



# **Downtown** Transportation Plan Update

## **DOWNTOWN TRANSPORTATION PLANNING BKR TRAVEL DEMAND MODEL DOWNTOWN PEDESTRIANS**

**TRANSPORTATION COMMISSION  
JULY 12, 2012**

## **Presentation and Discussion**

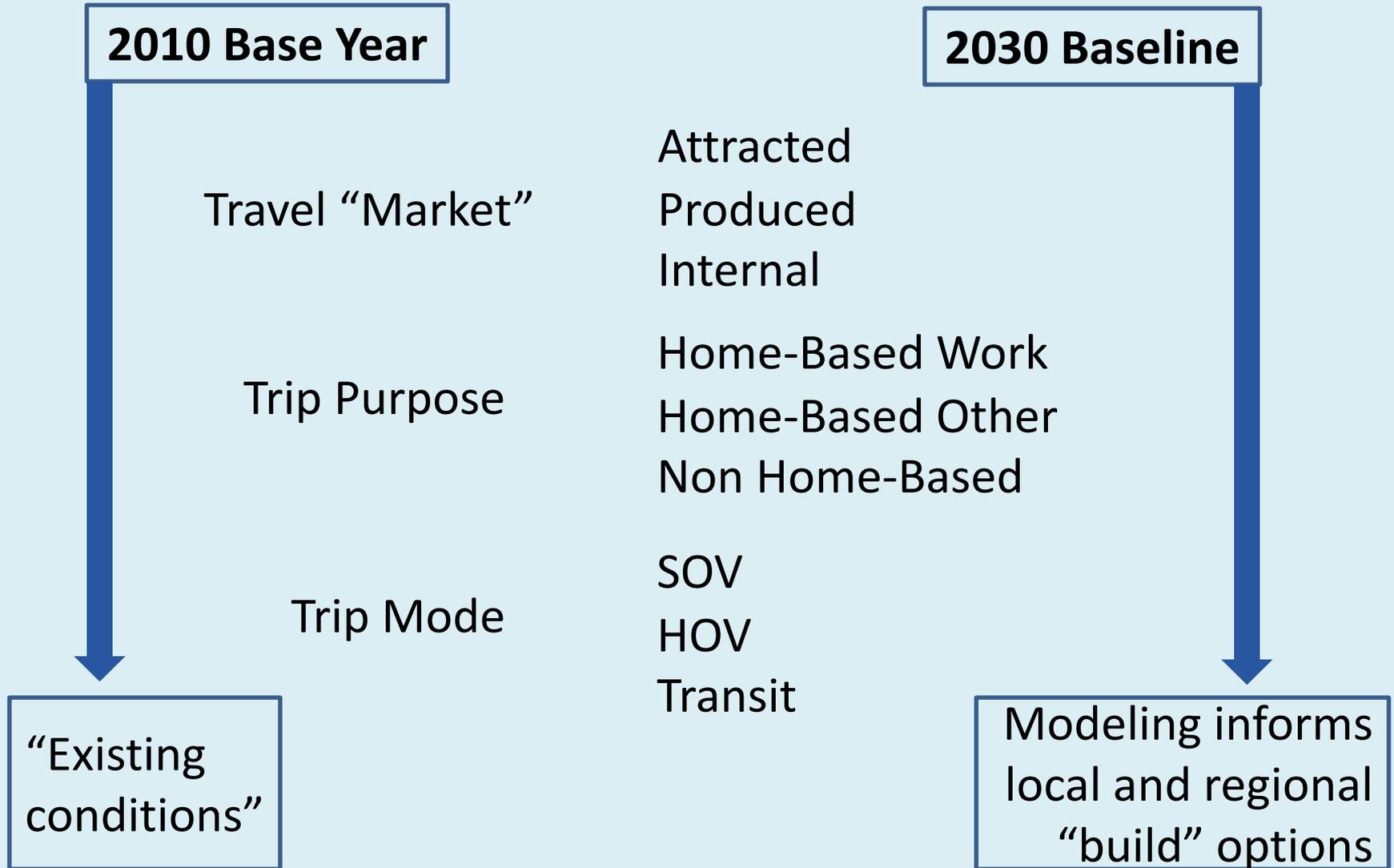
- BKR Travel Demand Model Results – Trip Ends in Downtown
- BKR Model Results Informing Measures of Effectiveness
- Pedestrians and Downtown Intersections
- Next Steps



