



# StudentSphere

Team 058 - TUT 0104



Yihao (Jason) Lin, Mingyu (George) Sun, Marcus Cheung

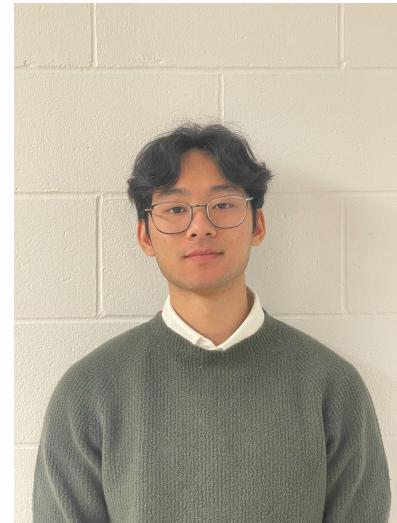
# Meet the Team!



Yihao (Jason) Lin



Mingyu (George) Sun



Marcus Cheung

# Road Map

01 Main Claim

Clarity of Information, What is Important for **Students?**...

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02 What Makes It Usable

**Color Palette, Search Bar, Toggle-based Layering System...**

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03 What Makes It Responsive

Parallel loadmap(), **Hierarchical** Information Display...

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04 Conclusion

**Benefits for the User,** Take Away Message...

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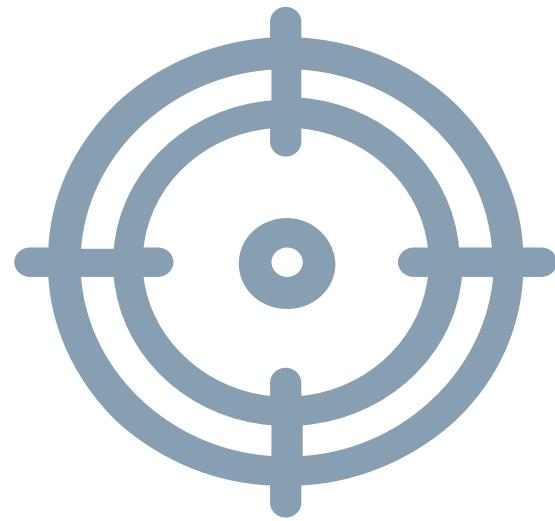
01

# Main Claim

Clarity of Information, What is Important for Students?...

# Main Goals

- Identify and prioritize the needs of students
- Clarity of Info
- Appropriate Colour Scheme



# What is Important for Students?

## Student-Oriented Features

- Library, Cafe



## Public Transportation

- Major choice of traveling [1]



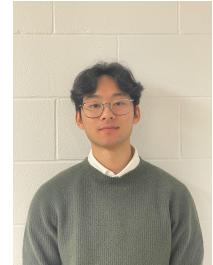
## Easy to Use

- Minimal Information



Our project focuses on **clearly displaying information** to the user so they can **easily extract information** from the map.

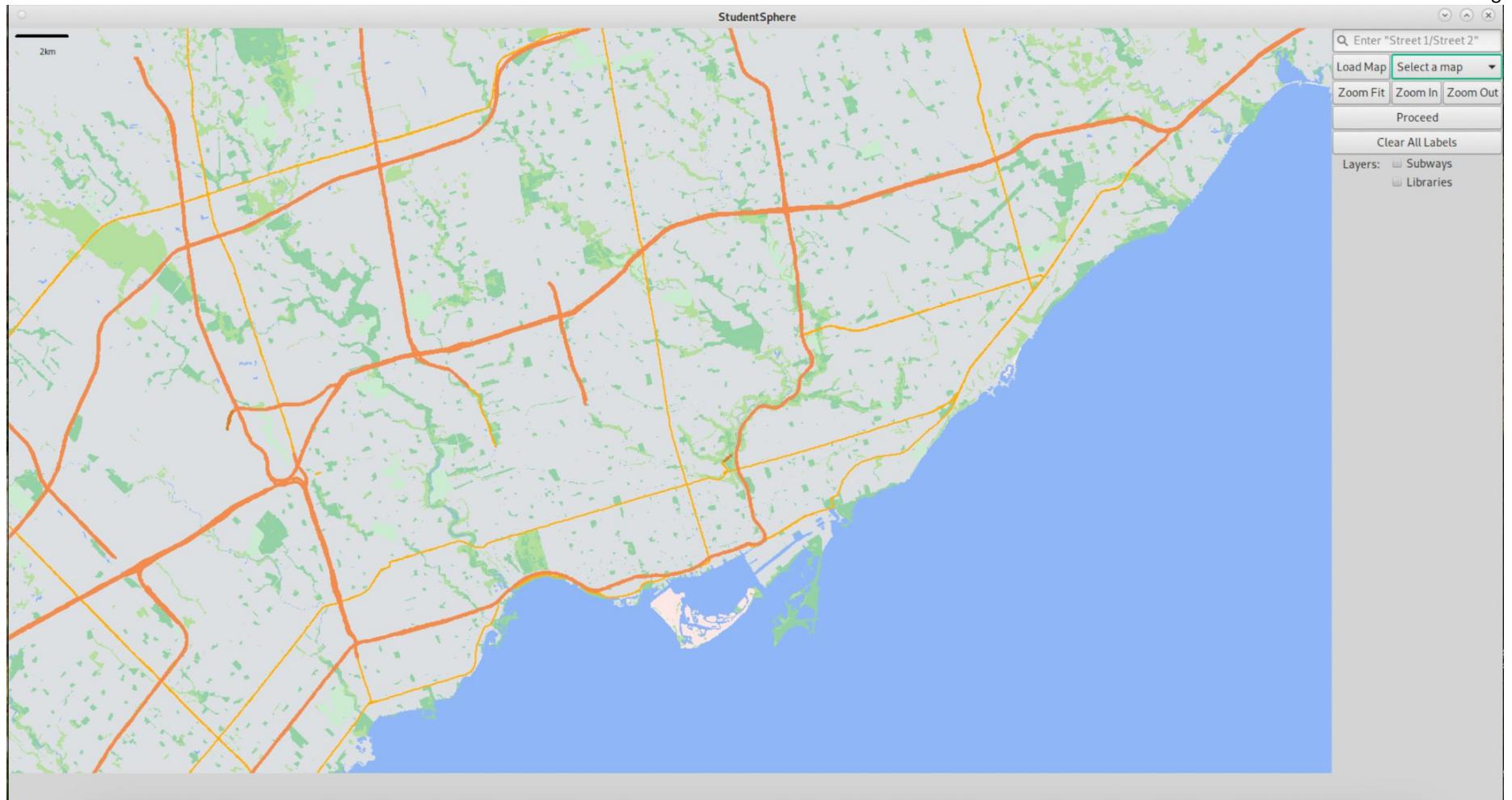
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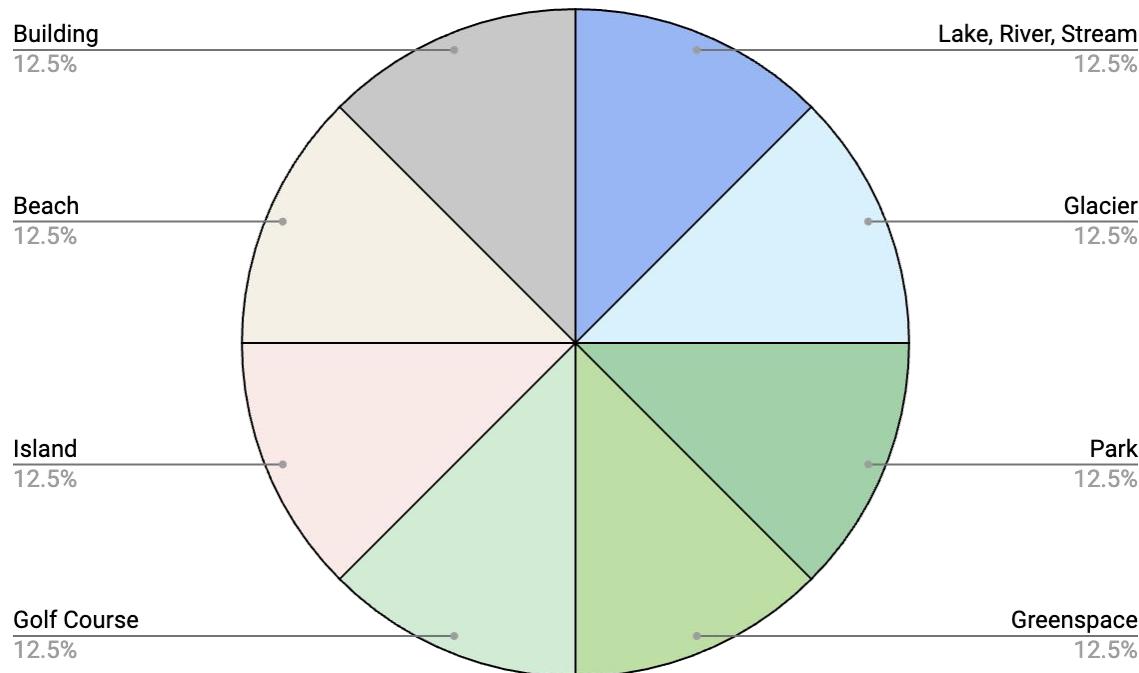
# 02

