FUTURE MULTIMODAL CONDITIONS

CITY OF SEATAC
TRANSPORTATION MASTER PLAN

AUGUST 2024

PREPARED FOR:

CITY OF SEATAC

DKS

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INTRODUCTION

This Future Multimodal Conditions report contains information and analysis of the City of SeaTac's transportation system forecasted for the year 2044. This report covers the possible growth scenarios analyzed using the new travel demand model, discusses future transportation forecasts for all modes of travel, and identifies the multimodal projects needed to accommodate the planned growth while achieving the larger vision for the City.

The report is divided into eight main sections:

- Anticipated Growth,
- Background Projects,
- Mode Share,
- Traffic Volumes,
- Traffic Operations,
- Active Transportation,
- Freight, and
- Transit.

This report follows the Existing Conditions Report created for the City in January 2024, which summarized the same set of multimodal conditions for the 2023 base year. The scope of the analyses generally covers the City limits, as shown in Figure 1.

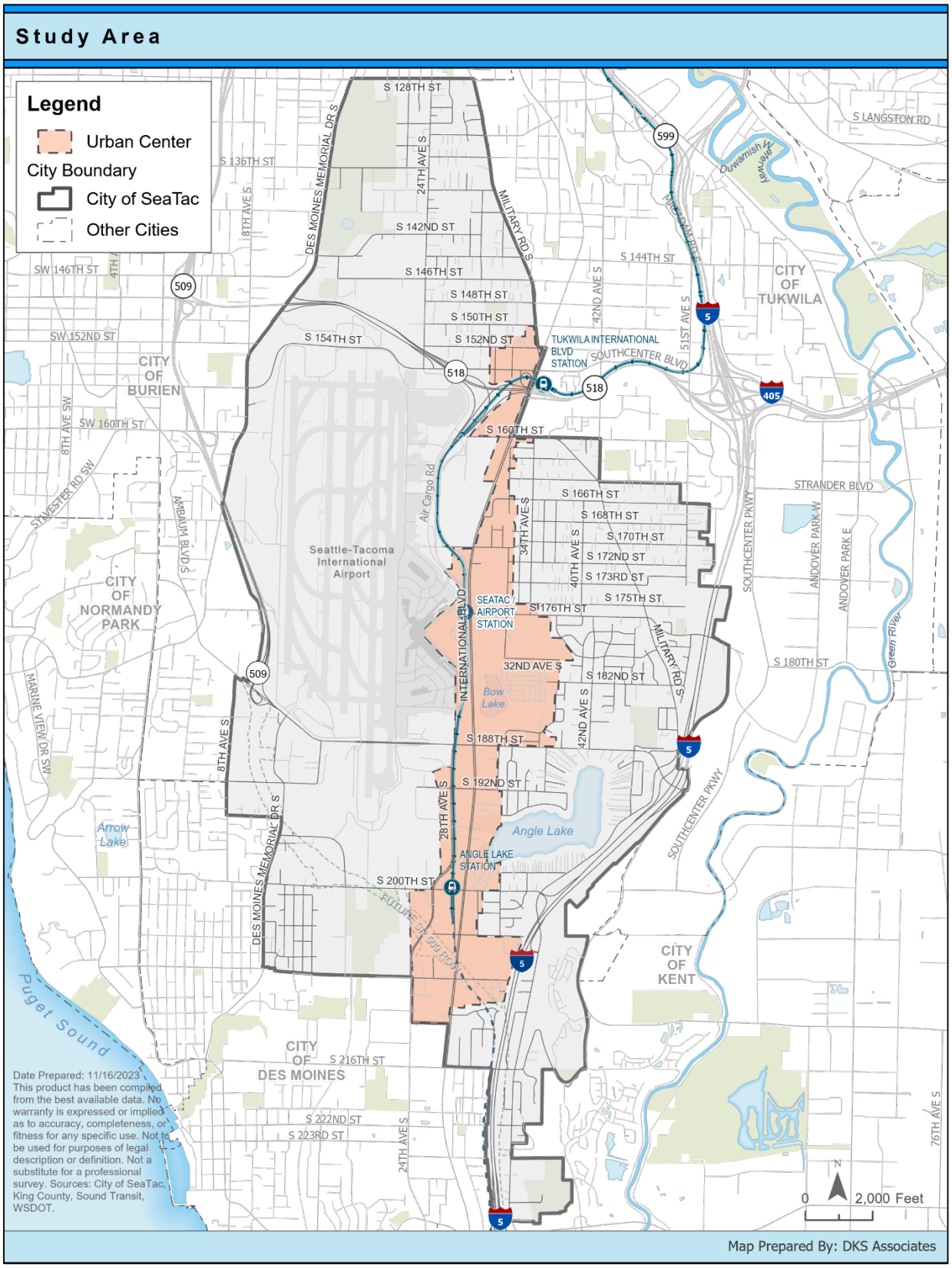

FIGURE 1: STUDY AREA

ANTICIPATED GROWTH

GROWTH SCENARIOS

The City's draft land use element explains the overall vision for land use in 2044. The goal is to focus growth within centers, urban villages, and smaller scale mixed use areas. Most of SeaTac's growth would be focused within these areas to support community health, equity, economic vitality, and citywide transit access.

With these goals in mind, three different growth scenarios were considered for the future 2044 horizon year:

- Alternative 1: Meets mandated Housing and Employment Targets with growth focused in the Urban Center
- Alternative 2: Alternative 1 + Neighborhood Villages
- Alternative 3: Alternative 2 + Corner Stores and Neighborhood Corridors

Neighborhood Villages are City-designated areas outside of the Urban Center (the City's designated Urban Growth Center) that provide access to everyday needs and contain a range of moderately scaled housing options. Corner Stores provide convenience services to adjacent residential areas and smaller scaled housing compatible with lower density residential areas. Neighborhood Corridors provide services and small to moderately scaled housing options along key corridors. See Figure 2 for where these growth areas are generally located.

Alt 1 is considered the "no action" scenario, where the target amount of growth is achieved for housing and employment within the City. No Neighborhood Villages, Corner Stores, or Neighborhood Corridors are included in this alternative.

Alt 2 builds upon Alt 1, adding in designated Neighborhood Villages.

Alt 3 builds further upon Alt 2, adding Corner Store locations and additional density along Neighborhood Corridors. High-level outcomes from the travel demand model showed that all three alternatives have similar results in terms of mode share, total volume, truck volume, and overall delay. See Appendix.

This report focuses on Alternative 3 for the evaluation of future conditions as it reflects the highest intensity growth with the intent of identifying the greatest needs/impacts of growth.

SEACAST TRAVEL DEMAND MODEL

A new travel demand model for the City of SeaTac was created from the Puget Sound Regional Council (PSRC) SoundCast Activity-Based Travel Demand Model[1] in collaboration with the Port of Seattle. This localized version of the PSRC model -- the SeaCast model-- uses a custom zone and network structure for higher resolution within SeaTac and incorporates a customized model for the Sea-Tac Airport.

[1] https://www.psrc.org/activity-based-travel-model-soundcast, Accessed 7/25/2024.

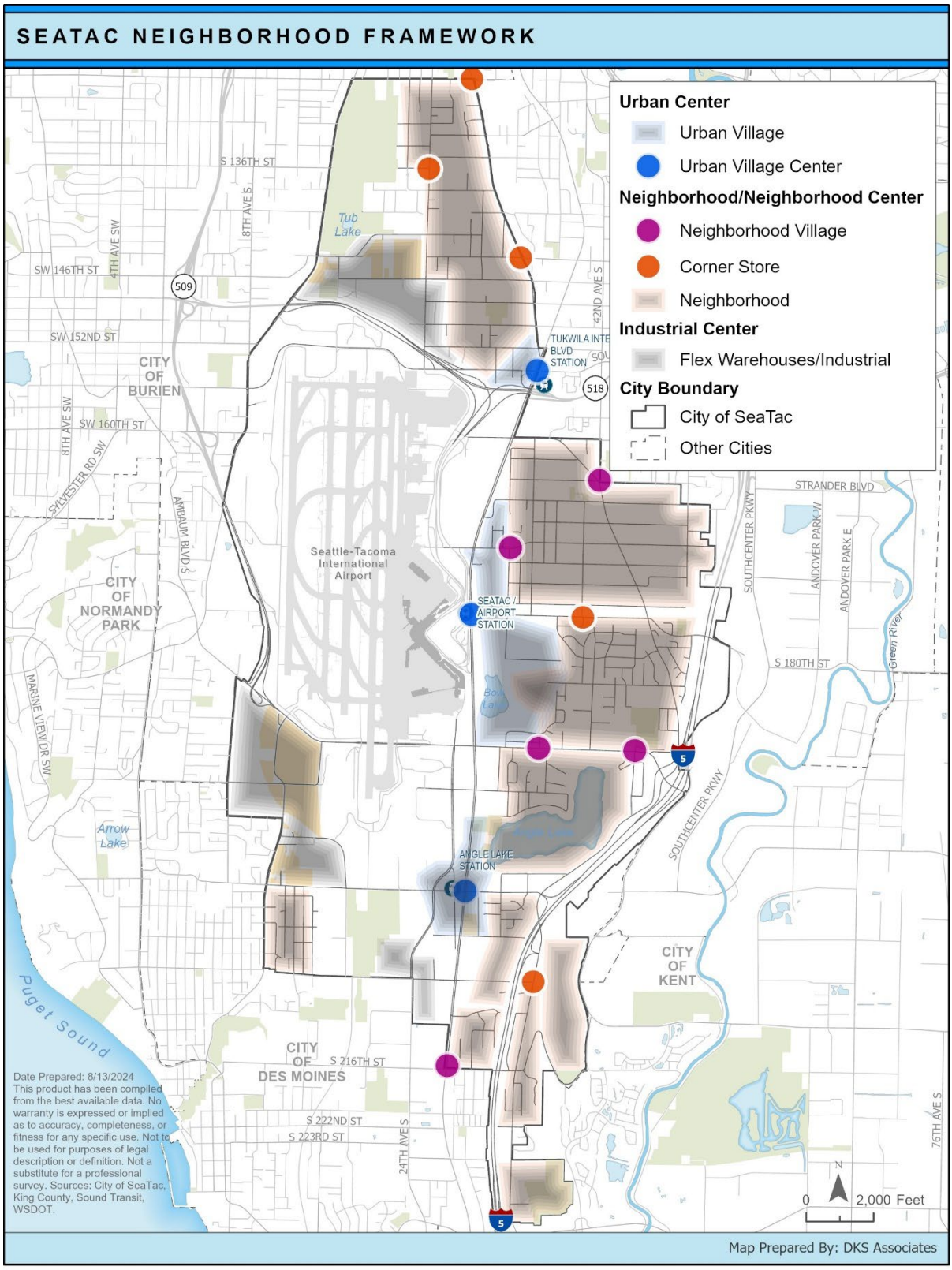

FIGURE 2: GROWTH TYPOLOGIES

Activity-based travel demand models derive travel demand from the daily activity patterns of a simulated population. Activity-based models represent each person's daily activity and travel choices. Behaviors and decisions around activities form the basis of these models.[2] In contrast, trip-based or four-step models estimate aggregate travel demand for each geographic zone directly from zonal land use data. Among other advantages, activity-based models produce more detailed information across a broader set of performance metrics and are therefore more useful in assessing policies and outcomes around equity, for example.

The base year for the SeaCast model is 2018 to match the PSRC SoundCast model and the forecast year is 2044 for all three growth scenario alternatives. The base year model was calibrated using segment counts from a variety of data sources which were collected between 2013 and 2023.

BACKGROUND PROJECTS

In addition to land use assumptions and anticipated growth, the development of a future 2044 scenario incorporates planned regional and local projects. The following describes the major projects which are assumed to be completed by 2044.

SR 509 COMPLETION PROJECT

SR 509 currently terminates at Des Moines Memorial Drive S/S 188th Street, west of Sea-Tac Airport. The SR 509 Completion Project will extend SR 509 south and east towards a new interchange with I-5.[3] The extension will be a tolled expressway and will include interchange ramps at 24th Avenue S and the new Airport South Access Expressway. The anticipated completion date is 2028.

AIRPORT SOUTH ACCESS EXPRESSWAY

Under current plans, the Airport South Access Expressway project will construct a new two-lane limited access arterial between the Sea-Tac Airport roadway system (including the existing Airport Expressway) and the SR 509 extension at 24th Avenue S.[4] The roadway will intersect at-grade with S 188th Street and S 200th Street, and the roadway will terminate via an interchange with SR 509. This project is included in the future 2044 model to align with PSRC's Regional Transportation Plan. The currently anticipated completion date is 2032. This project may be reconsidered in the future as no firm commitment has been made by the Port of Seattle regarding its construction.

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[2] Activity-Based Travel Demand Models: A Primer, Strategic Highway Research Program 2 Report S2-C46-RR-1, Transportation Research Board of the National Academies, 2015

[3] https://wsdot.wa.gov/construction-planning/search-projects/sr-509-completion-project, Accessed 7/25/2024.

[4] Regional Transportation Plan 2022-2050, Appendix D2: Regional Capacity Project List, Puget Sound Regional Council.

