Background for the Air Quality Analysis Supplemental Information

The Utah Department of Transportation (UDOT) is issuing a supplemental air quality hot-spot analysis for particulate matter (PM_{10} and $PM_{2.5}$) for the State Route (S.R.) 210: Wasatch Boulevard through the Town of Alta Project (also called the Little Cottonwood Canyon Environmental Impact Statement [EIS]). This supplemental hot-spot analysis is being provided pursuant to the National Environmental Policy Act (NEPA) and the transportation conformity regulations at 40 Code of Federal Regulations (CFR) Part 93, Subpart A.

Transportation conformity regulations require the S.R. 210 Project to be consistent with the regional conformity determination and require that potential local emission impacts are appropriately analyzed and addressed. The Federal Highway Administration (FHWA) is responsible for making the conformity determination for the S.R. 210 Project. Following publication of the Final EIS on August 31, 2022, FHWA requested that UDOT complete a further scenario evaluation by adjusting two factors in the hot-spot analyses for $PM_{2.5}$ and PM_{10}. In particular, FHWA requested that UDOT evaluate a scenario under the existing modeling where:

- All ski buses are assumed to be powered by diesel fuel to account for the possibility that buses using other fuels would not be available.
- All transit buses are assumed to be 14 years of age, the expected number of service years set by the Federal Transit Administration and specified in the Utah Transit Authority's *Asset Management Plan*.

The same modeling and methodology discussed in the Final EIS was used in this evaluation, and UDOT ran this scenario by adjusting these two factors in the model as discussed in the following technical report.

The hot-spot analysis discussed in the following technical report did not change the hot-spot analysis results discussed in the Final EIS nor identify any new or significant impacts that the Final EIS did not already analyze. This analysis does not present significant new circumstances or information relevant to environmental concerns that have a bearing on the Little Cottonwood Canyon EIS. Therefore, UDOT has determined that this analysis does not trigger the need to prepare a supplemental EIS per the Council on Environmental Quality's (CEQ) NEPA regulations [40 CFR Section 1502.9(c)(1), 1978]. However, in the interest of public disclosure, UDOT is providing this hot-spot analysis for public review and comment as supplemental information to the Final EIS.

Public Comment Information

Pursuant to NEPA, the transportation conformity regulations, and FHWA's request, this supplemental hot-spot analysis is being issued for a 30-day public review and comment period. The public review period is from March 19, 2023, to April 18, 2023. Please see the project's website for details regarding how to comment. (https://littlecottonwoodeis.udot.utah.gov).

UDOT is also providing notification in a similar manner as the Draft EIS distributions to property owners and/or occupants, stakeholders, and other interested parties. Public Notices will be published in the same newspapers as were notices for the Draft EIS distributions, including Salt Lake Tribune and Deseret News**.** UDOT also sent an email the project's database and made an announcement of the public comment period on its social media outlets (Instagram, Facebook, and Twitter).

The comment period for the Final EIS closed on October 17, 2022. The Final EIS is available on UDOT's website (https://littlecottonwoodeis.udot.utah.gov/final-eis/). The Final EIS is not currently part of this public review and comment process; however, it is available for review and reference. UDOT does not discriminate on the basis of disability and, on request, will provide reasonable accommodation to ensure equal access to its programs, services, and activities.

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Little Cottonwood Canyon ENVIRONMENTAL IMPACT STATEMENT
S.R. 210 | Wasatch Blvd. to Alta

Air Quality Supplemental Information Technical Report

Little Cottonwood Canyon Environmental Impact Statement
Wasatch Boulevard to Alta

Lead agency:
Utah Department of Transportation

March 17, 2023

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by UDOT pursuant to 23 United States Code (USC) Chapter 327 and a Memorandum of Understanding dated May 26, 2022, and executed by FHWA and UDOT.

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1.0 Introduction

The Utah Department of Transportation (UDOT) prepared a Final Environmental Impact Statement (EIS), released on August 31, 2022, to study proposed transportation solutions to State Route (S.R.) 210 from its intersection with S.R. 190/Fort Union Boulevard through the town of Alta in Little Cottonwood Canyon in Salt Lake County, Utah.