# What Make it Usable?

Color Palette, Search Bar, Toggle-based Layering System...

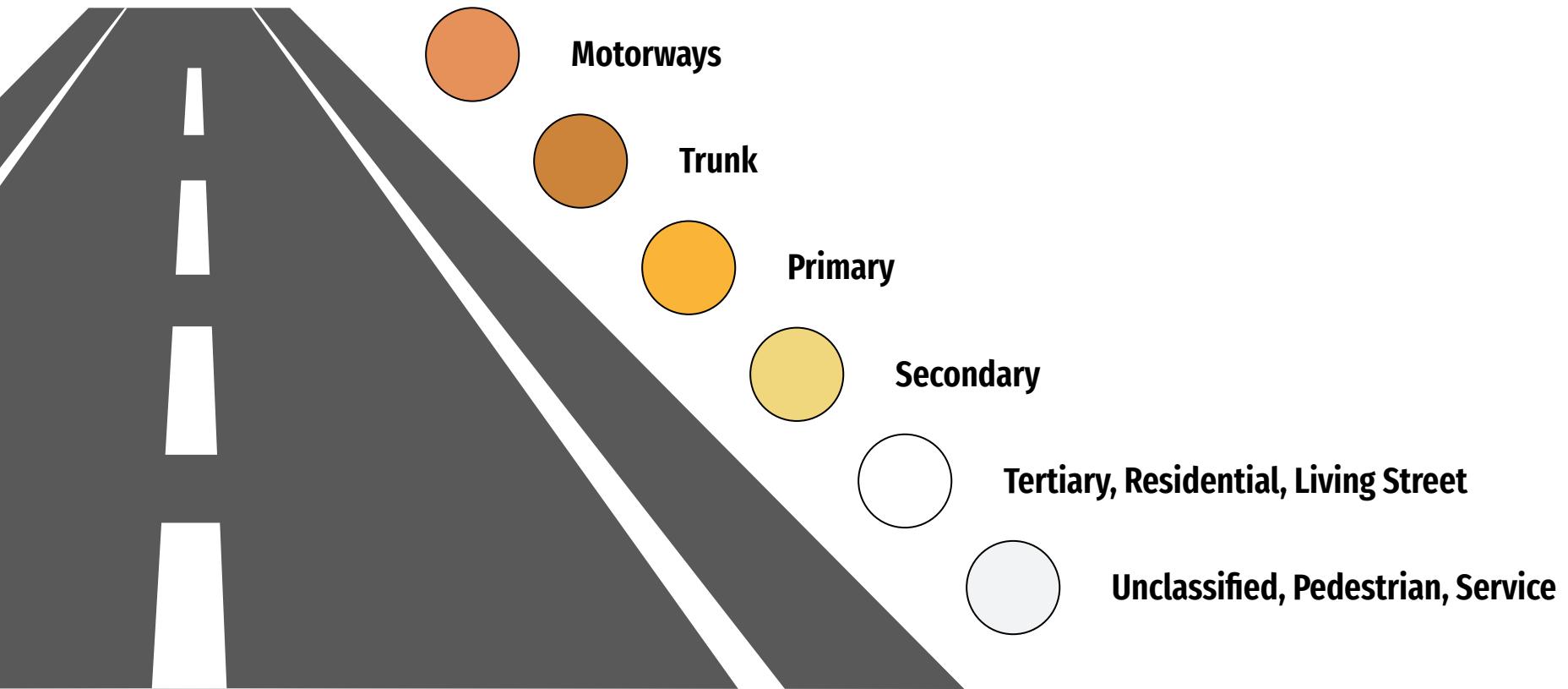


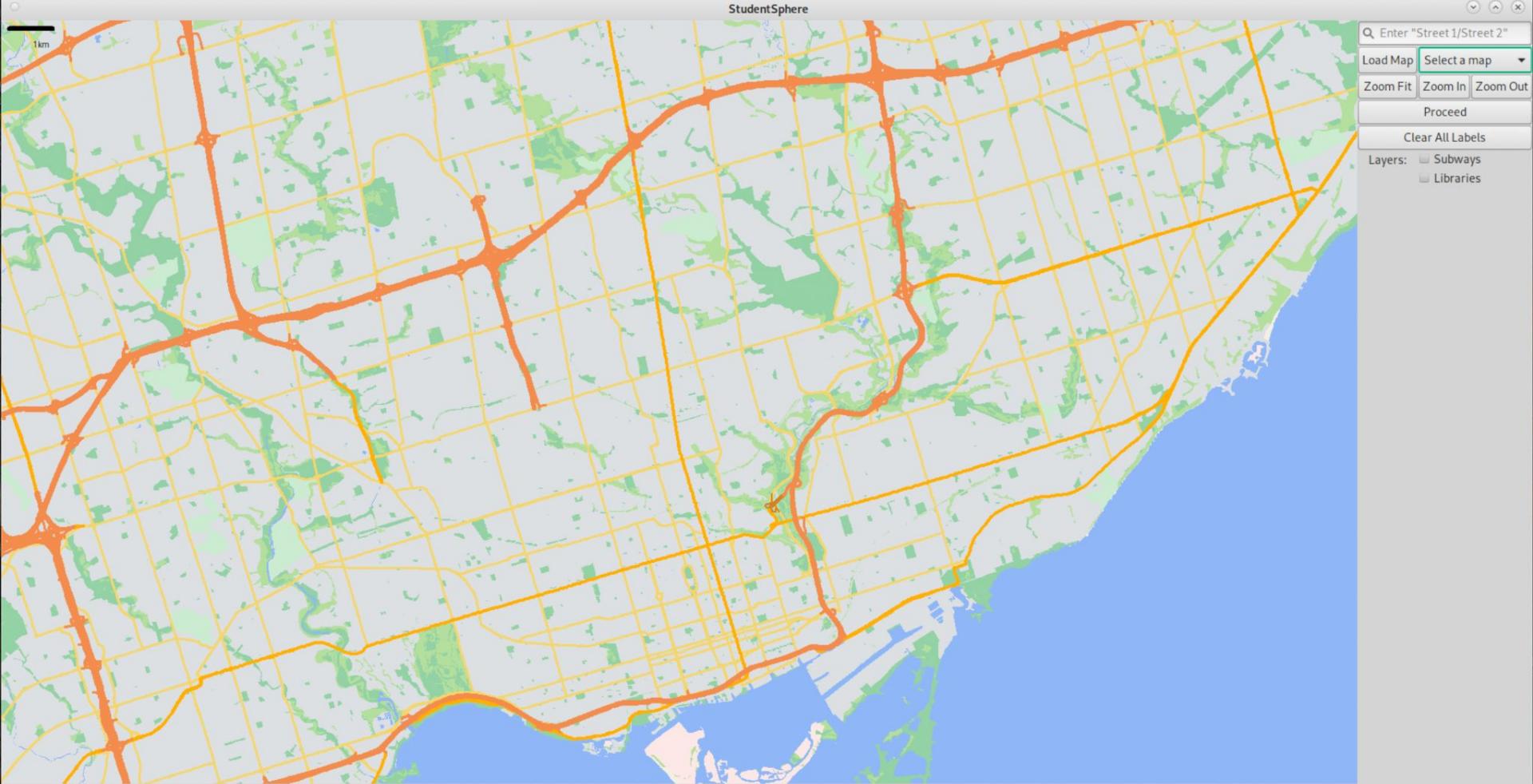
