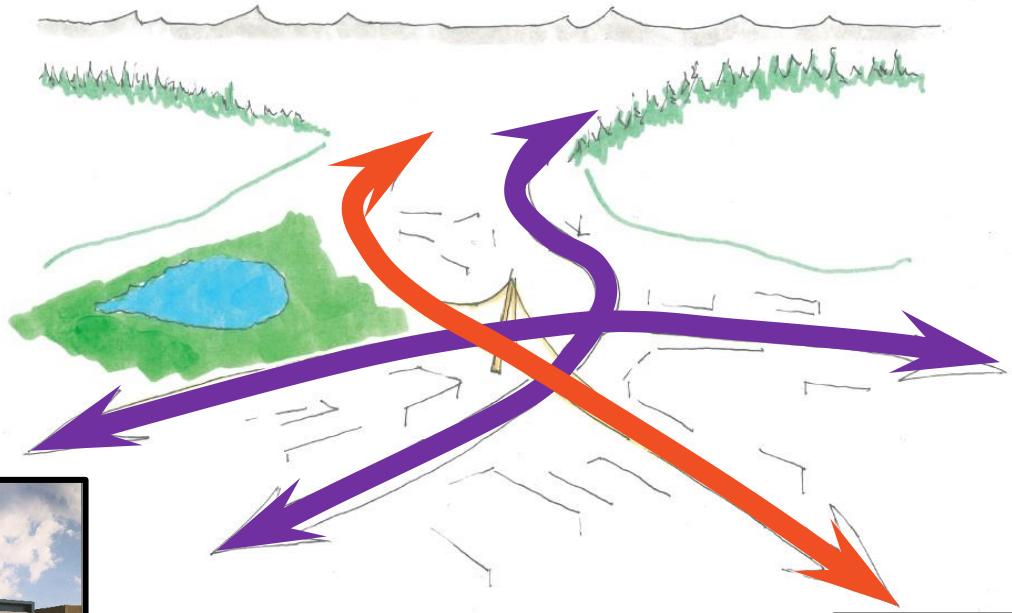
# PROCESS

- Engage the Community:
  - 3 open houses - 01/19, (03/8,  04/13 upcoming)
  - Totem Lake Business Roundtable - 10/2016 (3/2017?)
  - Kirkland Neighborhoods - KAN 1/11 (others as-requested)
  - Outside Agencies/groups – (ST, Cascade BC, Trust Pub Lands, etc)

- Engage the Council:
  - Council study session - 02/07
  - Council Meetings – (3/21, 5/2)

- Engage the Commissions:
  - Cultural Arts – 9/2016 & 2/2017, Transportation – 2/22, Parks - TBD

# CKC MP GOAL: CONNECT KIRKLAND



**Destinations north/east**

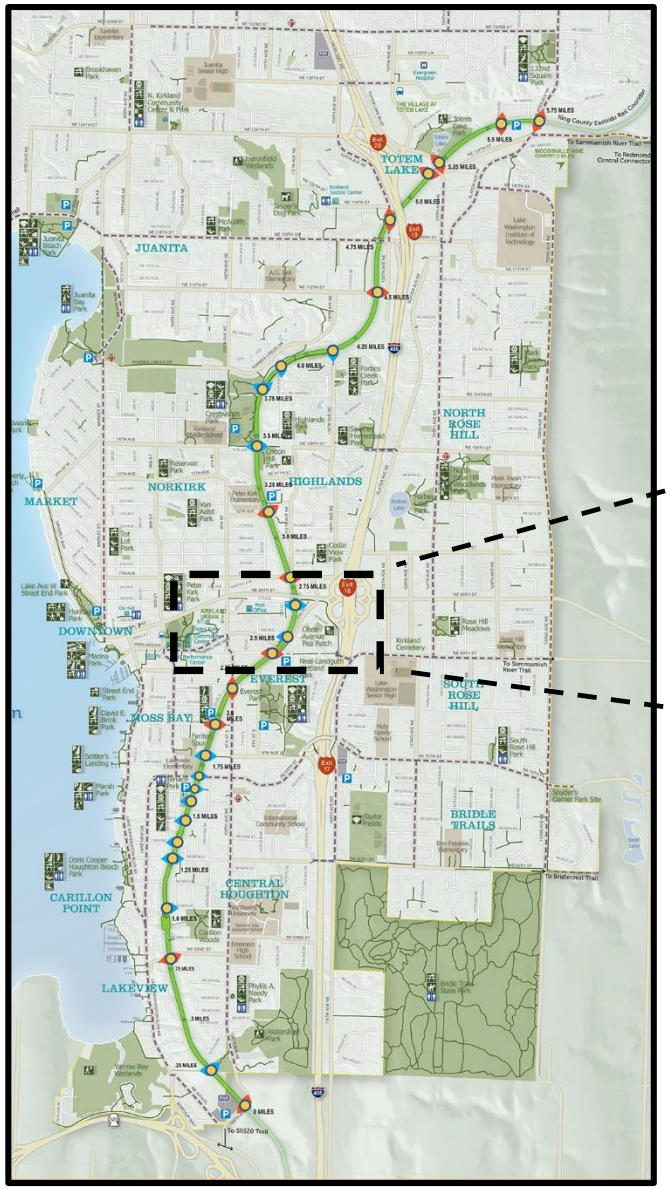
- Woodinville
- Redmond Central Connector
- Sammamish River Trail

**Destinations south**

- Totem Square
- Downtown Kirkland
- Kirkland Urban
- South Kirkland P&R

**CONNECTING THE CITY AND THE REGION!**

# CKC MP GOAL: CONNECT KIRKLAND




**Neighborhood Safety Program funded CKC Connections**

- Stairs from NE 68th Street
- Stairs and bridge connection from 116th Avenue NE
- Improved connection from NE 60th Street
- Walkway Improvement 2nd Ave
- Walkway Improvement 111th Ave NE at CKC
- Walkway Improvement 8th Street South at Railroad Ave
- Trail Connection at Forbes Creek Drive

**CKC Connections funded by other sources**

- Stairs at NE 64th Street and the CKC
- Stairs at Terrace Park
- Stairs at Crestwoods Park/Cotton Hill
- Stairs at NE 55th Street
- Walkway and bridge to the Houghton Shopping Center
- Walkway next to Google from 6th Street
- Walkway next to Google to Lakeview Elementary School
- Walkway next to Google at 7th Street

