APPENDIX G

Noise Metrics,
The Effects of Aviation Noise on People,
Noise Guidelines for Compatibility and
Noise Model Development

Noise Metrics, The Effects of Aviation Noise on People, Noise Guidelines for Compatibility and Noise Model Development

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Minneapolis-St. Paul International Airport
2020 Improvements
Environmental Assessment/
Environmental Assessment Worksheet

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APPENDIX G
Noise Metrics, the Effects of Aviation Noise on People, Noise Guidelines for Compatibility and Noise Model Development

INTRODUCTION

This appendix presents the details of noise metrics and the effect of noise on people. To assist reviewers in interpreting these noise metrics, this appendix presents an introduction to the relevant fundamentals of acoustics and noise terminology (see Section 1) and the effects of noise on human activity (see Section 2). A summary is provided of noise guidance relative to land use compatibility from a Federal and local perspective in Section 3. Lastly, the technical details of the noise model used to calculate aircraft noise exposure are discussed in Section 4. Sections 4.9, *Affected Environment, Noise* and 5.10, *Environmental Consequences, Noise* builds on this background information to provide impact analysis of aircraft noise.

1 Noise Metrics

Noise, which is often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only sources of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial, and neighborhood sources may also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by aviation noise and are typically singled out for criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

A “metric” is defined as something “of, involving, or used in measurement.” As used in environmental noise analyses, a metric refers to the unit or quantity that quantitatively measures the effect of noise on the environment. The Federal Aviation Administration (FAA) requires use of the Day-Night Average Sound Level (DNL) noise metric to determine and analyze noise exposure and aid in the determination of aircraft noise and land use compatibility issues around U.S. airports. Because the DNL metric correlates well with the degree of community annoyance from aircraft noise, DNL has been formally adopted by most federal agencies dealing with noise exposure. In addition to the FAA, these agencies include the Environmental Protection Agency, Department of Defense, Department of Housing and Urban Development and the Veterans Administration.

The DNL metric is calculated by cumulatively averaging sound levels over a 24-hour period. This average cumulative sound exposure includes the application of a 10-decibel penalty to sound exposures occurring during the nighttime (10:00 PM to 7:00 AM). The night sound exposures are increased by 10 decibels because nighttime noise is more intrusive.

Accordingly, this appendix discusses the following acoustic terms and metrics:

- Decibel (dB)
- A-Weighted Decibel (dBA)
- Maximum Sound Level (L_{max})
- Sound Exposure Level (SEL)
- Equivalent Sound Level (L_{eq})
- Day-Night Average Sound Level (DNL)

1.1 Decibel (dB)

All sounds come from a sound source—a musical instrument, a speaking voice, and an airplane passing overhead. Energy is needed to produce sound. The sound energy produced by any sound source is transmitted through the air in sound waves—tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear.

Human ears are sensitive to a wide range of sound pressures. The loudest sound that people hear without pain has about one trillion times more energy than the quietest sounds heard. As this range, on a linear scale, is unwieldy, the total range of sound pressures is compressed into a more meaningful range by introducing the concept of sound pressure level (SPL) and its logarithmic unit of decibel (dB).

SPL is a measure of the sound pressure of a given noise source relative to a standard reference value (typically the quietest sound that a young person with good hearing can detect). Decibels are logarithmic quantities, i.e., the ratio of the two pressures: the numerator being the pressure of the sound source of interest (e.g., an aircraft), and the denominator being the reference pressure (the quietest sound we can hear).

The logarithmic conversion of sound pressure to SPL means that the quietest sound people can hear (the reference pressure) has a SPL of about zero decibels, while the loudest sounds heard without pain have SPLs of about 120 dB. Most sounds in our day-to-day environment have SPLs from 30 to 100 dB.

Because decibels are logarithmic quantities, they require logarithmic math and not simple (linear) addition and subtraction. For example, if two sound sources each produce 100 dB and are operated together, they produce only 103 dB—not 200 dB as might be expected. Four equal sources operating simultaneously result in a total SPL of 106 dB. In fact, for every doubling of the number of equal sources, the SPL (of all of the sources combined) increases another three decibels. A ten-fold increase in the number of sources makes the SPL increase by 10 dB. A hundredfold increase makes the level increase by 20 dB and it takes a thousand equal sources to increase the level by 30 dB.

If one source is much louder than another, the two sources together will produce the same SPL (and sound to our ears) as if the louder source were operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source “masks” the quieter one. But if the quieter source gets louder, it will have an increasing effect on the total SPL. When the two sources are equal, as described above, they produce a level 3 decibels above the sound level of either one by itself.

From these basic concepts, note that one hundred 80 dB sources will produce a combined level of 100 dB; if a single 100 dB source is added, the group will produce a total SPL of 103 dB. Clearly, the loudest source has the greatest effect on the total.

There are two useful rules of thumb to remember when comparing SPLs: (1) most of us perceive a 6 to 10 dB increase in the SPL to be an approximate doubling of loudness, and (2) changes in SPL of less than about 3 dB are not readily detectable outside of a laboratory environment.

1.2 A-Weighted Decibel (dBA)

Another important characteristic of sound is its frequency, or “pitch.” This is the rate of repetition of the sound pressure oscillations as they reach our ear. Frequency can be expressed in units of cycles per second (cps) or Hertz (Hz). Although cps and Hz are equivalent, Hz is the preferred scientific unit and terminology.

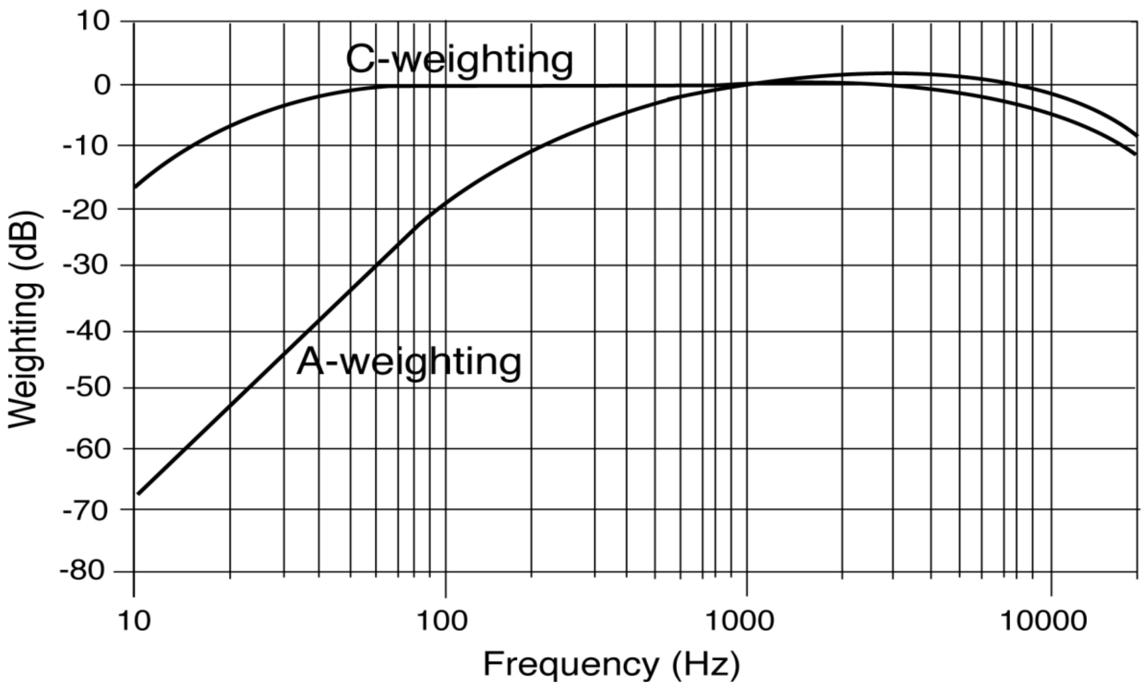
A very good ear can hear sounds with frequencies from 16 Hz to 20,000 Hz. However, most people hear from approximately 20 Hz to approximately 10,000-15,000 Hz. People respond to sound most readily when the predominant frequency is in the range of normal conversation, around 1,000 to 4,000 Hz. Acousticians have developed and applied “filters” or “weightings” to SPLs to match our ears’ sensitivity to the pitch of sounds and to help us judge the relative loudness of sounds made up of different frequencies. Two such filters, “A” and “C,” are most applicable to environmental noises.

A-weighting significantly deemphasizes noise at low and high frequencies (below approximately 500 Hz and above approximately 10,000 Hz) where people do not hear as well. The filter has little or no effect at intervening frequencies where human hearing is most efficient. **Figure G.1-1** shows a graph of the A-weighting as a function of frequency and its aforementioned characteristics. Because this filter generally matches our ears’ sensitivity, sounds having higher A-weighted sound levels are usually judged to be louder than those with lower A-weighted sound levels, a relationship which does not always hold true for unweighted levels. Therefore, A-weighted sound levels are normally used to evaluate environmental noise. SPLs measured through this filter are referred to as A-weighted decibels (dBA).

As shown in Figure G.1-1, C-weighting is nearly flat throughout the audible frequency range, hardly deemphasizing the low frequency noise. C-weighted levels are not used as frequently as A-weighted levels, but they may be preferable in evaluating sounds whose low-frequency components are responsible for secondary effects such as the shaking of a building, window rattle, perceptible vibrations, or other factors that can cause annoyance and complaints. Uses include the evaluation of blasting noise, artillery fire, sonic boom, and, in some cases, aircraft noise inside buildings. SPLs measured through this filter are referred to as C-weighted decibels (dBC).

Figure G.1-1

Frequency Response Characteristics of A and C Weighting



Source: ANSI S1.4-1983 "Specification of Sound Level Meters"

Other weighting networks have been developed to correspond to the sensitivity and perception of other types of sounds, such as the "B" and "D" filters. However, A-weighting has been adopted as the basic measure of community environmental noise by the U.S. Environmental Protection Agency (EPA) and nearly every other agency concerned with aircraft noise throughout the United States.

Figure G.1-2 presents typical A-weighted sound levels of several common environmental sources. Sound levels measured (or calculated) using A-weighting are most properly called "A-weighted sound levels" while sound levels measured without any frequency weighting are most properly called "sound levels." However, since this study deals only with A-weighted sound levels, the A-weighted sound levels are referred to simply as sound levels in the interests of conciseness.

An additional dimension to environmental noise is that sound levels vary with time and typically have a limited duration, as shown in **Figure G.1-3.** For example, the sound level increases as an aircraft approaches, then falls and blends into the background as the aircraft recedes into the distance. Sounds can be classified by their duration as continuous like a waterfall, impulsive like a firecracker or sonic boom, or intermittent like an aircraft overflight or vehicle passby.

Figure G.1-2

Sound Levels of Typical Noise Sources (dBA)

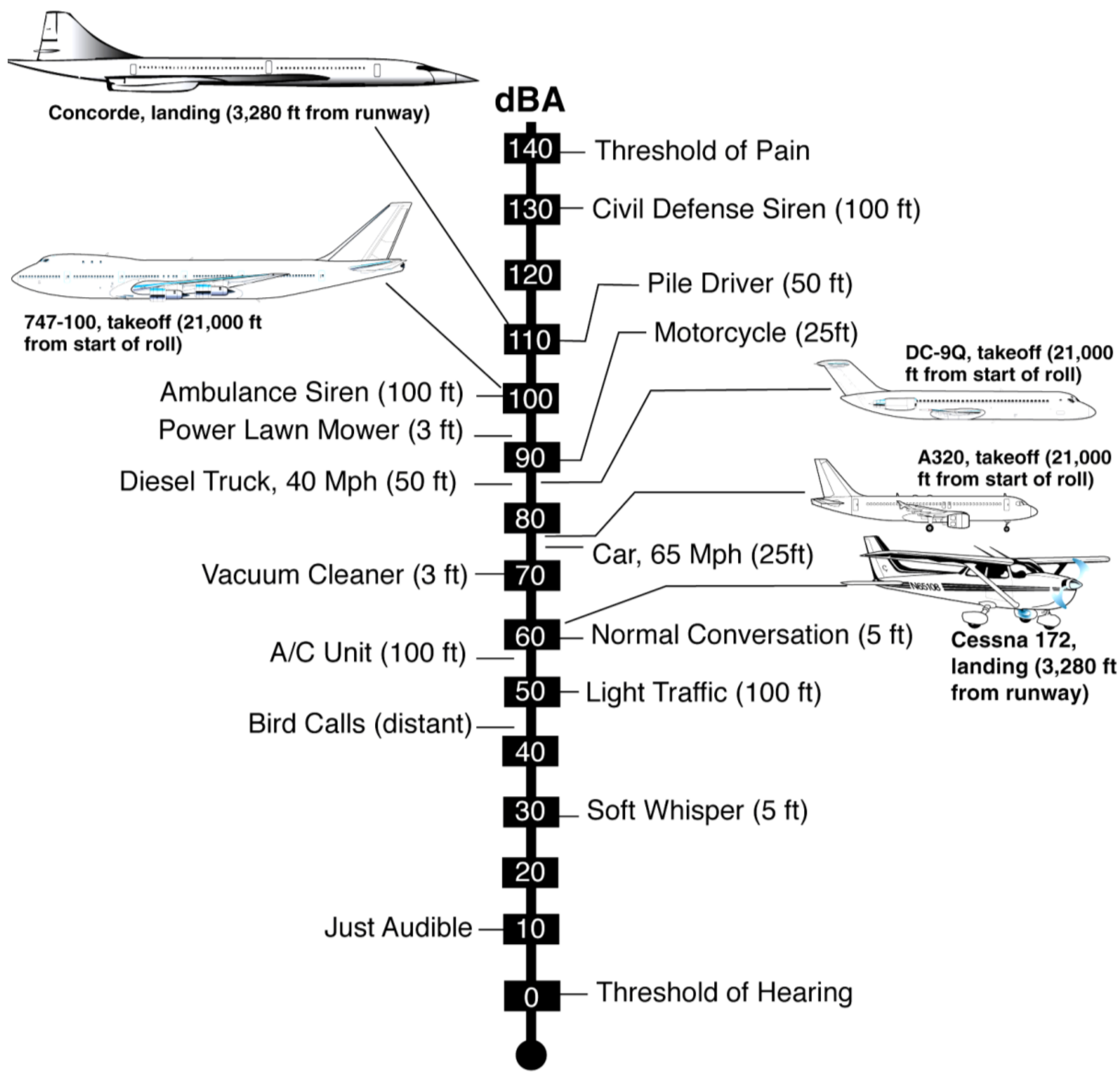
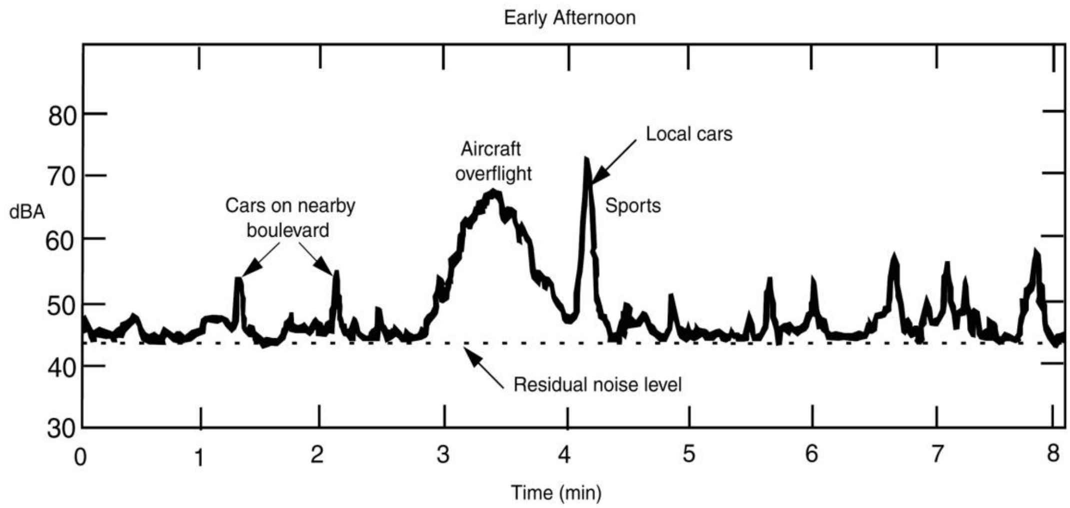


Figure G.1-3

Variation of Community Noise in a Suburban Neighborhood



Source: "Community Noise," NTID 300.3 EPA, December 1971.

1.3 Maximum Sound Level (L_{max})

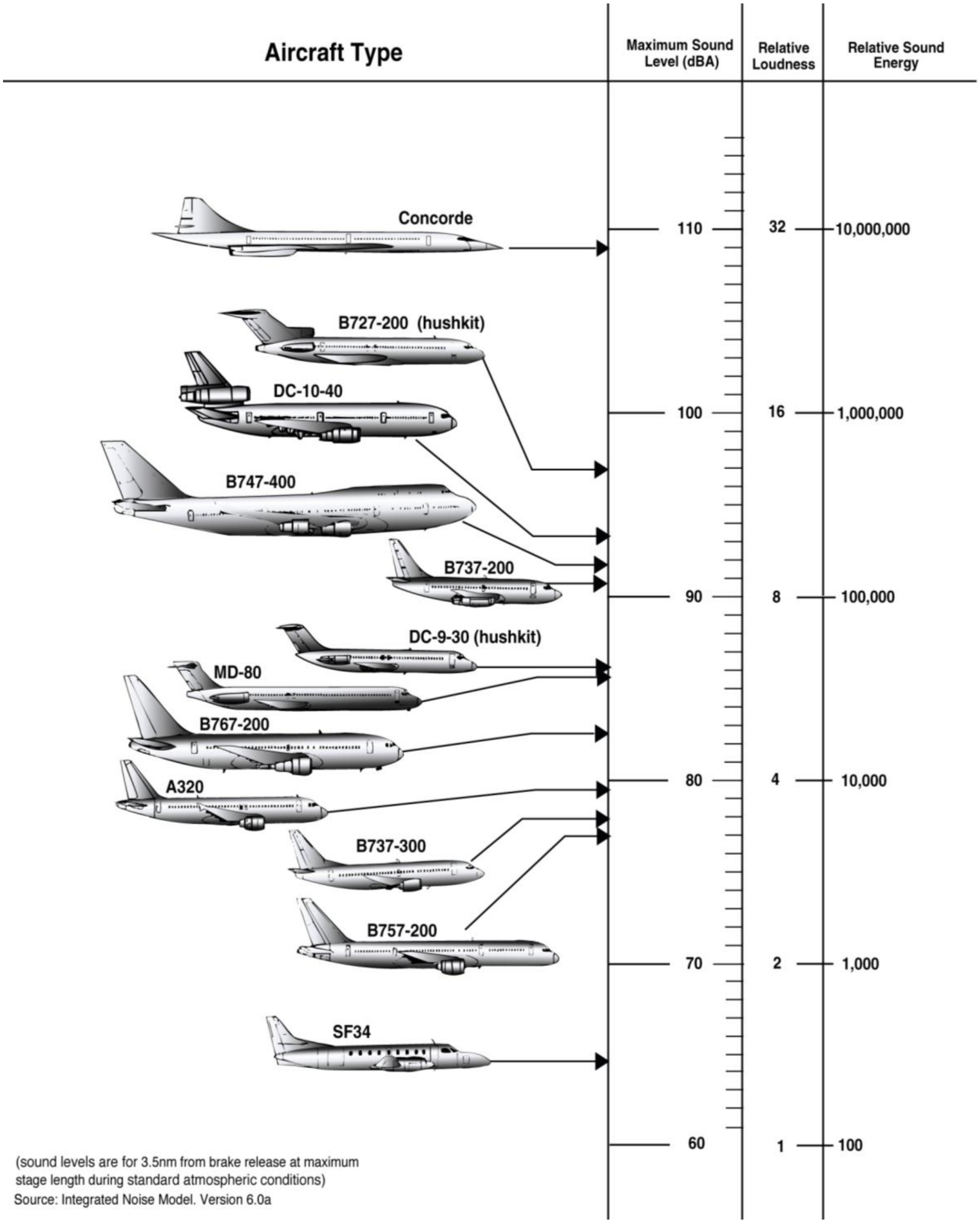
The variation in sound level over time often makes it convenient to describe a particular noise "event" by its maximum sound level, abbreviated as L_{max}. For example, the L_{max} due to the aircraft overflight event in Figure G.1-3 is approximately 67 dBA.

Figure G.1-4 shows L_{max} values for a variety of common aircraft from the FAA's Integrated Noise Model (INM) database. These L_{max} values for each aircraft type are for aircraft performing a maximum stage (trip) length departure on a day with standard atmospheric conditions at a reference distance of 3.5 nautical miles from their brake release point. Of the dozen aircraft types listed on the figure, the Concorde has the highest L_{max} and the Saab 340 turboprop has the lowest L_{max}.

The L_{max} describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. In fact, two events with identical maxima may produce very different total exposures (i.e., total influence of an event). One may be of short duration, while the other may continue for an extended period. This Sound Exposure Level metric, as discussed in the next section, corrects for this deficiency.

Figure G.1-4

Common Aircraft Departure Noise Levels



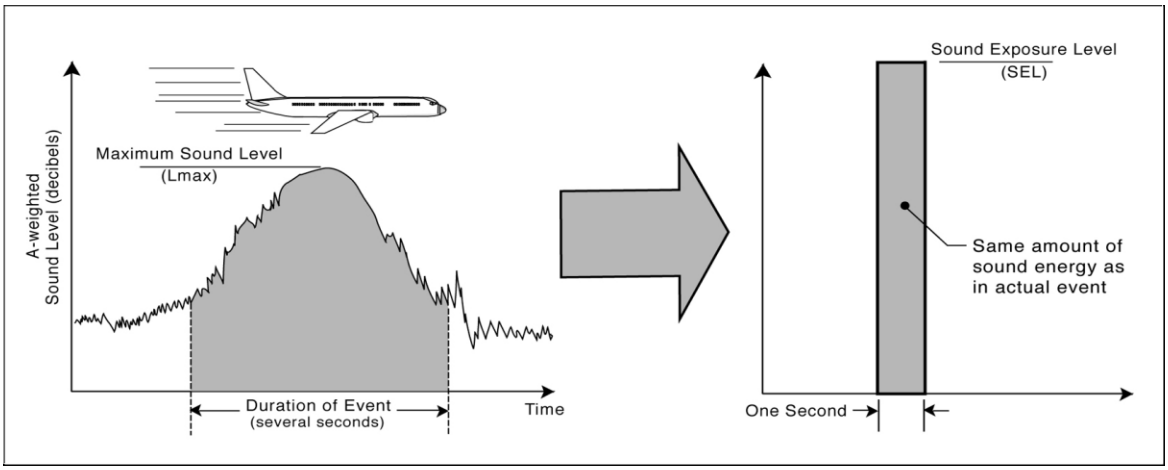
(sound levels are for 3.5nm from brake release at maximum stage length during standard atmospheric conditions)
Source: Integrated Noise Model. Version 6.0a

1.4 Sound Exposure Level (SEL)

The Sound Exposure Level (SEL) is frequently used to describe noise exposure for a single aircraft flyover. This metric is also sometimes referenced as the Single Event Noise Exposure Level, or SENEL. SEL may be considered an accumulation of the sound energy over the duration of an event. The shaded area in **Figure G.1-5** illustrates that portion of the sound energy (or "dose") included in an SEL computation. The dose is then normalized (standardized) to a duration of one second.

Figure G.1-5

Relationship between Single Event Noise Metrics



This "revised" dose is the SEL, shown as the shaded rectangular area in Figure G.1-5. Mathematically, the SEL represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as the actual time-varying noise event. For events that last more than one second, SEL does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event.

Note that, because the SEL is normalized to one second, it will always be larger in magnitude than the L_{max} (for an event that lasts longer than one second). In fact, for most aircraft overflights, the SEL is on the order of 7 to 12 dBA higher than the L_{max}. With the SEL metric, not only do louder flyovers have higher SELs than quieter ones (of the same duration), but longer flyovers also have greater SELs than shorter ones (of the same L_{max}).

SEL's inclusion of both the intensity and duration of a sound source makes it the metric of choice for comparing the single-event levels of varying duration and maximum sound level. This metric provides a comprehensive basis for modeling a noise event in determining overall noise exposure; aggregate SEL values from multiple events are used to calculate cumulative noise exposure levels with the L_{eq}, DNL, and Community Noise Equivalent Level (CNEL) noise metrics.

1.5 Equivalent Sound Level (L_{eq})

The Equivalent Sound Level (abbreviated L_{eq}), is a measure of the noise exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest (e.g., an hour, an 8-hour school day, nighttime, or a full 24-hour day). However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{eq(8)}$ or $L_{eq(24)}$.

Conceptually, L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal "peaks" and "valleys," as illustrated in Figure G.1-3. In the context of noise from typical aircraft flight events and as noted for SEL, L_{eq} does not represent the sound level heard at any particular time, but rather represents the total sound exposure for the period of interest. Also, it should be noted that the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged," sound level. Thus, loud events tend to dominate the noise environment described by the L_{eq} metric.

As for its application to airport noise issues, L_{eq} is often presented for consecutive 1-hour periods to illustrate how the hourly noise dose rises and falls throughout a 24-hour period, as well as how certain hours of the day are significantly affected by a few loud aircraft.

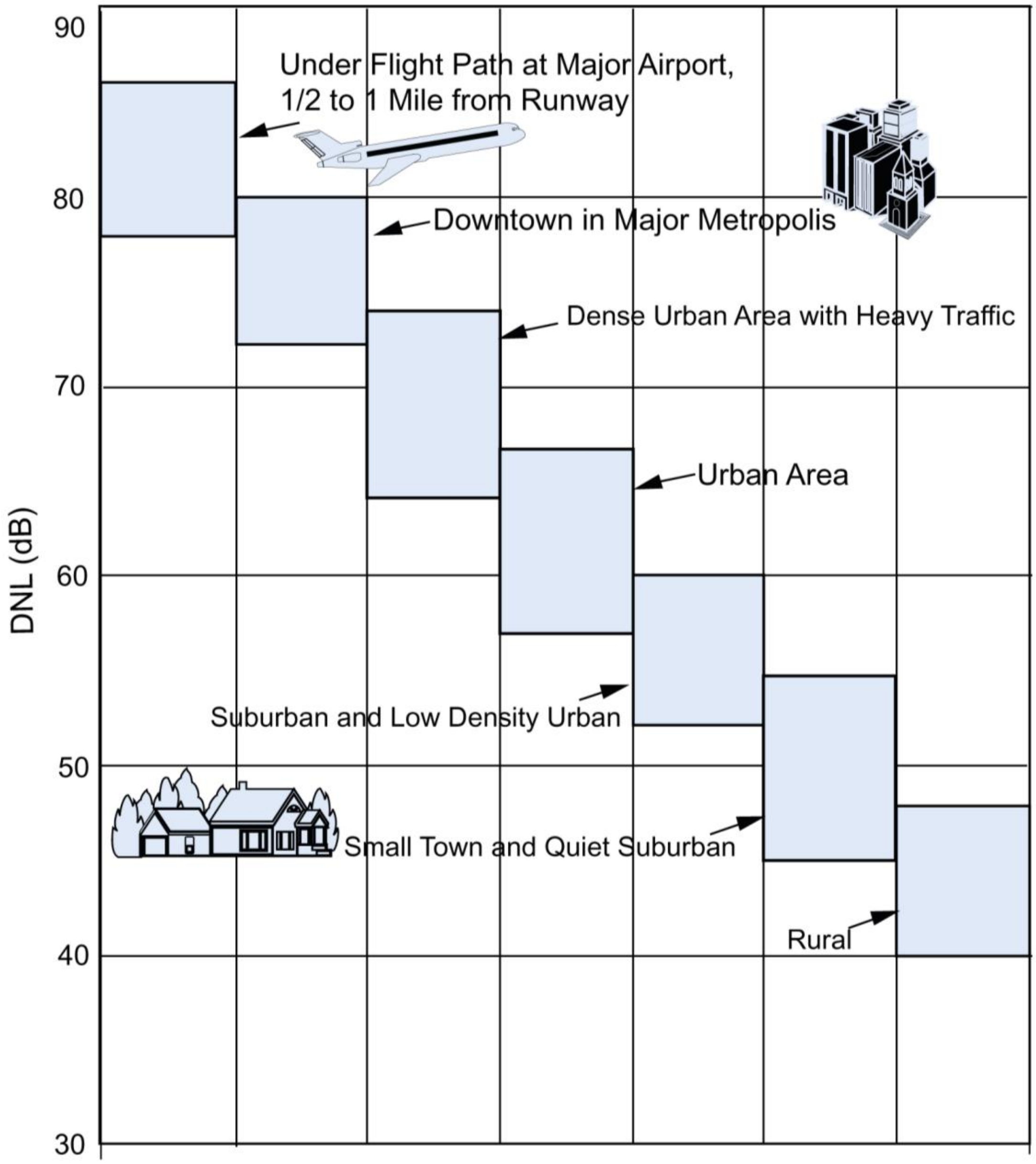
1.6 Day-Night Average Sound Level (DNL)

DNL is the same as L_{eq} (an energy-average noise level over a 24-hour period) except that 10 dB is added to those noise events occurring during the nighttime (between 10 p.m. and 7 a.m.). This weighting reflects the added intrusiveness of nighttime noise events due to community background noise levels that typically decrease by about 10 dB during those nighttime hours.

Typical DNL values for a variety of noise environments are shown in **Figure G.1-6** to indicate the range of noise exposure levels usually encountered.

Figure G.1-6

Typical Range of Outdoor Community Day-Night Average Sound Levels



Source: U.S. Department of Defense. Departments of the Air Force, the Army, and the Navy, 1978. *Planning in the Noise Environment.* AFM 19-10. TM 5-803-2, and NAVFAC P-970. Washington, D.C.: U.S. DoD.

As an example of the cumulative time-average nature of the DNL metric, **Table G.1.1** shows the correlation between the number of flights at a given SEL that are needed to generate a specific DNL. The table shows how the DNL metric correlates the number and sound energy of events into a time-average cumulative metric. As such, DNL represents the total sound exposure on the average day and not a specific single-event heard at a particular time.

Table G.1.1

Correlation between Operations Frequency, SEL, and DNL

Number of Flights	SEL of Flights	Resulting DNL
500	87.4 dB	65 dB
100	94.4 dB	65 dB
50	97.4 dB	65 dB

Source: FAA Office of Environment and Energy.

Due to the DNL metric's excellent correlation with the degree of community annoyance from aircraft noise (the subject of Section G.2), DNL has been formally adopted by most federal agencies for measuring and evaluating aircraft noise for land use planning and noise impact assessment. Federal interagency committees such as the Federal Interagency Committee on Urban Noise (FICUN) and the Federal Interagency Committee on Noise (FICON), which include the EPA, FAA, Department of Defense, Department of Housing and Urban Development (HUD), and Veterans Administration, found DNL to be the best metric for land use planning.

Also, the federal interagency committees have not identified new cumulative sound descriptors or metrics of sufficient scientific standing to substitute for DNL. Other cumulative metrics can be used to supplement, but not replace, DNL. FAA Orders 1050.1E and 5050.4B require that environmental studies use the DNL metric to describe cumulative noise exposure and identify aircraft noise/land use compatibility issues. [1] [2] [3] [4] [5] [6]

2 The Effects of Aircraft Noise on People

To many people, aircraft noise can be an annoyance and a nuisance. It can interfere with conversation and listening to television, disrupt classroom activities in schools, and disrupt sleep. Relating these effects to specific noise metrics aids in the understanding of how and why people react to their environment. This section addresses three ways we are potentially affected by aircraft noise: annoyance, interference of speech, and disturbance of sleep.

2.1 Community Annoyance

The primary potential effect of aircraft noise on exposed communities is one of annoyance. The U.S. EPA defines noise annoyance as any negative, subjective reaction on the part of an individual or group.[7]

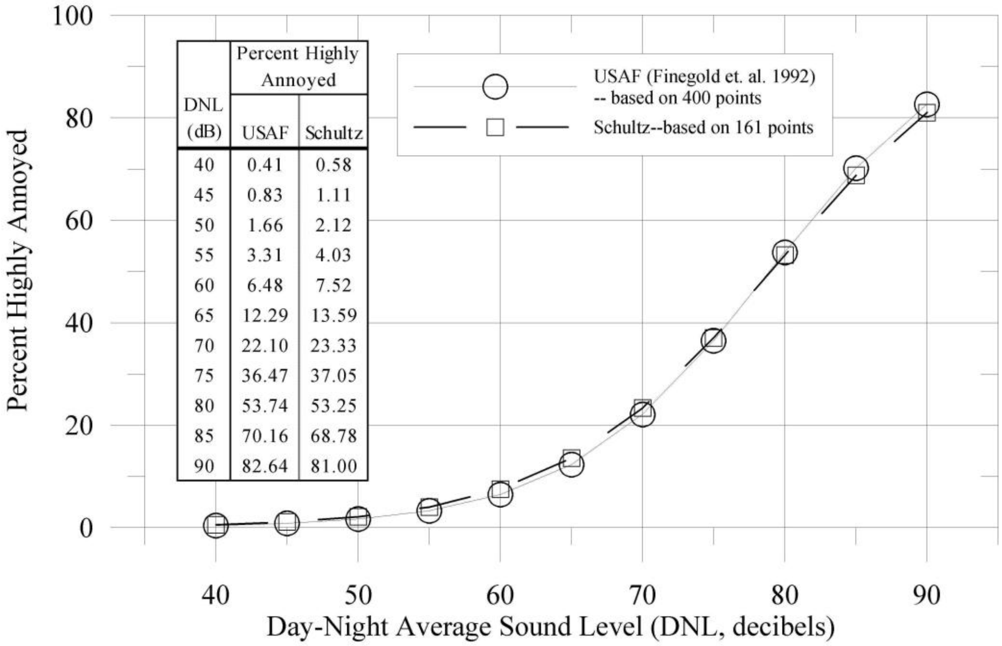
Scientific studies[8] [9] [10] [11] [12] and a large number of social/attitudinal surveys[13] [14] have been conducted to appraise U.S. and international community annoyance due to all types of environmental noise, especially aircraft events. These studies and surveys have found the DNL to be the best measure of that annoyance.

This relation between community annoyance and DNL has been confirmed, even for infrequent aircraft noise events.[15] For helicopter overflights occurring at a rate of 1 to 52 per day, the stated reactions of community individuals correlated with the daily time-average sound levels of the helicopter overflights.

The relationship between annoyance and DNL (that has been determined by the scientific community and endorsed by many federal agencies, including the FAA) is shown in **Figure G.2-1**. Two lines in Figure G.2-1 represent two large sets of social/ attitudinal surveys: one for a curve fit of 161 data points compiled by an individual researcher, Ted Schultz, in 1978[16] and one for a curve fit of 400 data points (which include Schultz's 161 points) compiled in 1992 by the U.S. Air Force.[17] The agreement of these two curves simply corroborates the survey results.

Figure G.2-1

Relationship between Annoyance and Day-Night Average Sound Level



DNL (dB)	Percent Highly Annoyed	
	USAF	Schultz
40	0.41	0.58
45	0.83	1.11
50	1.66	2.12
55	3.31	4.03
60	6.48	7.52
65	12.29	13.59
70	22.10	23.33
75	36.47	37.05
80	53.74	53.25
85	70.16	68.78
90	82.64	81.00

Source: Federal Interagency Committee on Noise (FICON), "*Federal Agency Review of Selected Airport Noise Analysis Issues*", August 1992, p. 3-6, Figure 3.1

Figure G.2-1 shows the percentage of people "highly annoyed" by a given DNL. For example, the two curves in the figure yield a value of about 13% for the percentage of the people that would be highly annoyed by a DNL exposure of 65 dB. The figure also shows that at very low values of DNL, such as 45 dB or less, 1% or less of the exposed population would be highly annoyed. Furthermore, at very high values of DNL, such as 90 dB, more than 80% of the exposed population would be highly annoyed.

Recently, the use of DNL has been criticized as not accurately representing community annoyance and land-use compatibility with aircraft noise. One frequent criticism is based on the inherent feeling that people react more to single noise events, rather than difficult-to-comprehend time-average sound levels. In fact, a time-average noise metric, such as DNL, takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime hours during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours 59 minutes and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.5 dB.

As a second example, assume that ten such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.4 dB.

Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of those events. This is the basic concept of a time-average sound metric, and, specifically, the DNL. It is often suggested that a lower DNL, such as 60 or 55 dB, be adopted as the threshold of community noise annoyance for airport environmental analysis documents. While there is no technical reason why a lower level cannot be measured or calculated for comparison purposes, a DNL of 65 dB:

(1) Provides a valid basis for comparing and assessing community noise effects.

(2) Represents a noise exposure level that is normally dominated by aircraft noise and not other community or nearby highway noise sources.

(3) Reflects the FAA's threshold for grant-in-aid funding of airport noise mitigation projects.

(4) Is used by HUD in determining eligibility for federally guaranteed home loans.

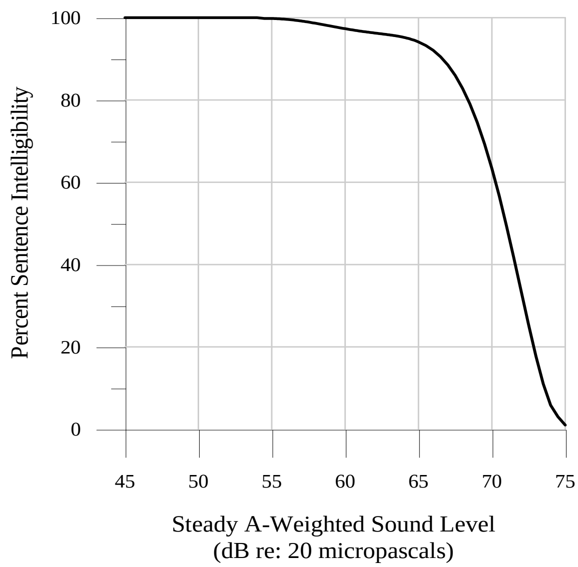
2.2 Speech Interference

A primary effect of aircraft noise is its tendency to drown out or "mask" speech, making it difficult to carry on a normal conversation. Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities, such as radio or television listening, telephone use, or family conversation, causes frustration and aggravation. Research has shown that "whenever intrusive noise exceeds approximately 60 dB indoors, there will be interference with speech communication."[18]

Indoor speech interference can be expressed as a percentage of sentence intelligibility among two people speaking in relaxed conversation approximately one meter apart in a typical living room or bedroom.[19] The percentage of sentence intelligibility is a non-linear function of the (steady) indoor background sound level, as shown in **Figure G.2-2**. This curve was digitized and curve-fitted for the purposes of this document. Such a curve-fit yields 100 percent sentence intelligibility for background levels below 57 dB and yields less than 10 percent intelligibility for background levels above 73 dB. Note that the function is especially sensitive to changes in sound level between 65 dB and 75 dB. As an example of the sensitivity, a 1 dB increase in background sound level from 70 dB to 71 dB yields a 14 percent decrease in sentence intelligibility. In the same document from which Figure G.2-2 was taken, the EPA established an indoor criterion of 45 dB DNL as requisite to protect against speech interference indoors.

Figure G.2-2

Sentence Intelligibility



Source: EPA, 1974

2.3 Sleep Disturbance

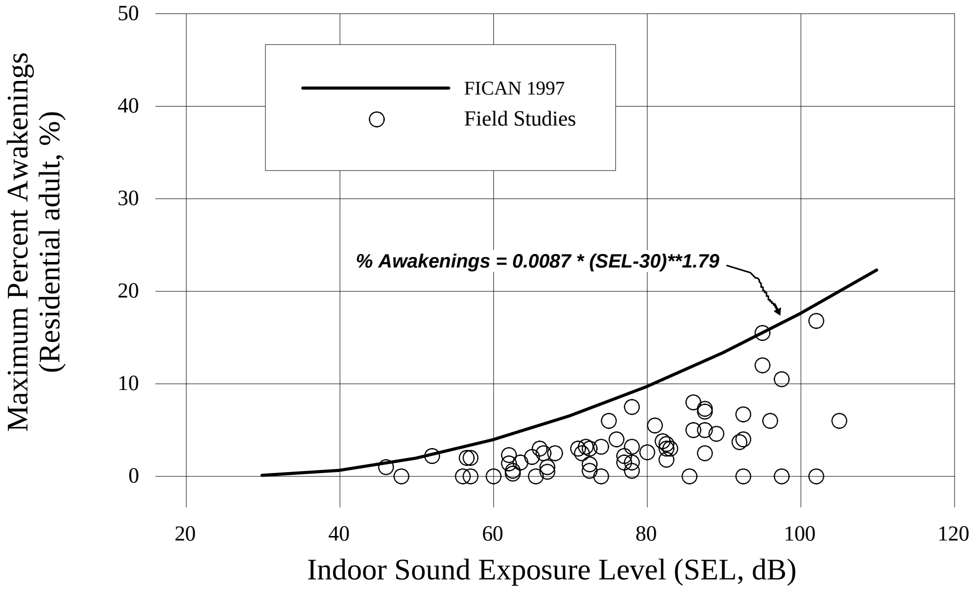
Sleep disturbance is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

Sleep disturbance can be measured in one of two ways. "Arousal" represents awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without awakening. In general, arousal requires a higher noise level than does a change in sleep stage.

In terms of average daily noise levels, some guidance is available to judge sleep disturbance. The EPA identified an indoor DNL of 45 dB as necessary to protect against sleep interference.[20] In June 1997, the Federal Interagency Committee on Aviation Noise (FICAN) reviewed the sleep disturbance issue and presented a sleep disturbance dose-response prediction curve.[21] FICAN based their curve on data from field studies[22] [23] [24] [25] and recommends the curve as the tool for analysis of potential sleep disturbance for residential areas. **Figure G.2-3** shows this curve which, for an indoor SEL of 60 dB, predicts that a maximum of approximately 5 percent of the residential population exposed are expected to be behaviorally awakened. FICAN cautions that this curve should only be applied to long-term adult residents.

Figure G.2-3

Sleep Disturbance Dose-Response Relationship



Source: FICAN, 1997

3 Noise Guidelines for Compatibility

The following provides additional detail on the FAA's and the Metropolitan Council's noise guidelines.

3.1 FAA 14 C.F.R Part 150

In 1979 the Aviation Safety and Noise Abatement Act established a congressional directive to the FAA calling for the implementation of a mechanism for the development of noise mitigation programs at U.S. airports. The result of this congressional direction was the adoption of 14 C.F.R. Part 150 in 1985. Part 150 is a voluntary program that provides a mechanism for airports to accomplish comprehensive noise reduction goals. Part 150 provides a means for airports to have access to federal funds to implement aircraft noise mitigation measures (including sound insulation) in communities surrounding an airport. The Part 150 process provides airport operators with the procedures, standards and methodology governing the development, submission and review of airport Noise Exposure Maps (NEMs) and airport Noise Compatibility Programs (NCPs).

While the Part 150 program is most often associated with residential insulation (usually the most significant portion of a Part 150 program), there are many other components. An NCP can contain a number of noise compatibility measures. These measures typically focus on airport or aircraft operational noise mitigation measures, land use measures and any other noise reduction initiatives.

The FAA has established Land Use Compatibility criteria in 14 C.F.R. Part 150 detailing acceptable land uses around airports considering noise impacts in terms of DNL.

The FAA considers the 65 DNL contour line to be the threshold of significance for mitigation purposes. As such, sensitive land use areas around airports that are located in the 65 or greater DNL contours are considered by the FAA to be eligible for federal grants/aid to mitigate incompatible structures. This position is based primarily on past analysis regarding noise impact and its relation to the degree of annoyance experienced by people. The FAA position regarding the 65 DNL threshold is stated on page 41 of an April 2000 GAO report titled “Aviation and the Environment – FAA’s Role in Major Airport Noise Programs”:

“The findings of a 1978 study that related transportation noise exposure to annoyance in communities has become the generally accepted model for assessing the effects of long-term noise exposure on communities.[26] According to this study, when sound exposure levels are measured by a method that assigns additional weight to sounds occurring between 10 p.m. and 7 a.m., and those sound levels exceed 65 decibels, individuals report a noticeable increase in annoyance.”

Based on the above-referenced 1978 study by T.J. Schultz, in 1980 the Federal Interagency Committee on Urban Noise (FICUN) published a document titled “Guidelines for Considering Noise in Land Use Planning and Control” which outlined 65 dB DNL as the threshold of significance for noise impact. Regarding land use compatibility guidelines, the report stated the following on page 7, 1(b):

“Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reductions (NLR) of at least 25 dB (Zone C-1) [Zone C-1 = 65 to 70 DNL] and 30 dB (Zone C-2) [Zone C-2 = 70 to 75 DNL] should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB [15 dB reduction only relates to transient lodging in the 75 to 80 DNL] over standard construction and normally assume mechanical ventilation and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels.”