In the Final EIS, UDOT identified Gondola Alternative B as the preferred alternative to improve transportation in the canyon. Recognizing that safety, mobility, and reliability are issues on S.R. 210 today, and that it might take years to secure funding and to complete construction of the gondola, the preferred alternative also includes a construction phasing plan that would provide bus service from the mobility hubs to Snowbird and Alta until gondola funding is obtained and construction is completed.

The proposed phasing would include increased and improved bus service as described for the Enhanced Bus Service Alternative (with no canyon roadway widening), tolling or restrictions on single-occupant vehicles, and the construction of mobility hubs. UDOT would also proceed with widening and other improvements to Wasatch Boulevard, constructing snow sheds, and implementing trailhead and roadside parking improvements, as funding allows. UDOT would start with a bus service adjusted to be closer to the implementation-year demand, and therefore smaller mobility hubs at the gravel pit and at 9400 South and Highland Drive would be needed, and fewer buses would be required compared to the full build-out of the Enhanced Bus Service Alternative. The bus service would likely start with 10-to-15-minute service instead of the 5-minute service evaluated to meet the demand in 2050. When the gondola system becomes operational, all parking would be located at the Gondola Alternative B base station; there would no longer be a need for enhanced bus service, and the impacts associated with operation of the enhanced bus service would cease.

In support of the EIS, UDOT conducted quantitative air quality analyses (also called “hot-spot” or project-level analyses) for particulate matter ($PM_{2.5}$ and PM_{10}) for emissions sources associated with Gondola Alternative A. Gondola Alternative A includes the gravel pit mobility hub, which has the highest number of buses (108 trips per day) departing from a single location, and the Gondola Alternative A base station, which has the highest number of buses (216 trips per day) dropping off passengers at a single location. This analysis modeled vehicle activity associated with the base station and the gravel pit mobility hub, which has a 1,500-space parking structure in addition to bus operation. UDOT assumed that, for Gondola Alternative A, the PM_{10} and $PM_{2.5}$ concentrations would be equal to or higher than those for other alternatives because the hot-spot analysis for Gondola Alternative A encompasses the components of diesel emission sources that are part of other the alternatives.

In response to the Final EIS, and the Federal Highway Administration’s (FHWA) request for additional information to make a transportation conformity determination, UDOT adjusted two factors in the quantitative air quality analyses for $PM_{2.5}$ and PM_{10} to analyze a scenario with a different mix and age of buses. Because the hot-spot analysis for Gondola Alternative A included the gravel pit mobility hub, which is the same primary diesel emissions source as the preferred alternative, the same methodology identified in the Final EIS was used to model this scenario.

This supplemental information report describes the interagency consultation history that occurred as part of the air quality analysis and presents the results of the refined hot-spot analyses for $PM_{2.5}$ and PM_{10}. The

results of the hot-spot analyses presented in this report do not change the analysis in the Final EIS and will be used by FHWA to help determine whether the S.R. 210 Project meets transportation conformity requirements.

2.0 Interagency Consultation History

The process of making a project-level conformity determination requires interagency consultation with local, state, and federal agencies to evaluate and choose associated methods and assumptions to be used in the hot-spot analyses. UDOT initiated interagency consultation in May 2020. In response to comments received from the U.S. Environmental Protection Agency (EPA), a participant in the interagency consultation process, UDOT refined its air quality model protocol to incorporate EPA's recommendations. The approach was described in a memorandum, *Protocol for $PM_{2.5}$ and PM_{10} Quantitative Hot-spot Analysis Technical Memorandum*. In January 2021, EPA advised UDOT to proceed with the model protocol (EPA 2021), the results of which are presented in the *Air Quality Technical Report* provided as Appendix 10A of the Final EIS.

Following publication of the Final EIS, FHWA requested that UDOT refine the hot-spot analyses for $PM_{2.5}$ and PM_{10} to consider potential scenarios specific to the preferred alternative. In an interagency consultation meeting held on November 21, 2022, FHWA requested that the hot-spot analysis for the gravel pit mobility hub be refined to account for a scenario in which all ski buses would be powered by diesel fuel. Previous modeling used EPA's MOVES2014b default fuel data, which assumed that 82% of transit buses would be powered by diesel fuel, 16% would be powered by compressed natural gas, and 2% would be powered by gasoline in the project design year, which is 2050.

