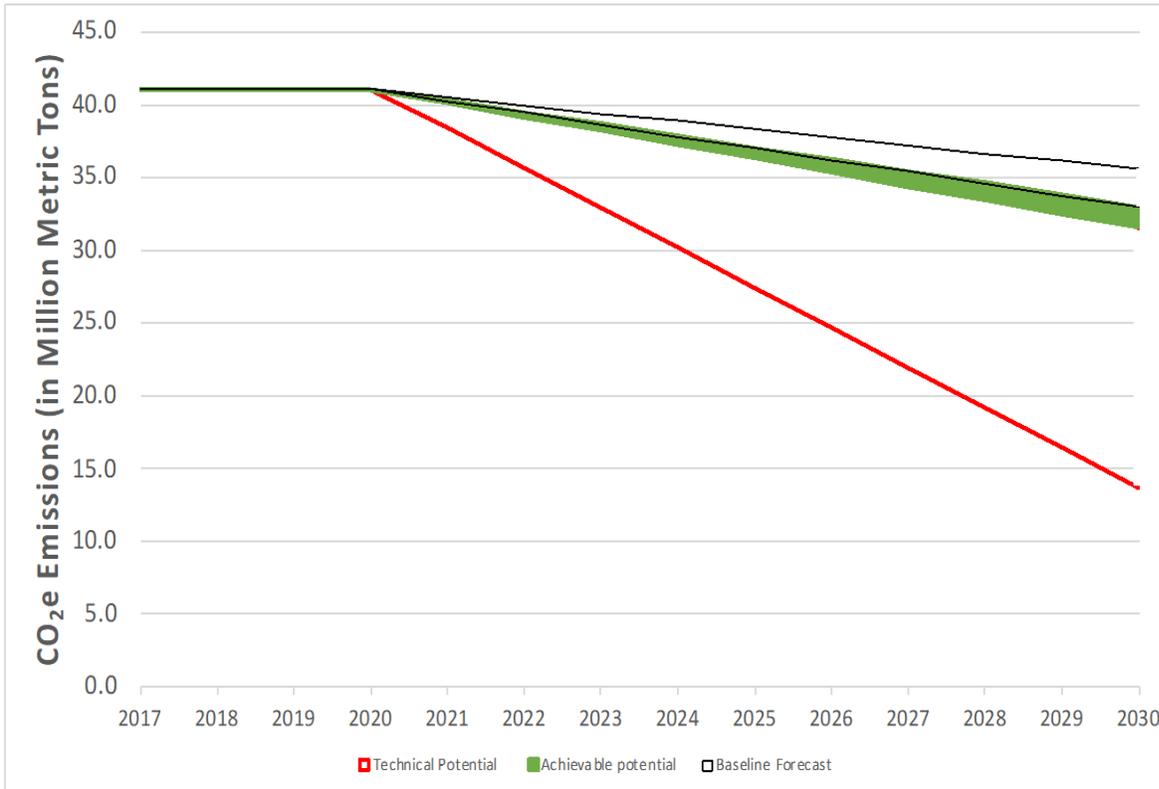
Distance	Bike + Walk Share	Transit Share	Auto Share
<0.5 mile	35.4%	0.2%	64.4%
0.5-1 mile	24.6%	0.3%	75.0%
1-2 miles	17.6%	0.5%	81.9%
2-4 miles	12.2%	0.6%	87.2%
>4 miles	0.2%	1.5%	98.3%

- Personal vehicles dominate mode share at all trip lengths – likely higher outside metro area
- Atlanta Regional Council
- Georgia Commute Options (ARC/GDOT) – incentivizes businesses to use alternate transport
 - Walk-Bike-Thrive (ARC) – outlines vision for a more connected city for walking and biking
 - Approved \$173b over 30 years for transportation issues, \$10b for bike and walking paths

Successful projects

- The Beltline, Perimeter Connects, Macon Connects

Drawdown potential in Georgia in 2030



Baseline = From 41.1 MtCO₂e in 2020, GA and U.S. DOT forecasts 35.2 MtCO₂ from 100B VMTs in GA in 2030.

Achievable Potential = Reduction of 1.8-3.6 MtCO₂e in 2030, considering an additional 5-10% of urban vehicle trips under 4 miles would be displaced by walking and cycling, and 10-20% additional telecommuting by 2030.

