

MEMORANDUM

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FROM: Richard Billings, Roger Chang, and Heather Perez, ERG

DATE: May 6, 2005

SUBJECT: Draft Texas Railroad Emission Inventory Railroad Model and Preliminary Results

1.0 Introduction

The objective of this Texas Commission for Environmental Quality (TCEQ) and Houston Advanced Research Center (HARC) project is to improve locomotive emission estimates for the Dallas/ Fort Worth and Houston/Galveston areas by developing a computer model to estimate locomotive emissions. Recent studies have indicated that locomotive emission estimates are associated with a large degree of uncertainty because the data elements needed to accurately calculate emissions were often not readily available. There is also considerable difference between estimates based on fuel consumption versus those derived from aggregated gross-ton mileage data. The model being developed for this project uses relatively high-resolution railway segment-specific activity data.

In the absence of system-wide requirements, stakeholders are reluctant to spend time and resources compiling the data necessary for this approach. Currently, there are no state, federal, or local statutes requiring railroads to provide the necessary data to estimate emissions, although the TCEQ does have a Memorandum of Understanding with the Class I railways in Texas regarding overall emission reduction goals.

In this project, the TCEQ project manager, Eastern Research Group (ERG) and Starcrest staff worked with the two most important railroad companies servicing the Dallas/Fort Worth and Houston/Galveston areas to provide as much detailed data as possible to develop accurate estimates of emissions from locomotives operating in the area. These detailed data have been used to populate the model developed for this project.

Initially, it was envisioned that the railroads would provide event recorder data for this analysis. Event recorders track locomotive operating parameters such as time stamp, throttle notch setting, horsepower, train speed, brake air pressure, and a variety of other operational characteristics. These data elements were to be combined with train count information and horsepower associated with individual locomotive train sets to accurately estimate activity and resulting emissions. This method was proposed by the Texas Transportation Institute's railway group because it would be a highly precise way to profile train trips by train type and route.

The introduction of event data recorders is a relatively new technology, and these devices tend to only be found on the newer engines. An unknown number of Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) trains are equipped with these event recorders, only BNSF could provide fuel consumption data from the recorders. (Even if all of the trains were equipped with these devices, the data recorders provide output in a format that must be manually converted from proprietary software code output into a compatible database format, which could be a problematic and expensive undertaking.) Because event recorder data were not readily available for the Dallas/Fort Worth and Houston/Galveston areas, an alternative approach to estimate locomotive emissions was developed.

The revised approach used for this model encouraged the railroads to provide the necessary data elements to estimate emissions from locomotives directly from their Gross Ton Mileage (GTM) data. Though this approach does not provide as detailed data as might be obtained from the locomotive event recorders, it still yields sufficient information to estimate emissions by railroad segment.

As noted earlier, BNSF estimated fuel consumption using event recorder data. As such, the emission estimating method for BNSF is a hybrid approach that allows for segment specific fuel consumption data for different railroad activities to be incorporated into the model. This is a vast improvement over the recent guidance known as the “Carretto Method” because it clearly differentiates between light intermodal trains and heavy bulk trains. While the other railways (i.e., UP and Kansas City Southern [KCS] and its affiliate Texas-Mexico [T-M]) cited logistical problems in obtaining event recorder data, it may be practical to incorporate a hybrid approach for all line-haul locomotive subtypes within the next five years.

As noted above, the UP data set aggregated all locomotive activities together, but the data elements were disaggregated into smaller railway segments. The fact that railroad companies compiled activity data differently to meet their different business needs was an important consideration in developing the data structure for the railroad model. The model was developed to be sufficiently flexible to include both aggregated and disaggregated data. This need for flexibility necessitated that the model be developed as an Access database. By using a relational database system such as Access, data tables can be easily updated to incorporate new activity data elements and emission factors. Details concerning the structure and operation of the model are discussed in Section 2.0 of this report.

This project focuses on railroad activity data elements for the four counties of the Dallas/Fort Worth area and eight Houston/Galveston counties. The compiled data elements are included in the Appendix of this report. Data for other counties were also incorporated into the model to provide a comprehensive assessment of locomotive emissions for the State of Texas.

It should also be noted that although the railroad companies submitted segment identification codes, these codes could not be matched to any of the publicly available Geographic Information Systems (GIS) shape files. Therefore at this time it is will not be possible to generate emission estimates at the segment level.

Initially the model was run with GTM data obtained from the Department of Transportation’s Bureau of Transportation Statistics (BTS) for all counties with line haul operations in the State. Data from the railroads for the Dallas/Fort Worth and Houston/Galveston Counties replaced the BTS data.

Table 1. Total Locomotive Contributions for the State of Texas (Annual Percentage)

| Area | CO | HC | NO_x | PM |
|--------------------|-----------|-----------|-----------------------|-----------|
| Dallas/Fort Worth | 9.11 | 10.01 | 8.93 | 9.03 |
| Houston/Galveston | 12.84 | 14.57 | 12.81 | 12.68 |
| All Other Counties | 78.05 | 75.43 | 78.26 | 78.29 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 |

In the State of Texas, locomotives are estimated to emit approximately 7,700 tons per year (21 tons per day) of carbon monoxide (CO), 3,000 tons per year (8.2 tons per day) of hydrocarbons (HC), 51,400 tons per year (140.8 tons per day) of nitrogen oxide (NO_x) and 2,000 tons per year (5.5 tons per day) of particulate matter (PM). Collectively, the Dallas/Fort Worth and Houston Galveston counties account for approximately 20% of Texas locomotive emissions, as noted in Table 1. The Houston/Galveston area is responsible for 40% to 45% more locomotive emissions than the Dallas/Fort Worth area.

Note that yard locomotive data are currently not available for counties outside the Dallas/Fort Worth and Houston/Galveston areas.

Section 3.0 of this report analyzes the complete emission estimate data set provided by the model for each county in the state of Texas. The Appendix of this memorandum explains how the railway data were incorporated into the model.

2.0 Texas Railroad Model

This Texas Railroad Emission Inventory Model is very user friendly and has been loaded with the data for all Texas counties with active rail lines. As discussed earlier, only the Dallas/Fort Worth and Houston/Galveston areas data were provided directly by the railways. All other counties were developed from the BTS GIS shape files.

The railroad model was developed to easily incorporate data provided by the railway companies for line haul and switch engine operations. The model was also designed to use general or specific data provided by the railways. As such, the model is divided into the following three major components:

- General line haul data,
- Specific line haul data, and
- Switch Data.

The opening screen of the model is shown in Figure 1.

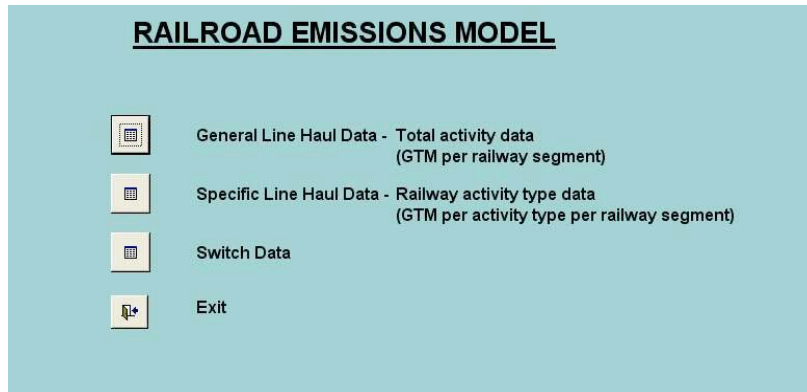


Figure 1. Opening Screen.

2.1 Line Haul Operations

The model structure considers line haul and switcher locomotives as two separate components. For line haul operations, the following input data tables were developed:

- Activity tables,
- Emission factor table,
- Fleet composition, and
- Source Classification Codes (SCC) linkage.

The model generates the following output data tables:

- Emissions table, and
- GIS attribute table.

The data tables and their linkages are shown in Figure 2. Note that the current model only contains the data management and emission calculation components. The GIS attribute table has not been developed at this time, as the railroad companies have not provided sufficient data to apply their segment codes to the available GIS data sets. At this time, activity and associated emissions have been spatially aggregated at the county level.

As noted above, the model has been populated with data for all counties including those that were not included in the railroad company data submittals. Emissions were estimated for these additional counties based on the GTM rating of each railway segment included in the BTS shape files. The GTM data obtained from the BTS provides a range of values for each railway segment. For this model the mid-point of the range was used and applied to the gallon of fuel/GTM factors developed from the data provided by the railway companies. These fuel usage estimates were applied to available EPA emission factors to estimate emissions for each segment. GIS tools were used to aggregate the emissions for each segment by county.

Where the railroads provided county-level activity data, these data were used to replace the BTS activity data. The data provided for Dallas/Fort Worth and Houston/Galveston by the railway companies accounted for 29,985,017,751 (30.0 billion) GTM and replaced 26,648,781,806 (26.6 billion) GTM estimated from the BTS data for these counties.

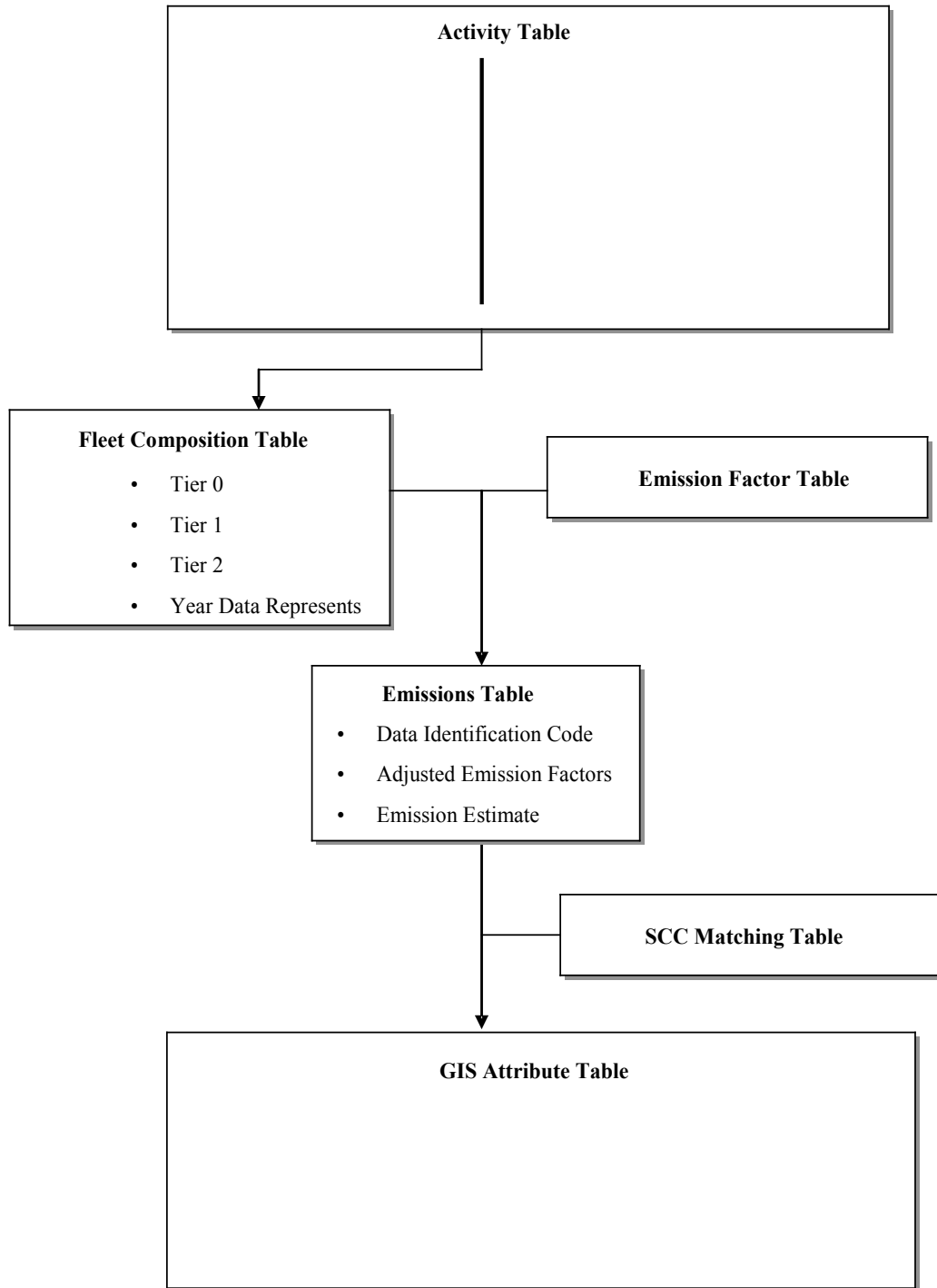


Figure 2. Line Haul Components of Railroad Model

Two different activity tables were developed for the model to allow for the inclusion of general and specific train type data. The general line haul data section has been developed to incorporate data that reflects total activity per railway segment, regardless of railway traffic type. The specific line haul data section has been developed to manage data by railroad activity type and railway segment as listed in Table 2.

Table 2. Locomotive Activity Codes

| Locomotive Activity Code | Locomotive Activity Description |
|---------------------------------|---------------------------------------------------|
| A | Amtrak |
| B | Baretable Intermodal |
| C | Loaded Unit Coal |
| D | Lite Engine |
| E | Empty Unit Coal |
| F | Foreign Railroad Trains NSF |
| G | Loaded Unit Grain |
| H | Manifest (High Priority) |
| I | Deadhead Crew Moves |
| J | Not Used |
| K | Helper Service |
| L | Local Service |
| M | Manifest (Normal Priority) |
| N | Hours of Service Relief Crews |
| O | Officer Specials |
| P | Intermodal Premium |
| Q | Intermodal Guarantee |
| R | Road Switcher Service |
| S | Intermodal D-Stack |
| T | Transfer Service (Interchange Received/Delivered) |
| U | Unit (Not Grain or Coal) |
| V | Vehicle (Auto) |
| W | Work Train |
| X | Empty Unit Grain |
| Y | Yard Engines |
| Z | Priority Ups Intermodal |

In each component, the model gives the user the opportunity to add or edit activity data by segment. For the general activity table, the data fields included the following:

- Data identification code (Primary Key),
- Railway company,

- Calendar year of activity,
- Train count,
- Fuel usage rate (gal/1000 GTM),
- Segment identification code, and
- GTM per segment.

