

November 28, 2018

To: Members
Public Works and Infrastructure Committee

Re: Residential Road Renewal Program Alternative Treatment Options

RECOMMENDATION

1. That City Council endorse the pilot implementation of Alternative Treatment Options as described in this report for 2019.
2. That City Council direct Administration to return to Public Works and Infrastructure Committee by Q3 of 2019 with a full plan based on the pilot methodology for 2020 and beyond outlining the following:
 - a. Estimates of rate of progress and redefinition of the target
 - b. Assessment of impact of using the proposed approach on service to residents as well as resident response
 - c. Financial implications
3. That this report be forwarded to the December 10, 2018 Special Budget meeting of City Council for approval.

CONCLUSION

By adopting alternative treatment techniques for the improvement of residential roads in poor condition, the City of Regina will be able to meet the established level of service target of 85 percent of roads in fair or better condition at a significantly faster pace than the previous plan without investing additional financial resources. The proposed approach balances the expectations of customers with the service requirements of residential roads. There are a few increased risks as a consequence of this approach, but these are mitigated by the improved overall levels of service experienced by customers.

The original Residential Roadways Renewal Program would have achieved the service level target of 85 percent of local roads in fair or better condition in 36 years. While full analysis will be undertaken in 2019, it is estimated that the new plan could achieve the service level target in 10 to 15 years. As we build experience with this new approach, there may be an opportunity to review and reset the service level target to a higher level in the future.

BACKGROUND

Prior to the creation of the Residential Road Renewal Program (RRRP), residential road improvements were funded by an approximate allocation of approximately 25 per cent of the annual Street Infrastructure Renewal Program (SIRP) budget. The allocation to residential roads

averaged less than \$3.0 million/year for the five years prior to the introduction of the RRRP, but varied from year to year depending on the total of the SIRP funding. Project in these years often depended on the approval of the Local Improvement Program, which occurred in parallel to the SIRP and was dependent on the support and financial investment of affected property owners. This funding was not sufficient to keep up with deterioration rates and the growing number of residential road improvements required.

A pilot program was approved in 2013, allocating one per cent of the 2014 mill rate increase to residential road renewal. The full RRRP was developed in 2014 to improve the residential road network. This program, approved by City Council in CM14-16, was funded from a one per cent dedicated mill rate to be allocated annually from 2015 to 2019, as well as 25 per cent of the annual SIRP budget. The mill rate allocation resulted in annually growing the base investment into residential road renewal – with the intention of carrying on that increased base investment once the mill rate allocation was completed. The six years of mill rate allocation grew the annual base investment in residential roads from \$3.8 million to \$16.3 million.

The goal of this program was to achieve a level of service where 85 per cent of the residential road network was in “fair” or “better” condition through a preventative maintenance strategy. This preventative maintenance strategy prioritized the treatment of roads in fair condition over the treatment of roads in poor condition in response to the following two factors:

1. The treatment of roads in fair condition is far less costly than the treatment of roads in poor condition. Typically, many more kilometres of residential roads can be addressed for the same investment.
2. The treatment of roads in fair condition had the greatest impact on the condition of the overall residential road network by limiting the deterioration of roads into poor condition, which requires significantly more resources to address.

Since the introduction of the RRRP in 2014, \$45 million has been invested in residential roads. The City has undertaken 300 projects to treat residential roads covering 87 kilometres (13 per cent of the residential roads network).

Also since the introduction of the RRRP in 2014, Administration has provided an annual report to Public Works & Infrastructure Committee regarding the impact of the program and how work is proceeding. The Committee and City Council have expressed growing concern that the progress in addressing roads in poor condition has not met expectations.

Administration has revised plans within the financial allocation provided through the 2014 decision. Generally these efforts have focused on the reallocation of some portion of resources to poor roads without undermining the principle of preventative maintenance.

In July of this year, City Council passed the following motion (CR18-76).