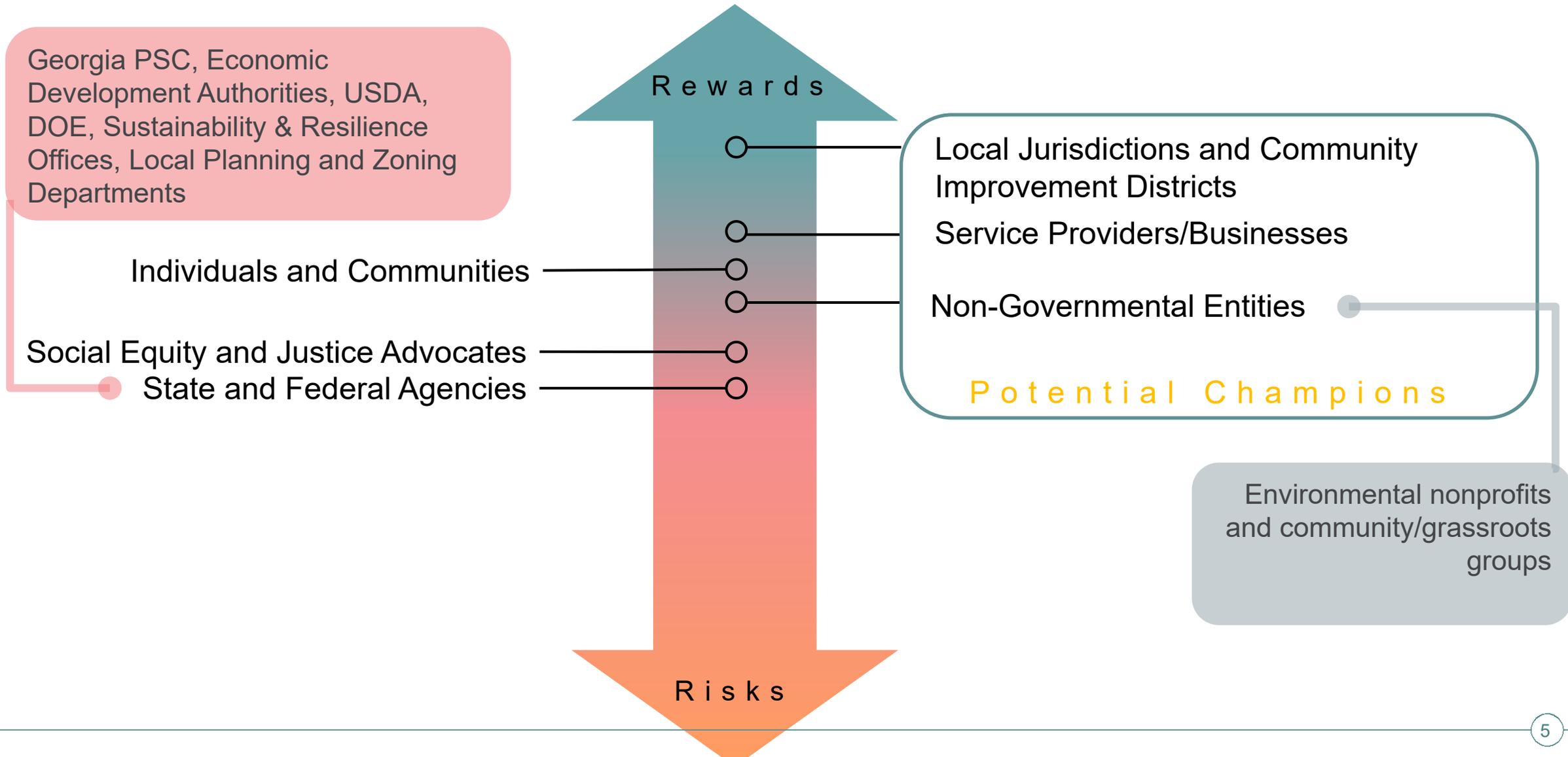
Technical Potential = Reduction of 21.5 MtCO₂e in 2030, considering 45% of all trips were taken by bike or walking, and 50% additional telecommuting by 2030. from 22 candidate landfills by 2030.