These data fields are shown in Figure 3. For the general line haul data, the train type is set at GENERIC and the train type code is set at AA.

RAILROAD EMISSIONS MODEL - GENERAL LINE HAUL DATA

| | | | |
|-----------------|-------------------------|------------------|------------------|
| Railway Company | Union Pacific | Data ID Code | UP1 |
| Data Year | 2003 | Segment ID Code | BrAN1640SIMN |
| Fuel Usage Rate | 0.000001305 GAL/1000GTM | Fuel Usage (GAL) | 923796.450000001 |
| Train Type | GENERIC | Train Type Code | AA |
| Train Count | 15.7 | | |
| GTM | 707890000.000001 | | |
| GTM/GAL | 766.283524904215 | | |

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View/Edit Fleet Composition Calculate Emissions Go to Previous Menu

Figure 3. General Line Haul Data Form.

For railway companies that provided more specific data, the following activity data were incorporated into the model:

- Data identification code (Primary key),
- Railway company,
- Calendar year of activity,
- Segment identification code,
- Railway activity type code,
- Fuel usage rate (gal/1000 GTM) by railway activity type and segment, and
- GTM by activity type and segment.

The *Specific Line Haul Data Form* (as noted in Figure 4) is similar to the *General Line Haul Data Form*, except that the train type can be set to any of the types noted in Table 1. The train type code is automatically set when the train type is selected.

RAILROAD EMISSIONS MODEL - SPECIFIC LINE HAUL DATA

| | | | |
|-----------------|---------------------------------------------------------------|------------------|-----------------------------------------------|
| Railway Company | <input type="text" value="BNSF"/> | Data ID Code | <input type="text" value="BNSF1"/> |
| Data Year | <input type="text" value="2004"/> | Segment ID Code | <input type="text" value="Conroe1"/> |
| Fuel Usage Rate | <input type="text" value="5.81221908276761E-07"/> GAL/1000GTM | Fuel Usage (GAL) | <input type="text" value="2669.42894736842"/> |
| Train Type | <input type="text" value="LITE ENGINE"/> | Train Type Code | <input type="text" value="D"/> |
| Train Count | <input type="text" value="7"/> | | |
| GTM | <input type="text" value="4592787.89969032"/> | | |
| GTM/GAL | <input type="text" value="1720.51325966851"/> | | |

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Figure 4. Specific Line Haul Data Form.

The user can also enter or edit the fleet composition for any railroad company in the data set. Figure 5 shows some example line haul fleet compositions. The fleet composition values are presented as fractions that sum to 1. Tier 0 locomotives are those that have been constructed or rebuilt prior to 2001; Tier 1 locomotives are those that have been constructed or rebuilt between 2001 and 2004; and Tier 2 locomotives are those that have been constructed or rebuilt since 2004. These fractions can vary from year to year as new locomotives are added to the railway roster and older locomotives are removed from service. To allow for backcasting and forecasting of locomotive emission estimates, the year associated with the Tier split must also be provided. The model is also being modified to allow for the inclusion of hybrid engines and engines powered by liquid natural gas and other alternative and reformulated fuels.

RAILROAD EMISSIONS MODEL - LINE HAUL FLEET COMPOSITION

| | RailwayCompany | DataYear | Tier0 | Tier1 | Tier2 |
|---|----------------|----------|-------|-------|-------|
| ▶ | BNSF | 2004 | 0.95 | 0.05 | 0 |
| | Other | 0 | 1 | 0 | 0 |
| | Union Pacific | 2003 | 0.88 | 0.12 | 0 |
| * | | 0 | 0 | 0 | 0 |

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Figure 5. Line Haul Fleet Composition Form.

Emissions can be calculated in either the general or specific line haul components by clicking the “calculate emission” button. The emission calculations for both are derived from the reported fuel usage by segment. Where fuel usage is not provided this field is automatically calculated by dividing the reported GTM with GTM/GAL values.

The emission factors applied to the fuel usage data are presented in Table 3. These emission factors are weighted by the locomotive fleet composition for the specified calendar year prior to being applied to the fuel estimates. Any revisions made to the fuel data or the fleet composition is automatically incorporated into the emission estimates for each of the railway segments once the “calculate emissions” button is clicked.

Table 3. Locomotive Emission Factors (g/gal)

| Locomotive type | Pollutants | | | |
|-------------------------------------------------------------------------------------|------------|------|-----|-----|
| | HC | CO | NOx | PM |
| <i>Controlled emission rates for locomotives manufactured in 1973-2001 (Tier 0)</i> | | | | |
| Line Haul | 10 | 26.6 | 178 | 6.7 |
| Switch | 21 | 38.1 | 262 | 9.2 |
| <i>Controlled emission rates for locomotives manufactured in 2002-2004 (Tier 1)</i> | | | | |
| Line Haul | 9.8 | 26.6 | 139 | 6.7 |
| Switch | 21 | 38.1 | 202 | 9.2 |
| <i>Controlled emission rates for locomotives manufactured after 2004 (Tier 2)</i> | | | | |
| Line Haul | 5.4 | 5.0 | 103 | 3.6 |
| Switch | 11 | 7.3 | 152 | 4.3 |

U.S. EPA Emission Factors for Locomotives – Table 9: Fleet Average Emission Factors for all Locomotives BPR 420-F-97-051, 1997.

The emissions screen provides two views of the calculated emissions: first, emissions are presented by segment including the adjusted emission factors used in the estimate or alternatively, emissions are presented as pollutant totals for each railway segment. An example emission table by railway segment code is presented in Figure 6. This table shows the adjusted emission factor used as noted above. Figure 7 provides an example emission table by pollutant.

RAILROAD EMISSIONS MODEL - GENERAL LINE HAUL EMISSIONS

| Emissions by Data ID | | Emissions by Pollutant | | | |
|----------------------|--------------|------------------------|--------------------------|-----------|------------------|
| Railway Company | Data ID Code | Segment ID Code | Adjusted Emission Factor | Pollutant | Emissions |
| Union Pacific | UP1 | BrAN1640SIMN | 0.05864 | CO | 54171.4238280001 |
| Union Pacific | UP1 | BrAN1640SIMN | 0.0219972 | HC | 20320.93526994 |
| Union Pacific | UP1 | BrAN1640SIMN | 0.3821024 | NOX | 352984.84065648 |
| Union Pacific | UP1 | BrAN1640SIMN | 0.01477 | PM | 13644.4735665 |
| Union Pacific | UP10 | GaAN1650SIMN | 0.05864 | CO | 2892.65255999993 |
| Union Pacific | UP10 | GaAN1650SIMN | 0.0219972 | HC | 1085.09987879997 |
| Union Pacific | UP10 | GaAN1650SIMN | 0.3821024 | NOX | 18848.7292895995 |
| Union Pacific | UP10 | GaAN1650SIMN | 0.01477 | PM | 728.589329999982 |
| Union Pacific | UP11 | GaGA1205SIMN | 0.05864 | CO | 13499.04528 |
| Union Pacific | UP11 | GaGA1205SIMN | 0.0219972 | HC | 5063.7994344 |
| Union Pacific | UP11 | GaGA1205SIMN | 0.3821024 | NOX | 87960.7366848 |
| Union Pacific | UP11 | GaGA1205SIMN | 0.01477 | PM | 3400.08354 |
| Union Pacific | UP12 | GaGA1206SIMN | 0.05864 | CO | 1561.11408 |
| Union Pacific | UP12 | GaGA1206SIMN | 0.0219972 | HC | 585.6094584 |
| Union Pacific | UP12 | GaGA1206SIMN | 0.3821024 | NOX | 10172.3300928 |
| Union Pacific | UP12 | GaGA1206SIMN | 0.01477 | PM | 393.20694 |
| Union Pacific | UP13 | GaGA1207SIMN | 0.05864 | CO | 2900.30508 |
| Union Pacific | UP13 | GaGA1207SIMN | 0.0219972 | HC | 1087.9705134 |
| Union Pacific | UP13 | GaGA1207SIMN | 0.3821024 | NOX | 18898.5936528 |
| Union Pacific | UP13 | GaGA1207SIMN | 0.01477 | PM | 730.516815 |
| Union Pacific | UP14 | HaBA1230SIMN | 0.05864 | CO | 405.58356 |
| Union Pacific | UP14 | HaBA1230SIMN | 0.0219972 | HC | 152.1436338 |
| Union Pacific | UP14 | HaBA1230SIMN | 0.3821024 | NOX | 2642.8112496 |
| Union Pacific | UP14 | HaBA1230SIMN | 0.01477 | PM | 102.156705 |
| Union Pacific | UP15 | HaBA1233SIMN | 0.05864 | CO | 8658.82638 |
| Union Pacific | UP15 | HaBA1233SIMN | 0.0219972 | HC | 3248.1230499 |

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Figure 6. Emission Estimate Table by Data ID Code.

RAILROAD EMISSIONS MODEL - SPECIFIC LINE HAUL EMISSIONS

| Emissions by Data ID | | Emissions by Pollutant | | | | |
|----------------------|--------------|------------------------|-------------------------|------------------|------------------|------------------|
| Railway Company | Data ID Code | Segment ID Code | Total Of Emissions(LBS) | CO | HC | NOX |
| BNSF | BNSF1 | Conroe1 | 1290.82639236053 | 156.535313473684 | 58.8021808526316 | 1036.06143248158 |
| BNSF | BNSF10 | Conroe1 | 39727.756763 | 4817.68648 | 1809.754396 | 31886.856997 |
| BNSF | BNSF11 | Conroe1 | 79.787235 | 9.6756 | 3.63462 | 64.039965 |
| BNSF | BNSF12 | Conroe1 | 3941.489409 | 477.97464 | 179.550228 | 3163.574271 |
| BNSF | BNSF2 | Conroe1 | 8588.00784 | 1041.4464 | 391.21728 | 8893.02896 |
| BNSF | BNSF3 | Conroe1 | 92069.8696531434 | 11165.0846255789 | 4194.14195314211 | 73898.4278643303 |
| BNSF | BNSF39 | Galv1 | 2101.547414 | 254.84944 | 95.733688 | 1686.773866 |
| BNSF | BNSF4 | Conroe1 | 11818.665519 | 1433.22024 | 538.386348 | 9486.065361 |
| BNSF | BNSF40 | Galv1 | 52147.600823693 | 6323.81014995349 | 2375.52677324651 | 41855.4488269116 |
| BNSF | BNSF41 | Galv1 | 477.000590493023 | 57.8446779534884 | 21.7292388465116 | 382.856996111628 |
| BNSF | BNSF42 | Galv1 | 33683.4649357116 | 4084.71020874419 | 1534.41330965581 | 27035.501550614 |
| BNSF | BNSF43 | Galv1 | 89928.8211832 | 10784.177472 | 4051.0549344 | 71377.3148808 |
| BNSF | BNSF44 | Galv1 | 52879.1603664558 | 6412.52456037209 | 2408.85216602791 | 42442.623548707 |
| BNSF | BNSF45 | Galv1 | 39098.162945 | 4741.3372 | 1781.07394 | 31381.523455 |
| BNSF | BNSF46 | Galv1 | 68710.8865246791 | 8332.39870586047 | 3130.04909093954 | 55149.7086991349 |
| BNSF | BNSF47 | Galv1 | 85.106384 | 10.32064 | 3.876928 | 68.309296 |
| BNSF | BNSF48 | Galv1 | 34320.2851493721 | 4161.93581581395 | 1563.42295618605 | 27546.6352450465 |
| BNSF | BNSF49 | Galv1 | 336.557064 | 40.81344 | 15.331488 | 270.132216 |
| BNSF | BNSF5 | Conroe1 | 95226.6821464868 | 11547.9034431579 | 4337.94708468421 | 76432.1935924605 |
| BNSF | BNSF50 | Galv1 | 23775.1341074419 | 2883.15151627907 | 1083.05016372093 | 19082.7361809302 |
| BNSF | BNSF51 | Galv1 | 63442.7743667395 | 7693.54781693023 | 2890.06601826977 | 50921.3416141674 |
| BNSF | BNSF52 | Galv1 | 19285.8848070233 | 2338.75139348837 | 878.547334511628 | 15479.5110776279 |
| BNSF | BNSF53 | Galv1 | 43794.6049068047 | 5310.86306269767 | 1995.01520370233 | 35151.0484781256 |
| BNSF | BNSF54 | Houston1 | 104.448744 | 12.66624 | 4.758048 | 83.834136 |
| BNSF | BNSF55 | Houston1 | 5154.255381 | 625.04376 | 234.796452 | 4136.981739 |
| BNSF | BNSF56 | Houston1 | 72.53385 | 8.796 | 3.3042 | 58.21815 |

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Figure 7. Emission Estimate by Pollutant.

2.2 Yard/Switcher Engine Operations

For yard locomotives, many of the procedures discussed for line haul locomotive are applicable. As with line haul operations, the following input data tables were developed:

- Activity tables,
- Emission factor table,
- Fleet composition, and
- SCC linkage.

The model generates the following tables:

- Emissions table, and
- GIS attribute table.

