

File:11-5400-23

DATE: February 5, 2018
TO: Mayor and Council
FROM: Michele Fernie, Engineering Technologist III – Traffic and Transport
SUBJECT: **7th Avenue Bike Lanes and BikeBC Grant Application**
ATTACHMENT: Appendix A – Project Extents

RECOMMENDATIONS: Council consider and resolve:

1. That out of the proposed four options listed in the Engineering Technologist III's report dated February 5, 2018, Option 1 be supported to implement separated bike lanes on both sides of 7th Avenue from Stave Lake Street to Grand Street, and shared bike lanes on both sides from Grand Street to Cedar Street;
2. That the implementation cost of Option 1 in the amount of \$145,000 be funded from the existing Paving Program budget;
3. That the required five year maintenance cost of Option 1 in the amount of \$66,000 be added to the District's Operating budget beginning in 2023 and every five years thereafter; and
4. To support the District's grant application to BikeBC for their cost sharing program for 7th Avenue Bike Lanes, and should that be approved it would partially offset the funding required from the Paving Program budget.

EXECUTIVE SUMMARY:

Various District of Mission plans, and most recently the Cycling Task Force (Task Force), have determined that 7th Avenue is the most logical option for dedicated cycling lanes running in the east-west direction.

Multiple Council reports have been presented over the last two years in an effort to implement bicycle lanes on 7th Avenue. Some 7th Avenue residents and businesses have raised concerns in the past that predominantly were centered on the loss of parking in front of their properties. Council in their October 17, 2016 session requested staff to form a cycling task force consisting of leading cycling advocates in the community. The primary goal of the Task Force was to investigate practical cycling route options that could provide a safe east-west route in the District, while minimizing the impact on local residents, businesses, and other modes of transportation. Staff have met with members of the Task Force to review options and discuss alternatives.

Four options are presented in this report for Council consideration. Staff is recommending implementation of Option 1. Option 1 is recommended because it has the lowest capital cost among the available separated bike lane options, is one of the safest options, supports both the Official Community Plan (OCP) and Transportation Master Plan (TMP), addresses the concerns expressed by the business owners near Taulbut Street, and is eligible for BikeBC funding. It will also provide the most benefit to the cycling community, while keeping the potential unwanted impacts to others at a minimum level.

This report is additionally seeking Council's support to apply for BikeBC funding for the selected option.

PURPOSE:

This report recommends that Council approve the installation of separated bike lanes along 7th Avenue, from Stave Lake Street to Grand Street, and shared bike lanes thereafter to Cedar Street. In addition, staff is seeking Council's support for a BikeBC cost share grant application for the 7th Avenue Bike Lane project.

BACKGROUND:

7th Avenue is a collector roadway that runs east-west and extends between Mary Street in the east and Wren Street in the west. It has been designated as a truck route in the Transportation Master Plan (TMP), has multiple bus routes along its length, and is where the Fire Station No. 1 is located.

A traffic study conducted in 2017 indicated that the average daily traffic volume along 7th Avenue is approximately 7,000 vehicles per day, and that the 85% of drivers are travelling at speeds of 57.5 km/h or less.

The OCP and the TMP identified bike lanes as a desirable amenity to the community. The TMP recommended five short-term cycling improvement projects in the District, where building-separated bicycle lanes on 7th Avenue from Cedar Street to Stave Lake Street was specified as the highest priority.

During the development of the TMP, public consultation was conducted through two public open houses. Residents and stakeholders were encouraged to express their concerns and provide feedback on all elements of the TMP, including the proposed bike lanes along 7th Avenue. Residents and stakeholders who attended the open houses did not express concerns regarding the recommendation to implement separated bike lanes along 7th Avenue, and were generally in favor of the infrastructure upgrade.

Based on the aforementioned plans, Council directed staff to proceed with the implementation of separated bike lanes along 7th Avenue.

The Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads identifies recommended lane widths for roadways based on research and engineering best practice. TAC recommends the following lane widths:

- Minimum travel lane width of 3.3 m is recommended where buses and larger truck are expected to regularly use a lane;
- Parking lanes should be 2.4 m wide, which can include the gutter portion of the curb; and
- The lowest practical limit for unbuffered bike lane width is 1.5 m wide. If a bike lane is next to parking, an additional 0.6m is recommended to account for door opening.

