Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Project Update
February 2022
Existing Work Groups

• Long-term Statewide Planning for Climate Change Workgroup
• Natural and Working Lands Workgroup
• Offshore Wind Ecological Monitoring Workgroup
• Public Health Workgroup
• Sustainable Organic Materials Management Workgroup

(NEW)
Transportation Workgroup
Changing policy dynamics at the State and national levels
New Jersey Emissions Targets

2020 Emissions Reduction Goal
(Equivalent to 1990 GHG Emissions)

- 125.6 MMTCO₂e

2050 Emissions Reduction Goal
(80% Decrease from 2006 Baseline)

- 25.7 MMTCO₂e
GHG Emissions in New Jersey

Reductions in the transportation sector will be critical to achieving NJ’s emissions target

NJ GREENHOUSE GAS SOURCES & SINKS 2019

Total Net Emissions, 97.7 million metric tons CO₂e

Source: NJDEP
Significant attention being paid to vehicle electrification

- Charging infrastructure investments
- Rebates and tax credits to encourage EV purchases
- EVs can use HOV lanes
This infographic compares emissions and space consumption for different transport modes. Source: Institute for Sensible Transport
What can the working group do?

**Healthy.** Improve health outcomes for people and communities by improving air quality and making it easier and safer to walk and bike.

**Just.** Promote equity by making travel by transit more reliable and convenient and by enhancing access to opportunity for marginalized groups.

**Efficient.** Increase transportation system efficiency and effectiveness by integrating advanced and emerging transportation technologies and modes.

**Resilient.** Enhance the resilience of transportation systems by adapting infrastructure to climate hazards.

**Carbon Neutral.** Reduce energy use and emissions of all kinds by facilitating a transition to CO2-neutral transportation.
Toward a healthier, more equitable, and cleaner transport future in New Jersey

HEALTHY, JUST, RESILIENT, AND CO2-NEUTRAL MOBILITY FOR ALL
What is healthy mobility?

- Access
- Safety
- Physical activity
- Mental health
- Air quality
- Noise
What is equitable and just mobility?

An equitable and **just transportation system** provides safe and clean transportation options that are affordable, convenient, and easy to use.

**Equitable mobility** provides the same opportunity for everyone to move around reliably and sustainably in ways that meet their needs.
What is resilient mobility?

- Robustness
- Redundancy
- Flexibility
- Responsiveness
- Coordination
What is carbon-neutral mobility?
Guiding concepts

• **Decarbonize** the transportation sector
• Empower people to **drive less**
• Create a network of **diverse and inclusive neighborhoods** that are well connected to each other
• Think of **mobility as a service** and **reimagine** public transportation
• Embrace **new technologies** but ensure they are affordable and accessible to all
• Make **social justice** a key indicator of transportation performance
Potential Organizing Framework

“15-minute” City/Neighborhood

Leading Practice Examples

- Singapore
- Paris
- Portland
- Melbourne
- Ottawa
- Barcelona

Source: https://www.ft.com/content/c1a53744-90d5-4560-9e3f-17ce06aba69a
What is a “15-minute” city/neighborhood?
Key relationships

People + Places + Connections

Neighborhood, Community, Region
## Work Plan

<table>
<thead>
<tr>
<th>Phase 1 – Exploring key concepts, desktop analysis, looking toward the future (Mar 2021 to Feb 2022)</th>
<th>Activities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Conduct leading practice research</td>
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<tr>
<td>• Collect, analyze, and map data</td>
<td></td>
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<tr>
<td>• Identify of potential community and equity partners</td>
<td></td>
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<tr>
<td>• Convene “Thought Leaders” webinar and visioning workshops</td>
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<tr>
<td>• Identify vision components</td>
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<tr>
<td>• Select locations for neighborhood-scale analysis</td>
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<table>
<thead>
<tr>
<th>Phase 2 – Field work, community engagement, and developing recommendations (Mar 2022 to Sep 2022)</th>
<th>Activities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Conduct field visits and interviews to get to know the neighborhoods</td>
<td></td>
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<tr>
<td>• Develop and implement community engagement plan</td>
<td></td>
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<tr>
<td>• Identify local mobility and other community needs and concerns</td>
<td></td>
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<tr>
<td>• Prepare concept plans for retrofitting existing neighborhoods</td>
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<tr>
<td>• Identify infrastructure needs</td>
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<tr>
<td>• Develop planning and policy recommendations</td>
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<tr>
<td>• Prepare comprehensive final report</td>
<td></td>
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<tr>
<td>• Convene “Thought Leaders” Forum #2 – How do we get there?</td>
<td></td>
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</tbody>
</table>
Phase 1 Case Study Locations