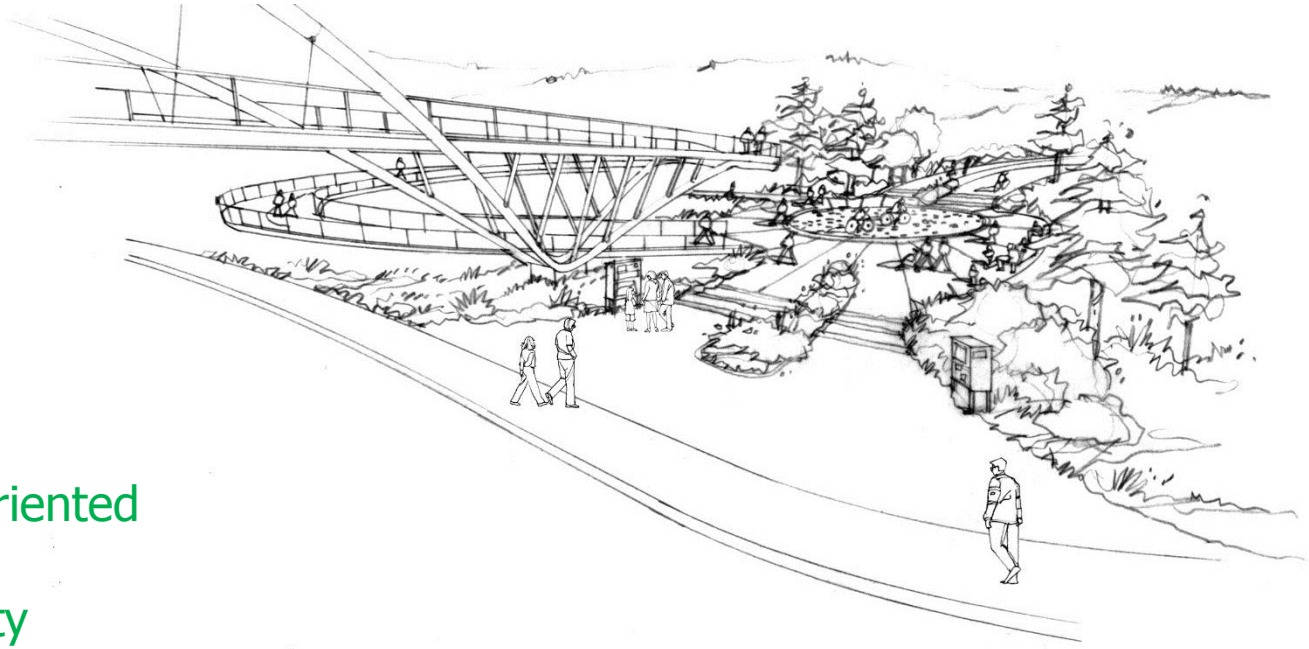
# CKC MP GOAL: SHAPE A PLACE UNIQUE TO KIRKLAND

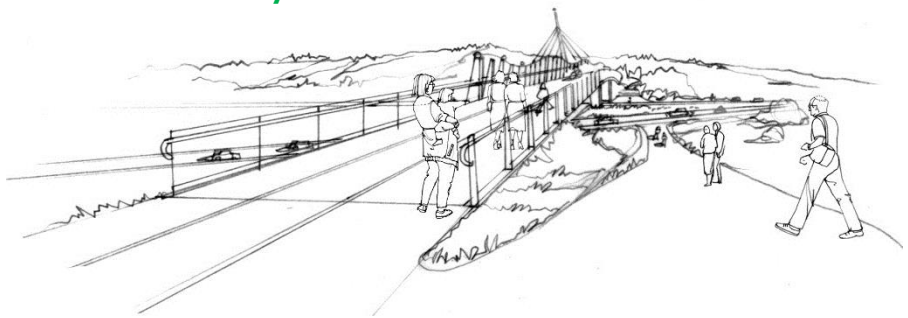
Design Concepts

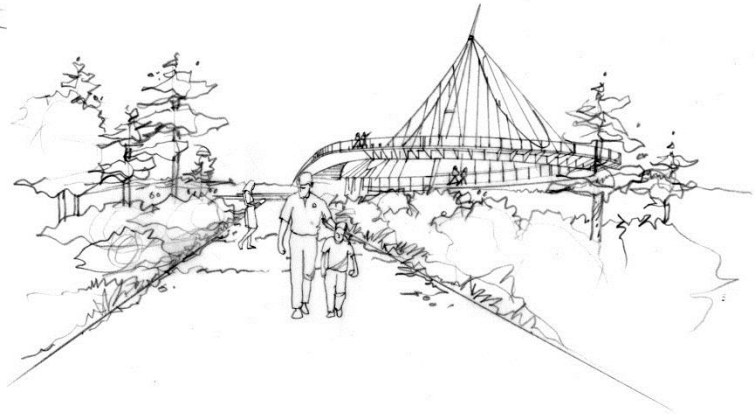
- **Innovative!**
- **Iconic!**
- **Place-Making!**

# CKC MP GOAL: FOSTER A GREENER KIRKLAND

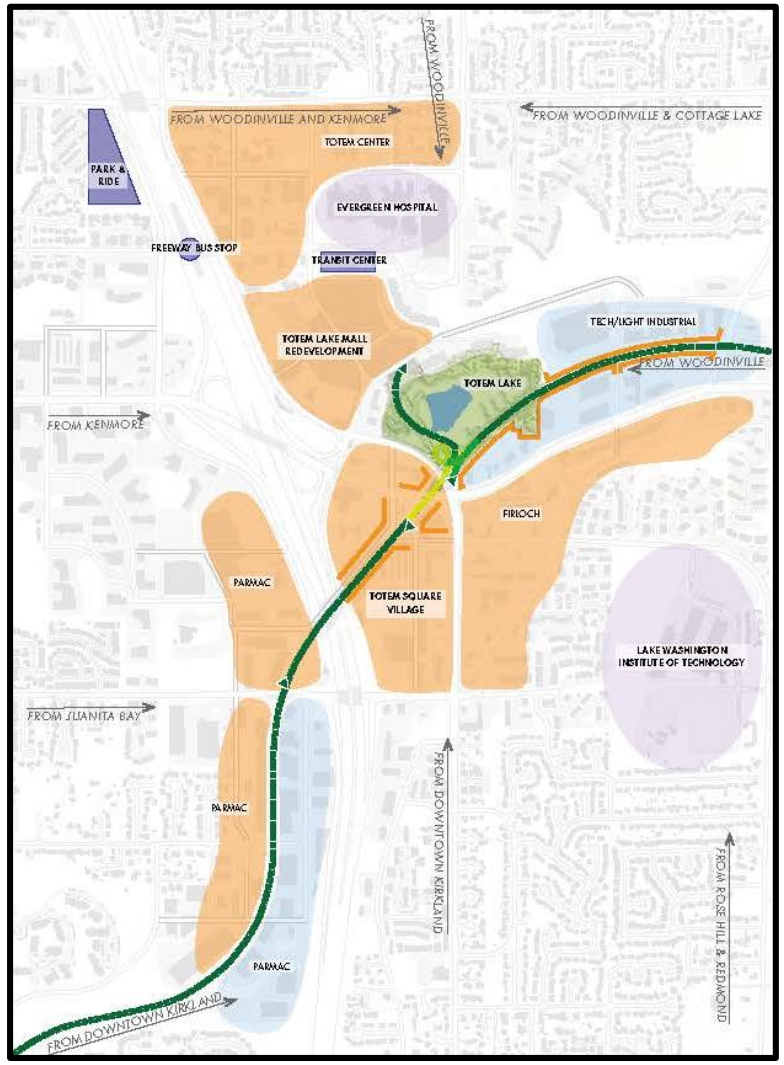
- Walkable
- Natural
- Scenic
- Attractive
- Sense of Place
- Pedestrian/Bike Oriented
- Human Scale
- Transit Connectivity







