

Attachment 2: Shared e-Bike and e-Scooter Data and Analysis




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Ridership

Table 1 shows a comparison of fleet size and number of trips recorded by shared e-Bikes and e-Scooters over the entire pilot period. Information was collected from the shared mobility companies in the mobility data specification (MDS) format. The data provides information on where and when a trip starts, ends, and the route it took to get there.

Table 1: e-Bike and e-Scooter Fleet Size & Ridership

Company	2019	2020
	500 e-bikes 1,000 e-Scooters	Lime chose to remove their e-Bikes in 2020 1,300 e-Scooters
	500 e-Scooters	1,000 e-Scooters
	N/A	500 e-Scooters
Number of trips per year	918,000	956,000
Operating Days	110	162
Number of unique riders	200,000+	
Total # of trips during the pilot	1,874,000	

Due to uncertainties with COVID19, a restricted number of 450 e-Scooters were permitted to operate between May 22nd and June 22nd, 2020. The permitted number of e-Scooters increased on June 22nd to 2,500, which was the original number of permitted e-Scooters for the second year of the pilot. In accordance with the performance based Dynamic Cap, the number of permitted e-Scooters increased again in August 2020 from 2,500 to 2,800. Although 2,800 e-Scooters were permitted, the maximum number deployed during the pilot was 2,300.

Destinations

People used e-Scooters and e-bikes to travel to a variety of destinations in the inner city, as shown in Figure 1. The following destinations were the most popular throughout the pilot:

- Stephen Avenue
- Kensington
- East Village
- 17th Avenue SW
- 4th Street SW
- Eau Claire

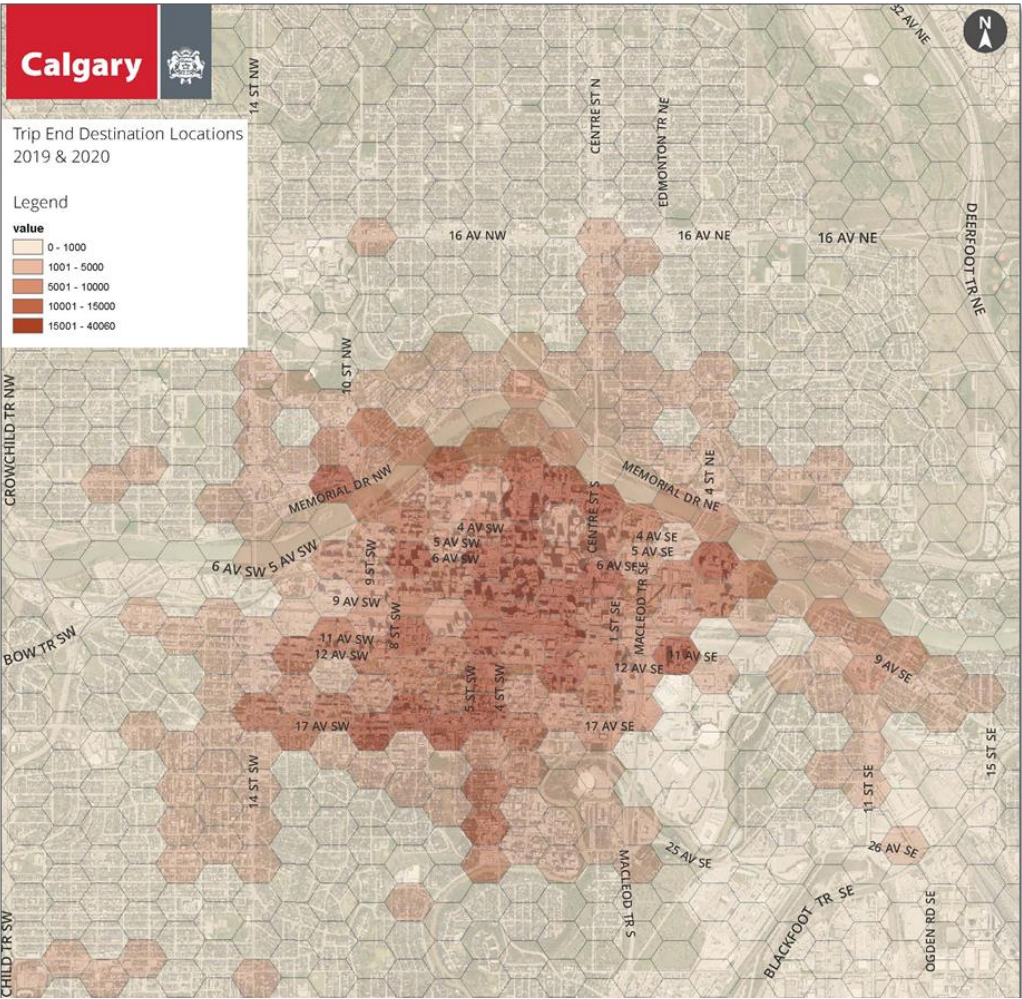


Figure 1: Trip End Locations for the Combined Two-Year Pilot

Throughout the duration of the pilot, approximately **55%** of shared e-scooter and e-bike trips ended in a BIA or BRZ, as shown in Figure 2.

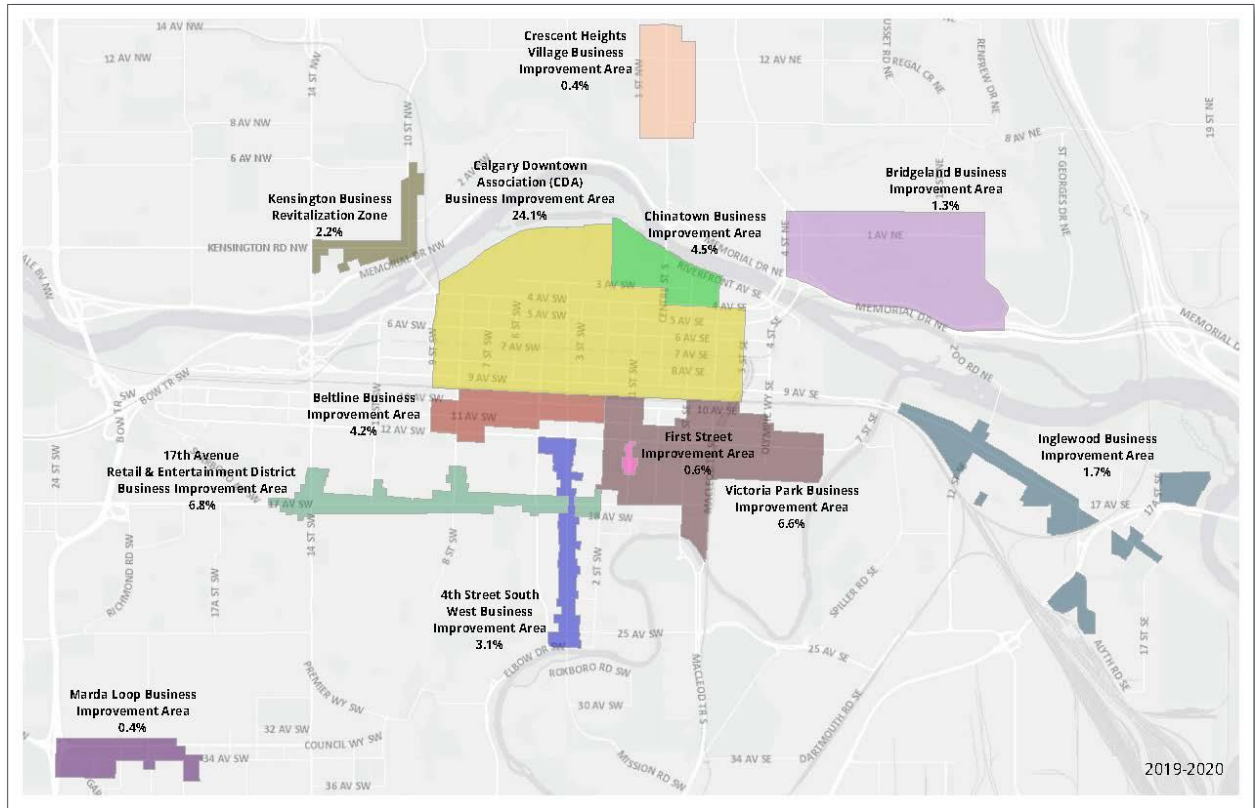


Figure 2: Percent of Overall Trip Destinations That End in a BIA or BRZ

Table 2 Percentage of Total Trips that ended in a BIA - 2019 vs 2020

BIA / BRZ	2019	2020
Calgary Downtown Association (CDA)	24.1%	24.1%
Victoria Park	7.2%	6.2%
17th Avenue Retail & Entertainment District	5.7%	7.7%
Beltline	4.0%	4.3%
Chinatown	3.6%	5.2%
4th Street South West	3.0%	3.3%
Kensington	2.3%	2.1%
Inglewood	1.8%	1.6%
Bridgeland	1.4%	1.2%
First Street Improvement Area	0.5%	0.7%
Total	53.6%	56.4%

Routes

Approximately 60% of e-Scooters and e-Bikes used the pathway network or cycling infrastructure to get to their destinations. The rest of the volume of the trips (40%) took place on sidewalks and/or roadways. The most popular routes in the city were along the river path, commercial areas, and in the cycle track network (Figure 3).

