

## A Cleaner Environment and Healthier Lives

Transportation is one of the largest sources of greenhouse gas emissions, and according to the Rhode Island Greenhouse Gas Emissions Plan,<sup>9</sup> produces 40% of greenhouse gas emissions in Rhode Island. Over half of these emissions come from private passenger vehicles and light trucks. One person driving a medium size car generates 404 grams of CO2 per mile. That same person riding a bus carrying 20 people would generate 134 grams, or 67% less.

For this reason, an important goal of the Greenhouse Gas Emissions Reduction plan is to reduce Vehicle Miles of Travel (VMT) by:

1. *Decreasing the absolute number of single-occupancy vehicle trips by promoting and investing in alternative modes of transportation (e.g., rail, bus, ridesharing, biking, walking)*
2. *Reducing the absolute length of single-occupancy vehicle trips by encouraging higher-density patterns of development or changes in behavior*

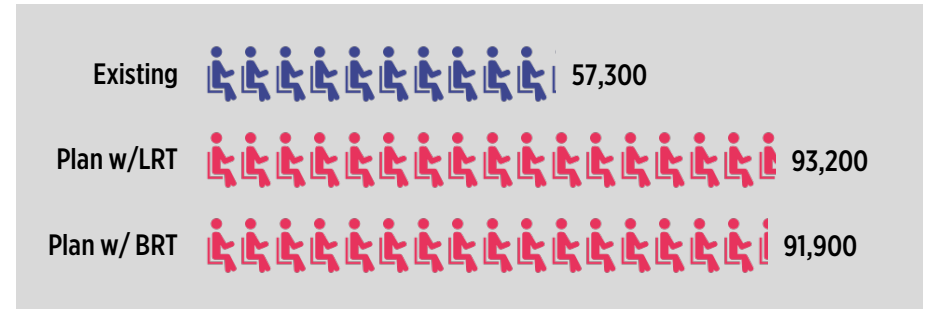
Transit Forward RI would help accomplish both. It is based on investment in alternative modes that will decrease single-occupancy vehicle trips and more robust transit will promote more concentrated development. In total, the plan will:

- *Increase transit ridership by over 60%*
- *Increase transit mode share for work trips from 3.1% to 5%*
- *Reduce VMT by 4%*
- *Reduce greenhouse gas emission by 155,300 metric tons per year*

### Encourage Use of Clean Forms of Transportation/ Increase Transit Ridership

Transit Forward RI will increase transit ridership by over 60% from 57,000 trips per weekday to over 92,000 trips. Most of this increase will be due to a shift from other modes, and importantly, from single occupancy vehicles.

### Transit Ridership will increase by over 60%



### Increase Transit Mode Share

The Emissions Reduction plan also references the State Guide Plan, which includes targets increasing the transit mode share of work trips from 2.5% in 2000 to 2.8% in 2010, 3.0% in 2020 and 3.2% in 2030.<sup>10</sup> In 2019, 3.1% of Rhode Island residents commuted by public transit,<sup>11</sup> so the state is on track to meet that goal. Transit Forward RI would increase transit ridership by 60%, which would increase the transit mode share for work trips well beyond the 2030 target to close to 5%.

### Transit mode share for work trips will increase to 5%

TRANSIT MODE SHARE	2019	2020	2030	2040
Actual	3.1%			
State Guide Plan Targets		3.0%	3.2%	--
Transit Forward RI				5%

### Reduce VMT

The Emissions Reduction Plan also suggests that more aggressive targets be considered to reduce VMT by 2% by 2035 and 10% by 2050.

<sup>9</sup> Rhode Island Greenhouse Gas Emission Reduction Plan, 2016

<sup>10</sup> State Guide Plan, Land Use 2025.

<sup>11</sup> Source: U.S. Department of Transportation, Bureau of Transportation Statistics (<https://www.bts.gov/commute-mode>)

Detailed VMT reduction estimates were not produced as part of the TMP. However, application of a Transit Cooperative Research Board (TCRP) methodology<sup>12</sup> suggests that full implementation of the Transit Forward RI estimates would reduce VMT by 8%, which would greatly exceed the 2035 target and comprise 80% of the 2050 target.

**Statewide VMT will be reduced by 8%**

VMT	2035	2040	2050
RI VMT Reduction Target	-2%	--	-10%
Transit Forward RI		-8%	

**Reduce Greenhouse Gas Emissions**

Using the same TCRP methodology described above, Transit Forward RI would reduce greenhouse gas emissions, in terms of CO<sub>2</sub>e,<sup>13</sup> which are the largest component of greenhouse gas emissions, by 231,500 metric tons per year.

Finally, there has been some discussion on whether it is more cost-effective to reduce emissions through the replacement of diesel buses with electric buses or through service improvements. Based on the estimates presented above, the cost of electric buses, capital costs for Transit Forward RI, the comparative annual costs to eliminate a pound of CO<sub>2</sub>e would range from 18¢ to 44¢. The lower cost would be for the Transit Forward RI program with BRT as the highest mode and the higher cost would be for the program with light rail as the highest mode. The costs for just replacing diesel buses with electric buses would be more expensive, at 40¢. Note that Transit Forward RI would reduce emissions and improve mobility while the replacement of diesel buses with electric buses would reduce emissions but not improve mobility.

**Transit Forward RI will be a cost-effective way to reduce greenhouse gas emissions and improve mobility**

COST-EFFECTIVENESS	Cost per Pound of CO <sub>2</sub> e Eliminated
Transit Forward RI with BRT as the highest mode	18¢
Transit Forward RI with light rail as the highest mode	44¢
Replacement of Diesel Buses with Electric Buses	49¢

<sup>12</sup> TCRP Report 176 Quantifying Transit’s Impact on GHG Emissions and Energy Use—The Land Use Component, 2015

<sup>13</sup> Carbon dioxide equivalent (CO<sub>2</sub>e) is a measure used to express the global warming potential of different greenhouse gases (e.g., carbon dioxide, methane, nitrous oxide) in a common unit.