

# **Appendix A** Air Quality Output

	Max kg/year			
	CO2	CO	HC	NOX
<b>Year 2019 (Existing)</b>				
Existing Conditions	148,720	181	13	221
<b>Year 2045 (Cumulative Conditions)</b>				
No Build Scenario	197,704	233	18	290
Project Scenario	239,341	266	23	359
<i>Change in Emissions</i>	41,637	33	5	69

	lbs/year			
	CO2	CO	HC	NOX
<b>Year 2019 (Existing)</b>				
Existing Conditions	327,871	399.04	28.66	487.22
<b>Year 2045 (Cumulative Conditions)</b>				
No Build Scenario	435,863	513.68	39.68	639.34
Project Scenario	527,657	586.43	50.71	791.46
<i>Change in Emissions</i>	91,794	72.75	11.02	152.12
	21%	14%	28%	24%

	tons/year			
	CO2	CO	HC	NOX
<b>Year 2019 (Existing)</b>				
Existing Conditions	163.94	0.20	0.01	0.24
<b>Year 2045 (Cumulative Conditions)</b>				
No Build Scenario	217.93	0.26	0.02	0.32
Project Scenario	263.83	0.29	0.03	0.40
<i>Change in Emissions</i>	45.90	0.04	0.01	0.08
BAAQMD Thresholds (tons/year)			10	10
Singificant Impact?			NO	NO

	lbs/day			
	CO2	CO	HC	NOX
<b>Year 2019 (Existing)</b>				
Existing Conditions	898.28	1.09	0.08	1.33
<b>Year 2045 (Cumulative Conditions)</b>				
No Build Scenario	1,194.14	1.41	0.11	1.75
Project Scenario	1,445.63	1.61	0.14	2.17
<i>Change in Emissions</i>	251.49	0.20	0.03	0.42
BAAQMD Thresholds (lbs /year)			54	54
			NO	NO

	MTCO2
	CO2
<b>Year 2019 (Existing)</b>	
Existing Conditions	148.72
<b>Year 2045 (Cumulative Conditions)</b>	
No Build Scenario	197.70
Project Scenario	239.34
<i>Change in Emissions</i>	41.64
<i>Project Plus Annualized Construction</i>	55.00
BAAQMD Thresholds (tons/year)	1,100
Singificant Impact?	No

		AM/PM Peak Annual Emissions (total kg)			
		CO2	CO	HC	NOX
<b>Year 2019 (Existing)</b>					
	AM	97746	119	9	151
	PM	148720	181	13	221
<b>Year 2045 (Cumulative Conditions) No Build</b>					
	AM	117,144	142	11	179
	PM	197,704	233	18	290
<b>Year 2045 (Cumulative Conditions) Project</b>					
	AM	133,332	155	12	212
	PM	239,341	266	23	359

**Road Construction Emissions Model**  
**Data Entry Worksheet**

Version 9.0.0

Note: Required data input sections have a yellow background.  
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.  
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.  
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

**Input Type**

Project Name

Construction Start Year

Project Type

Project Construction Time  
Working Days per Month

Predominant Soil/Site Type: Enter 1, 2, or 3  
(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)

Project Length

Total Project Area

Maximum Area Disturbed/Day

Water Trucks Used?

Devin Road/Soscol Ferry Road Roundabout
2022
2
6.00
22.00
2
0.26
2.20
0.25
1

Enter a Year between 2014 and 2040 (inclusive)

1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway  
 2) Road Widening : Project to add a new lane to an existing roadway  
 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane  
 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction

months  
days (assume 22 if unknown)

1) Sand Gravel : Use for quaternary deposits (Delta/West County)  
 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta)  
 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)

miles  
acres  
acres  
1. Yes  
2. No

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

[http://www.conservation.ca.gov/cgs/information/geologic\\_mapping/Pages/googlemaps.aspx#regionalseries](http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalseries)

