Using GPS data to map and model Colby student public transit efficiency

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Environmental Studies Program
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Objectives

- To analyze the current routes and patterns of the Jitney and Shuttles at Colby
- To determine an effective model for analyzing Colby’s transportation system
- To identify any discrepancies or repetition within the system
- To suggest an alternate route for the shuttle service that allows students, especially those living downtown, without personal vehicles to get around Waterville
Vehicle Descriptions

Downtown Shuttle
- 12 passenger
- Open to students, staff, faculty
- Runs on set loop with 5 stops
- Bring members of Colby community onto campus
- Weekdays 7:45 am- 6:00 pm

Jitney
- 6 passenger
- Student taxi
- Travels anywhere in Waterville
- Sunday-Wednesday: 2pm-12am & Thursday-Saturday: 2pm-2am
Data Limitations

- SGA shuttle is run by a third party so we were unable to get permission to place a GPS unit on it
  - Runs Friday-Sunday: Downtown and Walmart
- Limited data due to timing of GPS arrival
- Jitney Data: April 19th-April 25th (1 week)
- Downtown shuttle: April 22nd-25th (3-days)
  - Accepted Students Weekend limited relevant data due to route abnormalities
Jitney

Traveled 829 miles in one week for an average of 118 miles per day

Noted up to 42 minutes of stopped time, which is not necessarily idling time, but students often witness the Jitney idling outside of Eustis
Downtown Shuttle

Traveled 214 miles, average of 71 miles per day

Loop is approximately 5 miles, for 14 trips/day
Ridership

Peak day: Shuttle Tuesday, Jitney Friday
Peak hour: Shuttle 8-9am, Jitney 9-10 pm
Significant peaks for Jitney, Shuttle ridership is relatively constant across day and time
Kernel Density layers

Shows frequency of vehicle in a given location

Notable differences:

- Jitney spends a lot of time going to
  - Waterville commons - Hannafords/Kmart
  - Elm Plaza - Walmart/staples
  - JFK Plaza - Hannafords
  - Flagship Cinema Plaza
Encompassing route

Route containing all stops identified from Jitney and Shuttle data, this is not a recommended route for Colby to adopt.

8.5 mile loop

Shuttle could traverse this loop 22 times for the same average daily mileage of the Downtown Shuttle and Jitney.
A Realistic Route for Colby

Also an 8.5 mile loop

This is a recommended route for Colby to adopt in addition to a direct Downtown-Colby Campus shuttle

Removed excessive stops downtown and on campus

Added stop at Hathaway Center (popular faculty/staff residence)

Potential route to get around Waterville, not to get students from campus to Downtown Apartments
Proposed shuttle schedule

Goal: ensure off-campus students’ access to basic needs like groceries and all students access to Waterville amenities

Two options:

- One shuttle with time dependent routes: expanded route implemented after class/work hours (~5 or 6 pm)
- Two shuttles: one with direct downtown route and one with the expanded route
Future Research

- Implement a more efficient and expansive shuttle route that benefits students/staff/faculty living in Downtown Dorm and on campus to help influence campus culture surrounding student car ownership.
- We would like to have a similar study run next spring after the downtown dorms have been in use for a semester to evaluate:
  - How/when students are using the shuttle system
  - If they feel less of a need to own a personal vehicle
  - If students feel they have adequate access to Waterville amenities
Conclusions

This proof of concept study succeeded in showing it is possible to track, measure, and model actual and idealized routes for Colby’s campus transportation systems, which has future applications as Colby opens the Downtown Dorm and provide students, staff, and faculty adequate access to the Waterville community.
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