

EXAMPLE CONSTRUCTION PROJECTS

EXAMPLE PROJECT A

DESCRIPTION

Example Project A would develop 100 single-family residential units over a 2-year period. The project site would be approximately 33 acres (URBEMIS default assumption) and require an undetermined volume of fill materials to be imported to the site. In addition, the project would involve construction of a new access road to serve the development.

SCREENING ANALYSIS

The project size is less than the construction screening level for NO_x emissions of single-family residential uses listed in Table 3-1. However, because the project includes the importation of fill to the site, the construction screening levels cannot be used to address construction emissions of NO_x. Therefore, a detailed quantitative analysis of construction-generated NO_x emissions should be performed using URBEMIS to estimate NO_x generated by construction of the residential units and using the Roadway Model to estimate NO_x emissions from construction of the new access road.

EMISSIONS QUANTIFICATION

The size and type of land use proposed (i.e., single family housing) should be entered into the Land Use Module in URBEMIS. In this case, the project's total acres are equal to the default URBEMIS assumption; therefore, no override is necessary in the **Acres** data field. Modeling the construction emissions of NO_x associated with single-family residential units in URBEMIS requires detailed information about the construction schedule (e.g., commencement date, types of construction activities required, and length of construction activities).

The fugitive PM dust emissions associated with fill activities should be estimated using the **Fugitive Dust** tab of the **Mass Site Grading** phase. For use of the **Low Level of Detail** quantification method, the volume of fill activities should be divided by the number of days that fill activities would occur. For example, if the project would expect up to 20,000 yd³ of fill materials to be imported over a minimum of 40 work days, users should enter 500 (i.e., 20,000 yd³ ÷ 40 days) into the **Amount of Offsite Cut/Fill (cubic yards/day)** data field. In addition, users should also input the total volume of fill materials to be imported into the **Total Amount of Soil to Import (cubic yards)** data field in the **Soil Hauling** tab. Off-road

construction equipment required for grading activities is estimated by URBEMIS based on the [Maximum Daily Acreage Disturbed](#) data field.

URBEMIS estimates the types and quantities of construction equipment in the [Building Construction](#) phase required to develop the proposed project. For the [Asphalt Paving](#) phase, URBEMIS assumes the project requires asphalt paving for 25% of the total site. If more specific information can be provided, then users should turn off the [Reset acreage with land use changes](#) button in the [Off Gas Emissions](#) tab and override the [Total Acreage to be Paved with Asphalt](#) data field.

Due to the linear nature of the new access road to the project, daily mass emissions associated with its construction should be quantified using the Roadway Model. Users should obtain basic project information for the new access road and enter the information into the [Data Entry](#) tab of the Roadway Model. If project-specific information is not available the Roadway Model estimates the construction schedule for the road and the equipment used in each construction phase.

For analysis of the project's total maximum daily NO_x emissions, users should add the construction NO_x associated with development of the single-family residential units with the NO_x emissions associated with construction of the access road where construction activities are anticipated to overlap in the anticipated construction schedule. The maximum daily emissions of NO_x that would occur throughout the entire construction period should be identified and compared with the [District's threshold of significance](#). If the maximum daily NO_x emissions would exceed the threshold of significance, construction emissions would be considered significant and all feasible mitigation measures to reduce the NO_x emissions shall be implemented.

In addition to presenting the maximum daily mass emissions of NO_x the District recommends reporting the maximum daily mass emission levels of ROG, PM₁₀, and PM_{2.5} for disclosure purposes.

EXAMPLE PROJECT B

DESCRIPTION

Example Project B would replace an abandoned 250 ksf Department of Motor Vehicles (DMV) office with a multi-story, mixed-used development that includes 80 units of multi-family apartments on 6 stories, 200 ksf of offices, and 100 ksf of retail land uses on a 10-acre site.

SCREENING ANALYSIS

In URBEMIS the corresponding land use types of the proposed development would be **Apartment High Rise units**, **General Office Building**, and **Strip Mall**. The corresponding URBEMIS land use type for the demolition phase would be **Government Office Building**.

When each of the project components (i.e., **Apartment High Rise units**, **General Office Building**, and **Strip Mall**) is considered individually, their respective sizes would not exceed any of the construction screening levels in Table 3-1. However, because the project would contain more than one land use type and because existing buildings would undergo demolition, the construction screening levels cannot be used to assess the project's construction emissions. The lead agency would therefore be required to perform a detailed estimation of construction emissions using URBEMIS.

EMISSIONS QUANTIFICATION

When entering the proposed land uses into the Land Use Module, URBEMIS estimates **Acres** for each land use incorrectly assuming each land use type would be constructed on separate building pads. Using default values URBEMIS would assume Example Project B is 15.06 total acres (i.e., 1.29 acres for **Apartment High Rise**, 9.18 acres for **General Office Building**, and 4.59 acres for **Strip Mall**). For mixed-use and/or multi-level developments, users should adjust the **Acres** for each of the proposed land uses such that the combined total acreage of all land use types is equal to the actual total size of the project site (i.e., 10 acres) prior to running the model.

