

Evaluating Hamilton's Cycling Master Plan Progress, and Municipal Cycling Program Budget Figures

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Introduction

Background

Hamilton's Cycling Master Plan, approved by council in 2009, guides the development and operation of the city's cycling infrastructure over a 20-year period until 2029 (Hamilton's Cycling Master Plan, 2018). The plan is primarily focused on developing new on-road cycling facilities (Hamilton's Cycling Master Plan, 2018).

Purpose and Research Questions

The purpose of this report is to answer two questions asked by Cycle Hamilton, a member-supported group working to make cycling safe and convenient around Hamilton (Cycle Hamilton, 2019). Cycle Hamilton often accesses City Budget documents for cycling infrastructure and program spending and have found them often difficult to interpret. Further, Cycle Hamilton also wanted to assess how many kilometers of cycling routes have been completed compared to the initial 2009 Cycling Master Plan. This report is structured around these two research questions:

1. Using examples from other municipalities, what are best practices for reporting the City's cycling budget?
2. How much of the cycling master plan has been completed to date?

A team of 3 multi-disciplinary university graduates, volunteering for the McMaster University Research Shop, collaborated from January to April 2019 to obtain and analyze all relevant information in order to answer the above questions.

Structure of Report

This report is divided into two sections, each with their own subsections. Part 1, "Budgetary Analysis and Best Practices," addresses the first research question, and Part 2, "Proportion of Cycling Master Plan Completed," addresses the second research question. A final conclusion ties together both of these sections.

Part 1: Budgetary Analysis and Best Practice

Introduction

Part 1 of this report deals with recommendations to improve the clarity and accessibility of spending information in Hamilton’s municipal cycling budget. Currently, the City reports its spending on cycling infrastructure by dividing it between standalone spending and spending on the development of infrastructure as a part of other road construction (and trail) projects. This makes it difficult to discern the *collective* amount of money being spent on cycling infrastructure and creates a barrier for residents and other stakeholders invested in the City’s cycling infrastructure progress.

Although there’s no mandated format for presenting budgetary items to the public, some municipalities appear to present their cycling budget in ways that are more easily comprehensible than others. The aim of this section is to evaluate examples from other municipalities to suggest ways that Hamilton can improve the way it develops and presents open budget cycling infrastructure data. These suggestions should act as guidelines for the municipality when revising and/or developing their cycling budget, as budget transparency can enhance involvement of residents and interested parties in municipal cycling programs.

Methodology

Answering the research question for Part 1 required reviewing how other municipalities report their cycling budget and finding examples of “better ways” to report spending on cycling infrastructure. The research team searched online for the 2018 budget documents of 42 municipalities across Ontario, with populations ranging from 2.8 million to under ten thousand. The 42 municipalities reviewed were from a list provided by the community partner. The team then searched each document for any financial entries for cycling infrastructure and cycling programs, utilizing a keyword search within each document. The team then ranked each municipal budget based upon how easy it was to obtain the cycling information using a scale of 1 to 10. This scoring method was a subjective measurement from the team members in order to better determine which municipalities had easily accessible cycling information (for example, could easily identify relevant cycling infrastructure information using the CTRL + F feature). Out of the 42 municipal budgets, the team then selected seven budgets to feature as “good” examples.

After reviewing all 42 budgets, the team synthesized insights from the different budget reporting standards to formulate recommended best practices for reporting cycling

spending. These proposed best practices were supplemented by internet research of web published recommendations and best practices from the Government Finance Officers Association in the U.S.A. and The Organization for Economic Co-operation and Development in Canada.

Overall findings

Analysis of the 42 reports revealed that there were several budget styles with no common presentation format. The best budgets ranged from 7-9. Only seven budgets were in the 7-9 range, while 34 were below 6. Some budgets were long and extensive, while others were short with minimal information. Some municipalities had reports that had excessive pages and others as few as two pages, while others had their budgetary information broken down into 5 or more different files. Only a few reports had cycling information that was easy to find as many were not in a format amenable to keyword searching and/or consisted mainly of tables with several large monetary figures. Several budgets, despite being given a good ranking, used many undefined words and abbreviations, while others used many interchangeable terms related to “cycling,” making it difficult to search for the appropriate information. All of these factors made it difficult for the research team to find common words used to report cycling budget information.