In August 1992 the FICON published a document titled “Federal Agency Review of Selected Airport Noise Analysis Issues.” In addressing land use compatibility on pages 2-6 to 2-7, the following was stated regarding the above-referenced 1980 FICUN Guidelines Document:

“Federal guidelines for compatible land use that take into account the impact of aviation noise have been devised for land near airports. They were derived through an iterative process that started before 1972. Independent efforts by the FAA, HUD, USAF, USN, EPA and other Federal agencies to develop compatible land use criteria were melded into a single effort by the Federal Interagency Committee on Urban Noise in 1979, and resulted in the FICUN Guidelines document (1980). The Guidelines document adopted DNL as its standard noise descriptor, and the Standard Land Use Coding Manual (SLUCM) as its standard descriptor for land uses. The noise-to-land use relationships were then expanded for FAA’s advisory circular Airport-Land

Use Compatibility Planning. The current individual agency compatible land use criteria have been, for the most part, derived from those in the FICUN Guidelines. Airport environments pertain only to certain categories of these guidelines."

In 1985 the FAA adopted 14 C.F.R. Part 150 outlining land use compatibility guidelines around airports. **Table G.3.1** provides the land use compatibility guidelines as established by the FAA.

Table G.3.1

14 CFR Part 150 Noise/Land Use Compatibility Guidelines

	Yearly Day-Night Average Sound Level, DNL, in Decibels					
Land Use	**<65**	**65-70**	**70-75**	**75-80**	**80-85**	**>85**
Residential Use						
Residential, other than mobile homes and transient lodgings	Y	N(a)	N(a)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(a)	N(a)	N(a)	N	N
Public Use						
Schools	Y	N(a)	N(a)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(b)	Y(c)	Y(d)	Y(d)
Parking	Y	Y	Y(b)	Y(c)	Y(d)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware and farm equipment	Y	Y	Y(b)	Y(c)	Y(d)	N
Retail trade--general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(b)	Y(c)	Y(d)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(b)	Y(c)	Y(d)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(f)	Y(g)	Y(h)	Y(h)	Y(h)
Livestock farming and breeding	Y	Y(f)	Y(g)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(e)	Y(e)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

SLUCM Standard Land Use Coding Manual
Y(Yes) Land use and related structures compatible without restrictions.
N(No) Land use and related structures are not compatible and should be prohibited.

Table G.3.1

14 CFR Part 150 Noise/Land Use Compatibility Guidelines

NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35	Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes for Table G.3.1

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute Federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

(a) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(b) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.

(c) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.

(d) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.

(e) Land use compatible provided special sound reinforcement systems are installed.

(f) Residential buildings require an NLR of 25.

(g) Residential buildings require an NLR of 30.

(h) Residential buildings not permitted.

Source: Table 1 of 14 CFR Part 150.

3.2 Metropolitan Council's Land Use Compatibility Guidelines for Aircraft Noise

The Metropolitan Council has developed a set of land use planning guidelines for responsible community development in the Minneapolis-St. Paul Metropolitan Area. The intent is to provide city governments with a comprehensive resource with regard to planning and community development in a manner that considers the adequacy, quality and environmental elements of planned land uses.

In 1976 the Minnesota Legislature enacted the Minnesota State Land Planning Act, the underlying law that requires local units of government to prepare a comprehensive plan and submit it for Metropolitan Council review. Under the 1976 legislation, communities designated land uses and defined the zoning applicable to the particular land use parcel. Zoning was the statute's priority. The land use measure was a request that local jurisdictions review existing zoning in Airport Noise Zones to determine consistency with the regional compatibility guidelines and rezone property for compatible development if consistent with other development factors. In 1977, the Metropolitan Council also updated the 1973 Aviation Chapter of the Metropolitan Development Guide. In 1983, the Metropolitan Council amended its Aviation Policy Plan to include "Land Use Compatibility Guidelines for Aircraft Noise."

In 1994 the Minnesota Legislature amended the Land Planning Act to require that communities update their comprehensive plans at least every 10 years. As a result, all Metropolitan Development Guide chapters were updated by December 1996. Under the amended Land Planning Act, communities determine land use designation and zoning must be consistent with the designation. Thus, the communities had to re-evaluate designated use, permitted uses within the designation, zoning classifications and adequacy.

In 2004 the Metropolitan Council incorporated its Aviation Policy Plan into the Transportation Policy Plan (TPP) of the Metropolitan Development Guide. Land use compatibility guidelines for all metropolitan system airports are included in the TPP. The TPP considered noise exposure associated with airports located in the Minneapolis-St. Paul Metropolitan Area and provided land use guidelines based on four noise zones around an airport. The following is the Metropolitan Council's description of each noise zone:

- **Zone 1** – Occurs on and immediately adjacent to the airport property. Existing and projected noise intensity in the zone is severe and permanent. It is an area affected by frequent landings and takeoffs and subjected to aircraft noise greater than 75 DNL. Proximity of the airfield operating area, particularly runway thresholds, reduces the probability of relief resulting from changes in the operating characteristics of either the aircraft or the airport. Only new, non-sensitive, land uses should be considered – in addition to preventing future noise problems the severely noise-impacted areas should be fully evaluated to determine alternative land use strategies including eventual changes in existing land uses.[27]

- **Zone 2** – Noise impacts are generally sustained, especially close to runway ends. Noise levels are in the 70 to 74 DNL range. Based upon proximity to the airfield the seriousness of the noise exposure routinely interferes with sleep and speech activity. The noise intensity in this area is generally serious and continuing. New development should be limited to uses that have been constructed to achieve certain exterior-to-interior noise attenuation and that discourage certain outdoor uses.[28]

- **Zone 3** – Noise impacts can be categorized as sustaining. Noise levels are in the 65 to 69 DNL range. In addition to the intensity of the noise, location of buildings receiving the noise must also be fully considered. Aircraft and runway use operational changes can provide some relief for certain uses in this area. Residential development may be acceptable if it is located outside areas exposed to frequent landings and takeoffs, is constructed to achieve certain exterior-to-interior noise attenuation, and is restrictive as to outdoor use. Certain medical and educational facilities that involve permanent lodging and outdoor use should be discouraged.[29]

- **Zone 4** – Defined as a transitional area where noise exposure might be considered moderate. Noise levels are in the 60 to 64 DNL range. The area is considered transitional since potential changes in airport and aircraft operating procedures could lower or raise noise levels. Development in this area can benefit from insulation levels above typical new construction standards in Minnesota, but insulation cannot eliminate outdoor noise problems.[30]

- **Noise Buffer Zones –** Additional area that can be protected at the option of the affected community; generally, the buffer zone becomes an extension of noise zone 4. At MSP, a one-mile buffer zone beyond the DNL 60 has been established to address the range of variability in noise impact, by allowing implementation of additional local noise mitigation efforts. A buffer zone, out to DNL55 is optional at those reliever airports with noise policy areas outside the Metropolitan Urban Service Area (MUSA).[31]

The listed Metropolitan Council noise zones also use the DNL noise exposure metric. The Metropolitan Council Land Use Compatibility Guidelines for Aircraft Noise are provided in **Table G.3.2.**

Table G.3.2

Metropolitan Council Land Use Compatibility Guidelines for Aircraft Noise										
	Noise Exposure Zones									
Type of Development	**New Development or Major Redevelopment**					**Infill - Reconstruction or Additions to Existing Structures**				
Land Use Category	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	BZ	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	BZ
Residential										
Single/Multiplex, with individual entrance	INCO	INCO	INCO	INCO		COND	COND	COND	COND	
Multiplex/Apartment, with shared entrance	INCO	INCO	COND	PROV		COND	COND	PROV	PROV	
Mobile Home	INCO	INCO	INCO	COND		COND	COND	COND	COND	
Educational, Medical, Schools, Churches, Hospitals, & Nursing Homes	INCO	INCO	INCO	COND		COND	COND	COND	PROV	
Cultural, Entertainment, & Recreation										
Indoor	COND	COND	COND	PROV		COND	COND	COND	PROV	
Outdoor	COND	COND	COND	COND		COND	COND	COND	COMP	
Office, Commercial, Retail	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Services										
Transportation - Passenger Facilities	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Transient Lodging	INCO	COND	PROV	PROV		COND	COND	PROV	PROV	
Other Medical, Health, and Education	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Other Services	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Industrial, Communication, & Utilities	PROV	COMP	COMP	COMP		PROV	COMP	COMP	COMP	
Agriculture, Land/Water Area, & Resource Extraction	COMP	COMP	COMP	COMP		COMP	COMP	COMP	COMP	

Table Key:

- **COMP** – "Compatible" – uses that are acoustically acceptable for both indoors and outdoors.
- **PROV** – "Provisional" – uses that should be discouraged if at all feasible; if allowed, must meet certain structural performance standards to be acceptable according to MS473.192 (metropolitan area Noise Attenuation Act). Structures built after December 1983 shall be acoustically constructed so as to achieve interior noise levels as follows:
  - Residential, Educational and Medical = 45 dBA Interior Sound Level
  - Cultural, Entertainment, Recreational, Office, Commercial, Retail and Services = 50 dBA Interior Sound Level
  - Industrial, Communications, Utility, Agricultural Land, Water Area, Resource Extraction = 60 dBA Interior Sound Level

  Each local governmental unit having land within the airport noise zones is responsible for implementing and enforcing the structural performance standards in its jurisdiction.
- **COND** – "Conditional" – uses that should be strongly discouraged; if allowed, must meet the structural performance standards, and requires a comprehensive plan amendment for review of the project under the Conditional Land Use Review Factors outlined in the Metropolitan Council's 2030 Transportation Policy Plan, Appendix H, Table 5.
- **INCO** – "Incompatible" – land uses that are not acceptable even if acoustical treatment were incorporated in the structure and outside uses restricted.

Source: Metropolitan Council 2030 Transportation Policy Plan, Appendix H – December 15, 2004.

As outlined above, the Metropolitan Council developed the Aviation Chapter of the Metropolitan Development Guide, including the Builder's Guide and Model Ordinance for Aircraft Noise Attenuation, to provide a program framework for community adoption, pursuant to MSP Part 150 preventive land use measures.

The Model Ordinance and Builder's Guide are intended to ensure consistency with local land use planning practices in areas of infill development (e.g., building a home on a vacant lot on a residential block – including reconstruction and/or additions to existing structures) in known airport noise impact areas (60+ DNL noise contours) around MSP. Specifically, the documents provide a mechanism for cities around MSP to adopt building material and construction standards to ensure that developments in the airport impact areas are constructed consistent with MSP Part 150 program goals.

In establishing noise reduction level requirements the March 2006 Metropolitan Council Builder's Guide states the following on page 20:

"The overall noise reduction level (NRL) required within a given noise zone can be determined by subtracting the desired level (45dBA) from the highest noise level within that contour. For example, in Noise Zone 4 (60 to 64dBA), the required reduction is calculated as 64 – 45 = 19dBA."[32]

Table G.3.3 provides the Metropolitan Council's Structure Performance Standards (interior noise level goals).

Table G.3.3

Metropolitan Council Structure Performance Standards[1]

Land Use	Typical Interior[2] Sound Level
Residential	45 dBA
Educational/Medical/Churches, etc.	45 dBA[3]
Cultural/Entertainment/Recreational	50 dBA
Office/Commercial/Retail	50 dBA
Services	50 dBA
Industrial/Communication/Utility	60 dBA
Agricultural Land/Water Area/Resource Extraction	60 dBA

[1] These performance standards do not apply to buildings, accessory buildings, or portions of buildings that are not normally occupied by people.
[2] The noise description used to delineate the appropriate noise policy zone is an annualized Ldn.
[3] Special attention is required for certain noise sensitive uses, such as concert halls.

As detailed above, to determine the interior noise level of a structure in the vicinity of an airport, the external aircraft DNL noise level is subtracted from the Noise Level Reduction (NLR) of the structure to determine the interior noise level of the structure. NLR is the amount of noise level reduction in decibels provided by the structure. Metropolitan Airports Commission (MAC) noise monitoring data show an average of approximately 30 dB of NLR pre-existing in homes that were monitored as part of the MSP residential noise mitigation program. Moreover, city representatives have stated in the past that homes around MSP have existing NLRs that are as high as 37 dB. Non-residential uses such as schools, hospitals, transient lodging, nursing homes, child care centers and churches may provide commercial-grade construction, which typically provides better NLR performance than average home construction. As such, existing schools, hospitals, transient lodging, nursing homes, child care centers and churches would comply with the FAA and Metropolitan Council Structure Performance Standards in the 60 to 70 dB DNL noise contour areas.

The City of Eagan established aircraft noise zones by city ordinance, which incorporate standards of construction for all new development, redevelopment, reconstruction of MAC noise-insulated homes, buildings associated with a new subdivision or planned development, or amended use within an existing planned development.[33] Further, the City requires that construction shall be in accordance with defined noise reduction requirements and sound transmission class (STC) ratings outlined for each type of development.

The City of Minneapolis established construction requirements for noise attenuation that apply to the expansion of existing noise-insulated homes that were treated by the MAC, infill or teardown and rebuild of treated homes, construction of new homes or multifamily residential that are located within the MAC's noise mitigation program contour areas.[34] These requirements include installation of central air conditioning or mechanical ventilation and utilizing materials with a STC rating of at least 40.

The City of Richfield requires noise attenuation for any new single family or multifamily construction on property located within the 60+ DNL contours, or any infill construction or rebuilding of residential structures after tearing down the original structure which takes place within blocks or between structures that have received noise attenuation pursuant to the MAC's noise mitigation program.[35] Further, construction shall utilize building materials with a STC rating of at least forty (40) and shall include installation of central air conditioning and mechanical ventilation throughout the habitable areas. Noise attenuation is recommended, but not required for construction of a habitable addition to a dwelling unit that expands the habitable area of a dwelling which had previously received sound insulation.

4 Noise Model Development

This section summarizes development of the noise model used to evaluate aircraft-induced noise impacts for this study.

4.1 Noise Model

The development of DNL contours were generated using version 7.0c of the FAA's Integrated Noise Model (INM). Quantifying aircraft-specific noise characteristics in INM is accomplished through the use of a comprehensive noise database that has been developed under the auspices of Federal Aviation Regulation (FAR) Part 36. As part of the airworthiness certification process, aircraft manufacturers are required to subject aircraft to a battery of noise tests. Through the use of federally adopted and endorsed algorithms, this aircraft-specific noise information is used in the generation of DNL contours. Justification for such an approach is rooted in national standardization of noise quantification at airports. The FAA Office of Environment and Energy (AEE-100) developed the INM. Since 1978, the INM has been the FAA's standard tool for determining the predicted noise impact in the vicinity of airports. The INM is designed to estimate long-term average effects using average annual input conditions.

INM uses annual average daily operations to compute existing and forecast noise. Annual average daily operations are representative of all aircraft operations that occur over the course of a year. The total annual operations are divided by 365 days to determine the annual average daily operations. Runway and flight track use is also averaged over one year.

The use of INM and computer-based noise modeling allow for the projection of future, forecast noise exposure. When the calculations are made in a consistent manner, INM is most accurate for comparing "before-and-after" noise effects resulting from forecast changes or potential alternatives. INM allows noise predictions for such forecast change actions without the actual implementation and noise monitoring of those actions.

Atmospheric data from the National Weather Service (NWS) was gathered for the development of the 2010 existing noise contours. The NWS 2010 annual average temperature of 49.9 degrees Fahrenheit and 2010 average annual wind speed of 8.2 Knots was used in the INM modeling process. The 2010 average annual pressure of 29.98 inches and a 2010 annual average relative humidity of 63.9 percent were also used.

The atmospheric data for the 2020 and 2025 forecast noise contours were derived from the annual average values from the past 30 years' historical weather data available from the Minnesota State Climatologist's Office. An annual average temperature of 45.2 degrees Fahrenheit and an average annual wind speed of 9.2 Kts. were used in the INM modeling process. An average annual pressure of 29.11 inches and an annual average relative humidity of 68.0 percent were also used. High temperatures decrease air density, which decreases aircraft performance (e.g., takeoff distance increases and climb rate decreases) and generally results in increased noise. In conjunction with temperature, humidity affects the propagation of noise through the air. In general, sound travels farther in more humid conditions. Relative humidity is highest at night and gradually drops during the day, with the lowest point generally occurring in the afternoon.

Terrain data at 100-foot intervals were used in the noise model.

4.2 INM Analysis Existing and Forecast Operations and Fleet Mix

Table G.4.1 provides the total number of operations at MSP in 2010 (Existing Conditions) as well as the forecasted operations, detailed by operations category, for 2020 and 2025. The past 10 years have presented many challenges to the aviation industry. From a local perspective, operational levels and the aircraft fleet mix at MSP have been subject to lingering effects from the events of 9/11, high fuel prices, a flurry of bankruptcy filings by several legacy airlines including Northwest Airlines, an economic recession and overall market forces that appear to be favoring consolidation, as indicated by Delta Air Lines' acquisition of Northwest Airlines in 2008, United Air Lines' acquisition of Continental Airlines and Southwest Airlines' acquisition of AirTran Airways. These developments have had profound effects on airline and airport operations. For example, the 2010 operational level at MSP was below the operational level documented at the airport over 15 years ago.

The forecast operation levels are the same for the No Action, Airlines Remain and Airlines Relocate Alternative (Sponsor's Preferred Alternative) in 2020 and 2025, respectively. This is due to the belief that the level of future demand at MSP will remain constant among the various options. However, the level of service provided to the traveling public, and efficiency with which aircraft and passengers are accommodated by the airport, are the primary variables affected by the respective alternatives.

Table G.4.1

2010, 2020 and 2025 Operations Numbers

Operations Category	2010(1)	2020(2)	2025(2)
Scheduled Passenger Air Carrier(a)	394,407	439,940	480,960
Cargo	12,049	12,764	12,826
Charter	103	96	106
GA	26,185	29,934	30,003
Military	2,839	2,145	2,145
Total	435,583	484,879	526,040

Sources: (1) Based on actual year-to-date 2010 MACNOMS data adjusted to match FAA ATADS data (to account for unavailable MACNOMS operations data).
(2) Table 10.2 in Aviation Activity Forecast Technical Report, HNTB Corporation 8/5/2011.

Table G.4.2 provides a breakdown of the 2010 aircraft fleet mix at MSP. In 2010, the average daily number of total nighttime operations was 94.3. Overall, the 2010 total average daily operations number was 1,193.4.

Table G.4.2

2010 Aircraft Fleet Mix Average Daily Operations

Group	Aircraft Type	Day	Night	Total
Manufactured/Re-engined Stage 3 Jet	A300-622R	0.1	0.1	0.1
	A300B4-203	0.0	0.0	0.0
	A310-304	0.0	0.0	0.0
	A318	0.0	0.0	0.0
	A319-131	92.4	6.5	98.9
	A320-211	93.0	11.7	104.7
	A321-232	2.1	0.9	3.0
	A330	5.2	0.5	5.6
	A340	0.0	0.0	0.0
	ASTR	0.0	0.0	0.0
	B717-200	8.4	1.5	9.9
	B737-300	12.5	0.9	13.5
	B737-400	0.4	0.1	0.5
	B737-500	1.8	0.7	2.5
	B737-700	22.7	4.7	27.4
	B737-800	36.4	10.3	46.7
	B737-900	0.0	0.0	0.0
	B747-100	0.0	0.0	0.0
	B747-200	0.1	0.1	0.1
	B747-400	1.7	0.0	1.7
	B757-200	39.7	6.5	46.2
	B757-300	26.9	1.8	28.7
	B767-200	1.5	0.1	1.6
	B767-300	2.2	0.1	2.3
	B767-400	0.8	0.6	1.4
	B777-200	0.0	0.0	0.0
	B777-300	0.0	0.0	0.0
	BA46	0.0	0.0	0.0
	BEC400	1.5	0.1	1.6
	C500	0.0	0.0	0.0
	C650	0.0	0.0	0.0
	C750	0.0	0.0	0.0
	CARJ/CL601	334.5	16.2	350.8
	CL600	1.2	0.1	1.3
	CNA500	0.1	0.0	0.1
	CNA501	0.1	0.0	0.1
	CNA525	1.0	0.0	1.0
	CNA550	0.7	0.0	0.7
	CNA551	0.0	0.0	0.0
	CNA560	5.4	0.3	5.7
	CNA650	2.6	0.2	2.8

Table G.4.2

2010 Aircraft Fleet Mix Average Daily Operations

Group	Aircraft Type	Day	Night	Total
Manufactured/Re-engined Stage 3 Jet	CNA750	5.6	0.5	6.1
	DC10	2.9	1.5	4.4
	DC820	0.0	0.0	0.0
	DC860	0.0	0.0	0.0
	DC87	0.5	1.5	2.0
	E145	0.0	0.0	0.0
	EMB135	2.9	0.1	3.0
	EMB145	30.6	2.7	33.3
	EMB170	119.6	6.1	125.7
	EMB190	1.9	0.1	2.0
	FAL10	0.1	0.0	0.1
	FAL200	0.6	0.7	1.3
	FAL20A	0.7	0.0	0.7
	GLF4	0.0	0.0	0.0
	GLF5	1.1	0.1	1.2
	GLFIV	1.4	0.1	1.5
	HS125	4.0	0.4	4.3
	IA1124	0.1	0.0	0.1
	IA1125	0.5	0.1	0.5
	L101	0.0	0.0	0.0
	LEAR31	0.3	0.0	0.3
	LEAR35	2.2	0.3	2.5
	LEAR45	1.9	0.1	2.0
	LEAR55	0.2	0.0	0.2
	LEAR60	0.7	0.0	0.8
	MD11GE	2.0	1.6	3.6
	MD81	31.0	2.0	33.0
	MD83	0.0	0.0	0.0
	MD9025	32.4	2.5	34.8
	MU300	0.0	0.0	0.0
	SABR65	0.0	0.0	0.1
	SBR2	0.0	0.0	0.0
	Total	938.2	84.4	1022.4
Hushkit Stage 3 Jet	727Q	0.7	0.7	1.5
	737Q	0.1	0.0	0.1
	BAC111	0.0	0.0	0.0
	DC9Q	61.7	1.3	63.1
	Total	62.5	2.0	64.7
Microjet	CNA510	0.1	0.0	0.1
	Total	0.1	0.0	0.1

Table G.4.2

2010 Aircraft Fleet Mix Average Daily Operations

Group	Aircraft Type	Day	Night	Total
Stage 2 Less than 75,000 lb. MTOW	GII	1.4	0.1	1.5
	GIII	0.2	0.0	0.2
	LEAR24	0.0	0.0	0.0
	LEAR25	0.0	0.0	0.1
	SABR75	0.0	0.0	0.0
	Total	1.6	0.1	1.8
Propeller	A748	0.0	0.0	0.0
	BEC100	0.0	0.0	0.1
	BEC190	3.8	0.2	4.1
	BEC200	1.5	0.2	1.7
	BEC23	0.0	0.0	0.0
	BEC24	0.0	0.0	0.0
	BEC300	0.4	0.0	0.5
	BEC30B	0.2	0.0	0.2
	BEC33	0.1	0.0	0.1
	BEC55	0.0	0.0	0.0
	BEC58	0.2	0.0	0.2
	BEC60	0.0	0.0	0.0
	BEC65	7.3	1.5	8.8
	BEC80	2.2	0.3	2.5
	BEC90	0.6	0.2	0.8
	BEC95	0.0	0.0	0.0
	BEC99	5.1	0.9	5.9
	BL26	0.0	0.0	0.0
	CNA150	0.0	0.0	0.0
	CNA170	0.0	0.0	0.0
	CNA172	0.1	0.0	0.1
	CNA177	0.0	0.0	0.0
	CNA180	0.0	0.0	0.0
	CNA182	0.0	0.0	0.0
	CNA185	0.0	0.0	0.0
	CNA205	0.0	0.0	0.0
	CNA206	0.1	0.0	0.1
	CNA208	0.6	0.1	0.7
	CNA210	0.1	0.0	0.1
	CNA303	0.0	0.0	0.0
	CNA310	0.1	0.0	0.1
	CNA320	0.0	0.0	0.0
	CNA337	0.0	0.0	0.0
	CNA340	0.1	0.0	0.1
	CNA401	0.0	0.0	0.0

Table G.4.2

2010 Aircraft Fleet Mix Average Daily Operations

Group	Aircraft Type	Day	Night	Total
Propeller	CNA402	0.1	0.0	0.1
	CNA404	0.0	0.0	0.0
	CNA414	0.3	0.0	0.3
	CNA421	0.2	0.0	0.2
	CNA425	0.0	0.0	0.0
	CNA441	0.2	0.0	0.2
	DHC6	0.0	0.0	0.0
	DHC8	0.0	0.0	0.0
	DO328	0.1	0.0	0.1
	EMB110	0.0	0.0	0.0
	FK27	0.0	0.0	0.0
	GASEPF	0.3	0.0	0.3
	GASEPV	0.2	0.0	0.3
	GULF1	0.2	0.0	0.2
	LA42	0.0	0.0	0.0
	M20J	0.3	0.0	0.4
	MU2	0.0	0.0	0.0
	PA23AZ	0.0	0.0	0.0
	PA24	0.0	0.0	0.0
	PA28	0.1	0.0	0.1
	PA30	0.0	0.0	0.0
	PA31	0.6	0.1	0.6
	PA32	0.2	0.0	0.2
	PA34	0.2	0.0	0.3
	PA42	0.0	0.0	0.0
	PA44	0.0	0.0	0.0
	PA46	0.1	0.0	0.1
	PA60	0.0	0.0	0.1
	RWCM69	0.0	0.0	0.0
	SAMER2	0.0	0.0	0.0
	SAMER3	0.1	0.0	0.1
	SAMER4	1.5	0.0	1.6
	SD330	0.0	0.0	0.0
	SF340	66.0	3.2	69.3
	Total	93.2	6.7	100.6
Helicopter	A109	0.0	0.0	0.0
	B206L	0.0	0.0	0.0
	B212	0.0	0.0	0.0
	B222	0.0	0.0	0.0
	EC130	0.0	0.0	0.0
	S70	0.0	0.0	0.0

Table G.4.2

2010 Aircraft Fleet Mix Average Daily Operations

Group	Aircraft Type	Day	Night	Total
Helicopter	Total	0.0	0.0	0.0
Military Jet	C130	3.1	0.2	3.4
	C17	0.0	0.0	0.0
	C5	0.0	0.0	0.0
	C9A	0.0	0.0	0.0
	F-18	0.0	0.0	0.0
	F16GE	0.0	0.0	0.0
	F5E	0.0	0.0	0.0
	KC135	0.0	0.0	0.0
	T-38A	0.1	0.0	0.1
	T1	0.0	0.0	0.0
	T34	0.0	0.0	0.0
	T37	0.0	0.0	0.0
	T38	0.0	0.0	0.0
	U21	0.0	0.0	0.0
	Total	3.2	0.2	3.5
Total		1099.1	94.3	1193.4

Note: Totals may differ due to rounding.

Source: MAC analysis, 2012.

The aircraft fleet mix at MSP is continuing to change. All signs point to a fundamental change in the nature of airline operations at MSP, especially in the type of aircraft flown by all airlines and in particular by Delta Air Lines. Specifically, operations by older aircraft such as the DC9 and B727 that have been “hushkitted” to meet the Stage 3 noise standard are decreasing. Following the events of 9/11, the number of monthly Stage 3 hushkit operations dropped off significantly at MSP and has never returned to pre-9/11 levels. The number of monthly Stage 3 hushkit operations dropped to 9,450 in September 2001 and have continued to drop. Stage 3 hushkit operations dropped to a low of 4 total monthly operations in May 2012. At the same time that older hushkit aircraft operations are declining, the use of newer and quieter manufactured Stage 3 aircraft is on the rise. The best examples at MSP of the increasing use of newer aircraft are the Airbus A320/319, Airbus 330, Canadair Regional Jets (CRJ-200 and EMB-170), Boeing B757-200/300, and Boeing B737-700/800. These aircraft are replacing older hushkitted Stage 3 aircraft such as the DC9, and B727.

When comparing the DC9 hushkitted aircraft to the CRJ-200 regional jet, 43 CRJ operations would be required to generate the same noise energy as one DC9 operation. The CRJ-200 aircraft represents newer technology engine noise emission levels.

Similar to the total forecast operation numbers, the fleet mix for the respective alternatives shows minimal variation in the respective forecast years. Again, this is a function of future operations trends that are forecasted to transpire regardless of the development alternative selected at MSP. Specifically, it is anticipated that airlines will favor an up-gauging in the size of aircraft at the Airport, regardless of the development option that is selected.

The 2020 forecast operation level of 484,879 represents an increase of 49,296 operations (11.3%) from 2010 (Existing Conditions). Although 2020 forecasted operations are anticipated to be 10.4% lower than the peak in 2004, total passengers are expected to increase from the 2004 level of 36.7 million to 41.8 million in 2020. This is a direct result of higher load factors with larger aircraft. For the future years analysis, as previously stated, the fleet mix and operational level is the same for each alternative (No Action, Airlines Remain Alternative and Airlines Relocate Alternative). However, the split between daytime and nighttime operations vary slightly between alternatives. As an example, the average daily nighttime operations forecasted in 2020 increases from the 2010 Existing Condition of 94.3 to 104.2 under the Airlines Remain Alternative and to a level of 104.4 under the Airlines Relocate Alternative (the Sponsor's Preferred Alternative). The small variation between the forecast impacts for the various alternatives is a function of FAA air traffic control procedures during low-demand time periods in conjunction with the Runway Use System and the different geographic locations of new gate additions at MSP that are provided with the various development options. **Tables G.4.3 through G.4.5** detail the 2020 and 2025 aircraft fleet mix and a day-night operations breakdown for each alternative.

The fleet mix was developed from the gated flight schedule that was produced from the aviation activity forecasts, as described in Appendix A. For the noise analysis, the simulation results (see Appendix D) were used to define the time of day for aircraft operations (i.e., daytime and nighttime periods of DNL) based upon the effect of delay as estimated by the SIMMOD analysis. The gated flight schedule provided information on stage lengths. The forecast fleet mix details the full phase-out of hushkitted Stage 3 aircraft over 75,000 pounds at MSP. However, based on the existence of Stage 2 private/corporate aircraft under 75,000 pounds in the Existing Conditions fleet mix, for purposes of the forecast noise modeling, the private/corporate aircraft fleet mix includes a small number of aircraft under 75,000 pounds modeled as Stage 2. During the course of the EA development process the United States Congress passed the FAA Modernization and Reform Act of 2012. The Act includes a provision that prohibits, after December 31, 2015, the operation within the 48 contiguous states of jets weighing 75,000 pounds or less not already complying with Stage 3 noise levels, with some exceptions for temporary operations related to moving aircraft for modification or sale. Although it is highly probable that this provision could result in no operations by Stage 2 aircraft under 75,000 pounds at MSP in 2020 or 2025, the small number of Stage 2 operations by aircraft under 75,000 pounds was maintained in the forecast modeling, representing a worst case scenario at MSP post-December 31, 2015.

Table G.4.3

2020 and 2025 No Action Alternative Forecast Aircraft Fleet Mix Average Daily Operations

		2020			2025		
Group	**Aircraft Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Manufactured/Re-engined Stage 3 Jet	A300B4-203	2.8	2.4	5.2	2.7	2.4	5.2
	A319-131	113.8	5.9	119.7	125.5	4.7	130.2
	A320-211	88.1	9.7	97.8	95.4	13.0	108.4
	A321-232	4.3	0.9	5.2	48.7	5.5	54.2
	A330	2.1	0.8	2.9	3.8	0.8	4.6
	B717-200	5.0	2.0	6.9	0.0	0.0	0.0
	B737-400	0.1	1.6	1.7	0.1	1.6	1.7
	B737-700	63.1	7.6	70.7	89.4	10.0	99.4
	B737-800	116.3	18.7	135.0	205.7	26.3	232.0
	B747-400	4.2	0.0	4.2	1.4	0.0	1.4
	B757-200	35.9	8.4	44.4	4.0	2.8	6.9
	B757-300	26.3	0.9	27.2	27.1	1.8	29.0
	B767-200	1.7	0.0	1.7	1.7	0.0	1.7
	B767-300	0.0	0.0	0.0	0.1	1.6	1.7
	B767-400	4.0	0.8	4.8	7.1	0.8	7.9
	B777-200	2.4	0.8	3.2	5.7	0.8	6.5
	B787-800	4.3	0.0	4.3	5.7	0.0	5.7
	BEC400	2.6	0.8	3.4	2.6	0.8	3.4
	CARJ/CL601	278.0	12.5	290.5	280.8	12.1	292.9
	CL600	2.5	0.9	3.4	2.5	0.9	3.4
	CNA501	1.7	0.0	1.7	1.7	0.0	1.7
	CNA525	4.4	0.8	5.2	4.4	0.8	5.1
	CNA550	1.7	0.0	1.7	1.7	0.0	1.7
	CNA560	8.5	0.0	8.5	8.5	0.0	8.5
	CNA650	1.7	0.0	1.7	3.4	0.0	3.4
	CNA750	6.9	0.0	6.9	6.9	0.0	6.9
	CS-300	5.2	0.0	5.2	8.6	0.0	8.6
	DC10	1.8	1.6	3.5	1.8	1.6	3.4
	EMB145	20.5	1.9	22.4	18.6	2.0	20.6
	EMB170	151.2	3.6	154.9	145.5	5.6	151.1
	FAL200	2.5	0.8	3.3	2.5	0.8	3.3
	FAL20A	1.7	0.0	1.7	1.7	0.0	1.7
	GLF5	1.7	0.0	1.7	1.7	0.0	1.7
	HS125	5.1	0.0	5.1	5.1	0.0	5.1
	IA1125	1.7	0.0	1.7	1.7	0.0	1.7
	LEAR35	5.1	0.0	5.1	5.1	0.0	5.1
	LEAR45	3.5	0.0	3.5	3.5	0.0	3.5
	LEAR60	1.7	0.0	1.7	1.7	0.0	1.7

Table G.4.3

2020 and 2025 No Action Alternative Forecast Aircraft Fleet Mix Average Daily Operations

		2020			2025		
Group	**Aircraft Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Manufactured/Re-engined Stage 3 Jet	MD11GE	2.7	2.5	5.2	2.4	2.8	5.2
	MD81	55.8	2.7	58.6	17.6	2.9	20.5
	MD9025	88.4	5.7	94.0	89.2	1.1	90.4
	Total	1131.1	94.5	1225.6	1243.5	103.7	1347.1
Stage 2 Less than 75,000 lb. MTOW	GII	0.9	0.9	1.7	0.9	0.9	1.7
	Total	0.9	0.9	1.7	0.9	0.9	1.7
Propeller	ATR42	0.9	0.9	1.7	0.9	0.9	1.7
	BEC190	1.7	0.0	1.7	1.7	0.0	1.7
	BEC200	1.7	0.0	1.7	1.7	0.0	1.7
	BEC55	0.9	0.9	1.7	0.9	0.9	1.7
	BEC58	1.7	0.0	1.7	1.7	0.0	1.7
	BEC65	10.9	1.0	11.9	10.8	1.1	11.9
	BEC80	3.4	0.0	3.4	3.4	0.0	3.4
	BEC90	16.2	1.0	17.2	17.7	1.2	18.9
	BEC99	6.0	0.9	6.9	6.0	0.9	6.9
	CNA208	1.0	0.8	1.8	1.0	0.8	1.8
	GASEPV	1.7	0.0	1.7	1.7	0.0	1.7
	M20J	1.7	0.0	1.7	1.7	0.0	1.7
	PA31	2.7	0.9	3.5	2.7	0.9	3.5
	PA34	0.9	0.9	1.7	0.9	0.8	1.7
	SAMER4	1.7	0.0	1.7	1.7	0.0	1.7
	SF340	34.0	0.0	34.0	23.7	0.0	23.7
	Total	87.1	7.1	94.2	78.1	7.4	85.5
Military Jet	C130	3.4	1.6	5.0	3.4	1.6	5.0
	T-38A	1.7	0.0	1.7	1.7	0.0	1.7
	Total	5.2	1.6	6.7	5.1	1.6	6.7
Total Operations		1224.3	104.1	1328.3	1327.6	113.5	1441.1

Note: Totals may differ due to rounding.

Source: MAC analysis, 2012.

Table G.4.4

2020 and 2025 Alternative 1 - Airlines Remain Forecast Aircraft Fleet Mix Average Daily Operations

		2020			2025		
Group	**Aircraft Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Manufactured/Re-engined Stage 3 Jet	A300B4-203	2.7	2.4	5.2	2.8	2.4	5.2
	A319-131	113.8	6.0	119.7	125.5	4.7	130.2
	A320-211	88.0	9.8	97.8	95.4	13.0	108.4
	A321-232	4.3	0.9	5.2	48.8	5.5	54.2
	A330	2.1	0.8	2.9	3.8	0.8	4.6
	B717-200	5.0	2.0	6.9	0.0	0.0	0.0
	B737-400	0.1	1.6	1.7	0.1	1.6	1.7
	B737-700	63.4	7.3	70.7	89.4	9.9	99.4
	B737-800	116.2	18.7	135.0	205.7	26.3	232.0
	B747-400	4.2	0.0	4.2	1.4	0.0	1.4
	B757-200	35.9	8.5	44.4	4.0	2.8	6.9
	B757-300	26.3	0.9	27.2	27.2	1.8	29.0
	B767-200	1.7	0.0	1.7	1.7	0.0	1.7
	B767-300	0.0	0.0	0.0	0.1	1.6	1.7
	B767-400	4.0	0.8	4.8	7.1	0.8	7.9
	B777-200	2.4	0.8	3.2	5.7	0.8	6.5
	B787-800	4.3	0.0	4.3	5.7	0.0	5.7
	BEC400	2.6	0.8	3.4	2.6	0.8	3.4
	CARJ/CL601	277.9	12.6	290.5	280.8	12.1	292.9
	CL600	2.5	0.9	3.4	2.5	0.9	3.4
	CNA501	1.7	0.0	1.7	1.7	0.0	1.7
	CNA525	4.4	0.8	5.2	4.4	0.8	5.1
	CNA550	1.7	0.0	1.7	1.7	0.0	1.7
	CNA560	8.5	0.0	8.5	8.5	0.0	8.5
	CNA650	1.7	0.0	1.7	3.4	0.0	3.4
	CNA750	6.9	0.0	6.9	6.9	0.0	6.9
	CS-300	5.2	0.0	5.2	8.6	0.0	8.6
	DC10	1.8	1.6	3.5	1.8	1.6	3.4
	EMB145	20.5	1.9	22.4	18.6	2.0	20.6
	EMB170	151.2	3.6	154.9	145.5	5.6	151.1
	FAL200	2.5	0.8	3.3	2.5	0.8	3.3
	FAL20A	1.7	0.0	1.7	1.7	0.0	1.7
	GLF5	1.7	0.0	1.7	1.7	0.0	1.7
	HS125	5.1	0.0	5.1	5.1	0.0	5.1
	IA1125	1.7	0.0	1.7	1.7	0.0	1.7
	LEAR35	5.1	0.0	5.1	5.1	0.0	5.1
	LEAR45	3.5	0.0	3.5	3.5	0.0	3.5

Table G.4.4

2020 and 2025 Alternative 1 - Airlines Remain Forecast Aircraft Fleet Mix Average Daily Operations

		2020			2025		
Group	**Aircraft Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Manufactured/Re-engined Stage 3 Jet	LEAR60	1.7	0.0	1.7	1.7	0.0	1.7
	MD11GE	2.5	2.6	5.2	2.4	2.8	5.2
	MD81	55.8	2.8	58.6	17.6	2.9	20.5
	MD9025	88.4	5.6	94.0	89.2	1.1	90.4
	Total	1131.0	94.6	1225.6	1243.7	103.4	1347.1
Stage 2 Less than 75,000 lb. MTOW	GII	0.9	0.9	1.7	0.9	0.9	1.7
	Total	0.9	0.9	1.7	0.9	0.9	1.7
Propeller	ATR42	0.9	0.9	1.7	0.9	0.9	1.7
	BEC190	1.7	0.0	1.7	1.7	0.0	1.7
	BEC200	1.7	0.0	1.7	1.7	0.0	1.7
	BEC55	0.9	0.9	1.7	0.9	0.9	1.7
	BEC58	1.7	0.0	1.7	1.7	0.0	1.7
	BEC65	10.9	1.0	11.9	10.8	1.1	11.9
	BEC80	3.4	0.0	3.4	3.4	0.0	3.4
	BEC90	16.2	1.0	17.2	17.7	1.2	18.9
	BEC99	6.0	0.9	6.9	6.0	0.9	6.9
	CNA208	1.0	0.8	1.8	1.0	0.8	1.8
	GASEPV	1.7	0.0	1.7	1.7	0.0	1.7
	M20J	1.7	0.0	1.7	1.7	0.0	1.7
	PA31	2.7	0.9	3.5	2.7	0.9	3.5
	PA34	0.9	0.9	1.7	0.9	0.8	1.7
	SAMER4	1.7	0.0	1.7	1.7	0.0	1.7
	SF340	34.0	0.0	34.0	23.7	0.0	23.7
	Total	87.1	7.1	94.2	78.2	7.4	85.5
Military Jet	C130	3.4	1.6	5.0	3.4	1.6	5.0
	T-38A	1.7	0.0	1.7	1.7	0.0	1.7
	Total	5.2	1.6	6.7	5.1	1.6	6.7
Total Operations		1224.2	104.2	1328.3	1327.9	113.2	1441.1

Note: Totals may differ due to rounding.

Source: MAC analysis, 2012.

Table G.4.5

2020 and 2025 Alternative 2 - Airlines Relocate Forecast Aircraft Fleet Mix
Average Daily Operations

		2020			2025		
Group	**Aircraft Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Manufactured/Re-engined Stage 3 Jet	A300B4-203	2.7	2.5	5.2	2.7	2.4	5.2
	A319-131	113.8	5.9	119.7	125.5	4.7	130.2
	A320-211	88.0	9.8	97.8	95.3	13.1	108.4
	A321-232	4.3	0.9	5.2	48.7	5.6	54.2
	A330	2.1	0.8	2.9	3.8	0.8	4.6
	B717-200	5.0	2.0	6.9	0.0	0.0	0.0
	B737-400	0.1	1.6	1.7	0.1	1.6	1.7
	B737-700	63.5	7.3	70.7	89.3	10.1	99.4
	B737-800	116.3	18.7	135.0	205.4	26.6	232.0
	B747-400	4.2	0.0	4.2	1.4	0.0	1.4
	B757-200	35.9	8.4	44.4	4.0	2.8	6.9
	B757-300	26.3	0.9	27.2	27.1	1.9	29.0
	B767-200	1.7	0.0	1.7	1.7	0.0	1.7
	B767-300	0.0	0.0	0.0	0.1	1.6	1.7
	B767-400	4.0	0.8	4.8	7.1	0.8	7.9
	B777-200	2.4	0.8	3.2	5.7	0.8	6.5
	B787-800	4.3	0.0	4.3	5.7	0.0	5.7
	BEC400	2.6	0.8	3.4	2.6	0.8	3.4
	CARJ/CL601	277.9	12.6	290.5	280.7	12.1	292.9
	CL600	2.5	0.9	3.4	2.5	0.9	3.4
	CNA501	1.7	0.0	1.7	1.7	0.0	1.7
	CNA525	4.4	0.8	5.2	4.3	0.8	5.1
	CNA550	1.7	0.0	1.7	1.7	0.0	1.7
	CNA560	8.5	0.0	8.5	8.5	0.0	8.5
	CNA650	1.7	0.0	1.7	3.4	0.0	3.4
	CNA750	6.9	0.0	6.9	6.9	0.0	6.9
	CS-300	5.2	0.0	5.2	8.6	0.0	8.6
	DC10	1.8	1.6	3.5	1.8	1.6	3.4
	EMB145	20.5	1.9	22.4	18.6	2.0	20.6
	EMB170	151.3	3.6	154.9	145.5	5.6	151.1
	FAL200	2.4	0.9	3.3	2.5	0.8	3.3
	FAL20A	1.7	0.0	1.7	1.7	0.0	1.7
	GLF5	1.7	0.0	1.7	1.7	0.0	1.7
	HS125	5.1	0.0	5.1	5.1	0.0	5.1
	IA1125	1.7	0.0	1.7	1.7	0.0	1.7
	LEAR35	5.1	0.0	5.1	5.1	0.0	5.1
	LEAR45	3.5	0.0	3.5	3.5	0.0	3.5

Table G.4.5

2020 and 2025 Alternative 2 - Airlines Relocate Forecast Aircraft Fleet Mix Average Daily Operations

		2020			2025		
Group	**Aircraft Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Manufactured/Re-engined Stage 3 Jet	LEAR60	1.7	0.0	1.7	1.7	0.0	1.7
	MD11GE	2.4	2.8	5.2	2.5	2.6	5.2
	MD81	55.8	2.7	58.6	17.6	2.9	20.5
	MD9025	88.4	5.6	94.0	89.2	1.1	90.4
	Total	1130.8	94.8	1225.6	1242.9	104.2	1347.1
Stage 2 Less than 75,000 lb. MTOW	GII	0.9	0.9	1.7	0.9	0.9	1.7
	Total	0.9	0.9	1.7	0.9	0.9	1.7
Propeller	ATR42	0.9	0.9	1.7	0.9	0.9	1.7
	BEC190	1.7	0.0	1.7	1.7	0.0	1.7
	BEC200	1.7	0.0	1.7	1.7	0.0	1.7
	BEC55	0.9	0.9	1.7	0.9	0.9	1.7
	BEC58	1.7	0.0	1.7	1.7	0.0	1.7
	BEC65	10.9	1.0	11.9	10.8	1.1	11.9
	BEC80	3.4	0.0	3.4	3.4	0.0	3.4
	BEC90	16.2	1.0	17.2	17.7	1.2	18.9
	BEC99	6.0	0.9	6.9	6.0	0.9	6.9
	CNA208	1.0	0.8	1.8	1.0	0.8	1.8
	GASEPV	1.7	0.0	1.7	1.7	0.0	1.7
	M20J	1.7	0.0	1.7	1.7	0.0	1.7
	PA31	2.7	0.9	3.5	2.7	0.9	3.5
	PA34	0.9	0.9	1.7	0.9	0.8	1.7
	SAMER4	1.7	0.0	1.7	1.7	0.0	1.7
	SF340	34.0	0.0	34.0	23.7	0.0	23.7
	Total	87.1	7.1	94.2	78.2	7.4	85.5
Military Jet	C130	3.4	1.6	5.0	3.4	1.6	5.0
	T-38A	1.7	0.0	1.7	1.7	0.0	1.7
	Total	5.1	1.6	6.7	5.1	1.6	6.7
Total Operations		1223.9	104.4	1328.3	1327.1	114.0	1441.1

Note: Totals may differ due to rounding.