## **The Bellevue Kirkland Redmond BKR Travel Demand Model**

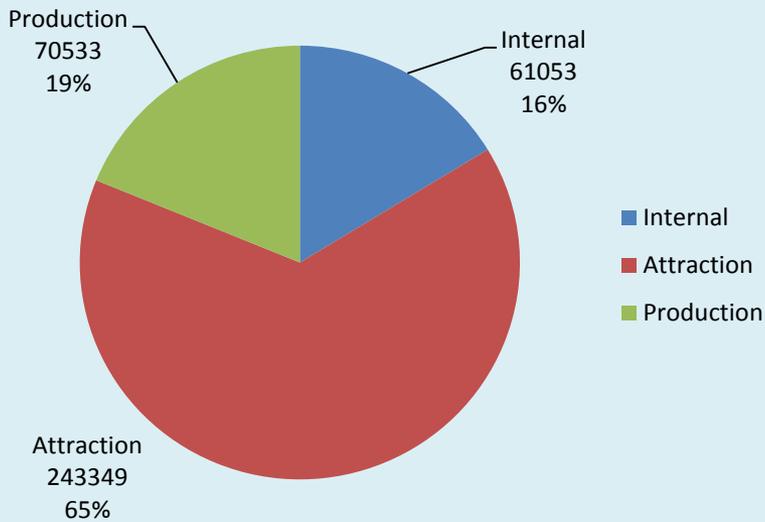
# BKR Model Results

Based on Daily Person Trips



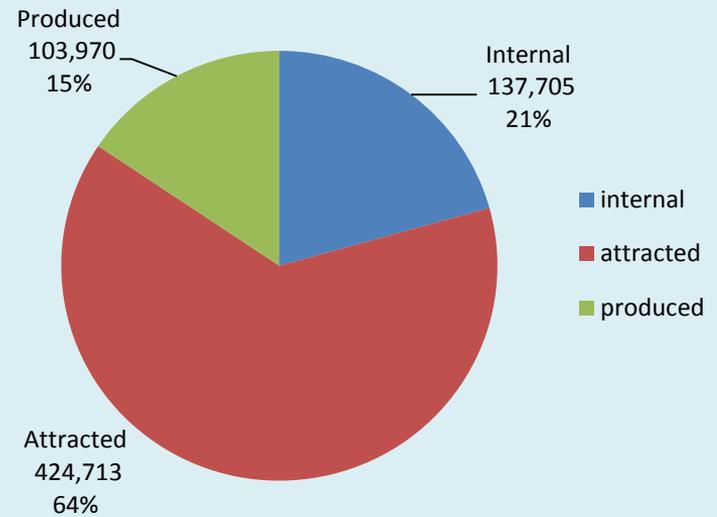
# BKR Model Results

## 2010 Daily Person Trips



**2010 Daily Person Trips**  
**375,000**

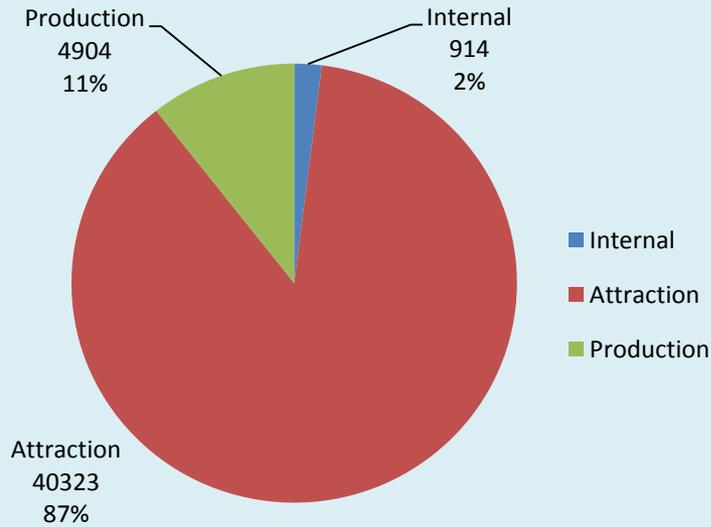
## 2030 Daily Person Trips



**2030 Daily Person Trips**  
**666,388**

# BKR Model Results

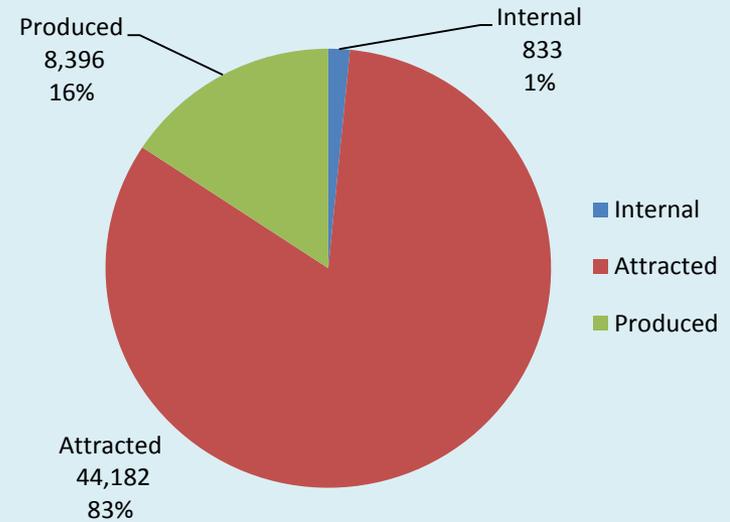
## 2010 HBW Drive Alone



### 2010 Home Based Work Drive Alone

**46,141**

## 2030 HBW Drive Alone

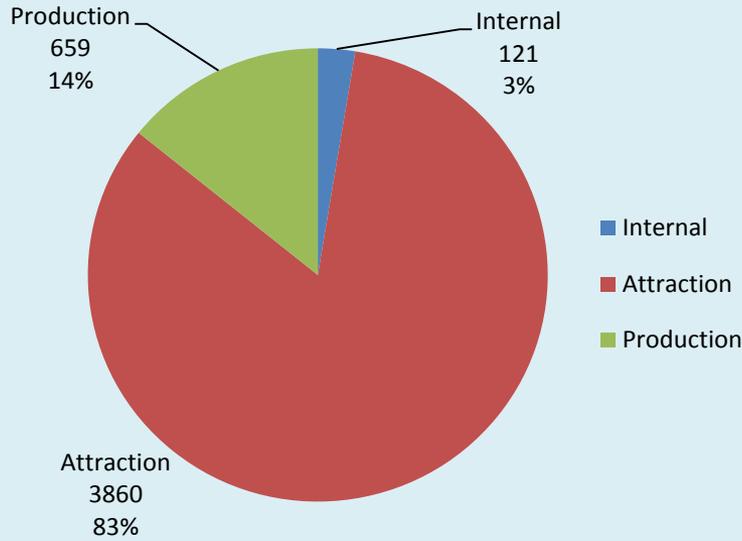