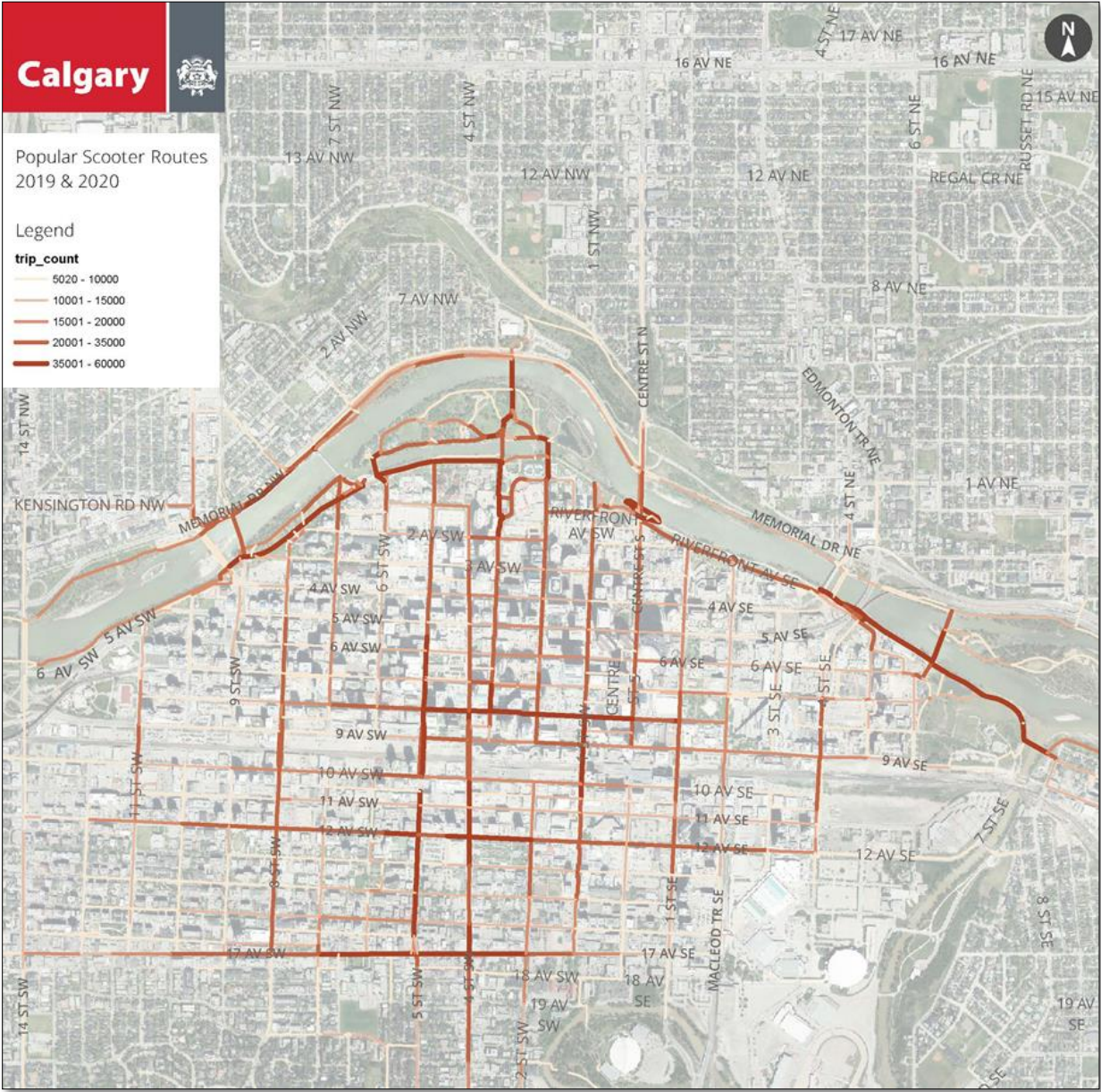


Figure 3: Most Popular Routes – 2019 + 2020

Figure 4 shows the difference in popular routes in 2019 vs 2020. Areas with a darker shade of orange/red indicate increased use in that area in 2020 compared to 2019. In 2020, there were a higher number of trips in: Eau Claire, the River Pathway, 17th Avenue SW, Memorial Drive (Adaptive Roadway) and select streets in the downtown core.

