

Report to Council



Date: December 12, 2012
File: 1350-20
To: City Manager
From: Director, Infrastructure Planning
Subject: Lakeshore Road Improvements - 3-Lane Rationale (SR 238493)

Recommendation:

THAT Council receives for information, the report from the Director, Infrastructure Planning, dated December 12, 2012 regarding Lakeshore Road Improvements - 3-Lane Rationale.

Purpose:

To respond to Council's request for more information on the rationale for designing Lakeshore Road to a 3-lane cross section between Barnaby Road and Richter Street. (SR 238493).

Background:

The 20-year Servicing Plan & Financing Strategy, funded through the Development Cost Charge program established by By-law, identifies upgrades to Lakeshore Road from Richter to Barnaby in 4 phases over 20 years. From a traffic perspective, it is designated as a 2-lane arterial with centre turn lane. All phases have an urban cross-section except for Lakeshore 1A (Vintage Terrace Road to Barnaby Road) which has a rural cross section. Generally, an urban cross section adds curb, gutter and sidewalk. Currently staff are working on a preliminary design for the major length of the Lakeshore Road 3 link (Richter-Lexington) and the Lakeshore Road Bridge over Mission Creek. This is scheduled for construction in the 1st quarter (2010-2015), subject to adequate funding.

The Lakeshore corridor currently plays a number of diverse and important roles in Kelowna's transportation network:

- It is one of two major arterials serving the South Slopes. The second, Gordon Drive, has been upgraded over time and will be complete with construction of Gordon 1 between Frost Rd and the future South Perimeter Road.
- It is a key connector between the South-West Mission and destinations north including the South Pandosy Town Centre, Kelowna General Hospital, downtown Kelowna, Highway 97 and West Kelowna.
- It is a designated Active Transportation Arterial in the 20-year Servicing Plan, the section between Gyro Park and Cook Road being complete.
- It is a principal route for residents and tourists to Gyro Beach, Rotary Beach, the Resort area at Cook Road, the Mission Creek Greenway and the South Slope Wineries.
- The section of Lakeshore Road between Barnaby and KLO is currently designated as a truck route.

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The corridor will need to be upgraded to accommodate anticipated traffic growth to 2030 in the developing South Mission. In addition, the current Lakeshore Bridge is at the end of its service life and will need to be replaced. Spring flooding in the last two years has come very close to topping the bridge span and City crews have had to keep watch to remove floating logs coming in contact with the structure. Underground utilities (especially sewer) are at design capacity and need to be expanded to accommodate any future development in the South Mission.

The milestones achieved on Lakeshore 3 Road and bridge project are as follows. A life-cycle cost assessment was completed in 2010 for the final sizing and alignment of the sewer. Conceptual design for the bridge was completed to support a federal gas tax application in 2011, and a preliminary design for the road was initiated to support a second application in 2012 following additional input from the community solicited through both an open house and a broad-based stakeholder workshop.

Design Philosophy

The 20-year Servicing Plan & Financing Strategy was approved in 2011 to provide services for growth anticipated in the 2030 OCP. At that time the key transportation objective was set out in the OCP as follows:

“Feature a Balanced Transportation Network. Increase the attractiveness, convenience and safety of all modes of transportation by implementing ‘complete streets’ that are designed to serve a broader range of transportation modes, focusing on pedestrians, cyclists and transit service, and function in the context of surrounding land uses.”

There was also a concerted effort to reduce the Development Cost Charges borne by real estate developers and supplemented by the taxpayer. This was achieved, making the charges for the urban core of Kelowna the median DCC for mid-sized communities in BC.

The key objectives for Lakeshore included:

- Maintain the ‘lakeshore-resort’ character of Lakeshore to the Cook Road resort area as well as Gyro Beach (at Richter), Rotary Beach (at Barrera), Mission Hall, park and school (at DeHart), and the planned Bellevue Creek Trailhead.
- Split Kelowna General Hospital traffic to and from Hwy 97 using both Pandosy and Richter by increasing the capacity and functionality of Rose Avenue.
- Do not increase capacity and efficiency of Lakeshore to the point where traffic is drawn to it from other routes (*diverted*).
- Do not increase capacity and efficiency of the Mission network to the point where drivers make unnecessary additional (*induced*) trips.
- Maintain walkability and pedestrian safety across Lakeshore throughout the commercial areas, and at schools and other public and institutional uses.
- Create a safe and efficient corridor for the remaining and necessary vehicular traffic.

The 20 year Servicing Plan & Financing Strategy (DCC) adopted the following strategies:

- Optimize the use of existing infrastructure and road right of way through traffic redistribution.
- Increase user choice by supporting transit and providing active transportation corridors that provide safe, convenient, connected corridors for walking and biking.
- Provide new roads to relieve excessive congestion on existing infrastructure.
- Work within the revenues available from Development Cost Charges.

The criteria used to determine the inclusion and scope of a transportation project included:

- Accommodating forecasted traffic volumes based on future (2030) land use;
- Improving network connectivity;
- Increasing accessibility, safety and mobility of all road users (pedestrians, cyclists, transit users and motor vehicles) including goods and services and community protection;
- Reducing community severance and other community impacts;
- Matching public transit speeds to single occupancy vehicles;
- Minimizing environmental impacts and impacts on agricultural land.

In addition, the DCC program recognized the need to overcome the following drawbacks associated with expanding road capacity in an attempt to solve congestion:

- Roads fill up to capacity with diverted and induced traffic,
- Externalized costs of driving may be absorbed by the public purse.
- Marginal value uses (easily forgone trips) are encouraged leading to a diversion of investment from other priorities.
- Alternative mode use is discouraged.

The specific implementation of these objectives and strategies pertinent to Lakeshore Road were:

- Provide new alternative routes to and from the South Mission to increase driver choice (new South Perimeter and realigned Stewart Road).
- Provide opportunities for traffic to redistribute to existing road infrastructure through alternative routes (DeHart expansion to redistribute from Lakeshore to Gordon & Swamp; South Perimeter construction to redistribute from Gordon and Lakeshore to Stewart and Benvoulin).
- Develop a new active transportation corridor to encourage and promote shifts in travel behaviour to other modes thereby reducing green house gas emissions.
- Use a 2-lane arterial with centre turn lane cross-section to accommodate anticipated traffic demand.

There is considerable research on the performance of the selected cross-section. Some cities (e.g. Seattle, Washington) have implemented road diets, reducing from 4 lanes to 2 with a centre left turn lane. In all cases, the capacity increased, allowing the existing road right of

way to be allocated to alternative uses (transit pull-outs, bicycle lanes, sidewalks), thereby increasing transportation choices (statistics are presented in Annex 1). This arrangement is currently used on Enterprise Way to carry high volumes and is proposed in several other new applications in the network such as Lakeshore, Hollywood, Richter, and Rose. Features contributing to the success of this configuration include:

- Removes left turning vehicles from through lanes
 - Reduces delay to through vehicles
 - Reduces rear-end and sideswipe collisions
- Provides spatial separation between opposing lanes of traffic thereby reducing head-on collisions
- Functions as emergency vehicle lane
- Functions as passing lane when buses stopped or vehicle stalled in through lane
- Simplifies traffic control when maintenance or construction requires lane closure
- ROW normally taken by 4th vehicle travel lane is available for active transportation

Lakeshore Rd. Current and Future Traffic Volumes

Generally, a two thru lane and centre left turning lane cross section designed to urban arterial standards can accommodate up to 1000 vehicles per hour per lane in situations with multiple accesses between intersections. The following outputs from recent traffic counts and the City’s traffic model provide car and truck volumes only (no bicycles) as recorded for 2011 and as projected for 2030.