1. Atlantic
2. Camden
3. Cumberland
4. Essex
5. Hudson
6. Mercer
7. Middlesex
8. Warren
Exploring the Geography of People, Place, and Connections

ESSEX COUNTY
Healthy, Just and CO2-neutral Mobility for All

GEOGRAPHY OF PEOPLE
County at a glance

A mix of small towns, urban centers and rural communities

- 129.6 square miles
- 22 Municipalities
- Almost 800,000 residents
- County Seat: The City of Newark
Population Density

Population per sq. mile by Block Group
- 173 - 4,812
- 4,813 - 9,101
- 9,102 - 14,589
- 14,590 - 22,064
- 22,064 - 102,801

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Change in Population: 2014-2019

Population projection, Essex County, NJ
Linear model
Change in Population : 2014-2019
Race and Ethnicity - 2019

Data source: US Census Bureau ACS 1-year Estimate. Graphic credit: Data USA
Age & Gender

Median Age: 37.6 years old
Household Income

County Average Median Household Income: $61,510

<table>
<thead>
<tr>
<th>AHPNJ Region 3: 2020 Affordable Housing Income Limits, Region 2: Essex, Morris, Union, and Warren</th>
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<tbody>
<tr>
<td>Income Limit (4 person Household)</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Very Low</td>
</tr>
<tr>
<td>Low</td>
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<tr>
<td>Moderate</td>
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<tr>
<td>Median</td>
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</tbody>
</table>

Median Household Income

- Low Income Block Group
  - Median Household Income by Block Group
    - 9,389 - 48,875
    - 48,876 - 89,659
    - 89,660 - 138,208
    - 138,209 - 194,773
    - 194,774 - 250,001
- No data

Note: Low Income Block Groups as Median Household Income ≤ $52,755 (APNHJ)
Data Source: NQGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Households living in poverty

Low Income Households

1 Dot = 10 Households under Poverty
Percent of Households under Poverty by Block Group

- 0% - 6.77%
- 6.78% - 16.58% County average-16.58%
- 16.59% - 31.58%
- 31.59% - 49.03%
- 49.04% - 81.58%
- No Data

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Educational Attainment

Educational Attainment (less than High School)

- Low Income Block Group Percent of Population with less than High School Degree:
  - 0% - 2.47%
  - 2.48% - 6.80%
  - 6.81% - 12.98%
  - 12.99% - 22.94%
  - 22.95% - 56.71%

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Educational Attainment

Educational Attainment (Bachelor's Degree or higher)

- Low Income Block Group
- Percent of Population with Bachelor's Degree or Higher
  - 0% - 1.61%
  - 1.62% - 3.48%
  - 3.49% - 5.64%
  - 5.65% - 7.93%
  - 7.94% - 22.87%

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Employment Status

Low Income Block Group Percent of Unemployed Population by Block Group

- 0% - 1.82%
- 1.83% - 4.89%
- 4.90% - 8.21%
- 8.22% - 13.08%
- 13.09% - 100%

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Indicators of Potential Disadvantage

• Racial Minority
• Foreign Born status
• Limited English Proficiency
• Disability status
• Older Adults (75+)
• Single Parent households
Indicators of Potential Disadvantage

Racial Minority

- Low Income Block Group
  1 Dot = 200 Persons of Racial Minority

Percent of Racial Minority Population by Block Group

- 0% - 30.63%
- 30.64% - 69.45% (County average: 69.45%)
- 69.46% - 93.01%
- 93.02% - 98.80%
- 98.81% - 100%

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Indicators of Potential Disadvantage

Foreign-born Population

- Low Income Block Group
  - 1 Dot = 200 Foreign-born Persons
- Percent of Foreign-born Population by Census Tract
  - 0% - 17.23%
  - 17.24% - 27.18% County average 27.18%
  - 27.19% - 35.49%
  - 35.50% - 49.83%
  - 49.84% - 68.97%

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Indicators of Potential Disadvantage

Limited English Proficiency

- Low Income Block Group
  - 1 Dot = 20 Households with Limited English Proficiency
- Percent of Limited English Proficiency Households by Block Group
  - 0% - 2.36%
  - 2.37% - 10.14%
  - 10.15% - 17.68%
  - 17.69% - 35.37%
  - 35.38% - 81.03%
  - No Data

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 30, 2021
by Alan M. Voorhees Transportation Center
Indicators of Potential Disadvantage

Persons with Disability

- Low Income Block Group
  - 1 Dot = 30 Persons with Disability

Percent of Population with Disability by Census Tract

- 0% - 7.41%
- 7.42% - 11.08%
- 11.09% - 15.48%
- 15.49% - 22.13%
- 22.14% - 44.16%
- No Data

