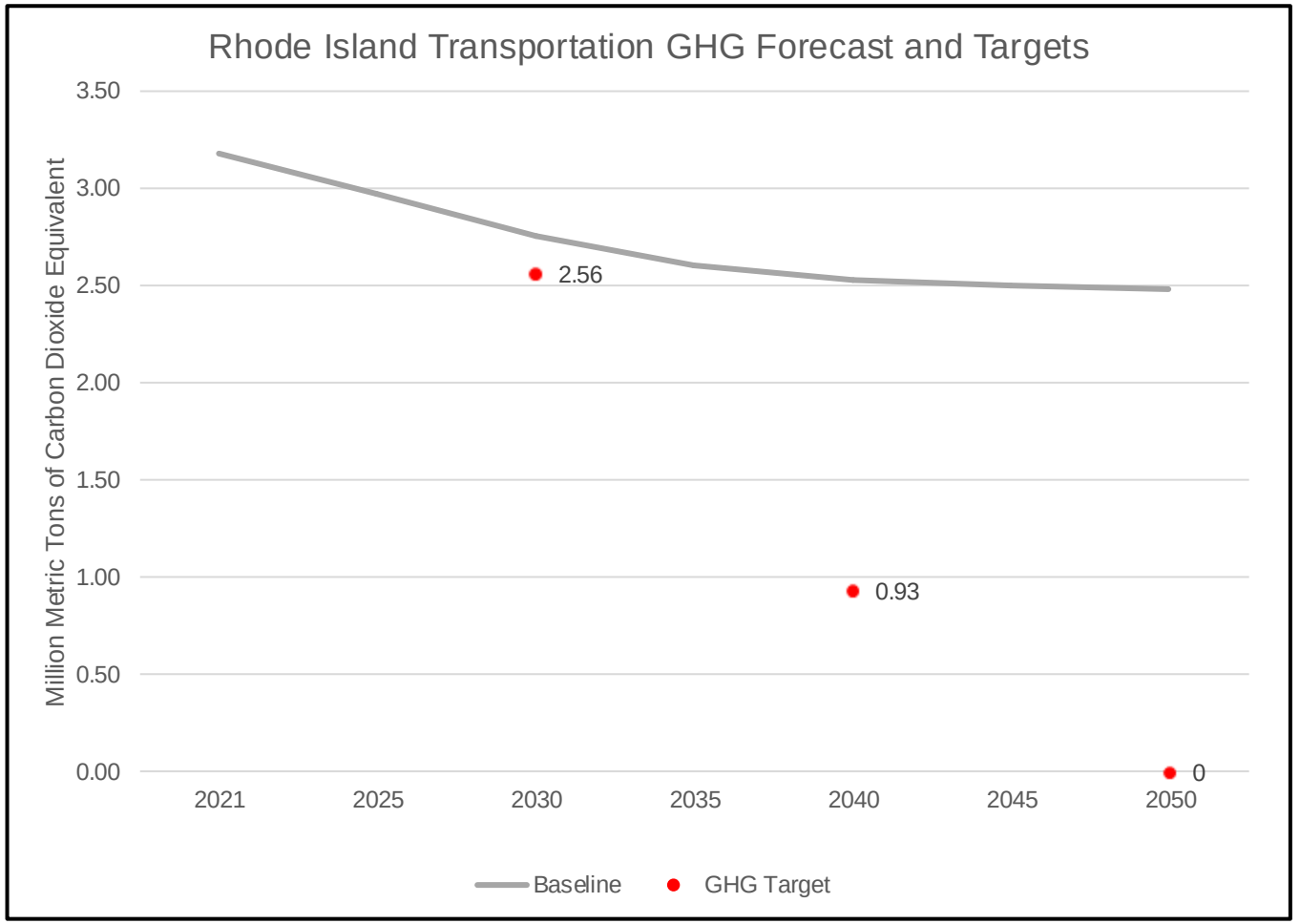
State of Rhode Island Surface Transportation Decarbonization Roadmap

RIDOT
Driven to get you there

Emission Targets for Transportation

- 2021 Act on Climate
  - 45% below 1990 by 2030
  - 80% below 1990 by 2040
  - Net zero by 2050



What was modeled

Strategy	Description	Responsible Agencies
Baseline Technology Improvements	Emissions reductions from baseline Rhode Island transportation forecasts – driven primarily by fuel economy improvements, and very modest electrification (~12% of light duty vehicles EV by 2050).	
Transit Master Plan	Modeled emissions impacts of Transit Master Plan, which estimates an 8% reduction in VMT from suite of policies to expand and improve service	RIPTA, Division of Statewide Planning, RIDOT
Bicycle Mobility Plan	Used TEA-CART to conduct sketch-level modeling emissions impacts of 750+ miles of new proposed bicycle facilities from Bicycle Mobility Plan	Division of Statewide Planning, RIDOT, Municipalities
Land Use- Rail TOD	Used TEA-CART to conduct sketch-level modeling of transit-oriented development around 5 rail stations, with assumed doubling of density from 5 to 10 dwelling units/acre within ¼ mile of the station area, and 50% of the area being suitable for development. Assume half of development complete by 2040 and all development complete by 2050.	Municipalities, RI Department of Housing, RIDOT

