This section addresses the aircraft noise impact of Georgetown Municipal Airport (GTU) on surrounding neighborhood for the next 20 years. Two forecast scenarios, "W/O NCTA & W/ATCT" and "W/NCTA & W/ATCT" scenarios, are studied in this section along with recommended noise abatement strategies. FAA Integrated Noise Model (INM) 6.1c, the latest version of INM program, is the FAA approved software to estimate aircraft noise around the airport, and was used to generate noise contours in this study.

The INM echo reports for all scenarios are attached in Appendix "D".

6.1 REPRESENTATIVE AIRCRAFT

Annual total operations and fleet mix data presented in Section Two, Activity Forecasts, were used for this noise modeling. Average daily operations are inputs to INM and were calculated by dividing annual operations by 365 days a year.

It is impractical to model every aircraft that are operating at GTU, therefore typical aircraft were selected from INM database to represent groups of aircraft. Table 6.1 lists these representative aircraft. It should be noted that helicopter operations were not included in this noise modeling due to insignificant numbers of helicopter operations.

6.2 DAYTIME AND NIGHTTIME OPERATIONS

The day-night average sound level (DNL) is a measurement used in this study to estimate aircraft noise exposure over a 24-hour period. Human sensitivity to noise during nighttime is presumed to increase compared with that during daytime. To account for this difference on human sensitivity to noise during different time-of-day, the DNL incorporates a weighting factor that adds 10 decibels to noise occurring during 10 pm to 7 am. Therefore, differentiating daytime and nighttime operations is essential to model aircraft noise at an airport. The daytime in INM is defined as the time period from

7 am to 10 pm, while the nighttime is from 10 pm to 7 am. No data is available to track day and night operations since no air traffic control tower is currently present at GTU. By discussion with the GTU Management and the consultant's previous experience on similar airports, it is assumed that no jets are operated during nighttime (10 pm to 7 am), 90% of non-jet operations occur during daytime (7 am to 10 pm), while 10% of non-jet operations during nighttime (10 pm to 7am). This time-of-day operation split is not expected to change during the 20-year planning period.

Table 6.1
List of Representative Aircraft

Aircraft Category	INM Designator	Examples of Aircraft
Single Engine	GASEPF	Cessna 150, Cessna 172, Piper PA-28 Archer, Piper Tomahawk, Piper PA-28 Cherokee Challenger
	GASEPV	Piper PA-22 Tripacer, Piper PA-24 Comanche, Cessna 180, Mooney, Beech Bonanza
Multi-Engine Piston	BEC58P	Cessna 310, Cessna 414 Chancellor, Grumman Cougar, Piper PA-23 Aztec, Piper PA-31 Navajo, Beech Baron, Beechcraft Queen Air 80 Series
Turboprop	CNA441	Cessna Conquest II, Cessna 425 Corsair, Beech King Air C90, Beech King Air 100, Gulfstream Commander, Piper PA-31T Cheyenne, Aero Commander 695, Swearingen Merlin II/III
Business Jet	LEAR35	Learjet 30 - 60 Series, Falcon 200/10
	MU3001	Cessna Citation II/V
	CNA750	Cessna Citation X

Source: GRW Willis, Inc., March 2004

6.3 RUNWAY UTILIZATION

There is no data available to track percentage of each runway that has been used by aircraft at GTU. The runway utilization by each type of aircraft was estimated based on the information provided by the GTU Management, consultant's previous experiences on similar airports, and weather information. As discussed in Section One Inventory, Runway 11-29 has two constraints that limit its usage by certain types of aircraft. One constraint is runway length. With 4,100 feet of pavement, Runway 11-29 poses a challenge to some business jets, turboprop and multi-engine piston aircraft, especially under high temperature and/or wet conditions. The second constraint is the operational restriction currently posed to Runway 11-29, which is Runway 11-29 is close to aircraft weighting 12,500 lbs or more. This restriction was placed in 1993 when a non-precision GPS approach was issued to Runway 11. Moreover, compared with other three runway ends, Runway 11 requires more

taxiing time. Therefore, it is assumed that aircraft other than single engine aircraft are using Runway 18 at 70% of time while using Runway 36 at 30% of time. Single engine aircraft are split 80-20 between Runway 18-36 and Runway 11-29, resulting in 56%, 24%, 10%, and 10% of time, respectively, on Runways 18, 36, 11, and 29. The runway utilization is summarized in Table 6.2.

