

CHAPTER 4 – IMPACTS AND MITIGATION

4.1 Introduction

This chapter summarizes the evaluation of air quality and energy impacts and mitigation measures associated with the future No Build Alternative and Build Alternatives through application of the methods described in Chapter 2. This chapter does not discuss the relative merits of the project alternatives; rather it presents the conditions expected with development of any of the alternatives.

4.2 Air Quality

4.2.1 Microscale Analysis

No Build Alternative

Table 4-1 shows the predicted CO and NO₂ concentrations under the No Build Alternative at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS under the No Build Alternative at all of the analysis sites.

**Table 4-1
No Build Alternative
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm 9 ppm	1-hour 8-hour	6.10 ppm 4.23 ppm	100 ug/m ³	Annual	39.26 µg/m ³
Five Corners	35 ppm 9 ppm	1-hour 8-hour	8.10 ppm 5.63 ppm	100 ug/m ³	Annual	45.66 µg/m ³
Williston Central School	35 ppm 9 ppm	1-hour 8-hour	3.90 ppm 2.69 ppm	100 ug/m ³	Annual	30.78 µg/m ³
Circ A/B Corridor at US 2	35 ppm 9 ppm	1-hour 8-hour	4.80 ppm 3.16 ppm	100 ug/m ³	Annual	34.46 µg/m ³
Allen Brook School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.56 ppm	100 ug/m ³	Annual	31.58 µg/m ³

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under the No Build Alternative.

VT 2A Alternatives**Alternative 2**

Table 4-2 shows the predicted CO and NO₂ concentrations under Alternative 2 at the Taft Corners, Five Corners and Williston Central School microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-2
Alternative 2
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm 9 ppm	1-hour 8-hour	6.60 ppm 4.58 ppm	100 ug/m ³	Annual	40.22 ug/m ³
Five Corners	35 ppm 9 ppm	1-hour 8-hour	8.00 ppm 5.56 ppm	100 ug/m ³	Annual	44.54 ug/m ³
Williston Central School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.62 ppm	100 ug/m ³	Annual	30.62 ug/m ³

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 2.

Alternative 3

Table 4-3 shows the predicted CO and NO₂ concentrations under Alternative 3 at the Taft Corners, Five Corners and Williston Central School microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-3
Alternative 3
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm	1-hour	6.20 ppm	100 ug/m ³	Annual	40.38 ug/m ³
	9 ppm	8-hour	4.30 ppm			
Five Corners	35 ppm	1-hour	8.20 ppm	100 ug/m ³	Annual	44.70 ug/m ³
	9 ppm	8-hour	5.70 ppm			
Williston Central School	35 ppm	1-hour	3.80 ppm	100 ug/m ³	Annual	30.62 ug/m ³
	9 ppm	8-hour	2.62 ppm			

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 3.

Alternative 22

Table 4-4 shows the predicted CO and NO₂ concentrations under Alternative 22 at the Taft Corners, Five Corners and Williston Central School microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-4
Alternative 22
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm	1-hour	6.20 ppm	100 ug/m ³	Annual	39.34 ug/m ³
	9 ppm	8-hour	4.30 ppm			
Five Corners	35 ppm	1-hour	8.20 ppm	100 ug/m ³	Annual	45.82 ug/m ³
	9 ppm	8-hour	5.70 ppm			
Williston Central School	35 ppm	1-hour	3.90 ppm	100 ug/m ³	Annual	30.78 ug/m ³
	9 ppm	8-hour	2.69 ppm			

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 22.

Circ A/B Alternatives

Alternative 16a

Table 4-5 shows the predicted CO and NO₂ concentrations under Alternative 16a at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-5
Alternative 16a
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm	1-hour	5.20 ppm	100 ug/m ³	Annual	35.50 ug/m ³
	9 ppm	8-hour	3.60 ppm			
Five Corners	35 ppm	1-hour	5.80 ppm	100 ug/m ³	Annual	38.38 ug/m ³
	9 ppm	8-hour	4.02 ppm			
Williston Central School	35 ppm	1-hour	3.80 ppm	100 ug/m ³	Annual	30.54 ug/m ³
	9 ppm	8-hour	2.62 ppm			
Circ A/B Corridor at US 2	35 ppm	1-hour	6.70 ppm	100 ug/m ³	Annual	41.58 ug/m ³
	9 ppm	8-hour	4.30 ppm			
Allen Brook School	35 ppm	1-hour	3.80 ppm	100 ug/m ³	Annual	32.62 ug/m ³
	9 ppm	8-hour	2.56 ppm			

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 16a.