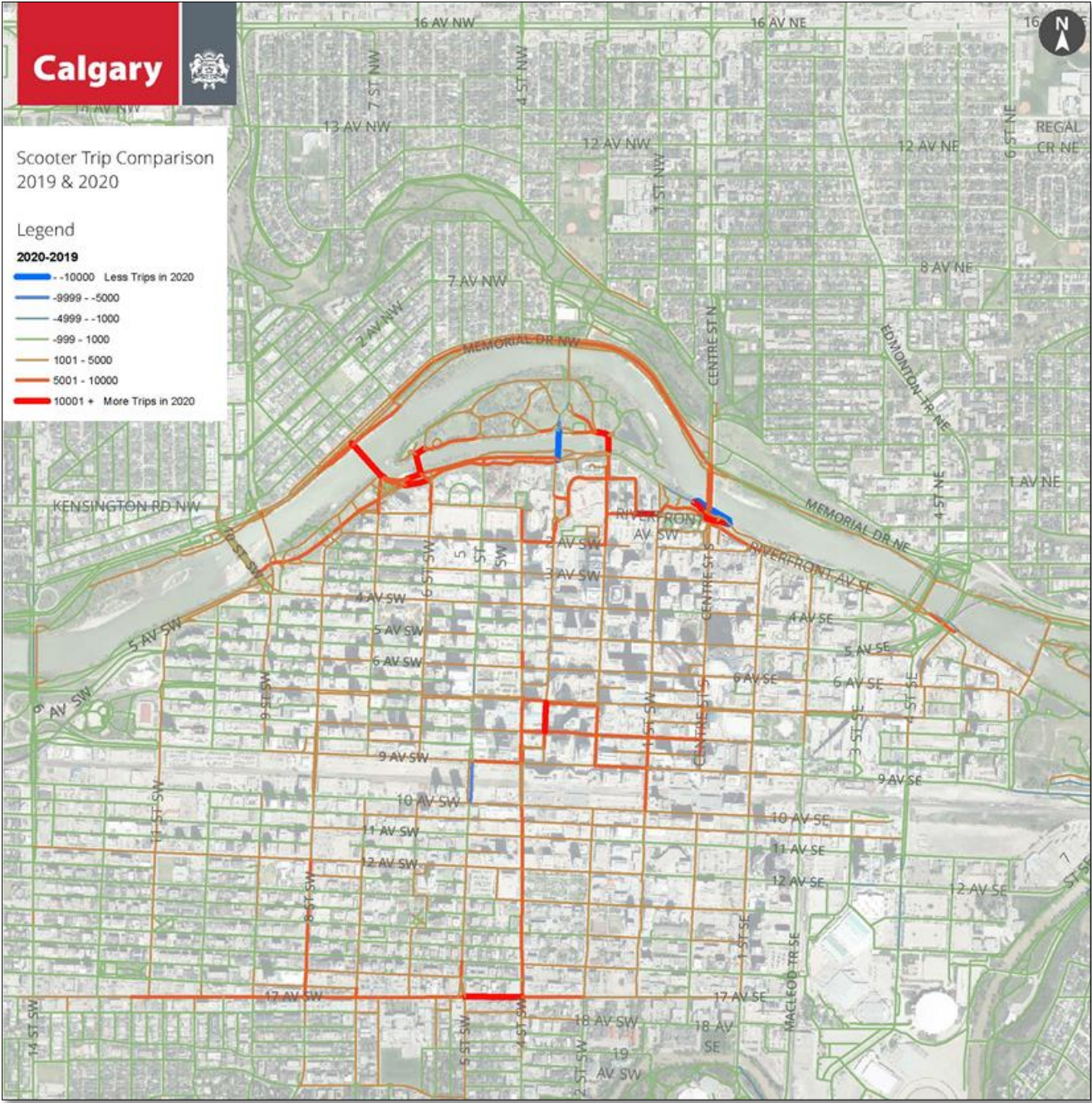


Figure 4: Differences in Route Use - 2019 vs 2020

311 Calls and Correspondence with Citizens

Throughout the course of the pilot, there were a total of 769 logged 311 service requests. As shown in Figure 5, the two most common complaints were around rider behaviour/conflict with pedestrians and parking. The number of concerns around bad behaviour and conflicts with other sidewalk and pathway users was higher in 2019 (206) than 2020 (125). More parking complaints were logged in 2020 (255) than in 2019 (69). More parking complaints were logged in 2020 (255) than in 2019 (69).

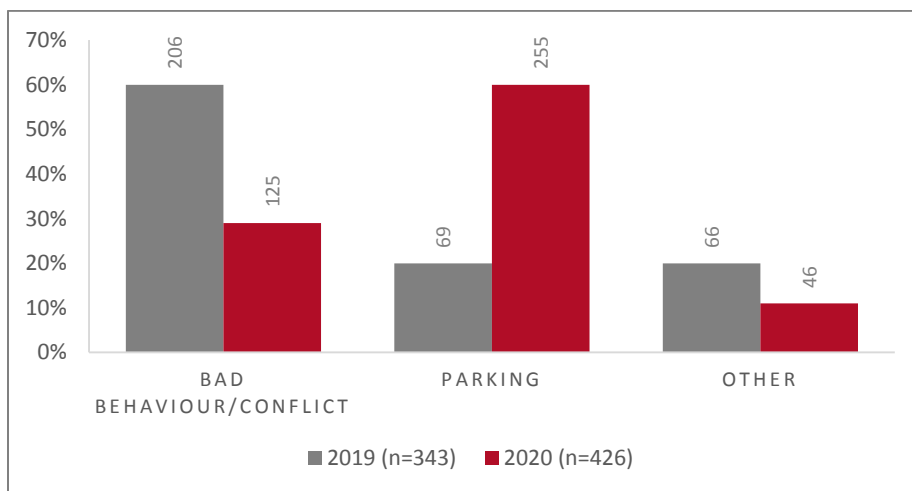


Figure 5: 311 Complaints by Category – 2019 vs 2020

While the total number of 311 complaints in 2020 exceeded those complaints in 2019, there were 52 more operational days in 2020 than in 2019, shown in Figure 6. Therefore, the overall average number of complaints per day dropped from 3.1/day in 2019 to 2.6/day in 2020.

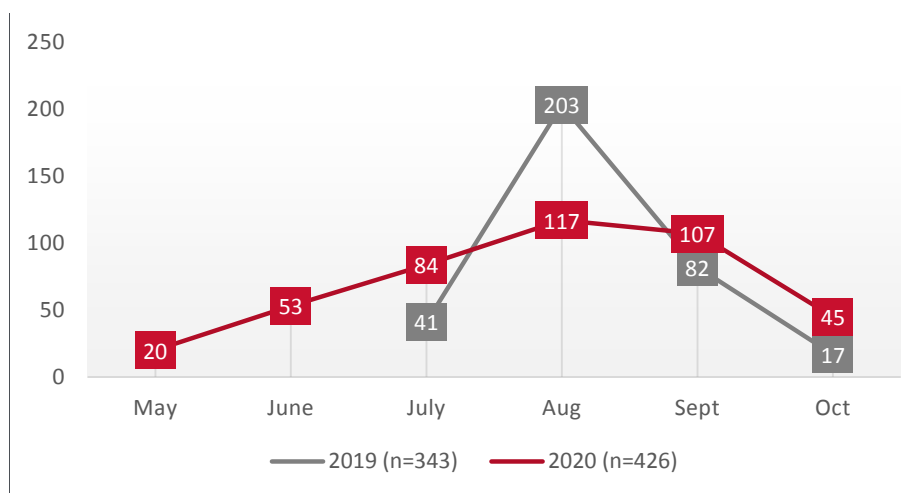


Figure 6: Overall 311 Complaints by Month – 2019 vs 2020

The areas with the most complaints were located centrally in Downtown and the Beltline, as well as along the riverfront in areas such as Eau Claire, Sunnyside and Bridgeland. For the 2020 operating season, The City implemented geofenced slow speed zones (highlighted blue in Figure 7) in Kensington, Mission, Stephen Avenue and Inglewood. While the overall number of 311s increased in 2020, 311 complaints generally went down in areas where Slow Speed Zones were implemented, as highlighted in Table 3. The Business Improvement Areas (BIAs), with slow speed zone's, reported user behaviour improved in 2020 compared to 2019.