1. That a new plan be created to rebuild, maintain and monitor residential roads to an acceptable standard...*[including]*:

- a. That City Administration set a reasonable goal to rebuild ‘poor’ residential roads and allocate sufficient funds to meet that goal until the backlog of poor roads is significantly reduced.
- b. That preventive maintenance of residential roads continue by reallocating current budget areas, as designated by administration, including sufficient budget from Roadways and Water Works to repair road damage caused by water breaks and underground repairs.
- c. That Administration ensure the coordination of underground infrastructure upgrades be given priority for roads that are in poor condition.
- d. That a redefinition of the Residential Road Program as outlined in the above amendments be presented to Council as part of the 2019 budget.

The original motion requested that the new plan be presented to City Council through the budget process. Because this report recommends a significant change in the City’s approach to residential roads, the report is being brought to Public Works and Infrastructure Committee in advance of being forwarded to the budget process. The recommendations have no budget implications.

DISCUSSION

The City’s residential road network consists of 647 km of paved roads. Based on the most recent condition inspection (2017), the residential road network currently has a level of service such that 79 per cent of the roads are in ‘fair’ or better condition. One hundred and thirty-seven kilometres (21 per cent) of residential roads are rated in ‘poor’ condition. Of these, 40 kilometres (30 per cent of the roads in poor condition) are in ‘very poor’ condition. Residents whose roads are in very poor condition have generally been experiencing roads in poor condition for an extended period of time.

To address this significant issue, Administration has gone back to the beginning to rethink the approach to the challenge. We explored a number of options by approaching the problem through three distinct filters:

1. Financial Improvements
2. Process Improvements
3. Technical Improvements

Administration consulted with five other jurisdictions in Canada to learn from what others are doing. A complete overview of the results of that consultation can be found in Appendix A. To summarize, each of the municipalities consulted indicated they have a large backlog of residential roads in poor condition that would take between 20 and 30 years to address. Only one of those municipalities (Edmonton) indicated they had a targeted approach to addressing these issues. Three municipalities used annual mill rate allocations to target resources. In the case of Edmonton, these resources are targeted to residential roads. In the case of Saskatoon and Winnipeg, they are targeted to the road renewal program in general. Each municipality shared challenges ranging from insufficient budgets, insufficient funding for utilities to match roadwork, coordination issues and resourcing issues. This review did not provide any specific

solution, but did validate for us that the City is not alone in addressing this challenge and there is still much to learn from each other's experiences.

Options Considered

Option 1: Financial Improvement Options

The reality is that, if we are to continue with our current approach to addressing residential roads in poor condition (i.e. full rebuild including underground renewal), the only way to speed up progress is to add new financial resources. Administration has exercised caution in this regard citing two concerns:

- In 2019, the RRRP program will be at \$12.05 million from the one per cent mill rate contribution and approximately \$4.3 million will be allocated from the SIRP, for a total of just over \$16.3 million. At this level of funding the City's investment in residential roads will be, for the first time, greater than the investment into the major road network. While both networks are important, the major network carries higher volumes of traffic and heavier vehicle weights and is critically important to the efficient and effective movement of goods, service and people that supports a vibrant economy. If new funding were available for roads, some consideration should be given to the priority of the SIRP over the RRRP.
- An increase in RRRP funding specifically targeted at poor roads using our current approach, would require matching funding from the Utility Budget for associated underground repairs and upgrades. Even though the practice of renewing underground infrastructure in coordination with the rebuilding of poor roads protects the investment in the road, it can however result in addressing the underground infrastructure prematurely.

That being said, the options considered in this category include:

1. **Debt:** Council would need to consider the City's current debt limit and value of using debt for this work over other priorities. Repayment of debt over the life of the asset can be considered good practice, as it spreads the cost of service to those who use the service over time.
2. **Extending the mill rate contribution beyond 2019:** The issue of residential roads continues to be a priority for residents and the extension of the mill rate allocation might be supported publicly. Like with debt, consideration needs to be given to what other priorities the City has and how a similar mill rate allocation may be required to achieve those other priorities. Note that this approach would have the effect of continuing to increase investment in residential roads, which will further add to the imbalance between residential roads and major arterial and corridor roads. An alternative to this approach would be to consider using the continuing mill rate contribution to reduce the reliance on the SIRP contribution. This course of action would limit the City's ability to apply a mill rate allocation to other critical asset needs such as facilities in the future.
3. **Grants and third-party funding:** The City currently receives approximately \$11 million annually in Gas Tax funding that is largely directed towards roadway programs. Additional grants may come available but cannot be relied on as a long-term sustainable funding source.

