Attachment B

CITY OF NANAIMO

Manual of Engineering Standards and Specifications

Proposed Revision 13 – Questions and Answers

March, 2020

Preamble

With the proposed engineering standards, Edition No. 13, a comprehensive program of engagement was undertaken with both the public, user groups, special needs groups, developers, engineers, and staff. This process started in late 2018 and progressed continuously through to early 2020. The goal was to undertake a comprehensive update to the standards with a primary focus on transportation, safety and asset management.

The process included the following major components/steps:

1. Collecting feedback on issues or problems with the standards, gathered from both staff, external users, such as developers or contractors as well as the general public.
2. Specialist engineering consultants were hired to provide expert advice on changes to specific sections. For example ISL Engineering was hired to develop the Complete Streets standards suitable for Nanaimo, but also to be in line with industry wide best practices. Another example is the engineering firm Tetra Tech was hired to provide expert advice on the City's aggregate and asphalt materials specifications.
3. Draft changes to the standards were published in Nov 2019, with notification provided to the engineering and development community.
4. Staff engaged with those organizations or individuals who provided comment. In some cases, the standards were changed to address their concerns; however, there were some changes that needed to be held to maintain the overall goals around transportation and asset management.
5. An independent engineering firm that had no previous involvement with the Nanaimo standards was hired to provide an overall comprehensive review of the proposed changes. The firm that was hired is considered to be subject matter experts because of their involvement with other provincial and lower mainland standards. Some changes were made to the draft standards as a result of this review.
6. Final draft standards were published in February 2020, with notification provided.

The details of the engagement can be found here: Stakeholder Management Summary – Attachment D.

Changes to the standards will inevitably have financial implications to those constructing, operating, maintaining and eventually renewing the infrastructure, similarly to how changes to building codes has financial implications for builders, homeowners, etc. Staff have endeavored to ensure all the proposed changes are backed by good rationale and add value, but also minimize the financial impact on developers and taxpayers. The proposed standards update is in keeping with industry best practices and consistent with peer municipalities.

Increased infrastructure costs, where they exist, will certainly be passed along to those buying the product, the home buyers or businesses. This will have the effect of raising housing or business costs, which is an unfortunate but unavoidable side effect. Given the housing crisis Nanaimo and many communities are experiencing, this is not a trivial concern; however, lowering the infrastructure standards is not a sustainable way to avoid that. If, over time, it is found that the standards update has had unintended consequences, they can be revisited to correct or adjust. In fact, it is normal practice for the City to update the standards every few years. Also, if the development community is seeing too much financial impact, Council could consider raising the DCC assist factor to alleviate that pressure.

The following **Questions** and **Answers** respond to commentary on the proposed changes.

Q1: Have cul-de-sacs been prohibited?

A1: The Street Design changes proposed with the standards update, are derived from the policies that were set in the Nanaimo Transportation Master Plan in 2014 and currently accepted best practices. These policies and practices support creating a redundant, well connected road network that reduces dependency on personal vehicles and disproportionate loading of roads. This approach also supports walking and biking for short trips which can reduce localized congestion and traffic concerns.

There are many examples of neighbourhoods in Nanaimo where cul-de-sacs have created barriers and are creating frustration and concern from residents. An example of this is parents feeling a need to drive their children to school because they do not want them walking a long distance on a major road. Not only does this cause additional production of GHGs, it creates traffic safety concerns at school sites, and ultimately propagates a car dependent community, which is not sustainable in the long term.

The cul-de-sac standard drawing has been removed from the proposed standards; however, it does not necessarily mean they are prohibited. If development applicants can rationalize why a cul-de-sac is the most appropriate form of land development for a site, staff can allow them.

Q2: The new standards increase the road asphalt thickness, is that necessary and what is the cost?

A2: Asphalt is the most valuable transportation asset the City owns and it tends to have a lower life expectancy than most other assets. As noted previously, the City's existing pavement quality is not sustainable with the current level of road rehabilitation funding. This puts financial stress on the taxpayer and will eventually lead to dissatisfaction with a declining level of affordable level of road service.

The new standards bring the minimum asphalt thickness up from 50mm to 75mm. There is greater cost with this but there are multiple benefits. The asphalt is thicker, stronger and will last considerably longer. As a technical aside, the structural strength increases with the square of the thickness, meaning a small increase in thickness has a disproportionately large benefit. The thicker road also has more cost effective rehab options available, when the time comes.

