ENVIRONMENTAL IMPACT

8

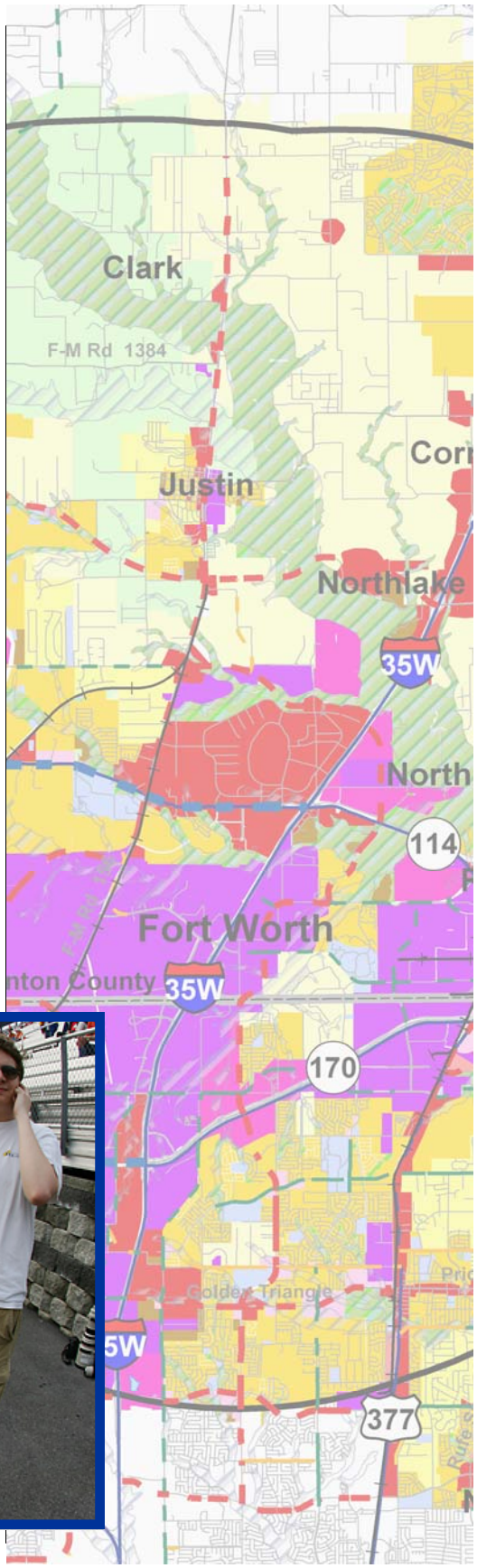


Figure 8.1 Race day traffic passing the TMS retention pond.

As the area around TMS changes from a mostly rural landscape to a more suburbanized landscape, the impact on the natural environment will increase. Through regional planning efforts such as Vision North Texas, the individual communities in the TMS area can work together to maintain environmental quality, connect community open space, and preserve environmentally sensitive areas.

City of Fort Worth Comprehensive Plan Environmental Goals that inform and support planning in this area include:

- Utilize natural areas to retain and filter storm water runoff.
- When feasible, develop linear parks with walking and biking trails along drainage ways as an effective means of filtering out water pollutants and connecting neighborhoods.
- Support innovative efforts that are cost and environmentally effective in addressing water quality issues associated with new development and extensive redevelopment.
- Leave floodplains in their natural state to improve water quality and minimize flooding.

Storm Water Runoff at TMS

Several storm water drainage documents exist for TMS. Huitt-Zollars produced the initial drainage design for TMS. Freese and Nichols prepared a TMS Storm Water Pollution Prevention Plan (SWP3) in 1998. Freese and Nichols also produced three drainage studies for TMS. A February 1998 study was a re-evaluation of the infield drainage design. The second drainage study, prepared in November 1999, determined the pre-development peak flow rate leaving the TMS site and evaluated modifications to the downstream retention pond. A January 2002 study evaluated the effects of deepening the downstream retention pond.

Figure 8.2 The TMS retention pond handles runoff from the southern portion of the site.