**Material Hauling Quantity Input**

Material Type	Phase	Haul Truck Capacity (yd <sup>3</sup> ) (assume 20 if unknown)	Import Volume (yd <sup>3</sup> /day)	Export Volume (yd <sup>3</sup> /day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

**Mitigation Options**

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure ( <a href="http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation">http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation</a> ). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> <i>Devlin Road/Soscol Ferry Road Roundabout</i>														
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.99	9.67	10.28	2.94	0.44	2.50	0.91	0.39	0.52	0.02	2,109.07	0.58	0.04	2,136.77
Grading/Excavation	5.04	44.83	53.77	4.78	2.28	2.50	2.58	2.06	0.52	0.10	9,590.56	2.87	0.12	9,697.88
Drainage/Utilities/Sub-Grade	2.99	28.89	29.53	3.84	1.34	2.50	1.75	1.23	0.52	0.06	5,618.56	1.19	0.08	5,671.57
Paving	1.34	17.21	13.08	0.72	0.72	0.00	0.64	0.64	0.00	0.03	2,758.16	0.74	0.05	2,792.50
Maximum (pounds/day)	5.04	44.83	53.77	4.78	2.28	2.50	2.58	2.06	0.52	0.10	9,590.56	2.87	0.12	9,697.88
Total (tons/construction project)	0.23	2.14	2.38	0.24	0.10	0.14	0.12	0.09	0.03	0.00	437.31	0.12	0.01	442.07

Notes:  
 Project Start Year -> 2022  
 Project Length (months) -> 6  
 Total Project Area (acres) -> 2  
 Maximum Area Disturbed/Day (acres) -> 0  
 Water Truck Used? -> Yes

Phase	Total Material Imported/Exported Volume (yd <sup>3</sup> /day)		Daily VMT (miles/day)			
	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	200	40
Grading/Excavation	0	0	0	0	800	40
Drainage/Utilities/Sub-Grade	0	0	0	0	560	40
Paving	0	0	0	0	400	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> <i>Devlin Road/Soscol Ferry Road Roundabout</i>														
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.06	0.07	0.02	0.00	0.02	0.01	0.00	0.00	0.00	13.92	0.00	0.00	12.79
Grading/Excavation	0.15	1.33	1.60	0.14	0.07	0.07	0.08	0.06	0.02	0.00	284.84	0.09	0.00	261.30
Drainage/Utilities/Sub-Grade	0.06	0.57	0.58	0.08	0.03	0.05	0.03	0.02	0.01	0.00	111.25	0.02	0.00	101.88
Paving	0.01	0.17	0.13	0.01	0.01	0.00	0.01	0.01	0.00	0.00	27.31	0.01	0.00	25.08
Maximum (tons/phase)	0.15	1.33	1.60	0.14	0.07	0.07	0.08	0.06	0.02	0.00	284.84	0.09	0.00	261.30
Total (tons/construction project)	0.23	2.14	2.38	0.24	0.10	0.14	0.12	0.09	0.03	0.00	437.31	0.12	0.01	401.05

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

# FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [Existing AM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	3.5	31.1	0.04	0.003	0.047	60.45
18	R2	3.8	33.5	0.04	0.003	0.043	62.07
Approach		7.2	64.6	0.08	0.006	0.090	122.51
East: Soscol Ferry Road							
1	L2	9.8	88.0	0.10	0.008	0.153	141.33
6	T1	2.3	20.4	0.03	0.002	0.023	40.27
Approach		12.1	108.4	0.13	0.010	0.177	181.60
West: Soscol Ferry Road							
2	T1	0.4	3.9	0.01	0.000	0.004	7.91
12	R2	3.0	26.8	0.03	0.002	0.043	44.58
Approach		3.4	30.7	0.04	0.003	0.047	52.49
All Vehicles		22.7	203.6	0.25	0.018	0.314	356.60
Intersection		22.7	203.6	0.25	0.018	0.314	356.60