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Indicators of Potential Disadvantage

Older Adults (75+)

- Low Income Block Group
  - 1 Dot = 20 Older Adults (75+)

Percent of Older Adults (75+) by Block Group

- 0% - 3.57%
- 3.58% - 5.79%
- 5.80% - 13.40%
- 13.41% - 24.33%
- 24.34% - 40.27%

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Indicators of Potential Disadvantage

Single parent Family

- Low Income Block Group
  - 1 Dot = 30 Single Parent Family

Percent of Single Parent Families by Block Group
- 0% - 13.52%
- 13.53% - 39.97% County average = 39.97%
- 39.98% - 54.72%
- 54.73% - 78.79%
- 78.80% - 100%
- No Data

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Health Behaviors

Essex is ranked among the least healthy counties in New Jersey (Lowest 0%-25%)

<table>
<thead>
<tr>
<th>Health Behaviors</th>
<th>Essex County</th>
<th>NJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult Smoking</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>Adult obesity</td>
<td>29%</td>
<td>26%</td>
</tr>
<tr>
<td>Food environment index</td>
<td>8.2</td>
<td>9.3</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>29%</td>
<td>26%</td>
</tr>
<tr>
<td>Access to exercise opportunities</td>
<td>100%</td>
<td>95%</td>
</tr>
<tr>
<td>Excessive drinking</td>
<td>17%</td>
<td>18%</td>
</tr>
<tr>
<td>Alcohol-impaired driving deaths</td>
<td>14%</td>
<td>22%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical Environment</th>
<th>Essex County</th>
<th>NJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pollution-particulate matter</td>
<td>8.9</td>
<td>9.9</td>
</tr>
<tr>
<td>Drinking water problems</td>
<td>Yes</td>
<td>-</td>
</tr>
<tr>
<td>Severe housing problems</td>
<td>28%</td>
<td>22%</td>
</tr>
<tr>
<td>Driving alone to work</td>
<td>61%</td>
<td>71%</td>
</tr>
<tr>
<td>Long commute-driving alone</td>
<td>45%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Source: 2020 NJ County Health rankings
Health Behaviors

<table>
<thead>
<tr>
<th>Quality of Life</th>
<th>Essex County</th>
<th>NJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor or fair health</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>Poor physical health days</td>
<td>4.3</td>
<td>3.7</td>
</tr>
<tr>
<td>Poor mental health days</td>
<td>4.4</td>
<td>3.8</td>
</tr>
<tr>
<td>Low birthweight</td>
<td>10%</td>
<td>8%</td>
</tr>
<tr>
<td>Life expectancy</td>
<td>79.8</td>
<td>80.5</td>
</tr>
<tr>
<td>Diabetes prevalence</td>
<td>11%</td>
<td>10%</td>
</tr>
<tr>
<td>Frequent physical distress</td>
<td>13%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Essex is ranked among the least healthy counties in New Jersey (Lowest 25%-50%)

Source: 2020 NJ County Health rankings
Healthy, Just and CO2-neutral Mobility for All

GEOGRAPHY OF PLACE
Natural Land Use

Land Use Division

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area (sq. miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRICULTURE</td>
<td>0.09</td>
</tr>
<tr>
<td>BARREN</td>
<td>0.96</td>
</tr>
<tr>
<td>FOREST</td>
<td>14.41</td>
</tr>
<tr>
<td>URBAN</td>
<td>108.70</td>
</tr>
<tr>
<td>WATER</td>
<td>23.51</td>
</tr>
<tr>
<td>WETLANDS</td>
<td>12.66</td>
</tr>
</tbody>
</table>

Data Source: NJGIN, ESRI Base Map
Urban Land Use

Land Use

Urban Land Use
- Residential
- Commercial and Service
- Industrial
- Transportation/
  Communication/Utilities
- Recreational Land
- Other Urban Land

Other Land Uses
- Agriculture
- Barren Land
- Forest
- Water
- Wetlands

Data Source: NJGIN, NJDEP, ESRI base map

Planning for Healthy, Just,
Resilient, and CO2-Neutral Mobility
in New Jersey

Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Employment Density

Number of Employees per sq. mile
- 0 - 111
- 111 - 754
- 754 - 1,707
- 1,707 - 3,065
- 3,065 - 52,202

Note: The area of a hexagon is 1 sq. mile
Data Source: NGIN, ACS 2015-2019 5-year estimate, NOAA, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Employment Density by Wage