The data tables and their linkages are shown in Figure 8.

Unlike the line haul component that allows for the inclusion of general or detailed railroad data, only one activity table is required for switch locomotives. The following data elements are required to run the model for switch locomotive activities:

- Data identification code (Primary key),
- Railway company,
- Calendar year of activity,
- Yard identification code,
- Number of locomotives,
- Average annual hours of operation per locomotive, and
- Latitude and longitude coordinates of the centroid of the yard.

These data elements are shown in *Switch Data Form* (Figure 9).

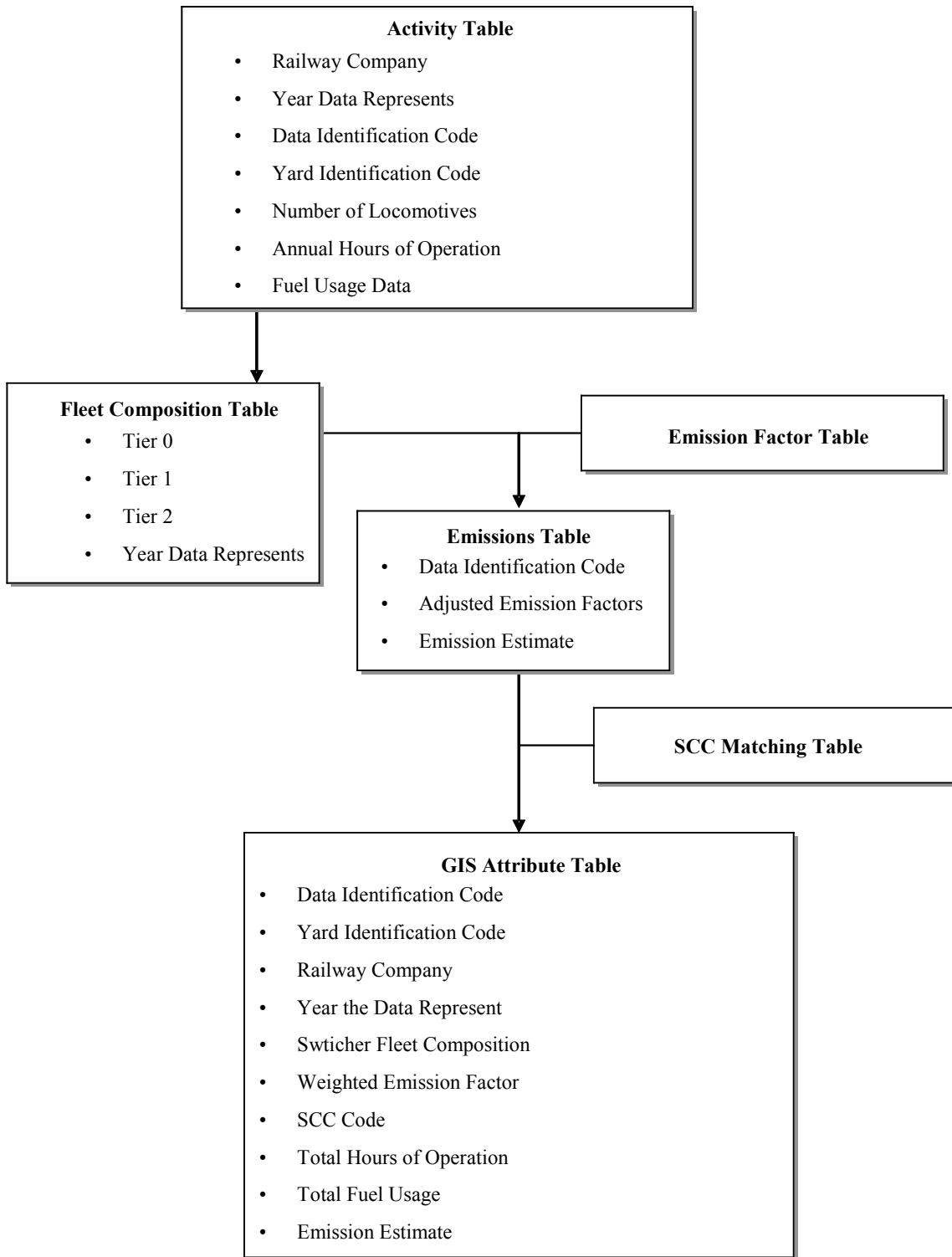


Figure 8. Switch Locomotive Components of Railroad Model

RAILROAD EMISSIONS MODEL - SWITCH DATA

| | | | |
|---------------------------|------------------------------------|--------------|---------------------------------------|
| Railway Company | <input type="text" value="BNSF"/> | Data ID Code | <input type="text" value="BNSF1000"/> |
| Data Year | <input type="text"/> | Yard ID Code | <input type="text" value="Alvin1"/> |
| City | <input type="text" value="Alvin"/> | Longitude | <input type="text"/> |
| Train Count | <input type="text" value="1"/> | Latitude | <input type="text"/> |
| Fuel Usage (GAL) | <input type="text" value="82490"/> | | |
| Annual Hours of Operation | <input type="text" value="8760"/> | | |

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Figure 9. Switch Data Form.

Currently, there is only one SCC for yard locomotives (i.e., 2285002010). This code was assigned to all switch locomotive emissions estimates.

As with the line-haul emission factor table, the switcher emission factor table included the emission factors noted in Table 2 above in pounds of pollutant per gallon of fuel used. The switch engine emission estimates were developed by adjusting the emission factors to account for the fleet mix of the switch engines.

Where the composition of the switcher fleet has been affected by State grant programs such as TERP, the vehicle fleet was modified to reflect these improvements. Figure 10 shows the ***Switch Engine Fleet Composition Form***. As with the line haul operations, the switcher fleet composition values are presented as fractions that sum to 1 and can vary from year to year as new switch engines are added and older engines are taken out of service.

RAILROAD EMISSIONS MODEL - SWITCH FLEET COMPOSITION

| RailwayCompany | DataYear | Tier0 | Tier1 | Tier2 |
|---------------------------|----------|-------|-------|-------|
| BNSF | 0 | 1 | 0 | 0 |
| CANAC | 0 | 1 | 0 | 0 |
| Farmland AMD | 0 | 1 | 0 | 0 |
| Galveston Railroad | 0 | 1 | 0 | 0 |
| KCS/Texas-Mexico | 0 | 1 | 0 | 0 |
| Port Terminal Rail Assoc. | 2003 | 1 | 0 | 0 |
| Rail Link | 0 | 1 | 0 | 0 |
| Texas City Terminal | 0 | 1 | 0 | 0 |
| Trans Global | 0 | 1 | 0 | 0 |

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Figure 10. Switch Engine Fleet Composition Form.

The emissions calculations were derived for each yard using the fuel usage values provided by the railways. If fuel usage was not provided, the fuel usage was based on hours of operation multiplied by the number of switch engines operating at the yard. For these calculations it is assumed that 1 engine consumed 9.375 gallons of diesel fuel per hour. (U.S. EPA Procedures for Emission Inventory Preparations, Volume IV Mobile Source, EPA 420-R-92-009, 1992)

As with the line haul operations, emission summary tables are generated by yard and pollutant as shown in Figure 11.

RAILROAD EMISSIONS MODEL - SWITCH EMISSIONS

| Emissions by Data ID | | Emissions by Pollutant | | | | |
|----------------------|------------|------------------------|---------------------|-----------|----------------|--|
| DataIDCode | YardIDCode | City | AdjustedEF(LBS/GAL) | Pollutant | Emissions(LBS) | |
| ▶ BNSF1000 | Alvin1 | Alvin | 0.084 | CO | 6929.16 | |
| BNSF1000 | Alvin1 | Alvin | 0.0463 | HC | 3819.287 | |
| BNSF1000 | Alvin1 | Alvin | 0.57761 | NOX | 47647.0489 | |
| BNSF1000 | Alvin1 | Alvin | 0.02028 | PM | 1672.8972 | |
| BNSF1001 | Casey1 | Casey | 0.084 | CO | 27716.64 | |
| BNSF1001 | Casey1 | Casey | 0.0463 | HC | 15277.148 | |
| BNSF1001 | Casey1 | Casey | 0.57761 | NOX | 190588.1956 | |
| BNSF1001 | Casey1 | Casey | 0.02028 | PM | 6691.5888 | |
| BNSF1002 | Dayton1 | Dayton | 0.084 | CO | 27716.64 | |
| BNSF1002 | Dayton1 | Dayton | 0.0463 | HC | 15277.148 | |
| BNSF1002 | Dayton1 | Dayton | 0.57761 | NOX | 190588.1956 | |
| BNSF1002 | Dayton1 | Dayton | 0.02028 | PM | 6691.5888 | |
| BNSF1003 | Galveston1 | Galveston | 0.084 | CO | 34645.8 | |
| BNSF1003 | Galveston1 | Galveston | 0.0463 | HC | 19096.435 | |
| BNSF1003 | Galveston1 | Galveston | 0.57761 | NOX | 238235.2445 | |
| BNSF1003 | Galveston1 | Galveston | 0.02028 | PM | 8364.486 | |
| BNSF1004 | Houston1 | Houston | 0.084 | CO | 194016.48 | |
| BNSF1004 | Houston1 | Houston | 0.0463 | HC | 106940.036 | |
| BNSF1004 | Houston1 | Houston | 0.57761 | NOX | 1334117.3692 | |
| BNSF1004 | Houston1 | Houston | 0.02028 | PM | 46841.1216 | |
| BNSF1005 | Pearland1 | Pearland | 0.084 | CO | 55433.28 | |
| BNSF1005 | Pearland1 | Pearland | 0.0463 | HC | 30554.296 | |
| BNSF1005 | Pearland1 | Pearland | 0.57761 | NOX | 381176.3912 | |
| BNSF1005 | Pearland1 | Pearland | 0.02028 | PM | 13383.1776 | |
| CANA1000 | Pasadena1 | Pasadena | 0.084 | CO | 12096 | |
| CANA1000 | Pasadena1 | Pasadena | 0.0463 | HC | 6667.2 | |
| CANA1000 | Pasadena1 | Pasadena | 0.57761 | NOX | 83175.84 | |

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Figure 11. Emission Estimate Table by Data ID Code.

3.0 Emission Summary

Locomotives are estimated to emit approximately 7,700 tons per year of CO; 3,000 tons per year of HC; 51,400 tons per year of NO_x and 2,000 tons per year of PM in the State of Texas (for details see Table 4). These emissions are underestimated relative to actual railway emissions since they include yard locomotives from Dallas/Fort Worth and Houston/Galveston, only. If yard locomotives were included for all other counties then the actual state total locomotive emissions would be greater than reported in these estimates. Emission estimates are provided at the end of this section in Table 11 for counties not included in the Dallas/Fort Worth and Houston/Galveston areas. Collectively, the Dallas/Fort Worth and Houston Galveston area counties account for approximately 20% of Texas locomotive emissions. The Houston/Galveston area emits 40% to 45% more locomotive emissions than the Dallas/For Worth area.

Table 4. Total Locomotive Emissions for the State of Texas (tons per year)

| Area | CO | HC | NO _x | PM |
|--------------------|-----------------|-----------------|------------------|-----------------|
| Dallas/Fort Worth | 701.93 | 300.00 | 4,590.59 | 174.63 |
| Houston/Galveston | 989.08 | 436.62 | 6,586.08 | 245.24 |
| All Other Counties | 6,012.06 | 2,260.68 | 40,232.85 | 1,514.29 |
| TOTAL | 7,703.08 | 2,997.30 | 51,409.52 | 1,934.16 |

Given that UP provided only general activity data, the emission estimates provided in Table 5 reflect their line haul estimates in the Dallas/Fort Worth areas. In general UP had roughly 3.7 times more emissions than BNSF for the Dallas/Fort Worth and Houston/Galveston counties. Harris County represents about half of the emissions for the Houston/Galveston Counties. Approximately 70% more of UP's traffic occurs in the Houston/ Galveston area than in the Dallas/Fort Worth area.

Table 5. General Line Haul Emission Estimates for Dallas/Fort Worth and Houston/Galveston Counties (tons per year)

| County | CO | HC | NO _x | PM |
|-------------------|--------|--------|-----------------|--------|
| Dallas/Fort Worth | | | | |
| Dallas | 58.55 | 21.96 | 381.49 | 14.75 |
| Denton | 76.09 | 28.54 | 495.79 | 19.16 |
| Tarrant | 191.67 | 71.90 | 1,248.95 | 48.28 |
| DFW Total | 326.31 | 122.50 | 2,126.23 | 82.19 |
| Houston Galveston | | | | |
| Brazoria | 66.27 | 24.86 | 431.80 | 16.69 |
| Chambers | 1.59 | 0.60 | 10.34 | 0.40 |
| Fort Bend | 63.84 | 23.95 | 416.01 | 16.08 |
| Galveston | 10.43 | 3.91 | 67.94 | 2.63 |
| Harris | 255.42 | 95.81 | 1,664.34 | 64.33 |
| Liberty | 83.43 | 31.30 | 543.61 | 21.01 |
| Montgomery | 60.14 | 22.56 | 391.85 | 15.15 |
| Waller | 7.49 | 2.81 | 48.81 | 1.89 |
| HGA Total | 548.61 | 205.80 | 3,574.70 | 138.18 |
| DFW and HGA Total | 874.92 | 328.30 | 5,700.93 | 220.37 |

Unlike UP, BNSF had 2.5 times more traffic in the Dallas/Fort Worth area than in the Houston Galveston area, (see Table 6 for details). This difference between the two areas may be due to the fact that BNSF's corporate headquarters is in Tarrant County., which had an order of magnitude more emissions than the next most significant Dallas/Fort Worth County.