# Colour System/Palette [2]



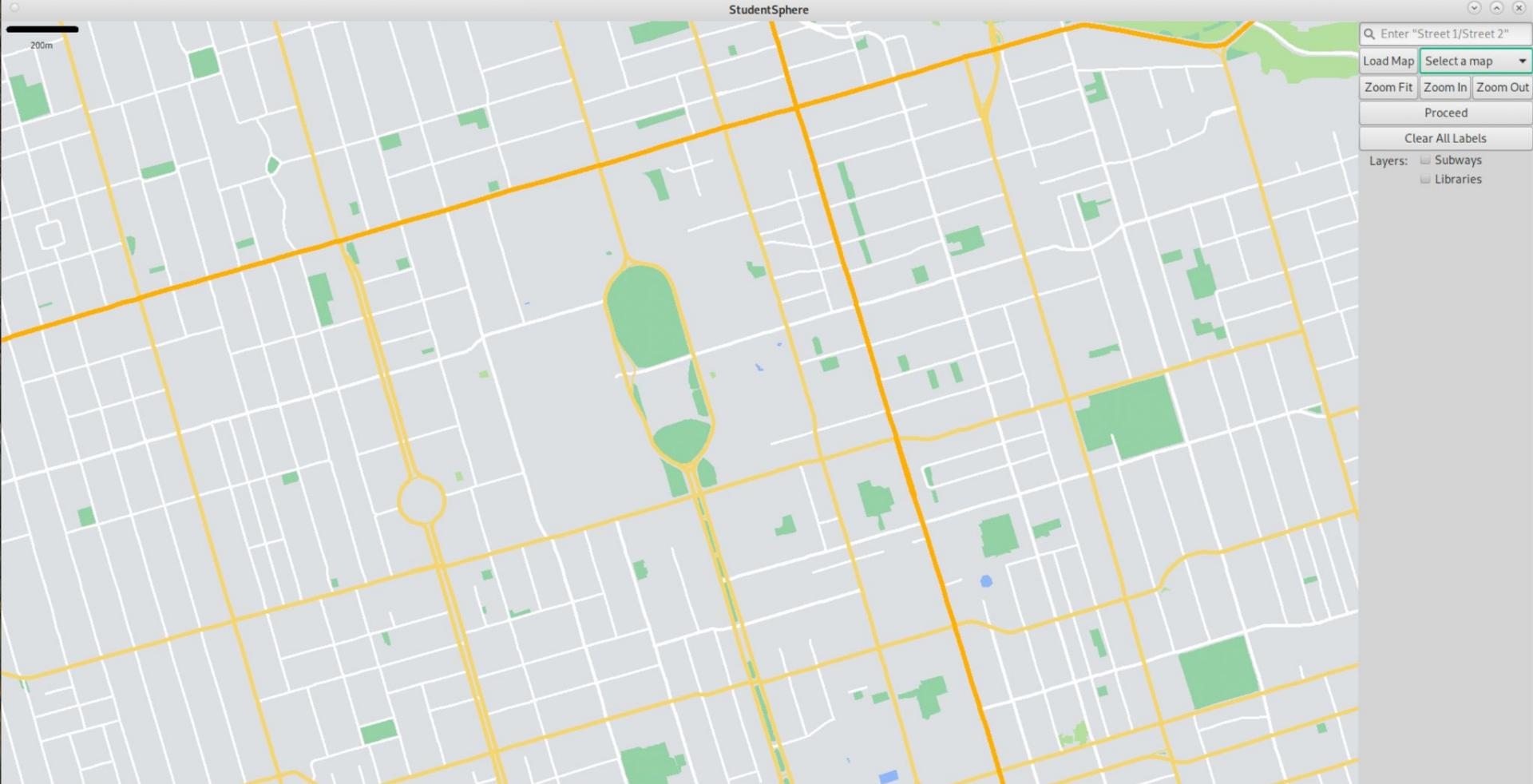
- LAKE, RIVER, STREAM**
- GLACIER**
- PARK**
- GREENSPACE**
- GOLF COURSE**
- ISLAND**
- BEACH**
- BUILDING**