Alternative 16b

Table 4-6 shows the predicted CO and NO₂ concentrations under Alternative 16b at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

Table 4-6
Alternative 16b
Ambient CO and NO₂ Microscale Results

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm	1-hour	5.20 ppm	100 ug/m ³	Annual	35.58 ug/m ³
	9 ppm	8-hour	3.60 ppm			
Five Corners	35 ppm	1-hour	5.90 ppm	100 ug/m ³	Annual	37.82 ug/m ³
	9 ppm	8-hour	4.09 ppm			
Williston Central School	35 ppm	1-hour	3.90 ppm	100 ug/m ³	Annual	30.62 ug/m ³
	9 ppm	8-hour	2.69 ppm			
Circ A/B Corridor at US 2	35 ppm	1-hour	7.10 ppm	100 ug/m ³	Annual	42.06 ug/m ³
	9 ppm	8-hour	4.54 ppm			
Allen Brook School	35 ppm	1-hour	3.80 ppm	100 ug/m ³	Annual	32.70 ug/m ³
	9 ppm	8-hour	2.56 ppm			

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 16b.

Alternative 16c

Table 4-7 shows the predicted CO and NO₂ concentrations under Alternative 16c at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-7
Alternative 16c
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm 9 ppm	1-hour 8-hour	5.20 ppm 3.60 ppm	100 ug/m ³	Annual	35.50 ug/m ³
Five Corners	35 ppm 9 ppm	1-hour 8-hour	5.80 ppm 4.02 ppm	100 ug/m ³	Annual	38.06 ug/m ³
Williston Central School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.62 ppm	100 ug/m ³	Annual	30.54 ug/m ³
Circ A/B Corridor at US 2	35 ppm 9 ppm	1-hour 8-hour	6.80 ppm 4.36 ppm	100 ug/m ³	Annual	41.58 ug/m ³
Allen Brook School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.56 ppm	100 ug/m ³	Annual	32.62 ug/m ³

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 16c.

Alternative 17

Table 4-8 shows the predicted CO and NO₂ concentrations under Alternative 17 at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-8
Alternative 17
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm	1-hour	5.20 ppm	100 ug/m ³	Annual	35.42 ug/m ³
	9 ppm	8-hour	3.60 ppm			
Five Corners	35 ppm	1-hour	5.70 ppm	100 ug/m ³	Annual	38.06 ug/m ³
	9 ppm	8-hour	3.95 ppm			
Williston Central School	35 ppm	1-hour	3.80 ppm	100 ug/m ³	Annual	30.54 ug/m ³
	9 ppm	8-hour	2.62 ppm			
Circ A/B Corridor at US 2	35 ppm	1-hour	5.90 ppm	100 ug/m ³	Annual	38.70 ug/m ³
	9 ppm	8-hour	3.82 ppm			
Allen Brook School	35 ppm	1-hour	3.80 ppm	100 ug/m ³	Annual	32.38 ug/m ³
	9 ppm	8-hour	2.56 ppm			

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 17.

Hybrid Alternatives**Alternative 18**

Table 4-9 shows the predicted CO and NO₂ concentrations under Alternative 18 at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

Table 4-9
Alternative 18
Ambient CO and NO₂ Microscale Results

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm 9 ppm	1-hour 8-hour	5.50 ppm 3.81 ppm	100 ug/m ³	Annual	36.46 ug/m ³
Five Corners	35 ppm 9 ppm	1-hour 8-hour	6.00 ppm 4.16 ppm	100 ug/m ³	Annual	37.74 ug/m ³
Williston Central School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.62 ppm	100 ug/m ³	Annual	30.54 ug/m ³
Circ A/B Corridor at US 2	35 ppm 9 ppm	1-hour 8-hour	5.20 ppm 3.40 ppm	100 ug/m ³	Annual	38.70 ug/m ³
Allen Brook School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.56 ppm	100 ug/m ³	Annual	32.14 ug/m ³

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 18.