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	10,899	97,746	119	9	151	171,170	
Persons						171,170	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	21.2	262.1	0.32	0.024	0.399	0.82
18	R2	20.1	277.0	0.33	0.027	0.355	0.83
Approach		20.6	269.6	0.32	0.026	0.377	0.82
East: Soscol Ferry Road							
1	L2	18.6	300.6	0.35	0.027	0.524	0.78
6	T1	36.1	155.3	0.22	0.012	0.179	0.49
Approach		21.8	255.6	0.31	0.023	0.417	0.69
West: Soscol Ferry Road							
2	T1	36.9	150.5	0.22	0.012	0.168	0.49
12	R2	24.2	230.6	0.29	0.020	0.366	0.62

Approach	25.8	216.0	0.28	0.018	0.330	0.59
All Vehicles	22.0	252.8	0.31	0.023	0.390	0.71
Intersection	22.0	252.8	0.31	0.023	0.390	0.71

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:10 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9

## FUEL CONSUMPTION, EMISSIONS & COST

Site: 101v [Existing PM - Conversion (Site Folder: Stop Controlled)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	1.1	9.5	0.01	0.001	0.015	18.13
18	R2	9.4	84.0	0.09	0.008	0.110	164.89
Approach		10.5	93.5	0.11	0.009	0.125	183.02
East: Soscol Ferry Road							
1	L2	5.6	50.3	0.06	0.005	0.087	83.44
6	T1	0.4	3.6	0.01	0.000	0.004	7.02
Approach		6.0	53.9	0.06	0.005	0.091	90.45
West: Soscol Ferry Road							
2	T1	3.0	26.7	0.04	0.002	0.030	54.18
12	R2	15.1	135.7	0.17	0.012	0.215	226.59
Approach		18.1	162.4	0.21	0.014	0.245	280.77
All Vehicles		34.6	309.8	0.38	0.028	0.461	554.24
Intersection		34.6	309.8	0.38	0.028	0.461	554.24

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	16,605	148,720	181	13	221	266,037	
Persons						266,037	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	21.7	257.1	0.31	0.024	0.394	0.79
18	R2	17.8	312.7	0.35	0.031	0.410	0.99
Approach		18.2	306.0	0.35	0.030	0.408	0.96
East: Soscol Ferry Road							
1	L2	17.8	312.8	0.36	0.029	0.542	0.83
6	T1	36.1	155.4	0.22	0.012	0.179	0.49
Approach		19.0	293.2	0.34	0.027	0.497	0.79
West: Soscol Ferry Road							
2	T1	36.9	150.5	0.22	0.012	0.168	0.49
12	R2	24.2	229.9	0.29	0.020	0.364	0.62

Approach	26.3	211.5	0.27	0.018	0.319	0.59
All Vehicles	22.6	246.4	0.30	0.022	0.366	0.71
Intersection	22.6	246.4	0.30	0.022	0.366	0.71

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:11 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9



# FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [2045 AM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	4.4	39.0	0.05	0.004	0.058	83.05
18	R2	4.4	39.6	0.05	0.004	0.051	73.57
Approach		8.8	78.7	0.09	0.008	0.108	156.62
East: Soscol Ferry Road							
1	L2	11.7	104.8	0.12	0.010	0.182	170.08
6	T1	2.7	24.1	0.03	0.002	0.028	47.61
Approach		14.4	128.9	0.16	0.011	0.210	217.69
West: Soscol Ferry Road							
2	T1	0.5	4.7	0.01	0.000	0.005	9.45
12	R2	3.5	31.8	0.04	0.003	0.051	52.90
Approach		4.1	36.5	0.05	0.003	0.056	62.35
All Vehicles		27.2	244.0	0.30	0.022	0.374	436.66
Intersection		27.2	244.0	0.30	0.022	0.374	436.66

