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Urban Mass Transit: New York State and the MTA Sustainability Initiatives on Greenhouse Gas Emission Reduction

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Urban Mass Transit: New York State and the MTA Sustainability Initiatives on Greenhouse Gas Emission Reduction

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Background

- MTA – Metropolitan Transportation Authority of New York State.
- The MTA is responsible for the construction and development of railroads and bus lines, operations and maintenance of the public mass transit in New York.
- The MTA is the largest transportation network in the North America, serving about 15.3 million population (MTA).
- The agency has about 70,000 employees with a fleet size of 5818 buses, 6418 subway, and 2352 commuter rail.
- It has the largest bus fleet, more commuter rail and subway cars than all other combined transit systems in the U.S. (MTA).
Grand Central Madison – New York City

Photo Credit: https://new.mta.info/grandcentralmadison
Sustainable Initiatives

➢ The MTA is an ISO 14001 certified – the first transportation agency in the U.S to be certified.

➢ Some of the sustainable initiatives of the MTA to reduce greenhouse gas emissions and prevent pollution are:
  - Air Pollution Control
  - Natural Lighting
  - LEED Buildings/Facilities
  - Electric Buses
  - Renewable Energy
  - Green Infrastructure
  - Recycling – recycled about 90% of construction and demolition wastes since 2009 (Personal communication).
MTA buses has a diesel particulate filter for air pollution control.
❖ LEED Buildings/Facilities/Natural Lighting

Photo Credit: Prof. Thomas Abdallah
➢ First LEED certified public transportation facility through the integration of many energy-efficient and environmental attributes such as solar panels, white roof, natural ventilation, heat recovery units, and an array of skylights (Abdallah, 2017).

➢ Another example is the Mother Clara Hale Bus Depot, which has attained Gold LEED level.
Electric Bus

- Plans to electrify all MTA buses.
- 60 electric buses are currently in operation out of the proposed 5818.

Photo Credit: Prof. Thomas Abdallah
Indoor Charging Station

Photo Credit: Prof. Thomas Abdallah
Energy Generation and Sources in New York State

- In New York State, more than 90% of the net electricity generation come primarily from natural gas, nuclear power, and hydroelectricity.
- Hydroelectric, wind, biomass, and solar plants generate 30% of in-state electricity in New York.

<table>
<thead>
<tr>
<th>Renewable energy</th>
<th>Total net electricity generation</th>
<th>Total renewable electricity generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroelectric</td>
<td>22%</td>
<td>73%</td>
</tr>
<tr>
<td>Wind</td>
<td>3%</td>
<td>11%</td>
</tr>
<tr>
<td>Solar</td>
<td>3%</td>
<td>-</td>
</tr>
<tr>
<td>Biomass</td>
<td>2%</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: U.S. Energy Information Administration, 2022
Public transportation operations are known to be energy intensive. However, considering the size of the MTA, it is important to highlight the energy consumption rate compared to other sectors.
Renewable Energy - Solar System

➢ Installation of solar panels on MTA building.

Photo Credit: Prof. Thomas Abdallah
Green Infrastructure

- Planting of trees at the stations and along the rail tracks
- Green roof
- Rainwater harvesting
- Stormwater management
Green roof at Mother Clara Depot.

Photo Credit: Prof. Thomas Abdallah
Green roof at another MTA facility.

Photo Credit: Prof. Thomas Abdallah
Subway Bus Wash Station

➢ Rainwater collection yard as part of the stormwater management.

➢ There are three more bus depots with rooftop rainwater collection system (Abdallah, 2017).

Photo Credit: Prof. Thomas Abdallah
Summary

➢ Urban mass transit significantly reduce the concentrations of greenhouse gases and air pollutants.
➢ Replacement of the regular buses with electric buses to control air pollution and to achieve a zero-emission by 2040.
➢ Building of solar energy system at MTA facilities and the derivation of about 80% of the energy from clean renewable energy sources.
➢ Implementation of climate change adaptability strategies to protect MTA infrastructure from climate catastrophe.
➢ Reduction in waste generation, and an increase in reuse and recycling of construction and demolition wastes.
Acknowledgement

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Thank You!