



INFORMATIONAL MEMORANDUM

TO: Transportation and Infrastructure Committee
FROM: Henry Hash, Public Works Director *H.H.*
BY: Adam Cox, Transportation Project Manager
CC: Mayor Ekberg
DATE: August 30, 2019
SUBJECT: Annual Bridge Inspections and Repairs
Project 91910402
2019 Presentation on the State of the City's Bridges

ISSUE

Provide the Transportation and Infrastructure Committee with information about the entire City bridge inventory and program, showing the overall condition of the City's bridges as well as steps for future projects and maintenance.

BACKGROUND

The Federal Highways Administration (FHWA) and Washington State Department of Transportation (WSDOT) require regularly scheduled inspections of all the City's vehicle carrying bridge structures. The City extends this effort to include its pedestrian bridges. This requirement allows for continuity in reporting as well as the opportunity to identify and potentially fund bridges in need of replacement and rehabilitation.

DISCUSSION

The City currently has ownership of 23 bridges (16 traffic bearing and 7 pedestrian). Of those, two are jointly owned jurisdictional bridges with shared ownership between the City of Renton (Grady Way) and the City of Kent (S 196th/200). The bridge structure types vary from steel through truss, pre-cast concrete girders, cast-in-place concrete girders, steel girder, wood girder, and steel tied arch spans. The 2019 discussion will focus on why the City inspects its bridges, where the City stands with respect to the state and the country, and recommendations for additional steps that can be taken to address known issues.

RECOMMENDATION

Information only.

ATTACHMENT

- Page 17, 2019 CIP
- State of the City's Bridges Report

CITY OF TUKWILA CAPITAL PROJECT SUMMARY

2019 to 2024

PROJECT: Annual Bridge Inspections and Repairs

Project No. 9XX10402

DESCRIPTION: Ongoing program of bi-annual inspections, repairs, painting and rehabilitation of the 22 City bridges.

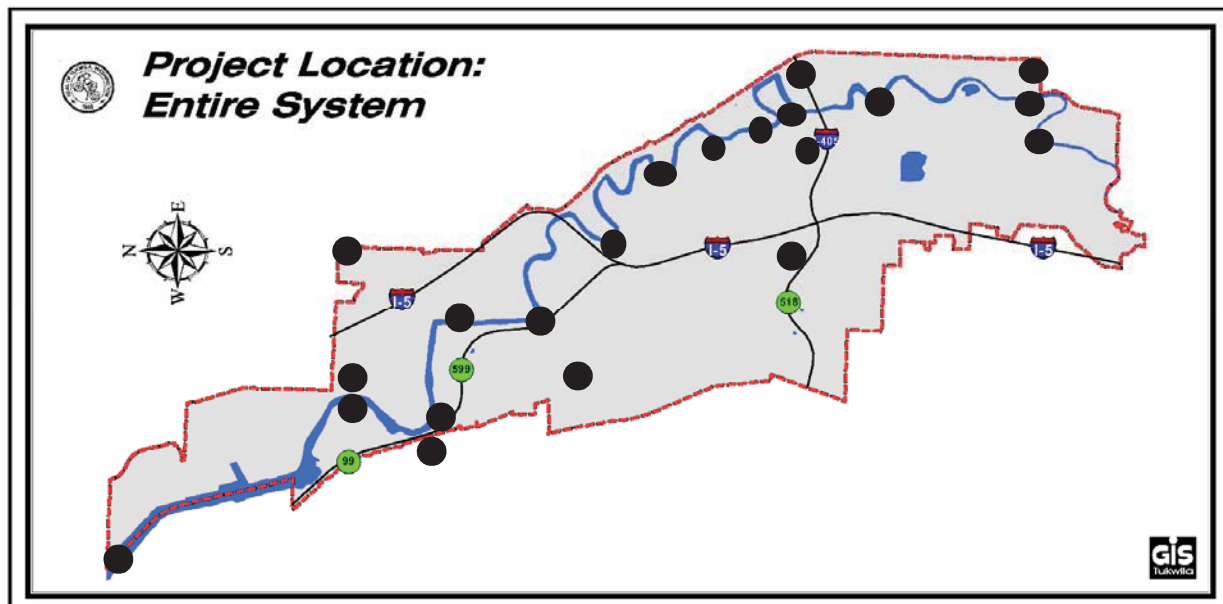
JUSTIFICATION: Federally required program identifies safety or repair needs in the early stages to minimize hazards and costs. The number of bridge inspections necessary each year can vary year to year. Inspection frequencies vary from bridge to bridge and King County has provided some inspection services.