Source: MAC analysis, 2012.

Run-up operations were projected to increase from the 2010 Base Case levels in a manner that considers overall operations growth and fleet mix out to 2020 and 2025. The aircraft stage length data were provided by the forecast analysis conducted for this EA.

Aircraft types not contained in the INM were modeled with the INM's list of approved substitutions or with aircraft identified as appropriate substitutions through coordination with the FAA **(see Attachment 1).**

4.3 INM Analysis 2010 (Existing) Runway Use

FAA control of runway use throughout the year for arrival and departure operations at MSP has a notable effect on the noise impact around the airport. The number of people and dwellings impacted by noise is a direct result of the number of operations on a given runway and the land uses off the end of the runway.

Historically, prior to the opening of Runway 17/35, arrival and departure operations occurred on the parallel runways at MSP (12L/30R and 12R/30L) in a manner that resulted in approximately 50 percent of the arrival and departure operations occurring to the northwest over South Minneapolis and 50 percent to the southeast over Mendota Heights and Eagan. As a result of the dense residential land uses to the northwest and the predominantly industrial/commercial land uses to the southeast of MSP, focusing arrival and departure operations to the southeast has long been the preferred configuration from a noise reduction perspective.

Since the introduction of Runway 17/35 at MSP in 2005, another opportunity exists to route aircraft over an unpopulated area – the Minnesota River Valley. With use of the Runway 17 Departure Procedure, westbound departure operations off Runway 17 are routed such that they avoid close-in residential areas southwest of the runway. Thus, use of Runway 17 for departure operations is the second preferred operational configuration (after Runways 12L and 12R) for noise reduction purposes.

Table G.4.6 provides the runway use percentages for 2010.

Table G.4.6

2010 Runway Use Percentages

Operation Type	Runway	Day	Night	Total
Arrivals	4	0.0%	0.1%	0.0%
	12L	19.9%	14.0%	19.4%
	12R	19.1%	24.8%	19.6%
	17	0.1%	0.0%	0.1%
	22	0.3%	0.9%	0.4%
	30L	17.9%	36.4%	19.4%
	30R	22.2%	22.1%	22.2%
	35	20.6%	1.8%	19.0%
	Total	100.0%	100.0%	100.0%
Departures	4	0.1%	0.1%	0.1%
	12L	12.6%	17.4%	12.9%
	12R	6.5%	25.4%	8.0%
	17	21.8%	14.2%	21.2%
	22	0.4%	0.6%	0.4%
	30L	26.2%	22.4%	25.9%
	30R	32.5%	19.9%	31.6%
	35	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%
Overall	4	0.0%	0.1%	0.0%
	12L	16.2%	15.6%	16.2%
	12R	12.8%	25.1%	13.8%
	17	10.9%	6.8%	10.6%
	22	0.3%	0.7%	0.4%
	30L	22.0%	29.7%	22.6%
	30R	27.3%	21.1%	26.8%
	35	10.3%	0.9%	9.6%
	Total	100.0%	100.0%	100.0%

Note:
- Total may not add up to 100% due to rounding.

Source: MACNOMS data was used to calculate runway use for 2010.

4.4 INM Analysis Forecast Runway Use

Tables G.4.7 through G.4.9 provide the 2020 and 2025 No Action, Airlines Remain Alternative and the Airlines Relocate Alternative runway use percentages. The SIMMOD use assumptions that resulted in the runways' use percentages included the consideration of the Runway Use System (RUS) at MSP, as well as the FAA's runway selection patterns related to various operational flows, weather conditions, and aircraft destination and origin locations.

Table G.4.7

2020 and 2025 No Action Alternative Forecast Runway Use

		2020			2025		
Operation Type	**Runway**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Arrivals	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	12L	19.3%	10.9%	18.6%	19.0%	12.1%	18.5%
	12R	19.6%	28.2%	20.3%	19.8%	26.7%	20.4%
	17	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
	22	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
	30L	18.7%	39.1%	20.4%	19.1%	38.2%	20.6%
	30R	21.1%	21.3%	21.1%	21.0%	22.6%	21.1%
	35	20.9%	0.0%	19.2%	20.6%	0.0%	19.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Departures	4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	12L	12.8%	16.9%	13.1%	13.0%	19.8%	13.6%
	12R	7.5%	26.6%	9.0%	6.8%	23.1%	8.1%
	17	21.3%	14.4%	20.7%	21.9%	14.3%	21.3%
	22	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%
	30L	26.2%	21.9%	25.9%	26.8%	22.8%	26.5%
	30R	31.6%	19.6%	30.7%	30.9%	19.5%	30.0%
	35	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Overall	4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	12L	16.0%	13.9%	15.9%	16.1%	16.0%	16.0%
	12R	13.5%	27.4%	14.6%	13.3%	24.9%	14.2%
	17	10.7%	7.1%	10.4%	11.0%	7.2%	10.7%
	22	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
	30L	22.5%	30.6%	23.1%	23.0%	30.4%	23.5%
	30R	26.3%	20.5%	25.9%	25.9%	21.0%	25.5%
	35	10.4%	0.0%	9.6%	10.3%	0.0%	9.5%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note:
- Total may not add up to 100% due to rounding.

Source: MAC, 2011.

Table G.4.8

2020 and 2025 Alternative 1 – Airlines Remain Forecast Runway Use

		2020			2025		
Operation Type	**Runway**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Arrivals	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	12L	19.2%	10.9%	18.5%	19.1%	11.4%	18.5%
	12R	19.7%	28.3%	20.4%	19.8%	27.8%	20.4%
	17	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
	22	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
	30L	18.8%	39.3%	20.4%	19.4%	39.5%	21.0%
	30R	21.1%	21.2%	21.1%	21.1%	20.9%	21.1%
	35	20.7%	0.0%	19.1%	20.2%	0.0%	18.6%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Departures	4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	12L	12.8%	15.8%	13.1%	13.1%	19.8%	13.6%
	12R	7.5%	27.4%	9.0%	6.8%	24.3%	8.2%
	17	21.3%	14.4%	20.7%	21.9%	13.9%	21.2%
	22	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%
	30L	26.3%	21.2%	25.9%	26.9%	22.0%	26.5%
	30R	31.5%	20.6%	30.7%	30.8%	19.5%	29.9%
	35	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Overall	4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	12L	16.0%	13.3%	15.8%	16.1%	15.7%	16.0%
	12R	13.6%	27.8%	14.7%	13.3%	26.0%	14.3%
	17	10.7%	7.1%	10.4%	11.0%	7.1%	10.7%
	22	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
	30L	22.6%	30.3%	23.2%	23.1%	30.6%	23.7%
	30R	26.3%	20.9%	25.9%	26.0%	20.2%	25.5%
	35	10.4%	0.0%	9.6%	10.1%	0.0%	9.3%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes:
- Total may not add up to 100% due to rounding.

Source: MAC, 2011.

Table G.4.9

2020 and 2025 Alternative 2 – Airlines Relocate Forecast Runway Use

		2020			2025		
Operation Type	**Runway**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
Arrival	4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	12L	19.3%	9.0%	18.5%	19.2%	10.3%	18.5%
	12R	19.5%	30.2%	20.4%	19.6%	28.9%	20.4%
	17	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
	22	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
	30L	18.4%	41.1%	20.2%	18.8%	41.2%	20.6%
	30R	21.3%	19.4%	21.2%	21.2%	19.2%	21.0%
	35	21.0%	0.0%	19.3%	20.7%	0.0%	19.1%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Departure	4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	12L	12.8%	14.9%	13.0%	13.1%	19.0%	13.5%
	12R	7.6%	27.1%	9.1%	6.8%	23.7%	8.1%
	17	21.2%	16.0%	20.8%	21.9%	14.8%	21.3%
	22	0.5%	0.5%	0.5%	0.4%	0.4%	0.4%
	30L	26.5%	23.1%	26.3%	26.6%	21.4%	26.2%
	30R	31.3%	18.3%	30.3%	31.1%	20.6%	30.2%
	35	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Overall	4	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
	12L	16.1%	11.9%	15.7%	16.1%	14.7%	16.0%
	12R	13.5%	28.6%	14.7%	13.2%	26.3%	14.3%
	17	10.6%	7.9%	10.4%	11.0%	7.5%	10.7%
	22	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
	30L	22.5%	32.2%	23.2%	22.7%	31.2%	23.4%
	30R	26.3%	18.9%	25.7%	26.1%	19.9%	25.6%
	35	10.5%	0.0%	9.7%	10.4%	0.0%	9.5%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes:
- Total may not add up to 100% due to rounding.

Source: MAC, 2011.

The RUS is a major factor in the nighttime runway use percentages. However, in the low demand time periods during the nighttime hours, the FAA will use the parallel runway that is closest to the airport arrival or departure gate of an aircraft. As a result, arrival percentages to the south parallel runway (Runway 12R/30L) during nighttime hours are notably higher than on the north parallel runway (Runway 12L/30R). This has a dramatic effect on the arrival noise contour lobes off the ends of the south parallel runway.

4.5 INM Analysis Existing and Forecast Flight Tracks and Usage

The flight tracks used and the use of individual tracks in 2010 (Existing Conditions) are provided in **Figures G.4-1 through G.4-16**, at the end of the appendix. The 2020 and 2025 forecast flight tracks for the No Action, Airlines Remain Alternative and Airlines Relocate Alternative (Sponsor's Preferred Alternative) scenarios are provided in **Figures G.4-17 through G.4-32,** at the end of the appendix. The 2020 and 2025 forecast flight track use percentages for each alternative are detailed in **Tables G.4.10 through G.4.12**.

The 2010 Base Case INM track locations and existing use statistics, with slight modifications, were used for the 2020 and 2025 INM forecast noise analysis for all of the alternatives. Recent procedures implemented by FAA ATC were considered in the analysis of future noise exposure. The forecast flight tracks used in this EA include operational assumptions based on recent FAA ATC implementation of increased heading dispersion for northbound departure operations off Runway 30R as requested by the City of Minneapolis, the MSP Noise Oversight Committee (NOC) and the MAC. Additionally, the HESTN ONE and SLAYR ONE Area Navigation (RNAV) Standard Instrument Departures (SIDs) off Runway 17, as implemented on August 15, 2012 by FAA ATC, per the request of the NOC and MAC, are modeled in the forecast flight tracks in this EA.

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A04XA0	04X	A	83.8%	95.4%	84.6%	83.4%	94.2%	84.1%
A04XA1	04X	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
A04XA2	04X	A	14.1%	4.6%	13.4%	14.7%	5.8%	14.1%
A04XA7	04X	A	0.5%	0.0%	0.5%	0.5%	0.0%	0.5%
A04XDL	04X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A04XEL	04X	A	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
A04XFR	04X	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
D04XF	04X	D	3.7%	0.0%	3.5%	3.5%	0.0%	3.3%
D04XF1	04X	D	9.1%	1.0%	8.7%	9.7%	1.3%	9.2%
D04XF2	04X	D	0.5%	0.0%	0.5%	0.5%	0.0%	0.4%
MAC04A	04X	D	0.1%	0.0%	0.1%	0.2%	0.4%	0.2%
MAC04B	04X	D	0.9%	0.0%	0.9%	1.0%	0.0%	0.9%
MAC04C	04X	D	5.1%	29.8%	6.5%	5.2%	26.9%	6.4%
MAC04D	04X	D	5.6%	0.9%	5.4%	5.7%	1.1%	5.4%
MAC04E	04X	D	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
MAC04F	04X	D	3.2%	1.4%	3.1%	3.0%	1.8%	2.9%
MAC04G	04X	D	14.4%	0.0%	13.6%	15.1%	0.0%	14.2%
MAC04H	04X	D	12.1%	10.4%	12.0%	12.3%	11.6%	12.3%
MAC04I	04X	D	4.2%	4.5%	4.2%	3.7%	5.3%	3.8%
MAC04J	04X	D	1.0%	0.0%	0.9%	0.5%	0.0%	0.5%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
MAC04K	04X	D	11.7%	3.2%	11.2%	11.6%	4.3%	11.2%
MAC04L	04X	D	11.0%	14.3%	11.2%	9.1%	13.3%	9.3%
MAC04M	04X	D	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
MAC04N	04X	D	11.9%	17.7%	12.3%	13.0%	17.8%	13.3%
MAC04O	04X	D	1.5%	16.8%	2.3%	1.2%	16.1%	2.1%
MAC04P	04X	D	0.6%	0.0%	0.6%	0.3%	0.0%	0.3%
MAC04Q	04X	D	2.7%	0.0%	2.6%	3.8%	0.0%	3.5%
A12LA0	12L	A	44.9%	40.6%	44.7%	45.5%	40.2%	45.3%
A12LA1	12L	A	1.9%	1.0%	1.9%	1.8%	1.0%	1.8%
A12LA2	12L	A	28.8%	31.9%	28.9%	29.0%	35.3%	29.2%
A12LA3	12L	A	1.2%	0.5%	1.2%	1.3%	0.5%	1.3%
A12LA4	12L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A12LA5	12L	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A12LA6	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LA7	12L	A	0.4%	0.1%	0.3%	0.3%	0.1%	0.3%
A12LA8	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LBL	12L	A	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
A12LBR	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LCL	12L	A	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
A12LCR	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LDL	12L	A	0.3%	0.9%	0.3%	0.2%	0.6%	0.2%
A12LDR	12L	A	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%
A12LEL	12L	A	1.0%	0.6%	1.0%	0.9%	0.7%	0.9%
A12LER	12L	A	0.3%	0.2%	0.3%	0.3%	0.3%	0.3%
A12LFL	12L	A	1.4%	1.4%	1.4%	1.4%	1.5%	1.4%
A12LFR	12L	A	0.0%	0.6%	0.1%	0.0%	0.4%	0.1%
A12LGL	12L	A	2.4%	2.1%	2.4%	2.3%	2.0%	2.3%
A12LGR	12L	A	0.1%	0.7%	0.1%	0.1%	0.5%	0.1%
A12LHL	12L	A	2.8%	1.9%	2.7%	2.5%	1.3%	2.5%
A12LHR	12L	A	0.2%	1.5%	0.3%	0.3%	1.4%	0.3%
A12LIL	12L	A	4.0%	2.4%	4.0%	3.9%	2.2%	3.8%
A12LIR	12L	A	0.2%	1.1%	0.2%	0.2%	1.0%	0.2%
A12LJL	12L	A	3.9%	3.1%	3.9%	3.8%	2.3%	3.7%
A12LJR	12L	A	0.2%	1.4%	0.3%	0.2%	1.6%	0.3%
A12LKL	12L	A	5.3%	4.4%	5.2%	5.1%	3.7%	5.0%
A12LKR	12L	A	0.5%	2.8%	0.6%	0.5%	2.8%	0.6%
D12LA1	12L	D	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%
D12LA2	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
D12LA3	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
D12LA4	12L	D	0.3%	1.1%	0.4%	0.2%	0.9%	0.3%
D12LB1	12L	D	0.6%	0.6%	0.6%	0.5%	1.2%	0.6%
D12LB2	12L	D	5.2%	5.3%	5.2%	4.8%	5.2%	4.9%
D12LC1	12L	D	0.9%	0.4%	0.8%	0.7%	0.4%	0.7%
D12LC2	12L	D	3.1%	1.1%	2.9%	3.2%	0.9%	3.0%
D12LD	12L	D	7.0%	4.7%	6.8%	6.9%	4.8%	6.7%
D12LD1	12L	D	1.3%	1.4%	1.3%	1.3%	1.5%	1.3%
D12LD2	12L	D	0.8%	0.3%	0.7%	0.7%	0.6%	0.7%
D12LD3	12L	D	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%
D12LD4	12L	D	0.7%	0.6%	0.7%	0.7%	0.5%	0.7%
D12LE	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12LE1	12L	D	0.3%	0.1%	0.3%	0.3%	0.1%	0.3%
D12LE2	12L	D	7.2%	2.7%	6.8%	7.3%	2.5%	6.8%
D12LE4	12L	D	7.8%	3.7%	7.4%	8.0%	3.6%	7.5%
D12LF1	12L	D	4.2%	3.5%	4.1%	4.0%	3.2%	3.9%
D12LF2	12L	D	0.9%	0.7%	0.9%	0.8%	0.5%	0.7%
D12LF3	12L	D	0.9%	1.2%	0.9%	0.8%	1.0%	0.8%
D12LF4	12L	D	0.4%	0.3%	0.4%	0.4%	0.3%	0.3%
D12LG1	12L	D	3.3%	9.4%	3.8%	3.4%	8.8%	3.9%
D12LG2	12L	D	1.4%	1.8%	1.4%	1.4%	2.8%	1.5%
D12LG3	12L	D	3.3%	7.9%	3.7%	4.8%	8.9%	5.2%
D12LG4	12L	D	0.5%	0.7%	0.5%	0.4%	0.7%	0.4%
D12LH1	12L	D	0.1%	0.6%	0.2%	0.2%	0.5%	0.2%
D12LH2	12L	D	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
D12LI	12L	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
D12LI1	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12LI2	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12LK1	12L	D	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%
D12LK2	12L	D	2.8%	1.9%	2.7%	2.5%	1.6%	2.4%
D12LL	12L	D	0.2%	0.2%	0.2%	0.1%	0.2%	0.1%
D12LL1	12L	D	0.3%	0.6%	0.4%	0.4%	0.4%	0.4%
D12LL2	12L	D	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
D12LL3	12L	D	0.3%	0.8%	0.3%	0.3%	1.3%	0.4%
D12LL4	12L	D	0.4%	0.1%	0.4%	0.4%	0.1%	0.4%
DF12LA	12L	D	0.0%	0.3%	0.0%	0.0%	0.2%	0.0%
DF12LA1	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
DF12LA2	12L	D	0.2%	0.8%	0.3%	0.2%	1.4%	0.3%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
DF12LB	12L	D	1.9%	2.7%	1.9%	1.5%	2.9%	1.6%
DF12LC1	12L	D	2.9%	1.8%	2.8%	2.7%	1.5%	2.6%
DF12LC2	12L	D	6.2%	3.2%	6.0%	6.9%	2.7%	6.5%
DF12LC3	12L	D	2.2%	1.6%	2.2%	2.1%	1.3%	2.1%
DF12LC4	12L	D	3.2%	1.3%	3.0%	3.4%	1.4%	3.2%
DF12LD1	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
DF12LD2	12L	D	1.9%	1.9%	1.9%	1.6%	1.5%	1.6%
DF12LE1	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
DF12LF1	12L	D	2.2%	0.9%	2.1%	2.1%	0.6%	1.9%
DF12LF2	12L	D	0.9%	0.7%	0.9%	0.8%	0.6%	0.8%
DF12LG	12L	D	2.5%	5.6%	2.8%	2.6%	7.3%	3.1%
DF12LG1	12L	D	0.9%	4.9%	1.3%	0.8%	2.1%	0.9%
DF12LG2	12L	D	0.5%	0.4%	0.4%	0.6%	0.3%	0.6%
DF12LH1	12L	D	0.2%	1.9%	0.3%	0.4%	2.6%	0.6%
DF12LH2	12L	D	0.4%	0.7%	0.5%	1.1%	1.7%	1.2%
DF12LI1	12L	D	0.4%	0.6%	0.4%	0.5%	1.2%	0.5%
DF12LI2	12L	D	0.4%	0.7%	0.4%	0.6%	1.3%	0.6%
DF12LJ	12L	D	0.9%	1.0%	0.9%	0.8%	0.8%	0.8%
DF12LJ1	12L	D	0.3%	0.9%	0.4%	0.2%	0.7%	0.3%
DF12LJ2	12L	D	7.4%	5.8%	7.3%	7.0%	5.2%	6.8%
DF12LK1	12L	D	0.2%	0.6%	0.3%	0.2%	0.4%	0.2%
DF12LK2	12L	D	0.7%	1.8%	0.8%	0.6%	1.3%	0.7%
DF12LK3	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12LK4	12L	D	0.4%	0.3%	0.4%	0.3%	0.3%	0.3%
DF12LL1	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
DF12LL2	12L	D	0.6%	1.7%	0.7%	0.5%	2.8%	0.7%
DFC12LC	12L	D	5.2%	2.0%	4.9%	5.0%	1.6%	4.7%
DFC12LF	12L	D	0.8%	0.4%	0.8%	0.8%	0.4%	0.8%
DFC12LH	12L	D	1.1%	2.1%	1.2%	1.1%	1.8%	1.1%
DFC12LK	12L	D	0.4%	0.7%	0.4%	0.3%	0.6%	0.3%
A12RA0	12R	A	37.7%	32.8%	37.2%	38.3%	32.2%	37.8%
A12RA1	12R	A	0.4%	0.4%	0.4%	0.4%	0.3%	0.4%
A12RA2	12R	A	49.1%	34.5%	47.7%	48.6%	37.1%	47.6%
A12RA3	12R	A	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%
A12RA4	12R	A	0.5%	0.0%	0.4%	0.5%	0.0%	0.5%
A12RA5	12R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12RA6	12R	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A12RA7	12R	A	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A12RA8	12R	A	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%
A12RBL	12R	A	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
A12RBR	12R	A	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%
A12RCL	12R	A	0.0%	0.3%	0.1%	0.0%	0.3%	0.1%
A12RCR	12R	A	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
A12RDL	12R	A	0.0%	0.4%	0.1%	0.0%	0.5%	0.1%
A12RDR	12R	A	0.0%	0.7%	0.1%	0.0%	0.6%	0.1%
A12REL	12R	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A12RER	12R	A	0.1%	0.4%	0.2%	0.1%	0.5%	0.2%
A12RFL	12R	A	0.1%	2.8%	0.4%	0.1%	2.9%	0.4%
A12RFR	12R	A	0.2%	1.1%	0.3%	0.2%	0.6%	0.2%
A12RGL	12R	A	0.2%	0.5%	0.2%	0.2%	0.6%	0.2%
A12RGR	12R	A	0.4%	1.3%	0.5%	0.4%	1.1%	0.4%
A12RHL	12R	A	0.3%	0.7%	0.3%	0.3%	0.6%	0.3%
A12RHR	12R	A	0.8%	2.3%	0.9%	0.8%	2.0%	0.9%
A12RIL	12R	A	0.4%	0.8%	0.4%	0.3%	0.8%	0.4%
A12RIR	12R	A	1.3%	1.8%	1.3%	1.3%	1.8%	1.3%
A12RJL	12R	A	0.5%	1.3%	0.6%	0.5%	1.0%	0.5%
A12RJR	12R	A	1.9%	2.7%	1.9%	2.0%	2.5%	2.1%
A12RKL	12R	A	0.8%	1.5%	0.8%	0.7%	1.4%	0.8%
A12RKR	12R	A	4.8%	12.0%	5.5%	4.8%	12.0%	5.4%
12RAB	12R	D	2.0%	2.1%	2.0%	2.0%	1.8%	2.0%
12RAB1	12R	D	0.3%	0.3%	0.3%	0.4%	0.2%	0.3%
12RAB2	12R	D	2.9%	1.1%	2.6%	2.9%	1.7%	2.6%
D12RA1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RA2	12R	D	0.6%	0.2%	0.5%	0.7%	0.1%	0.6%
D12RB1	12R	D	2.1%	4.7%	2.6%	2.0%	5.2%	2.6%
D12RB2	12R	D	4.4%	8.4%	5.2%	4.3%	9.4%	5.3%
D12RB3	12R	D	0.8%	1.3%	0.9%	0.8%	2.3%	1.1%
D12RB4	12R	D	2.2%	2.3%	2.2%	2.1%	2.8%	2.2%
D12RC1	12R	D	4.6%	3.8%	4.5%	4.6%	3.5%	4.4%
D12RC2	12R	D	5.4%	2.5%	4.8%	4.9%	2.2%	4.4%
D12RC2D	12R	D	7.4%	11.5%	8.2%	7.5%	8.9%	7.8%
D12RC2D1	12R	D	3.2%	2.6%	3.1%	3.5%	2.9%	3.4%
D12RC2D2	12R	D	7.5%	2.8%	6.6%	8.0%	2.5%	6.9%
D12RC2D3	12R	D	4.3%	7.0%	4.8%	4.4%	8.9%	5.3%
D12RC2D4	12R	D	3.8%	1.6%	3.4%	3.8%	1.6%	3.3%
D12RC3	12R	D	0.2%	0.2%	0.2%	0.2%	0.1%	0.2%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D12RC4	12R	D	2.9%	0.9%	2.5%	2.9%	0.7%	2.5%
D12RD1	12R	D	2.3%	4.3%	2.7%	2.2%	3.8%	2.5%
D12RD2	12R	D	2.9%	2.7%	2.9%	2.4%	2.3%	2.4%
D12RD3	12R	D	0.2%	0.6%	0.3%	0.2%	0.5%	0.3%
D12RD4	12R	D	1.3%	0.4%	1.1%	1.4%	0.5%	1.2%
D12RF1	12R	D	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
D12RF2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RF3	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RF4	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RG	12R	D	0.2%	0.0%	0.1%	0.2%	0.2%	0.2%
D12RG1	12R	D	0.4%	0.0%	0.4%	0.4%	0.0%	0.3%
D12RG2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RG3	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RG4	12R	D	0.0%	0.2%	0.1%	0.0%	0.1%	0.0%
D12RH1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH2	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH3	12R	D	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH4	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RI1	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RI2	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RA1	12R	D	0.6%	0.2%	0.5%	0.7%	0.2%	0.6%
DF12RA2	12R	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
DF12RB1	12R	D	0.5%	1.8%	0.8%	0.6%	2.0%	0.9%
DF12RB2	12R	D	2.8%	4.0%	3.1%	2.5%	5.4%	3.1%
DF12RC	12R	D	6.4%	4.9%	6.1%	6.3%	5.3%	6.1%
DF12RC1	12R	D	1.6%	0.8%	1.4%	1.2%	0.6%	1.1%
DF12RC2	12R	D	2.3%	3.2%	2.4%	2.5%	3.1%	2.6%
DF12RD	12R	D	3.9%	3.0%	3.7%	3.7%	2.3%	3.5%
DF12RD1	12R	D	0.9%	0.3%	0.8%	0.8%	0.5%	0.7%
DF12RD2	12R	D	1.6%	3.0%	1.9%	2.0%	2.2%	2.1%
DF12RF	12R	D	0.3%	0.1%	0.3%	0.3%	0.3%	0.3%
DF12RF1	12R	D	0.2%	0.2%	0.2%	0.1%	0.3%	0.2%
DF12RF2	12R	D	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RG1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RG2	12R	D	1.2%	0.3%	1.0%	1.0%	0.3%	0.9%
DF12RH1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RH2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%
DF12RI	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
DF12RI1	12R	D	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%
DF12RI2	12R	D	0.5%	0.1%	0.5%	0.6%	0.1%	0.5%
DFC12RA	12R	D	0.5%	0.0%	0.4%	0.5%	0.0%	0.4%
DFC12RB	12R	D	3.7%	5.8%	4.1%	3.7%	7.1%	4.4%
DFC12RE	12R	D	4.5%	2.9%	4.2%	5.2%	2.0%	4.6%
DFC12RE1	12R	D	1.5%	4.0%	2.0%	1.9%	3.1%	2.1%
DFC12RE2	12R	D	2.5%	1.3%	2.2%	2.4%	0.9%	2.1%
DFC12RE3	12R	D	0.5%	1.9%	0.8%	0.5%	1.7%	0.8%
DFC12RE4	12R	D	0.6%	0.4%	0.6%	0.6%	0.2%	0.6%
DFC12RH	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A17AA0	17A	A	91.2%	0.0%	91.2%	92.1%	0.0%	92.1%
A17AA1	17A	A	0.7%	0.0%	0.7%	0.7%	0.0%	0.7%
A17AA2	17A	A	6.7%	0.0%	6.7%	6.2%	0.0%	6.2%
A17AA4	17A	A	0.8%	0.0%	0.8%	0.5%	0.0%	0.5%
A17AA6	17A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A17AA8	17A	A	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
A17AFR	17A	A	0.2%	0.0%	0.2%	0.1%	0.0%	0.1%
A	17A	D	0.1%	0.3%	0.1%	0.1%	0.2%	0.1%
AA	17A	D	0.2%	0.0%	0.1%	0.2%	0.1%	0.2%
B	17A	D	1.0%	0.0%	0.9%	0.9%	0.0%	0.9%
BB	17A	D	0.7%	0.1%	0.7%	0.8%	0.1%	0.8%
C	17A	D	2.5%	0.0%	2.4%	2.8%	0.0%	2.6%
CC	17A	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D	17A	D	6.6%	4.4%	6.5%	6.4%	3.9%	6.3%
DD	17A	D	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
E	17A	D	4.7%	0.0%	4.4%	4.9%	0.0%	4.6%
EE	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
F	17A	D	5.7%	1.8%	5.5%	5.2%	1.8%	5.0%
FF	17A	D	0.0%	3.7%	0.2%	0.0%	0.5%	0.0%
G	17A	D	3.1%	0.9%	3.0%	3.4%	0.8%	3.3%
GG	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
H	17A	D	3.3%	1.7%	3.2%	3.6%	1.5%	3.5%
HH	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
HSTIN	17A	D	14.5%	7.0%	14.1%	14.5%	9.0%	14.2%
I	17A	D	3.2%	0.1%	3.0%	3.0%	0.1%	2.8%
II	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
J	17A	D	4.0%	2.8%	3.9%	4.3%	2.6%	4.2%
JJ	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
K	17A	D	6.7%	2.0%	6.4%	6.1%	1.8%	5.8%
KK	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
L	17A	D	3.2%	0.8%	3.1%	3.2%	0.7%	3.1%
LL	17A	D	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
M	17A	D	2.9%	0.9%	2.8%	2.6%	0.7%	2.5%
MAC17A	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAC17B	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAC17C	17A	D	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%
MAC17D	17A	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
MM	17A	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
N	17A	D	2.8%	0.2%	2.7%	2.7%	0.2%	2.6%
NN	17A	D	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
O	17A	D	3.3%	10.1%	3.6%	3.3%	12.1%	3.8%
OO	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
P	17A	D	3.5%	24.9%	4.6%	3.7%	21.2%	4.6%
Q	17A	D	1.3%	18.2%	2.2%	1.3%	16.2%	2.1%
R	17A	D	0.6%	8.0%	1.0%	0.6%	7.2%	1.0%
SLAYR	17A	D	21.4%	4.6%	20.5%	21.4%	12.5%	20.9%
T	17A	D	0.6%	1.0%	0.7%	0.6%	0.8%	0.6%
U	17A	D	0.5%	0.2%	0.5%	0.5%	0.3%	0.5%
V	17A	D	0.8%	0.1%	0.8%	0.8%	0.2%	0.8%
W	17A	D	0.3%	0.2%	0.3%	0.3%	0.1%	0.3%
X	17A	D	0.3%	2.5%	0.4%	0.4%	2.2%	0.5%
Y	17A	D	0.7%	2.7%	0.8%	0.6%	2.3%	0.7%
Z	17A	D	0.7%	0.2%	0.6%	1.0%	0.2%	1.0%
A22XA0	22X	A	54.8%	73.3%	56.2%	55.2%	74.8%	56.5%
A22XA1	22X	A	0.5%	0.2%	0.5%	0.5%	0.1%	0.5%
A22XA2	22X	A	43.6%	26.5%	42.4%	43.4%	25.0%	42.1%
A22XA4	22X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A22XA5	22X	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A22XA6	22X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.2%
A22XA8	22X	A	0.4%	0.0%	0.3%	0.3%	0.0%	0.2%
A22XBR	22X	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A22XDL	22X	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D22XA1	22X	D	6.0%	4.5%	5.9%	5.4%	7.1%	5.5%
D22XA2	22X	D	3.3%	10.0%	3.7%	3.0%	7.2%	3.3%
D22XA3	22X	D	10.9%	14.9%	11.1%	11.3%	16.9%	11.7%
D22XA4	22X	D	6.3%	7.1%	6.4%	6.2%	7.9%	6.3%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
D22XB1	22X	D	0.7%	0.0%	0.6%	0.7%	0.0%	0.7%
D22XB2	22X	D	1.1%	0.0%	1.0%	0.9%	0.0%	0.8%
D22XC	22X	D	3.3%	0.9%	3.1%	3.1%	0.9%	3.0%
D22XC1	22X	D	1.4%	1.5%	1.4%	1.2%	1.4%	1.2%
D22XD	22X	D	1.0%	5.1%	1.2%	1.0%	4.6%	1.3%
D22XD1	22X	D	0.3%	1.4%	0.3%	0.1%	1.3%	0.2%
D22XD2	22X	D	1.7%	5.5%	2.0%	1.9%	4.3%	2.0%
D22XD3	22X	D	2.4%	0.0%	2.2%	3.0%	0.0%	2.8%
D22XD4	22X	D	3.5%	2.0%	3.4%	3.0%	1.9%	2.9%
D22XE1	22X	D	3.2%	0.6%	3.0%	3.1%	0.6%	2.9%
D22XF	22X	D	2.7%	5.3%	2.9%	3.1%	5.4%	3.2%
D22XF1	22X	D	2.9%	1.1%	2.8%	2.9%	1.0%	2.7%
DF22XA2	22X	D	21.7%	6.6%	20.7%	19.7%	6.4%	18.8%
DF22XC1	22X	D	5.7%	2.5%	5.5%	6.6%	2.8%	6.3%
DF22XD1	22X	D	0.4%	0.3%	0.4%	3.8%	0.3%	3.6%
DF22XD2	22X	D	1.6%	0.3%	1.5%	1.8%	0.3%	1.7%
DF22XE1	22X	D	1.2%	4.8%	1.4%	1.1%	4.3%	1.3%
DF22XF1	22X	D	10.4%	13.7%	10.6%	9.5%	14.3%	9.8%
DF22XG	22X	D	2.6%	7.5%	2.9%	2.3%	7.1%	2.6%
DFC22XA	22X	D	5.1%	3.5%	5.0%	5.0%	3.1%	4.8%
DFC22XB	22X	D	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
DFC22XE	22X	D	0.3%	0.9%	0.3%	0.2%	0.8%	0.3%
A30LA0	30L	A	56.0%	44.9%	54.5%	55.5%	43.5%	54.0%
A30LA1	30L	A	0.8%	0.5%	0.8%	0.7%	0.3%	0.7%
A30LA2	30L	A	18.5%	17.1%	18.3%	19.0%	16.8%	18.7%
A30LA3	30L	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A30LA4	30L	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A30LA5	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LA6	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LA7	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LA8	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LBL	30L	A	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
A30LBR	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LCL	30L	A	0.1%	0.9%	0.2%	0.1%	0.7%	0.1%
A30LCR	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LDL	30L	A	0.1%	0.6%	0.2%	0.1%	0.5%	0.1%
A30LDR	30L	A	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
A30LEL	30L	A	0.2%	0.3%	0.2%	0.2%	0.3%	0.2%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A30LER	30L	A	0.2%	0.1%	0.2%	0.1%	0.1%	0.1%
A30LFL	30L	A	0.3%	0.6%	0.4%	0.3%	0.9%	0.4%
A30LFR	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LGL	30L	A	0.7%	1.6%	0.8%	0.7%	2.3%	0.9%
A30LGR	30L	A	0.3%	0.1%	0.3%	0.3%	0.1%	0.3%
A30LHL	30L	A	0.8%	3.1%	1.1%	0.9%	3.7%	1.2%
A30LHR	30L	A	0.4%	0.2%	0.4%	0.4%	0.2%	0.4%
A30LIL	30L	A	1.3%	3.7%	1.7%	1.6%	4.0%	1.9%
A30LIR	30L	A	0.5%	0.3%	0.5%	0.5%	0.3%	0.5%
A30LJL	30L	A	1.6%	4.1%	1.9%	1.6%	5.3%	2.1%
A30LJR	30L	A	0.6%	0.6%	0.6%	0.5%	0.4%	0.5%
A30LKL	30L	A	1.4%	2.8%	1.6%	1.5%	3.1%	1.7%
A30LKR	30L	A	0.6%	0.5%	0.6%	0.7%	0.5%	0.7%
A30LLL	30L	A	2.2%	3.8%	2.4%	2.4%	4.0%	2.6%
A30LLR	30L	A	1.2%	0.8%	1.2%	1.2%	0.8%	1.2%
A30LML	30L	A	8.4%	9.5%	8.5%	8.2%	9.4%	8.4%
A30LMR	30L	A	2.1%	2.8%	2.2%	2.0%	2.1%	2.0%
A30LNL	30L	A	0.4%	0.2%	0.3%	0.3%	0.3%	0.3%
A30LOR	30L	A	0.5%	0.2%	0.4%	0.4%	0.2%	0.4%
D30LA1	30L	D	0.5%	2.0%	0.6%	0.5%	4.4%	0.7%
D30LA2	30L	D	1.2%	6.6%	1.6%	1.2%	5.9%	1.5%
D30LB1	30L	D	12.1%	6.7%	11.8%	12.5%	8.0%	12.2%
D30LB3	30L	D	2.3%	5.1%	2.5%	2.2%	5.4%	2.4%
D30LB4	30L	D	3.4%	0.8%	3.2%	3.4%	1.0%	3.3%
D30LC1	30L	D	0.9%	0.3%	0.9%	0.9%	0.4%	0.9%
D30LC2	30L	D	1.4%	0.2%	1.3%	1.3%	0.5%	1.2%
D30LC3	30L	D	1.0%	3.8%	1.2%	1.0%	3.3%	1.1%
D30LC4	30L	D	0.8%	0.4%	0.8%	0.7%	0.6%	0.7%
D30LD	30L	D	1.7%	1.0%	1.7%	1.2%	1.0%	1.2%
D30LD1	30L	D	1.2%	2.5%	1.3%	1.0%	1.6%	1.0%
D30LD2	30L	D	0.5%	0.4%	0.5%	0.4%	0.4%	0.4%
D30LD3	30L	D	0.3%	1.1%	0.3%	0.2%	1.0%	0.3%
D30LD4	30L	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
D30LE	30L	D	0.3%	0.5%	0.3%	0.3%	0.4%	0.3%
D30LE1	30L	D	0.6%	0.0%	0.6%	0.7%	0.0%	0.6%
D30LE2	30L	D	0.1%	0.3%	0.1%	0.1%	0.2%	0.1%
D30LF1	30L	D	0.2%	0.4%	0.2%	0.2%	0.5%	0.2%
D30LF2	30L	D	0.8%	2.6%	0.9%	0.9%	2.1%	0.9%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
D30LG	30L	D	1.1%	6.1%	1.4%	1.3%	4.8%	1.5%
D30LG1	30L	D	1.9%	7.6%	2.3%	1.9%	6.9%	2.2%
D30LG2	30L	D	0.6%	0.6%	0.6%	0.6%	0.5%	0.6%
DF30LA1	30L	D	0.2%	0.7%	0.2%	0.2%	0.7%	0.2%
DF30LA2	30L	D	0.2%	1.2%	0.3%	0.2%	1.6%	0.3%
DF30LB2	30L	D	24.6%	15.9%	24.1%	24.8%	15.1%	24.2%
DF30LB4	30L	D	6.7%	6.0%	6.7%	6.4%	5.6%	6.3%
DF30LC1	30L	D	0.9%	0.8%	0.9%	0.8%	1.2%	0.9%
DF30LC2	30L	D	0.3%	0.3%	0.3%	0.2%	0.1%	0.2%
DF30LD1	30L	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
DF30LD2	30L	D	0.2%	0.4%	0.2%	0.1%	0.4%	0.1%
DF30LE1	30L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF30LE2	30L	D	0.6%	0.5%	0.6%	0.5%	0.9%	0.5%
DF30LF1	30L	D	0.5%	1.2%	0.5%	0.4%	0.9%	0.4%
DF30LF2	30L	D	0.3%	0.4%	0.3%	0.3%	0.4%	0.3%
DF30LG	30L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF30LG1	30L	D	0.7%	2.0%	0.8%	0.9%	2.2%	1.0%
DF30LG2	30L	D	0.2%	0.6%	0.2%	0.2%	0.4%	0.2%
DF30LH	30L	D	1.3%	1.1%	1.3%	1.2%	1.0%	1.2%
DFC30LA	30L	D	0.2%	0.9%	0.2%	0.2%	1.1%	0.2%
DFC30LB	30L	D	26.4%	15.6%	25.8%	27.4%	16.2%	26.7%
DFC30LC	30L	D	2.4%	1.5%	2.3%	2.1%	1.5%	2.1%
DFC30LF	30L	D	0.9%	1.0%	0.9%	1.2%	0.8%	1.2%
DFC30LG	30L	D	0.2%	0.6%	0.2%	0.2%	0.5%	0.2%
A30RA0	30R	A	20.4%	18.6%	20.3%	20.4%	17.6%	20.2%
A30RA1	30R	A	0.2%	0.2%	0.2%	0.2%	0.0%	0.1%
A30RA2	30R	A	39.6%	38.0%	39.5%	40.5%	36.4%	40.2%
A30RA3	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA4	30R	A	0.5%	0.1%	0.5%	0.5%	0.1%	0.5%
A30RA5	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA6	30R	A	0.2%	0.0%	0.2%	0.2%	0.1%	0.2%
A30RA7	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA8	30R	A	0.3%	0.0%	0.2%	0.3%	0.0%	0.3%
A30RBL	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RBR	30R	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A30RCL	30R	A	0.0%	0.1%	0.0%	0.0%	0.3%	0.0%
A30RCR	30R	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30RDL	30R	A	0.0%	0.4%	0.0%	0.0%	0.4%	0.1%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
A30RDR	30R	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A30REL	30R	A	0.1%	0.3%	0.1%	0.1%	0.4%	0.1%
A30RER	30R	A	0.8%	0.4%	0.8%	0.7%	0.4%	0.7%
A30RFL	30R	A	0.1%	0.6%	0.1%	0.1%	0.6%	0.1%
A30RFR	30R	A	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%
A30RGL	30R	A	0.1%	1.4%	0.2%	0.1%	1.4%	0.2%
A30RGR	30R	A	1.0%	0.5%	0.9%	1.0%	0.5%	0.9%
A30RHL	30R	A	0.2%	2.4%	0.3%	0.2%	3.9%	0.5%
A30RHR	30R	A	1.2%	1.0%	1.2%	1.1%	1.1%	1.1%
A30RIL	30R	A	0.3%	2.5%	0.4%	0.3%	2.5%	0.4%
A30RIR	30R	A	2.3%	2.1%	2.3%	2.2%	2.5%	2.3%
A30RJL	30R	A	0.4%	2.9%	0.6%	0.4%	4.7%	0.7%
A30RJR	30R	A	3.7%	2.0%	3.6%	3.7%	1.6%	3.5%
A30RKL	30R	A	0.3%	2.4%	0.5%	0.4%	3.5%	0.6%
A30RKR	30R	A	3.4%	2.6%	3.4%	3.2%	2.3%	3.2%
A30RLL	30R	A	0.5%	2.5%	0.6%	0.6%	3.2%	0.8%
A30RLR	30R	A	6.6%	3.8%	6.4%	6.4%	2.8%	6.1%
A30RML	30R	A	5.6%	6.6%	5.6%	5.6%	7.4%	5.7%
A30RMR	30R	A	8.7%	6.7%	8.5%	8.3%	4.3%	8.0%
A30ROL	30R	A	2.6%	1.4%	2.6%	2.5%	1.0%	2.4%
D30R340-0	30R	D	0.7%	2.1%	0.8%	0.7%	3.0%	0.9%
D30R340-1	30R	D	0.5%	1.3%	0.5%	0.5%	1.9%	0.5%
D30R340-2	30R	D	0.5%	1.3%	0.5%	0.5%	1.9%	0.5%
D30R340-3	30R	D	0.1%	0.3%	0.1%	0.1%	0.5%	0.1%
D30R340-4	30R	D	0.1%	0.3%	0.1%	0.1%	0.5%	0.1%
D30RA	30R	D	2.9%	1.4%	2.8%	3.0%	1.0%	2.9%
D30RA1	30R	D	0.4%	0.2%	0.4%	0.5%	0.2%	0.5%
D30RA2	30R	D	1.1%	0.5%	1.1%	1.2%	0.2%	1.2%
D30RA3	30R	D	0.1%	0.1%	0.1%	0.0%	0.1%	0.1%
D30RA4	30R	D	0.3%	1.5%	0.4%	0.4%	1.0%	0.4%
D30RB2	30R	D	2.2%	0.3%	2.1%	2.1%	0.3%	2.0%
D30RB3	30R	D	0.7%	0.2%	0.7%	0.7%	0.2%	0.7%
D30RC	30R	D	10.7%	3.7%	10.3%	10.7%	4.4%	10.4%
D30RC1	30R	D	2.2%	1.0%	2.2%	2.6%	1.1%	2.6%
D30RD	30R	D	0.6%	0.1%	0.6%	0.6%	0.1%	0.6%
D30RD1	30R	D	1.4%	0.2%	1.3%	1.4%	0.2%	1.3%
D30RD2	30R	D	3.4%	0.6%	3.3%	3.3%	0.5%	3.2%
D30RE1	30R	D	1.9%	1.9%	1.9%	1.8%	1.9%	1.8%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D30RE2	30R	D	3.4%	4.4%	3.4%	3.3%	4.4%	3.3%
D30RF	30R	D	8.3%	7.6%	8.3%	8.3%	7.3%	8.2%
D30RF1	30R	D	8.1%	7.0%	8.0%	8.2%	6.8%	8.1%
D30RF2	30R	D	4.1%	4.7%	4.2%	4.2%	4.5%	4.2%
D30RF3	30R	D	5.9%	7.2%	5.9%	5.8%	7.1%	5.9%
D30RF4	30R	D	0.6%	2.2%	0.7%	0.6%	2.2%	0.7%
DF30RA	30R	D	0.8%	0.3%	0.8%	0.9%	0.2%	0.9%
DF30RA1	30R	D	0.7%	1.4%	0.7%	0.7%	1.0%	0.7%
DF30RA2	30R	D	0.1%	0.4%	0.1%	0.1%	0.4%	0.1%
DF30RA3	30R	D	0.4%	2.2%	0.5%	0.4%	1.8%	0.4%
DF30RA4	30R	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
DF30RB	30R	D	0.7%	2.6%	0.8%	0.7%	2.3%	0.8%
DF30RB1	30R	D	0.7%	0.2%	0.6%	0.8%	0.1%	0.8%
DF30RB4	30R	D	3.8%	1.3%	3.6%	3.6%	1.6%	3.5%
DF30RC2	30R	D	13.6%	20.5%	14.0%	13.2%	21.1%	13.7%
DF30RD1	30R	D	0.7%	0.1%	0.7%	0.7%	0.1%	0.7%
DF30RD2	30R	D	2.0%	0.2%	1.9%	1.9%	0.2%	1.8%
DF30RF	30R	D	2.8%	2.1%	2.8%	2.9%	2.0%	2.9%
DF30RF1	30R	D	5.3%	4.1%	5.3%	5.3%	4.0%	5.2%
DF30RF2	30R	D	0.7%	1.5%	0.7%	0.7%	1.4%	0.7%
DF30RF3	30R	D	4.1%	4.9%	4.1%	3.8%	4.8%	3.9%
DF30RF4	30R	D	0.3%	3.5%	0.5%	0.4%	3.4%	0.5%
DFC30RC	30R	D	0.5%	0.5%	0.5%	0.5%	0.6%	0.5%
DFC30RE	30R	D	1.7%	1.9%	1.7%	1.7%	1.9%	1.7%
DFC30RF	30R	D	0.8%	1.8%	0.8%	0.8%	1.7%	0.8%
A35AA0	35A	A	73.3%	0.0%	73.3%	74.1%	0.0%	74.1%
A35AA1	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AA2	35A	A	23.1%	0.0%	23.1%	22.2%	0.0%	22.2%
A35AA3	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA4	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AA5	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA6	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA7	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA8	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ABL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35ABR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ACL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ACR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table G.4.10