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	13,063	117,144	142	11	179	209,595	
Persons						209,595	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	20.0	278.6	0.33	0.027	0.411	0.95
18	R2	20.0	277.5	0.33	0.027	0.356	0.83
Approach		20.0	278.0	0.33	0.027	0.383	0.89
East: Soscol Ferry Road							
1	L2	18.4	303.0	0.35	0.028	0.526	0.79
6	T1	36.1	155.3	0.22	0.012	0.179	0.49
Approach		21.7	257.2	0.31	0.023	0.419	0.70
West: Soscol Ferry Road							
2	T1	36.9	150.5	0.22	0.012	0.168	0.49
12	R2	24.2	230.6	0.29	0.020	0.366	0.62

Approach	25.8	215.9	0.28	0.018	0.330	0.59
All Vehicles	21.8	256.1	0.31	0.023	0.392	0.74
Intersection	21.8	256.1	0.31	0.023	0.392	0.74

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:12 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9

## FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [2045 PM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	1.4	12.3	0.01	0.001	0.019	24.85
18	R2	14.5	129.4	0.14	0.014	0.168	306.31
Approach		15.9	141.7	0.15	0.015	0.186	331.16
East: Soscol Ferry Road							
1	L2	7.3	65.1	0.07	0.006	0.111	114.66
6	T1	0.5	4.4	0.01	0.000	0.005	8.72
Approach		7.7	69.5	0.08	0.006	0.116	123.39
West: Soscol Ferry Road							
2	T1	3.7	33.1	0.05	0.003	0.037	67.00
12	R2	18.7	167.6	0.21	0.014	0.265	280.46
Approach		22.4	200.7	0.26	0.017	0.302	347.46
All Vehicles		46.0	411.9	0.49	0.038	0.604	802.00
Intersection		46.0	411.9	0.49	0.038	0.604	802.00

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	22,078	197,704	233	18	290	384,962	
Persons						384,962	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	20.9	266.3	0.32	0.025	0.400	0.86
18	R2	14.3	389.3	0.41	0.041	0.505	1.48
Approach		14.8	374.2	0.40	0.039	0.492	1.41
East: Soscol Ferry Road							
1	L2	17.1	326.8	0.37	0.031	0.557	0.93
6	T1	36.1	155.4	0.22	0.012	0.179	0.49
Approach		18.3	305.3	0.35	0.028	0.510	0.87
West: Soscol Ferry Road							
2	T1	36.9	150.4	0.22	0.012	0.168	0.49
12	R2	24.3	229.5	0.28	0.020	0.363	0.62

Approach	26.4	211.2	0.27	0.018	0.318	0.59
All Vehicles	21.0	264.6	0.31	0.025	0.388	0.83
Intersection	21.0	264.6	0.31	0.025	0.388	0.83

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:13 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9

# FUEL CONSUMPTION, EMISSIONS & COST

Site: 101 [2045 AM (Site Folder: Single lane approaches)]

New Site  
 Site Category: (None)  
 Roundabout

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	3.6	31.9	0.04	0.003	0.043	55.20
18	R2	4.4	39.7	0.05	0.004	0.056	67.56
Approach		8.0	71.6	0.09	0.006	0.099	122.76
East: Soscol Ferry Road							
1	L2	13.5	121.1	0.13	0.011	0.198	198.23
6	T1	6.1	54.3	0.06	0.005	0.089	89.04
Approach		19.6	175.4	0.19	0.016	0.286	287.27
West: Soscol Ferry Road							
2	T1	1.0	8.9	0.01	0.001	0.014	15.95
12	R2	3.6	32.0	0.04	0.003	0.047	55.61
Approach		4.6	40.9	0.05	0.004	0.062	71.56
All Vehicles		32.1	287.9	0.33	0.026	0.447	481.59
Intersection		32.1	287.9	0.33	0.026	0.447	481.59

