Report to Council

Date: August 12, 2019

To: Council

From: City Manager

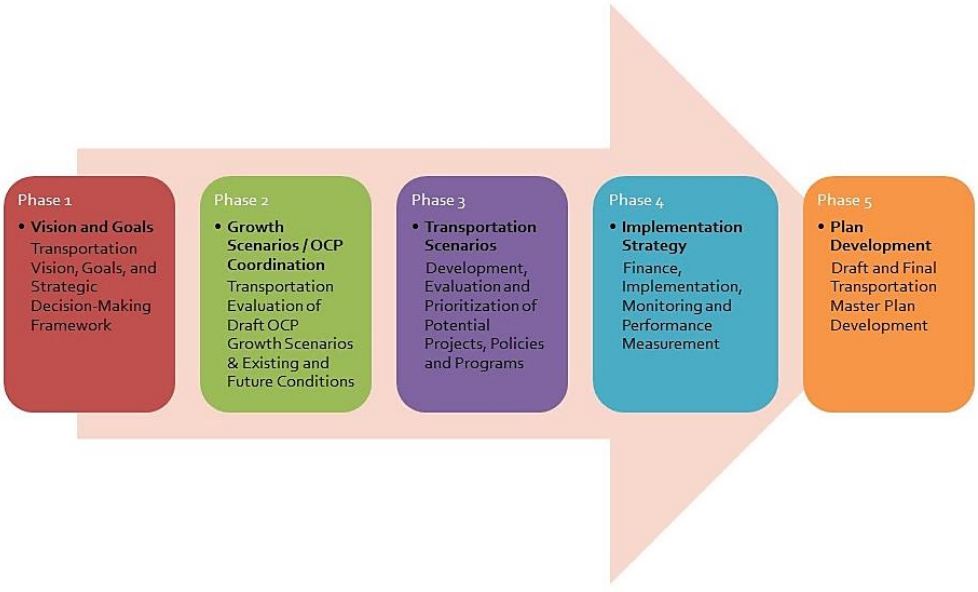
Subject: Transportation Master Plan: Problem Identification and Existing and Future Conditions Technical Report

Department: Integrated Transportation

Recommendation:
THAT Council receives, the report from the Integrated Transportation Department dated August 12th, 2019, with respect to the Existing and Future Conditions Technical Report for the Transportation Master Plan.

Purpose:
To provide Council with an overview of existing and projected future transportation conditions, along with a summary of future challenges and opportunities to be addressed in the upcoming Transportation Master Plan.

Background:
Development of the Transportation Master Plan – our Kelowna as we Move was launched in 2018 and is being developed in five phases.



Phase 1 began by developing a vision and goals for the Transportation Master Plan (TMP), derived from Imagine Kelowna and presented to the public during spring 2018. The final vision and associated set of goals that will guide the TMP are below:

TMP Vision:

"Kelowna will be a city with vibrant urban centres where people and places are conveniently connected by diverse transportation options that help us transition from our car-centric culture."

TMP Goals:

Phase 1 also included the development of four background "Facts in Focus" topic papers for Transportation. The papers were developed to address questions and themes heard during the spring 2018 TMP public engagement. The paper topics are listed below and are available on the TMP project website.

- Transportation and Land Use
- How Transit can keep Kelowna Moving
- The Congestion Paradox
- Transportation, Technology and our Changing Future

Phase 2 of the TMP involved detailed coordination with the 2040 Official Community Plan (OCP). The TMP team provided support during the development and evaluation of the four different growth scenarios presented as part of the Pick Your Path to 2040 engagement. For each scenario, an assessment to understand the broad impacts of land use choices on the transportation system was developed, including the amount of vehicle travel, mode share, and planning-level cost ranges. On March 3rd, 2019 Council endorsed the preferred Growth Scenario, which serves as the foundation for the Transportation Master Plan moving forward.

Phase 2 also includes the development of an Existing and Future Conditions Technical Report for the Transportation Master Plan. The technical report helps to provide a comprehensive understanding of Kelowna's existing transportation system performance, challenges and opportunities, for all modes, as well as the projected future transportation system performance in 2040 under the endorsed Growth Scenario. The technical report helps bring the issues and challenges that the Transportation Master Plan will need to address into better focus and lays the foundation for the identification of potential

projects, policies and programs that will be needed to achieve Kelowna's vision and goals for transportation in 2040.