### 2030 Home Based Work Drive Alone

**53,411**

# BKR Model Results

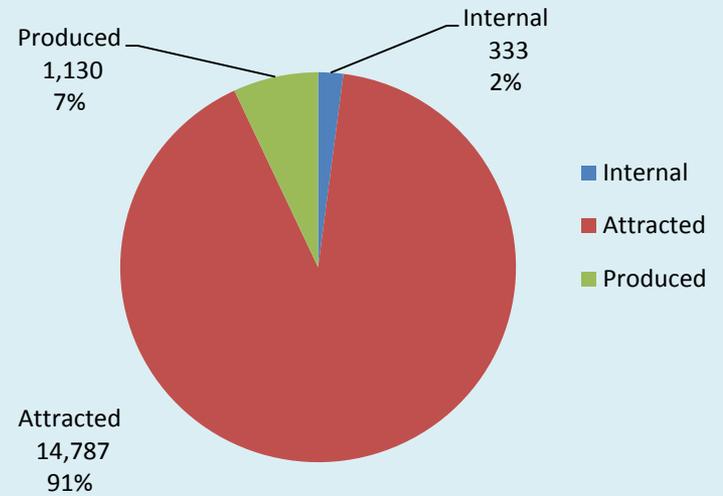
## 2010 HBW Shared Ride



### 2010 Home Based Work Shared Ride

**4,641**

## 2030 HBW Shared Ride

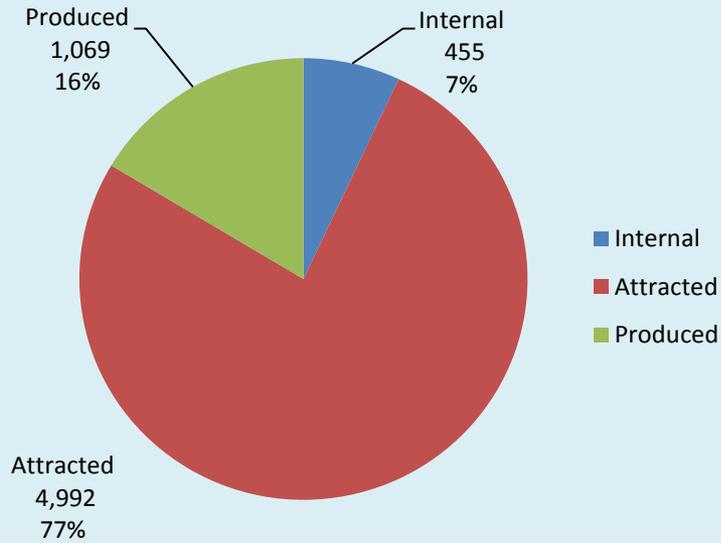


### 2030 Home Based Work Shared Ride

**16,250**

# BKR Model Results

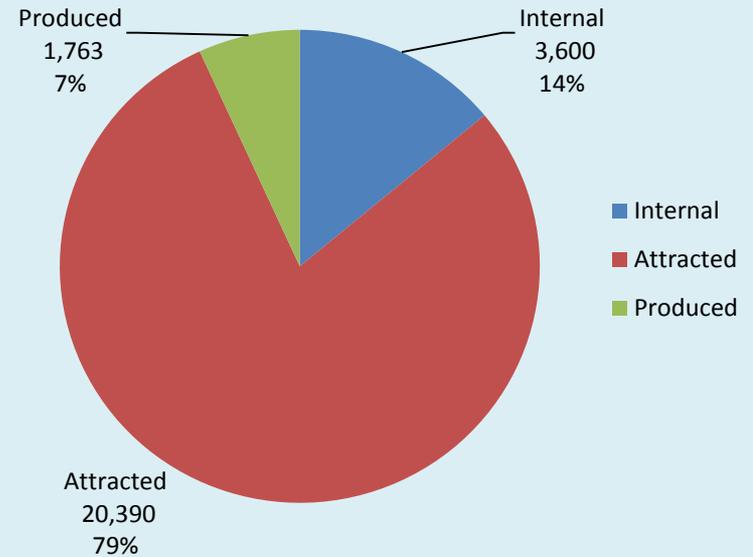
## 2010 HBW Transit



**2010 Home Based Work Transit**

**6,517**

## 2030 HBW Transit

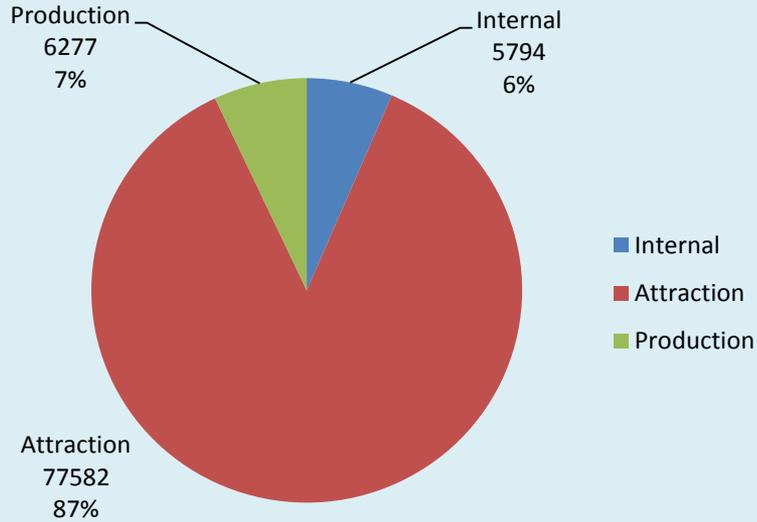


**2030 Home Based Work Transit**

**25,753**

# BKR Model Results

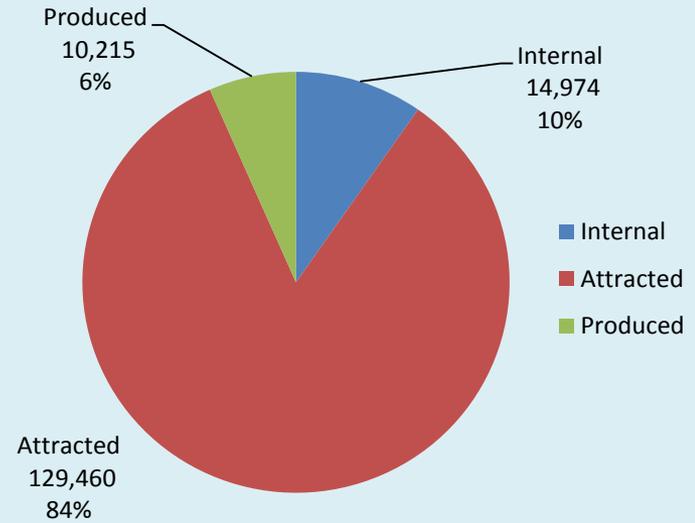
## 2010 HBO Shared Ride



### 2010 Home Based Other Shared Ride

89,653