Alternative 19

Table 4-10 shows the predicted CO and NO₂ concentrations under Alternative 19 at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-10
Alternative 19
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm 9 ppm	1-hour 8-hour	5.40 ppm 3.74 ppm	100 ug/m ³	Annual	36.30 ug/m ³
Five Corners	35 ppm 9 ppm	1-hour 8-hour	5.90 ppm 4.09 ppm	100 ug/m ³	Annual	37.58 ug/m ³
Williston Central School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.62 ppm	100 ug/m ³	Annual	30.46 ug/m ³
Circ A/B Corridor at US 2	35 ppm 9 ppm	1-hour 8-hour	5.20 ppm 3.40 ppm	100 ug/m ³	Annual	35.98 ug/m ³
Allen Brook School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.56 ppm	100 ug/m ³	Annual	32.14 ug/m ³

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 19.

Alternative 23

Table 4-11 shows the predicted CO and NO₂ concentrations under Alternative 23 at the five microscale analysis sites. Concentrations of CO and NO₂ would be below the applicable NAAQS and would meet the Prevention of Significant Deterioration (PSD) criteria.

**Table 4-11
Alternative 23
Ambient CO and NO₂ Microscale Results**

Analysis Site	CO			NO ₂		
	NAAQS	Period	Predicted Highest Concentrations	NAAQS	Period	Predicted Highest Concentration
Taft Corners	35 ppm 9 ppm	1-hour 8-hour	5.40 ppm 3.74 ppm	100 ug/m ³	Annual	37.18 ug/m ³
Five Corners	35 ppm 9 ppm	1-hour 8-hour	5.80 ppm 4.02 ppm	100 ug/m ³	Annual	37.98 ug/m ³
Williston Central School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.62 ppm	100 ug/m ³	Annual	35.66 ug/m ³
Circ A/B Corridor at US 2	35 ppm 9 ppm	1-hour 8-hour	5.20 ppm 3.40 ppm	100 ug/m ³	Annual	35.66 ug/m ³
Allen Brook School	35 ppm 9 ppm	1-hour 8-hour	3.80 ppm 2.56 ppm	100 ug/m ³	Annual	32.06 ug/m ³

Note: ppm = parts per million
 ug/m³ = micrograms per cubic meter
 Including 1-hour CO background concentration 3.2 ppm, and 8-hour CO background 2.2 ppm
 Including annual average NO₂ background 28.22 ug/m³

Using the *FHWA/USEPA Joint Guidance* (March 2006), a qualitative analysis for PM₁₀ and PM_{2.5} levels was conducted by reviewing the state monitored ambient concentrations. This review included Vermont programs for reducing motor vehicle emissions, such as inspection and maintenance, low emission vehicles, alternative fuels, and heavy duty vehicles. Based upon the analysis, the ambient PM₁₀ and PM_{2.5} levels would continue to meet the NAAQS for these pollutants under Alternative 23.

4.2.2 Regional Criteria Pollutants Emission Burden Analysis

No Build Alternative

Table 4-12 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under the No Build Alternative compared to the 2005 baseline. Regional NOx and HC (ozone precursor) emissions would decrease under the No Build Alternative.

**Table 4-12
Regional Criteria Pollutant Emission Changes Between 2005 Baseline and the Future No Build Alternative**

Year	Roadways	Period	NOx (Lbs / hour)	HC (Lbs / hour)
2010 versus 2005	Regional Roadways with more than 5% changes in VMT	Peak Hour	-494.7	-480.4
2030 versus 2005	Regional Roadways with more than 5% changes in VMT	Peak Hour	-1034.2	-854.2

+ / - : Emission Increase / Decrease, No Build versus 2005 Baseline

VT 2A Alternatives**Alternative 2**

Table 4-13 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 2 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 2.

**Table 4-13
Alternative 2
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-11.4
	2030	-4.0
Hydrocarbons (H/C)	2010	-31.2
	2030	-18.6

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 3

Table 4-14 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 3 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 3.

