

# **Incorporating Public Transit into Measures of Accessibility**



**UBCO 2021 Capstone Project**

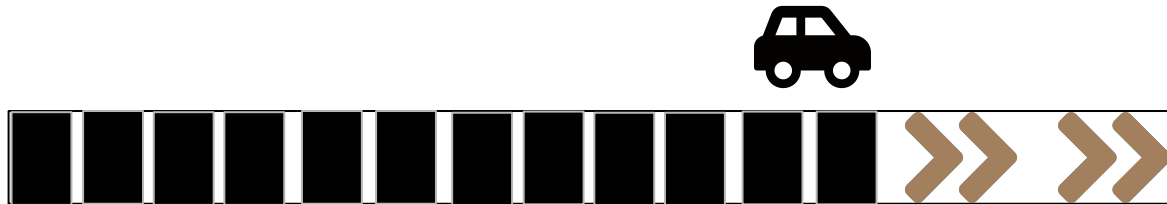
# Overall progress

**Week 6**



## Week 6

### Overall Progress and Completed Tasks



# Last Week's Tasks

**Week 5**

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- Dashboard functions with pre-rendered HTML maps (performance boost)

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# Last Week's Tasks

## Week 5

- Dashboard functions with pre-rendered HTML maps (performance boost)
- Investigated models for network efficiency
- Daily/hourly accessibility scores for Kepler
- Preliminary report writing
- Dashboard deployment
- Other (code merge, cleaned files, new wrangling functions)

# Summary of team and individual tasks

	Luka	Graham	Yuxuan	Rain	All
Dashboard html functionality					
Isochrone visualizations					
NA filler functions for missing values					
Fixed amenity weights wrangling					
Network efficiency exploration					
Daily/hourly accessibility - Isochrone					
Dashboard deployment					
Report writing / general formatting					
Code merge and project cleanup					

# Preliminary Results



- Developed interpretable isochrone visualizations
- Developed Kepler visualizations which use custom different departure times and days
- Developed a basic efficiency model:
  - Efficiency = deviation between **block population** and **block accessibility score**
  - Disadvantages:
    - Does not consider unpopulated/high traffic areas (amenity dense /low population areas are given bad efficiency values)
    - Transit efficiency depends on a lot more than only cultural amenities

# Created isochrone map

- **What is isochrone map?**

# Created isochrone map

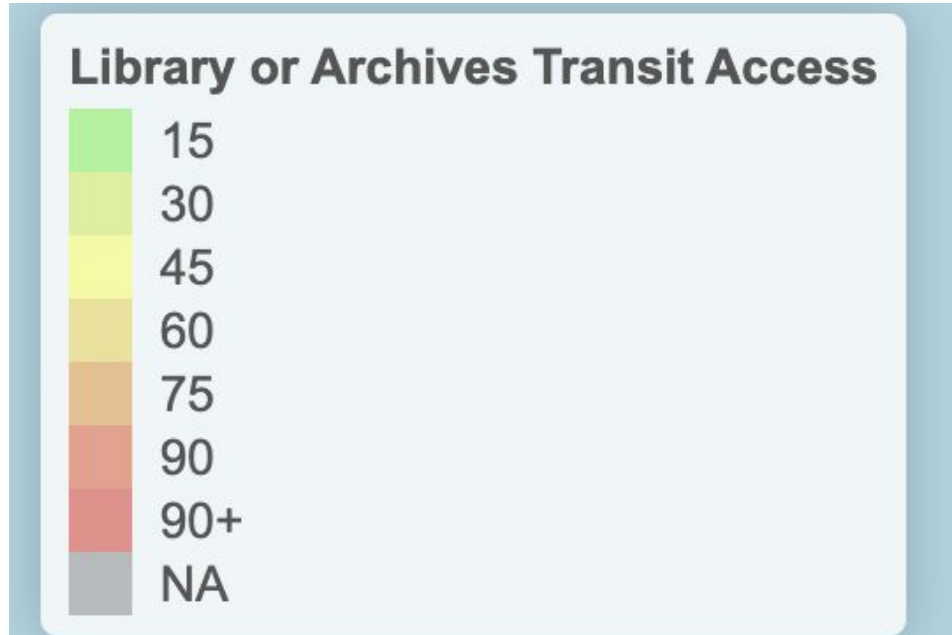
- **What is isochrone map?**

An **isochrone map** in [geography](#) and [urban planning](#) is a map that depicts the area accessible from a point within **a certain time threshold**<sup>[1]</sup>

<sup>[1]</sup>Allen, Jeff (2018-12-01). "Using Network Segments in the Visualization of Urban Isochrones".

