

DATE: May 13, 2021  
TO: Users of the Functional Road Classification Map and Overlays  
CC: Integrated Transportation Team  
FROM: Natasha Elliott, P.Eng., PTOE (Urban Systems)  
Jasmine Smith, EIT (Urban Systems)  
FILE: 0467.0502.01  
SUBJECT: REVISED Memo #1 Functional Road Classification

This Memo is #1 of 3. It is a complement and supporting document to **Memo #2 Standard Road Cross-Sections Development** and **Memo #3 Functional Road Classification System – Implementation Guidance**.

## 1.0 OVERALL APPROACH

As part of the TMP and OCP, the City is updating the 20-Year Major Road Network Map and associated road classes with a new road classification scheme. The overall goals of updating the map and road classification scheme are to:

- Refine the road classification scheme and provide clearer guidance to users of the map than today, and
- Update the map to align with the City's Draft 2040 Official Community Plan (OCP) and Draft 2040 Transportation Master Plan (TMP)

The new road classification scheme developed by the project team builds upon the Transportation Association of Canada (TAC) guidelines and current best practices in the industry. The scheme considers land-use context and road type to form a matrix of individual “road classifications.” This approach ensures that the identified road classifications’ cross-section and design elements will align with the vision as well as the function of the corridor.

The road classification scheme has been updated to consider both the street's function within the transportation network and how its context (most significantly, land use) influences the mix of trips it services. Both these factors, as well as local conditions, will influence the classification.

Ultimately the functional classification scheme cannot reflect the particularities of every street, and unique treatments will still be required; however, the goal is to have a system that provides clearer guidance than we have today. The use of Overlays has been introduced to help identify common transportation considerations that influence the function of transportation network. Overlays have been developed to represent these additional considerations, as they often represent a network that transcends land use or road classification. The Functional Road Classification system includes Overlays for Bicycles, Truck Routes, Transit, and TMP Projects, and are described further below in **Section 2.3**.

The assigned functional classes reflect future conditions based on OCP proposed land use and the TMP proposed road network, so some may seem out of place for today's conditions but are considering future street networks, traffic patterns, and/or development. Additionally, the Functional Classification Map shows the future role of a street in the transportation network, not TMP projects. For TMP projects, please refer to the TMP Project Overlay and the draft TMP project maps and descriptions, when available.

## 2.0 FUNCTIONAL ROAD CLASSES

The updated road classification scheme considers both the road type and surrounding context (land use) to develop a matrix of road classes. The proposed matrix is shown below results in 21 road classifications, as shown below in **Table 2.1**.

Table 2.1: Recommended Road Classifications

		Road Network Function			
		Neighbourhood Street Network		Major Road Network	
		Local	Collector	Minor Arterial	Major Arterial
Land Use Context	Rural	Rural Local	Rural Collector	Rural Minor Arterial	Rural Major Arterial
	Hillside	Hillside Local	Hillside Collector	Hillside Minor Arterial	
	Suburban	Suburban Local	Suburban Collector	Suburban Minor Arterial	Suburban Major Arterial
	Industrial	Industrial Local	Industrial Collector		
	Core Area	Core Area Local	Core Area Collector	Core Area Minor Arterial	Core Area Major Arterial
	Urban Centre	Urban Centre Local	Urban Centre Collector	Urban Centre Minor Arterial	Urban Centre Major Arterial

When applying the road classification scheme to a specific segment of road it is important to consider the intent conveyed by the road classification then apply engineering judgement to ensure the outcome is sensitive to the context. Road cross-sections have been developed to support the goals and objectives of the OCP and TMP, including multimodal mobility and road safety, balanced against the surrounding context, and considering the many needs within the right-of-way (ROW). This approach ensures that the identified road classifications' cross-section design elements align with the general vision, context, and function of the corridor. Further details on the road cross-sections are provided in **Memo #2 Standard Road Cross-Sections Development**.

In regards to implementation of the cross-sections, it is expected that new roads will be dedicated and constructed consistent with the typical cross-sections. Where additional functions for roads have been identified, guidance is provided in the form of four overlay maps, including: bicycles, trucks, transit, and TMP projects. For these streets, additional right-of-way and roadway elements varying from the standard cross-sections may be required. For some local streets cross-sections, where existing right-of-ways are constrained, dimensions that can be varied have been identified as ranges. **Memo #3 Functional Road Classification System – Implementation Guidance** provides more information on how the functional classification system and standard road cross-sections are intended to be used together.