Table 1 - 2011 AM Peak Traffic Counts vs. 2030 Projections on Lakeshore Rd.

Section of Lakeshore	Southbound		Northbound	
	2011	2030	2011	2030
Richter - Barrera	428	509	836	720
Barrera - Cook	437	587	792	985
Cook - Lexington	384	366	626	570

Table 2 - 2011 PM Peak Traffic Counts vs. 2030 Projections on Lakeshore Rd.

Section of Lakeshore	Southbound		Northbound	
	2011	2030	2011	2030
Richter - Barrera	958	1138	584	591
Barrera - Cook	863	955	628	896
Cook - Lexington	803	897	601	361

The data shows that Lakeshore as proposed, assuming the completion of all three main Mission arterials and the planned east-west connectors between them, accommodates projected 2030 traffic demand with the exception of the Richter to Barrera section in the PM peak hour. The exception is manageable as discussed below.

Enterprise Way Current Traffic Volumes

For comparison purposes traffic count data (for 2008 and 2012) is provided for Enterprise Way which has a similar 2 lane with centre turn lane cross section. The data shows that anticipated 2030 volumes on Lakeshore will be generally less than those already experienced on Enterprise Way. Further, mid-block turning movements (which tend to slow the flow of traffic) on Enterprise are accessing businesses which attract more vehicle turning movements than residential properties such as those seen along much of Lakeshore Rd.

Table 3 - 2008 and 2012 AM Peak Traffic Counts on Enterprise Way

Section of Enterprise	East/Northbound		West/Southbound	
	2008	2012	2008	2012
Spall - Hardy	1097	694	616	688
Hardy - Cooper	1126	679	609	651
Cooper - Dilworth	672	572	643	583
Dilworth - Leckie	656	565	569	678
Leckie - Banks	707	527	695	540
Banks - Highway 33	554	608	710	581

Table 4 - 2008 and 2012 PM Peak Traffic Counts

Section of Enterprise	East/Northbound		West/Southbound	
	2008	2012	2008	2012
Spall - Hardy	1177	828	896	1011
Hardy - Cooper	1245	1013	899	954
Cooper - Dilworth	907	895	838	834
Dilworth - Leckie	825	831	804	858
Leckie - Banks	889	837	780	842
Banks - Highway 33	971	845	688	618

In 2008, Enterprise Way (eastbound between Spall and Hardy) carried higher than desirable traffic volumes in both the AM and PM peaks. While traffic volumes have generally dropped from 2008 levels, in 2012 Enterprise continues to see the maximum recommended volumes in both directions during the PM peak. One possible factor contributing to the overall traffic decrease on Enterprise is the 6-laning of Highway 97 which occurred in 2010. This highlights the fact that as capacity is added to one road, it will attract traffic from other more congested or less convenient nearby routes (diversion). But in addition, the design capacity will also be filled (inducement).

The one section of Lakeshore which exceeds projected traffic usage is acceptable because:

- It will perform with 2030 traffic better than Enterprise does today
- It will avoid building infrastructure that will induce unnecessary traffic.

Design Flexibility

Transportation modeling and the resulting Servicing Plan are developed on the basis of a set of land use, population and other assumptions which are the best available at the time the model is run. Some of these assumptions will prove accurate while others will require revision over time. Therefore, while designing for today and for anticipated future

projections, there are various means by which a road design can be made more flexible so that the cost of future expansion, if later deemed necessary, can be minimized. Annex 2 provides a list of typical considerations in designing a road for future expansion.

Land is being acquired along the Lakeshore Corridor for a 30-metre cross section. This is adequate for several future modifications of the cross section that could include an additional travel lane in each direction. If required, corridor modifications could be included in a future 20-year Servicing Plan & Financing Strategy and financed through amendments to the DCC Bylaw at that time.

Compatibility of this cross section with other Lakeshore Phases

The traffic modeling shows that this cross section is suitable for all other Lakeshore Road phases with the exception of Lakeshore 1 and 1a (Barnaby to Dehart). This section shows a morning peak hour volume that justifies an additional north-bound travel lane. However, these phases are planned to be built in the latter part of the 2020-2030 period. If actual traffic demand is not reduced through traffic demand management initiatives such as public transit and other transportation modes by that time, the DCC program can be adjusted through an amendment and rate adjustment at that time.

Next Steps

A consultant has been hired to complete the preliminary engineering in accordance with the current 20-year Servicing Plan & Financing Strategy. Land surveys and the first phase of public engagement regarding the project objectives have been completed along with the evaluation of intersection control strategies. The purpose of the consulting work is to:

- Complete a preliminary design that meets public and corporate objectives;
- Return to the public and Council with the preliminary design for further input;
- Confirm land acquisition requirements;
- Be prepared to proceed to detailed design, tender documents and construction of the Bridge and Cook to Lexington section if grant funding is received.

Internal Circulation:

Director, Civic Operations

Director, Communications

Director, Design & Construction Services

Director, Regional Services

Manager, Development Engineering/Subdivisions

Existing Policy:

The 2030 OCP focuses on creating a livable and walkable mixed-use community. An important part of a healthy and sustainable city is a land use strategy that encourages mixed-use, compact and complete communities along with a transportation system that encourages walking, biking and public transit and that reduces the need for single occupant vehicles.

2030 OCP objectives related to transportation are provided in Annex 3.

External Agency/Public Comments:

The two key sources of public comment relating to this project and its design philosophy are:

1. The January 26, 2012 Lakeshore Road Mission Creek Bridge Community Consultation (Annex 4 includes Prioritized Criteria for Success as identified by Stakeholders)
2. The 2030 OCP Survey (Annex 5 presents the Survey Data)

Financial/Budgetary Considerations:

The 20 year Servicing Plan and Financing Strategy includes the upgrading of Lakeshore Road to a 2 Lane Arterial with Centre Turn Lane. If the road and bridge cross-section is increased, DCC rates would increase for all DCC sectors to reflect any increase in project cost.

