


Active Transportation TIP Project Evaluation Criteria


Item # X

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For H-GAC Transportation Air Quality Subcommittee

August 2021

Regional Collaboration • Transportation Planning • Multimodal Mobility

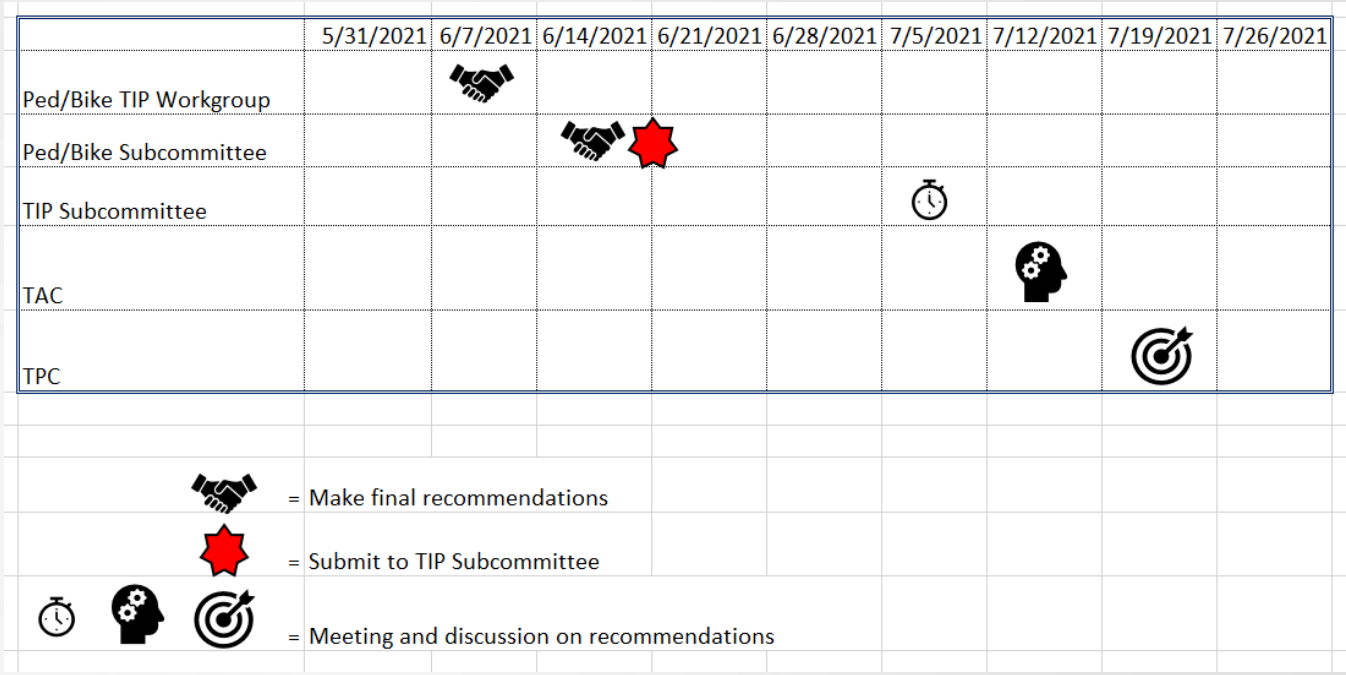
METROPOLITAN PLANNING ORGANIZATION

Purpose

- Ped/Bike Subcommittee identified need to revise evaluation criteria as part of 2045 Active Transportation Plan process
- Increase applicability of evaluation criteria to active transportation projects
- Anticipation of active transportation projects becoming eligible for CMAQ funding
- Align with current focus of service area members
  - Safety
  - Equity
  - Geographical Equity
  - Connectivity

Timeline

- Ped/Bike Subcommittee
  - Final Recommendations to TIP Subcommittee in June 2021
- TIP Subcommittee
  - TAC in July/August 2021
  - TPC in July/August 2021



Process

- Ongoing collaboration engagement
- Ped/Bike Subcommittee
  - April 15, 2021
  - April 29, 2021
  - June 17, 2021
- Ped/Bike Subcommittee TIP Project Prioritization Workgroup
  - April 20, 2021
  - April 21, 2021
  - April 28, 2021
  - April 30, 2021
  - May 3, 2021
  - May 11, 2021
  - May 12, 2021
  - June 1, 2021
  - June 9, 2021