## 2030 HBO Shared Ride

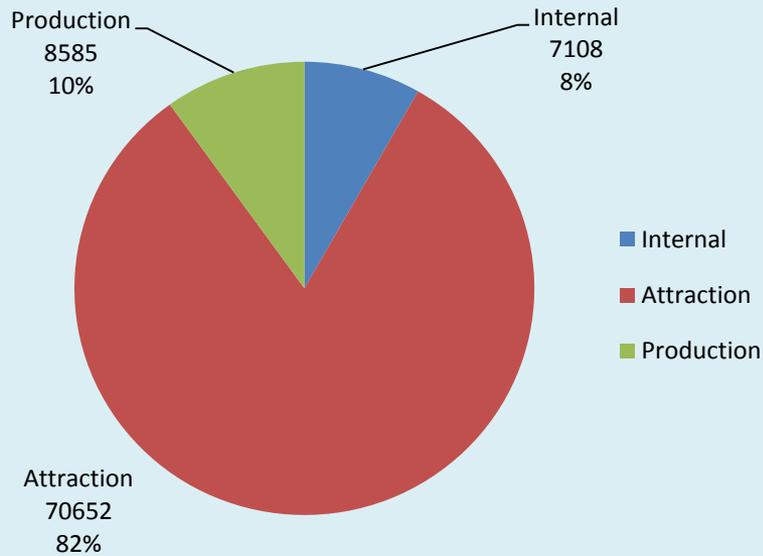


### 2030 Home Based Other Shared Ride

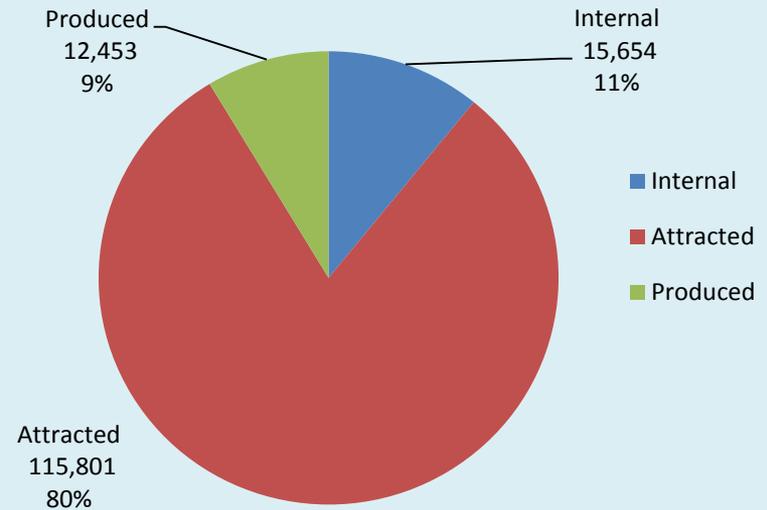
154,650

# BKR Model Results

## 2010 HBO Drive Alone



## 2030 HBO Drive Alone



### 2010 Home Based Other Drive Alone

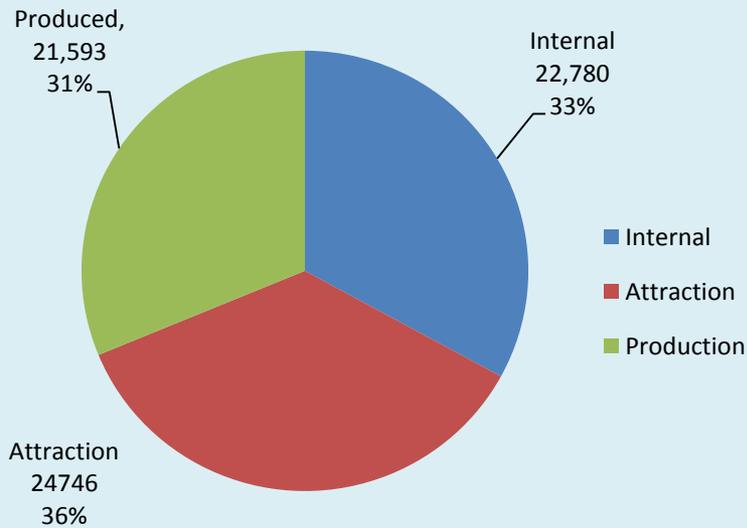
**86,344**

### 2030 Home Based Other Drive Alone

**143,908**

# BKR Model Results

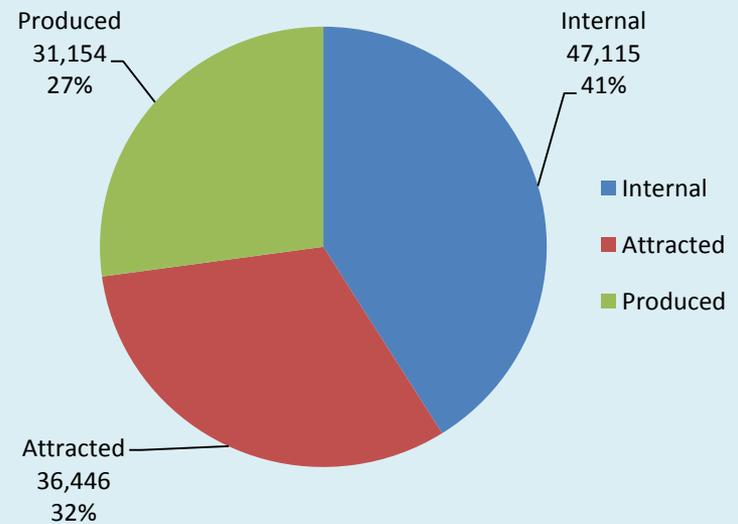
## 2010 NHB Shared Ride



### 2010 Non-Home Based Shared Ride

**69,119**

## 2030 NHB Shared Ride

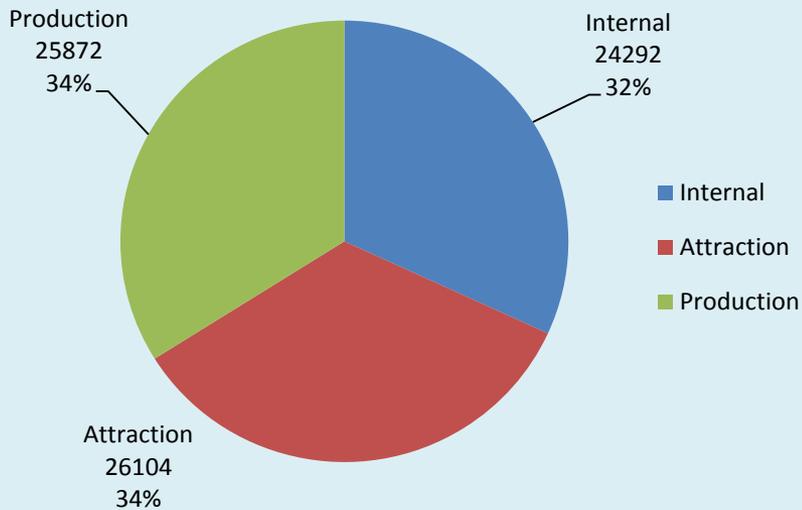


### 2030 Non-Home Based Shared Ride

**114,715**

# BKR Model Results

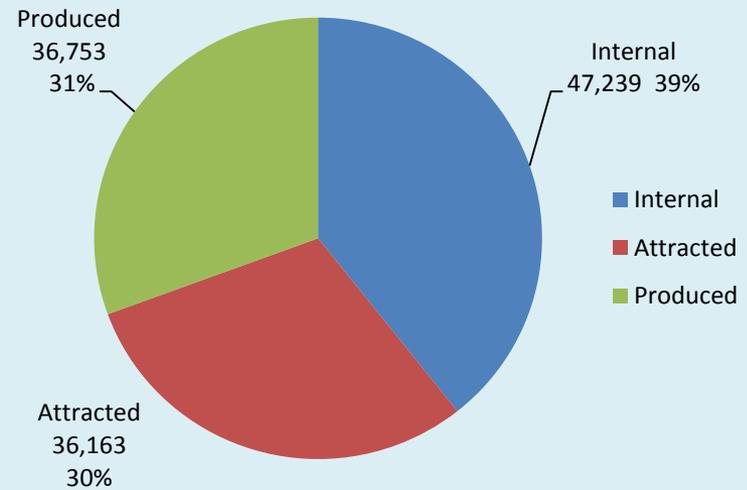