Considerations not applicable to this report:

Legal/Statutory Authority:

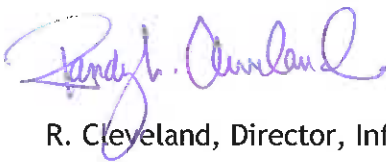
Legal/Statutory Procedural Requirements:

Personnel Implications:

Communications Comments:

Alternate Recommendation:

Submitted by:



R. Cleveland, Director, Infrastructure Planning

Approved for inclusion:



D. Gilchrist, Acting GM, Community Sustainability

Attachments:

Annex 1 - Seattle Road Diet Statistics

Annex 2 - Considerations when Designing Roads for Future Expansion (to 4 Lanes)

Annex 3 - OCP Transportation Objectives

Annex 4 - Lakeshore Road - Mission Creek Bridge Community Consultation

Annex 5 - 2030 OCP Survey Data,

cc: Director, Civic Operations
Director, Design & Construction Services
Director, Land Use Management
Director, Development Services
Director, Regional Services
Director, Communications
Acting Director, Real Estate & Development Services

Annex 1 - Seattle Road Diet Statistics

Roadway Section	Date Changed	ADT* Before	ADT After	Change
Greenwood Ave. N (N 80 th St. - N 50 th St.)	Apr 1995	11,872	12,427	4 lanes to 2 lanes plus TWLTL* plus bike lanes
N 45 th St. (Wallingford area)	Dec 1972	19,421	20,274	4 lanes to 2 lanes plus TWLTL
8 th Ave. NW (Ballard area)	Jan 1994	10,549	11,858	4 lanes to 2 lanes plus planted median with turn pockets as needed
Martin Luther King Jr. Way (north of I-90)	Jan 1994	12,336	13,161	4 lanes to 2 lanes plus TWLTL plus bike lanes
Dexter Ave. N (east side of Queen Anne area)	Jun 1991	13,606	14,949	4 lanes to 2 lanes plus TWLTL plus bike lanes
24 th Ave. NW (NW 85 th St. - NW 65 th St.)	Oct 1995	9,727	9,754	4 lanes to 2 lanes plus TWLTL
Madison St. (7 th Ave. - Broadway)	Jul 1994	16,969	18,075	4 lanes to 2 lanes plus TWLTL
W Government Way/ Gilman Ave. W (W Ruffner St. - 31 st Ave. W)	Jun 1991	12,916	14,286	4 lanes to 2 lanes plus TWLTL plus bike lanes
12 th Ave. (Yesler Way - John St.)	Mar 1995	11,751	12,557	4 lanes to 2 lanes plus TWLTL plus bike lanes

*Acronyms

ADT - Average Daily Traffic

TWLTL - Two way left turn lane

Annex 2 - Considerations when Designing Roads for Future Expansion (to 4 Lanes)

It should be noted that not all of these measures are appropriate in all instances and any extra costs must be weighed against the current budget and the risk (likelihood) of future expansion.

1. Locate curb/gutter at edge of future 4-lane section to avoid future replacement.
2. Design drainage cross fall/grading to accommodate the 4-lane section (i.e. set curb/gutter elevation accordingly)
3. Place any trees, root zones/Silva cells outside the 4-lane section
4. Locate Bioswales outside the 4-lane section.
5. Place any new deep utilities in a location appropriate for both the immediate section and a 4-lane section (i.e. not within a wheel path or lane line).
6. Space manholes such that catch basins can be added in future to accommodate additional runoff from the 4-lane section.
7. Design the road such that the wider cycle-tracks can be eliminated in favour of on-street bicycle lanes for the 4-lane section.
8. Current and future design sections should accommodate existing utility poles to avoid costly relocations.
9. Land acquisitions should consider the 4-Lane cross section.
10. Any long-life assets (e.g. bridges) should be expandable to accommodate a future 4-lane section.
11. While there are inherent complexities and increased costs, roundabout geometry can be designed to accommodate a single-lane movement now, and a potential dual-lane in future (two-lane roundabout).

Annex 3 - OCP Transportation Objectives

Chapter 7 of the 2030 OCP covers Municipal Infrastructure. Objectives 7.6 through 7.11 are related to Transportation. Relevant policies are included for clarity:

General: To support sustainability, Kelowna will: Design transportation routes to prioritize investment in transit, pedestrians and bicycle infrastructure in order to increase mobility choices for residents and minimize the use of single occupancy vehicles --- one of the largest producers of greenhouse gases;

Objective 7.6: Place increased emphasis on sustainable modes of transportation (walking, cycling, transit) while maintaining automobile, commercial goods and emergency vehicle mobility.

- Policy 1 Transportation Infrastructure Priority - Transportation infrastructure will be funded, designed, constructed and maintained to meet the needs of users and according to the following priority:

- i. Active Transportation (Walking and Cycling)
- ii. Transit
- iii. Movement of Goods and Services
- iv. High Occupancy Vehicles (HOVs)
- v. Single Occupancy Vehicles (SOVs)

Priority will be assigned to active transportation and transit infrastructure that serves and connects Urban Centres, major employers, health care and educational facilities.

- Policy 2 Complete Streets - Ensure new roads are built as complete streets that incorporate sidewalks and on street bike lanes on arterial and major collector roads and off-road bike paths as per the Active Transportation Plan and provides for efficient transit service as well as sufficient space to include landscaping

Objective 7.7: Reduce peak hour trips and the percentage of trips undertaken by single occupant vehicles, particularly in Urban Centres, in order to reduce or eliminate the expansion of the transportation network and capacity.

- Policy 1 Motorized Trips - Provide infrastructure to the Urban Centres based on the expectation that not more than 45% of total trips in the City Centre and other Town Centres will be by motor vehicle.
- Policy 2 Ease of Movement - Ensure that pedestrians, bicyclists and transit users can move about pleasantly and conveniently and that they are not unduly impeded in their movements by provisions for enhanced automobile mobility.
- Policy 3 Congestion - Recognize and accept that a greater level of congestion will result from an increase in suburban growth and a reduced road construction program. The construction of active transportation corridors will be one of the methods of providing alternatives to relieve this congestion.

Objective 7.8: Provide more active transportation infrastructure to: increase resilience in the face of higher energy prices; improve community health; and reduce greenhouse gas emissions.

Objective 7.9: Ensure efficient and effective transit infrastructure and facilities.

Objective 7.10: Ensure roadway planning supports sustainability goals.

- Policy 1 Roadway Modifications - Implement roadway modifications based on Map 7.3 - 20 Year Major Road Network Plan and a process which primarily considers TDM objectives, but also addresses factors such as collision reduction, travel time savings, pavement quality, cost/benefits, minimum level-of-service policy criteria, movement of goods and services on designated truck routes, and environmental, land use and development objectives. Except where there are safety issues, refrain from implementing major roadway modifications intended to increase capacity and/or efficiency for automobiles on non-commercial routes (truck routes are considered commercial routes) until the peak hour level-of-service (LOS) is at the threshold of failure, measured at non-tourist season peaks.

Objective 7.11: Implement parking management programs that promote reduced car ownership, reduced car trips and increased use of active modes of transportation.

Annex 4 - Lakeshore Road - Mission Creek Bridge Community Consultation

Stakeholder Prioritized Criteria for Success

The following list of prioritized criteria for success was created following a discussion of all of the possible design elements, features, functions and other considerations relating to the replacement of the existing bridge and upgrading of adjacent transportation corridor.