While there may be cases where a 50mm local road has lasted greater than 20 years, that is the exception, not the norm. As soon as a patch is cut into a 50mm thickness of asphalt, that

life expectancy is reduced to +/- 5 years. Without a lap joint, the asphalt may hold together, but it will settle regardless of the level of care taken in compaction and asphalt placing.

When a 50mm thick road fails, the only possibility of rehabilitation is to remove all asphalt to gravel, regrade and re-compact the gravel and put all new asphalt back – current costs are $50 sq.m.

A 75mm road will last 20+ years, even with patching, as this thickness will allow milling across the joint. A patch with a milled lap joint will likely outlast the existing asphalt life and will not settle. In addition, trenching in a 75mm asphalt thickness holds up better and allows for less extensive asphalt restoration, saving future projects the cost of having to redo a larger area. Also, a 75mm road allows for a mill and overlay which is one of the most cost effective road rehab techniques. The current costs for a mill and overlay are $35 sq.m.

The only project that saves money with a 50mm asphalt road is the first time the road is paved. Every other party afterword pays disproportionately more – this means City taxpayers – over the lifecycle of the asphalt.

This change to the standards is driven entirely by asset management with an aim to reduce cost pressures for future generations, and is a direct result of the rapid decline in pavement condition the City has witnessed over the past 25 years.

Q 3: Does the proposed standard prohibit the curving of sewer pipes?

A 3: For O&M, asset longevity and risk, curved sewers can be a liability. The reasons to avoid curved sewers include:

- More difficult to CCTV and clean
- Increased risk of blockage
- More difficult to locate the pipe in the ground for repairs or other excavation

We recognize there are some instances where a curved sewer is a reasonable solution. In those cases, the City Engineer can permit them, subject to a reasonable rationale.

When permitted, curves to pipe alignments can be accomplished using two methods, they are: forcing the straight pipe into a bend or deflecting joints slightly at each connection. The method of forcing the pipe into a bend has long since proved to be unacceptable in the industry due to the residual stresses in the pipe that can cause failure later on. The existing standards are vague in the prohibition of this method. The second method of deflecting pipes at each joint is often considered an acceptable means of changing direction and is typically employed in the construction of watermains.

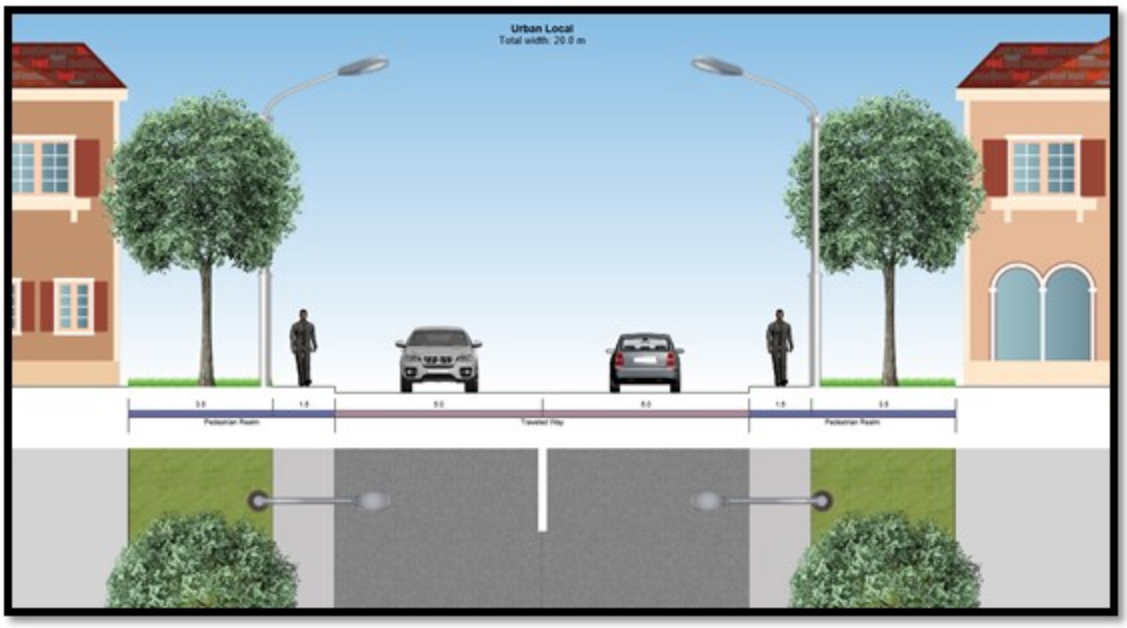
When a curved sewer is approved by the City Engineer, the standards change only permits joint deflection, no bending of the pipe.