Figure 1 is a graphical representation of the safety concerns that would rise if separated bike lanes are implemented on 7th Avenue and parking lanes on both sides are kept. A 3 m wide fire truck has been included in Figure 1 for scale to demonstrate why 7th Avenue's cross-sectional width is insufficient to accommodate minimum TAC recommendations. Under this configuration, separated bike lanes would cause conflict with cars parked in narrow lanes, buses and truck traffics, and hence raise safety concerns for cyclists.

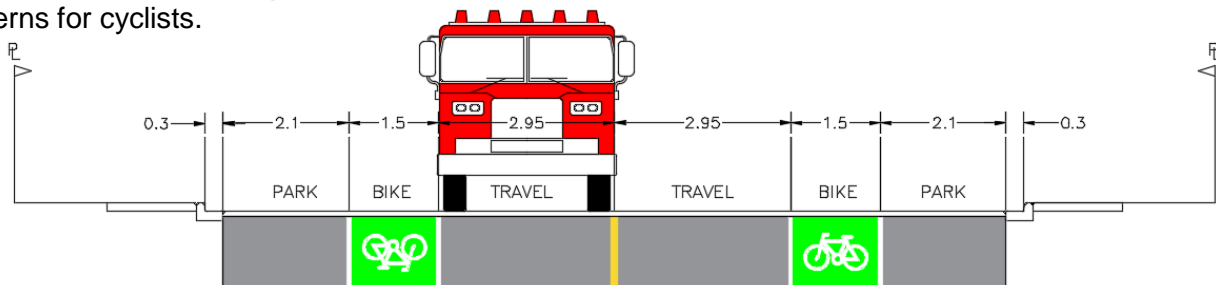


Figure 1: Existing 7th Avenue cross section with two travel, parking, and bike lanes

To comply with TAC's lane width guidelines, the 7th Avenue Bike Lane Project will require the removal of parking along one side of 7th Avenue to accommodate the necessary width for dedicated bike lanes.

On July 7, 2016, staff conducted a parking study along 7th Avenue from Stave Lake Street to Grand Street. The number of vehicles parked on both sides of 7th Avenue between Grand Street and Stave Lake Street was counted in the early morning, at noon, and again in the evening. The evening had the most vehicles parked at each of the three counts, with 13 vehicles parked on both the north and south sides, for a total maximum vehicles parked at any time of 26 vehicles.

The July 18, 2016, 7th Avenue Bike Lanes report to Council requested approval to install bike lanes from Stave Lake Street to Cedar Street, with parking limited to the south side to accommodate adequately sized bike lanes.

After, the report concerns were received from residents and the business at 33093 7th Avenue regarding the removal of parking along the north side of 7th Avenue. The raised concerns were mainly focused on potential loss of business, loss of employee parking, and safety concerns related to customers parking on the south side having to cross 7th Avenue.

Staff's report to Council on August 15, 2016 put forward six options to implement separated bike lanes along 7th Avenue, and to address the residents and businesses concerns. The proposed options included:

1. Implement separated bike lanes on both sides of 7th Avenue between Stave Lake Street and Grand Street with parking only permitted on the south side. Between Grand Street and Cedar Street, the shared use lanes would remain and parking would be permitted on both sides of the road;
2. Extend the separated bike lanes from Stave Lake Street to Taulbut Street;
3. Maintain the status quo;
4. Implement time-restricted parking on the north side of 7th Avenue;
5. Shift the parking restriction from the north side to the south side of 7th Avenue at the business plaza located at 33093 7th Avenue; and
6. Implement parking restrictions on the south side of 7th Avenue.

Staff recommended to proceed with Option 2, as it supported both the OCP and the TMP, addressed the concerns expressed by the business owners at 33093 7th Avenue, and the effect on surrounding resident parking arrangements was consistent with the letters distributed along 7th Avenue. Council deferred the decision until public consultation could be conducted. Following the presentation to Council, letters were delivered to residents notifying them of the planned open house to present the available options and engaged the public in a dialogue on how to best proceed.

