City of Madison

Problem Identification: Bus Rapid Transit Network Analysis

1.0: Contact Information	
City Data Team Lead	E. Anderson, Finance (eanderson3@cityofmadison.com)
Traffic Engineering SME	Mike Cechvala, Transportation (mcechvala@cityofmadison.com), Tim Sobota, Transportation (tsobota@cityofmadison.com)
UW Madison Lead	Tyler Harter-Caraza (tylerharter@gmail.com)
UW Madison Project Team	Jin Woo Lee (jlee487@wisc.edu), Ebrahim Eldamnhoury (eldamnhoury@wisc.edu), Hunter Olsen (holson23@wisc.edu)

2.0 Problem Statement (max 200 words)
Prompt: What's the problem we are trying to solve? What is actually happening? Where does the problem exist? How do you know this is a problem?

Bus Rapid Transit (BRT) routes, when implemented, may create redundancy with other bus routes.

3.0 Impact Statement (max 100 words)
Prompt: What change would you like to see happen? What should be happening?

The City of Madison would like to see recommendations for bus route optimization with respect to the proposed BRT routes to ensure service availability and avoid redundancy. The recommendations should contain several options. This should be done for the weekday schedule only.

Constraints to consider: Title VI, walking distance to bus stops, geographic coverage across city and within sub-areas, frequency, cycle time, operating hours, budget impacts.

4.0 Service Change Statement
Prompt: What is the results you are trying to make with this project?

Current State	Future State
BRT routes, when implemented, may create redundancy with other bus routes.	Bus routes will be optimized to ensure service availability while avoiding redundancy.

5.0 Project Success Statement
Prompt: How will we know the project is successful?

In order to address redundancy with other bus routes created by BRT, UW students will perform a network analysis in order to ensure service availability and avoid redundancy. All recommendations will be Title VI-compatible.

City of Madison

- *Metro General Transit Feed Service (GTFS) feed*
  This gives all bus schedule information in an industry-standard format. This service is publicly available and updates regularly at
  https://www.cityofmadison.com/metro/business/information-for-developers.

- *Metro boardings GIS file*
  This gives boarding numbers for every Metro stop. This is posted to the City's Open Data Portal in several configurations:
  - https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-ridership-by-route
  - https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-ridership-by-route-weekday
  - https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-ridership-by-route-saturday
  - https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-ridership-by-route-sunday
  - https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-ridership-by-stop
  - https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-ridership-by-intersection

- *Metro proposed BRT route GIS files*
  These show the proposed BRT routes. These are posted to the City's Open Data portal at:
  - https://data-cityofmadison.opendata.arcgis.com/datasets/bus-rapid-transit-system-lines
  - https://data-cityofmadison.opendata.arcgis.com/datasets/bus-rapid-transit-stops
  - https://data-cityofmadison.opendata.arcgis.com/datasets/bus-rapid-transit-stations

- *Metro bus routes GIS file*
  This shows all Metro bus routes. This is posted to the City's Open Data portal at https://data-cityofmadison.opendata.arcgis.com/datasets/metro-transit-bus-routes.

- *Metro Title VI report*
  This shows Metro's methodology as it demonstrates that its routes comply with Title VI. This is a helpful resource since any analyses resulting from this project will also need to be Title VI-compliant. It is available at
  https://www.cityofmadison.com/metro/documents/titlevi2017.pdf.