

Highway Impacts Summary

March 23, 2025

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1. Overview

The Oregon Department of Transportation (ODOT) has prepared this Highway Impact Summary (HIS) to assist the City of Eugene in complying with OAR 660-012-0310 through 0320 relating to Climate-Friendly Areas (CFAs). OAR 660-012-0325 describes the requirements for transportation review within a CFA. Cities and counties adopting CFAs are required to prepare a HIS if there is a state highway in proximity to the CFA. They are also required to prepare a separate *multimodal transportation gap* summary.

ODOT has prepared this HIS for the Downtown CFA designated by the City of Eugene. It provides a high-level assessment of the change in trip generation that will result from the change in zoning regulations the city is proposing within the CFA. The HIS also provides a summary of fatal and serious injury crashes that have occurred within the most recent 6-year reporting period.¹

This HIS was developed using a modified version of the methodology described in the ODOT *Highway Impacts Summary Guide*. It was prepared by Bill Johnston, AICP, Region 2 Transportation Planner. The trip generation rates were reviewed by Region 2 traffic engineers.

¹ OAR 660-012-0325(5) specifies a 5-year reporting period. The ODOT mapping tool used to develop this HIS reports crash data for a 6-year period (January 2018 through December 2023).

The following is a summary of the key findings:

- The zoning changes the city is proposing in the Downtown CFA will not have a significant effect on the transportation system, in terms of the number of trips generated within the CFA 20 years in the future.² The assessment indicates there will be a 7% increase in trip generation. This is compared to the number of trips that would be generated in the future without the zoning changes.

The methodology applies a 10% reduction factor to account for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. Without this reduction factor there would be a 17% increase in trip generation.

- There have been two fatal injury crashes and 25 serious injury crashes within the CFA, within the most recent 6-year reporting period (2018-2023). This HIS does not attempt to forecast future crash rates. Presumably, the roadway and multimodal improvements the city is planning in this area will help to reduce the number of crashes in the future.

The remainder of this document explains the methodology ODOT used for this assessment and discusses the findings in more detail. The supporting calculations, information provided by the city, and a more detailed description of the methodology is included in the appendices.

2. Planning context

This section describes the Downtown CFA. More detailed information is provided in the city's multimodal transportation gap summary.

The Downtown CFA is shown in Figure 1 on the following page. It extends approximately from the railroad tracks south to 18th Ave., and from Lincoln St. east to the University.

Additional information:

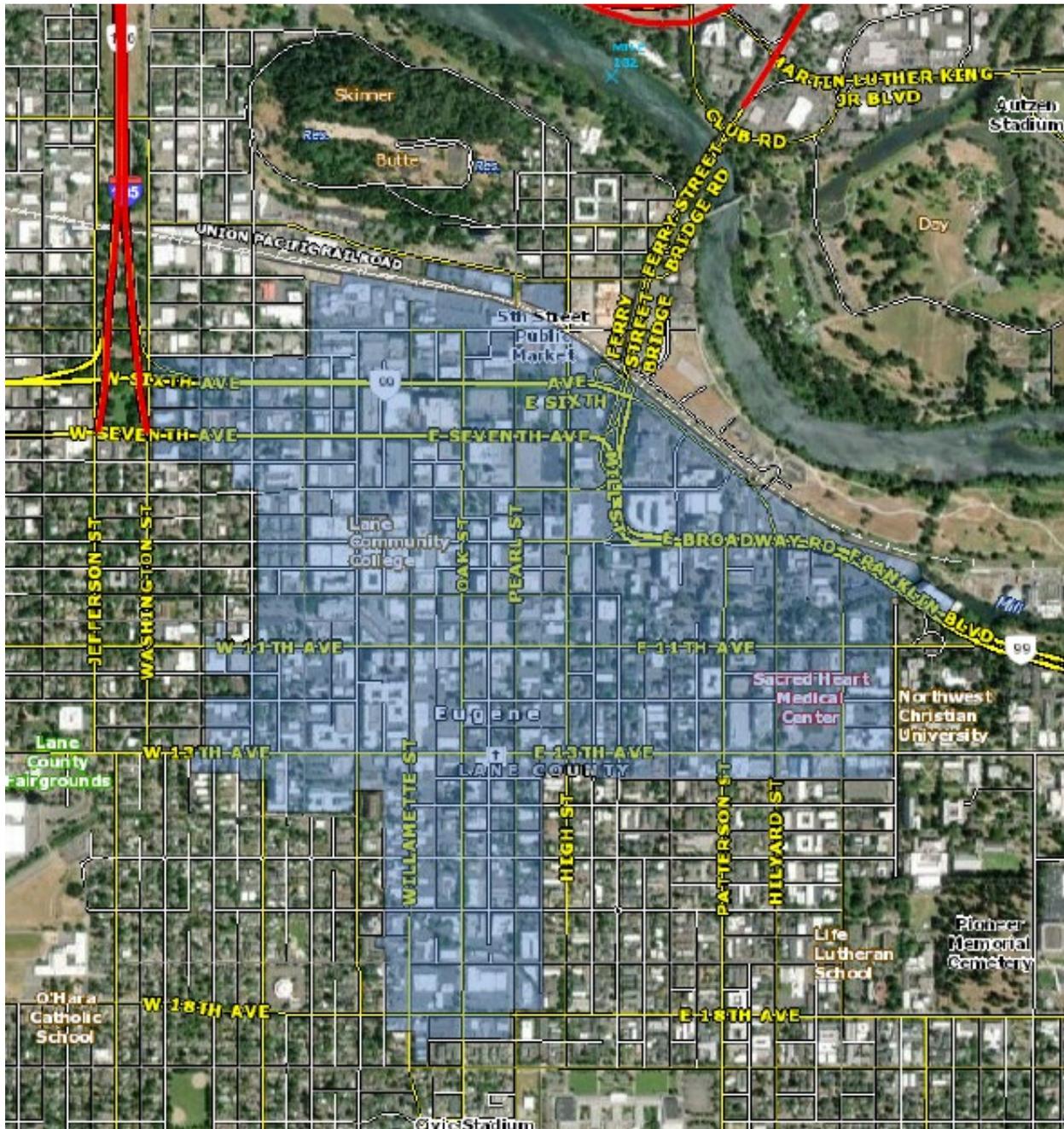
Area – 423 acres total. 399 net acres, not including public land or parcels with historic buildings that cannot be developed or redeveloped. This information was provided by the city. Refer to Appendix D.

HIS triggers – There is one roadway feature within the CFA that triggers the requirement to prepare an HIS. There is a ramp terminal intersection on W. 7th Ave at Washington St.

Existing land use – Commercial, offices, medical offices, hotels, apartments.

² The established method for evaluating zone changes and plan amendments in Oregon is to consider the *future condition*. The city's 2035 Transportation System Plan (TSP) also has a 20-year *planning horizon*. Note that trip generation is not the same as traffic volume. The actual traffic volume on the streets will increase over the next 20 years, due to the expected increase in population. Trip generation calculations, within a defined subarea, do not account for pass-through traffic that is not coming from or going to the subarea.

Figure 1 – Downtown CFA



Rail crossings – There are rail crossings at Pearl St. and High St.

Freight routes – I-105, which terminates at W. 7th Ave., is an Oregon Highway Plan (OHP) Freight Route. It is also a National Highway Freight Route.

3. Existing conditions and proposed changes

The following is a summary of the data and other information that ODOT used to prepare this HIS. It was provided by the city. Refer to Appendix D for additional detail.

Zoning – There are six existing zoning districts within the Downtown CFA:

- C-2 Community Commercial (190 acres)
- C-3 Major Commercial (109 acres)
- S-F Fifth Ave Special Area (7 acres)
- I-2 Light-Medium Industrial (32 acres)
- I-3 Heavy Industrial (32 acres)
- R-4 High-Density Residential (30 acres)

The city will be rezoning the areas designated for industrial use (I-2 and I-3) to Community Commercial (C-2). The Fifth Ave Special Area (S-F) will also be rezoned to Community Commercial.

The city will be modifying the C-2 and C-3 standards to comply with the CFA requirements specified in OAR 660-012-0320. This includes (1) requiring a minimum residential density of 25 units per net acre; (2) allowing single-unit attached housing (row houses); and (3) removing height limitations on certain properties near Skinner’s Butte.

Building height – The zoning districts in the Downtown CFA specify maximum building heights ranging from 120 to 150 feet. (There is no maximum height in the industrial zones.) The housing capacity analysis the city prepared to comply with the CFA requirements assumed a building height of 85 feet for the Downtown CFA, regardless of what the zoning regulations allow. This is consistent with the methodology described in the DLCDCFA Methods Guide for a primary CFA.³ For this HIS, ODOT also assumed a building height of 85 feet for the purpose of calculating development capacity.

Dwelling units – The city indicates there are 5,008 existing dwelling units within the CFA.

4. Development capacity

The existing and proposed development capacity calculations are shown in Table 1 and Table 2, in Appendix A. The footnotes provide some explanation of the methodology. A more detailed explanation is provided in Appendix E. The following is a summary.

Development capacity is described in terms of square feet (sq ft) of floor area. It accounts for building height, which is used to determine the number of floors.

The capacity calculations are not based on existing development. The calculations are based on the future development that will exist when the area is developed to its full (theoretical) *potential*, based on

³ The *Climate Friendly Areas Methods Guide* was developed by the State of Oregon Department of Land Conservation and Development (DLCDC). The city has designated the Downtown CFA as a primary CFA. The assumed building height in a primary CFA is 85 feet.

what the zoning regulations allow. This applies to both the existing condition (current zoning designations) and the proposed condition (proposed zoning designations).^{4, 5}

Residential and non-residential capacity are accounted for separately. This is necessary because trip generation rates and calculations (explained in Section 5) are different for residential and non-residential uses. Residential capacity is subtracted from the total capacity to determine the non-residential capacity.

The modified methodology used to develop this HIS does not rely on the city's dwelling unit estimates. ODOT has developed its own estimates, for both the existing and proposed conditions (before and after the rezoning). The basic assumption is that 30% of the total development capacity (in sq ft) will be residential, in zoning districts where mixed-use residential development is allowed.⁶

The city used a similar method to develop their estimates. Because ODOT uses a slightly different method to calculate net developable area, ODOT's estimates and the City's estimates may differ. For the purpose of this HIS it is not important for the number of dwelling units to agree exactly. The margin of error for these calculations is large.

ODOT used a different methodology because a HIS needs to assess both the existing condition (before zoning regulations are changed) and the proposed condition (after the regulations are changed) in order to determine the change in trip generation. The CFA methodology used by cities is only concerned with the proposed condition.

5. Traffic impacts

a. Trip generation calculations

The existing and proposed trip generation calculations are shown in Table 3 and Table 4 in Appendix A. Trip generation is based on land use. In order to determine which trip generation rates to use (from the most recent version of the ITE Trip Generation Manual) some assessment of land use is required.⁷

The land use categories shown in Table 3 do not describe (represent) the existing buildings and activities in the area. They represent the development that will exist in the future when the area is developed to

⁴ In this document, existing may refer either to (1) existing development, or (2) existing zoning designations. (Current may also be used.) Proposed refers to the city's proposed zoning designations. (After may also be used, as in after the zoning is changed.) Future refers to a future point in time (20 years).