Staff prepared a questionnaire to gather input both at an open house and online for residents who could not attend. A total of 121 questionnaires were received. The following paragraphs summarize the findings. These findings, while showed local residents' views, could not represent a statistically reliable survey of the whole community, as it rather represented the feedback of residents who were invested in the project enough to either attend the open house or fill in a questionnaire. For this reason, the following information should be reviewed as anecdotal evidence only.

The October 17, 2016, 7th Avenue Bike Lanes report to Council conveyed the results of the public consultation process. A brief summary of responses to the questionnaire is provided below.

- 66.4% of respondents supported the creation of a safe multi-modal transportation network including pedestrian and cycling networks in Mission, while 33.6% did not support this.
- 48.7% of respondents stated that the existing shared-use roads were adequate for encouraging cycling, while 51.3% stated they were not.

- 41.2% of respondents supported the concept of dedicated bike lanes on 7th Avenue, while 58.8% did not.

Of the respondents that supported dedicated bike lanes, the following were the reasons given:

- it is the most straightforward east-west connection and provides an easy route for cyclists to cross from Hatzic across to the west side of Mission;
- it is the route that respondent's children already use to cycle to school or the Leisure Centre;
- it is an investment in encouraging cycling as a viable transportation option; and
- Mission lags behind many other municipalities in regards to cycling infrastructure.

Of those that opposed the dedicated bike lanes, the following reasons were supplied:

- loss of parking, including concerns regarding safety and security for themselves, their visitors and vehicles should they be required to park further away from their homes;
- lack of lane access to homes;
- Low cyclists volumes and doubts that bike lane usage will justify the loss of parking;
- Vehicle traffic volume along the route is too high to be safe for cycling; and
- Project is a waste of taxpayer funds.

On October 17, 2016, Council instructed staff to engage with a range of cyclists to review alternatives to the proposed bike lanes and develop recommendations for Council.

Based on this recommendation, a Task Force was created. On November 6, 2017 the Manager of Civic Engagement and Corporate Initiatives presented the Cycling Route Task Force Summary report to Council. The Task Force's findings and recommendations were generally in line with those put forward through the OCP and previous master plans, with a few specific findings as follows:

- 7th Avenue is the single best opportunity for providing a safe and effective connection for cyclists east-west across the municipality, effectively connecting Hatzic to the High School and Sports Park, and provides the spine for building the cycling network in the future;
- Physically separated / buffered cycling lanes are the preferred option as they are the best means to encourage cycling, followed by marked shared-lanes on quiet, residential streets;
- 7th Avenue bike lanes is a crucial east-west connection to establish connectivity for both recreational and commuter cyclists; and
- Mission is far behind neighbouring municipalities in terms of the maturity of its cycling program, due to a lack of investment in cycling infrastructure or action taken on previous plans.

The Task Force also recommended pursuing grant funding to enable the creation of safe cycling routes in Mission that connect important destinations across the community.

The Province has a cost-sharing cycling infrastructure program called BikeBC aimed at encouraging healthy living and to help address climate change. The program provides 50% cost share for new infrastructure and infrastructure upgrade projects which form part of a municipality's adopted cycling network plan. The deadline for applications for the 2018 cycle of funding is February 9, 2018.

DISCUSSION AND ANALYSIS:

The District's OCP promotes the multimodal transportation system to support all modes of travel, including cycling. Although cycling trips currently make up less than 1% of daily trips in Mission, building safe cycling infrastructures, such as separated bike lanes, would encourage residents to bike more.

The District's TMP identified separated bike lanes from Stave Lake Street to Cedar Street as the top priority bike lane project in Mission. This report addresses 7th Avenue Bike lanes from Stave Lake Street to Grand Street.

Once the proposed separated bike lanes are implemented on 7th Avenue, an engineered and paved bike lane can be constructed at Heritage Park in the future to replace the current bike route to connect Hatzic neighbourhood to Mary Street. This project would take the pressure off of motor vehicle traffic along 1st Avenue and as a result, is potentially eligible for grants from ICBC, and the provincial and federal governments.