2020 & 2025 No Action Alternative Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
A35ADL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ADR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AEL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AER	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AFL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AFR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AGL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AGR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AHL	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AHR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AIL	35A	A	0.5%	0.0%	0.5%	0.6%	0.0%	0.6%
A35AIR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AJL	35A	A	1.6%	0.0%	1.6%	1.7%	0.0%	1.7%
A35AJR	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
MACD35C	35A	D	3.4%	0.0%	3.2%	3.8%	0.0%	3.6%
MACD35E	35A	D	0.0%	22.4%	0.9%	0.0%	19.3%	0.8%
MACD35F	35A	D	12.4%	24.5%	12.9%	14.0%	22.3%	14.4%
MACD35G	35A	D	9.3%	0.0%	8.9%	8.7%	0.0%	8.3%
MACD35H	35A	D	19.4%	0.0%	18.6%	18.1%	0.0%	17.3%
MACD35I	35A	D	2.5%	0.0%	2.4%	2.7%	0.0%	2.6%
MACD35J	35A	D	3.3%	0.0%	3.1%	2.6%	0.0%	2.5%
MACD35K	35A	D	5.5%	0.0%	5.3%	5.1%	0.0%	4.8%
MACD35L	35A	D	1.9%	0.0%	1.8%	1.7%	0.0%	1.7%
MACD35M	35A	D	19.3%	21.0%	19.4%	20.4%	31.5%	20.9%
MACD35N	35A	D	5.3%	0.0%	5.1%	4.8%	0.0%	4.6%
MACD35O	35A	D	1.7%	0.0%	1.6%	1.5%	0.0%	1.5%
MACD35P	35A	D	9.4%	26.8%	10.1%	8.4%	26.6%	9.2%
MACD35Q	35A	D	2.7%	0.0%	2.6%	4.5%	0.0%	4.3%
MACD35S	35A	D	1.7%	0.0%	1.6%	1.5%	0.0%	1.5%
MACD35T	35A	D	2.3%	5.4%	2.4%	1.9%	0.4%	1.9%

Source: MAC analysis, 2012.

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A04XA0	04X	A	83.8%	95.4%	84.6%	78.6%	89.8%	79.3%
A04XA1	04X	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
A04XA2	04X	A	14.1%	4.6%	13.4%	13.2%	4.3%	12.6%
A04XA7	04X	A	0.5%	0.0%	0.5%	0.5%	0.0%	0.5%
A04XDL	04X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A04XEL	04X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.2%
A04XFR	04X	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
D04XF	04X	D	3.7%	0.0%	3.5%	3.5%	0.0%	3.3%
D04XF1	04X	D	9.1%	1.0%	8.6%	8.4%	1.0%	8.0%
D04XF2	04X	D	0.5%	0.0%	0.5%	0.5%	0.0%	0.5%
MAC04A	04X	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
MAC04B	04X	D	0.9%	0.0%	0.9%	0.9%	0.0%	0.8%
MAC04C	04X	D	5.1%	28.8%	6.5%	4.7%	28.3%	6.0%
MAC04D	04X	D	5.6%	0.9%	5.4%	5.2%	0.9%	5.0%
MAC04E	04X	D	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
MAC04F	04X	D	3.2%	1.3%	3.0%	2.9%	1.3%	2.8%
MAC04G	04X	D	14.4%	0.0%	13.5%	13.3%	0.0%	12.6%
MAC04H	04X	D	12.1%	13.4%	12.2%	11.2%	13.1%	11.3%
MAC04I	04X	D	4.2%	4.3%	4.2%	3.9%	4.2%	3.9%
MAC04J	04X	D	1.0%	0.0%	0.9%	0.9%	0.0%	0.9%
MAC04K	04X	D	11.7%	3.1%	11.2%	10.8%	3.1%	10.4%
MAC04L	04X	D	11.0%	13.8%	11.2%	10.2%	13.6%	10.4%
MAC04M	04X	D	0.2%	0.0%	0.2%	0.2%	0.0%	0.1%
MAC04N	04X	D	11.9%	17.1%	12.3%	11.1%	16.8%	11.4%
MAC04O	04X	D	1.5%	16.2%	2.3%	1.4%	15.9%	2.2%
MAC04P	04X	D	0.6%	0.0%	0.6%	0.6%	0.0%	0.5%
MAC04Q	04X	D	2.7%	0.0%	2.5%	2.5%	0.0%	2.4%
A12LA0	12L	A	44.9%	40.6%	44.8%	41.5%	36.6%	41.3%
A12LA1	12L	A	1.9%	1.0%	1.9%	1.8%	0.9%	1.7%
A12LA2	12L	A	28.8%	31.9%	28.9%	26.6%	28.8%	26.7%
A12LA3	12L	A	1.2%	0.5%	1.2%	1.1%	0.4%	1.1%
A12LA4	12L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%
A12LA5	12L	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A12LA6	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LA7	12L	A	0.4%	0.1%	0.3%	0.3%	0.1%	0.3%
A12LA8	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LBL	12L	A	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
A12LBR	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A12LCL	12L	A	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
A12LCR	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LDL	12L	A	0.3%	0.9%	0.3%	0.2%	0.8%	0.3%
A12LDR	12L	A	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%
A12LEL	12L	A	1.0%	0.6%	0.9%	0.9%	0.5%	0.9%
A12LER	12L	A	0.3%	0.2%	0.3%	0.3%	0.2%	0.3%
A12LFL	12L	A	1.4%	1.4%	1.4%	1.3%	1.2%	1.3%
A12LFR	12L	A	0.0%	0.6%	0.1%	0.0%	0.5%	0.1%
A12LGL	12L	A	2.3%	2.1%	2.3%	2.2%	1.9%	2.2%
A12LGR	12L	A	0.1%	0.7%	0.1%	0.1%	0.6%	0.1%
A12LHL	12L	A	2.8%	1.9%	2.7%	2.5%	1.7%	2.5%
A12LHR	12L	A	0.2%	1.5%	0.3%	0.2%	1.3%	0.3%
A12LIL	12L	A	4.0%	2.4%	3.9%	3.7%	2.2%	3.6%
A12LIR	12L	A	0.2%	1.1%	0.2%	0.2%	1.0%	0.2%
A12LJL	12L	A	3.9%	3.1%	3.9%	3.6%	2.8%	3.6%
A12LJR	12L	A	0.2%	1.4%	0.3%	0.2%	1.2%	0.2%
A12LKL	12L	A	5.3%	4.4%	5.2%	4.9%	4.0%	4.8%
A12LKR	12L	A	0.5%	2.8%	0.6%	0.5%	2.5%	0.5%
D12LA1	12L	D	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%
D12LA2	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
D12LA3	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
D12LA4	12L	D	0.3%	1.1%	0.4%	0.3%	0.8%	0.3%
D12LB1	12L	D	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%
D12LB2	12L	D	5.2%	5.5%	5.3%	4.7%	3.9%	4.6%
D12LC1	12L	D	0.9%	0.3%	0.8%	0.8%	0.2%	0.7%
D12LC2	12L	D	3.1%	1.1%	2.9%	2.8%	0.8%	2.6%
D12LD	12L	D	7.0%	4.9%	6.8%	6.3%	3.5%	6.0%
D12LD1	12L	D	1.3%	1.2%	1.3%	1.2%	0.9%	1.2%
D12LD2	12L	D	0.8%	0.3%	0.7%	0.7%	0.2%	0.7%
D12LD3	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
D12LD4	12L	D	0.7%	0.5%	0.7%	0.6%	0.4%	0.6%
D12LE	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12LE1	12L	D	0.3%	0.1%	0.3%	0.3%	0.0%	0.3%
D12LE2	12L	D	7.2%	2.7%	6.8%	6.5%	1.9%	6.1%
D12LE4	12L	D	7.8%	3.8%	7.5%	7.0%	2.7%	6.6%
D12LF1	12L	D	4.2%	3.5%	4.1%	3.8%	2.5%	3.7%
D12LF2	12L	D	0.9%	0.7%	0.9%	0.8%	0.5%	0.8%
D12LF3	12L	D	0.9%	1.2%	0.9%	0.8%	0.9%	0.8%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D12LF4	12L	D	0.4%	0.2%	0.3%	0.3%	0.2%	0.3%
D12LG1	12L	D	3.3%	9.4%	3.8%	2.9%	6.8%	3.3%
D12LG2	12L	D	1.4%	1.8%	1.4%	1.3%	1.3%	1.3%
D12LG3	12L	D	3.3%	7.0%	3.6%	3.0%	5.0%	3.2%
D12LG4	12L	D	0.5%	0.6%	0.5%	0.5%	0.5%	0.5%
D12LH1	12L	D	0.1%	0.6%	0.2%	0.1%	0.4%	0.2%
D12LH2	12L	D	0.2%	0.2%	0.2%	0.2%	0.1%	0.2%
D12LI	12L	D	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
D12LI1	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12LI2	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12LK1	12L	D	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%
D12LK2	12L	D	2.8%	2.1%	2.7%	2.5%	1.5%	2.4%
D12LL	12L	D	0.2%	0.2%	0.2%	0.1%	0.2%	0.1%
D12LL1	12L	D	0.3%	0.6%	0.4%	0.3%	0.4%	0.3%
D12LL2	12L	D	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
D12LL3	12L	D	0.3%	0.9%	0.4%	0.3%	0.6%	0.3%
D12LL4	12L	D	0.4%	0.1%	0.4%	0.4%	0.1%	0.4%
DF12LA	12L	D	0.0%	0.3%	0.0%	0.0%	0.2%	0.0%
DF12LA1	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
DF12LA2	12L	D	0.2%	0.9%	0.3%	0.2%	0.6%	0.2%
DF12LB	12L	D	1.9%	2.8%	1.9%	1.7%	2.0%	1.7%
DF12LC1	12L	D	2.9%	1.8%	2.8%	2.6%	1.3%	2.5%
DF12LC2	12L	D	6.2%	3.3%	6.0%	5.6%	2.4%	5.3%
DF12LC3	12L	D	2.2%	1.8%	2.2%	2.0%	1.3%	1.9%
DF12LC4	12L	D	3.2%	1.3%	3.1%	2.9%	1.0%	2.7%
DF12LD1	12L	D	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
DF12LD2	12L	D	1.9%	1.7%	1.9%	1.7%	1.3%	1.7%
DF12LE1	12L	D	0.1%	0.1%	0.1%	0.1%	0.0%	0.1%
DF12LF1	12L	D	2.2%	1.0%	2.1%	2.0%	0.7%	1.8%
DF12LF2	12L	D	0.9%	0.6%	0.9%	0.8%	0.5%	0.8%
DF12LG	12L	D	2.5%	5.0%	2.7%	2.2%	3.6%	2.4%
DF12LG1	12L	D	0.9%	4.5%	1.2%	0.8%	3.3%	1.1%
DF12LG2	12L	D	0.5%	0.4%	0.4%	0.4%	0.3%	0.4%
DF12LH1	12L	D	0.2%	2.0%	0.3%	0.2%	1.4%	0.3%
DF12LH2	12L	D	0.4%	0.8%	0.5%	0.4%	0.6%	0.4%
DF12LI1	12L	D	0.4%	0.6%	0.4%	0.4%	0.4%	0.4%
DF12LI2	12L	D	0.4%	0.7%	0.4%	0.3%	0.5%	0.4%
DF12LJ	12L	D	0.9%	1.1%	0.9%	0.8%	0.8%	0.8%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
DF12LJ1	12L	D	0.3%	1.0%	0.4%	0.3%	0.7%	0.3%
DF12LJ2	12L	D	7.4%	5.8%	7.3%	6.7%	4.2%	6.4%
DF12LK1	12L	D	0.2%	0.6%	0.3%	0.2%	0.4%	0.2%
DF12LK2	12L	D	0.7%	1.9%	0.8%	0.6%	1.3%	0.7%
DF12LK3	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12LK4	12L	D	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%
DF12LL1	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
DF12LL2	12L	D	0.6%	1.8%	0.7%	0.6%	1.3%	0.6%
DFC12LC	12L	D	5.2%	2.0%	4.9%	4.7%	1.4%	4.3%
DFC12LF	12L	D	0.8%	0.5%	0.8%	0.7%	0.3%	0.7%
DFC12LH	12L	D	1.1%	2.2%	1.2%	1.0%	1.6%	1.0%
DFC12LK	12L	D	0.4%	0.8%	0.4%	0.3%	0.6%	0.3%
A12RA0	12R	A	37.7%	32.8%	37.2%	34.5%	31.7%	34.2%
A12RA1	12R	A	0.4%	0.4%	0.4%	0.4%	0.3%	0.4%
A12RA2	12R	A	49.1%	34.5%	47.6%	44.9%	33.4%	43.8%
A12RA3	12R	A	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%
A12RA4	12R	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
A12RA5	12R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12RA6	12R	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A12RA7	12R	A	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
A12RA8	12R	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A12RBL	12R	A	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
A12RBR	12R	A	0.0%	0.5%	0.1%	0.0%	0.5%	0.1%
A12RCL	12R	A	0.0%	0.3%	0.1%	0.0%	0.3%	0.1%
A12RCR	12R	A	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
A12RDL	12R	A	0.0%	0.4%	0.1%	0.0%	0.4%	0.1%
A12RDR	12R	A	0.0%	0.7%	0.1%	0.0%	0.7%	0.1%
A12REL	12R	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A12RER	12R	A	0.1%	0.4%	0.2%	0.1%	0.4%	0.2%
A12RFL	12R	A	0.1%	2.8%	0.4%	0.1%	2.7%	0.3%
A12RFR	12R	A	0.2%	1.1%	0.3%	0.2%	1.0%	0.3%
A12RGL	12R	A	0.2%	0.5%	0.2%	0.2%	0.5%	0.2%
A12RGR	12R	A	0.4%	1.3%	0.5%	0.3%	1.2%	0.4%
A12RHL	12R	A	0.3%	0.7%	0.3%	0.2%	0.7%	0.3%
A12RHR	12R	A	0.8%	2.3%	0.9%	0.7%	2.2%	0.9%
A12RIL	12R	A	0.4%	0.8%	0.4%	0.3%	0.8%	0.4%
A12RIR	12R	A	1.3%	1.8%	1.4%	1.2%	1.8%	1.2%
A12RJL	12R	A	0.5%	1.3%	0.6%	0.4%	1.2%	0.5%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A12RJR	12R	A	1.9%	2.7%	1.9%	1.7%	2.6%	1.8%
A12RKL	12R	A	0.8%	1.5%	0.8%	0.7%	1.4%	0.8%
A12RKR	12R	A	4.8%	12.0%	5.5%	4.4%	11.7%	5.1%
12RAB	12R	D	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
12RAB1	12R	D	0.3%	0.3%	0.3%	0.4%	0.3%	0.3%
12RAB2	12R	D	2.9%	1.1%	2.5%	3.0%	1.1%	2.6%
D12RA1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RA2	12R	D	0.6%	0.1%	0.5%	0.6%	0.1%	0.5%
D12RB1	12R	D	2.1%	4.6%	2.6%	2.2%	4.7%	2.7%
D12RB2	12R	D	4.4%	8.2%	5.1%	4.5%	8.3%	5.2%
D12RB3	12R	D	0.8%	1.3%	0.9%	0.9%	1.3%	0.9%
D12RB4	12R	D	2.2%	2.3%	2.2%	2.3%	2.3%	2.3%
D12RC1	12R	D	4.6%	3.9%	4.5%	4.7%	3.9%	4.6%
D12RC2	12R	D	5.4%	2.6%	4.8%	5.5%	2.6%	4.9%
D12RC2D	12R	D	7.4%	11.3%	8.2%	7.6%	11.4%	8.3%
D12RC2D1	12R	D	3.2%	2.6%	3.1%	3.3%	2.6%	3.1%
D12RC2D2	12R	D	7.5%	2.9%	6.6%	7.7%	2.9%	6.7%
D12RC2D3	12R	D	4.3%	6.9%	4.8%	4.4%	7.0%	4.9%
D12RC2D4	12R	D	3.8%	1.7%	3.4%	3.9%	1.7%	3.5%
D12RC3	12R	D	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
D12RC4	12R	D	2.9%	1.0%	2.5%	3.0%	1.0%	2.6%
D12RD1	12R	D	2.3%	4.3%	2.7%	2.4%	4.4%	2.8%
D12RD2	12R	D	2.9%	2.7%	2.9%	3.0%	2.7%	3.0%
D12RD3	12R	D	0.2%	0.7%	0.3%	0.2%	0.7%	0.3%
D12RD4	12R	D	1.3%	0.4%	1.1%	1.3%	0.4%	1.1%
D12RF1	12R	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
D12RF2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RF3	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RF4	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RG	12R	D	0.2%	0.0%	0.1%	0.2%	0.0%	0.1%
D12RG1	12R	D	0.4%	0.0%	0.4%	0.5%	0.0%	0.4%
D12RG2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RG3	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RG4	12R	D	0.0%	0.2%	0.1%	0.0%	0.2%	0.1%
D12RH1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH2	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH3	12R	D	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
D12RH4	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D12RI1	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RI2	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RA1	12R	D	0.6%	0.2%	0.5%	0.6%	0.2%	0.6%
DF12RA2	12R	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
DF12RB1	12R	D	0.5%	1.7%	0.8%	0.5%	1.7%	0.8%
DF12RB2	12R	D	2.8%	4.0%	3.1%	2.9%	4.0%	3.1%
DF12RC	12R	D	6.4%	5.0%	6.1%	6.6%	5.0%	6.3%
DF12RC1	12R	D	1.6%	0.8%	1.4%	1.6%	0.8%	1.4%
DF12RC2	12R	D	2.3%	3.3%	2.5%	2.3%	3.3%	2.5%
DF12RD	12R	D	3.9%	3.1%	3.7%	4.0%	3.1%	3.8%
DF12RD1	12R	D	0.9%	0.3%	0.8%	1.0%	0.3%	0.8%
DF12RD2	12R	D	1.6%	3.0%	1.9%	1.6%	3.1%	1.9%
DF12RF	12R	D	0.3%	0.1%	0.3%	0.3%	0.1%	0.3%
DF12RF1	12R	D	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
DF12RF2	12R	D	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
DF12RG1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RG2	12R	D	1.2%	0.3%	1.0%	1.2%	0.3%	1.0%
DF12RH1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RH2	12R	D	0.1%	0.0%	0.0%	0.1%	0.0%	0.1%
DF12RI	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RI1	12R	D	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
DF12RI2	12R	D	0.5%	0.1%	0.5%	0.5%	0.1%	0.5%
DFC12RA	12R	D	0.5%	0.0%	0.4%	0.5%	0.0%	0.4%
DFC12RB	12R	D	3.7%	5.7%	4.1%	3.8%	5.7%	4.2%
DFC12RE	12R	D	4.5%	3.0%	4.2%	4.6%	3.0%	4.2%
DFC12RE1	12R	D	1.5%	4.0%	2.0%	1.5%	4.0%	2.0%
DFC12RE2	12R	D	2.5%	1.3%	2.2%	2.5%	1.3%	2.3%
DFC12RE3	12R	D	0.5%	1.8%	0.8%	0.5%	1.8%	0.8%
DFC12RE4	12R	D	0.6%	0.4%	0.6%	0.6%	0.4%	0.6%
DFC12RH	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A17AA0	17A	A	91.2%	0.0%	91.2%	83.5%	0.0%	83.5%
A17AA1	17A	A	0.7%	0.0%	0.7%	0.7%	0.0%	0.7%
A17AA2	17A	A	6.7%	0.0%	6.7%	6.1%	0.0%	6.1%
A17AA4	17A	A	0.8%	0.0%	0.8%	0.7%	0.0%	0.7%
A17AA6	17A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A17AA8	17A	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A17AFR	17A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A	17A	D	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
AA	17A	D	0.2%	0.0%	0.1%	0.2%	0.1%	0.2%
B	17A	D	1.0%	0.0%	0.9%	0.9%	0.0%	0.9%
BB	17A	D	0.7%	0.1%	0.7%	0.8%	0.1%	0.8%
C	17A	D	2.5%	0.0%	2.4%	2.8%	0.0%	2.7%
CC	17A	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D	17A	D	6.6%	4.4%	6.5%	6.4%	3.8%	6.2%
DD	17A	D	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
E	17A	D	4.7%	0.0%	4.4%	4.8%	0.0%	4.6%
EE	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
F	17A	D	5.7%	1.8%	5.5%	5.3%	1.8%	5.1%
FF	17A	D	0.0%	3.7%	0.2%	0.0%	0.5%	0.0%
G	17A	D	3.1%	0.9%	3.0%	3.5%	0.8%	3.3%
GG	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
H	17A	D	3.3%	1.7%	3.2%	3.6%	1.4%	3.5%
HH	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
HSTIN	17A	D	14.5%	7.0%	14.1%	14.5%	9.1%	14.2%
I	17A	D	3.2%	0.1%	3.0%	3.0%	0.1%	2.8%
II	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
J	17A	D	4.0%	2.8%	3.9%	4.3%	2.5%	4.2%
JJ	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
K	17A	D	6.7%	2.0%	6.4%	6.1%	1.8%	5.8%
KK	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
L	17A	D	3.2%	0.8%	3.1%	3.2%	0.7%	3.1%
LL	17A	D	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
M	17A	D	2.9%	0.8%	2.8%	2.6%	1.5%	2.5%
MAC17A	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAC17B	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAC17C	17A	D	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%
MAC17D	17A	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
MM	17A	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
N	17A	D	2.8%	0.2%	2.7%	2.7%	1.0%	2.6%
NN	17A	D	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
O	17A	D	3.3%	10.1%	3.6%	3.3%	12.6%	3.8%
OO	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
P	17A	D	3.5%	24.9%	4.6%	3.7%	22.5%	4.6%
Q	17A	D	1.3%	18.2%	2.3%	1.3%	16.1%	2.1%
R	17A	D	0.6%	8.0%	1.0%	0.6%	7.4%	1.0%
SLAYR	17A	D	21.3%	4.6%	20.4%	21.4%	4.4%	20.5%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
T	17A	D	0.6%	1.0%	0.7%	0.6%	0.8%	0.6%
U	17A	D	0.5%	0.2%	0.5%	0.5%	0.3%	0.5%
V	17A	D	0.8%	0.1%	0.8%	0.8%	0.2%	0.8%
W	17A	D	0.3%	0.2%	0.3%	0.3%	0.3%	0.3%
X	17A	D	0.3%	2.5%	0.4%	0.4%	4.5%	0.6%
Y	17A	D	0.7%	2.7%	0.8%	0.6%	4.6%	0.8%
Z	17A	D	0.7%	0.2%	0.6%	1.0%	0.1%	1.0%
A22XA0	22X	A	54.8%	73.4%	56.1%	50.2%	67.8%	51.4%
A22XA1	22X	A	0.5%	0.2%	0.5%	0.5%	0.1%	0.5%
A22XA2	22X	A	43.6%	26.5%	42.4%	39.9%	24.5%	38.8%
A22XA4	22X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A22XA6	22X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.2%
A22XA8	22X	A	0.4%	0.0%	0.3%	0.3%	0.0%	0.3%
A22XBR	22X	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D22XA1	22X	D	6.0%	4.4%	5.9%	5.9%	4.7%	5.8%
D22XA2	22X	D	3.3%	10.7%	3.8%	3.2%	11.4%	3.7%
D22XA3	22X	D	10.9%	15.4%	11.2%	10.7%	16.5%	11.0%
D22XA4	22X	D	6.3%	6.9%	6.4%	6.2%	7.4%	6.3%
D22XB1	22X	D	0.7%	0.0%	0.6%	0.7%	0.0%	0.6%
D22XB2	22X	D	1.1%	0.0%	1.0%	1.0%	0.0%	1.0%
D22XC	22X	D	3.3%	0.9%	3.1%	3.2%	1.0%	3.1%
D22XC1	22X	D	1.4%	1.5%	1.4%	1.4%	1.6%	1.4%
D22XD	22X	D	1.0%	4.9%	1.3%	1.0%	5.3%	1.2%
D22XD1	22X	D	0.3%	1.3%	0.3%	0.3%	1.4%	0.3%
D22XD2	22X	D	1.7%	5.4%	2.0%	1.7%	5.8%	2.0%
D22XD3	22X	D	2.4%	0.0%	2.2%	2.4%	0.0%	2.2%
D22XD4	22X	D	3.5%	1.9%	3.4%	3.5%	2.0%	3.4%
D22XE1	22X	D	3.2%	0.6%	3.0%	3.1%	0.6%	3.0%
D22XF	22X	D	2.7%	6.1%	3.0%	2.7%	6.5%	2.9%
D22XF1	22X	D	2.9%	1.1%	2.8%	2.9%	1.2%	2.8%
DF22XA2	22X	D	21.7%	6.4%	20.7%	21.3%	6.8%	20.4%
DF22XC1	22X	D	5.7%	2.5%	5.5%	5.6%	2.6%	5.4%
DF22XD1	22X	D	0.4%	0.3%	0.4%	0.4%	0.3%	0.4%
DF22XD2	22X	D	1.6%	0.3%	1.5%	1.5%	0.3%	1.5%
DF22XE1	22X	D	1.2%	4.7%	1.4%	1.2%	5.0%	1.4%
DF22XF1	22X	D	10.4%	13.3%	10.6%	10.3%	14.2%	10.5%
DF22XG	22X	D	2.6%	7.2%	2.9%	2.5%	7.8%	2.8%
DFC22XA	22X	D	5.1%	3.4%	5.0%	5.0%	3.6%	4.9%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
DFC22XB	22X	D	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
DFC22XE	22X	D	0.3%	0.9%	0.3%	0.3%	1.0%	0.3%
A30LA0	30L	A	55.9%	44.9%	54.4%	49.8%	42.5%	48.9%
A30LA1	30L	A	0.8%	0.5%	0.8%	0.7%	0.5%	0.7%
A30LA2	30L	A	18.5%	17.1%	18.3%	16.5%	16.2%	16.5%
A30LA3	30L	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A30LA4	30L	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A30LA5	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LA6	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LA7	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LA8	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LBL	30L	A	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
A30LBR	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LCL	30L	A	0.1%	0.9%	0.2%	0.1%	0.8%	0.2%
A30LCR	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LDL	30L	A	0.1%	0.6%	0.2%	0.1%	0.6%	0.1%
A30LDR	30L	A	0.1%	0.1%	0.1%	0.0%	0.1%	0.0%
A30LEL	30L	A	0.2%	0.3%	0.2%	0.2%	0.3%	0.2%
A30LER	30L	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A30LFL	30L	A	0.3%	0.6%	0.4%	0.3%	0.6%	0.3%
A30LFR	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LGL	30L	A	0.7%	1.6%	0.8%	0.6%	1.5%	0.7%
A30LGR	30L	A	0.3%	0.1%	0.3%	0.3%	0.1%	0.3%
A30LHL	30L	A	0.8%	3.1%	1.2%	0.7%	3.0%	1.0%
A30LHR	30L	A	0.5%	0.2%	0.4%	0.4%	0.2%	0.4%
A30LIL	30L	A	1.3%	3.7%	1.7%	1.2%	3.5%	1.5%
A30LIR	30L	A	0.5%	0.3%	0.5%	0.5%	0.3%	0.4%
A30LJL	30L	A	1.6%	4.1%	1.9%	1.4%	3.9%	1.7%
A30LJR	30L	A	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%
A30LKL	30L	A	1.4%	2.8%	1.6%	1.3%	2.7%	1.4%
A30LKR	30L	A	0.6%	0.5%	0.6%	0.6%	0.5%	0.6%
A30LLL	30L	A	2.2%	3.8%	2.4%	2.0%	3.6%	2.2%
A30LLR	30L	A	1.2%	0.8%	1.2%	1.1%	0.7%	1.1%
A30LML	30L	A	8.4%	9.5%	8.5%	7.5%	9.0%	7.7%
A30LMR	30L	A	2.1%	2.8%	2.2%	1.9%	2.6%	2.0%
A30LNL	30L	A	0.4%	0.2%	0.3%	0.3%	0.2%	0.3%
A30LOR	30L	A	0.5%	0.2%	0.4%	0.4%	0.2%	0.4%
D30LA1	30L	D	0.5%	2.0%	0.6%	0.4%	1.7%	0.5%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
D30LA2	30L	D	1.2%	6.7%	1.6%	1.1%	5.8%	1.4%
D30LB1	30L	D	12.1%	6.2%	11.8%	10.9%	5.3%	10.6%
D30LB3	30L	D	2.3%	5.0%	2.5%	2.1%	4.3%	2.2%
D30LB4	30L	D	3.3%	0.8%	3.2%	3.0%	0.7%	2.9%
D30LC1	30L	D	1.0%	0.3%	0.9%	0.9%	0.2%	0.8%
D30LC2	30L	D	1.4%	0.2%	1.3%	1.3%	0.1%	1.2%
D30LC3	30L	D	1.0%	3.8%	1.2%	0.9%	3.3%	1.1%
D30LC4	30L	D	0.8%	0.4%	0.8%	0.7%	0.4%	0.7%
D30LD	30L	D	1.7%	1.0%	1.7%	1.6%	0.9%	1.5%
D30LD1	30L	D	1.2%	2.6%	1.3%	1.1%	2.2%	1.2%
D30LD2	30L	D	0.5%	0.4%	0.5%	0.5%	0.4%	0.4%
D30LD3	30L	D	0.3%	1.2%	0.3%	0.3%	1.0%	0.3%
D30LD4	30L	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
D30LE	30L	D	0.3%	0.5%	0.3%	0.3%	0.4%	0.3%
D30LE1	30L	D	0.6%	0.0%	0.6%	0.6%	0.0%	0.5%
D30LE2	30L	D	0.1%	0.3%	0.1%	0.1%	0.2%	0.1%
D30LF1	30L	D	0.2%	0.4%	0.2%	0.2%	0.3%	0.2%
D30LF2	30L	D	0.8%	2.7%	0.9%	0.7%	2.4%	0.8%
D30LG	30L	D	1.1%	6.4%	1.4%	1.0%	5.5%	1.3%
D30LG1	30L	D	1.9%	7.9%	2.3%	1.7%	6.8%	2.0%
D30LG2	30L	D	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%
DF30LA1	30L	D	0.2%	0.6%	0.2%	0.2%	0.5%	0.2%
DF30LA2	30L	D	0.2%	1.2%	0.3%	0.2%	1.0%	0.3%
DF30LB2	30L	D	24.6%	15.8%	24.1%	22.2%	13.6%	21.7%
DF30LB4	30L	D	6.7%	5.9%	6.7%	6.1%	5.1%	6.0%
DF30LC1	30L	D	0.9%	0.9%	0.9%	0.8%	0.8%	0.8%
DF30LC2	30L	D	0.3%	0.2%	0.3%	0.3%	0.2%	0.2%
DF30LD1	30L	D	0.1%	0.3%	0.1%	0.1%	0.2%	0.1%
DF30LD2	30L	D	0.2%	0.4%	0.2%	0.1%	0.3%	0.2%
DF30LE1	30L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF30LE2	30L	D	0.6%	0.5%	0.6%	0.5%	0.4%	0.5%
DF30LF1	30L	D	0.5%	1.2%	0.5%	0.4%	1.0%	0.4%
DF30LF2	30L	D	0.3%	0.4%	0.3%	0.3%	0.4%	0.3%
DF30LG	30L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF30LG1	30L	D	0.7%	2.1%	0.8%	0.7%	1.8%	0.7%
DF30LG2	30L	D	0.2%	0.6%	0.2%	0.2%	0.5%	0.2%
DF30LH	30L	D	1.3%	1.0%	1.3%	1.2%	0.9%	1.2%
DFC30LA	30L	D	0.2%	0.8%	0.2%	0.2%	0.7%	0.2%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
DFC30LB	30L	D	26.4%	15.2%	25.8%	23.9%	13.1%	23.2%
DFC30LC	30L	D	2.4%	1.5%	2.3%	2.1%	1.3%	2.1%
DFC30LF	30L	D	0.9%	1.0%	0.9%	0.8%	0.9%	0.8%
DFC30LG	30L	D	0.2%	0.7%	0.2%	0.2%	0.6%	0.2%
A30RA0	30R	A	20.4%	18.6%	20.2%	18.8%	17.9%	18.7%
A30RA1	30R	A	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
A30RA2	30R	A	39.7%	38.0%	39.6%	36.6%	36.4%	36.6%
A30RA3	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA4	30R	A	0.5%	0.1%	0.5%	0.5%	0.1%	0.5%
A30RA5	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA6	30R	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A30RA7	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA8	30R	A	0.3%	0.0%	0.2%	0.2%	0.0%	0.2%
A30RBL	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RBR	30R	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A30RCL	30R	A	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
A30RCR	30R	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30RDL	30R	A	0.0%	0.4%	0.0%	0.0%	0.3%	0.0%
A30RDR	30R	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A30REL	30R	A	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%
A30RER	30R	A	0.8%	0.4%	0.8%	0.7%	0.4%	0.7%
A30RFL	30R	A	0.1%	0.6%	0.1%	0.1%	0.6%	0.1%
A30RFR	30R	A	0.5%	0.4%	0.5%	0.5%	0.4%	0.5%
A30RGL	30R	A	0.1%	1.4%	0.2%	0.1%	1.3%	0.2%
A30RGR	30R	A	1.0%	0.5%	0.9%	0.9%	0.5%	0.9%
A30RHL	30R	A	0.2%	2.4%	0.3%	0.2%	2.3%	0.3%
A30RHR	30R	A	1.2%	1.0%	1.2%	1.1%	0.9%	1.1%
A30RIL	30R	A	0.3%	2.5%	0.4%	0.3%	2.3%	0.4%
A30RIR	30R	A	2.3%	2.1%	2.3%	2.1%	2.0%	2.1%
A30RJL	30R	A	0.4%	2.9%	0.6%	0.3%	2.8%	0.5%
A30RJR	30R	A	3.7%	2.0%	3.6%	3.4%	1.9%	3.3%
A30RKL	30R	A	0.3%	2.4%	0.5%	0.3%	2.3%	0.4%
A30RKR	30R	A	3.4%	2.6%	3.4%	3.2%	2.5%	3.1%
A30RLL	30R	A	0.5%	2.5%	0.6%	0.5%	2.4%	0.6%
A30RLR	30R	A	6.6%	3.8%	6.4%	6.0%	3.6%	5.9%
A30RML	30R	A	5.6%	6.6%	5.6%	5.1%	6.3%	5.2%
A30RMR	30R	A	8.6%	6.7%	8.5%	8.0%	6.4%	7.9%
A30ROL	30R	A	2.6%	1.4%	2.6%	2.4%	1.3%	2.4%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D30R340-0	30R	D	0.7%	2.0%	0.8%	0.8%	1.6%	0.7%
D30R340-1	30R	D	0.5%	1.3%	0.5%	0.5%	1.0%	0.5%
D30R340-2	30R	D	0.5%	1.3%	0.5%	0.5%	1.0%	0.5%
D30R340-3	30R	D	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%
D30R340-4	30R	D	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%
D30RA	30R	D	2.8%	1.3%	2.8%	3.0%	1.2%	2.8%
D30RA1	30R	D	0.4%	0.2%	0.4%	0.5%	0.3%	0.5%
D30RA2	30R	D	1.1%	0.4%	1.1%	1.2%	0.3%	1.1%
D30RA3	30R	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
D30RA4	30R	D	0.3%	1.4%	0.4%	0.4%	1.2%	0.3%
D30RB2	30R	D	2.2%	0.3%	2.1%	2.1%	0.3%	2.0%
D30RB3	30R	D	0.7%	0.4%	0.7%	0.7%	0.3%	0.7%
D30RC	30R	D	10.7%	3.4%	10.3%	10.8%	1.3%	10.3%
D30RC1	30R	D	2.2%	0.9%	2.2%	2.7%	0.4%	2.5%
D30RD	30R	D	0.6%	0.1%	0.6%	0.6%	0.1%	0.6%
D30RD1	30R	D	1.4%	0.2%	1.3%	1.4%	0.2%	1.3%
D30RD2	30R	D	3.4%	0.5%	3.3%	3.3%	0.6%	3.2%
D30RE1	30R	D	1.9%	2.0%	1.9%	1.8%	2.1%	1.7%
D30RE2	30R	D	3.4%	4.6%	3.4%	3.3%	5.0%	3.1%
D30RF	30R	D	8.4%	8.1%	8.4%	8.3%	8.6%	7.9%
D30RF1	30R	D	8.1%	7.4%	8.0%	8.2%	8.0%	7.8%
D30RF2	30R	D	4.1%	5.0%	4.2%	4.2%	5.3%	4.0%
D30RF3	30R	D	5.8%	7.5%	5.9%	5.8%	8.1%	5.5%
D30RF4	30R	D	0.6%	2.3%	0.7%	0.6%	2.4%	0.6%
DF30RA	30R	D	0.8%	0.3%	0.8%	0.9%	0.3%	0.8%
DF30RA1	30R	D	0.7%	1.3%	0.7%	0.7%	1.2%	0.6%
DF30RA2	30R	D	0.1%	0.4%	0.1%	0.1%	0.4%	0.1%
DF30RA3	30R	D	0.4%	1.9%	0.4%	0.4%	1.4%	0.3%
DF30RA4	30R	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
DF30RB	30R	D	0.7%	2.5%	0.8%	0.8%	2.3%	0.7%
DF30RB1	30R	D	0.7%	0.2%	0.6%	0.8%	0.1%	0.8%
DF30RB4	30R	D	3.8%	1.2%	3.6%	3.6%	0.5%	3.4%
DF30RC2	30R	D	13.7%	19.5%	14.0%	13.2%	21.1%	12.6%
DF30RD1	30R	D	0.7%	0.1%	0.7%	0.7%	0.1%	0.7%
DF30RD2	30R	D	2.0%	0.2%	1.9%	1.9%	0.2%	1.8%
DF30RF	30R	D	2.8%	2.2%	2.8%	3.0%	2.4%	2.9%
DF30RF1	30R	D	5.3%	4.4%	5.3%	5.2%	4.8%	5.0%
DF30RF2	30R	D	0.7%	1.6%	0.7%	0.7%	1.7%	0.7%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
DF30RF3	30R	D	3.9%	5.1%	4.0%	3.8%	5.5%	3.7%
DF30RF4	30R	D	0.3%	3.4%	0.5%	0.4%	3.6%	0.3%
DFC30RC	30R	D	0.5%	0.4%	0.5%	0.5%	0.2%	0.5%
DFC30RE	30R	D	1.8%	2.0%	1.8%	1.7%	2.2%	1.6%
DFC30RF	30R	D	0.8%	1.8%	0.8%	0.8%	1.9%	0.8%
A35AA0	35A	A	73.5%	0.0%	73.5%	69.4%	0.0%	69.4%
A35AA1	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AA2	35A	A	23.1%	0.0%	23.1%	21.8%	0.0%	21.8%
A35AA3	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA4	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AA5	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA6	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA7	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA8	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ABL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ABR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ACL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ACR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ADL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ADR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AEL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AER	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AFL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AFR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AGL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AGR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AHL	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AHR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AIL	35A	A	0.5%	0.0%	0.5%	0.5%	0.0%	0.5%
A35AIR	35A	A	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
A35AJL	35A	A	1.6%	0.0%	1.6%	1.5%	0.0%	1.5%
A35AJR	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
MACD35C	35A	D	3.4%	0.0%	3.2%	3.0%	0.0%	2.9%
MACD35E	35A	D	0.0%	21.3%	0.9%	0.0%	20.2%	0.8%
MACD35F	35A	D	12.4%	23.8%	12.9%	11.0%	22.6%	11.5%
MACD35G	35A	D	9.3%	0.0%	8.9%	8.3%	0.0%	8.0%
MACD35H	35A	D	19.4%	0.0%	18.5%	17.2%	0.0%	16.5%
MACD35I	35A	D	2.5%	0.0%	2.4%	2.3%	0.0%	2.2%

Table G.4.11

2020 & 2025 Alternative 1 - Airlines Remain Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
MACD35J	35A	D	3.3%	0.0%	3.1%	2.9%	0.0%	2.8%
MACD35K	35A	D	5.5%	0.0%	5.3%	4.9%	0.0%	4.7%
MACD35L	35A	D	1.9%	0.0%	1.8%	1.7%	0.0%	1.6%
MACD35M	35A	D	19.3%	19.9%	19.3%	17.2%	18.9%	17.3%
MACD35N	35A	D	5.3%	0.0%	5.1%	4.7%	0.0%	4.5%
MACD35O	35A	D	1.7%	0.0%	1.6%	1.5%	0.0%	1.4%
MACD35P	35A	D	9.4%	29.9%	10.3%	8.3%	28.3%	9.2%
MACD35Q	35A	D	2.7%	0.0%	2.6%	2.4%	0.0%	2.3%
MACD35S	35A	D	1.7%	0.0%	1.6%	1.5%	0.0%	1.4%
MACD35T	35A	D	2.3%	5.1%	2.4%	2.1%	4.8%	2.2%

Source: MAC analysis, 2012.