**Table 4-14
Alternative 3
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-10.8
	2030	-4.0
Hydrocarbons (H/C)	2010	-29.8
	2030	-20.0

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 22

Table 4-15 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 22 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 22.

**Table 4-15
Alternative 22
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-10.8
	2030	-4.0
Hydrocarbons (H/C)	2010	-29.8
	2030	-21.2

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Circ A/B Alternatives**Alternative 16a**

Table 4-16 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 16a compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 16a.

**Table 4-16
Alternative 16a
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-10.2
	2030	-2.6
Hydrocarbons (H/C)	2010	-30.8
	2030	-17.4

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 16b

Table 4-17 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 16b compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 16b.

**Table 4-17
Alternative 16b
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-10.4
	2030	-2.8
Hydrocarbons (H/C)	2010	-31.0
	2030	-17.6

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 16c

Table 4-18 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 16c compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 16c.

**Table 4-18
Alternative 16c
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-10.4
	2030	-2.8
Hydrocarbons (H/C)	2010	-31.0
	2030	-17.6

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 17

Table 4-19 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 17 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 17.

**Table 4-19
Alternative 17
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-11.2
	2030	-4.2
Hydrocarbons (H/C)	2010	-31.8
	2030	-19.4

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Hybrid Alternatives

Alternative 18

Table 4-20 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 18 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 18.

**Table 4-20
Hybrid Alternatives
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-11.8
	2030	-4.2
Hydrocarbons (H/C)	2010	-31.6
	2030	-18.0

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 19

Table 4-21 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 19 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 19.

**Table 4-21
Alternative 19
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-11.2
	2030	-3.8
Hydrocarbons (H/C)	2010	-32.0
	2030	-17.4

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 23

Table 4-22 shows the change in regional nitrogen oxides (NOx) and hydrocarbon (HC) emissions under Alternative 23 compared to the No Build Alternative. Regional NOx and HC (ozone precursor) emissions would decrease under Alternative 23.

**Table 4-22
Alternative 23
Peak Hour Emissions of Regional Criteria Pollutants ***

Pollutant	Year	lbs/hour change compared to No Build
Nitrogen oxides (NOx)	2010	-10.8
	2030	-4.2
Hydrocarbons (H/C)	2010	-30.0
	2030	-18.2

* For roadways with more than 5 percent changes in VMT
+ / - : Emission Increase / Decrease, Build versus No Build

4.2.3 Mobile Source Air Toxics Analysis

No Build Alternative

Table 4-23 shows the change in MSAT emissions under the No Build Alternative as compared to the 2005 baseline for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under the No Build Alternative.

**Table 4-23
Regional MSAT Emission Changes (Lbs / Hour) Between 2005 Baseline and the Future
No Build Alternative**

	Benzene	1,3 Butadiene	Formaldehyde	Acetaldehyde	Acrolein
2010 versus 2005	-21.36	-2.92	-5.50	-2.05	-0.30
2030 versus 2005	-38.69	-4.83	-9.20	-3.46	-0.50

+ / - : Emission Increase / Decrease

VT 2A Alternatives**Alternative 2**

Table 4-24 shows the change in MSAT emissions under Alternative 2 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 2.

**Table 4-24
Alternative 2
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.114
	2030	-0.483
1,3 Butadiene	2010	-0.124
	2030	-0.056
Formaldehyde	2010	-0.305
	2030	-0.161
Acetaldehyde	2010	-0.110
	2030	-0.055
Acrolein	2010	-0.016
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 3

Table 4-25 shows the change in MSAT emissions under Alternative 3 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 3.

**Table 4-25
Alternative 3
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.069
	2030	-0.490
1,3 Butadiene	2010	-0.119
	2030	-0.057
Formaldehyde	2010	-0.295
	2030	-0.163
Acetaldehyde	2010	-0.106
	2030	-0.056
Acrolein	2010	-0.016
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 22

Table 4-26 shows the change in MSAT emissions under Alternative 22 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 22.