Site Hydrology

The TMS site drains into two different branches of the Denton Creek watershed, which empties into Lake Grapevine. The northern portion of the TMS site drains towards the Catherine Branch, while the southern portion of TMS, including the infield, drains towards the Elizabeth Branch. A downstream retention pond, located in the quadrant of SH 114 and I-35W interchange, retains runoff from the southern portion before crossing under I-35W and entering the Elizabeth Branch.

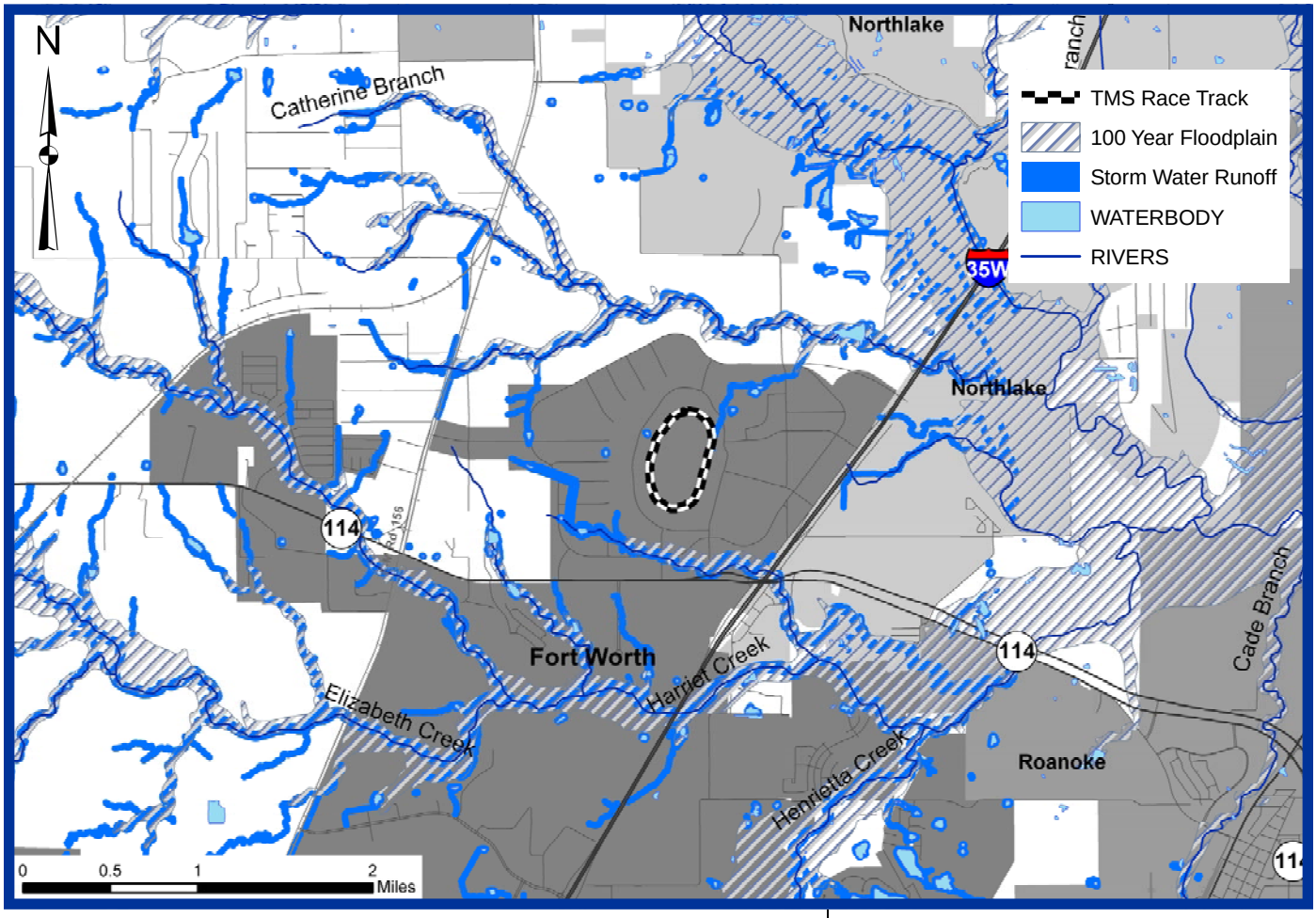


Figure 8.3 Stormwater runoff patterns near TMS.