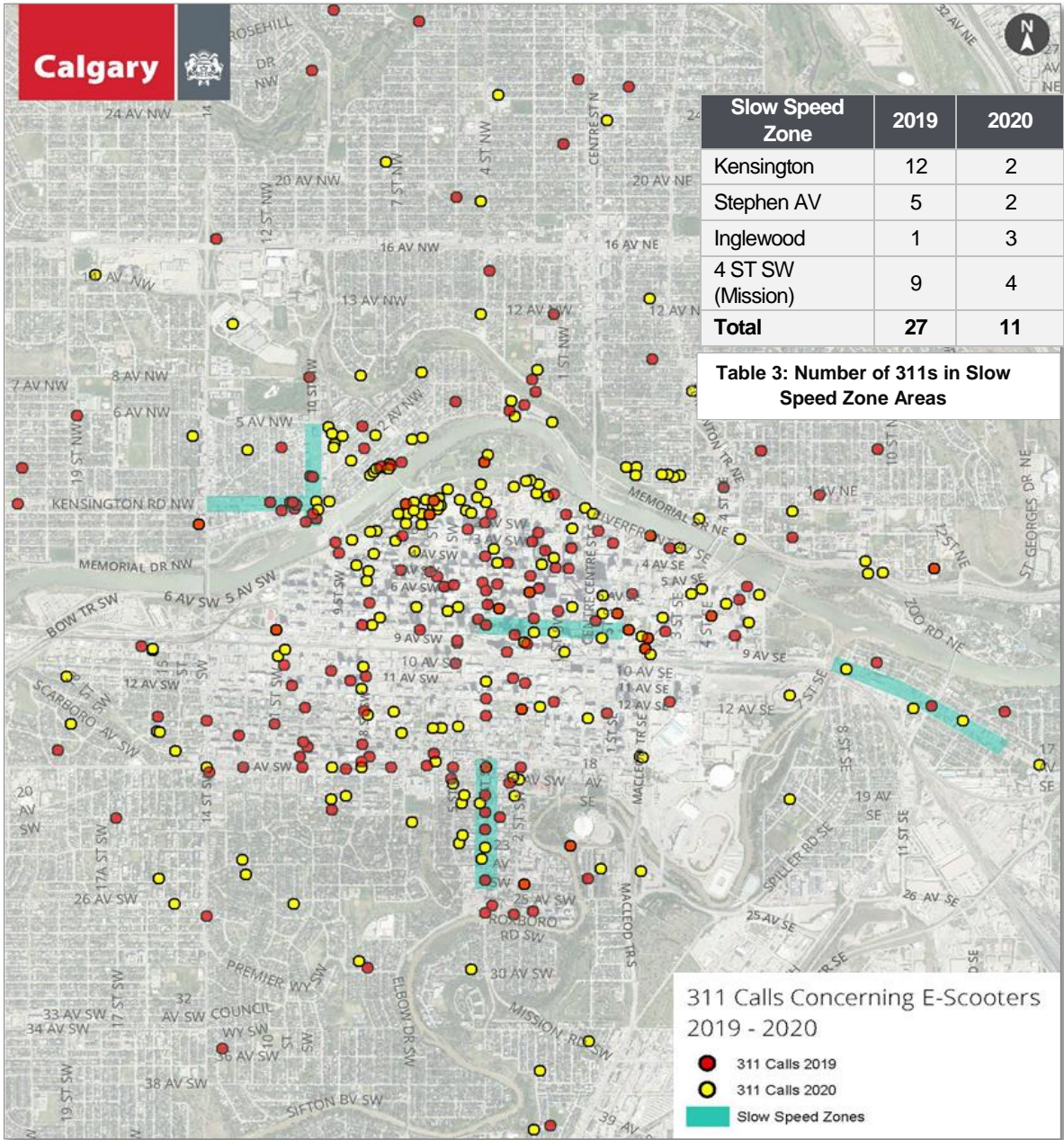


Figure 7: Locations of 311 Complaints – 2019 vs 2020

Eau Claire was one of the busiest areas for e-Scooter use in Calgary, with usage increasing by 80% in the area from 2019 to 2020. Rides in the area increased from 50,000 in 2019 to 90,000 in 2020. Eau Claire accounted for 11% of the 311s in 2019, and 40% of 311s in 2020 (Figure 8).

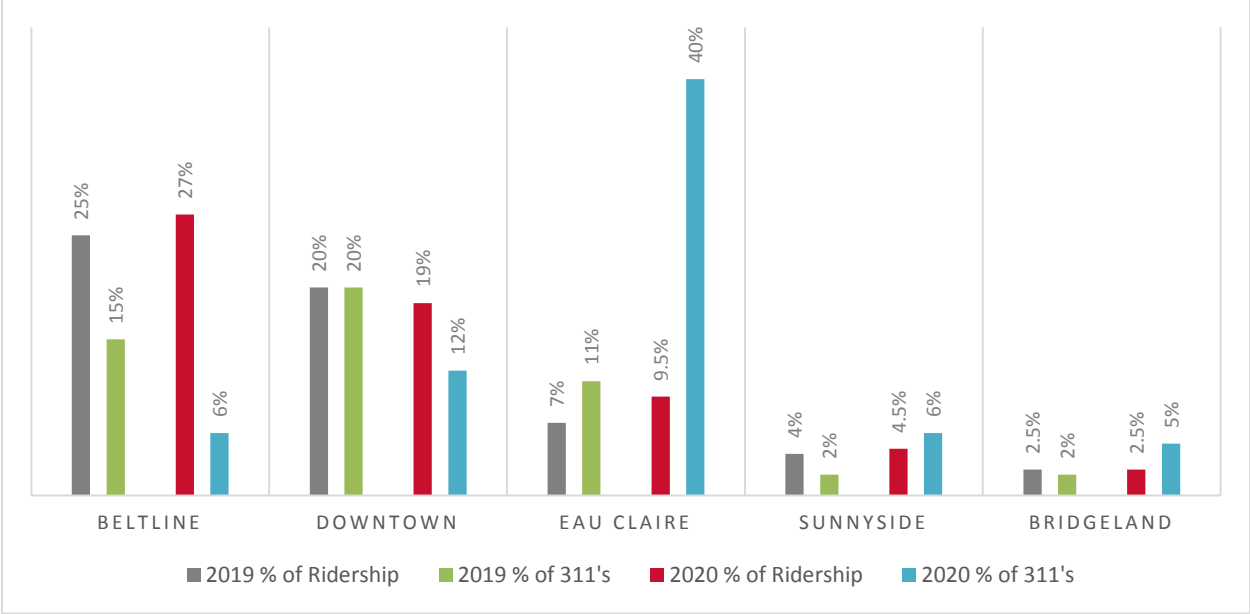


Figure 8: Ridership vs 311 Complaints in Top 5 Communities – 2019 vs 2020

Parking

The 2020 e-Scooter citizen survey indicated parking was the 3rd top concern. Figure 9 shows the parking specific complaints made to 311. There were 69 parking 311s in 2019 and 255 in 2020. The City worked with the e-Scooter providers to implement a \$10 company fine to users who parked their e-Scooters improperly starting in August 2020. Companies issued 188 fines in August through October 2020. There was a greater number permitted of e-Scooters in Calgary in 2020 (n=2,800) compared to 2019 (n=1,500), which could account for increases in e-Scooter 311 parking concerns.

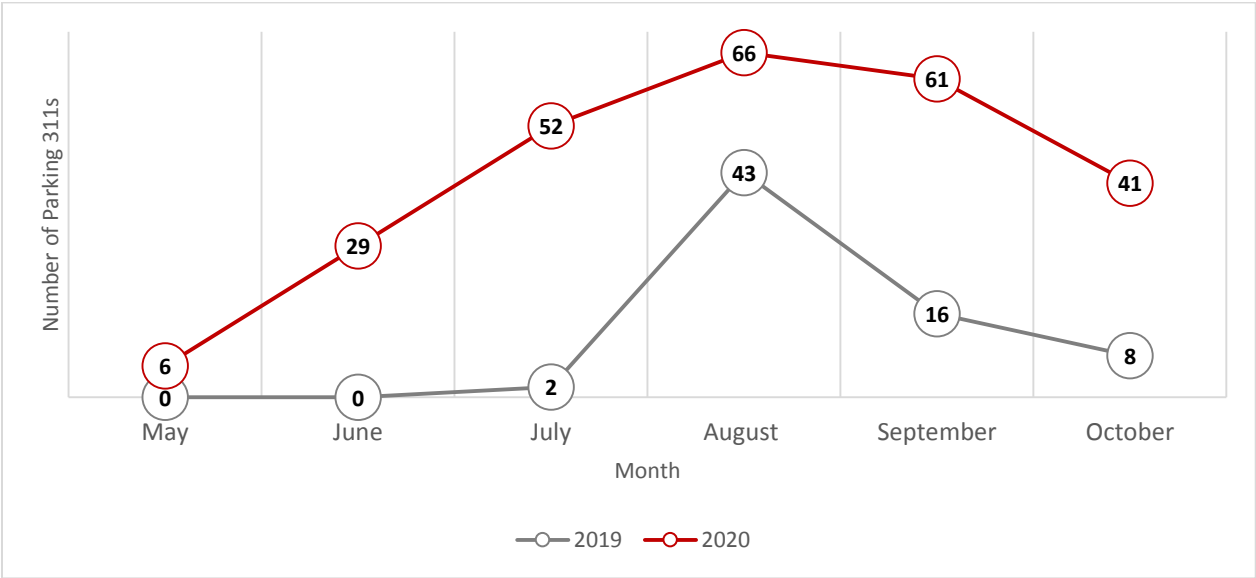


Figure 9: Number of Parking Specific Complaints by Months – 2019 vs 2020

Share and Go Parking Zones

In response to concerns around improperly parked e-Scooters, The City implemented 30 “Share and Go Parking Zones” in 2020. These zones were created as a go-to place to find an e-Scooter or to end a ride. Three styles of parking zones were installed: painted off street zone, painted parking mat, and repurposed Car2Go parking stalls. Costs associated with the installation of parking zones were paid for by the fees collected from the e-Scooter companies.



Figure 10: Three Types of e-Scooter “Share & Go” Parking Zones

Since installation, approximately 2.5% of riders ended their trips in a Share and Go Parking Zone. The three most popular parking zones were:

- South of the Peace Bridge (painted off street zone)
- North of Eau Claire AV & 6 ST SW (painted off street zone)
- South of the Jaipur Bridge (painted parking mat)

Approximately 10% of e-Scooters deployed by the operating companies were in Share and Go Parking Zones. The three most popular deployment zones were:

- 12 AV & 10 ST SW (repurposed Car2Go stall)
- North of Eau Claire AV & 6 ST SW (painted off street zone)
- 15 AV & 5 ST SW (repurposed Car2Go stall)

Public Engagement Survey

The City conducted two public engagement surveys that took place from September 23 to October 6, 2019 and September 16 to October 7, 2020 to understand what citizens thought about the shared e-Bike and e-Scooter pilot. The full What We Heard report is available publicly online. In 2019, approximately 9,900 people responded to the survey, while 2020 saw approximately 7,200 survey responses. As illustrated in Figure 11, about half of the survey participants had tried riding an e-Scooter.

