

# BTS Impact Valuation 2024/2025

**Impact of the BTS Skytrain:**  
Green Line, Pink Line, Yellow Line, and Gold Line



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# Introduction

# Overview and Objectives: BTS Skytrain Impact Valuation

In 2024/2025, the BTS Skytrain Green Line, Pink Line, Yellow Line, and Gold Line carried around 306 million trips for work, school, and leisure. This figure reflects the significant role of the Skytrain system in improving mobility in Bangkok and its vicinity.



## Objectives:

- In addition to its positive impact on mobility, the operation of the BTS Skytrain offers significant societal benefits, including reducing greenhouse gas (GHG) emissions, improving air quality, and helping to decrease road accidents. These outcomes contribute to enhancing the overall quality of life for residents and visitors in the city, making transportation more efficient and safer.
- Therefore, by quantifying both the positive and negative effects generated on natural and social capitals through its operations, a clearer understanding of its impact is achieved, which helps in managing and enhancing its contributions to both social and natural capitals.



# Impacts Comparison

## BTS Skytrain Impact Valuation 2019 & 2024/2025

|                            |   | Economic Impact                        |   | Social Impact                          |   | Environmental Impact                            |   |
|----------------------------|---|--|---|--|---|---|---|
|                            | Scope of Impact Valuation   | Passenger cost of daily transportation | Employment through BTS Skytrain Operation | Passenger time in daily transportation | Passenger accidents in daily transportation | Emission associated with BTS Skytrain operation | Waste associated with the operation of the BTS Skytrain |
| Impact Valuation 2019      | <ul style="list-style-type: none"> <li>Green Line</li> </ul>  | ✓                                      | ✗   | ✓                                      | ✗   | ✓   | ✗   |
| Impact Valuation 2024/2025 | <ul style="list-style-type: none"> <li>Green Line</li> <li>Pink Line</li> <li>Yellow Line</li> <li>Gold Line</li> </ul> | ✓                                      | ✓   | ✓                                      | ✓   | ✓   | ✓   |

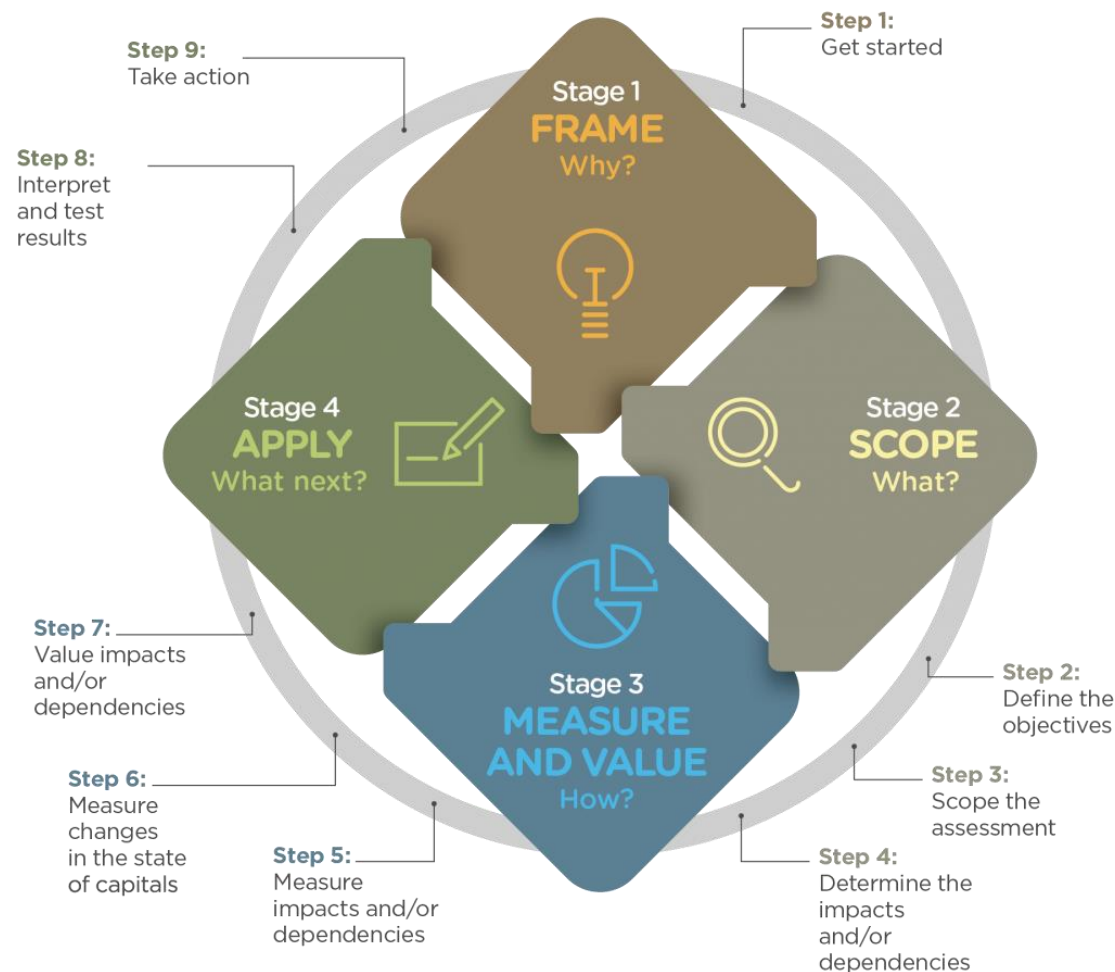
**Note:** ✓ refers to impacts **included** in the scope of impact valuation

✗ refers to impacts **not included** in the scope of impact valuation



## Impact Valuation Process

# Impact Valuation Methodology



Reference: [Capitals Coalition](#)

## Stage 1: Frame

Identify risks and opportunities for external stakeholders resulting from the relationships with natural and social capital and explore how an assessment would be relevant to your decision making.

## Stage 2: Scope

Identify the objective of the assessment and conduct a materiality process to select the most relevant impacts and dependencies from the perspective.

## Stage 3: Measure & Value

Use relevant approaches to measure and value the costs and benefits resulting from material impacts and dependencies on natural and social capital.