Recommendations

- Scoring split - 80% planning factors and 20% Benefits Cost Analysis (BCA)
- Caveat that at least 65% of available TASA (Category 9) funds are designated solely for active transportation infrastructure projects
- CMAQ set-aside amounts:
  - CMAQ funds less than $45 million, then at least 15% set aside for active transportation projects
  - CMAQ funds greater than $45 million, then at least 20% set aside for active transportation projects
- Planning factors updated
- BCA revisions

Project Scoring/Composite Score

Project	Category	80/20 Tot Score	50/50 Tot Score
Hermann Park Bike Network	Bike	184	123
Holman Street Reconstruction	Bike	93	58
Scott Street Reconstruction	Bike	115	72
Stafford Sidewalk	Pedestrian	148	80
Waller-Tomball Rd Sidewalk	Pedestrian	141	88
Birnham Woods Dr Sidewalk	Pedestrian	160	102
FM 1960 Sidewalk	Pedestrian	184	142

Example comparison between the 2018 scoring split and proposed scoring split.

Planning Factors

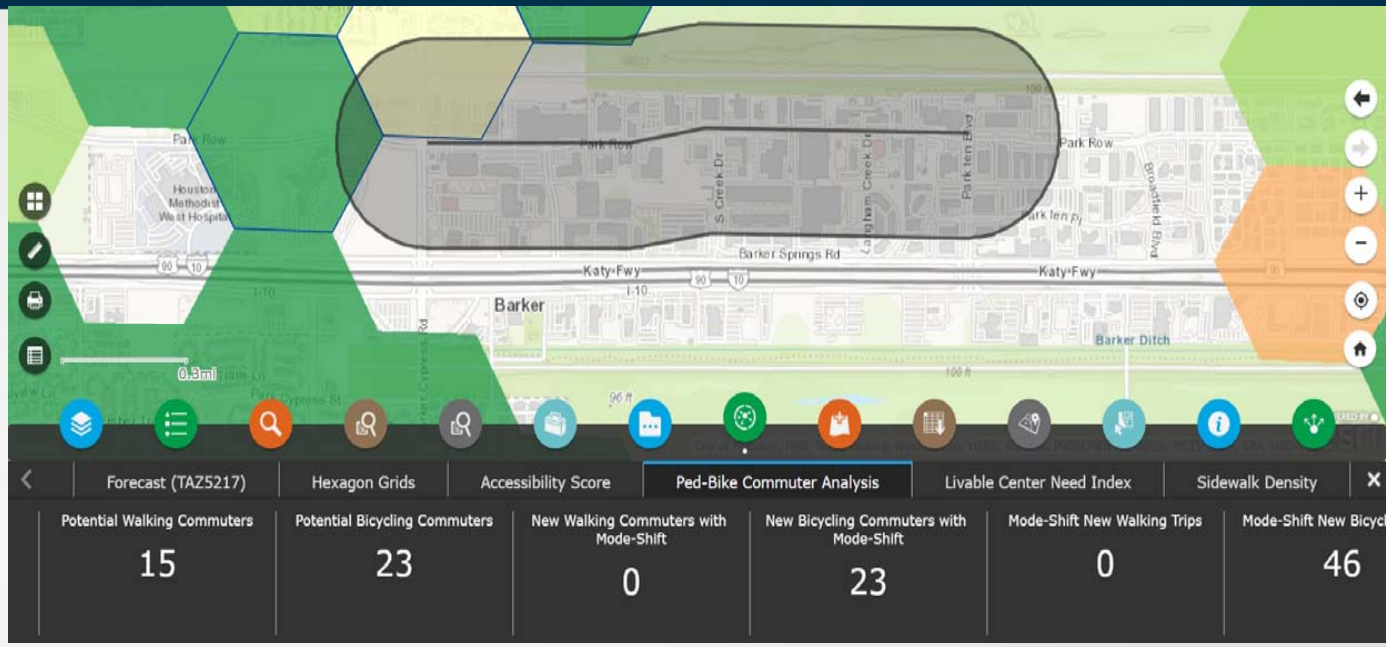
- Sliding scale of points for multiple Planning Factors
- Consistent usage of publicly available tools (e.g. H-GAC's ACE tool, etc.)
- Overall Categories:
  - Connectivity (including Planning Coordination) – 39% (Max 62 points)
  - Safety – 25% (Max 40 points)
  - Equity – 24% (Max 39 points)
  - Barrier Elimination – 8% (Max 13 points)
  - Innovation – 4% (Max of 6 points)
- Total of 14 questions