⁵ The modified methodology used to develop this HIS accounts for potential development for both the existing and the proposed conditions, for both residential and non-residential uses. The method described in the ODOT HIS guide, for the existing condition, accounts for potential development but only for non-residential uses. For the future condition, potential development is accounted for, for both residential and non-residential uses (same as the modified methodology.)

⁶ OAR 660-012-0315(2)(d).

⁷ Land use is different than zoning. Zoning determines what types of buildings and activities are allowed. Land use describes the actual (or expected) buildings and activities.

its full (theoretical) potential, based on what the current zoning designations allow. Table 4 shows the land uses representing the full potential development, based on what the proposed zoning designations will allow.

Note also that the land use categories shown in the tables do not represent all the potential (future) uses within the CFA. They represent the predominant land uses. For this type of assessment, it is not necessary to be more precise. Increasing precision (by including more land uses) does not necessarily increase the accuracy of the trip generation calculation. This is because the margin of error for each input, and the overall margin of error, is large.

The residential trip generation for the existing condition (Table 3) is not based on the number of existing dwelling units. It is based on the projected number of dwelling units that will exist in the future when the area is developed to its full potential (based on what the existing zoning allows). This is consistent with the method used to calculate trip generation for the proposed condition (Table 4). This was explained in the previous section.

Note that there is a 10% *Internal Capture Reduction Factor* that is applied to the trip generation calculations for the proposed condition (Table 4). It accounts for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. It assumes the enhanced mixed-use, pedestrian-friendly character of the area will enable people to travel within and beyond the CFA using other modes (walking, bicycling, public transportation). Refer to the footnotes in the Table and Appendix E for additional explanation.

b. Change in trip generation (findings)

Table 5 in Appendix A compares the trip generation for the existing condition (without zoning changes) to the proposed condition (with zoning changes). Both the existing and proposed condition represent the future condition when this area is developed to its full (theoretical) potential, 20 years (or more) in the future.

The analysis indicates the proposed zoning changes will result in a slight increase (7%) in the volume of traffic generated within the Downtown CFA. This is the key finding of this highway impacts summary.

The following explains why the change in trip generation is not more significant, and why there is an increase rather than a decrease.

- The zoning changes are not that significant, in terms of trip generation. The existing zoning in the downtown area already allows for high-density mix-use development.
- The small area (7 acres) that will be rezoned from S-F (Fifth Ave Special Area) to C-2 (Commercial) will not affect trip generation. The assumed height and proportion of residential use for S-F is the same as C-2.
- The most significant change in zoning is the 64 acres that will be rezoned from industrial to commercial. Industrial uses have a very low trip generation rate (5 trips per 1,000 s.f.) compared to commercial uses (20-100 trips).

- The methodology applies a 10% reduction factor to account for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. Without this reduction factor there would be a 17% increase in trip generation (7% + 10% = 17%).

Highway impact summaries prepared for other CFAs may have different results. Each CFA is unique. There are many variables. The zoning designations are the most significant variable. Some assessments indicate there will be a decrease in trip generation. These are usually in areas that have a concentration of commercial zoning that does not allow residential uses. Changing the zoning to allow mixed use residential (to qualify as a CFA) results in less trip generation because residential use generate fewer trips than commercial uses.

c. Margin of error

It is important to understand that these calculations have a large margin of error (uncertainty). They rely on many assumptions and approximations. The estimated margin of error is 30%. (It could be much higher.)

The calculations are still useful for the purpose of this HIS, where the proposed (after) condition is being compared to the existing (before) condition. This is because the errors affect both calculations equally (more or less) and because the change in trip generation is expressed in relative terms (percentage). The calculations are less useful for determining total trip generation in absolute terms (number of trips).

6. Traffic related deaths & serious injuries

There have been two fatal injury crashes and 25 serious injury crashes within the CFA, within the most recent 6-year reporting period (2018-2023). A map showing the location of these crashes is provided in Appendix B. A table providing more information about these crashes is also provided Table 7). This HIS does not attempt to forecast future crash rates. Presumably, the roadway and multimodal improvements the city is planning in this area will help to reduce the number of crashes in the future.

7. Other safety data (SPIS)

A second map is provided in Appendix B showing SPIS crash locations. SPIS refers to the ODOT Safety Priority Index System. The SPIS is a screening tool ODOT uses to identify potential safety problems on public roadways. It assigns a score to road segments where crashes occur, based on crash frequency, rate, and severity over a three-year period. Higher SPIS scores indicate higher potential safety needs. Annual reports listing the top 10% of these hazardous locations guide further investigation and the development of safety improvement projects. The SPIS database includes both state highways and local roads.

The map included in Appendix B shows crashes that occurred within two three-year reporting periods: 2018-20 and 2019-21.⁸ Data from previous reporting periods is not included because too much

⁸ SPIS data for the 2020-22 reporting period is now available. The ODOT mapping tool used to develop this HIS has not yet been updated. It only reports data through 2019-21.

information would make the map difficult to interpret. A table describing the crashes in more detail is not provided. The data is more difficult to interpret than the fatal and serious crashes described in Table 7. The crash locations (by street name) are only provided for the crashes that occurred on state highways. Additional information about the SPIS is available on the following ODOT webpages.

Safety Priority Index System Reports for On-State Highways

<https://www.oregon.gov/odot/engineering/pages/spis-reports-on-state.aspx>

Safety Priority Index System Reports for Off-State Highways

<https://www.oregon.gov/odot/engineering/pages/spis-reports-off-state.aspx>

ODOT staff is available to assist in interpreting the data if necessary.

8. Planned improvements

The current City of Eugene Transportation System Plan (TSP) was adopted in 2017. It identifies the planned improvements that are reasonably likely to be funded for construction or implementation within the 20-year planning horizon (2035). Appendix C of this HIS lists the projects within the Downtown CFA.

A formal traffic impact study would account for the planned roadway improvements in determining the adequacy of specific intersections within the study area, in terms of capacity to accommodate the forecasted traffic. A HIS does not include this level of detail. However, a simple qualitative assessment can be provided. Here are some observations:

- The downtown area has well established street system. The TSP does not identify a need for any improvements in this area to relieve congestion.
- The bicycle and pedestrian improvements listed in Appendix C will facilitate transportation by other modes including public transportation.

The city considered these planned improvements in deciding to designate this area as a CFA. One of the criteria described in OAR 660-012-0310 is that a CFA is currently served, or will be served in the future, by high-quality pedestrian, bicycle, and transit services.

The HIS methodology developed by ODOT also accounts for these improvements, indirectly. The 10% *internal capture reduction factor*, which is applied in Table 4, accounts for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. This assumes that the enhanced mixed-use, pedestrian-friendly character of the area will enable people to travel within and beyond the CFA using other modes (walking, bicycling, and public transportation).

Listing and evaluating the planned improvements within a CFA is not required by OAR 660-012-0325(5).⁹ The HIS guidance document prepared by ODOT recommends including this information to provide a

⁹ OAR 660-012-0325(5) specifies the requirements for a highway impacts summary.

more comprehensive assessment of the transportation system within the CFA. Some of the planned improvements may address some of the safety concerns described in Section 6 and 7 of this HIS. The city may or may not identify additional transportation improvements for this area when they update their TSP in the future.

The list of planned transportation improvements included in Appendix C of this HIS may overlap with (or duplicate) information provided in the multi-modal transportation gap summary prepared by the city. OAR 660-012-0325(4) requires that a multi-modal transportation gap summary include a list of proposed projects to fill the identified gaps in the pedestrian and bicycle network within the CFA. The list of improvements included in a HIS is broader in scope. It also includes planned roadway improvements (if any) that increase the motor vehicle carrying capacity, or improve motor vehicle safety, within the CFA. This list of projects is also included in this HIS so it can serve as a standalone document if necessary.

[break]

Appendix A

Trip generation assessment

Table 1 – Existing development capacity

Table 2 – Proposed development capacity

Table 3 – Existing trip generation

Table 4 – Proposed trip generation

Table 5 – Change in trip generation

[break]

Table 1 – Existing development capacity

A	B	C	D	E	F	G	H	I	J	K
zoning designation	developable area (net)	developable area (net)	development standards reduction factor	developable area (adjusted)	building height	maximum number of floors	total development capacity	residential development capacity	dwelling units	non-residential development capacity
units:	acres	sq ft		sq ft	ft	floors	sq ft	sq ft	units	sq ft
formulas: (letters refer to columns)		B x 43,560		C – (C x D)		F ÷ 12 (rounded)	E x G	H x 0.30	H ÷ 900 (rounded)	H – I
notes:	1		2, 3		4		5	6	7	
C-2 Community Commercial	190.4	8,293,824	0.4	4,976,294	85	7	34,834,061	10,450,218	11,611	24,383,843
C-3 Major Commercial	108.6	4,730,616	0.4	2,838,370	85	7	19,868,587	5,960,576	6,623	13,908,011
S-F Fifth Ave Special Area	6.6	287,496	0.4	172,498	85	7	1,207,483	362,245	402	845,238
I-2 Light-Medium Industrial	31.9	1,389,564	0.5	694,782	20	1	694,782	0	0	694,782
I-3 Heavy Industrial	31.9	1,389,564	0.5	694,782	20	1	694,782	0	0	694,782
R-4 High-Density Residential	29.9	1,302,444	0.4	781,466	85	7	5,470,265	5,470,265	6,078	0
total	399.3	17,393,508		10,158,192			62,769,960	22,243,304	24,715	40,526,656

assumptions

- residential use (%): 30 total development capacity occupied by residential uses, consistent with OAR 660-012-0315(2)(d)
- dwelling unit size (sq ft): 900 consistent with OAR 660-012-0315(2)(e)
- building height (ft): 85 consistent with OAR 660-012-0315(2)(b)
- height per floor (ft): 12 consistent with OAR 660-012-0315(2)(b); example: a 50-ft building allows for 4 floors