Q 4: What is the expected change in costs with complete streets?

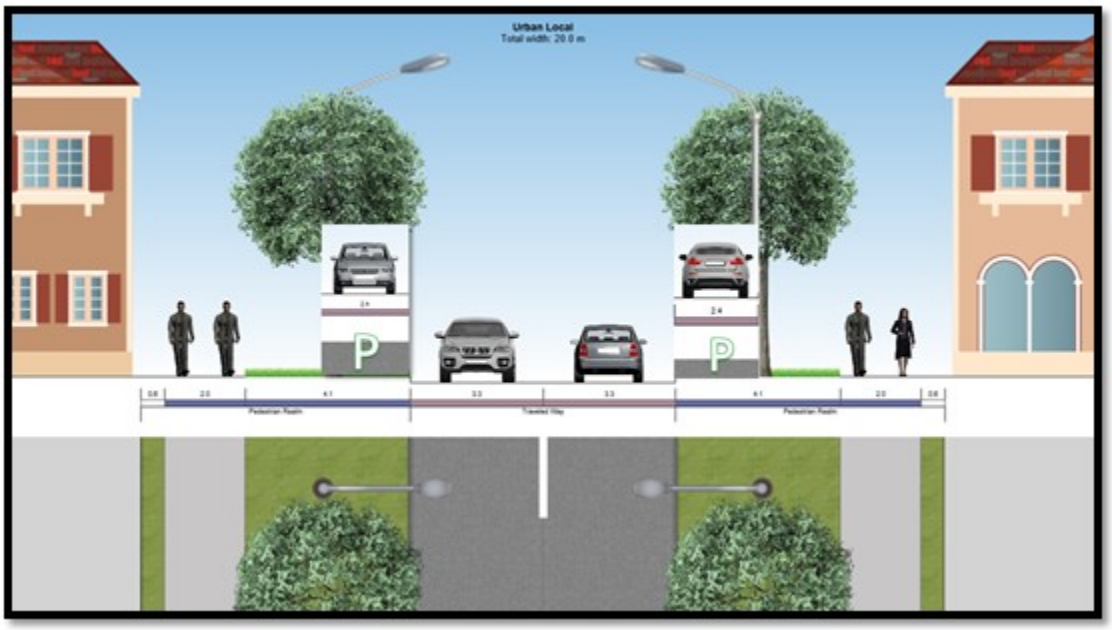
A 4: The actual cost of construction varies for each project depending on the specific circumstances. For example, a housing development using local streets will be different from a major

commercial development on a thoroughfare. To show visually the cross-sectional difference between the existing and proposed standards below are examples for a local street.

Existing:



Proposed:



A substantial impact to the cost is the amount of street parking which is discretionary. If developers choose not to install pocket parking, the costs could be lower, if they install as much as possible the costs could be slightly higher. However, some developers are already building

the cross-sectional elements included in complete streets, at their discretion, because it makes for a more desirable neighborhood and improves their marketing.

To help understand the cost impacts of the proposed changes, a theoretical comparison has been prepared for several of the common road classifications (numbers are approximate).

Road Classification	Existing Standards	Complete Street (proposed standard)	Complete Street + 50% Parking
Urban Local	Base case	Less than 1 % difference	14% more
Urban Collector	Base case	14% less	3% less

Notes: This analysis does not include proposed changes to the standards other than that related to complete streets.

The differences shown are much lower if the entire costs of a road and utilities are included. For example, if utilities are included in an Urban Local street, the percent difference drops down below 5%.

The two cross-sections shown above are common for developers to build. Larger more thoroughfare streets, such as arterials, will have a more substantial cost increase; however, are less common for development.

Staff routinely work with developers to help them with their projects, while maintaining the intent of the infrastructure standards. It is routine practice to negotiate the detailed requirements of a development in cases where it may be impractical to achieve the complete engineering standards.

Q 5: With the proposed complete streets standards, is additional road right-of-way required that would affect FAR (floor area ratio) of developments?