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	15,419	138,181	159	13	215	231,162	
Persons						231,162	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	25.0	223.0	0.28	0.020	0.298	0.62
18	R2	20.7	268.6	0.32	0.025	0.382	0.74
Approach		22.6	246.2	0.30	0.022	0.341	0.68
East: Soscol Ferry Road							
1	L2	17.1	325.5	0.36	0.030	0.531	0.86
6	T1	17.1	325.5	0.36	0.030	0.531	0.86
Approach		17.1	325.5	0.36	0.030	0.531	0.86
West: Soscol Ferry Road							
2	T1	19.7	282.1	0.33	0.026	0.456	0.82
12	R2	24.2	230.5	0.29	0.020	0.342	0.64

Approach	23.2	240.0	0.30	0.021	0.363	0.68
All Vehicles	19.3	287.9	0.33	0.026	0.447	0.78
Intersection	19.3	287.9	0.33	0.026	0.447	0.78

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Monday, May 03, 2021 2:29:48 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin.sip9

# FUEL CONSUMPTION, EMISSIONS & COST

Site: 101 [2045 PM (Site Folder: Single lane approaches)]

New Site  
 Site Category: (None)  
 Roundabout

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	1.2	11.0	0.01	0.001	0.014	19.41
18	R2	10.9	97.7	0.11	0.009	0.132	170.91
Approach		12.2	108.7	0.13	0.010	0.146	190.32
East: Soscol Ferry Road							
1	L2	7.0	62.4	0.07	0.006	0.105	98.88
6	T1	1.0	8.9	0.01	0.001	0.015	14.15
Approach		8.0	71.4	0.08	0.006	0.120	113.03
West: Soscol Ferry Road							
2	T1	10.9	97.6	0.10	0.010	0.153	228.97
12	R2	26.7	239.1	0.26	0.024	0.355	525.82
Approach		37.6	336.7	0.36	0.034	0.509	754.79
All Vehicles		57.7	516.7	0.57	0.051	0.775	1058.13
Intersection		57.7	516.7	0.57	0.051	0.775	1058.13

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	27,715	248,027	272	25	372	507,904	
Persons						507,904	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	23.6	236.1	0.29	0.022	0.304	0.67
18	R2	19.0	291.6	0.34	0.028	0.394	0.82
Approach		19.5	284.8	0.34	0.027	0.383	0.80
East: Soscol Ferry Road							
1	L2	19.3	289.1	0.32	0.026	0.486	0.74
6	T1	19.3	289.1	0.32	0.026	0.486	0.74
Approach		19.3	289.1	0.32	0.026	0.486	0.74
West: Soscol Ferry Road							
2	T1	12.7	437.5	0.44	0.046	0.688	1.65
12	R2	17.1	324.4	0.35	0.033	0.482	1.15

Approach	15.9	350.7	0.37	0.036	0.530	1.27
All Vehicles	17.1	325.3	0.36	0.032	0.488	1.07
Intersection	17.1	325.3	0.36	0.032	0.488	1.07

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Monday, May 03, 2021 2:34:03 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin.sip9



## FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [Existing AM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	3.5	31.1	0.04	0.003	0.047	60.45
18	R2	3.8	33.5	0.04	0.003	0.043	62.07
Approach		7.2	64.6	0.08	0.006	0.090	122.51
East: Soscol Ferry Road							
1	L2	9.8	88.0	0.10	0.008	0.153	141.33
6	T1	2.3	20.4	0.03	0.002	0.023	40.27
Approach		12.1	108.4	0.13	0.010	0.177	181.60
West: Soscol Ferry Road							
2	T1	0.4	3.9	0.01	0.000	0.004	7.91
12	R2	3.0	26.8	0.03	0.002	0.043	44.58
Approach		3.4	30.7	0.04	0.003	0.047	52.49
All Vehicles		22.7	203.6	0.25	0.018	0.314	356.60
Intersection		22.7	203.6	0.25	0.018	0.314	356.60