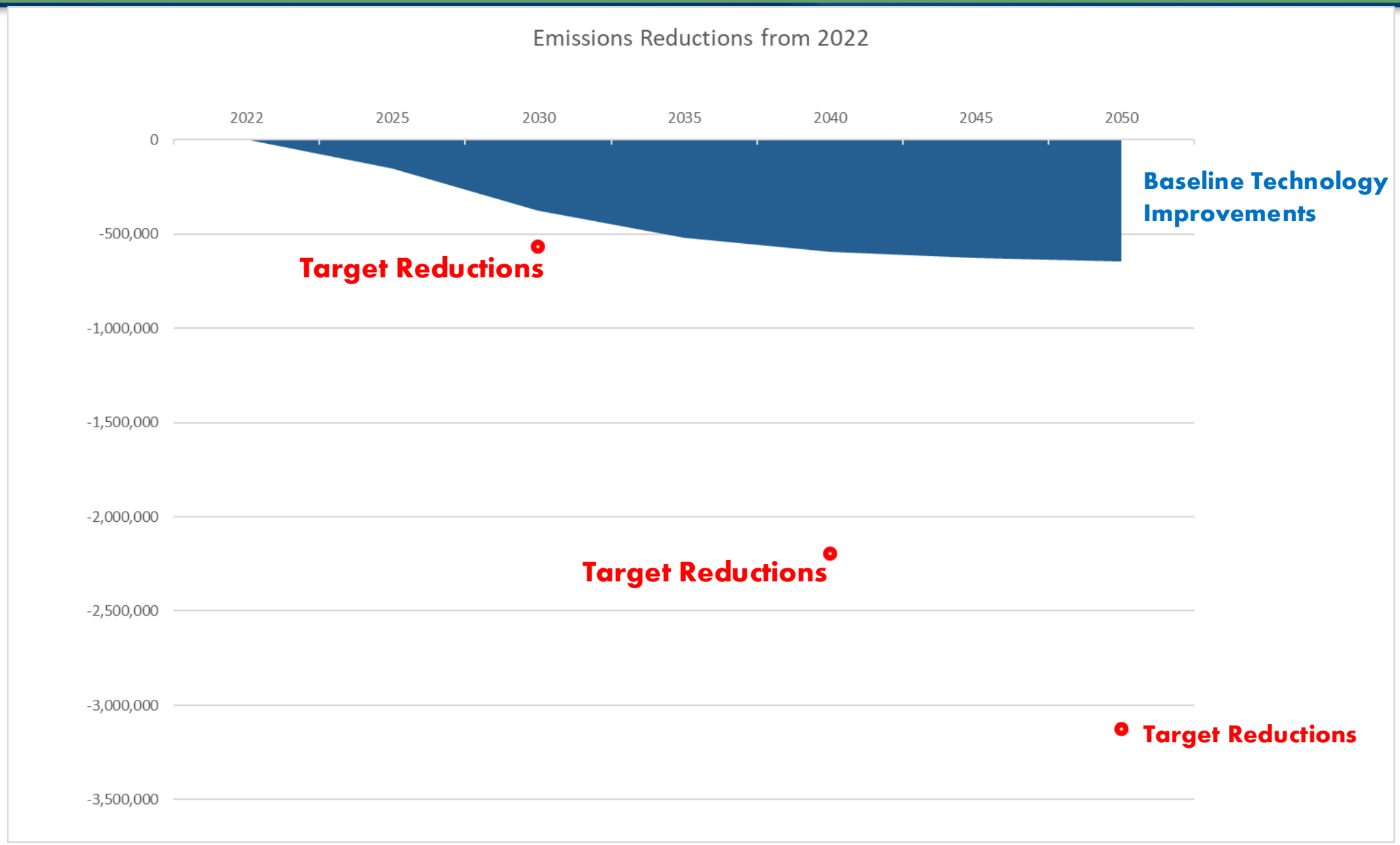
What was modeled

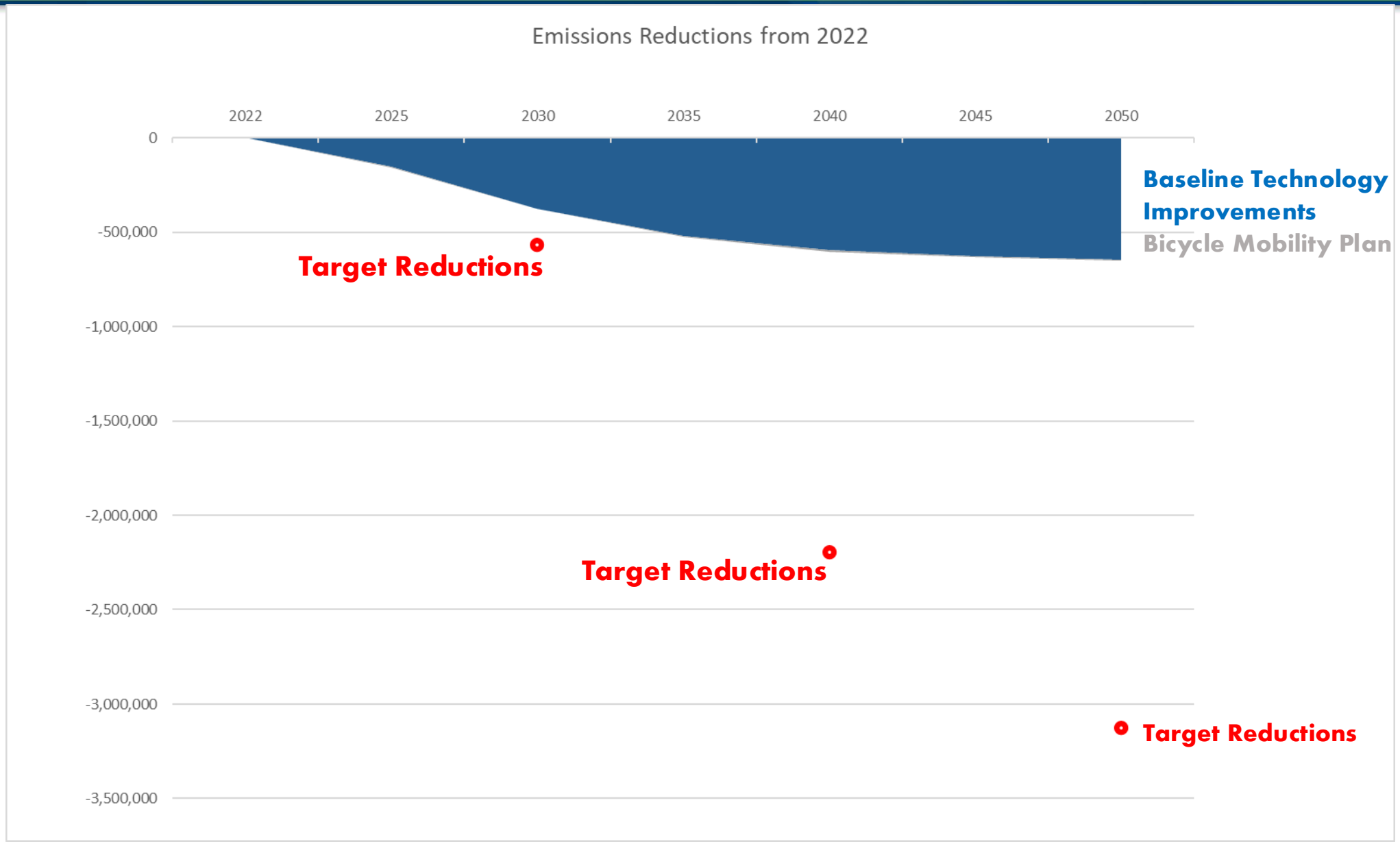
Strategy	Description	Responsible Agencies
Transit Electrification	Forecasted emissions reductions from transitioning all public transit vehicles to zero emission vehicles by 2050.	RIPTA, RIDOT
ACCII	Modeled additional impacts of adoption of Advanced Clean Cars II (*note – modeling assumed law would not take effect until 2027 but manufacturers would bank advance sales credits and catch-up to California levels by 2040). By 2040, 71% of LDV are ZEV. By 2050, 93% of LDV are ZEV.	Administration, (OER, RIDOT, RIDEM, DMV, Commerce, RIIB)
ACT	Modeled additional impacts of adoption of Advanced Clean Trucks (*note – modeling assumed law would not take effect until 2027 but manufacturers would bank advance sales credits and catch-up to California levels by 2040). By 2040, 30% of trucks are ZEV. By 2050, 40% of trucks are ZEV.	Administration, (OER, RIDOT, RIDEM, DMV, Commerce, RIIB)
Gap (Additional Strategies)	The additional emissions reductions that would be needed to meet emissions targets for the transportation sector. While several strategies could be explored, this will at minimum require the light-duty stock to go from 93% to 100% ZEV, and truck stock to go from **40% to 100%** ZEV in 2050, as well as additional VMT reductions.	All agencies and general public