**Table 4-26
Alternative 22
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.070
	2030	-0.503
1,3 Butadiene	2010	-0.119
	2030	-0.058
Formaldehyde	2010	-0.295
	2030	-0.167
Acetaldehyde	2010	-0.106
	2030	-0.057
Acrolein	2010	-0.016
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

Circ A/B Alternatives

Alternative 16a

Table 4-27 shows the change in MSAT emissions under Alternative 16a as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 16a.

**Table 4-27
Alternative 16a
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.054
	2030	-0.417
1,3 Butadiene	2010	-0.118
	2030	-0.049
Formaldehyde	2010	-0.292
	2030	-0.146
Acetaldehyde	2010	-0.105
	2030	-0.050
Acrolein	2010	-0.016
	2030	-0.007

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 16b

Table 4-28 shows the change in MSAT emissions under Alternative 16b as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 16b.

**Table 4-28
Alternative 16b
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.061
	2030	-0.425
1,3 Butadiene	2010	-0.118
	2030	-0.050
Formaldehyde	2010	-0.294
	2030	-0.148
Acetaldehyde	2010	-0.106
	2030	-0.050
Acrolein	2010	-0.016
	2030	-0.007

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 16c

Table 4-29 shows the change in MSAT emissions under Alternative 16c as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 16c.

**Table 4-29
Alternative 16c
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.061
	2030	-0.430
1,3 Butadiene	2010	-0.118
	2030	-0.050
Formaldehyde	2010	-0.294
	2030	-0.149
Acetaldehyde	2010	-0.106
	2030	-0.051
Acrolein	2010	-0.016
	2030	-0.007

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 17

Table 4-30 shows the change in MSAT emissions under Alternative 17 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 17.

**Table 4-30
Alternative 17
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.099
	2030	-0.508
1,3 Butadiene	2010	-0.122
	2030	-0.059
Formaldehyde	2010	-0.303
	2030	-0.169
Acetaldehyde	2010	-0.109
	2030	-0.058
Acrolein	2010	-0.016
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

Hybrid Alternatives

Alternative 18

Table 4-31 shows the change in MSAT emissions under Alternative 18 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 18.

**Table 4-31
Alternative 18
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.134
	2030	-0.498
1,3 Butadiene	2010	-0.126
	2030	-0.058
Formaldehyde	2010	-0.310
	2030	-0.165
Acetaldehyde	2010	-0.112
	2030	-0.056
Acrolein	2010	-0.017
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 19

Table 4-32 shows the change in MSAT emissions under Alternative 19 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 19.

**Table 4-32
Alternative 19
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.096
	2030	-0.473
1,3 Butadiene	2010	-0.122
	2030	-0.055
Formaldehyde	2010	-0.301
	2030	-0.159
Acetaldehyde	2010	-0.109
	2030	-0.054
Acrolein	2010	-0.016
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

Alternative 23

Table 4-33 shows the change in MSAT emissions under Alternative 23 as compared to the No Build Alternative for the years 2010 and 2030. Reductions in emissions of the five MSATs analyzed are expected under Alternative 23.

**Table 4-33
Alternative 23
Mobile Source Air Toxics Emissions**

Pollutant	Year	lbs/hour change compared to No Build
Benzene	2010	-1.075
	2030	-0.495
1,3 Butadiene	2010	-0.120
	2030	-0.057
Formaldehyde	2010	-0.297
	2030	-0.165
Acetaldehyde	2010	-0.107
	2030	-0.056
Acrolein	2010	-0.016
	2030	-0.008

+ / - : Emission Increase / Decrease, Build versus No Build

4.2.4 Construction Air Quality Impacts and Mitigation

Potential construction-related air quality impacts from the Build Alternatives include particulate matter (PM), fugitive dust and CO emissions from demolition, construction of structures, land clearing and mobile source emissions. Construction activities such as site preparation, demolition, excavation, vehicle movement, and material transport release dust particles into the atmosphere. These potential impacts to air quality during construction can be reduced through construction management practices.