# CKC MP GOAL:
# ACTIVATE KIRKLAND AND EVOLVE WITH TIME




Totem Lake Comp. Plan

- **Current and Future Developments**
- **Anticipate Future Uses**
- **Understand Connection Needs**
- **Public Driven Design**

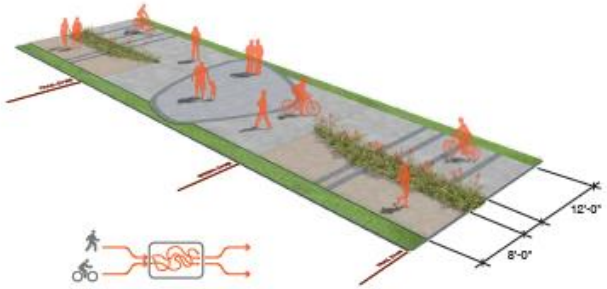
# CKC TRAIL CHARACTERISTICS

## REGIONAL TRAIL NETWORK

## TRAIL TYPES AND ELEMENTS FOR THE CROSS KIRKLAND CORRIDOR (CKC) PER THE MASTER PLAN

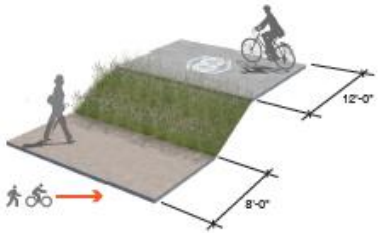
### PRIMARY TRAIL

The primary trail is envisioned as a shared use path that cyclists and pedestrians use, as it will tend to be wide, flat and smooth and will appeal to a wide variety of users. This trail is consistent with the vast majority of the regional trail system.




### MIXING ZONES

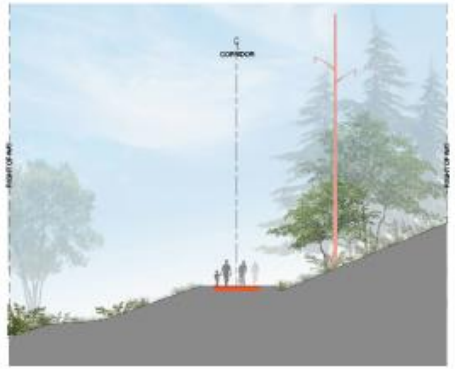
Areas of high activity along the trail corridor, including trail access points, pedestrian crossing points, and when the primary and side trails join apply a kit of parts to intuitively slow and alert trail users to "heads up" moments.




### GRADE TRANSITIONED SIDE TRAIL

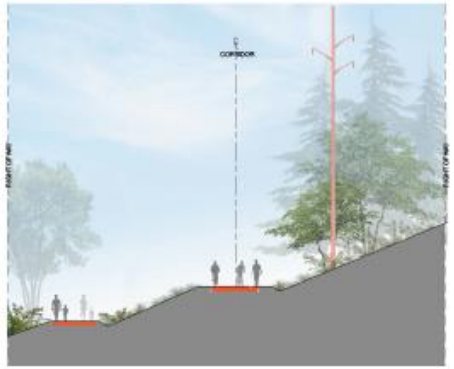
A side, parallel trail may provide an alternate, slower speed, less direct, more interesting and rich route for corridor users.

## REPRESENTATIVE CKC TRAIL CONFIGURATIONS



### NEAR TERM PRIMARY TRAIL

The primary trail is generally assumed to be on the old trackway alignment, on the centerline of the corridor. To provide the 16-foot (or wider) trail envelope, the existing track bed must be widened through a combination of cut/fill grading.



### NEAR TERM PRIMARY TRAIL AND SIDE TRAIL

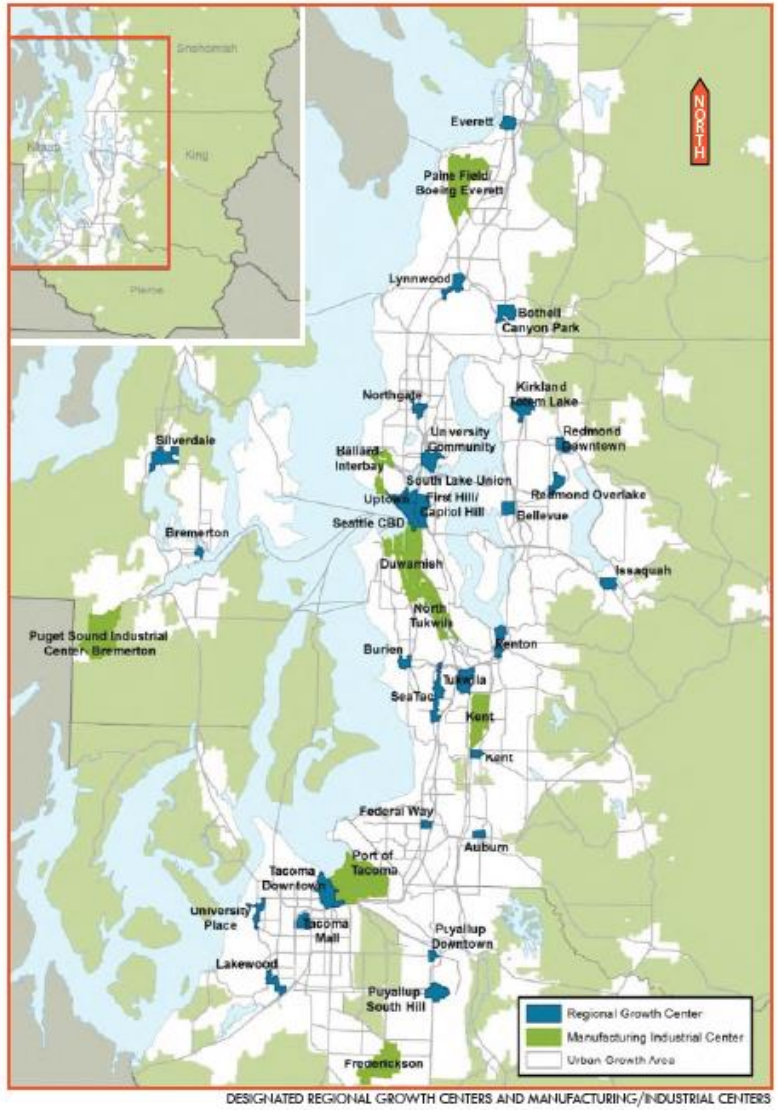
A parallel side trail may be added to the corridor where desired and where space and topography allow.