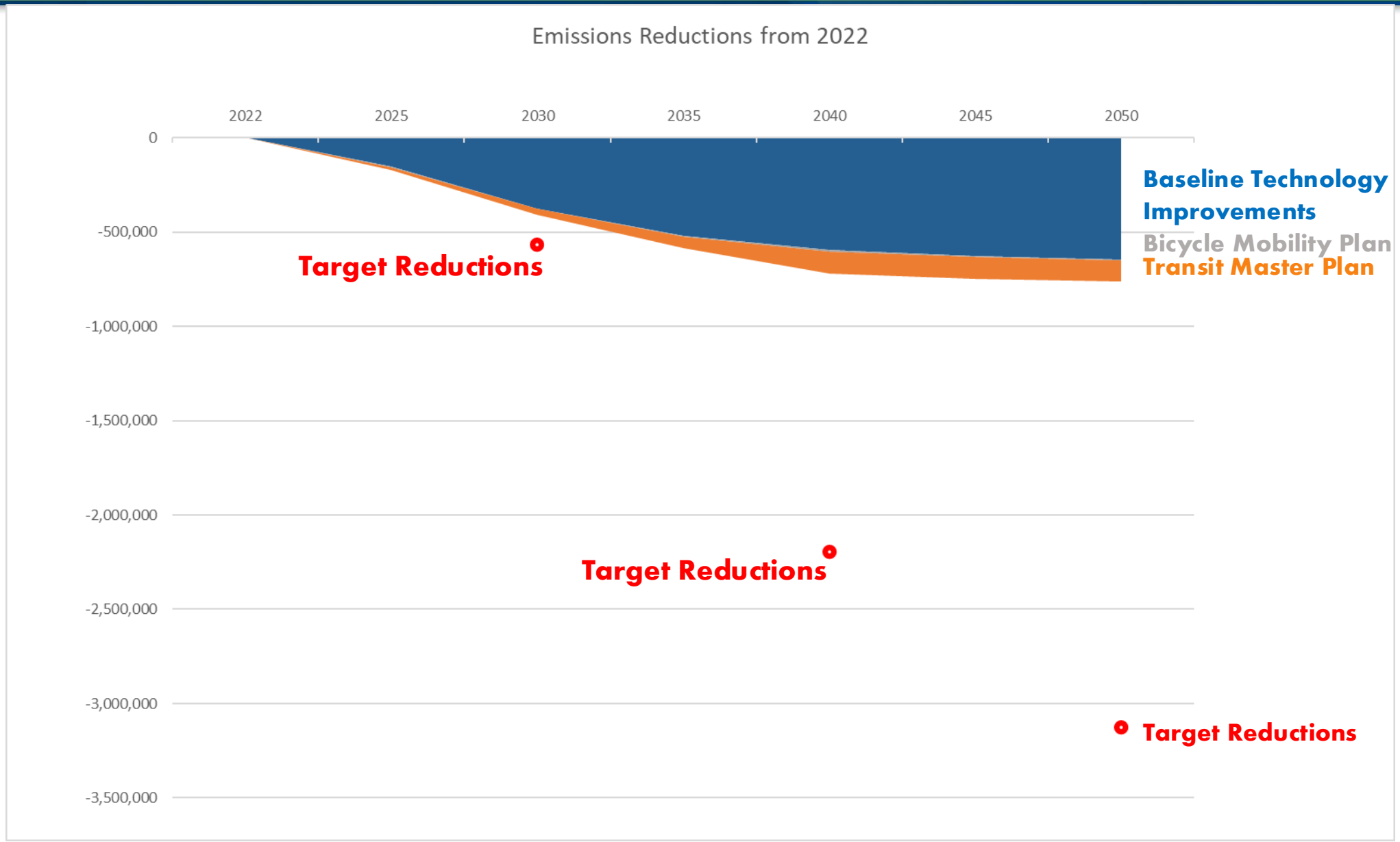
What was not modeled

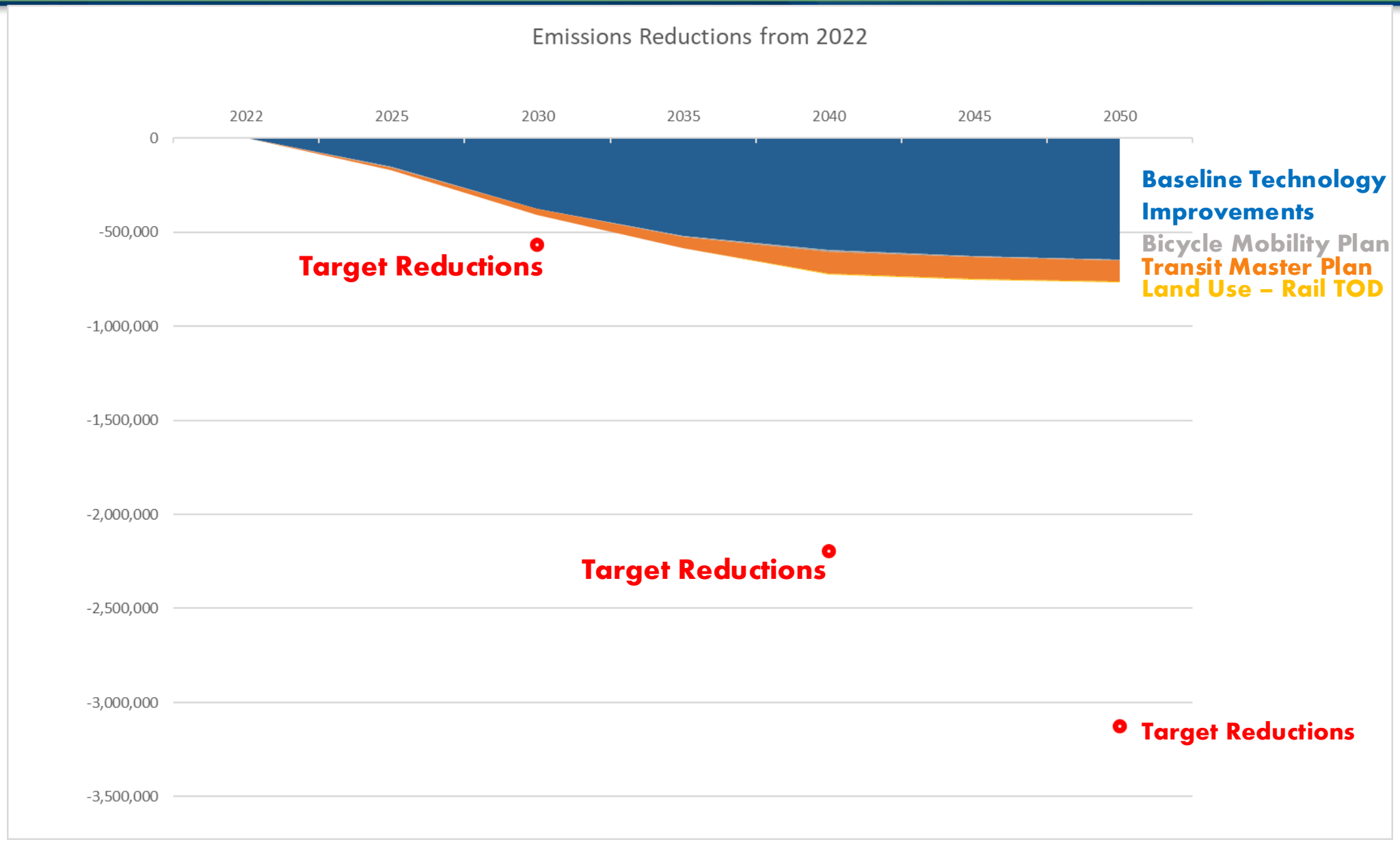
- Other VMT reduction strategies (travel demand management programs, carpool/vanpool, telework, etc.)
- Pricing strategies (carbon pricing, cap-and-invest, etc.)