Table 6. Specific Line Haul Emission Estimates for Dallas/Fort Worth and Houston/Galveston Counties (tons per year)

| County | CO | HC | NO _x | PM |
|-------------------|--------|-------|-----------------|-------|
| Dallas/Fort Worth | | | | |
| Collin | 12.09 | 4.54 | 80.00 | 3.04 |
| Dallas | 2.21 | 0.83 | 14.60 | 0.56 |
| Tarrant | 154.03 | 57.86 | 1,019.46 | 38.80 |
| DFW Total | 168.32 | 63.23 | 1,114.05 | 42.40 |
| Houston Galveston | | | | |
| Galveston | 31.72 | 11.91 | 209.92 | 7.99 |
| Harris | 20.75 | 7.79 | 137.32 | 5.23 |
| Montgomery | 15.66 | 5.88 | 103.66 | 3.94 |
| HGA Total | 68.12 | 25.59 | 450.90 | 17.16 |
| DFW and HGA Total | 236.44 | 88.82 | 1,564.95 | 59.55 |

One of the most surprising results from the modeled estimates is the extent to which switch engines and yard locomotives contribute to railway emissions. Yard locomotives continue to generate emissions throughout the year, while line haul locomotives only contribute emissions to a location during the brief period they transit an area. Yard locomotives accounted for between 34% and 43% (depending upon the pollutant) of the locomotive emissions in the Dallas/Fort Worth and Houston/Galveston counties. Most of the switch engine and yard locomotive emissions occur in the Houston/Galveston area (see Table 7 for details).

Table 7. Switch Engine Emission Estimates for Dallas/Fort Worth and Houston/Galveston Counties (tons per year)

| | CO | HC | NO _x | PM |
|-------------------|--------|--------|-----------------|--------|
| Dallas/Fort Worth | | | | |
| Dallas | 98.50 | 54.29 | 654.28 | 23.78 |
| Denton | 4.85 | 2.67 | 33.36 | 1.17 |
| Tarrant | 103.96 | 57.30 | 662.67 | 25.10 |
| DFW Total | 207.31 | 114.27 | 1,350.31 | 50.05 |
| Houston Galveston | | | | |
| Brazoria | 31.18 | 17.19 | 214.41 | 7.53 |
| Galveston | 32.82 | 18.09 | 225.68 | 7.92 |
| Harris | 294.50 | 162.33 | 2,025.09 | 71.10 |
| Liberty | 13.86 | 7.64 | 95.29 | 3.35 |
| HGA Total | 372.36 | 205.24 | 2,560.48 | 89.90 |
| DFW and HGA Total | 579.67 | 319.51 | 3,910.79 | 139.95 |

Table 8 presents the line haul locomotive emission estimates for the remaining 207 Texas counties having railroad traffic. These estimates are based on the average GTM data provided by the BTS.

The following nine counties all had slightly elevated emission estimates (HC >35 tpy, CO >100 tpy, PM >25 tpy, and NO_x>670 tpy). These higher estimates are considered reasonable as major rail lines intersect in these nine counties, as noted in Figure 12.

| | | |
|--------|----------|-----------|
| Bell | Hemphill | Parmer |
| Bexar | McLennan | Potter |
| Carson | Milam | Robertson |

More detailed data from the railroad companies for these additional counties would allow for a more accurate emission estimate and a reduction in the uncertainty associated with these estimates.

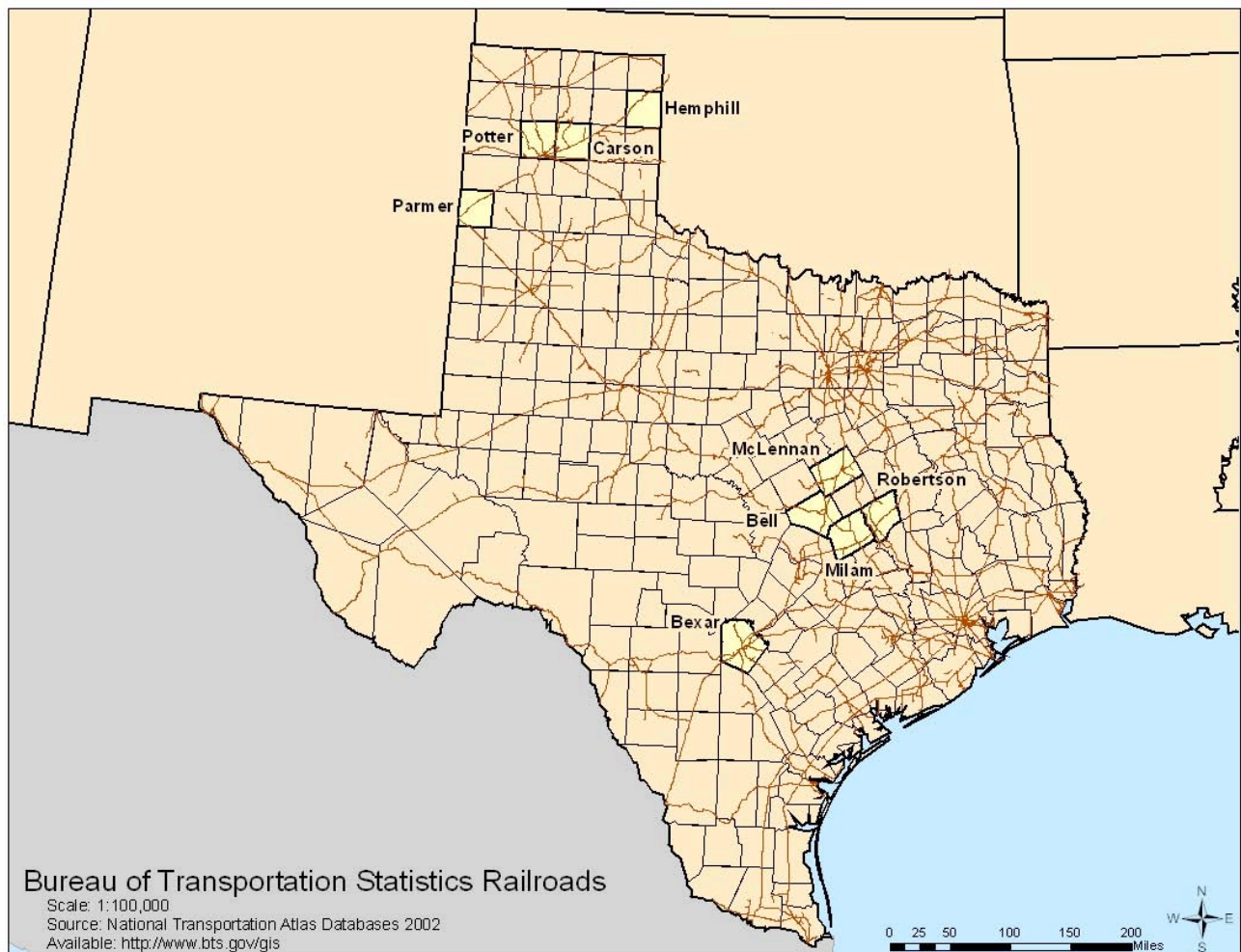


Figure 12. Texas Railroad Map with Additional High Traffic Counties Highlighted

4.0 Comparisons to External Studies

These findings can be converted to “tons per average ozone season weekday” measure to compare to other emission inventories in the State Implementation Plan (SIP). The Federal Clean Air Act Amendments of 1990 required a new baseline for SIP emission inventories, including non-road mobile sources such as locomotive engines. This base year inventory was to be updated in 1996 and every three years thereafter. A survey was conducted to support the 1990 Base Year Emissions Inventory but the response rate was low and many railway companies declined to participate. This inventory was assembled as best as practicable and subsequently was approved as part of the SIP. Due to lack of information about locomotive growth potentials, the 1996 Periodic Emissions Inventory (PEI) was reflective of the 1990 baseline, without any significant changes. The three PEIs included in the analysis for this report include:

- 1996 inventory performed by TCEQ (same as 1990 baseline).
- 1999 update: locomotive emissions appear to have been extracted from a report done by ENVIRON in which a fuel sales method was applied to railroad track miles.
- 2002 update: this was prepared by ERG and used 2001 survey data from BNSF and UP for all Texas counties; some data was available from KCS and one yard switch operator (PTRA). (TCEQ, 2002, ‘Locomotive Emissions Inventory: Update and Discussion’, Version 1.2, prepared by ERG, August 30, 2002)

As is shown in the tables below, each approach resulted in overall emissions that were not consistent over time. Results from the current study confirm the need to recalculate the baseline locomotive emissions inventory so that past, present, and future emissions may somehow be adjusted to show a more consistent trend, as expected. In addition to the three official PEI sources and this report, we have also included summary locomotive emissions from the ozone SIPs (i.e., “Modeling EI”) we have also included summary locomotive emissions from the modeling inventories developed for the Houston and Dallas/Fort Worth ozone SIPs.

The Houston area, which includes eight counties has the most severe ozone problem in Texas and has been studied far more extensively as to its emissions inventory, and thus is listed first. The Dallas area is comprised of the central four counties in the Metro region. The Beaumont-Port Arthur area is also a serious ozone nonattainment area but was not included in this scope of work. Units are expressed in terms of tons per average ozone season weekday (June-August).

Table 8. Locomotive Emissions in the Houston Nonattainment Region by Scenario, Tons per Day

| Scenario | CO | VOC | NO_x |
|--------------------|-------------|-------------|-----------------------|
| 1996 PEI | 3.36 | 1.36 | 22.19 |
| 1999 PEI | 5.18 | 2.09 | 52.74 |
| 2002 PEI | 1.93 | 0.75 | 18.53 |
| Modeling EI (2000) | n/a | 1.47 | 35.94 |
| This Report | <i>3.66</i> | <i>1.62</i> | <i>24.39</i> |

Table 9. Locomotive Emissions in the Dallas Nonattainment Region by Scenario, Tons per Day

| Scenario | CO | VOC | NO_x |
|--------------------|-----------|------------|-----------------------|
| 1996 PEI | 1.49 | 0.64 | 10.48 |
| 1999 PEI | 3.81 | 1.55 | 38.65 |
| 2002 PEI | 1.68 | 0.65 | 16.29 |
| Modeling EI (2000) | n/a | 0.93 | 22.90 |
| This Report | 2.60 | 1.11 | 17.00 |

Tables 8 and 9 show that the 1999 PEI is the highest, possibly due to the fact that many railroad companies purchase diesel fuel in Texas but use it elsewhere (e.g., BNSF is based in Fort Worth but ships locomotive diesel all over the country). In all other inventories, except for the modeling inventories, used a gross ton-mile (GTM) method for line haul locomotives and switch yard activity as opposed to Department of Energy sales data. Adjustments may have been made to the temporal and spatial allocation of the modeling EIs causing these estimates to be different from the other inventories, but still within the range of the 1999 and 2002 PEIs for VOC and NO_x.

One condition to note is that over time, locomotive emissions should have trends that reflect (1) activity growth and (2) reductions due to cleaner technology such as from the EPA Locomotive Rule (See <http://www.epa.gov/otaq/locomotv.htm>) and state initiatives such as the Texas Emission Reduction Plan (See <http://www.tnrcc.state.tx.us/oprd/sips/terp.html>).

An additional study was compared to insure the reasonableness of this studies results. CENRAP commissioned an “Emission Inventory Development for Mobile Sources and Agricultural Dust Sources for the Central States” (October 2004). Results for this study are between 10 and 25 percent less than the CENRAP study which is understandable as the CENRAP study was derived from fuel sales data which tends to overestimate emissions as fuel sold in a given area may not necessarily be combusted in the same area.

Table 10. CENRAP Texas Locomotive Study (tons per year)

| Study | CO | VOC | NO_x | PM |
|--------------|-----------|------------|-----------------------|-----------|
| CENRAP | 9,489 | 3,753 | 68,236 | 2,149 |
| This Report | 7,703 | 2,997 | 51,140 | 1,934 |
| % Difference | 18% | 20% | 25% | 10% |