In regards to 7th Avenue between Taulbut Street and Grand Street, there are provisions in the foreseeable future regarding the property at 33093 7th Avenue. The District owns the aforementioned property and in approximately 10 years, once the lease expires, the District can explore options other than leasing the land in its current format. This move would give the District the opportunity to look into possibilities to allow for separated bike lanes along this section of 7th Avenue. These possibilities include, but are not limited to, widening the road at this location or reconfiguring the building foot print to allow for more onsite parking spots for the businesses.

West of Grand Street is Mission Secondary School. In an effort to minimize the impact on local businesses and parents picking up/dropping off their children at the school, the shared-use lanes will remain from Grand Street to Cedar Street at this time. Mission Secondary School is exploring the option of expanding their building footprint, during which a redevelopment permit will be submitted to the District. Staff recommend that the District negotiate for road expansion with the School District and other property owners at that time to allow for widening the 7th Avenue from Grand Street to Cedar Street. This would allow the District to upgrade the bike route in that segment from shared to separated lanes and achieve bike lane consistency for cyclists along the length of 7th Avenue.

The second high priority bike lane project, as identified in the TMP, is 7th Avenue from Cedar Street to Wren Street. This project can be implemented within the next 3 to 4 years when the Hatzic neighbourhood to Mary Street bike lane project is implemented.

With the implementation of these projects along 7th Avenue, the Hatzic neighbourhood will be connected to Wren Street, hence promoting a safe east-west cycling commute that can alleviate/substitute car traffic passing through Downtown Mission.

Parking Lane Removal Impact on the Residents

In order to evaluate the potential impact of removing north-side parking lane along the 7th Avenue, staff conducted a parking study in 2016, by counting the number of cars parking on both sides of 7th Avenue between Stave Lake Street and Grand Street at approximately 6:00 am, noon, and 7:30 pm. This report assumes the same parking pattern is still binding in this area.

It was assumed that most cars parked in the early morning have been parked overnight and hence represent mainly local residents' vehicles. Also, the number of parked cars at noon and evening hours likely represents a combination of residents' and their guests' vehicles. The result of the study indicated that while residents and their guests appear to have no preference on which side of 7th Avenue to park, they are slightly biased towards parking on the south side of the road. As a result, staff recommend that the north side parking lane be removed. The Task Force also expressed their preference for north side parking removal versus the south side.

The project area at 7th Avenue, from Grand Street to Stave Lake Street, is approximately 1,200 m long, and the maximum number of cars parked during different times of the day is 26. This suggests that

even with one parking lane along 7th Avenue, there is roughly up to 46 m of parking lane available per car on the average and as a result, staff do not expect that removing one parking lane would cause any negative impact on availability of parking spots in the street for the residents and their guests.

Project Cost

The Class C cost estimate of each option is presented below. The estimate includes pavement markings, bike signs, curbing, delineators, and asphalt paving as applicable to each option, as well as PST and a 15% contingency. GST is not included in the estimated costs.

BikeBC funding may be available for the project at a 50% cost share rate.

Options

Staff previously proposed a number of options to implement dedicated bike lanes along 7th Avenue. These options were reviewed and assessed later by the Task Force. Staff met with members of the Task Force on January 10, 2018 to discuss their proposed option. Through this process, options were refined and are presented below.

Four options are presented in this report for Council consideration. All of the options include on-street bike lanes between Stave Lake Street and Taulbut Street, with north side bike lane(s) transitioning to behind the sidewalk from Taulbut Street to Grand Street. The shared-use lanes between Grand Street and Cedar Street would remain, and parking would be permitted on both sides of the road (Appendix A). Once implemented, the proposed bike lanes will connect to the existing shared bike lanes along 7th Avenue, which extend from Stave Lake Street to Heritage Park.

The following paragraphs summarize four feasible options that were considered by staff and the Task Force. Figures 2 to 4 are included in the body of the report to provide graphical representations of the proposed cross sections. The green of the bike lane is illustrative only. Green pavement markings will only be used at locations with conflict points.