LINK LIGHT RAIL EXTENSIONS

The Angle Lake Light Rail Station in SeaTac is currently the end of the line for Sound Transit's Link Light Rail service. Sound Transit plans to extend their light rail service in two phases:

- Federal Way Link Light Rail Extension[5]
- Tacoma Dome Link Light Rail Extension[6]

The Federal Way Link Extension will extend the light rail from its current terminus to Federal Way, then the Tacoma Dome Link Extension will extend it further from Federal Way to Tacoma Dome where it will connect to the Sounder (S Line), Amtrak (Cascades and Coast Starlight), and the Tacoma Link Light Rail (T Line).

The Federal Way extension is currently in the design and construction phase, while the Tacoma Dome extension is in the planning phase. Service is anticipated to start for Federal Way in 2026, then in Tacoma Dome in 2035. Both projects extend Sound Transit's 1 Line further south, adding eight miles to reach Federal Way and 10 additional miles to reach Tacoma Dome.

PREVIOUSLY ADOPTED SEATAC PLANS

A summary of all of the relevant plans completed by the City is available in the Existing Plans Summary memorandum. The following are very brief summaries of these existing plans. These plans indicate the level of planning, study, and care that SeaTac has taken to address multimodal needs throughout the City. These plans laid the groundwork for this needs assessment and the Transportation Master Plan.

INTERNATIONAL BOULEVARD PEDESTRIAN SAFETY STUDY

The City of SeaTac led a project to identify pedestrian safety countermeasures for the International Boulevard corridor with City limits, from S 152nd Street to S 216th Street.[7] The project identified factors for pedestrian safety, analyzed costs and benefits, and developed a process for selecting countermeasures.

ANGLE LAKE DISTRICT STATION AREA PLAN

The Angle Lake District Station Area Plan was created to optimize the economic opportunities of the Angle Lake Station on Sound Transit's Link Light Rail alignment.[8] The plan informs infrastructure improvements and code development to support a pedestrian-friendly and transit-oriented community.

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[5] https://www.soundtransit.org/system-expansion/federal-way-link-extension, Accessed 8/5/2024.

[6] https://www.soundtransit.org/system-expansion/tacoma-dome-link-extension, Accessed 8/5/2024.

[7] https://www.seatacwa.gov/government/city-departments/public-works/ib-pedestrian-crossings-safety-plan, Accessed 7/25/2024.

[8] Angle Lake District Station Area Plan, Adopted July 2015.

ADA TRANSITION PLAN

The Americans with Disabilities Act (ADA) Self-Evaluation and Transition Plan (2018) established the City of SeaTac's ongoing commitment as an all-inclusive community to providing equal access to those with disabilities.

PERMIT PARKING PROGRAM

The City of SeaTac Parking Permit Program aims to manage parking in congested neighborhoods. This program was established in response to resident feedback about a lack of on-street parking in the McMicken neighborhood.

CITY CENTER PLAN UPDATE

The City Center Plan Update Phase 1 Project established an updated vision for the city center area and documented a consensus about a path forward for the district. The concept for this district involves two sub-areas with distinct characteristics:

- an urban, airport-serving, mixed-use district along International Boulevard, and
- a residential area stepping down in intensity to meet the single-family neighborhoods at the eastern-most boundary.

Phase 2 of this project aims to complete a sub-area plan that identifies how to implement the vision from Phase 1. Phase 2 is currently underway with community outreach.

MILITARY ROAD S FIVE-WAY INTERSECTION STUDY

This project studied the five-way intersection of Military Road S, S 164th Street, and 42nd Avenue S to determine a configuration that will improve mobility and safety for people driving, walking, and biking through the intersection, while also serving as a potential community hub. The project team's recommendation for the installation of a roundabout has been incorporated into the City's Transportation Improvement Project (TIP) list.

S 200TH STREET CORRIDOR STUDY

This project investigates recommendations from the City's Transportation Master Plan (TMP), which calls for the S 200th Street corridor to be converted from a four-lane roadway to one lane in each direction with a center turn-lane, bicycle lanes, and improved pedestrian facilities. Recommendations from the project team advocate for either of the options below:

- Option 1: Add bike lanes, wider sidewalks, a two-way left turn-lane, and revise access to I-5
- Option 2: Keep existing configuration (four-lane roadway), acquire right-of-way to expand sidewalks and add a bike lane, and add roundabouts at intersections with Military Road S and 32nd Avenue S

Additional conversations with the community and stakeholders are needed to determine the best treatment along S 200th Street.

LOCAL ROAD SAFETY PLAN

The local road safety plan (LRSP) provides a basis for systematic safety improvements in the City of SeaTac. It creates a framework to identify and understand safety issues, then uses the knowledge gained to recommend improvements through a prioritized list of projects. Crash analysis revealed trends including the high share of Killed/Severe Injury (KSI) crashes that involved pedestrians and fixed objects. The LRSP applied countermeasures to locations where high-risk factors are present, resulting in a set of eight countermeasure-based projects and twelve corridor-based projects, including cost estimates.

FUTURE TRIP CHARACTERISTICS

MODE SHARE

There are seven primary modes[9] that SeaTac residents utilize to travel in the SeaCast model:

- Walking
- Biking
- Transit
- TNC (Transportation Network Company, or ride-sharing companies)
- SOV (Single Occupancy Vehicle, or driving alone)
- HOV2 (High Occupancy Vehicle with two persons traveling)
- HOV3+ (High Occupancy Vehicle with three or more persons, not including transit)

The daily travel mode shares are shown in Figure 3 for SeaTac residents by trip type.

[9] School Bus is an additional mode but is not considered since its mode share never exceeded 0.26% for any growth alternative for any trip purpose.

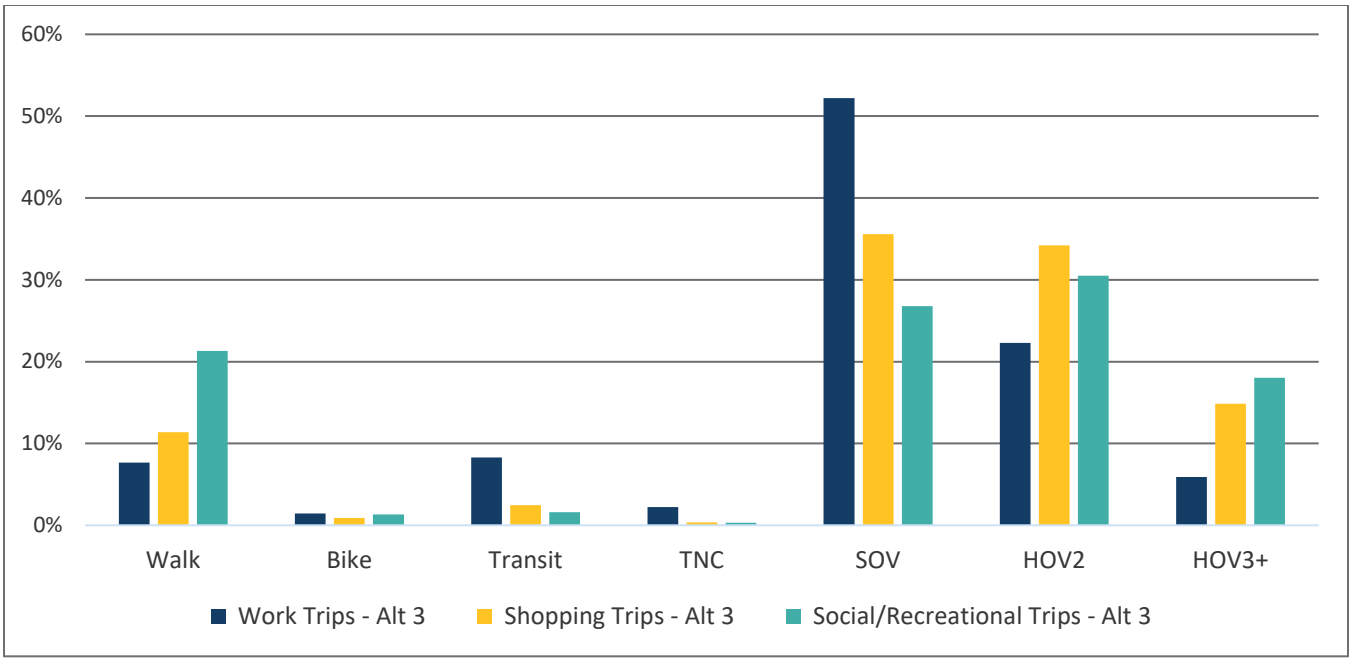


FIGURE 3: DAILY MODE SHARE FOR SEATAC RESIDENTS BY TRIP TYPE

As shown, SOV is the most common mode for work trips, SOV and HOV2 are the most common modes for shopping trips, and HOV2, SOV, and walking are all common modes for social/recreational trips. Bike trips and TNC trips are consistently the least popular modes for any trip type.

TRIP LENGTH AND DURATION

Figure 4 and Figure 5 show the average daily trip length and duration, respectively, for residents of SeaTac based on different trip types. Each trip type is further divided into two travel modes: transit or automobile.

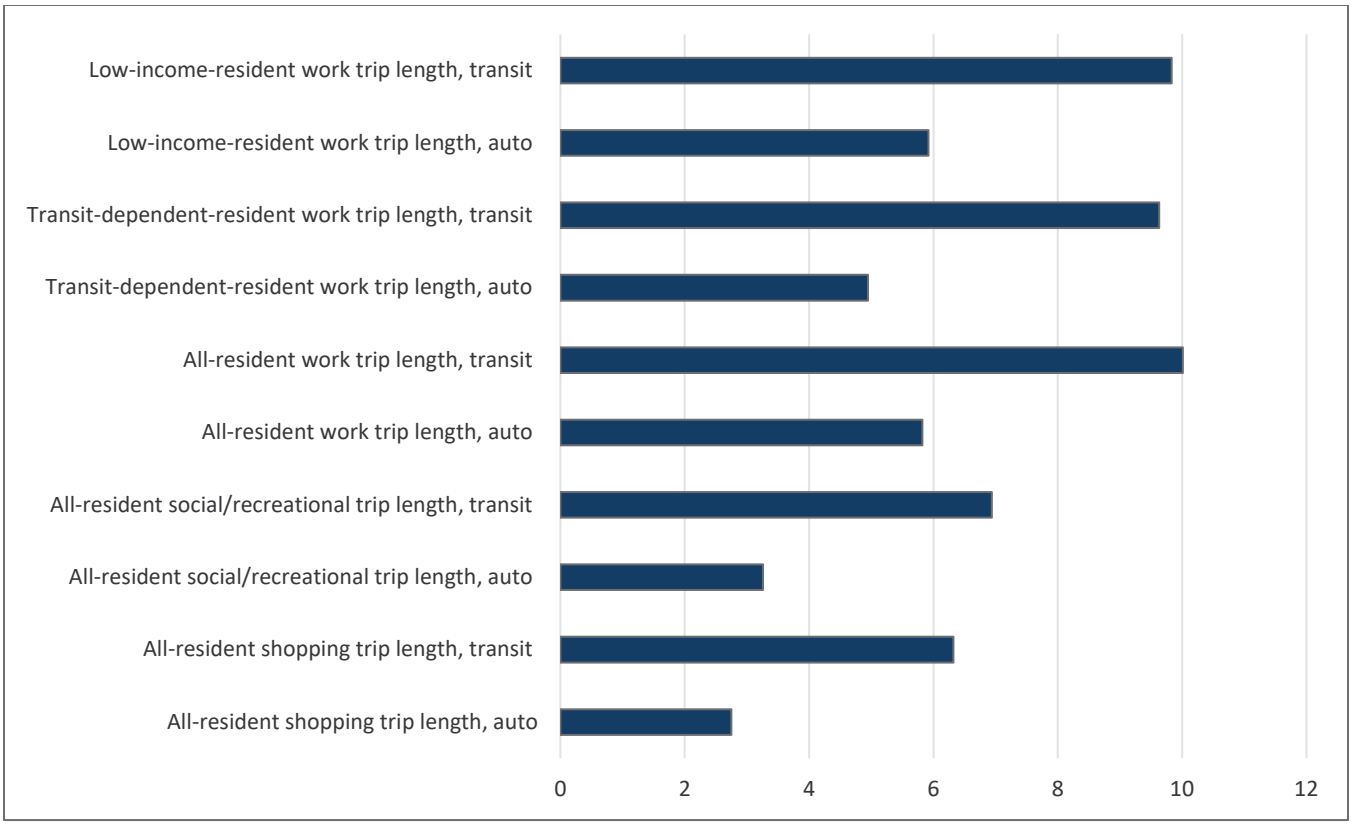


FIGURE 4: AVERAGE DAILY TRIP LENGTH FOR SEATAC RESIDENTS BY TRIP TYPE & MODE

As shown, trip lengths are consistently longer for transit users compared to automobile users. Shopping trips tended to be the shortest trip type, while work trips were among the longest. Work trip lengths do not appear to be longer for low-income or transit-dependent residents, regardless of travel mode, compared to all-resident work trips. Transportation equity appears to be balanced.