**Table 11. Line Haul Locomotive Emission Estimates for Texas Counties (tons per year)
(excluding Dallas/Fort Worth and Houston/Galveston Areas)**

| FIPS | County Name | CO | HC | NO_x | PM |
|-------------|--------------------|-----------|-----------|-----------------------|-----------|
| 001 | Anderson | 43.84 | 16.49 | 293.40 | 11.04 |
| 005 | Angelina | 11.64 | 4.38 | 77.87 | 2.93 |
| 007 | Aransas | 0.61 | 0.23 | 4.09 | 0.15 |
| 009 | Archer | 0.03 | 0.01 | 0.20 | 0.01 |
| 011 | Armstrong | 45.77 | 17.21 | 306.29 | 11.53 |
| 013 | Atascosa | 11.24 | 4.23 | 75.25 | 2.83 |
| 015 | Austin | 69.86 | 26.27 | 467.49 | 17.60 |
| 017 | Bailey | 16.15 | 6.07 | 108.04 | 4.07 |
| 021 | Bastrop | 50.02 | 18.81 | 334.72 | 12.60 |
| 023 | Baylor | 0.05 | 0.02 | 0.35 | 0.01 |
| 025 | Bee | 0.10 | 0.04 | 0.66 | 0.02 |
| 027 | Bell | 108.28 | 40.72 | 724.60 | 27.27 |
| 029 | Bexar | 124.87 | 46.95 | 835.61 | 31.45 |
| 035 | Bosque | 58.15 | 21.86 | 389.12 | 14.65 |
| 037 | Bowie | 69.83 | 26.26 | 467.30 | 17.59 |
| 041 | Brazos | 45.51 | 17.11 | 304.56 | 11.46 |
| 043 | Brewster | 40.45 | 15.21 | 270.67 | 10.19 |
| 045 | Briscoe | 0.02 | 0.01 | 0.12 | 0.00 |
| 047 | Brooks | 0.05 | 0.02 | 0.35 | 0.01 |
| 049 | Brown | 25.93 | 9.75 | 173.53 | 6.53 |
| 051 | Burleson | 98.01 | 36.86 | 655.91 | 24.69 |
| 053 | Burnet | 0.06 | 0.02 | 0.41 | 0.02 |
| 055 | Caldwell | 33.77 | 12.70 | 225.99 | 8.51 |
| 057 | Calhoun | 1.65 | 0.62 | 11.04 | 0.42 |
| 059 | Callahan | 28.21 | 10.61 | 188.76 | 7.10 |
| 061 | Cameron | 20.56 | 7.73 | 137.61 | 5.18 |
| 063 | Camp | 18.33 | 6.89 | 122.65 | 4.62 |
| 065 | Carson | 105.66 | 39.73 | 707.09 | 26.61 |
| 067 | Cass | 75.50 | 28.39 | 505.28 | 19.02 |
| 069 | Castro | 9.78 | 3.68 | 65.48 | 2.46 |
| 073 | Cherokee | 44.22 | 16.63 | 295.93 | 11.14 |
| 075 | Childress | 43.91 | 16.51 | 293.84 | 11.06 |
| 077 | Clay | 49.38 | 18.57 | 330.42 | 12.44 |
| 079 | Cochran | 0.04 | 0.01 | 0.24 | 0.01 |
| 081 | Coke | 0.04 | 0.02 | 0.29 | 0.01 |
| 083 | Coleman | 39.51 | 14.86 | 264.38 | 9.95 |
| 087 | Collingsworth | 1.05 | 0.40 | 7.06 | 0.27 |
| 089 | Colorado | 57.98 | 21.80 | 387.98 | 14.60 |
| 091 | Comal | 32.99 | 12.40 | 220.75 | 8.31 |
| 093 | Comanche | 0.07 | 0.03 | 0.47 | 0.02 |

**Table 11. Line Haul Locomotive Emission Estimates for Texas Counties (tons per year)
(excluding Dallas/Fort Worth and Houston/Galveston Areas) (Continued)**

| FIPS | County Name | CO | HC | NO_x | PM |
|-------------|--------------------|-----------|-----------|-----------------------|-----------|
| 097 | Cooke | 34.20 | 12.86 | 228.84 | 8.61 |
| 099 | Coryell | 9.30 | 3.50 | 62.20 | 2.34 |
| 101 | Cottle | 0.06 | 0.02 | 0.41 | 0.02 |
| 103 | Crane | 0.50 | 0.19 | 3.33 | 0.13 |
| 105 | Crockett | 0.00 | 0.00 | 0.01 | 0.00 |
| 107 | Crosby | 0.03 | 0.01 | 0.19 | 0.01 |
| 109 | Culberson | 59.35 | 22.32 | 397.17 | 14.95 |
| 111 | Dallam | 82.25 | 30.93 | 550.39 | 20.72 |
| 115 | Dawson | 0.03 | 0.01 | 0.18 | 0.01 |
| 117 | Deaf Smith | 65.50 | 24.63 | 438.31 | 16.50 |
| 119 | Delta | 0.01 | 0.00 | 0.08 | 0.00 |
| 123 | DeWitt | 6.78 | 2.55 | 45.39 | 1.71 |
| 127 | Dimmit | 0.05 | 0.02 | 0.36 | 0.01 |
| 129 | Donley | 59.32 | 22.31 | 396.96 | 14.94 |
| 131 | Duval | 0.07 | 0.03 | 0.45 | 0.02 |
| 133 | Eastland | 28.74 | 10.81 | 192.33 | 7.24 |
| 135 | Ector | 29.20 | 10.98 | 195.38 | 7.35 |
| 141 | El Paso | 96.98 | 36.47 | 649.00 | 24.43 |
| 139 | Ellis | 18.98 | 7.14 | 127.00 | 4.78 |
| 143 | Erath | 0.07 | 0.03 | 0.45 | 0.02 |
| 145 | Falls | 43.95 | 16.53 | 294.14 | 11.07 |
| 147 | Fannin | 0.08 | 0.03 | 0.54 | 0.02 |
| 149 | Fayette | 81.01 | 30.46 | 542.12 | 20.40 |
| 151 | Fisher | 17.39 | 6.54 | 116.39 | 4.38 |
| 153 | Floyd | 0.14 | 0.05 | 0.94 | 0.04 |
| 155 | Foard | 0.03 | 0.01 | 0.23 | 0.01 |
| 159 | Franklin | 2.26 | 0.85 | 15.13 | 0.57 |
| 161 | Freestone | 19.35 | 7.28 | 129.51 | 4.87 |
| 163 | Frio | 33.79 | 12.70 | 226.10 | 8.51 |
| 165 | Gaines | 0.01 | 0.00 | 0.06 | 0.00 |
| 169 | Garza | 39.30 | 14.78 | 263.00 | 9.90 |
| 175 | Goliad | 0.05 | 0.02 | 0.31 | 0.01 |
| 177 | Gonzales | 54.67 | 20.56 | 365.84 | 13.77 |
| 179 | Gray | 59.95 | 22.54 | 401.20 | 15.10 |
| 181 | Grayson | 73.97 | 27.81 | 494.98 | 18.63 |
| 183 | Gregg | 39.01 | 14.67 | 261.03 | 9.82 |
| 185 | Grimes | 20.58 | 7.74 | 137.71 | 5.18 |
| 187 | Guadalupe | 85.43 | 32.13 | 571.73 | 21.52 |
| 189 | Hale | 9.94 | 3.74 | 66.53 | 2.50 |
| 191 | Hall | 24.24 | 9.12 | 162.23 | 6.11 |

**Table 11. Line Haul Locomotive Emission Estimates for Texas Counties (tons per year)
(excluding Dallas/Fort Worth and Houston/Galveston Areas) (Continued)**

| FIPS | County Name | CO | HC | NO_x | PM |
|-------------|--------------------|-----------|-----------|-----------------------|-----------|
| 195 | Hansford | 0.09 | 0.03 | 0.60 | 0.02 |
| 197 | Hardeman | 47.09 | 17.71 | 315.10 | 11.86 |
| 199 | Hardin | 10.84 | 4.08 | 72.57 | 2.73 |
| 203 | Harrison | 97.18 | 36.54 | 650.34 | 24.48 |
| 205 | Hartley | 87.33 | 32.84 | 584.42 | 22.00 |
| 207 | Haskell | 0.10 | 0.04 | 0.64 | 0.02 |
| 209 | Hays | 27.67 | 10.41 | 185.18 | 6.97 |
| 211 | Hemphill | 100.12 | 37.65 | 670.02 | 25.22 |
| 213 | Henderson | 11.09 | 4.17 | 74.24 | 2.79 |
| 215 | Hidalgo | 1.62 | 0.61 | 10.82 | 0.41 |
| 217 | Hill | 91.36 | 34.35 | 611.39 | 23.01 |
| 219 | Hockley | 6.24 | 2.35 | 41.77 | 1.57 |
| 221 | Hood | 0.04 | 0.02 | 0.30 | 0.01 |
| 223 | Hopkins | 16.56 | 6.23 | 110.81 | 4.17 |
| 225 | Houston | 16.82 | 6.33 | 112.57 | 4.24 |
| 227 | Howard | 30.38 | 11.42 | 203.27 | 7.65 |
| 229 | Hudspeth | 121.03 | 45.51 | 809.94 | 30.48 |
| 231 | Hunt | 7.23 | 2.72 | 48.41 | 1.82 |
| 233 | Hutchinson | 0.05 | 0.02 | 0.32 | 0.01 |
| 235 | Irion | 0.07 | 0.02 | 0.44 | 0.02 |
| 239 | Jackson | 22.53 | 8.47 | 150.75 | 5.67 |
| 241 | Jasper | 14.91 | 5.61 | 99.78 | 3.76 |
| 243 | Jeff Davis | 30.42 | 11.44 | 203.55 | 7.66 |
| 245 | Jefferson | 43.11 | 16.21 | 288.51 | 10.86 |
| 247 | Jim Hogg | 0.02 | 0.01 | 0.14 | 0.01 |
| 249 | Jim Wells | 0.12 | 0.04 | 0.80 | 0.03 |
| 251 | Johnson | 70.01 | 26.33 | 468.53 | 17.63 |
| 253 | Jones | 0.07 | 0.03 | 0.48 | 0.02 |
| 255 | Karnes | 0.05 | 0.02 | 0.30 | 0.01 |
| 257 | Kaufman | 23.67 | 8.90 | 158.42 | 5.96 |
| 261 | Kenedy | 22.34 | 8.40 | 149.51 | 5.63 |
| 271 | Kinney | 43.48 | 16.35 | 290.99 | 10.95 |
| 273 | Kleberg | 9.54 | 3.59 | 63.83 | 2.40 |
| 275 | Knox | 0.07 | 0.03 | 0.45 | 0.02 |
| 283 | La Salle | 40.54 | 15.25 | 271.32 | 10.21 |
| 277 | Lamar | 0.10 | 0.04 | 0.66 | 0.02 |
| 279 | Lamb | 30.65 | 11.53 | 205.13 | 7.72 |
| 281 | Lampasas | 36.63 | 13.77 | 245.14 | 9.23 |
| 285 | Lavaca | 5.66 | 2.13 | 37.87 | 1.43 |
| 287 | Lee | 24.06 | 9.05 | 161.03 | 6.06 |

**Table 11. Line Haul Locomotive Emission Estimates for Texas Counties (tons per year)
(excluding Dallas/Fort Worth and Houston/Galveston Areas) (Continued)**

| FIPS | County Name | CO | HC | NO_x | PM |
|-------------|--------------------|-----------|-----------|-----------------------|-----------|
| 289 | Leon | 56.03 | 21.07 | 374.96 | 14.11 |
| 293 | Limestone | 16.33 | 6.14 | 109.31 | 4.11 |
| 295 | Lipscomb | 31.40 | 11.81 | 210.11 | 7.91 |
| 297 | Live Oak | 11.03 | 4.15 | 73.79 | 2.78 |
| 299 | Llano | 0.03 | 0.01 | 0.20 | 0.01 |
| 303 | Lubbock | 40.64 | 15.28 | 271.95 | 10.24 |
| 305 | Lynn | 0.57 | 0.21 | 3.79 | 0.14 |
| 313 | Madison | 6.69 | 2.52 | 44.77 | 1.69 |
| 315 | Marion | 38.28 | 14.40 | 256.19 | 9.64 |
| 317 | Martin | 10.71 | 4.03 | 71.65 | 2.70 |
| 321 | Matagorda | 24.72 | 9.30 | 165.42 | 6.23 |
| 323 | Maverick | 13.94 | 5.24 | 93.32 | 3.51 |
| 307 | McCulloch | 0.02 | 0.01 | 0.16 | 0.01 |
| 309 | McLennan | 127.04 | 47.77 | 850.18 | 32.00 |
| 325 | Medina | 50.05 | 18.82 | 334.94 | 12.61 |
| 329 | Midland | 25.96 | 9.76 | 173.72 | 6.54 |
| 331 | Milam | 120.56 | 45.33 | 806.80 | 30.37 |
| 333 | Mills | 30.61 | 11.51 | 204.82 | 7.71 |
| 335 | Mitchell | 28.56 | 10.74 | 191.12 | 7.19 |
| 337 | Montague | 26.91 | 10.12 | 180.07 | 6.78 |
| 341 | Moore | 15.06 | 5.66 | 100.75 | 3.79 |
| 343 | Morris | 14.79 | 5.56 | 98.95 | 3.72 |
| 345 | Motley | 0.05 | 0.02 | 0.37 | 0.01 |
| 347 | Nacogdoches | 15.46 | 5.81 | 103.46 | 3.89 |
| 349 | Navarro | 30.48 | 11.46 | 204.00 | 7.68 |
| 351 | Newton | 5.82 | 2.19 | 38.94 | 1.47 |
| 353 | Nolan | 43.20 | 16.24 | 289.11 | 10.88 |
| 355 | Nueces | 17.68 | 6.65 | 118.33 | 4.45 |
| 357 | Ochiltree | 0.05 | 0.02 | 0.34 | 0.01 |
| 359 | Oldham | 24.52 | 9.22 | 164.11 | 6.18 |
| 361 | Orange | 64.35 | 24.20 | 430.61 | 16.21 |
| 363 | Palo Pinto | 33.29 | 12.52 | 222.76 | 8.38 |
| 365 | Panola | 7.10 | 2.67 | 47.53 | 1.79 |
| 367 | Parker | 14.22 | 5.35 | 95.16 | 3.58 |
| 369 | Parmer | 125.06 | 47.03 | 836.92 | 31.50 |
| 371 | Pecos | 7.18 | 2.70 | 48.08 | 1.81 |
| 373 | Polk | 6.84 | 2.57 | 45.76 | 1.72 |
| 375 | Potter | 122.15 | 45.93 | 817.44 | 30.77 |
| 377 | Presidio | 39.45 | 14.84 | 264.03 | 9.94 |
| 381 | Randall | 96.09 | 36.13 | 643.04 | 24.20 |