In addition, FHWA requested that, to be conservative, the analyses should model all transit buses at their maximum age of 14 years as specified in the Utah Transit Authority's *Asset Management Plan* and the Federal Transit Administration's *National Transit Database 2022 Policy Manual* (FTA 2022). Previous modeling applied an age distribution used by the local metropolitan planning organization, the Wasatch Front Regional Council, for 2050 regional conformity analysis and state implementation plan (SIP) analysis (Billings 2020; WFRC 2019) in which the age of transit buses ranged between 0 and 30 years.

Because the hot-spot analysis for Gondola Alternative A included the gravel pit mobility hub, which is the same primary diesel emissions source as the preferred alternative, the same methodology identified in the Final EIS was used to model this scenario. These changes were applied only to the hot-spot analyses for the gravel pit mobility hub. The analyses for the Gondola Alternative A base station were not refined because the Gondola Alternative A base station is not a component of the preferred alternative.

No other changes were made to the methodology or modeling conducted for the Final EIS.

3.0 Methodology

The methodology described in the *Air Quality Technical Report* provided as Appendix 10A of the Final EIS was followed and the scenario evaluation was completed by updating two input files used in EPA's MOVES2014b model. The alternative vehicle and fuel technology input file was updated to account for all transit buses being powered by diesel fuel, and the age distribution input file was updated to model all transit buses to be 14 years old. All other input files were kept the same, which assumed the full build-out of the gravel pit mobility hub as described for the Enhanced Bus Service Alternative (ridership was not scaled to meet reduced demand anticipated before 2050).

The design year of 2050 was retained in the model to be conservative and because it is unknown when Gondola Alternative B might be funded and implemented. Prior to 2050, as described above, the bus system would be built in phases, starting with a limited number of buses and increasing each year to meet actual demands. At the midpoint of this ramp-up period, about 50% to 60% of the buses would be operating, and traffic would not be at its full peak. Nevertheless, the full 2050 bus fleet was modeled.

Updated MOVES emission rates were then used in the latest approved version of EPA's AERMOD dispersion model (version 22112) in conjunction with Trinity Consultant's Breeze AERMOD (version 11.0), using the methodology described in the *Air Quality Technical Report* provided as Appendix 10A of the Final EIS.

Background concentrations and design values were also calculated using the methodology described in the *Air Quality Technical Report* provided as Appendix 10A of the Final EIS.

4.0 Results

4.1 24-hour PM_{10}

The 24-hour PM_{10} design value was calculated by adding the modeled receptor value to the background monitor value (EPA 2015). The resulting 24-hour PM_{10} design value concentration was then rounded to the nearest 10 micrograms per cubic meter ($\mu g/m^3$) (EPA 2015).

Table 1 shows the results of the analysis for the 24-hour PM_{10} standard. The 24-hour PM_{10} design value of 90 $\mu g/m^3$ is less than the 24-hour PM_{10} National Ambient Air Quality Standard (NAAQS) (150 $\mu g/m^3$). This demonstrates that the S.R. 210 Project and the preferred alternative would not contribute to any new local violations of, increase the frequency or severity of any existing violation of, or delay timely attainment of the 24-hour PM_{10} NAAQS. Therefore, the S.R. 210 Project, including the preferred alternative, is consistent with the SIP and would not cause an exceedance of the 24-hour PM_{10} NAAQS.

Table 1. Design Values for the 24-hour PM_{10} Standard in 2050 (in µg/m^3)

Location	Modeled Value[a]	Background Concentration[b]	Design Value[c]	24-hour PM_{10} NAAQS
Gravel pit mobility hub	5.1	85.0	90	150

[a] Modeled values were derived from AERMOD and are reported to one decimal place beyond the NAAQS value.
[b] Background concentrations are reported to one decimal place beyond the NAAQS value.
[c] 24-hour PM_{10} design value is rounded to the nearest 10 µg/m^3 (EPA 2015).

Note that the previous modeled value was 5.110 and the revised modeled value is 5.111, both of which round to 5.1, so there is no overall change in the design value between the Final EIS and the new scenario analyzed in this report.

4.2 24-hour $PM_{2.5}$

The 24-hour $PM_{2.5}$ design value was calculated by adding the modeled receptor value to the background monitor value (EPA 2015). The resulting 24-hour $PM_{2.5}$ design value concentration was then rounded to the nearest 1 µg/m^3 (EPA 2015).