The grading of the TMS site during construction increased the drainage area to the downstream retention pond from 585 acres to 742 acres. The amount of runoff from the TMS site also increased due to the paving and construction of facilities. The drainage study findings indicate that although the downstream retention pond lowers the peak discharges from the TMS site, they are still above pre-development discharge levels. Although the peak discharges are higher since the construction of TMS, no complaints of adverse impacts from this additional drainage have been filed from downstream owners. The 2002 study concludes that an update of the Storm Water Pollution Plan should be completed to address current site conditions.

Noise Pollution Generators in the Study Area

The study area is subject to two large noise generators, Fort Worth Alliance Airport and TMS itself. Even though both produce high levels of noise specific to each facility's main operation, the types and duration of noise pollution can vary greatly.

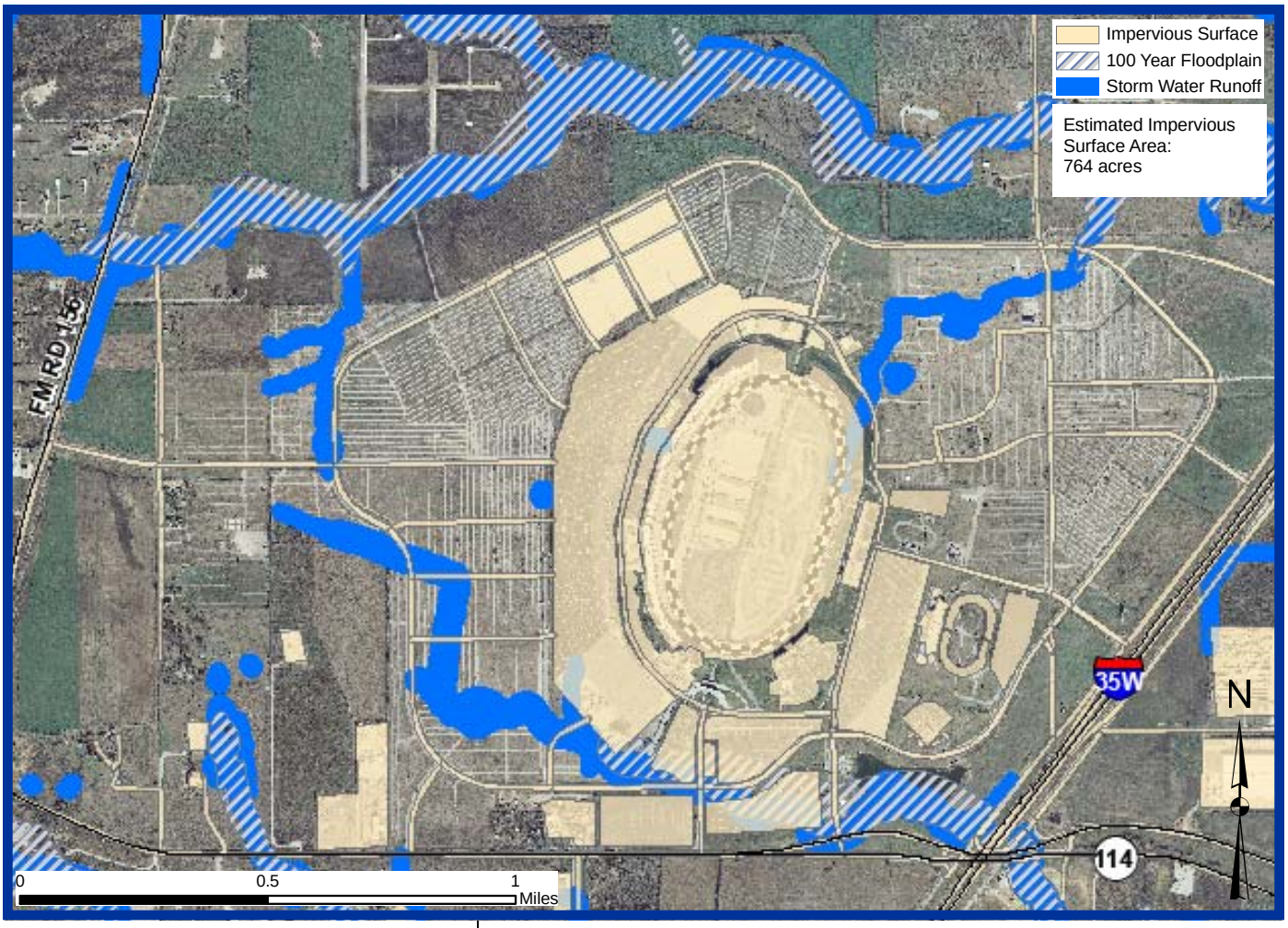


Figure 8.4 Estimated Impervious Surface Area on the TMS Site.

Figure 8.5 The high-bank configuration of the track and obstacles such as the Speedway Club Tower help reduce the noise levels further away from the track.

Alliance Airport Noise