STATUS: Construction projects will be determined from inspection reports and noted deficiencies/problems.

MAINT. IMPACT: Reduces maintenance costs.

COMMENT: Ongoing project, only one year actuals are shown in the first column.

FINANCIAL (in \$000's)	Through 2017	Estimated 2018	2019	2020	2021	2022	2023	2024	BEYOND	TOTAL
EXPENSES										
Design	141	45	45	45	55	55	65	65	65	581
Land (R/W)										0
Const. Mgmt.	1	40	40	40	50	50	60	60	60	401
Construction	32	250	250	250	300	300	325	325	325	2,357
TOTAL EXPENSES	174	335	335	335	405	405	450	450	450	3,339
FUND SOURCES										
Awarded Grant										
Proposed Grant										0
Mitigation Actual										0
Mitigation Expected										0
City Oper. Revenue	174	335	335	335	405	405	450	450	450	3,339
TOTAL SOURCES	174	335	335	335	405	405	450	450	450	3,339



CITY OF TUKWILA



CITY ENGINEER’S BRIDGE INSPECTION REPORT SEPTEMBER 2019



Tukwila Urban Center Pedestrian Bridge

City of Tukwila



Public Works Department

6300 Southcenter Blvd

Tukwila, WA 98188

CITY ENGINEER'S BRIDGE INSPECTION REPORT SEPTEMBER 2019

Hari Ponnekanti, P.E., Deputy PW Director/City Engineer

Table of Contents

Executive Summary	ii
Forward	iii
Quick Bridge Reference	iv
GROUP I BRIDGES - Bridges Recommended for Replacement/Rehabilitation	1
GROUP II BRIDGES - Bridges recommended for Major Maintenance	2
GROUP III BRIDGES - Posted Bridges	3
GROUP IV BRIDGES - Bridges Recommended for Rail Retrofit	4
GROUP V BRIDGES - Bridges Repair Recommendations for Repair	5
ADT (Average Daily Traffic)	9

Executive Summary

The City currently has ownership of 23 bridges (16 traffic bearing and 7 pedestrian). Of those, two are jointly owned jurisdictional bridges with shared ownership between the City of Renton (Grady Way) and the City of Kent (S 196th/200). The different types of bridge configuration vary from steel through truss, pre-cast concrete girders, cast-in-place concrete girders, steel girder, wood girder, and steel tied arch spans.

Currently the City has a total of five (5) bridges that have a sufficiency rating between 80 to 100; six (6) bridges that have a sufficiency rating between 60 to 79; two (2) bridges that have a sufficiency rating between 40 to 59; and three (3) bridges that have a sufficiency rating of 39 or less. Note, pedestrian bridges do not receive a sufficiency rating. Please refer to the Quick Bridge Reference sheet for the break down of city owned bridges and the assigned sufficiency rating.

The sufficiency rating formula provides a method of evaluating highway bridge data by calculating four (4) separate factors to obtain a numeric value which is indicative of bridge sufficiency to remain in service. The result of this method is a percentage in which 100 percent would represent an entirely sufficient bridge and zero (0) percent would represent an entirely insufficient or deficient bridge. The formula considers the structural adequacy, functional obsolescence, level of service and essentiality for public use.

Forward

The *City Engineer's Bridge Inspection Report*, dated September 2019, is published by the City of Tukwila Public Works Department, and the information contained herein is the best available at the time of publication. It is to be used as an information tool for planning and maintenance activities, and reflects the general condition of the City's bridges. The repairs indicated are summarized for brevity from actual bridge inspection reports.

Background

The FHWA (Federal Highway Administration) issued the NBIS (National Bridge Inspection Standards) in 1971. These standards established a comprehensive inspection for all federal highway system bridges. Minimum qualifications were set forth for bridge inspectors. Specific types and frequencies of inspections for bridges were established, and the reporting of certain standard information about each bridge was required. In 1978, these requirements were extended to all public bridges carrying vehicular traffic.

A national bridge inspection program has been in place ever since, and state and local agencies have performed bridge inspection in accordance with these guidelines. Inspections for the City of Tukwila's bridges are conducted every two years unless conditions warrant additional inspections or frequencies as dictated by the NBIS.