The construction management practices for the proposed project may include general environmental commitments from contractors regarding operation and construction activities, such as:

- Use low sulfur diesel fuel in construction equipment
- Limit unnecessary idling times on diesel powered engines to 5~10 minutes.
- Direct diesel powered exhaust away from local residential or building fresh air intakes.
- Use low operating speeds with on-site equipment in order to reduce dust and PM pollutants from tires and brakes.
- Use water or appropriate liquids for dust control during demolition, land clearing, grading; and on materials stockpile or surface; and other activities.
- Cover open-body trucks for transporting materials.

4.3 Energy

4.3.1 Operational Energy Consumption

No Build Alternative

Under the No Build Alternative, automotive transportation fuel consumption in Chittenden County would be 36,426 gallons per day during the peak hours.

VT 2A Alternatives

Alternative 2

Under the Alternative 2, automotive transportation fuel consumption in Chittenden County would be 36,315 gallons per day during the peak hours. This is less than one hundredth of one percent less than the No Build Alternative fuel consumption.

Alternative 3

Under the Alternative 3, automotive transportation fuel consumption in Chittenden County would be 36,337 gallons per day during the peak hours. This is less than one hundredth of one percent less than the No Build Alternative fuel consumption.

Alternative 22

Under the Alternative 22, automotive transportation fuel consumption in Chittenden County would be 36,427 gallons per day during the peak hours. This is less than one hundredth of one percent greater than the No Build Alternative fuel consumption.

Circ A/B Alternatives

Alternative 16a

Under the Alternative 16a, automotive transportation fuel consumption in Chittenden County would be 36,189 gallons per day during the peak hours. This is one hundredth of one percent less than the No Build Alternative fuel consumption.

Alternative 16b

Under the Alternative 16b, automotive transportation fuel consumption in Chittenden County would be 36,609 gallons per day during the peak hours. This is one hundredth of one percent greater than the No Build Alternative fuel consumption.

Alternative 16c

Under the Alternative 16c, automotive transportation fuel consumption in Chittenden County would be 36,064 gallons per day during the peak hours. This is one hundredth of one percent less than the No Build Alternative fuel consumption.

Alternative 17

Under the Alternative 17, automotive transportation fuel consumption in Chittenden County would be 35,906 gallons per day during the peak hours. This is one hundredth of one percent less than the No Build Alternative fuel consumption.

Hybrid Alternatives**Alternative 18**

Under the Alternative 18, automotive transportation fuel consumption in Chittenden County would be 36,092 gallons per day during the peak hours. This is one hundredth of one percent less than the No Build Alternative fuel consumption.

Alternative 19

Under the Alternative 19, automotive transportation fuel consumption in Chittenden County would be 35,906 gallons per day during the peak hours. This is one hundredth of one percent less than the No Build Alternative fuel consumption.

Alternative 23

Under the Alternative 23, automotive transportation fuel consumption in Chittenden County would be 36,403 gallons per day during the peak hours. This is less than one hundredth of one percent less than the No Build Alternative fuel consumption.

4.3.2 Construction Energy Consumption**No Build Alternative**

No energy would be consumed to construct to proposed project under the No Build Alternative.

VT 2A Alternatives**Alternative 2**

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 2, total construction energy consumption would be approximately 739,751 MBTU.

Alternative 3

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 3, total construction energy consumption would be approximately 631,092 MBTU.

Alternative 22

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 22, total construction energy consumption would be approximately 524,521 MBTU.

Circ A/B Alternatives**Alternative 16a**

A short-term increase in energy consumption is expected during the construction due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 16a, total construction energy consumption would be approximately 1,537,967 MBTU.

Alternative 16b

A short-term increase in energy consumption is expected during the construction due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 16b, total construction energy consumption would be approximately 1,575,504 MBTU.

Alternative 16c

A short-term increase in energy consumption is expected during the construction due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 16c, total construction energy consumption would be approximately 1,485,074 MBTU.

Alternative 17

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 17, total construction energy consumption would be approximately 1,112,347 MBTU.

Hybrid Alternatives**Alternative 18**

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 18, total construction energy consumption would be approximately 1,062,680 MBTU.

Alternative 19

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 19, total construction energy consumption would be approximately 954,021 MBTU.