All streets work as a system, so new road infrastructure must ensure that it integrates with adjacent streets such that it is effective, safe, and functional. Cross-sections are but one source of design guidance and work in coordination with other City policies, bylaws, and broader professional design guidance. While the road

classification scheme and typical road cross-sections guide the design of roads within the City, adaptation will be required to specific contexts, particularly on existing streets.

## 2.1 ROAD TYPES

The road types used in the proposed road classification scheme are traditionally referred to as road classification (local, collector, arterial) and typically focus on a continuum of access versus mobility. In addition, these classifications have been broadly broken into two groups: Neighbourhood Street Network, and Major Road Network. The Neighbourhood Street Network is primarily focused on access to destinations, sees slower speeds, lower volumes and will be used for shorter trips within neighbourhoods or to access the Major Road Network. The Major Road Network is primarily focused on moving large volumes of traffic over longer distances – focusing on mobility and managing access.

The goal was to create a clear break between the two road categories and to use that break to better manage the street policies moving forward. The City's historic road classification scheme used collectors as the break point between these two categories with minor collectors being a Neighbourhood Street and major collectors being part of the Major Road Network. In many cases there is minimal difference in function between a major collector and a minor arterial.

With the aim of simplifying the scheme and providing greater clarity, the new road classification scheme consists of the following road types:

- Neighbourhood Street Network
  - Laneway
  - Local
  - Collector
- Major Road Network
  - Minor Arterial
  - Major Arterial
  - Highway

A description of each road type is described in the table below in the context of the TMP and the SDS Bylaw.

Laneways have a growing role in supporting direct site access in dense urban areas. While they are not included in the mapping or standard cross sections, they are part of the Neighbourhood Street Network and their inclusion will assist in developing clearer direction within standards and policy.

Due to their critical role in Kelowna's vehicle network, highways are included in the system despite being under provincial jurisdiction. Anywhere the City has a role in managing areas along (such as frontage requirements from the curb to the property line), approaching, or within highways, Major Arterial guidelines for the applicable land use context will apply.

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Road Type		TMP Description	SDS Bylaw Description
Neighbourhood Street Network	Lanes	Public Lanes are used by the residents of a community as a venue for social interaction and play. They can contribute greatly to the fabric of a liveable community. They are common in higher density areas such as village centres. The inclusion of Public Lanes in these neighbourhoods contribute to the more urban feel envisioned and provide an alternate route for bikes and pedestrians.	Provides alternate access to residences and businesses in higher density areas. Typically, one lane and accommodates small to mid-sized vehicles. Traffic volumes and speeds are very low.
	Local	Local streets are primarily for use by the residents who live or work on the street. Pedestrians, cyclists, and motorists often mix within the street since vehicular volumes are low and speeds are slow. Motorists should only expect to travel a short distance before reaching a Collector or Arterial for the rest of their journey. Driveways and on-street parking are common.	Provides direct land access and is not intended to carry through traffic. Typically includes on-street parking. Traffic volumes are less than 1,000 vpd in residential areas and less than 3,000 vpd in mixed-use.
	Collector	Collectors are both used by residents who live or work on the street as well as providing connections within a neighbourhood between the Local streets and the Arterial roads. Typically, motorists should only need to travel a couple of blocks on a collector street to reach an Arterial Road. Driveways and on-street parking are common, but more emphasis is placed on accommodating vehicles on Collector streets compared to Local streets. Given the short journey length and direct property access motorists should expect to travel relatively slowly on Collector streets. Separate space for pedestrians (sidewalks) is typically provided and, in some cases, separate space for cyclists may also be provided (typically bike lanes).	Provides direct land access, but more emphasis on accommodating vehicles compared to local streets. Typically used for short distances and movement between arterial road and local streets. Vehicle speeds tend to be low. On-street parking and driveways are common.
Major Road Network	Minor Arterial	Minor Arterials are focused on facilitating moderate to long journeys within the city and prioritize traffic movement over access. Vehicle speeds tend to be higher on Minor Arterials than Collectors. While some businesses or multi-family buildings will have direct access, the location, design, and alternative access options are considered before providing direct access to a Minor Arterial. Given the higher vehicular volumes and speeds, pedestrians and cyclists can typically expect some physical separation from vehicles (buffers or boulevards). Parking is allowed in some contexts but is often limited.	Traffic mobility is primary function with some land access allowed. Provides link between town centres. Limited/rare on-street parking provided. The desired traffic volume range may have some overlap with collectors with the key differentiators being that minor arterials have greater emphasis on mobility (longer trips at higher speeds with less direct land access).
	Major Arterial	Major Arterials are intended to provide a continuous route for longer journeys within the city. Vehicle volumes and speeds tend to be highest, therefore, pedestrians and cyclists are typically physically separated from vehicles. Driveways are very limited with land access being provided via adjacent lower-class roads whenever feasible. Generally, Major Arterials do not have on-street parking.	Serves a continuous route primarily for longer trips by through-traffic, with limited land access. No on-street parking is typically allowed.