Examples of poor reporting practices

The municipalities rated below 6 were determined to have unclear data and/or inconsistent between the website version of the budget and the downloadable PDF. Some budgets did not mention any cycling spending information or mentioned cycling budget figures in a different category, such as transportation projects, road construction projects, street light projects, or overall infrastructure (often as part of a “sharos”—a cycle path where cars and cycles use the same road way). This made it difficult to locate cycling spending.

Although some municipalities had proposed cycling budgets (both operating and capital), often there were no definitions and breakdowns of these entries (for example some municipalities mentioned an overall transportation budget without mentioning how much of it would go towards cycling or road construction or bike lanes, etc.), while other municipalities published only draft or proposed budget reports. Some budgets were well structured but frequently used undefined terms (e.g., used abbreviations without expanding on their meaning) making it hard to interpret their meaning. Proposed budgets that spanned several years, such as from 2018 - 2023, were the only budgets found for some municipalities, with no clear set budget for a specific year. It was also

found that many reports had double entries of monetary figures, and due to different terminology, it could not be deciphered if these were the same entry twice, or two different entries of the same budgeted amount. Finally, many budget files had information that was difficult to access from different sources, as some mentioned the creation of a master cycling plan, but no clear links were provided for finding these in the report or online.

Examples of good reporting practices

The reports that were ranked best were easily available online as they had information in an open PDF format that allowed, to some extent, third party analysis and transparency of their budget information (e.g., Halton Hills, 2018; City of Greater Sudbury, 2018; Cambridge, 2018; Region of Waterloo, 2018; City of Toronto, 2018). Some municipalities explicitly mentioned their cycling budget with clear monetary figures mentioned under specific subheadings like cycling infrastructure, bikeways and pathways, etc. (e.g., City of Greater Sudbury, 2018; Ottawa, 2018; Mississauga, 2018). Some budgets mentioned collaborations with city partners, researchers, and government funding agencies for their proposed plans (e.g., City of Toronto, 2018; Mississauga, 2018).

Three good examples of easily accessible information of cycling budgetary information are Halton Hills (2018), Ottawa (2018) and the Town of Caledon (2018). All their budget reports were found to be exceptionally easy to access and understand:

- The Halton Hills budget contained easy to search cycling information, and each project's allocated funds were indicated, making it easy to determine how much was going to cycling from capital projects (Halton Hills, 2018). Additionally, each project had a breakdown of where the money was coming from, e.g., Gas Tax, Reserve, etc. These numbers were easy to find as they appeared either by a visual scan or a simple keyword search, such as 'cycling', 'trail', 'bicycle', 'trail', 'plan', etc.
- The City of Ottawa has allocated \$4.14 million to enhance community connectivity, adding signs and wayfinding to cycling routes. Specifically, it mentions the roads and pathways linked to lakes, bridges, and station links (Ottawa, 2018). These details were easier to find in the budget document and thus makes it trouble-free for the general public to discern how much of the work is to be done.
- The Town of Caledon refers to a "Cycling Program" within their budget. It also outlines funding for cycling infrastructure studies, the organization of school-based and community-based events, organized rides, and training of cycling

skills; all of this information aside from mentioning the cycling-related spending promotes the benefits of cycling for human and environmental health, as well as tourism and other economic benefits (Town of Caledon, 2018).

