Cycling in Vancouver:
A portrait of bicycle ridership and safety in Vancouver 2010-2020

About Eco-Counter



Design & manufacture bike and pedestrian counters



Work with organizations to develop count programs



Enable a data-driven approach to bike and pedestrian planning

eco counter

Methodology

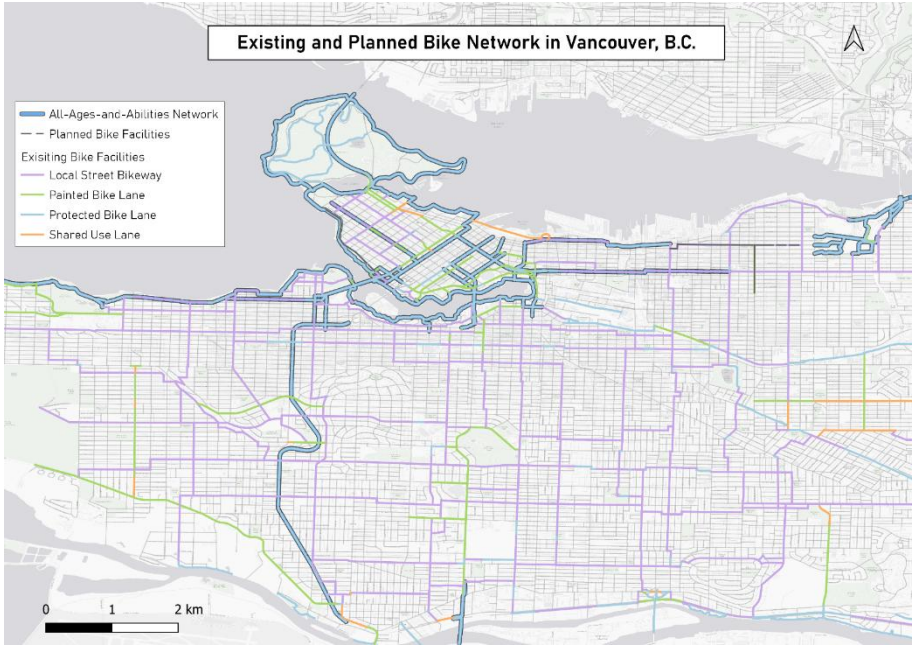
1. **Temporal analysis**
   - Publicly available data from permanent bicycle counters is analyzed to determine long-term bicycle growth
   - The impact of the pandemic on cycling activity in Vancouver is explored
2. **Geospatial bicycle activity analysis**
   - Data from permanent bicycle counting locations is combined with GPS bike trip data to extrapolate bicycle activity throughout the entire road network
3. **Safety analysis**
   - Explore where (which intersections) and when (which months of the year) bicycle crashes occur at the highest rates

