3.1 Air Quality

This section of the Draft EIS addresses air quality conditions and impacts, including greenhouse gas (GHG) emissions. Impacts are described in the context of the relationships to adopted laws and regulations and evaluate both construction activities and ongoing operation of development that could be built under the ***Draft MIMP*** and EIS alternatives.

Policy Context

The Seattle Municipal Code (SMC) contains specific provisions that describe the scope of the SEPA analysis relative to air quality. Applicable policies from SMC 25.05.675 are noted below:

A.2 Air Quality Policies

A. It is the City's policy to minimize or prevent adverse air quality impacts.

B. For any project proposal which has a substantial adverse effect on air quality, the decisionmaker shall, in consultation with appropriate agencies with expertise, assess the probable effect of the impact and the need for mitigating measures. "Nonattainment areas" identified by the Puget Sound Clean Air Agency shall be given special consideration.

C. Subject to the overview policy set forth in Section 25.05.665, if the decisionmaker makes a written finding that the applicable federal, state, and/or regional regulations did not anticipate or are inadequate to address the particular impact(s) of the project, the decisionmaker may condition or deny the proposal to mitigate its adverse impacts.

Mitigating measures may include but are not limited to:

1) The use of alternative technologies, including toxic air control technologies;
2) Controlling dust sources with paving, landscaping, or other means
3) Berming, buffering, and screening;
4) Landscaping and/or retention of existing vegetation; and
5) A reduction in size or scope of the project or operation.

3.1-1 Affected Environment

Existing Air Quality

Existing sources of air pollution in the project study area include marine traffic within the Lake Washington Ship Canal, commercial and industrial activities to the north of the project area, and local traffic sources. With typical vehicular traffic, the air pollutant of concern is CO. Other pollutants include ozone precursors (hydrocarbons and nitrogen oxides – NOx), coarse and fine particulate matter (PM_{10} and $PM_{2.5}$), and SO_2. The amounts of particulate matter generated by well-maintained individual vehicles are minimal compared with other sources (e.g., a wood-burning stove). Concentrations of SO_2 and NOx are usually not high except near large industrial facilities. With marine sources the air pollutants of concern are usually fine particles and NOx. Taken together, existing air quality in the project area is considered good. The project study area is in the former Puget Sound Ozone and CO maintenance areas but now maintains an "attainment" status for all monitored air pollutants.

Refer to **Appendix _** for a detailed background on GHGs and climate change, as well as information on current regulatory guidance relative to GHG emissions.

3.1-2 Impacts of the Proposed Action and Alternatives

Construction Impacts

Impacts of Draft MIMP (Proposed Action)

Early Site Work and Construction

The ***Proposed Action*** (***Draft MIMP***) would involve construction activities that include renovation existing buildings, demolition and construction of new buildings, excavation and site work, and construction of a new parking areas.

For the ***Draft MIMP***, construction activity would occur over multiple years (20+ years). Development activity could result in temporary, localized increases in particulate concentrations due to emissions from construction-related sources. For example, dust from construction activities such as excavation and site work could contribute to ambient concentrations of suspended particulate matter. Construction contractors would be required, however, to comply with PSCAA regulations requiring that reasonable precautions be taken to minimize dust emissions.

Demolition and renovation of existing structures would require the removal and disposal of building materials, some of which could contain asbestos. If asbestos were found, demolition contractors would be required to comply with EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing materials to ensure such materials do not become air-borne pollutants.

Construction would require the use of heavy trucks and other large diesel construction equipment and a range of smaller equipment such as generators, pumps, and compressors. Emissions from existing transportation sources around the project area (cars, trucks, buses) is likely to outweigh emissions from on-site construction equipment. Pollution control agencies are nonetheless now urging that emissions from diesel equipment be minimized to the extent practicable to reduce potential health risks.

In general, construction contractor(s) would be required to comply with PSCAA regulations that prohibit the emission of any air contaminant in sufficient quantities and of such characteristics and duration that may be injurious to human health, plant or animal life, or property, or that unreasonably interfere with enjoyment of life and property.

Construction Effects on Traffic

Construction equipment and material hauling could affect traffic flow within the vicinity of the project site, especially if construction vehicles travel during peak periods or other heavy-traffic hours of the day and pass-through congested areas. Although there could be short-term periods with increased congestion and increased vehicle emissions, such events would likely be the exception rather than the rule and significant adverse impacts to air quality would be unlikely.