Recommended best practices

The following recommendations are a synthesis of our evaluation of the 42 municipal budgets examples with the purpose of enhancing a reader's ability to access and understand the information. The first recommendation is that the cycling budget report should ideally be available as its own document (separate from the consolidated municipal budget) and easily retrieved online in a PDF format. On top of this recommendation, the cycling budget report should place a particular emphasis on the following:

1) **Format:** The report should follow a standard design. Ideal report formats are comprised of:

- a) A set font size and type (preferably type new roman size 12), spacing and paragraph alignment, margins, bullet points, and the consistent use of a single format (i.e., portrait or landscape) (Government Finance Officers Association, 2012)
- b) Various infographics like pictures, graphs, charts, and borders, which should be created and placed under appropriate sections in order to summarize and enhance data presentation
- c) Cycling data in percentages (e.g., what % of the cycling infrastructure has been completed) as it's easier to understand than reading long numbers
- d) Hyperlinks to the city's cycling websites to allow access to additional information (like information that is absent in the budget document or a Frequently Asked Questions webpage)
- e) An appendix and table of contents to define all the terms/abbreviations and to locate information in the document respectively.

2) **Clarity:** The report should be short enough to include only the important information explaining the rationale behind cycling budgetary decisions, programs and updates. To avoid excessive detail a separate supplemental document should be created for readers who desire detail. The financial information should be reported in plain language and should avoid presenting each account in whole dollars (rounding may be beneficial).

3) **Services/Amenities:** A description of services or functional responsibilities, including the hours of operation, address, phone number, email address, and contact information for the department responsible for the budget's development should be included (Government Finance Officers Association, 2012).

4) Cycling Program Expenditures: An easy to understand analysis of expenditures should be included. All ongoing and future cycling programs should be mentioned with a summary of funds spent and the source of these funds (like gas tax, reserve or others). Cycling program statements should include:

- a) Program title and duration,
- b) Program objectives,
- c) List of the main outputs (services) and activities,
- d) A brief narrative outline of the program strategy and funding sources,
- e) Challenges and key new initiatives, and
- f) Program expenditure estimates of current and following years.

A separate and easy-to-understand summary (budget in brief) of the budget should also be prepared for citizens (Public Expenditure Management, 2019).

5) Cycling Program Updates:

- a) Make a table of proposed cycling network upgrades (e.g., facility type added), additions (e.g., length added), and costs - like the one that has been added in the budgetary report of Mississauga (see Figure 1)
- b) Include per year kilometers of active transportation infrastructure, such as multi-use trails in boulevards and parks, on-road bike lanes, and urban shoulders (Government Finance Officers Association, 2012), (see Figure 1),
- c) If long term budgets are to be included, provide a budget for a duration, but update it every year in terms of where the project is, what needs to be done and how much of the project is accessible to people (Government Finance Officers Association, 2012). Also, include a separate cycling budget highlights document (budget-in brief on the website) intended to give readers a short and easy to comprehend summary of the city's priorities for spending for the coming year.

Summary of proposed cycling network upgrades, additions and costs

Facility Type	Existing Length (km)	Upgrade Length (km)	Additional Length (km)	Total Length (km)	Total Cost (\$ million)
Cycle Tracks/Separated Bike Lanes	0	20	150	170	106.8
Bike Lanes	51	1	56	108	12.4
Multi-Use Trails (Boulevard)	68	15	125	208	40.8
Shared Routes	87	0	131	218	6.6
Multi-Use Trails (Parks)	70	34	89	193	67.3
Totals	276	70	551	897	233.9

Note: Lengths may differ from other sources due to the measuring methodology used. Parkland multi-use trail lengths only include major trails, and minor trails that connect cycling facilities.

Figure 1: From City of Mississauga 2018 Budget (Mississauga, 2018)

6) **Prioritization:** The report should mention when and how services are prioritized, including budget message expressing priorities and issues for the upcoming year (Government Finance Officers Association, 2012). The message should include: budget in brief, goals of the upcoming budget, summary analysis of the municipality's financial condition & outlook, summary of the previous year's accomplishments, and a summary of major upcoming issues and projects and effectiveness measures to achieving desired outcomes (Government Finance Officers Association, 2012).