A 5: When developing the new standards, we strived to ensure that the right-of-way width for the majority of developer-constructed streets would remain the same. Here is a summary:

New		Existing Equivalent		Difference (m)	Land Required Per Side (m)
Name	**Width (m)**	**Name**	**Width (m)**		
Lane*	7	Lane	7	0	0*
Rural - Local	20	Rural - Local	20	0	0
Industrial – Collector*	25	Minor/Major Collector (2 lanes)	25	0	0*
Industrial – Local*	22	Industrial	22	0	0*
Urban - Arterial (5 lanes)	34.5	Urban - Arterial (5 lanes)	28.7	5.8	2.9
Urban - Collector (3 lanes)	26.7	Major Collector (3 lanes)	25	1.7	0.85
Urban - Collector (2 lanes)*	25	Minor/Major Collector (2 lanes)	25	0	0*
Urban – Local**	20	Urban Local	20	0	0*
Mobility - Arterial	30	Urban - Arterial (5 lanes)	28.7	1.3	0.65
Mobility – Collector	28.4	Minor/Major Collector (2 lanes)	25	3.4	1.7
Mobility – Local*	20	Urban Local	20	0	0*

**Streets primarily constructed by developers*

Furthermore, a clause in the standards permits the City Engineer to consider a statutory right-of-way (not road dedication) as a means to achieve the required width and cross-sectional elements. This is done periodically to avoid FAR issues.

Q 6: Are the new street standards an "over design"?

A 6: The goals are sustainability, accessibility and inclusivity. What an able bodied person considers overdesign, is considered the bare minimum for certain user groups. A good example is Boxwood Road. At one point, it was thought that sidewalks were not needed in industrial zoning; however, the City is now under pressure to retrofit the area at considerable cost. The planned capital project on Metral Drive has been cited as an example of a road that is "over designed". Metral Drive is not a local residential road; it is an urban collector (previously a major collector) that acts as a transit and transportation corridor connecting two mobility hubs and will extend the spine of the network further north, beyond the extents of the E&N Trail. When the Active Transportation Plan is developed, this will be considered an

active transportation highway/arterial within our network. It is true that Metral Drive will be the first of its kind in Nanaimo and will appear overbuilt compared to the City's existing infrastructure. The City's vision is to be more environmentally conscious and move towards more sustainable options, then we have to start somewhere and Metral Drive provided the opportunity to do so.

Q 7: Has enough consideration been given to how to accommodate underground services with the new Complete Streets standards?

A 7: The overall right-of-way widths have not changed; however, it is easier to fit utilities in boulevards/sidewalks compared to the traveled roadway. There is also the flex zone that can be used for items like transformers and other utilities that need surface space. In our opinion, there is little to no difference in utility alignments from the old standard to the new standard.

Q 8: Are changes to the crushed gravel standards necessary and what are the costs?

A 8: In general, the modifications to the gravels were very minor to come into alignment with more common and widely used Provincial (Master Municipal Construction Documents) standards. It is unnecessary to have special gravels for the City of Nanaimo when other municipalities around us are using the Provincial Standard. Many of the local aggregate suppliers already produce the product proposed in the new standards.

The new standards will limit the use of unprocessed "pit run" gravel. Although it has been used for many years, it is less reliable and does not possess the same structural strength as a machine graded/crushed product. The cost of unprocessed pit run is usually $16-17 / t and processed product is $17-19 / t. The additional $1-2 / t translates to approximately 5-10% more. Many contractors are already using this gravel since it reduces their risk of rework or deficiencies. This change will reduce risk to contractors, the City, and provide long-term asset management benefits.

Q9: What has changed with laneway requirements?

A9: The draft standards published in 2019 included an increase in laneway right-of-ways and paved width. The proposed increase went from (7 m right-of-way / 5 m paved) to (8 m right-of-way / 6 m paved). The increase in width is necessary to accommodate access for Fire Department vehicles. After reviewing feedback from the development community, that this change would be challenging to work with, staff reviewed the proposed change and dialed the requirement back to (7 m right-of-way / 6 m paved) that meets the bare minimum Fire Department needs and alleviates the issue for developers.

Q10: Will the new complete streets standards have maintenance impacts?

A10: With the new standard there will be some road classifications that now include a dedicated cycling facility. Similar to the City's existing trails or dedicated bike lanes the new facilities will require maintenance. Examples of maintenance include snow and ice control, as well as sweeping. Currently the City provides SNIC and sweeping service to the existing facilities on

a priority and needed basis. The level of service that the City provides with those types of facilities is subject to review as part of the Active and Sustainable Transportation Master Plan. In addition, there are plans to update the bylaws that require adjacent property owners to look after certain aspects of the Boulevards, including vegetation control.

With the complete streets standards there will be additional boulevard space to allow for snow storage. This will also mitigate the conflict between sidewalk snow removal and road clearing.