# Road Colour System



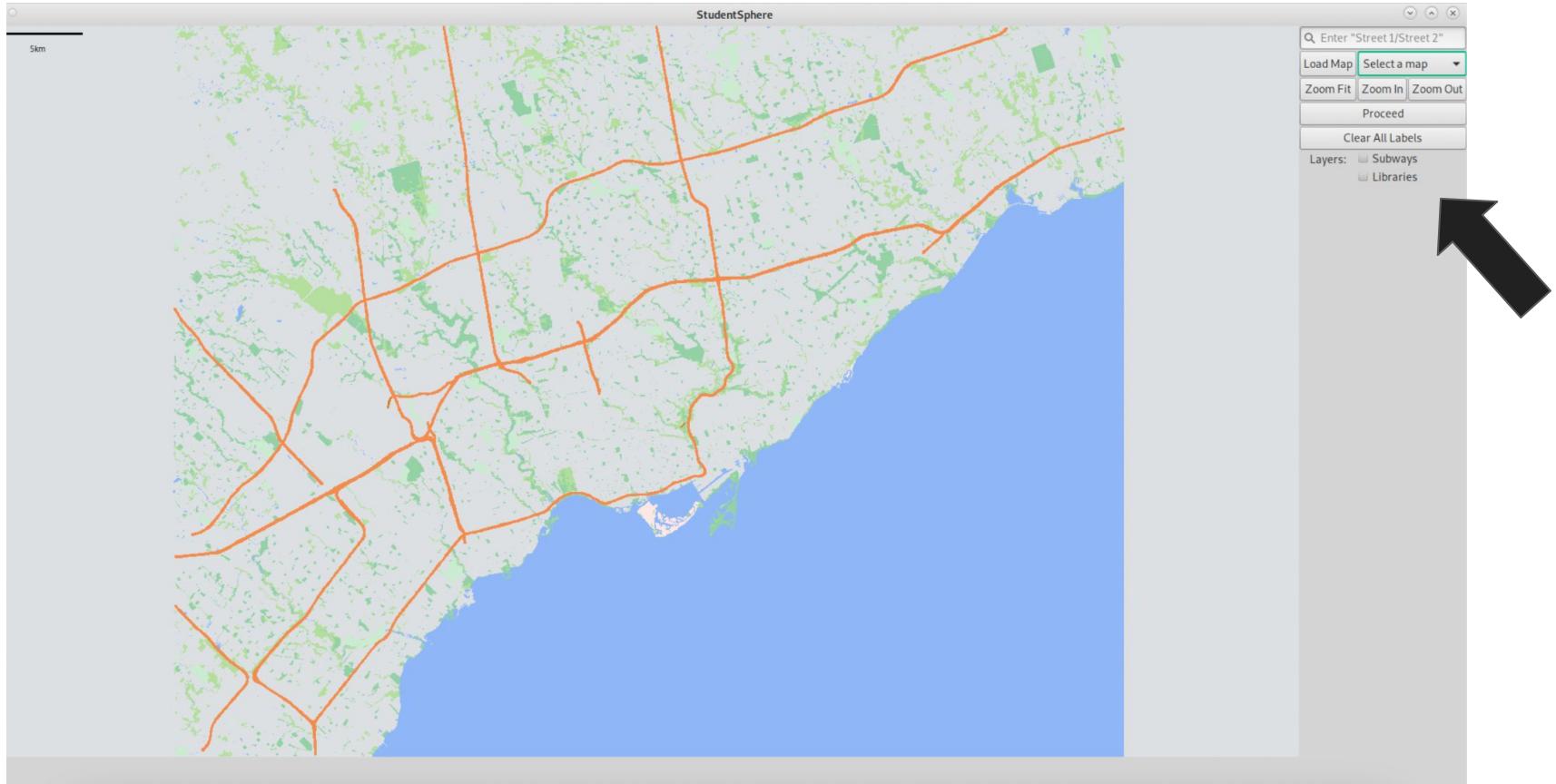


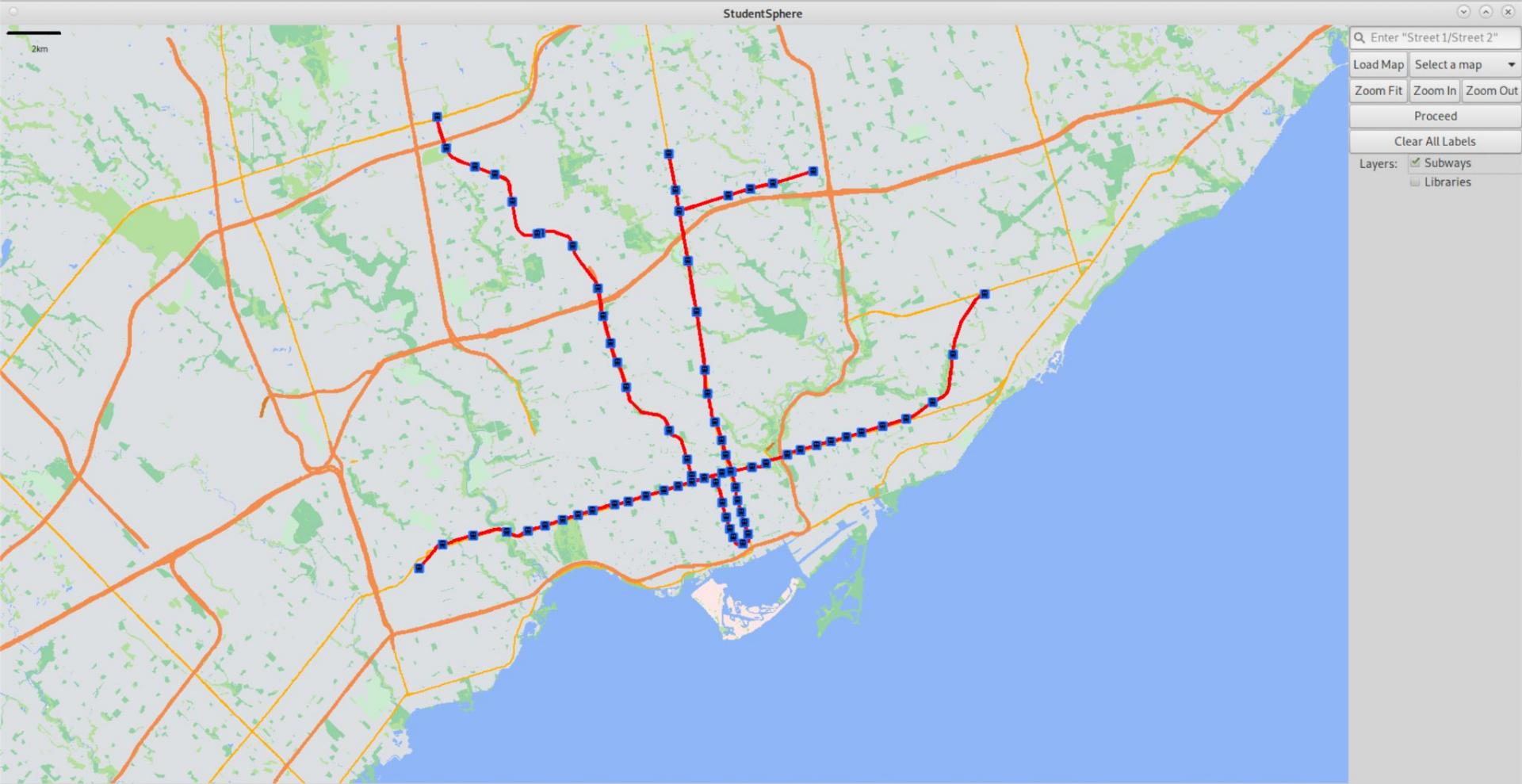
Screenshot of our map showing the colour palette and various road colours (zoomed out view)