## Stage 4: Apply

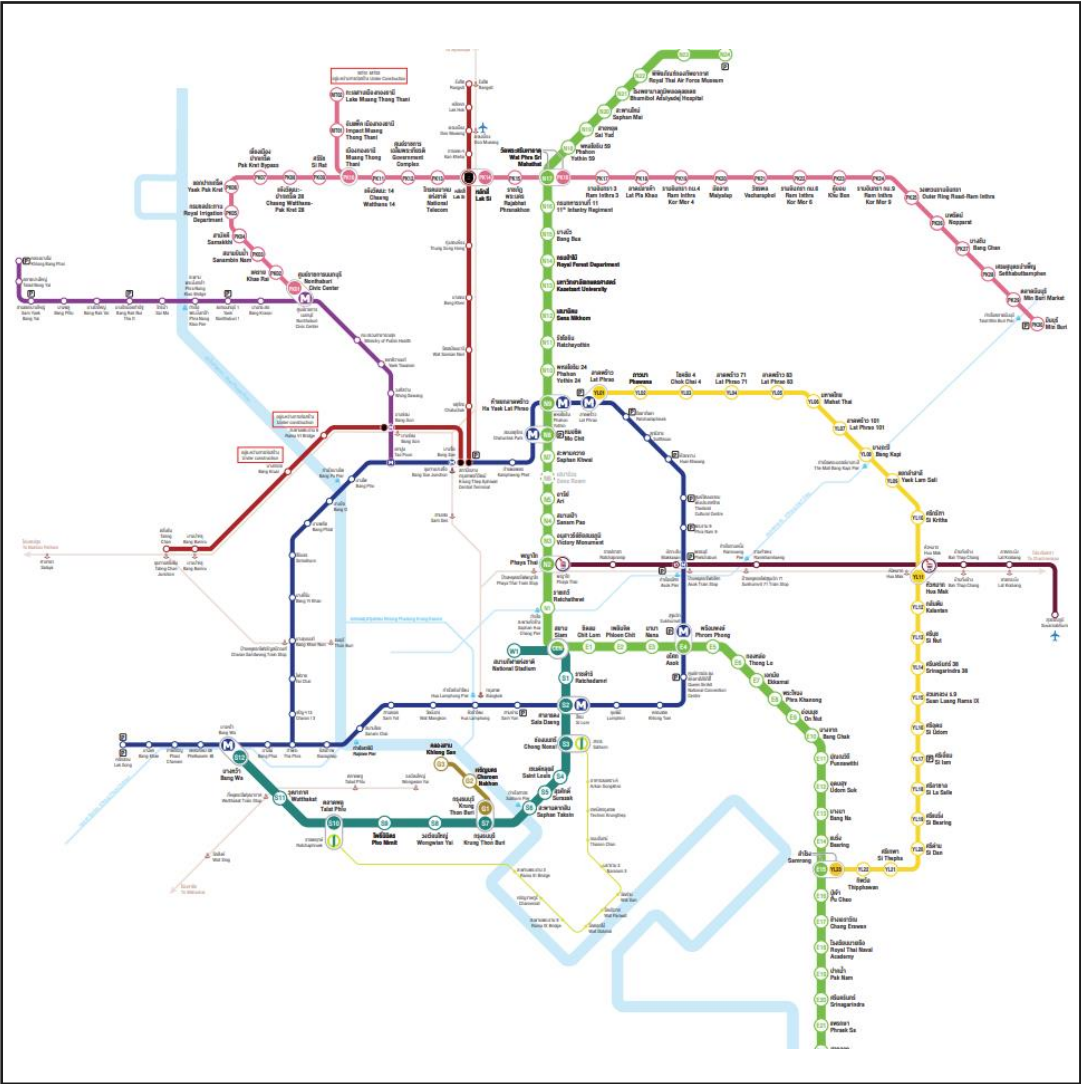
Interpret, validate and verify the assessment process and results and integrate them into existing business processes to inform decision-making.

# Step 1: Frame

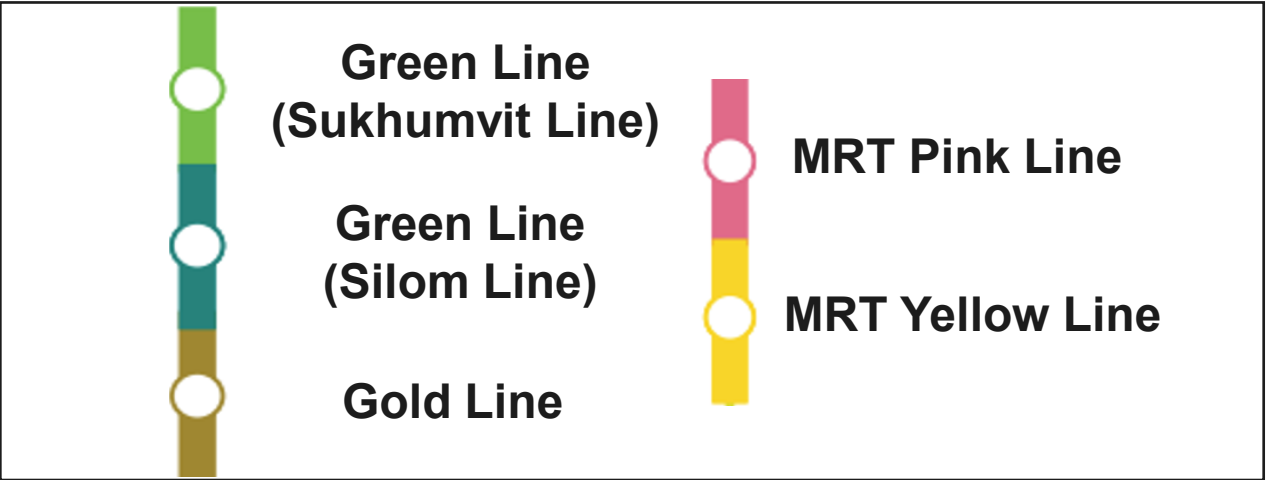
- **Key Concepts:** The Study uses following concepts to frame the impact valuation methodology,
  - ✓ Understand the main externalities associated with BTS Skytrain activity;
  - ✓ Carry out a monetary valuation of the economic, social, and environmental impacts for the main externalities; and
  - ✓ Share the methodology for BTS Skytrain's impact valuation.
- **Natural and Social Capital related to BTS Group:** By embracing natural and social capital, BTS Group strengthens its commitment to its vision: “To serve our community with unique and sustainable solutions that greatly contribute to an improved life.” This approach seamlessly aligns with our core values—Delivering Customer Satisfaction, Creating Shareholder Value, Supporting Sustainable Growth, and Developing Communities—ensuring a lasting positive impact on society and the environment.