Votes Criteria

- 17% 1. **Destination.** Make this an attractive draw with a unique identity for local and non-local people to recreate and enjoy
- 14% 2. **Attractive Active Transportation Corridor.** Provide attractive corridor for non-vehicle use that is also functional (practical, safe route)
- 9% 3. **Safety.** This should provide safe transportation for both the non-vehicular and vehicular travelers.
- 9% 4. **Greenway Continuation.** Provide a logical, continuous route for users of the Greenway to continue West to the lake.
- 8% 5. **Efficient corridor from South Mission to downtown.** Ensure that the route for residents is not overly impeded by design changes to corridor.
- 8% 6. **Better parking.** Improve the parking for Greenway users (not on existing commercial space), boat parking and parking for high-traffic commercial locations.
- 7% 7. **Environmental protection.** Invest in protection and enhancement of Mission Creek, sanctuary spaces, etc in the area.
- 6% 8. **Access to local business.** The design should enhance access to local businesses for both through traffic and destination visitors.
- 6% 9. **Aesthetics of design.** The bridge design should create a minimum impact on nearby residents (access, egress, visibility, natural light) - this may require the minimum height change from the existing bridge.
- 6% 10. **Environment.** Construction plan and roadway design should incorporate best practices for removal, construction, etc.
- 4% 11. **Enhance Tourism Opportunities.** Enhance the tourist draw for boating, Greenway, walking, shopping, etc. in the corridor area and for local commercial businesses.
- 4% 12. **Improve boat launch.** Enhance the access and egress to the existing, sole boat launch to reduce waiting time, volume of waiting vehicles, etc.
- 3% 13. **Ensure that anticipated increased traffic volume (all modes) is served.** Incorporate roundabouts and other design features to accommodate anticipated growth in overall traffic volume (vehicular and non-vehicular).
- 1% 14. **Economically feasible.** Design a project that achieves all of the desired objectives, in the near future and is within the financial capacity of the City.

Annex 5 - 2030 OCP Survey Data:

Designate transportation corridors in each part of the City that will retain a pedestrian/cyclist focus regardless of increased vehicular needs

- 83% Support
- 11% Do not support
- 6% Support with refinements

If you had \$100 to spend on transportation related improvements, how would you allocate your money?

- 16% Sidewalks
- 17% Bike lanes on the road
- 26% Pedestrian paths/cyclist lanes
- 25% Better/more transit
- 16% New/widened roads

Tradeoffs

- 24% Keep on street parking on an arterial road
- 76% Add a bike lane
- 19% Decrease driving time by 3 to 5 minutes
- 81% Increase safety for cyclists/pedestrians
- 48% Decrease driving time by 3 to 5 minutes
- 52% Increase speed for transit buses
- 50% Increase taxes to pay for new roads
- 50% No new roads / don't widen existing roads

How should priorities be set when the needs of pedestrians and vehicles conflict?
(Respondents could indicate more than one selection)

- 35% Priority to cars along Highway 97 and Highway 33
- 30% Priority to pedestrians in Urban Centres
- 21% Priority to pedestrians throughout the city
- 7% Priority to cars throughout the city
- 7% Priority to other

If you typically travel alone by car, would you consider another form of transportation?

- 50% No
- 37% Yes
- 12% No answer

How far is your principal destination from your home?

- 41% 1 to 5 km
- 32% 6 to 10 km
- 16% 11 to 15 km
- 6% More than 15 km
- 5% Less than 1 km

Do you think that the way transportation infrastructure has been provided within the past 10 years is sustainable?

- 64% No
- 36% Yes

Do you think that the City should do more to ensure that future transportation infrastructure is sustainable?

- 95% Yes
- 5% No

LAKESHORE ROAD DESIGN

Rationale Report to Council December 17, 2012



POLICY DIRECTION

- ▶ Official Community Plan (Annex 3)
- ▶ 20-Year Servicing Plan
 - ▶ DCC Bylaw
- ▶ Climate Action Plan
- ▶ Community Input



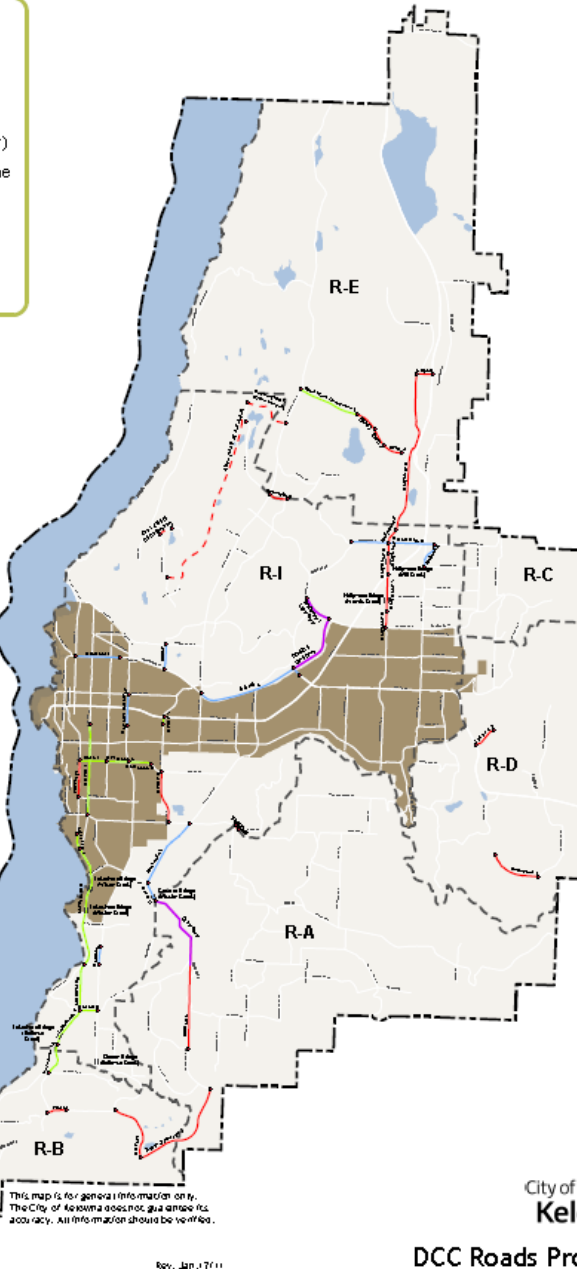
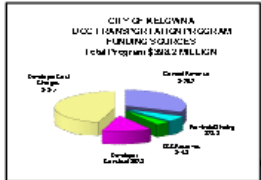
PROJECT CONTEXT

- ▶ DCC Road
 - ▶ Network Strategies
 - ▶ Project Selection Criteria
 - ▶ Risk Management
- ▶ Project Drivers
 - ▶ Bridge Service Life
 - ▶ Sewer Capacity

- City Boundary
- Core Area
- DCC Sectors Boundary
- 2 Lane
- 2 Lane (100% By Developer)
- 2 Lane and Centre Turn Lane
- 4 Lane
- Land Only
- DCC Road Limits
- Bridge