Table 2 shows the results of the analysis for the 24-hour $PM_{2.5}$ standard. The 24-hour $PM_{2.5}$ design value of 30 µg/m^3 is less than the 24-hour $PM_{2.5}$ NAAQS (35 µg/m^3). This demonstrates that the S.R. 210 Project and the preferred alternative would not contribute to any new local violations of, increase the frequency or severity of any existing violation of, or delay timely attainment of the 24-hour $PM_{2.5}$ NAAQS. Therefore, the S.R. 210 Project, including the preferred alternative, is consistent with the SIP and would not cause an exceedance of the 24-hour $PM_{2.5}$ NAAQS.

Table 2. Design Values for the 24-hour $PM_{2.5}$ Standard in 2050 (in µg/m^3)

Location	Modeled Value[a]	Background Concentration[b]	Design Value[c]	24-hour $PM_{2.5}$ NAAQS
Gravel pit mobility hub	0.2	29.3	30	35

[a] Modeled values were derived from AERMOD and are reported to one decimal place beyond the NAAQS value.
[b] Background concentrations are reported to one decimal place beyond the NAAQS value.
[c] 24-hour $PM_{2.5}$ design value is rounded to the nearest 1 µg/m^3 (EPA 2015).

Note that the previous modeled value was 0.198 and the revised modeled value is 0.202, both of which round to 0.2, so there is no overall change in the design value between the Final EIS and the new scenario analyzed in this report.

4.3 Annual $PM_{2.5}$

The annual $PM_{2.5}$ design value was calculated by adding the modeled receptor value to the background monitor value (EPA 2015). The resulting annual $PM_{2.5}$ design value concentration was then rounded to the nearest 0.1 µg/m^3 (EPA 2015).

Table 3 shows the results of the analysis for the annual $PM_{2.5}$ standard. The annual $PM_{2.5}$ design value of 7.6 µg/m^3 is less than the annual $PM_{2.5}$ NAAQS (12 µg/m^3). This demonstrates that the S.R. 210 Project and the preferred alternative would not contribute to any new local violations of, increase the frequency or severity of any existing violation of, or delay timely attainment of the annual $PM_{2.5}$ NAAQS. Therefore, the S.R. 210 Project, including the preferred alternative, is consistent with the SIP and would not cause an exceedance of the annual $PM_{2.5}$ NAAQS.

Table 3. Design Values for the Annual $PM_{2.5}$ Standard in 2050 (in µg/m^3)

Location	Modeled Value[a]	Background Concentration[b]	Design Value[c]	Annual $PM_{2.5}$ NAAQS
Gravel pit mobility hub	0.09	7.47	7.6	12.0

[a] Modeled values were derived from AERMOD and are reported to one decimal place beyond the NAAQS value.
[b] Background concentrations are reported to one decimal place beyond the NAAQS value.
[c] Annual $PM_{2.5}$ design value is rounded to the nearest 0.1 µg/m^3 (EPA 2015).

Note that the previous modeled value was 0.088 and the revised modeled value is 0.089, both of which round to 0.09, resulting in no overall change in the Final EIS findings. However, this additional scenario is intended to supplement the prior hot-spot analyses completed to consider and evaluate potential impacts from a different mix and age of buses.

5.0 References

Billings, Kip

2020 Email from Kip Billings of WFRC to Amy Croft of HDR regarding data sets for MOVES inputs. June 15.

[EPA] U.S. Environmental Protection Agency

2015 Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas. EPA-420-B-15-040. November.

2021 Email from Tim Russ, EPA, to Naomi Kisen, UDOT, regarding review of the *Little Cottonwood Canyon Draft Modeling Protocol for $PM_{2.5}$ and PM_{10} Quantitative Hot-spot Analysis*. January 22.

[FTA] Federal Transit Administration Office of Budget and Policy

2022 National Transit Database 2022 Policy Manual. https://www.transit.dot.gov/sites/fta.dot.gov/files/2023-03/2022%20NTD%20Full%20Reporting%20Policy%20Manual_v1-1.pdf.

[WFRC] Wasatch Front Regional Council

2019 Wasatch Front Regional Transportation Plan 2019–2050. https://wfrc.org/VisionPlans/RegionalTransportationPlan/Adopted2019_2050Plan/RTP_2019_2050_ADOPTED.pdf.