Table 6.2
Runway Utilization

Runway	Single-Engine	Multi-Engine Piston & Turboprop	Business Jet
18	56%	70%	70%
36	24%	30%	30%
11	10%	0	0%
29	10%	0	0%

Sources: Georgetown Municipal Airport Management; GRW Willis, Inc., March 2004

The above runway utilization is not expected to change for both scenarios during the 20-year planning period unless Runway 11-29 is undergone extension and operational restriction is lift.

6.4 TOUCH-AND-GO OPERATIONS

The GTU Management estimated that about 25-35% of total operations at GTU are touch-and-go operations. In this study, approximately 27% of total operations are assumed to be touch-and-go operations and were used as an input to INM to model touch-and-go activities at GTU. Generally, majority of touch-and-go operations are conducted by single-engine aircraft and during daylight. It is assumed that 99% of touch-and-go operations are performed by single-engine aircraft and the remaining 1% are performed by multi-engine piston aircraft. In terms of time of day that operations are conducted, 90% of operations are assumed to occur during 7am to 10 pm and 10% during 10 pm to 7 am. The touch-and-go operations are summarizes in Table 6.3 for the 20-year planning period for both scenarios. The runway utilization for touch-and-go operations is expected to be the same as in Table 6.2 for both "W/O NCTA & W/ATCT" and "W/NCTA & W/ATCT" scenarios.

Table 6.3 summarizes the average daily operations in the year 2004, 2009, 2014, and 2024 for both scenarios.

Table 6.3
Average Daily Operations [(1)]

	2004			2009			2014			2024		
Aircraft	**Arr**	**Dep**	**TGO**	**Arr**	**Dep**	**TGO**	**Arr**	**Dep**	**TGO**	**Arr**	**Dep**	**TGO**
W/O NCTA & W/ ATCT												
GASEPV	54.83	54.83	47.00	60.97	60.97	52.26	68.47	68.47	58.69	83.54	83.54	71.61
GASEPF	54.83	54.83	47.00	60.97	60.97	52.26	68.47	68.47	58.69	83.54	83.54	71.61
BEC58P	10.10	10.10	1.29	11.76	11.76	1.50	13.25	13.25	1.69	16.26	16.26	2.08
CNA441	5.37	5.37	-	6.51	6.51	-	7.33	7.33	-	9.69	9.69	-
MU3001	1.43	1.43	-	1.60	1.60	-	2.03	2.03	-	2.77	2.77	-
LEAR35	1.43	1.43	-	1.60	1.60	-	2.03	2.03	-	2.77	2.77	-
CNA750	0.72	0.72	-	0.80	0.80	-	1.01	1.01	-	1.38	1.38	-
TOTAL	**128.71**	**128.71**	**95.28**	**144.20**	**144.20**	**106.01**	**162.58**	**162.58**	**119.06**	**199.95**	**199.95**	**145.29**
W/ NCTA & W/ ATCT												
GASEPV	54.83	54.83	47.00	59.30	59.30	50.83	57.06	57.06	48.90	58.38	58.38	50.04
GASEPF	54.83	54.83	47.00	59.30	59.30	50.83	57.06	57.06	48.90	58.38	58.38	50.04
BEC58P	10.10	10.10	1.29	11.44	11.44	1.46	11.04	11.04	1.41	11.36	11.36	1.45
CNA441	5.37	5.37	-	6.33	6.33	-	6.11	6.11	-	6.77	6.77	-
MU3001	1.43	1.43	-	1.56	1.56	-	1.69	1.69	-	1.93	1.93	-
LEAR35	1.43	1.43	-	1.56	1.56	-	1.69	1.69	-	1.93	1.93	-
CNA750	0.72	0.72	-	0.78	0.78	-	0.85	0.85	-	0.97	0.97	-
TOTAL	**128.71**	**128.71**	**95.28**	**140.27**	**140.27**	**103.12**	**135.49**	**135.49**	**99.22**	**139.72**	**139.72**	**101.53**

Note: (1) Arr = Arrival Operations, Dep = Departure Operations, TGO = Touch-and-Go Operations.

Source: GRW Willis, Inc., March 2004

6.5 FLIGHT TRACKS

Generalized flight tracks were developed in this study based on the published flight procedures at GTU, input from the GTU Management, and a review of *FAR Part 150 Noise Compatibility Study Update*.