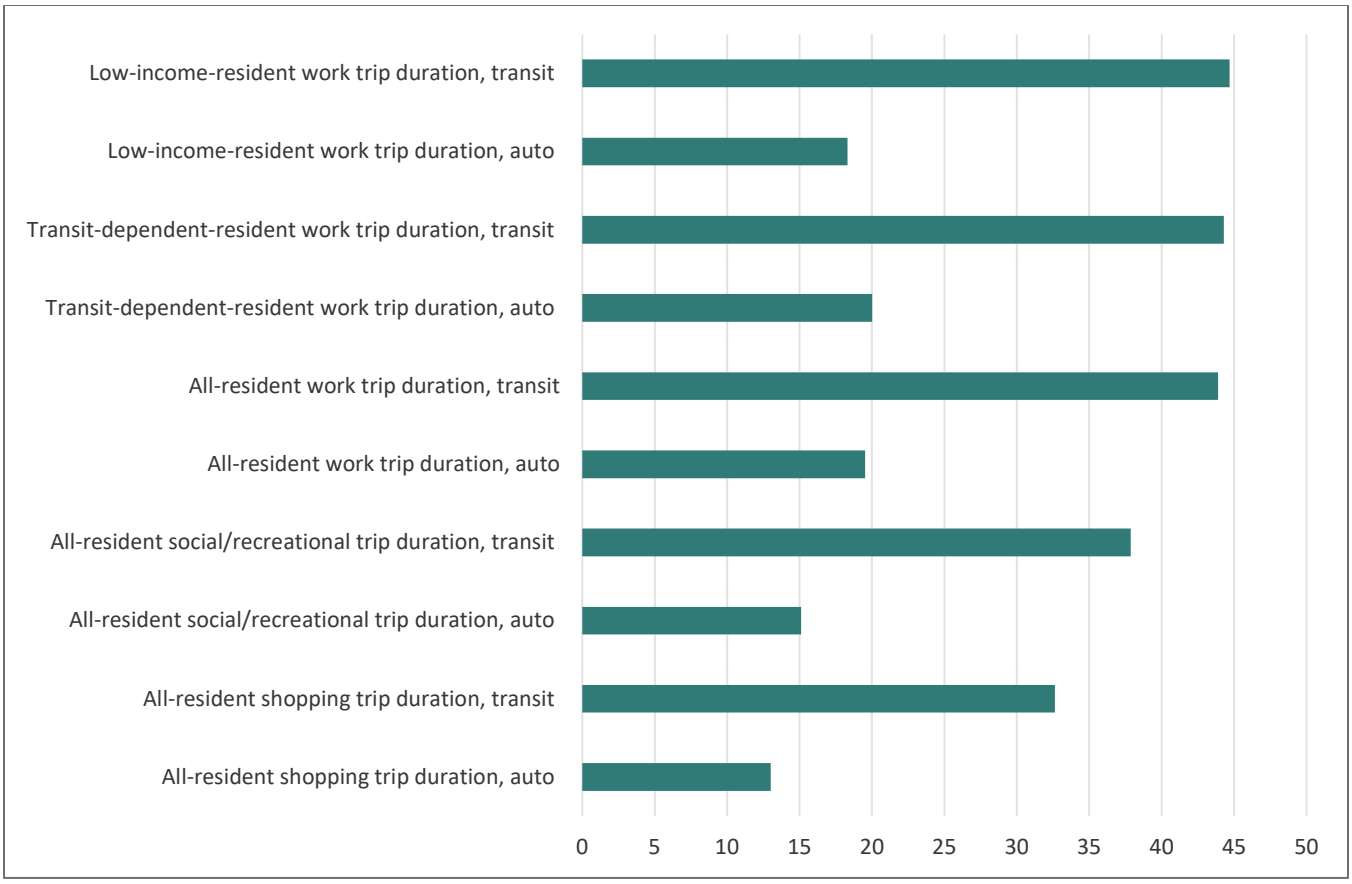


FIGURE 5: AVERAGE DAILY TRIP DURATION FOR SEATAC RESIDENTS BY TRIP TYPE & MODE

Trip durations generally mirror the same trends as the trip length trends shown in Figure 4, but automobile travel times are noticeably lower for low-income and all-resident work trip cohorts. Additionally, the trip duration for transit users for social/recreational purposes is considerably higher in relation to both auto users and the average length of these trips. Again, transportation equity for low-income and transit-dependent residents appears to be balanced with overall all-resident trip durations.

TRAFFIC VOLUMES

DAILY VOLUMES

Average Daily Traffic (ADT) is the amount of motorized traffic on a roadway segment over a 24-hour period. Daily volumes from the SeaCast model are estimated as the sum of traffic from each of the 12 time periods[10] for which the model assigns traffic to the roadway network. To provide a

[10] Time periods are as follows: 5AM-6AM, 6AM-7AM, 7AM-8AM, 8AM-9AM, 9AM-10AM, 10AM-2PM, 2PM-3PM, 3PM-4PM, 4PM-5PM, 5PM-6PM, 6PM-8PM, and 8PM-5AM.

relative overview of daily traffic volumes, data from the Alternative 3 scenario representing 2044 demand is mapped in Figure 6.

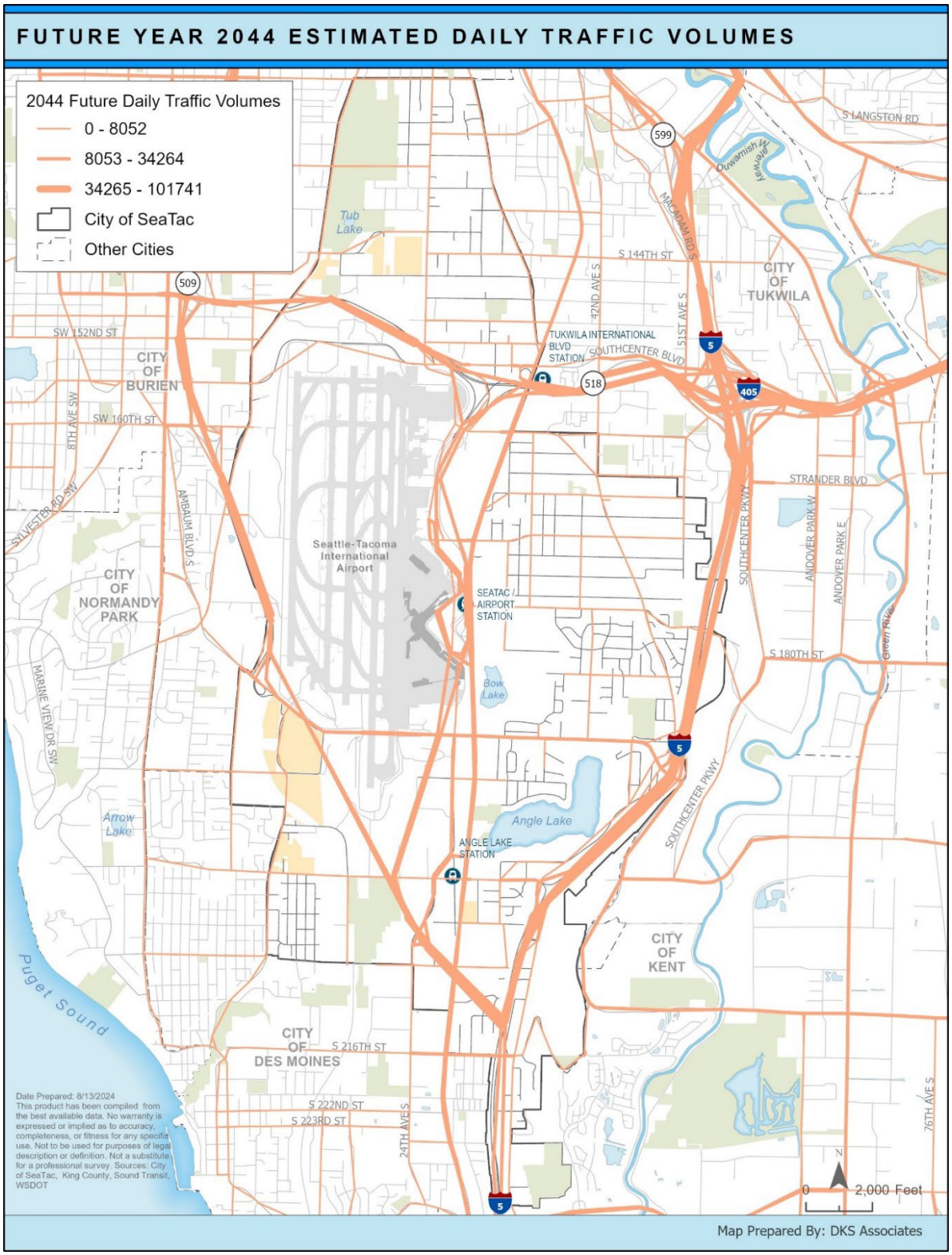


FIGURE 6: 2044 FORECASTED DAILY TRAFFIC VOLUMES

As shown, the highest-volume corridors for vehicles are I-5, SR 518, SR 509 (including the extension), International Boulevard (SR 99), the new Airport South Access Expressway, and S 188th Street. The SR 509 extension and South Access Expressway are both well utilized in future forecasts, preventing additional demand or even decreasing demand on SeaTac's local roadways.

Decreases in daily volume are forecasted for the northbound direction of International boulevard from S 200th Street to S 182nd Street/Arrivals Drive, the eastbound and westbound directions of S 188th Street between SR 509 and International Boulevard, the westbound direction of S 200th Street between 26th Avenue S and Military Road S, and the eastbound direction of S 200th Street from International Boulevard to I-5. Travel patterns here show a shift to using the SR 509 extension and South Access Expressway.

Growth is forecasted for International Boulevard in the southbound direction, primarily south of S 182nd Street/Arrivals Drive. Northbound volume growth on International Boulevard is primarily on the section north of S 170th Street. For east-west corridors, growth is forecasted on S 188th Street but only east of International Boulevard. There is also growth shown on S 200th Street west of the new South Access Expressway. All other corridors see only modest changes in daily traffic.

AFTERNOON PEAK HOUR VOLUMES

The afternoon peak hour is typically the highest volume period that the transportation network will experience. The afternoon peak hour usually occurs between 4 PM and 6 PM on a typical Tuesday, Wednesday, or Thursday when schools are in session. The maximum demand during this period is typically used to determine the needed size of roadway facilities and intersections, as well as the need for traffic signals. The PM peak hour in SeaTac was identified as 4 PM to 5 PM.

Peak hour intersection volumes are also used to measure the intersection's performance and assess the adequacy of the intersection's capacity. Using the turning movement counts collected at the 44 study intersections, the 2018 base year SeaCast model, and the 2044 future year Alternative 3 SeaCast model, forecasted turning movement volumes were estimated for all study intersections in accordance with NCHRP 765 methodology.[11]

Figure 7 depicts the raw model output peak hour volumes on links throughout the City. Figure 8 in the next section shows the total post-processed PM peak hour approach volumes at each study intersection.

Volume growth was observed on Des Moines Memorial Drive S between the SR 518 interchange and S 160th Street. Traffic utilizes the new SR 509 extension, which causes lower demand on S 188th Street/Des Moines Memorial Drive S from SR 509 to International Boulevard especially in the eastbound direction.

International Boulevard volumes increase mostly between S 154th Street and S 176th Street. The Airport South Access Expressway diverts growth away from International Boulevard, and in

[11] https://nap.nationalacademies.org/catalog/22366/analytical-travel-forecasting-approaches-for-project-level-planning-and-design, Accessed 8/9/2024.

particular northbound left turns from International Boulevard near the airport see significant decreases.

A moderate amount of growth is forecasted for S 188th Street east of International Boulevard, including at the interchange with I-5. No other major travel patterns within the City were significantly altered according to the PM peak hour forecasts.