notes

- The net developable area (Column B) excludes existing right-of-way, land set aside to protect natural resources, public parks, and open space areas, consistent with OAR 660-012-0315(2) and the Climate-Friendly Area Methods Guide developed by DLCDC (August 2024). The net developable area for each zoning district shown in Column B was calculated by ODOT. Refer to Appendix D.
- The *Development Standards Reduction Factor* (Column D) accounts for other types of undevelopable area. It accounts for parking, setbacks, landscaping, and other requirements specified in the zoning regulations that reduce the developable area of individual parcels, and the CFA as a whole. It combines these individual reductions into a single factor that is easier to apply in the calculations used for this analysis. The ODOT HIS methodology applies these reduction factors to both existing and proposed conditions. The ODOT methodology is explained in more detail in Appendix E.
- To assist ODOT in preparing this HIS, ODOT asked the city to provide reduction factors for each zone based on the data they developed for their CFA housing capacity study. (DLCDC does not require cities to calculate reduction factors.) ODOT may or may not use the reduction factors provided by the city. For some assessments, ODOT adjusts the reduction factors to calibrate the spreadsheet model so the number of dwelling units (calculated in Table 2) agrees with the city’s calculations (for the proposed condition). If the reduction factors are adjusted in Table 2, the adjusted factors are also applied in Table 1. For this HIS, ODOT adjusted the reduction factors provided by the city. (Refer to Appendix D.) They are shown in Column D.
- For the purpose of this HIS, the city indicated that 85 feet should be used to calculate the development capacity in the C-2 and C-3 zones, even though the zoning regulations allow taller buildings. This is the assumption they used to develop their CFA capacity analysis, consistent with the standard (prescriptive) methodology described in the CFA Methods Guide for primary CFAs. (50 feet is used in secondary CFAs.) For this HIS, ODOT used this assumption for both the existing and proposed condition in the C-2, C-3 and R-4 zones, and in the S-F zone for the existing condition. In the industrial zones, for the existing condition, ODOT assumed one-story structures (20 feet).
- Existing development capacity does not represent the actual existing conditions. It represents the potential development capacity, regardless of existing development, based on current zoning and development regulations. This is explained in more detail in Appendix E.
- Residential and non-residential uses are accounted for separately. This is necessary in order to calculate trip generation in Tables 3 and 4. Different methods are used for residential and non-residential uses. To determine the residential capacity, the basic assumption is that 30% of the theoretical maximum development capacity (in sq ft) will be residential, in zoning districts where mixed-use residential development is allowed. In zoning districts where residential use is not allowed (e.g., industrial zones), the formula is adjusted. There is no reduction for residential use. In zoning districts where the primary use is residential (e.g. high density residential) the formula is adjusted to account for more than 30% residential. For this HIS the R-4 zone is assumed to be 100% residential.
- The number of dwelling units shown in Column J was calculated by ODOT for the existing condition, for the purpose of preparing this HIS. The city did not calculate the number units for the existing condition. The city only calculated the number units for the proposed condition, for the purpose of complying with the CFA requirements. This is explained in more detail in Appendix E (Methodology).
- The ODOT HIS methodology is described in more detail in the *Highway Impacts Summary Guide* (November 2024). This HIS uses a modified methodology. It accounts for the potential development for both residential and non-residential uses, for both the existing (before) and the proposed (after) conditions. The method described in the HIS guide, for the existing condition, accounts for potential development but only for non-residential uses. The residential trip generation calculations are based on the actual number of existing dwelling units. (The calculations for the future condition are based on the projected number of dwelling units.) This is explained in more detail in Appendix E.

Table 2 – Proposed development capacity

A	B	C	D	E	F	G	H	I	J	K
zoning designation	developable area (net)	developable area (net)	development standards reduction factor	developable area (adjusted)	building height	maximum number of floors	total development capacity	residential development capacity	dwelling units	non-residential development capacity
units:	acres	sq ft		sq ft	ft	floors	sq ft	sq ft	units	sq ft
formulas: (letters refer to columns)		B x 43,560		C – (C x D)		F ÷ 12 (rounded)	E x G	H x 0.30	H ÷ 900 (rounded)	H – I
notes:									2, 3	
C-2 Community Commercial	260.9	11,363,497	0.4	6,818,098	85	7	47,726,688	14,318,006	15,909	33,408,682
C-3 Major Commercial	108.6	4,728,438	0.4	2,837,063	85	7	19,859,440	5,957,832	6,620	13,901,608
R-4 High-Density Residential	29.9	1,302,008	0.4	781,205	85	7	5,468,435	5,468,435	6,076	0
total	399.3	17,393,944		10,436,366			73,054,563	25,744,274	28,605	47,310,289

city's estimate: 26,863

assumptions

- residential use (%): 30 total development capacity occupied by residential uses, consistent with OAR 660-012-0315(2)(d)
- dwelling unit size (sq ft): 900 consistent with OAR 660-012-0315(2)(e)
- building height (ft): 85 consistent with OAR 660-012-0315(2)(b)
- height per floor (ft): 12 consistent with OAR 660-012-0315(2)(b); example: a 50-ft building allows for 4 floors

notes

1. The Table 1 notes also apply to this table.
2. The number of dwelling units shown in Column J was calculated by ODOT for the purpose of preparing this HIS. This number may not agree exactly with the number of dwelling units calculated by the city and reported to DLCD for the purpose of complying with the CFA requirements (OAR 660-012-0315). The city's estimate is shown below the table. For the purpose of this HIS, it is not important for the number of dwelling units to agree exactly. The margin of error for these calculations is large (both ODOT's calculations and the city's calculations). They rely on many assumptions and approximations.
3. The modified method used to prepare this HIS includes an adjustment to calibrate the spreadsheet model. The reduction factors are adjusted, if necessary, so the number of dwelling units agrees (more or less) with the city's calculations. For this HIS, ODOT adjusted the reduction factors provided by the city.

Table 3 – Existing trip generation

A	B	C	D	E	F
zoning designation (or housing type)	% of zone occupied by each land use	development capacity	land use category (ITE code)	trip generation rate	trip generation
units:	%	sq ft (or dwelling units)		ADT per 1,000 sq ft (or D.U.)	average daily weekday trips
formulas: (letters refer to columns)		N.R. capacity (from Table 1) x B (or dwelling units)			non-residential: (C ÷ 1,000) x E residential: C x E
notes:	1, 2	3	4	5	
C-2 Community Commercial	50%	12,191,921	710 General Office	10.84	132,160
C-2 Community Commercial	10%	2,438,384	720 Medical Office	36.00	87,782
C-2 Community Commercial	30%	7,315,153	820 Shopping/Retail	37.01	270,734
C-2 Community Commercial	10%	2,438,384	932 Restaurant	107.20	261,395
C-3 Major Commercial	50%	6,954,006	710 General Office	10.84	75,381
C-3 Major Commercial	10%	1,390,801	720 Medical Office	36	50,069
C-3 Major Commercial	30%	4,172,403	820 Shopping/Retail	37.01	154,421
C-3 Major Commercial	10%	1,390,801	931 Restaurant	107.20	149,094
S-F Fifth Ave Special Area	100%	845,238	820 Shopping/Retail	37.01	31,282
I-2 Light-Medium Industrial	100%	694,782	110 Light Industrial	4.87	3,384
I-3 Heavy Industrial	100%	694,782	140 Manufacturing	4.75	3,300
multi-family housing (mid-rise)	dwelling units	24,715	221 Multi-Family Housing (Mid-Rise)	4.54	112,205
				total:	1,331,207

totals (calculation check)		40,526,656	non-residential capacity (column total)
C-2 Community Commercial	100%	24,383,843	
C-3 Major Commercial	100%	13,908,011	
other zones	100%	<u>2,234,802</u>	
	(column total)	40,526,656	total (agrees with Table 1)

notes

1. Trip generation calculations are based on land use. In order to determine which trip generation rates to use (from the ITE Trip Generation Manual) some assessment of land use is required. The land uses shown in this table represent the future condition when the CFA is developed to the full potential allowed under the existing zoning regulations. Table 4 shows the land uses representing the full potential development allowed under the proposed zoning regulations.
2. The percentages shown in Column B indicate the proportion of the zoning district occupied by the individual land uses shown in Column D. These percentages relate to land area. The development capacity shown in Column C accounts for both land area and vertical development potential (number of floors) as described in Table 1.
3. Residential and non-residential uses are accounted for separately. Trip generation rates for non-residential uses are based on square footage, whereas trip generation rates for residential uses are based on the number of dwelling units. Column C indicates the non-residential development capacity for each zone. The calculations within each zone are subdivided by land use category (shown in Column D). The total number of dwelling units within the CFA is also shown in Column C. Dwelling units are not included in the calculation check below the table.
4. The land uses listed in Column D do not represent all the potential (future) uses within the CFA (allowed under the existing zoning). They represent the predominant land uses. Some land uses are proxies (approximations) for other similar land uses that have similar trip generation rates. Similarly, the percentages shown in Column B are not based on precise calculations. They are estimates. For this type of assessment, it is not necessary to be more precise. Increasing precision (by including more land uses) does not necessarily increase the accuracy of the trip generation calculation. This is because the margin of error for each input and the overall margin of error is large.
5. Trip generation rates for non-residential uses are expressed in terms of trips per 1,000 ft of floor area, in the ITE Trip Generation Manual. Trip generation rates for residential uses are expressed in terms of trips per dwelling unit. For this HIS, the number of trips refers to average daily (weekday) trips (ADT).

Table 4 – Proposed trip generation

A	B	C	D	E	F	G
zoning designation (or housing type)	% of zone occupied by each land use	development capacity	land use category (ITE code)	trip generation rate	trip generation	adjusted trip generation
units:	%	sq ft (or dwelling units)		ADT per 1,000 sq ft (or D.U.)	average daily weekday trips	average daily weekday trips
formulas: (letters refer to columns)		N.R. capacity (from Table 1) x B (or dwelling units)			non-residential: (C ÷ 1,000) x E residential: C x E	F – (F x 0.1)
notes:						2, 3
C-2 Community Commercial	50%	16,704,341	710 General Office	10.84	181,075	162,968
C-2 Community Commercial	10%	3,340,868	720 Medical Office	36.00	120,271	108,244
C-2 Community Commercial	30%	10,022,605	820 Shopping/Retail	37.01	370,937	333,843
C-2 Community Commercial	10%	3,340,868	932 Restaurant	107.20	358,141	322,327
C-3 Major Commercial	50%	6,950,804	710 General Office	10.84	75,347	67,812
C-3 Major Commercial	10%	1,390,161	720 Medical Office	36	50,046	45,041
C-3 Major Commercial	30%	4,170,482	820 Shopping/Retail	37.01	154,350	138,915
C-3 Major Commercial	10%	1,390,161	932 Restaurant	107.20	149,025	134,123
multi-family housing (mid-rise)	dwelling units	28,605	221 Multi-Family Housing (Mid-Rise)	4.54	129,866	116,879
					total:	1,430,151

totals (calculation check)

C-2 Community Commercial	100%	33,408,682	non-residential capacity
C-3 Major Commercial	100%	<u>13,901,608</u>	non-residential capacity
		47,310,289	total (agrees with Table 2)

notes

1. The Table 3 notes also apply to this table.
2. An Internal Capture Reduction Factor is applied to the trip generation calculations shown in Column F. The adjusted trip generation is shown in Column G. This reduction factor is different than the Development Standards Reduction Factor that was applied in Table 1 and Table 2. The Internal Capture Reduction Factor accounts for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. It assumes the enhanced mixed-use, pedestrian-friendly character of the area will enable people to travel within and beyond the CFA using other modes (walking, bicycling, public transportation). Refer to Highway Impacts Summary Guide, p.20.
3. The Internal Capture Reduction Factor is only applied in calculating the proposed trip generation. It could be argued that this reduction factor should be also applied to the existing condition because the methodology (modified for this HIS) accounts for the increase in density and mix of uses that will occur under the existing zoning designations (over a 20-year planning horizon). The rationale for only applying the reduction factor to the proposed condition is that, presumably, the city will target more investment within this area after it is designated as a CFA to make it more pedestrian, bicycle and transit friendly.