Purpose of the Existing and Future Conditions Technical Report:
This Council Report provides a summary of the more detailed Existing and Future Conditions Technical Report. The Existing and Future Conditions Technical Report is intended to be a reference document that can be used as a resource for Council, staff and the public for looking up data related to various aspects of the current and future performance of Kelowna's transportation network. The Existing and Future Conditions Technical Report can be viewed online at: kelowna.ca/transportation2040

Summary of Future Changes:
By 2040, Kelowna is projected to grow by 50,000 residents, from a current population of approximately 130,000 to a future population of approximately 180,000. In accordance with the Imagine Kelowna Vision and the 2040 OCP endorsed Growth Scenario, 67 per cent of residential and 75 per cent of employment growth will be focused in Kelowna's Core Area and five Urban Centres. These are areas of the City where travel options like transit, walking and biking are increasingly becoming viable alternatives to driving. The remaining growth (33 per cent of residential and 25 per cent of employment) will occur in outlying suburban areas, including hillside neighborhoods that are mostly car-dependent. In addition, changes to transportation technology, demographic shifts, and changing weather patterns mean that transportation in 2040 will likely be very different than it is today.

Central Okanagan Regional Travel Model:
To prepare a Transportation Master Plan it is necessary to develop a baseline scenario for the future against which potential investments can be evaluated. To prepare this baseline, staff used the Central Okanagan Regional Travel Model, which is a traditional transportation planning tool that uses assumptions about population growth, land use and the transportation network to estimate future vehicle traffic volumes. In addition, the transportation model also considers human factors, including resident travel behaviors and travel mode choices when generating projections, making it more complex and less flexible than other infrastructure/utility forecasting tools. In regions where most trips are made by cars, travel models are less accurate at projecting future pedestrian, biking and transit trips and impacts. This is because traditional travel models do not account well for potential changes in traffic flow or travel behavior that may result from significant improvements in transportation technology or improvements to the bicycle, pedestrian, transit or shared mobility options available. For emerging transportation technologies, projections are even more limited. Travel model results should be interpreted keeping these limitations in mind.

To create the 2040 TMP Baseline Scenario, the 2040 OCP endorsed Growth Scenario was used in combination with the existing transportation network. A limited number of road improvement projects currently within the 10-Year Capital Plan were also included. These have an approximate value of $43 million and include projects that are currently underway and/or very likely to be constructed by 2040, such as South Perimeter Road. This approach of including some, but not all, of the improvements in the 10-year Capital Plan represents a balance between a no future improvement scenario (which would have resulted in an overly pessimistic projection of the future), and a scenario that included all currently planned projects (which would have left the TMP without much flexibility to address emerging issues). Projects not included in the 2040 TMP Baseline Scenario will be considered as part of the TMP evaluation process.

2040 TMP Baseline Scenario:
Overall, the 2040 TMP Baseline Scenario reflects a future in which Kelowna grows in accordance with the 2040 OCP Growth Scenario, but does so in the absence of a Transportation Master Plan to guide future investment in infrastructure, policies and programs. Travel behaviors are assumed to remain the same as today and are estimated primarily as a function of travel time and cost. Traffic volume estimates are for the weekday afternoon peak, which typically represents the most congested period on Kelowna's transportation network. The purpose of creating this scenario is not to predict the future, but rather to create a baseline for the identification and evaluation of potential investments during Phase 3 of the Transportation Master Plan.

Citywide Results: Under the Baseline Scenario it is projected that 58 per cent of the intersections in this study would be at or over capacity in 2040 (compared to 10 per cent today). Additionally, the total amount of vehicle kilometres travelled (VKT) in the City would grow by approximately 40 per cent, total vehicle hours (time spent driving) would grow by approximately 70 per cent, and average travel speeds would fall by approximately 15 per cent. The greater increase in vehicle hours travelled compared to vehicle kilometres travelled, as well as the reduction in average travel speeds, indicates greater levels of traffic congestion under this future scenario.