**Table 11. Line Haul Locomotive Emission Estimates for Texas Counties (tons per year)
(excluding Dallas/Fort Worth and Houston/Galveston Areas) (Continued)**

| FIPS | County Name | CO | HC | NO_x | PM |
|-------------|--------------------|-----------|-----------|-----------------------|-----------|
| 383 | Reagan | 0.05 | 0.02 | 0.31 | 0.01 |
| 387 | Red River | 0.05 | 0.02 | 0.34 | 0.01 |
| 389 | Reeves | 42.11 | 15.84 | 281.81 | 10.61 |
| 391 | Refugio | 34.80 | 13.09 | 232.91 | 8.77 |
| 393 | Roberts | 51.38 | 19.32 | 343.81 | 12.94 |
| 395 | Robertson | 101.29 | 38.09 | 677.81 | 25.51 |
| 399 | Runnels | 0.07 | 0.03 | 0.45 | 0.02 |
| 401 | Rusk | 17.60 | 6.62 | 117.80 | 4.43 |
| 403 | Sabine | 4.58 | 1.72 | 30.63 | 1.15 |
| 405 | San Augustine | 4.00 | 1.50 | 26.77 | 1.01 |
| 409 | San Patricio | 26.58 | 9.99 | 177.85 | 6.69 |
| 411 | San Saba | 0.05 | 0.02 | 0.35 | 0.01 |
| 415 | Scurry | 34.18 | 12.85 | 228.75 | 8.61 |
| 419 | Shelby | 20.23 | 7.61 | 135.40 | 5.10 |
| 421 | Sherman | 36.06 | 13.56 | 241.31 | 9.08 |
| 423 | Smith | 23.48 | 8.83 | 157.10 | 5.91 |
| 427 | Starr | 0.03 | 0.01 | 0.17 | 0.01 |
| 429 | Stephens | 4.92 | 1.85 | 32.94 | 1.24 |
| 433 | Stonewall | 0.00 | 0.00 | 0.03 | 0.00 |
| 437 | Swisher | 7.84 | 2.95 | 52.45 | 1.97 |
| 441 | Taylor | 64.94 | 24.42 | 434.56 | 16.36 |
| 443 | Terrell | 54.57 | 20.52 | 365.22 | 13.75 |
| 445 | Terry | 0.06 | 0.02 | 0.39 | 0.01 |
| 449 | Titus | 15.12 | 5.68 | 101.15 | 3.81 |
| 451 | Tom Green | 0.08 | 0.03 | 0.53 | 0.02 |
| 453 | Travis | 25.86 | 9.73 | 173.08 | 6.51 |
| 455 | Trinity | 7.45 | 2.80 | 49.84 | 1.88 |
| 457 | Tyler | 0.06 | 0.02 | 0.39 | 0.01 |
| 459 | Upshur | 36.01 | 13.54 | 240.99 | 9.07 |
| 461 | Upton | 0.05 | 0.02 | 0.35 | 0.01 |
| 463 | Uvalde | 43.72 | 16.44 | 292.60 | 11.01 |
| 465 | Val Verde | 82.80 | 31.13 | 554.07 | 20.85 |
| 467 | Van Zandt | 25.96 | 9.76 | 173.75 | 6.54 |
| 469 | Victoria | 32.02 | 12.04 | 214.30 | 8.07 |
| 471 | Walker | 6.43 | 2.42 | 43.05 | 1.62 |
| 475 | Ward | 39.62 | 14.90 | 265.14 | 9.98 |
| 477 | Washington | 30.99 | 11.65 | 207.39 | 7.81 |
| 479 | Webb | 0.13 | 0.05 | 0.90 | 0.03 |
| 481 | Wharton | 1.71 | 0.64 | 11.45 | 0.43 |
| 483 | Wheeler | 0.09 | 0.04 | 0.63 | 0.02 |

**Table 11. Line Haul Locomotive Emission Estimates for Texas Counties (tons per year)
(excluding Dallas/Fort Worth and Houston/Galveston Areas) (Continued)**

| FIPS | County Name | CO | HC | NO_x | PM |
|-------------|--------------------|-----------|-----------|-----------------------|-----------|
| 485 | Wichita | 50.48 | 18.98 | 337.82 | 12.72 |
| 487 | Wilbarger | 51.63 | 19.42 | 345.53 | 13.01 |
| 489 | Willacy | 8.56 | 3.22 | 57.26 | 2.16 |
| 491 | Williamson | 67.57 | 25.41 | 452.15 | 17.02 |
| 493 | Wilson | 0.04 | 0.01 | 0.26 | 0.01 |
| 495 | Winkler | 0.04 | 0.02 | 0.28 | 0.01 |
| 497 | Wise | 18.15 | 6.83 | 121.49 | 4.57 |
| 499 | Wood | 25.05 | 9.42 | 167.64 | 6.31 |
| 507 | Zavala | 0.06 | 0.02 | 0.40 | 0.01 |
| | Total | 6,012.06 | 2,260.68 | 40,232.85 | 1,514.29 |

**APPENDIX – ACTIVITY DATA FOR DALLAS/FORT WORTH
AND HOUSTON/GALVESTON AREAS**

Dallas/Fort Worth Data

General Line Haul for the Dallas/Fort Worth

| Rail Company | Data Year | County | Subdivision | Track Type | Segment | Miles of Track | Fuel Usage (gal) | Train Type | Train Count | GTM |
|---------------------|------------------|---------------|--------------------|-------------------|----------------|-----------------------|-------------------------|-------------------|--------------------|---------------|
| UP | 2003 | Dallas | Dallas | SIMN | 1040-0 | 12.91 | 657,054 | AA | 26 | 503,490,000 |
| UP | 2003 | Dallas | Dallas | SIMN | 1044-0 | 2.62 | 133,345 | AA | 27.7 | 102,180,000 |
| UP | 2003 | Dallas | Dallas | SIMN | 1045-0 | 0.44 | 26,413 | AA | 37.1 | 20,240,000 |
| UP | 2003 | Dallas | Dallas | NO 1 | 1045-0 | 1.73 | 47,411 | AA | 18.55 | 36,330,000 |
| UP | 2003 | Dallas | Dallas | NO 2 | 1045-0 | 1.73 | 56,441 | AA | 18.55 | 43,250,000 |
| UP | 2003 | Dallas | Dallas | NO 1 | 1046-0 | 0.37 | 10,140 | AA | 18.55 | 7,770,000 |
| UP | 2003 | Dallas | Dallas | NO 2 | 1046-0 | 0.37 | 12,071 | AA | 18.55 | 9,250,000 |
| UP | 2003 | Dallas | Dallas | NO 1 | 1047-0 | 1.87 | 51,247 | AA | 18.55 | 39,270,000 |
| UP | 2003 | Dallas | Dallas | NO 2 | 1047-0 | 1.87 | 61,009 | AA | 18.55 | 46,750,000 |
| UP | 2003 | Dallas | Dallas | NO 1 | 1050-0 | 13.78 | 377,641 | AA | 14.65 | 289,380,000 |
| UP | 2003 | Dallas | Dallas | NO 2 | 1050-0 | 13.78 | 449,572 | AA | 14.65 | 344,500,000 |
| UP | 2003 | Dallas | Ennis | SIMN | 1380-0 | 11.36 | 88,949 | AA | 2.2 | 68,160,000 |
| UP | 2003 | Dallas | Ennis | SIMN | 1381-0 | 3.26 | 25,526 | AA | 2.2 | 19,560,000 |
| UP | 2003 | Denton | Choctaw | SIMN | 1840-0 | 19.34 | 1,413,367 | AA | 18.2 | 1,083,040,000 |
| UP | 2003 | Denton | Choctaw | SIMN | 1845-0 | 16.17 | 1,181,704 | AA | 18.2 | 905,520,000 |
| UP | 2003 | Tarrant | Baird | SIMN | 1080-0 | 4.01 | 465,741 | AA | 40.3 | 356,890,000 |
| UP | 2003 | Tarrant | Baird | SIMN | 1083-0 | 8.18 | 362,947 | AA | 17.3 | 278,120,000 |
| UP | 2003 | Tarrant | Choctaw | SIMN | 1845-0 | 18.89 | 1,380,481 | AA | 18.2 | 1,057,840,000 |
| UP | 2003 | Tarrant | Dallas | NO 1 | 1050-0 | 0.47 | 12,880 | AA | 14.65 | 9,870,000 |
| UP | 2003 | Tarrant | Dallas | NO 2 | 1050-0 | 0.47 | 15,334 | AA | 14.65 | 11,750,000 |
| UP | 2003 | Tarrant | Dallas | NO 1 | 1060-0 | 2.4 | 65,772 | AA | 14.65 | 50,400,000 |
| UP | 2003 | Tarrant | Dallas | NO 2 | 1060-0 | 2.4 | 78,300 | AA | 14.65 | 60,000,000 |
| UP | 2003 | Tarrant | Dallas | NO 1 | 1065-0 | 11.74 | 520,904 | AA | 14.5 | 399,160,000 |
| UP | 2003 | Tarrant | Dallas | NO 2 | 1065-0 | 11.74 | 474,942 | AA | 14.5 | 363,940,000 |
| UP | 2003 | Tarrant | Dallas | NO 1 | 1079-0 | 2.79 | 123,792 | AA | 14.5 | 94,860,000 |
| UP | 2003 | Tarrant | Dallas | NO 2 | 1079-0 | 2.79 | 112,869 | AA | 14.5 | 86,490,000 |
| UP | 2003 | Tarrant | Dallas | NO 1 | 1080-0 | 2.2 | 134,937 | AA | 20.15 | 103,400,000 |
| UP | 2003 | Tarrant | Dallas | NO 2 | 1080-0 | 2.2 | 120,582 | AA | 20.15 | 92,400,000 |
| UP | 2003 | Tarrant | Dallas | SIMN | 1080-0 | 4.01 | 465,741 | AA | 40.3 | 356,890,000 |
| UP | 2003 | Tarrant | Duncan | SIMN | 7905-0 | 3.87 | 111,108 | AA | 8.1 | 85,140,000 |
| UP | 2003 | Tarrant | Duncan | SIMN | 7910-0 | 13.55 | 389,020 | AA | 8.1 | 298,100,000 |
| UP | 2003 | Tarrant | Duncan | NO 1 | 7915-0 | 1.63 | 34,034 | AA | 4.05 | 26,080,000 |
| UP | 2003 | Tarrant | Duncan | NO 2 | 7915-0 | 1.63 | 12,763 | AA | 4.05 | 9,780,000 |
| UP | 2003 | Tarrant | Duncan | NO 1 | 7770-0 | 0.87 | 18,166 | AA | 4.05 | 13,920,000 |
| UP | 2003 | Tarrant | Duncan | NO 2 | 7770-0 | 0.87 | 6,812 | AA | 4.05 | 5,220,000 |
| UP | 2003 | Tarrant | Duncan | SIMN | 7770-0 | 0.21 | 6,029 | AA | 8.1 | 4,620,000 |
| UP | 2003 | Tarrant | Ft. Worth | SIMN | 7555-0 | 9.04 | 778,615 | AA | 13.7 | 596,640,000 |
| UP | 2003 | Tarrant | Ft. Worth | SIMN | 7550-0 | 2.23 | 192,070 | AA | 26.6 | 147,180,000 |
| UP | 2003 | Tarrant | Ft. Worth | NO 1 | 7550-0 | 1.47 | 84,407 | AA | 13.3 | 64,680,000 |
| UP | 2003 | Tarrant | Ft. Worth | NO 2 | 7550-0 | 1.47 | 42,204 | AA | 13.3 | 32,340,000 |
| UP | 2003 | Tarrant | Ft. Worth | NO 1 | 7545-0 | 0.34 | 19,523 | AA | 13.3 | 14,960,000 |
| UP | 2003 | Tarrant | Ft. Worth | NO 2 | 7545-0 | 0.7 | 20,097 | AA | 13.3 | 15,400,000 |
| UP | 2003 | Tarrant | Midlothian | SIMN | 1811-0 | 20.74 | 487,183 | AA | 13.3 | 373,320,000 |

Specific Line Haul for the Dallas/Fort Worth Area

| Rail Company | Data Year | County | Segment Code | Train Type | Fuel Usage (gal) | Train Type Code | Train Count | GTM |
|--------------|-----------|---------|-----------------------------|---------------------------|------------------|-----------------|-------------|-------------|
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Baretable Intermodal | 43 | B | 1 | 31,422 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Loaded Unit Coal | 5,957 | C | 23 | 5,264,507 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Empty Unit Coal | 152 | E | 18 | 104,397 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Loaded Unit Grain | 342 | G | 2 | 275,057 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Manifest(High Priority) | 1,088 | H | 7 | 837,035 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Manifest(Normal Priority) | 29,932 | M | 438 | 29,542,683 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Officer Specials | 11 | O | 1 | 5,964 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Unit(Not Grain Or Coal) | 37,547 | U | 377 | 25,363,210 |
| BNSF | 2004 | Dallas | DFW - MP 769.3 - 781.7 | Empty Unit Grain | 162 | X | 3 | 135,780 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Amtrak | | A | 810 | |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Baretable Intermodal | 20,422 | B | 91 | 12,324,677 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Loaded Unit Coal | 268,787 | C | 316 | 332,872,868 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Lite Engine | 228 | D | 3 | 114,777 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Empty Unit Coal | 99,671 | E | 200 | 58,825,861 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Loaded Unit Grain | 484,010 | G | 678 | 490,786,140 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Manifest(High Priority) | 666,850 | H | 1117 | 545,149,875 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Local Service | 111,490 | L | 281 | 108,907,125 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Manifest(Normal Priority) | 1,115,904 | M | 2121 | 831,348,480 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Officer Specials | 660 | O | 6 | 351,900 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Intermodal Premium | 2,361 | P | 8 | 1,990,323 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Intermodal Guarantee | 213,358 | Q | 673 | 134,948,935 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Road Switcher Service | 516 | R | 13 | 267,712 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Intermodal D-Stack | 22,928 | S | 48 | 12,002,808 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Unit(Not Grain Or Coal) | 58,663 | U | 147 | 40,536,133 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Vehicle(Auto) | 139,402 | V | 428 | 85,941,333 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Work Train | 480 | W | 8 | 281,923 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Empty Unit Grain | 288,636 | X | 680 | 159,615,708 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Yard Engines | 112,313 | Y | 270 | 92,618,647 |
| BNSF | 2004 | Tarrant | Ft.Worth - MP 333.7 - 392.2 | Priority UPS Intermodal | 378,410 | Z | 955 | 224,775,540 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Baretable Intermodal | 54 | B | 1 | 68,418 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Loaded Unit Coal | 179 | C | 1 | 473,040 |