Conclusion

The analysis of budgetary reports (with regards to cycling) from 42 municipalities highlight that there is a need to improve the accessibility and clarity of cycling budget information and reporting processes. There are many differences in various municipal budget styles, and the lack of consistency makes comparison of the different municipalities difficult. Further, as many municipalities combined their budgetary figures for cycling within other larger projects, or had figures covering several years, it was difficult to determine the actual cycling budget figure.

By enhancing the presentation of cycling budget reports, they become more transparent and comprehensive to the public and interested parties. Pursuing best practice standards for documenting cycling budget information across municipalities can encourage greater public involvement in and awareness of cycling infrastructure programs. It's in the best interest of Hamilton to improve their cycling budget reporting

practices to encourage maximum support and interest in municipal cycling projects and programs.

Part 2: Proportion of Cycling Master Plan Completed

Introduction

Cycle Hamilton requested that the research team calculate the number of kilometers of bike lanes completed to date as a proportion of the City's projected total from the 2009 Cycling Master Plan. Part 2 of the report deals with the percentage of completed cycle routes in Hamilton's 2009 Cycling Master Plan, "Shifting Gears".

Methodology

There were two primary documents used to analyze the progress of the completion of Hamilton's 2009 Cycling Master Plan (CMP): 1) Chapter 5 of Hamilton's 2009 Cycling Master Plan, which contains all the proposed routes and route lengths, and 2) the Cycling Infrastructure webpage on the City of Hamilton's website (Cycling Infrastructure, 2019), which maintains an online record of completed cycling paths, paths in progress of construction, the removal of planned paths, and the addition of unplanned paths to the City's commitment. The main component of our analysis involved adding up the total kilometers of bike lanes completed, by year and by ward, and calculating this as a proportion of the total kilometers of bike lane proposed in the CMP. Our detailed calculations for CMP completion by year and by ward are presented in two tables in the Appendix.

During the data collection we noticed the names of the routes in the 2009 CMP list were not consistent with the names on the Cycling Infrastructure web page. Therefore, if a route listed as completed on the web page did not match a route in the CMP, then we searched for the route on Google Maps and compared it to a map of all proposed routes in the CMP to determine the name of the appropriate route. When an entire route was completed the kilometers completed were recorded for that year in the applicable Ward. If the route listed as completed was only part of a route in the CMP, then the distance completed was calculated using Google Map's measuring tool and recorded as only being partially completed on our spreadsheet. If a route traversed several Wards, the distance of that route for each ward was measured with Google Map's measuring tool and recorded for the appropriate year and Ward. Finally, when a route completed was not a part of the original CMP, we added it as an additional route, adding to both the total number of kilometers completed to date and the total number of planned

kilometers. The total number of proposed kilometers in the 2009 CMP was updated to account for additional routes and deleted routes from the original 2009 CMP.

Findings

The total kilometers of bike paths planned in Hamilton's 2009 CMP, amended for all additional kilometers of routes added or removed post 2009, resulted in a total of 709.415 kilometers. The total number of kilometers constructed as of the date of this report is 311.245 kilometers, which is 43.9% of the total planned kilometers.

A breakdown of the proportion of the plan completed by year can be seen in Figure 2. The mean completion rate per year was 4.87%. However, the kilometers for 2010 included any routes completed prior to 2010, therefore the data from the year 2010 skews the average kilometers completed each year. In addition to this, there were no completed cycling routes indicated for the year 2018 on the Cycling Infrastructure web page as of the date of this report, and thus 2018 has 0% kilometers completed. (It is not known if projects were not completed in 2018, or the lack of any routes listed under that year is just a delay in publishing them). Therefore, an alternate mean percentage for the years of 2011 to 2017, would be 5.19%.