Overall Construction-Related Air Quality

With implementation of the controls required by PSCAA for the various aspects of construction activities and consistent use of best management practices to minimize on-site emissions (see ***Section 3.1-3***), construction associated with planned and potential projects under the ***Draft MIMP*** would not be expected to significantly impact air quality.

Impacts of No Action Alternative

With this alternative, only development/renovation that is consistent with the SPU's current MIMP would be built. With implementation of controls discussed above, construction-related air quality impacts under the ***No Action Alternative*** would not be expected to significantly impact air quality.

Impacts of Alternatives 2 - 5

Alternatives 2 through ***5*** are comparable to the ***Draft MIMP*** with some variations in demolition and construction of new buildings (see **Chapter 2** for details). With implementation of controls for various aspects of construction activities and best management practices as discussed above, construction of these alternatives would not be expected to significantly affect air quality.

Operational Impacts

Impacts of Proposed Action and Alternatives

The Proposed Action (***Draft MIMP***) and EIS Alternatives would result in an increase in vehicular traffic to and from the campus that would increase emissions near the campus and along roads in the area. To assess the potential for localized air quality impacts due to an increase in traffic, projected future traffic conditions with and without the project were examined and a screening level review was conducted. This analysis focused on potential for carbon monoxide (CO) emissions to cause localized "hot spots" based on EPA guidance.[1] EPA guidance recommends screening for intersections with "level of service" (LOS) "D" or worse because longer traffic delays have a greater potential to result in CO air quality impacts. This hot spot review evaluated signalized intersections in the vicinity that would be most affected by project-related traffic during peak-hour periods.

Table 3.1-1 and **Table 3.1-2** provide intersection LOS and per-vehicle delay for the AM and PM peak periods, respectively. Projected intersection conditions indicate the Dexter Ave N/4th Ave N and Nickerson St/Westlake Ave N intersection had the lowest-performing LOS of the intersections evaluated for this assessment and would perform worse during the AM peak period (projected LOS "F" for the Proposed Action and all project alternatives). Therefore, the AM peak-period traffic conditions were used to screen for CO air quality impacts where concentrations might exceed the health-protective ambient air quality standards.

Based on the Dexter Ave N/4th Ave N and Nickerson St/Westlake Ave N intersection configuration and traffic conditions including volumes, delays, and projected operational phasing, air quality screening modeling was conducted using the latest version of the WSDOT WASIST tool.[2] This screening modeling tool applies worst-case assumptions to estimate CO concentrations at nearby locations. This model uses vehicle emission factors estimated using the latest available tool from the EPA, the MOVES2014 model.[3] For this modeling, near-road receptors were placed along both sides of each roadway "leg" of the analyzed intersection at 3, 25, 50, and 100 meters from cross

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1 US Environmental Protection Agency (EPA). 1992. Guideline for Modeling Carbon Monoxide from Roadway Intersections. Office of Air Quality Planning and Standards. Technical Support Division. Research Triangle Park, North Carolina. EPA-454/R-92-005.

2 Washington State Intersection Screening Tool (WASIST) Version 3.0, Washington State Department of Transportation, June 2015

3 Jim Laughlin, WSDOT Air, Noise, and Energy Program Technical Manager, email of 5/18/2015 announcing the release of WASIST 3.0

streets, 3 meters from the nearest traffic lane, and 1.8 meters above the ground (i.e., typical sidewalk locations at breathing height).

Table 3.1-1
AM Peak-Period Signalized Intersection Conditions

Signalized Intersection	Existing 2021		No Action 2035		Draft MIMP 2035		Alt 2 2035		Alt 3 2035		Alt 4 2035		Alt 5 2035	
	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)
6th Ave W & W Nickerson St [1]	-	-	-	-	B	18.2	B	17.3	B	17.5	B	17.8	B	17.9
3rd Ave W & W Nickerson St	B	14.1	B	18.6	B	15.6	B	15.4	B	15.4	B	15.4	B	15.3
W Cremona St & W Nickerson St/Nickerson St [1]	-	-	-	-	B	14.0	B	14.6	B	14.2	B	14.3	B	14.1
3rd Ave N & Nickerson St & Florentia St	D	35.8	D	42.9	D	43.3	D	43.4	D	43.2	D	43.5	D	43.2
Dexter Ave N/4th Ave N & Nickerson St/Westlake Ave N	E	59.5	F	115.1	F	114.7	F	114.9	F	114.6	F	114.9	F	114.8

[1] Intersections are currently unsignalized and would become signalized with the ***Draft MIMP*** and ***Alternatives 2*** through ***5***.
Source: LOS and delay provided by Transpo Group, 2021. For additional information, refer to EIS Section 3.8; computations by Ramboll.