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A04XA0	04X	A	83.8%	95.4%	84.6%	83.4%	94.2%	84.1%
A04XA1	04X	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
A04XA2	04X	A	14.1%	4.6%	13.4%	14.7%	5.8%	14.1%
A04XA7	04X	A	0.5%	0.0%	0.5%	0.5%	0.0%	0.5%
A04XDL	04X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A04XEL	04X	A	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
A04XFR	04X	A	0.5%	0.0%	0.4%	0.4%	0.0%	0.4%
D04XF	04X	D	3.7%	0.0%	3.5%	3.5%	0.0%	3.3%
D04XF1	04X	D	9.1%	1.0%	8.7%	9.7%	1.1%	9.2%
D04XF2	04X	D	0.5%	0.0%	0.5%	0.5%	0.0%	0.4%
MAC04A	04X	D	0.1%	0.0%	0.1%	0.2%	0.1%	0.2%
MAC04B	04X	D	0.9%	0.0%	0.9%	1.0%	0.0%	0.9%
MAC04C	04X	D	5.1%	29.4%	6.4%	5.2%	26.4%	6.4%
MAC04D	04X	D	5.6%	0.9%	5.4%	5.7%	0.9%	5.4%
MAC04E	04X	D	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
MAC04F	04X	D	3.2%	1.4%	3.1%	3.0%	1.5%	2.9%
MAC04G	04X	D	14.4%	0.0%	13.6%	15.1%	0.0%	14.2%
MAC04H	04X	D	12.1%	11.9%	12.1%	12.3%	14.1%	12.4%
MAC04I	04X	D	4.2%	4.4%	4.2%	3.8%	5.0%	3.8%
MAC04J	04X	D	1.0%	0.0%	0.9%	0.5%	0.0%	0.5%
MAC04K	04X	D	11.7%	3.2%	11.2%	11.6%	4.2%	11.2%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
MAC04L	04X	D	11.0%	13.9%	11.2%	9.1%	13.2%	9.3%
MAC04M	04X	D	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
MAC04N	04X	D	12.0%	17.3%	12.2%	13.0%	17.7%	13.3%
MAC04O	04X	D	1.5%	16.6%	2.3%	1.2%	15.7%	2.1%
MAC04P	04X	D	0.6%	0.0%	0.6%	0.3%	0.0%	0.3%
MAC04Q	04X	D	2.7%	0.0%	2.6%	3.8%	0.0%	3.5%
A12LA0	12L	A	44.9%	40.9%	44.8%	45.6%	40.2%	45.4%
A12LA1	12L	A	1.9%	1.0%	1.9%	1.8%	1.0%	1.8%
A12LA2	12L	A	28.7%	31.5%	28.8%	28.9%	35.3%	29.2%
A12LA3	12L	A	1.2%	0.5%	1.2%	1.3%	0.5%	1.2%
A12LA4	12L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A12LA5	12L	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%
A12LA6	12L	A	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
A12LA7	12L	A	0.4%	0.0%	0.3%	0.3%	0.1%	0.3%
A12LA8	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LBL	12L	A	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
A12LBR	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LCL	12L	A	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
A12LCR	12L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12LDL	12L	A	0.3%	1.0%	0.3%	0.2%	0.6%	0.2%
A12LDR	12L	A	0.0%	0.3%	0.0%	0.0%	0.3%	0.0%
A12LEL	12L	A	1.0%	0.5%	0.9%	0.9%	0.7%	0.9%
A12LER	12L	A	0.3%	0.1%	0.3%	0.3%	0.3%	0.3%
A12LFL	12L	A	1.4%	1.3%	1.4%	1.4%	1.6%	1.4%
A12LFR	12L	A	0.0%	0.6%	0.1%	0.0%	0.3%	0.0%
A12LGL	12L	A	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%
A12LGR	12L	A	0.1%	0.7%	0.1%	0.1%	0.4%	0.1%
A12LHL	12L	A	2.7%	2.2%	2.7%	2.5%	1.3%	2.5%
A12LHR	12L	A	0.2%	1.2%	0.3%	0.3%	1.1%	0.3%
A12LIL	12L	A	4.0%	2.3%	4.0%	3.9%	2.2%	3.8%
A12LIR	12L	A	0.2%	1.1%	0.2%	0.2%	0.9%	0.2%
A12LJL	12L	A	3.9%	3.3%	3.9%	3.8%	2.3%	3.7%
A12LJR	12L	A	0.2%	1.3%	0.3%	0.2%	1.6%	0.3%
A12LKL	12L	A	5.3%	4.5%	5.2%	5.1%	3.6%	5.0%
A12LKR	12L	A	0.5%	2.9%	0.6%	0.5%	3.0%	0.6%
D12LA1	12L	D	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%
D12LA2	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
D12LA3	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D12LA4	12L	D	0.3%	1.2%	0.4%	0.2%	0.9%	0.3%
D12LB1	12L	D	0.6%	0.7%	0.6%	0.5%	0.5%	0.5%
D12LB2	12L	D	5.2%	5.1%	5.2%	4.8%	4.9%	4.9%
D12LC1	12L	D	0.9%	0.3%	0.8%	0.7%	0.3%	0.7%
D12LC2	12L	D	3.1%	1.0%	2.9%	3.2%	1.0%	3.0%
D12LD	12L	D	7.0%	4.9%	6.8%	6.9%	5.6%	6.7%
D12LD1	12L	D	1.3%	0.8%	1.3%	1.3%	1.3%	1.3%
D12LD2	12L	D	0.8%	0.3%	0.7%	0.7%	0.3%	0.7%
D12LD3	12L	D	0.0%	0.1%	0.0%	0.1%	0.1%	0.1%
D12LD4	12L	D	0.7%	0.4%	0.7%	0.7%	0.5%	0.7%
D12LE	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12LE1	12L	D	0.3%	0.1%	0.3%	0.3%	0.1%	0.3%
D12LE2	12L	D	7.2%	2.6%	6.8%	7.3%	2.8%	6.9%
D12LE4	12L	D	7.8%	3.7%	7.4%	8.0%	5.0%	7.7%
D12LF1	12L	D	4.2%	3.1%	4.1%	4.0%	4.0%	4.0%
D12LF2	12L	D	0.9%	0.7%	0.9%	0.8%	0.6%	0.7%
D12LF3	12L	D	0.9%	1.2%	0.9%	0.8%	1.2%	0.8%
D12LF4	12L	D	0.4%	0.1%	0.3%	0.4%	0.2%	0.3%
D12LG1	12L	D	3.3%	12.0%	4.0%	3.4%	8.4%	3.9%
D12LG2	12L	D	1.4%	1.6%	1.4%	1.4%	2.7%	1.5%
D12LG3	12L	D	3.3%	6.0%	3.5%	4.8%	7.1%	5.0%
D12LG4	12L	D	0.5%	0.6%	0.5%	0.4%	0.9%	0.4%
D12LH1	12L	D	0.1%	0.5%	0.2%	0.2%	0.9%	0.2%
D12LH2	12L	D	0.2%	0.1%	0.2%	0.2%	0.2%	0.2%
D12LI	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12LI1	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12LI2	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12LK1	12L	D	0.2%	0.2%	0.2%	0.1%	0.2%	0.1%
D12LK2	12L	D	2.8%	2.0%	2.7%	2.5%	1.9%	2.4%
D12LL	12L	D	0.2%	0.2%	0.2%	0.1%	0.2%	0.1%
D12LL1	12L	D	0.3%	0.6%	0.4%	0.4%	0.5%	0.4%
D12LL2	12L	D	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
D12LL3	12L	D	0.3%	0.9%	0.4%	0.3%	0.7%	0.3%
D12LL4	12L	D	0.4%	0.1%	0.4%	0.4%	0.1%	0.4%
DF12LA	12L	D	0.0%	0.3%	0.0%	0.0%	0.2%	0.0%
DF12LA1	12L	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
DF12LA2	12L	D	0.2%	0.9%	0.3%	0.2%	0.7%	0.2%
DF12LB	12L	D	1.9%	2.7%	1.9%	1.5%	2.3%	1.6%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
DF12LC1	12L	D	2.9%	1.7%	2.8%	2.7%	1.7%	2.6%
DF12LC2	12L	D	6.2%	3.2%	6.0%	6.9%	3.5%	6.5%
DF12LC3	12L	D	2.2%	1.7%	2.2%	2.1%	1.7%	2.1%
DF12LC4	12L	D	3.2%	1.3%	3.1%	3.4%	1.2%	3.2%
DF12LD1	12L	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
DF12LD2	12L	D	1.9%	1.6%	1.9%	1.6%	1.8%	1.6%
DF12LE1	12L	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
DF12LF1	12L	D	2.2%	0.9%	2.1%	2.1%	0.9%	2.0%
DF12LF2	12L	D	0.9%	0.5%	0.8%	0.8%	0.8%	0.8%
DF12LG	12L	D	2.5%	4.6%	2.7%	2.6%	6.9%	3.0%
DF12LG1	12L	D	0.9%	7.1%	1.4%	0.8%	1.7%	0.9%
DF12LG2	12L	D	0.5%	0.4%	0.4%	0.6%	0.4%	0.6%
DF12LH1	12L	D	0.2%	2.0%	0.3%	0.4%	2.9%	0.6%
DF12LH2	12L	D	0.4%	0.7%	0.5%	1.1%	1.8%	1.2%
DF12LI1	12L	D	0.4%	0.6%	0.4%	0.5%	0.5%	0.5%
DF12LI2	12L	D	0.4%	0.7%	0.4%	0.6%	0.6%	0.6%
DF12LJ	12L	D	0.9%	1.1%	0.9%	0.8%	0.9%	0.8%
DF12LJ1	12L	D	0.3%	1.0%	0.4%	0.2%	0.8%	0.3%
DF12LJ2	12L	D	7.4%	5.1%	7.2%	7.0%	5.9%	6.9%
DF12LK1	12L	D	0.2%	0.6%	0.3%	0.2%	0.5%	0.2%
DF12LK2	12L	D	0.7%	2.0%	0.8%	0.6%	1.5%	0.7%
DF12LK3	12L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12LK4	12L	D	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%
DF12LL1	12L	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
DF12LL2	12L	D	0.6%	1.9%	0.7%	0.5%	1.6%	0.6%
DFC12LC	12L	D	5.2%	1.8%	4.9%	5.0%	1.9%	4.7%
DFC12LF	12L	D	0.8%	0.5%	0.8%	0.8%	0.5%	0.8%
DFC12LH	12L	D	1.1%	2.0%	1.2%	1.1%	2.3%	1.2%
DFC12LK	12L	D	0.4%	0.8%	0.4%	0.3%	0.6%	0.3%
A12RA0	12R	A	37.7%	33.0%	37.2%	38.3%	32.2%	37.7%
A12RA1	12R	A	0.4%	0.4%	0.4%	0.4%	0.3%	0.4%
A12RA2	12R	A	49.1%	34.8%	47.6%	48.6%	37.3%	47.5%
A12RA3	12R	A	0.1%	0.3%	0.1%	0.1%	0.3%	0.1%
A12RA4	12R	A	0.5%	0.0%	0.4%	0.5%	0.0%	0.5%
A12RA5	12R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A12RA6	12R	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A12RA7	12R	A	0.0%	0.1%	0.0%	0.0%	0.2%	0.0%
A12RA8	12R	A	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A12RBL	12R	A	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
A12RBR	12R	A	0.0%	0.5%	0.1%	0.0%	0.0%	0.0%
A12RCL	12R	A	0.0%	0.3%	0.1%	0.0%	0.3%	0.1%
A12RCR	12R	A	0.0%	0.2%	0.0%	0.0%	0.2%	0.0%
A12RDL	12R	A	0.0%	0.4%	0.1%	0.0%	0.5%	0.1%
A12RDR	12R	A	0.0%	0.7%	0.1%	0.0%	0.6%	0.1%
A12REL	12R	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A12RER	12R	A	0.1%	0.4%	0.2%	0.1%	0.5%	0.2%
A12RFL	12R	A	0.1%	2.6%	0.4%	0.1%	2.7%	0.4%
A12RFR	12R	A	0.2%	1.0%	0.3%	0.2%	0.6%	0.2%
A12RGL	12R	A	0.2%	0.5%	0.2%	0.2%	0.6%	0.2%
A12RGR	12R	A	0.4%	1.3%	0.5%	0.4%	1.2%	0.4%
A12RHL	12R	A	0.3%	0.7%	0.3%	0.3%	0.7%	0.3%
A12RHR	12R	A	0.8%	2.3%	0.9%	0.8%	2.1%	0.9%
A12RIL	12R	A	0.4%	0.8%	0.4%	0.3%	0.8%	0.4%
A12RIR	12R	A	1.3%	1.9%	1.4%	1.3%	1.8%	1.3%
A12RJL	12R	A	0.5%	1.3%	0.6%	0.5%	1.0%	0.5%
A12RJR	12R	A	1.9%	2.7%	1.9%	2.0%	2.6%	2.1%
A12RKL	12R	A	0.8%	1.5%	0.8%	0.7%	1.5%	0.8%
A12RKR	12R	A	4.8%	11.8%	5.5%	4.8%	11.5%	5.5%
12RAB	12R	D	2.0%	2.0%	2.0%	2.0%	1.7%	2.0%
12RAB1	12R	D	0.3%	0.3%	0.3%	0.4%	0.2%	0.3%
12RAB2	12R	D	2.8%	1.1%	2.5%	2.8%	1.4%	2.5%
D12RA1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RA2	12R	D	0.5%	0.1%	0.5%	0.5%	0.1%	0.4%
D12RB1	12R	D	2.2%	4.6%	2.7%	2.0%	4.5%	2.5%
D12RB2	12R	D	4.3%	8.2%	5.1%	4.3%	8.1%	5.1%
D12RB3	12R	D	0.8%	1.3%	0.9%	0.8%	1.1%	0.9%
D12RB4	12R	D	2.2%	2.3%	2.2%	2.1%	3.4%	2.3%
D12RC1	12R	D	4.6%	3.8%	4.4%	4.6%	3.6%	4.4%
D12RC2	12R	D	5.4%	2.6%	4.9%	4.9%	3.0%	4.5%
D12RC2D	12R	D	7.5%	11.4%	8.2%	7.5%	11.7%	8.4%
D12RC2D1	12R	D	3.2%	2.6%	3.1%	3.5%	2.8%	3.4%
D12RC2D2	12R	D	7.7%	2.9%	6.7%	8.1%	2.9%	7.0%
D12RC2D3	12R	D	4.2%	6.9%	4.8%	4.5%	9.8%	5.5%
D12RC2D4	12R	D	3.8%	1.7%	3.4%	3.8%	1.6%	3.4%
D12RC3	12R	D	0.2%	0.2%	0.2%	0.2%	0.4%	0.2%
D12RC4	12R	D	3.0%	1.0%	2.6%	2.9%	0.8%	2.5%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
D12RD1	12R	D	2.3%	4.3%	2.7%	2.2%	3.8%	2.5%
D12RD2	12R	D	2.9%	2.7%	2.9%	2.4%	2.4%	2.4%
D12RD3	12R	D	0.3%	0.7%	0.4%	0.2%	0.5%	0.3%
D12RD4	12R	D	1.3%	0.4%	1.1%	1.4%	0.6%	1.2%
D12RF1	12R	D	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%
D12RF2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RF3	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RF4	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RG	12R	D	0.1%	0.0%	0.1%	0.2%	0.3%	0.2%
D12RG1	12R	D	0.4%	0.0%	0.3%	0.4%	0.0%	0.3%
D12RG2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RG3	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RG4	12R	D	0.0%	0.2%	0.1%	0.0%	0.1%	0.0%
D12RH1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH2	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH3	12R	D	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RH4	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D12RI1	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D12RI2	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RA1	12R	D	0.6%	0.2%	0.5%	0.7%	0.3%	0.6%
DF12RA2	12R	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
DF12RB1	12R	D	0.5%	1.7%	0.8%	0.6%	1.8%	0.9%
DF12RB2	12R	D	2.8%	4.0%	3.1%	2.5%	5.1%	3.0%
DF12RC	12R	D	6.5%	5.0%	6.2%	6.3%	5.1%	6.1%
DF12RC1	12R	D	1.5%	0.8%	1.4%	1.2%	0.7%	1.1%
DF12RC2	12R	D	2.2%	3.3%	2.4%	2.6%	3.3%	2.7%
DF12RD	12R	D	4.0%	3.1%	3.8%	3.7%	2.7%	3.5%
DF12RD1	12R	D	1.1%	0.3%	0.9%	0.8%	0.5%	0.7%
DF12RD2	12R	D	1.6%	3.0%	1.8%	2.1%	2.5%	2.2%
DF12RF	12R	D	0.3%	0.1%	0.2%	0.3%	0.1%	0.2%
DF12RF1	12R	D	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%
DF12RF2	12R	D	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RG1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RG2	12R	D	1.2%	0.3%	1.0%	1.0%	0.3%	0.9%
DF12RH1	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RH2	12R	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%
DF12RI	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF12RI1	12R	D	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
DF12RI2	12R	D	0.5%	0.1%	0.4%	0.5%	0.1%	0.4%
DFC12RA	12R	D	0.5%	0.0%	0.4%	0.5%	0.0%	0.4%
DFC12RB	12R	D	3.7%	5.7%	4.1%	3.7%	5.9%	4.1%
DFC12RE	12R	D	4.5%	3.0%	4.2%	5.3%	1.8%	4.6%
DFC12RE1	12R	D	1.5%	3.9%	2.0%	1.9%	2.6%	2.0%
DFC12RE2	12R	D	2.5%	1.3%	2.2%	2.4%	0.9%	2.1%
DFC12RE3	12R	D	0.5%	1.8%	0.7%	0.5%	1.2%	0.6%
DFC12RE4	12R	D	0.6%	0.4%	0.6%	0.6%	0.2%	0.6%
DFC12RH	12R	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A17AA0	17A	A	91.1%	0.0%	91.1%	92.1%	0.0%	92.1%
A17AA1	17A	A	0.7%	0.0%	0.7%	0.7%	0.0%	0.7%
A17AA2	17A	A	6.7%	0.0%	6.7%	6.2%	0.0%	6.2%
A17AA4	17A	A	0.8%	0.0%	0.8%	0.5%	0.0%	0.5%
A17AA6	17A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A17AA8	17A	A	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
A17AFR	17A	A	0.2%	0.0%	0.2%	0.1%	0.0%	0.1%
A	17A	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
AA	17A	D	0.2%	0.0%	0.1%	0.2%	0.1%	0.2%
B	17A	D	1.0%	0.0%	0.9%	0.9%	0.0%	0.9%
BB	17A	D	0.7%	0.1%	0.7%	0.8%	0.1%	0.8%
C	17A	D	2.5%	0.0%	2.3%	2.8%	0.0%	2.6%
CC	17A	D	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
D	17A	D	6.6%	4.0%	6.4%	6.4%	3.8%	6.2%
DD	17A	D	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
E	17A	D	4.9%	0.0%	4.6%	4.9%	0.0%	4.6%
EE	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
F	17A	D	5.5%	1.8%	5.2%	5.2%	1.5%	5.0%
FF	17A	D	0.0%	3.3%	0.2%	0.0%	2.6%	0.2%
G	17A	D	3.1%	0.8%	2.9%	3.4%	0.8%	3.3%
GG	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
H	17A	D	3.3%	1.5%	3.2%	3.6%	1.5%	3.5%
HH	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
HSTIN	17A	D	14.6%	11.5%	14.4%	14.5%	10.5%	14.3%
I	17A	D	3.1%	0.1%	3.0%	3.0%	0.1%	2.8%
II	17A	D	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
J	17A	D	4.0%	2.6%	3.9%	4.3%	2.4%	4.2%
JJ	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
K	17A	D	6.6%	1.8%	6.4%	6.1%	1.7%	5.9%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
KK	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
L	17A	D	3.3%	0.7%	3.1%	3.2%	0.7%	3.1%
LL	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
M	17A	D	2.9%	0.8%	2.8%	2.6%	1.5%	2.5%
MAC17A	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAC17B	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MAC17C	17A	D	0.3%	0.2%	0.3%	0.2%	0.2%	0.2%
MAC17D	17A	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
MM	17A	D	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
N	17A	D	2.8%	0.2%	2.6%	2.7%	0.9%	2.6%
NN	17A	D	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%
O	17A	D	3.3%	9.4%	3.6%	3.3%	12.8%	3.8%
OO	17A	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
P	17A	D	3.5%	23.2%	4.7%	3.7%	25.0%	4.8%
Q	17A	D	1.4%	16.9%	2.3%	1.3%	18.2%	2.2%
R	17A	D	0.6%	7.4%	1.0%	0.6%	8.4%	1.1%
SLAYR	17A	D	21.4%	6.7%	20.5%	21.4%	0.0%	20.2%
T	17A	D	0.6%	0.9%	0.6%	0.6%	0.9%	0.6%
U	17A	D	0.6%	0.2%	0.5%	0.5%	0.3%	0.5%
V	17A	D	0.8%	0.1%	0.8%	0.8%	0.3%	0.8%
W	17A	D	0.3%	0.2%	0.3%	0.3%	0.4%	0.3%
X	17A	D	0.3%	2.2%	0.4%	0.4%	2.2%	0.5%
Y	17A	D	0.7%	2.4%	0.8%	0.6%	2.3%	0.7%
Z	17A	D	0.7%	0.2%	0.6%	1.0%	0.1%	1.0%
A22XA0	22X	A	54.8%	73.4%	56.1%	55.2%	74.8%	56.5%
A22XA1	22X	A	0.5%	0.2%	0.5%	0.5%	0.1%	0.5%
A22XA2	22X	A	43.6%	26.5%	42.4%	43.4%	25.0%	42.1%
A22XA4	22X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
A22XA5	22X	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A22XA6	22X	A	0.3%	0.0%	0.3%	0.3%	0.0%	0.2%
A22XA8	22X	A	0.4%	0.0%	0.3%	0.3%	0.0%	0.2%
A22XBR	22X	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A22XDL	22X	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
D22XA1	22X	D	6.0%	4.5%	5.9%	5.4%	6.9%	5.5%
D22XA2	22X	D	3.3%	10.4%	3.7%	3.0%	7.8%	3.4%
D22XA3	22X	D	10.9%	15.2%	11.2%	11.3%	17.3%	11.7%
D22XA4	22X	D	6.3%	7.0%	6.4%	6.2%	7.8%	6.3%
D22XB1	22X	D	0.7%	0.0%	0.6%	0.7%	0.0%	0.7%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D22XB2	22X	D	1.1%	0.0%	1.0%	0.9%	0.0%	0.8%
D22XC	22X	D	3.3%	0.9%	3.1%	3.1%	0.8%	2.9%
D22XC1	22X	D	1.4%	1.5%	1.4%	1.2%	1.3%	1.2%
D22XD	22X	D	1.0%	5.0%	1.2%	1.0%	4.5%	1.3%
D22XD1	22X	D	0.3%	1.3%	0.3%	0.1%	1.3%	0.2%
D22XD2	22X	D	1.7%	5.5%	2.0%	1.9%	4.2%	2.0%
D22XD3	22X	D	2.4%	0.0%	2.2%	3.0%	0.0%	2.8%
D22XD4	22X	D	3.5%	1.9%	3.4%	3.0%	1.9%	2.9%
D22XE1	22X	D	3.2%	0.6%	3.0%	3.1%	0.6%	2.9%
D22XF	22X	D	2.7%	5.7%	2.9%	3.1%	6.1%	3.3%
D22XF1	22X	D	2.9%	1.1%	2.8%	2.9%	1.0%	2.7%
DF22XA2	22X	D	21.7%	6.5%	20.8%	19.7%	6.3%	18.8%
DF22XC1	22X	D	5.7%	2.5%	5.5%	6.6%	2.7%	6.3%
DF22XD1	22X	D	0.4%	0.3%	0.4%	3.8%	0.3%	3.6%
DF22XD2	22X	D	1.6%	0.3%	1.5%	1.8%	0.3%	1.7%
DF22XE1	22X	D	1.2%	4.7%	1.4%	1.1%	4.2%	1.3%
DF22XF1	22X	D	10.4%	13.4%	10.6%	9.5%	14.0%	9.8%
DF22XG	22X	D	2.6%	7.3%	2.8%	2.3%	6.8%	2.6%
DFC22XA	22X	D	5.1%	3.4%	5.0%	5.0%	3.0%	4.8%
DFC22XB	22X	D	0.3%	0.0%	0.3%	0.3%	0.0%	0.3%
DFC22XE	22X	D	0.3%	0.9%	0.3%	0.2%	0.8%	0.3%
A30LA0	30L	A	55.8%	44.4%	54.1%	55.6%	43.0%	53.8%
A30LA1	30L	A	0.8%	0.5%	0.8%	0.7%	0.3%	0.7%
A30LA2	30L	A	18.5%	17.2%	18.3%	18.9%	16.8%	18.6%
A30LA3	30L	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A30LA4	30L	A	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
A30LA5	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LA6	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LA7	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LA8	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LBL	30L	A	0.1%	0.2%	0.1%	0.1%	0.1%	0.1%
A30LBR	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LCL	30L	A	0.1%	0.8%	0.2%	0.1%	0.6%	0.1%
A30LCR	30L	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30LDL	30L	A	0.1%	0.6%	0.2%	0.1%	0.5%	0.2%
A30LDR	30L	A	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
A30LEL	30L	A	0.2%	0.3%	0.2%	0.2%	0.3%	0.2%
A30LER	30L	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A30LFL	30L	A	0.3%	0.6%	0.4%	0.3%	0.9%	0.4%
A30LFR	30L	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30LGL	30L	A	0.7%	1.6%	0.8%	0.7%	2.3%	0.9%
A30LGR	30L	A	0.3%	0.2%	0.3%	0.3%	0.2%	0.3%
A30LHL	30L	A	0.8%	3.3%	1.2%	0.9%	3.7%	1.3%
A30LHR	30L	A	0.5%	0.2%	0.4%	0.4%	0.2%	0.4%
A30LIL	30L	A	1.3%	3.7%	1.7%	1.5%	4.0%	1.8%
A30LIR	30L	A	0.5%	0.3%	0.5%	0.5%	0.3%	0.5%
A30LJL	30L	A	1.6%	4.2%	2.0%	1.6%	5.2%	2.1%
A30LJR	30L	A	0.6%	0.6%	0.6%	0.5%	0.4%	0.5%
A30LKL	30L	A	1.4%	3.0%	1.6%	1.5%	3.2%	1.8%
A30LKR	30L	A	0.6%	0.5%	0.6%	0.7%	0.6%	0.7%
A30LLL	30L	A	2.2%	4.0%	2.5%	2.4%	4.1%	2.6%
A30LLR	30L	A	1.3%	0.8%	1.2%	1.3%	0.8%	1.2%
A30LML	30L	A	8.4%	9.6%	8.6%	8.2%	9.6%	8.4%
A30LMR	30L	A	2.1%	2.7%	2.2%	2.0%	2.1%	2.0%
A30LNL	30L	A	0.4%	0.2%	0.3%	0.3%	0.3%	0.3%
A30LOR	30L	A	0.5%	0.2%	0.4%	0.4%	0.2%	0.4%
D30LA1	30L	D	0.5%	1.8%	0.6%	0.5%	3.5%	0.6%
D30LA2	30L	D	1.2%	8.2%	1.7%	1.2%	6.6%	1.5%
D30LB1	30L	D	12.1%	6.1%	11.7%	12.5%	7.8%	12.2%
D30LB3	30L	D	2.3%	4.6%	2.4%	2.2%	5.4%	2.4%
D30LB4	30L	D	3.4%	0.7%	3.2%	3.4%	0.8%	3.3%
D30LC1	30L	D	1.0%	0.2%	0.9%	1.0%	0.4%	0.9%
D30LC2	30L	D	1.4%	0.1%	1.3%	1.3%	0.3%	1.2%
D30LC3	30L	D	1.0%	3.5%	1.2%	1.0%	3.7%	1.1%
D30LC4	30L	D	0.8%	0.4%	0.8%	0.7%	0.4%	0.7%
D30LD	30L	D	1.7%	1.4%	1.7%	1.2%	0.8%	1.2%
D30LD1	30L	D	1.2%	2.3%	1.3%	1.0%	2.3%	1.1%
D30LD2	30L	D	0.5%	0.4%	0.5%	0.4%	0.5%	0.4%
D30LD3	30L	D	0.3%	1.5%	0.4%	0.2%	0.8%	0.3%
D30LD4	30L	D	0.1%	0.2%	0.1%	0.1%	0.3%	0.1%
D30LE	30L	D	0.3%	0.4%	0.3%	0.3%	0.3%	0.3%
D30LE1	30L	D	0.6%	0.0%	0.6%	0.7%	0.0%	0.6%
D30LE2	30L	D	0.1%	0.2%	0.1%	0.1%	0.3%	0.1%
D30LF1	30L	D	0.2%	0.3%	0.2%	0.2%	0.4%	0.2%
D30LF2	30L	D	0.8%	2.4%	0.9%	0.9%	2.4%	0.9%
D30LG	30L	D	1.1%	5.7%	1.4%	1.3%	6.0%	1.5%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	Runway	Op Type	Day	Night	Total	Day	Night	Total
D30LG1	30L	D	1.9%	7.1%	2.2%	1.9%	7.4%	2.2%
D30LG2	30L	D	0.6%	1.1%	0.6%	0.6%	1.1%	0.6%
DF30LA1	30L	D	0.2%	1.1%	0.2%	0.2%	0.6%	0.2%
DF30LA2	30L	D	0.2%	1.0%	0.3%	0.2%	0.8%	0.2%
DF30LB2	30L	D	24.6%	15.4%	24.0%	24.8%	14.7%	24.2%
DF30LB4	30L	D	6.8%	5.4%	6.7%	6.4%	6.1%	6.4%
DF30LC1	30L	D	0.9%	2.9%	1.0%	0.8%	1.2%	0.9%
DF30LC2	30L	D	0.3%	0.2%	0.3%	0.2%	0.3%	0.2%
DF30LD1	30L	D	0.1%	0.2%	0.1%	0.1%	0.2%	0.1%
DF30LD2	30L	D	0.2%	0.3%	0.2%	0.1%	0.4%	0.1%
DF30LE1	30L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF30LE2	30L	D	0.6%	0.4%	0.6%	0.5%	1.1%	0.5%
DF30LF1	30L	D	0.5%	1.0%	0.5%	0.4%	0.8%	0.4%
DF30LF2	30L	D	0.3%	0.4%	0.3%	0.3%	0.2%	0.3%
DF30LG	30L	D	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DF30LG1	30L	D	0.7%	1.9%	0.8%	0.9%	2.8%	1.0%
DF30LG2	30L	D	0.2%	0.6%	0.2%	0.2%	0.6%	0.2%
DF30LH	30L	D	1.3%	0.9%	1.3%	1.2%	1.2%	1.2%
DFC30LA	30L	D	0.2%	0.8%	0.2%	0.2%	0.5%	0.2%
DFC30LB	30L	D	26.4%	15.4%	25.7%	27.4%	13.6%	26.6%
DFC30LC	30L	D	2.4%	1.9%	2.3%	2.1%	1.6%	2.1%
DFC30LF	30L	D	0.9%	0.9%	0.9%	1.2%	1.1%	1.2%
DFC30LG	30L	D	0.2%	0.6%	0.2%	0.2%	0.5%	0.2%
A30RA0	30R	A	20.3%	19.1%	20.3%	20.4%	18.1%	20.2%
A30RA1	30R	A	0.2%	0.2%	0.2%	0.2%	0.0%	0.1%
A30RA2	30R	A	39.8%	38.1%	39.7%	40.5%	36.7%	40.3%
A30RA3	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA4	30R	A	0.5%	0.1%	0.5%	0.5%	0.1%	0.5%
A30RA5	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA6	30R	A	0.2%	0.0%	0.2%	0.2%	0.1%	0.2%
A30RA7	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RA8	30R	A	0.3%	0.0%	0.2%	0.3%	0.0%	0.3%
A30RBL	30R	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A30RBR	30R	A	0.2%	0.0%	0.2%	0.2%	0.1%	0.2%
A30RCL	30R	A	0.0%	0.1%	0.0%	0.0%	0.3%	0.0%
A30RCR	30R	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A30RDL	30R	A	0.0%	0.4%	0.0%	0.0%	0.4%	0.1%
A30RDR	30R	A	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A30REL	30R	A	0.1%	0.2%	0.1%	0.1%	0.4%	0.1%
A30RER	30R	A	0.8%	0.4%	0.8%	0.7%	0.3%	0.7%
A30RFL	30R	A	0.1%	0.6%	0.1%	0.1%	0.6%	0.1%
A30RFR	30R	A	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%
A30RGL	30R	A	0.1%	1.3%	0.2%	0.1%	1.4%	0.2%
A30RGR	30R	A	1.0%	0.6%	1.0%	1.0%	0.5%	0.9%
A30RHL	30R	A	0.2%	2.0%	0.3%	0.2%	3.5%	0.4%
A30RHR	30R	A	1.2%	1.0%	1.2%	1.1%	1.0%	1.1%
A30RIL	30R	A	0.3%	2.4%	0.4%	0.3%	2.4%	0.4%
A30RIR	30R	A	2.3%	2.2%	2.3%	2.2%	2.6%	2.3%
A30RJL	30R	A	0.4%	2.6%	0.5%	0.4%	4.3%	0.6%
A30RJR	30R	A	3.7%	2.1%	3.6%	3.7%	1.6%	3.6%
A30RKL	30R	A	0.3%	2.0%	0.4%	0.4%	3.1%	0.5%
A30RKR	30R	A	3.4%	2.7%	3.4%	3.3%	2.6%	3.2%
A30RLL	30R	A	0.5%	2.2%	0.6%	0.6%	2.9%	0.8%
A30RLR	30R	A	6.6%	3.9%	6.4%	6.4%	2.9%	6.2%
A30RML	30R	A	5.6%	6.7%	5.6%	5.6%	7.3%	5.7%
A30RMR	30R	A	8.7%	7.1%	8.6%	8.3%	4.9%	8.1%
A30ROL	30R	A	2.6%	1.4%	2.6%	2.5%	0.9%	2.4%
D30R340-0	30R	D	0.8%	2.4%	0.8%	0.7%	2.4%	0.8%
D30R340-1	30R	D	0.5%	1.5%	0.5%	0.5%	1.5%	0.5%
D30R340-2	30R	D	0.5%	1.5%	0.5%	0.5%	1.5%	0.5%
D30R340-3	30R	D	0.1%	0.4%	0.1%	0.1%	0.4%	0.1%
D30R340-4	30R	D	0.1%	0.4%	0.1%	0.1%	0.4%	0.1%
D30RA	30R	D	2.9%	0.2%	2.7%	3.0%	1.1%	2.9%
D30RA1	30R	D	0.4%	0.3%	0.4%	0.5%	0.3%	0.5%
D30RA2	30R	D	1.2%	0.1%	1.1%	1.2%	0.3%	1.2%
D30RA3	30R	D	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
D30RA4	30R	D	0.3%	0.1%	0.3%	0.4%	1.2%	0.4%
D30RB2	30R	D	2.2%	0.2%	2.1%	2.1%	0.4%	2.0%
D30RB3	30R	D	0.7%	0.1%	0.7%	0.7%	0.3%	0.7%
D30RC	30R	D	10.7%	3.4%	10.4%	10.7%	4.9%	10.4%
D30RC1	30R	D	2.2%	0.9%	2.2%	2.6%	1.3%	2.6%
D30RD	30R	D	0.6%	0.1%	0.6%	0.6%	0.2%	0.6%
D30RD1	30R	D	1.4%	0.1%	1.3%	1.3%	0.3%	1.3%
D30RD2	30R	D	3.4%	0.3%	3.3%	3.3%	0.8%	3.2%
D30RE1	30R	D	1.9%	2.0%	1.9%	1.8%	1.9%	1.8%
D30RE2	30R	D	3.4%	4.7%	3.4%	3.3%	4.4%	3.4%

Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
D30RF	30R	D	8.3%	8.1%	8.3%	8.3%	7.5%	8.3%
D30RF1	30R	D	8.1%	7.5%	8.0%	8.2%	6.9%	8.1%
D30RF2	30R	D	4.2%	5.0%	4.2%	4.2%	4.6%	4.2%
D30RF3	30R	D	5.9%	7.7%	6.0%	5.8%	7.1%	5.9%
D30RF4	30R	D	0.6%	2.4%	0.7%	0.6%	2.2%	0.7%
DF30RA	30R	D	0.8%	0.4%	0.8%	0.9%	0.4%	0.9%
DF30RA1	30R	D	0.6%	0.3%	0.6%	0.7%	1.1%	0.8%
DF30RA2	30R	D	0.1%	0.3%	0.1%	0.1%	0.4%	0.1%
DF30RA3	30R	D	0.3%	1.1%	0.4%	0.4%	1.0%	0.4%
DF30RA4	30R	D	0.1%	0.2%	0.1%	0.1%	0.3%	0.1%
DF30RB	30R	D	0.7%	2.7%	0.8%	0.8%	2.3%	0.8%
DF30RB1	30R	D	0.7%	0.1%	0.6%	0.8%	0.2%	0.8%
DF30RB4	30R	D	3.8%	1.2%	3.7%	3.6%	1.8%	3.5%
DF30RC2	30R	D	13.7%	22.4%	14.1%	13.1%	19.9%	13.5%
DF30RD1	30R	D	0.7%	0.1%	0.7%	0.7%	0.2%	0.7%
DF30RD2	30R	D	2.0%	0.1%	1.9%	1.9%	0.3%	1.8%
DF30RF	30R	D	2.8%	2.2%	2.8%	3.0%	2.1%	2.9%
DF30RF1	30R	D	5.3%	4.4%	5.3%	5.3%	4.1%	5.2%
DF30RF2	30R	D	0.7%	1.6%	0.7%	0.7%	1.5%	0.8%
DF30RF3	30R	D	3.9%	5.2%	3.9%	3.9%	4.8%	3.9%
DF30RF4	30R	D	0.3%	3.7%	0.5%	0.4%	3.3%	0.5%
DFC30RC	30R	D	0.5%	0.4%	0.5%	0.5%	0.6%	0.5%
DFC30RE	30R	D	1.7%	2.0%	1.8%	1.7%	1.9%	1.7%
DFC30RF	30R	D	0.8%	1.9%	0.8%	0.8%	1.7%	0.8%
A35AA0	35A	A	73.5%	0.0%	73.5%	74.2%	0.0%	74.2%
A35AA1	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AA2	35A	A	23.1%	0.0%	23.1%	22.2%	0.0%	22.2%
A35AA3	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA4	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AA5	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA6	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA7	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AA8	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ABL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ABR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ACL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ACR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35ADL	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

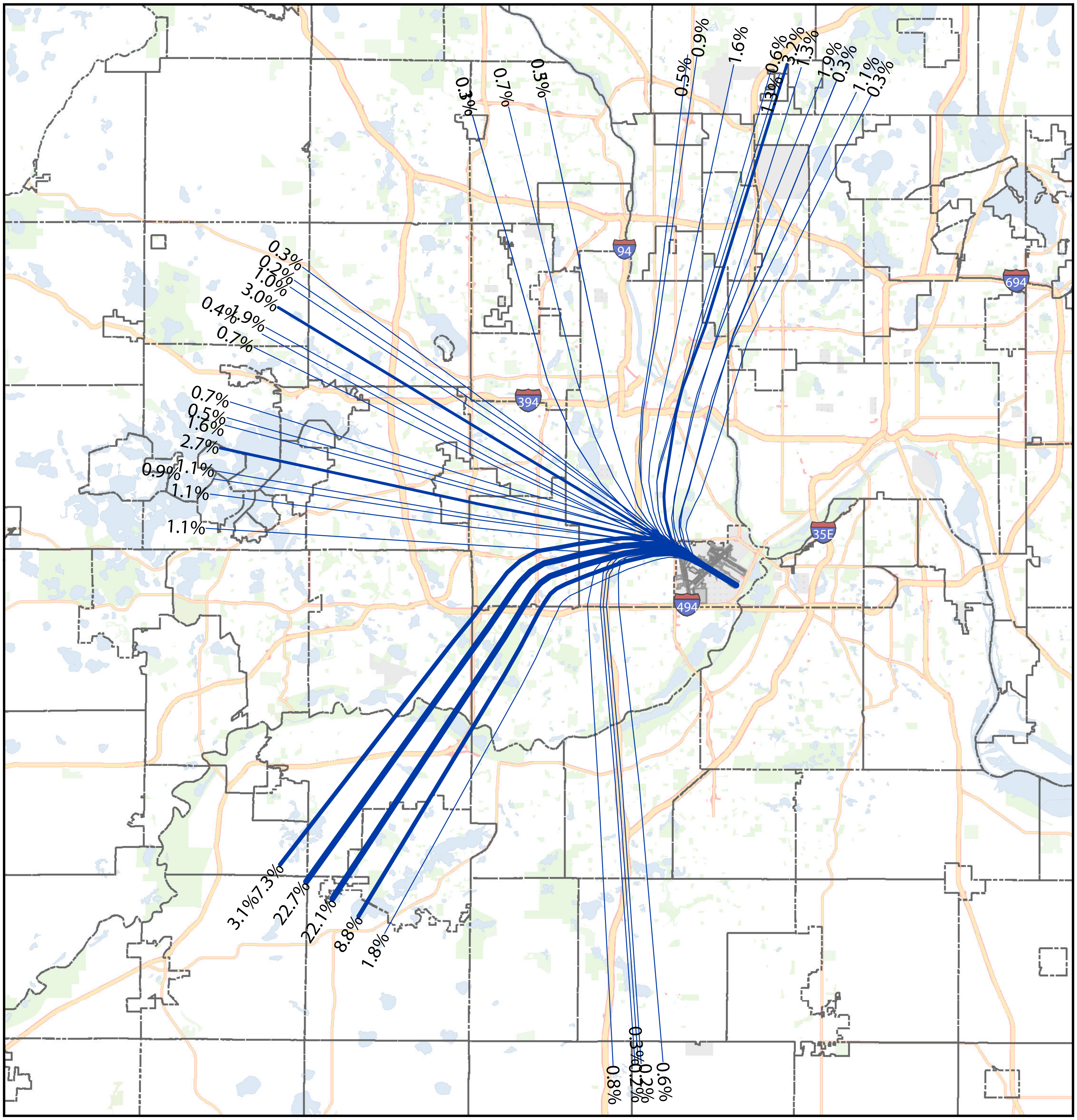
Table G.4.12

2020 & 2025 Alternative 2 - Airlines Relocate Average Daily Counts by INM Track

			2020			2025		
INM Track	**Runway**	**Op Type**	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
A35ADR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AEL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AER	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AFL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AFR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AGL	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
A35AGR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AHL	35A	A	0.2%	0.0%	0.2%	0.2%	0.0%	0.2%
A35AHR	35A	A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A35AIL	35A	A	0.5%	0.0%	0.5%	0.5%	0.0%	0.5%
A35AIR	35A	A	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
A35AJL	35A	A	1.6%	0.0%	1.6%	1.7%	0.0%	1.7%
A35AJR	35A	A	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%
MACD35C	35A	D	3.4%	0.0%	3.2%	3.8%	0.0%	3.6%
MACD35E	35A	D	0.0%	23.4%	0.9%	0.0%	19.2%	0.8%
MACD35F	35A	D	12.4%	26.0%	12.9%	14.0%	22.6%	14.4%
MACD35G	35A	D	9.3%	0.0%	9.0%	8.7%	0.0%	8.3%
MACD35H	35A	D	19.4%	0.0%	18.6%	18.1%	0.0%	17.3%
MACD35I	35A	D	2.5%	0.0%	2.4%	2.7%	0.0%	2.6%
MACD35J	35A	D	3.3%	0.0%	3.1%	2.6%	0.0%	2.5%
MACD35K	35A	D	5.5%	0.0%	5.3%	5.1%	0.0%	4.8%
MACD35L	35A	D	1.9%	0.0%	1.8%	1.7%	0.0%	1.7%
MACD35M	35A	D	19.3%	21.9%	19.4%	20.4%	31.3%	20.9%
MACD35N	35A	D	5.3%	0.0%	5.1%	4.8%	0.0%	4.6%
MACD35O	35A	D	1.7%	0.0%	1.6%	1.5%	0.0%	1.5%
MACD35P	35A	D	9.4%	28.1%	10.1%	8.4%	26.5%	9.2%
MACD35Q	35A	D	2.7%	0.0%	2.6%	4.5%	0.0%	4.3%
MACD35S	35A	D	1.7%	0.0%	1.6%	1.5%	0.0%	1.5%
MACD35T	35A	D	2.3%	0.6%	2.2%	1.9%	0.4%	1.9%

Source: MAC analysis, 2012.