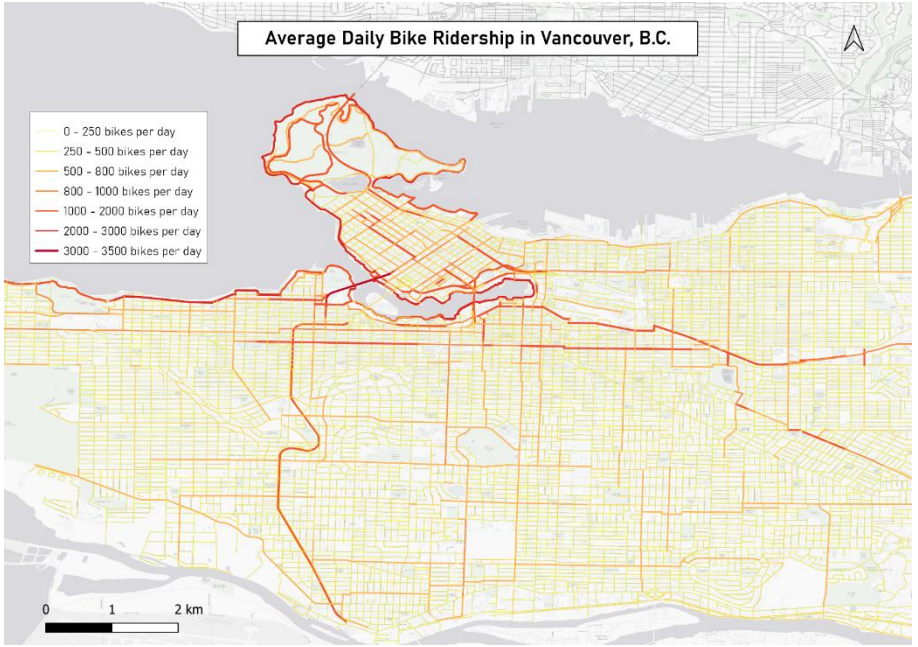
Key Takeaways

1. **There has been a significant and consistent yearly increase in cycling participation over the past decade in Vancouver**. Three downtown Vancouver counting systems have reported a 40% increase in bicycle traffic between 2011 and 2019.
2. **Winter cycling is becoming more common among Vancouver residents**.
3. **Bicycle participation grew by 6% during the pandemic despite a reduction in commuting trips**.
4. **Reported collisions involving vehicles and people on bikes have reduced by 15% and 43% in 2019 and 2020 respectively.**
5. **Collision risk for people on bikes is highest in the late fall and early winter**.
6. **The City of Vancouver has made many impactful improvements to the bicycle network over the past decade**, resulting in safer intersections throughout the all ages and abilities (AAA) bicycle network. **A network screening approach using collision risk at intersections illustrates a handful of higher-risk intersections in Vancouver**.