The scheduled expansion of the runway at Alliance Airport will modify the area affected by noise generated from aircraft taking off and landing at the facility. The federal noise measure used for assessing aircraft noise exposures in communities near airports is the day-night average sound level (DNL, or Ldn), which is described in terms of decibel noise level (dB). DNL is an average sound level generated by all aviation-related operations during an average 24-hour period (Wyle Report, 2004).

The Alliance Airport 2014 noise exposure map indicates that large areas to the north and northeast of the runway will be subjected to day-night average sound levels greater than 65 decibels, the established threshold for discouraging residential uses by the City of Fort Worth. These areas include the Northwest I.S.D. campus, parcels to the west of the complex, parcels north of SH 114, and onto TMS property. The exposure

Noise Levels During Race Conditions at TMS						
Location	Approx. Distance to Track (ft)	Avg. Sound Level (Leq - dBA)	Min. Sound Level (Lmin - dBA)	Max. Sound Level (Lmax - dBA)	Monitoring Period (min:sec)	Monitoring Start Time
1	4,400	70.0	60.8	76.8	5:00	7:12 p.m.
2	2,500	73.0	68.8	77.3	5:00	7:23 p.m.
3	1,900	65.4	57.3	70.8	5:00	7:40 p.m.
4	3,100	61.2	69.8	54.8	4:00	8:12 p.m.
5	2,200	74.8	71.3	78.8	3:00	8:23 p.m.
6	3,100	79.6	71.3	86.3	3:06	8:45 p.m.
7	3,100	81.1	70.3	86.3	3:00	8:53 p.m.

Table 8.1 Noise levels during Indy Racing League event in June, 2001.