Table 5 – Change in trip generation

A	B	C	D	E
existing trip generation	proposed trip generation	change	change (percent)	notes
ADT	ADT	ADT	%	The units are shown in this row.
Table 3 Column F total	Table 4 Column G total	B – A	$((B-A) \div A) \times 100$	The formulas are shown in this row. The letters refer to the columns.
notes:			1	2, 3
1,331,207	1,430,151	98,944	7.43%	

notes

1. The calculated increase in trip generation can be attributed to the zoning changes the city is proposing. 64 acres will be rezoned from industrial to C-2. (Industrial uses have a low trip generation rate.) A small area of S-F (7 acres) will also be rezoned to C-2 but that change does not affect trip generation. The assumed height and proportion of residential use for S-F is the same as C-2. The Internal Capture Reduction Factor described in Table 4 offset some of the increase in trip generation. Without the reduction factor the increase would be approximately 10% larger (18%).
2. Highway impact summaries prepared for other CFAs may have different results. An HIS could conclude that a CFA will have either an increase, decrease, or no change in trip generation. There are many variables that influence the calculations. The zoning designations are the most significant variable. If there is no change in zoning, there will not be much change in trip generation. Other variables that influence the calculations are the Development Standards Reduction Factor (refer to Tables 1 and 2), the assumed land uses within each zone that are used to determine the trip generation rates (Tables 3 and 4), and the Internal Capture Reduction Factor (Table 4). Each CFA is unique.
3. This HIS was prepared by ODOT to assist the city in complying with the CFA requirements specified in OAR 660-012-0325, Transportation Review in Climate-Friendly Areas. It is not intended to be used for other transportation planning or development review related purposes.

Appendix B

Safety assessment

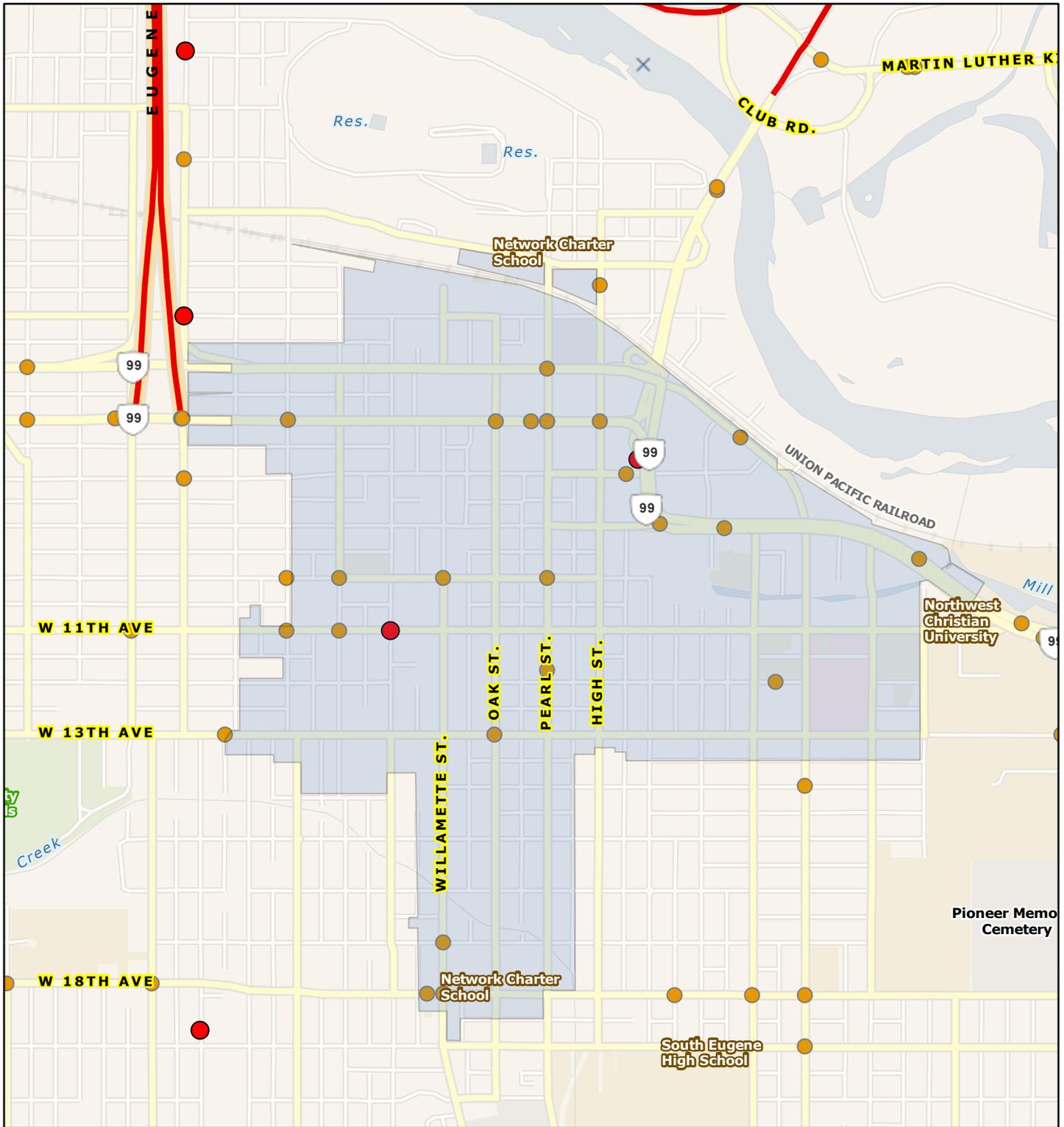
These maps and

- Map showing crash locations
- Table 6 – Fatal and serious injury crashes (2018-2023)
- Map showing SPIS crash locations (2018-2021)

SPIS refers to the ODOT Safety Priority Index System. Refer to Section 7 of this HIS for a more detailed explanation.

[break]

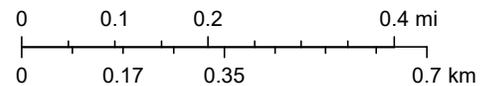
Downtown CFA crash locations (2018-23)



9/18/2025, 7:11:02 AM

1:18,056

- GreaterDowntownCFA_dissolve
- Highway Network
- City Limits
- State Boundary
- County
- Fatal
- Serious Injury



Oregon Department of Transportation

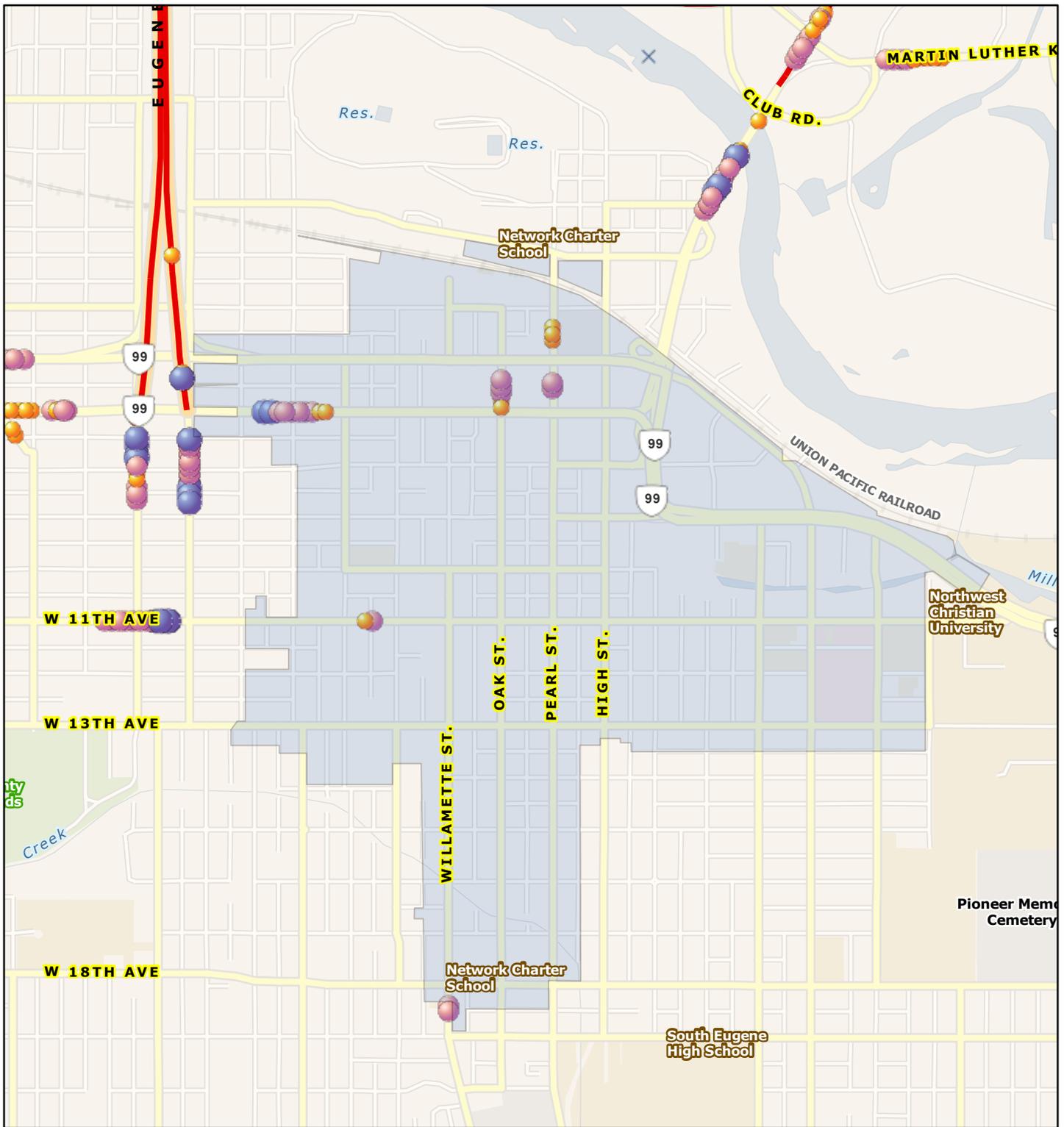
Table 6 – Fatal and serious injury crashes