Specific Line Haul for the Dallas/Fort Worth Area (Continued)

| Rail Company | Data Year | County | Segment Code | Train Type | Fuel Usage (gal) | Train Type Code | Train Count | GTM |
|---------------------|------------------|---------------|---------------------------|---------------------------|-------------------------|------------------------|--------------------|-------------|
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Lite Engine | | D | 1 | |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Empty Unit Coal | 2,155 | E | 11 | 909,534 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Loaded Unit Grain | 5,982 | G | 35 | 7,722,904 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Manifest(High Priority) | 427 | H | 3 | 359,781 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Local Service | 42,246 | L | 563 | 40,333,232 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Manifest(Normal Priority) | 26,818 | M | 186 | 23,679,598 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Officer Specials | 21 | O | 1 | 12,987 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Road Switcher Service | 6,136 | R | 329 | 4,549,077 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Unit(Not Grain Or Coal) | 327,716 | U | 1890 | 243,656,546 |
| BNSF | 2004 | Collin | MADILL - MP 673.6 - 700.6 | Priority UPS Intermodal | 483 | Z | 3 | 311,283 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Amtrak | | A | 433 | |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Baretable Intermodal | 2,841 | B | 44 | 2,415,390 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Loaded Unit Coal | 251,148 | C | 1233 | 279,921,294 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Empty Unit Coal | 197,712 | E | 1193 | 86,202,601 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Loaded Unit Grain | 123,395 | G | 521 | 129,194,115 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Manifest(High Priority) | 119,893 | H | 793 | 228,287,354 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Helper Service | 47 | K | 7 | 19,573 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Local Service | 55,352 | L | 358 | 82,747,969 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Manifest(Normal Priority) | 232,224 | M | 1266 | 163,369,678 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Officer Specials | 46 | O | 2 | 50,737 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Intermodal Premium | 854 | P | 9 | 1,256,632 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Intermodal Guarantee | 70,213 | Q | 976 | 105,530,057 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Road Switcher Service | 8,766 | R | 119 | 10,200,401 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Intermodal D-Stack | 12,296 | S | 132 | 17,853,316 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Unit(Not Grain Or Coal) | 17,081 | U | 179 | 24,842,409 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Vehicle(Auto) | 5,481 | V | 288 | 7,341,295 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Work Train | 192 | W | 16 | 195,888 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Empty Unit Grain | 70,403 | X | 489 | 34,497,307 |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Yard Engines | | Y | 503 | |
| BNSF | 2004 | Tarrant | Wichita Falls - MP 0-19.0 | Priority UPS Intermodal | 100,275 | Z | 1300 | 113,335,695 |

Locomotive Yards in the Dallas/Fort Worth Area

| Railway Company | Data Year | Yard ID Code | City | Train Count | Annual Fuel Consumption (gal) | Annual Hours of Operation |
|------------------------|------------------|-----------------------|---------------|--------------------|--------------------------------------|----------------------------------|
| Amtrak | | Dallas1 | Dallas | 2 | 280,000 | 4,000 |
| Amtrak | | Denton1 | Denton | 1 | 115,500 | 1,650 |
| DGNTNR | | DFW1 | Dallas | 19 | 867,899 | 63,232 |
| FWWR | | DFW1 | Tarrant | 11 | 492,024 | 19,422 |
| KCS | 2004 | Metro1and2 | Collin | 2 | 109,788 | 0 |
| KCS | 2004 | DAMT/MTDA & WYDA/DAWY | Dallas | 2 | 181,528 | 0 |
| KCS | 2004 | Wylie | Collin | 2 | 127,022 | 0 |
| TREP | | DFW1 | Dallas | 6 | 540,000 | 22,464 |
| UP | | Browder yard1 | Browder yard | 4 | 107,989 | 6,708 |
| UP | | Ft Worth1 | Ft Worth | 51 | 1,323,229 | 79,399 |
| UP | | Grand Prairiel | Grand Prairie | 4 | 71,504 | 5,330 |
| UP | | Mesquite1 | Mesquite | 9 | 220,380 | 13,760 |
| UP | | Miller1 | Miller | 9 | 257,495 | 17,960 |
| UP | | Ney Yard1 | Ney Yard | 6 | 164,980 | 5,840 |

Houston/Galveston Data

General Line Haul for the Houston/Galveston Area

| Rail Company | Data Year | County | Subdivision | Track Type | Segment | Miles of Track | Fuel Usage (gal) | Train Type | Train Count | GTM |
|---------------------|------------------|---------------|--------------------|-------------------|----------------|-----------------------|-------------------------|-------------------|--------------------|-------------|
| UP | 2003 | Brazoria | Angleton | SIMN | 1640-0 | 24.41 | 923,796 | AA | 15.7 | 707,890,000 |
| UP | 2003 | Brazoria | Angleton | SIMN | 1650-0 | 22 | 1,205,820 | AA | 19.2 | 924,000,000 |
| UP | 2003 | Brazoria | Freeport | SIMN | 1645-0 | 10 | 130,500 | AA | 2 | 100,000,000 |
| UP | 2003 | Chambers | Baytown | SIMN | 1933-0 | 3.77 | 54,118 | AA | 2 | 41,470,000 |
| UP | 2003 | Fort Bend | Glidden | SIMN | 1324-0 | 7.44 | 563,134 | AA | 29.5 | 431,520,000 |
| UP | 2003 | Fort Bend | Glidden | SIMN | 1326-0 | 12.07 | 913,578 | AA | 29.5 | 700,060,000 |
| UP | 2003 | Fort Bend | Glidden | SIMN | 1328-0 | 11.24 | 621,785 | AA | 22.9 | 476,463,600 |
| UP | 2003 | Fort Bend | Popp | SIMN | 1215-0 | 6.68 | 34,870 | AA | 1 | 26,720,000 |
| UP | 2003 | Fort Bend | Popp | SIMN | 1216-0 | 8.45 | 44,109 | AA | 1 | 33,800,000 |
| UP | 2003 | Galveston | Angleton | SIMN | 1650-0 | 0.9 | 49,329 | AA | 19.2 | 37,800,000 |
| UP | 2003 | Galveston | Galveston | SIMN | 1205-0 | 17.64 | 230,202 | AA | 1.7 | 176,400,000 |
| UP | 2003 | Galveston | Galveston | SIMN | 1206-0 | 2.04 | 26,622 | AA | 1.7 | 20,400,000 |
| UP | 2003 | Galveston | Galveston | SIMN | 1207-0 | 3.79 | 49,460 | AA | 1.7 | 37,900,000 |
| UP | 2003 | Harris | Baytown | SIMN | 1230-0 | 1.06 | 6,917 | AA | 2 | 5,300,000 |
| UP | 2003 | Harris | Baytown | SIMN | 1233-0 | 22.63 | 147,661 | AA | 2 | 113,150,000 |
| UP | 2003 | Harris | Baytown | SIMN | 1933-0 | 9.76 | 140,105 | AA | 2 | 107,360,000 |
| UP | 2003 | Harris | Beaumont | NO 1 | 1250-0 | 3.48 | 587 | AA | 8.65 | 450,000 |
| UP | 2003 | Harris | Beaumont | NO 2 | 1250-0 | 0.15 | 4,111 | AA | 8.65 | 3,150,000 |
| UP | 2003 | Harris | Beaumont | SIMN | 1250-0 | 0.15 | 108,994 | AA | 17.3 | 83,520,000 |
| UP | 2003 | Harris | Beaumont | NO 1 | 1665-0 | 3.88 | 106,331 | AA | 6.95 | 81,480,000 |
| UP | 2003 | Harris | Beaumont | NO 2 | 1665-0 | 3.88 | 45,571 | AA | 6.95 | 34,920,000 |
| UP | 2003 | Harris | Beaumont | SIMN | 1665-0 | 15.78 | 617,787 | AA | 13.9 | 473,400,000 |
| UP | 2003 | Harris | Eureka | SIMN | 1370-0 | 34.98 | 319,542 | AA | 5.5 | 244,860,000 |
| UP | 2003 | Harris | Galveston | SIMN | 1204-0 | 2.05 | 26,753 | AA | 5.4 | 20,500,000 |
| UP | 2003 | Harris | Galveston | SIMN | 1205-0 | 21.23 | 277,052 | AA | 1.7 | 212,300,000 |
| UP | 2003 | Harris | Glidden | SIMN | 1220-0 | 3.51 | 148,118 | AA | 9.5 | 113,500,000 |
| UP | 2003 | Harris | Glidden | SIMN | 1221-0 | 4.54 | 121,039 | AA | 9.5 | 92,750,000 |
| UP | 2003 | Harris | Glidden | SIMN | 1323-0 | 3.71 | 234,639 | AA | 29.5 | 179,800,000 |
| UP | 2003 | Harris | Glidden | SIMN | 1324-0 | 3.1 | 75,690 | AA | 29.5 | 58,000,000 |
| UP | 2003 | Harris | Glidden | SIMN | 1385-0 | 1 | 82,450 | AA | 4.4 | 63,180,000 |
| UP | 2003 | Harris | Hardy | SIMN | 1950-0 | 0.74 | 27,040 | AA | 7 | 20,720,000 |
| UP | 2003 | Harris | Houston | NO 1 | 1190-0 | 1.7 | 206,973 | AA | 14.65 | 158,600,000 |
| UP | 2003 | Harris | Houston | NO 2 | 1190-0 | 1.7 | 289,658 | AA | 14.65 | 221,960,000 |
| UP | 2003 | Harris | Houston | NO 1 | 1191-0 | 2.8 | 13,885 | AA | 14.65 | 10,640,000 |
| UP | 2003 | Harris | Houston | NO 2 | 1191-0 | 2.8 | 19,092 | AA | 14.65 | 14,630,000 |
| UP | 2003 | Harris | Houston | NO 1 | 1196-0 | 3.5 | 66,555 | AA | 19 | 51,000,000 |
| UP | 2003 | Harris | Houston | NO 2 | 1196-0 | 3.5 | 46,589 | AA | 19 | 35,700,000 |
| UP | 2003 | Harris | Houston | NO 1 | 1197-0 | 0.1 | 109,620 | AA | 19 | 84,000,000 |
| UP | 2003 | Harris | Houston | NO 2 | 1197-0 | 3.2 | 76,734 | AA | 19 | 58,800,000 |
| UP | 2003 | Harris | Houston | NO 1 | 1660-0 | 2.87 | 104,400 | AA | 15.6 | 80,000,000 |
| UP | 2003 | Harris | Houston | NO 1 | 1660-0 | 7.93 | 114,188 | AA | 15.6 | 87,500,000 |
| UP | 2003 | Harris | Houston | NO 2 | 1660-0 | 7.16 | 168,998 | AA | 15.6 | 129,500,000 |
| UP | 2003 | Harris | Houston | NO 2 | 1660-0 | 1.33 | 138,578 | AA | 15.6 | 106,190,000 |

General Line Haul for the Houston/Galveston Area (Continued)