To put this in context, Kelowna's population is projected to grow by 39 per cent over the same period. While total VKT is projected to increase in pace with population growth, VKT per capita is projected to fall by 5 per cent. This decrease reflects the endorsed Growth Scenario's focus on targeting future growth in Kelowna's Core Area and Urban Centres. As travel distances shorten, people living and/or working in the Core Area and Urban Centres will be able to walk, bike or take transit more easily, and when they do drive, they will not have to drive as far as residents living in car-dependent hillside neighbourhoods on the edge of town. While the total amount of VKT and congestion levels are still projected to increase citywide, the increase will be much less than it would have been under a more dispersed growth scenario.

Subarea Results: The 2040 TMP Baseline Scenario shows that future travel demand and traffic patterns will vary in different parts of the City. Some future trips will be inherently car-dependent, while others will be easier to accommodate using more space-efficient and sustainable travel modes. Overall, traffic is projected to become busier and more complex within the Core Area, where residents commuting in and out of car-dependent hillside neighbourhoods will compete for limited roadway space with Core Area residents who will have options to get around using a variety of travel modes. More focused projections of future travel patterns in different subareas of the City are provided in the Driving Chapter of the Existing and Future Conditions Technical Report.[1]

What is Traffic Congestion?
With traffic levels projected to increase under the 2040 TMP Baseline Scenario, it is important to understand what traffic congestion is and potential options for managing it effectively. In economic terms, traffic congestion happens when the demand for roadway space exceeds the supply. Due to the way society is organized, this typically occurs during the morning and afternoon peaks when most people need to travel to work and/or school at the same time. This means that increasing congestion levels are often a sign of a growing, vibrant and economically productive city. In fact, traffic levels often

[1] See the Driving Chapter section titled "Future Traffic Conditions – the 2040 Baseline Scenario"

become heaviest when the economy is booming and notably recline during a recession[2]. As such, one way to view traffic congestion is as a sign of prosperity and economic success, rather than a wholly negative phenomenon.

However, nobody likes being stuck in traffic. Inching along congested roads in a vehicle capable of going over 100 kilometres an hour is an inherently frustrating experience. Often the response by communities to growing traffic congestion is to increase roadway capacity by building new roads and widening existing ones. However, as discussed in The Congestion Paradox Facts in Focus discussion paper, this approach can be expensive and ineffective over the long-term, with negative community impacts.

In Kelowna, the construction of new roads is constrained by steep hillsides, Okanagan Lake and protected agricultural lands. In the Core Area, there is little room to widen roads without buying land, tearing down homes, or disrupting local businesses. This would be expensive and physically divide existing, established neighbourhoods, making Kelowna a less attractive and healthy place to live. On average, the cost to widen a major road in the Core Area is estimated at $26 million per kilometer (but could be much higher where impacts to adjacent properties are significant). This means that substantial tax increases or new sources of revenue would be needed to try and build our way out of congestion.

Even if the space and funds were available, expanding roadways often reduces congestion to a smaller degree, and for less time, than initially expected. This is because when a new road opens, or an existing road is expanded, people typically respond by shifting routes, traveling at different times, traveling more often, or even relocating where they live or work. These effects are more prominent where new roads significantly reduce travel times between locations. This rebound effect, called "induced demand" by economists, can reduce the long-term congestion mitigation effects of roadway expansion projects[3], often eroding the benefits they originally sought to achieve.

While free-flow automobile travel during the morning or afternoon peaks may not be achievable in a rapidly-growing, economically successful city[4] like Kelowna, there are still a number of strategies that can be implemented to help reduce the rate at which traffic congestion intensifies. Strategies to help manage and minimize the growth of traffic congestion will be explored as part of the Transportation Master Plan.

Keeping Kelowna Moving:
One of the most effective long-term congestion mitigation strategies is to reduce auto-dependence by providing more convenient and realistic alternatives for getting around, especially during the morning and afternoon peaks. This requires a coordinated approach to land use and transportation that shortens trip distances and creates complete, connected and safe bicycle, pedestrian and transit networks between residential and commuting destinations.