2020 DCC Road Inventory

CD	CD No.	CD Name	CD Type	%	Start of Calendar
1	1	1st St	Local	0.01	01
1	2	2nd St	Local	0.01	01
1	3	3rd St	Local	0.01	01
1	4	4th St	Local	0.01	01
1	5	5th St	Local	0.01	01
1	6	6th St	Local	0.01	01
1	7	7th St	Local	0.01	01
1	8	8th St	Local	0.01	01
1	9	9th St	Local	0.01	01
1	10	10th St	Local	0.01	01
1	11	11th St	Local	0.01	01
1	12	12th St	Local	0.01	01
1	13	13th St	Local	0.01	01
1	14	14th St	Local	0.01	01
1	15	15th St	Local	0.01	01
1	16	16th St	Local	0.01	01
1	17	17th St	Local	0.01	01
1	18	18th St	Local	0.01	01
1	19	19th St	Local	0.01	01
1	20	20th St	Local	0.01	01
1	21	21st St	Local	0.01	01
1	22	22nd St	Local	0.01	01
1	23	23rd St	Local	0.01	01
1	24	24th St	Local	0.01	01
1	25	25th St	Local	0.01	01
1	26	26th St	Local	0.01	01
1	27	27th St	Local	0.01	01
1	28	28th St	Local	0.01	01
1	29	29th St	Local	0.01	01
1	30	30th St	Local	0.01	01
1	31	31st St	Local	0.01	01
1	32	32nd St	Local	0.01	01
1	33	33rd St	Local	0.01	01
1	34	34th St	Local	0.01	01
1	35	35th St	Local	0.01	01
1	36	36th St	Local	0.01	01
1	37	37th St	Local	0.01	01
1	38	38th St	Local	0.01	01
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1	40	40th St	Local	0.01	01
1	41	41st St	Local	0.01	01
1	42	42nd St	Local	0.01	01
1	43	43rd St	Local	0.01	01
1	44	44th St	Local	0.01	01
1	45	45th St	Local	0.01	01
1	46	46th St	Local	0.01	01
1	47	47th St	Local	0.01	01
1	48	48th St	Local	0.01	01
1	49	49th St	Local	0.01	01
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1	65	65th St	Local	0.01	01
1	66	66th St	Local	0.01	01
1	67	67th St	Local	0.01	01
1	68	68th St	Local	0.01	01
1	69	69th St	Local	0.01	01
1	70	70th St	Local	0.01	01
1	71	71st St	Local	0.01	01
1	72	72nd St	Local	0.01	01
1	73	73rd St	Local	0.01	01
1	74	74th St	Local	0.01	01
1	75	75th St	Local	0.01	01
1	76	76th St	Local	0.01	01
1	77	77th St	Local	0.01	01
1	78	78th St	Local	0.01	01
1	79	79th St	Local	0.01	01
1	80	80th St	Local	0.01	01
1	81	81st St	Local	0.01	01
1	82	82nd St	Local	0.01	01
1	83	83rd St	Local	0.01	01
1	84	84th St	Local	0.01	01
1	85	85th St	Local	0.01	01
1	86	86th St	Local	0.01	01
1	87	87th St	Local	0.01	01
1	88	88th St	Local	0.01	01
1	89	89th St	Local	0.01	01
1	90	90th St	Local	0.01	01
1	91	91st St	Local	0.01	01
1	92	92nd St	Local	0.01	01
1	93	93rd St	Local	0.01	01
1	94	94th St	Local	0.01	01
1	95	95th St	Local	0.01	01
1	96	96th St	Local	0.01	01
1	97	97th St	Local	0.01	01
1	98	98th St	Local	0.01	01
1	99	99th St	Local	0.01	01
1	100	100th St	Local	0.01	01



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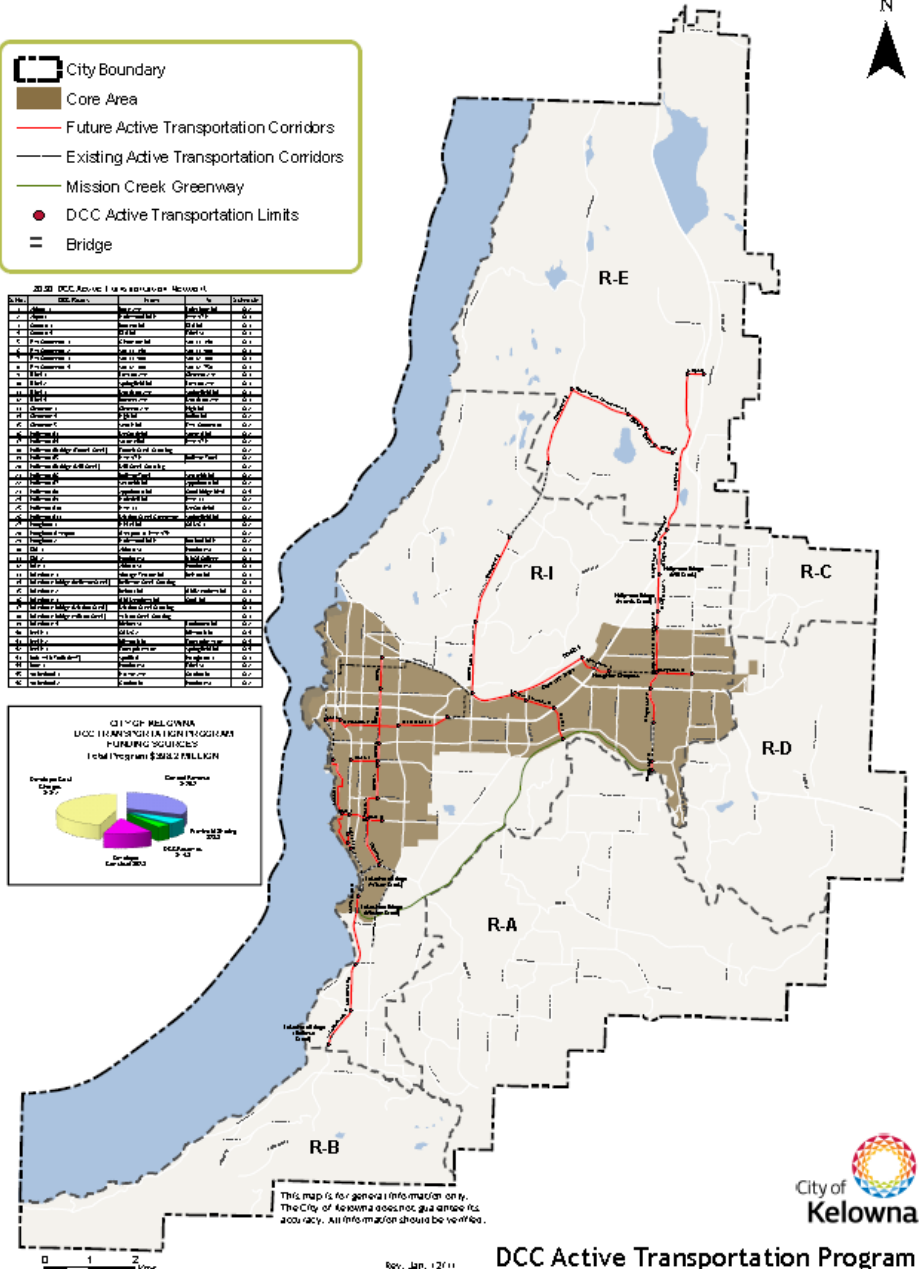
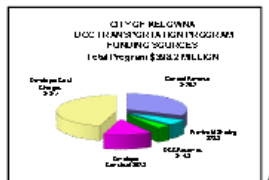
City of Kelowna