# Step 2: Scope



Source: [btsroutes](#)



- **Study Scope:** the Impact Valuation of BTS Skytrain has been conducted for the BTS Green Line, Pink Line, Yellow Line, and Gold Line, which consisted of 118 Stations in total.
- **Timeline of Study:** the Impact Valuation of BTS Skytrain undertaken for the operation of BTS Green Line, Pink Line, Yellow Line, and Gold Line in fiscal year 2024/2025.
- **The study values:**
  - Economic Impacts: 1) Reduction in passenger cost of daily transportation, 2) Employment creation through BTS Skytrain operation
  - Social Impacts: 1) Reduction in passenger time of daily transportation, 2) Reduction in accident through BTS Skytrain operation
  - Environmental Impacts: 1) Emission reduction/increase through BTS Skytrain operation, 2) Waste from BTS Skytrain operation

# Step 3: Measure and Value

- **Tool:** The impact valuation calculation spreadsheet is designed to systematically assess the environmental, social, and economic impacts of a project or initiative. This assessment process involves identifying specific outputs, selecting appropriate indicators, and applying relevant financial proxies for each impact area. By quantifying these factors, the spreadsheet enables the calculation of the monetary value associated with each impact dimension, with the goal of ultimately determining the monetary value of each impact area.
- **Data:** The data for output, indicators, and financial proxies are from the following source;
  - Data provided by the Company
  - Passenger survey data
  - Data from secondary sources (e.g., research paper, news article, information from official/trusted website)

## Tool

| Inputs  | Activity  | Description   | Impact        | Dimension | Type    | External Stakeholder/ Beneficiary | Number  | Output     | Description   | Number     | Indicator                         | Description | Value           | Financial Proxy | Description | Monetary value (THB/yr) |
|---|---|---|---------------|-----------|---------|-----------------------------------|---|------------|---|------------|-----------------------------------|-------------|-----------------|-----------------|-------------|-------------------------|
| Total expense of BTS Skytrain (4,314,400,000 THB) | BTS Skytrain provides safe, convenient, and environmentally friendly transportation services for passengers through the operation of the green line, pink line, yellow line, and gold line. | Impact 1: CO2 emission reduction from providing BTS Skytrain service as environmentally friendly alternative to other modes of transportation | Environmental | Positive  | Society | 306,475,590.00                    | Total number of BTS Skytrain trips (Trip/year)  | 0.00055    | Average CO2 emission reduction per trip when using BTS Skytrain compared to other modes of transport (tCO2e/trip) | 1,886.95   | Social Cost of Carbon (THB/tCO2e) |             | 316,793,357.53  |                 |             |                         |
|   |   | Impact 2: CO2 emission from consumption of grid electricity of BTS Skytrain operation   | Environmental | Negative  | Society | 164,965.39                        | Electricity consumption from BTS Skytrain operation* (MWh/year)<br>* total traction power | 0.093090   | CO2 emission from electricity generation of BTS Skytrain operation (tCO2e/MWh)                                    | 1,886.95   | Social Cost of Carbon (THB/tCO2e) |             | (28,977,153.91) |                 |             |                         |
|   |   | Impact 3: SO2 emission reduction from providing BTS Skytrain service as environmentally friendly alternative to other modes of transportation | Environmental | Positive  | Society | 306,475,590.00                    | Total number of BTS Skytrain trips (Trip/year)  | 0.00000045 | SO2 emission reduction per trip when using BTS Skytrain compared to other modes of transport (tSO2/trip)          | 400,466.00 | Social Cost of SO2 (THB/tSO2)     |             | 5,538,910.47    |                 |             |                         |
|   |   | Impact 4: SO2 emission from operation of BTS Skytrain   | Environmental | Negative  | Society | 164,965.39                        | Electricity consumption from BTS Skytrain operation* (MWh/year)<br>* total traction power | 0.000043   | SO2 emission from electricity generation of BTS Skytrain operation (tSO2/MWh)                                     | 400,466.00 | Social Cost of SO2 (THB/tSO2)     |             | (2,846,710.35)  |                 |             |                         |
|   |   | Impact 5: NOx emission reduction from providing BTS Skytrain service as environmentally friendly alternative to other modes of transportation | Environmental | Positive  | Society | 306,475,590.00                    | Total number of BTS Skytrain trips (Trip/year)  | 0.0000015  | NOx emission reduction per trip when using BTS Skytrain compared to other modes of transport (tNOx/trip)          | 298,529.20 | Social Cost of NOx (THB/tNOx)     |             | 140,159,160.15  |                 |             |                         |
|   |   | Impact 6: NOx emission from operation of BTS Skytrain   | Environmental | Negative  | Society | 164,965.39                        | Electricity consumption from BTS Skytrain operation* (MWh/year)<br>* total traction power | 0.00013    | NOx emission from electricity generation of BTS Skytrain operation (tNOx/MWh)                                     | 298,529.20 | Social Cost of NOx (THB/tNOx)     |             | (6,303,614.35)  |                 |             |                         |

## Data

| Data Point (2024-2025)   | Value (2024-2025) | Unit (2024-2025) | Reference  |
|--|-------------------|------------------|--|
| Total BTS Skytrain expense   | 4,315,400,000.00  | THB/year         | Data sheet provided by BTS   |
| <b>Impact 1: CO2 emission reduction from providing BTS Skytrain service as environmentally friendly alternative to other modes of transportation</b>   |                   |                  |  |
| Description: BTS Skytrain plays a crucial role in reducing greenhouse gas (GHG) emissions by providing an energy-efficient and environmentally friendly alternative to traditional modes of transportation. As passengers travel by electric-powered BTS Skytrain instead of private cars, motorcycles, and fossil-fuel-powered public transport, there is a significant decrease in GHG Emission. |                   |                  |  |
| <b>Output</b>  |                   |                  |  |
| Total number of BTS Skytrain trips   | 306,475,590.00    | Trip/year        | Data sheet provided by BTS   |
| <b>Indicator</b>   |                   |                  |  |
| Average CO2 emission reduction per trip when using BTS Skytrain compared to other modes of transport   | 0.00055           | tCO2e/trip       | <a href="https://www.researchgate.net/publication/267247313_Emission_Factor_of_Carbon_Dioxide_from_In-Use_Vehicles_in_Thailand">https://www.researchgate.net/publication/267247313_Emission_Factor_of_Carbon_Dioxide_from_In-Use_Vehicles_in_Thailand</a>  |
| <b>Financial Proxy</b>   |                   |                  |  |
| Social Cost of Carbon (THB)  | 1,886.95          | THB/tCO2e        | Calculation from data below  |
| Social Cost of Carbon (USD)  | 56.00             | USD/tCO2e        | The Social Cost of Carbon (SCC) is referenced from Interagency Working Group - IWG. (2021) at 3% of Discount Rate and Statistic, year 2025 ( <a href="https://www.energy.gov/sites/default/files/2023-04/51.%20Social%20Cost%20of%20Carbon%202021.pdf">https://www.energy.gov/sites/default/files/2023-04/51.%20Social%20Cost%20of%20Carbon%202021.pdf</a> ) |
| Exchange rate per 1 USD  | 33.70             | THB/USD          | The exchange rate (THB per USD) is referenced from the Bank of Thailand as of 31st March 2025 ( <a href="https://www.bot.or.th/th/statistics/exchange-rate.html">https://www.bot.or.th/th/statistics/exchange-rate.html</a> )  |
| <b>Impact 2: CO2 emission from operation of BTS Skytrain</b>   |                   |                  |  |
| Description: BTS Skytrain's operations result in indirect (Scope 2) GHG emissions from consumption of grid electricity.  |                   |                  |  |
| <b>Output</b>  |                   |                  |  |
| Electricity consumption from BTS Skytrain operation  | 164,965.39        | MWh/year         | Data sheet provided by BTS   |
| Total CO2e from train traction   | 15,356.58         | tCO2e/year       | Data sheet provided by BTS   |
| <b>Indicator</b>   |                   |                  |  |
| CO2 emission from electricity generation of BTS Skytrain operation   | 0.093090          | tCO2e/MWh        | CO2 emission from electricity generation is reference from   |
| <b>Financial Proxy</b>   |                   |                  |  |
| Social Cost of Carbon (THB)  | 1,886.95          | THB/tCO2e        | Calculation from data below  |
| Social Cost of Carbon (USD)  | 56.00             | USD/tCO2e        | The Social Cost of Carbon (SCC) is referenced from Interagency Working Group - IWG. (2021) ( <a href="https://www.energy.gov/sites/default/files/2023-04/51.%20Social%20Cost%20of%20Carbon%202021.pdf">https://www.energy.gov/sites/default/files/2023-04/51.%20Social%20Cost%20of%20Carbon%202021.pdf</a> )   |
| Exchange rate per 1 USD  | 33.70             | THB/USD          | The exchange rate (THB per USD) is referenced from the Bank of Thailand as of 31st March 2025 ( <a href="https://www.bot.or.th/th/statistics/exchange-rate.html">https://www.bot.or.th/th/statistics/exchange-rate.html</a> )  |