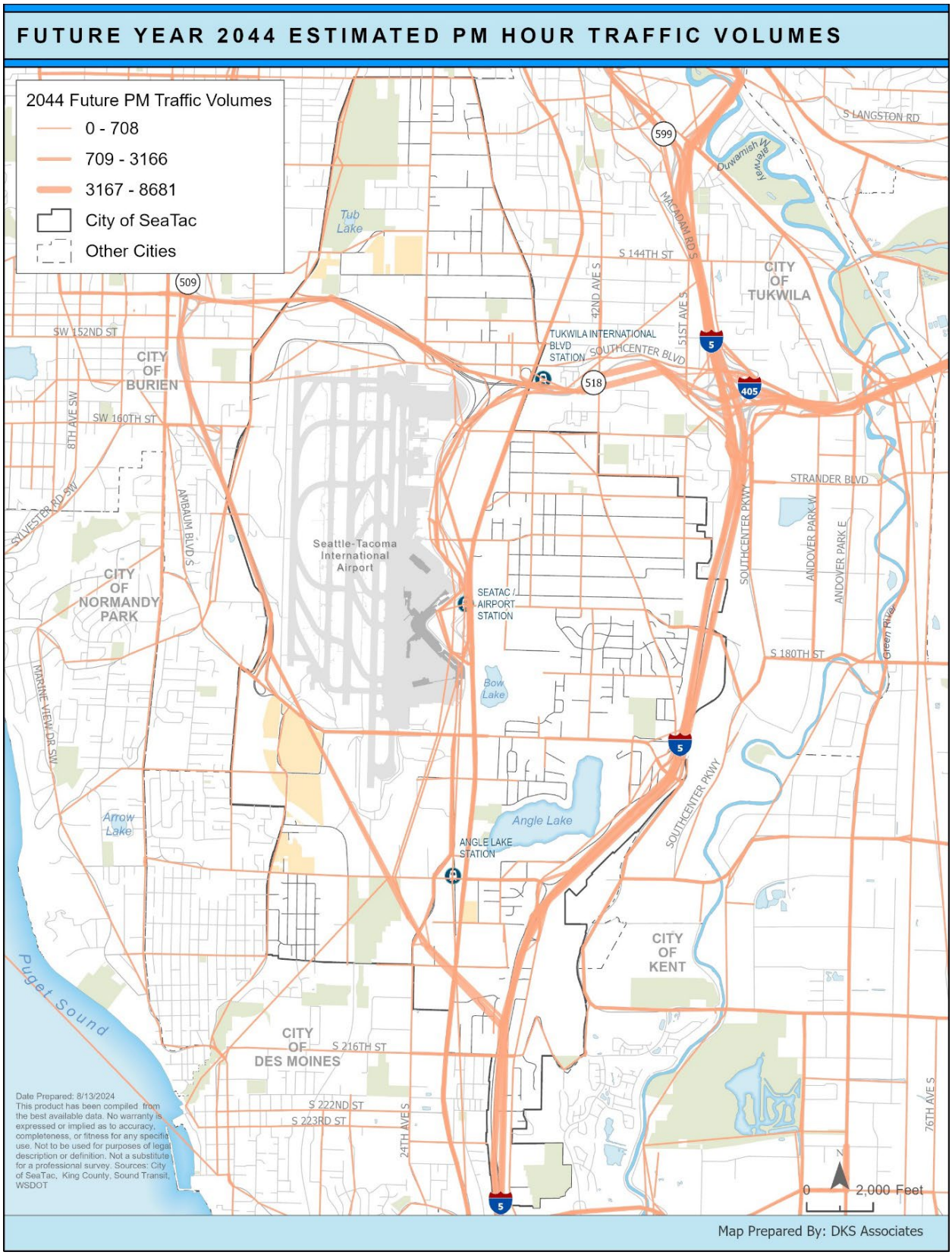


FIGURE 7: FUTURE (2044) PM PEAK HOUR VOLUMES

TRAFFIC OPERATIONS

INTERSECTION LEVEL OF SERVICE

Traffic operations analyses provide valuable insight into current and predicted levels of vehicular congestion on the arterial roadway network. This traffic operational analysis is based on the forecasted PM peak hour volumes described in the previous section. Currently planned intersection and roadway improvements are included in the analysis model.

The study intersection results are shown in Figure 8 and listed in Table 1.

Intersection Level of Service (LOS) is a performance measure commonly used to provide an overview of how each intersection operates overall. The LOS provides a "report card" rating of letters A through F based on average vehicle delay through the intersection. LOS A indicates free flow conditions with minimal delay traveling through an intersection while LOS F indicates excessive vehicle delay and demand greater than capacity. LOS thresholds for signalized and unsignalized intersections are specified in the Highway Capacity Manual.[12] Level of service and delay are reported for the overall intersection at signalized intersections, for the worst major and minor approaches (critical movements) at two-way stop-controlled (TWSC) intersections, and for the worst approach (critical movement) at all-way stop-control (AWSC) intersections.

[12] Highway Capacity Manual, 7th Edition, A Guide for Multimodal Mobility Analysis, The National Academies, 2022.

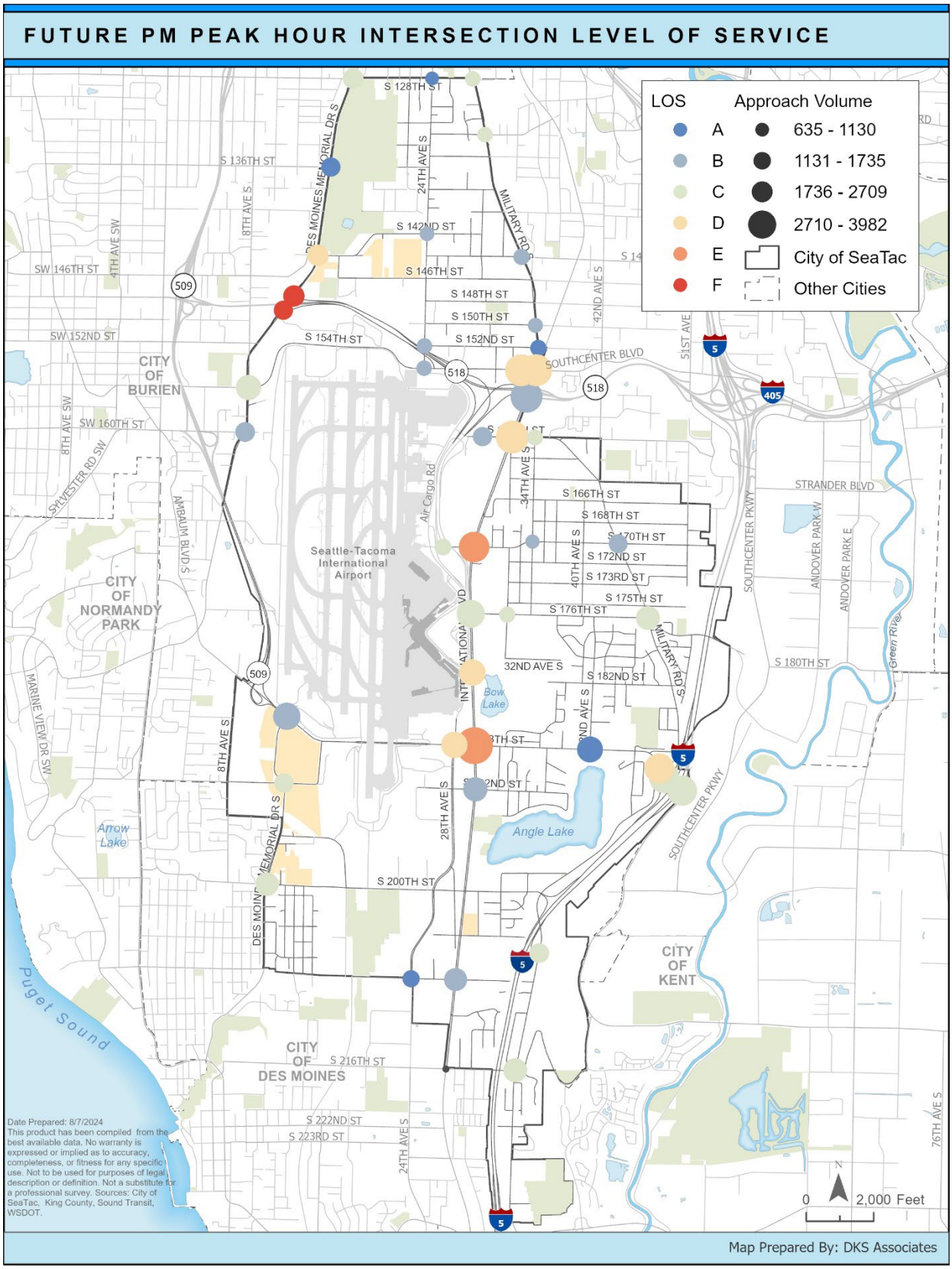


FIGURE 8: FUTURE (2044) PM PEAK HOUR INTERSECTION VOLUMES & LOS

TABLE 1: FUTURE PM PEAK HOUR INTERSECTION LEVEL OF SERVICE (2044)

	INTERSECTION	CONTROL TYPE	LOS[a]	DELAY[a]	CRITICAL MOVEMENT
1	DES MOINES MEMORIAL DR & S 128TH ST	Signal	C	22	N/A
2	24TH AVE S & S 128TH ST	Signal	A	6	N/A
3	MILITARY RD S & S 133RD ST	AWSC	C	16	SB
4	DES MOINES MEMORIAL DR & S 136TH ST	Signal	A	9	N/A
5	24TH AVE S & S 142ND ST	AWSC	B	11	NB
6	DES MOINES MEMORIAL DR & S 144TH ST	Signal	D	44	N/A
7	MILITARY RD S & S 144TH ST	AWSC	B	13	SB
8	DES MOINES MEMORIAL DR & SR 518 OFF RAMP	TWSC	**A/F**	**0/170**	NB/WB
9	DES MOINES MEMORIAL DR & SR 518 OFF RAMP/SR 518 ON RAMP	TWSC	**A/F**	**9/151**	SB/EB
10	MILITARY RD S & S 150TH ST	AWSC	B	15	SB
11	24TH AVE S & S 152ND ST	TWSC	A/B	8/14	SB/WB
12	MILITARY RD S & S 152ND ST	Signal	A	8	N/A
13	AIR CARGO RD/24TH AVE S & S 154TH ST	Signal	A	10	N/A
14	SR 518 OFF RAMP & S 154TH ST	Signal	A	8	N/A
15	INTERNATIONAL BLVD & S 154TH ST	Signal	D	39	N/A
16	DES MOINES MEMORIAL DR & S 156TH ST	Signal	C	23	N/A
17	INTERNATIONAL BLVD & SR 518 ON RAMP	Signal	B	12	N/A
18	DES MOINES MEMORIAL DR & S 160TH ST	Signal	B	12	N/A
19	RENTAL CAR FACILITY/PORT GROUND LOT & S 160TH ST	Signal	B	16	N/A
20	INTERNATIONAL BLVD & S 160TH ST	Signal	D	37	N/A
21	34TH AVE S & S 160TH ST	TWSC	A/C	9/22	WB/NB
22	PORT CELL LOT/AIRPORT EXP SB OFF RAMP & S 170TH ST	Signal	C	29	N/A
23	INTERNATIONAL BLVD & S 170TH ST	Signal	**E**	**70**	N/A
24	34TH AVE S & S 170TH ST	AWSC	B	11	EB
25	MILITARY RD S & S 170TH ST	Signal	B	13	N/A
26	INTERNATIONAL BLVD & S 176TH ST	Signal	C	35	N/A
27	34TH AVE S & S 176TH ST	TWSC	A/C	8/16	WB/SB
28	MILITARY RD S & S 176TH ST	Signal	C	26	N/A
29	INTERNATIONAL BLVD & S 182ND ST	Signal	D	46	N/A
30	DES MOINES MEMORIAL DR S/STARLING DR & S 188TH ST	Signal	B	19	N/A
31	28TH AVE S & S 188TH ST	Signal	D	54	N/A
32	INTERNATIONAL BLVD & S 188TH ST	Signal	**E**	**57**	N/A
33	S 188TH ST & 42ND AVE S	Signal	A	10	N/A
34	MILITARY RD S & S 188TH ST	Signal	D	44	N/A
35	I-5 ON RAMP/I-5 OFF RAMP & S 188TH ST	Signal	C	26	N/A
36	I-5 OFF RAMP/I-5 ON RAMP & S 188TH ST	Signal	C	26	N/A

INTERSECTION	CONTROL TYPE	LOS[a]	DELAY[a]	CRITICAL MOVEMENT
37 DES MOINES MEMORIAL DR S & S 192ND ST	Signal	C	21	N/A
38 INTERNATIONAL BLVD & S 192ND ST	Signal	B	15	N/A
39 DES MOINES MEMORIAL DR & S 200TH ST	Signal	C	29	N/A
40 MILITARY RD S & I-5 NB OFF/ON RAMP	Signal	C	30	N/A
41 24TH AVE S & S 208TH ST	Signal	A	10	N/A
42 INTERNATIONAL BLVD & S 208TH ST	Signal	B	15	N/A
43 PACIFIC HWY S & S 216TH ST	Signal	**E**	**55**	N/A
44 MILITARY RD S & S 216TH ST	Signal	C	35	N/A

[a] LOS E or worse are shown in bold and red.

As shown, the following stop-controlled intersections operate at LOS F for the worst approach:

- Des Moines Memorial Drive S & SR 518 Off Ramp (#8)
- Des Moines Memorial Drive S & SR 518 Off Ramp/SR 518 On Ramp (#9)

Both intersections are under WSDOT jurisdiction (with a LOS D standard) but are expected to operate at LOS F on the off-ramp approaches. The interchange is currently a three-quarter configuration, with no westbound on-ramp from Des Moines Memorial Drive S to SR 518. There is a project identified to reconstruct the Des Moines Memorial Drive S interchange at SR 518, known as SR 518 at Des Moines Memorial Drive S Interchange Phase II - Westbound Ramps, which will add an on-ramp from Des Moines Memorial Drive S to westbound SR 518 thus completing a full-diamond interchange.[13]

This project was identified in the SR 518 Corridor Planning Study by WSDOT in 2020, which anticipated a completion year of 2030. The two interchange intersections were noted candidates for signalization or roundabout improvements.[14] The City of Burien also noted the westbound on-ramp as a project in their six-year Transportation Improvement Program.[15] When Phase II of the SR 518 at Des Moines Memorial Drive S Interchange project is completed, the intersections are expected to operate at LOS C or better.

Additionally, two signalized intersections on International Boulevard/SR 99 operate at LOS E: at S 170th Street and at S 188th Street. International Boulevard, north of S 204th Street, is not a Highway of Statewide Significance.[16] WSDOT policy at these intersections is to maintain a LOS of "E Mitigated" which means, "Congestion should be mitigated (such as transit) when p.m. peak hour LOS falls below LOS 'E'…"[17] This indicates that mitigation is not required at these locations.

[13] Regional Transportation Plan 2022-2050, Appendix D2: Regional Capacity Project List, Puget Sound Regional Council.