Option 2: Process Improvement Options

The RRRP is currently delivered using a combination of in-house resources complemented with external contracted services. With this approach the City maintains full control of how the program is run, including the treatment and location selection. It also allows the City to maintain its relationship with the residents. Contracted services augment the City's capacity to deliver a larger program and sometimes adds skill sets and resources not available to the City.

However, we also explored process options to improve the amount of renewal delivered with the same financial resources:

1. **Multi-year contracts:** The Saskatchewan Heavy Construction Association (SHCA) has proposed to work with the City to improve its success in advancing the RRRP. Primary among its approaches would be for us to engage the local construction industry using multi-year contracts. The SHCA argues that the guarantee of work would allow the industry to offer improved pricing such that the same program would be able to be delivered at a lower cost. The implication is that, if we spend the same amount of money, the number of roads that can be addressed could increase. This process is already available to the City and would simply require that City Council pre-approve multiple years of spending at budget time. The option is not likely to provide the level of savings required to address resident expectations, but will be further explored by the Administration in combination with other approaches discussed here.
2. **Public Private Partnership (P3):** It would be possible to bundle the City's residential roads into a Design, Build, Finance, Maintain (DBFM) public private partnership (P3). The contract requirements could establish a service target that must be met early in the contract and maintained throughout the life of the contract. The result would be that the pace of roadwork could be advanced more quickly and financed within the P3 through the life of the contract.

There are no examples of similar P3 arrangements in Canada, however there are several good examples of large interchanges or bridges being delivered using such contracts. There are provinces that maintain geographic bundles of highway through long term maintenance contracts as well.

Such a program would have significant impact on the City's debt limit. Indeed, there is insufficient debt limit available to address the full scope of all residential roads. A P3 contract would have to be established based on a few geographic areas – likely those with the most poor roads. The complexity of the P3 contracting process means it is unlikely that any work would begin for at least two years.

Option 3: Technical Improvement Option: Alternative Treatments

The City of Regina has been working hard over the last two years to research and adopt contemporary asset management practices. In our analysis of the challenge we are facing in the RRRP, we are looking at different options we can adopt through asset management principles and philosophies.

Asset Management is defined as *the coordinated activity of an organization to realize value from its assets. In our case, the value we realize from our assets is generally in the form of services to residents.* This definition is important, because it starts with the *service we provide to residents* and not with the asset itself.

Understanding Where We've Been

The asset management tools we have been leveraging as we begin to adopt contemporary asset management practices have helped us understand where we have been.

Our traditional decision making has focused on the physical condition of the asset and its criticality in within the system.

- Preservation is targeted at extending the life of the assets: The goal is to maintain the asset at the lowest cost over the lifecycle of the asset. The process is to determine the right treatment and the right time for that treatment, which is often determined by the physical condition of the asset. This is accomplished by measuring things like how many potholes and cracks, the condition of the surface, the condition of the structure. The examination also includes sidewalks, curbs and gutters as well as how well the water drains and how safe the road is to drive down. These assessments have become proxies to understand the experience of people driving on the road or living near the road. Treatments applied using this approach throughout the life of an asset can extend the life of an asset almost in perpetuity. However, when it hasn't been applied throughout the life of an asset and the asset declines to poor condition, it often requires a comprehensive renewal approach.
- Comprehensive renewal approach: When investing in poor roads this has meant that work typically includes addressing the entire right-of-way (property line to property line) and has included full replacement of sidewalks, curbs, and gutters, assessment of utilities and renewal of highest risk assets, as well as full rebuilding of the road structure – making the renewal of poor roads expensive and slow.
- Investment in the most critical assets first: Prior to the establishment of the RRRP, the SIRP allocations focused on roads with high criticality – major arterial, and collector and expressway roads. With limited financial resources, there were simply insufficient funds to get to those roads with low criticality (e.g. residential roads). Treatments on low criticality roads were therefore deferred, resulting in deteriorating condition.