| Rail Company | Data Year | County | Subdivision | Track Type | Segment | Miles of Track | Fuel Usage (gal) | Train Type | Train Count | GTM |
|---------------------|------------------|---------------|--------------------|-------------------|----------------|-----------------------|-------------------------|-------------------|--------------------|-------------|
| UP | 2003 | Harris | Houston | SIMN | 1660-0 | 1.33 | 8,091 | AA | 31.2 | 6,200,000 |
| UP | 2003 | Harris | Lafayette | SIMN | 1932-0 | 18.22 | 784,644 | AA | 19.3 | 601,260,000 |
| UP | 2003 | Harris | Lafayette | NO 1 | 1934-0 | 0.11 | 3,732 | AA | 9.65 | 2,860,000 |
| UP | 2003 | Harris | Lafayette | NO 2 | 1934-0 | 0.11 | 1,005 | AA | 9.65 | 770,000 |
| UP | 2003 | Harris | Lufkin | SIMN | 1950-0 | 18.41 | 672,701 | AA | 7 | 515,480,000 |
| UP | 2003 | Harris | Navasota | SIMN | 1775-0 | 13.05 | 579,029 | AA | 11.9 | 443,700,000 |
| UP | 2003 | Harris | Palestine | NO 1 | 1170-0 | 2.63 | 57 | AA | 4.8 | 43,500 |
| UP | 2003 | Harris | Palestine | NO 2 | 1170-0 | 0.15 | 4,698 | AA | 4.8 | 3,600,000 |
| UP | 2003 | Harris | Palestine | SIMN | 1170-0 | 0.15 | 83,367 | AA | 9.6 | 63,882,700 |
| UP | 2003 | Harris | Palestine | NO 1 | 1180-0 | 5.17 | 168,671 | AA | 9.6 | 129,250,000 |
| UP | 2003 | Harris | Palestine | NO 2 | 1180-0 | 5.17 | 222,646 | AA | 9.6 | 170,610,000 |
| UP | 2003 | Harris | Palestine | NO 1 | 1185-0 | 10.75 | 350,719 | AA | 9.6 | 268,750,000 |
| UP | 2003 | Harris | Palestine | NO 2 | 1185-0 | 10.75 | 462,949 | AA | 9.6 | 354,750,000 |
| UP | 2003 | Harris | Palestine | NO 1 | 1190-0 | 2 | 3,654 | AA | 14.65 | 2,800,000 |
| UP | 2003 | Harris | Palestine | NO 1 | 1195-0 | 2 | 65,250 | AA | 9.6 | 50,000,000 |
| UP | 2003 | Harris | Palestine | NO 2 | 1195-0 | 0.14 | 78,300 | AA | 9.6 | 60,000,000 |
| UP | 2003 | Harris | Popp | SIMN | 1215-0 | 5.87 | 30,641 | AA | 1 | 23,480,000 |
| UP | 2003 | Harris | Strang | NO 1 | 1355-0 | 1.84 | 26,413 | AA | 5.2 | 20,240,000 |
| UP | 2003 | Harris | Strang | NO 2 | 1355-0 | 1.84 | 12,006 | AA | 5.2 | 9,200,000 |
| UP | 2003 | Harris | Strang | NO 1 | 1357-0 | 1.12 | 16,078 | AA | 5.2 | 12,320,000 |
| UP | 2003 | Harris | Strang | NO 2 | 1357-0 | 1.12 | 7,308 | AA | 5.2 | 5,600,000 |
| UP | 2003 | Harris | Strang | SIMN | 1358-0 | 3.32 | 69,322 | AA | 10.4 | 53,120,000 |
| UP | 2003 | Harris | Strang | SIMN | 1359-0 | 3.51 | 64,128 | AA | 10.7 | 49,140,000 |
| UP | 2003 | Harris | Strang | NO 1 | 1364-0 | 4.03 | 134,102 | AA | 10.7 | 102,760,000 |
| UP | 2003 | Harris | Strang | NO 1 | 1366-0 | 0.2 | 3,654 | AA | 10.7 | 2,800,000 |
| UP | 2003 | Harris | Strang | NO 2 | 1366-0 | 0.2 | 2,088 | AA | 5.35 | 1,600,000 |
| UP | 2003 | Harris | Strang | SIMN | 1366-0 | 7.34 | 31,555 | AA | 10.7 | 24,180,000 |
| UP | 2003 | Harris | Terminal | NO 2 | 1319-0 | 3.91 | 70,235 | AA | 8 | 53,820,000 |
| UP | 2003 | Harris | Terminal | NO 1 | 1320-0 | 3.91 | 70,744 | AA | 11 | 54,210,000 |
| UP | 2003 | Harris | Terminal | NO 2 | 1320-0 | 3.5 | 54,419 | AA | 11 | 41,700,000 |
| UP | 2003 | Harris | Terminal | NO 1 | 1321-0 | 3.5 | 67,416 | AA | 8 | 51,660,000 |
| UP | 2003 | Harris | Terminal | NO 2 | 1321-0 | 2.99 | 52,435 | AA | 8 | 40,180,000 |
| UP | 2003 | Harris | Terminal | NO 1 | 1322-0 | 2.99 | 89,066 | AA | 11 | 68,250,000 |
| UP | 2003 | Harris | Terminal | NO 2 | 1322-0 | 2.87 | 68,513 | AA | 11 | 52,500,000 |
| UP | 2003 | Harris | Terminal | NO 1 | 1934-0 | 2.87 | 132,666 | AA | 9.65 | 101,660,000 |
| UP | 2003 | Harris | Terminal | NO 2 | 1934-0 | 4.17 | 35,718 | AA | 9.65 | 27,370,000 |
| UP | 2003 | Harris | Terminal | NO 1 | 1935-0 | 4.17 | 173,565 | AA | 11.15 | 133,000,000 |
| UP | 2003 | Harris | Terminal | NO 2 | 1935-0 | 5.25 | 109,620 | AA | 11.15 | 84,000,000 |
| UP | 2003 | Harris | Terminal | NO 1 | 1936-0 | 5.25 | 54,627 | AA | 8 | 41,860,000 |
| UP | 2003 | Liberty | Baytown | NO 1 | 1933-0 | 7.63 | 8,744 | AA | 1 | 6,700,000 |
| UP | 2003 | Liberty | Baytown | NO 2 | 1933-0 | 3.35 | 39,346 | AA | 1 | 30,150,000 |
| UP | 2003 | Liberty | Baytown | SIMN | 1933-0 | 3.35 | 109,529 | AA | 2 | 83,930,000 |
| UP | 2003 | Liberty | Baytown | SIMN | 1933-0 | 0.47 | 6,747 | AA | 2 | 5,170,000 |

General Line Haul for the Houston/Galveston Area (Continued)

| Rail Company | Data Year | County | Subdivision | Track Type | Segment | Miles of Track | Fuel Usage (gal) | Train Type | Train Count | GTM |
|---------------------|------------------|---------------|--------------------|-------------------|----------------|-----------------------|-------------------------|-------------------|--------------------|-------------|
| UP | 2003 | Liberty | Beaumont | SIMN | 1665-0 | 28.12 | 1,100,898 | AA | 13.9 | 843,600,000 |
| UP | 2003 | Liberty | Lafayette | SIMN | 1930-0 | 28.38 | 962,933 | AA | 15 | 737,880,000 |
| UP | 2003 | Liberty | Lafayette | SIMN | 1932-0 | 6.92 | 298,010 | AA | 19.3 | 228,360,000 |
| UP | 2003 | Liberty | Lufkin | SIMN | 1950-0 | 6.27 | 229,106 | AA | 7 | 175,560,000 |
| UP | 2003 | Liberty | Lufkin | SIMN | 1954-0 | 4.06 | 90,071 | AA | 8 | 69,020,000 |
| UP | 2003 | Montgomery | Lufkin | SIMN | 1950-0 | 16.95 | 619,353 | AA | 7 | 474,600,000 |
| UP | 2003 | Montgomery | Navasota | SIMN | 1775-0 | 12.47 | 553,294 | AA | 11.9 | 423,980,000 |
| UP | 2003 | Montgomery | Palestine | SIMN | 1170-0 | 27.71 | 878,364 | AA | 9.6 | 673,075,900 |
| UP | 2003 | Waller | Eureka | SIMN | 1370-0 | 19.32 | 176,488 | AA | 5.5 | 135,240,000 |
| UP | 2003 | Waller | Navasota | SIMN | 1775-0 | 1.78 | 78,979 | AA | 11.9 | 60,520,000 |

Specific Line Haul for the Houston/Galveston Area

| Rail Company | Data Year | County | Segment Code | Train Type | Fuel Usage (gal) | Train Type Code | Train Count | GTM |
|--------------|-----------|------------|---------------------------|---------------------------|------------------|-----------------|-------------|-------------|
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Lite Engine | 2,669 | D | 7 | 2,296,394 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Loaded Unit Grain | 17,760 | G | 48 | 32,888,986 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Manifest(High Priority) | 190,400 | H | 467 | 189,621,103 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Local Service | 24,441 | L | 315 | 17,657,682 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Manifest(Normal Priority) | 196,929 | M | 639 | 167,881,782 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Intermodal Premium | 391 | P | 1 | 351,181 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Intermodal Guarantee | 432 | Q | 2 | 458,047 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Road Switcher Service | 9,406 | R | 175 | 6,392,715 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Intermodal D-Stack | 1,260 | S | 3 | 1,193,981 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Unit(Not Grain Or Coal) | 82,157 | U | 417 | 71,790,223 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Work Train | 165 | W | 1 | 115,564 |
| BNSF | 2004 | Montgomery | CONROE - MP 55.6 - 111.0 | Empty Unit Grain | 8,151 | X | 33 | 6,387,731 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Baretable Intermodal | 4,346 | B | 24 | 4,396,702 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Loaded Unit Coal | 107,841 | C | 210 | 172,803,955 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Lite Engine | 986 | D | 8 | 762,516 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Empty Unit Coal | 69,657 | E | 199 | 30,300,971 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Loaded Unit Grain | 183,905 | G | 577 | 261,696,530 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Manifest(High Priority) | 109,354 | H | 667 | 104,159,782 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Local Service | 80,855 | L | 451 | 86,087,473 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Manifest(Normal Priority) | 142,094 | M | 905 | 118,932,771 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Officer Specials | 176 | O | 2 | 182,455 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Intermodal Premium | 70,974 | P | 359 | 64,206,525 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Intermodal Guarantee | 696 | Q | 3 | 892,218 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Intermodal D-Stack | 49,167 | S | 250 | 29,573,937 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Unit(Not Grain Or Coal) | 131,200 | U | 303 | 113,555,993 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Vehicle(Auto) | 39,883 | V | 310 | 27,577,672 |
| BNSF | 2004 | Galveston | GALVESTON - MP 2.2 - 76.2 | Empty Unit Grain | 90,567 | X | 538 | 80,813,334 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Baretable Intermodal | 216 | B | 2 | 195,120 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Loaded Unit Coal | 10,659 | C | 19 | 14,259,880 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Lite Engine | 150 | D | 6 | 117,840 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Empty Unit Coal | 6,223 | E | 62 | 2,314,787 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Loaded Unit Grain | 3,556 | G | 9 | 4,133,095 |

Specific Line Haul for the Houston/Galveston Area

| Rail Company | Data Year | County | Segment Code | Train Type | Fuel Usage (gal) | Train Type Code | Train Count | GTM |
|--------------|-----------|--------|---------------------------|---------------------------|------------------|-----------------|-------------|-------------|
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Manifest(High Priority) | 148,491 | H | 983 | 223,404,573 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Manifest(Normal Priority) | 126,921 | M | 1136 | 124,128,945 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Officer Specials | 47 | O | 2 | 40,710 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Intermodal Premium | 17,162 | P | 113 | 22,526,904 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Intermodal Guarantee | 106 | Q | 1 | 172,640 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Intermodal D-Stack | 5,068 | S | 28 | 6,926,014 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Unit(Not Grain Or Coal) | 87,830 | U | 277 | 56,913,722 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Vehicle(Auto) | 196 | V | 2 | 322,400 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Work Train | 100 | W | 2 | 113,056 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Empty Unit Grain | 36,406 | X | 174 | 21,352,012 |
| BNSF | 2004 | Harris | HOUSTON - MP 70.6 - 110.5 | Yard Engines | 11,455 | Y | 278 | 12,229,760 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Amtrak | | A | 1 | |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Baretable Intermodal | 1,198 | B | 26 | 1,317,945 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Loaded Unit Coal | 3,001 | C | 11 | 3,894,733 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Lite Engine | 416 | D | 10 | 248,527 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Empty Unit Coal | 170 | E | 2 | 120,358 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Loaded Unit Grain | 19,745 | G | 95 | 24,768,170 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Manifest(High Priority) | 25,308 | H | 402 | 25,232,076 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Local Service | 34,730 | L | 361 | 31,350,088 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Manifest(Normal Priority) | 24,453 | M | 351 | 17,887,370 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Officer Specials | 55 | O | 2 | 43,804 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Intermodal Premium | 27,860 | P | 406 | 25,310,810 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Intermodal Guarantee | 258 | Q | 3 | 248,048 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Intermodal D-Stack | 27,840 | S | 190 | 27,312,938 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Unit(Not Grain Or Coal) | 40,156 | U | 358 | 39,950,943 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Vehicle(Auto) | 19,327 | V | 250 | 13,970,060 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Work Train | 163 | W | 2 | 127,342 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Empty Unit Grain | 5,786 | X | 65 | 4,943,633 |
| BNSF | 2004 | Harris | MYKAWA - MP 0 - 19.4 | Yard Engines | 22,584 | Y | 656 | 15,846,593 |

Locomotive Yards in the Houston/Galveston Area

| Railway Company | Data Year | Yard ID Code | City | Train Count | Annual Fuel Consumption (gal) | Annual Hours of Operation |
|---------------------------|-----------|--------------|----------------------|-------------|-------------------------------|---------------------------|
| BNSF | | Alvin1 | Alvin | 1 | 82,490 | 8,760 |
| BNSF | | Casey1 | Casey | 4 | 329,960 | 35,040 |
| BNSF | | Dayton1 | Dayton | 4 | 329,960 | 35,040 |
| BNSF | | Galveston1 | Galveston | 5 | 412,450 | 43,800 |
| BNSF | | Houston1 | Houston | 28 | 2,309,720 | 245,280 |
| BNSF | | Pearland1 | Pearland | 8 | 659,920 | 70,080 |
| CANAC | | Pasadena1 | Pasadena | 4 | 144,000 | 35,040 |
| Farmland AMD | | Unknown1 | Unknown | 6 | 494,940 | 52,560 |
| Galveston Railroad | | Galveston1 | Galveston | 6 | 84,000 | 52,560 |
| KCS/Texas-Mexico | | Galveston1 | Galveston | 2 | 164,980 | 17,520 |
| Port Terminal Rail Assoc. | 2003 | HoustonShip1 | Houston Ship Channel | 25 | 3,005,913 | 219,000 |
| Rail Link | | HoustonShip1 | Houston Ship Channel | 3 | 150,000 | 26,280 |
| Trans Global | | HoustonShip1 | Houston Ship Channel | 13 | 1,072,370 | 113,880 |
| Texas City Terminal | | TXCity1 | Texas City | 3 | 120,000 | 26,280 |
| UP | | BASIN1 | Basin Yard | 3 | 31,392 | 3,900 |
| UP | | CONGRESS1 | Congress Yard | 1 | 20,056 | 2,990 |
| UP | | ENGLEWOOD1 | Englewood | 37 | 1,030,661 | 61,700 |
| UP | | EUREKA1 | Eureka Yard | 1 | 13,952 | 2,080 |
| UP | | GALENA1 | Galena Park | 10 | 217,352 | 12,737.5 |
| UP | | GALVESTON1 | Galveston | 2 | 26,160 | 3,900 |
| UP | | HARDY1 | Hardy | 4 | 75,841 | 9,940 |
| UP | | HOUSTON1 | Houston | 36 | 940,858 | 54,347.5 |