A	B	C	D	E	F	G	H	I	J
crash ID	date (sort by)	time	road & intersecting road	crash type	collision type	weather & road surface	traffic control device	crash cause	highest injury severity
41045	1/6/2018	6:00 PM	WILLAMETTE ST & 18TH AVE	Entering at angle - all others	Turning Movement	clear & dry	Unknown or not definite	(1) Did not yield right-of-way. (2) Wrong way on one-way road; wrong side divided road.	Suspected Serious Injury (A)
40919	6/11/2018	11:00 AM	7TH AVE & PEARL ST	From same direction - both going straight	Rear-End	clear & dry	One-way Street	Failed to avoid vehicle ahead.	Suspected Serious Injury (A)
92924	2/7/2019	1:00 AM	LINCOLN ST & 11TH AVE	Pedalcyclist	Angle	clear & dry	Traffic Signals	Disregarded traffic signal.	Suspected Serious Injury (A)
81960	3/2/2019	1:00 PM	CHARNELTON ST & 10TH AVE	From opposite direction - both going straight	Sideswipe - Meeting	clear & dry	Traffic Signals	(1) Reckless Driving (per PAR). (2) Physical illness. (3) Disregarded traffic signal.	Suspected Serious Injury (A)
94589	3/18/2019	2:00 PM	PEARL ST & 6TH AVE	Entering at angle - all others	Angle	clear & dry	Traffic Signals	Disregarded traffic signal.	Suspected Serious Injury (A)
83918	5/6/2019	8:00 AM	HILYARD ST & 8TH AVE	From same direction - one turn, one straight	Turning Movement	clear & dry	One-way Street	Made improper turn.	Suspected Serious Injury (A)
96648	7/29/2019	7:00 AM	LINCOLN ST & 7TH AVE	Entering at angle - all others	Angle	clear & dry	Traffic Signals	Disregarded traffic signal.	Suspected Serious Injury (A)
130641	6/1/2020	9:00 PM	PEARL ST & 7TH AVE	Entering at angle - all others	Angle	clear & dry	Traffic Signals	(1) Wrong way on one-way road; wrong side divided road. (2) Disregarded traffic signal. (3) Reckless Driving.	Suspected Serious Injury (A)
100606	6/5/2020	6:00 PM	LINCOLN ST & 7TH AVE	Entering at angle - all others	Angle	cloudy & dry	Traffic Signals	Disregarded traffic signal.	Suspected Serious Injury (A)
176838	8/22/2021	8:00 PM	OLIVE ST & 11TH AVE	Pedestrian	Pedestrian	clear & dry	Traffic Signals	(1) Inattention. (2) Did not yield right-of-way. (3) Non-motorist not visible; non-reflective clothing.	Fatal Injury (K)
227923	6/3/2022	3:00 PM	WILLAMETTE ST & 10TH AVE	Pedalcyclist	Angle	cloudy & wet	Traffic Signals	(1) Disregarded traffic signal. (2) Inattention.	Suspected Serious Injury (A)
188950	6/6/2022	7:00 PM	FRANKLIN BLVD & ALDER ST	Fixed object	Fixed or Other Object	clear & dry	Unknown or not definite	(1) Inattention. (2) Too fast for conditions (not exceed posted speed).	Suspected Serious Injury (A)
186289	6/23/2022	4:00 PM	OAK ST & 7TH AVE	Entering at angle - all others	Turning Movement	clear & dry	Traffic Signals	Did not yield right-of-way.	Suspected Serious Injury (A)
190111	9/30/2022	4:00 PM	CHARNELTON ST & 11TH AVE	Entering at angle - all others	Angle	clear & dry	Traffic Signals	Disregarded traffic signal.	Suspected Serious Injury (A)
220049	11/4/2022	11:00 AM	12TH AVE & PATTERSON ST	Fixed object	Fixed or Other Object	rain & wet	Unknown or not definite	Other improper driving.	Suspected Serious Injury (A)
188524	11/28/2022	4:00 PM	WILLAMETTE ST & 18TH AVE	Pedalcyclist	Turning Movement	rain & wet	Traffic Signals	Did not yield right-of-way.	Suspected Serious Injury (A)
225200	12/17/2022	10:00 AM	BROADWAY ST & FERRY ST	From opposite direction - both going straight	Head-On	clear & ice	Unknown or not definite	Drove left of center on two-way road; straddling.	Suspected Serious Injury (A)
272126	1/2/2023	3:00 PM	BROADWAY ST & MILL ST	Fixed object	Fixed or Other Object	cloudy & wet	Traffic Signals	Reckless Driving (per PAR).	Suspected Serious Injury (A)
260619	1/16/2023	12:00 PM	PEARL ST & 7TH AVE	Entering at angle - all others	Angle	clear & dry	Traffic Signals	(1) Inattention. (2) Disregarded traffic signal.	Suspected Serious Injury (A)
268060	4/21/2023	7:00 AM	PEARL ST & 12TH AVE	Parked motor vehicle	Sideswipe - Overtaking	clear & dry	One-way Street	Defective steering mechanism.	Suspected Serious Injury (A)
233208	4/27/2023	6:00 PM	COBURG RD & 8TH AVE	From same direction - one stopped	Rear-End	clear & dry	One-way Street	(1) Driving in excess of posted speed. (2) Failed to avoid vehicle ahead. (3) Improper change of traffic lanes.	Fatal Injury (K)
261634	5/6/2023	10:00 AM	18TH AVE & WILLAMETTE ST	Pedalcyclist	Turning Movement	clear & dry	Unknown or not definite	Did not yield right-of-way.	Suspected Serious Injury (A)
271414	8/15/2023	12:00 PM	COBURG RD & 8TH AVE	Entering at angle - all others	Turning Movement	clear & dry	Yield Sign	Did not yield right-of-way.	Suspected Serious Injury (A)
273749	8/29/2023	10:00 PM	HIGH ST & 7TH AVE	Entering at angle - all others	Angle	clear & dry	Traffic Signals	Disregarded traffic signal.	Suspected Serious Injury (A)
228874	9/26/2023	4:00 PM	PEARL ST & 10TH AVE	Pedestrian	Pedestrian	clear & dry	Traffic Signals	(1) Did not yield right-of-way. (2) Inattention.	Suspected Serious Injury (A)
232834	12/2/2023	11:00 AM	OAK ST & 13TH AVE	Entering at angle - all others	Angle	rain & wet	Traffic Signals	(1) Disregarded traffic signal. (2) Inattention.	Suspected Serious Injury (A)
265172	12/3/2023	10:00 PM	WILLAMETTE ST & 17TH AVE	From opposite direction - one left turn, one straight	Turning Movement	rain & wet	Unknown or not definite	Did not yield right-of-way.	Suspected Serious Injury (A)

notes

1. This table provides summary information about the crashes shown on the map (on the previous page) for the 6-year period between Jan 2018 and Dec 2023. More detailed information about these crashes is available from the database this summary information was extracted from.
2. There have been two fatal injury crashes (highlighted) and 25 serious injury crashes within the CFA, within the most recent reporting period.
3. This HIS does not attempt to forecast future crash rates. Presumably, the roadway and multimodal improvements the city is planning in this area will help reduce the number of crashes in the future.

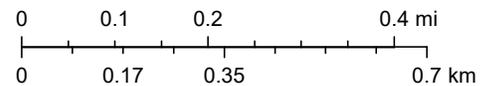
Downtown CFA SPIS locations (2018-21)



9/18/2025, 6:53:50 AM

1:18,056

- GreaterDowntownCFA_dissolve
- SPIS 2022 (2019-21 crashes)
- 85% - 89.99%
- 90% - 94.99%
- 95% - 100%
- SPIS 2021 (2018-20 crashes)
- 85% - 89.99%
- 90% - 94.99%
- 95% - 100%
- Highway Network
- City Limits
- State Boundary
- County



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Appendix C

Planned improvements

Included in this appendix is Table 7, which lists the projects identified in the existing City of Eugene Transportation System Plan, within the Downtown CFA, that are reasonably likely to be funded within the 20-year planning horizon. The city may or may not identify additional transportation improvements for this area when they update their TSP in the future. For additional explanation, refer to the footnotes in the table and to Section 8 of this HIS.

Table 7 – Planned improvements

A	B	C	D	E
project	page	project description	map	cost
(note 2)	(note 3)		(note 4)	(2014)
roadway, multimodal, and rail projects to be completed within 20 Years (Eugene TSP, Table 5.1, beginning on p.60)				
MM-19	61	Franklin Blvd: Walnut Street to Onyx Street – Reconstruct Franklin Boulevard pursuant to the Walnut Station Plan (for purposes of cost estimating a multiway boulevard design from this plan was used); make streetscape improvements including new sidewalks on the south side and a shared use path on the north side between Onyx and Alder Streets. (0.6 miles)	2	\$27.7M
MM-23	62	Amtrak train station (depot) – Improve passenger platform and construct new rail sidings to enhance passenger rail service and separate passenger rail from freight rail.	2	\$20.3M
MM-24	62	Railroad quiet zone – Establish a railroad quiet zone in the Downtown and Whiteaker neighborhoods. Assume 10 crossings.	2	\$5M
MM-25	62	Railroad crossing improvements – Relocate highway-railroad crossing to align with the existing 8th Avenue improvements. Includes track panels, lights, relocated signal, gates, audible warning devices, and upgraded railroad track detection as required by ODOT Rail and Union Pacific Railroad. Also includes an accessway to establish a walking and bicycling connection to the South Bank Path.	2	\$3.1M
pedestrian and bicycle projects to be completed within 20 years (Eugene TSP, Table 5.2, beginning on p.65)				
PB-107	65	W 15th Ave: Jefferson Alley to Kincaid St. – neighborhood greenway (1.16 miles)	4	\$117,000
PB-109	65	Willamette Street: Amtrak Station to W 6th Ave – neighborhood greenway (0.12 miles)	4	\$18,000
PB-111	65	Broadway: Charnelton St to High St – neighborhood greenway (0.38 miles)	4	\$47,000
PB-114	65	Lawrence Street: Cheshire Ave to W 19th Ave – neighborhood greenway (1.49 miles)	4	\$151,000
PB-486	67	Willamette Street: 7th Ave to 13th Ave – neighborhood greenway (0.46 miles)	4	\$58,000
PB-488	67	Mill Street/E 10th Ave: High St to E 19th Ave – neighborhood greenway (0.76 miles)	4	\$91,000
PB-508	70	Franklin Boulevard: Alder St to Millrace Park Path – sidewalk path (0.18 miles)	4	\$273,000
PB-571	68	Lincoln Street: W 5th Ave to W 13th Ave – neighborhood greenway (0.61 miles)	4	\$1,419,000
PB-574	69	High Street: 6th Ave to 4th Ave – bike lane (0.15 miles)	4	\$16,500
PB-588	67	17th Avenue: Alder St to Jefferson St – neighborhood greenway (1.04 miles)	4	\$104,000

notes

1. This table lists the projects identified in the Eugene 2035 Transportation System Plan (TSP), within the Downtown CFA, that are reasonably likely to be funded within the 20-year planning horizon. This list was compiled by ODOT.
2. All of the projects included in this list are pedestrian or bicycle (PB) related improvements (multi-modal). There are no roadway improvement projects. The list does not include projects that have been completed, according to the city (MM-22, PB-18, PB-226, PB-556, PB-583).
3. The page number shown in Column B refers to the page in the TSP where the project is described.
4. The number shown in Column D refers to the map (figure) in the TSP that shows the location of the project.

Appendix D

Information provided by the city

City staff provided numerical data and other information for ODOT to use in developing this Highway Impacts Summary (HIS). ODOT provided a worksheet describing the required information. Additional information was obtained from follow-up discussions. The following is a compilation of the information. It includes comments from ODOT explaining how the information was adapted for this HIS.

1. CFA name: Downtown CFA (Eugene)

2. Gross area: 423.16 acres

3. Net developable area: 399.32 acres

The net developable area provided by the city, to assist ODOT in preparing this HIS, may or may not agree with the net area the city used to calculate housing capacity for the purpose of complying with the CFA requirements.

ODOT's methodology for determining net developable area is generally consistent with the method described in the DLCD CFA Methods Guide (p.25) that local governments use to calculate development capacity. ODOT uses a slightly different definition of net area, and a simplified methodology to calculate development capacity.

The CFA methodology is more precise. (It may or may not be more accurate, in terms of estimating the actual amount of developable area.) ODOT uses a different methodology because a HIS needs to assess the existing condition (i.e., the development capacity before zoning regulations are changed) in addition to the future condition (after the regulations are changed), in order to determine the change in trip generation. The CFA methodology is only concerned with the future condition.

The city calculated the net area (399.32 acres). ODOT calculated the gross area using the CFA boundary provided by the city.

The city explained: (1) The net area does not include parcels zoned Public Land or Special Historic, where no capacity is assumed. (2) CFA boundaries generally do not include adjacent parks or open space. Some parcels (within the CFA) have a Willamette Greenway overlay zone, which does not preclude development outside of the required setbacks. (3) ROW is accounted for (set aside) in the development standards assumptions. (Refer to Item 6 below.)