FIGURE G.4-1



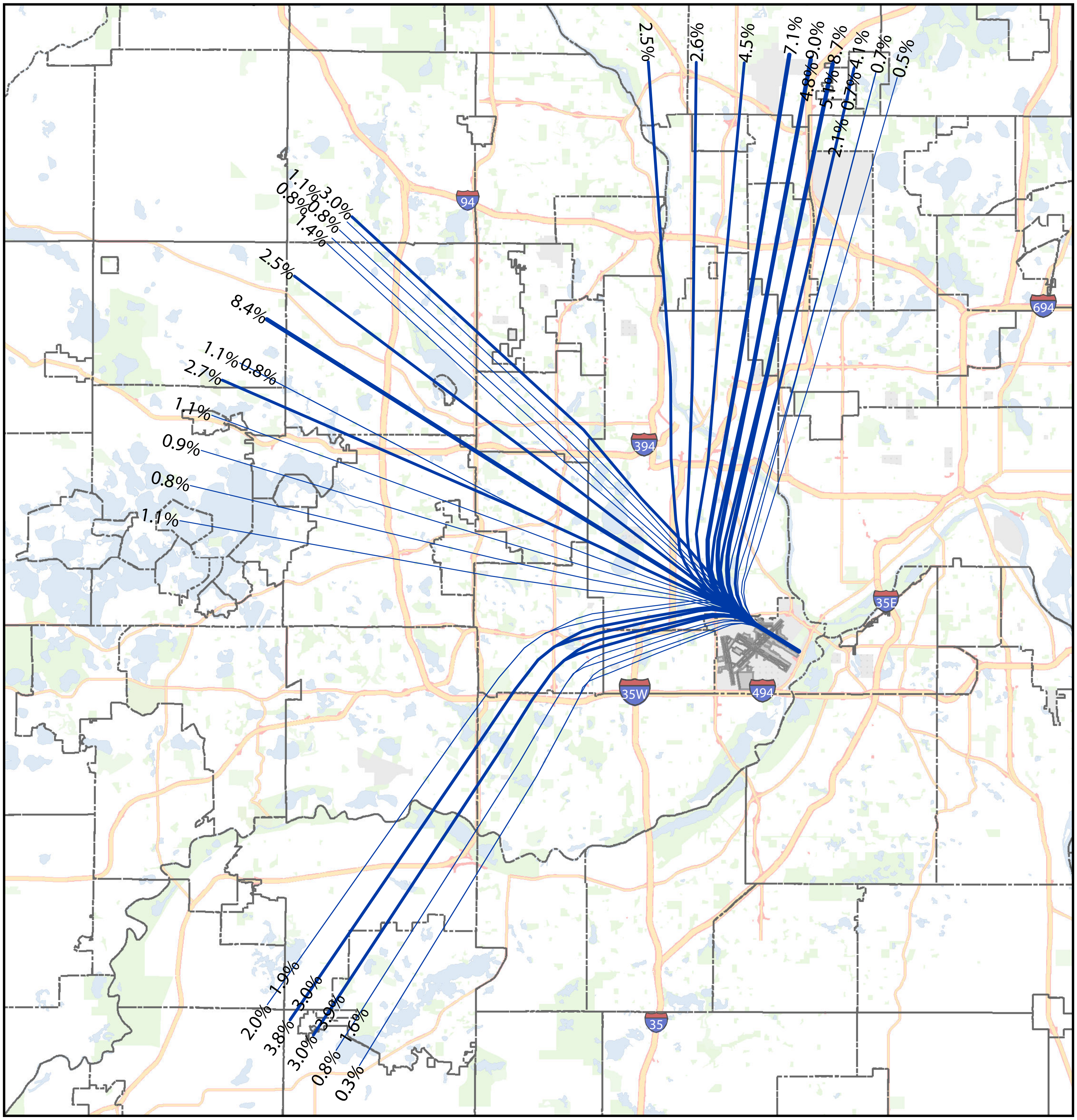
2010 INM Tracks - Runway 30L Departures
Overall Use Percentage

N

0 4 8 Miles

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

FIGURE G.4-2



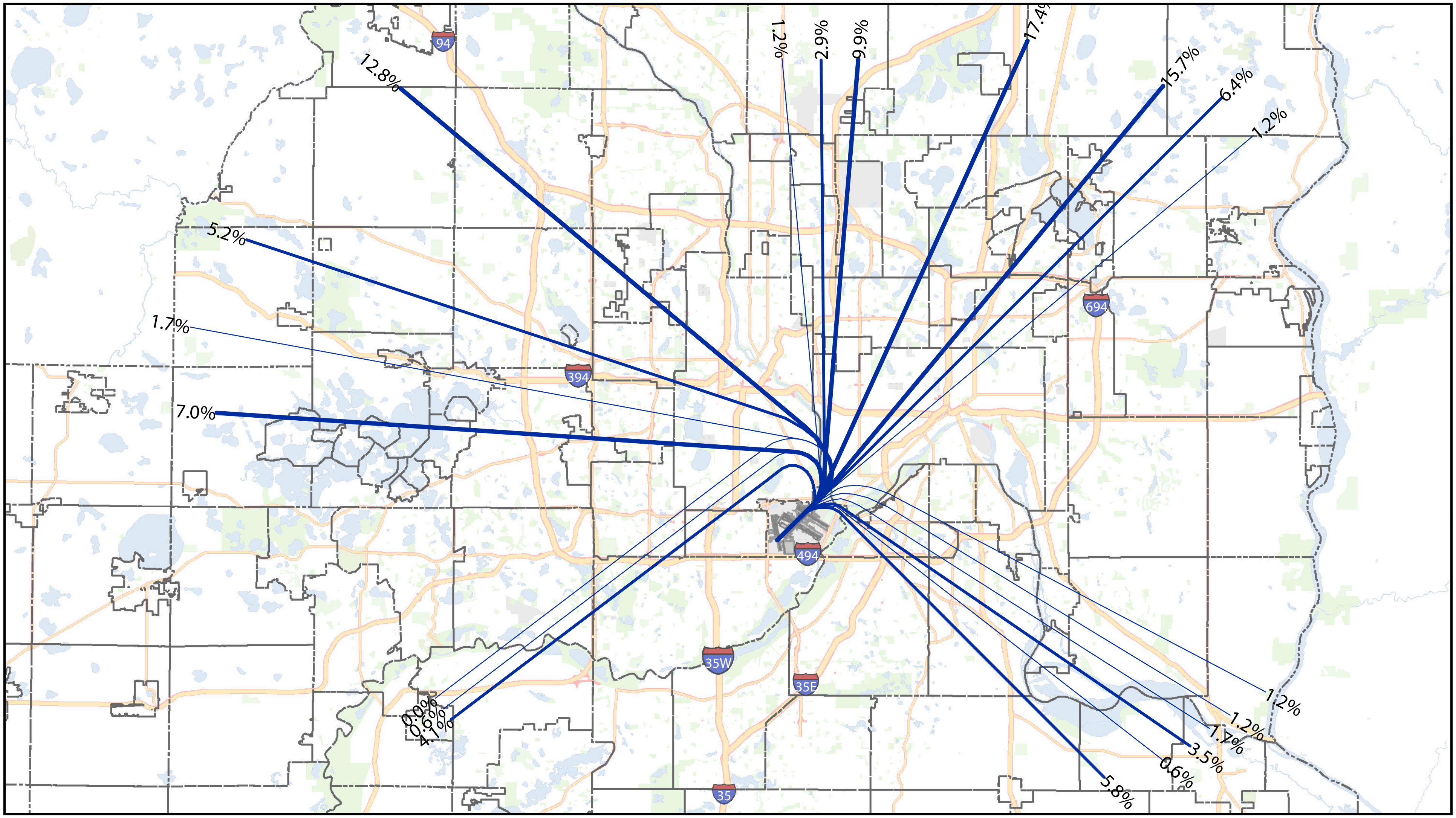
2010 INM Tracks - Runway 30R Departures
Overall Use Percentage

N

0 3 6 Miles

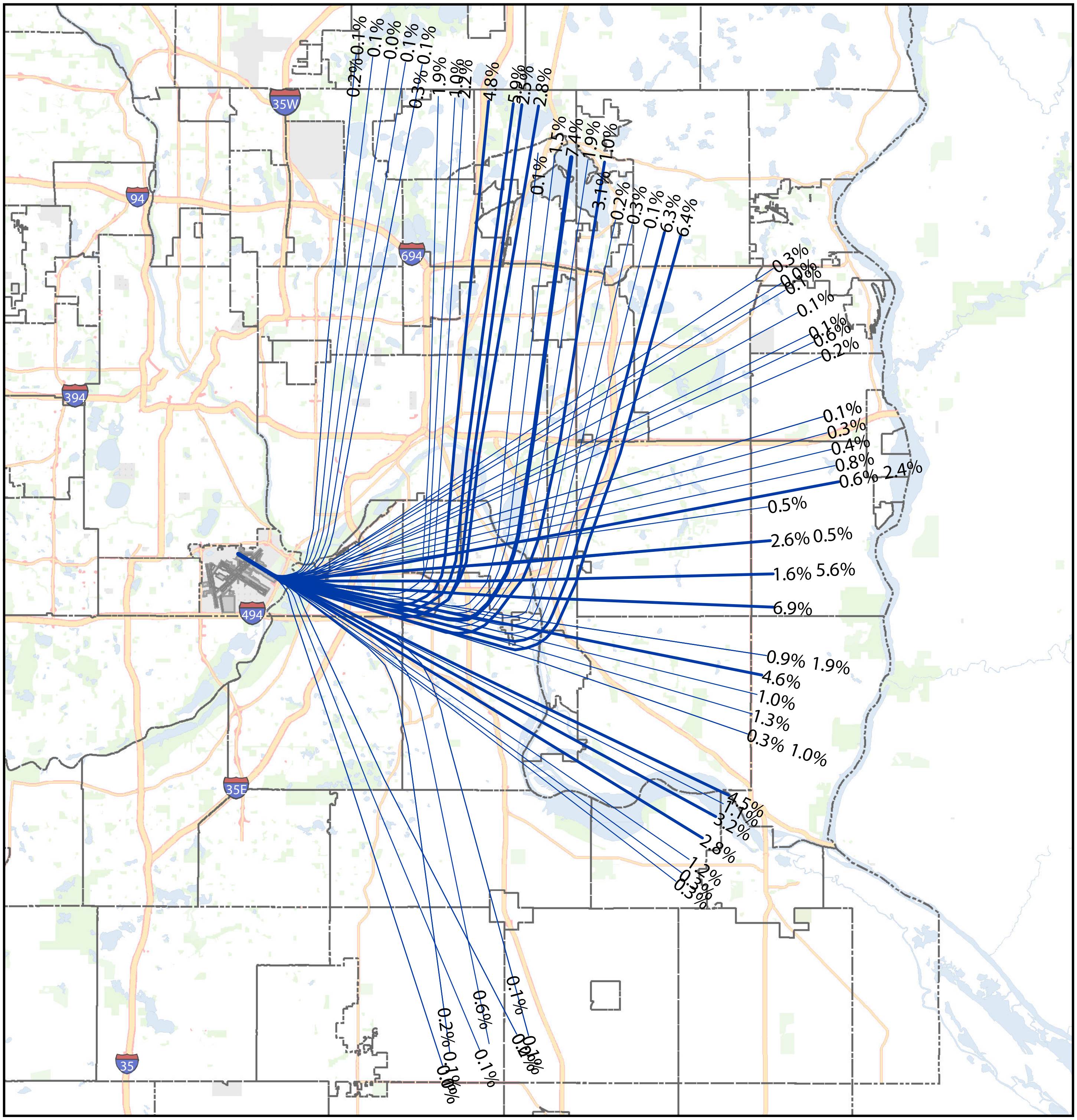
Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

FIGURE
G.4-3



2010 INM Tracks -Runway 04 Departures
Overall Use Percentage

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.



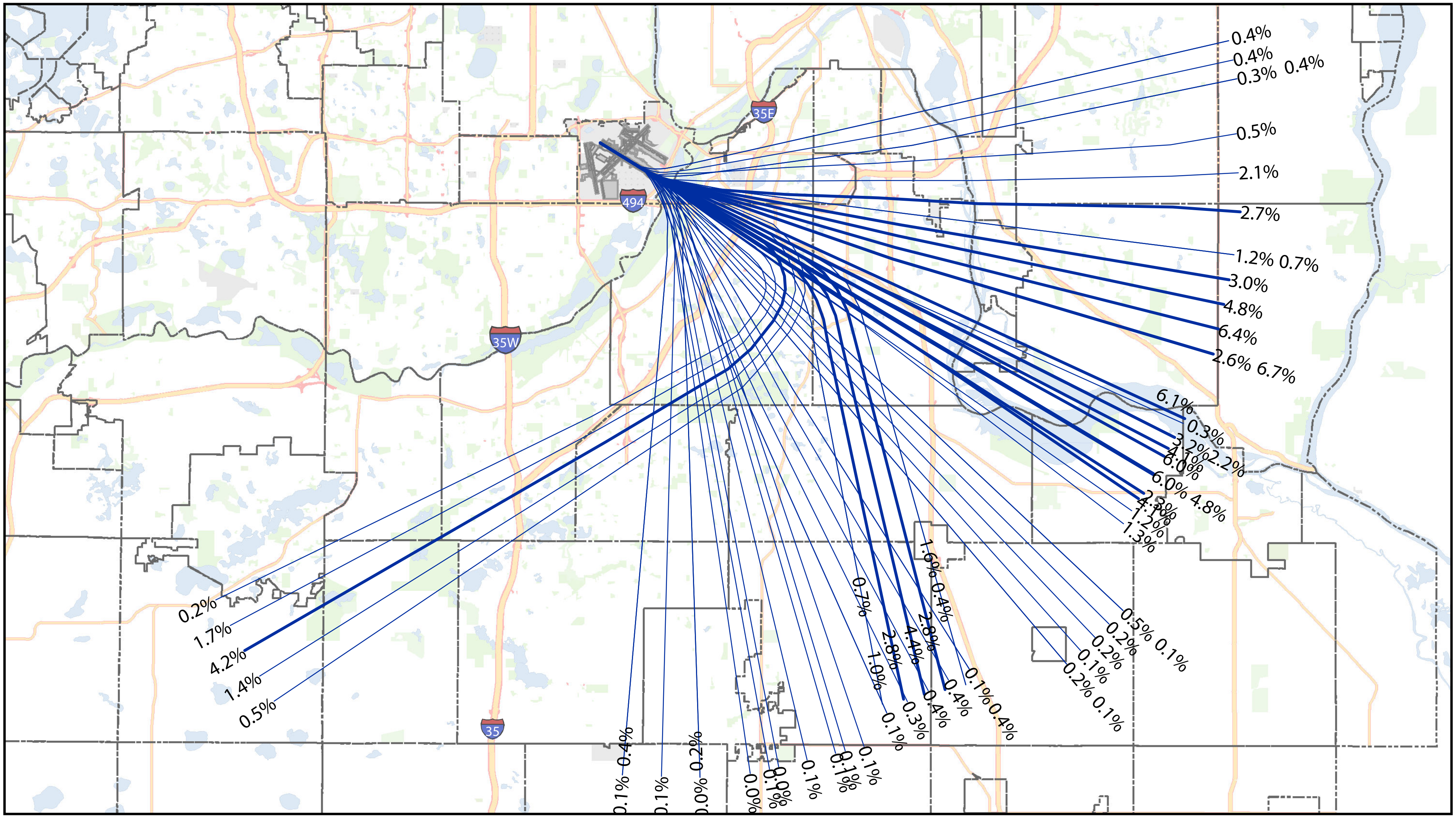
2010 INM Tracks - Runway 12L Departures
Overall Use Percentage

N

Miles
0 4 8

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

FIGURE
G.4-5

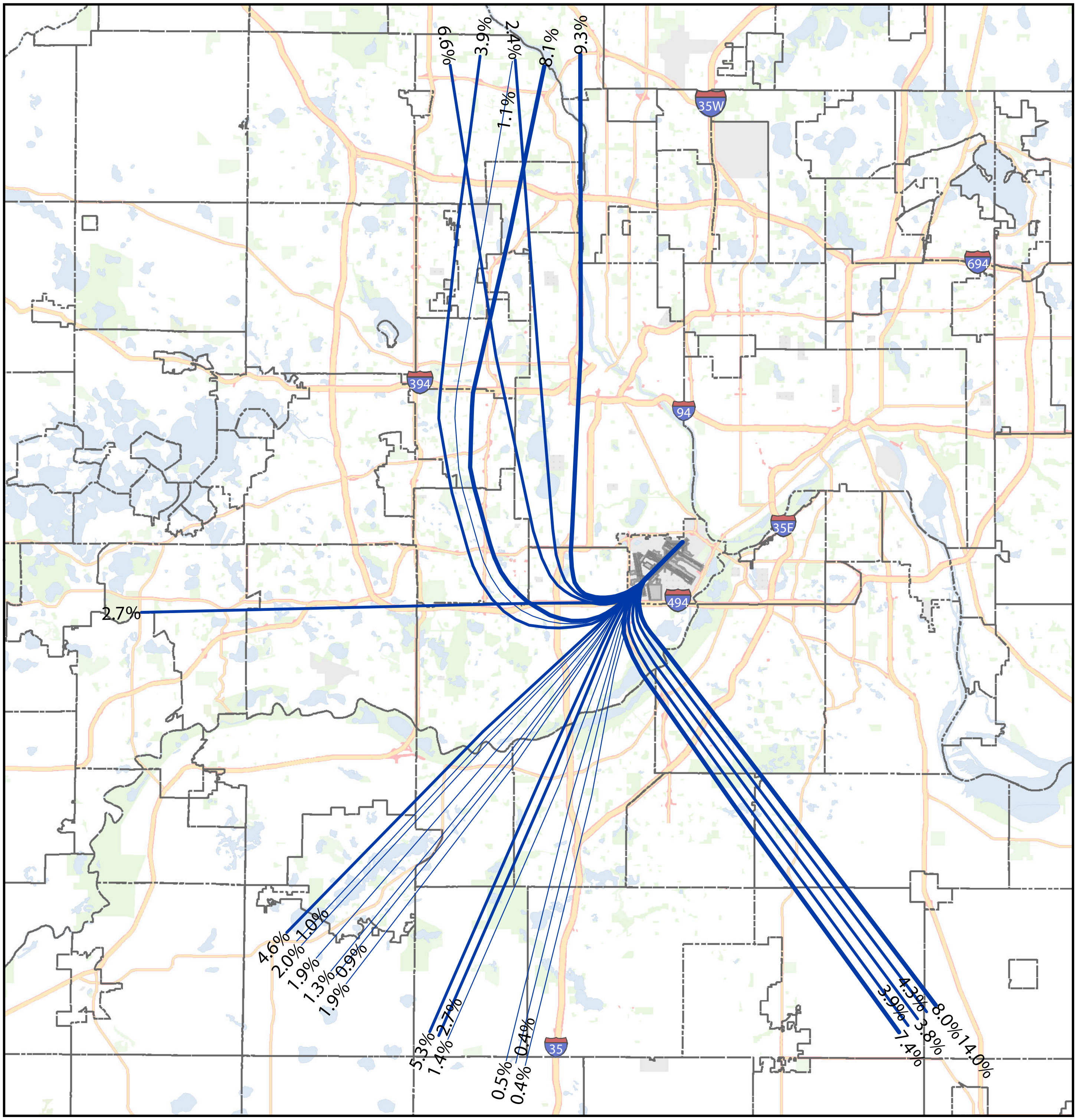


2010 INM Tracks -Runway 12R Departures
Overall Use Percentage

N

0 12,500 25,000 Meters

MAC METROPOLITAN AIRPORTS COMMISSION MINNEAPOLIS SAINT PAUL



2010 INM Tracks - Runway 22 Departures
Overall Use Percentage

N

0 4 8 Miles

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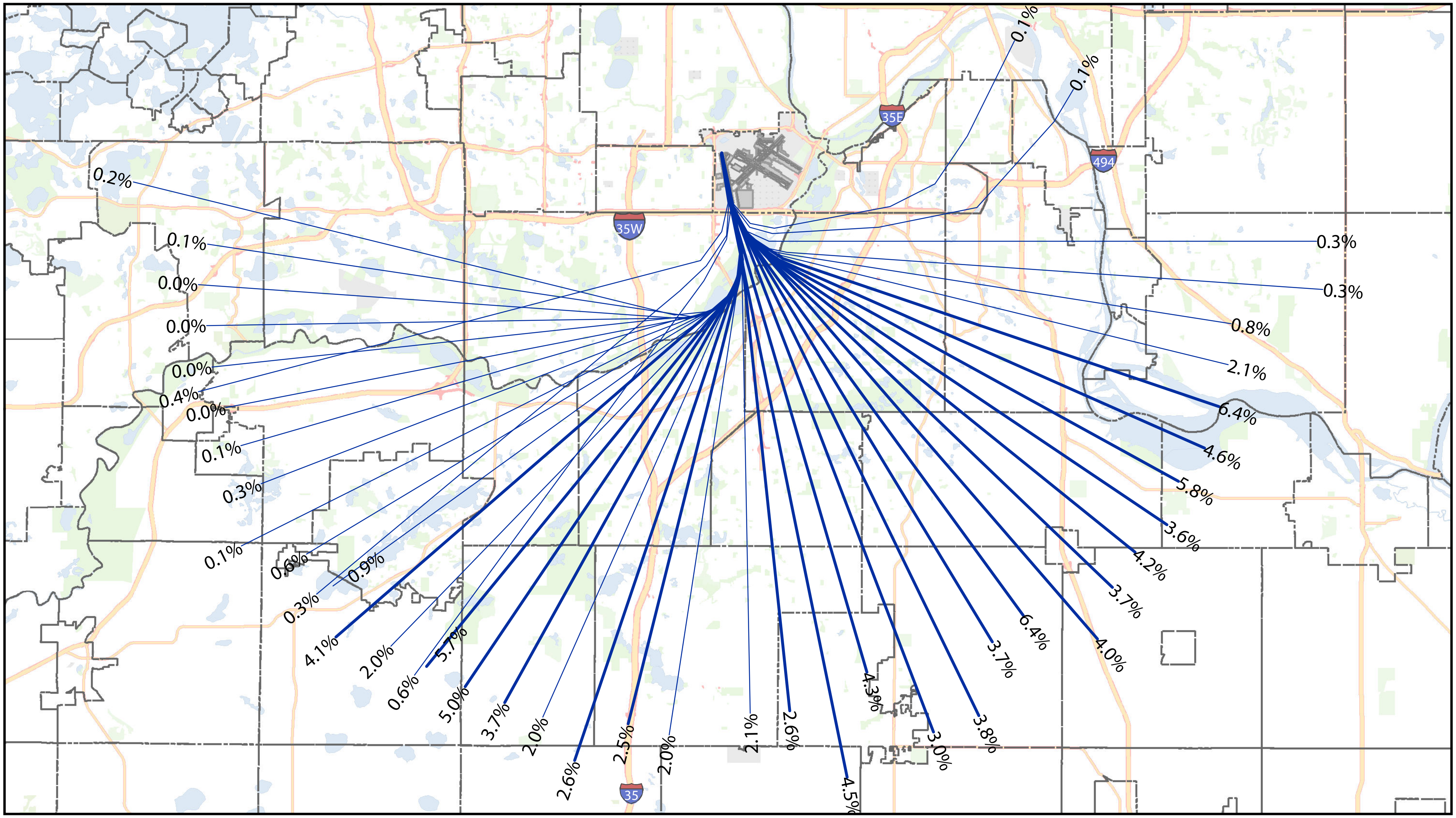
FIGURE
G.4-7

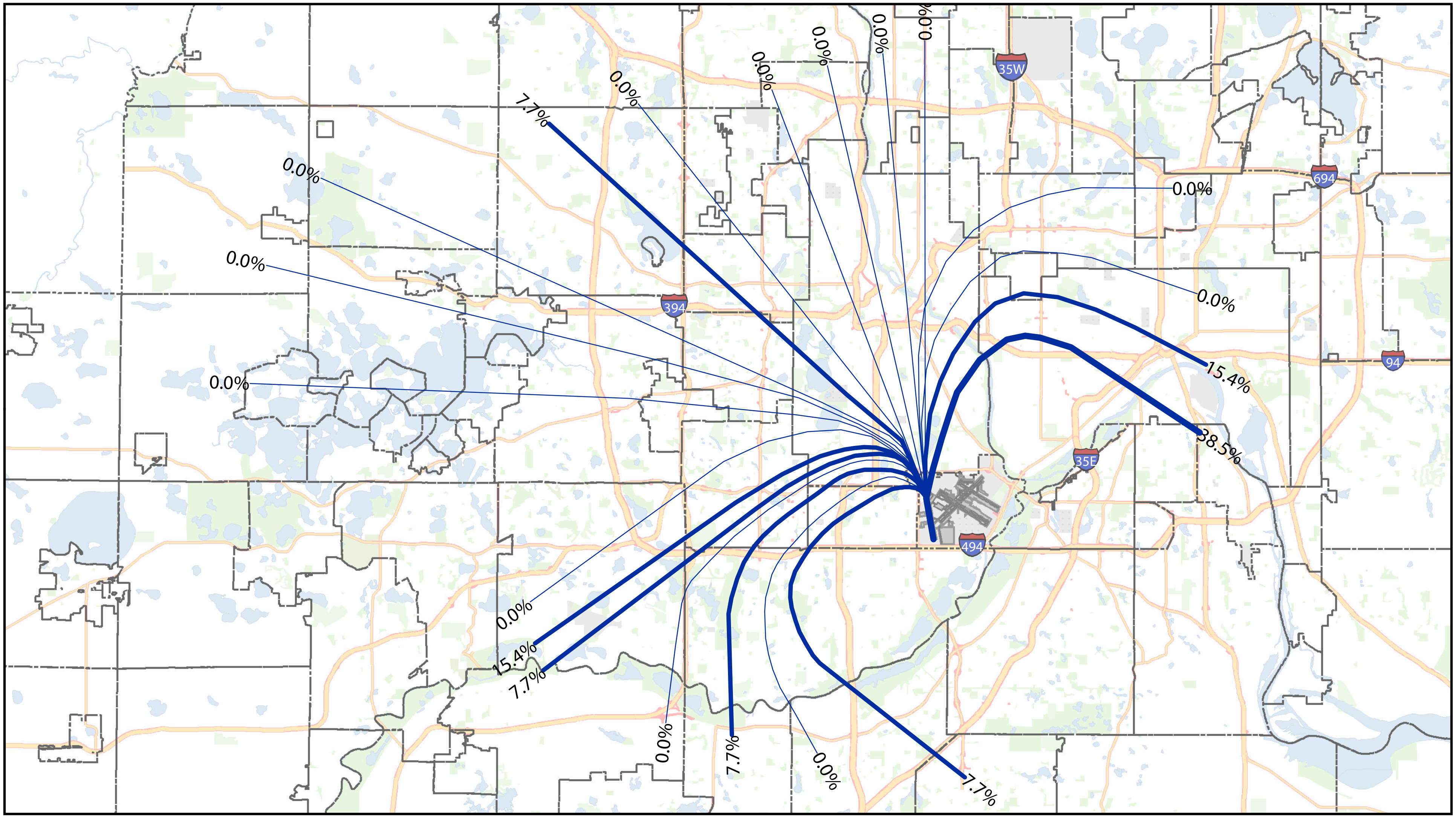


2010 INM Tracks -Runway 17 Departures Overall Use Percentage

N

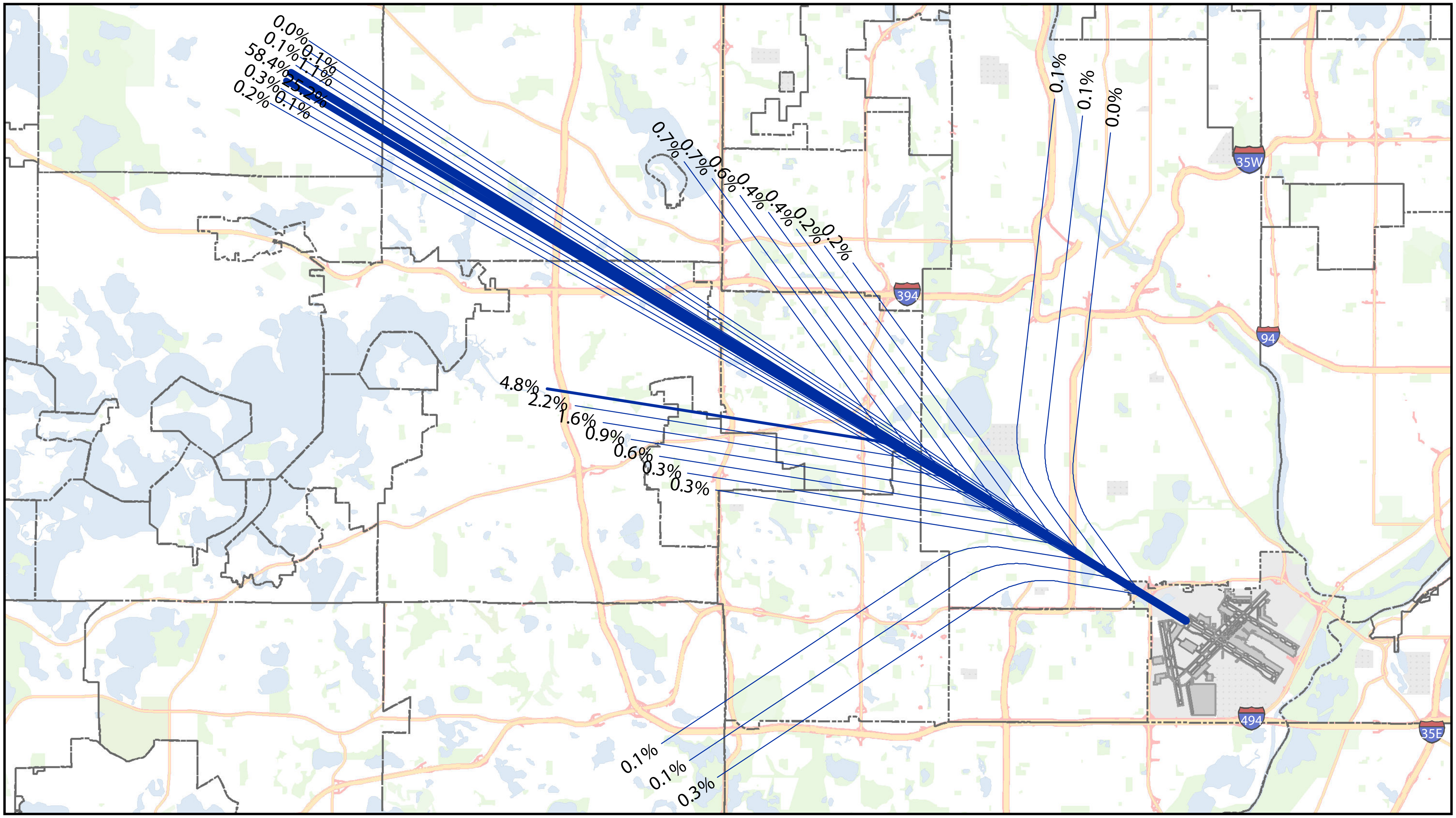
0 12,500 25,000 Meters

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.



2010 INM Tracks -Runway 35 Departures
Overall Use Percentage

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.



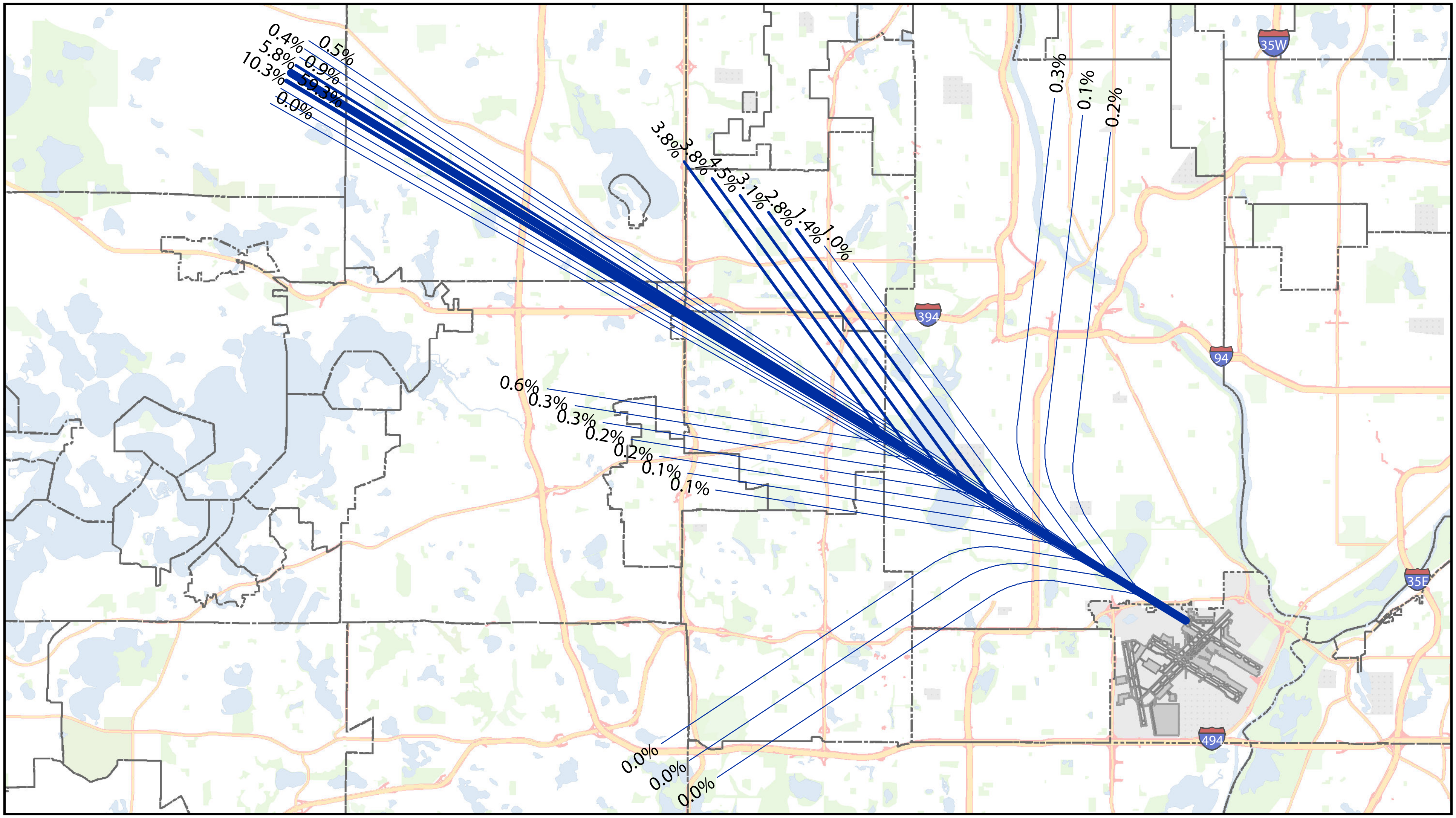
2010 INM Tracks -Runway 12R Arrivals
Overall Use Percentage

N

0 7,400 14,800 Meters

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

FIGURE G.4-10



2010 INM Tracks -Runway 12L Arrivals
Overall Use Percentage

N

0 7,400 14,800 Meters

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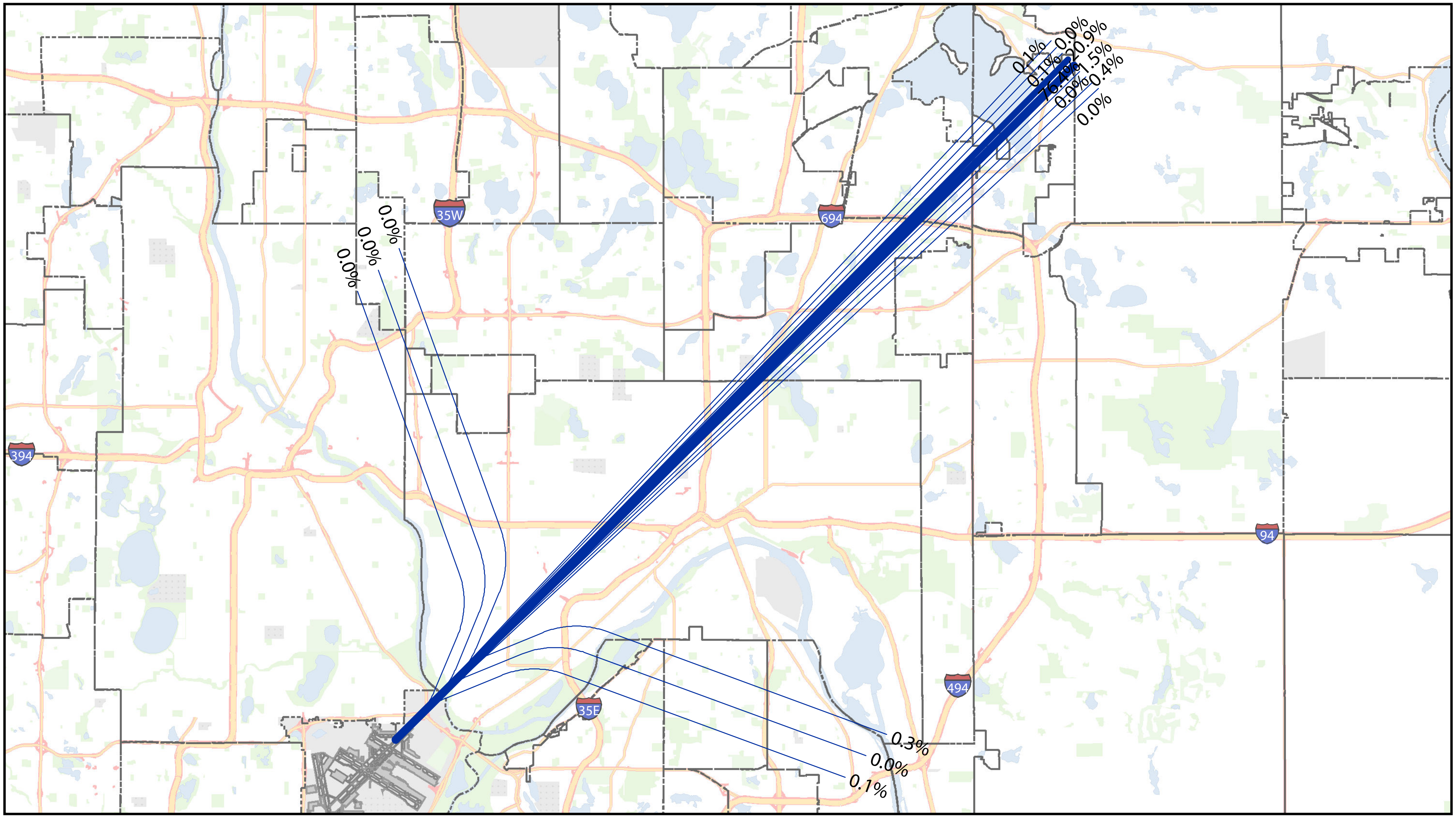
MAC



2010 INM Tracks -Runway 22 Arrivals
Overall Use Percentage

N

0 8,100 16,200 Meters

MAC

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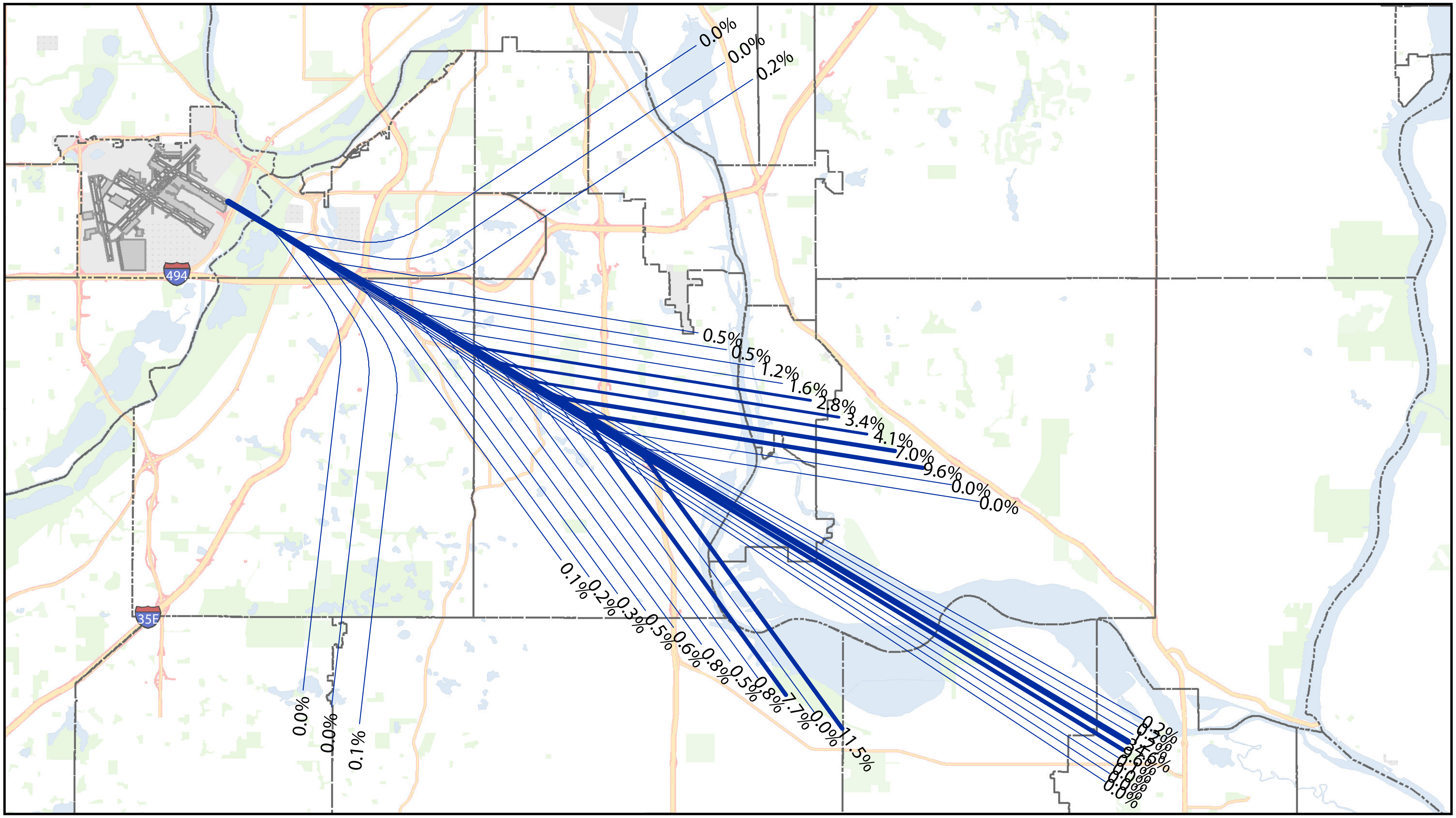