### LONG TERM TRAIL WITH TRANSIT

The primary trail layout on the historic trackway allows for a future 40-foot transit envelope to be constructed east of the trail envelope. (See the Transit and Utility Study in the appendix of the CKC Master Plan document for more information.)

# PROVIDING CONNECTIONS FOR A GROWING REGION

## PUGET SOUND REGIONAL GROWTH PLAN




DESIGNATED REGIONAL GROWTH CENTERS AND MANUFACTURING/INDUSTRIAL CENTERS

## EMERGING PRIORITIES

### 01 FULFIL THE VISION

Distinguish the CKC as a unique cultural and recreational destination for the community and region. Provide an experience beyond that of a typical regional trail.

### 02 SUPPORT ECONOMIC DEVELOPMENT

Utilize the corridor's development to catalyze economic growth, encouraging residential and commercial development that can charge the corridor and city with energy and vitality.

Totem Lake, 6th Street S, and the Parmac area are re-imagined as an "active zone" in this master plan.

### 03 CONNECT TO REGIONAL TRAILS/TRANSIT

Connecting to new and existing trail/transit facilities will make the CKC available to more users and regional destinations.

Connections to the South Kirkland Park and Ride, Totem Lake Transit Center, the new 520 trail, and Redmond Central Connector.

### 04 NON-MOTORIZED TRANSPORTATION ARTERY

The CKC will connect with significant growth and density high-use areas with unimpeded travel.

Ensuring connections are made with the CKC and key streets, schools, parks, commercial land, and transit will maximize the public benefit.

### 05 SAFETY

The Totem Lake Non-Motorized Bridge project will prioritize projects that significantly improve safety by providing CKC users with a grade separated crossing of 124th Avenue NE and NE 124th Street.

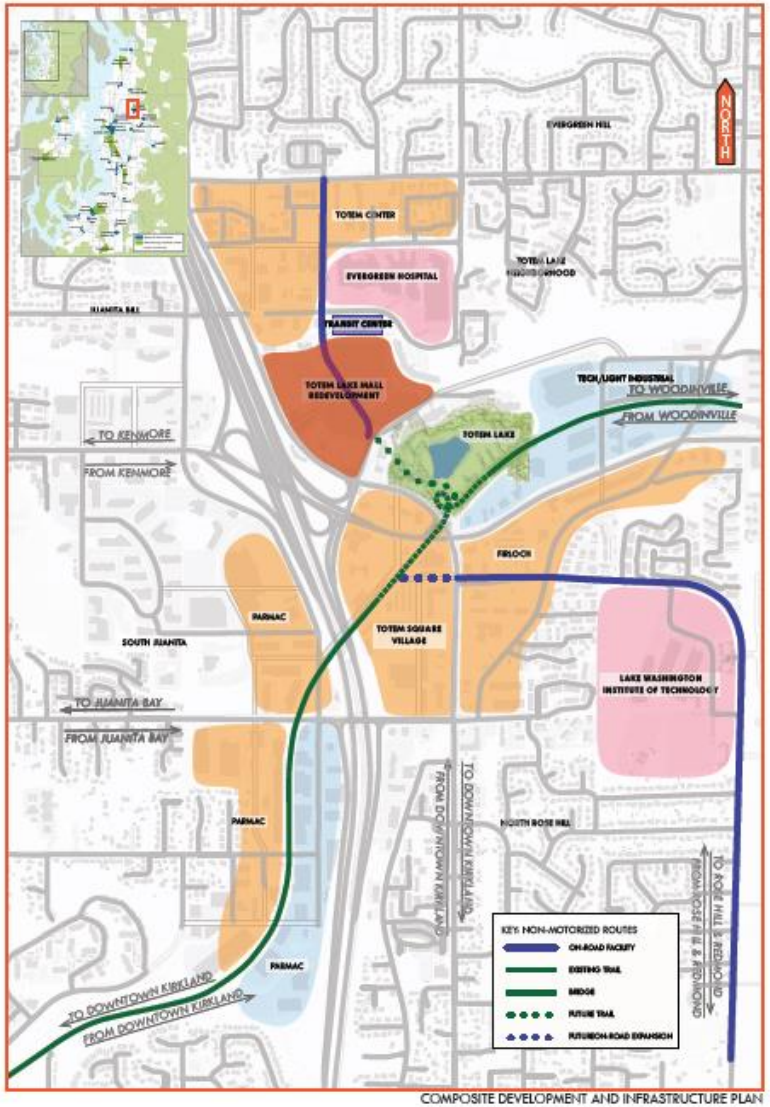
A convenient, direct link between the currently disconnected CKC Trail segments will greatly increase the functionality of the trail and will attract users.

The CKC Trail is a fully off-street facility that provides non-motorized commuters with a safe route to regional destinations.

### 06 CREATE A DESTINATION

The CKC and Totem Lake Non-Motorized Bridge are envisioned to become destinations. This linear 'park,' with the future redevelopment of Totem Lake PAnk provides Kirkland residents and visitors with superb recreational opportunities and an enjoyable environment to travel within and between places.