[14] SR 518 Corridor Planning Study: SR 509 to I-5, WSDOT, May 2020

[15] Six-Year Transportation Improvement Program, 2024-2029, City of Burien, Washington.

[16] https://geo.wa.gov/datasets/WSDOT::wsdot-highways-of-statewide-significance/about, Accessed 8/6/2024.

[17] https://geo.wa.gov/datasets/WSDOT::wsdot-level-of-service-standard-for-state-routes/about, Accessed 8/6/2024.

Lastly, the intersection of Pacific Highway and S 216th Street also operates at LOS E. This intersection is not within the City of SeaTac but is shown in this analysis for informational purposes only.

CONCURRENCY CORRIDOR TRAVEL SPEED

SeaTac tracks concurrency based on a minimum travel speed on its concurrency corridors. There are 17 concurrency corridors, two of which are exempt from the standards and are tracked for informational purposes only. The concurrency corridors are shown in Figure 9.

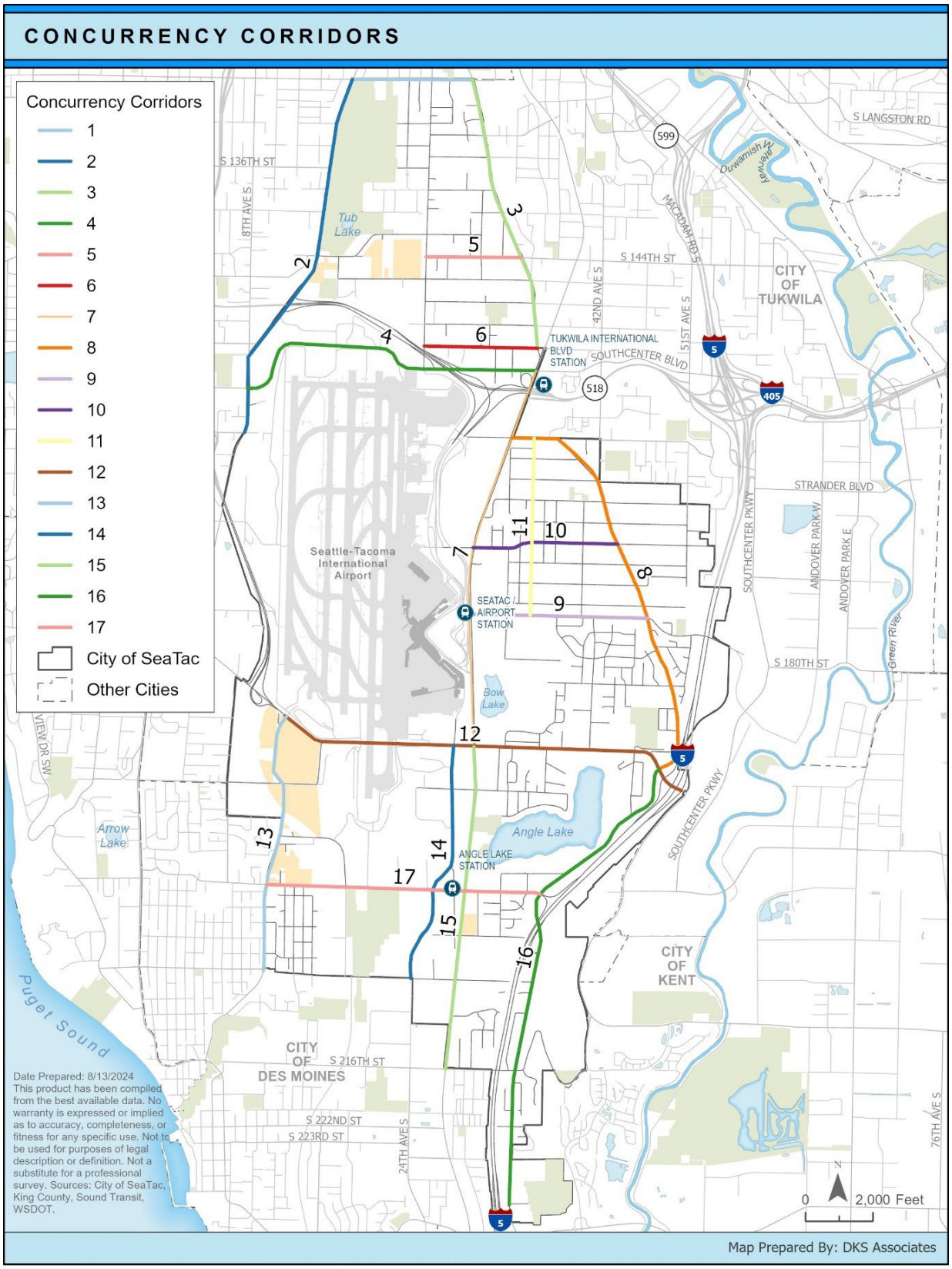


FIGURE 9: CONCURRENCY CORRIDORS

To estimate what the future concurrency corridor speeds may be, the City's current Concurrency Impact Estimator spreadsheet tool was used. The tool is used to keep track of new developments and assign their newly generated PM peak hour traffic onto the City's concurrency corridors. The tool uses a speed/volume curve to estimate the "concurrency balance" on each corridor, i.e. how many trips can be added to the corridor before the concurrency test fails.

Total PM peak hour volume growth was used at the study intersections to determine an average volume growth for the entire corridor. The results are shown in Table 2. Exempt corridors are shaded in grey. Where volumes decreased in 2044 compared to the 2023 turning movement counts, values are shown as negative numbers.

TABLE 2: FUTURE (2044) FORECASTED CONCURRENCY BALANCE

CORRIDOR	EXTENTS	DIRECTION	CONCURRENCY BALANCE (3/13/2024)	2023-2044 VOLUME GROWTH (AVERAGE)	2044 FORECASTED CONCURRENCY BALANCE
1- S 128th St	DMM Dr to Military	EB	176	-29	205
		WB	1119	2	1117
2-Des Moines M Dr	128th to 160th	NB	408	102	306
		SB	633	104	529
3-Military Rd S	152nd to 128th	NB	624	14	611
		SB	478	6	472
4 - S 154th St	DMM Dr to IB	EB	546	62	484
		WB	1010	37	974
5- S 144th St	24th to Military Rd	EB	409	18	391
		WB	352	1	351
6- S 152nd St	24th to Military Rd	EB	263	11	252
		WB	312	14	298
7 - International Blvd	154th to 188th	NB	1018	113	905
		SB	542	141	401
8 - Military Rd S	IB to 188th	NB	493	35	458
		SB	338	43	295
9 - S 176th St	IB to Military Rd	EB	557	60	497
		WB	750	79	671
10 - S 170th St	IB to Military Rd	EB	700	48	652
		WB	556	43	513
11 - 34th Ave S	160th to 176th	NB	677	37	640
		SB	667	20	647
12 - S 188th St	I5 NB Ramp to DMM Dr	EB	580	-114	694
		WB	414	59	355
13 - Des Moines M Dr	188th to 208th	NB	674	10	664
		SB	520	-176	696
14 - 24/26/28 Ave S	188th to 208th	NB	1712	90	1622
		SB	1287	-153	1440
15 -International Blvd	188th to 216th	NB	877	-83	960
		SB	838	-95	933
16 - Military Rd S	188th to 228th	NB	440	98	342
		SB	381	7	374
17 - S 200th St	DMM Dr to Military Rd	EB	342	84	258
		WB	415	59	356

As shown, all corridors maintain a positive concurrency balance in the future 2044 forecast, therefore the concurrency test is expected to pass.

ACTIVE TRANSPORTATION

The policies in the documents listed earlier in the "Previously Adopted SeaTac Plans" section and the proposals in the upcoming Comprehensive Plan update are in support of increased walking and biking on facilities for all ages and abilities. Using updated data from these various documents, a bicycle and pedestrian facility needs assessment was conducted for the full City roadway network.

PEDESTRIAN AND BICYCLE NEEDS ASSESSMENT

For the needs assessment, the existing pedestrian network analyses were reviewed to identify remaining network implementation needs. There are many street segment and intersection projects identified in both the LRSP and the ADA Transition Plan that still need to be completed. The proposed pedestrian projects were aggregated and included in the Pedestrian Segment and Intersection Needs Assessment Map (See Figure 10). The pedestrian network is typically developed through public projects and private development frontage improvements, designed to King County Road Standards as amended by the City of SeaTac.

Beyond currently proposed projects, the maps identify additional pedestrian infrastructure needs to fill missing gaps in the sidewalk network and improve intersections to better support pedestrian safety and reduce stress. For assessing intersection needs, the evaluation looked at where additional intersections are needed to facilitate pedestrian crossings between intersections with traffic control and/or traffic calming elements. The evaluation also considered ADA improvements needed at crossings, as previously identified in the City's ADA Transition Plan.

As illustrated in Figure 11, the bicycle network in the City is less developed than the pedestrian network. The assessment found that some road segments lack bicycle facilities, while several existing facilities do not meet current best practices for an all ages and abilities network. For example, there are some bike lanes that do not provide enough of a barrier to reduce the level of stress that a cyclist experiences along the facility – typically a combination of the speed and proximity of vehicles in the adjacent lane. There are also stress reduction opportunities for improving bicycle facilities and adding traffic calming elements on local roads with lower traffic volumes and speeds. In addition to the needs for linear facilities, intersection adjustments are required to facilitate safe bicycle crossings, especially across arterials.

The following maps depict the results of this assessment of bicycle and pedestrian infrastructure. The scope of this assessment included all public roads within the City of SeaTac. A summary list of the identified segments and intersections shown on the maps is also available as a reference.

These maps identify all segments and intersections that meet the following criteria:

- Segments already identified for active transportation projects under previous planning efforts
- Segments with no existing facilities
- Segments with existing facilities below Level of Traffic Stress 2 (LTS 2) threshold