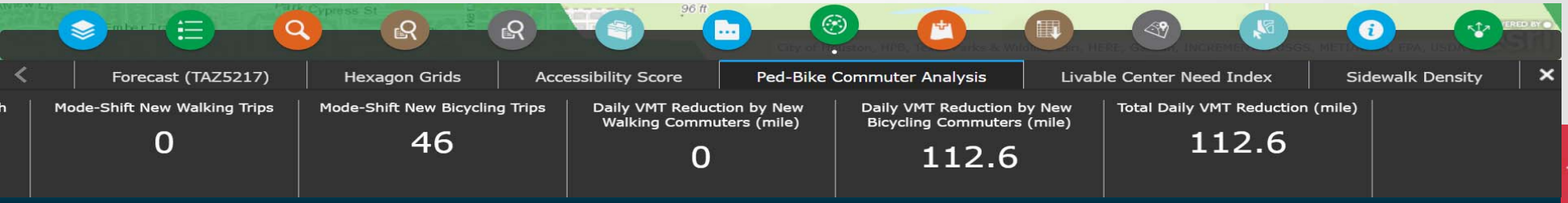
Benefits Cost Analysis

- Remove the delay benefits template
- Revise the 2018 safety benefits template
- Replace the 2018 emissions benefits template with recommended version

Benefits Cost Analysis - Safety

- Similar process as 2018
- Daily travel demand using ACE tool for inputs of new commuters and VMT

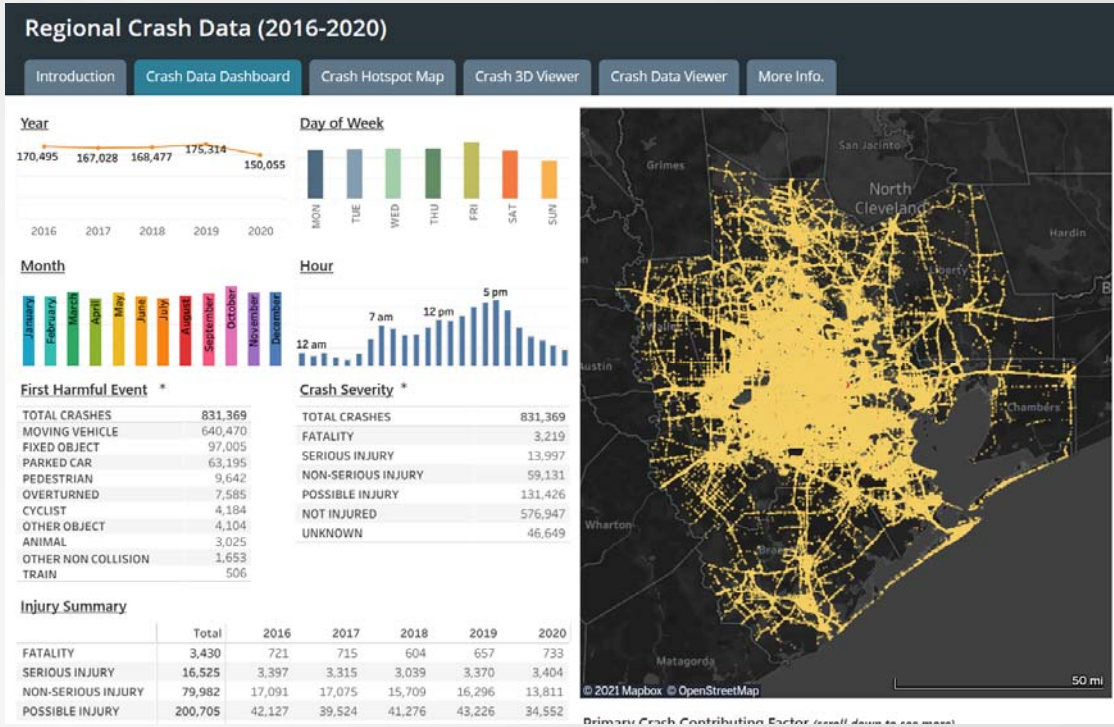




H-GAC METROPOLITAN PLANNING ORGANIZATION

Benefits Cost Analysis - Safety

- Regional Crash Data
  - Uses most current 5 years of crash data instead of 3 years
  - Uses location specific crash data catered to project area instead of county crash data
  - Ped/Bike crashes only (all severities/injuries)



Benefits Cost Analysis – Emissions Template

- Use general average speed of 25 mph for roadways
- Removed freeway emission factors from calculators
- Revise/modify types of improvement
- Updated value of emissions to most recent available for NOx and VOC.
- Change in service life
- Uses inputs from ACE tool (e.g. household info, etc.)