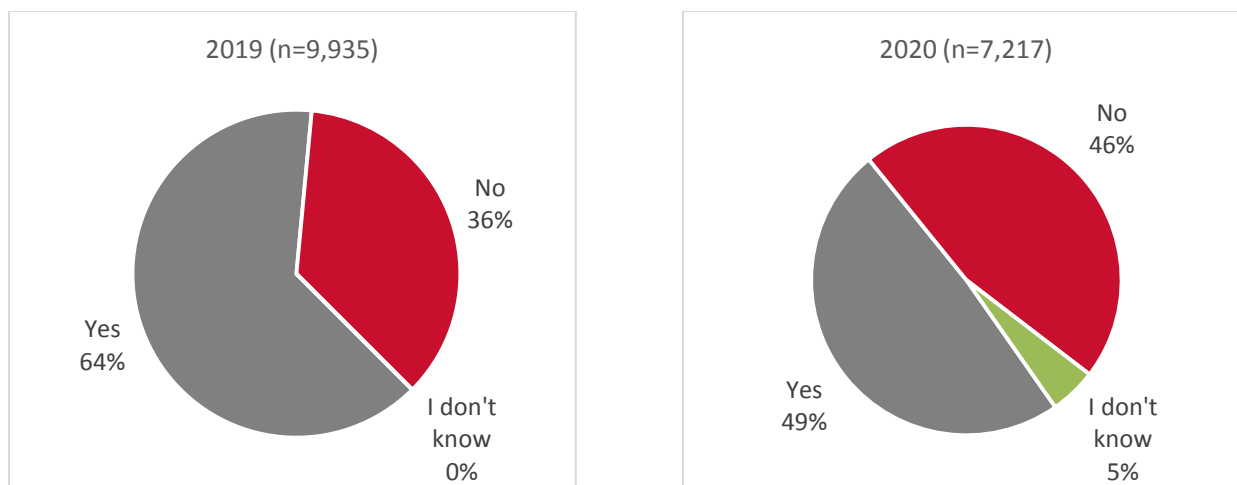


Figure 11: Survey Response to Using a Shared e-Scooter - 2019 vs 2020

In 2019, most riders took between five and 15 trips. As shown in Figure 12, the number of people who had used an e-Scooter 16 or more times increased in 2020.

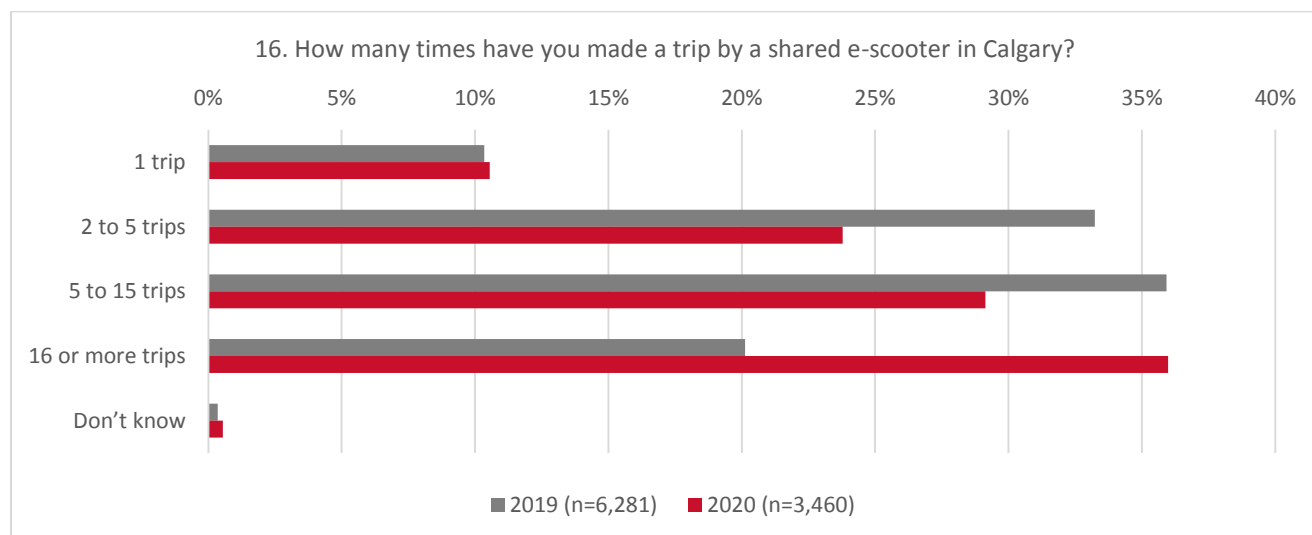


Figure 12: Survey Response to Number of Times Riders Use e-Scooters - 2019 vs 2020

As illustrated in Figure 13, in 2020, e-Scooter rider survey participants felt most comfortable riding the shared e-Scooters on pathways, empty sidewalks and bike lanes/cycle tracks. Residential roads were not as comfortable, but were preferred to busy sidewalks, commercial main streets, and major roadways, which were ranked the least comfortable.

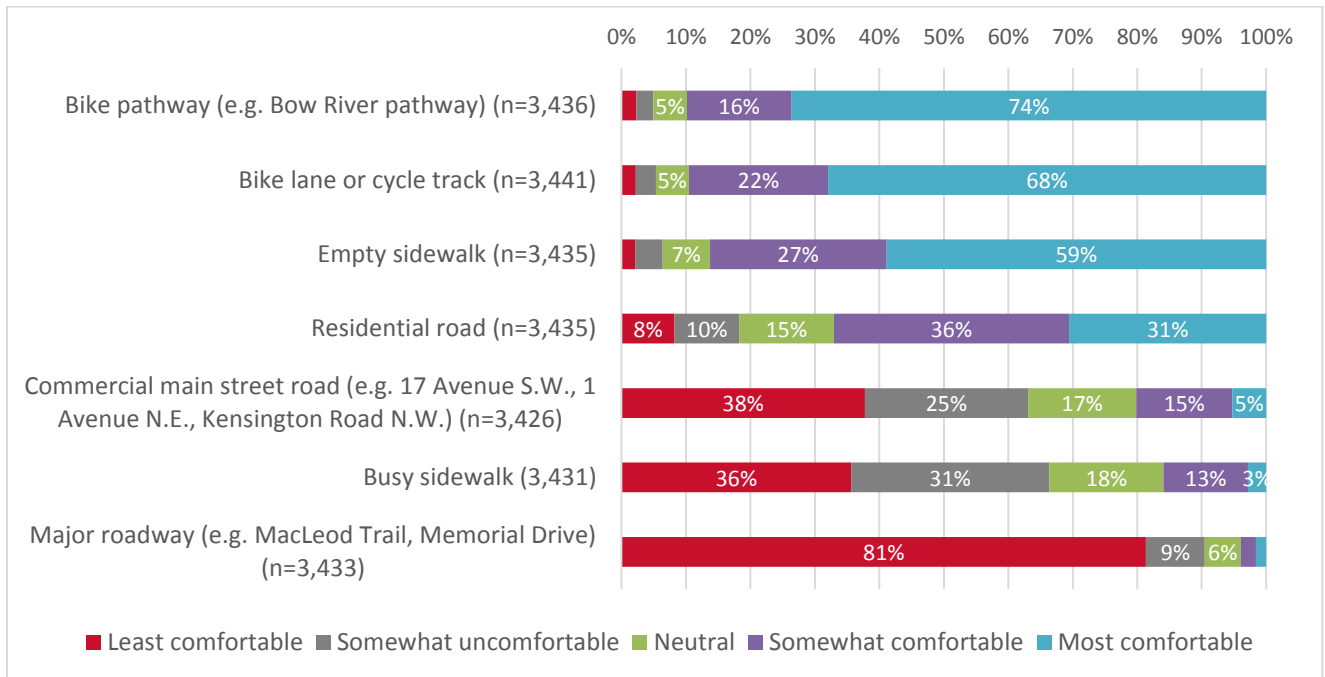


Figure 13: 2020 Survey Response to Level of Rider Comfort Based on Style of Infrastructure

When asked where people should be able to ride shared e-scooters, survey respondents (both riders and non-riders) were in favour of shared e-Scooters being permitted to use bikes lanes, bike pathways and cycle tracks. Residential roads and empty sidewalks were also acceptable, but sidewalks with many pedestrians were not. There was less support for allowing shared e-Scooters on main streets in commercial areas like 17th Avenue SW, Bridgeland and Kensington Road and almost no support for on major roadways like Memorial Drive and MacLeod Trail. Figure 14 illustrates the survey response summary for citizens' preference on where people should be allowed to ride e-Scooters.