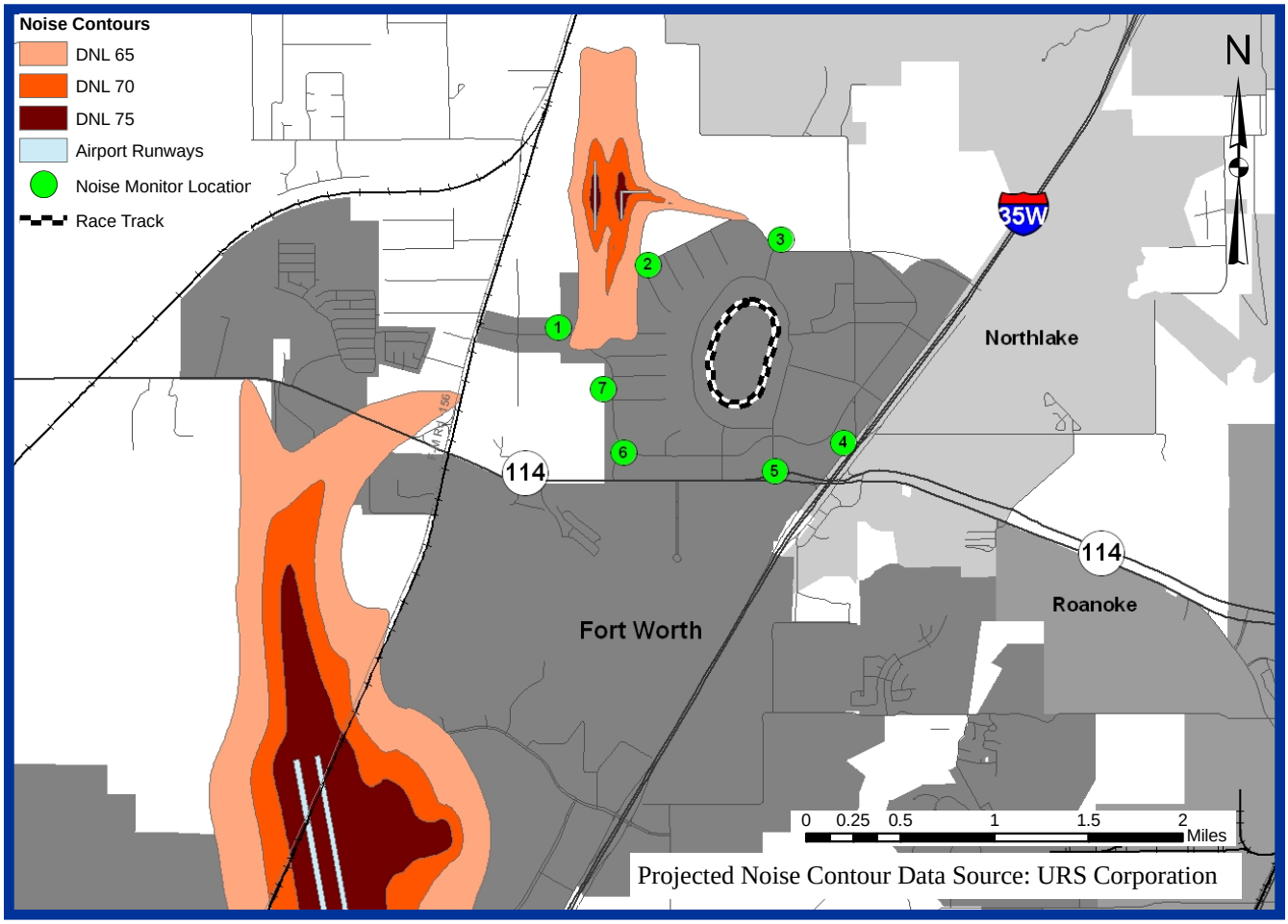


Figure 8.6 Combined Map of Alliance Airport projected noise contours and TMS noise monitor locations.

map also indicates high noise levels associated with the Bell Helicopter training facility adjacent to TMS to the northwest of the racetrack.

Figure 8.7 Alliance Airport is a major source of noise in the TMS area.

To implement the Fort Worth policy of discouraging residential uses in airport noise impact areas, amendments to the City's Future Land Use maps may be required. Similar amendments may be appropriate to Northlake's Future Land Use map.

Noise Levels During TMS Race Events

TMS hired Freese and Nichols to take noise level readings during an Indy Racing League auto race in June 2001. The result of these noise readings are shown in Table 8.1. Freese and Nichols used A-weighted readings, which approximate the human ear's response to sound, but are not the day-night average sound level used to measure noise generated from activities at Alliance Airport.

TMS officials assisted Freese and Nichols in choosing seven locations on the grounds of TMS for monitoring (see Figure 8.6). Four of these locations were west of the grandstand, one was directly north of the track and two were southeast of track. Readings from these locations indicated a varied level of noise impact during race events. The highest average sound level, 81.1 dBA, was found at location #7, approximately 3,100 feet west of the track. The lowest average sound level, 61.2 dBA, was recorded 3,100 feet southeast of the track at location #4. Location #7 is shielded from the track by the main grandstand. Location #4 is partially shielded from the track by the Lonestar Condominium Tower and the Lil' Texas Dirt Track. The TMS facility has large parking lots that act as an initial buffering space from the track itself but there is minimal natural vegetation, such as trees and shrubs, between the track and nearby neighborhoods to act as a sound barrier.