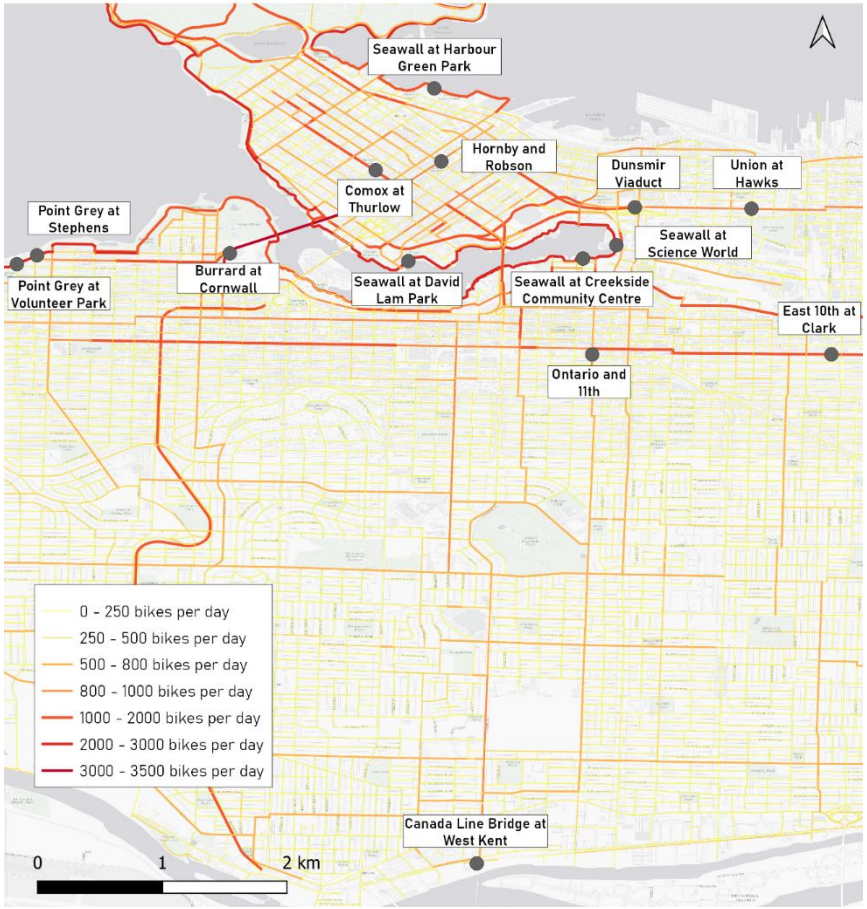


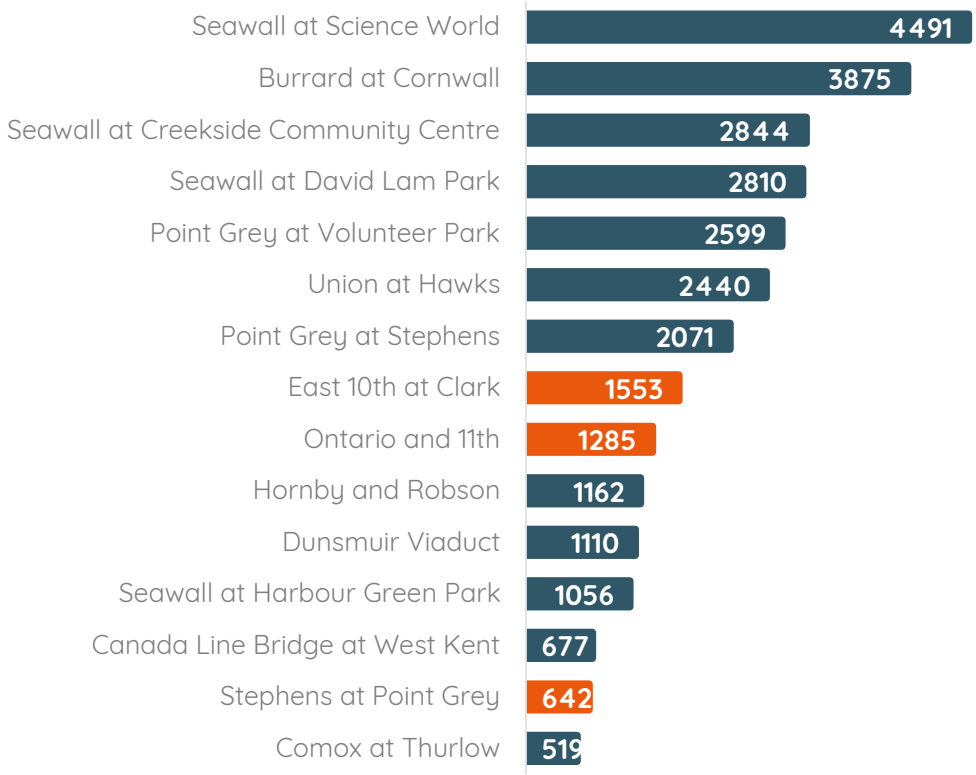
Bicycle Network at Ridership



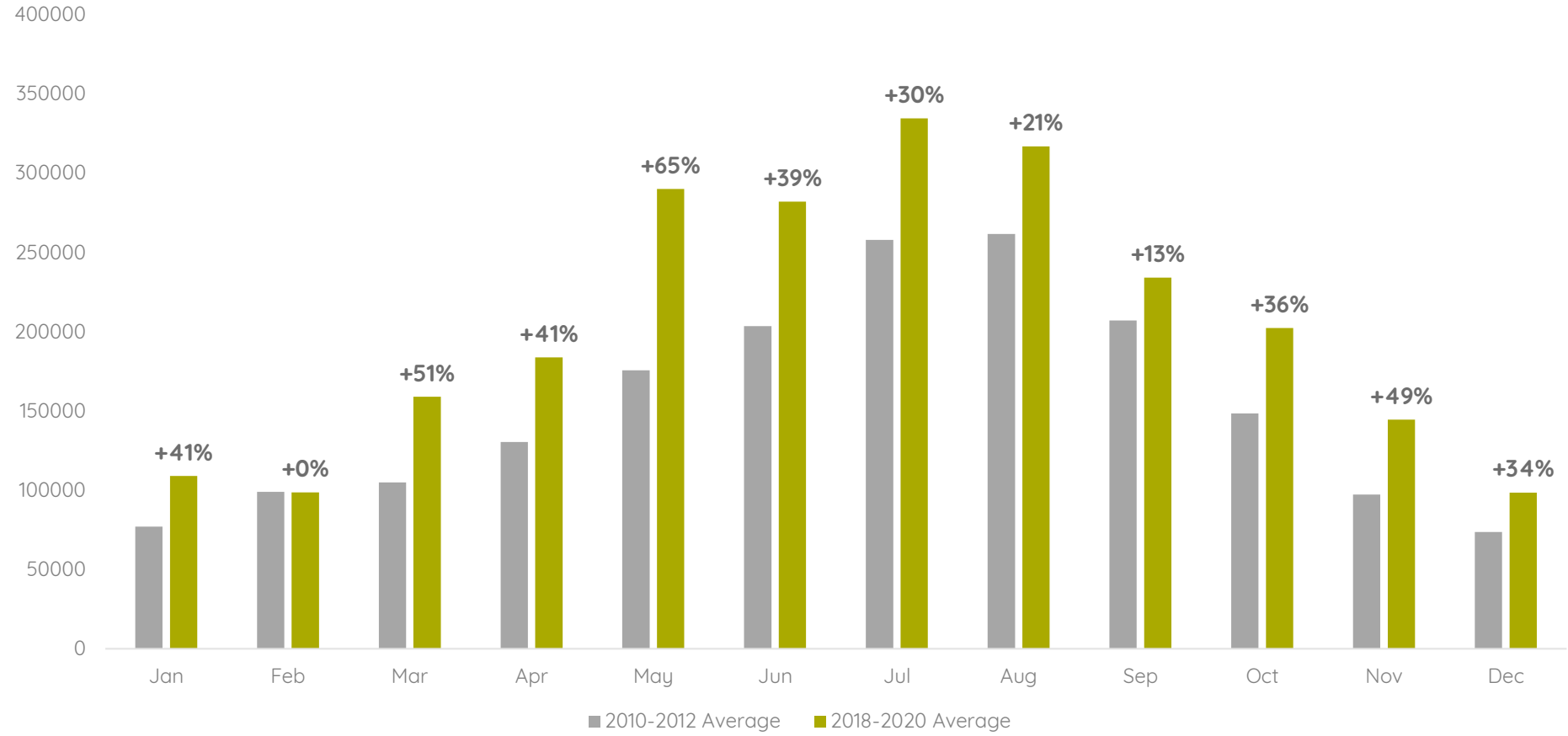


Bicycle Counting Network

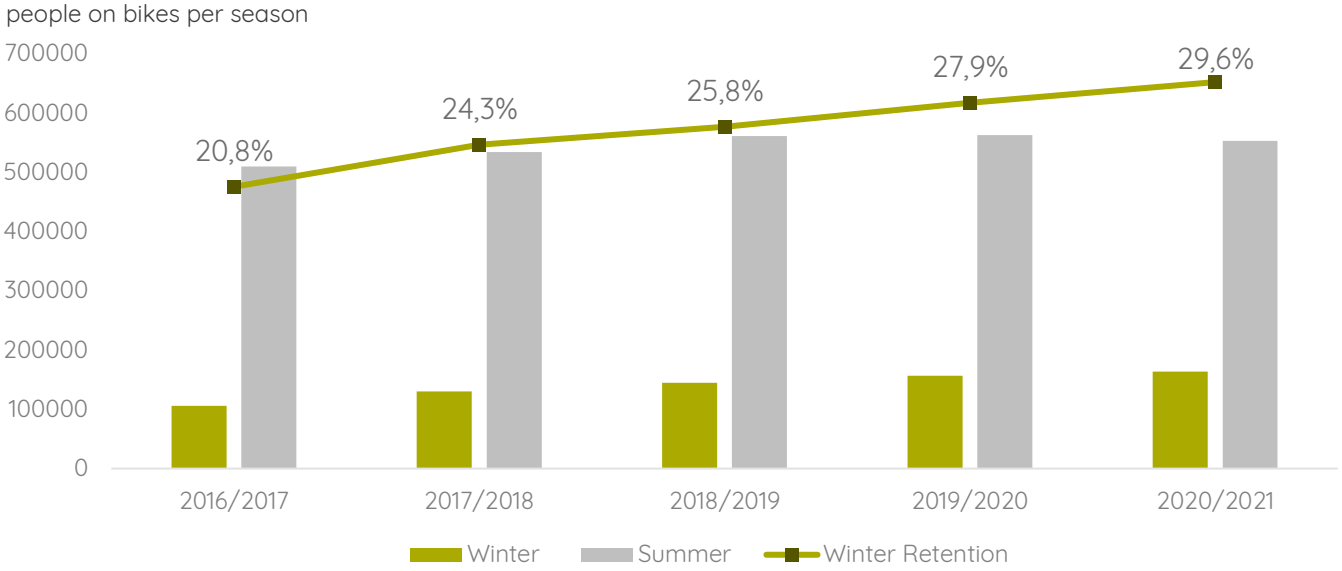




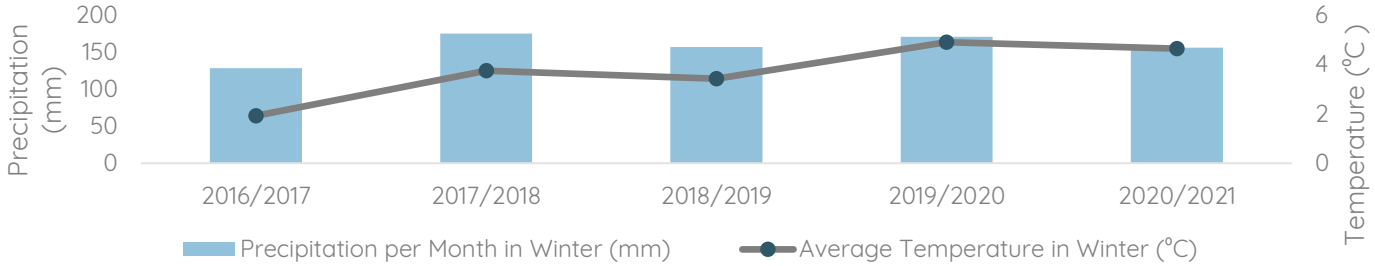
Bicycle Growth Over 10 Years



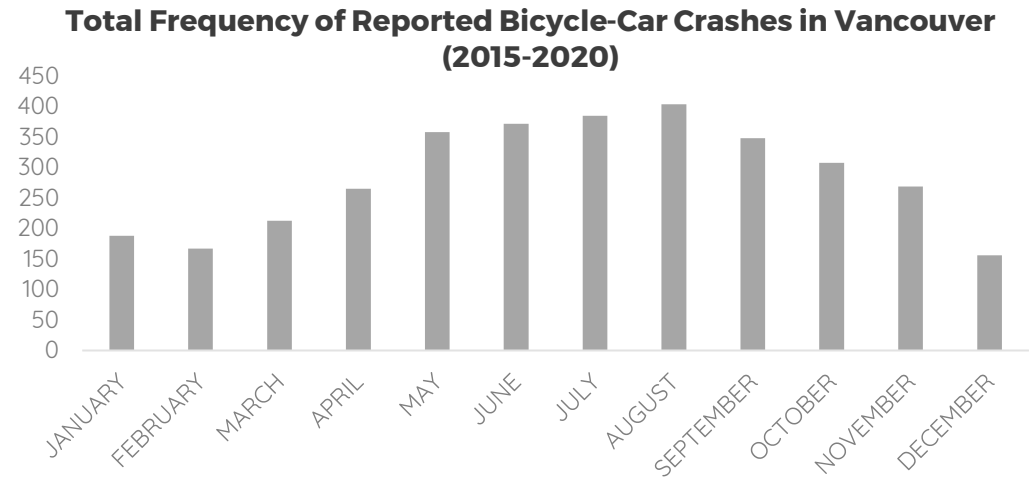
Winter Retention Over 5 Years

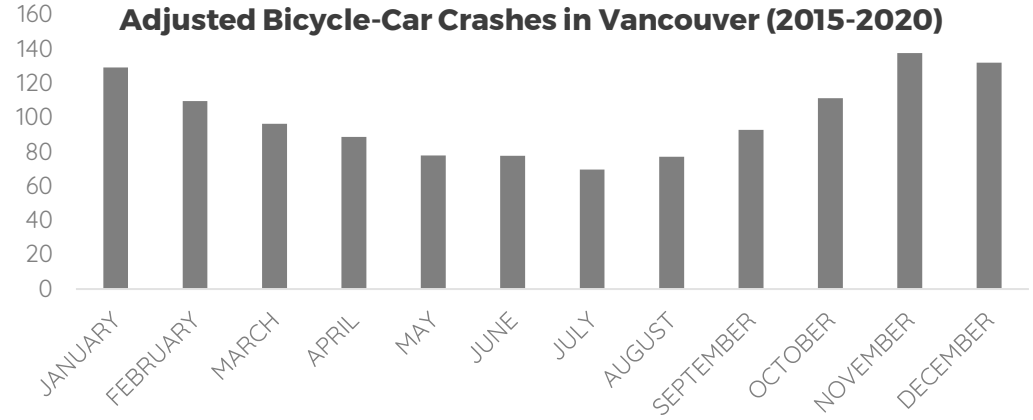


