

# Potential Cost of Nonattainment in the San Antonio Metropolitan Area

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The content, finding, opinions and conclusions are the work of the authors and do not necessarily represent findings, opinions or conclusions of the TCEQ.

# Purpose of Study

Purpose: Project the costs of marginal and moderate nonattainment in the eight counties of the San Antonio Metropolitan Area.

This presentation is derived from a draft report that still has open comments from AACOG and TCEQ staff. Cost estimates are subject to change until a final version is issued.

# Overview of Key Assumptions and Methodologies

- Assumptions:
  - Costs for marginal nonattainment measured over 27 year period and costs for moderate nonattainment measured over 30 year period.
  - All dollar values in 2016 dollars.
  - All 8 counties in the MSA are assumed to be designated nonattainment.
  - In order to distribute some costs across counties, the proportion of employment in the county relative to the total MSA population as projected for 2018 was used.
- Methodologies:
  - Costs are estimated in terms of reduced gross regional product
  - IMPLAN input-output model: includes multiplier effects; assumes constant returns to scale and no price changes; an industry will always produce the same mix of commodities regardless of the level of production

## Summary of Annual Potential Costs of Nonattainment in the San Antonio MSA (Millions 2016 \$)

	Marginal		Moderate	
	<i>Low Estimate</i>	<i>High Estimate</i>	<i>Low Estimate</i>	<i>High Estimate</i>
Lost Manufacturing Company Expansion/Relocation*	\$25.917	\$925.445	\$25.917	\$925.445
Cost of Permitting	\$0.894	\$2.234	\$0.894	\$2.234
Cost of Project Delays	\$52.817	\$52.817	\$52.817	\$52.817
TERP	\$0.318	\$0.318	\$0.318	\$0.318
Costs Associated with Commute Solutions	\$0.546	\$0.546	\$1.109	\$1.109
Reductions in GRP due to Inspection Fees			\$112.533	\$181.032
Lost GRP due to Road Construction Delays	\$21.133	\$21.133	\$28.530	\$28.530
Costs of Point Source NOX Reduction	\$15.674	\$16.563	\$15.467	\$16.267
<b>Total</b>	<b>\$117.299</b>	<b>\$1,019.056</b>	<b>\$237.585</b>	<b>\$1,207.752</b>

\*Cost estimates could be subject to overestimation due to uncertainties of the impacts on manufacturing

NOTE: Numbers do not include costs to small businesses and other control strategies that may be implemented beyond what is estimated in this analysis.

## Summary of Annual Potential Hard Costs of Nonattainment for Bexar County (Millions 2016 \$)

	Marginal		Moderate	
	<i>Low Estimate</i>	<i>High Estimate</i>	<i>Low Estimate</i>	<i>High Estimate</i>
Cost of Permitting	\$0.470	\$1.176	\$0.470	\$1.175
Cost of Project Delays	\$33.224	\$33.224	\$33.224	\$33.224
Reductions in GRP due to Inspection Fees	\$0.000	\$0.000	\$89.681	\$89.681
Lost GRP due to Road Construction Delays	\$16.984	\$16.984	\$22.929	\$22.929
<b>Total</b>	<b>\$50.678</b>	<b>\$51.384</b>	<b>\$146.304</b>	<b>\$147.009</b>

NOTE: Numbers do not include costs to small businesses and other control strategies that may be implemented beyond what is estimated in this analysis.

**Summary of Potential Total Annual Costs of Nonattainment by County  
(Millions 2016 \$)**

<i>County</i>	<b>Marginal</b>		<b>Moderate</b>	
	<i>Low Estimate</i>	<i>High Estimate</i>	<i>Low Estimate</i>	<i>High Estimate</i>
Atascosa	\$3.022	\$22.068	\$5.394	\$25.883
Bandera	\$0.304	\$8.554	\$1.335	\$10.213
Bexar	\$79.668	\$797.678	\$175.190	\$947.745
Comal	\$14.662	\$14.662	\$21.536	\$72.330
Guadalupe	\$15.021	\$72.455	\$22.297	\$84.092
Kendall	\$0.844	\$14.975	\$2.690	\$17.896
Medina	\$2.507	\$21.807	\$4.900	\$25.657
Wilson	\$1.352	\$19.657	\$3.759	\$23.453
<b>MSA</b>	<b>\$117.380</b>	<b>\$971.856</b>	<b>\$237.101</b>	<b>\$1,207.269</b>

NOTE: Numbers do not include costs to small businesses and other control strategies that may be implemented beyond what is estimated in this analysis.

Questions?