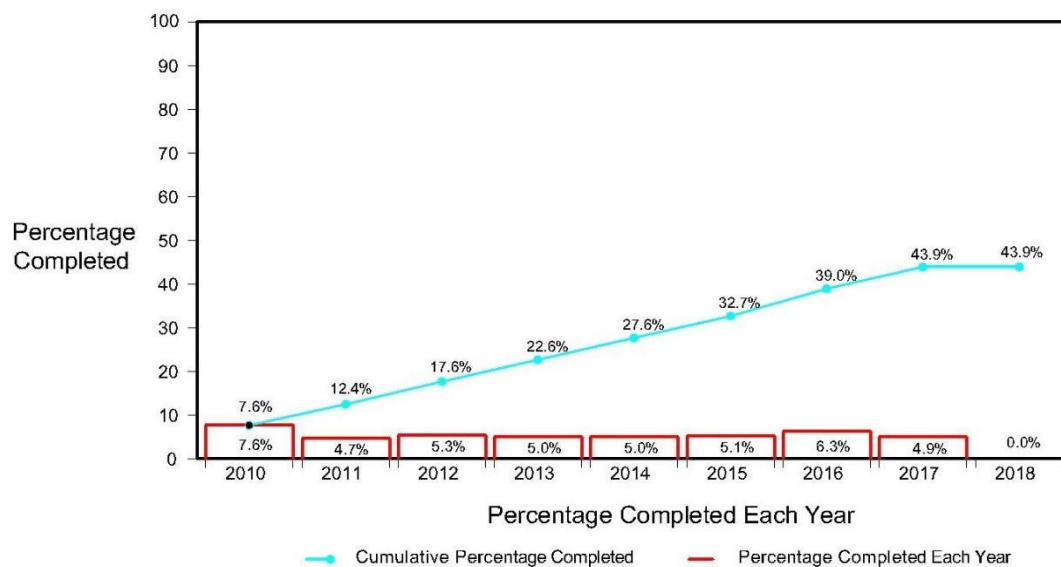


Figure 2: Percent bike lane completion by year.

There were also several cycle routes listed on the Cycling Infrastructure web page that are indicated to be in the planning stages, as well as designated to be “in the works”

(Cycling Infrastructure, 2019). Routes designated “in the works” totaled 20.629 kilometers, which is 2.9% of the entire route network planned. Additionally, those in the planning stage totaled 22.839 kilometers and would result in an additional 3.2% of the entire cycling routes planned. However, there was no indication of when these routes are to be completed; as such, they were not added to the total completed figures. These projects were recorded in the tables in the Appendix, in an additional row, with an alternate total should these two categories be included.

In the analysis of the kilometers completed by Ward (see Figure 3), it was noted that some Wards have a much larger percentage of cycle routes completed than other wards. Wards 1, 2, and 3 have the largest proportion completed, ranging from 32.6% to 47.8%. In contrast, Wards 12, 13, 14, and 15 range from having 0% to 2.4% of their cycle routes completed. It should be noted that the total number of kilometers planned for Wards 1, 2 and 3, is 71.897 kilometers, whereas the total number of kilometers planned for Wards 12, 13, 14, and 15, is 274.521 kilometers, which is 3.8 times more kilometers planned for these Wards.

According to the 2009 Cycling Master Plan, Wards 12 to 15 are in suburban/rural areas, and therefore the larger quantity of kilometers planned are more likely a result of a less dense urban build up and may be an explanation for the differences in percentage completed. However, the mean total of kilometers completed for Wards 1, 2 and 3 is 9.238 kilometers, and the mean total of kilometers completed for Wards 12, 13, 14 and 15 is only 0.717 kilometers. This indicates that there are differences between the quantity of kilometers completed in each Ward.