Bridge Quick Check Informational Sheet

Bridge Number	Name	Year Built	Suff. Rating	WSDOT Bridge ID	ADT	Next ADT Reqd	Last Inspection	Next Inspection Date	UBIT Required	Last UBIT Inspection	Next UBIT Insp Reqd	Fracture Critical	Special Notes
Tukwila 01	Macadam Road	1997	80.58	08674200	3,600	2024	4/18/2019	2021	N	-	-	N	
Tukwila 02	Frank Zepp	1968	75.37 FO	08561400	36,000	2022	4/18/2019	2021	Y	2017	2021	N	
Tukwila 03	Lois T Newton	1973	75.36	08544400	18,900	2021	4/18/2019	2021	Y	2017	2023	N	
Tukwila 05	South-center Blvd	1994	96.98	0014269D	10,616	2023	8/16/2018	2020	Y	2014	2020	N	
Tukwila 06	Foster 56th Ave	1985	58.05	08166200	2,850	2024	4/11/2019	2021	Y	2017	2023	N	
Tukwila 07	51st Ave South	1996	69.09	08634500	4,600	2024	4/16/2019	2021	N	-	-	N	
Tukwila 08	Grady Way	1986	64.93	08543600	25,500	2024	4/16/2019	2021	Y	2018	2023	N	Jointly owned with City of Renton
Tukwila 09	E Marginal Way	1989	89.83	08110200	13,000	2024	4/11/2019	2021	Y	2017	2023	N	

Bridge Number	Name	Year Built	Suff. Rating	WSDOT Bridge ID	ADT	Next ADT Reqd	Last Inspection (2 Yr Cycle)	Next Inspection Date	UBIT Required	Last UBIT Inspection	Next UBIT Insp Reqd (4 yr cycle)	Fracture Critical	Special Notes
Tukwila 11	BAR Airport Way	1952	39.80 SD	08001800	40,000	2024	4/25/2019	2021	N	-	-	N	
Tukwila 12	BAR BNSF	1945	37.19 SD	08002500	38,800	2021	4/25/2019	2021	Y	2017	2021	N	
Tukwila 13	Beacon Ave S	1971	78.36	7996800	500	2020	4/9/2019	2021	N	2017	2019	Y	
Tukwila 14	42nd Ave S	1949	7.56 SD	08651500	10,300	2023	4/1/2019	2021	Y	2019	2021	Y	Applying for replacement funding 2019
Tukwila 15	Pacific Hwy	2000	86.36	08651500	30,300	2021	8/16/2018	2020	Y	2016	2020	N	
Tukwila 16	S 119th	1965	--	08104300	NA	NA	4/25/2019	2024	N	-	-	N	
Tukwila 17	Foster Golf Course	1987	--	08584100	NA	NA	4/11/2019	2024	N	-	-	N	
Tukwila 18	Green River Ped & Utility	1983	--	08584200	NA	NA	8/16/2018	2023	N	-	-	N	
Tukwila 19	Inter-urban Trail	2006	--	08742500	NA	NA	9/11/2018	2023	N	-	-	N	

Bridge Number	Name	Year Built	Suff. Rating	WSDOT Bridge ID	ADT	Next ADT Reqd	Last Inspection	Next Inspection Date	UBIT Required	Last UBIT Inspection	Next UBIT Insp Reqd	Fracture Critical	Special Notes
Tukwila 20	180th Street Trail	2001	--	08742600	NA	NA	8/16/2018	2023	Y	2016	2018	Y	
Tukwila 21	Fort Dent Road	1975	65.00	08328300	1,115	2023	8/16/2018	2020	Y	2014	2020	N	
Tukwila 22	Fort Dent Trail	2002	--	08718400	NA	NA	8/16/2018	2023	N	-	-	N	
Tukwila 24	Klickitat	2012	93.93 FO	08853600	14,024	2023	4/25/2019	2021	N	-	-	N	
Tukwila 25	TUC Ped Bridge	2018	-	xxnewxxx	-	-	2019	2024	Y	2019	2024	Y	
4001	196-200th	1998	59 SD	08712100	17,406	2023	4/18/2019	2021	Y	2015	2021	N	Jointly owned with City of Kent

NOTES:

Bridge Rating is out of 100.