Where Asset Management Is Taking Us

The City of Regina is leveraging new tools from contemporary asset management practice that can provide more nuanced decisions and alternatives. Essentially, we are adding two new inputs to decision making and prioritization (in addition to the traditional assessment of physical condition and asset criticality):

1. Functional condition: An assessment of how the asset delivers the service expected by customers. It requires that asset managers look at the *service* rather than the asset, and that they do that through the customers' perspective. In essence, this is why the City of Regina introduced the RRRP – residents' expectation for residential roads was not being met. The current discussion, regarding residents' expectation about the pace at which poor roads are improved, is another element to this assessment.

2. Demand condition: An assessment of the impact of the demand on the asset as it relates to asset design and ongoing maintenance. In the case of roads, demand condition refers to the level of traffic and type of traffic the road would typically experience. The design and level of maintenance that would be required for a road with high traffic that includes transit buses and transport trucks is different than that required for a residential road that would typically see low volumes of light-weight vehicles. While this decision frame has always been used in the design of new infrastructure to influence the type for road structure that is built, it has been less of a factor in planning the maintenance and preservation of existing infrastructure. In examining the question of how to improve the RRRP, this decision frame became a key consideration. The demand on residential roads suggest that some rationalization might be made with regard to the level of service delivered to residents.

Now we have three decision frames that provide a balanced approach to guide the City's planning related to residential roads:

1. Physical Condition: will identify the state of repair of the assets that leads to a range of treatment options (e.g. condition of the road surface, road structure, extent of sidewalk repair and underground and utility condition).
2. Functional Condition: will further look at what is needed to meet customer expectations. What the customer values the most from the services will be considered.
3. Demand Condition: will consider what is needed to support the service the asset is intended to provide. In the case of residential roads, this could be significantly different than what is done on major roadways, simply due to the nature of carrying less traffic and typically lighter vehicles and may lead to different treatment approaches than traditionally used.

A New Approach

If we look more closely at a range of possible treatments of poor roads, the reality is that the City can significantly improve the driving experience for customers as well as the look and feel of the road (functional condition), providing a fair or even good level of service while still having a road with condition deficiencies. This is even more profoundly the case for roads where the demand condition is low – high traffic or heavy traffic is not likely to cause the physical condition of the road to deteriorate further. This led Administration to consider alternative treatment options for poor roads, such that the functional condition would be improved, but the physical structure of the road may not be.

The range of possible options is dependent on the physical condition of the current road and sidewalks/gutters as well as the risk of near-term underground work being required. If these options can be applied to the current bundle of roads in poor condition, the rate of improvement would be significantly increased.

Figure 1 below provides a range of treatment options for roads in poor condition considering the functional and demand requirements as well as the physical condition requirements.

| | Rebuild | Rehab | Surface Treatment |
|------------------------------|--|--|---|
| Treatment Description | Required when road structure not stable to perform other treatments, construction equipment will fail the road | 50 per cent to 100 per cent concrete replacement; mill and pave road | Poor roads where concrete and road structure is in reasonable condition and pavement is level |
| Undergrounds | Yes | No | No |
| Construction Timeline | 3 to 6 months | 3 to 4 weeks | 2 to 3 days |
| Cost | \$2 million per km (plus cost of undergrounds) | \$600,000 to \$1.25 million per km | \$180,000 per km |
| Life Expectancy | 50 years | 20 to 25 years | 10 to 15 years |

Figure 1: The range of treatment options for poor roads and the implications of each.

The City has been using surface treatment on poor roads already, but for a different reason. Where there are maintenance activities or poor roads (e.g. filling potholes and crack sealing) have become too expensive, the choice has been made, where conditions allow, to do maintenance paving. Where this has occurred, there has been a notable reduction in service requests and the City has even received positive comments from residents.

The improvement option would see this approach applied through the implementation plan of the RRRP.

Impact of the Approach

Appendix B provides photographic examples of each treatment. Once the approach evolves into a sustainable program, it is likely that the need for full rebuilds of roads will be driven more by the need to address underground utilities than by the physical condition of the road itself.