## TOTEM LAKE GROWTH PLAN




COMPOSITE DEVELOPMENT AND INFRASTRUCTURE PLAN

# BRIDGE GOALS, ALIGNMENT, AND EXPERIENCE

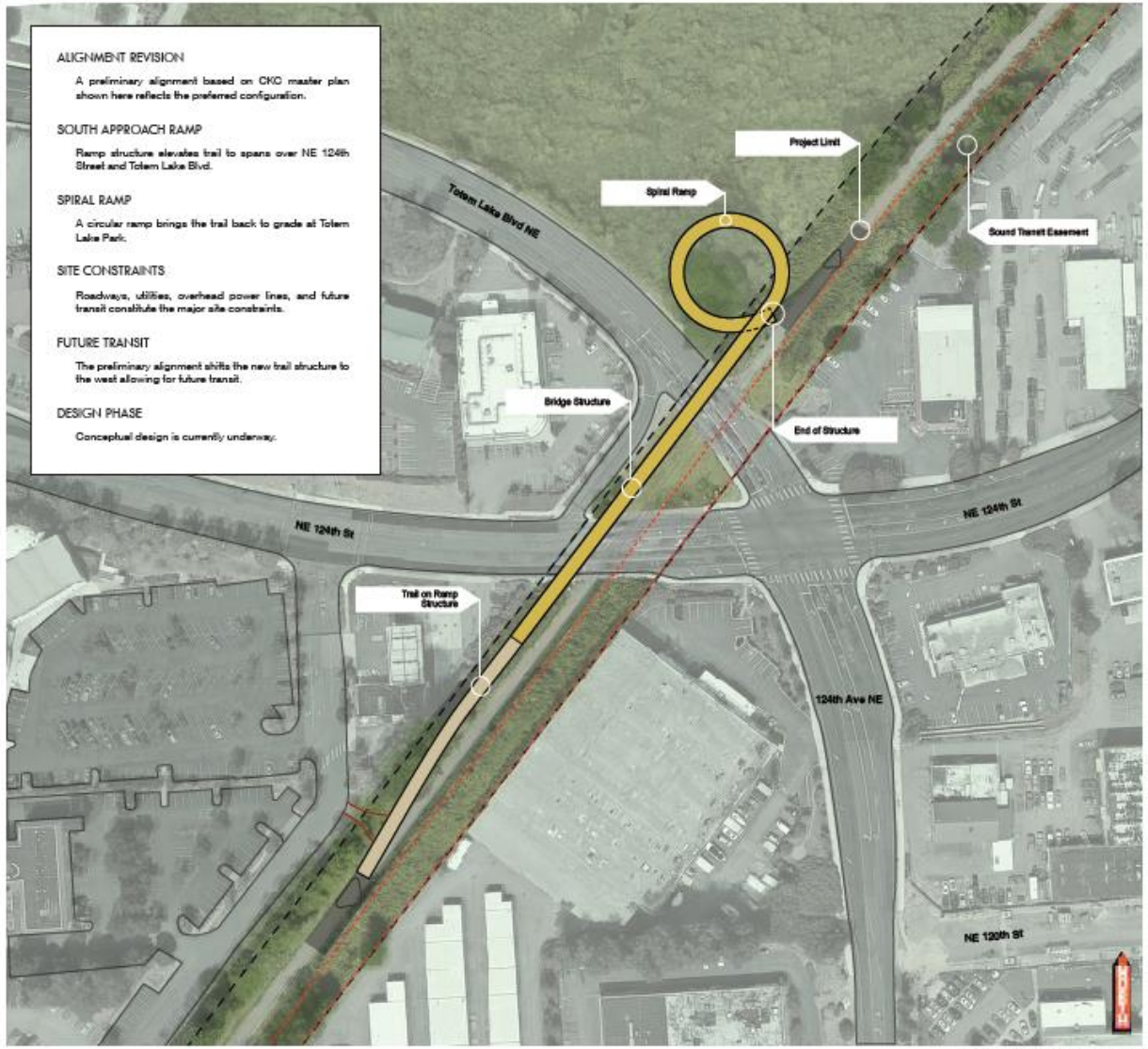
## PROJECT DESCRIPTION

A grade-separated crossing of NE 124th Street and Totem Lake Boulevard provides safe passage across the highest traffic intersection on the CKC. This crossing is envisioned to be a structurally expressive bridge that will become a landmark for the City and Totem Lake as one of the more dramatic experiences on the corridor, its form is derived by the restrictions imposed by clearance requirements of traffic and overhead power lines. The passage of the trail over this busy intersection becomes a gateway to the neighborhood as well as a powerful symbol for the growth and change of Totem Lake into an increasingly important center of retail, residential, and commercial activity for Kirkland and the region.*

## CKC TOTEM LAKE PARK AND BRIDGE VISION

CKC MASTER PLAN TOTEM LAKE GATEWAY AND PARK PLAN

## PROPOSED BRIDGE ALIGNMENT




PROPOSED BRIDGE ALIGNMENT

*Text excerpt from CKC Master Plan

# EXISTING SITE FEATURES

## HOW THE NEW BRIDGE WILL FIT INTO THE SITE

01 SOUTH APPROACH FROM 124TH AVE NE

AERIAL VIEW OF THE FUTURE BRIDGE SITE LOOKING SOUTHWEST

08 EAST APPROACH FROM NE 124TH STREET

02 NORTH APPROACH FROM THE 120TH AVE NE

07 WEST APPROACH FROM NE 124TH STREET

03 NORTHEAST APPROACH FROM TOTEM LAKE BLVD

04 NORTH APPROACH FROM THE EXISTING CKC

05 VIEW OF TOTEM LAKE FROM EXISTING BOARDWALK TRAIL

06 SOUTH APPROACH FROM THE EXISTING CKC

# SCHEDULE

- Selected firm of COWI November 2016
- Berger Partnership under contract to City (advise on CKCMP vision)
- Phase I (Preferred Alternative Selection) – est. complete by July 2017
- Final alternative selection by Council with input from Commissions (through Council memo)
- Phase II will take selected alternative to final PS&E – est. complete by March 2018
- Construction TBD (additional funding needed for current CIP)

# CURRENT CHALLENGES

- Determine User Level Of Service (A-F)

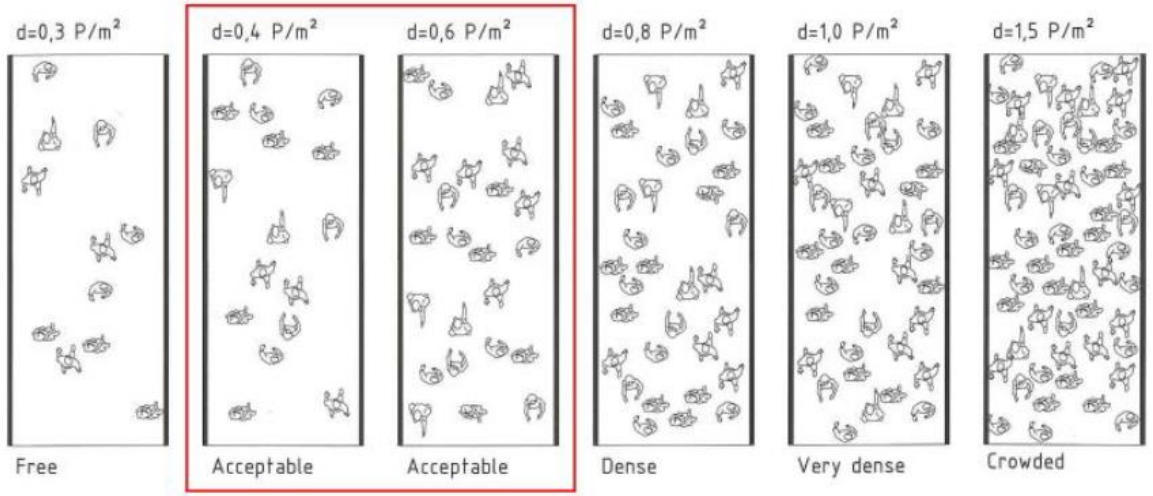
- Key determinant of deck/trail width, and user experience
  - Decreasing future LOS may be mitigated by providing for future channelization