Type of Improvement	MOSERS Min Service Life	MOSERS Max Service Life	Safety Analysis (H-GAC) Service Life
Install new Sidewalks	10	12	10
Sidewalk improvements	10	12	10
ADA Ramps	10	12	10
Paved Shoulder/Shared Use path	10	12	20
On Street bicycle lane	10	12	20
Pedestrian/Bicycle Bridge/Underpass	10	12	30
Off street hike & bike trails	10	12	20

Service life source: Texas Guide to MOSERS for the MOSERS service life and HSIP for the original 2018 Safety Analysis service life calculations.

2018 Emissions template used VMT-based calculations for emission reductions.

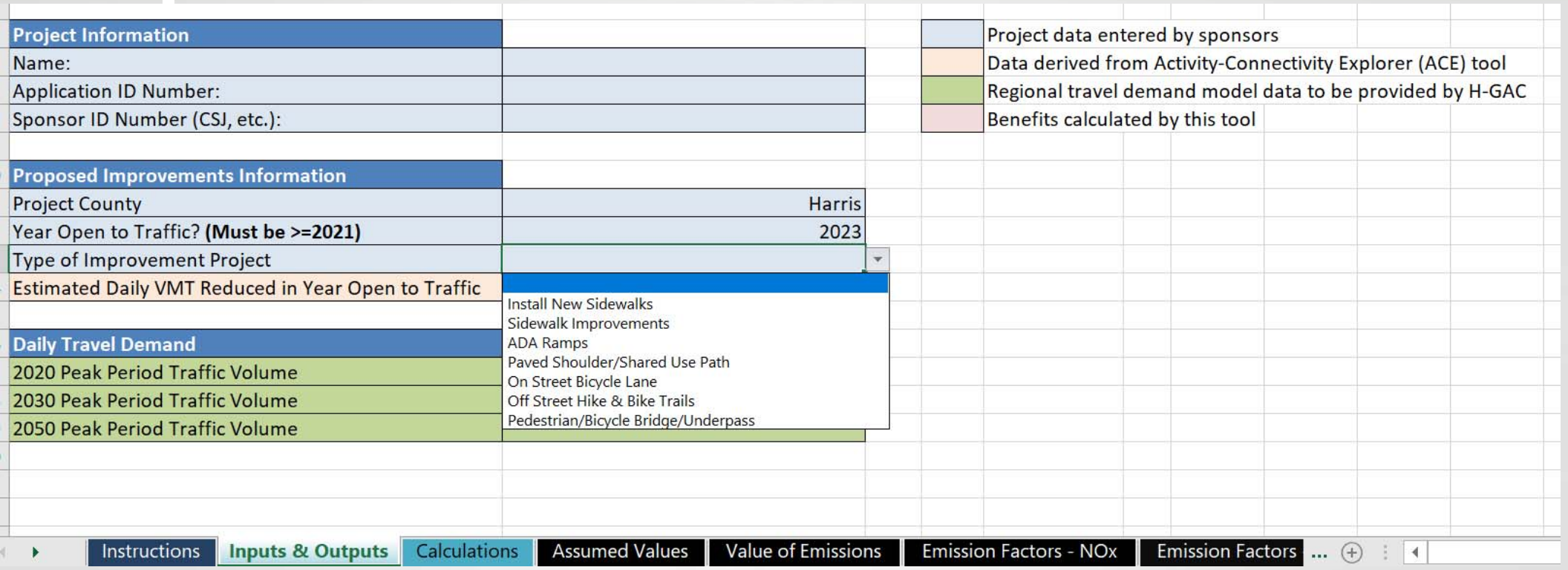
Benefits Cost Analysis – Emissions Template

INPUTS

Project Information			Project data entered by sponsors
Name:			Data derived from Activity-Connectivity Explorer (ACE) tool
Application ID Number:			Regional travel demand model data to be provided by H-GAC
Sponsor ID Number (CSJ, etc.):			Benefits calculated by this tool
Proposed Improvements Information			
Project County			
Year Open to Traffic? **(Must be >=2021)**			
Type of Improvement Project			
Estimated Daily VMT Reduced in Year Open to Traffic			
Daily Travel Demand			
2020 Peak Period Traffic Volume			
2030 Peak Period Traffic Volume			
2050 Peak Period Traffic Volume			

Instructions | Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Factors - NOx | Emission Factors ...