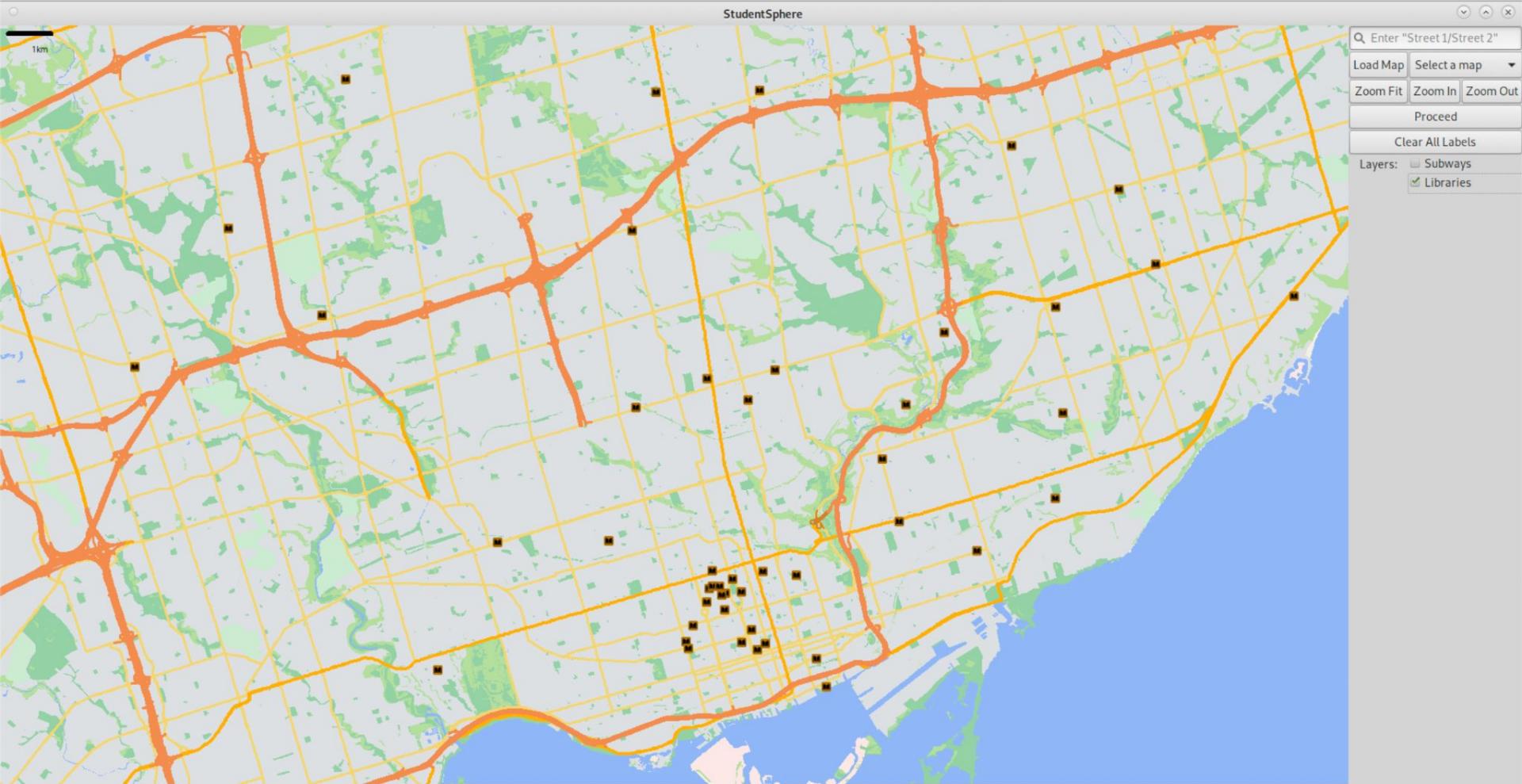
Screenshot of our map showing the colour palette and various road colours (zoomed in closer)