Number of low/mid/higher wage employees per sq. mile by residence/workplace block group
- < 500
- 501 - 1,000
- 1,001 - 2,000
- 2,001 - 5,000
- > 5,000

Note: low-wage: earnings $1,250/month or less; mid-wage: earnings $1,251/month to $3,333/month; higher-wage: earnings greater than $3,333/month

Data Source: NUGIN, Longitudinal Employer-Household Dynamics (LEHD) 2014-2018 5-year estimate, ESRI Base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center

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Recreation

- Fitness Centers
- State, local, and nonprofit open spaces
- Low Income Block Group

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI Business Search Safegraph, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Medical Services

Medical Service

- Hospitals and Emergency Centers
- Pharmacies and Drug Stores
- Low Income Block Group

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI Business Search Safegraph, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Other Essential Services

- Postal Services
- Commercial Banks
- Credit Unions
- Child Care Centers

Low Income Block Group

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI Business Search Safegraph, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
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by Alan M. Voorhees Transportation Center
Commercial Amenities

- Full-service Grocery Stores
- Convenience/ Specialty Stores
- Laundromats
- Low Income Block Group

Data Source: NJGIN, ACS 2015-2019 5-year estimate, ESRI Business Search Safegraph, Data Axle, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021 by Alan M. Voorhees Transportation Center
Climate Vulnerability

Sea Level Rise (5ft)

- Low Income Block Group
- 5 ft. sea level rise depth

Data Source: NJGIN, ACS 2015-2019 5-year estimate, NOAA, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

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by Alan M. Voorhees Transportation Center
Climate Vulnerability

Exposure to extreme heat (High-emissions scenario)

Source: NJ Forest Adapt
Healthy, Just and CO2-neutral Mobility for All

GEOGRAPHY OF MOBILITY AND CONNECTIONS
Intersection Density

Number of Intersections per acre
- 0 - 47
- 48 - 82
- 83 - 116
- 117 - 166
- 167 - 319
- Low Income Block Group

Data Source: NJGIN, EPA, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
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by Alan M. Voorhees Transportation Center

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Transit Service Area

- Rail Stations
  - Rail Station Service Area
  - Bus Service Area
  - Bus Routes
  - Low Income Block Group

Data Source: NJGIN, EPA, ESRI base map, NJT Transit GTFS data

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey

Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center

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Bus Stop Density

- Low Income Block Group
- Number of Bus Stops per sq. mile
  - 0 - 11
  - 12 - 38
  - 39 - 93
  - 94 - 222
  - 223 - 407

Note: The area of a hexagon is 1 sq. mile
Data Source: NJGIN, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
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by Alan M. Voorhees Transportation Center
Service Frequency-Bus Stops

Maximum Wait Time (minutes)
- 0 - 11
- 12 - 28
- 29 - 50
- 51 - 75
- 76 - 148

Bus Route
Low Income Block Group

Note: Weekday Morning Hours: 6:00 - 10:00
Data Source: NJGIN, EPA, ESRI base map, NJT Transit GTFS data

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
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Edward J. Bloustein School of Planning and Public Policy
Service Frequency - Rail Stations

Trips Per Hour
- 2.25 - 4.25
- 4.26 - 6.75
- 6.76 - 10.25
- 10.26 - 19.00
- 19.01 - 28.25

Railroads
Low Income Block Group

Note: Weekday Morning Hours - 6:00 - 10:00
Data Source: NJGIN, EPA, ESRI base map, NJT Transit GTFS data

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Alternative Fuel Stations

Fuel Type
- Biodiesel
- CNG
- Ethanol
- Electric
- Liquefied Petroleum Gas
- Low Income Block Group

Data Source: NJGIN, Alternative Fuel Data Center, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
Prepared: June 10, 2021
by Alan M. Voorhees Transportation Center
Measured Accessibility Analysis
Accessibility

Accessibility
Best Access
Moderate Access
Limited Access
Low Income Block Group

Data Source: NJGIN, ESRI Business Analyst, NJ Transit GTFS data, ESRI base map

Planning for Healthy, Just, Resilient, and CO2-Neutral Mobility in New Jersey
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by Alan M. Voorhees Transportation Center
Issues Forum #1

• Objectives
  – Explore the components of the multi-goal framework
  – Identify
    • Needs, concerns, and desired long-term outcomes
    • Performance measures
    • What needs to change
    • Potential obstacles and impediments to achieving healthy, just, resilient, and carbon-neutral mobility for all

• Format
  – Plenary + breakouts
  – Virtual or in-person depending on conditions

• Timing – Dec 2021- March 2022
Thoughts? Questions? Discussion?