Exhibits 6.1, 6.2, 6.3 illustrate generalized arrival, departure and touch-and-go flight tracks for GTU. It should be noted that currently Runway 18 and Runway 11 adapt left traffic patterns while Runway 36 and Runway 29 adapt right traffic patterns.

Exhibit 6.1 Generalized Arrival Flight Tracks

Exhibit 6.2 Generalized departure Flight Tracks

Exhibit 6.3 Generalized Touch-and-Go Flight Tracks

6.6 NOISE EXPOSURE MAPS

Noise exposure maps at GTU were generated using the FAA Integrated Noise Model (INM) Version 6.1c for both scenarios in the years 2004 (Existing), 2009, 2014, and 2024.

6.6.1 2004 Existing Conditions

Exhibit 6.4 illustrates noise impacts in the year 2004. As shown in Exhibit 6.4, 70 DNL and 65 DNL noise contours extend outside of the airport property line to the northwest, southwest, and southeast of Runway 18-36. About nine single-family homes located to the northwest of Runway 18 end are exposed to 65 DNL noise while no residential structures and noise-sensitive facilities on other sides of the airport are impacted by 65 DNL noise.

6.6.2 W/O NCTA & W/ATCT Scenario

Exhibits 6.5 through 6.7 depict aircraft noise exposures for the year 2009, 2014, and 2024, respectively, under "W/O NCTA & W/ATCT" scenario.

As illustrated in Exhibit 6.5, by 2009 70 DNL and 65 DNL noise contours will extend outside of airport property line to the northwest, southwest, and southeast of Runway 18-36. Twelve single-family homes located to the northwest of Runway 18 end will be exposed to 65 DNL noise by 2009.

As illustrated in Exhibit 6.6, by 2014 with the increasing aircraft activities, 70 DNL and 65 DNL noise contours will extend further outside of airport property line to the northwest, southwest, and southeast of Runway 18-36. Thirteen single-family homes located to the northwest of Runway 18 end will be exposed to 65 DNL noise by 2014.

Exhibit 6.4 2004 Noise Contours - Existing Conditions

Exhibit 6.5 2009 Noise Contours - W/O NCTA & W/ATCT

Exhibit 6.6 2014 Noise Contours - W/O NCTA & W/ATCT

By 2024, a substantial expansion of noise contours was contributed by the continuing growth of aircraft activities at the airport. As illustrated in Exhibit 6.7, 70 DNL noise contour will extend outside of the airport property line to the northwest, southwest, and southeast of Runway 18-36. 65 DNL noise contour extends outside of the airport property to the northwest, southwest, and southwest of Runway 18-36, as well as to the north and to the south along the extended Runway 18-36 centerline. On the north side, four single-family homes locate to the northwest of Runway 18 end will be exposed to 70 DNL noise, 14 single-family homes located to the northwest of Runway 18 end and two single-family homes located along the extended Runway 18-36 centerline to the north of Runway 18 end will be affected by 65 DNL noise by 2024. On the south side, two single-family homes located along the extended Runway 18-36 centerline to the south of Runway 36 end will be exposed to 65 DNL noise by the year 2024.

6.6.3 W/NCTA & W/ATCT Scenario

Exhibits 6.8 through 6.10 depict aircraft noise exposures for the year 2009, 2014, and 2024, respectively, under "W/NCTA & W/ATCT" scenario.

As illustrated in these three exhibits, 70 DNL and 65 DNL noise contours extend outside of airport property line to the northwest, southwest, and southeast of Runway 18-36. Due to the lower activity levels, the noise contours under this scenario are smaller than those for "W/O NCTA & W/ATCT "scenario. However, 12, 11, 12 single-family homes located to the northeast of Runway 18 end will still be exposed to 65 DNL noise in the year 2009, 2014, and 2024, respectively. No residential buildings and noise sensitive facilities on other sides of the airport are impacted by 65 DNL noise during the 20-year planning period.