# Layering System





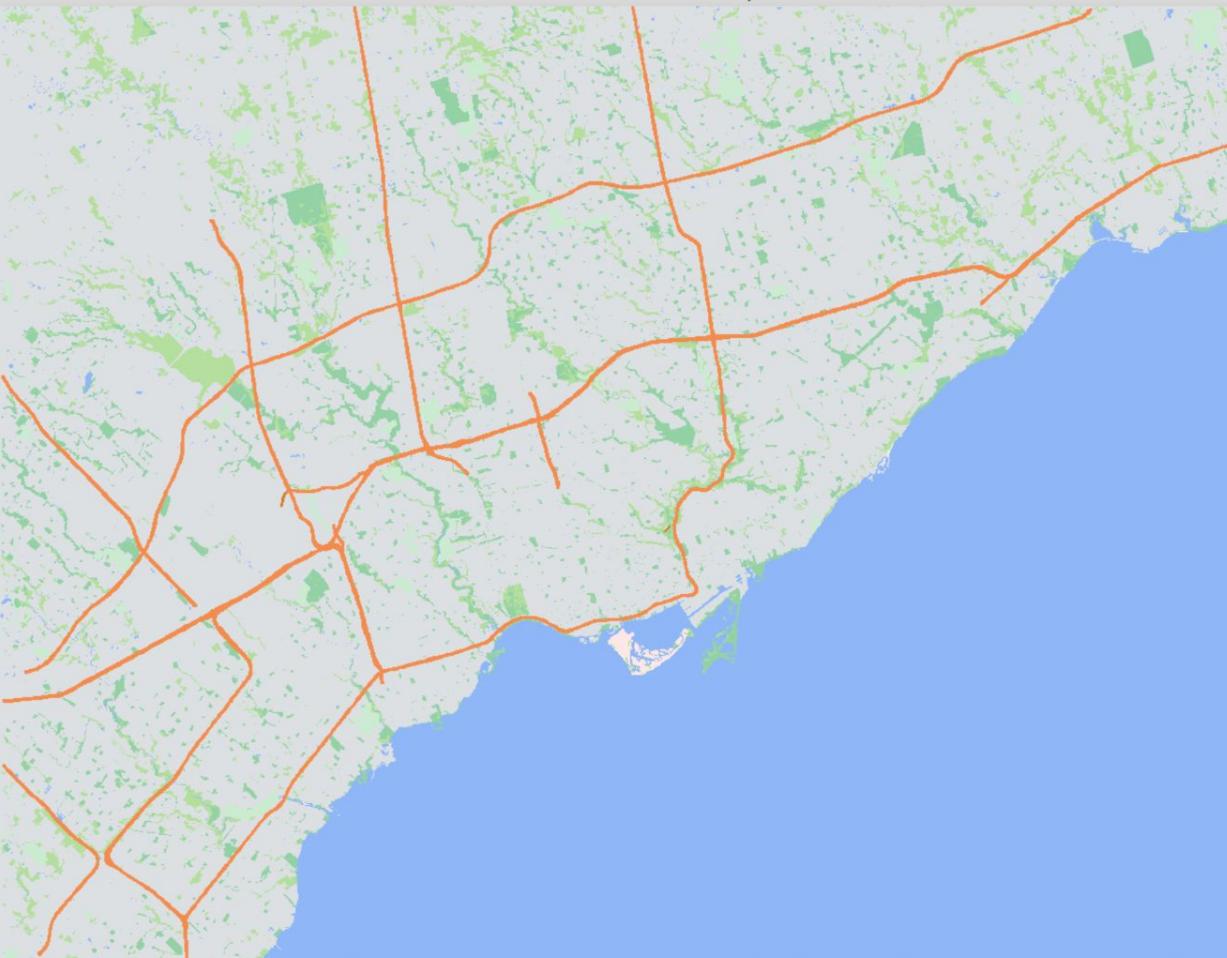
Screenshot of our map showing the subway layer



now showing libraries

Screenshot of our map showing the libraries layer

5km

 yon/bloYonge Street/Bloor Street East  
Yonge Street/Bloor Street West

Process

Clear All Labels

Layers:

 Subways Libraries

Screenshot of our map showcasing the search bar

5km

Q : Street/Bloor Street West

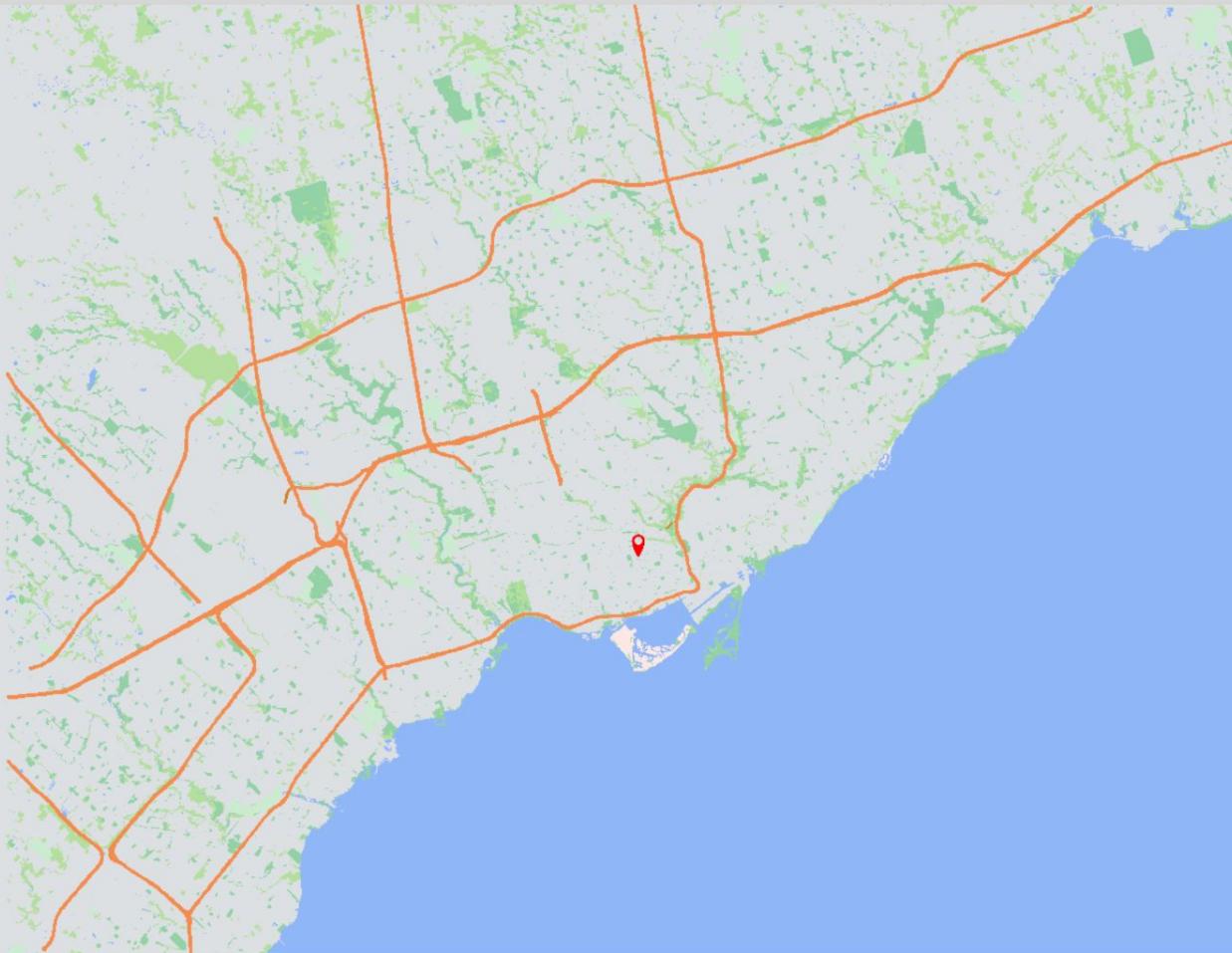
Load Map Select a map

Zoom Fit Zoom In Zoom Out

Proceed

Clear All Labels

Layers:  Subways  
 Libraries



Screenshot of our map showing the highlighted intersection



# 03

# What Makes it Responsive?

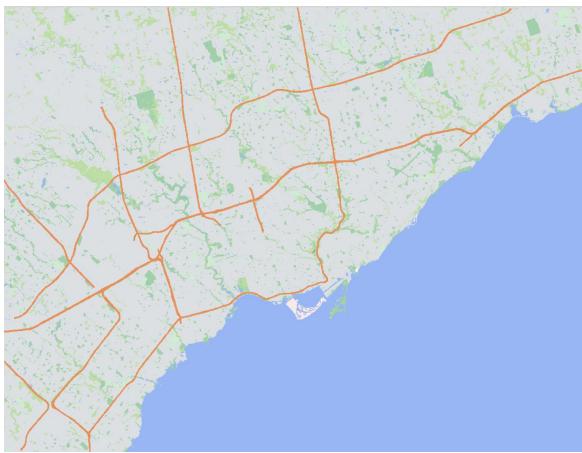
Parallel loadmap(), Hierarchical Information Display

# Responsiveness of StudentSphere

To improve responsiveness of both front/back end:

Front End	Back End
<ul style="list-style-type: none"><li>• <b>Hierarchical</b> Information Display<ul style="list-style-type: none"><li>○ Tiering map's zoom levels</li><li>○ Improves <b>smoothness and FPS</b></li><li>○ <b>Clear distinction</b> between major and minor roads</li></ul></li><li>• <b>Live feedbacks</b> when loading new maps</li></ul>	<ul style="list-style-type: none"><li>• Using threads to enable multitasking</li><li>• Parallel map loading<ul style="list-style-type: none"><li>○ Map Elements</li><li>○ Subway/Libraries</li></ul></li></ul>
<p><b>Results:</b> minimize irrelevant information, maximize smoothness</p>	<p>Results: significantly faster in loading maps</p> <ul style="list-style-type: none"><li>- Able to load additional features at no cost</li></ul>

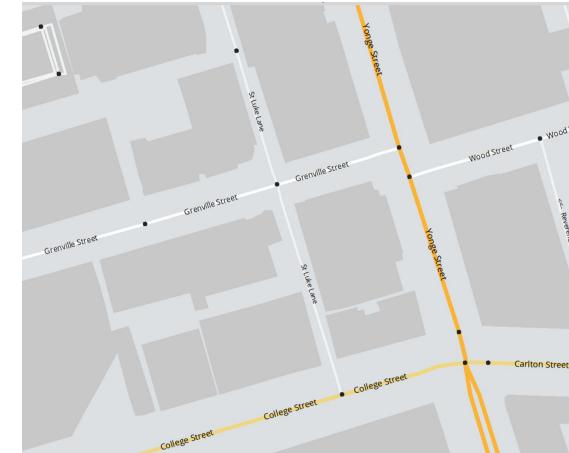
# Tiered Map Display



Regional View



City View

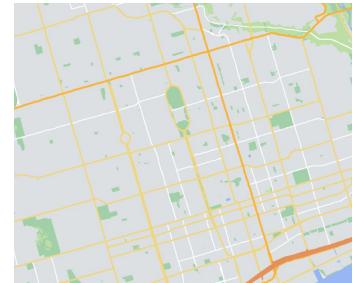


Street View

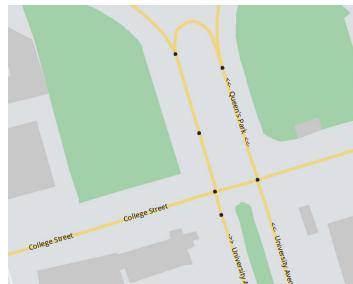
**Results:** reduces cognitive load of the user by minimizing irrelevant information [3]

# Front-end Performance Measure

Maps	FPS (City Level)	FPS (Street Level)
Toronto, Canada	24.8	13.9
Golden Horseshoe, Canada	22.3	10.1
Beijing, China	28.7	15.8
Tokyo, Japan	15.1	7.4
New York, USA	16.2	8.6
Iceland	15.2	8.3



City Level



Street Level

**Results:** Achieved minimal average FPS (15 fps) for daily using [4]

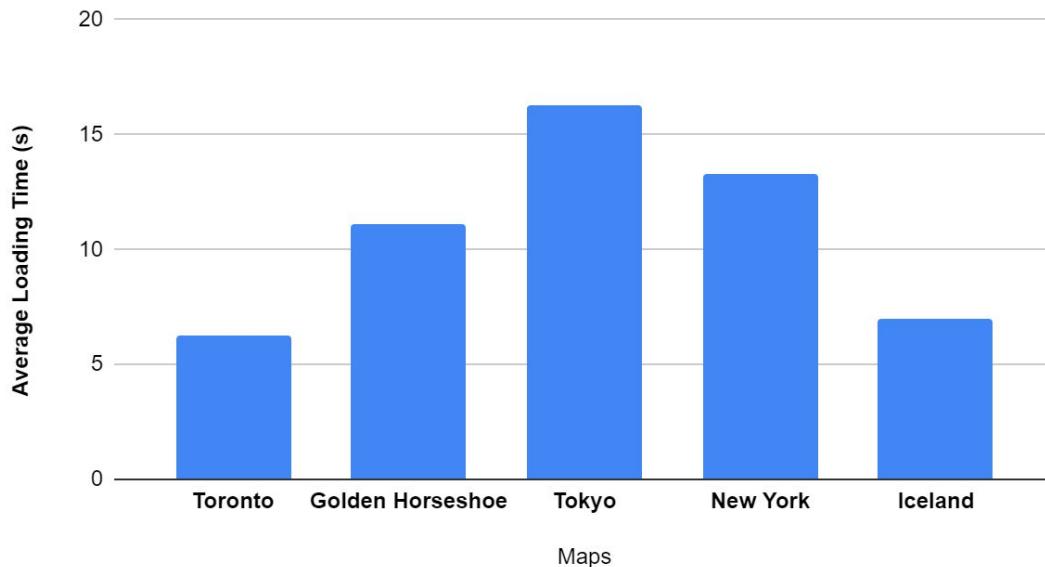
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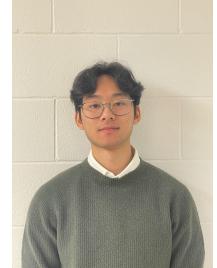
# Back-end Performance Measure