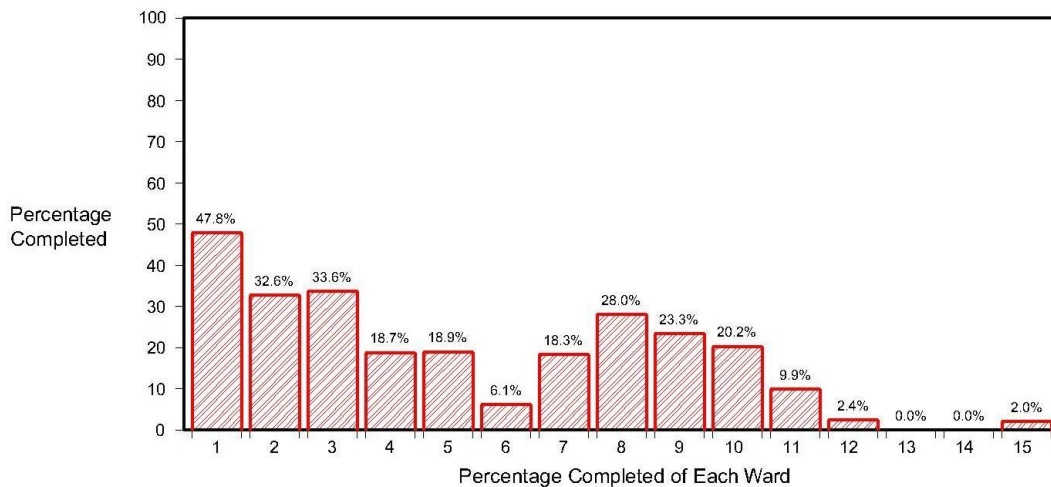


Figure 3: Percent bike lane completion by Ward.

Limitations

As mentioned in our methods, many of the names of the routes on the Cycling Infrastructure web page did not use the same names or route codes that were used in the 2009 CMP. There were also some routes that traversed several Wards. Further, many of the routes listed as completed on the website were only sections of routes listed in the CMP. Differences in how routes were recorded in the two documents is a potential source of error in our analysis. There is the possibility of unforeseen errors in any measurements made, or errors in misattributing a route to an existing route when it may have been a new route.

When measuring with the 'measure distance feature' of Google Maps, our precision was limited by the application and how close we were able to be to the route start and finish points. Therefore, a certain error needs to be considered with our measurements. There were a total of 63 required measurements, consisting of 59.731 kilometers measured of the 311.245 kilometers. However, it was estimated that each measurement was within 0.01 to 0.1 kilometers, therefore any accumulated error of all measured distances would be between 0.63 and 6.3 kilometers of the 59.731 kilometers.

It should also be noted that the routes that had been listed as discontinued on the Cycling Infrastructure web page did not appear on the CMP list. It was reasoned that the CMP list was already updated and these routes and their lengths were already

deleted, as the web address for the CMP we obtained contained the date 2014-12-17, which the authors assumed was a revision date.

There were some routes on the Cycling Infrastructure list that could not be located on the CMP list, or there was insufficient information to locate them using Google Maps. Of the list of routes in the planning stage, and routes in the works, one route of each could not be measured. Also, of the other lists of completed routes, three entries could not be measured: one entry was resurfacing of an existing route, one entry was a repeat of a previous year's entry, and there was one entry for bicycle racks and one for stairs. None of these were included in the total kilometers completed.

In the process of collecting the necessary data to assess the percentage of the plan that has been completed, there were several difficulties encountered. These difficulties were similar in nature to the difficulties encountered in part one of this report, namely inconsistent terminology used in published information between the Cycling Infrastructure web page and the CMP. This added a challenge when conducting this analysis, and may have contributed to errors in the kilometers recorded as completed.

Conclusion

From the data input and analysis, it can be concluded that the City of Hamilton has been constructing approximately less than 5% of the total routes of the CMP per year. Therefore, if the city continues at this rate the CMP should be completed by the year 2029 or 2030. The original timeline given in Hamilton's 2009 Cycling Master Plan was 20 years (Hamilton's 2009 Cycling Master Plan, 2018). Therefore, it appears that the implementation of the CMP may be slightly behind schedule. However, if one includes the routes in the planning stages and the routes presently under construction, assuming both will be completed at the end of 2019, then the plan would be approximately 50% completed by 2019, and the city would in fact be on schedule.