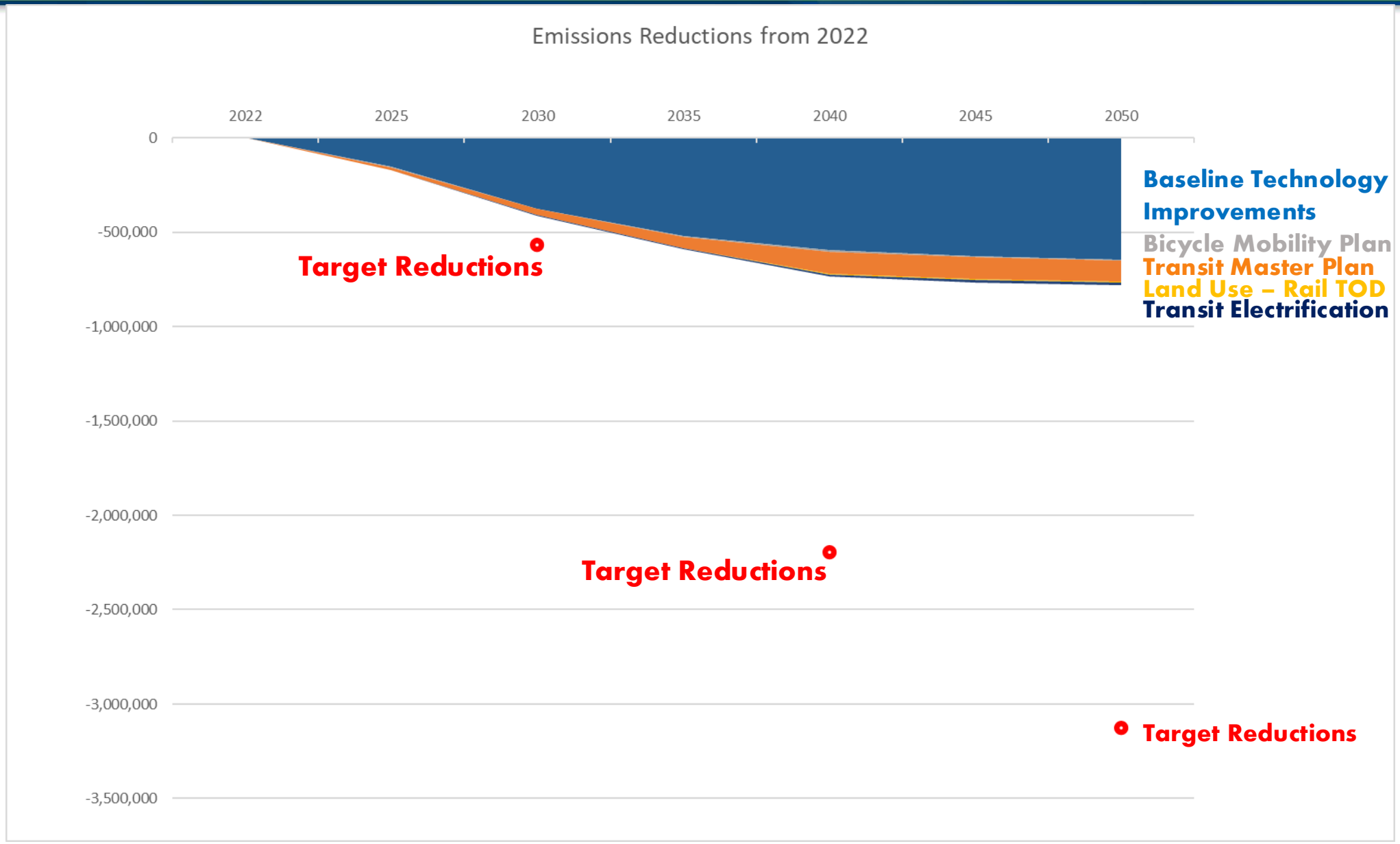
Results

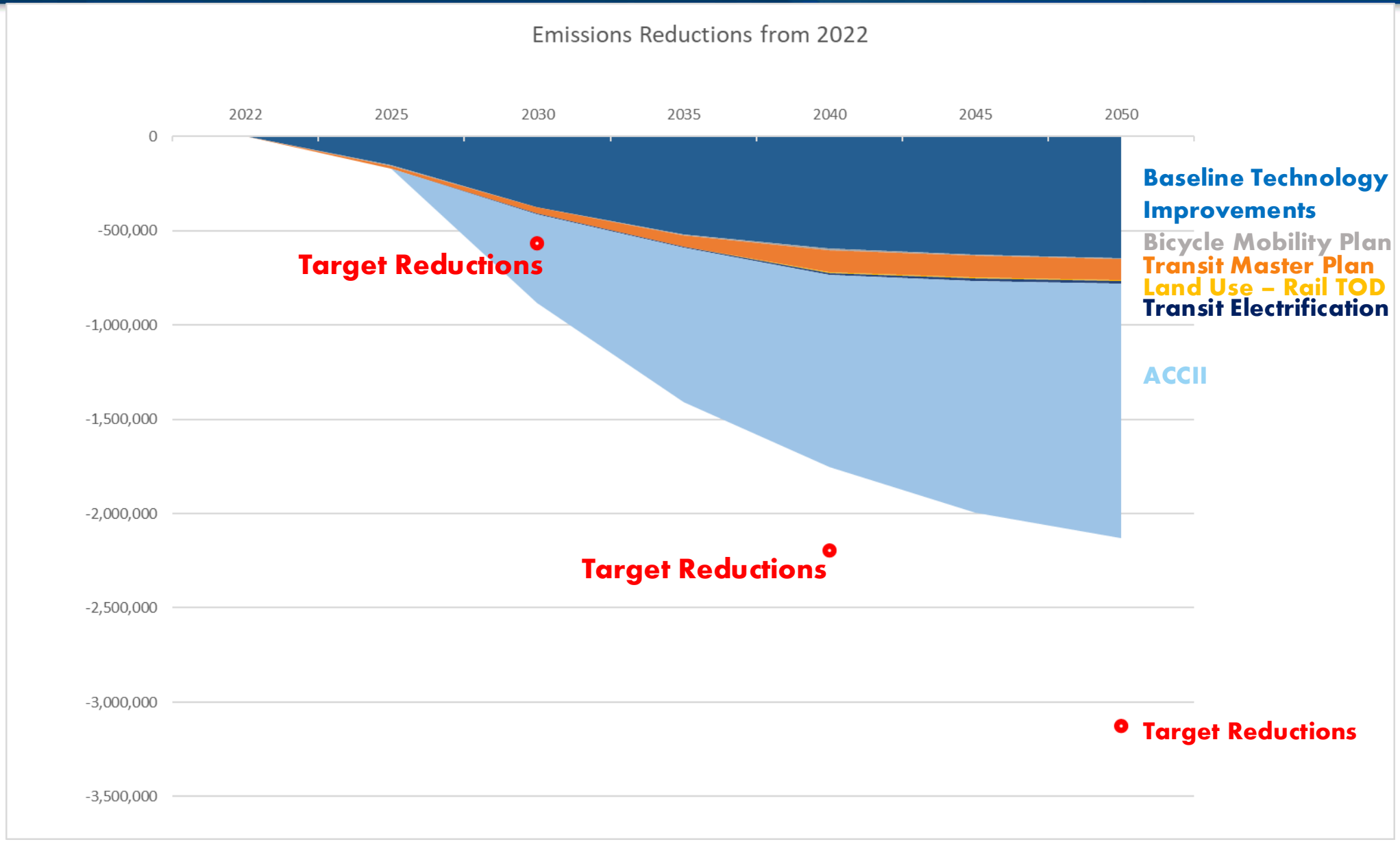

Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Baseline Technology Improvements
Target Reductions
Target Reductions
Target Reductions