Mode Shift: To help keep Kelowna moving, it will be necessary to shift as many future trips as possible to more sustainable transportation modes that can move more people in the same amount of space.

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[2] Downs, A. (2014). Still Stuck in Traffic: Coping with Peak Hour Traffic Congestion
[3] Ewing, R. & Proffitt, D. (2016). Improving Decision Making for Transportation Capacity Expansion: Qualitative Analysis of Best Practices for Regional Planning. Transportation Research Record, 2568, p.1
[4] Downs, A. (2014). Still Stuck in Traffic: Coping with Peak Hour Traffic Congestion

The best opportunities for mode shift will be within the Urban Centres and the Core Area, where the terrain is relatively flat, and some supporting infrastructure for walking, biking and transit is already available. Increased densification will result in shorter trip distances, thus removing the primary barrier to walking and biking for nearby residents. If the City takes consistent and complementary action to ensure the transportation network provides safe, attractive and convenient infrastructure for walking, biking and transit in these densifying areas, the number of trips that are shifted to these modes can be maximized. This will help prioritize road space for trips that must be made by driving, while giving Kelowna residents more choices for getting around.

A Well-Connected, Complete Urban Street Network**:** Developing a permeable, well-connected and complete urban street network will also be important to keep Kelowna moving. Within the Core Area, where streets will be the busiest, streets with high traffic volumes, long blocks and limited crossings will make it challenging to accommodate growing numbers of people walking, cycling and riding transit. Additionally, streets with high vehicle speeds will require greater space and separation for people to walk and bike safely. To maximize the people-moving capacity in the Core Area and within our Urban Centres, it will be necessary to re-think our existing streets and roadway network. Developing a well-connected grid network of streets that are designed to accommodate growing numbers of people walking, biking, taking transit and driving in the future will be important.

A Progressive Approach to Congestion: As discussed in Appendix A of the Existing and Future Conditions Technical Report, it will be important to seek out *healthy levels of congestion (*congestion levels that are neither impractically low nor too excessive) to keep Kelowna moving while also achieving the City's vision and goals for transportation. This approach will ensure that the unintended negative consequences of building too much road capacity is minimized, while ensuring that investments in effective infrastructure are maximized.

Future Challenges / Opportunities:
To keep Kelowna moving, staff have identified 30 future challenges and opportunities around the themes of mode shift, developing a well-connected urban street network, and identifying a progressive approach to congestion management. These have been developed based on the review of existing and future conditions and are intended to work together to guide the development of potential projects, policies and programs to meet Kelowna's vision and goals for transportation. Each future challenge is also envisioned as an opportunity; that is – they are two different sides of the same coin. The future challenges and opportunities are listed below. Further details can be found in Chapter 4 of the Existing and Future Conditions Technical Report.

Report Chapter		Future Challenge / Opportunity
4a) Walking	1	Design for Walkability in the Urban Centres
	2	Connect the Pedestrian Network in the Core Area
	3	Shift Short Trips to Walking
	4	Ensure People Walking Feel Safe
	5	Create Flexible and Adaptable Pedestrian Spaces
4b) Biking	6	Shift Trips within the Core Area to Biking
	7	Increase Perception of Biking as a Safe Mode of Travel
	8	Make Biking Accessible to More People
	9	Integrate Bicycles with Transit

	10	Build-out a Complete Bicycle Network
4c) Transit	11	Focus Growth near Frequent Transit and Ensure Multimodal Access
	12	Increase Transit Investment where Effective to Serve Growing Demand
	13	Speed Up Transit and Make it More Reliable
	14	Maximize Benefits of Technology Change on Transit
	15	Collect High Quality Data to Support Transit Planning
4d) Driving	16	Growth in Downtown and South Pandosy
	17	Continued Growth in Suburban Hillsides
	18	Increasing Travel Demand through Midtown
	19	Employment Growth Along Highway 97
	20	Reduce the Frequency and Severity of Traffic Collisions
	21	Develop a Well-Connected, Complete Urban Street Network
4e) Shared Mobility	22	Expand and Improve Bikeshare and other Emerging Options
	23	Attract One-way Carshare
	24	Prepare for the Arrival of Ride-Hailing
	25	Prepare for the Arrival of Autonomous Vehicles
4g) Programs	26	Build Community Capacity
	27	Enhance Safe Routes to School
	28	Improve Transit Passes and Payment
	29	Manage the Curb
	30	Move Toward Parking On-Demand