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	10,899	97,746	119	9	151	171,170	
Persons						171,170	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	21.2	262.1	0.32	0.024	0.399	0.82
18	R2	20.1	277.0	0.33	0.027	0.355	0.83
Approach		20.6	269.6	0.32	0.026	0.377	0.82
East: Soscol Ferry Road							
1	L2	18.6	300.6	0.35	0.027	0.524	0.78
6	T1	36.1	155.3	0.22	0.012	0.179	0.49
Approach		21.8	255.6	0.31	0.023	0.417	0.69
West: Soscol Ferry Road							
2	T1	36.9	150.5	0.22	0.012	0.168	0.49
12	R2	24.2	230.6	0.29	0.020	0.366	0.62

Approach	25.8	216.0	0.28	0.018	0.330	0.59
All Vehicles	22.0	252.8	0.31	0.023	0.390	0.71
Intersection	22.0	252.8	0.31	0.023	0.390	0.71

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:10 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9

# FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [Existing PM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	1.1	9.5	0.01	0.001	0.015	18.13
18	R2	9.4	84.0	0.09	0.008	0.110	164.89
Approach		10.5	93.5	0.11	0.009	0.125	183.02
East: Soscol Ferry Road							
1	L2	5.6	50.3	0.06	0.005	0.087	83.44
6	T1	0.4	3.6	0.01	0.000	0.004	7.02
Approach		6.0	53.9	0.06	0.005	0.091	90.45
West: Soscol Ferry Road							
2	T1	3.0	26.7	0.04	0.002	0.030	54.18
12	R2	15.1	135.7	0.17	0.012	0.215	226.59
Approach		18.1	162.4	0.21	0.014	0.245	280.77
All Vehicles		34.6	309.8	0.38	0.028	0.461	554.24
Intersection		34.6	309.8	0.38	0.028	0.461	554.24

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	16,605	148,720	181	13	221	266,037	
Persons						266,037	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	21.7	257.1	0.31	0.024	0.394	0.79
18	R2	17.8	312.7	0.35	0.031	0.410	0.99
Approach		18.2	306.0	0.35	0.030	0.408	0.96
East: Soscol Ferry Road							
1	L2	17.8	312.8	0.36	0.029	0.542	0.83
6	T1	36.1	155.4	0.22	0.012	0.179	0.49
Approach		19.0	293.2	0.34	0.027	0.497	0.79
West: Soscol Ferry Road							
2	T1	36.9	150.5	0.22	0.012	0.168	0.49
12	R2	24.2	229.9	0.29	0.020	0.364	0.62

Approach	26.3	211.5	0.27	0.018	0.319	0.59
All Vehicles	22.6	246.4	0.30	0.022	0.366	0.71
Intersection	22.6	246.4	0.30	0.022	0.366	0.71

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:11 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9

# FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [2045 AM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	4.4	39.0	0.05	0.004	0.058	83.05
18	R2	4.4	39.6	0.05	0.004	0.051	73.57
Approach		8.8	78.7	0.09	0.008	0.108	156.62
East: Soscol Ferry Road							
1	L2	11.7	104.8	0.12	0.010	0.182	170.08
6	T1	2.7	24.1	0.03	0.002	0.028	47.61
Approach		14.4	128.9	0.16	0.011	0.210	217.69
West: Soscol Ferry Road							
2	T1	0.5	4.7	0.01	0.000	0.005	9.45
12	R2	3.5	31.8	0.04	0.003	0.051	52.90
Approach		4.1	36.5	0.05	0.003	0.056	62.35
All Vehicles		27.2	244.0	0.30	0.022	0.374	436.66
Intersection		27.2	244.0	0.30	0.022	0.374	436.66

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	13,063	117,144	142	11	179	209,595	
Persons						209,595	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	20.0	278.6	0.33	0.027	0.411	0.95
18	R2	20.0	277.5	0.33	0.027	0.356	0.83
Approach		20.0	278.0	0.33	0.027	0.383	0.89
East: Soscol Ferry Road							
1	L2	18.4	303.0	0.35	0.028	0.526	0.79
6	T1	36.1	155.3	0.22	0.012	0.179	0.49
Approach		21.7	257.2	0.31	0.023	0.419	0.70
West: Soscol Ferry Road							
2	T1	36.9	150.5	0.22	0.012	0.168	0.49
12	R2	24.2	230.6	0.29	0.020	0.366	0.62