Table 3.1-2
PM Peak-Period Signalized Intersection Conditions

Signalized Intersection	Existing 2021		No Action 2035		Draft MIMP 2035		Alt 2 2035		Alt 3 2035		Alt 4 2035		Alt 5 2035	
	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)	LOS	Delay (secs)
6th Ave W & W Nickerson St [1]	-	-	-	-	C	23.3	C	21.7	C	21.8	C	22.5	C	22.8
3rd Ave W & W Nickerson St	C	24.2	D	41.1	C	25.5	C	27.2	C	26.9	C	26.3	C	27.1
W Cremona St & W Nickerson St/Nickerson St [1]	-	-	-	-	B	17.0	C	21.5	C	20.2	B	19.9	C	20.0
3rd Ave N & Nickerson St & Florentia St	D	43.8	E	61.2	E	68.6	E	71.6	E	71.4	E	69.5	E	70.7
Dexter Ave N/4th Ave N & Nickerson St/Westlake Ave N	D	53.0	E	66.3	E	66.0	E	64.4	E	66.8	E	68.2	E	66.3

[1] Intersections are currently unsignalized and would become signalized with the ***Draft MIMP*** and ***Alternatives 2*** through ***5***.
Source: LOS and delay provided by Transpo Group, 2021. For additional information, refer to EIS Section 3.8; computations by Ramboll.

Traffic Air Quality Analysis Findings

The WASIST modeling results are listed in **Table 3.1-3**. Model results indicate CO concentrations near the most congested intersection in the project study area would be far less than the 35 ppm 1-hour and 9 ppm 8-hour health based ambient air quality standards. While future (2035) traffic volumes and delays would increase over existing (2021) conditions, future CO concentrations would be reduced due to adoption of newer, more efficient vehicles and cleaner fuel regulations.[4] Model results also demonstrate that at this intersection, ***Draft MIMP*** related traffic would not increase CO concentrations over future No Action conditions. These findings indicate that the ***Draft MIMP*** and EIS Alternatives would not likely cause or contribute to any significant traffic-related air quality impacts.

Table 3.1-3
WASIST Calculated AM Peak-Period CO Concentrations (PPM)[1,2.3]

Signalized Intersection	Averaging Period	Existing 2021	No Action 2035	Draft MIMP 2035	Alt 2 2035	Alt 3 2035	Alt 4 2035	Alt 5 2035
Dexter Ave N/4th Ave N & Nickerson St/Westlake Ave N	1-Hour	5.5	5.3	5.3	5.3	5.3	5.3	5.3
	8-Hour	5.3	5.2	5.2	5.2	5.2	5.2	5.2

Source: Ramboll, based on modeling using the WSDOT WASIST tool
[1] CO concentrations are typically quantified in terms of parts per million, or ppm, and both the WASIST- calculated concentrations.
[2] Concentrations include a 5-ppm background concentration to reflect the potential contribution from other traffic or other sources in the vicinity. This is considered a very conservative assumption.
[3] The WASIST screening tool contains a variety of standard intersection configurations from which to choose as the basis of the air quality modeling. However, none of the available options were precisely representative of the actual configuration of the Dexter Ave N/4th Ave N and Nickerson St/Westlake Ave N intersection. The modeling therefore used the most conservative configuration available as the basis for this analysis based on sensitivity test runs.

Air Quality Impacts Related to Facility Operational Emissions

Emergency Equipment

One or more emergency generators may be required to ensure safe and consistent operation of the project. Emissions associated with emergency generators result from the combustion of fossil fuels and would occur during emergency use or routine testing of the generators.

PSCAA Regulation I, Section 6.03(c) exempts some sources of air pollution from Notice of Construction applications and Order of Approvals. Sources defined in 6.03(c) are not expected to cause or contribute to local air quality impacts. Stationary internal combustion engines, including emergency generators, with less than 50 horsepower output or those that are operated less than 500 hours per year are included in these exemptions. The project would not require larger emergency engines or engines that operate more than 500 hours per year.