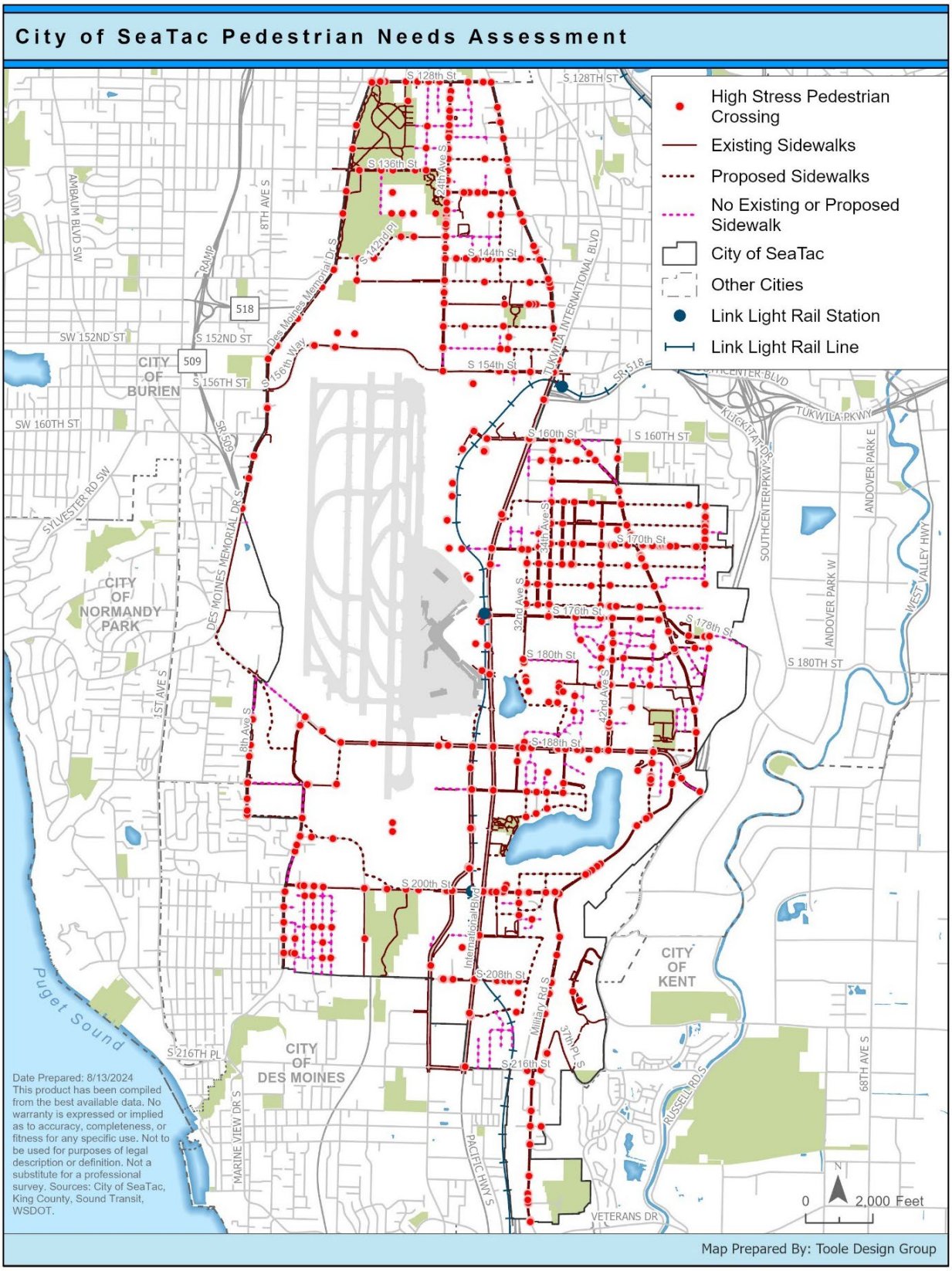
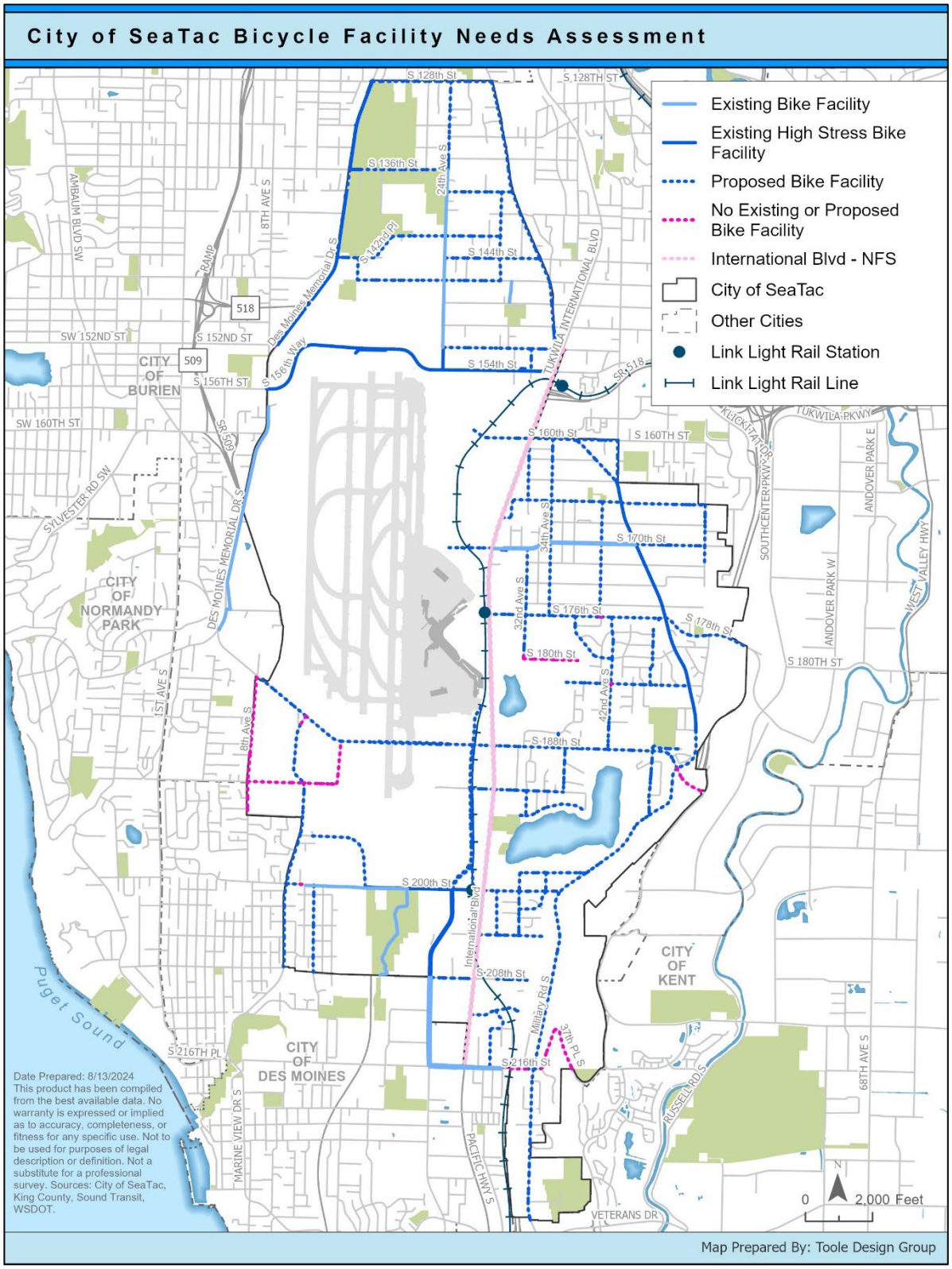


FIGURE 10: PEDESTRIAN SEGMENT AND INTERSECTION NEEDS ASSESSMENT



Note: NFS- Needs Further Study

FIGURE 11: BICYCLE SEGMENT NEEDS ASSESSMENT

ADDRESSING PEDESTRIAN AND BICYLE NEEDS

The segments and intersections identified in the needs assessment will be used to inform the development of a project list to improve the City's active transportation network. The project list will include both projects to fill gaps in the pedestrian and bicycle network and projects to improve existing facilities to bring them up to all ages and abilities standards.

For next steps, existing TIP projects and program lists will be combined and reviewed to look for overlap with the identified bicycle and pedestrian needs from the assessment. Based on this evaluation, the updated project list will include recommended changes to current planned projects and any new project recommendations. New projects could include additional studies on corridors where speed reduction, space allocation, and bicycle facility treatments appropriate for the land use context of each roadway. Some corridors need to have further study to allow for coordination with the Port of Seattle and/or WSDOT – especially International Boulevard in the context of WSDOT Complete Street Requirements to identify potential speed reduction, space reallocation, and level of traffic stress analysis to inform project alternatives, as described below.

These recommended updates and additions will be based on policies identified from previous City planning efforts and studies, including the 2022 Local Road Safety Plan, and consideration of national best practices and state, regional and federal requirements. Incorporating these best practices and requirements into the evaluation will help ensure that all projects included on the final list are eligible and meet the priorities for state and federal funding sources. Updated best practices and requirements include:

- Since 2022, all projects constructed on state highways routed over city streets with an estimated cost of $500,000 must now incorporate the principles of Complete Streets[18], as defined by WSDOT. Under these new standards, all bicycle and pedestrian facilities must offer LTS 1 or 2. Information on the criteria for achieving LTS 1 or 2 is provided in WSDOT's Designing for Level of Traffic Stress Bulletin #2022-01[19], with detailed information on criteria for separation from traffic, facility widths, and buffer types.
- In 2024, WSDOT published an Active Transportation Programs Design Guide[20], which provides detailed information and guidance on the types of pedestrian and bicycle facilities and treatments that are favored for funding in the state Pedestrian and Bicycle Program and Safe Routes to School funding competitions.
- Under the ADA, the U.S. Access Board recently produced updated Public Right-of-Way Accessibility Guidelines (PROWAG)[21] requirements, which were adopted in 2024.

For the future, it will be important to incorporate updated state and federal requirements and best practices into the City of SeaTac's local road standards. The current road standards do not

[18] https://wsdot.wa.gov/construction-planning/complete-streets, Accessed 8/7/2024.

[19] https://wsdot.wa.gov/sites/default/files/2022-06/DesignBulletin2022-01.pdf, Accessed 8/7/2024.

[20] https://wsdot.wa.gov/sites/default/files/2024-02/WSDOT-Active-Transportation-Programs-Design-Guide_0.pdf, Accessed 8/13/2024.

[21] https://www.access-board.gov/prowag/, Accessed 8/13/2024.

explicitly include bike facility design guidance to reduce levels of stress and support all ages and abilities. A mix of protected bike lanes, shared use paths, and neighborhood greenways is needed.

Finally, as large parcels get redeveloped the land use code should support active transportation connections that are required in coordination with building access, parcel access roads, and/or maintenance roads to be constructed by the developer to and through the site. Enhancing network connectivity will help ensure that pedestrians and bicyclists are able to access important destinations within Urban Centers and Neighborhood Villages, including transit stops, neighborhood services, grocery stores and parks.

FREIGHT

The City's freight transportation system consists of designated City Truck Routes, Port of Seattle Truck Routes, and State Highway Truck Routes. In addition, the City enforces No Through Hauling Routes, where through traffic is prohibited for trucks. A map showing the truck routes and truck prohibitions is shown in Figure 13.

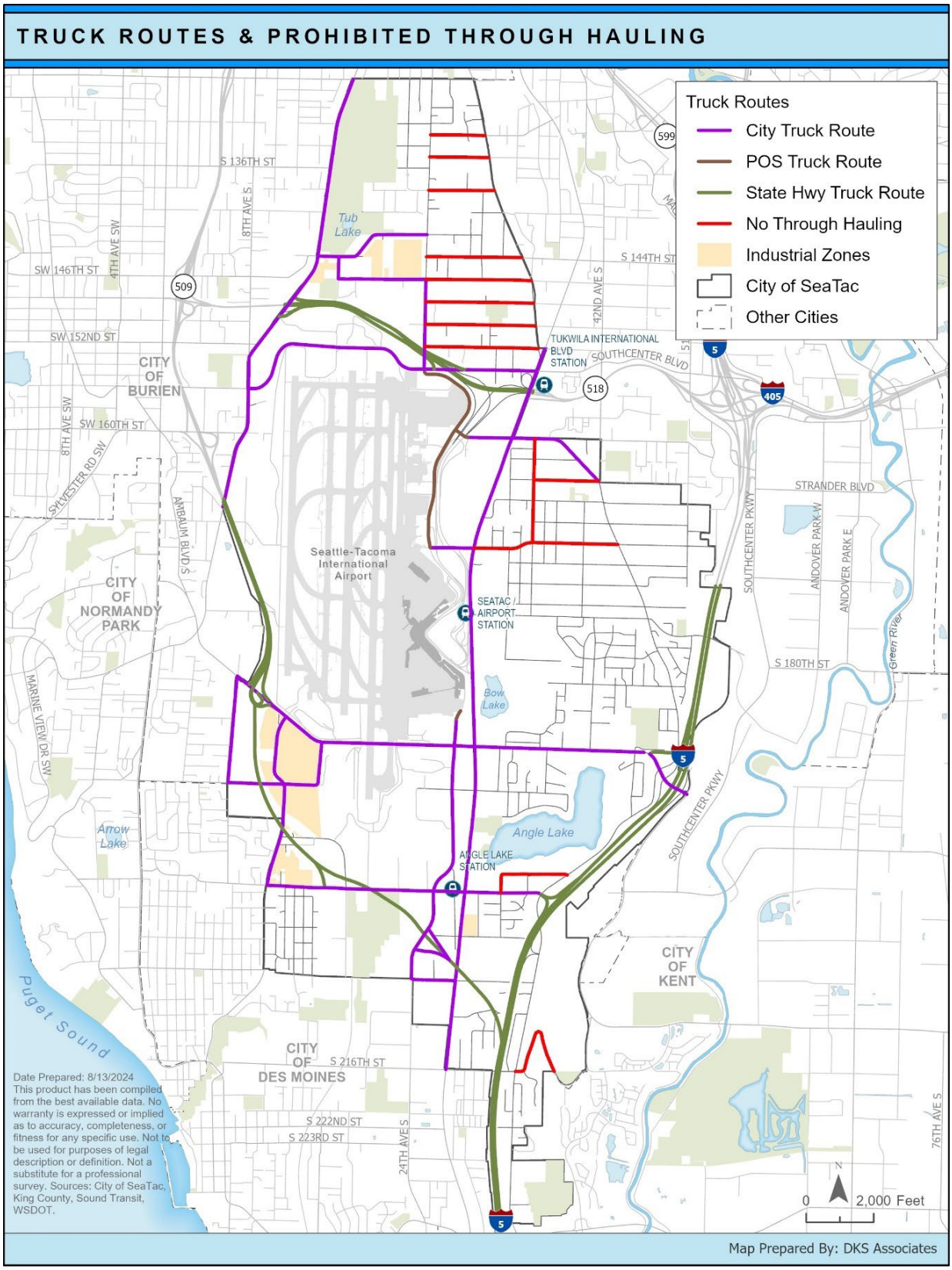


FIGURE 12: TRUCK ROUTES & PROHIBITED THROUGH HAULING

INCREASED VOLUMES

The SeaCast model is capable of forecasting travel demand for different vehicle classes, including trucks. Future truck volumes consist of heavy and medium trucks, while light trucks are excluded for the purposes of this analysis.[22] Forecasted truck volumes for both daily and the PM peak hour are shown, respectively, in Figure 14 and Figure 15.

[22] "Medium trucks are defined as single unit, six or more tires, two to four axles and 16,000 to 52,000 lbs. gross vehicle weight and heavy trucks are defined as double or triple unit, combinations, five or more axles, and greater than 52,000 lbs. gross vehicle weight." PSRC SoundCast Wiki, Accessed 8/13/2024.