## 2.2 LAND USE

Land use context is the other primary consideration of the functional road classification matrix. Land-use can be used to help understand the potential character and urban form of an area plus movement and activity patterns, including the type and expected number of users. In a transportation context, land-use often indicates the amount of pedestrian, bicycle, and transit activity that should be expected on the corridor and informs the types of vehicles that should be accommodated. A street with a consistent road type (i.e., local, collector, arterial) may change significantly as it moves through different land use contexts. For example, a Rural Arterial is very different from an arterial within an Urban Centre, but they are both arterials; this part of the road classification scheme allows the City to respond consistently to these changes in context.

In most cases, the land use component of the road classification aligns with the OCP Districts Map; however, some land uses on the Road Classification Map have been adjusted to better reflect the transportation context of the location. Considerations include the expected amount of people walking, cycling, and riding transit, the speed of traffic, the types of vehicles, the density and scale of accesses and the character of frontages. This results in classifications that vary from the underlying OCP land use district in some cases, which are described further below.

- Lower levels of active transportation (AT) activity is typically expected within land uses that correspond to lower density (Suburban, Hillside, and Rural). However, Village Centres and other key locations within the Suburban, Hillside, or Rural land uses may have higher levels of pedestrian and cyclist activity in the immediate vicinity. Therefore, a Core Area or Urban Centre land-use has been used for the road classification in these locations.
- Locations with different land uses on either side of the same road can result in inconsistent road designs with the centreline acting as the break point. In these cases, the most appropriate land use, from a transportation perspective, has been assigned to the whole road and is shown as such on the Road Classification Map. The higher standard land use is typically assigned; however, the City's Integrated Transportation department may be consulted to determine if a specific context justifies adopting the lower standard.
- On the OCP District Map the land use sometimes changes at an intersection. Consistency through an intersection is important for transportation and therefore, a consistent land use is often carried through the intersection on the Road Classification Map. This enables the road classification transition to occur in a more appropriate location for the context.
- In some instances, land-use on the OCP District Map only applies to a very short segment of a corridor. In these cases, it may not make sense to transition to a different road classification for a very short segment and therefore an adjacent land-use is carried through on the Road Classification Map.
- Gateway: The OCP Districts Map includes Gateway as a land use type. Gateway encompasses a variety of land uses including residential, rural, and industrial. Roads within the Gateway vary greatly in terms of the characteristics and attributes. Therefore, it was determined that the roads within Gateway were better addressed by individually assigning them to the other existing land use categories based on the area context; the Gateway land use was not included in the road classification scheme.
- Industrial: The OCP Districts Map does not include Industrial land use. However, from a transportation perspective it is important to recognize the unique characteristics of industrial areas. For example, large trucks are expected and should be readily accommodated (robust pavement design,

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appropriate turning paths). Therefore, Industrial was included as a land use type in the road classification scheme.

The land use designations and their definitions in terms of the functional classification scheme (the TMP and the SDS Bylaw) are described in the table below.