- Challenge is to forecast future use with little knowledge or guidance

- **A: Excellent.** Trail has optimum conditions for individual bicyclists and retains ample space to absorb more users of all modes, while providing a high-quality user experience. Some newly built trails will provide grade-A service until they have been discovered or until their ridership builds up to projected levels.
- **B: Good.** Trail has good bicycling conditions, and retains significant room to absorb more users, while maintaining an ability to provide a high-quality user experience.
- **C: Fair.** Trail has at least minimum width to meet current demand and to provide basic service to bicyclists. A modest level of additional capacity is available for bicyclists and skaters; however more pedestrians, runners, or other slow-moving users will begin to diminish LOS for bicyclists.
- **D: Poor.** Trail is nearing its functional capacity given its width, volume, and mode split. Peak-period travel speeds are likely to be reduced by levels of crowding. The addition of more users of any mode will result in significant service degradation. Some bicyclists and skaters are likely to adjust their experience expectations or to avoid peak-period use.
- **E: Very Poor.** Given trail width, volume, and user mix, the trail has reached its functional capacity. Peak-period travel speeds are likely to be reduced by levels of crowding. The trail may enjoy strong community support because of its high usage rate; however, many bicyclists and skaters are likely to adjust their experience expectations, or to avoid peak-period use.
- **F: Failing.** Trail significantly diminishes the experience for at least one, and most likely for all user groups. It does not effectively serve most bicyclists; significant user conflicts should be expected.

Therefore, from the descriptions above, we can conclude that **LOS C & D would be the appropriate target level** to assess future capacity while maintaining adequate LOS.

- LOS A & B relate to trails that are sparsely used.
- LOS C appears to be the target for a well-used trail
- LOS D during peak hours the trail is crowded where cyclists will need to slow to navigate.
- LOS E & F are heavily used trails that become difficult to navigate on a bicycle.




(at 0.5 persons/m²)

14-ft (4.25m):

Lower Bound = 7,650 persons/hr

Upper Bound = 9,690 persons/hr

16-ft (4.9m):