FIGURE 13: ESTIMATED FUTURE 2044 DAILY TRUCK VOLUMES

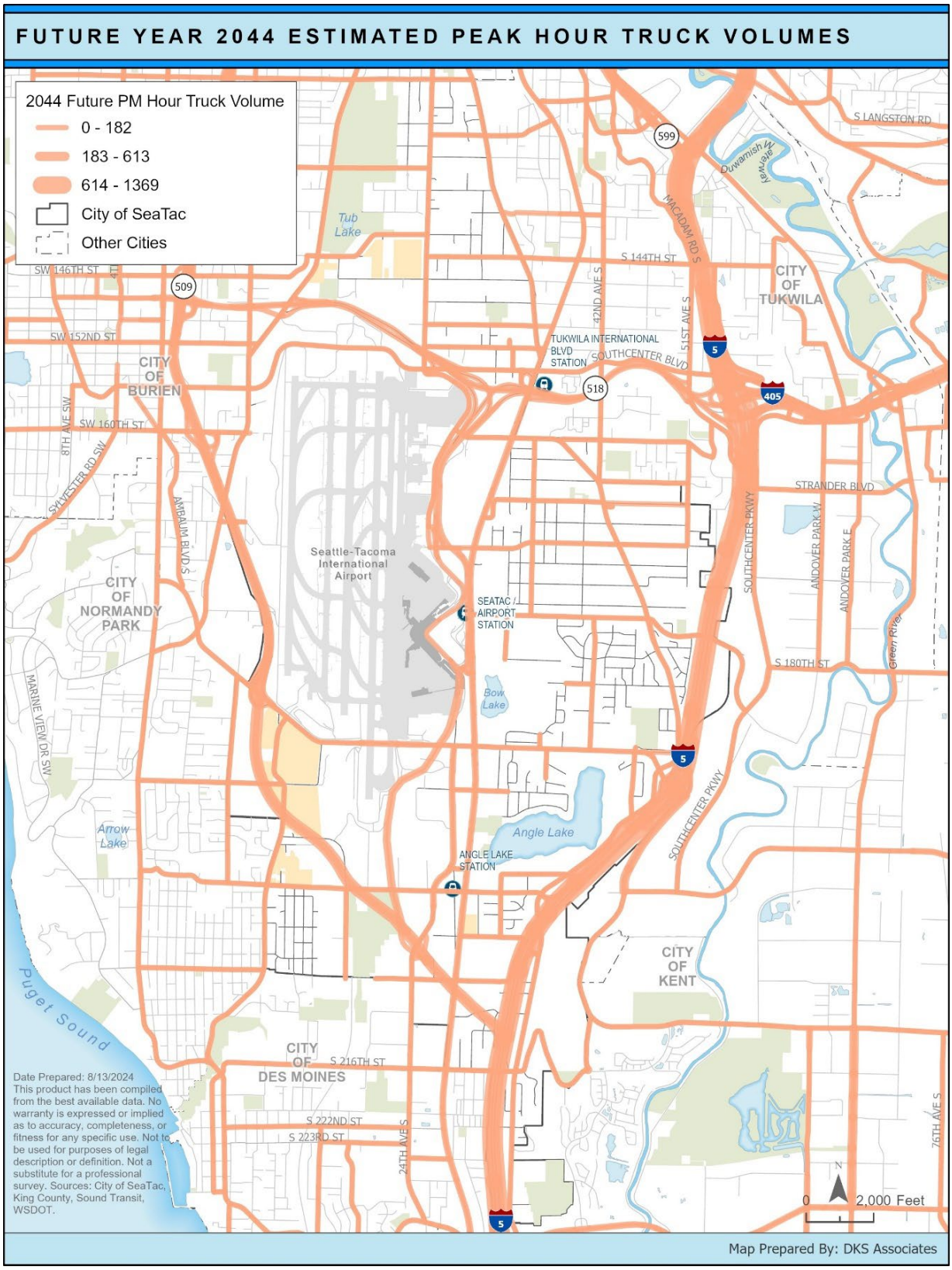


FIGURE 14: ESTIMATED FUTURE 2044 PM PEAK HOUR TRUCK VOLUMES

As shown, the truck demand is highest for highways and major arterials. The SR 509 extension and Airport South Access Expressway both attract a significant number of truck trips, lessening the demand on International Boulevard south of S 182nd Street/Arrivals Drive.

All other City streets showed similar levels of truck traffic in the future 2044 forecasts compared to the base year model.

Of note are the trucks utilizing routes that are designated No Through Hauling routes. All designated No Through Hauling routes are utilized by at least some trucks in the SeaCast model. These prohibited routes are particularly dense between S 128th Street and S 154th Street, where there are no through routes allowed to the east of the industrial area located southwest of 24th Avenue S and S 142nd Street. Since the east-west through routes in this area are all prohibited and the roadways that are not prohibited do not connect between 24th Avenue S and Military Road S, there is effectively a 1.6-mile stretch where no truck connectivity is allowed located adjacent to the industrial area. This indicates that a truck route better serving the connection between Tukwila and the northern industrial area may be needed, such as 24th Avenue S and S 128th Street.

The other industrial areas appear to be well-connected by the designated truck routes.

TRANSIT

Transit service in SeaTac is provided by King County Metro and Sound Transit. King County Metro operates several bus routes, including the A Line and F Line RapidRide (bus rapid transit) routes. Sound Transit operates the Link Light Rail 1 Line as well as the 560 and 574 bus routes. The current walksheds for these routes cover most of the City's area, as shown in Figure 16.

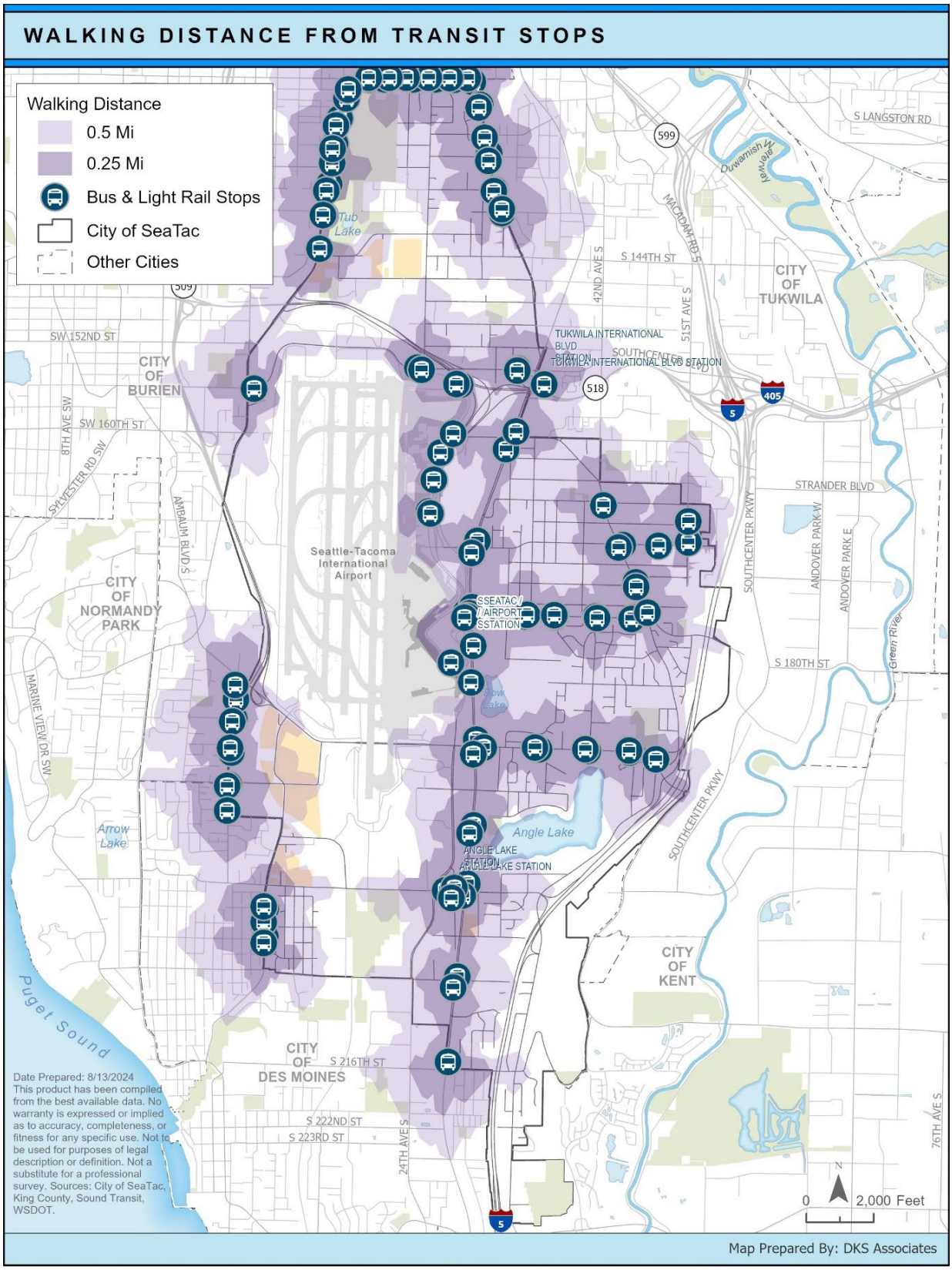


FIGURE 15: CURRENT 0.5-MILE AND 0.25-MILE WALKSHEDS FROM TRANSIT STOPS

FUTURE SERVICE

King County Metro (KCM) identified SeaTac as one of three areas within the County for focused improvements to the transportation equity gap. No additional RapidRide bus rapid transit lines are proposed as candidates for the 2050 horizon within the City of SeaTac, however more frequent service lines are planned for segments of S 128th Street, Military Road, Des Moines Memorial Drive S, SR 518, Airport Expressway, S 176th Street/S 178th Street, S 188th Street, S 200th Street, and 24th Avenue S. KCM aims to decrease travel time between Federal Way and SeaTac to 25 minutes, a 50% reduction compared to 2019. Travel time between SeaTac and Redmond is expected to drop by 21% to only 1 hour and 15 minutes.[23]

Sound Transit's Stride bus rapid transit is planned to have the S1 Line between Bellevue and Burien stop at the Tukwila International Boulevard station.[24] This line will connect to the Burien Transit Center and the Bellevue Transit Center.

The SeaCast travel demand model assumes the following additional transit segments will be operational by 2044:

- Bus route on 24th Avenue S from City limits to S 144th Street and on S 144th Street to Military Road S
- Bus route on 42nd Avenue S between Southcenter Boulevard and Military Road S
- Bus route S 170th Street between International Boulevard and Military Road S
- Bus route 42nd Avenue S between S 176th Street and S 188th Street
- Bus route S 178th Street east of Military Road S
- Bus route Military Road S from S 176th Street to S 200th Street
- Bus route Des Moines Memorial Drive S from S 188th Street to S 200th Street
- Bus route S 200th Street from 1st Avenue S to Military Road S
- Link Light Rail Extension from Angle Lake Station to Federal Way and Tacoma Dome

The following bus route segments are assumed to be removed in 2044:

- S 170th Street from Military Road S to 51st Avenue S and 51st Avenue S from S 170th Street to S 164th Street
- 8th Avenue S from SR 509/Des Moines Memorial Drive S to S 200th Street
- Des Moines Memorial Way S between S 200th Street and SR 509/S 216th Place
- S 216th Street/35th Avenue S/37th Place S/40th Place S east of Military Road S

To determine where transit may be lacking in the future, the 0.5-mile and 0.25-mile walksheds around transit stops assumed in the 2044 SeaCast model scenario are shown in Figure 17. The walksheds were calculated as distances along the roadway network. Walksheds for frequent (15-minute headways or less) transit line stops are shown in Figure 18. These frequent transit walksheds are shown again, overlayed with growth centers, in Figure 19.

[23] Metro Connects: King County Metro Long-Range Plan, November 17, 2021

[24] Sound Transit Stride S1 Line, Accessed 7/30/2024.