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Land Use	TMP Description	SDS Bylaw Description
<b>Rural</b>	In rural areas, properties tend to be large resulting in low densities and well spaced driveways. Therefore, few pedestrians or cyclists tend to be present and vehicle traffic is prioritized. Many cyclists in rural areas are recreational in nature. Land use is mainly Agricultural or Industrial and trucks serving these uses are common. No on-street parking or urbanization (curb, gutter, sidewalks, etc.) is typically provided, and roads typically have shoulders and ditches.	Land use is mainly agricultural or industrial. Properties are larger with low access frequency, but some larger vehicles. Primary mode is vehicle, and no parking or urbanization is provided.
<b>Hillside</b>	Hillside land use is mainly lower density residential with single family homes. It is often in geographically constrained areas. Roadways prioritize vehicle traffic since this land use is usually further from amenities and Urban Centres. However, basic active transportation facilities and access to transit are also provided. Village Centres within Hillside area may have higher levels of pedestrian and cyclist activity in the immediate vicinity.	Land use is mainly lower density single family residential. Typically, vehicle focused with basic active transportation facilities. Often constrained corridors due to geography that result in windy roads.
<b>Suburban</b>	Suburban land use is mainly lower density residential with single family homes. Roadways prioritize vehicle traffic since this land use is usually further from amenities and Urban Centres. However, basic active transportation facilities and access to transit are also provided. Village Centres within Suburban areas may have higher levels of pedestrian and cyclist activity in the immediate vicinity.	Land use is mainly lower density single family residential. Typically, vehicle focused with basic active transportation facilities.
<b>Industrial</b>	Industrial areas prioritize vehicle and truck traffic as high volumes of trucks are expected. Properties tend to be of varying size with some larger properties and well spaced driveways, and in other locations properties are smaller and driveways are more frequent. Industrial uses typically have infrequent visitors as employees and deliveries form most trips to the area. Roadways often have limited active transportation facilities and may allow on-street parking. However, some industrial uses, such as breweries, can attract many customers and, in these situations, appropriate active transportation facilities become more important.	Primary mode is vehicle, with accommodation for heavy vehicles. However, active transportation facilities should be considered in areas with breweries or other uses with high customer numbers. Roadways may allow on-street parking.
<b>Core Area</b>	Core areas are higher density and may be a combination of Residential, Commercial, and Mixed-Use properties. The higher density combined with the proximity of amenities means more pedestrian, cycling, and transit activity is expected; therefore, both vehicle and active transportation traffic is accommodated but a higher emphasis is placed on providing high quality facilities for pedestrians and cyclists (compared to Suburban areas). Higher quality facilities are important to encourage active transportation mode choices and to provide sufficient space for the more frequent pedestrians and cyclists expected in the Core Areas.	Higher density with residential, commercial, and mixed use. More pedestrian, cycling and transit activity is expected; therefore, vehicle and AT are both accommodated with higher emphasis on pedestrians and bicycles compared to Suburban
<b>Urban Centres</b>	Urban Centres have the highest density of development with high levels of street-level activity. Streets in Urban Centres often also function as public spaces with outdoor dining, benches, and gathering spaces. Many trips are internal and completed on foot or by bike so pedestrian and cyclist traffic is prioritized. While good access into the Urban Centre area is important, the speed of vehicles travelling through the area is lower priority.	Highest density of development with high levels of street level activity. Street often also function as public spaces. Many trips are internal and completed on foot/bike. While good access to the area is important, speed of vehicles through the area is lower priority with an emphasis on pedestrians.



## 2.3 OVERLAYS

The standard road classes and cross sections respond to the priorities and objectives of the City based on the land use context and the road classification. This provides a framework to address the primary needs of each road segment throughout the City based on the general context. However, many transportation considerations influence the operations and needs of the road network and inform the design process. Additionally, some contexts or situations do not apply to all roads within a classification or land-use, but rather transect multiple classifications or land-uses and require a consistent response.

Overlays have been developed to represent these additional considerations. The objective of the overlays is to define the situations that require additional consideration, or cases where aspect(s) of the identified road type cross-section should be customized to fit a unique context. These overlays are critical to delivering on a functional road network and on the City of Kelowna's priority projects and objectives.

The Overlays are included in **Appendix B** and further details on how the overlays impact the standard cross sections is provided in **Memo #3 Functional Road Classification System – Implementation Guidance**.

### 2.3.1 Bicycles

Providing a continuous active transportation (AT) network is important to support various City goals and objectives. The planned All Ages and Abilities (AAA) and supporting AT network does not necessarily correspond to a road type or land-use. Therefore, the Bicycle Overlay has been developed, similar to the existing OCP Map 7.1, to ensure the current and future bicycle network is considered and accommodated with appropriate infrastructure on these identified routes.