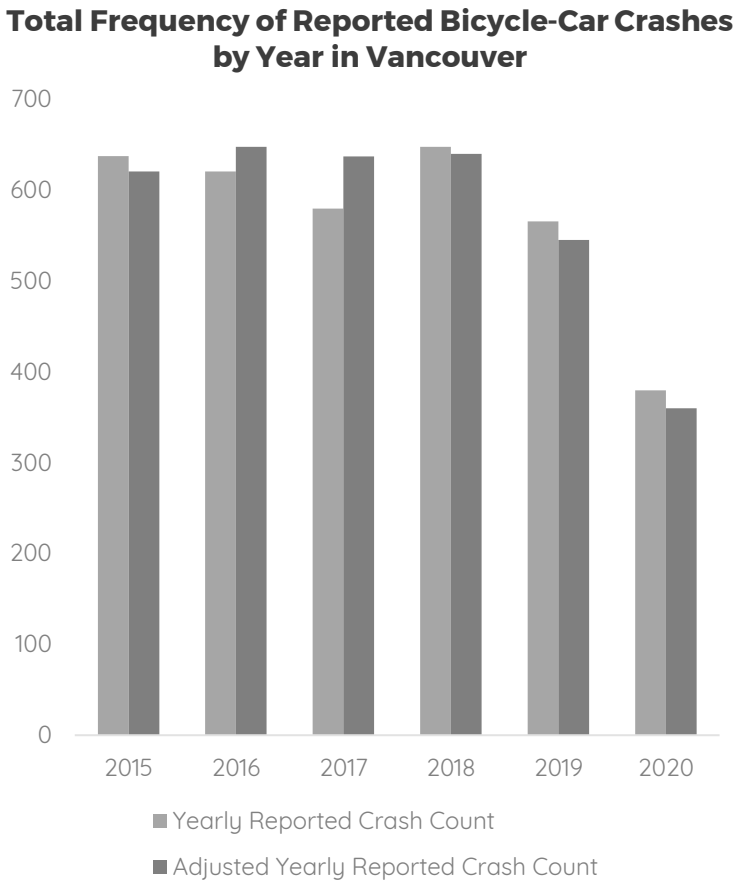




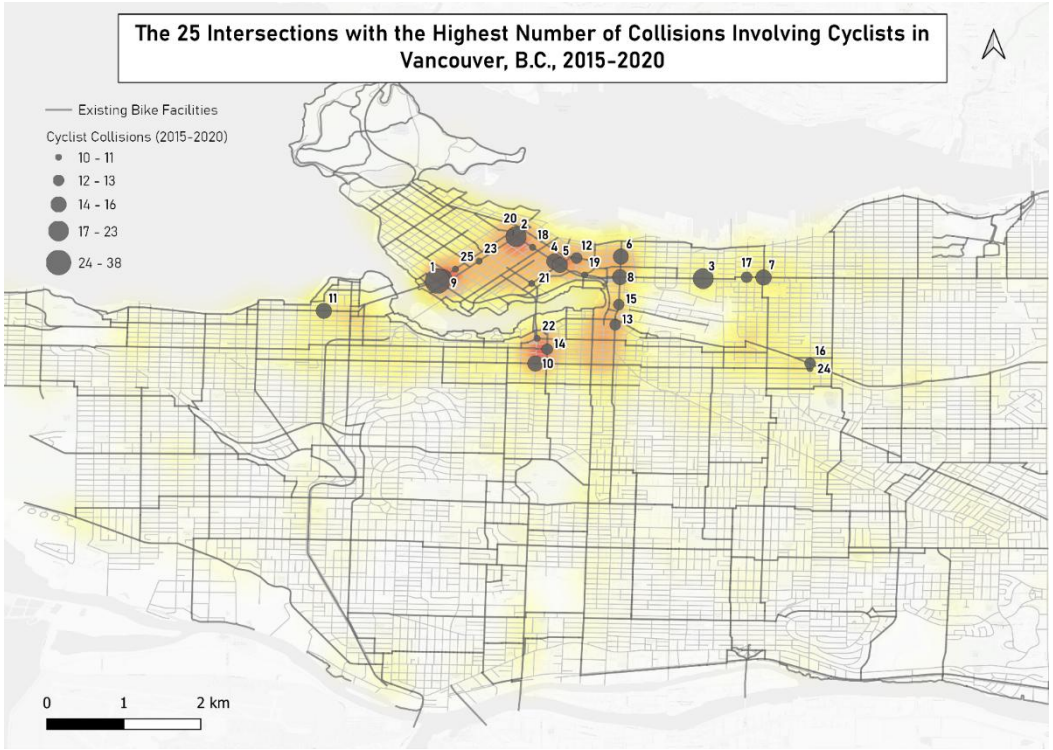
Changes in Bike Safety Over Time







Collision Frequency of People on Bikes

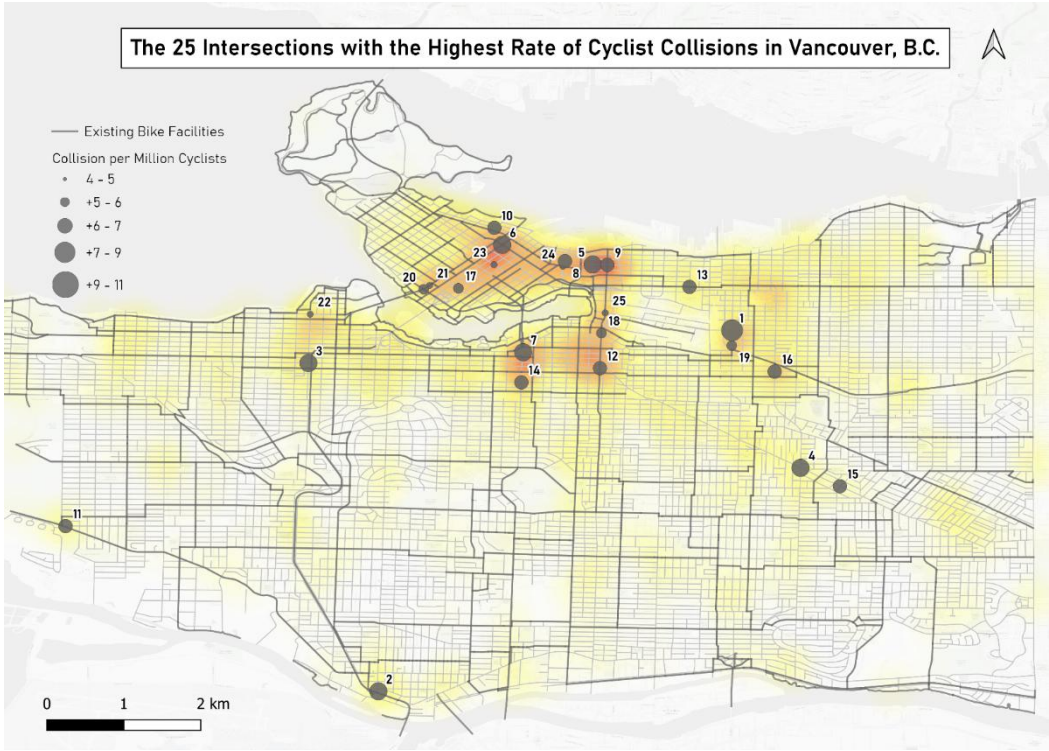


Rank (Highest to Lowest)	Location	Number of Collisions (2015-2020)	Risk (Collisions per Million Cyclists)	Average Annual Daily Bikes	Existing Bike Facilities?	Year of Network Change