2010 INM Tracks -Runway 30R Arrivals
Overall Use Percentage

N

0 7,400 14,800 Meters

MAC — Metropolitan Airports Commission, Minneapolis Saint Paul

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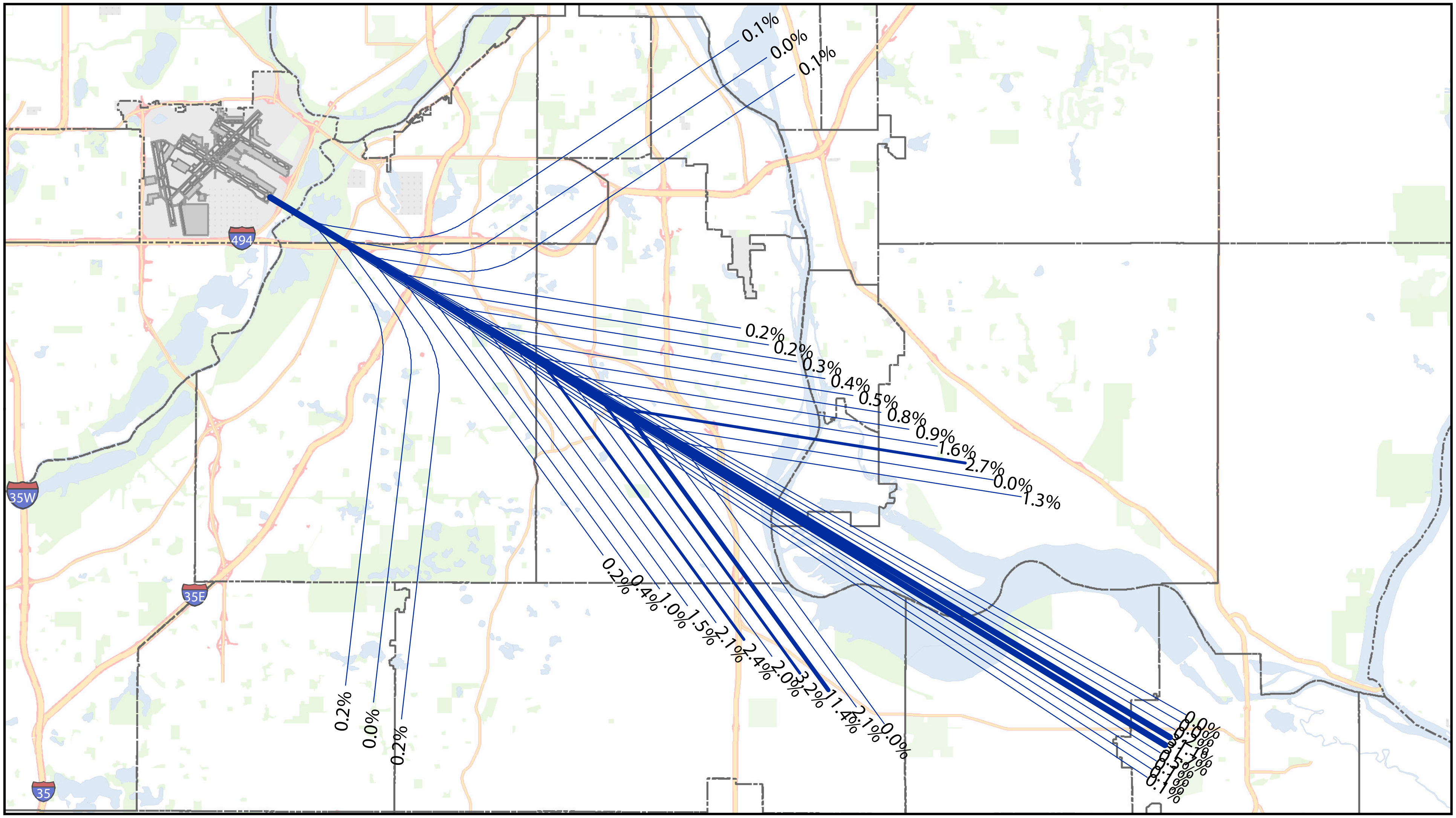
FIGURE
G.4-13



2010 INM Tracks -Runway 30L Arrivals
Overall Use Percentage

N

0 7,400 14,800 Meters

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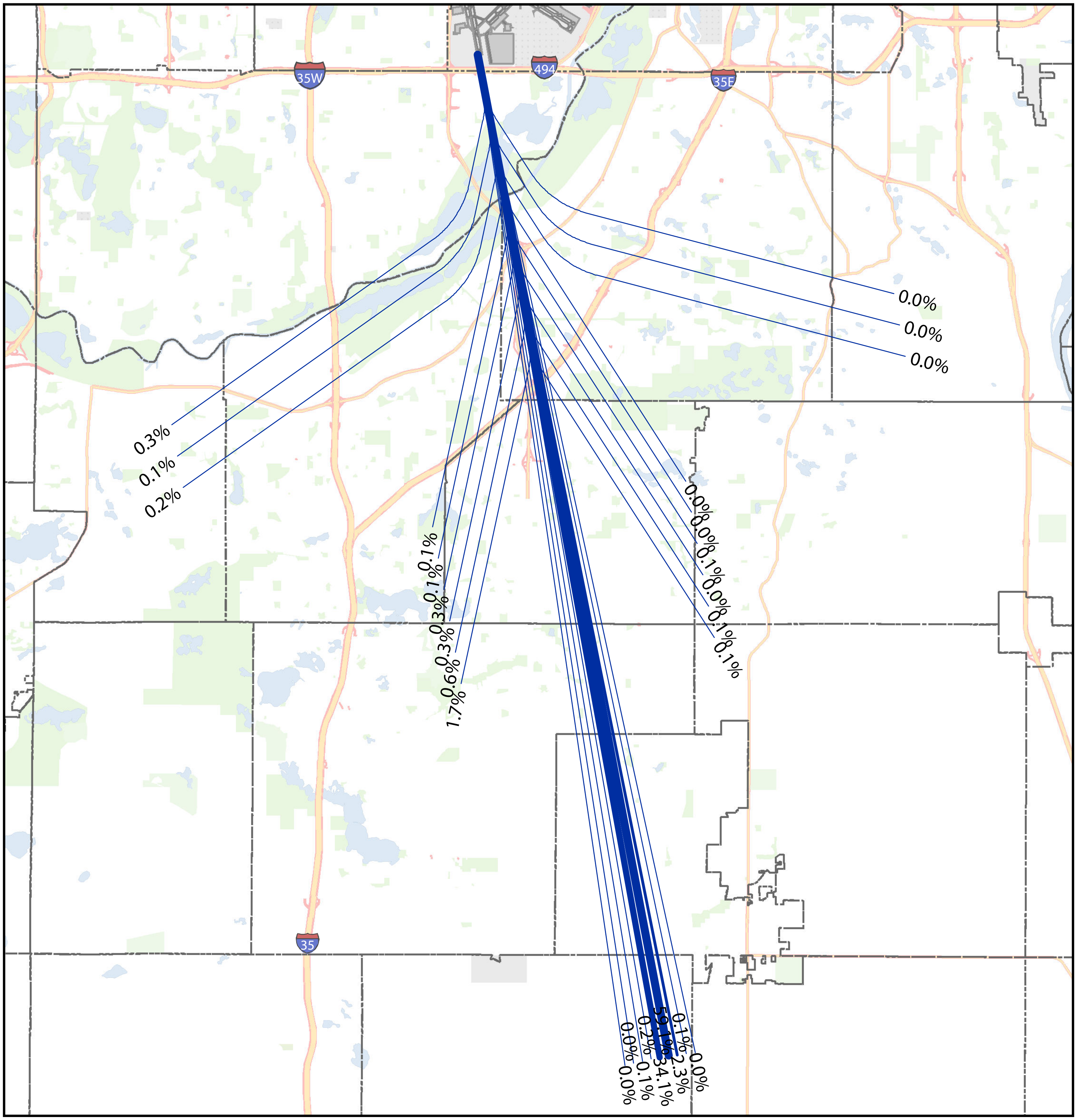


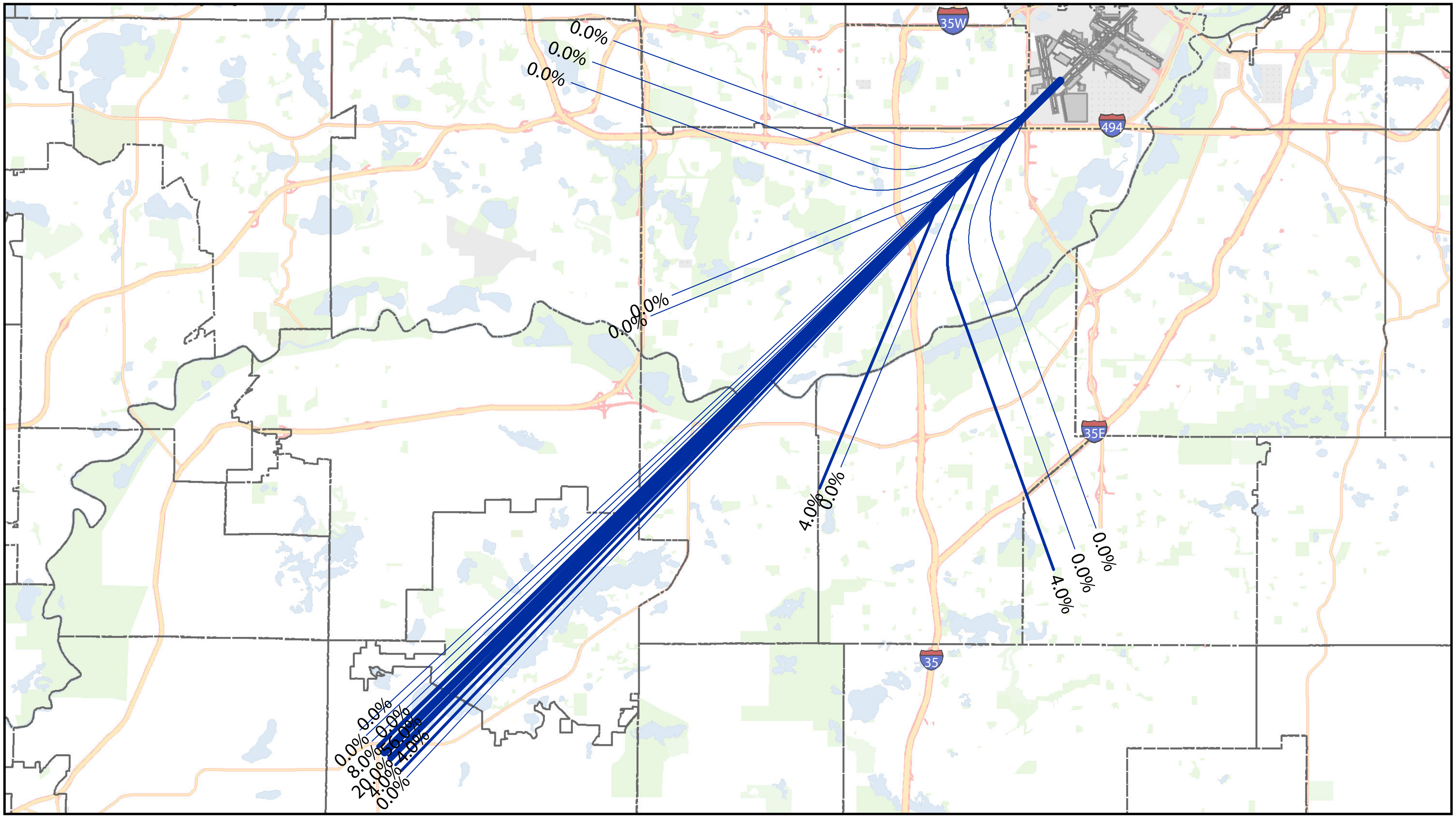
2010 INM Tracks - Runway 35 Arrivals
Overall Use Percentage

N

0 2 4 Miles

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

FIGURE G.4-15



2010 INM Tracks -Runway 04 Arrivals
Overall Use Percentage

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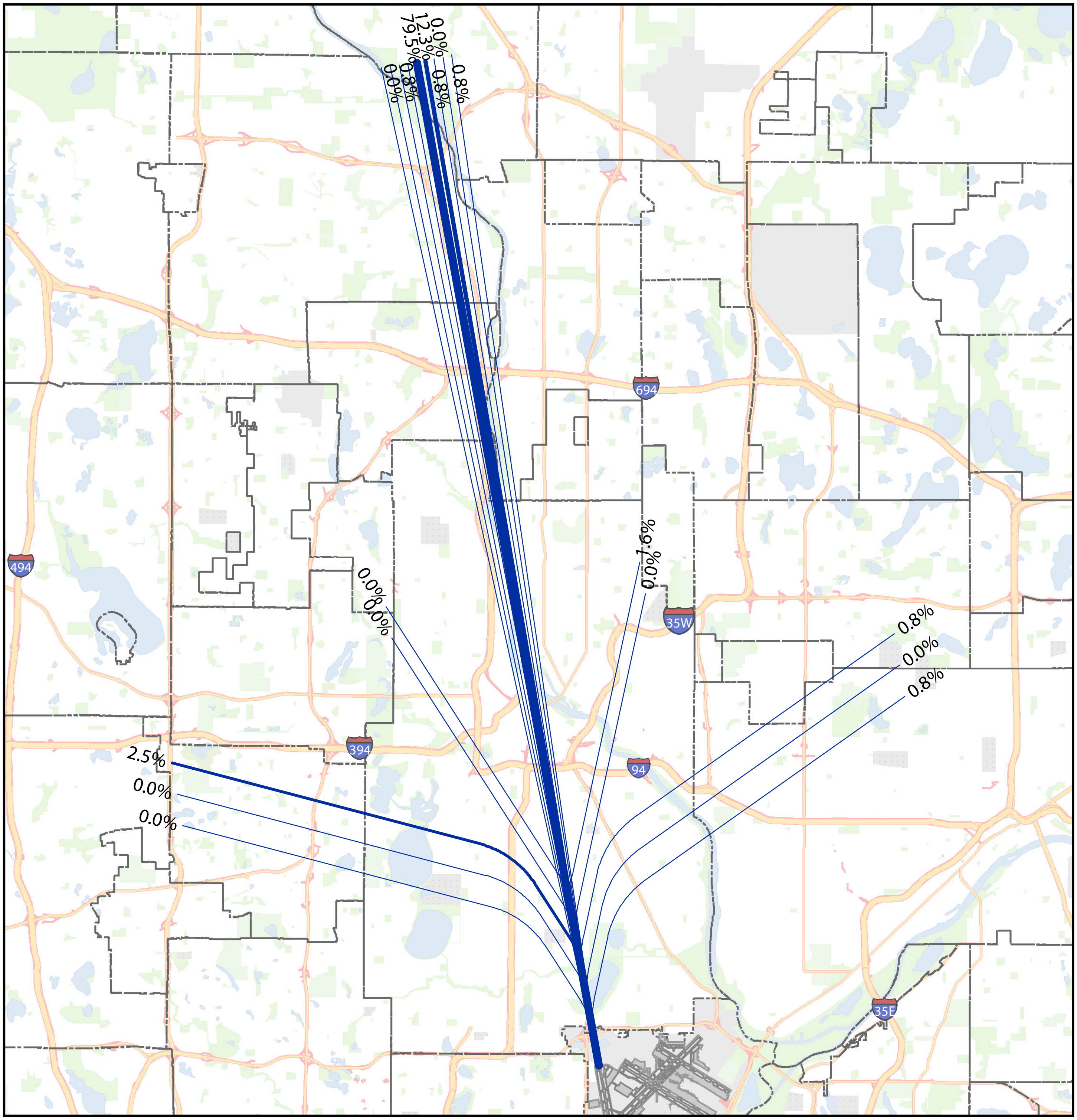
Minneapolis-St. Paul International Airport 2020 Improvements EA

FIGURE G.4-16



2010 INM Tracks - Runway 17 Arrivals
Overall Use Percentage

N

0 2 4 Miles

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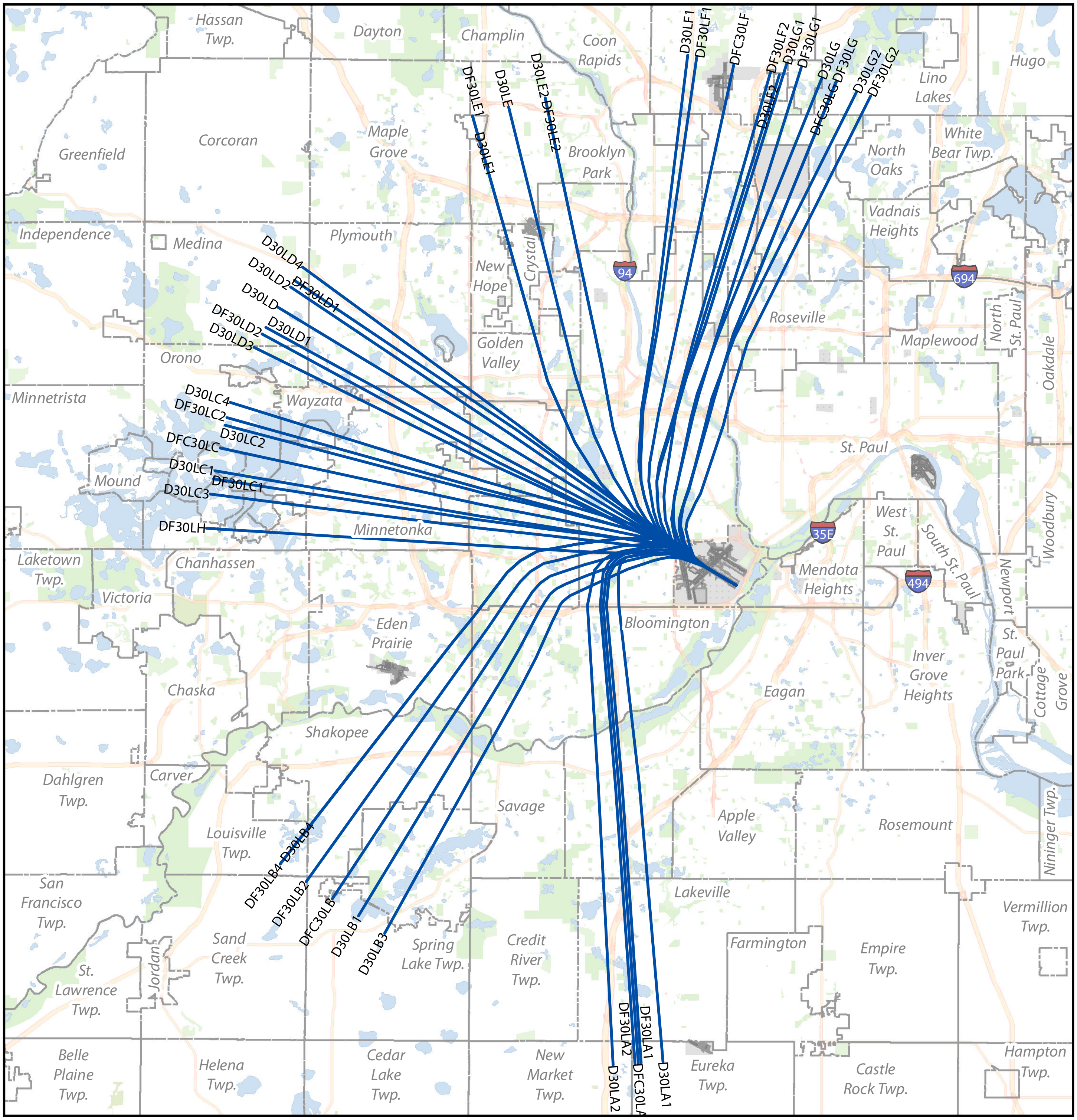
FIGURE G.4-17



INM Tracks - Runway 30L Departures

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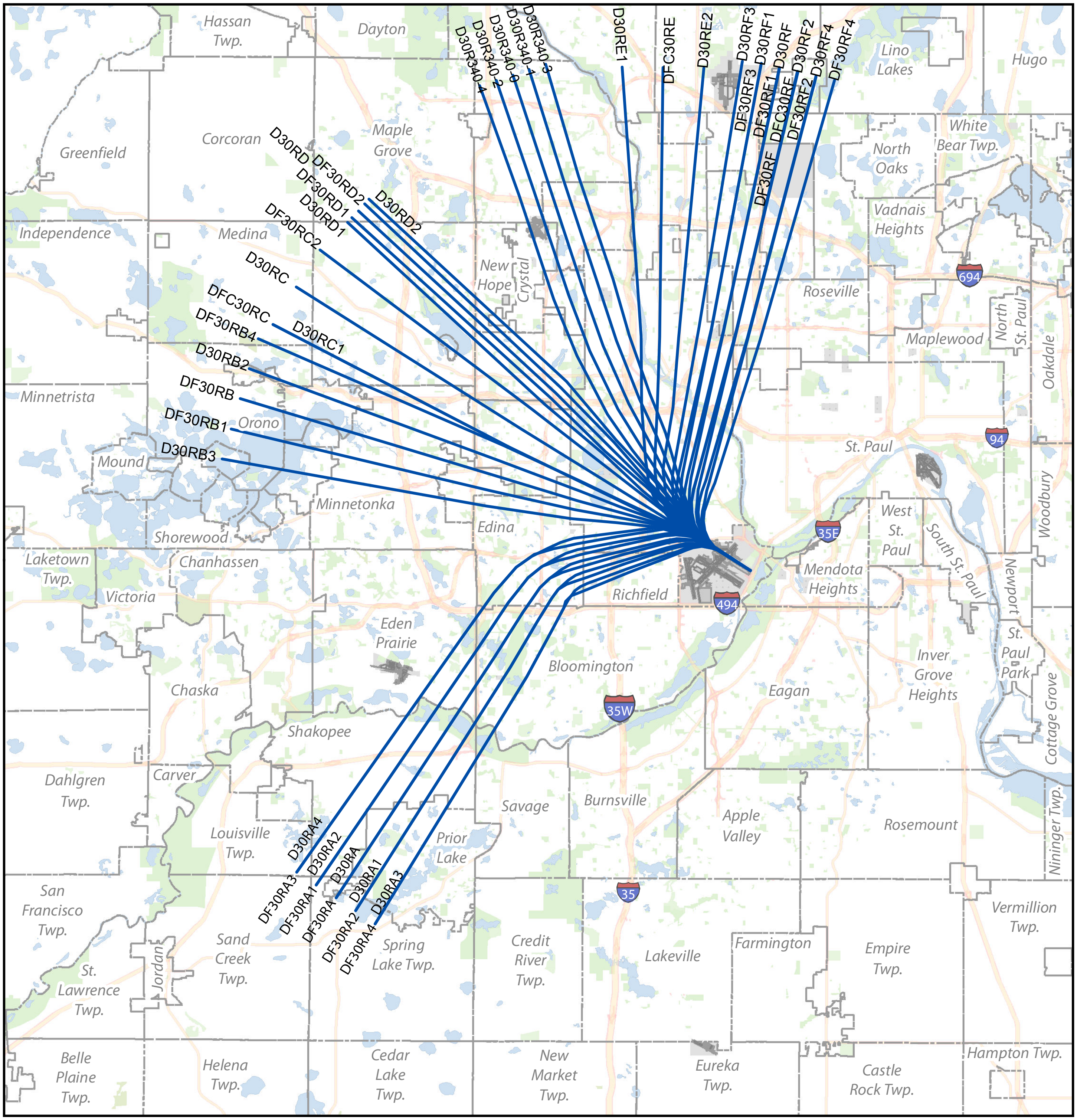
FIGURE
G.4-18



INM Tracks - 30R Departures

N

Miles
0 4 8

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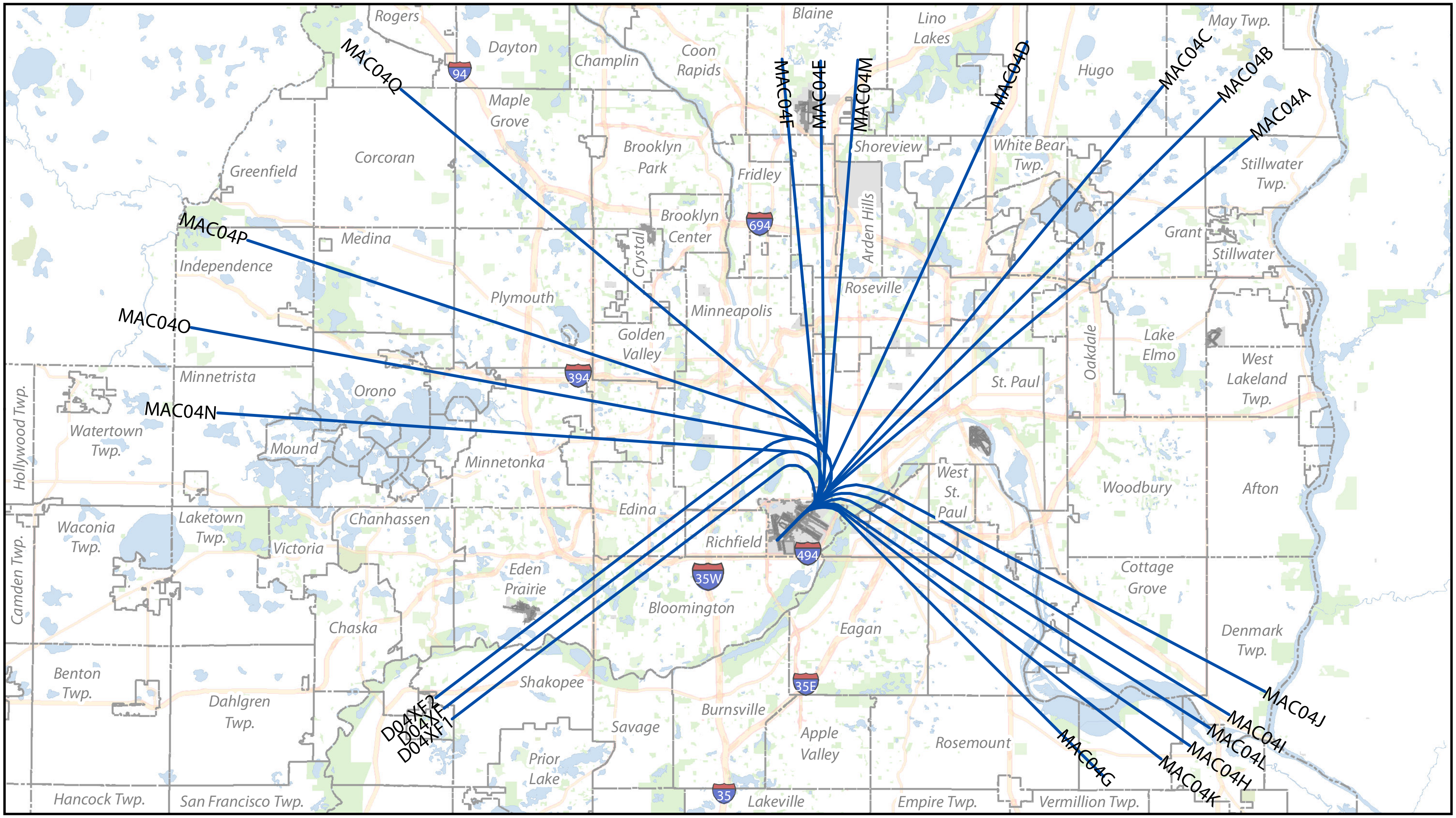

INM Tracks - Runway 04 Departures

N

0 18,000 36,000 Meters

METROPOLITAN AIRPORTS COMMISSION MINNEAPOLIS SAINT PAUL MAC

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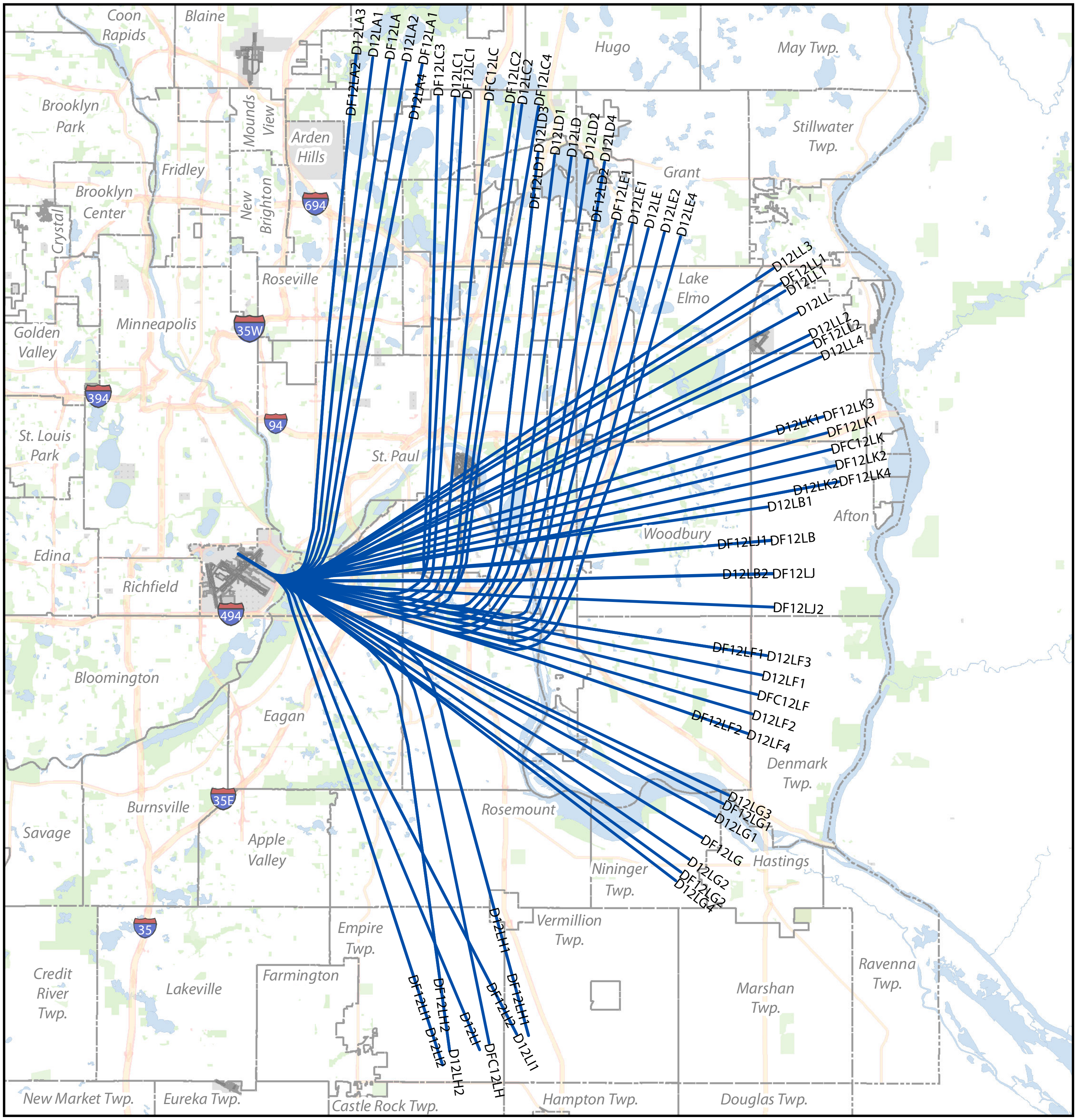
FIGURE
G.4-20



INM Tracks - 12L Departures

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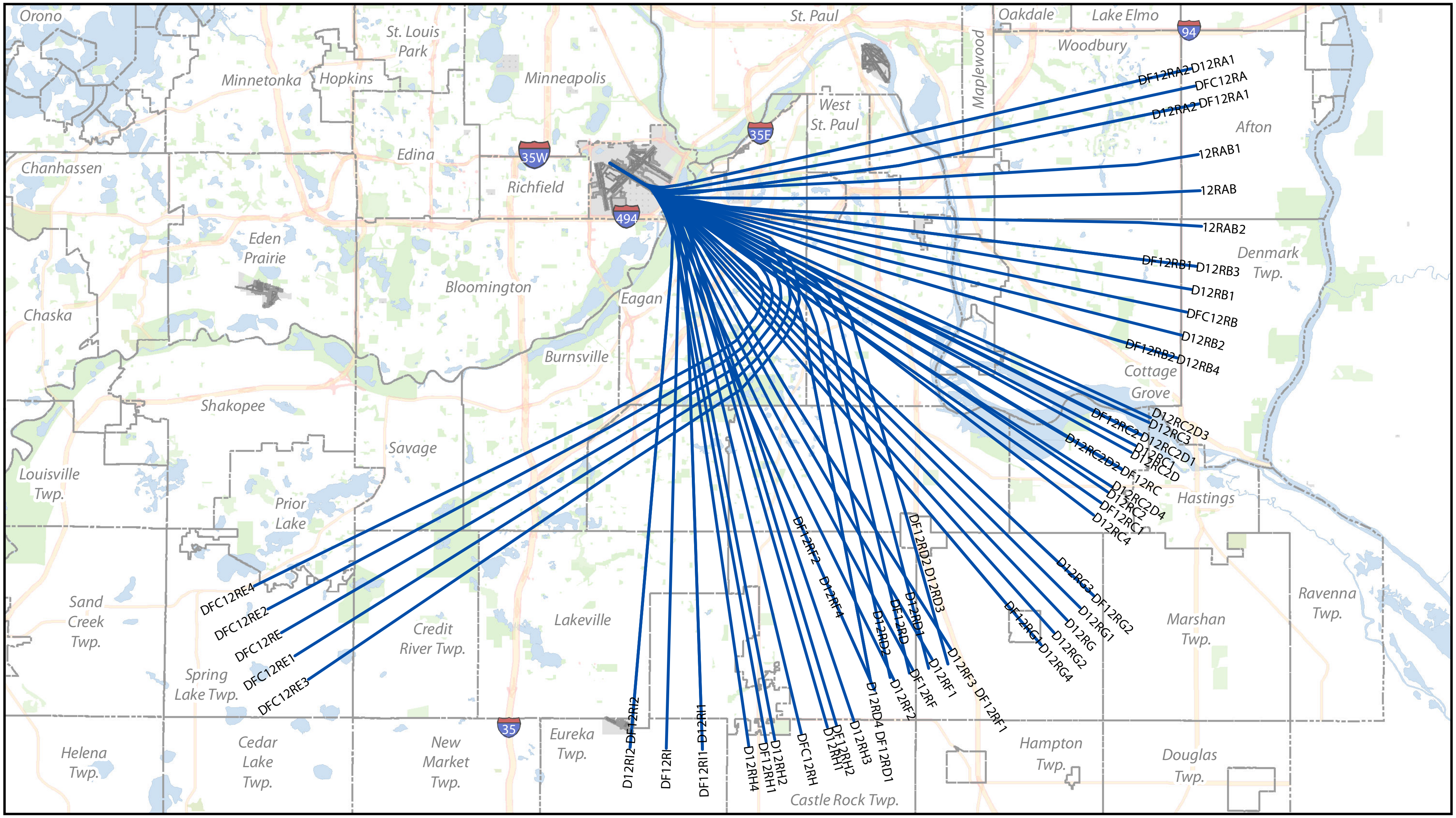

INM Tracks - Runway 12R Departures

N

0 | 13,000 | 26,000 Meters

MAC – Metropolitan Airports Commission, Minneapolis Saint Paul

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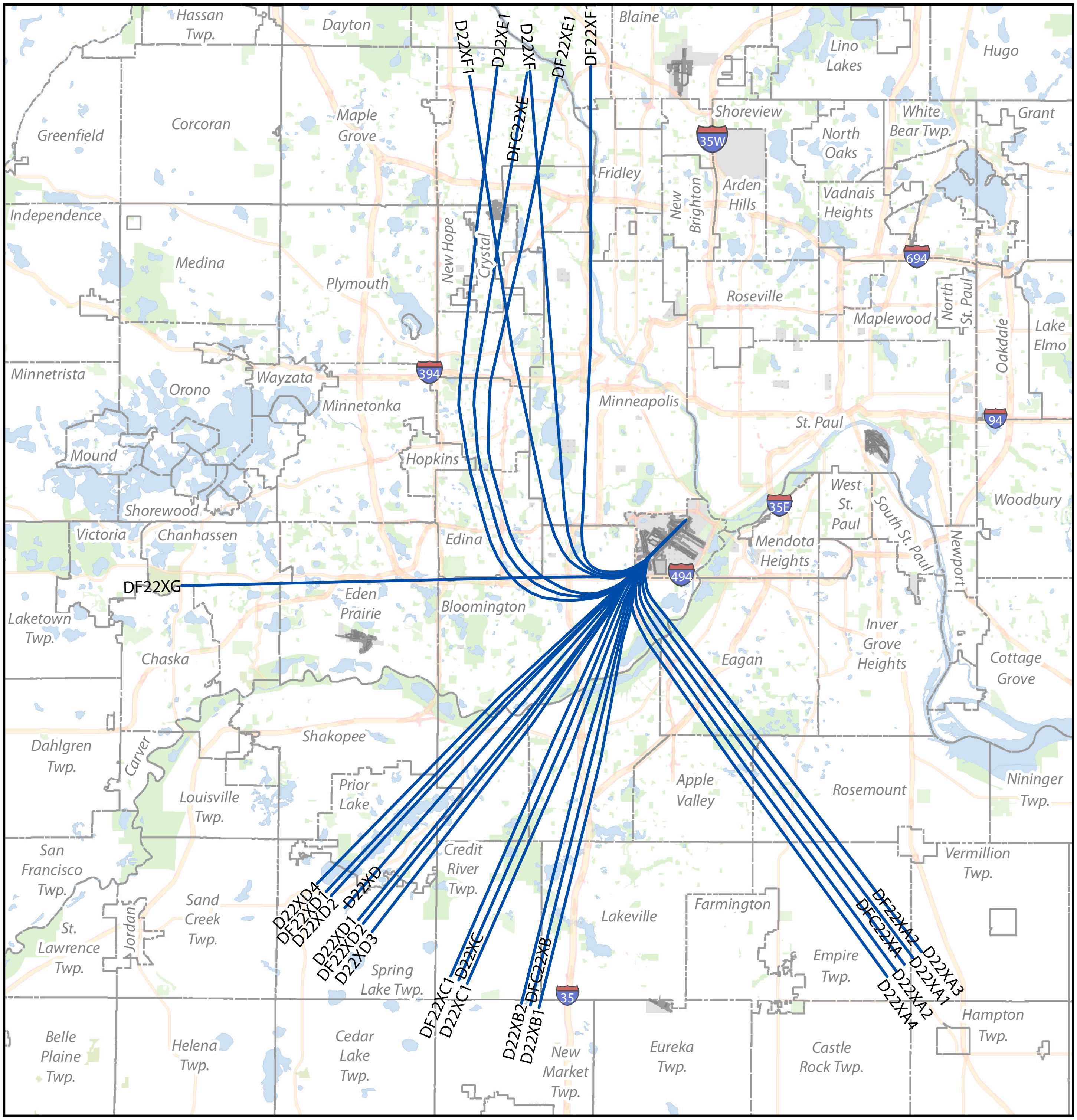
FIGURE G.4-22



INM Tracks - Runway 22 Departures

N

0 4 8 Miles

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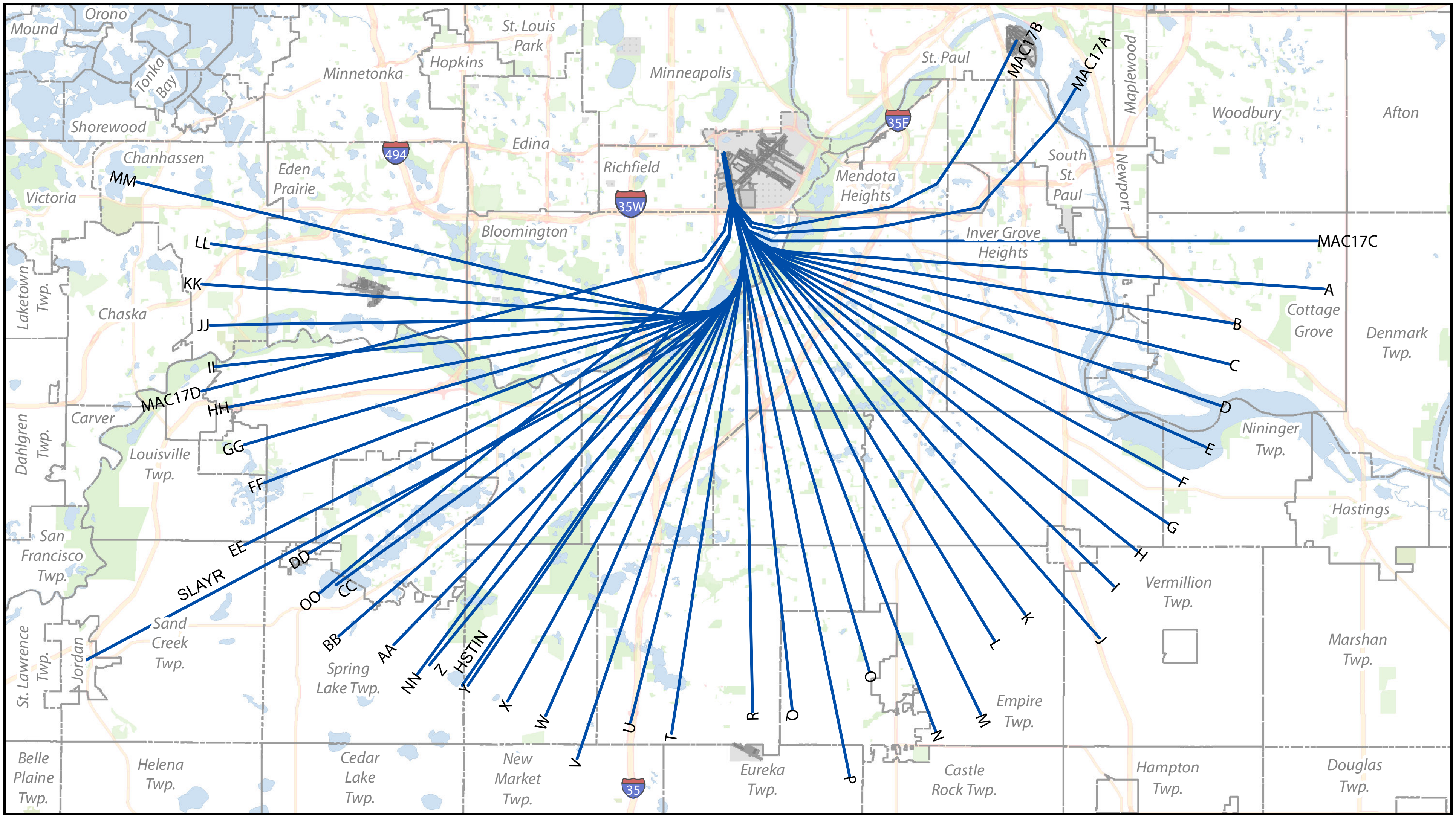
Minneapolis-St. Paul International Airport 2020 Improvements EA