## 2010 NHB Drive Alone



### 2010 Non-Home Based Drive Alone

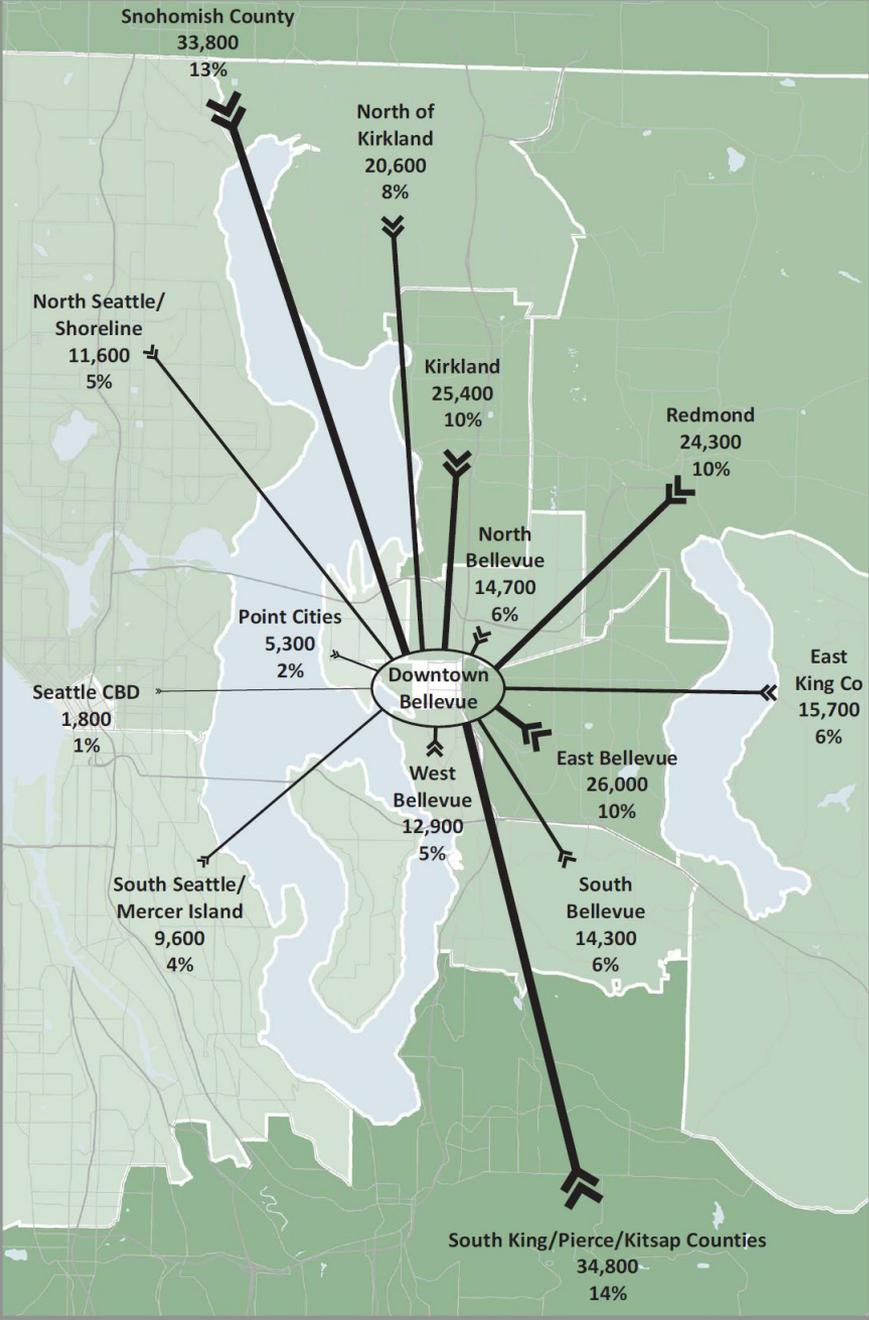
**76,267**

## 2030 NHB Drive Alone

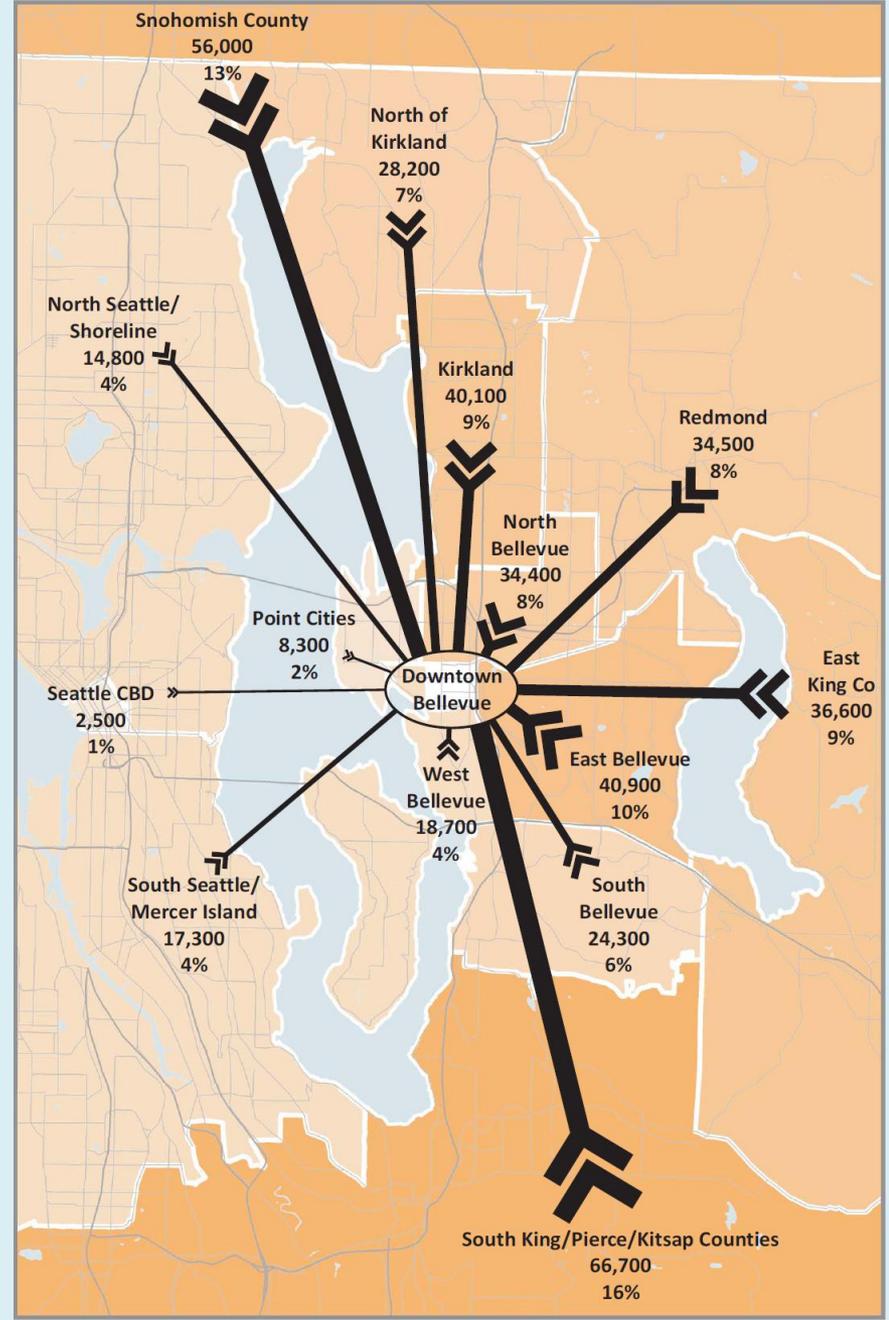


### 2030 Non-Home Based Drive Alone

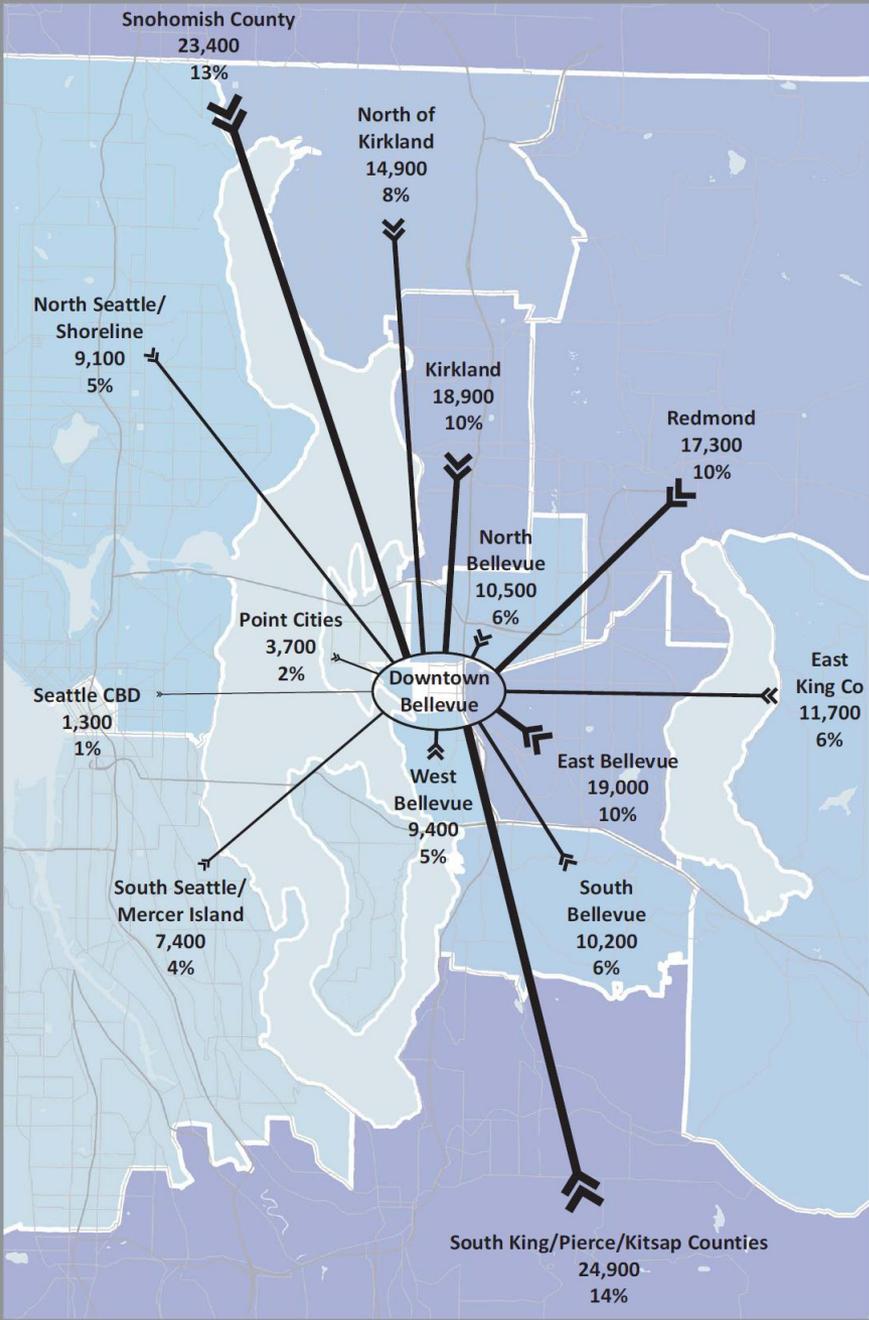
**120,155**



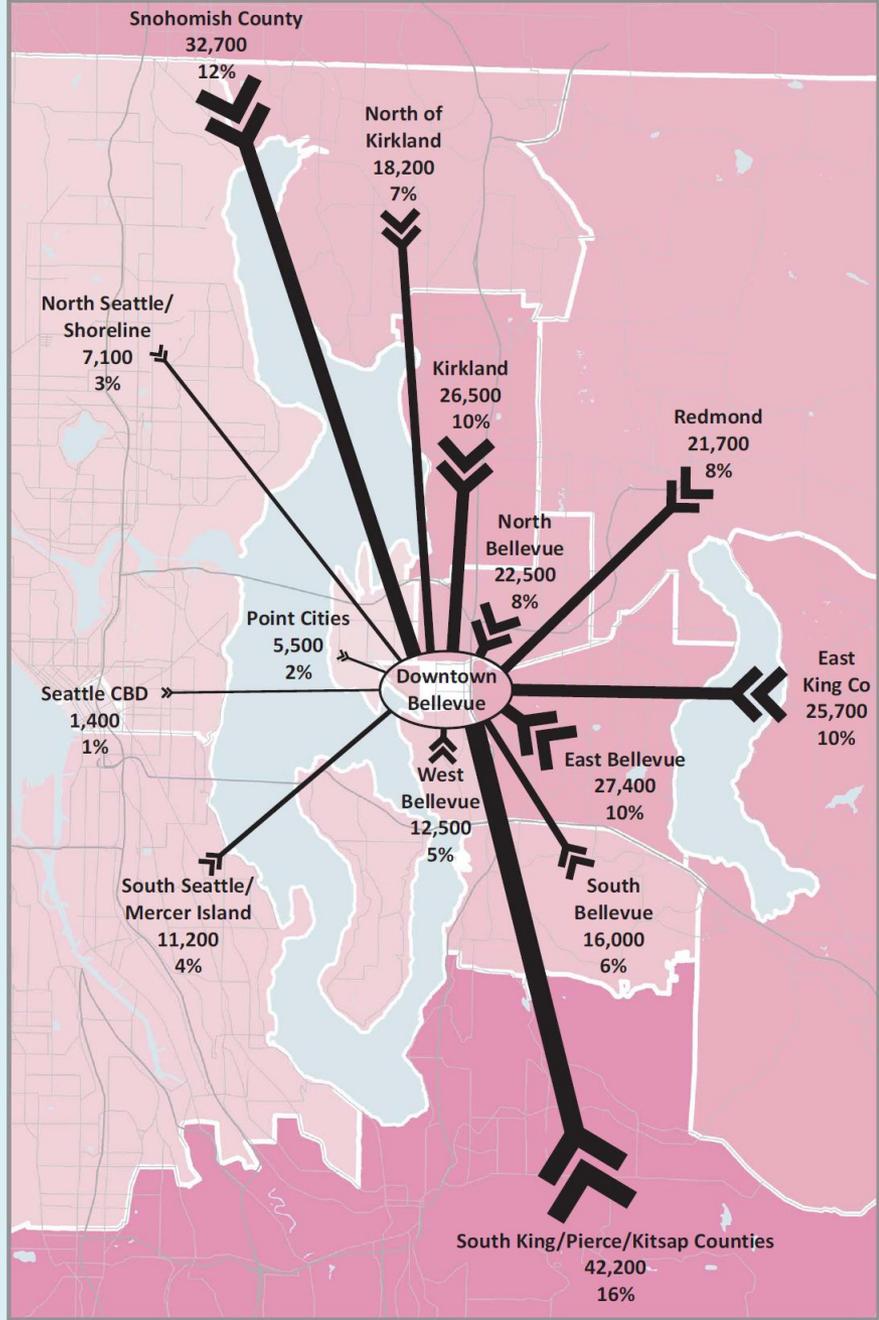
2010 Total Daily External Person Trips to Downtown Bellevue by District  
Total Trips: 250,700



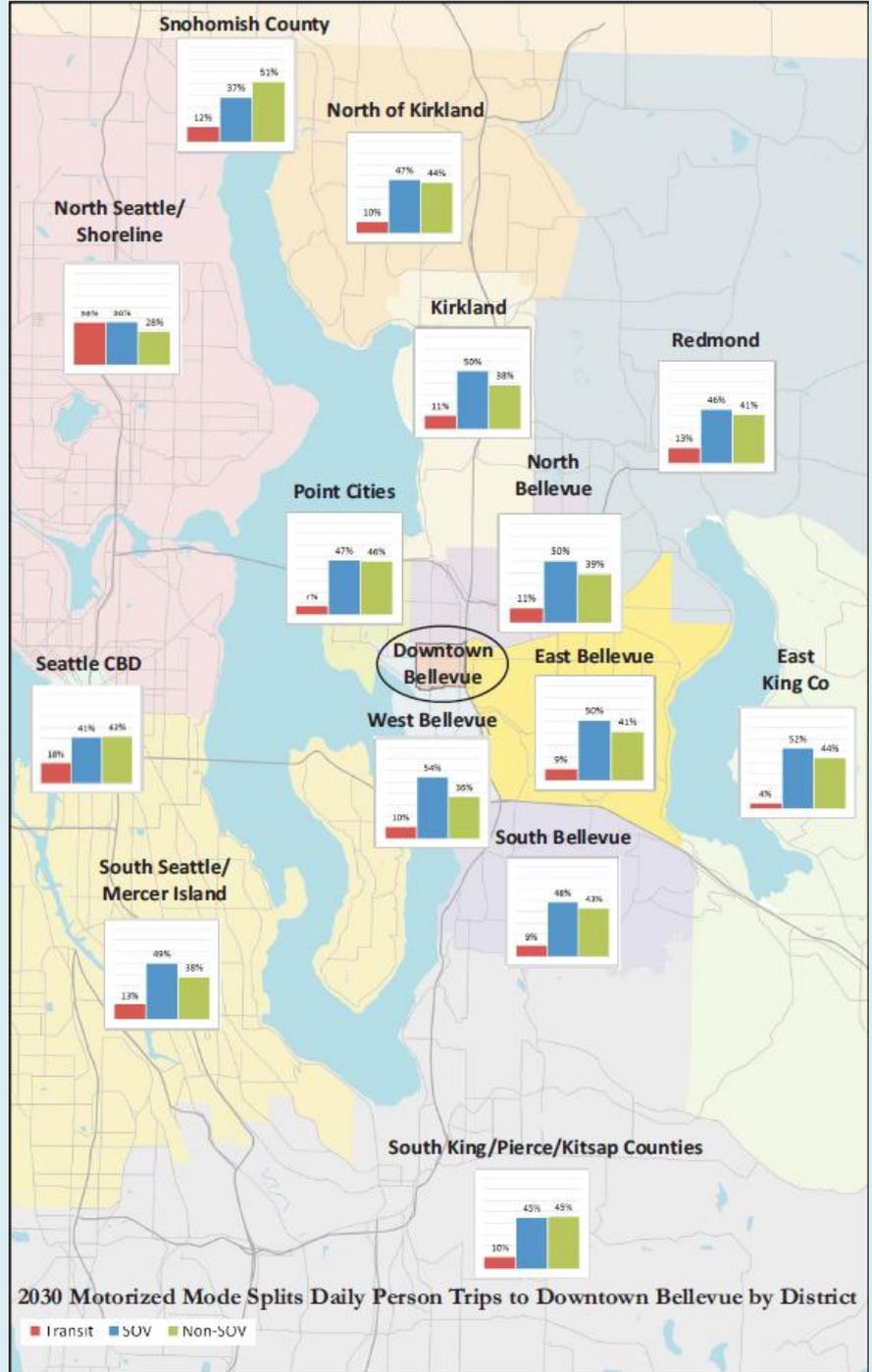
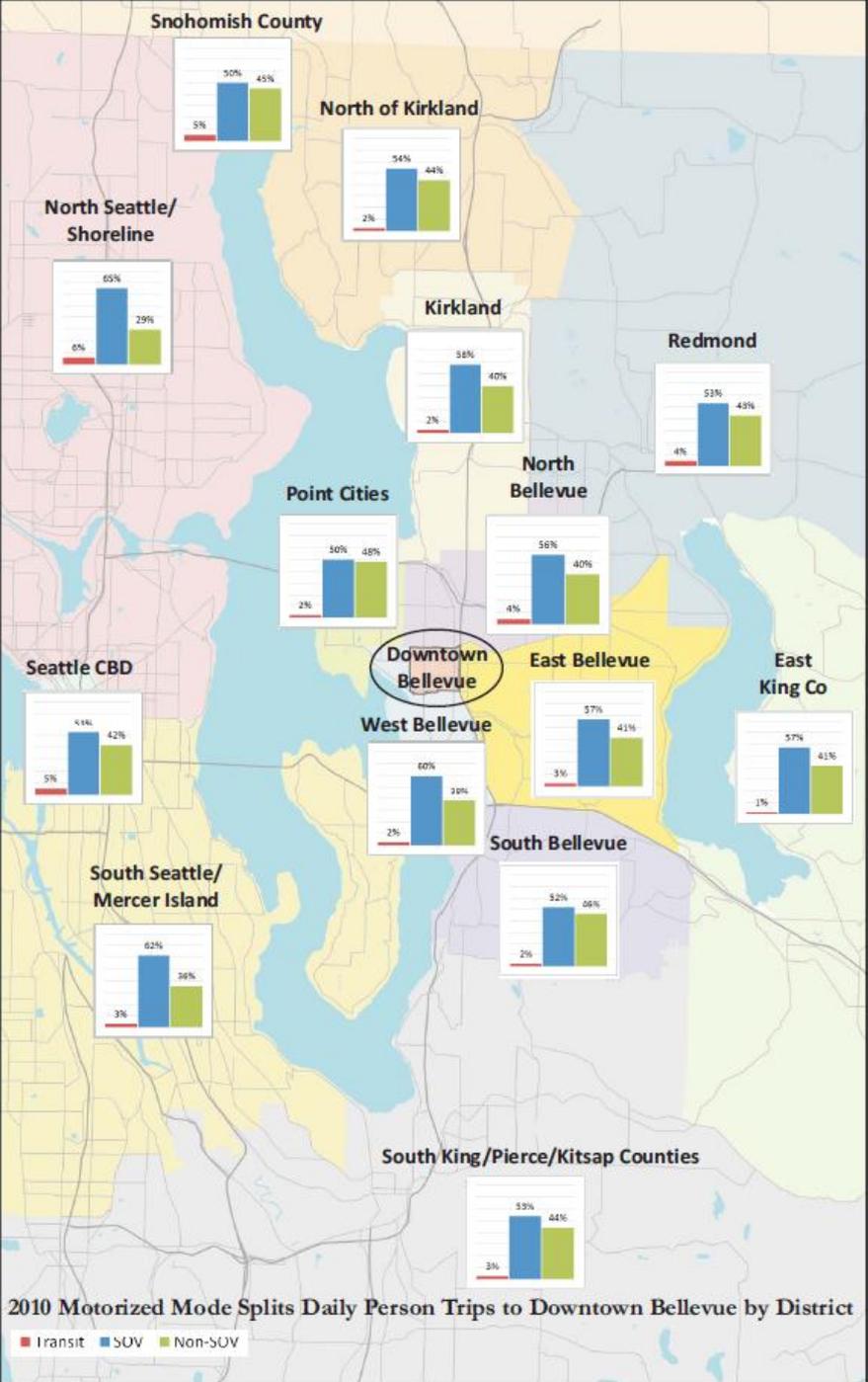
2030 Total Daily External Person Trips to Downtown Bellevue by District  
Total Trips: 423,100