# Step 4: Apply

Information obtained from stakeholder interviews and evaluation results will be systematically analyzed and synthesized to formulate practical and targeted recommendations for future improvements.



## **Improvement in Transportation Time:**

- BTS Skytrain offers significantly shorter passenger transportation time compared to other modes of transportation, further time reduction could be achieved by increasing train availability and providing real-time train schedules through an online application

## **Lower Transportation Cost:**

- While BTS Skytrain offers transportation services at reasonable cost compared to other modes of transportation, further cost reduction could be achieved through a consistent fare structure and easier access to promotions, helping to ease the financial burden on daily commuters.

## **Improvement in Safety:**

- BTS Skytrain provides significantly safer transportation compared to other modes. However, passenger safety and walking convenience remain concerns from the passengers. To improve overall safety and comfort within the BTS system, it is recommended that BTS implement safety behavioral stimulation and design improvements to create a more user-friendly and secure travel environment.

## **Good Practices for Impact Valuation**

- Regular Monitoring and Evaluation
- Risk Assessment
- Sustainability and Long-Term Impact
- Continuous Improvement



## Impact Valuation Result



# Disclaimer

The impact valuation of the BTS Skytrain for 2024/2025 is based on the best available data and a set of informed assumptions. However, it may not fully capture all variables or potential outcomes. The findings and conclusions presented in this report are subject to change as new information becomes available or as valuation methodologies continue to evolve.

It is important to note that while efforts have been made to ensure the accuracy and reliability of the data used, the results should be interpreted with caution. This impact assessment is designed to provide a general overview of the potential benefits and limitations and should not be regarded as definitive or exhaustive. Stakeholders are encouraged to use these findings as part of a broader decision-making process and to seek additional information and perspectives as appropriate.

# Value Creation of **BTS Skytrain** (1/2)

|  |               | Impact 1  | Impact 2   | Impact 3   |
|--|---------------|---|--|--|
| Material Issue for External Stakeholders     |               | Climate Action  | Infrastructure and Accessibility   | Health and Safety for All  |
| Category                                     |               | Climate Transition & Physical Risks   | Product / Service Quality & Safety   | Product / Service Quality & Safety   |
| Cause of the Impact                          |               | Products/ Services  | Products/ Services   | Products/ Services   |
| External stakeholders/ impact area evaluated |               | <ul style="list-style-type: none"><li>• Environmental</li><li>• Society</li></ul>   | <ul style="list-style-type: none"><li>• Consumers/end-users</li></ul>  | <ul style="list-style-type: none"><li>• Consumers/end-users</li></ul>  |
| Topic relevance on external stakeholders     |               | BTS Skytrain provides environmentally friendly transportation services that can reduce overall CO2, NOx, and SO2 emissions compared to other modes of transportation. | BTS Skytrain provides convenient transportation services for passengers, significantly reducing both transportation costs and travel time compared to other modes of transportation. | BTS Skytrain provides safe transportation services for passengers, significantly reducing the accident rate compared to other modes of transportation. |
| Output Metric                                |               | CO2, NOx, SO2 emission created/reduced  | Transportation cost and time reduced   | Transportation related accident reduced  |
| Impact Valuation                             |               | Social cost caused/avoided  | Access to product/service with positive impact provided  | Access to product/service with positive impact provided  |
| Impact Metric                                | Positive (a)  | Decreased social cost of CO2, Nox, SO2 by 476.93 million THB  | Decreased the transportation cost and time of passengers by 33,796.07 million THB  | Decreased cost of accident rate by 3,206.81 million THB  |
|  | Negative (b)  | Increased social cost of CO2, Nox, SO2 by 192.57 million THB  | -  | -  |
|  | Overall (a-b) | Decreased social cost of CO2, Nox, SO2 by 284.36 million THB  | Decreased the transportation cost and time of passengers by 33,796.07 million THB  | Decreased cost of accident rate by 3,206.81 million THB  |

# Value Creation of **BTS Skytrain** (2/2)

|   |               | Impact 4  | Impact 5   |
|---|---------------|---|--|
| Material Issue for External Stakeholders    |               | Human Resources Management  | Environmental Resource Management  |
| Category                                    |               | Human Capital Management  | Climate Transition & Physical Risks  |
| Cause of the Impact                         |               | <ul style="list-style-type: none"><li>• Operation</li><li>• Supply Chain</li></ul>                | <ul style="list-style-type: none"><li>• Operation</li></ul>                                |
| External stakeholder/ impact area evaluated |               | <ul style="list-style-type: none"><li>• Society</li></ul>   | <ul style="list-style-type: none"><li>• Environmental</li><li>• Society</li></ul>          |
| Topic relevance on external stakeholders    |               | BTS Skytrain operation generates employment for full-time employees, contractors, and internship. | BTS Skytrain operations both generate and recycle/reuse hazardous and non-hazardous waste. |
| Output Metric                               |               | Social Benefit in term of Net Value   | Cost of waste management created/reduced   |
| Impact Valuation                            |               | Increase in household-level income  | Social cost caused/avoided   |
| Impact Metric                               | Positive (a)  | Increased employment with total value of 232.51 million THB                                       | Decreased the waste management cost by 190,941 THB   |
|   | Negative (b)  | -   | Increased the waste management cost by 1,152,652 THB                                       |
|   | Overall (a-b) | Increased employment with total value of 232.51 million THB                                       | Increased the waste management cost by 961,711 THB   |