The Bicycle Overlay map identifies the existing and future primary (AAA) network and supporting network. The standard cross sections accommodate the supporting bike network (painted bike lanes) and can be directly referenced and applied using the classification map. However, the primary network, or AAA network, does not have standard cross sections as they represent a unique and complex design process. A range of design solutions (uni- and/or bi-directional protected bike lanes, on-street or off-street, or multi-use pathway) can be implemented based on the project objectives, context, and local constraints. Often, these corridors are more complex projects and are also found on the TMP Projects Overlay.

If the corridor is identified as part of the primary network, the cross section should be adjusted to accommodate bicycles and may require a wider ROW than identified in the corresponding standard cross-section.

### 2.3.2 Trucks

While trucks and commercial vehicles occur across the entire road network, the truck route overlay shows our existing truck routes and industrial areas to help convey where larger trucks can be expected. It enables these roads and intersections to be appropriately designed to accommodate trucks. Industrial areas have been designated truck zones since trucks are common throughout these areas.

This map is used in referencing requirements through the SDS Bylaw when designing a road on a truck route, to confirm the appropriate design vehicle and identify any cross-section or pavement design modifications. Truck routes can also influence operational processes including, but not limited to, re-paving and snow clearing priority.

### 2.3.3 Transit

The transit overlay identifies key corridors for existing and future transit infrastructure. This map is used in referencing requirements through the SDS Bylaw to confirm the appropriate design vehicle, adjust the cross-



section to accommodate the minimum lane width, and consider what non-linear infrastructure (i.e., stops, shelters, etc.) is required. Higher levels of transit stop infrastructure should be provided in Core Areas and Urban Centres, compared to Suburban and Rural areas.

Transit routes can also influence operational processes including, but not limited to, re-paving and snow clearing priority.

### 2.3.4 TMP Projects

The TMP Projects Overlay shows the projects recommended in the TMP broken down by those in Scenario 2, which are considered high priority and are above the funding line, as well as those in Scenario 3, which performed well in the analysis and are still recommended but are below the funding line within the next 20 years.

Projects identified in this overlay have larger OCP and TMP objectives that result in non-standard cross sections and may impact the required ROW. Incorporating Council's concern that the Scenario 3 projects not be "forgotten" the intent is to account for them and not do anything to preclude them from being built at some point in the future, if possible.

Corridors identified on the TMP Projects Overlay should be reviewed and discussed with Integrated Transportation to determine the most current project-specific plans or designs available.

## 3.0 FUNCTIONAL ROAD CLASSIFICATION MAP

The Functional Road Classification Map has been developed to show the classification that has been assigned to each road segment and is included in **Appendix A**. The road classifications identified on the map correspond with the anticipated future function of the road network. Therefore, the road types and land use shown on the map might not align with existing conditions but reflect the road network based on the OCP growth scenario, future land use, and resulting traffic patterns. As noted previously, the Functional Classification Map shows the future role of a street in the transportation network, not TMP projects. For TMP projects, please refer to the TMP Project Overlay and the draft TMP project maps and descriptions.

Two additional considerations on the map content are noted below:

### Future Neighbourhood Street Connections

Future Neighbourhood Street connections (Laneways, Locals, and Collectors) and emergency accesses are shown infrequently on the Road Classification Map. They were only included where they have been identified as part of an existing major infrastructure project, Area Structure Plan, or Urban Centre Plan. However, in many cases, additional connections or links are required to support future development (both within and beyond Area Structure Plan or Urban Centre Plan locations). Even though these connections are not always shown on the map they are still required, and Integrated Transportation should be consulted to confirm if there are any missing links and, in the selection of new roads not identified on the maps, appropriate classification.

### UBCO Roadways

The University of British Columbia Okanagan (UBCO) has jurisdiction over the roadways within their campus. While the City is not responsible for these roadways, road classes were assigned based on the scheme applied to the whole transportation network to maintain consistency throughout the city. However, these road types are assigned for information and context only and UBCO is not obligated to adhere to these suggested designations.

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Please see **Memo #2 Standard Road Cross-Sections Development** and **Memo #3 Functional Road Classification System – Implementation Guidance** for additional information.

Sincerely,

URBAN SYSTEMS LTD.