Alternative 23

A short-term increase in energy consumption is expected during the construction phase due to roadway work and minor associated traffic delays or detoured re-routing. Under Alternative 23, total construction energy consumption would be approximately 778,841 MBTU.

4.4 Summary of Impacts and Mitigation

4.4.1 VT 2A Alternatives

Alternative 2 – Four-Lane VT 2A with Signalized Intersection Improvements

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 2 conditions. Also under Alternative 2, regional emissions of NOx and VOC would decrease as well as the overall mesoscale mobile source air toxics (MSAT) emissions. As a result, Alternative 2 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 2 would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 3 – Four-Lane VT 2A with Roundabouts

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD

criteria under the Alternative 3 conditions. Also under Alternative 3, regional emissions of NO_x and VOC would decrease as well as the overall mesoscale mobile source air toxics (MSAT) emissions. As a result, Alternative 3 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 3 would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 22 – Tapered Widening on VT 2A with Signalized and Roundabout Intersections

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 22 conditions. Also under Alternative 22, regional emissions of NO_x and VOC would decrease as well as the overall mesoscale mobile source air toxics (MSAT) emissions. As a result, Alternative 22 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 22 would result in negligible change in peak hour fuel consumption in Chittenden County.

4.4.2 Circ A/B Alternatives

Alternative 16a – Circ A/B Limited Access Highway (No Connection to US 2 and Trumpet Interchange at Redmond Road) with VT 2A Spot Improvements

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 16a conditions. Also under Alternative 16a, regional emissions of NO_x and VOC would decrease as well as the overall mesoscale mobile source air toxics (MSAT) emissions. As a result, Alternative 16a would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 16a would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 16b – Circ A/B Limited Access Highway (Partial Cloverleaf Interchange at US 2 and Trumpet Interchange at Redmond Road) with VT 2A Spot Improvements

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 16b conditions. Also under Alternative 16b, regional emissions of NO_x and VOC would decrease as well as the overall mobile source air toxics (MSAT) emissions. As a result, Alternative 16b would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 16b would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 16c – Circ A/B Limited Access Highway (No Connection to US 2 and Diamond Interchange at Mountain View Road) with VT 2A Spot Improvements

In summary, the results for the predicted ambient concentrations for criteria pollutants CO,

PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 16C conditions. Also under Alternative 16C, regional emissions of NO_x and VOC would decrease as well as the overall mobile source air toxics (MSAT) emissions. As a result, Alternative 16C would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 16c would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 17 – Circ A/B Boulevard with VT 2A Spot Improvements

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 17 conditions. Also under Alternative 17, regional emissions of NO_x and VOC would decrease as well as the overall mobile source air toxics (MSAT) emissions. As a result, Alternative 17 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 17 would result in negligible change in peak hour fuel consumption in Chittenden County.

4.4.3 Hybrid Alternatives

Alternative 18 – Four-Lane VT 2A with Signalized Intersection Improvements Plus Circ Street

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 18 conditions. Also under Alternative 18, regional emissions of NO_x and VOC would decrease as well as the overall mobile source air toxics (MSAT) emissions. As a result, Alternative 18 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 18 would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 19 – Four-Lane VT 2A with Roundabout Plus Circ Street

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD criteria under the Alternative 19 conditions. Also under Alternative 19, regional emissions of NO_x and VOC would decrease as well as the overall mobile source air toxics (MSAT) emissions. As a result, Alternative 19 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 19 would result in negligible change in peak hour fuel consumption in Chittenden County.

Alternative 23 – Tapered Widening with Signalized and Roundabout Intersections Plus Circ Street

In summary, the results for the predicted ambient concentrations for criteria pollutants CO, PM₁₀, PM_{2.5}, and NO₂ for the locations examined fall below NAAQS levels and meet the PSD

criteria under the Alternative 23 conditions. Also under Alternative 23, regional emissions of NO_x and VOC would decrease as well as the overall mobile source air toxics (MSAT) emissions. As a result, Alternative 23 would be in compliance with the Clean Air Act and Amendments and Vermont Air Pollution Control Regulations, and consistent with the Vermont State Implementation Plan (SIP).

Alternative 23 would result in negligible change in peak hour fuel consumption in Chittenden County.