DCC Roads Program

- City Boundary
- Core Area
- Future Active Transportation Corridors
- Existing Active Transportation Corridors
- Mission Creek Greenway
- DCC Active Transportation Limits
- Bridge

2020 DCC Active Transportation Inventory

CD No.	CD Name	CD Type	%	Start of Calendar
1	1st St	Local	0.01	01
1	2nd St	Local	0.01	01
1	3rd St	Local	0.01	01
1	4th St	Local	0.01	01
1	5th St	Local	0.01	01
1	6th St	Local	0.01	01
1	7th St	Local	0.01	01
1	8th St	Local	0.01	01
1	9th St	Local	0.01	01
1	10th St	Local	0.01	01
1	11th St	Local	0.01	01
1	12th St	Local	0.01	01
1	13th St	Local	0.01	01
1	14th St	Local	0.01	01
1	15th St	Local	0.01	01
1	16th St	Local	0.01	01
1	17th St	Local	0.01	01
1	18th St	Local	0.01	01
1	19th St	Local	0.01	01
1	20th St	Local	0.01	01
1	21st St	Local	0.01	01
1	22nd St	Local	0.01	01
1	23rd St	Local	0.01	01
1	24th St	Local	0.01	01
1	25th St	Local	0.01	01
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1	27th St	Local	0.01	01
1	28th St	Local	0.01	01
1	29th St	Local	0.01	01
1	30th St	Local	0.01	01
1	31st St	Local	0.01	01
1	32nd St	Local	0.01	01
1	33rd St	Local	0.01	01
1	34th St	Local	0.01	01
1	35th St	Local	0.01	01
1	36th St	Local	0.01	01
1	37th St	Local	0.01	01
1	38th St	Local	0.01	01
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1	64th St	Local	0.01	01
1	65th St	Local	0.01	01
1	66th St	Local	0.01	01
1	67th St	Local	0.01	01
1	68th St	Local	0.01	01
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1	72nd St	Local	0.01	01
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1	74th St	Local	0.01	01
1	75th St	Local	0.01	01
1	76th St	Local	0.01	01
1	77th St	Local	0.01	01
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1	80th St	Local	0.01	01
1	81st St	Local	0.01	01
1	82nd St	Local	0.01	01
1	83rd St	Local	0.01	01
1	84th St	Local	0.01	01
1	85th St	Local	0.01	01
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1	87th St	Local	0.01	01
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1	93rd St	Local	0.01	01
1	94th St	Local	0.01	01
1	95th St	Local	0.01	01
1	96th St	Local	0.01	01
1	97th St	Local	0.01	01
1	98th St	Local	0.01	01
1	99th St	Local	0.01	01
1	100th St	Local	0.01	01



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City of Kelowna

DCC Active Transportation Program

DCC NETWORK

LAKESHORE ROAD: CURRENT FUNCTIONS

- 1 of 2 Arterials to South Mission
- Connector (Pandosy, KGH, 97, Transit)
- Active Transportation Arterial
- Resort Route (Beaches, Greenway, Wineries)
- Designated Truck Route (Barnaby-KLO)

DESIGN OBJECTIVES:

- ▶ Accommodate planned traffic demand: efficiently, safely
 - ▶ Alternatives
 - ▶ Avoid diverted and induced traffic
- ▶ Maintain Lakeshore-Resort Character
- ▶ Kelowna General Hospital Traffic Strategy
- ▶ Greenway and Active Transportation Network integration
- ▶ Improve balance of modal splits
- ▶ Encourage healthy lifestyle choices - a livable, walkable city
- ▶ Environmental: Green House Gas, Vehicle Kilometres Traveled
- ▶ Healthy Community: walk-ability and active mobility

MATURING OF CITIES AND PUBLIC HEALTH

- ▶ *"Many would be surprised to learn that the greatest contribution to the health of the nation over the past 150 years was made not by doctors or hospitals but by local government."*

"The Health of a City" by Dr. Jessie Parfitt - a public health physician from Oxford, England