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Transportation Engineer

Jasmine Smith, EIT  
Transportation Engineer

cc: Integrated Transportation Team  
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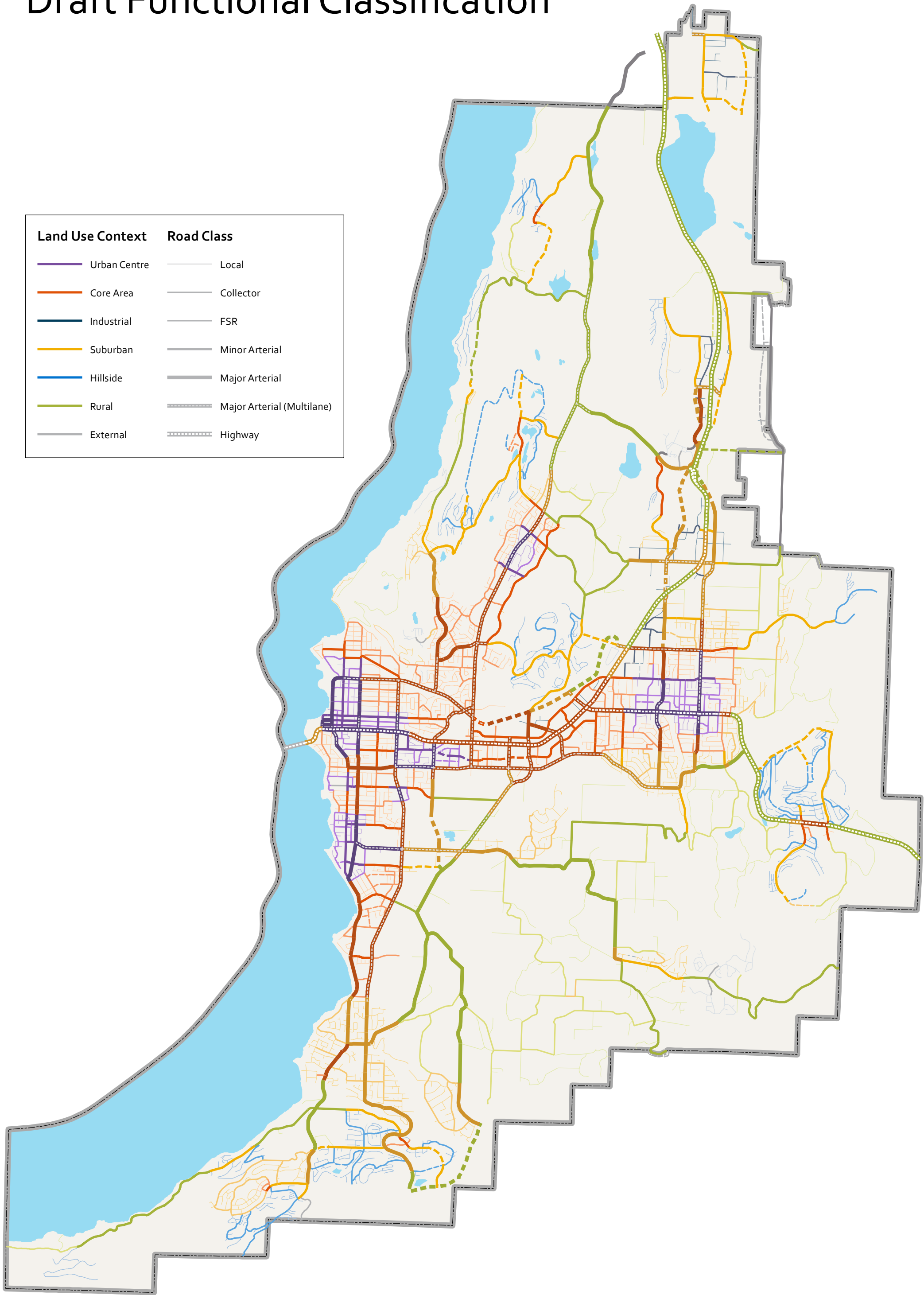
\\usl.urban-systems.com\projects\Projects\_KEL\0467\0502\01\R-Reports-Studies-Documents\RI-Reports\Memo 1 - Functional Class Map\2021-05-13 Kelowna TMP - Road Class Memo RI.docx

# APPENDIX A

## FUNCTIONAL ROAD CLASSIFICATION MAP

# Draft Functional Classification

Land Use Context	Road Class
Urban Centre	Local
Core Area	Collector
Industrial	FSR
Suburban	Minor Arterial
Hillside	Major Arterial
Rural	Major Arterial (Multilane)
External	Highway