SD - Indicates the bridge structure is "Structural Deficient" as defined by the WSDOT (Washington State Department of Transportation) bridge inspection program. The structure is still safe for use by the public and the condition is being monitored.

FO - Indicates the bridge structure is "Functionally Obsolete" as defined by the WSDOT (Washington State Department of Transportation) bridge inspection program. This designation only indicates the roadway geometrics do not meet current standards for bridge design.

UBIT - Under Bridge Inspection Truck. This indicates the bridge needs special equipment in order to reach portions of the structure for inspection.

ADT - Average Daily Traffic

NA - Sufficiency ratings are not given on pedestrian facilities since they are not a part of the NBI system so a Suff. Rating of NA is given in that location.

All pedestrian bridges do not have a calculated sufficiency rating - they are not traffic loaded bridges and the rating numbers are not calculated per Federal Requirements

GROUP I BRIDGES

Bridges Recommended for Replacement or Rehabilitation

Bridge Number	Bridge Name	Location	Reason
Tukwila 14	42nd Ave South*	Allentown (42nd Ave)	Deteriorating Structural Condition of the steel superstructure
Tukwila 12	Boeing Access Road over Airport Way**	Boeing Access Road	Substructure Seismic Rehabilitation

Note: See individual bridge reports in Public Works for detailed repair work.

* Application is currently under review by the Washington State Department of Transportation Local Programs and the Bridge replacement Advisory Committee (BRAC) program. Application results will likely be announced in Septmeber/October 2019.

** This structure is currently funded by the BRAC program. The project is anticipated to be designed in Winter 2019 and constructed in 2020.

GROUP II BRIDGES

Bridges Recommended for Major Maintenance

Bridge Number	Bridge Name	Location	Reason
Tukwila 16	South 119th Pedestrian Bridge	119th Str (Allentown)	Painting of entire structure with possible rot repair as encountered
Tukwila 18	Green River Pedestrian and Utility	Interurban Trail near 180th	Rehabilitation of structure coating and timber rot repair and replacement

GROUP III BRIDGES

Posted Bridges

Bridge Number	Bridge Name	Location	Reason
Tukwila 14	42nd Ave South	Allentown	Bridge is posted for reduced truck speed and posted for reduced loading on AASHTO Type 3 trucks and 6 and 7 axle vehicles.

Note: See individual bridge reports in Public Works for detailed repair work.

GROUP IV BRIDGES

Bridges Recommended for Rail Retrofit

Bridge Number	Bridge Name	Location	Reason
Tukwila 1	Macadam	Macadam Road	Provide Guardrail, terminal and transitions that meet current standards
Tukwila 2	Frank Zepp	180th Street	Provide bridge rail that meet current standards
Tukwila 3	Lois T Newton	Stander Boulevard	Provide bridge rail, guardrail, terminal and transitions that meet current standards
Tukwila 6	Foster 56th Ave South	56th Avenue South	Provide bridge rail, guardrail, terminal and transitions that meet current standards
Tukwila 8	Grady Way	Grady Way	Provide Guardrail, terminal and transitions that meet current standards
Tukwila 9	East Marginal Way	East Marginal Way	Provide bridge rail, guardrail, terminal and transitions that meet current standards
Tukwila 11	Boeing Access Road - Airport Way	Boeing Access Road	Provide bridge rail, guardrail, terminal and transitions that meet current standards
Tukwila 13	Beacon Ave South	Victor Street	Provide bridge rail, guardrail, terminal and transitions that meet current standards
Tukwila 14	42nd Avenue South	42nd Avenue South	Provide Guardrail, terminal and transitions that meet current standards

Note: See individual bridge reports in Public Works for detailed repair work.

GROUP V BRIDGES

Bridges Repair Recommendations

PRIORITY CODE 'A'	Highest Priority - Structural integrity and safety involved.
PRIORITY CODE 'B'	Regular Priority - General bridge structural repair work not requiring immediate response.
PRIORITY CODE 'C'	Low Priority - General minor maintenance or other work to be accomplished as time and money permit.
PRIORITY CODE 'M'	Monitor - The repair or item described needs to be monitored at the rate indicated.

Note: See individual bridge reports in Public Works for detailed repair work.