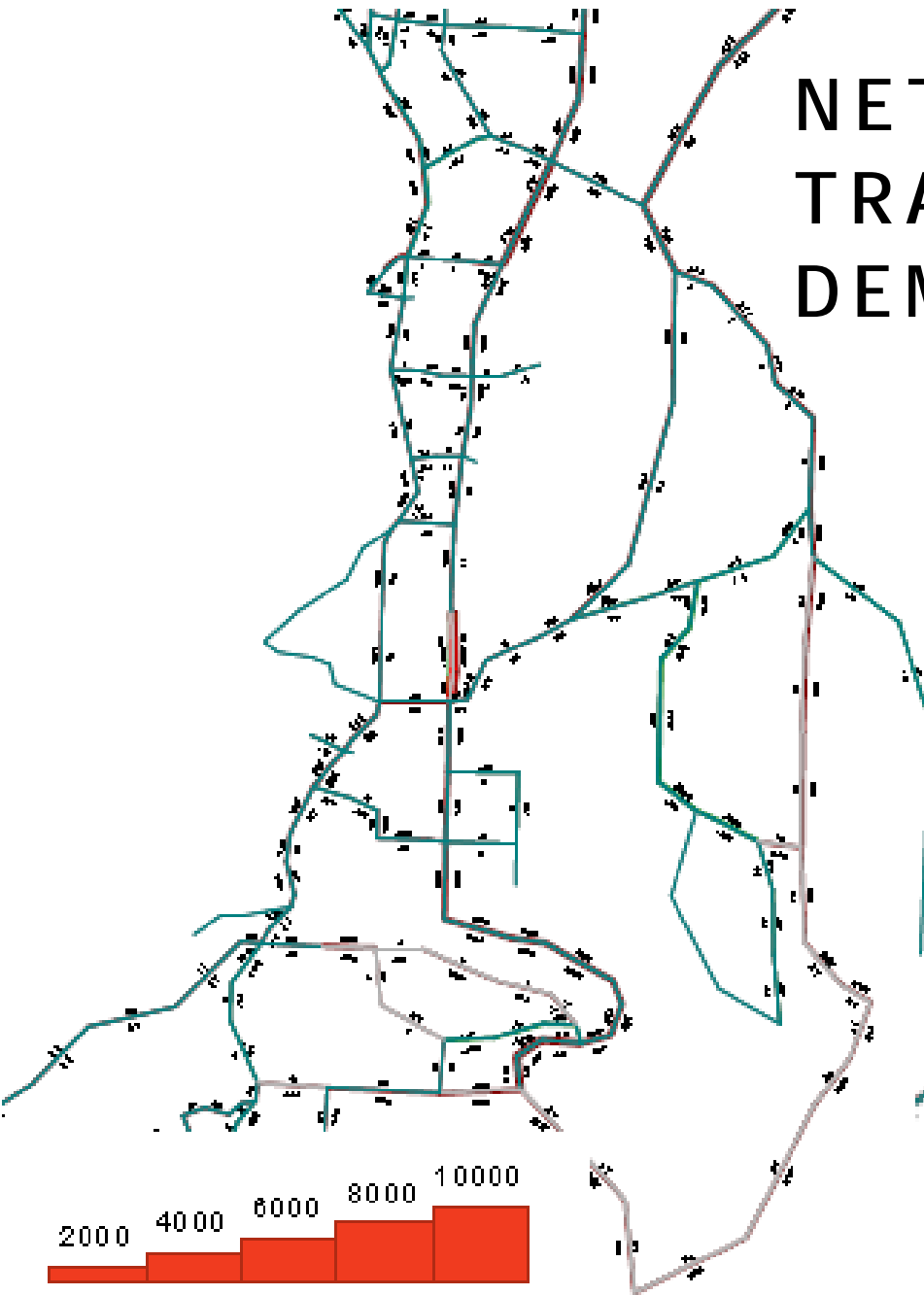
OBESITY

- ▶ More than one in four adults in Canada are obese.
- ▶ The proportion of obese children has nearly tripled in the last 25 years. In 2004, 29.2% of Canadian youth ages 12-17 years were classified as overweight or obese.
- ▶ Obesity is considered the 'new tobacco'
- ▶ Every additional 30 minutes a person spends in a car translates into a 3 percent greater chance of being obese.

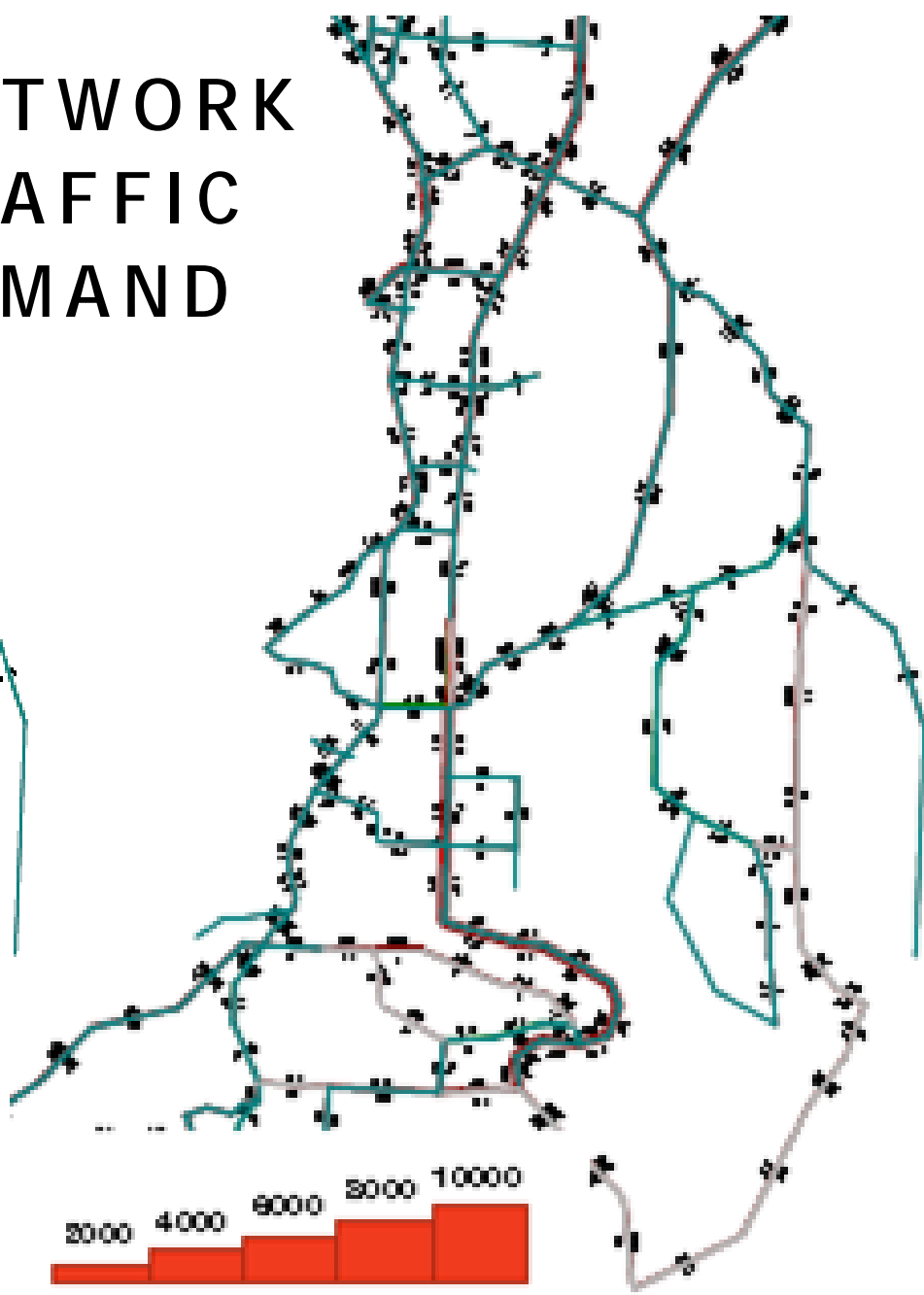
NETWORK STRATEGIES FOR LAKESHORE

- ▶ **Alternative routes** (South Perimeter-Stewart)
- ▶ **Redistribution** (Dehart, Frost 1)
- ▶ **Modal split**
- ▶ **Optimize use of existing infrastructure**

NETWORK TRAFFIC DEMAND



[auto volume] volau



[auto volume] volau

LAKESHORE - AM PEAK TRAFFIC

Section	Southbound		Northbound	
	<u>2011 Count</u>	<u>2030 Forecast</u>	<u>2011 Count</u>	<u>2030 Forecast</u>
Richter - Barrera	428	509	836	720
Barrera - Cook	437	587	792	985
Cook - Lexington	384	366	626	570

LAKESHORE - PM PEAK TRAFFIC

Section	Southbound		Northbound	
	<u>2011 Count</u>	<u>2030 Forecast</u>	<u>2011 Count</u>	<u>2030 Forecast</u>
Richter - Barrera	958	1138	584	591
Barrera - Cook	863	955	628	896
Cook - Lexington	803	897	601	361