Exhibit 6.7 2024 Noise Contours - W/O NCTA & W/ATCT

Exhibit 6.8 2009 Noise Contours - W/NCTA & W/ATCT

Exhibit 6.9 2014 Noise Contours - W/NCTA & W/ATCT

Exhibit 6.10 2024 Noise Contours - W/NCTA & W/ATCT

6.7 NOISE ABATEMENT ALTERNATIVES

As discussed in the previous section, the aircraft noise contours extend outside of the airport property and impact residential structures to the north and south throughout the 20-year planning period for both scenarios. On the northwestern and southeastern sides of airport, noise contours are contained within the airport property. No residential development presently exists between Runway 29 end and Airport Road at the southeast of the airport. One potential noise abatement alternative is to reallocate noise exposure between north-south direction and northwest-southeast direction. This alternative can be executed by relocating some aircraft operations from Runway 18-36 to Runway 11-29.

As discussed in Section 6.2, Daytime and Nighttime Operations, nighttime operations create worse noise impacts on humans than daytime activity. The second alternative investigated in this study evaluates the noise benefits generated by designating Runway 11-29 as a preferred nighttime and touch-and-go runway.

The length of Runway 11-29 along with the operational restriction discussed previously limits its usage; therefore a third alternative, which is the extension of Runway 11-29 to the southeast and allocation of more traffic especially jet operations to this runway, was also considered. This alternative evaluates the feasibility of the possible extension by comparing the development costs with the noise benefits.

These three alternatives were studied for both "W/O NCTA & W/ATCT" and "W/NCTA & W/ATCT" scenarios for the year 2009 and 2024, and then compared with the noise exposure maps generated in the previous section. The noise exposure maps generated in the previous section were named as "Do-Nothing" cases for discussion purposes.

6.7.1 Alternative 1 - Reallocate Runway Utilization

Currently, Runway 11-29 is closed to aircraft weighting 12,500 lbs or more. The "Do-Nothing" cases discussed above anticipate only 20% of single-engine aircraft using this runway during the 20-year planning period. This alternative was established by assuming that

Runway 11-29 pavement strength is comparable to Runway 18-36 under its existing condition or through pavement overlay to increase its pavement strength. A discussion of the pavement strength on Runway 11-29 is presented in Section 3.1.3, Runway Pavement Strength. As a result, the operational restriction on Runway 11-29 could be lifted and runway utilization by aircraft can be reallocated as shown in Table 6.4. It should be noted that a runway length of less than 5,000 feet still limits jet operations on Runway 11-29. Runway extension is not anticipated to occur during this 20-year planning period under this alternative, and as summarized in Table 6.4, no business jets will be operated on Runway 11-29 throughout the planning period. This runway utilization could be implemented when the ATCT is commissioned.

The flight tracks shown in Exhibit 6.1 to 6.3 were applied to this alternative.

Table 6.4
Runway Utilization Reallocation - Alternative 1 (1)

Runway	Single-Engine	Multi-Engine Piston & Turboprop	Business Jet
18	49%	49%	70%
36	21%	21%	30%
11	21%	21%	0%
29	9%	9%	0%

Note: (1). Moving additional traffic to Runway 29 will result in an increase of noise to the northwestern neighborhood. It is not the City's policy to shift noise from one neighborhood to another.
Sources: Georgetown Municipal Airport Management; GRW Willis, Inc., March 2004

W/O NCTA & W/ATCT Scenario - Exhibits 6.11 and 6.12 compare the DNL noise contours resulting from reallocating runway utilization with the "Do-Nothing" case for "W/O NCTA & W/ATCT" scenario, by the year 2009 and 2024, respectively. As expected, in both years the noise contours extend further out in northwest-southeast direction and shrinks towards the airport in north-south direction. By reallocating runway utilization, two out of 12 single-family homes, which are impacted by the 65 DNL noise under the "Do-Nothing" case, are free from the 65 DNL noise exposures by 2009. By 2024, three out of four single-family homes, which are exposed to 70 DNL noise under the "Do-Nothing" case, will be out of 70 DNL noise contour, however, will still expose to 65 DNL noise. No residences north to Runway 18 end and south to Runway 36 end along the extended runway centerline will be impacted by 65 DNL noise.

W/O NCTA & W/ATCT Scenario - Exhibits 6.13 and 6.14 compare the DNL noise contours resulting from reallocating runway utilization with the "Do-Nothing" case for "W/NCTA & W/ATCT" scenario, by the year 2009 and 2024, respectively. As expected, in both years the noise contours extend further out in northwest-southeast direction and shrink towards the airport in north-south direction. By reallocating runway utilization, two single-family homes, which are impacted by the 65 DNL noise under the "Do-Nothing" case, will be free from the 65 DNL noise exposures by 2009 and 2024.