The typical NASCAR automobile generates noise in excess of 130 decibels, a level considered harmful to human hearing. Many variables go into the noise levels emanating from TMS during race events, including wind speeds, temperature, and time of day. Structures such as the grandstand and The LoneStar Condominium Tower also affect how noise carries in different directions from the track on race day.

Lessons Learned From Other Noise Studies

Recently, the City of Fort Worth co-sponsored the Joint Land Use Study Report (2007), which addressed land use compatibility and

Figure 8.8 Aerial view of Alliance Airport, looking north.

other issues involving the Joint Reserve Base Naval Air Station JRB/NAS) in west Fort Worth. An examination of the noise related issues for residences near the JRB/NAS was a part of the study. Lessons learned form this study may be instructive for managing noise impacts in the TMS Study area.

"In general, housing is compatible with an exterior noise exposure up to 55 dB DNL. Standards indicate that with exposure between 65-75 dB DNL, additional protective measures, such as indoor noise reduction/isolation for residential and certain other types of indoor uses may be warranted. Noise exposure that exceeds 75 dB DNL is incompatible with all residential uses, but many uses, such as manufacturing, retail, government facilities, and agriculture can be suitable even within a relatively high noise setting, with strict conditions". (JLUS II-25)

The City of Fort Worth discourages new construction of homes located in areas subject to average noise levels above 65 decibels. This most often applies to airports such as the Joint Reserve Base Naval Air Station and Alliance Airport, but during race conditions at TMS, noise levels exceed 65 decibels at locations beyond the racetrack. These high decibel levels occur during races, qualifying events, practice sessions, or whenever TMS is being used in a similar capacity. The Freese and Nichols noise

study indicates high noise levels during typical race conditions, but these should not be compared with the noise levels generated by the Alliance Airport or other similar facilities. Further noise level readings would be necessary to establish a decibel DNL noise exposure map for TMS during race weekends.

The Air Installations Compatible Use Zones Update (AICUZ) prepared for JRB/NAS in 2002 also addressed noise compatibility issues. The study suggests several options for cities to minimize complaints about noise levels.

- *Areas currently zoned for incompatible uses should be rezoned to those uses compatible with AICUZ criteria* (criteria which outline land uses compatible with air installations).
- *Future land use plans for these cities should also revise the proposed uses for undeveloped land within the AICUZ footprint, in order to achieve compatible development with air operations.*
- *Some local bodies have adopted a "truth in sales and rental" ordinance that requires local real estate and rental agents to provide prospective purchasers and renters with current information detailing the special circumstances within the AICUZ footprint. Under the terms of the ordinance, notice in writing would be given to prospective purchasers, stating that the seller is required by law to show the buyer copies of the recorded subdivision plat, the approved site plan, and the current AICUZ footprint. A similar notice to prospective lessees would be required of rental agents.*

Currently, Fort Worth Alliance Airport is updating its FAR Part 150 Noise Compatibility Study which is considering several land use alternatives to mitigate noise exposure to impacted residences. Recommendations may include:

- Revisions to the current Airport Zoning Overlay District to incorporate and buffer the 2014 DNL 65 dB noise contour.
- Approval of a Real Estate Disclosure ordinance to ensure that prospective buyers of property are aware of the noise exposure issues. This is the same as the "truth in sales and rental" option suggested by the AICUZ.
- Acquisition of avigation easements for existing residential dwellings and platted undeveloped residential lots within the DNL 65 dB contour. Avigation easements are property rights acquired from a land owner that grant the right of flight, including the right to cause noise related to aircraft flight.

Even though Alliance Airport and TMS are not air installations such as JRB/NAS, similar regulations could prove applicable in the TMS study area. Recommendations in Chapter 4 of this plan address zoning and future land use for area impacted by noise in the study area.