Coordination with Other Plans:
Development of the TMP is occurring in coordination with development of the 2040 OCP and the 2040 Servicing Plan and Financing Strategy. These plans are being developed in parallel using Imagine Kelowna as a foundation, and will work together to support our growing City, while minimizing future challenges. While population growth will necessitate substantial future investment to maintain Kelowna's quality of life, the 2040 OCP endorsed Growth Scenario will help mitigate future costs by focusing transportation and infrastructure investments in locations that benefit a high number of people and yield strong returns on investment.

By focusing growth in the Core Area and Urban Centres and targeting investments to maximize mode shift, the endorsed Growth Scenario and TMP will work together to help address several global and local future challenges as well. In addition to mitigating the rise of traffic congestion, this combined approach can help strategically address other issues such as climate change, housing affordability, and an aging population:

- Climate change: Transportation accounts for the largest share of Kelowna's greenhouse gas emissions (55 per cent as of 2012). Working to reduce VKT and shift modes through combined land use and transportation planning is an effective long-term strategy for reducing transportation-related greenhouse gas emissions and is aligned with Kelowna's Community Climate Action Plan.
- Housing Affordability: While housing costs are typically viewed as the main culprit of an expensive city, transportation-related costs typically reflect the next highest share of a households' budget. Growing and investing in a way that enables households to reduce the cost of owning and

maintaining a vehicle can dramatically reduce a household's combined housing & transportation financial burden.

- Aging Population: Kelowna is projected to have more people in all age categories in 2040, with the greatest increases occurring in the segment of the population over 65 years old. Providing more housing close to services combined with travel options will help Kelowna's older citizens maintain mobility once they can no longer drive.

Public Engagement:
In coordination with the 2040 OCP and 2040 Servicing Plan and Financing Strategy, the TMP is preparing for public engagement in the Fall of 2019. Both online and in-person opportunities will be available for the public to review the TMP Existing and Future Conditions Technical Report, provide input on key issue areas, and share ideas for projects, policies and/or programs they would like considered in the TMP planning process.

Next Steps:
Moving forward, the 30 future challenges and opportunities described in the Existing and Future Conditions Technical Report will be used along with input from the public to identify potential transportation projects, programs and policies for evaluation. These potential options will be shared with Council and the public for input and evaluated using a strategic decision-making framework. Ultimately, the projects, programs, and policies that are projected to do the best job of helping the City reach its vision and goals for transportation will be brought forward as recommendations for consideration by Council. Final endorsement of the Transportation Master Plan is anticipated in summer 2020.

Internal Circulation:
Divisional Director, Infrastructure
Divisional Director, Planning & Development Services
Integrated Transportation Department Manager
Infrastructure Delivery Department Manager
Infrastructure Engineering Manager
Infrastructure Operations Department Manager
Utility Services Manager
Utility Planning Manager
Public Works Manager
Traffic Operations & Technical Support Supervisor
Policy & Planning Department Manager
Development Planning Department Manager
Development Engineering Manager
Parks & Buildings Planning Manager
Parking Services Manager
Community Communications Manager
Transportation Engineering Manager
Transit and Programs Manager
Long Range Policy Planning Manager
OCP Project Planner
Transportation Planner
Transportation Engineer Planning & Development

Active Transportation Coordinator
Sustainability Coordinator
Planner Specialist
Communications Advisor

Considerations not applicable to this report:

Legal/Statutory Authority
Legal/Statutory Procedural Requirements
Financial/Budgetary Considerations
External Agency/Public Comments
Communications Comments

Submitted by:

M. VanZerr, Strategic Transportation Planning Manager

Approved for inclusion: Alan Newcombe, Divisional Directors, Infrastructure

Attachment 1 – TMP Existing and Future Conditions Technical Report Presentation