6.7.2 Alternative 2 - Designating Runway 11-29 as a Preferential Nighttime and Touch-and-Go Runway

As previously discussed, the DNL calculation incorporates a weighting factor to account for the difference of the human sensitivity to noise during daytime and nighttime. This alternative is to evaluate the noise benefits resulting from designating Runway 11-29 as a preferential nighttime and touch-and-go runway. The runway utilization was revised to reflect this designation and is summarized in Table 6.5. This runway utilization could be materialized under the instruction of an air traffic controller. And at the same time, a well-designed and widely distributed program flyer could contribute greatly to implementing this alternative.

The flight tracks shown in Exhibits 6.1 to 6.3 were applied to this alternative.

Exhibit 6.11 Comparison of 2009 Noise Contours
"Do-Nothing" vs. "Alternative 1"- W/O NCTA & W/ATCT

Exhibit 6.12 Comparison of 2014 Noise Contours
"Do-Nothing" vs. "Alternative 1"- W/O NCTA & W/ATCT

Exhibit 6.13 Comparison of 2009 Noise Contours
"Do-Nothing" vs. "Alternative 1"- W/NCTA & W/ATCT

Exhibit 6.14 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Alternative 1"- W/NCTA & W/ATCT

Table 6.5
Runway Utilization Reallocation - Alternative 2 (1)

Runway	Single-Engine	Multi-Engine Piston & Turboprop	Business Jet
Daytime for Non-Touch-and-Go Operations			
18	49%	49%	70%
36	21%	21%	30%
11	21%	21%	0%
29	9%	9%	0%
Nighttime for Non-Touch-and-Go Operations			
18	21%	21%	0%
36	9%	9%	0%
11	49%	49%	0%
29	21%	21%	0%
Daytime and Nighttime for Touch-and-Go Operations			
18	21%	21%	0%
36	9%	9%	0%
11	49%	49%	0%
29	21%	21%	0%

Note: (1). Moving additional traffic to Runway 29 will result in an increase of noise to the northwestern neighborhood. It is not the City's policy to shift noise from one neighborhood to another.
Source: GRW Willis, Inc., May 2004

W/O NCTA & W/ATCT Scenario

Exhibits 6.15 and 6.16 compare the DNL noise contours generated for this alternative with the "Do-Nothing" case for "W/O NCTA & W/ATCT" scenario, by the year 2009 and 2024, respectively. Similar as Alternative 1, in both years the noise contours extend further out in northwest-southeast direction and shrink towards the airport in north-south direction. By the year 2009, seven out of 12 single-family homes, which are impacted by the 65 DNL noise under the "Do-Nothing" case, will be out of the 65 DNL noise contour. By 2024, no single-family homes will expose to 70 DNL noise, and the number of homes that will be impacted by 65 DNL or more noise reduces from 18 to 11.

W/NCTA & W/ATCT Scenario

Exhibits 6.17 and 6.18 compare the DNL noise contours generated for this alternative with the "Do-Nothing" case for "W/NCTA & W/ATCT" scenario, by the year 2009 and 2024, respectively. As illustrated in both exhibits, seven out of 12 single-family homes, which are impacted by the 65 DNL noise under the "Do-Nothing" case, will be free from the 65 DNL noise contour by the years 2009 and 2024.

Exhibit 6.15 Comparison of 2009 Noise Contours
"Do-Nothing" vs. "Alternative 2"- W/O NCTA & W/ATCT

Exhibit 6.16 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Alternative 2"- W/O NCTA & W/ATCT

Exhibit 6.17 Comparison of 2009 Noise Contours
"Do-Nothing" vs. "Alternative 2"- W/NCTA & W/ATCT

Exhibit 6.18 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Alternative 2"- W/NCTA & W/ATCT

6.7.3 Alternative 3 - Upgrading Runway 11-29 to a C-II Runway

Alternative 3 is to evaluate the noise benefit generated by upgrading Runway 11-29 to a C-II Runway and shifting jet operations to Runway 11-29. An estimate of construction costs for this upgrading was also prepared.