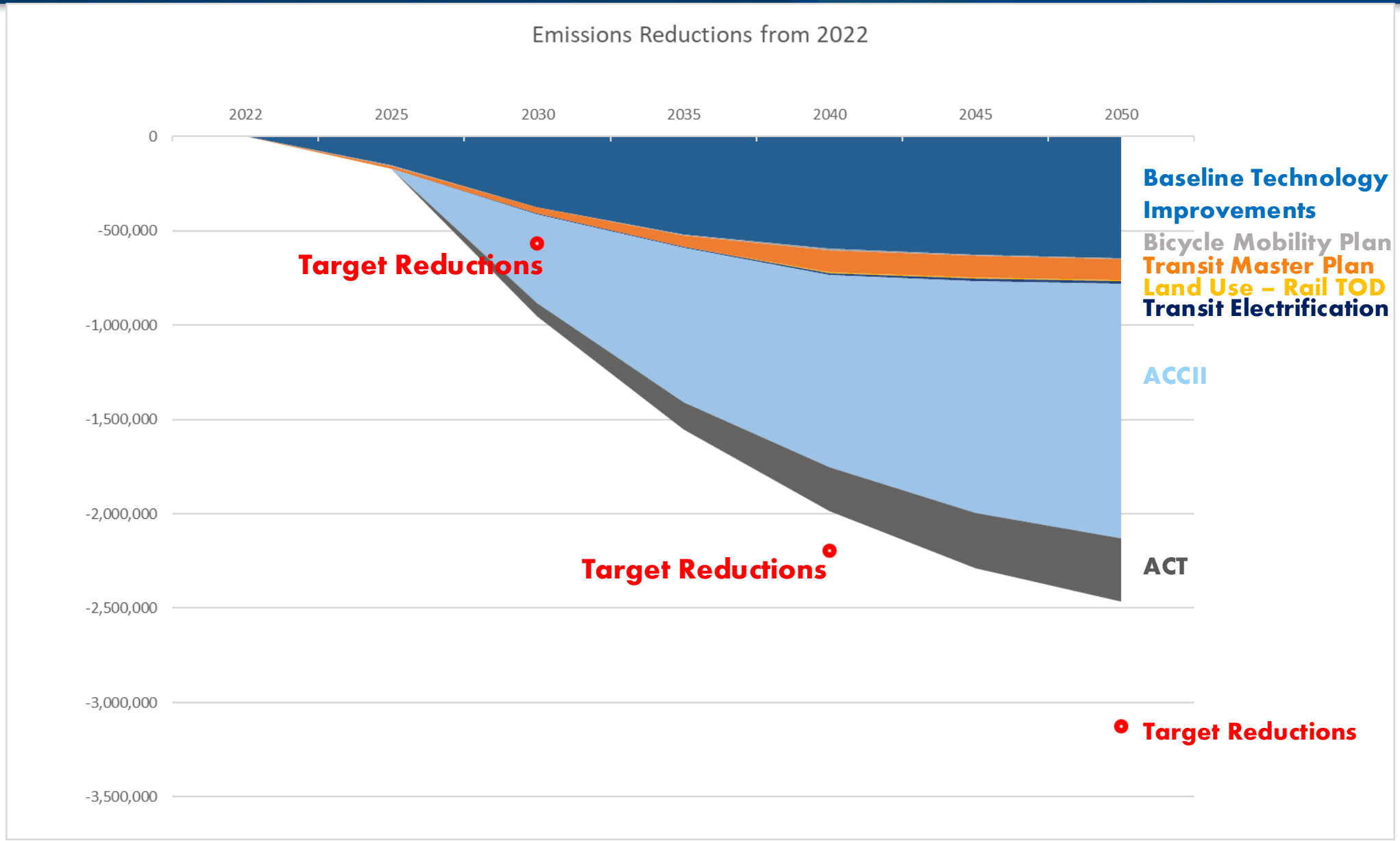

Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Baseline Technology Improvements
Bicycle Mobility Plan
Target Reductions
Target Reductions
Target Reductions