1 Travel lane in each direction sufficient for 2030 demand

SEATTLE ROAD DIET DATA

Roadway Section	Date Changed	ADT Before	ADT After	Changes Made
Greenwood Ave. N (N 80 th St, - N 50 th St.)	Apr 1995	11,872	12,427	4 lanes to 2 lanes plus TWLTL plus bike lanes
N 45 th St. (Wallingford area)	Dec 1972	19,421	20,274	4 lanes to 2 lanes plus TWLTL
8 th Ave. NW (Ballard area)	Jan 1994	10,549	11,858	4 lanes to 2 lanes plus planted median with turn pockets as needed
Martin Luther King Jr. Way (north of I-90)	Jan 1994	12,336	13,161	4 lanes to 2 lanes plus TWLTL plus bike lanes
Dexter Ave. N (E side of Queen Anne area)	Jun 1991	13,606	14,949	4 lanes to 2 lanes plus TWLTL plus bike lanes
24 th Ave. NW (NW 85 th St. - NW 65 th St.)	Oct 1995	9,727	9,754	4 lanes to 2 lanes plus TWLTL
Madison St. (7 th Ave. - Broadway)	Jul 1994	16,969	18,075	4 lanes to 2 lanes plus TWLTL
W Government Way/ Gilman Ave. W (W Ruffner St. - 31 st Ave. W)	Jun 1991	12,916	14,286	4 lanes to 2 lanes plus TWLTL plus bike lanes
12 th Ave. (Yesler Way - John St.)	Mar 1995	11,751	12,557	4 lanes to 2 lanes plus TWLTL plus bike lanes

BENEFITS OF 2-LANES + LEFT TURN RELATIVE TO 4-LANES

- ▶ Removes left turning vehicles from through lanes
 - ▶ Reduces delay to through vehicles
 - ▶ Reduces rear-end and sideswipe collisions
- ▶ Provides spatial separation between opposing lanes reducing head-on collisions
- ▶ Functions as emergency vehicle lane
- ▶ Functions as passing lane when buses stopped or vehicle stalled in through lane
- ▶ Simplifies traffic control when maintenance or construction requires lane closure
- ▶ ROW normally taken by 4th vehicle travel lane is available for active transportation

ENTERPRISE AM PEAK TRAFFIC

Section	East/Northbound		West/Southbound	
	<u>2008</u>	<u>2012</u>	<u>2008</u>	<u>2012</u>
Spall - Hardy	1097	694	616	688
Hardy - Cooper	1126	679	609	651
Cooper - Dilworth	672	572	643	583
Dilworth - Leckie	656	565	569	678
Leckie - Banks	707	527	695	540
Banks - Highway 33	554	608	710	581

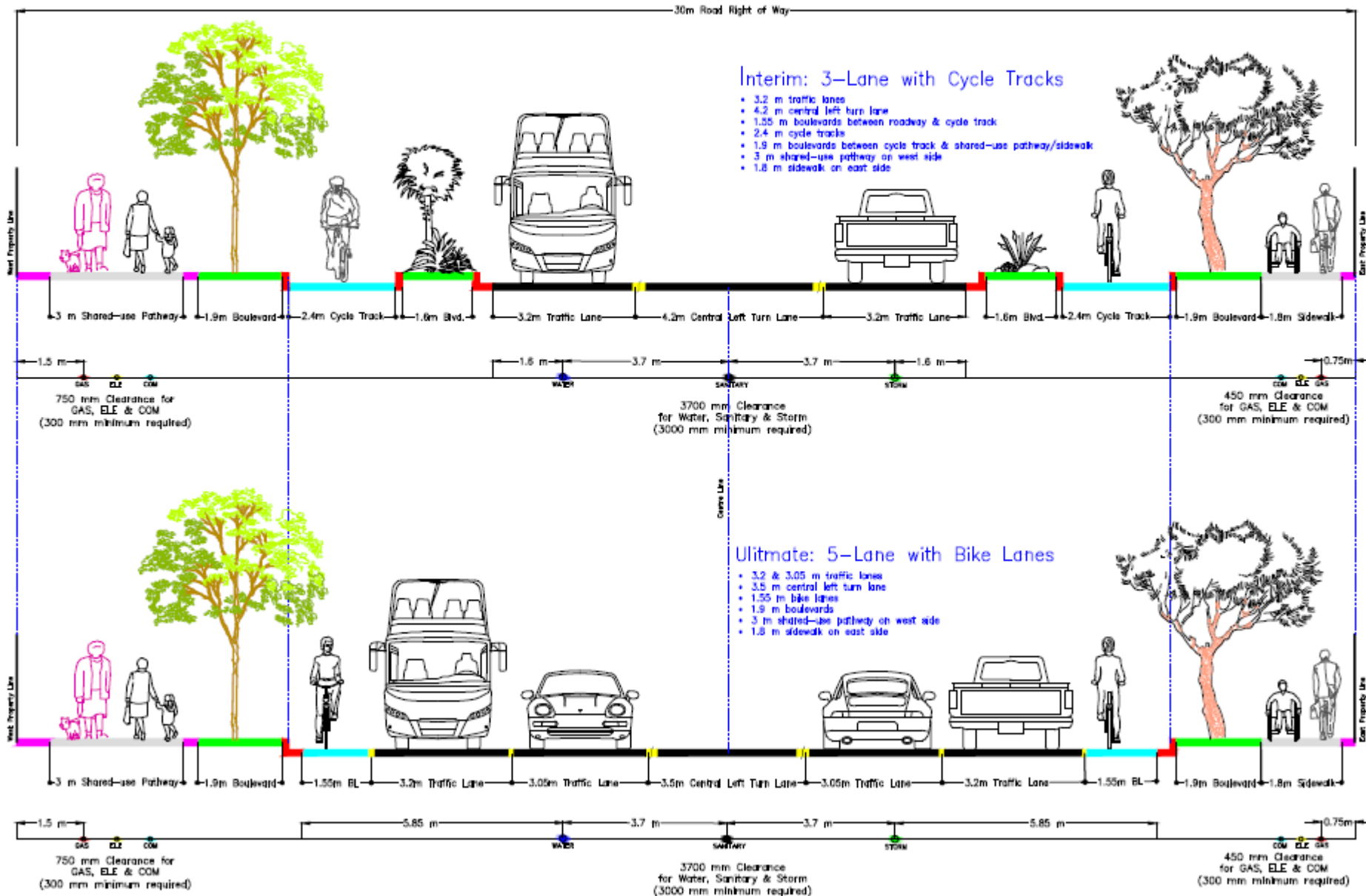
ENTERPRISE PM PEAK TRAFFIC

Section	East/Northbound		West/Southbound	
	2008	2012	2008	2012
Spall - Hardy	1177	828	896	1011
Hardy - Cooper	1245	1013	899	954
Cooper - Dilworth	907	895	838	834
Dilworth - Leckie	825	831	804	858
Leckie - Banks	889	837	780	842
Banks - Highway 33	971	845	688	618

CONSISTENCY

- ▶ 2011-15: Richter-Old Meadows
- ▶ 2016-20: Lanfranco-Richter
- ▶ 2021-25: Old-Meadows-Dehart
Dehart-Vintage Terrace
- ▶ 2026-30: Vintage Terrace - Barnaby

DESIGN FLEXIBILITY



NEXT STEPS

- ▶ Complete preliminary engineering (USL)
- ▶ Return to public and Council
- ▶ Confirm land acquisitions
- ▶ Proceed based on grant or funding

SUSTAINABLE KELOWNA

- ▶ To support sustainability, Kelowna will: Design transportation routes to prioritize investment in transit, pedestrians and bicycle infrastructure in order to increase mobility choices for residents and minimize the use of single occupancy vehicles --- one of the largest producers of greenhouse gases;