# Created isochrone map

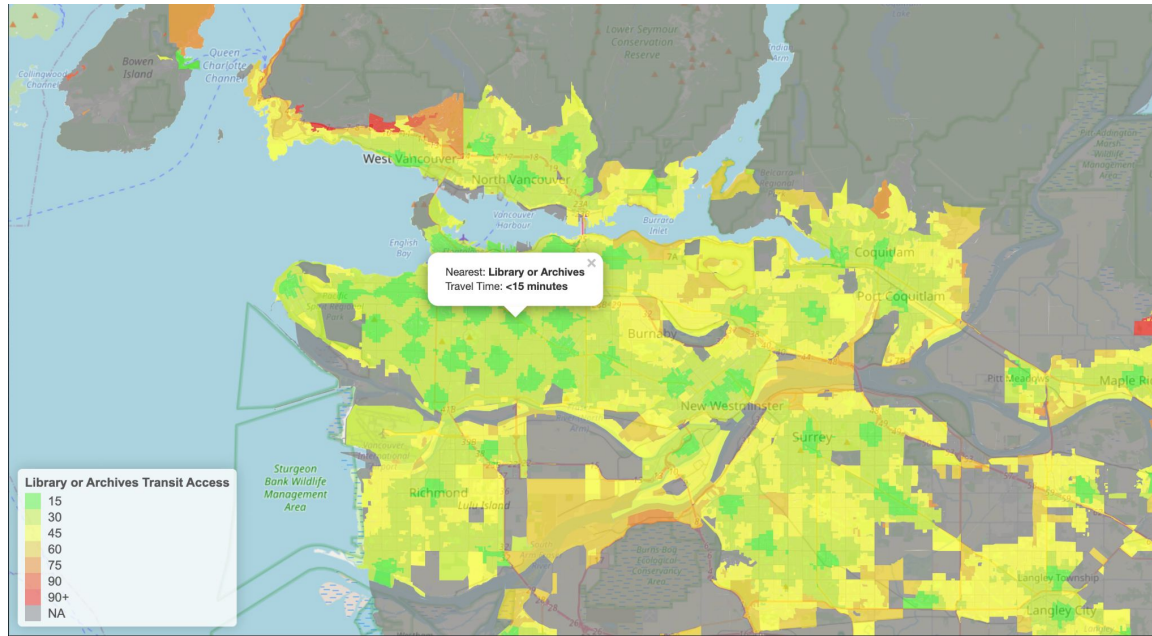
- The minimum time from **block *i*** to **amenity *j***.  
By default, the minimum time points to the nearest amenity



**7 Levels + NA:  
From 15 mins up to 90+ mins**

# Created isochrone map

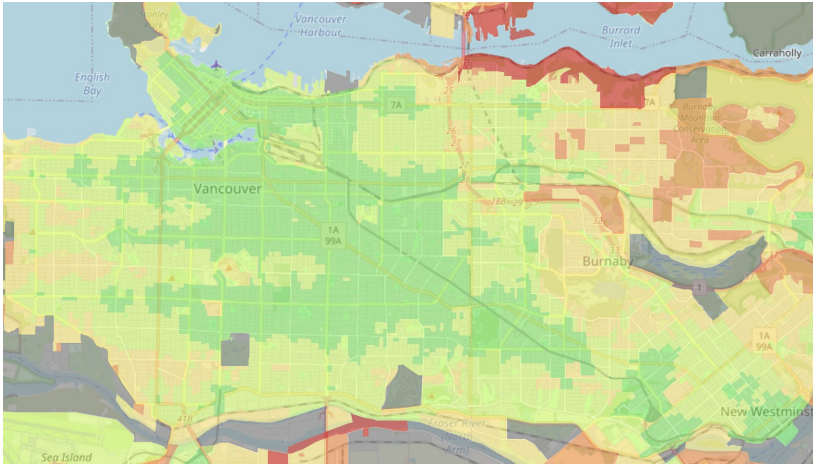
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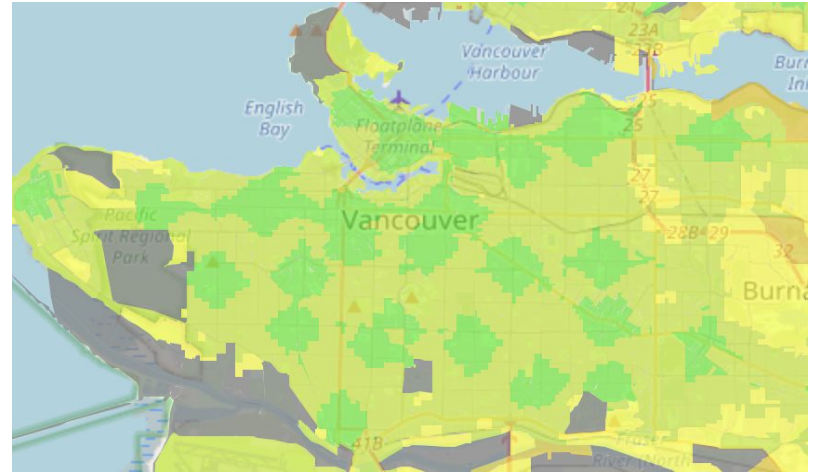