1 MtCO₂e solution in 2030 = eliminating approximately 2.5% of VMTs using a vehicle emissions rate of 0.34 kg/mile.

+Less air pollution
+Public health benefits

-Land use distribution
-Real Estate Values

Stakeholder Analysis of Alternative Mobility



Interactions with other solutions

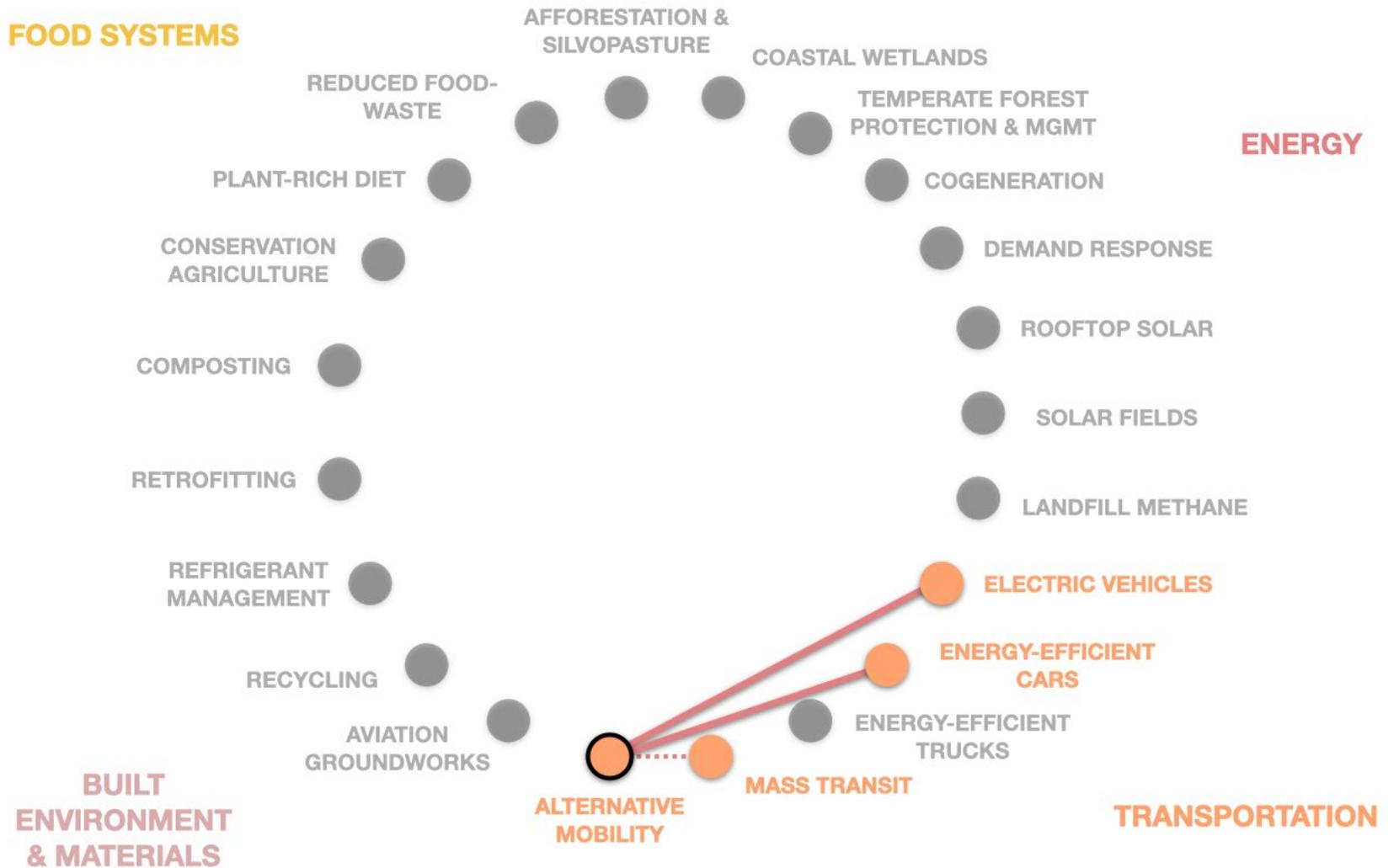
Electric vehicles, energy efficient cars and mass transit

- Low-carbon and energy efficient vehicles would reduce the carbon reduction potential of the alternative mobility solutions because energy efficiency yields more emissions savings when the energy avoided has a higher carbon content.