Lower Bound = 8,820 persons/hr

Upper Bound = 11,172 persons/hr

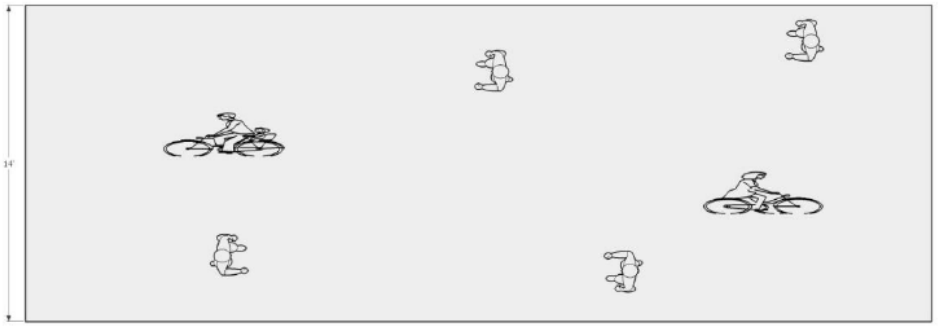


Figure showing 14-ft wide deck with 0.1 persons/m² with 67% pedestrian traffic

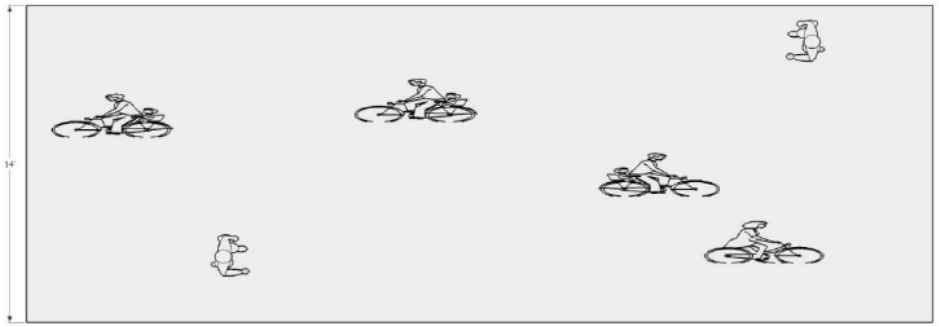


Figure showing 14-ft wide deck with 0.1 persons/m² with 67% bicycle traffic

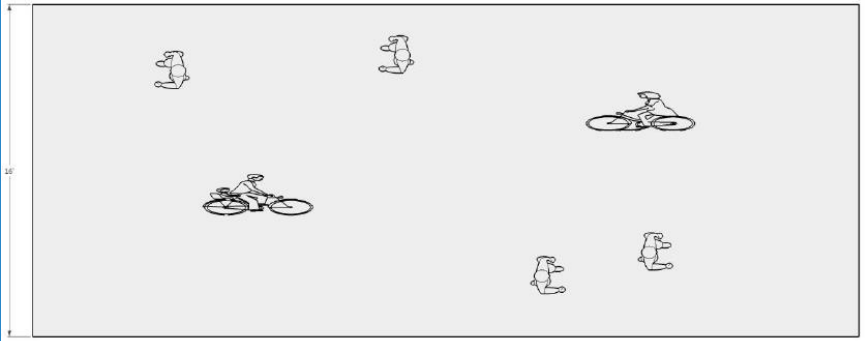


Figure showing 16-ft wide deck with 0.1 persons/m² with 67% pedestrian traffic

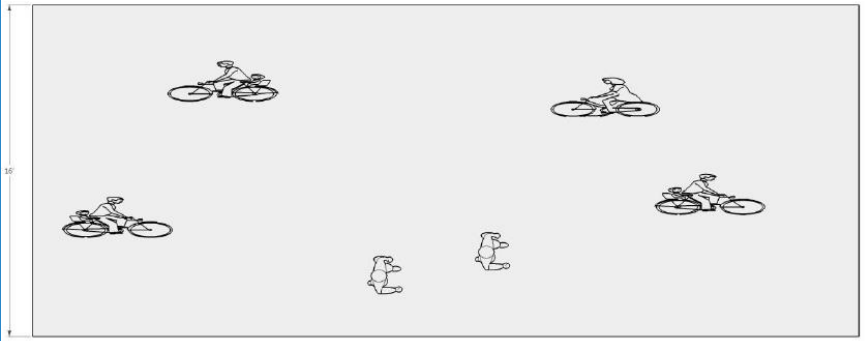


Figure showing 16-ft wide deck with 0.1 persons/m² with 67% bicycle traffic

14-ft width with a light density of 0.1 persons/m²

Normal Pace = 2,040 persons/hr

16-ft width with a light density of 0.1 persons/m²

Normal Pace = 2,352 persons/hr

Width allows for 3-path delineation

Width allows for 2-path delineation

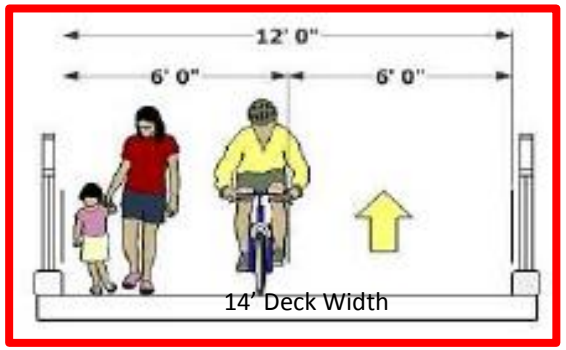
**Table 7. Study trail level of service grades and characteristics.**

| | | | | | | | Trail User Type Mode Split Percentage | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Path Name | LOS Score | LOS Grade | Total Two-Way Volume (per hour) | One-Way Volume (per hour) | Trail Width (ft) | Center-line | Adult Bikes | Pedestrians | Runners | Skaters | Child Bikes |
| Pinellas Trail | 4.05 | A | 120 | 60 | 15.0 | Yes | 81.4 | 4.6 | 2.3 | 11.6 | 0.0 |
| Honeymoon Island Trail | 3.78 | B | 110 | 55 | 12.0 | No | 22.9 | 54.2 | 12.5 | 8.3 | 2.1 |
| White Rock Lake Trail | 3.75 | B | 252 | 126 | 14.0 | Yes | 71.6 | 13.6 | 8.0 | 3.4 | 3.4 |
| Grant's Trail | 3.72 | B | 122 | 111 | 12.0 | Yes | 59.2 | 16.3 | 4.1 | 10.2 | 10.2 |
| W&OD Trail | 3.50 | B | 44 | 22 | 10.0 | Yes | 73.7 | 5.3 | 15.8 | 5.3 | 0.0 |
| Sammamish River Trail | 3.31 | C | 418 | 209 | 10.0 | No | 78.9 | 3.4 | 3.4 | 6.0 | 8.4 |
| Minuteman Bikeway | 3.30 | C | 442 | 221 | 12.0 | Yes | 51.9 | 6.2 | 15.6 | 18.1 | 8.1 |
| Capital Crescent Trail | 3.15 | C | 159 | 80 | 10.0 | Yes | 55.9 | 17.0 | 18.6 | 3.4 | 5.1 |
| White Creek Trail | 3.07 | C | 216 | 108 | 8.0 | No | 64.8 | 9.9 | 6.6 | 14.3 | 4.4 |
| South Bay Trail | 2.39 | E | 616 | 308 | 14.0 | Yes | 40.3 | 17.4 | 12.5 | 25.0 | 4.9 |
| Charles River Bike Path | 2.37 | E | 438 | 219 | 8.0 | Yes | 72.3 | 8.2 | 3.8 | 14.7 | 1.1 |
| Forest Park Trail | 2.17 | E | 299 | 150 | 10.0 | Yes | 33.0 | 24.4 | 27.8 | 13.9 | 0.9 |
| Mill Valley—Sausalito Pathway | 1.94 | F | 641 | 320 | 9.5 | No | 62.8 | 7.8 | 27.8 | 0.0 | 1.7 |
| Lake Johnson Trail | 1.61 | F | 205 | 102 | 8.0 | No | 14.1 | 63.3 | 21.9 | 0.0 | 0.8 |
| Lakefront Trail | 0.0 | F | 2320 | 1160 | 20.0 | Yes | 48.8 | 20.5 | 17.7 | 12.3 | 0.7 |
| Average Trail† | 3.15 | C | 311 | 105 | 11.0 | Yes | 55.0 | 20.0 | 10.0 | 10.0 | 5.0 |

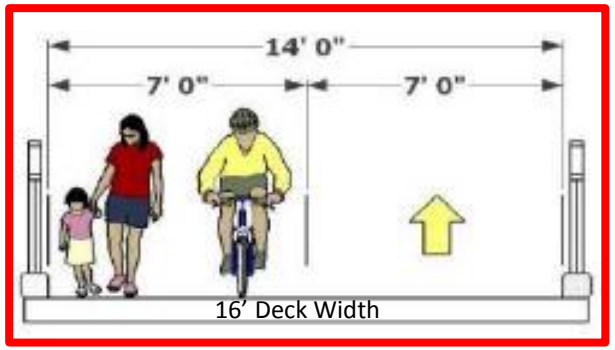
1 ft = 0.3 m

† The profile of the Average Trail was created by averaging the data for 13 of the 15 study trails. The high and low volume trails (W&OD and Lakefront) were dropped from the mix and the data of the remaining trails was averaged. The mode splits were rounded to the nearest increment of five.

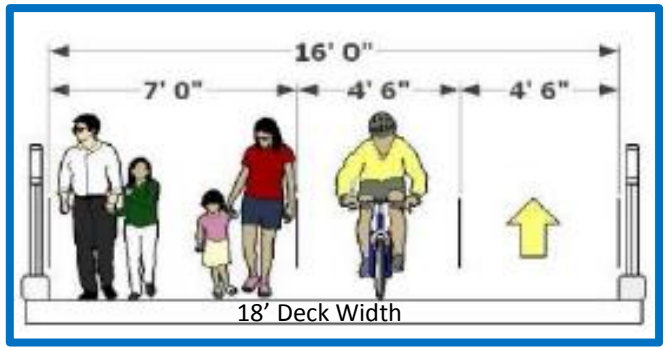
Source: FHWA "Shared-Use Path Level of Service Calculator – A User's Guide" July 2006



14' Deck Width



16' Deck Width



18' Deck Width

**Totem Lake Pedestrian Bridge Project - 15094 - 1-27-2017**

Trail LOS A-F - Shared Path Mix Options and Volumes

Assumed no centerline

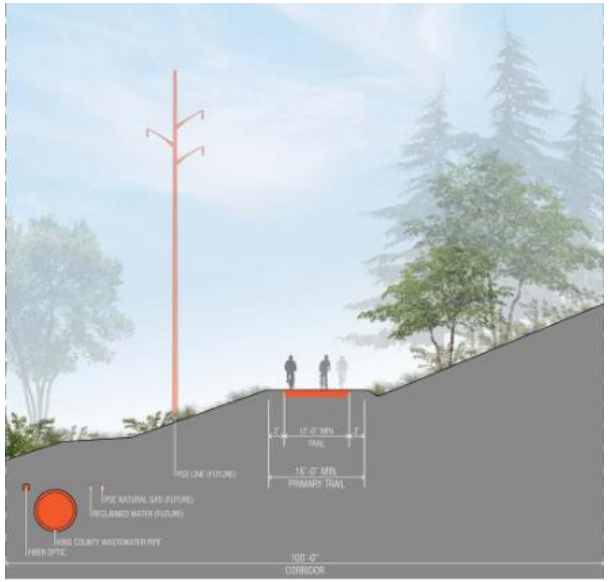
Note: these user splits are developed from info in FHWA memo and are roughly correlated/assigned to these table categories.