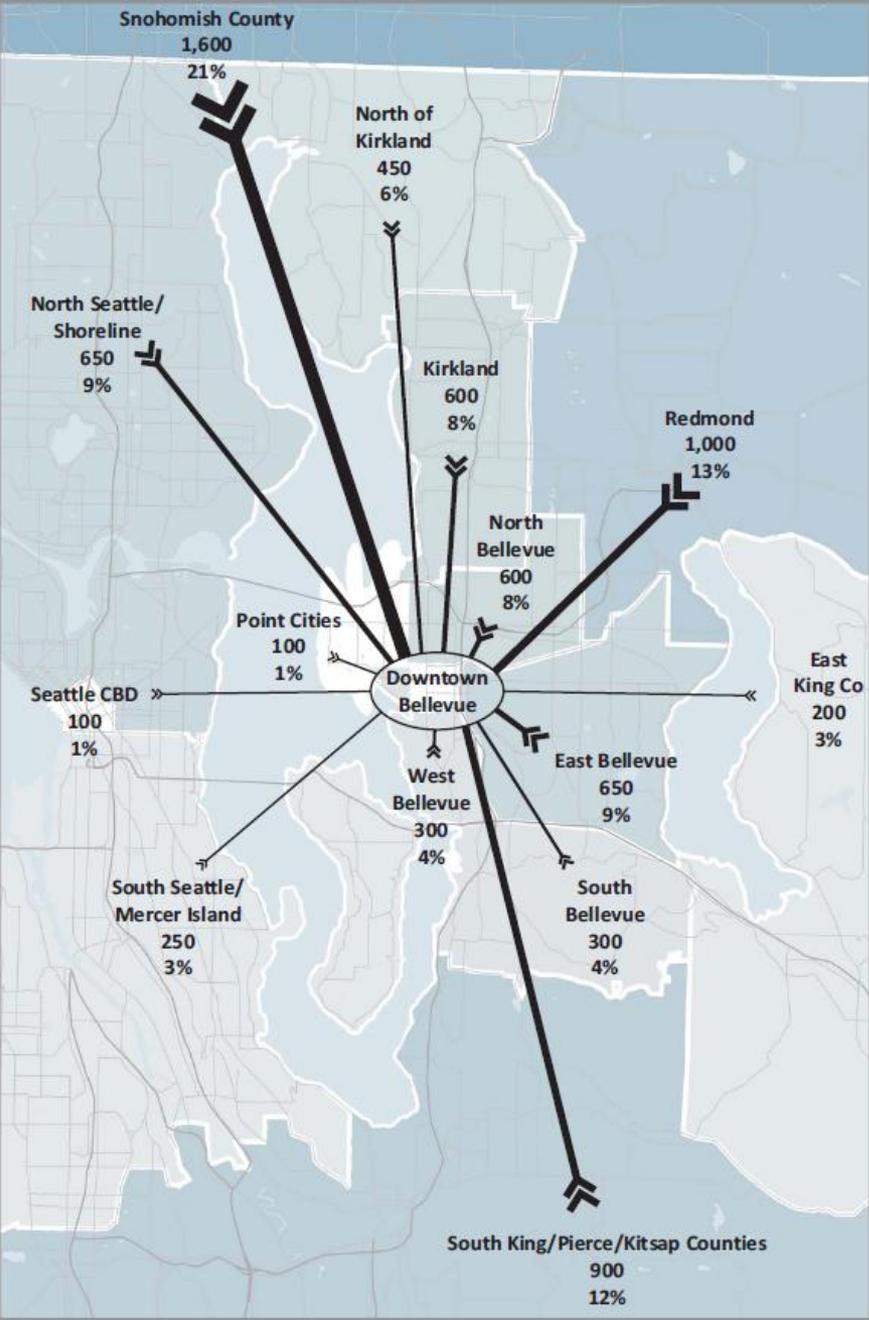


2010 Total Daily External Vehicle Trips to Downtown Bellevue by District  
Total Trips: 181,800

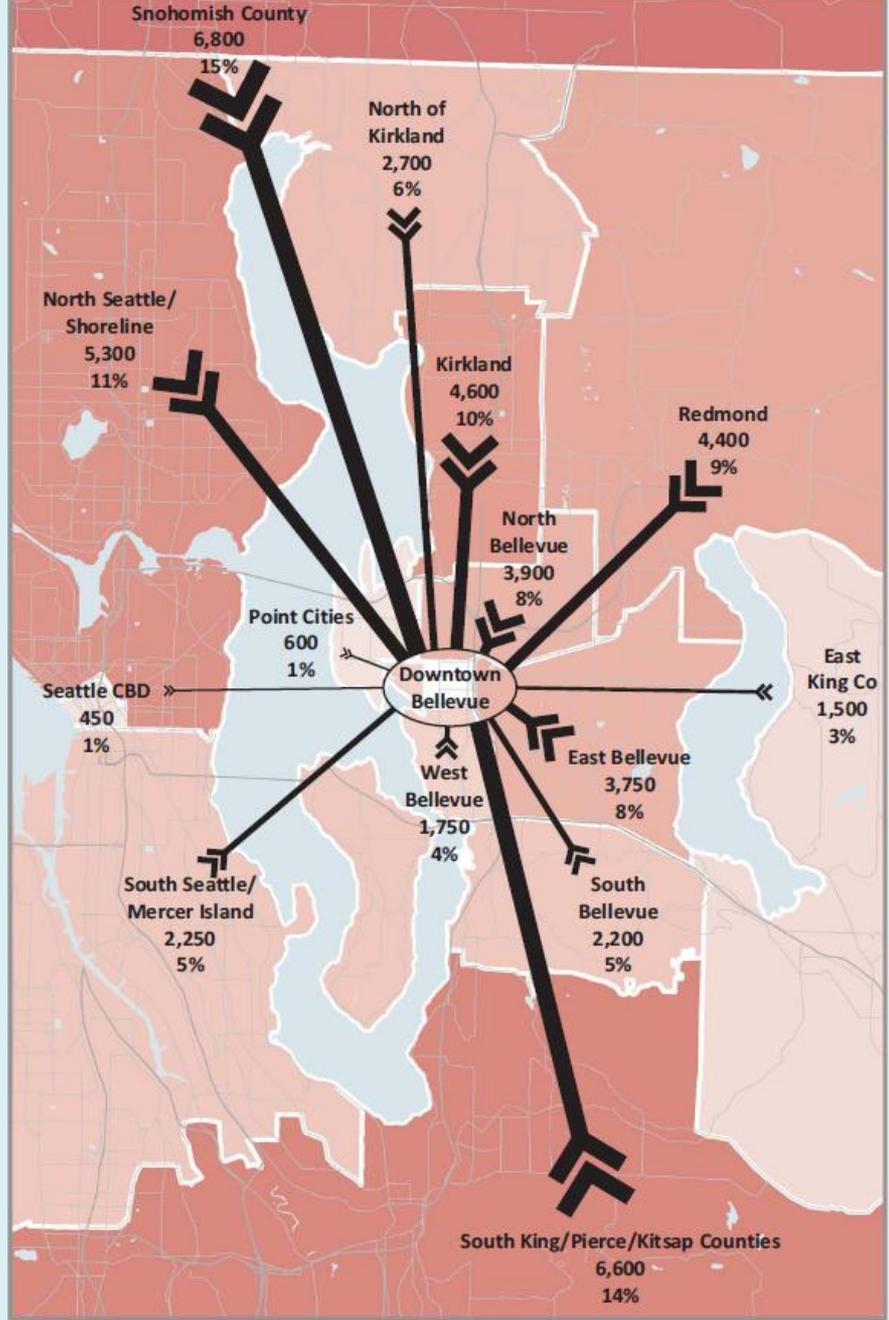


2030 Total Daily External Vehicle Trips to Downtown Bellevue by District  
Total Trips: 270,700





2010 Total Daily External Transit Trips to Downtown Bellevue by District  
Total Trips: 7,600



2030 Total Daily External Transit Trips to Downtown Bellevue by District  
Total Trips: 46,700

# BKR Model Results - Summary

- Overall trip pattern for external trips attracted to Downtown is relatively consistent from 2010 to 2030, however the number of trips increases significantly
  - Person trips increase by about 170,000
  - Vehicle trips increase by about 90,000
- Percent of trips from S King County and E King County each increase by 2% from 2010 to 2030.
- There is a very slight shift away from longer distance trips from the districts north of Bellevue, and toward East King County and south of Bellevue.
- Trip length appears to increase slightly as more people live farther from the Downtown Bellevue urban center.
- Most external trips to downtown Bellevue would use the I-405 corridor

# BKR Model Results - Summary

- The Non Home Based and Home Based Other trips are the vast majority of trips to Downtown Bellevue. Non work trips comprise 84% of all trips attracted to Downtown. This indicates:
  - Other purposes generate more trips to downtown Bellevue than employment
  - There is more flexibility for non-work travel so peak will spread.
- Trips attracted from Seattle appear to have a lower growth
  - Higher job growth than population growth within Seattle suggests a slower growth in travel from Seattle to Bellevue
  - Dampening of discretionary, non-commute trips due to tolling on SR 520.
- Transit ridership is projected to grow significantly
  - Additional traffic has a proportionately larger share by Transit.
  - The largest increase of transit ridership is for Home Based Work trips.
- Vehicle trips from East Link corridor districts are lower (Redmond, Seattle CBD, South Seattle/Mercer Island, North Seattle)
  - Light rail service will accommodate lots of people and dampen vehicle trip growth from these areas