Final Conclusion

In this report we have attempted to answer two questions: what proportion of the cycling infrastructure proposed in Hamilton's 2009 Cycling Master Plan "Shifting Gears" has been completed, and what recommendations could improve the accessibility to cycling infrastructure monetary figures in municipal budgets by interested parties?

After evaluating the cycling information within the infrastructure budgets of the 42 municipalities suggested by Cycle Hamilton, we provided recommendations for how municipalities can improve the way they present their cycling budgets. The most

important recommendations are to utilize a consistent format and vocabulary, and clear details of the program and projects the funds are to be used for. Also, it is recommended to have easily available contact information of the department responsible for the project for public inquiries. Finally, it is recommended that the budgets have details of the overall progress of multi-year projects.

In part 2 of this report, after comparing the total number of kilometers of bike lanes completed to date, by year and by ward, to the total number of kilometers of proposed bike lanes in the 2009 CMP, we determined that 43.9% of the plan is completed to date. The approximate completion rate per year is 5%. There were large differences in the completion rates per ward, between 0% to 47.8%. If one includes the routes in the planning stages and the routes presently under construction, assuming both will be completed at the end of 2019, then the plan would be approximately 50% completed by 2019, and the city would in fact be on schedule.

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Appendix

2009 Master Cycle Plan Kilometers Completed

Year Completed	Total Kms Completed	Accumulated Kms Completed	Percentage of Plan Total *	Accumulated Percentage Completed
2010**	54.140	54.14	7.6	7.6
2011	33.580	87.72	4.7	12.4
2012	37.287	125.007	5.3	17.6
2013	35.330	160.337	5.0	22.6
2014	35.772	196.109	5.0	27.6
2015	35.931	232.04	5.1	32.7
2016	44.701	276.741	6.3	39.0
2017	34.504	311.245	4.9	43.9
2018***	0.000	311.245	0.0	43.9
Total Kms Completed	311.245		43.9	
				Future % Projection (Date TBA)
In the Works	20.629	331.884	2.9	46.8
In Planning Stage	22.839	354.713	3.2	50.0

* Percentages based upon 709,415 km total : Includes all routes from 2009 plan, plus/minus routes added or removed

** Includes routes constructed in 2010 plus all pre-existing routes

*** No routes posted as completed for 2018

2009 Master Cycle Plan Kilometers Completed: By Ward per Year														
Ward	2010	2011	2012	2013	2014	2015	2016	2017	2018	Kms Completed per Ward	Total Kms Planned per Ward	Percentage Completed	Kms In The Works	Kms In Planning Stage
1	4.392	1.430	1.978	0.492	1.510		2.340	0.725		12.867	26.913	47.8		0.881
2	1.954	0.941	0.203	0.230	2.769		0.820	2.300		9.217	28.239	32.6		1.328
3			0.571	0.847	2.157	1.700	0.355			5.630	16.745	33.6	2.960	
4	1.000	0.004	1.525							2.529	13.549	18.7	2.530	4.080
5	5.129	0.004								5.133	27.158	18.9		3.530
6						1.750	0.826			2.576	42.401	6.1		
7		1.996		0.869		1.680	1.000	0.991		6.536	35.701	18.3		1.030
8	2.715		1.589	1.000		1.000	1.543	1.400		9.247	32.988	28.0	2.169	1.990
9	1.140					0.765	7.040			8.945	38.430	23.3	1.500	3.600
10	3.560			2.600						6.160	30.545	20.2		2.770
11	6.110	1.051	2.853	1.110	1.140		1.760			14.024	142.233	9.9		
12							0.793	0.850		1.643	68.930	2.4		2.700
13										0.000	28.565	0.0		0.930
14										0.000	115.875	0.0	5.400	
15			0.400			0.826				1.226	61.151	2.0	6.070	

Note: Empty Cells designate Zero Kms