1	Burrard St. and Pacific St.	38	5.35	3241	Yes	2018
2	Hornby St. and Dunsmuir St.	23	7.4	1420	Yes	2015
3	Union St. and Campbell Ave.	19	6.31	1374	Yes	2019
4	Dunsmuir St. and Cambie St.	16	4.52	1615	Yes	2016
5	Dunsmuir St. and Beatty St.	16	4.51	1621	Yes	2016
6	Main St. and E. Hastings St.	16	6.64	1100	No	2019
7	Adanac St. and Mclean Dr.	15	4.58	1495	Yes	-
8	Main St. and Union St.	15	3.07	2228	Yes	-
9	Burrard St. and Harwood St.	14	5.01	1275	Yes	2018
10	Cambie St. and 10th Ave.	14	4.38	1459	Yes	2018
11	Arbutus St. and York Ave.	14	4.04	1581	Yes	-
12	Abbott St. and W. Pender St.	13	4.64	1281	Yes	-
13	Main St. and E 2nd Ave.	13	5.64	1053	No	2019
14	W. 7th Ave. and Yukon St.	12	2.49	2200	Yes	-
15	Main St. and Terminal Ave.	12	4.58	1196	No	2019
16	E. Broadway and Victoria Dr.	12	3.42	1604	Yes	-
17	Adanac St. and Clark Dr.	12	4.2	1306	Yes	2017
18	Dunsmuir St. and Seymour St.	11	3.24	1549	Yes	2016
19	Carrall St. and Expo Blvd.	11	2.78	1804	Yes	-
20	Burrard St. and Dunsmuir St.	11	4.48	1121	Yes	-
21	Beatty St. and Smithe St.	11	3.24	1551	Yes	2016
22	Cambie St. Bridge and W. 2nd Ave.	11	2.89	1736	Yes	-
23	Hornby St. and Nelson St.	10	2.63	1740	Yes	-
24	E. 10th Ave. and Victoria Dr.	10	4.28	1066	Yes	-
25	Burrard St and Davie St.	10	2.99	1525	Yes	-