Natural Gas Well Drilling and Production

Barnett Shale natural gas well drilling is a prominent activity in the TMS study area. The Barnett Shale is a large natural gas reserve encompassing more than 5,000 square miles and covering at least 17 counties in North Texas, including all of the TMS study area.

There are numerous issues associated with gas well drilling and the related pipelines that deliver the gas to market. The Fort Worth gas well ordinance does not permit a new gas well to be drilled within 600 feet from any residences, religious institutions, public buildings, hospitals, schools, or public parks. The current ordinance does provide a waiver process to reduce the required gas well setback. The ordinance also does not allow new structures to be built within 200 feet of an existing gas well or over abandoned wells. Importantly, gas wells that are in county jurisdiction are not impacted by these restrictions.

The map in Figure 8.9 illustrates the significant number of gas wells in rural areas of Tarrant, Denton and Wise Counties, including the TMS study area. The typical production life of these wells can be up to 20 years or more. One to four million gallons of water can be required during the hydraulic fracturing process to release the natural gas deposits. After the drilling and fracing is complete, waste water produced from the wells (often referred to as salt water) is – within the city limits – typically removed from the site by truck, which can create additional traffic congestion and damage roadways. Alternatively, waste water can be removed from the site by a system of pipes that transport the produced water to a disposal well. Within the City of Fort Worth, only one salt water disposal well has been permitted, however no such restriction applies within the county jurisdictions.

Because state law prohibits structures from being built over pipelines, whether those lines carry natural gas or produced water from drilling, pipelines associated with Barnett Shale natural gas production create a significant constraint to development in the TMS area.

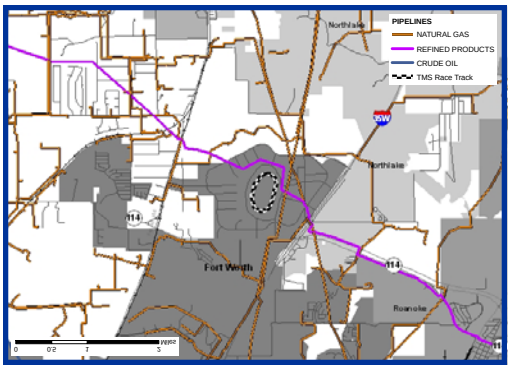
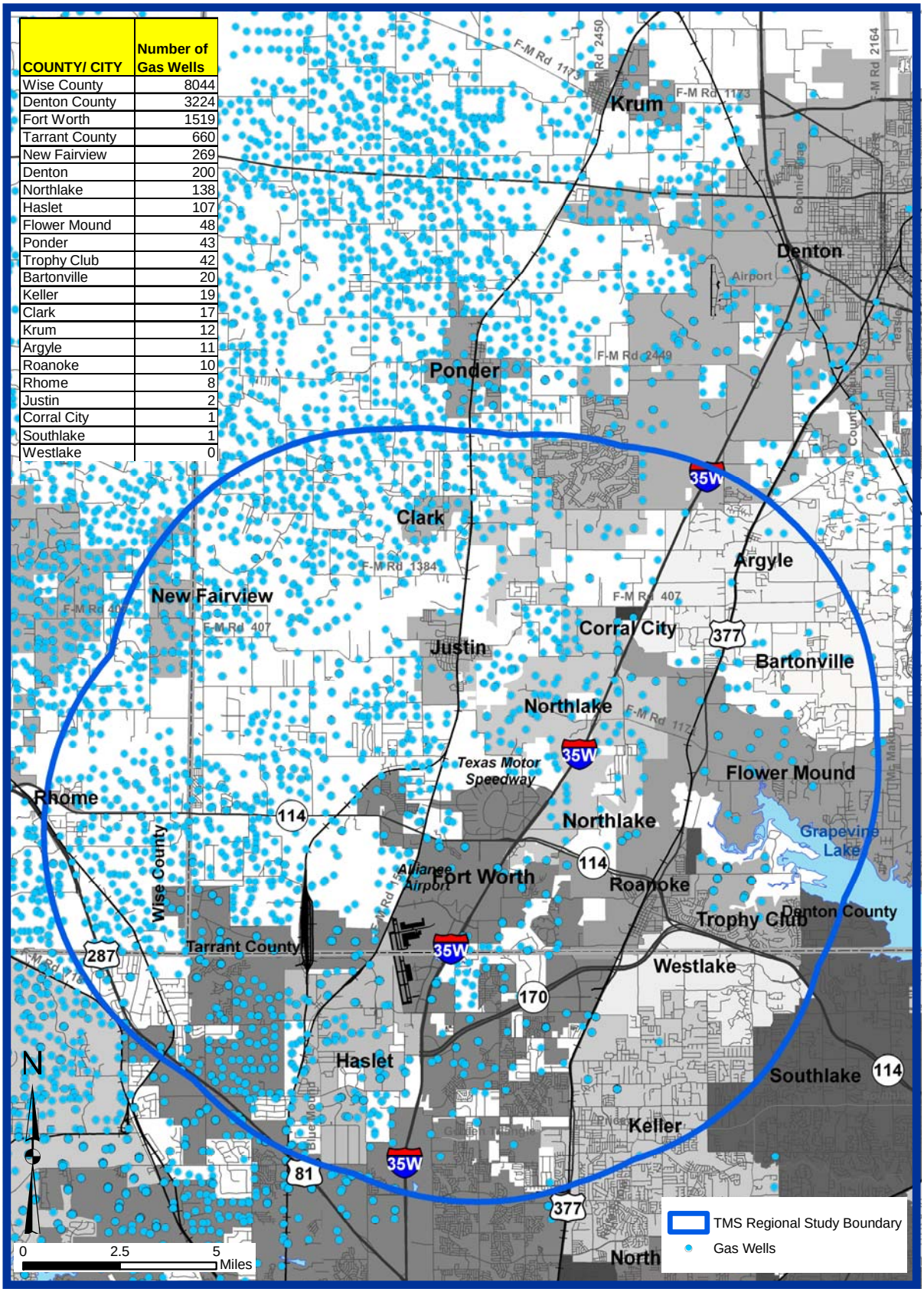