# Impact Materiality 1: Climate Action

| Input  | Activity  | Output   | Impact  | IRIS Metric  |
|--|---|--|---|--|
| <ul style="list-style-type: none"><li>Operating expenses of the BTS Skytrain</li></ul> | <ul style="list-style-type: none"><li>BTS Skytrain provides environmentally friendly transportation services that can reduce overall CO2, NOx, and SO2 emissions compared to other modes of transportation.</li></ul> | A total of <b>306,475,590</b> BTS Skytrain trips were operated                           | <div><div></div><div><b>Environmental Impact:</b><br/>The BTS Skytrain provides an environmentally friendly alternative to other modes of transportation, resulting in a reduction of social cost of <b>CO2</b> emissions by approximately <b>328.96</b> million THB.</div></div> | IRIS, 2021. Greenhouse Gas Emissions Avoided (PI2764). v5.2.   |
|  |   |  | <div><div></div><div><b>Environmental Impact:</b><br/>The BTS Skytrain provides an environmentally friendly alternative to other modes of transportation, resulting in a reduction of social cost of <b>SO2</b> emissions by approximately <b>6.24</b> million THB.</div></div>   |  |
|  |   |  | <div><div></div><div><b>Environmental Impact:</b><br/>The BTS Skytrain provides an environmentally friendly alternative to other modes of transportation, resulting in a reduction of social cost of <b>NOx</b> emissions by approximately <b>141.73</b> million THB.</div></div> |  |
|  | <ul style="list-style-type: none"><li>BTS Skytrain operations result in CO2, NOx, and SO2 emission primarily from electricity generation.</li></ul>   | A total of <b>164,965</b> MWh of electricity was consumed by the BTS Skytrain operations | <div><div></div><div><b>Environmental Impact:</b><br/>The electricity consumed by the BTS Skytrain operations create social cost of <b>CO2</b> emissions by approximately <b>183.42</b> million THB.</div></div>  | IRIS, 2021. Greenhouse Gas Emissions: Indirect (OI9604). v5.2. |
|  |   |  | <div><div></div><div><b>Environmental Impact:</b><br/>The electricity consumed by the BTS Skytrain operations create social cost of <b>SO2</b> emissions by approximately <b>2.84</b> million THB.</div></div>  |  |
|  |   |  | <div><div></div><div><b>Environmental Impact:</b><br/>The electricity consumed by the BTS Skytrain operations create social cost of <b>NOx</b> emissions by approximately <b>6.30</b> million THB.</div></div>  |  |



# Impact Materiality 2: Infrastructure and Accessibility

| Input  | Activity   | Output   | Impact  | IRIS Metric   |
|--|--|--|---|---|
| <ul style="list-style-type: none"><li>Operating expenses of the BTS Skytrain</li></ul> | <ul style="list-style-type: none"><li>BTS Skytrain provides convenient transportation services for passengers, significantly reducing both transportation costs and travel time compared to other modes of transportation.</li></ul> | A total of <b>306,475,590</b> BTS Skytrain trips were operated | <div><div>+</div><div><b>Economic Impact:</b><br/>The BTS Skytrain reduces <b>transportation cost</b> for passenger compared to other modes of transport by approximately <b>9,752.19</b> million THB.</div></div>        | IRIS, 2021. Number of Routes Served (PI6504). v5.2. |
|  |  |  | <div><div>+</div><div><b>Social Impact:</b><br/>The BTS Skytrain reduces <b>transportation time</b> for passenger compared to other modes of transport, valued at approximately <b>24,043.87</b> million THB.</div></div> |   |

# Impact Materiality 3: Health and Safety for All

| Input  | Activity  | Output  | Impact   | IRIS Metric   |
|--|---|---|--|---|
| <ul style="list-style-type: none"><li>Operating expenses of the BTS Skytrain</li></ul> | <ul style="list-style-type: none"><li>BTS Skytrain provides safe transportation services for passengers, significantly reducing transportation related accident</li></ul> | A total of 717,400 passengers used the BTS Skytrain | <div><div>+</div><div><b>Social Impact:</b><br/>The BTS Skytrain reduces accident rate for passenger compared to other modes of transport. The total value of accident avoided is approximately 32,068.17 million THB.</div></div> | IRIS, 2021. Target Stakeholder Injuries (PI7161). v5.2. |