Average Loading Time vs. Maps    Requirement: <45s



```
Test Summary: [green] ( 0 of 17 failed)
Draw_Toronto      PASS ( 0 of 1 failed)
Draw_Boston        PASS ( 0 of 1 failed)
Draw_Beijing       PASS ( 0 of 1 failed)
Draw_Tehran        PASS ( 0 of 1 failed)
Draw_Iceland       PASS ( 0 of 1 failed)
Draw_Rio_De_Janeiro PASS ( 0 of 1 failed)
Draw_Golden_Horseshoe PASS ( 0 of 1 failed)
Draw_New_Delhi     PASS ( 0 of 1 failed)
Draw_New_York       PASS ( 0 of 1 failed)
Draw_London         PASS ( 0 of 1 failed)
Disabled_Graphics PASS ( 0 of 1 failed)
Valgrind_Saint_Helena PASS ( 0 of 6 failed)
ug79:~/ece297/work/mapper%
```

**Results:** Passes all test cases



04

# Conclusion

Benefits for the User, Take Away Message...

# Conclusion

**EFFICIENTLY  
EXTRACT  
INFORMATION**

1. Main Goals

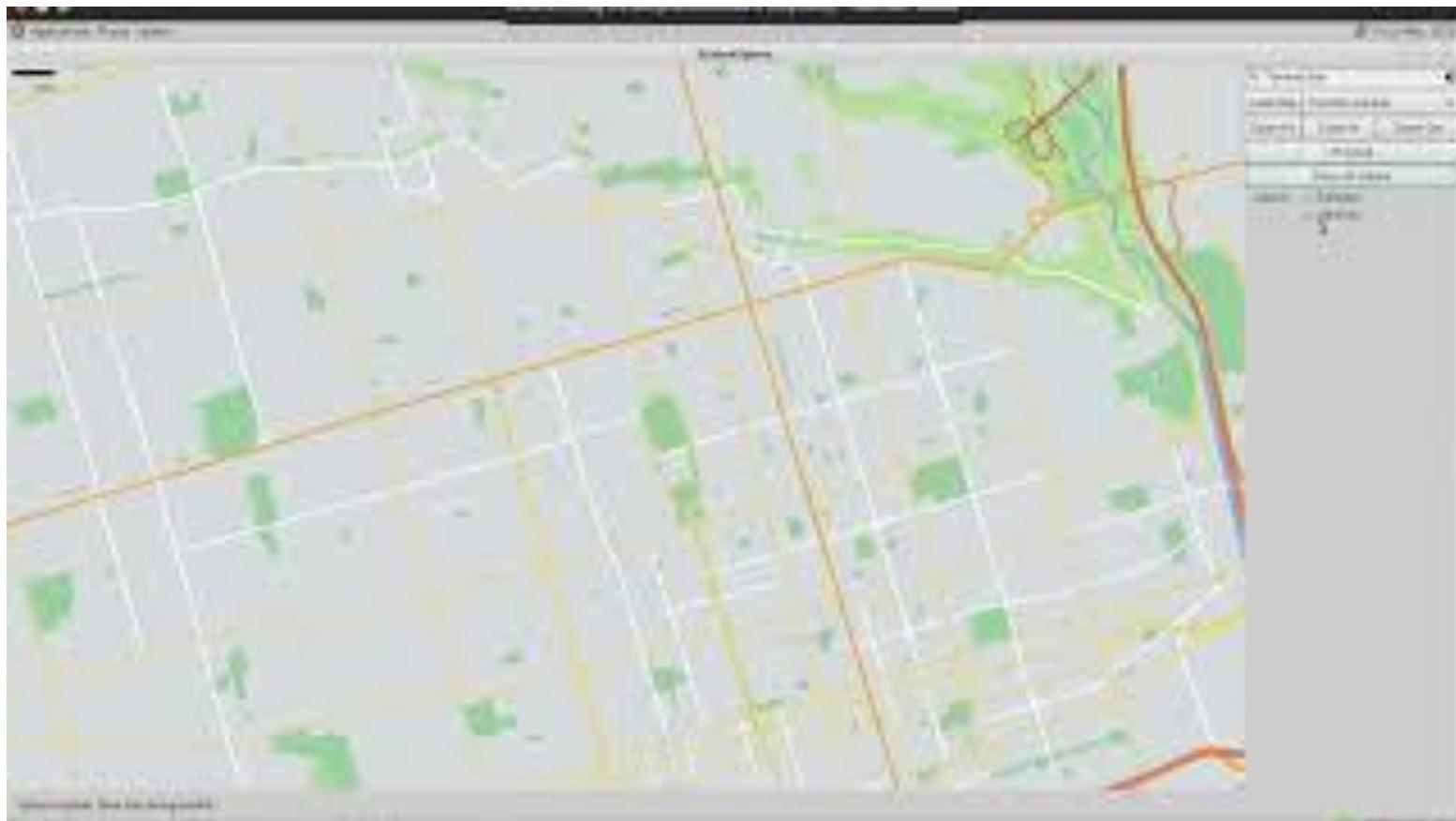


2. Implementation



3. Responsiveness

# StudentSphere Demo



# List of References

- [1] M. L. Black, “College students drive Toyotas and Hondas but dream of teslas - ...,” College Students Drive Toyotas and Hondas but Dream of Teslas, <https://www.valuepenguin.com/college-students-cars-survey> (accessed Mar. 15, 2024).
- [2] F. I. Waliullah and H. Ekman, “Reducing cognitive load on the working memory by signaling primed colors ” KTH, <http://kth.diva-por>
- [3] L. Harrie, H. Stigmar, and M. Djordjevic, “Analytical Estimation of Map Readability,” ISPRS international journal of geo-information, vol. 4, no. 2, pp. 418–446, 2015, doi: 10.3390/ijgi4020418.
- [4] J. Wang and R. Shi, Effect of frame rate on user experience, performance, and simulator ..., [https://ieeexplore.ieee.org/document/10049694/?jsessionid=8pPHTxBWY4fUdy\\_ca3WvgWCKqV\\_ibeiIgi3UnrfLEM\\_qbuVMYfAtl-1752545838](https://ieeexplore.ieee.org/document/10049694/?jsessionid=8pPHTxBWY4fUdy_ca3WvgWCKqV_ibeiIgi3UnrfLEM_qbuVMYfAtl-1752545838) (accessed Mar. 15, 2024).