Approach	25.8	215.9	0.28	0.018	0.330	0.59
All Vehicles	21.8	256.1	0.31	0.023	0.392	0.74
Intersection	21.8	256.1	0.31	0.023	0.392	0.74

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:12 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9

# FUEL CONSUMPTION, EMISSIONS & COST

**Site: 101v [2045 PM - Conversion (Site Folder: Stop Controlled)]**

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	1.4	12.3	0.01	0.001	0.019	24.85
18	R2	14.5	129.4	0.14	0.014	0.168	306.31
Approach		15.9	141.7	0.15	0.015	0.186	331.16
East: Soscol Ferry Road							
1	L2	7.3	65.1	0.07	0.006	0.111	114.66
6	T1	0.5	4.4	0.01	0.000	0.005	8.72
Approach		7.7	69.5	0.08	0.006	0.116	123.39
West: Soscol Ferry Road							
2	T1	3.7	33.1	0.05	0.003	0.037	67.00
12	R2	18.7	167.6	0.21	0.014	0.265	280.46
Approach		22.4	200.7	0.26	0.017	0.302	347.46
All Vehicles		46.0	411.9	0.49	0.038	0.604	802.00
Intersection		46.0	411.9	0.49	0.038	0.604	802.00

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	22,078	197,704	233	18	290	384,962	
Persons						384,962	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	20.9	266.3	0.32	0.025	0.400	0.86
18	R2	14.3	389.3	0.41	0.041	0.505	1.48
Approach		14.8	374.2	0.40	0.039	0.492	1.41
East: Soscol Ferry Road							
1	L2	17.1	326.8	0.37	0.031	0.557	0.93
6	T1	36.1	155.4	0.22	0.012	0.179	0.49
Approach		18.3	305.3	0.35	0.028	0.510	0.87
West: Soscol Ferry Road							
2	T1	36.9	150.4	0.22	0.012	0.168	0.49
12	R2	24.3	229.5	0.28	0.020	0.363	0.62

Approach	26.4	211.2	0.27	0.018	0.318	0.59
All Vehicles	21.0	264.6	0.31	0.025	0.388	0.83
Intersection	21.0	264.6	0.31	0.025	0.388	0.83

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Tuesday, May 04, 2021 3:28:13 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin - SSSC.sip9



# FUEL CONSUMPTION, EMISSIONS & COST

Site: 101 [2045 AM (Site Folder: Single lane approaches)]

New Site  
 Site Category: (None)  
 Roundabout

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	3.6	31.9	0.04	0.003	0.043	55.20
18	R2	4.4	39.7	0.05	0.004	0.056	67.56
Approach		8.0	71.6	0.09	0.006	0.099	122.76
East: Soscol Ferry Road							
1	L2	13.5	121.1	0.13	0.011	0.198	198.23
6	T1	6.1	54.3	0.06	0.005	0.089	89.04
Approach		19.6	175.4	0.19	0.016	0.286	287.27
West: Soscol Ferry Road							
2	T1	1.0	8.9	0.01	0.001	0.014	15.95
12	R2	3.6	32.0	0.04	0.003	0.047	55.61
Approach		4.6	40.9	0.05	0.004	0.062	71.56
All Vehicles		32.1	287.9	0.33	0.026	0.447	481.59
Intersection		32.1	287.9	0.33	0.026	0.447	481.59