Modeling the construction emissions associated with mixed-use development in URBEMIS requires detailed construction schedule information (e.g., commencement date, types of construction activities required, and length of construction activities). As discussed in the section about Special Project Types above, multi-story development projects may not require the amount of asphalt paving assumed by URBEMIS. Without obtaining project-specific information for **Acres to be Paved with Asphalt**, asphalt paving emissions for multi-story developments could be overestimated. In addition, the total acres from the Land Use Module would also be used to estimate the **Total Acreage To Be Graded** and **Maximum Daily Acreage Disturbed** data fields in the **Mass Site Grading** phase. Therefore, construction emissions associated with grading activities would be overestimated without proper adjustment to the **Acres** in Land Use Module, as

discussed above. Lastly, the quantities of building construction equipment, particularly those types used for grading, would be based on the total Acres input into the Land Use Module.

As described above, URBEMIS assumes the size of the building to be demolished was equal to the building to be developed. Therefore, if the size (i.e., Acres) of the Government Office Building is different from the size (i.e., 10 acres) of the proposed mixed-use building, users should create a separate URBEMIS model run to estimate the mass emission levels generated during the Demolition phase. For the separate model run to estimate emissions during the Demolition phase, users should input the dimensions (i.e., width, length, and height in feet) of the Government Office Building to be demolished into the Total Volume of All Buildings data field on the Demolition Dust/On Road tab. URBEMIS also requires project-specific information for the maximum daily volume of building to be demolished to calculate demolition-related fugitive PM dust emissions. If an equal amount of demolition activities is anticipated for the project, users should divide the total cubic feet of buildings to be demolished by the minimum number of work days in the Demolition phase. For entry into the Maximum Daily Volume of Buildings to be Demolished Concurrently data field, users should input the width, length, and height once again. The District allows users to take the cube root of the maximum daily volume to be demolished, which provides users with equal values for width, length, and height, whose product equals the maximum daily volume to be demolished. For example, if the existing DMV building's width, length, and height dimensions were 500 feet by 500 feet by 12 feet, the Total Volume data field would be 3,000,000 cubic feet. If the Demolition phase would occur over 20-25 work days at a consistent rate, the maximum daily volume to be demolished would be 150,000 cubic feet per day (i.e., 3,000,000 cubic feet ÷ the 20-day minimum). To calculate the values that should be entered for the Maximum Daily Volume of Building to be Demolish Concurrently data field, users should calculate the cube root of 150,000 cubic feet. For the Government Office Building, users should enter 53.13 feet for the width, length, and height in the Maximum Daily Volume of Building to be Demolish Concurrently data field. If project-specific information is available for the haul truck capacity or distance to the disposal site, users should enter the values into the Truck Capacity and Miles Per Round Trip data field in the Demolition Dust/On Road tab.

Lastly, users should compare the maximum daily emissions of NO_x with the District's threshold of significance. If the maximum daily NO_x emissions would exceed the threshold of significance, construction emissions would be considered significant and all feasible mitigation measures shall be implemented to reduce

NO_x emissions. For disclosure purposes, the District recommends reporting the maximum daily mass emission levels of ROG, PM₁₀, and PM_{2.5}.

EXAMPLE PROJECT C

DESCRIPTION

Example Project C would develop a 1,000 ksf shopping mall on a 55-acre site. The project would be constructed on a fast-track schedule that includes a 1-month grading phase and a total construction period of 1 year. No cut/fill activities are required for site preparation; however, it is anticipated that grading activities could be performed on up to 18 acres per day. Asphalt paving and building construction activities would commence immediately after areas have been graded and before grading of the entire site is complete. Therefore, it is possible that grading, asphalt paving, and building construction activities could occur simultaneously.

SCREENING ANALYSIS

Given the size of the retail project it would be most similar to the [Regional Shopping Center](#) land use type in the Land Use Module of URBEMIS ([Step 2: Enter Land Use Data](#)). The size of the proposed land use would be less than the construction screening level in Table 3-1 for a regional strip mall. By default URBEMIS assumes that 13.75 acres would be graded on a maximum day (i.e., 25% of the total acres), which is less than 15 acres. However, the accelerated project schedule would involve grading up to 18 acres in a single day. The high level of grading would preclude using the screening table to evaluate the project's construction-generated NO_x emissions. In addition, the fast-track schedule of the project could involve the simultaneous operation of more than two construction phases (i.e., grading, asphalt paving, and building construction), another attribute that would exclude it from being evaluated with the screening levels.

EMISSIONS QUANTIFICATION

When entering the proposed land use (i.e., 1,000 ksf [Strip Mall](#)) into the Land Use Module, URBEMIS assumes the project site is 45.91 acres by default. Users should override the [Acres](#) column in the Land Use Module to reflect the project-specific information with a value of 55 acres.

For the [Mass Site Grading](#) phase, users should change the [Maximum Daily Acreage Disturbed](#) data field in the [Daily Acreage](#) tab to 18 acres. Users would need to turn

off the **Reset acreage with land use changes** button before overriding the **Maximum Daily Acreage Disturbed** data field. The project would not require any cut/fill activities; therefore no change is necessary to the **Fugitive Dust** tab, which would calculate the daily mass emission levels of fugitive PM dust using the default emission factor.

In addition to presenting the maximum daily mass emissions of NO_x the District recommends reporting the maximum daily mass emission levels of ROG, PM_{10} , and $\text{PM}_{2.5}$ for disclosure purposes. Lastly, users should compare the maximum daily emissions of NO_x with the District's threshold of significance. If the maximum daily NO_x emissions would exceed the threshold of significance, construction emissions of NO_x would be considered significant and all feasible mitigation measures shall be implemented to reduce NO_x emissions.