## **DOWNTOWN PEDESTRIANS**

# City Council

## Project Principles

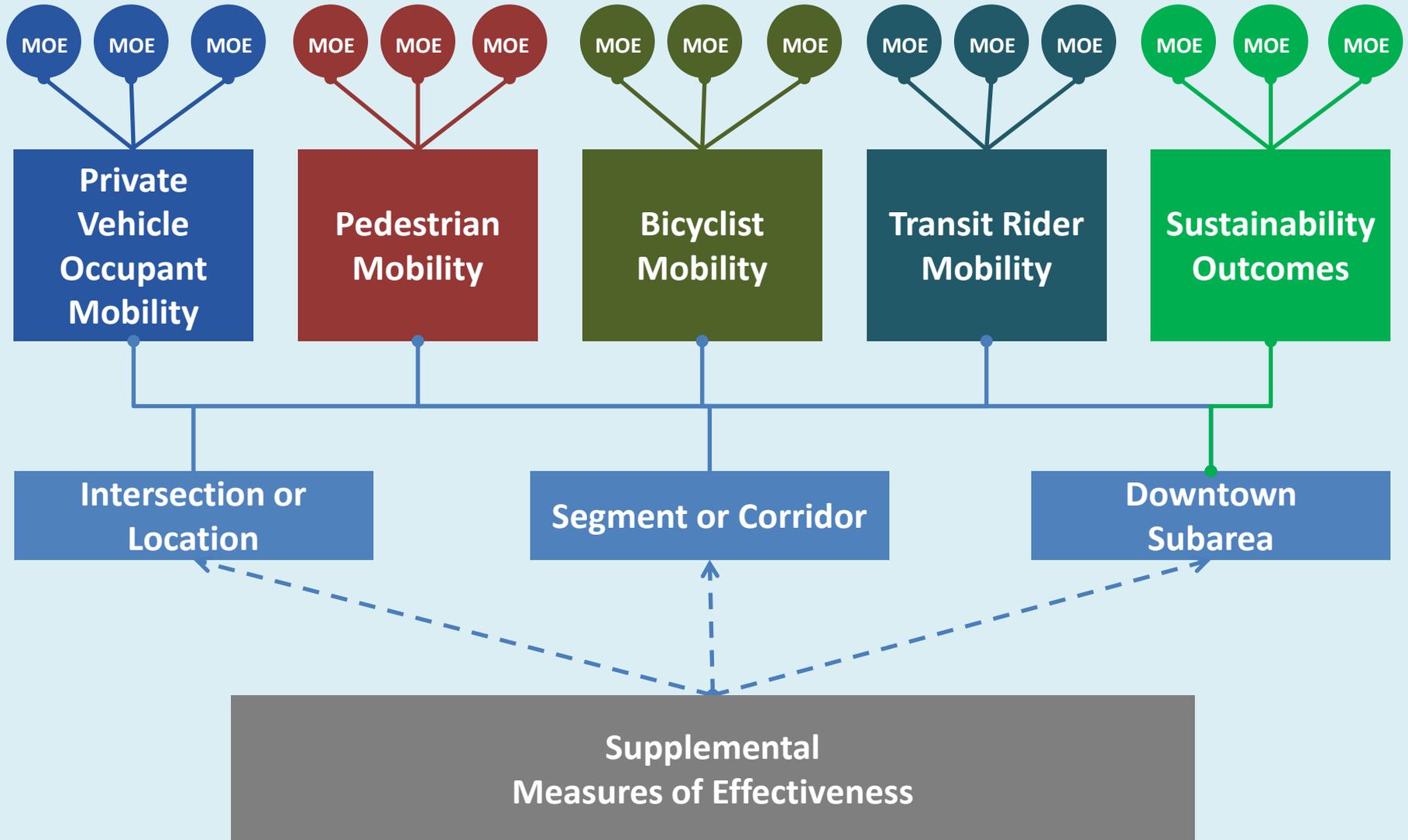
### **Plan for multiple modes of travel within and to and from Downtown Bellevue**

Develop a multimodal transportation strategy for Downtown Bellevue that updates the existing Downtown Subarea Plan project list. The recommended strategy should consider and incorporate the **emerging and anticipated mobility needs** of motorists, **pedestrians**, bicyclists, transit riders, and carpool/vanpool riders, and support the transport, parking and loading needs of employers, residents and businesses.

## **DTP Briefing, Monday, July 9, 2012**

- Accommodate walking Downtown
- Look to other cities of ideas and inspiration
- Create an enjoyable experience for pedestrians
- Consider additional grade-separation

# Measures of Effectiveness



# Pedestrian Mobility



# Pedestrian Mobility

Intersection or  
Location

## Intersection Crosswalk Rating

- Pedestrian Delay
- Crosswalk Width
- Number of Travel Lanes to be Crossed
- Volume/Speed of Traffic
- Size of Queuing Area

# Downtown Pedestrian Mobility Concerns

## Intersections



## Mid-Block Crossings



## Sidewalks



## Through-Block Connections



# Pedestrian Mobility Concerns @ Intersections

## General Comments

- Encroaching vehicles
- Right turning vehicles
- Crossing time seems too short
- Wait time seems too long
- Prefer automatic walk to push buttons
- Crosswalk striping is worn by tires
- Crosswalk width is narrow in places to accommodate everyone



# Pedestrian Mobility Concerns @ Intersections

## Walking Audit Feedback

### Crosswalks

- Provide a high level of visibility



### Signals

- Minimize pedestrian wait time
- Provide automatic pedestrian walk phase
- Increase available walk time across intersections



# Intersections - Existing Conditions

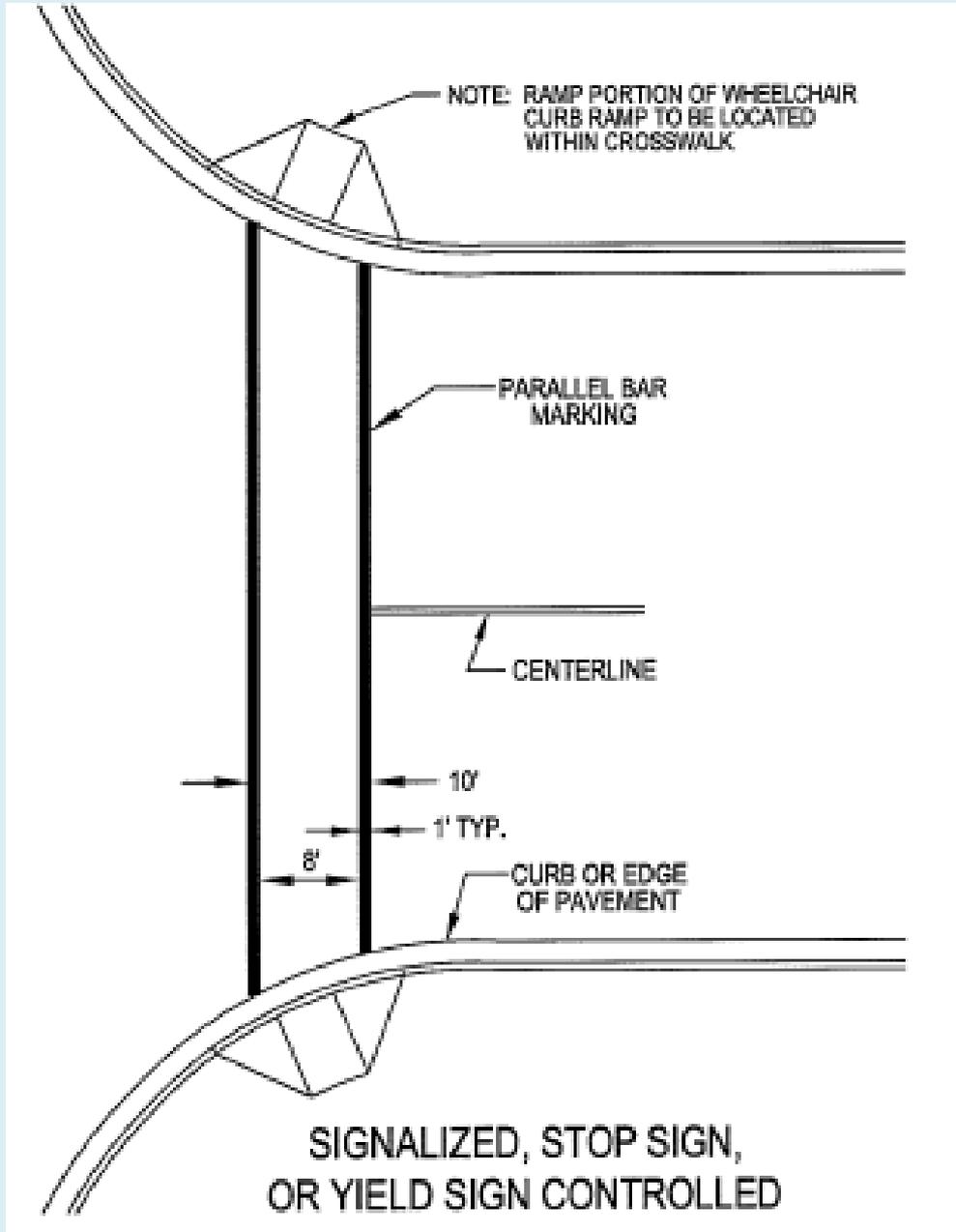
## Crosswalks

- Standard Typology
  - Two parallel white bars
  - Piano key at unsignalized intersections
  - 10 feet between the outside edges
  - 8 feet effective width