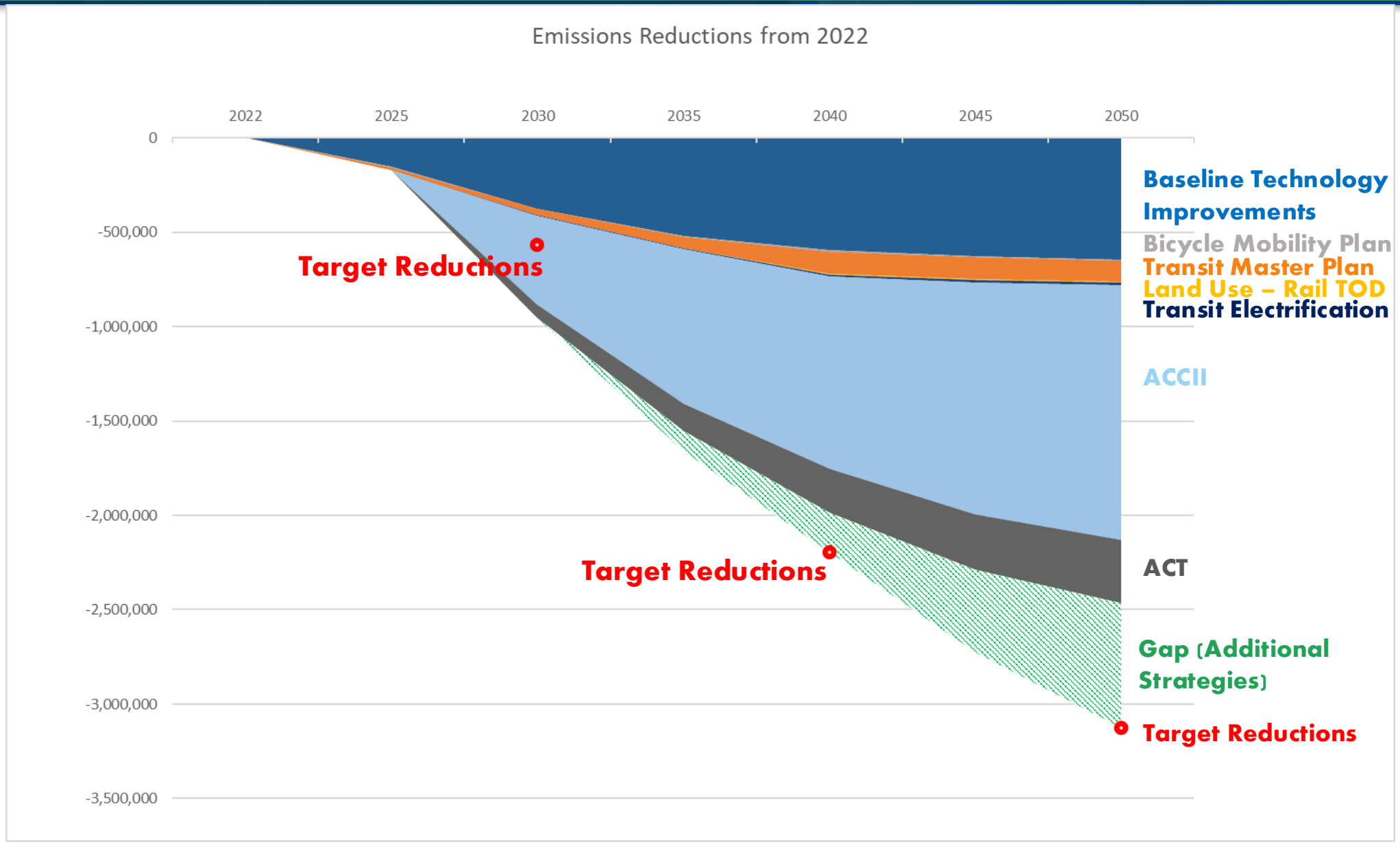

Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Baseline Technology Improvements
Bicycle Mobility Plan
Transit Master Plan
Target Reductions
Target Reductions
Target Reductions


Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Baseline Technology Improvements
Bicycle Mobility Plan
Transit Master Plan
Land Use – Rail TOD
Target Reductions
Target Reductions
Target Reductions


Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Target Reductions
Target Reductions
Target Reductions
Baseline Technology Improvements
Bicycle Mobility Plan
Transit Master Plan
Land Use – Rail TOD
Transit Electrification


Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Target Reductions
Target Reductions
Target Reductions
Baseline Technology Improvements
Bicycle Mobility Plan
Transit Master Plan
Land Use – Rail TOD
Transit Electrification
ACCII


Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Target Reductions
Target Reductions
Target Reductions
Baseline Technology Improvements
Bicycle Mobility Plan
Transit Master Plan
Land Use – Rail TOD
Transit Electrification
ACCII
ACT


Emissions Reductions from 2022
2022
2025
2030
2035
2040
2045
2050
0
-500,000
-1,000,000
-1,500,000
-2,000,000
-2,500,000
-3,000,000
-3,500,000
Target Reductions
Target Reductions
Target Reductions
Baseline Technology Improvements
Bicycle Mobility Plan
Transit Master Plan
Land Use – Rail TOD
Transit Electrification
ACCII
ACT
Gap (Additional Strategies)

Implications for FHWA GHG Rule

FHWA GHG Performance Measure

- Requires states to set *declining* GHG targets for emissions occurring on *National Highway System Roadways*
- FHWA-prescribed methodology to estimate emissions:
  - 1. Calculate total statewide emissions based on fuel sales of gasoline and special fuels (diesel)
  - 2. Calculate NHS emissions by applying percent of statewide VMT that occurs on NHS roadways