Option 1: Separated bike lanes

This option includes separated bike lanes on the north and south side of 7th Avenue between Stave Lake Street and Taulbut Street. Just west of Taulbut Street the north bike lane would transition to behind the sidewalk. The existing parking on the north and south side of 7th Avenue would remain in this location. Option 1 has a Class C cost estimate of \$145,000, and would have a recurring five year pavement marking replacement cost of \$66,000.



Figure 2: Option 1 - separated bike lanes on the north and south side

Option 1 Advantages:

- Designated space for cyclists on roadway;
- Encourages cycling by increasing perceived comfort and safety;
- Appeals to a wide cross section of cyclists;
- Lower cyclist injury rate compared to streets without bike lanes;

- Physically buffered by parking lane on the south side;
- 0.6 m buffer reduces risk of “dooring”;
- Visually narrows the road which generally slows vehicle traffic;
- Least expensive separated bike lane option;
- Decreases risk of collisions with over-taking vehicles;
- Prevents double-parking, unlike a bike lane; and
- Supported by the Task Force.

Option 1 Disadvantages:

- Loss of some parking;
- Higher maintenance costs;
- Special consideration required at bus stops;
- May encourage side-by side riding due to available space; and
- Foreign objects now on the road;

Staff recommend that Council approve Option 1, as its advantages outweigh the disadvantages at the lowest cost.

Option 2: Two-way separated cycle track

This option includes a separated two-way cycle track on 7th Avenue between Stave Lake Street and Taulbut Street with parking only permitted on the south side. Just west of Taulbut Street, the cycle track would transition to behind the sidewalk. The existing parking on the north and south side of 7th Avenue would remain in this location. Two-way cycle tracks present a safety challenge, as drivers are not generally expecting cyclists to arrive from both directions, especially at intersections. Additional provisions will be required to improve safety at intersections. This option has the strongest support of the Task Force. Option 2 has a Class C cost estimate of \$205,000, and would have a recurring five year pavement marking replacement cost of \$100,000.

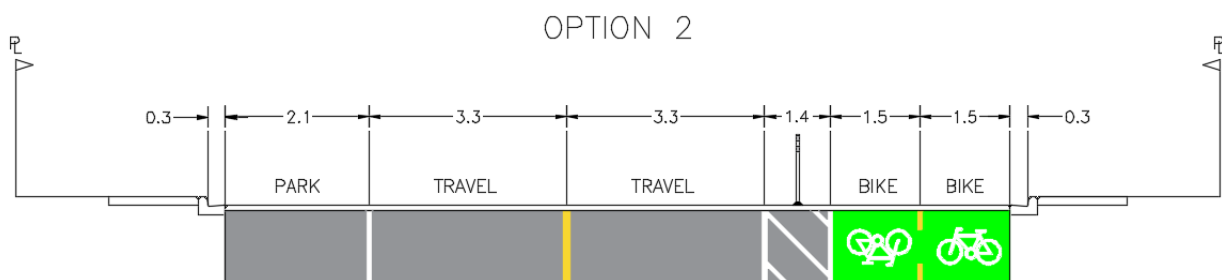


Figure 3: Option 2 - two-way separated cycle track on the north side

Option 2 Advantages:

- Designated space for cyclists on roadway;
- Encourages cycling by increasing perceived comfort and safety;
- Most attractive to a wide range of cyclists;
- Lower cyclist injury rate compared to streets without bike lanes;
- Greatly reduced risk of “dooring”;
- Visually narrows the road which generally slows vehicle traffic;
- Buffer between conflicting travel directions; and
- Strongly supported by the Task Force.

Option 2 Disadvantages:

- Safety at intersections and driveway crossings is an issue;
- Future high capital cost to increase safety levels at intersections (i.e., bike signals);
- Conflicting directions of travel less than 1.5 m apart;
- Higher maintenance costs;
- Need to include special considerations at bus stops to safeguard riders and cyclists;
- Stopped buses will temporarily obstruct traffic; and
- Highest initial capital cost.

Option 3: Narrow two-way separated cycle track

There was a request by Council to present an option where there is no loss of parking. Option 3 was designed to accomplish this by narrowing bike lanes well below TAC minimums for a two-way cycle track. This option as such will not be eligible for BikeBC funding, as it raises safety concerns for cyclists.