[4] EPA Air Pollution Emissions Trend Data (https://www.epa.gov/air-emissions-inventories/air-pollutant-emissions-trends-data)

Mobile Source Air Toxics (MSATs)

The traffic impact analysis indicates a total of 2,216 and 2,772 daily passenger and truck trips would result due to the ***Draft MIMP*** and ***Alternative 2*** (considered the highest out of all four alternatives), respectively. The daily project-related traffic volumes are far fewer than the 140,000 to 150,000 annual average daily traffic (AADT) threshold that FHWA states may result in a higher potential for impacts from MSATs. In addition, MSAT emissions in future years are expected to decline compared with existing levels of emissions because of national emission control programs.

Greenhouse Gas Emissions

Impacts of Proposed Action

The GHG emissions associated with the Proposed Action (***Draft MIMP***) were calculated using King County's SEPA GHG Emissions Worksheet. King County's GHG worksheet estimates all GHG emissions that are created over the life span of a project from construction materials, fuel used during construction, energy consumed during building operation, and transportation by building occupants.

The results for the ***Draft MIMP*** are presented in **Table 3.1-4**.The ***Draft MIMP*** is expected to produce about 2,178,622 metric tons (tonnes) of CO_2 equivalent (MTCO2e) over a 62.5-year lifespan. Annually this corresponds to about 34,858 tonnes. To put these values into context, in the Washington State GHG emission inventory for 2010-2018, Ecology estimated state-wide annual GHG emissions in 2018 were about 100 million $MTCO_2e$.[5] Estimated annual worldwide GHG emissions for 2015 were about 46 billion $MTCO_2e$.[6] Thus, the project's annual GHG emissions represent approximately 0.03% of estimated annual 2018 GHG emissions within Washington and much smaller percentages of worldwide emissions.

It is important to note that the scale of global climate change is so large that the impacts from one project, no matter the size, would almost certainly have no discernible effect on increasing or decreasing global climate change. Any such effects can only be considered on a "cumulative" basis. It is, appropriate to conclude that the Proposed Action's GHG emissions would combine with emissions across the City, County, State, nation, and planet to cumulatively contribute to increases or decreases in the rate and effects of global climate change.

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5 Washington State Department of Ecology (Ecology). 2018. *Washington's greenhouse gas inventory*. Accessed January 2022: https://apps.ecology.wa.gov/publications/documents/2002020.pdf.

6 United States Environmental Protection Agency (USEPA). 2015. *Climate Change Indicator: Global Greenhouse Gas Emissions*. Accessed January 2022: https://www.epa.gov/climate-indicators/climate-change-indicators-global-greenhouse-gas-emissions.

Table 3.1-4
Estimated Draft MIMP Greenhouse Gas Emissions ($MTCO_2E$)

Components	Area (sq. ft.)	Lifespan Emissions [1]	Annual Emissions [2]
Education[3]	749,900	831,052	13,297
Lodging[4]	831,900	776,270	12,420
Retail (Other Than Mall)[5]	203,200	175,312	2,805
Public Assembly[6]	429,500	395,988	6,336

Source: Ramboll, based on using the King County's GHG worksheet

[1] Estimated lifecycle emissions are based on an assumed average useful life of about 62.5 years for all types of structures that are not considered residential. These emissions are reported in MTCO2e representing metric tons (tonnes) of carbon dioxide equivalent, or 2,204.62 pounds of CO2. This metric is a standard measure of CO2 equivalent emissions that include CO2 and other GHGs.

[2] Annual emissions estimates are based on dividing total emissions by assumed facility useful lifespan as indicated in note (1) above.

[3] Defined as buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."

[4] Defined as buildings used to offer multiple accommodations for short-term or long-term residents, including skilled nursing and other residential care buildings.

[5] Defined as buildings used for the sale and display of goods other than food.

[6] Defined as buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls.

The estimates of project GHG emissions do not consider any potential efforts to reduce GHG emissions and/or resource consumption by incorporating sustainable features into the development, although such sustainable features would be incorporated into the project by virtue of the City and State Building and Energy Code requirements. Green building technologies could also be considered in the approach to the design of buildings to reduce GHG emissions.

The GHG emissions associated with the ***Draft MIMP*** would contribute to the cumulative carbon footprint of King County. No significant adverse air quality impacts would be expected due to project-related GHG emissions.

Impacts of No Action Alternative

With this alternative, only development/renovation that is consistent with the SPU's current MIMP would be built. GHG emissions were evaluated using the King County's GHG worksheet.