Figure 8.9 Natural gas pipelines near TMS.



COUNTY/ CITY	Number of Gas Wells
Wise County	8044
Denton County	3224
Fort Worth	1519
Tarrant County	660
New Fairview	269
Denton	200
Northlake	138
Haslet	107
Flower Mound	48
Ponder	43
Trophy Club	42
Bartonville	20
Keller	19
Clark	17
Krum	12
Argyle	11
Roanoke	10
Rhome	8
Justin	2
Corral City	1
Southlake	1
Westlake	0

Figure 8.10 Gas Well locations in the TMS Study Area.

Environmental Impact Recommendations

- Use environmentally sensitive areas as buffers between TMS and residential areas.
- Promote the planting of trees and other vegetation to provide natural noise reducing elements to the landscape.
- Establish a system of communication between jurisdictions when evaluating stormwater runoff from new developments. Communities downstream from new development should be aware of and have the opportunity to mitigate negative impacts from upstream development.
- All study area jurisdictions should establish floodplains as natural green corridors. This could be achieved either through zoning or subdivision ordinances that prohibit development within the 100-year floodplain. These green corridors would provide valuable open space for residents, be available for hiking and biking trails and act as a migration route for wildlife.
- Consider an additional noise study during race events to establish a noise level contour map of the study area. This map could then be used to establish any city ordinances necessary to minimize residential development within areas impacted by high noise levels.
- Consider a real estate disclosure ordinance that requires local real estate and rental agents to provide information to prospective purchasers or renters about the special circumstances involved with living within the 65 decibel DNL contour of a noise generator such as Alliance Airport or TMS.
- TMS should perform an update of the Storm Water Pollution Plan as recommended by Freese and Nichols in their 2002 study. Recommendations to reduce the stormwater volume and improve stormwater quality should be implemented.

Figure 8.11 Gas well site near TMS.