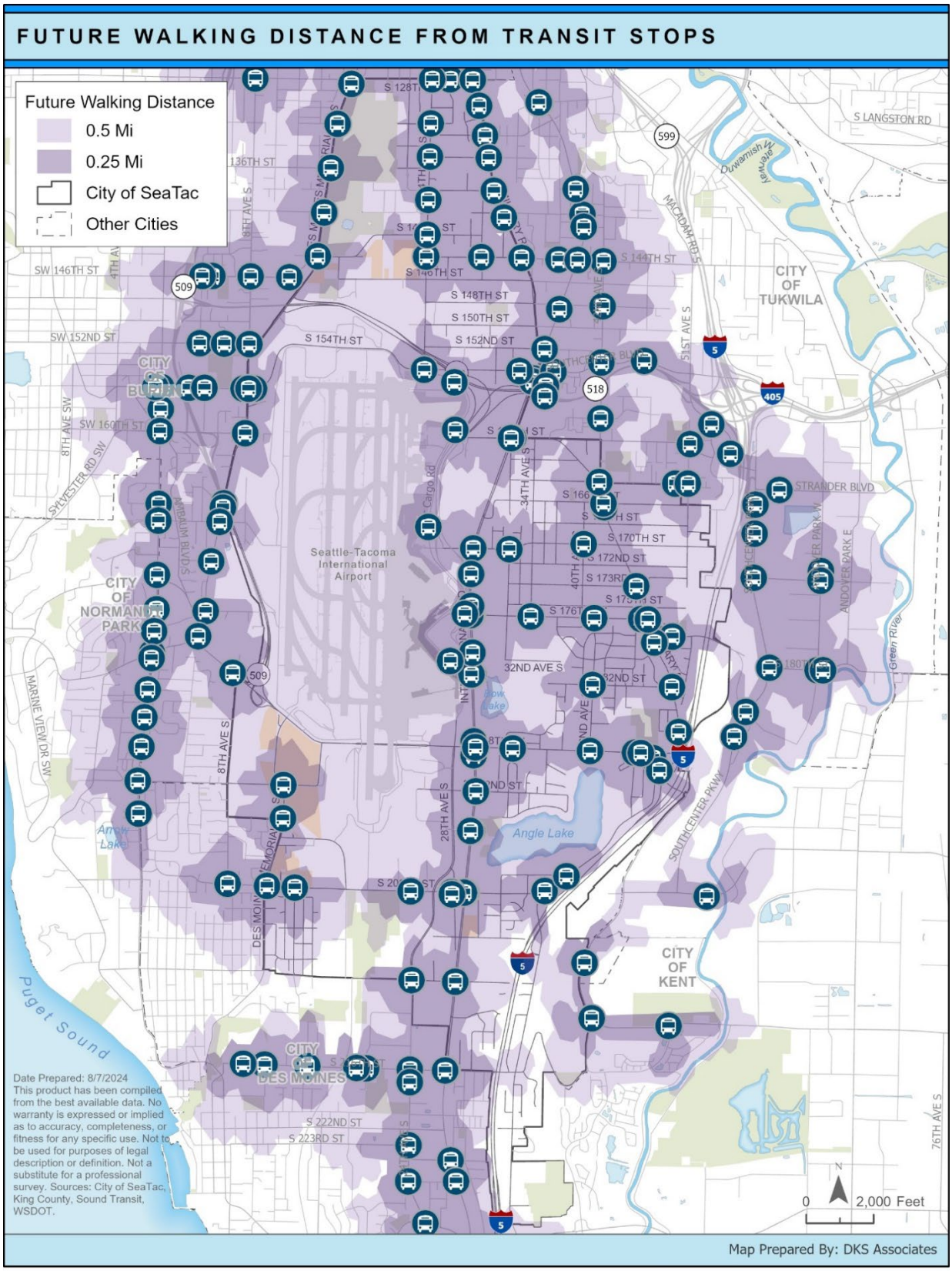


FIGURE 16: FUTURE 0.5-MILE AND 0.25-MILE WALKSHEDS FROM ALL TRANSIT STOPS

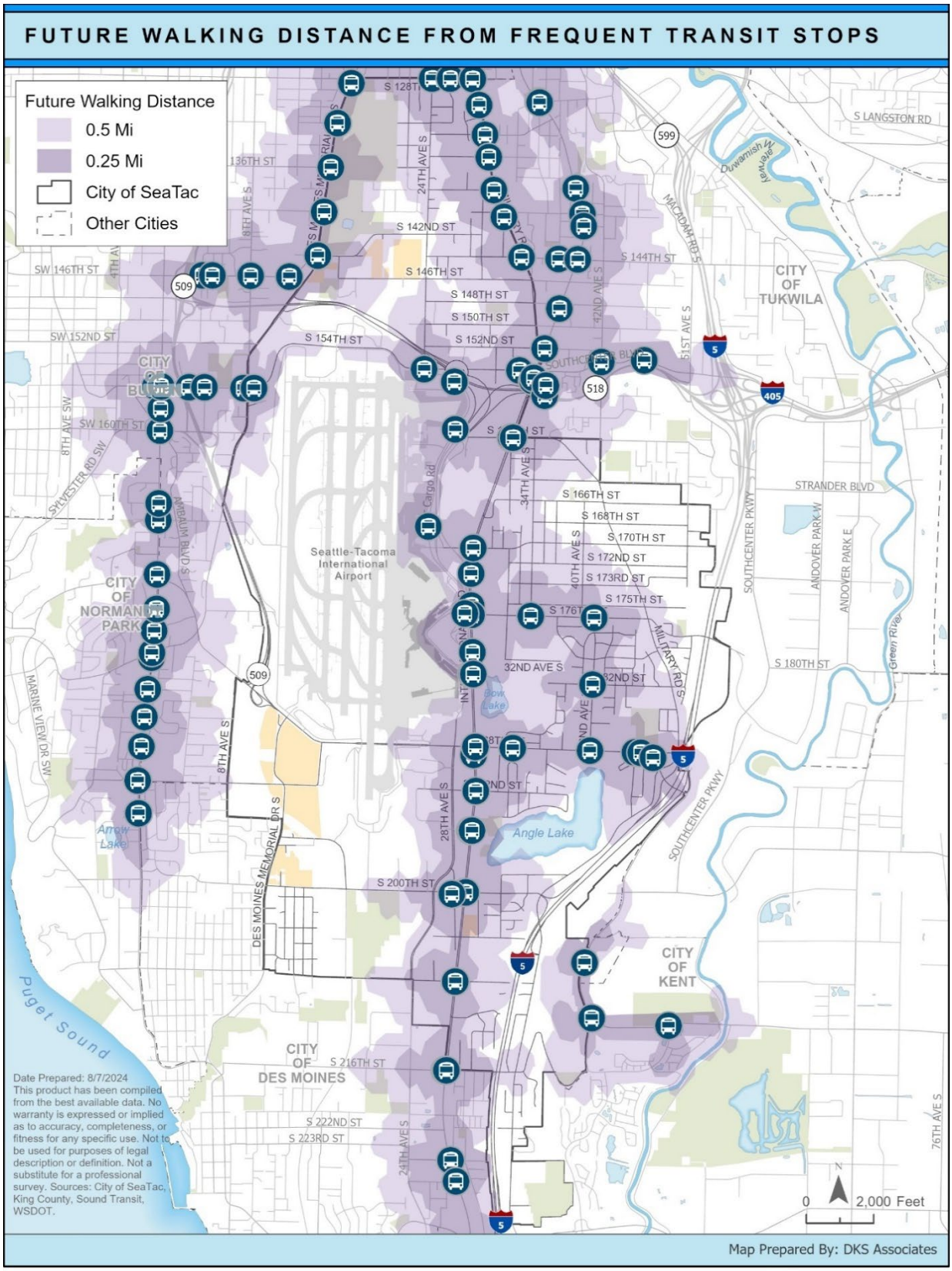


FIGURE 17: FUTURE 0.5-MILE AND 0.25-MILE WALKSHEDS FROM FREQUENT TRANSIT STOPS

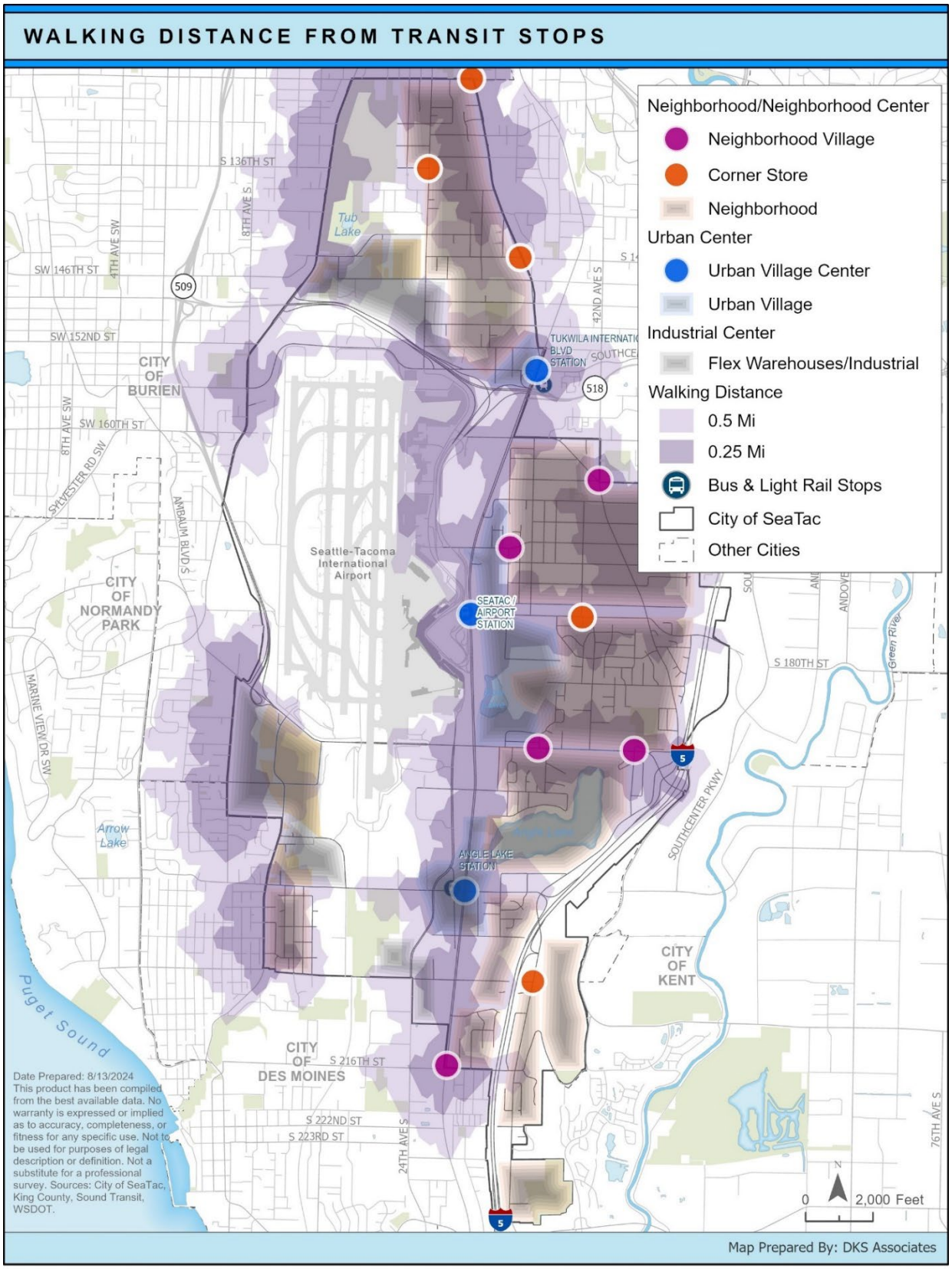


FIGURE 18: FUTURE WALKSHEDS FROM FREQUENT TRANSIT STOPS WITH GROWTH OVERLAYS

As shown, there are four main area outside of the 0.5-mile walksheds to frequent transit:

- Near S 142nd Street and S 146th Street along 24th Avenue S
- From S 164th Street through S 172nd Place by Military Road S (mostly east of Military Road S)
- West of 18th Avenue S near S 200th Street towards the city limits at Des Moines Memorial Drive
- The stretch of Military Road S located on the east side of I-5

There is future transit assumed for 24th Avenue S, Military Road S, S 164th Street, and S 200th Street, as shown in Figure 17, but each of the lines serving those segments have headways greater than 15 minutes. Looking at the walksheds for all transit stops (not just frequent service) the only areas beyond a 0.5-mile walking distance are located near Military Road S east of I-5 in the southern part of the City.

As shown in Figure 19, all of the Urban Village Centers and Neighborhood Villages lie within 0.25-mile walksheds to frequent transit, and all but one Corner Store locations lie within a 0.5-mile walking distance to frequent transit. The Corner Store located near Military Road S and S 208th Street is not within 0.5 miles of stops located on SR 99, Orilla Road S, S 200th Street, and S 216th Street.

SUMMARY

Key findings from the future multimodal conditions analysis of the City of SeaTac's transportation system are highlighted below with respect to traffic operations, active transportation, freight, and transit services.

- Traffic Operations
  - Two WSDOT intersections are forecasted to operate below LOS standards: Des Moines Memorial Drive & SR 518 Westbound Off Ramp and Des Moines Memorial Drive & SR 518 Eastbound Ramps, which operate at LOS F. Phase II of the Des Moines Memorial Drive S Interchange Project is expected to bring these intersections to LOS C or better.
  - Two intersections on International Boulevard (S 170th Street and S 188th Street) are forecast to operate at LOS E but will not require mitigation per WSDOT standards.
  - These results assume the build out of the SR 509 Completion project and the Airport South Access Expressway. With the inclusion of the South Access Expressway in future airport plans unconfirmed, additional impacts (delay, congestion) to city streets are possible if the project is cancelled.
- Active Transportation
  - The assessment shows several road segments that are missing sidewalks and bicycle facilities or have existing facilities that need improvements to meet all ages and abilities standards. Some corridors need to have further study to allow for coordination with the Port of Seattle and/or WSDOT to identify potential speed reduction, space reallocation, and level of traffic stress analysis to inform project alternatives.
  - Many intersections need to be adjusted to improve pedestrian safety and provide better access to key destinations through more frequent crossings and ADA upgrades.

- Next steps will include any needed recommendations for additional projects or amendments to current projects in order to bring the pedestrian and roadway network in alignment with local policies, current best practices, and state, regional and federal requirements.
- Future updates to the City road standards and land use code should include support for advancing active transportation connectivity, safety and access opportunities.

- Freight
  - The SeaCast model assigns trucks to all prohibited truck route segments. The area east of the northern industrial zone appears to be lacking truck connections with Tukwila.
- Transit
  - The City is expected to be well-served by transit in 2044 with nearly all residents having access to a transit stop within a 0.5-mile walking distance. However, frequent transit (with headways of 15 minutes or less) is not forecasted for some neighborhoods, particularly the west edge of Riverton Heights, McMicken Heights, Maywood, and Grandview.

APPENDIX

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CONTENTS

SECTION 1. FUTURE ALTERNATIVES ANALYSIS RESULTS

SECTION 1. FUTURE ALTERNATIVES ANALYSIS RESULTS