Bridge Number	Bridge Name	Location	Repair Recommendations	Priority	Inspection Date
Tukwila 1	Macadam	Macadam	<ol style="list-style-type: none"> 1. Replace rotting guardrail posts 2. Replace missing guardrail hardware 3. Upgrade guardrail to current standards 4. Replace missing pedestrian rail bar at the SW corner. 	B B B B	18-Apr-19
Tukwila 2	Frank Zepp	180th Street	<ol style="list-style-type: none"> 1. Remove dirt, debris, and concrete debris from around bearings at both abutments. Clean and repaint bearings. 2. Epoxy inject crack at the interface between new and old concrete at Pier 3. 3. Saw cut and remove all delaminated concrete from the northeast corner of the deck and patch it with high strength non-shrink grout. 4. Correct the vertical height difference between the steel finger joints 	B B B B	18-Apr-19
Tukwila 3	Lois Newton	Strander Blvd	<ol style="list-style-type: none"> 1. No repairs recommended at this time. 	NA	18-Apr-19
Tukwila 5	South center Blvd	SC Blvd	<ol style="list-style-type: none"> 1. replace missing block spacer on guardrail post 	C	16-Aug-18
Tukwila 6	Foster 56th Ave S	56th Ave S	<ol style="list-style-type: none"> 1. Fill scour void under SE wingwall 2. replace expansion joint material 3. repair damaged guardrail terminal end 	B B B	11-Apr-19
Tukwila 7	51st Ave S	51st Ave S	<ol style="list-style-type: none"> 1. Apply deck sealer to prevent ponding water to leak in to the cox girders 2. Remove waste and transient debris beneath bridge 3. Repair spalls at expansion joint 4. Repair northwest rail terminal 	B M B B	16-Apr-19

Bridge Number	Bridge Name	Location	Repair Recommendations	Priority	Inspection Date
Tukwila 8 (Renton-Tukwila Joint Ownership)	Grady Way	Grady Way	<ol style="list-style-type: none"> 1. Repair vertical sliding surfaces on columns 2. Repair damage bridge rail (spalling and delaminations) 4. Repair pedestrian fencing 5. Monitor homeless encampment and makeshift facilities under structure 6. Clear out material between bearings at Abutment 1 6. Remove vegetation on retaining wall 	B B B M B C	16-Apr-19
Tukwila 9	E Marginal Way	E Marginal Way	<ol style="list-style-type: none"> 1. Replace compression seals at expansion joints 	B	11-Apr-19
Tukwila 11	BAR Airport Way	Boeing Access Road	<ol style="list-style-type: none"> 1. Repair column delamination 2. Repair bridge rail damage 	A B	25-Apr-19
Tukwila 12	BAR BNSF	Boeing access road	<ol style="list-style-type: none"> 1. Repair the southeast approach rail. 	B	25-Apr-19
Tukwila 13	Beacon Ave South	At Victor Street	<ol style="list-style-type: none"> 1. Repair interior lighting. 	B	9-Apr-19

Bridge Number	Bridge Name	Location	Repair Recommendations	Priority	Inspection Date
Tukwila 14	42nd Ave S	42nd Ave S	<ol style="list-style-type: none"> 1. Clean out open joints over floor beams thoroughly and fill with a flexible sealant, priority 1 due to corrosion at top flanges of floorbeams from leaking joints. 2. Rework the sliding plate expansion joint so it is smooth with sidewalk and patch spalls near panel points, seal open cracks. 3. Replace missing guard rail and terminal at SW corner, replace damaged rail at SE corner, reset NW rail and posts to bring rail up to standard height. 4. Thoroughly pressure wash clean truss of all dirt/algae/guano, prepare surface, paint bridge to encapsulate pack rust and protect truss members. Add bird deterrent at all panel points, upper and lower chords. 5. Replace steel sliding plate expansion joints with either a strip seal with steel header or modular joint to eliminate water intrusion onto steel bearings. 6. Recommend design seismic retrofit steel collar and construct around bearing columns, anchored to cap, then fill tight with epoxy. 7. FRP wrap columns 4 A-C. Reinforce west wingwall. Add quarryspall along abutment 4 and under span 3 to retain fill and discourage transient activity. 8. Replace missing riprap along banks and in front of piers. 9. Recommend raising portals and sways due to the high volume of truck traffic and existing damage to sway members. 10. Replace sliding plates with elastomeric dynamic isolation bearings. 11. Chip any delaminated concrete from exposed rebar, clean and seal exposed bar and patch spalls. Sack honeycombed areas throughout soffit. Shotblast deck surface, patch spalled areas and apply epoxy overlay. 	<p style="text-align: center;">B</p> <p style="text-align: center;">S</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p> <p style="text-align: center;">B</p>	19-Apr-19
Tukwila 15	Pacific Hwy	Pacific/TIB at Duwamish	<ol style="list-style-type: none"> 1. Repair leaky pipe inside the west girder 2. Arrest channel erosion along the south bank 3. Repair the approach guardrails at the southwest, southeast, and northeast ends 4. Apply epoxy overlay on the bridge deck 	<p style="text-align: center;">A</p> <p style="text-align: center;">A</p> <p style="text-align: center;">B</p> <p style="text-align: center;">C</p>	16-Aug-18