FOOD SYSTEMS

FORESTS & LAND USE

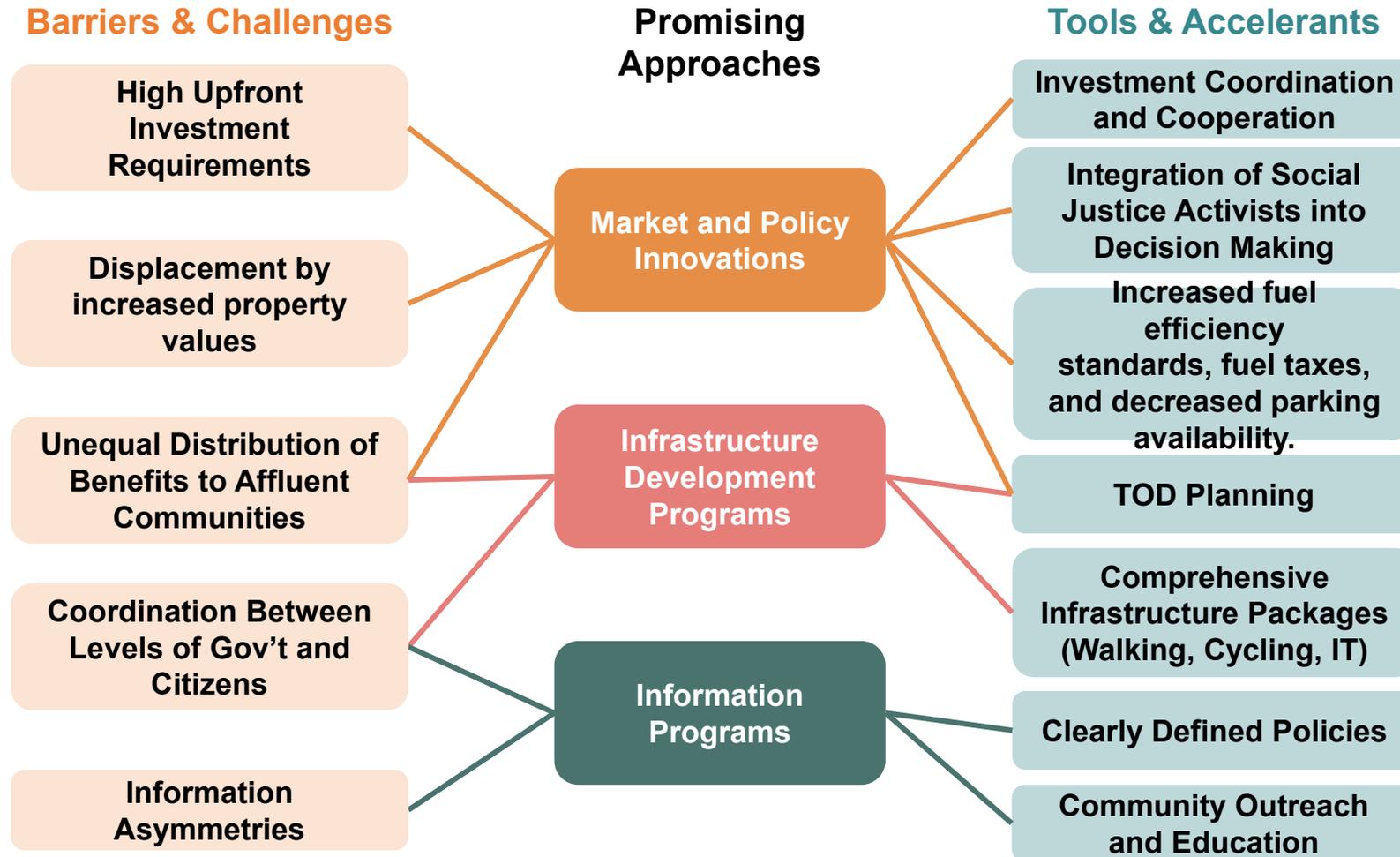
ENERGY



———— Strongly Competitive
 Weakly Competitive

———— Strongly Synergistic
 Weakly Synergistic

Alternative Mobility: Challenges and Promising Approaches (summary)



Other considerations

Challenges

- High upfront costs
- Information asymmetries
- High levels of communication and coordination between local, state and federal governments, as well as communities and citizens is required for the construction of regional and connected networks of infrastructure

Promising Policies

- Providing safe, connected, and convenient walking and cycling infrastructure, as well information technology (IT) infrastructure for telecommuting.
- Informational programs that promote these options as convenient and healthy alternatives.
- Comprehensive packages with infrastructure and facility improvements, clearly defined policies and education programs.



Corresponding author:

Dr. Daniel Matisoff
Associate Professor,
School of Public Policy
Georgia Institute of Technology
Phone: 404-385-0504
Climate and Energy Policy
Lab: www.cepl.gatech.edu