FHWA GHG Performance Measure

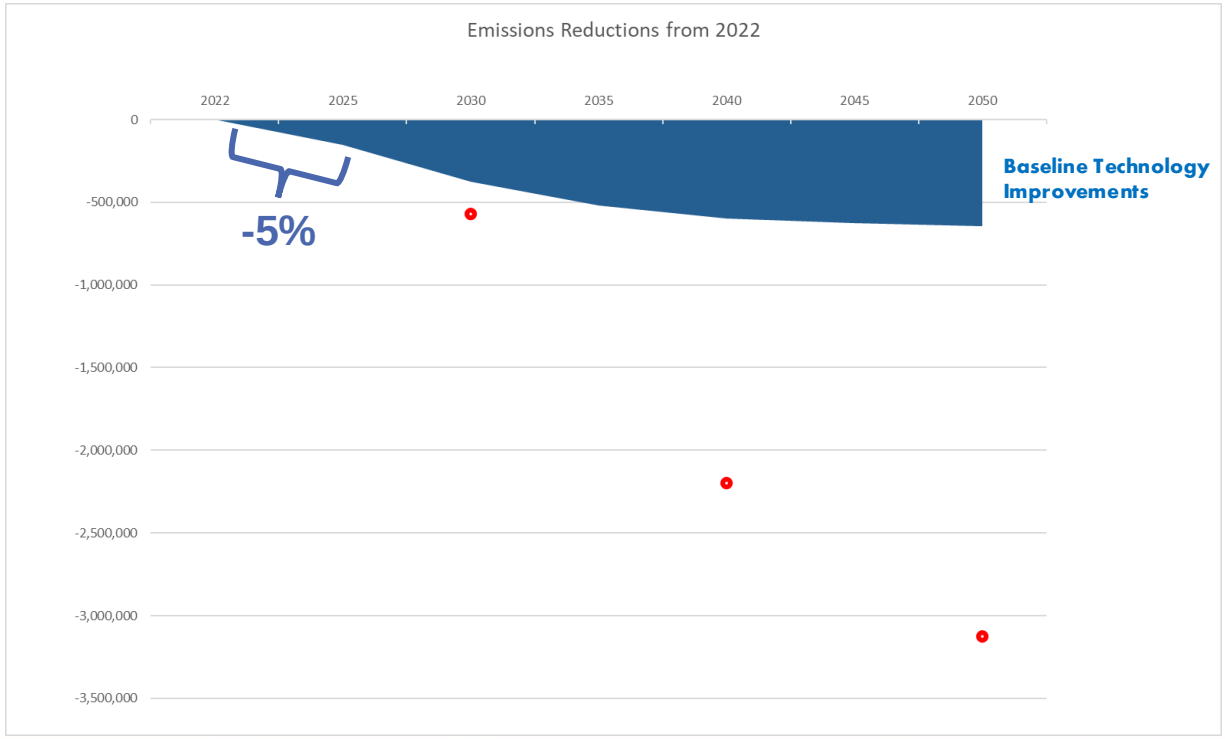
Category	2022 Value
Gasoline Carbon Coefficient (kg CO2/gal)	8.10
Diesel Carbon Coefficient (kg CO2/gal)	10.19
Gasoline (Thousand Gallons)	336,774
Special Fuel (Thousand Gallons)	78,390
VMT (Million Miles, All Roadways)	7,531
VMT (Million Miles, NHS Roadways)	5,181
Percent of VMT on NHS	69%
Total Statewide Emissions (MMT CO2e)	3.53
Total NHS Emissions (MMT CO2e)	**2.43**

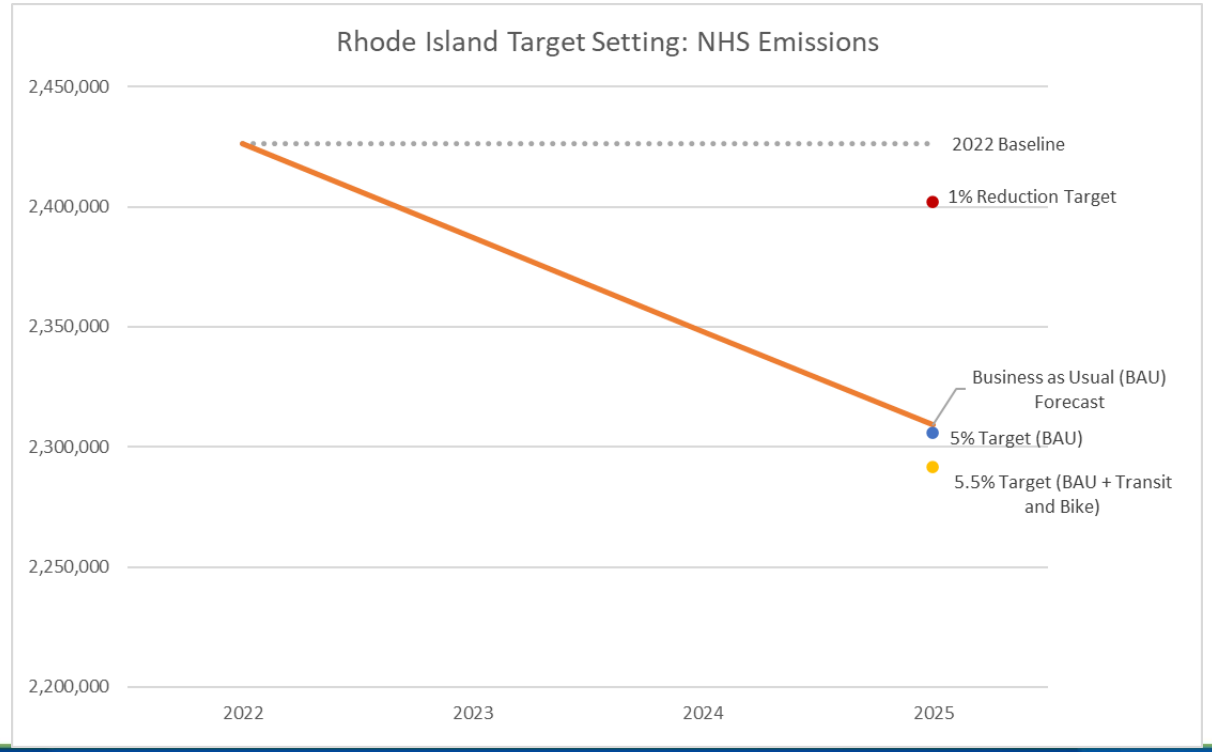
FHWA GHG Target Setting

- Under modeled suite of policies, Rhode Island has a path to meet 2030 reduction targets, but additional measures will be needed to reach 2040 and 2050 targets
- Reasonable to set NHS reduction target according to 2025 baseline reductions with understanding that majority of reductions will take place after 2025 as EV adoption ramps up and transit+bike measures get implemented gradually

FHWA GHG Target Setting

- 5% reduction target would be in line with current technology projections
- Could explore slightly more aggressive target (5.5%) to include any reductions associated with transit + bike that might be realized by 2025





Modeling Results Appendix

FHWA GHG Performance Measure

Strategy	MT CO2 Reduced (2050)	Percent of 2050 Target Achieved
Baseline Technology Improvements	-644,191	20.6%
Advanced Clean Cars II	-1,348,482	43.1%
Advanced Clean Trucks	-333,432	10.7%
Transit Master Plan	-112,038	3.6%
Transit Electrification	-17,301	0.6%
Bicycle Mobility Plan	-6,720	0.2%
Land Use – Rail TOD	-2,975	0.1%
Gap (Additional Strategies)	-661,101	21.1%