As show in **Table 3.1-5**, the ***No Action Alternative*** is expected to produce about 196,968 metric tons (tonnes) of CO2 equivalent (MTCO2e) over a 62.5 year lifespan and corresponds to about 3,152 tonnes annually. When compared to the annual state-wide and worldwide GHG emissions as stated above, the ***No Action Alternative*** represents a much smaller percentage overall.

Table 3.1-5
Estimated No Action Alternative Greenhouse Gas Emissions (MTCO2E)

Components	Area (sq. ft.)	Lifespan Emissions [1]	Annual Emissions [2]
Education[3]	188,400	196,968	3,152

Source: Ramboll, based on using the King County's GHG worksheet

[1] Estimated lifecycle emissions are based on an assumed average useful life of about 62.5 years for all types of structures that are not considered residential. These emissions are reported in MTCO2e representing metric tons (tonnes) of carbon dioxide equivalent, or 2,204.62 pounds of CO2. This metric is a standard measure of CO2 equivalent emissions that include CO2 and other GHGs.

[2] Annual emissions estimates are based on dividing total emissions by assumed facility useful lifespan as indicated in note (1) above.

[3] Defined as buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."

Impacts of Alternatives 2 - 5

As discussed in ***Section II***, ***Alternatives 2 - 5*** are comparable to the ***Draft MIMP*** in terms of total development square footage, with variations in terms of building heights, demolition and construction of additional buildings. Total square footage for each alternative is the same (see **Chapter 2** for details). GHG emissions estimates for ***Alternatives 2-5*** would, therefore, be expected to be the same as for the ***Draft MIMP*** (approximately 2,178,622 metric tonnes).

As with the ***Draft MIMP***, the estimates of GHG emissions from each alternative do not consider any potential efforts to reduce GHG emissions and/or resource consumption by incorporating sustainable features into the development, and the GHG emissions associated with each alternative would contribute to the cumulative carbon footprint of King County. No significant adverse air quality impacts would be expected due to project-related GHG emissions.

3.1-3 Mitigation Measures

Construction

Although significant adverse air quality impacts are not anticipated due to construction of the planned and potential projects, construction contractors would be required to comply with all relevant federal, state, and local air quality regulations.

Construction contractors could minimize emissions from diesel-powered construction equipment, to the extent practicable, by taking steps such as implementation of best management practices that would reduce emissions related to project construction. Management practices for reducing the potential for air quality impacts during construction include measures for reducing both exhaust emissions and fugitive dust.

- Use only equipment and trucks that are maintained in optimal operational condition.
- Require all off-road equipment to have emission reduction equipment (e.g., require participation in Puget Sound Region Diesel Solutions, a program designed to reduce air pollution from diesel, by project sponsors and contractors).

- Use car-pooling or other trip-reduction strategies for construction workers.
- Implement restrictions on construction truck and other vehicle idling (e.g., limit idling to a maximum of five minutes).
- Spray exposed soil with water or other suppressant to reduce emissions and deposition of particulate matter.
- Pave or use gravel on staging areas and roads that would be exposed for long periods.
- Cover all trucks transporting materials, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck bed), to reduce emissions and deposition of particulate matter during transport.
- Provide wheel washers to remove particulate matter that would otherwise be carried off-site by vehicles in order to decrease deposition of particulate matter on area roadways.
- Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.
- Stage construction to minimize overall transportation system congestion and delays to reduce regional emissions of pollutants during construction.

Other than direct construction equipment and activity emissions that would be addressed as described above, the largest potential emissions source related to facility construction would be traffic-related emissions associated with disrupted and/or rerouted traffic in the site vicinity.

With appropriate controls, construction-related diesel emissions would not be expected to significantly affect air quality in the project vicinity.

Operation of Proposed Action or Alternatives

The screening analysis described in this section indicates that operation of the ***Draft MIMP*** or ***EIS Alternatives*** would not result in any significant adverse air quality impacts. Consequently, no specific additional mitigation is necessary or proposed.

GHG and Sustainability

The environmental analysis described above does not quantify or take into consideration any potential efforts to reduce climate change-related impacts by incorporating sustainable features into the development. Sustainable features would be incorporated into individual projects as they are built to reduce the impacts quantified in this section through compliance with requirements of Building and Energy Codes. Green building technologies could be considered in the approach to the design of buildings, and in ongoing site programming and management.

3.1-4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse air impacts have been identified and none are anticipated.