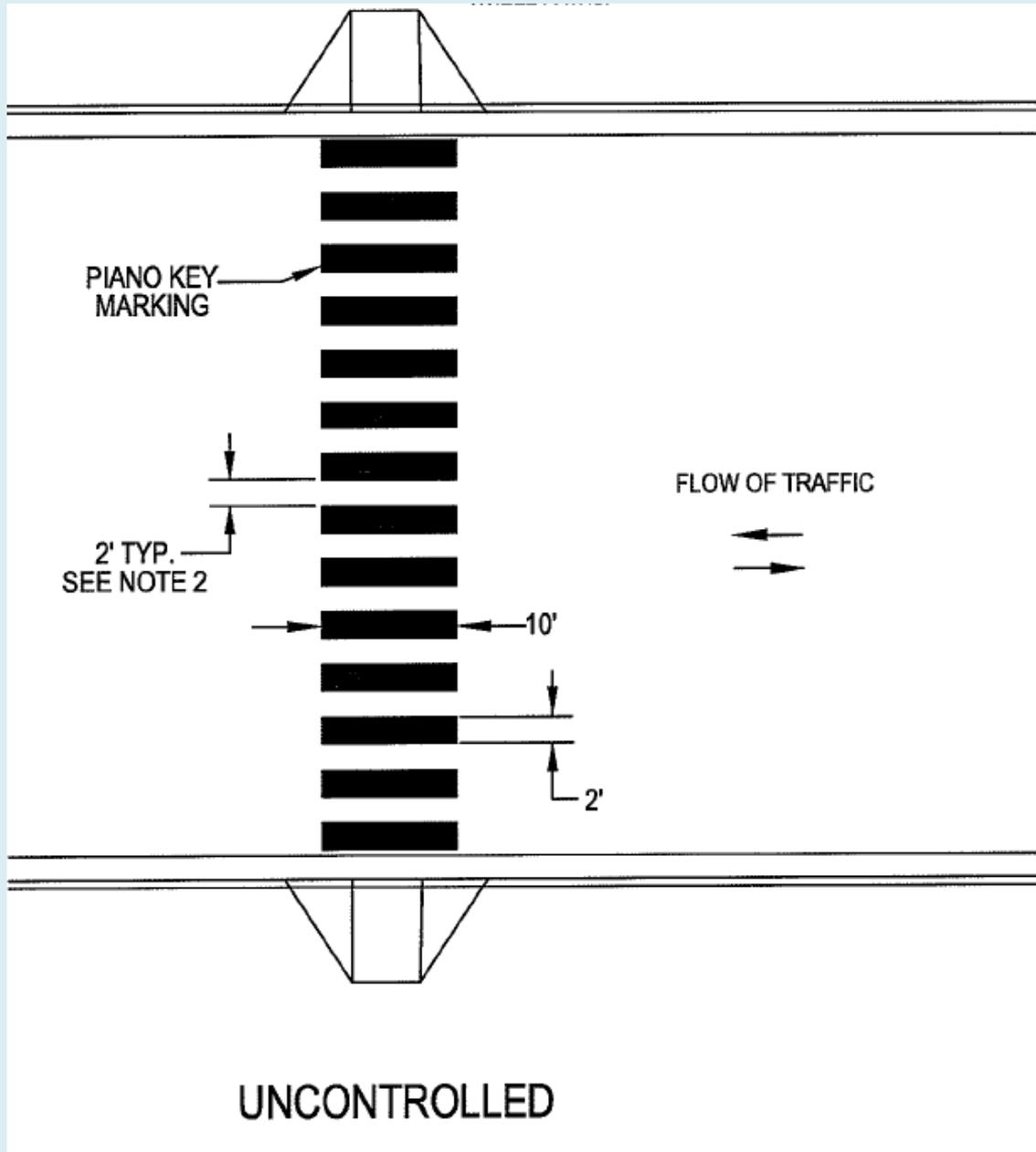
## Signals

- Downtown signals are push button activated
  - Improve pedestrian attentiveness
  - Coordinated arterials can handle multiple walk phases
  - Accommodate occasional emergency vehicles
- Crossing times
  - 3.5 feet per second walk speed
  - Average 5 second walk time (4 – 7 range)
  - 10 second flashing do not walk
  - 5 second clearance time

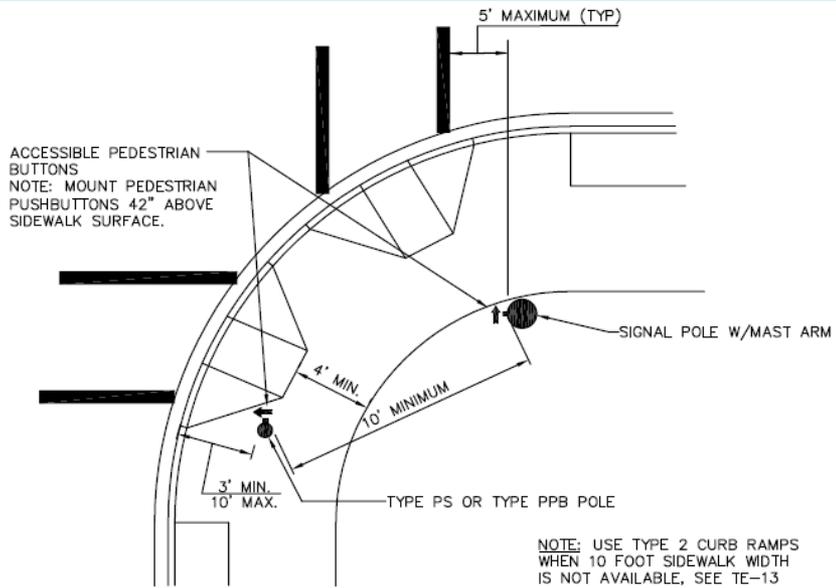
# Transportation Design Manual



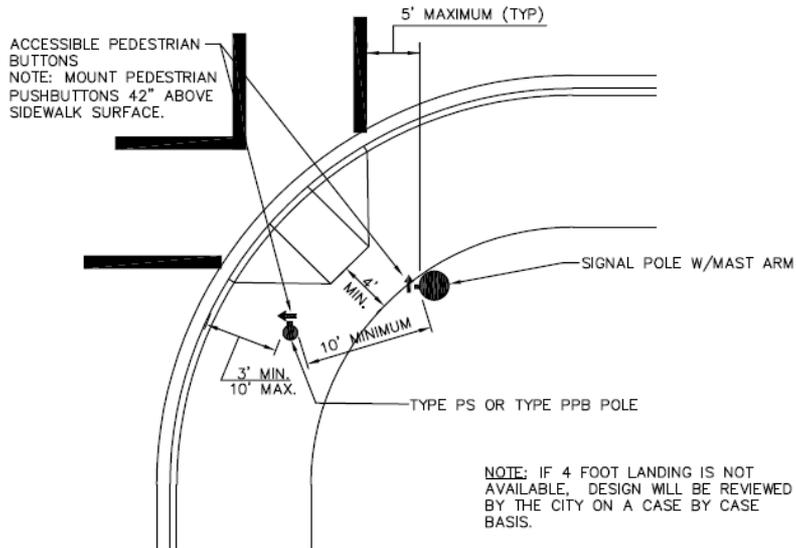
# Transportation Design Manual



# Transportation Design Manual



**TWO CURB-CUT RAMPS**



**ONE CURB-CUT RAMP**



# Intersection Components



**Crosswalks**



**Paving Materials**



**Signals**



**Geometry**

# Intersection Components – Crosswalks



## Typical Crosswalk Typology

- Parallel bars define crosswalk
- Visible and functional
- Demand can dictate width
- Maintenance considerations



## Pedestrian Environment

- Highlight/improve pedestrian experience
- Improve pedestrian visibility



## Advance Stop Bars

- Separate vehicles and pedestrians
- Raise visibility and awareness
- Loop detector placement

# Intersection Components – Paving Materials



## Alternate Materials

- Increase awareness of crossings
- Provide visual interest
- Exceptional pedestrian environment
- Opportunities for art



# Intersection Components – Signals



## Crossing Time

- Provide adequate time for average street crossing
- Standard walk speed may be faster than mobility impaired



## Push Button vs. Automated Walk

- Pros and cons for automated walk related to traffic operations
- Push button allows SCATS to allocate signal phase time to pedestrians when present



## Pedestrian Scramble

- Improve pedestrian circulation at high volume locations – traffic operations implications
- Effective with diagonal desire lines
- Reduce pedestrian vehicle conflicts

# Intersection Components - Geometry



## Curb Extension

- Opportunities for art and wayfinding
- Shorten crossing distance
- Improve ecology with pavers and planters
- Accommodate seating for cafés or rest



## Queuing Space

- “Landing” space at top of curb ramp for ADA compliance
- Accommodate queuing pedestrians



# Intersections – What City is already doing



## Crosswalks

Implement standard design at signalized and unsignalized intersections



## Paving Materials

- Stamped asphalt in brick patterns
- Colored concrete



## Signals

- SCATS implemented at all Downtown intersections – optimizes signal timing
- Leading pedestrian interval
- Countdown and audible signals  
Old-style push buttons being replaced



## Geometry

- ADA Compliance with new construction
- Curb bulb-outs where possible
- Corner set-backs for queuing

# Intersection Project Ideas from Staff



## Crosswalks

- Consider wider crosswalk bars at high pedestrian volume crosswalks
- Identify locations and design for an exceptional pedestrian environment
- Consider stop bars



## Paving Materials

Differentiate from asphalt or grey concrete to clearly designate as pedestrian space at high pedestrian volume crosswalks or where an exceptional environment is desired



## Signals

- Continue to use advanced signal technology (SCATS) to maximize crossing opportunities and minimize wait times
- Consider additional locations for pedestrian scramble



## Geometry

Incorporate curb extensions where possible and practical to shorten pedestrian crossing distance and accommodate other amenities to create an exceptional Downtown pedestrian environment



# **Downtown** Transportation Plan Update

## **Next Meeting – September 13**

### **BKR Modeling Results**

- Internal Trips

### **Pedestrian Facilities**

- Mid-Block Crossings
- Sidewalks
- Through Block Connections

### **Bicycle Facilities**

- NE 6<sup>th</sup> Street
- 112<sup>th</sup> Avenue NE



# **Downtown** Transportation Plan Update

**Thank you!**

**Kevin McDonald  
Judy Clark  
Sean Wellander**

**[www.bellevuewa.gov/DowntownTransportationPlanUpdate](http://www.bellevuewa.gov/DowntownTransportationPlanUpdate)**