# Impact Materiality 4: Human Resources Management

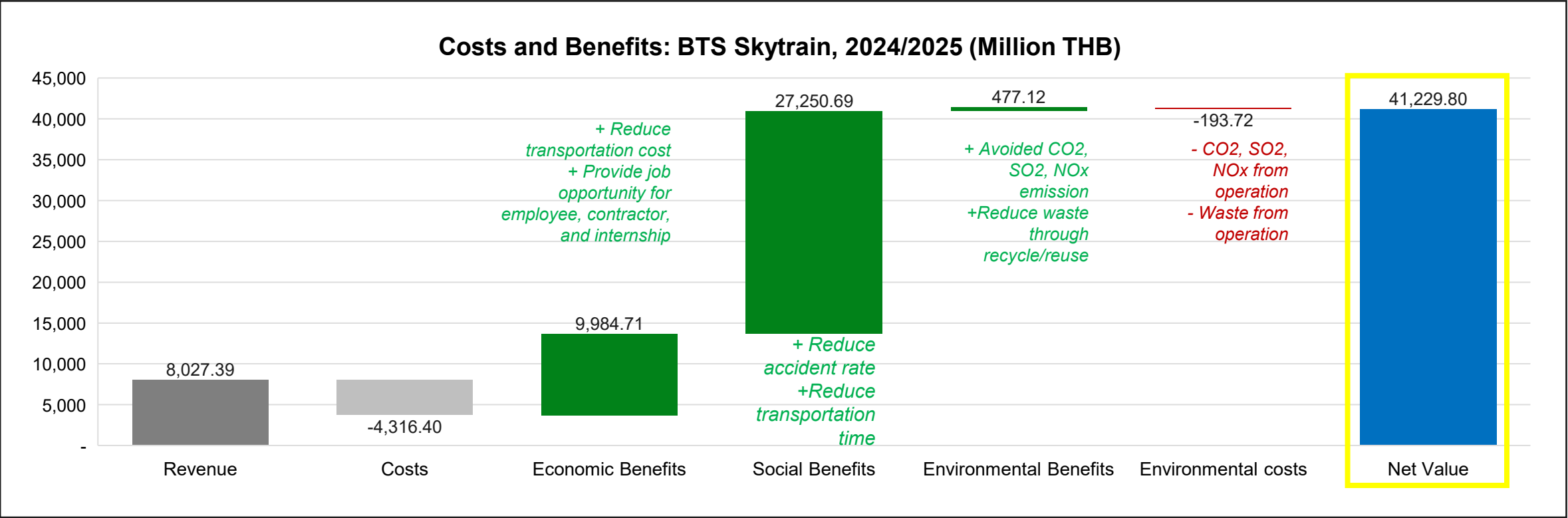
| Input  | Activity  | Output   | Impact   | IRIS Metric  |
|--|---|--|--|--|
| <ul style="list-style-type: none"> <li>Operating expenses of the BTS Skytrain</li> </ul> | <ul style="list-style-type: none"> <li>BTS Skytrain creates employment opportunities for full-time employees</li> </ul>               | A total of <b>591</b> full-time employees were hired to support BTS Skytrain operation                             | <b>+</b> <b>Economic Impact:</b><br>The total wages and compensation received by full-time employees amounted to <b>120.35</b> million THB.  | <ul style="list-style-type: none"> <li>IRIS, 2021. Jobs Created at Directly Supported/Financed Enterprises (PI3687). v5.2.</li> <li>IRIS, 2021. Jobs Type (OD0660). v5.2.</li> <li>IRIS, 2021. Full-time Employees: Hired (OI5479). v5.2.</li> <li>IRIS, 2021. Full-time Wages: Total (OI5887). v5.2.</li> </ul> |
|  | <ul style="list-style-type: none"> <li>BTS Skytrain creates employment opportunities for contract workers</li> </ul>                  | A total of <b>182</b> contract workers that were hired to support operation activities of BTS Skytrain             | <b>+</b> <b>Economic Impact:</b><br>The total wages and compensation received by contract workers hired to support BTS Skytrain operation activities amounted to approximately <b>29.33</b> million THB.             |  |
|  |   | A total of <b>247</b> contract workers that were hired to support maintenance activities of BTS Skytrain           | <b>+</b> <b>Economic Impact:</b><br>The total wages and compensation received by contract workers hired to support BTS Skytrain maintenance amounted to approximately <b>50.32</b> million THB.                      |  |
|  |   | A total of <b>231</b> contract workers that were hired to support security and cleaning activities of BTS Skytrain | <b>+</b> <b>Economic Impact:</b><br>The total wages and compensation received by contract workers hired to support BTS Skytrain security and cleaning activities amounted to approximately <b>31.05</b> million THB. |  |
|  | <ul style="list-style-type: none"> <li>BTS Skytrain creates opportunity for internship</li> </ul>                                     | A total of <b>63</b> paid-internship students were hired to support BTS Skytrain operation                         | <b>+</b> <b>Economic Impact:</b><br>The total wages and compensation received by paid-internship students for BTS Skytrain operation amounted to approximately <b>835,758</b> million THB.                           |  |
|  | <ul style="list-style-type: none"> <li>BTS Skytrain hires a certain number of internship students for full-time employment</li> </ul> | A total of <b>3</b> paid-internship were hired as full-time employees  | <b>+</b> <b>Economic Impact:</b><br>The total wages and compensation received by full-time employees that were paid-internship student amounted to <b>610,920</b> THB.   |  |

# Impact Materiality 5: Environmental Resource Management

| Input  | Activity  | Output   | Impact  | IRIS Metric   |
|--|---|--|---|---|
| <ul style="list-style-type: none"> <li>Operating expenses of the BTS Skytrain</li> </ul> | <ul style="list-style-type: none"> <li>BTS Skytrain create waste from operation and maintenance service.</li> </ul>                                   | A total of <b>228.75</b> tons of hazardous waste from BTS Skytrain operation and maintenance service                       | <b>– Environmental Impact:</b><br>The cost of hazardous waste management from BTS Skytrain operation and maintenance service is approximately <b>543,281.25</b> million THB.  | IRIS, 2021. Waste Produced: Hazardous Waste (OI1346). v5.2.     |
|  |   | A total of <b>827.20</b> tons of non-hazardous waste from BTS Skytrain operation and maintenance service                   | <b>– Environmental Impact:</b><br>The cost of non-hazardous waste management from BTS Skytrain operation and maintenance service is approximately <b>609,371.40</b> million THB.  | IRIS, 2021. Waste Produced: Non-Hazardous Waste (OI7442). v5.2. |
|  | <ul style="list-style-type: none"> <li>BTS Skytrain recycle/reuse a signification portion of waste from operation and maintenance service.</li> </ul> | A total of <b>38.38</b> tons of hazardous waste from BTS Skytrain operation and maintenance service can be recycled/reused | <b>+ Environmental Impact:</b><br>The cost of hazardous waste management from BTS Skytrain operations and maintenance services that can be avoided through recycling and reuse is approximately <b>91,152.50</b> million THB. | IRIS, 2021. Waste Produced: Hazardous Waste (OI1346). v5.2.     |
|  |   | A total of <b>135.46</b> tons of non-hazardous waste from BTS Skytrain operation and maintenance service can recycle/reuse | <b>+ Environmental Impact:</b><br>The cost of non-hazardous waste management from BTS Skytrain operations and maintenance services that can be avoided through recycling and reuse is approximately <b>99,788.87</b> THB.     | IRIS, 2021. Waste Produced: Non-Hazardous Waste (OI7442). v5.2. |



# Costs and Benefits from BTS Skytrain





## Recommendations

# Recommendations (1/2)

## Increase Ridership:

- Although BTS Skytrain currently operates a sufficient number of trips to serve its existing passengers effectively, there remains an opportunity to expand its ridership base. Doing so can generate additional positive and negative impacts, which can be managed and optimized through the following approaches:
  - **Expand Operating Period:** Currently, BTS Skytrain operates from 6:00 AM to 12:00 AM to align with the working hours and travel needs of most passengers. However, there is strong potential to expand ridership by targeting individuals who need to travel earlier in the day, such as those with early work shifts or long commutes. Introducing a small number of additional trips before 6:00 AM could significantly increase the number of active passengers and improve accessibility for a wider range of commuters.
  - **Offer reduced fares during off-peak hour:** Implementing a discounted fare structure during off-peak hours, such as mid-morning, early afternoon, or late evening, can help distribute passenger traffic more evenly throughout the day. This approach not only alleviates congestion during peak travel times, but also makes the BTS Skytrain system more accessible to cost-sensitive groups.