**Annual GRP Forgone due to Potential Lost Manufacturing Company  
Expansion/Relocation by County (Millions 2016 \$)**

<i>County</i>	<b>Marginal</b>		<b>Moderate</b>	
	<i>Low Estimate</i>	<i>High Estimate</i>	<i>Low Estimate</i>	<i>High Estimate</i>
Atascosa	\$0.546	\$19.507	\$0.546	\$19.507
Bandera	\$0.237	\$8.479	\$0.237	\$8.479
Bexar	\$20.654	\$737.517	\$20.654	\$737.517
Comal	\$1.345	\$48.042	\$1.345	\$48.042
Guadalupe	\$1.650	\$58.924	\$1.650	\$58.924
Kendall	\$0.407	\$14.528	\$0.407	\$14.528
Medina	\$0.551	\$19.682	\$0.551	\$19.682
Wilson	\$0.526	\$18.765	\$0.526	\$18.765
<b>MSA</b>	<b>\$25.917</b>	<b>\$925.445</b>	<b>\$25.917</b>	<b>\$925.445</b>



## Annual Economic Impacts of Potential Lost Manufacturing Company Under Marginal Nonattainment by County (Millions 2016 \$)

### Low Estimate

<i>County</i>	<i>Employment (FTE Person)</i>	<i>Income</i>	<i>Gross Regional Product</i>	<i>Output</i>
Atascosa	4	\$0.265	\$0.546	\$1.167
Bandera	2	\$0.115	\$0.237	\$0.507
Bexar	145	\$10.021	\$20.654	\$44.135
Comal	9	\$0.653	\$1.345	\$2.875
Guadalupe	12	\$0.801	\$1.650	\$3.526
Kendall	3	\$0.197	\$0.407	\$0.869
Medina	4	\$0.267	\$0.551	\$1.178
Wilson	4	\$0.255	\$0.526	\$1.123
<b>MSA</b>	<b>181</b>	<b>\$12.574</b>	<b>\$25.917</b>	<b>\$55.381</b>

### High Estimate

<i>County</i>	<i>Employment (FTE Person)</i>	<i>Income</i>	<i>Gross Regional Product</i>	<i>Output</i>
Atascosa	89	\$5.875	\$19.507	\$42.901
Bandera	39	\$2.554	\$8.479	\$18.647
Bexar	3383	\$222.111	\$737.517	\$1,621.964
Comal	220	\$14.468	\$48.042	\$105.655
Guadalupe	270	\$17.746	\$58.924	\$129.588
Kendall	67	\$4.375	\$14.528	\$31.950
Medina	90	\$5.927	\$19.682	\$43.285
Wilson	86	\$5.651	\$18.765	\$41.268
<b>MSA</b>	<b>4245</b>	<b>\$278.708</b>	<b>\$925.445</b>	<b>\$2,035.259</b>

## Annual Economic Impacts of Potential Lost Manufacturing Company Expansion Under Moderate Nonattainment by County (Millions 2016 \$)

Low Estimate				
<i>County</i>	<i>Employment (FTE Person- Years)</i>	<i>Income</i>	<i>Gross Regional Product</i>	<i>Output</i>
Atascosa	4	\$0.265	\$0.546	\$1.167
Bandera	2	\$0.115	\$0.237	\$0.507
Bexar	145	\$10.021	\$20.654	\$44.135
Comal	9	\$0.653	\$1.345	\$2.875
Guadalupe	12	\$0.801	\$1.650	\$3.526
Kendall	3	\$0.197	\$0.407	\$0.869
Medina	4	\$0.267	\$0.551	\$1.178
Wilson	4	\$0.255	\$0.526	\$1.123
<b>MSA</b>	<b>181</b>	<b>\$12.574</b>	<b>\$25.917</b>	<b>\$55.381</b>

High Estimate				
<i>County</i>	<i>Employment (FTE Person- Years)</i>	<i>Income</i>	<i>Gross Regional Product</i>	<i>Output</i>
Atascosa	99	\$6.528	\$19.507	\$47.668
Bandera	43	\$2.837	\$8.479	\$20.719
Bexar	3759	\$246.790	\$737.517	\$1,802.182
Comal	245	\$16.076	\$48.042	\$117.394
Guadalupe	300	\$19.717	\$58.924	\$143.987
Kendall	74	\$4.861	\$14.528	\$35.500
Medina	100	\$6.586	\$19.682	\$48.095
Wilson	96	\$6.279	\$18.765	\$45.854
<b>MSA</b>	<b>4717</b>	<b>\$309.675</b>	<b>\$925.445</b>	<b>\$2,261.399</b>

## Annual Cost of Permitting by County (Millions 2016 \$)

<i>County</i>	<b>Marginal</b>		<b>Moderate</b>	
	<i>Low Estimate</i>	<i>High Estimate</i>	<i>Low Estimate</i>	<i>High Estimate</i>
Atascosa	\$0.056	\$0.139	\$0.057	\$0.142
Bandera	\$0.007	\$0.019	\$0.007	\$0.017
Bexar	\$0.470	\$1.176	\$0.470	\$1.175
Comal	\$0.093	\$0.231	\$0.093	\$0.233
Guadalupe	\$0.107	\$0.269	\$0.107	\$0.267
Kendall	\$0.007	\$0.019	\$0.007	\$0.017
Medina	\$0.111	\$0.278	\$0.113	\$0.283
Wilson	\$0.044	\$0.111	\$0.043	\$0.108
<b>MSA</b>	<b>\$0.896</b>	<b>\$2.241</b>	<b>\$0.897</b>	<b>\$2.242</b>

- Assumed cost of preparing the permit ranged from \$100,000 to \$250,000 under both marginal and moderate nonattainment.
- Projected number of projects based on construction permits from 2000-2016.
- Low estimate and high estimate will be the same under both marginal and moderate nonattainment.