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	15,419	138,181	159	13	215	231,162	
Persons						231,162	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	25.0	223.0	0.28	0.020	0.298	0.62
18	R2	20.7	268.6	0.32	0.025	0.382	0.74
Approach		22.6	246.2	0.30	0.022	0.341	0.68
East: Soscol Ferry Road							
1	L2	17.1	325.5	0.36	0.030	0.531	0.86
6	T1	17.1	325.5	0.36	0.030	0.531	0.86
Approach		17.1	325.5	0.36	0.030	0.531	0.86
West: Soscol Ferry Road							
2	T1	19.7	282.1	0.33	0.026	0.456	0.82
12	R2	24.2	230.5	0.29	0.020	0.342	0.64

Approach	23.2	240.0	0.30	0.021	0.363	0.68
All Vehicles	19.3	287.9	0.33	0.026	0.447	0.78
Intersection	19.3	287.9	0.33	0.026	0.447	0.78

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Monday, May 03, 2021 2:29:48 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin.sip9

# FUEL CONSUMPTION, EMISSIONS & COST

Site: 101 [2045 PM (Site Folder: Single lane approaches)]

New Site  
 Site Category: (None)  
 Roundabout

Fuel Consumption, Emissions & Cost (Total)							
Mov ID	Turn	Fuel Total gal/h	CO2 Total kg/h	CO Total kg/h	HC Total kg/h	NOX Total kg/h	Cost Total \$/h
South: Devlin Road							
3	L2	1.2	11.0	0.01	0.001	0.014	19.41
18	R2	10.9	97.7	0.11	0.009	0.132	170.91
Approach		12.2	108.7	0.13	0.010	0.146	190.32
East: Soscol Ferry Road							
1	L2	7.0	62.4	0.07	0.006	0.105	98.88
6	T1	1.0	8.9	0.01	0.001	0.015	14.15
Approach		8.0	71.4	0.08	0.006	0.120	113.03
West: Soscol Ferry Road							
2	T1	10.9	97.6	0.10	0.010	0.153	228.97
12	R2	26.7	239.1	0.26	0.024	0.355	525.82
Approach		37.6	336.7	0.36	0.034	0.509	754.79
All Vehicles		57.7	516.7	0.57	0.051	0.775	1058.13
Intersection		57.7	516.7	0.57	0.051	0.775	1058.13

Fuel Consumption, Emissions & Cost (Annual Values)							
	Fuel Total gal/y	CO2 Total kg/y	CO Total kg/y	HC Total kg/y	NOX Total kg/y	Cost Total \$/y	
Vehicles	27,715	248,027	272	25	372	507,904	
Persons						507,904	

Fuel Consumption, Emissions & Cost (Rate)							
Mov ID	Turn	Fuel Efficiency mpg	CO2 Rate g/km	CO Rate g/km	HC Rate g/km	NOX Rate g/km	Cost Rate \$/mi
South: Devlin Road							
3	L2	23.6	236.1	0.29	0.022	0.304	0.67
18	R2	19.0	291.6	0.34	0.028	0.394	0.82
Approach		19.5	284.8	0.34	0.027	0.383	0.80
East: Soscol Ferry Road							
1	L2	19.3	289.1	0.32	0.026	0.486	0.74
6	T1	19.3	289.1	0.32	0.026	0.486	0.74
Approach		19.3	289.1	0.32	0.026	0.486	0.74
West: Soscol Ferry Road							
2	T1	12.7	437.5	0.44	0.046	0.688	1.65
12	R2	17.1	324.4	0.35	0.033	0.482	1.15

Approach	15.9	350.7	0.37	0.036	0.530	1.27
All Vehicles	17.1	325.3	0.36	0.032	0.488	1.07
Intersection	17.1	325.3	0.36	0.032	0.488	1.07

---

**SIDRA INTERSECTION 9.0 | Copyright © 2000-2020 Akcelik and Associates Pty Ltd | sidrasolutions.com**  
Organisation: GHD INC. | Licence: NETWORK / Enterprise | Processed: Monday, May 03, 2021 2:34:03 PM  
Project: \\ghdnet\ghd\US\Roseville\Projects\561\11222323\Tech\Sidra\Soscol And Devlin.sip9