## Increase the proportion of renewable energy in operation:

- Increase the proportion of renewable energy used in BTS Skytrain operations to reduce emissions of CO<sub>2</sub>, SO<sub>2</sub>, and NO<sub>x</sub> from electricity generation. This will significantly contribute to lowering the carbon footprint of urban transportation. The transition to cleaner energy sources can also strengthen BTS's position as a sustainable urban mobility provider, attract environmentally conscious passengers and stakeholders, and potentially lead to an increase in ridership.

# Recommendations (2/2)

## Improvement in Transportation Time:

- BTS Skytrain offers significantly shorter passenger transportation time compared to other modes of transportation, further time reduction could be achieved by increasing train availability and providing real-time train schedules through an online application.
  - *“The BTS Skytrain schedule should be accurately available through online applications such as Google Maps or BTS Official Application.”* - Passenger 1
  - *“During peak hours, the number of train services should be increased to better accommodate the high volume of passengers, reduce overcrowding, and shorten waiting times.”* - Passenger 2

## Lower Transportation Cost:

- While BTS Skytrain offers transportation services at reasonable cost compared to other modes of transportation, further cost reduction could be achieved through a consistent fare structure and easier access to promotions, helping to ease the financial burden on daily commuters.
  - *“The BTS Skytrain should implement a flat-rate fare for travel across the entire BTS Skytrain line to reduce travel costs.”*- Passenger 1
  - *“The BTS Skytrain should offer more frequent fare promotions or discounts to reward regular users and encourage continued use of the service.”* - Passenger 2

## Improvement in Safety and Comfort:

- BTS Skytrain provides significantly safer transportation compared to other modes. However, passenger safety and walking convenience still remain concerns from the passengers. To improve overall safety and comfort within the BTS system, it is recommended that BTS implement safety behavioral stimulation and design improvements to create a more user-friendly and secure travel environment.
  - *“BTS Skytrain should encourage passengers to keep right on escalator and walkway to ensure smooth flow during peak hours.”*- Passenger 1
  - *“BTS Skytrain should ensuring trains consistently stop with full alignment on flat level platforms to improve passenger stability, reduce the risk of tripping, and enhance overall boarding comfort.”* - Passenger 2
  - *“BTS Skytrain should install platform doors at all stations to prevent accidental falls and improve safety while waiting.”* - Passenger 3



# Good Practices for Impact Valuation

## ■ Regular Monitoring and Evaluation

- Periodically review and update the impact valuation to reflect changes and new data.
- Implement a regular monitoring and evaluation system to track progress and impact over time.

## ■ Risk Assessment

- Conduct a thorough risk assessment to identify potential obstacles and mitigation strategies.
- Incorporate risk management plans to address identified risks and ensure project success.

## ■ Sustainability and Long-Term Impact

- Focus on the sustainability and long-term impact of the project.
- Assess the project's ability to generate sustained benefits and its resilience to potential future challenges.

## ■ Continuous Improvement

- Foster a culture of continuous improvement by learning from each valuation.
- Implement feedback loops and regularly update processes based on lessons learned and stakeholder input.