This option includes a narrow separated two-way cycle track on 7th Avenue between Stave Lake Street and Taulbut Street, with parking permitted on both the north and south side. Just west of Taulbut Street, the cycle track would transition to behind the sidewalk. This option would maintain most of the parking along 7th Avenue. This option utilizes a two-way width that is not ideal. However, it may be sufficient in the short to medium term based on existing cycle volumes. Two-way cycle tracks present a safety challenge, as drivers are not generally expecting cyclists to arrive from both directions, especially at intersections. Additional provisions will be required to ensure that cyclists utilizing this cycle track are as safe as possible. Option 3 has a Class C cost estimate of \$155,000, and would have a recurring five year pavement marking replacement cost of \$58,000.

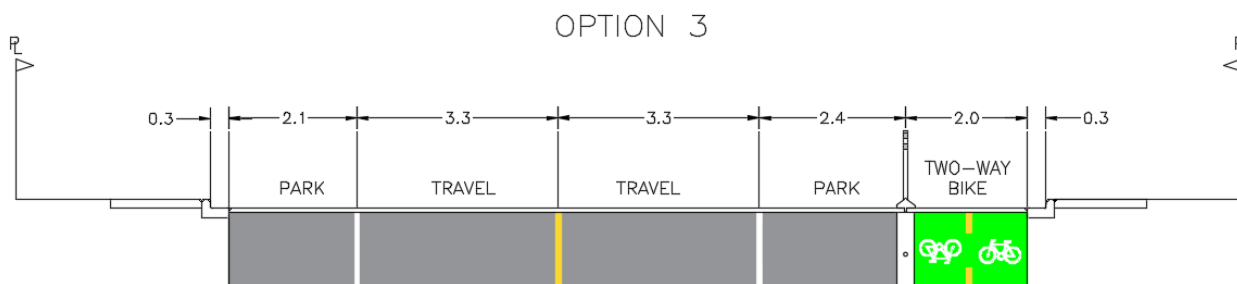


Figure 4: Option 3 - narrow two-way separated cycle track on the north side

Option 3 Advantages:

- Designated space for cyclists on roadway;
- Preserves parking along the route;
- Visually narrows the road which generally slows vehicle traffic; and
- Parked vehicles or large buffer between conflicting travel directions.

Option 3 Disadvantages:

- Safety at intersections and driveway crossings is an issue;
- No buffer between parked cars and cyclists to decrease dooring;
- Future high capital cost to increase safety levels at intersections (i.e. bike signals);
- Higher maintenance costs;
- May not be sufficient for high volume of cyclists;
- May encourage side-by side riding due to available space;
- Special consideration is required at bus stops;
- Stopped buses will temporarily obstruct traffic;
- Second highest initial capital cost; and
- Grant funding through BikeBC unlikely as the width of the cycle lanes does not meet the minimum width required by BikeBC.

Option 4: Maintaining shared bicycle lane along Stave Lake Street

This option will keep the existing shared bike lanes on 7th Avenue between Stave Lake Street and Cedar Street, with parking permitted on both sides. This option will require the reinstatement of "sharrow" (i.e., shared road) symbols on 7th Avenue between Stave Lake Street and Cedar Street. This option does not support either the District's OCP or its TMP, nor does it have the support of staff or the Task Force. Staff does not consider Option 4 a viable option, as it is the bare minimum that can be done, does very little for cyclists, and even less to advance cycling as a viable transportation mode in Mission. The Class C cost estimate for this option is \$10,000, and would have a recurring five-year pavement marking replacement cost of \$10,000.

Option 4 Advantages:

- Preserves parking along the route; and
- Incurs no additional maintenance costs.

Option 4 Disadvantages:

- Does not encourage cycling;
- Perceived as unsafe and unpleasant for less experienced cyclists;
- Shared lanes should only be used on roadways with low vehicle volumes and operating speeds;
- Does not slow vehicles by visually narrowing the roadway;
- High incidence of "dooring";
- Wrong-way riding;

- Sidewalk riding; and
- Motorists may squeeze cyclists against parked cars, or exhibit other aggressive behaviors.