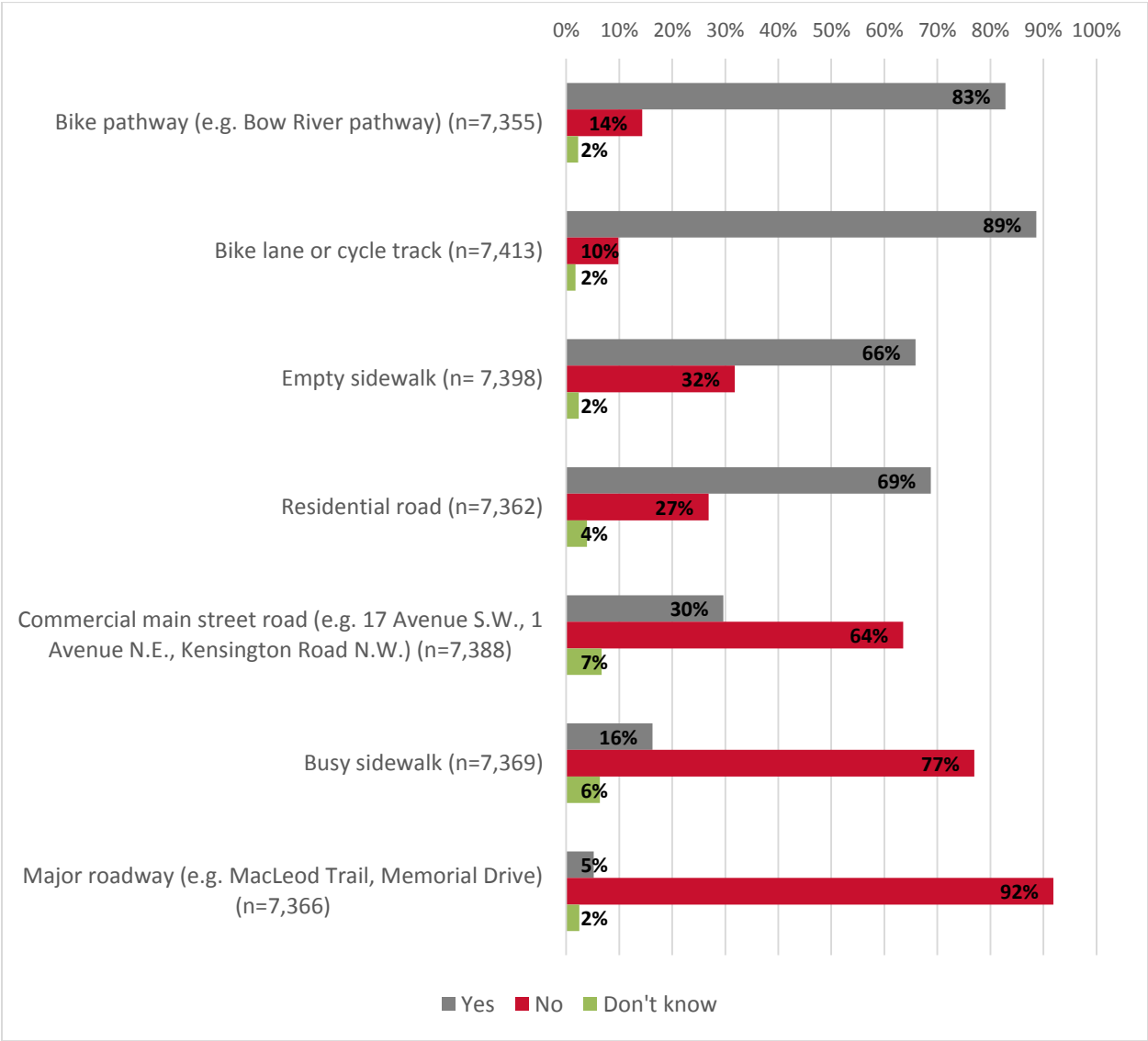


Figure 14: 2020 Survey Response to Where People Should be Allowed to Ride E-Scooters

As shown in Figure 15, in 2019 and 2020, approximately 1/3 of survey respondents indicated that they would have used a vehicle (either personal, taxi or rideshare) had an e-Scooter not been available. In 2019, In the absence of an e-Scooter, 56% of respondents indicated the same trip would have been made by walking, in 2020 that dropped to 47%. In the 2020 survey, a new answer option of “I would not have made the trip” was added. Close to 8% of survey respondents said they would not have made the trip had an e-Scooter not been available.

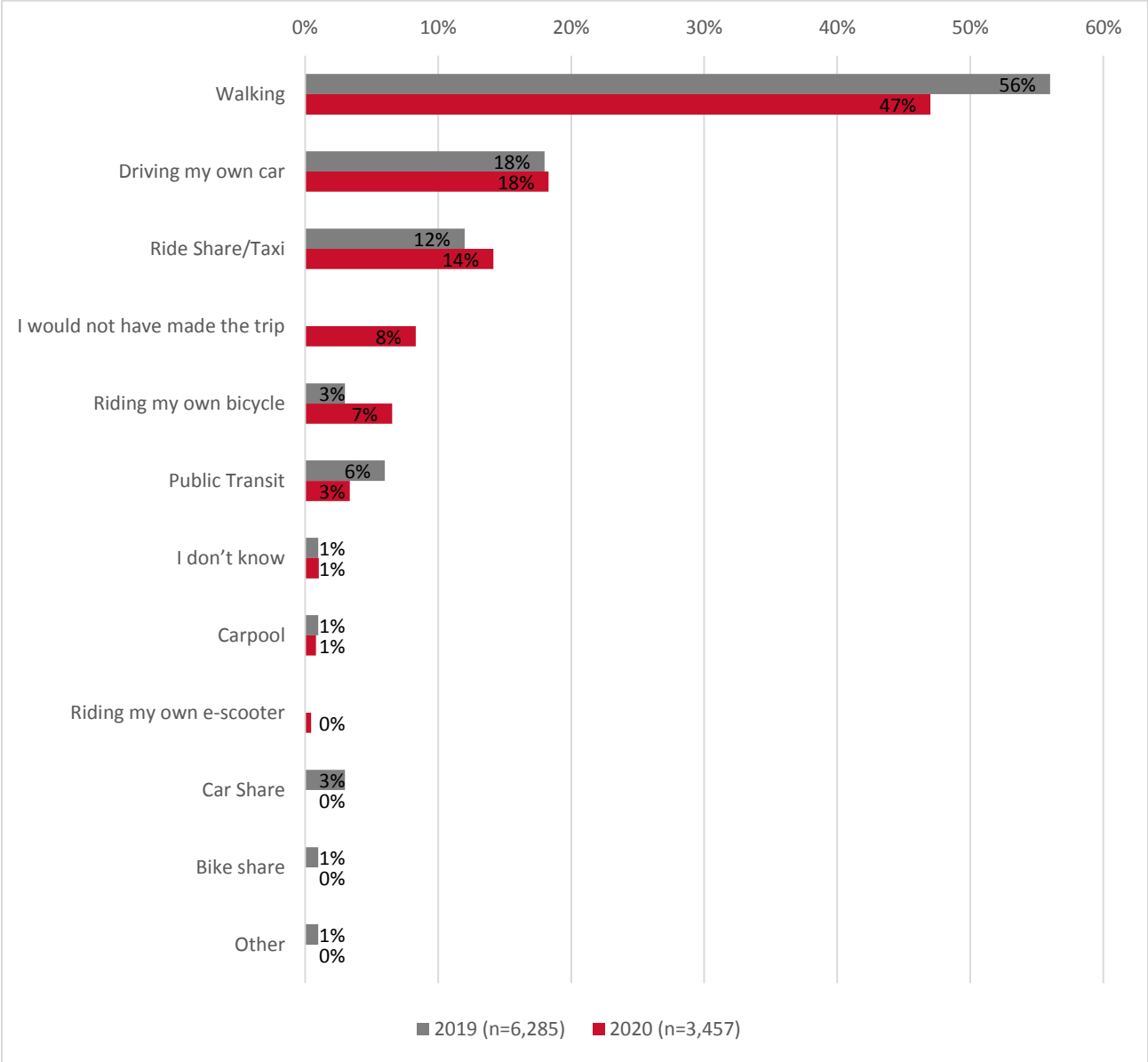


Figure 15: 2020 Survey Response to Alternative Mode Choice if an e-Scooter was Unavailable

The most common purpose for an e-Scooter trip in 2020 was getting to and/or from errands or social gatherings, such as going shopping or to an appointment, or visiting a restaurant or friend’s house. The second most common purpose for an e-Scooter trip was for fun/recreation. A summary of responses (n = 3,460) is illustrated in Figure 16.