Where surface treatments would be applied to roads in poor condition, residents will immediately see a smooth surface for driving. The treatment may not fully address all ponding issues, but the improved condition of the road would see any ponding resolve more quickly. Where this treatment has been applied, the City has seen a significant reduction in service requests. Finally, this plan can be delivered without any budget impacts.

This plan brings with it some risks. Administration believes that these risks are offset by the benefits to residents of significant improvement in the rate at which poor roads can be improved and the lower cost of road treatment. These risks include:

- Road cuts and necessary repairs for underground work
- Not all treatments will return a road to good functional condition
- Maintenance paves will result in a loss of curb height
- Some residents on adjacent roadways would receive different treatments depending on the current condition of their road and concrete

Recommended Option

The proposal is to apply the *Alternative Treatments Options* to the RRRP. Rather than repairing all roads in poor condition to “like new” condition, with sidewalks and undergrounds included as part of the process, it is recommended that the City strategically choose to repair some roads, where the conditions allow, to poor/fair physical condition and fair/good functional condition.

This choice opens up the range of treatments available and allows for roads in poor condition to be improved far more quickly than is currently the case. The choice of treatment is dependent upon the current physical condition of the road, but the result is that the customer experience is much improved.

Timelines and Next Steps

Administration has established a pilot plan for 2019 that would significantly increase the rate at which roads in poor condition are addressed from two to three kilometres to 11 kilometres by using the above approach for targeted roads.

To establish a full plan for all roads in poor condition will require on-site physical examination of the road and concrete. Administration will use 2019 to carry out that examination and provide a full plan prior to the 2020 construction season, including opportunities to supplement the City’s construction resources with external multi-year contracts. At some point early in this work, Administration will provide City Council with a tour to review first-hand the treatment options and the conditions under which each option might be appropriate.

Administration will return to Committee with the findings of this work and recommendations for a long-term plan in the fall of 2019. This plan could potentially recommend new level of service targets depending on how the alternative treatment approaches can be applied to our existing road network.

RECOMMENDATION IMPLICATIONS

Financial Implications

There are no budget implications to the recommended option. At some point in the future, City Council may want to consider the balance between the amount invested in major roads and residential roads by making adjustments to the 25 per cent allocated from SIRP to residential road improvement.

Environmental Implications

None associated with this report.

Policy and/or Strategic Implications

The recommended approach to improving residential roads in poor condition, is consistent with *The Official Community Plan, Bylaw No. 2013-48 (OCP)*, specifically:

- *Section B, Goal 1 – Financial Policies, “Achieving long-term financial viability.”*

- *Section B, Goal 2 – Sustainable Services and Amenities, “Ensure that the City of Regina services and amenities are financially sustainable.”*
- *Section D4, Goal 2 – Asset Management and Services “Ensure infrastructure decisions result in long-term sustainability.”*
- *Section D4, Goal 2 -Infrastructure Staging, “Build infrastructure in a sequential and coordinated manner.”*
- *Section D5, Goal 1 - Land Use and Built Environment, “Enable the development of complete neighbourhoods.”*

The RRRP supports the City’s strategic focus to improve the development and maintenance of liveable neighbourhoods, while improving the residential road infrastructure condition to a level and quality that is sustainable.

Accessibility Implications

One of the goals of this program is to improve walkability and better accommodate those who use walking as their primary mode of transportation, by implementing pedestrian accessibility ramps where practical and feasible. This is consistent with the OCP, *Section D5, Goal 1 - Land Use and Built Environment, “Enable the development of complete neighbourhoods.”* Not all poor road treatments will include concrete work, so the advancement of this goal may not proceed as quickly as the improvement of poor roads.

Other Implications

An improved residential road network will provide residents with improved quality of life due to reductions in frustration, travel delays, fuel consumption and vehicle repairs/maintenance.

COMMUNICATION

Information about the RRRP program and approved approach will be shared with residents when a decision is made by City Council. At the launch of the next construction season, the City will communicate to residents about the program through a number of mediums.

DELEGATED AUTHORITY

The recommendations contained in this report require City Council approval.

Respectfully submitted,



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Respectfully submitted,



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