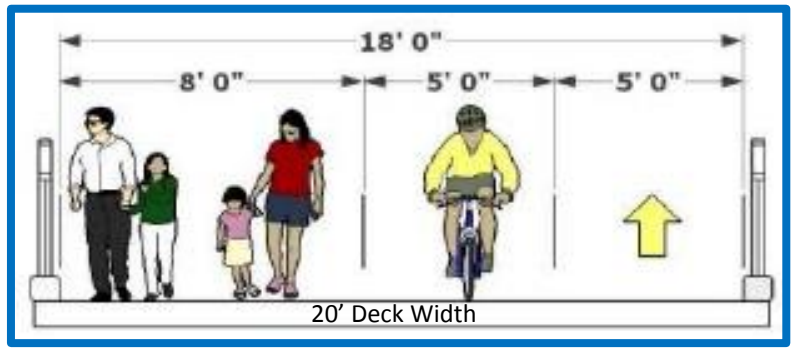
(Volume is one-direction/lane)

| | 85%/10% High Bike | 70%/30% Typical | | 35%/60% High Ped | | |
|---|---|---|---|---|---|---|
| | Bike/Ped | Bike/Ped | Bike/Ped | Bike/Ped | Bike/Ped | Path Width (Deck Width) |
| Volume | 84%/0% | 63%/21% | 42%/42% | 21%/63% | 0%/84% | |
| 509 | A | E | F | F | F | 20' (22') |
| 409 | A | D | E | F | F | 20' (22') |
| 309 | A | C | E | E | F | 20' (22') |
| 209 | A | B | C | E | E | 20' (22') |
| 509 | A | E | F | F | F | 18' (20') |
| 409 | A | D | F | F | F | 18' (20') |
| 309 | A | C | E | F | F | 18' (20') |
| 209 | A | B | D | E | E | 18' (20') |
| 509 | B | E | F | F | F | 16' (18') |
| 409 | A | D | F | F | F | 16' (18') |
| 309 | A | C | E | F | F | 16' (18') |
| 209 | A | B | D | E | E | 16' (18') |
| 509 | B | F | F | F | F | 14' (16') |
| 409 | B | E | F | F | F | 14' (16') |
| 309 | B | D | E | F | F | 14' (16') |
| 209 | A | C | E | E | F | 14' (16') |
| 509 | C | F | F | F | F | 12' (14') |
| 409 | B | F | F | F | F | 12' (14') |
| 309 | B | E | F | F | F | 12' (14') |
| 209 | B | C | E | F | F | 12' (14') |
| 509 | D | F | F | F | F | 10' (14') |
| 409 | D | F | F | F | F | 10' (14') |
| 309 | C | F | F | F | F | 10' (14') |
| 209 | C | E | F | F | F | 10' (14') |

Functionally equivalent at these category/service level splits

| LEGEND LOS |
|---|
| A |
| B |
| C |
| D |
| E |
| F |





20' Deck Width

# Reference Capacities for Existing Bridges in Urban Environments

| Name | Fremont Bridge | Brooklyn Bridge | Harbourside West Pedestrian Bridge | Trans Canada Trail, Alexandra Bridge |
|---|---|---|---|---|
| Location | Seattle, WA | New York, NY | North Vancouver, BC | Ottawa, ON |
| Picture | | | | |
| Width | 6 ft* | 10 ft | 13 ft (4 m) | 14 ft* |
| Avg Daily Total | - | 13,500 | 718 | 3,500 |
| Avg Daily Bicycles | 1,917 | 3,500 | 144 | 1,500 |
| Avg Daily Peds | - | 10,000 | 574 | 2,000 |
| Peak Hourly | 255 (bikes only) | - | - | - |

| Name | Cykelslangen (Snake Bridge) | Wing Tip Bridge | Brygge Bridge | Calgary Peace Bridge |
|---|---|---|---|---|
| Location | Copenhagen, DK | Mount Hope, WV | Copenhagen, DK | Calgary, AB |
| Picture | | | | |
| Width | 15 ft (4.6 m) | 15 ft | 18 ft (5.5 m) | 20 ft (6.2 m) |
| Avg Daily Total | - | 30,000 | - | 6,000 |
| Avg Daily Bicycles | 12,700 | - | 14,200 | 2,196 |
| Avg Daily Peds | - | - | - | 3,804 |
| Peak Hourly | - | 15,000 (Peds only) | - | - |

# Reference Widths of Existing Bridges

Below are examples of bridges at varying deck widths.

These examples can be useful in understanding the number of people that can fit within the deck width and also give an understanding of how comfortable the users may feel while on the bridge.

| Name | Fremont Bridge | Squamish Pedestrian Overpass | Thomas Street Pedestrian Bridge | Bow River Pedestrian Bridge | Delta Ponds |
|---|---|---|---|---|---|
| Location | Seattle, WA | Squamish, BC | Seattle, WA | Banff, AB | Eugene, OR |
| Picture | | | | | |
| Width | 6 ft* | 8.5 ft (2.6 m) | 10.3 ft | 13 ft (4m) | 14 ft |

| Name | New Bay Bridge | Brygge Bridge | Calgary Peace Bridge | Kissing Bridge | Charles Bridge |
|---|---|---|---|---|---|
| Location | San Francisco, CA | Copenhagen, DK | Calgary, AB | Copenhagen, DK | Prague, CZ |
| Picture | | | | | |
| Width | 15.5 ft | 18 ft (5.5 m) | 20 ft (6.2 m) | 23 ft (7 m) | 31 ft (9.5 m) |

# IN SUMMARY:

- CKC Master Plan provides a touchstone for trail characteristics and community experience
- Future trail use will be determined as the area is developed – use patterns hard to predict now
- Must consider the trail/bridge in a regional context as well as local context
- Public has shown high-interest and engagement in the project so far – work to maintain/increase
- With regards to schedule, team is currently exactly on-schedule (but challenging aspects are upcoming)
- Determining an appropriate Level-Of-Service is difficult, especially when predicting local and regional growth
- Tools exist (SUPLOS) to help make the LOS decision, but are limited in the variables they can consider