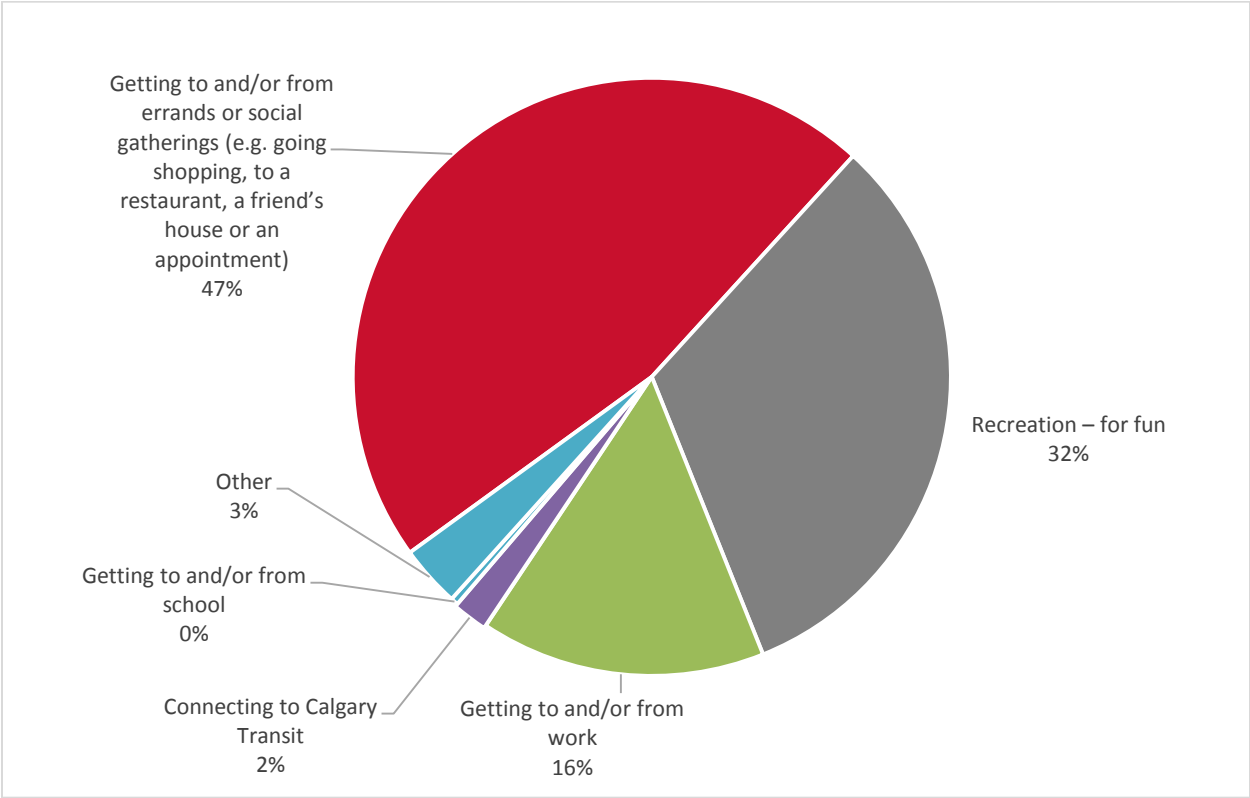


Figure 16: 2020 Survey Response on Purpose of e-Scooter Trip

As shown in Figure 17, in 2019, the amount of people who could find an e-scooter “almost always” or “most of the time” was 75%. In 2020, this increased to 85%. In 2019, 20% of people could find an e-Scooter “about half the time” while in 2020 this number changed to 13%. In both 2019 and 2020, less than 5% stated rarely or never being able to find an e-Scooter.

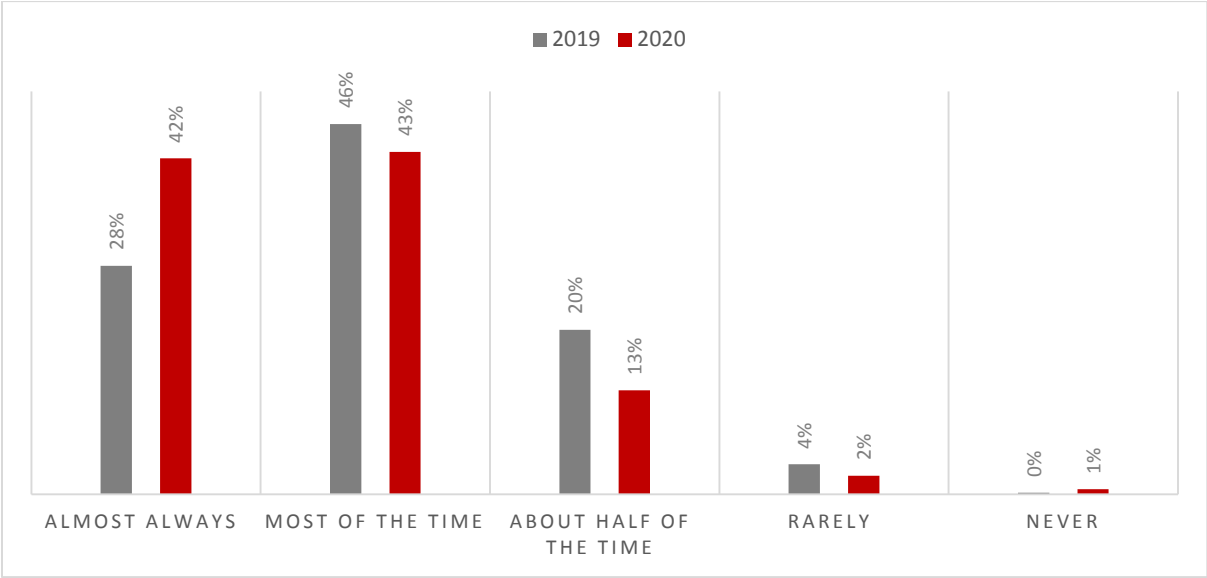


Figure 17: Survey Response on How Often a Rider Could Find an e-Scooter - 2019 vs 2020

As shown in Figure 18, public survey respondents (both riders and non-riders) in 2020 cited e-Scooter riders not following the rules and not sharing the sidewalk or pathway with others as their top two concerns. The danger to others, abandonment of shared e-scooters after use, interference with traffic, and the need for more enforcement also rated high in the survey.

