**DECISION-AID METHODOLOGIES**

**IN TRANSPORTATION**

Graded Assignment #2

Group Number:

**Problem 1:**

Extend the tables, if necessary, to accommodate additional sets, parameters, variables or constraints.

**Definitions:**

Sets:

|  |  |
| --- | --- |
| Name | Description |
|  |  |

Parameters:

|  |  |
| --- | --- |
| Name | Description |
|  |  |

Variables:

|  |  |
| --- | --- |
| Name | Description |
|  |  |

Objective Function:

|  |
| --- |
| Mathematical Form |
|  |
| Description |
|  |

Constraints (Please write the mathematical form of each constraint and describe it precisely):

|  |
| --- |
| Constraint (1) |
|  |
| Description |
|  |
| Constraint (2) |
|  |
| Description |
|  |

**Solution:**

1. Expected energy profile of the bus battery at each station (variable Energy) based on the plan (Figure)
2. Proposed installation plan

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Station | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| FFS Installation Plan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Capacity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CFS Installation Plan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Capacity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Cost |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Problem 2:**

Extend the table, if necessary, to accommodate additional constraints.

Write the mathematical form and description of only the constraints that were modified or added with respect to the model of Problem 1:

|  |
| --- |
| Constraint (1) |
|  |
| Description |
|  |
| Constraint (2) |
|  |
| Description |
|  |

**Solution:**

1. Expected energy profile of the bus battery at each station (variable Energy) based on the plan (Figure)
2. Installation plan

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Station | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| FFS Installation Plan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Capacity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CFS Installation Plan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Capacity |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Total Cost |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

**Discussion:**