The upgrading involved in this alternative includes relocation of Runway 11 threshold by 476 feet to accommodate a 1,000 feet long runway Object Free Area (OFA) beyond the runway threshold, extension of Runway 11-29 by 1,376 feet to southeast reaching a total length of 5,000 feet, extension of Taxiway "A" to the new Runway 29 end, and widening Runway 11-29 to 100 feet wide. By doing so, an additional 30 acres of land southeast to the existing airport property has to be acquired in fee as the airport property, and an additional 36 acres of land which falls within the Runway Protection Zone (RPZ) shall be acquired as an avigation easement. Lakeway Drive has to be realigned to the southeast at least outside of the Runway 11-29 OFA. A part of Airport Road shall be either closed or reconstructed as a roadway tunnel underneath the Runway 11-29 OFA. The total construction cost was estimated to be well above $6 millions. One of problems created from this upgrading is the encroachment of Interstate Highway 35 (IH-35) to the Runway 29 RPZ. Ideally, IH-35 should be realigned outside the RPZ, which will add a substantial amount of construction cost on the top of $6 million.

It was assumed in this alternative that all jet operations would be performed on Runway 11-29. Table 6.6 summarizes the runway utilization for this alternative.

Table 6.6
Runway Utilization Reallocation - Alternative 3 (1)

Runway	Single-Engine	Multi-Engine Piston & Turboprop	Business Jet
18	49%	49%	0%
36	21%	21%	0%
11	21%	21%	70%
29	9%	9%	30%

Note: (1). Moving additional traffic to Runway 29 will result in an increase of noise to the northwestern neighborhood. It is not the City's policy to shift noise from one neighborhood to another.
Source: GRW Willis, Inc., June 2004

The flight tracks shown in Exhibits 6.1 to 6.3 were used in this alternative to generate noise contours.

Exhibits 6.19 and 6.20 compare the noise contours generated for this alternative with the "Do-Nothing" case for both "W/O NCTA & W/ATCT" and "W/NCTA & W/ATCT" scenarios. As expected, compared with the "Do-Nothing" case, the noise contours of this alternative shrink towards the center of the airfield in the north-south direction, while extend further to the southeast as a result of the extension of Runway 29 and relocation of Runway 11 threshold. As illustrated in Exhibit 6.19, under "W/O NCTA & W/ ATC" scenario, by 2024 no single-family homes will expose to 70 DNL noise, and the number of homes that will be impacted by 65 DNL or more noise reduces from 18 to 13. For "W/NCTA & W/ATCT" scenario, Exhibit 6.20 depicts that by 2024 six residential homes will be free from 65 DNL noise.

The noise benefits resulting from this alternative are not significant better than Alternative 2. Considering the high development cost associated with this alternative, it is not recommended as a feasible noise abatement measurement in this study.

Exhibit 6.19 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Alternative 3"- W/O NCTA & W/ATCT

Exhibit 6.20 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Alternative 3"- W/NCTA & W/ATCT

6.8 OTHER CONSIDERATION - MODIFY RUNWAY TRAFFIC PATTERN

One issue that was brought up by pilots on pilot surveys is the conflicting traffic patterns on both Runways. Runways 18 and 11 are supporting left traffic patterns while Runways 36 and 29 are supporting right traffic patterns. With extensive touch-and-go training activities and without an ATCT at present, the current traffic pattern configuration at Georgetown Municipal Airport raises some safety concerns. The establishment of an ATCT has been approved by the City and is expected to be in operation in the next two years. This alternate is to investigate the adverse noise impacts or benefit, if any, resulting from changing right traffic patterns on both Runways 36 and 29 to left traffic patterns.

Exhibits 6.21 and 6.22 illustrate the modified generalized arrival and touch-and-go flight tracks reflecting left traffic patterns for all runway ends.

Noise contours were generated for the year 2024 by using the modified left-traffic-pattern flight tracks and the same runway utilization as of the present. Exhibits 6.23 and 6.24 compare the noise contours resulting from left traffic patterns with the "Do-Nothing" case for "W/O NCTA & W/ATCT" and "W/NCTA & W ATCT" scenarios.

As shown in both exhibits, virtually no changes occur on the noise contours resulting from shifting traffic patterns on Runways 36 and 29. However, as previously mentioned, DNL averages noise levels throughout a 24-hour period, thus it does not represent truly the real-time situation, especially a single event with noisy aircraft. By shifting traffic patterns to the left for Runways 36 and 29, more aircraft will flight over the residential communities northwest to the airport. It is not desirable for the airport that intends to maintain the environmental friendly relationship with neighbors and continue to obtain public/communities support. On the other hand, with the establishment of ATCT at the airport, the confusion caused by different traffic patterns on four runway ends shall be eliminated or reduced to the minimum. Therefore, this study is not recommended to shift the exiting right traffic patterns on Runways 36 and 29 to left traffic patterns.