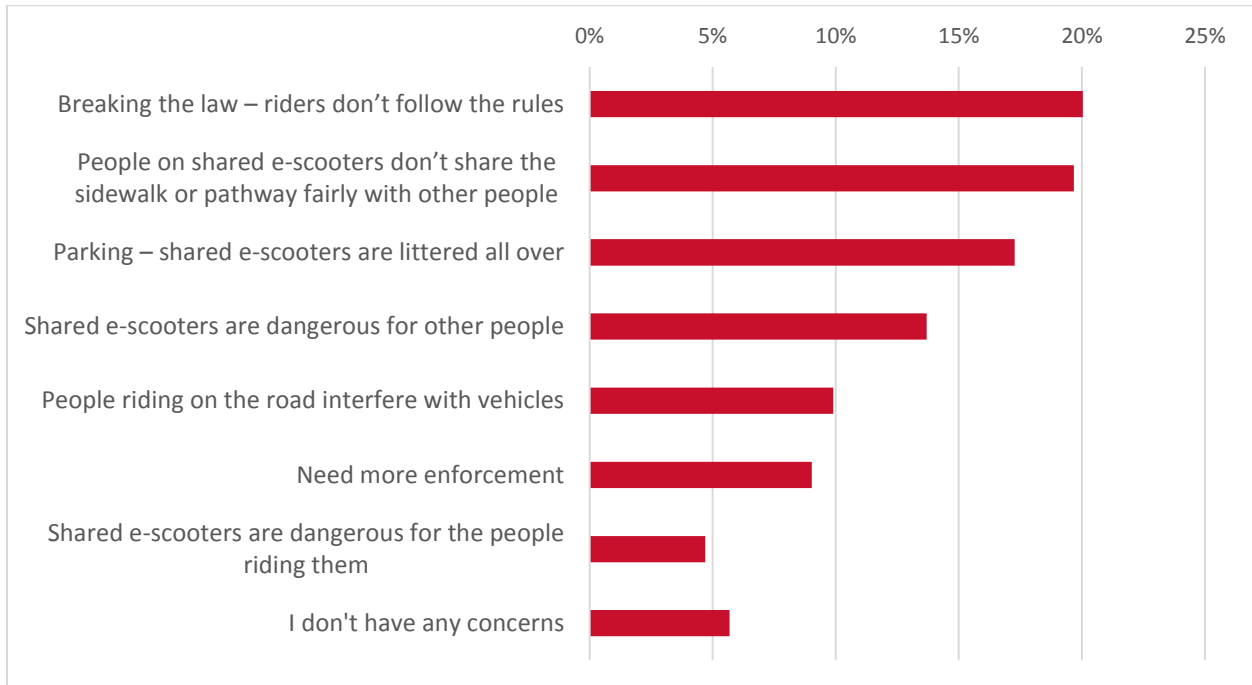


Figure 18: 2020 Survey Response on the Top Concerns with Shared e-Scooters

Safety & e-Scooter Injuries

The City used the funds collected from the shared mobility companies to commission a study with Alberta Health Services and the University of Calgary Cumming School of Medicine. This study aimed to better understand who, how, when, and why people were being injured on shared e-Scooters. The study took place from July 8, 2019 to October 31, 2019 and from May 22, 2020 to September 30, 2020.

This study retrospectively reviews paper medical records of all patients presenting to Adult Emergency Departments in Calgary who arrive via emergency medical services (EMS) with the term “scooter” included in the triage note. One research assistant reviewed each paper chart in the secure Health Records Office and transcribed de-identified data onto the Case Report Form.

The University of Calgary Research Team reviewed 75 detailed patient records using this methodology. This was a purposeful selection of people who had the most severe types of injuries. The key findings from the study include:

- 71 out of 75 people injured during the pilot were riding on an e-Scooter; three incidents involved pedestrians and one incident involved a person cycling
- The average age of a person injured was 35 years.
- Females accounted for 55% of injuries, while males accounted for 45%.
- Common causes of injuries occurred due to losing control, removing a hand or foot while in motion, and environmental hazards in the built environment such as riding over gravel, potholes or transitioning over a curb.
- In 2019, the majority of injuries were evenly distributed between 12:00pm and 12:00am
- In 2020, the amount of injuries occurring between 8:00pm and 12:00am increased compared with 2019.
- In three out of 75 instances, the injured was known to be wearing a helmet
- Six out of 75 were double riding. Five in 2019 and one in 2020.
- Of the patients where alcohol intoxication was suspected, 28 patients had blood alcohol detected.
- 20 out of 75 injured were admitted to the hospital, with 32 injuries requiring surgery within 30 days.
- There were 0 fatalities and 0 admissions to the ICU

According to Alberta Health Services medical data and shown in Figure 19, the most common time of day for e-Scooter injuries requiring EMS in 2020 was between 8:00pm – 12:00am. This is a change from 2019, when injuries were more distributed between 12:00pm and 12:00am.

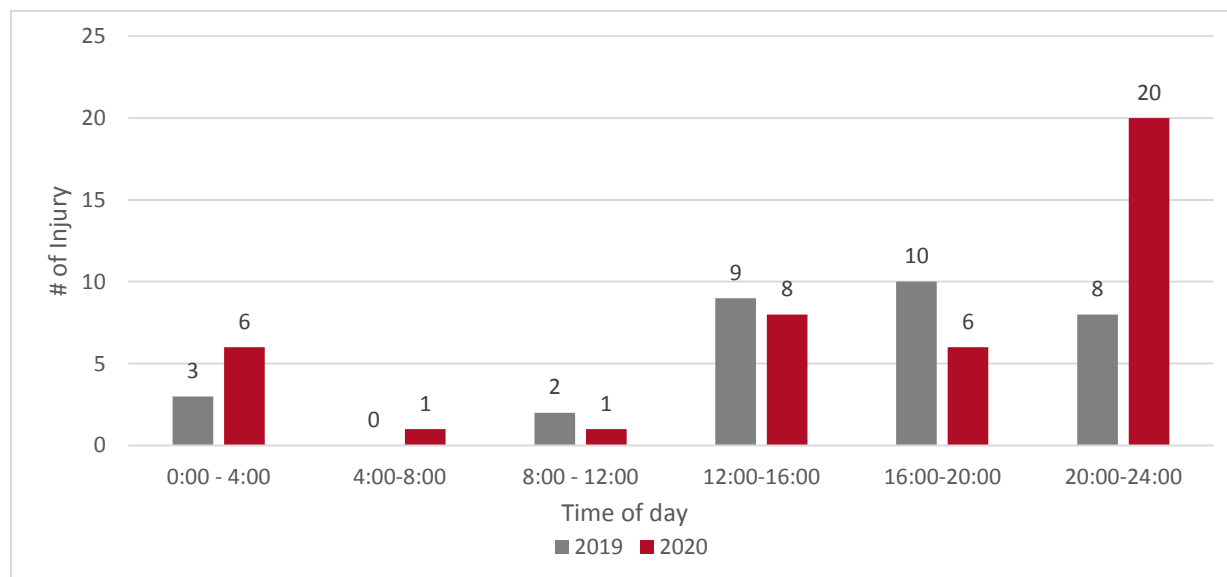


Figure 19: Time of Day Comparison for e-Scooter Injuries – 2019 vs 2020

A comparative analysis looked at injuries requiring an ambulance that involved bicycles, motorcycles, and/or motor vehicles, shown in Table 4. It is important to note that these numbers do not factor in the rate of travel by mode. There are more bicycle trips and driving trips than there are e-Scooter trips. However, it is difficult to compare rates of injury directly as the number of e-Scooter trips can be estimated more precisely using the MDS data, while trip rates from other modes must be estimated using different methods.

Table 4: AHS Data on Number of Transportation Injuries Requiring an Ambulance

Type	2019 (July 8 to October 31)				2020 (May 22 to September 30)			
	E-Scooter	Bicycle	Vehicle	Motorcycle	E-Scooter	Bicycle	Vehicle	Motorcycle
Emergency	33	197	502	103	42 ¹	484	617	166
ICU	0	4	17	3	0	3	11	5
Fatality ²	0	1	3	0	0	3	4	1
Surgery	8	33	51	35	24	109	79	57

¹ There were an additional 25 e-Scooter injuries requiring EMS that did not contain detailed patient records in 2020.

² Fatality numbers do not include those who died on site. There were no e-Scooter fatalities.



Approximately 1,300 e-Scooter related emergency department visits were identified using the keyword search “e-Scooter” in Alberta Health Services records during the pilot period. This may be an over inclusive amount due to the search strategy and could include: personal e-Scooters, mobility scooters, vespas, motorcycles and other devices referred to as scooters.

Based on this information, approximately one in every 1,400 e-Scooter trips resulted in a visit to the emergency room.

Financial Summary

Table 5: City of Calgary Revenues and Costs 2019 and 2020

Line Item	Revenue	Costs
Company Fees (<i>security deposits not included*</i>)	\$177,000	
Staff Time		\$120,000
Infrastructure (Parking Zones)		\$15,000
AHS/U of C Medical Study		\$6,000
Enforcement and Education		\$11,000
Data Analysis (Internal and External)		\$11,000
Total	\$177,000	\$163,000

**Fees to remove e-Scooter from the river were paid for by the company's security deposits*