Benefits Cost Analysis – Emissions Template



Project Information	
Name:	
Application ID Number:	
Sponsor ID Number (CSJ, etc.):	

Proposed Improvements Information	
Project County	Harris
Year Open to Traffic? **(Must be >=2021)**	2023
Type of Improvement Project	
Estimated Daily VMT Reduced in Year Open to Traffic	

Daily Travel Demand
2020 Peak Period Traffic Volume
2030 Peak Period Traffic Volume
2050 Peak Period Traffic Volume

- Install New Sidewalks
- Sidewalk Improvements
- ADA Ramps
- Paved Shoulder/Shared Use Path
- On Street Bicycle Lane
- Off Street Hike & Bike Trails
- Pedestrian/Bicycle Bridge/Underpass

	Project data entered by sponsors
	Data derived from Activity-Connectivity Explorer (ACE) tool
	Regional travel demand model data to be provided by H-GAC
	Benefits calculated by this tool

Instructions | Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Factors - NOx | Emission Factors ...

Benefits Cost Analysis – Emissions Template

2020 TIP Call For Projects - Benefit-Cost Analysis Assumptions*

Emissions Reduction Values

VOC emissions factor, **Ped/Bike Projects Only** (g/VMT)	0.016406	Information determined from
NOx emissions factor, **Ped/Bike Projects Only** (g/VMT)	0.072252	project inputs
Improvement Type	Off Street Hike & Bike Trails	
Applicable Project Life (years)	20	
Average Arterial Roadway Speed	25	Judgement estimate from regional model

Assumptions	
Vehicle Occupancy (BCA Guidance)	1.39
Number of Days considered in a Year (Weekdays)	260

Mode Shift/Conversion Ratio

Minimum Length (miles)	Auto	Bike/Walk Combined	Walk	Bike	Constraint
1	57.40%	42.50%	39.60%	2.90%	min one walk flow
5	81.30%	18.70%	2.00%	16.70%	min one bike flow

Instructions | Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Factors - NOx | Emission Factors ...

Benefits Cost Analysis – Emissions Template

	All Rates are in gms/mile								
Facility Type	Speed Bin	Brazoria	Chambers	Fort Bend	Galveston	Harris	Liberty	Montgomery	Waller
Non Freeway	0	0.16262	0.18854	0.15209	0.17185	0.16298	0.26901	0.15704	0.30041
Non Freeway	2.5	0.11369	0.13100	0.10859	0.11942	0.11430	0.18356	0.10969	0.20407
Non Freeway	7.5	0.08922	0.10224	0.08683	0.09320	0.08996	0.14083	0.08602	0.15589
Non Freeway	12.5	0.08106	0.09265	0.07958	0.08447	0.08185	0.12658	0.07813	0.13984
Non Freeway	17.5	0.07613	0.08689	0.07505	0.07922	0.07693	0.11830	0.07334	0.13056
Non Freeway	22.5	0.07144	0.08147	0.07051	0.07430	0.07225	0.11100	0.06879	0.12248
Non Freeway	27.5	0.06561	0.07481	0.06515	0.06814	0.06635	0.10111	0.06322	0.11131
Non Freeway	32.5	0.06354	0.07242	0.06336	0.06591	0.06427	0.09749	0.06122	0.10713
Non Freeway	37.5	0.06249	0.07121	0.06252	0.06476	0.06324	0.09563	0.06021	0.10495
Non Freeway	42.5	0.06265	0.07137	0.06287	0.06486	0.06342	0.09557	0.06036	0.10475
Non Freeway	47.5	0.06441	0.07337	0.06485	0.06663	0.06521	0.09789	0.06207	0.10714
Non Freeway	52.5	0.06658	0.07583	0.06725	0.06881	0.06741	0.10078	0.06417	0.11016
Non Freeway	57.5	0.06925	0.07886	0.07018	0.07151	0.07011	0.10438	0.06677	0.11393
Non Freeway	62.5	0.07388	0.08414	0.07523	0.07620	0.07478	0.11062	0.07127	0.12047
Non Freeway	67.5	0.08384	0.09554	0.08608	0.08632	0.08481	0.12407	0.08099	0.13455
Non Freeway	72.5	0.09831	0.11207	0.10186	0.10099	0.09935	0.14342	0.09511	0.15483

... Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Factors - NOx | Emission Factors - VOC | Se

Ready

Benefits Cost Analysis – Emissions Template

Value of Emissions, Benefit-Cost Analysis Guidance forDiscretionary Grant Programs

Year	NOX	VOC/PM2.5	SO2	CO2
2020	$15,700	$729,300	$40,400	$50
2021	$15,900	$742,300	$41,300	$52
2022	$16,100	$755,500	$42,100	$53
2023	$16,400	$769,000	$43,000	$54
2024	$16,600	$782,700	$43,900	$55
2025	$16,800	$796,600	$44,900	$56
2026	$17,000	$807,500	$45,500	$57
2027	$17,300	$818,600	$46,200	$58
2028	$17,500	$829,800	$46,900	$59
2029	$17,700	$841,200	$47,600	$60
2030	$18,000	$852,700	$48,200	$61
2031	$18,000	$852,700	$48,200	$62
2032	$18,000	$852,700	$48,200	$63
2033	$18,000	$852,700	$48,200	$64
2034	$18,000	$852,700	$48,200	$66
2035	$18,000	$852,700	$48,200	$67

... | Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Fa

Benefits Cost Analysis – Emissions Template

	All Rates are in gms/mile								
3	Facility Type	Speed Bin	Brazoria	Chambers	Fort Bend	Galveston	Harris	Liberty	Montgomery	Waller
4	Non Freeway	0	0.06557	0.08107	0.06189	0.07060	0.06396	0.11463	0.06430	0.12922
5	Non Freeway	2.5	0.03925	0.04833	0.03806	0.04195	0.03852	0.06760	0.03834	0.07576
6	Non Freeway	7.5	0.02609	0.03196	0.02614	0.02763	0.02580	0.04409	0.02537	0.04904
7	Non Freeway	12.5	0.02170	0.02650	0.02216	0.02285	0.02156	0.03625	0.02104	0.04013
8	Non Freeway	17.5	0.01903	0.02320	0.01964	0.01997	0.01895	0.03159	0.01842	0.03487
9	Non Freeway	22.5	0.01645	0.02006	0.01704	0.01725	0.01641	0.02731	0.01591	0.03011
10	Non Freeway	27.5	0.01516	0.01843	0.01585	0.01585	0.01514	0.02491	0.01464	0.02741
11	Non Freeway	32.5	0.01380	0.01677	0.01449	0.01442	0.01380	0.02261	0.01333	0.02486
12	Non Freeway	37.5	0.01269	0.01541	0.01335	0.01324	0.01269	0.02075	0.01225	0.02279
13	Non Freeway	42.5	0.01204	0.01461	0.01273	0.01255	0.01205	0.01964	0.01161	0.02154
14	Non Freeway	47.5	0.01190	0.01442	0.01266	0.01238	0.01193	0.01932	0.01147	0.02115
15	Non Freeway	52.5	0.01196	0.01448	0.01280	0.01242	0.01201	0.01931	0.01152	0.02111
16	Non Freeway	57.5	0.01222	0.01477	0.01316	0.01267	0.01228	0.01961	0.01176	0.02141
17	Non Freeway	62.5	0.01309	0.01580	0.01421	0.01354	0.01318	0.02084	0.01259	0.02270
18	Non Freeway	67.5	0.01549	0.01863	0.01703	0.01595	0.01564	0.02434	0.01487	0.02643
19	Non Freeway	72.5	0.01938	0.02322	0.02150	0.01990	0.01959	0.02997	0.01860	0.03248

... Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Factors - NOx | Emission Factors - VOC | S

Benefits Cost Analysis – Emissions Template

Interim Calculations	
2020-2030 Demand Growth	0.65%
2030-2050 Demand Growth	0.30%
2021-2050 Demand Growth	0.42%