4. Existing zoning:

The following table lists the existing (and proposed) zoning designations within CFA. The number of net acres is also indicated.

zoning district	existing		proposed	
	acres	%	acres	%
C-2 Community Commercial	190.4	47.7%	260.9	65.3%
C-3 Major Commercial	108.6	27.2%	108.6	27.2%
S-F Fifth Ave Special Area	6.6	1.7%	0.0	0.0%
I-2 Light-Medium Industrial	31.9	8.0%	0.0	0.0%
I-3 Heavy Industrial	31.9	8.0%	0.0	0.0%
R-4 High-Density Residential	29.9	7.5%	29.9	7.5%
total	399.3	100.0%	399.3	100.0%

The city did not provide the areas for each zoning district. They only provided the total area (for both CFAs) and the relative size of each zone, as a percentage of the total area (for both CFAs). ODOT calculated the area of each zoning district for both the existing and proposed condition (before and after the zoning is changed). This required estimating the area of some zoning districts.

The following is a description of the zoning districts. This summary was compiled by ODOT from information contained in the city’s development code.¹ This information is needed to determine the appropriate land uses and associated trip generation rates (refer to Appendix A, Tables 3 and 4).

C-2 Community Commercial – This zone allows a wide range of commercial uses including: retail sales of consumer goods, entertainment, office, and services. Housing is also permitted in this zone. (Rowhouses are permitted as a Special Use.) The intended service area is smaller than the entire metropolitan area but larger than the surrounding neighborhood. The maximum building height is 120 feet. (Refer to Eugene Code, Section 9.2110 and Tables 9.2160 and 9.2170.)

C-3 Major Commercial – This zone is similar to the C-2 zone. It allows a wide range of commercial uses including: retail sales of consumer goods, entertainment, office, and services. Housing is also permitted in this zone. (Rowhouses are not permitted.) It differs from the C-2 zone in that the intended service area includes the entire metropolitan area. It also excludes or limits less intense uses (e.g., garden supply/nursery, storage facility, RV parks, vehicle sales and service. The maximum building height is 150 feet. (Refer to Eugene Code, Section 9.2120 and Tables 9.2160 and 9.2170.)

S-F Fifth Ave Special Area – This zone allows for a variety of commercial, employment, and industrial uses. The zone encourages redevelopment that is primarily pedestrian-oriented with only limited provision for automobile use. The maximum building height is 120 feet. (Refer to Eugene Code, Section 9.3400 and Tables 9.2160 and 9.2170.)

¹ Link to Eugene Zoning Code: <https://eugene.municipal.codes/EC/9>

I-2 Light-Medium Industrial – This zone provides areas to serve a wide variety of manufacturing and other industrial activities with controlled external impacts. There is no maximum building height. (Refer to Eugene Code, Section 9.2410 and Tables 9.2450 and 9.2460.)

I-3 Heavy Industrial – This zone provides areas to serve a range of manufacturing uses that has significant external impacts. There is no maximum building height. (Refer to Eugene Code, Section 9.2420 and Tables 9.2450 and 9.2460.)

R-4 High-Density Residential – This zone provides areas for high-density residential development. The minimum density is 20 units per acre. The maximum density is 112 units per acre. The maximum building height is 120 feet. The zone allows for a limited range of commercial activities to serve the residents of the area (e.g., medical services, athletic club, neighbor commercial). The zone also allows for churches, schools, and government services. (Refer to Eugene Code, Section 9.2730 and Tables 9.2740 and 9.2750.)

The city explained that the areas zoned R-4 are “abutting residential or employment-zoned areas within a half-mile walking distance of a mixed-use area,” as described in OAR 660-012-0320(3). They are included in the CFA for purposes of calculating development capacity but they do not allow the same mix of uses (as permitted uses) as the other zones within the CFA.

For this trip generation assessment, to simplify the calculations, ODOT will assume the areas zoned R-4 are 100% residential. (Mixed use zones are assumed to be 30% residential.) Refer to Table 2.

5. Proposed zoning

The city will be making some modifications to the C-2 and C-3 standards to comply with the CFA requirements specified in OAR 660-012-0320. The following is a summary of the modifications.

- C-2 Community Commercial – (1) Require a minimum residential density of 25 units per net acre, consistent with OAR 660-012-0320(8)(c). (2) Allow single-unit attached housing (row houses) as an outright permitted use, consistent with OAR 660-012-0320(2)(a). (The current regulations allow row houses as a Special Use.)
- C-3 Major Commercial – (1) Require a minimum residential density of 25 units per net acre, consistent with OAR 660-012-0320(8)(c). (2) Allow single-unit attached housing (row houses), consistent with OAR 660-012-0320(2)(a). (The current regulations do not allow row houses.) (3) Remove area-specific height limitations on certain properties near Skinner’s Butte.

The city does not expect these changes, to either the C-2 or C-3 regulations, to significantly increase the amount of buildable area or intensity of land uses in the Downtown CFA.

In addition to these changes to the C-2 and C-3 zones, the city will also be making the following changes:

- The I-2 Light Medium Industrial and I-3 Heavy Industrial will be re-zoned to C-2 Community Commercial.
- The S-F Fifth Ave Special Area will be rezoned to C-2.

6. Development standards reduction factor

This reduction factor accounts for parking, setbacks, landscaping, and other requirements specified in the zoning regulations that reduce the developable area of individual parcels, and the CFA as a whole. The ODOT HIS methodology applies these reduction factors to both existing and proposed conditions.

To assist ODOT in preparing this HIS, ODOT asked the city to provide reduction factors for each zone based on the data they developed for the Housing Capacity Matrix they prepared for DLCDC to comply with the CFA requirements.² (DLCDC does not require cities to calculate reduction factors.) The following table shows the reduction factors provided by the city.

The city provided reduction factors for the C-2 and C-3 zones. They did not provide reduction factors for the other zones. The table also shows the reduction factors that ODOT used.

zoning district	City	ODOT
C-2 Community Commercial	0.00	0.40
C-3 Major Commercial	0.00	0.40
S-F Fifth Ave Special Area		0.40
I-2 Light-Medium Industrial		0.50
I-3 Heavy Industrial		0.50
R-4 High-Density Residential		0.40

The city provided the following rationale for specifying a 0.0 reduction factor for the C-2 and C-3 zones:

- The C-2 zone requires a 5' front yard setback, but no lot setbacks or landscaping requirements if there is ground floor commercial (EC 9.2170). The 20% open space requirement does not apply to higher-density development, which is assumed within the CFA (EC 9.5500(9)). There are no minimum off-street parking requirements in Eugene.
- The C-3 zone requires a 3' front yard setback per EC 9.2170, but no lot setbacks or landscaping requirements if there is ground floor commercial or for development within the Downtown Plan Boundary. There is no open space requirement (EC 9.5500(9)) and no minimum off-street parking requirement.

This is a logical explanation. However, it is not realistic to assume that 100% of each parcel will be occupied by buildings. Doing so would significantly inflate the trip generation calculations.

² The Lane Council of Governments (LCOG) prepared the Housing Capacity Matrix for the city.

For this HIS, ODOT initially applied a 30% reduction factor for both the C-2 and C-3 zones. It was increased to 40% in order to calibrate the spreadsheet model so the number of dwelling units agrees with the city's calculations. Refer to Table 2.

ODOT estimated reduction factors for the other zoning districts. They were also adjusted in order to calibrate the model.

7. Allowable building height

Building height is used to calculate development capacity. The following table shows the maximum building height allowed in each zoning district. This information was provided by the city.

zoning district	height
C-2 Community Commercial	120
C-3 Major Commercial	150
S-F Fifth Ave Special Area	120
I-2 Light-Medium Industrial	none
I-3 Heavy Industrial	none
R-4 High-Density Residential	120

The housing capacity analysis the city prepared to comply with the CFA requirements assumed a maximum building height of 85 feet for the Downtown CFA, regardless of what the zoning regulations allow.³ This is consistent with the methodology described in the DLCD CFA Methods Guide for a primary CFA. For this HIS, ODOT also assumed a maximum building height of 85feet.

The city did not indicate that one of the CFAs is a primary CFA and the other is a secondary CFA. They indicated the maximum building height for both CFAs is 85 ft, for the purpose of this HIS. This indicates that the city considers both CFAs to be primary CFAs. (For secondary CFAs, the maximum building height is assumed to be 50 ft.)

8. Dwelling units

ODOT asked the city to determine the number of existing dwelling units within the CFA and to project the number of future dwelling units (accounting for the proposed zoning changes). If possible, they were asked to provide subtotals for each zoning district. The city only provided totals, as shown in the table below.

³ The city did not provide ODOT with a copy of the Housing Capacity Matrix they prepared for DLCD. ODOT assumes it specified a maximum building height of 85 ft.

The projected total is the theoretical number of units, assuming the area is developed to its full potential based on what the zoning allows. (The assumed building height specified in Section 7 (85 ft) establishes an upper limit on the building envelope.)

(dwelling units)

zoning district	existing	projected
C-2 Community Commercial		
C-3 Major Commercial		
S-F Fifth Ave Special Area		
I-2 Light-Medium Industrial		
I-3 Heavy Industrial		
R-4 High-Density Residential		
total	5,008	26,863

The city also provided projections based on a market analysis prepared by a consulting firm (ECONorthwest). The consultant provided both a low (750) and high (2,250) estimate of the number of additional units the market could absorb with the CFA. Accounting for the number of existing units, the high estimate is 7,258 units (5,008 + 2,250). This number is significantly lower than the theoretical number of units (26,863). Note that the market analysis is based on current market conditions. The theoretical projection accounts for development that is expected to occur over the 20-year planning horizon this HIS accounts for.

The revised methodology used to prepare this HIS does not use the existing dwelling unit data provided by the city. Instead, ODOT calculated the number of dwelling units that will exist in the future when the area is developed to its full potential based on what the existing zoning regulations allow. See Table 1.

The revised methodology does consider the projected number of dwelling units provided by the city. This represents the number of dwelling units that will exist in the future when the area is developed to its full potential based on the revised zoning.

ODOT developed its own estimates using a similar but slightly different method than the city. The spreadsheet model used to calculate development capacity, dwelling units, and trip generation is calibrated so the number of projected dwelling units (for the proposed condition) is consistent with the city’s projections. The calibration is accomplished by adjusting the development standards reduction factors, if necessary. (It was necessary for this HIS.) Refer to Table 2.

This is explained in more detail in Appendix E, Methodology, Section D.1.a. The calculated number of dwelling units is shown in Appendix A, Tables 1 and 2.

Appendix E

Methodology

Revised 2026.02.18

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A. Overview

ODOT has developed a methodology for preparing a Highway Impacts Summary (HIS). The methodology is described in the *Highway Impacts Summary Guide* (November 2024), which is available to view and download from the ODOT Planning for Climate-Friendly & Equitable Communities webpage [\[link\]](#).

This HIS was developed using a modified version of the recommended methodology. This appendix to the HIS provides a summary of both the recommended and modified methodology. It only describes the method for determining the change in trip generation. It does not describe the HIS requirement to provide a summary of traffic-related deaths and serious injuries within the climate-friendly area in the past five years, or other optional elements described in the HIS guide.