Bridge Number	Bridge Name	Location	Repair Recommendations	Priority	Inspection Date
Tukwila 16	S 119th Pedestrian	S 119th Street	<ol style="list-style-type: none"> 1. Repair warped and twisted deck planks, deck has non-skid coating but timber is still weathered 2. Major rehabilitation or replacment in near future 3. Special inspection requested to inspect the underside of the superstructure 	B A A	25-Apr-19
Tukwila 17	Foster Golf Course	Foster GC	<ol style="list-style-type: none"> 1. Monitor bearing movement at Abutment 1 2. Remove blackberry bushes under the bridge 	M C	11-Apr-19
Tukwila 18	Green River	Interurban trail near 180th	<ol style="list-style-type: none"> 1. Monitor utility pipe alignment 2. Repair chord patching material debonding 3. repair and replace rotting timber pedestrian rail 4. Paint entrie superstructure 	M B B B	6-Aug-18
Tukwila 19	Interurban Trail	Interurban Trail at TIB	No repairs noted	-	11-Sep-18
Tukwila 20	180th Ped	Interurban trail at 180th	<ol style="list-style-type: none"> 1. Monitor leaching cracks in abutment and retaining walls 2. Remove debris from bearing seat 3. repair approach settlement 	M C B	16-Aug-18
Tukwila 21	Fort Dent Road	Fort Dent Road	<ol style="list-style-type: none"> 1. Trim vegetation overhanging along sidewalk 	C	16-Aug-18
Tukwila 22	Fort Dent Trail	Interurban trail	<ol style="list-style-type: none"> 1. Trim overgrowing vegetation at approaches 2. Remove debris on chords of bridge girders 3. Replace missing safety chains at corners of bridge 	C M B	16-Aug-18
Tukwila 24	Klickitat Drive	Klickitat Drive	No repairs noted	NA	25-Apr-19
4001 (Kent-Tukwila Joint Ownership)	196-200th	196th Street	<ol style="list-style-type: none"> 1. Repair west approach settlement (Scheduled for Fall/Winter 2019) 2. repair guardrail at bridge approaches and replace damaged W Beam 3. Repair joints and seals 4. Clean deck drains 	A B B B	18-Apr-19

**City of Tukwila
Bridge ADT Schedule**

Bridge Average Daily Traffic (ADT)					
Bridge Number	Name	Year Built	Structure ID	ADT	Next ADT Reqd (5 yr Cycle)
Tukwila 01	Macadam Road	1997	08674200	3600	2024
Tukwila 02	Frank Zepp	1968	08561400	36000	2022
Tukwila 03	Lois T Newton	1973	08544400	18900	2021
Tukwila 05	South-center Blvd	1994	0014269D	10616	2023
Tukwila 06	Foster 56th Ave	1985	08166200	2850	2024
Tukwila 07	51st Ave South	1996	08634500	4600	2024
Tukwila 08	Grady Way	1986	08543600	25500	2024
Tukwila 09	E Marginal Way	1989	08110200	13000	2024
Tukwila 11	BAR Airport Way	1952	08001800	40000	2024
Tukwila 12	BAR BNSF	1945	08002500	38800	2021
Tukwila 13	Beacon Ave S	1971	7996800	500	2020
Tukwila 14	42nd Ave S	1949	08651500	10300	2023
Tukwila 15	Pacific Hwy	2000	08651500	30300	2021
Tukwila 21	Fort Dent Road	1975	08328300	1115	2023
Tukwila 24	Klickitat	2012	08853600	14024	2023
4001	196-200th	1998	08712100	17406	2023