Estimated Travel Demand Reduced	
Estimated Daily VMT Reduced in Year Open to traffic	*1,500*

Estimated NOx Reductions In Year Open to Traffic (in gms/day	108.3781254
Estimated VOC Reductions In Year Open to Traffic (in Gms/day	24.60829983

Benefits Cost Analysis – Emissions Template

Annual Emission Reductions Over Life of Project

Year	Demand Growth	Use in Analysis?	Estimated Daily VMT Reduced	NOx (g/day)	NOx (Short ton/yr)	NOx Emission Reduction Benefit	Discounted NOx Benefit (7%)	VOC (g/day)	VOC (Short ton/yr)	VOC Emission Reduction Benefit	Discounted VOC Benefit (7%)
2021	0.65%	0	-	-	-	$ -	$ -	-	-	$ -	$ -
2022	0.65%	0	-	-	-	$ -	$ -	-	-	$ -	$ -
2023	0.65%	1	1,500.00	108.38	0.0311	$ 509.41	$ 444.93	24.61	0.0071	$ 23,886.14	$ 20,863.08
2024	0.65%	1	1,509.71	109.08	0.0313	$ 518.96	$ 423.62	24.77	0.0071	$ 24,469.09	$ 19,974.07
2025	0.65%	1	1,519.49	109.79	0.0315	$ 528.61	$ 403.27	24.93	0.0071	$ 25,064.88	$ 19,121.88
2026	0.65%	1	1,529.33	110.50	0.0317	$ 538.37	$ 383.85	25.09	0.0072	$ 25,572.36	$ 18,232.74
2027	0.65%	1	1,539.23	111.21	0.0319	$ 551.41	$ 367.43	25.25	0.0072	$ 26,091.73	$ 17,386.02
2028	0.65%	1	1,549.19	111.93	0.0321	$ 561.40	$ 349.61	25.42	0.0073	$ 26,619.96	$ 16,577.57
2029	0.65%	1	1,559.22	112.66	0.0323	$ 571.49	$ 332.61	25.58	0.0073	$ 27,160.40	$ 15,807.60
2030	0.65%	1	1,569.32	113.39	0.0325	$ 584.94	$ 318.17	25.75	0.0074	$ 27,709.96	$ 15,072.38
2031	0.30%	1	1,574.08	113.73	0.0326	$ 586.72	$ 298.26	25.82	0.0074	$ 27,794.09	$ 14,129.10
2032	0.30%	1	1,578.86	114.08	0.0327	$ 588.50	$ 279.59	25.90	0.0074	$ 27,878.47	$ 13,244.86
2033	0.30%	1	1,583.66	114.42	0.0328	$ 590.28	$ 262.09	25.98	0.0074	$ 27,963.10	$ 12,415.95
2034	0.30%	1	1,588.46	114.77	0.0329	$ 592.08	$ 245.69	26.06	0.0075	$ 28,047.99	$ 11,638.92
2035	0.30%	1	1,593.29	115.12	0.0330	$ 593.87	$ 230.31	26.14	0.0075	$ 28,133.14	$ 10,910.52
2036	0.30%	1	1,598.12	115.47	0.0331	$ 595.68	$ 215.90	26.22	0.0075	$ 28,218.55	$ 10,227.70
2037	0.30%	1	1,602.97	115.82	0.0332	$ 597.49	$ 202.39	26.30	0.0075	$ 28,304.21	$ 9,587.62
2038	0.30%	1	1,607.84	116.17	0.0333	$ 599.30	$ 189.72	26.38	0.0076	$ 28,390.14	$ 8,987.59
2039	0.30%	1	1,612.72	116.52	0.0334	$ 601.12	$ 177.85	26.46	0.0076	$ 28,476.33	$ 8,425.12
2040	0.30%	1	1,617.62	116.88	0.0335	$ 602.94	$ 166.72	26.54	0.0076	$ 28,562.78	$ 7,897.85
2041	0.30%	1	1,622.53	117.23	0.0336	$ 604.77	$ 156.29	26.62	0.0076	$ 28,649.49	$ 7,403.57
2042	0.30%	1	1,627.45	117.59	0.0337	$ 606.61	$ 146.50	26.70	0.0077	$ 28,736.46	$ 6,940.23

Instructions | Inputs & Outputs | Calculations | Assumed Values | Value of Emissions | Emission Factors - NOx | Emission Factors ...

Questions?