# Created isochrone map

- Advantage:
  - **Clear visualizations**



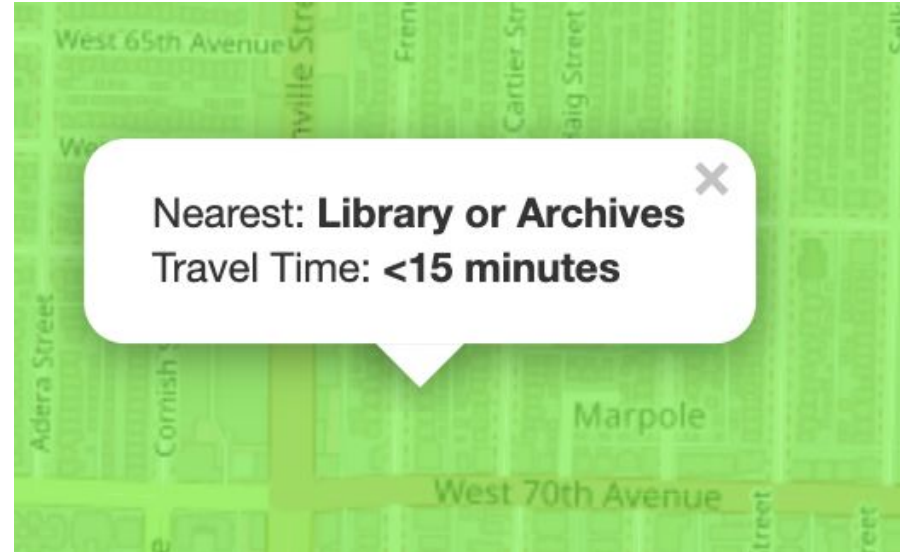
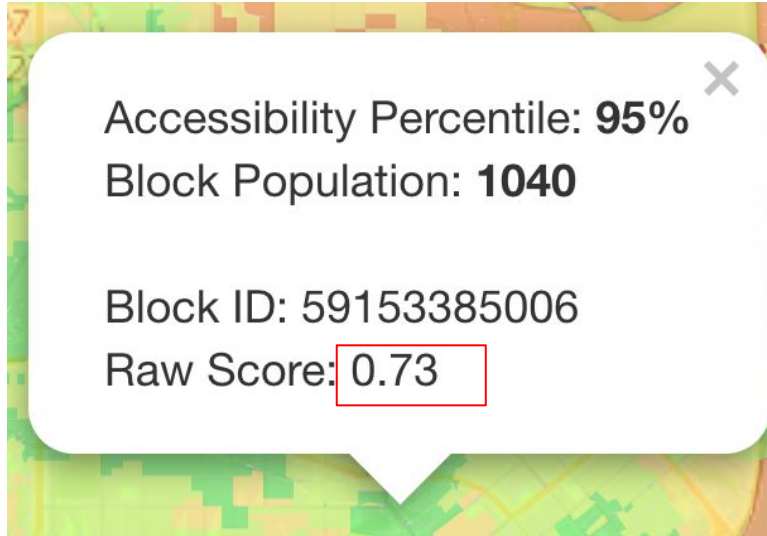
All accessible libraries to each block



Isochrone map nearest one amenity Library

# Created isochrone map

- Advantage:
  - **Easy to Interpret**



# A lot of cleaning....

Welcome, the archive folder

University > w2020-data599-capstone-projects-statistics-canada-transit

Name

archived

code

dashboard

dashpub

data

final-report

personal-logs

proposal

weekly

.DS\_Store

.gitignore

README.md

Status

Date modified

2021-06-07 12:51 PM

2021-06-07 12:51 PM

2021-06-07 12:51 PM

2021-06-07 2:00 PM

2021-06-02 12:05 PM

2021-06-02 12:05 PM

2021-06-02 12:05 PM

2021-06-02 12:05 PM

2021-06-02 12:05 PM

2021-06-07 12:51 PM

2021-06-02 12:05 PM

2021-06-02 12:05 PM

Type

File folder

File folder

File folder

File folder

File folder

File folder

File folder

File folder

File folder

DS\_STORE File

Text Document

Markdown Source File

Size

11 KB

1 KB

1 KB

Search w2020-data599-capstone-projects-statistics-canada-transit

# Accomplishments



- **Shiny Dashboard**
  - Updated to use HTMLs

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    - Added NAs to HTML files