This modified methodology was developed by Bill Johnston, Region 2 Area 5 Transportation Planner. The ODOT Transportation Planning Rule (TPR) Implementation Unit, who developed the HIS guide, have encouraged ODOT Region Planners to deviate from the recommended methodology if they determine it is appropriate. OAR 660-012-0325 (Transportation Review in Climate-Friendly Areas) requires that an HIS be prepared, but it does not specify a methodology.

Sections B and C of this document describe the recommended methodology outlined in the HIS guide. Section D explains the modified methodology.

B. Summary of recommended methodology

The following is a high-level summary of the methodology. There are five basic steps in the process.

- 1. Existing development capacity** – Determine the existing development capacity within the Climate Friendly Area (CFA). This is also referred to as the existing condition.
- 2. Proposed development capacity** – Determine the proposed development capacity, accounting for whatever changes the city is proposing to their zoning designations and development regulations to comply with the CFA requirements. This is also referred to as the proposed condition.
- 3. Existing trip generation** – Calculate the trip generation based on the existing development capacity determined in Step 1.

4. **Proposed trip generation** – Calculate the trip generation based on the proposed development capacity determined in Step 2.
5. **Change in trip generation** – Calculate the change by comparing the existing trip generation to the proposed trip generation.

C. Detail

The following is a more detailed explanation of the methodology.

1. Existing development capacity

The development capacity, within each zoning district, in square feet (sf), is calculated by multiplying the net developable area (sf) times the number of floors allowed within the zoning district. The number of floors equals the maximum allowed building height (ft) divided by 12 ft per floor. The simple mathematical equation is: $\text{capacity} = \text{area} \times (\text{height} \div 12)$.

For an individual building, the building footprint x the allowable height is referred to as the building envelope. The total development capacity of the CFA is equal to the sum of the individual capacities calculated for each zoning district.

The residential capacity is calculated by multiplying the number of dwelling units by the average floor area per unit (units x floor area). The non-residential capacity is calculated by subtracting the residential capacity from the total capacity (total – residential = non-residential).

Residential and non-residential capacities are accounted for separately. This is because trip generation rates for residential uses are based on the number of dwelling units, whereas trip generation rates for non-residential uses are based on square footage. Trip generation calculations are described in more detail in Steps 3 and 4 (Sections C.3 and C.4).

The following is a description of the data and other information used in the calculations.

a. Net developable area

The capacity calculations (for both the existing and proposed condition) are based on the amount of net developable area within the CFA. The net area does not include large areas of undevelopable land. Public parks and open space areas and land set aside to protect natural resources are excluded. Existing right-of-way (for streets) is also excluded.

Net area also excludes parking, setbacks, landscaping, and other requirements specified in the zoning regulations that reduce the area available for development. The ODOT HIS methodology accounts for these other exclusions in the Development Standards Reduction Factor, which is described in item c, below.

Comments

ODOT’s definition of net developable area is consistent with OAR 660-012-0315(2). It is also generally consistent with the method described in the DLCD *CFA Methods Guide* (2024) that cities use to calculate development capacity.¹

ODOT uses a slightly different definition of net area, and a simplified methodology to calculate development capacity. The CFA methodology does not require cities to calculate a development standards reduction factor. ODOT’s method of determining net developable area is described in the HIS guide (p.12). DLCD’s method of determining net area is described in the CFA Methods Guide (p.25).

The CFA methodology is more precise. (It may or may not be more accurate, in terms of estimating the actual amount of developable area.) ODOT uses a different methodology because a HIS needs to assess the existing condition (i.e., the development capacity before zoning regulations are changed) in addition to the future condition (after the regulations are changed), in order to determine the change in trip generation. The CFA methodology is only concerned with the future condition.

b. Existing zoning designations

If there is more than one zoning district (designation) within the CFA, cities are asked to indicate the cumulative area for each zone (i.e., the number of acres that have that zoning designation).

The allowed uses and development standards that apply are different for each zoning district.

Zoning is an important consideration in calculating development capacity. Setbacks, parking, and other development standards are accounted for in determining net developable area. Maximum allowed building heights are used to calculating development capacity. Allowed uses are considered in selecting trip generation rates.

c. Development standards

A “Development Standards Reduction Factor” is applied to each zoning district. This accounts for required setbacks and landscaping, parking, and other development regulations that reduce the area available for development on an individual site. The remaining area can be thought of as the building footprint.

The ODOT HIS methodology applies reduction factors to both existing and future conditions. The reduction factors may or may not be the same (for existing and future conditions) depending on whether the city is proposing any changes to their zoning designations or development regulations.

Comments

The methodology prescribed by DLCD does not require local jurisdictions to calculate a reduction factor. ODOT asks the cities to calculate this factor using the data they developed for the CFA capacity analysis. This may require some interpretation and adjustment on the part of the city to adapt their data for this purpose.

¹ Some counties are required to designate CFAs. Most CFAs are designated by cities. This document simply refers to cities, rather than cities and counties or local governments.

Accounting for undevelopable area in this way introduces an error factor that contributes to the overall margin of error inherent in this type of analysis. In addition, because different methodologies are used, ODOT's net area calculations may not agree exactly with city's calculations.

For the purpose of this HIS, it is not important for the net area calculations (or other calculations) to agree exactly. The margin of error for both ODOT's calculations and the city's calculations is very large.

d. Building height

The allowed building height within the zoning district is used to calculate the non-residential development capacity. (Residential capacity, for the existing condition, is based on the number of existing dwelling units.)

e. Land use

Land use is different than zoning. Land use refers to how individual parcels are currently being used or will be used in the future. The uses are usually consistent with the uses allowed within the zoning district, unless they are non-conforming uses.

The HIS methodology accounts for residential and non-residential uses separately. This is necessary in order to calculate the trip generation for the CFA (in Step 3). Different methods are used for residential and non-residential uses.

f. Dwelling units

The HIS methodology, for the existing condition, uses the number of existing dwelling units to determine the developable area required for residential use, which is equal to the number of units multiplied times the average dwelling unit size (900 sq ft). The area required for residential use is subtracted from the total developable area to determine the non-residential development capacity (total – residential area = non-residential). The residential capacity is accounted for later (added back in) when trip generation is calculated in Step 3.

Comment

Note that the residential capacity calculation is based on the number of existing dwelling units, which represents the existing condition. In contrast, the non-residential capacity accounts for the full development potential allowed under the existing zoning regulations, regardless of existing development. Because full build out won't occur until many years in the future, this represents a future condition (allowed under the existing regulations).

This is not consistent with how ODOT evaluates the traffic impacts associated with a plan amendment (or rezoning) proposed by a developer or local government. In evaluating plan amendments, ODOT considers the full potential development capacity (or "reasonable worst case") allow under both the existing zoning and proposed zoning. This is consistent with OAR 660-012-0060 and with OHP Policy 1F. Section D of this document explains the modified methodology, which addresses this inconsistency.

g. Dwelling unit size

Dwelling unit size is used to calculate the amount of area occupied by (or needed for) residential use (as described above). The HIS methodology assumes an average dwelling unit size of 900 sq ft. This is consistent with OAR 660-012-0315(2)(e) and with the DLCD CFA Methods Guide that local governments use to calculate development capacity.

2. Proposed development capacity

The method used to calculate development capacity for the proposed condition is similar to the method used to calculate capacity for the existing condition. The primary distinction is that both the residential and non-residential capacity represent the future condition, when the area reaches its full development potential. The calculations are influenced by three key parameters (variables): zoning, the number of dwelling units, and building height. The following sections (items) explain how these inputs are different from the corresponding inputs that are used to calculate the existing development capacity.

a. Zoning

The city may or may not need to change the zoning designations and associated development regulations within the CFA to comply with the CFA requirements. If they do, the new designations and regulations are reflected in the proposed development capacity calculations.

b. Dwelling units

The HIS guide (p.14) describes two methods for determining the number of dwelling units, for the future condition. The first method applies if a jurisdiction is only proposing one CFA. In this case, assume that 30% of the proposed development capacity will be residential. The second method applies if the jurisdiction is proposing to adopt more than one CFA. In this case, the jurisdiction will provide either an alternative percentage to use for each CFA, or an exact number of dwellings units based on the housing capacity analysis they are required to prepare.

c. Building height

The allowed building height within the zoning district is used to calculate the total development capacity (within each zoning district) for both the existing and proposed conditions. The non-residential capacity is calculated by subtracting the residential capacity (calculated separately) from the total capacity. (In equation format: total – residential = non-residential.)

The HIS methodology relies on the city to specify the allowed building height. This may or may not be the actual maximum building height allowed within the zoning district. The CFA methods guide allows cities to assume lower heights if the maximum allowed heights are not realistic. For the purpose of developing their housing capacity analysis, many larger cities assume 85 ft. This is the minimum allowable building height that needs to be provided for in the zoning regulations.

The city may or may not specify different building heights for existing and proposed conditions. (If the city is not changing any of the zoning designations or development regulations within the CFA, the building heights would presumably be the same.) If the building heights are different, the new building heights are reflected in the HIS proposed development capacity calculations.

Comment

Even if the city assumes lower building heights than what the zoning regulations allow, the development capacity calculations are still somewhat theoretical. It may not be realistic to assume that every parcel will be developed to its full potential, or that it will be developed to its potential within 20 years. The residential development capacity is based on the projected need for housing over a 20-year period.

The non-residential housing capacity, however, is not based on employment projections (like a transportation system plan). It is based on building heights. It could take more than 20 years for a CFA to reach its full potential.

3. Existing trip generation

Trip generation calculations are based on land use. In order to determine which trip generation rates to use (from the ITE Trip Generation Manual), some assessment of land use is required. The land uses shown in Table 3 (in Appendix A of this HIS) represent the future condition when the CFA is developed to the full potential allowed under the existing zoning regulations, regardless of existing development. This is generally consistent with the method ODOT uses to evaluate plan amendments and rezonings proposed by developers and local governments. The following is a more detailed description of the data and method used to calculate trip generation for the existing condition.

a. Land use

The land uses shown in Table 3 do not represent all the potential uses. They represent the most likely, predominant land uses. The ODOT planners who prepare the HIS rely on their familiarity with the area and their professional judgement to determine which generalized land use categories and associated trip generation rates to use. Because it is difficult to predict future development, especially for such large subareas, it may be necessary to consider existing land use. A simple visual assessment of an aerial photo (from Google Maps) is accurate enough for this type of analysis.

Existing land use provides some guidance. It also reflects the practical limitations of redeveloping areas that are already developed. When local governments and ODOT evaluate development proposals, they consider the full development potential allowed under the existing and proposed zoning. They also consider the "reasonable worst case" in terms of development intensity, accounting for economics (actual market demand) and other practical limitations.

Note that using trip generation rates based on specific land uses to determine total trip generation is a method that is usually used to assess the impact of a specific development proposal involving a much smaller area (a few parcels). Modeling is more commonly used to determine the trip generation associated with larger subareas.

b. Trip generation rates

Trip generation rates are obtained from the ITE Trip Generation Manual (most recent version). Trip generation rates for non-residential uses are expressed in terms of trips per 1,000 ft of floor area, in the ITE Trip Generation Manual. Trip generation rates for residential uses are expressed in terms of trips per dwelling unit. The number of trips refers to average daily (weekday) trips (ADT).

Comments

The methodology described in the HIS guide for calculating development capacity and trip generation is not entirely consistent with the method ODOT uses to evaluate plan amendments and rezonings proposed by developers and local governments. The following is a more detailed explanation.