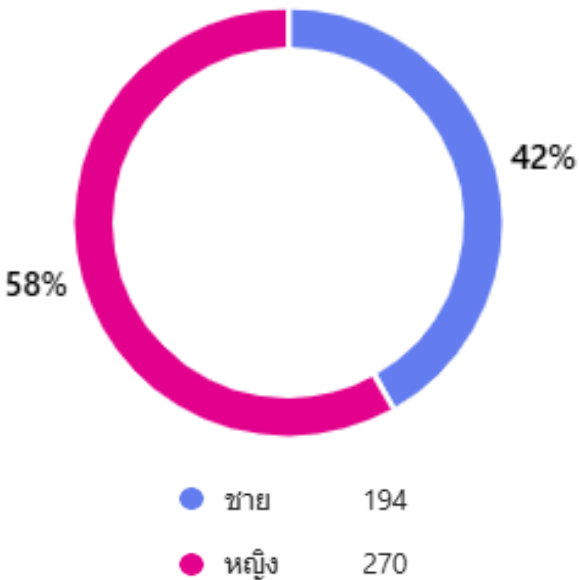


## **Appendix: Survey Responses**

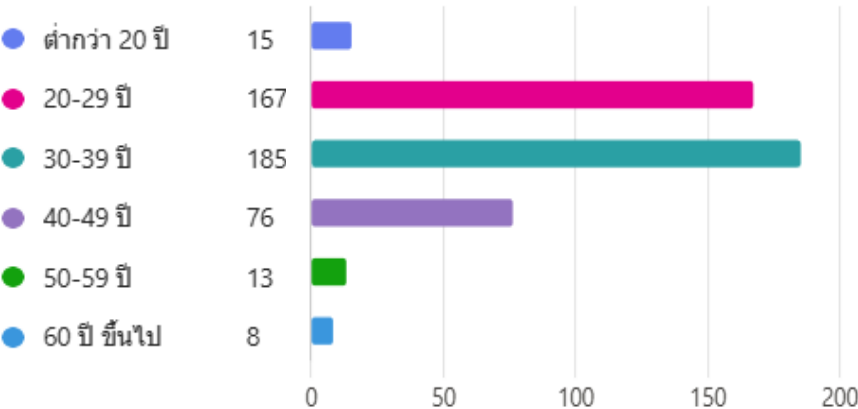
# Appendix: Responses Overview

■ Total Responses: 464

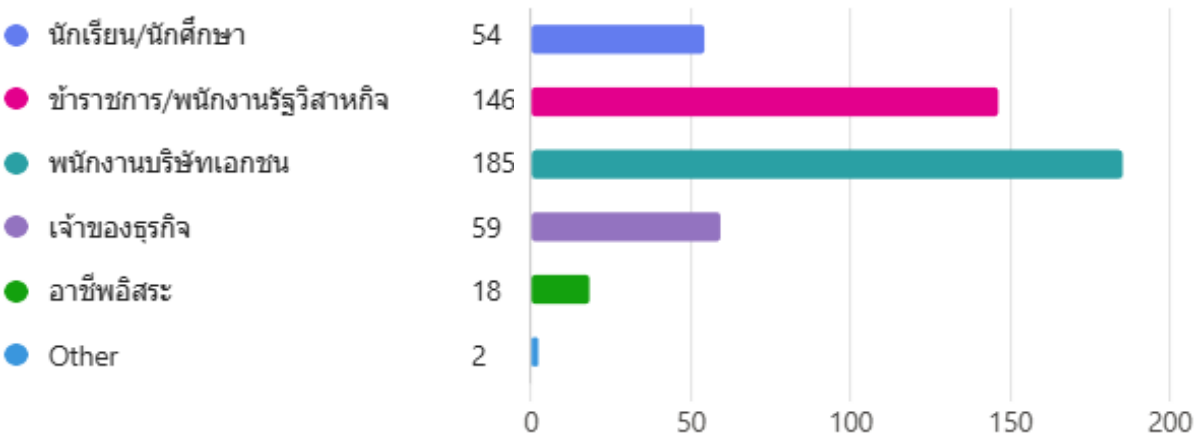
■ Gender



■ Age

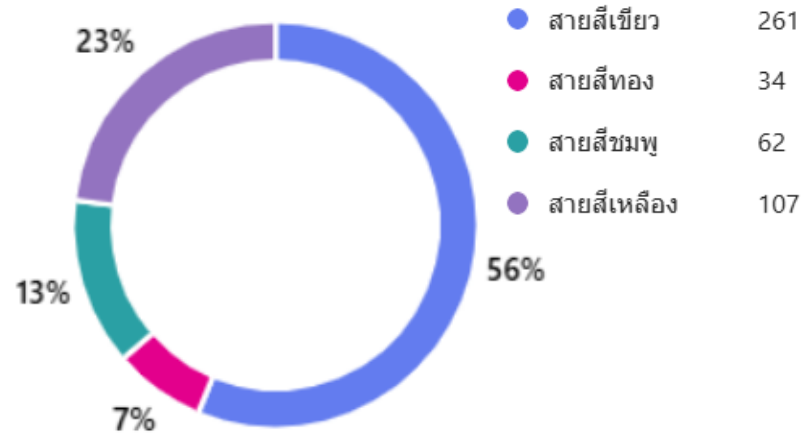


■ Occupation

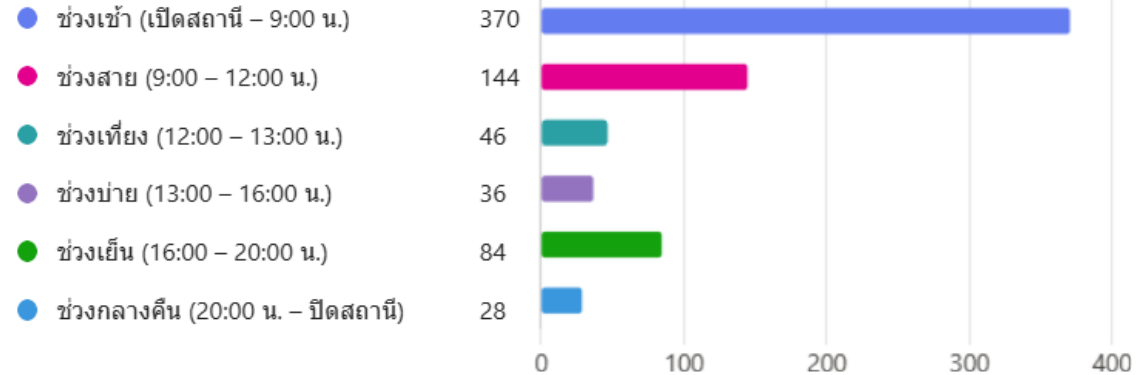


# Appendix: BTS Skytrain Usage

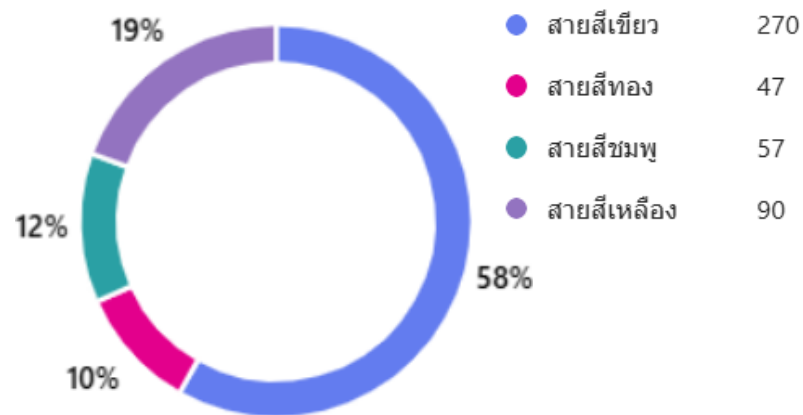
## Origin Station



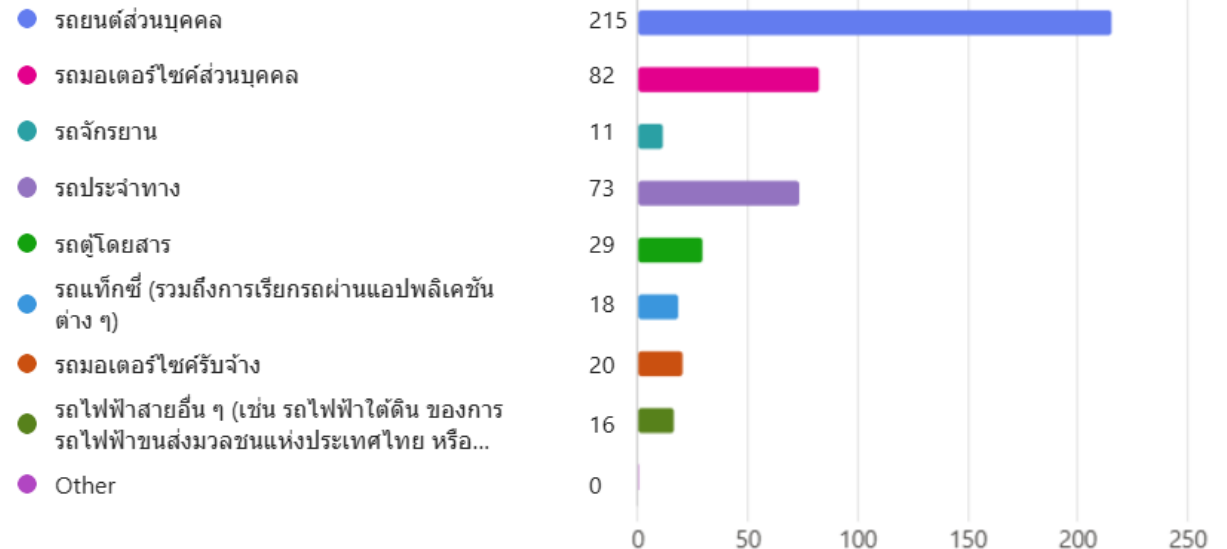
## Time to use BTS Skytrain



## Destination Station



## Alternative Transportation



# Thank you



**Sustainability Department**

**BTS Group Holdings Public Company Limited**

1000/9 BTS Visionary Park - South Tower, 33rd Floor,  
Phahonyothin Road, Chomphon Sub-district, Chatuchak District, Bangkok 10900  
[sustainability@btsgroup.co.th](mailto:sustainability@btsgroup.co.th)

[www.btsgroup.co.th](http://www.btsgroup.co.th)