Locations with upgrades/improvements between 2015-2020

Removed from formal cycling network between 2015-

Collision Rate of People on Bikes



Rank (Highest to Lowest)	Location	Risk (Collisions per Million Cyclists)	Average Annual Daily Bikes	Number of Collisions (2015-2020)	Existing Bike Facilities?	Year of Network Change
1	Clark Dr. & E. 1st Ave. & Grandview Viaduct	9.3	393	8	No	-
2	Granville St. & Milton St. & SW. Marine Dr.	7.9	349	6	No	-
3	Arbutus St. & W. Broadway	7.7	414	7	Yes	2017/2018
4	Kingsway and Victoria Dr.	7.6	361	6	No	-
5	Columbia St. and E. Hastings St.	7.6	422	7	No	-
6	Dunsmuir St. and Hornby St.	7.4	1420	23	Yes	2015
7	Cambie St. and W. 6th Ave.	7.4	618	10	No	-
8	Abbott St. and W. Hastings St.	6.8	473	7	No	-
9	E. Hastings St. And Main St.	6.6	1100	16	No	2019
10	Thurlow St. and W. Hastings St.	6.6	416	6	No	-
11	Camosun St. & SW Marine Dr. & W. 41st Ave. & Turning Lane	6.6	485	7	Yes	2018
12	E. Broadway and Main St.	6.5	419	6	No	2019
13	Campbell Ave. and Union St.	6.3	1374	19	Yes	2019
14	Cambie St. and W. 12th Ave.	6.2	366	5	No	-
15	Kingsway and Nanaimo St.	6.2	370	5	No	-
16	Commercial Dr. and E. Broadway	6.1	373	5	No	-
17	Davie St. and Granville St.	5.7	480	6	No	-
18	E. 2nd Ave. and Main St.	5.6	1053	13	No	2019
19	Clark Dr. and E. 4th Ave.	5.6	410	5	No	-
20	Burrard St. and Pacific St.	5.4	3241	38	Yes	2018
21	Burrard St. and Harwood St.	5.0	1275	14	Yes	2018
22	Arbutus St. and Cornwall Ave.	4.9	560	6	No	-
23	Granville St. and Robson St.	4.7	484	5	No	-
24	Abbott St. and W. Pender St.	4.6	1281	13	Yes	-
25	. Main St. and Terminal Ave	4.6	1196	12	No	2019

Locations with upgrades/improvements between 2015-2020

Removed from formal cycling network between 2015-

Collision Rate – Highest Risk Intersections



Clark Dr & East 1st Ave: *Eight collisions in six years* representing an estimated rate of *9.3 collisions per million cyclists*

Granville St. & SW. Marine Dr: *Six collisions in six years* representing an estimated rate of *7.9 collisions per million cyclists*





Kingsway and Victoria Dr: *Six collisions in six years* representing an estimated rate of *7.6 collisions per million cyclists*

Data Limitations

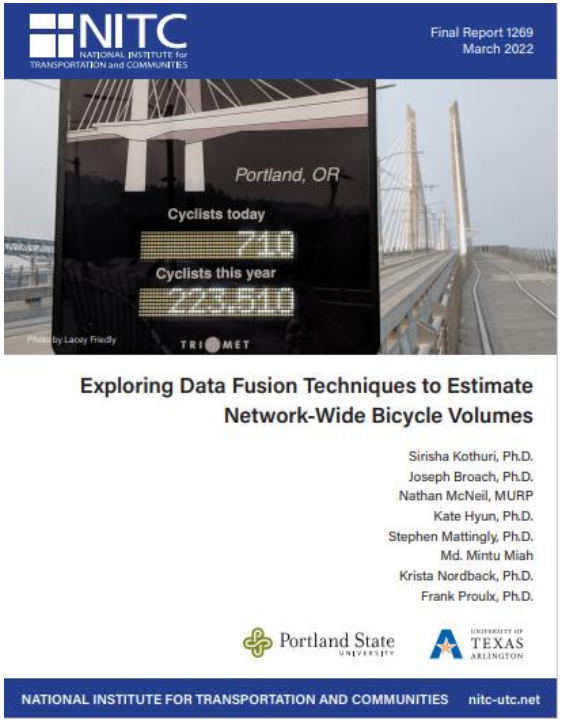
1. **GPS trace data**
   - Representation of people on bikes
   - Trace density and spatial coverage
2. **AADB Model**
   - Low bicycle volume segments lack accuracy
3. **Crash data and analysis**
   - Incomplete crash data
   - Low spatial resolution of crash data
   - No temporal resolution of crash data

Lessons Learned

Bicycle trip trace data
- Combine sources
- Validate representivity
- Validate network coverage

Point-based counting sites
- More sites needed – data must be validated
- Improved heterogeneity of sites

Identify road treatments of before/after impact study
- Establish which road treatments can be studied using available crash data



PPT link
Manuscript link

Interested to know more?

Get in touch!