The ODOT HIS Guide (p.18) specifies that trip generation calculations should assume full build-out based on what the zoning and development regulations allow, rather than simply calculating the number of trips generated by the existing land uses. Specifically, the calculations should be based on the “reasonable worst case” development scenario, accounting for market demand and other practical considerations that would limit the amount of development to something less than the maximum allowed by the zoning regulations.

The guide specifies this method is to be used for both the existing and proposed condition, which is consistent with the method ODOT uses to evaluate plan amendments. Refer to OAR 660-012-0060 and OHP Policy 1F. The guide also specifies, however, that this method only applies for non-residential zones (or uses). Trip generation for residential uses is calculated based on the number of existing dwelling units for the existing condition, and the number future (forecasted) dwelling units for the proposed condition. This is not consistent with how plan amendments are evaluated. Section D of this document explains the modified methodology, which addresses this inconsistency.

4. Proposed trip generation

The method used to calculate trip generation for the proposed condition is similar to the method used to calculate trip generation for the existing condition. There are two key distinctions. The trip generation calculations are based on the proposed zoning rather than existing zoning. In addition, a special reduction factor is applied to account for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. The following is a more detailed explanation.

Internal Capture Reduction Factor

The ODOT HIS methodology applies an *Internal Capture Reduction Factor* in calculating the trip generation for the proposed condition. This reduction factor is different than the *Development Standards Reduction Factor* that was applied in Steps 1 and 2. The *Internal Capture Reduction Factor* accounts for the increased likelihood that people living and working within the CFA will be less reliant on automobiles. It assumes the enhanced mixed-use, pedestrian-friendly character of the area will enable people to travel within and beyond the CFA using other modes (walking, bicycling, and public transportation). Refer to the Highway Impacts Summary Guide, p.20.

Comment

It could be argued that this reduction factor should also be applied to the existing condition, because the non-residential capacity accounts for future development and increased densities. The rationale for only applying the reduction factor to the proposed condition is that, presumably, the city will target more investment within this area after it is designated as a CFA to make it more pedestrian, bicycle and transit friendly.

5. Change in trip generation

This calculation is straightforward. There are not any additional details to explain.

Comment

The calculations are straightforward but the results may not be intuitive, especially when comparing one CFA to another. A HIS prepared for one CFA may show an increase in trip generation, while another CFA may have a decrease. There are many variables that influence the calculations. A change in zoning designations can have an effect. Applying different *Development Standards Reduction Factors* (described in Table 1) to the existing and proposed conditions can also have an effect. Each CFA is unique.

D. Modified methodology

The previous sections of this appendix describe the recommended methodology outlined in the ODOT *Highway Impacts Summary Guide* (November 2024). This section describes the modified methodology that was used to develop this HIS.

Comments

The requirement for cities to designate Climate Friendly Areas is new (OAR 660-012-0310 through 0325). The requirement to prepare a Highway Impacts Summary (HIS) is specified in 660-012-0325(5). ODOT developed the methodology described in the HIS guide assist cities in complying with this requirement.

ODOT is preparing the initial impact assessments for all newly established CFAs. Cities may be required to prepare impact assessments in the future to evaluate amendments to CFAs.

ODOT only recently began developing these assessments, applying the methodology outlined in the HIS guide. ODOT transportation planners and traffic engineers developing the assessments have identified some refinements and alternative methods that may be incorporated into future versions of the guide.

The HIS guide is only a guide. The methodology is not specified in the OAR. The OAR only requires that a HIS provide “a summary of the additional motor vehicle traffic generation that may be expected in the planning period.” The HIS must also provide “a summary of traffic-related deaths and serious injuries within the climate-friendly area in the past five years.”

1. Existing development capacity

The methodology described in the HIS guide accounts for residential and non-residential development differently. The residential capacity calculation is based on the number of existing dwelling units, which represents the existing condition. In contrast, the non-residential capacity accounts for the full development potential allowed under the existing zoning regulations, regardless of existing development. Because full build out won’t occur until many years in the future, this represents a future condition (allowed under the existing regulations). This was explained previously. Refer to Section C.1.f.

This HIS uses a modified methodology. The existing development capacity, for both residential and non-residential uses, is based on the full development potential allowed under the existing zoning

regulations. This is consistent with how ODOT usually evaluates the traffic impacts associated with a plan amendment (or rezoning) proposed by a developer or local government.

The city did not calculate the existing residential capacity of the CFA. They only provided the number of existing dwelling units.² For the modified methodology, ODOT calculated the existing residential capacity by assuming that 30% of the total building capacity (in sq ft), in zones where mixed-used residential development is allowed, will be residential.³ This is consistent with how the city (and ODOT) calculated the proposed residential capacity, which is described in the next section.

Additional explanation

This modified methodology is consistent with OAR 660-012-0060 (Plan and Land Use Regulation Amendments), Section (1)(a-c). It is also consistent with OHP Policy 1F (Highway Mobility Policy), Action 1F.5 (amendments to transportation system plans). Both policies refer to projected conditions, at the 20-year planning horizon.⁴ This method is described in the ODOT Development Review Guidelines (2017). Refer to Section 3.2 (Transportation Planning Rule Reviews), Subsection 3.2.2, Item 5. Item 5.a states: Identify before and after reasonable worst case land use assumptions. Item 5.b states: Compare trip generation numbers for before and after reasonable worst case land uses.

This definition of development capacity is also consistent with OAR 660-012-0315(2)(a), which describes the requirements for designating a CFA. CFA requirements are primarily concerned with the proposed condition, after the city amends its regulations (if necessary) to comply with the CFA requirements. A HIS considers both the before (existing) and after (future) conditions. The purpose of an HIS is to assess the change in development capacity, and associated trip generation, resulting from the proposed changes to zoning and development regulations.

² The city was not required to calculate the existing residential capacity for the Housing Capacity Matrix they prepared for DLCD to comply with the CFA requirements, which are only concerned with the future condition. ODOT did not ask the city to provide this information because the methodology described in the HIS guide does not consider this in calculating the existing development capacity.

³ If an existing zone allowed only residential use, ODOT would assume 100% of the building capacity is residential.

⁴ Refer to OAR 660-012-0060 (Plan and Land Use Regulation Amendments), Section (1)(a-c). Refer also to Oregon Highway Plan (OHP) Policy 1F (Highway Mobility Policy), Action 1F.5 (amendments to transportation system plans). Both policies refer to projected conditions, at the 20-year planning horizon. This method of assessing traffic impacts is described in the ODOT Development Review Guidelines (2017). Refer to Section 3.2 (Transportation Planning Rule Reviews), Subsection 3.2.2, Item 5. Item 5.a states: Identify before and after reasonable worst case land use assumptions. Item 5.b states: Compare trip generation numbers for before and after reasonable worst case land uses.

a. Model calibration

The Development Standards Reduction Factor is described in Section C.1. It accounts for parking, setbacks, landscaping, and other requirements specified in the zoning regulations that reduce the developable area of individual parcels, and the CFA as a whole.

In the modified methodology described in this document (Appendix E), these reduction factors can also be used to calibrate the spreadsheet model used to calculate trip generation, for both the existing and proposed condition. The reduction factors can be adjusted, if necessary, so that the number of dwelling units calculated in Table 2 (for the proposed condition) is more closely aligned with the number of dwellings units calculated by the city (for the purpose of designating the CFA).

If the reduction factors used in Table 2 are adjusted, the reduction factors used in Table 1 (for the existing condition) should also be adjusted, for consistency. For a specific zoning district, if it applies in both the existing and proposed condition, the reduction factors may or may not be the same. If the city is modifying the regulations (for that district) the reduction factor (for the proposed condition) may need to be adjusted to account for the modifications.

This calibration may or may not be necessary. In some cases, the reduction factors provided by the city may result in dwelling unit calculations (using this ODOT model) that are consistent with the city's calculations.

A simple sensitivity analysis shows that adjusting the reduction factors (for the purpose of calibrating the number dwelling units) has a significant, non-proportional, effect on trip generation. Increasing the reduction factor by 20% will decrease trip generation by 17%. Increasing the reduction factor by 50% will decrease trip generation by 30%.

There are two primary contributing factors. (1) The basic assumption in the model is that 30% of the development capacity will be residential, in zoning districts where mixed-use residential development is allowed. This means that decreasing the net developable area (by increasing the reduction factor) has a proportionally larger effect on non-residential capacity (and trip generation) than it has on residential capacity.

The other factor (2) relates to trip generation rates. Non-residential uses generate approximately 10 times the number of trips as residential uses. This means that decreasing the net developable area (by increasing the reduction factor) will reduce the number of non-residential trips more than it will reduce the number of residential trips.

This sensitivity is important in terms of understanding how the model works. However, after the number of dwelling units is calibrated (if necessary), this detail is not important. Calibrating the model essentially improves the accuracy of the trip generation calculations and consistency with the city's land use calculations.

2. Proposed development capacity

The methodology described in the HIS guide relies on dwelling unit estimates provided by the city to calculate the proposed development capacity. The modified methodology used to develop this HIS relies on ODOT's own dwelling unit estimates.

ODOT used its own estimates to be consistent with the method used to calculate the existing development capacity, as described in the previous section. The city did not provide an estimate of the full potential residential capacity of the area based on current zoning regulations. They only indicated the number of existing dwelling units and potential dwelling units, after the zoning regulations are changed.

Additional explanation

ODOT's residential capacity calculations may not agree with the number of dwelling units calculated by the city and reported to DLCD for the purpose of complying with the CFA requirements (OAR 660-012-0315). Both methods assume that 30% of the building capacity (in sq ft) will be residential, consistent with OAR 660-012-0315(2)(d). However, there may be some differences in the methods used to account for unbuildable area. (Refer to Section C.1, a-c.)

For the purpose of this HIS, it is not important for the number of dwelling units to agree exactly. The margin of error for these calculations (both ODOT's and the city's) is large.

The previous section (D.1.a) explains how the development standards reduction factors can be used to calibrate the model, if necessary, so that the number of dwelling units calculated by ODOT is more closely aligned with the number of dwellings units calculated by the city.

3. Existing trip generation

Section D.1 (above) explained that (using this modified method) the existing development capacity for both residential and non-residential uses is based on the full development potential allowed under the existing zoning regulations. The number of dwelling units calculated in Table 1 is then used to calculate the residential-related trip generation in Table 3, rather than using the actual number of existing dwelling units as prescribed in the HIS guide.

4. Proposed trip generation

Section D.2 (above) explained that (using this modified method) ODOT develops its own residential capacity estimates (in terms of dwelling units) rather than using the number provided by the city as prescribed in the HIS guide. The number of dwelling units calculated in Table 2 is then used to calculate the residential-related trip generation in Table 4.

5. Change in trip generation

No modifications to this step in the process. This is a simple calculation.

D. Margin of error and disclaimer

A Highway Impacts Summary provides a high-level (broad brush) assessment of the potential traffic impacts associated with a newly designated (or amended) Climate Friendly Area.

The method used to calculate the change in trip generation within a CFA relies on many assumptions and approximations. The margin of error for each input, and the overall cumulative margin of error, is large.

This HIS was prepared by ODOT to assist the city in complying with the CFA requirements specified in OAR 660-012-0325, Transportation Review in Climate-Friendly Areas. It is not intended to be used for other transportation planning or development review related purpose.