Exhibit 6.21 Modified Generalized Arrival Flight Tracks

Exhibit 6.22 Modified Generalized Touch-and-Go Flight Tracks

Exhibit 6.23 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Left Traffic Patterns"- W/O NCTA & W/ATCT

Exhibit 6.24 Comparison of 2024 Noise Contours
"Do-Nothing" vs. "Left Traffic Patterns"- W/NCTA & W/ATCT

6.9 ENGINE RUN-UP NOISE

Several fixed base operators (FBOs) at GTU provide aircraft maintenance services. Generally, engine run-ups are performed either before repairing to diagnose the problem or after completion of repairing to test the result. As a part of "Fly Friendly" program that is currently in place at GTU, engine run-ups are required to be conducted as close as possible to the center of the airfield, intending to minimize the resultant aircraft noise disturbance to the surrounding neighborhood. Through discussion with the GTU Management and reviewing of *Part 150 FAR Part 150 Noise Compatibility Study Update* (Part 150 Study) that was completed in the year 2003, two locations were identified as run-up sites depending on wind direction. One, the commonly used location, is on a stub taxiway that is the second stub taxiway from the Runway 36 end. The other is on Taxiway B adjacent to the wind cone.

Mitsubishi Mu-2, a two-engine turboprop aircraft, was selected as a representative aircraft to model engine run-up noise. MU-2 was stated in Part 150 Study as the most common aircraft conducted engine run-ups at GTU. The Maximum A-Weighted Sound Level, describing the maximum noise level of a single even, was used to measure noise from engine run-ups. To limit noise exposure outside the airport property, aircraft was modeled facing south on the second stub taxiway from the Runway 36 end, and facing north on the Taxiway B. Typical run-up lasts 30 seconds to 30 minutes depending on the nature of aircraft maintenance, as indicated in Part 150 Study. In this study, run-up operation was modeled for 60 second.

Exhibit 6.25 graphically depicts the maximum noise level of a single run-up with 100% thrust setting lasting for 60 seconds at the two selected locations. The noise impacts generated from these two locations shall not be added because engine run-ups mostly likely will not be performed at the both locations at the same time. The exhibit indicates three noise levels, ranging from 55 dBA to 65 dBA. The external noise levels of 55 dBA and 65 dBA will result in noise levels of 40 to 45 dBA inside a typical home, due to the sound attenuation function of a house. As indicated in Part 150 Study, these 40 to 45 noise levels "generally represent the lower end of the sleep disturbance spectrum." As illustrated in Exhibit 6.25, 55 dBA noise contour that is generated for either the northern or southern engine run-up site covers over 100 residential homes.

Moreover, the duration and the pattern of maintenance engine run-up vary greatly with different testing. This uncertainty makes engine run-up noise more irritating to the airport surrounding communities than the noise resulting from aircraft overflight.

The City of Georgetown has approved the recommendation that was proposed in Part 150 Study to build engine maintenance run-up enclosure. As indicated in Part 150 Study, such an engine maintenance run-up enclosure would reduce noise by approximately 15 decibels. However, the location of the enclosure has not been finalized, and in order to meet airport operational and functional requirements, it may necessary to construct taxiways and utility services (water, sewer, electrical) to the site selected. The precise orientation of the enclosure would also need to be determined by the designers, and an acoustical analysis shall be performed.

6.10 REMEDIES

The 2003 Part 150 Noise Exposure Maps show nine houses outside the airport and within the 65 DNL noise contour. The City strongly supports every effort to contain the 65 DNL within the airport property. These efforts included possible reallocation of traffic to Runway 11, stabilizing the level of airport traffic through the establishment of the Central Texas Regional Airport and the City's own determination to build no more tie-downs, hangars, or maintenance facilities. Other alternatives available to FAA/TxDOT are to authorize limiting of growth in numbers of based aircraft or regulating fleet mix. If every effort to contain the 65 DNL within the airport property fails, the City can and may seek remedies for the properties affected, if in consultation with the property owners these remedies are determined to benefit them. These remedies include FAA/TxDOT grants to purchase properties or to sound attenuate them.

Exhibit 6.25 Noise Contours From Aircraft Engine Runup