Table 1 is a side-by-side comparison of the advantages and disadvantages of each option, quantified with 5 representing the ideal scenario, 1 representing the least ideal scenario, and 0 representing absolutely no support. The scores are summed in the last line of the table, with a best possible score of 50. Although certain criteria may warrant a heavier weighting, this is a simple side-by-side comparison to show how each option compares to the others.

Table 1: Comparison of 7th Avenue bike lane options

Evaluation Criteria	Option 1 – One-way cycle tracks	Option 2 – Two-way cycle track	Option 3 – Narrow two- way cycle track	Option 4 – Reinstatement of shared lanes
Cycling safety, comfort and convenience	4	5	4	1
Intersection safety and comfort	4	2	2	2
Slows vehicle traffic	5	5	5	1
Transit impacts	4	3	3	4
Parking impacts	3	3	5	5
Collision risk and consequence	4	2	3	2
“Dooring” potential	5	5	3	1
Maintenance	2	2	1	5
Costs (including grant eligibility)	4	3	2	5
• Capital cost	\$145,000	\$205,000	\$155,000	\$10,000
• Five year maintenance costs	\$66,000	\$100,000	\$58,000	\$10,000
Task Force Support	3	5	3	0
TOTAL	38	35	31	26

As stated before, staff recommend proceeding with Option 1 as presented herein. Option 1 has the lowest capital cost of the separated bike lane options, supports both the OCP and the TMP, addresses the concerns expressed by the business owners at 33093 7th Avenue, and the effect on surrounding resident parking arrangements and is eligible for BikeBC funding. It will provide the most benefit to the cycling community, while keeping the potential unwanted impacts to others at a minimum level.

While Option 4 has been included in this report, both staff and the Task Force strongly recommend that it not be selected for implementation. The first step for Mission to move forward with a safe multi-modal transportation system is safe separated bike lanes.

COUNCIL GOALS/OBJECTIVES:

This report addresses multiple Council Goals and Objectives. Encouraging safe multi-modal transportation supports Council’s value of balancing environmental, financial, and operational sustainability. It provides enhanced lifestyle opportunities and community health by encouraging active transportation methods. By providing a safer route for cyclists, it will improve public safety. From an asset management standpoint, this project supports the optimized planning and management of assets and infrastructure as pavement bike lanes are under less stress than vehicle or parking lanes, and as such, age slower.

FINANCIAL IMPLICATIONS:

Financial implications vary depending on the selected option, with Class C estimates for capital costs ranging from \$10,000 to \$205,000. Annual maintenance costs will increase once bike lanes are installed on 7th Avenue, due to the need to periodically repaint the pavement markings. The pavement marking budget would need to be increased to address the increase in pavement markings. The five-year replacement costs range from \$10,000 to \$100,000 depending on the option installed. Snow removal and street sweeping budgets may need to be increased as well, based on the set level of service.

Staff support Option 1 at a cost of \$145,000, with funds coming from the 2018 Paving Program account. Maintenance costs for this option would be \$66,000 every five years for the replacement of pavement markings.

The final cost of implementing the recommended projects may be less than stated above, as the District can apply to the BikeBC for up to 50% cost share. The funds received from the BikeBC would partially offset the funding required from the Pavement Management Program account. Funding through ICBC will also be solicited. Staff will report back to Council to advise the whether or not the outside funding applications are approved, but for clarity it is important to note that staff are currently recommending proceeding with this project regardless of outside funding being approved.



I have reviewed the financial implications
Kris Boland, Director of Finance

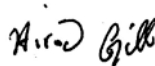
COMMUNICATION:

The implementation of the proposed bike lanes along 7th Avenue between Grand Street and Stave Lake Street will be in close cooperation with the RCMP. Staff will also inform the local residents and public through mail, the District’s website, social media, and the Mission City Record.


SIGN-OFFS:



Michele Fernie, Engineering Technologist III –
Traffic and Transport



Reviewed by:
Hirod Gill, Manager of Engineering Planning &
Design



Reviewed by:
Tracy Kyle, Director of Engineering & Public
Works

Comment from Chief Administrative Officer:
Reviewed.

Appendix A



Separated Bike Lanes Project Extents