## Annual Reductions in GRP due to Project Delays by County (Millions 2016 \$)

<i>County</i>	<i>Marginal</i>	<i>Moderate</i>
Atascosa	\$2.307	\$2.307
Bandera	\$0.010	\$0.010
Bexar	\$33.224	\$33.224
Comal	\$2.106	\$2.106
Guadalupe	\$12.908	\$12.908
Kendall	\$0.122	\$0.122
Medina	\$1.729	\$1.729
Wilson	\$0.411	\$0.411
<b>MSA</b>	<b>\$52.817</b>	<b>\$52.817</b>

- Projected number of projects based on construction permits from 2000-2016.
- Assumed one-year delay in project under both scenarios.
- Low and high estimates under both marginal and moderate nonattainment are assumed to be the same.

## Annual Cost of TERP by County (Millions 2016 \$)

County	Marginal	Moderate
Atascosa	\$0.099	\$0.099
Bandera	\$0.044	\$0.044
Bexar	-	-
Comal	-	-
Guadalupe	-	-
Kendall	\$0.074	\$0.074
Medina	\$0.101	\$0.101
Wilson	-	-
<b>MSA</b>	<b>\$4.731</b>	<b>\$4.731</b>

- Low and high estimates under both marginal and moderate nonattainment are assumed to be the same.
- Bexar, Comal, Guadalupe, and Wilson Counties are already TERP-affected counties, so there should not be any additional cost to these counties for being designated nonattainment

## Annual Cost of Commute Solutions by County (Millions 2016 \$)

County	Marginal	Moderate
Atascosa	\$0.012	\$0.024
Bandera	\$0.005	\$0.009
Bexar	\$0.431	\$0.876
Comal	\$0.029	\$0.060
Guadalupe	\$0.037	\$0.076
Kendall	\$0.009	\$0.018
Medina	\$0.012	\$0.023
Wilson	\$0.011	\$0.023
<b>MSA</b>	<b>\$0.546</b>	<b>\$1.109</b>

- Low and high estimates under both marginal and moderate nonattainment are assumed to be the same.
- Commute Solutions is a voluntarily implemented program. Any costs represented are above and beyond the costs associated with a nonattainment designation

## Annual Reductions in GRP due to Inspection Fees (Millions 2016 \$)

	Inspection Fee per Vehicle
<i>County</i>	\$11.50
Atascosa	\$2.372
Bandera	\$1.031
Bexar	\$89.681
Comal	\$5.842
Guadalupe	\$7.165
Kendall	\$1.767
Medina	\$2.393
Wilson	\$2.282
<b>MSA</b>	<b>\$112.533</b>

- Only applies to moderate nonattainment.
- Assumed inspection fees would result in reduced consumer spending resulting in lower gross regional product.
- Not all counties may be required to have an emissions testing fee, even if they are all designated nonattainment.

## Annual Lost GRP due to Road Construction Delays by County (Millions 2016 \$)

<i>County</i>	<i>Marginal</i>	<i>Moderate</i>
Atascosa	\$0.000	\$0.000
Bandera	\$0.000	\$0.000
Bexar	\$16.984	\$22.929
Comal	\$3.247	\$4.384
Guadalupe	\$0.318	\$0.429
Kendall	\$0.225	\$0.304
Medina	\$0.000	\$0.000
Wilson	\$0.359	\$0.484
<b>MSA</b>	<b>\$21.133</b>	<b>\$28.530</b>

- Assumed two-year delay under marginal nonattainment and three-year delay under moderate nonattainment.



**Annual Potential Costs of Point Source NOX Reduction  
by County (Millions 2016 \$)**

<i>County</i>	<b>Marginal</b>		<b>Moderate</b>	
	<i>Low Estimate</i>	<i>High Estimate</i>	<i>Low Estimate</i>	<i>High Estimate</i>
Atascosa	-	-	-	-
Bandera	-	-	-	-
Bexar	\$7.837	\$8.281	\$7.733	\$8.133
Comal	\$7.837	\$8.281	\$7.733	\$8.133
Guadalupe	-	-	-	-
Kendall	-	-	-	-
Medina	-	-	-	-
Wilson	-	-	-	-
<b>MSA</b>	<b>\$15.674</b>	<b>\$16.563</b>	<b>\$15.467</b>	<b>\$16.267</b>