

Technical Memorandum Update

Appendix 4

Air Quality Assessment

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Since the completion of the Air Quality Assessment Technical Memorandum in November 2006 (see Appendix 4 of the 2007 Approved Documented CE on attached CD), several regulatory changes have occurred related to new pollutant standards. However, none of these changes affects the results of the original analysis. The recent regulatory changes include the following pollutant standards:

Ozone (O₃)

- The 8-hour standard was revised to 0.075 ppm (parts per million) from 0.08 ppm on May 27, 2008; and,
- The 1-hour standard of 0.12 ppm was eliminated in all areas.

Nitrogen Dioxide (NO₂)

- A new 1-hour standard of 100 ppb (parts per billion) was added on April 12, 2010; and,
- The official 8-hour standard remains unchanged at 0.053 ppm but may be documented as 53 ppb for a clearer comparison with the new 1-hour standard.

Particulate Matter (PM_{2.5})

- The 24-hour standard was revised to 35 µg/m³ from 65 µg/m³ on December 17, 2006.

Particulate Matter (PM₁₀)

- The annual standard of 50 µg/m³ was eliminated.

As shown in **Table 1**, the measured concentrations for local pollutants (such as CO and O₃) at the Alexandria monitoring location (517 North Saint Asaph Street) demonstrate a downward trend between 2005 and 2009.

Table 1: Recent Trend of Ambient Concentrations Monitored in the Vicinity of the Project

Year	CO 1-Hour	CO 8-Hour	O ₃ 8-Hour	PM _{2.5} 24 Hour*
2005	2.3	1.7	0.089	34.2
2006	2.4	1.9	0.123	32.5
2007	2.1	1.6	0.09	29.5
2008	1.9	1.3	0.09	23.4
2009	1.8	1.4	0.069	23.2

Source: VDEQ air quality monitoring reports, 2005 through 2009.

*PM_{2.5} 24 Hour concentrations correspond to Arlington monitoring location (18th and Hayes Streets).

The attainment status for the City of Alexandria has not changed since 2006 as the region is still in non-attainment for ozone and PM_{2.5}. The region also continues to be a maintenance area for CO due to violations before 1996.

For the original analysis, a hot spot analysis was conducted to determine maximum pollutant concentrations of carbon monoxide (CO) at the most congested intersections in the project study area. Based on this analysis, maximum 1- and 8-hour concentrations of CO were predicted to be well below the National Ambient Air Quality Standards (NAAQS) of 35 and 9 ppm, respectively. The hot spot analysis evaluated an intersection in the City of Alexandria at US Route 1 and Potomac Avenue.

Section B of the transitway will operate in the current northbound lanes of US Route 1. The updated traffic analysis indicates that two intersections are predicted to operate at level-of-service (LOS) 'D' or 'E' indicating potentially adverse air quality conditions. Based on the recent downward trend of pollutant concentrations of CO, the background concentration in 2010 would also be lower than the background level used in the 2006 analysis resulting in even lower overall concentration levels.

Appendix 3, Transportation Effects Technical Memorandum, provides detailed estimates of intersection delays and LOS at study area intersections. At the intersection of East Glebe Road and US Route 1, the LOS is predicted to decline from 'C' under the 2015 No Build condition to 'E' under the 2030 No Build condition. For 2015, the transit project has minor effects on the function of this intersection; LOS remains at 'C' for Build condition. In 2030 AM, the LOS declines from 'D' (42-second delay) in No Build to 'E' (74-second delay) in Build conditions. However, in the 2030 PM peak, the LOS is predicted to remain the same at 'E', between the No Build and Build conditions; the expected delay increases from 75 to 80 seconds a minimal increase of five seconds.

At the intersection of Potomac Avenue and US Route 1, the LOS is predicted to decline from 'B' under the 2015 No Build condition to 'C' under the 2030 No Build condition. For 2015, the transit project has minimal effects on the function of this intersection; LOS remains at 'B' for Build condition. In 2030 AM, the LOS remains at 'C' with a five second decrease in intersection delay. In 2030 PM, the LOS declines from 'C' to 'D' (48-second delay). However, this does not create unacceptable conditions. The LOS does not decline to 'F' at any intersection in the study corridor, with maximum delays not exceeding 80 seconds.

According to the results of the modeling analysis completed in 2006, the intersection with the highest predicted concentration of CO is located at US Route 1 and Potomac Avenue. The projected delay was 40 seconds and the maximum 1- and 8-hour concentrations of CO were predicted to be 3.9 ppm and 2.6 ppm respectively, which are below the NAAQS criteria of 35 ppm and 9 ppm. According to the recent traffic analysis (see Appendix 3: Transportation Effects Technical Memorandum) the maximum delay at a study intersection is projected to be 80 seconds at the US Route 1/East Glebe Road intersection. The corresponding CO concentrations were assessed qualitatively and are unlikely to exceed 8 ppm for 1-hour and 5 ppm for 8-hour concentrations. These estimates are well within the NAAQS criteria of 35 ppm and 9 ppm respectively.

The project is not expected to cause or exacerbate a violation of the applicable NAAQS as a result of the proposed dedicated transit lanes. With respect to regional emissions and conformity, the project has been shown to conform to the State Implementation Plan (SIP) by being included in a conforming Transportation Improvement Program (TIP). The project also demonstrates transportation conformity on a project level by not exceeding the NAAQS. No mitigation measures are necessary with respect to compliance with the transportation conformity requirements.