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    - Added NAs to HTML files
    - Added Isochrone HTML maps

# Accomplishments



- **Isochrones in Kepler.gl** - average travel time to nearest

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  - Created time window for each hour based on r5r



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  - Peak time v.s. Non-peak time (hourly)

# Accomplishments



- **Isochrones in Kepler.gl** - average travel time to nearest
  - Created time window for each hour based on r5r
  - Weekdays v.s. Weekends (Sat/Sun)
  - Peak time v.s. Non-peak time (hourly)
  - By type of amenities

# Accomplishments



**A Quick Demo**  
**Isochrones for Saturday transit**

# Roadblocks



- Kepler.gl file size limit
  - Data set size cannot exceed 250Mb

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    - Use cloud storage and mapbox token

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- Kepler.gl file size limit
  - Data set size cannot exceed 250Mb
    - Use cloud storage and mapbox token
  - Slow map loading
    - Hard to include weekdays, and weekends together
    - Busy map for including amenity locations

# Roadblocks



- Visualization of Dashboard
  - Requires html for efficient image display times



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      - File size limit using r.cloud
      - Number of html files

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- Visualization of Dashboard
  - Requires html for efficient image display times
    - Difficulty publishing the dashboard
      - File size limit using r.cloud
      - Number of html files
    - Converting dashboard to use html files

# Week 6 Plan

- Writing of the report
  - Introduction
  - Background
  - Methods
    - Weights
    - Dashboard
- Create dual view of Kepler maps for comparison
- Deploy dashboard with Kepler.gl maps
- Transit efficiency modeling and visualization

# Week 5 - Timeline

Weekly Tasks	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
<i>This week's theme:</i> Code Cleanup and Dashboard Performance	5/31/2021	6/1/2021	6/2/2021	6/3/2021	6/4/2021	6/5/2021
Embed HTML Kepler visualization in R		Rain, Graham ✓	Rain, Graham ✓			
Create weekly presentation	All ✓					
Create <a href="#">kepler.gl</a> map with time windows			Rain ✓	Rain ✓	Rain ✓	
Create isochrone maps in leaflet		Yuxuan ✓	Yuxuan ✓	Yuxuan ✓		
Update main score scripts / clean project files		Luka ✓	Luka ✓			
Implement html map calling in R shiny		Graham, Luka ✓	Graham, Luka ✓	Graham ✓	Graham ✓	
Merge code for travel time matrix to map rendering		Luka ✓	Luka ✓			
Created functions for filling NA values for missing blocks and corresponding scores or isochrones	Luka ✓	Luka ✓				

# Week 6 - Timeline

Weekly Tasks	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
<i>This week's theme:</i> <b>Dashboards and Scoring Models</b>	6/7/2021	6/8/2021	6/9/2021	6/10/2021	6/11/2021	6/12/2021
Publish dashboard	All <input type="checkbox"/>					
Create weekly presentation	All <input checked="" type="checkbox"/>					
Report writing - Intro	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	
Report writing - Background	Rain <input type="checkbox"/>	Rain <input type="checkbox"/>	Rain <input type="checkbox"/>	Rain <input type="checkbox"/>	Rain <input type="checkbox"/>	
Report writing - Methodologies - Weight Index	Yuxuan <input type="checkbox"/>	Yuxuan <input type="checkbox"/>	Yuxuan <input type="checkbox"/>	Yuxuan <input type="checkbox"/>	Yuxuan <input type="checkbox"/>	
Report writing - Methodologies - Dashboard	Graham <input type="checkbox"/>	Graham <input type="checkbox"/>	Graham <input type="checkbox"/>	Graham <input type="checkbox"/>	Graham <input type="checkbox"/>	
Report writing - Methodologies - Scores Sets & Computation	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	Luka <input type="checkbox"/>	
Dashboard aesthetics	Graham <input type="checkbox"/>					
Incorporate weekday and weekend maps into one <a href="#">Kepler.gl</a> map		Rain <input type="checkbox"/>	Rain <input type="checkbox"/>			

# Closing Remarks

Questions?