# APPENDIX B

## OVERLAYS

# Draft Biking Overlay

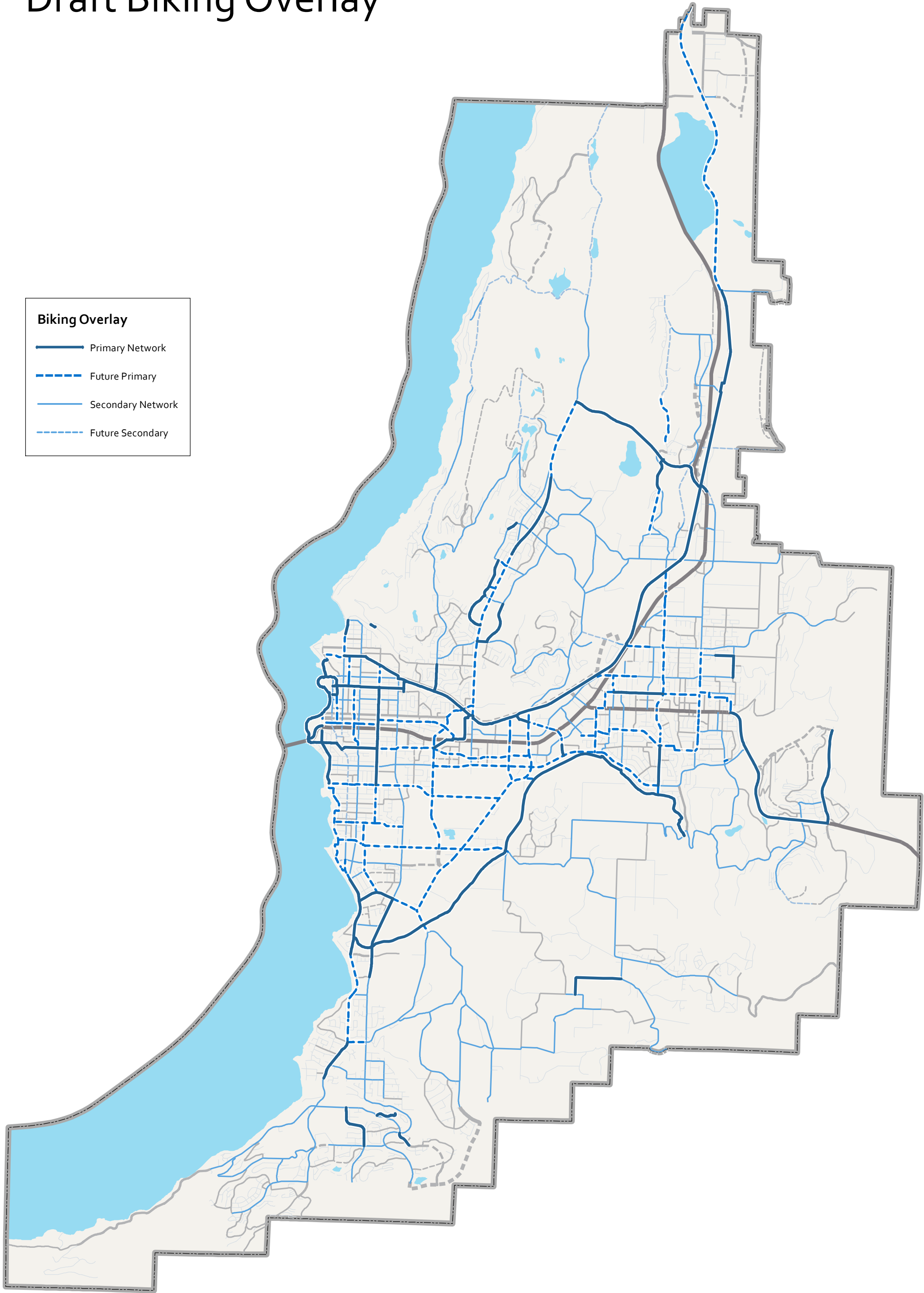
**Biking Overlay**

Primary Network

Future Primary

Secondary Network

Future Secondary



# Draft TMP Project Overlay

**TMP Project Overlay**

**Within 20 Years**

Existing Road

Future Road

**Beyond 20 Years**

Existing Road

Future Road





# Draft Transit Overlay



# Draft Truck Overlay

Truck Overlay

7am to 7pm

7am to 10pm

24 Hours