FIGURE G.4-23



INM Tracks - Runway 17 Departures

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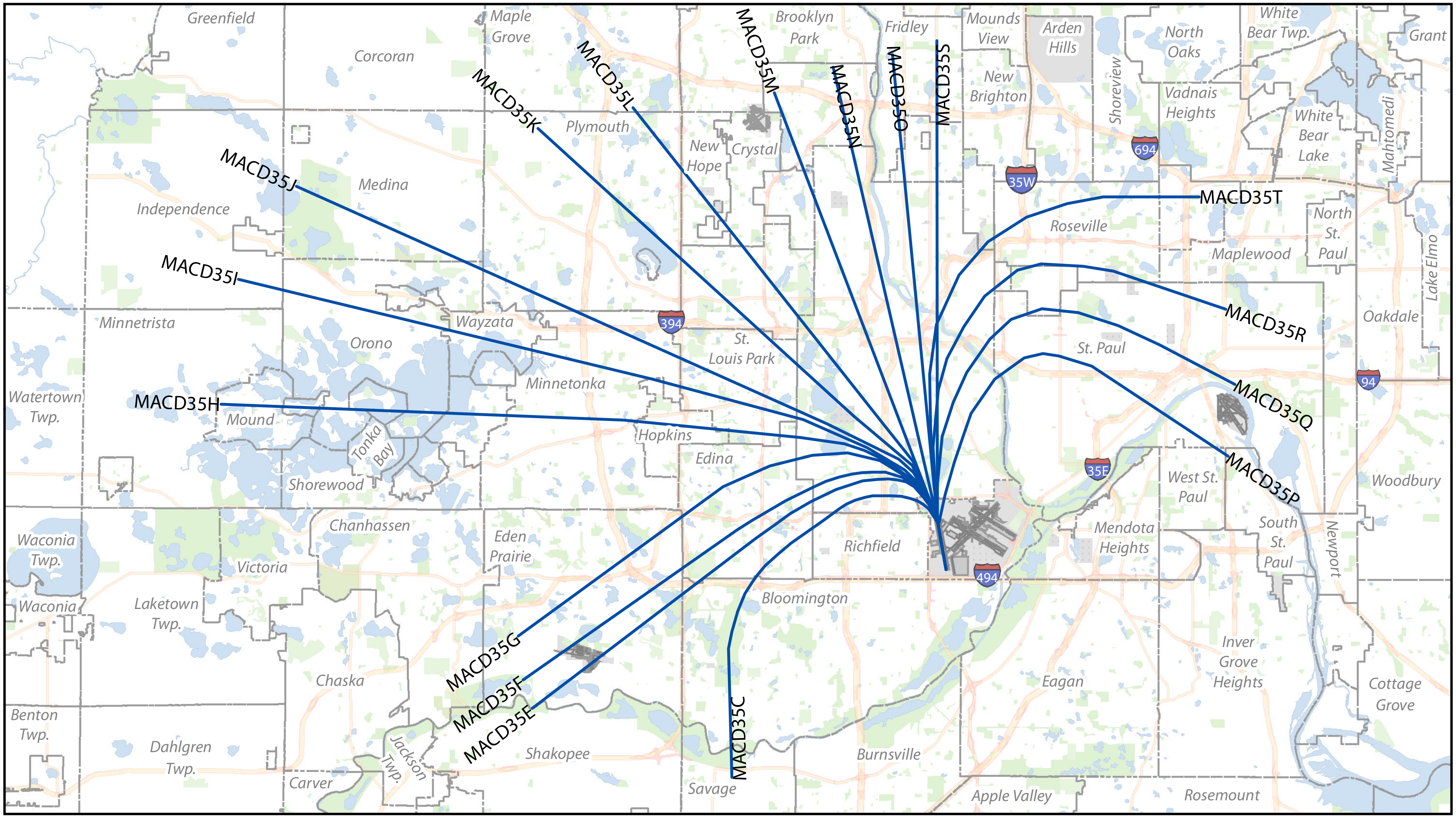
FIGURE
G.4-24



INM Tracks - Runway 35 Departures

N

0 12,500 25,000 Meters

MINNEAPOLIS SAINT PAUL METROPOLITAN AIRPORTS COMMISSION MAC

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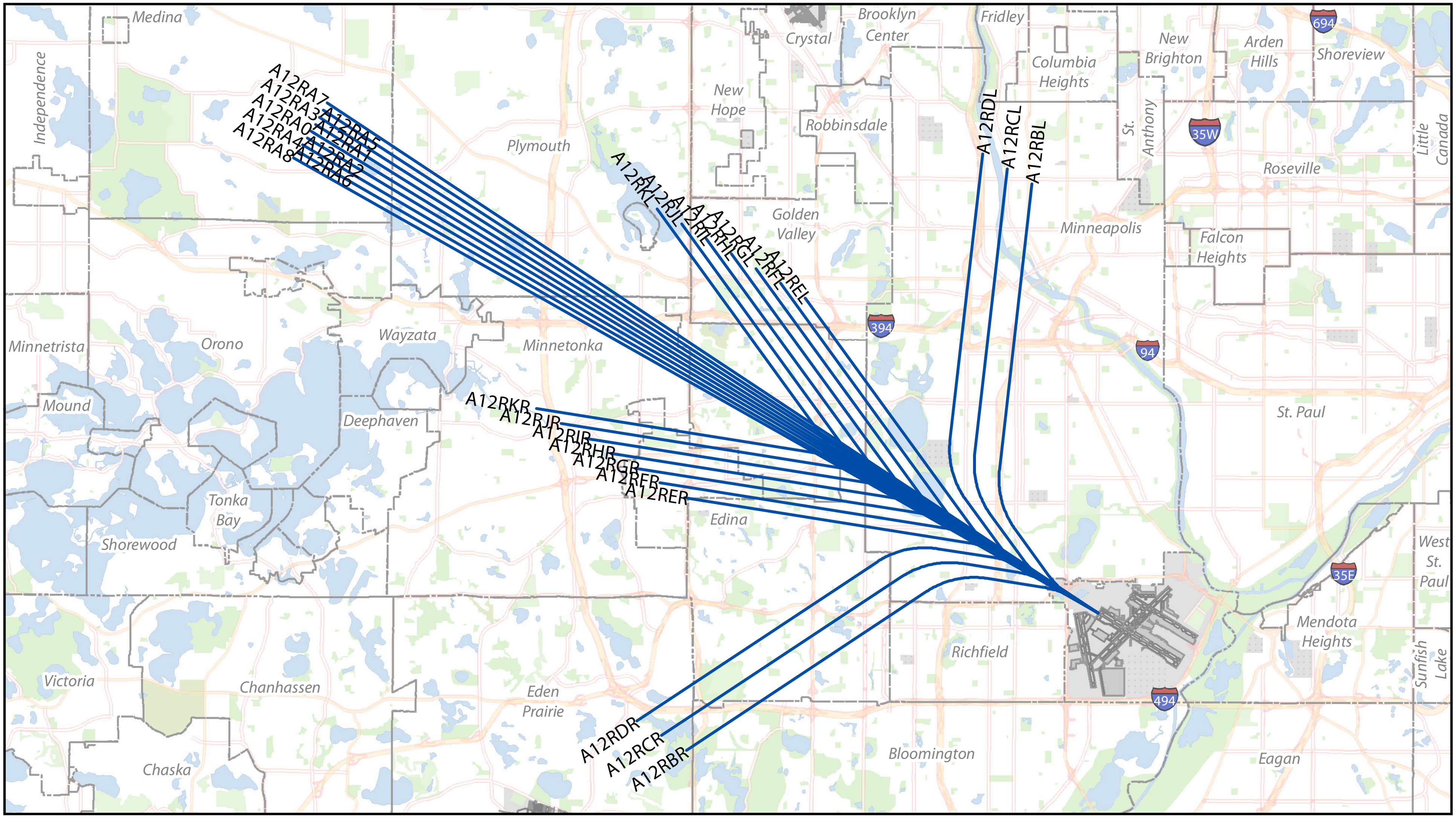
FIGURE G.4-25



INM Tracks - Runway 12R Arrivals

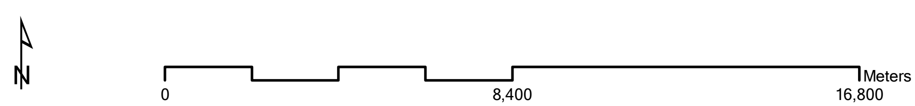


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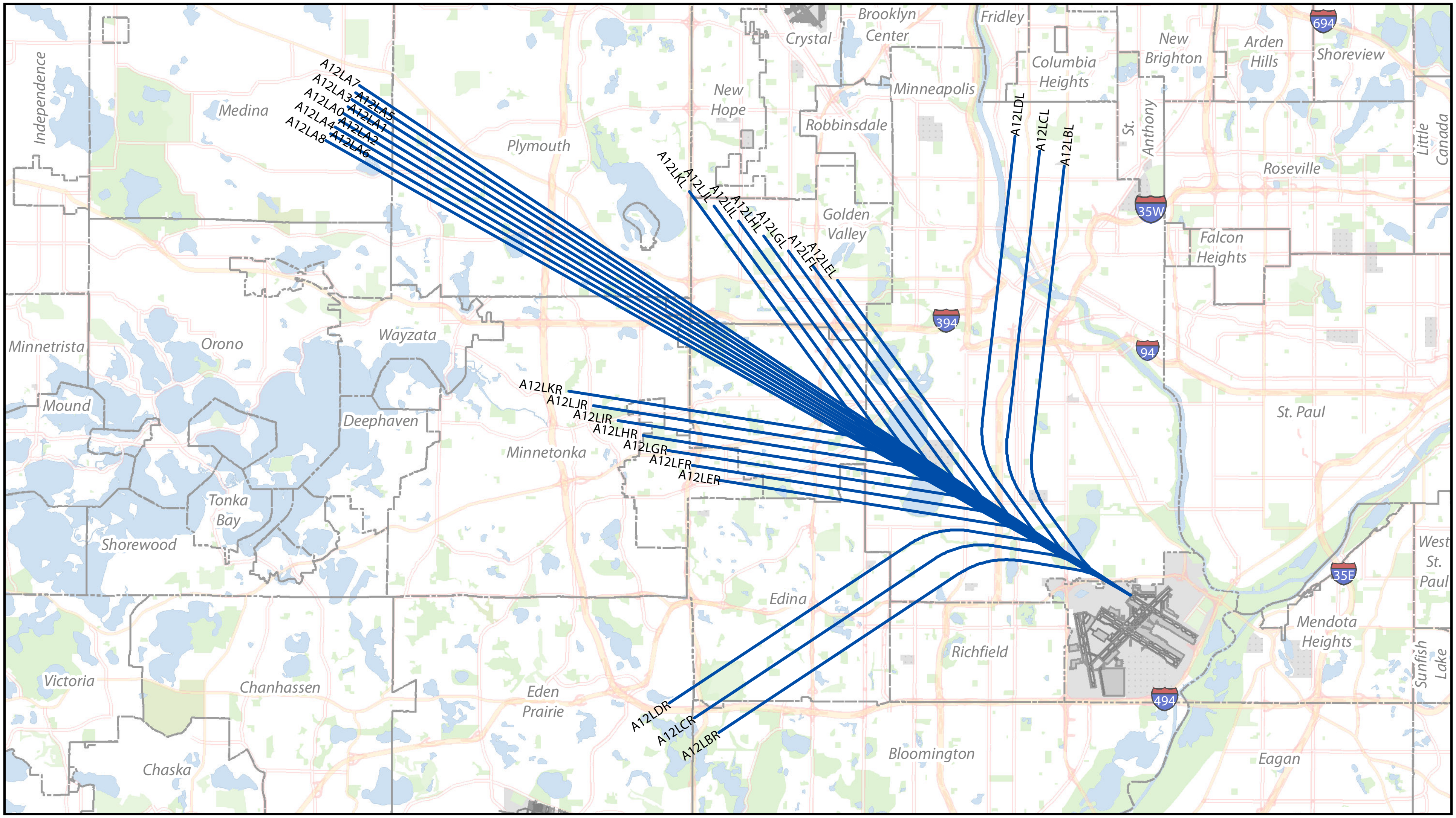
FIGURE G.4-26



INM Tracks - Runway 12L Arrivals

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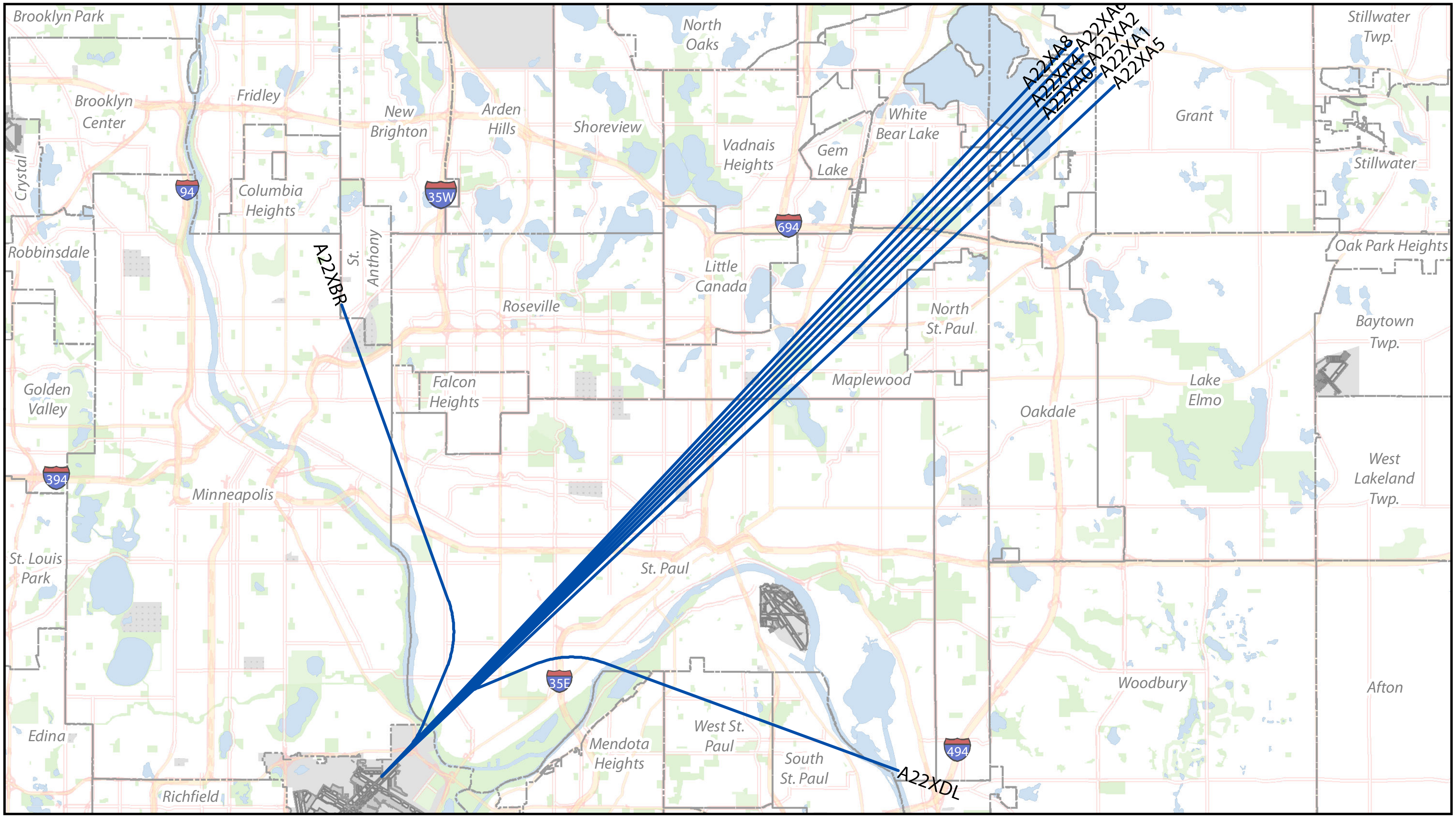
FIGURE G.4-27



INM Tracks - 22 Arrivals

N

0 7,700 15,400 Meters

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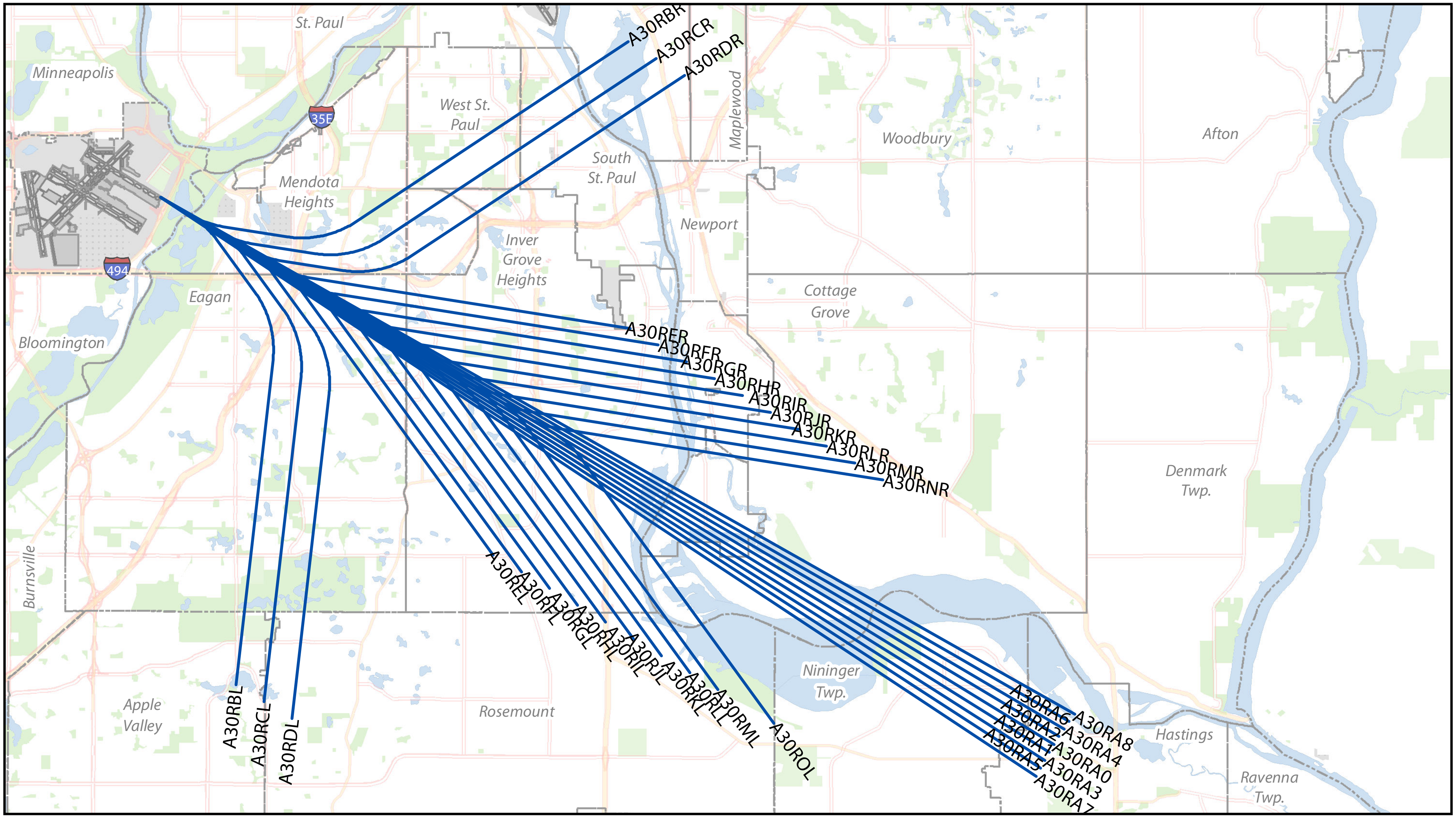
FIGURE G.4-28



INM Tracks - Runway 30R Arrivals

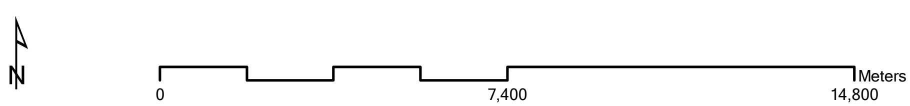


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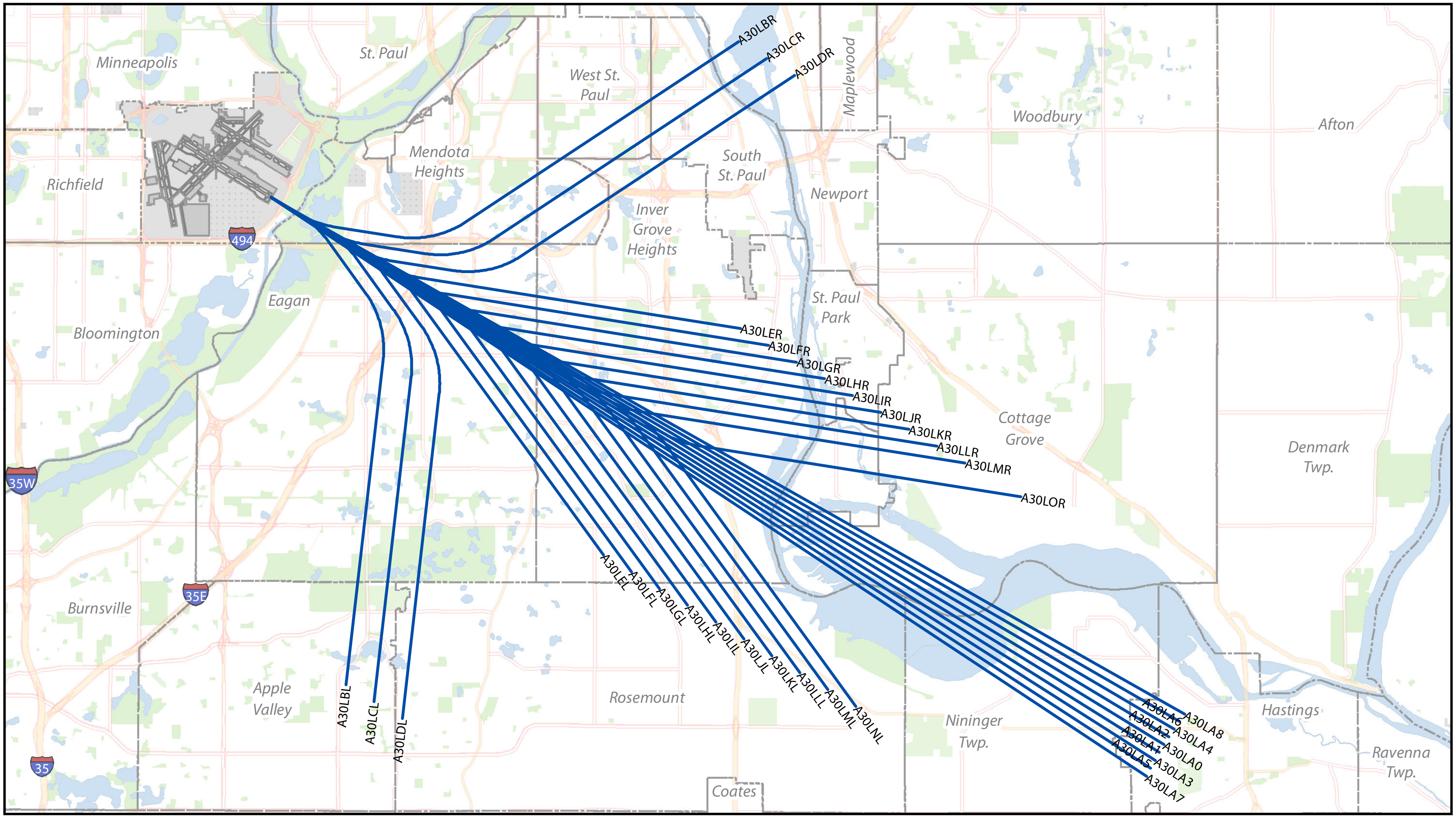
FIGURE
G.4-29



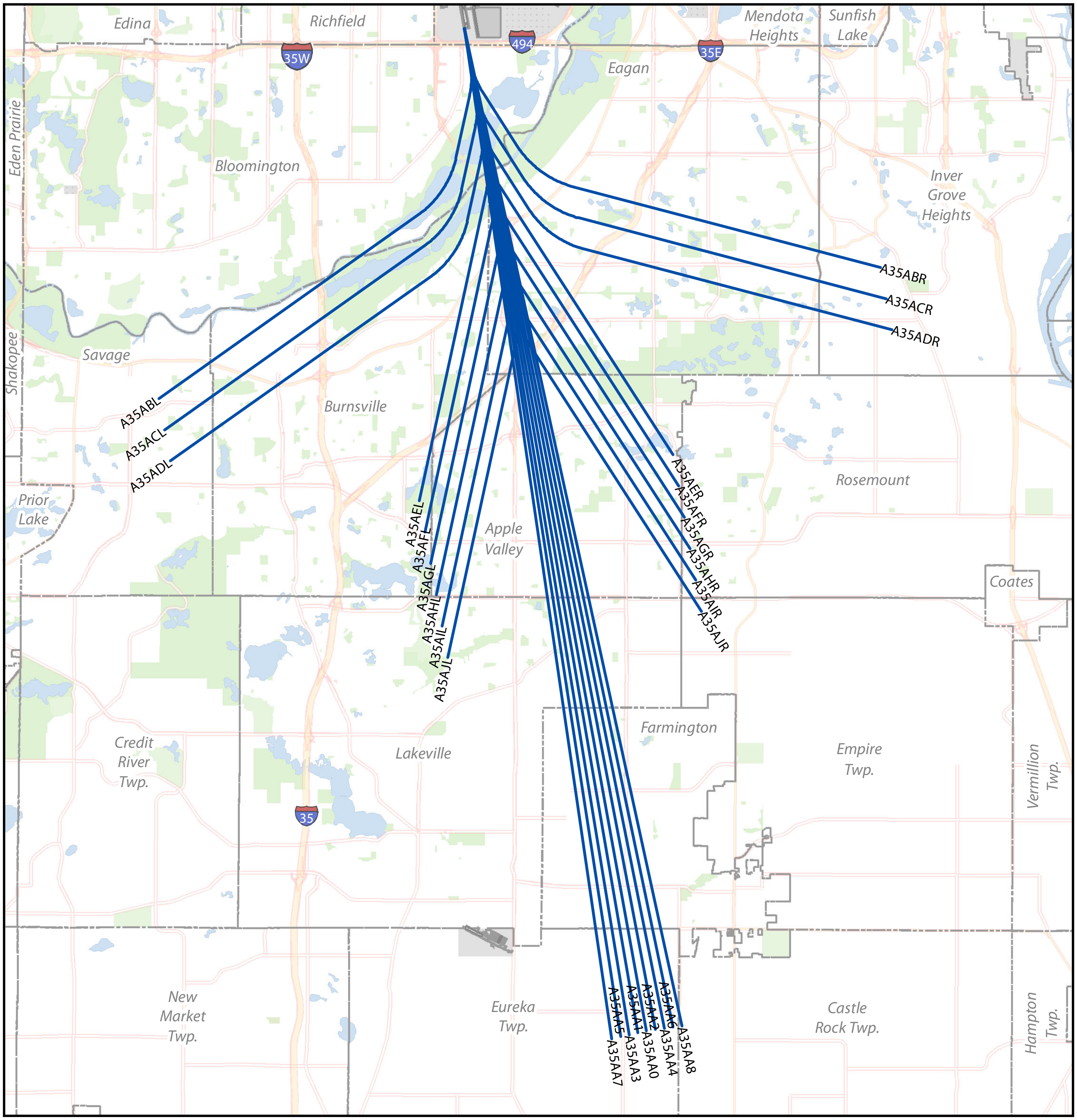
INM Tracks - Runway 30L Arrivals

N

0 7,400 14,800 Meters

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

FIGURE G.4-30



INM Tracks - Runway 35 Arrivals

N

0 2 4 Miles

MINNEAPOLIS SAINT PAUL METROPOLITAN AIRPORTS COMMISSION MAC

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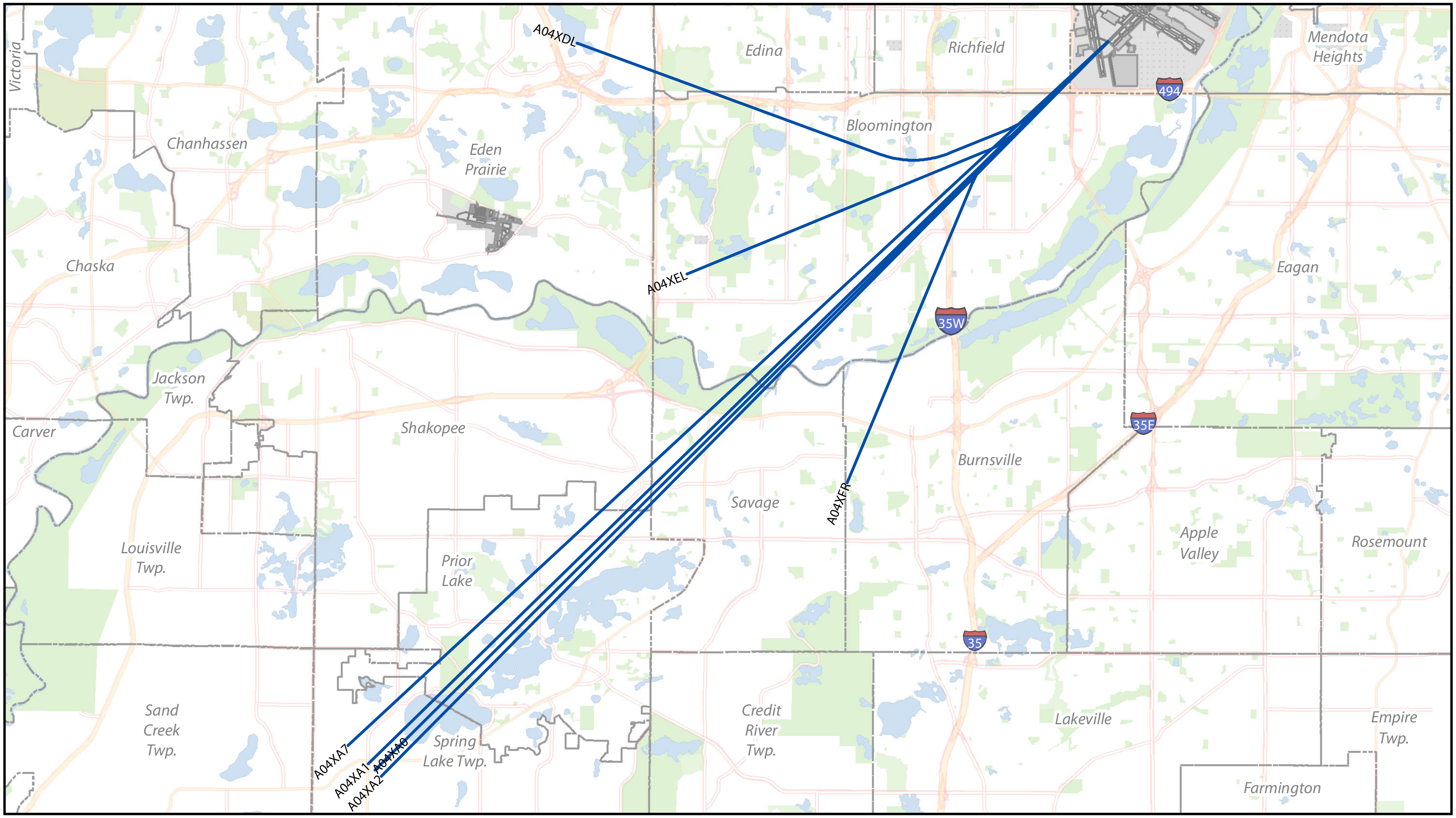
FIGURE G.4-31



INM Tracks - Runway 04 Arrivals

N

0 7,500 15,000 Meters

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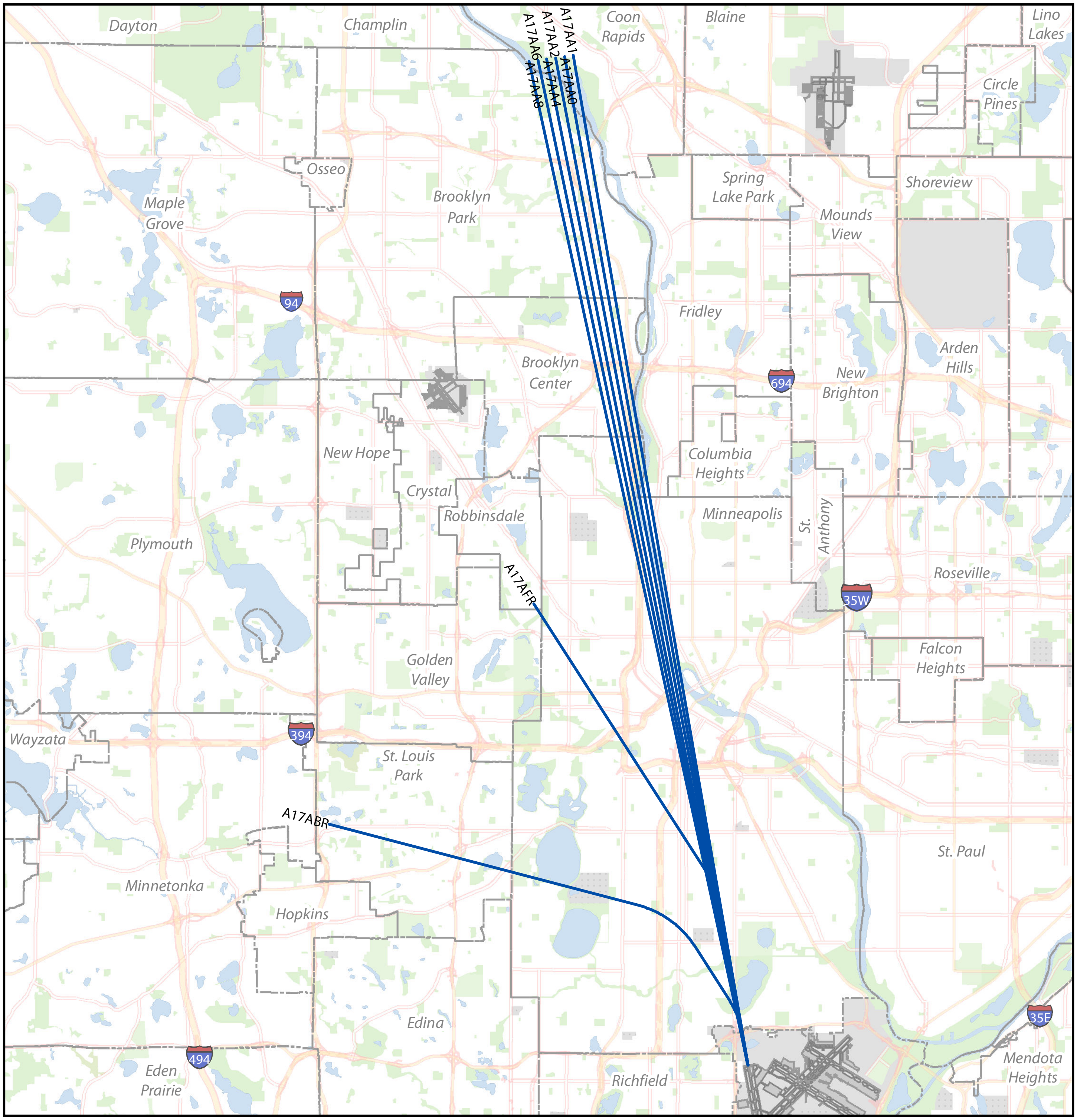
MAC



INM Tracks - Runway 17 Arrivals

N

0 2 4 Miles

Disclaimer: This map was generated by the Metropolitan Airports Commission using GIS (Geographic Information System) software. No claims are made to the accuracy or completeness of the information shown herein nor to its suitablity for a particular use. The scale and location of all mapped data are approximate.

5 2010 Modeled Versus Measured DNL Levels

As part of the 2010 existing noise contour modeling process, a correlation analysis comparing the INM-developed 2010 DNL noise contours to measured aircraft noise levels at the 39 MAC Noise and Operations Monitoring System (MACNOMS) Remote Monitoring Towers (RMTs) around MSP in 2010 was conducted. An INM grid point analysis to determine the model's predicted 2010 DNL noise levels at each of the RMT locations (determined in the INM by the latitude and longitude coordinates of each RMT) was also performed.

Table G.5.1 provides a comparison of the INM grid point analysis at each MACNOMS RMT site, based on the 2010 existing noise contour as produced with the INM, and the actual MACNOMS monitored aircraft DNLs at those locations in 2010.

The average absolute difference between the modeled and measured DNLs was 1.7 dB. The median difference was 1.2 dB. The MACNOMS RMTs, on average, reported slightly higher DNL levels than the INM model generated. This is due in part to the inclusive approach used in tuning MACNOMS noise-to-track matching parameters. This inclusive approach, along with the increasing number of quieter jets operating at the airport, resulted in increased instances of community-driven noise events being attributed to quieter aircraft operating at further distances from the monitoring location. The use of absolute values provides a perspective of total difference between the INM modeled values and the measured DNL values provided by MACNOMS in 2010. The median is considered the most reliable indicator of correlation when considering the data variability across modeled and monitored data.

Overall, the small variation between the actual MACNOMS monitored aircraft noise levels and the INM modeled noise levels provides additional external system verification that the INM is providing an accurate assessment of the aircraft noise impacts around MSP.

Table G.5.1

2010 Measured vs. Modeled INM DNL Values at MACNOMS RMT Locations

RMT Site	2010 Annual Measured DNL (1)	2010 Modeled DNL	Difference (Modeled minus Measured)	
			Sign	Absolute
1	55.5	55.7	0.2	0.2
2	57.6	56.9	-0.7	0.7
3	62.2	62.2	0.0	0.0
4	60.2	60.4	0.2	0.2
5	68.2	67.9	-0.3	0.3
6	69.2	67.2	-2.0	2.0
7	58.9	57.8	-1.1	1.1
8	57.3	56.1	-1.2	1.2
9	50.9	46.5	-4.4	4.4
10	53.8	51.2	-2.6	2.6
11	44.7	43.9	-0.8	0.8
12	37.3	46.1	8.8	8.8
13	52.4	53.6	1.2	1.2
14	59.9	59.9	0.0	0.0
15	54.2	54.3	0.1	0.1
16	63.5	62.1	-1.4	1.4
17	48.1	46.6	-1.5	1.5
18	56.7	57.1	0.4	0.4
19	51.7	52.0	0.3	0.3
20	43.4	48.2	4.8	4.8
21	48.1	49.9	1.8	1.8
22	54.5	55.8	1.3	1.3
23	59.8	59.2	-0.6	0.6
24	57.8	58.8	1.0	1.0
25	50.3	54.2	3.9	3.9
26	52.7	50.7	-2.0	2.0
27	55.7	55.9	0.2	0.2
28	57.4	59.0	1.6	1.6
29	51.2	51.4	0.2	0.2
30	60.1	58.5	-1.6	1.6
31	45.8	47.7	1.9	1.9
32	41.7	45.1	3.4	3.4
33	45.7	48.6	2.9	2.9
34	42.6	47.3	4.7	4.7
35	52.1	53.4	1.3	1.3
36	52.9	52.1	-0.8	0.8
37	46.0	47.8	1.8	1.8
38	48.4	49.5	1.1	1.1
39	50.2	51.1	0.9	0.9
			Average	**1.7**
			Median	**1.2**

Notes: All units in dB DNL
(1) computed from daily DNLs

Source: MAC RMT data, MAC analysis, 2012

END NOTES

[1] U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety," Report 550/9-74-004, March 1974.

[2] "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980.

[3] Federal Interagency Committee on Noise, "Federal Agency Review of Selected Airport Noise Analysis Issues," August 1992.

[4] 14 CFR Part 150, Amendment 150-3, December 8, 1995.

[5] FAA Order 1050.1E, Environmental Impacts: Policies and Procedures, Department of Transportation, Federal Aviation Administration, June 8, 2004.

[6] FAA Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions, Department of Transportation, Federal Aviation Administration, April 28, 2006.

[7] U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety," Report 550/9-74-004, March 1974.

[8] Ibid.

[9] "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980.

[10] Federal Interagency Committee on Noise, "Federal Agency Review of Selected Airport Noise Analysis Issues," August 1992.

[11] "Sound Level Descriptors for Determination of Compatible Land Use," American National Standards Institute Standard ANSI S3.23-1980."

[12] "Quantities and Procedures for Description and Measurement of Environmental Sound, Part I," American National Standards Institute Standard ANSI S21.9-1988.

[13] Schultz, T.J., "Synthesis of Social Surveys on Noise Annoyance," J. Acoust. Soc. Am., 64, 377-405, August 1978.

[14] Fidell, S., Barger, D.S., Schultz, T.J., "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise." J. Acoust. Soc. Am., 89, 221-233, January 1991.

[15] "Community Reactions to Helicopter Noise: Results from an Experimental Study," J. Acoust. Soc. Am., 479-492, August 1987.

[16] Schultz, T.J., "Synthesis of Social Surveys on Noise Annoyance," J. Acoust. Soc. Am., 64, 377-405, August 1978.

[17] Fidell, S., Barger, D.S., Schultz, T.J., "Updating a Dosage-Effect Relationship for the Prevalence of Annoyance Due to General Transportation Noise." J. Acoust. Soc. Am., 89, 221-233, January 1991.

[18] U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety," Report 550/9-74-004, March 1974.

[19] Ibid.

[20] U.S. Environmental Protection Agency, "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety," Report 550/9-74-004, March 1974.

[21] Federal Interagency Committee on Aviation Noise (FICAN), "Effects of Aviation Noise on Awakenings from Sleep," June 1997.

[22] Pearson, K.S., Barber, D.S., Tabachnick, B.G., "Analyses of the Predictability of Noise-Induced Sleep Disturbance," USAF Report HSD-TR-89-029, October 1989.

[23] Ollerhead, J.B., Jones, C.J., Cadous, R.E., Woodley, A., Atkinson, B.J., Horne, J.A., Pankhurst, F., Reyner, L, Hume, K.I., Van, F., Watson, A., Diamond, I.D., Egger, P., Holmes, D., McKean, J., "Report of a Field Study of Aircraft Noise and Sleep Disturbance." London Department of Safety, Environment, and Engineering, 1992.

[24] Fidell, S., Pearsons, K., Howe, R., Tabachnick, B., Silvati, L., Barber, D.S. "Noise-Induced Sleep Disturbance in Residential Settings," AL/OE-TR-1994-0131, Wright Patterson AFB, OH, Armstrong Laboratory, Occupational and Environmental Health Division, 1994.

[25] Fidell, S., Howe, R., Tabachnick, B., Pearsons, K., Sneddon, M., "Noise-Induced Sleep Disturbance in Residences Near Two Civil Airports," Langley Research Center, 1995.

[26] T.J. Schultz, "Synthesis of Social Surveys on Noise Annoyance, "*Journal of the Acoustical Society of America* 64(2) (1978), pp. 377-405.

[27] Metropolitan Council 2030 Transportation Policy Plan, Appendix M, November 2010.

[28] Ibid.

[29] Ibid.

[30] Ibid.

[31] Ibid.

[32] The Metropolitan Council's NRL calculation approach is consistent with FAA's calculations in 14 C.F.R. Part 150.

[33] City of Eagan, Ord. No. 436, 2nd series, § 1, eff. 2-3-09; Ord. No. 465, 2nd series, § 1, 11-16-2010

[34] City of Minneapolis, Effective January 1, 2009. (2008-Or-089, § 2, 11-7-08)

[35] City of Richfield, SECTION 541 - ZONING: OVERLAY DISTRICTS (ADDED, BILL NO. 2009-5), §541.19. Noise Attenuation

Attachment 1:

MAC Letter to FAA,

Request for Approval of INM Substitutions

METROPOLITAN AIRPORTS COMMISSION

Minneapolis-Saint Paul International Airport
6040 - 28th Avenue South • Minneapolis, MN 55450-2799
Phone (612) 726-8100

October 5, 2011

Ms Kandice Krull
Environmental Protection Specialist
Federal Aviation Administration
Minneapolis Airports District Office MSP-ADO-600
6020 28th Avenue South, Suite 102
Minneapolis, MN 55450

Ms Krull,

The Metropolitan Airports Commission (MAC) is in the process of preparing an Environmental Assessment (EA) to evaluate and disclose the potential environmental impacts of proposed development at the Minneapolis-St. Paul International Airport (MSP). The proposed development consists of the first two phases of development identified in the airport's current Long Term Comprehensive Plan. Phases I and II include terminal and landside improvements needed by the year 2020. The phased improvements are based on relocating all non-SkyTeam airlines (all airlines except Delta Air Lines and its alliance partners) from Terminal 1-Lindbergh to Terminal 2-Humphrey.

As part of preparing the EA, the MAC is analyzing potential noise impacts in accordance with FAA's Order 1050.1E, *Environmental Impacts: Policy and Procedures* and a detailed noise analysis is being conducted using the FAA's Integrated Noise Model (INM), version 7.0b. A forecast of aviation activity including a fleet mix has been prepared for 2020 and 2025. The fleet mix includes three aircraft that are not part of the INM standard database of aircraft: the Boeing 787, the Lancair Legacy 2000 and the Bombardier CS-300. The number of average annual day operations for each of these aircraft is shown in **Table 1.**

Table 1. 2020 and 2025 Operations for Aircraft without INM Substitutions

Code	Aircraft	Category	2020 AAD Operations	2020 % of Fleet Mix	2025 AAD Operations	2025 % of Fleet Mix
B787	Boeing 787	Wide Body Jet	4.3	0.32%	5.7	0.4%
Leg2	Lancair Legacy 2000	Single Engine Propeller	1.7	0.1%	1.7	0.1%
CS3	Bombardier C-series 300	Narrow Body Jet	5.2	0.4%	8.6	0.6%

In previous noise environmental analyses and publications, FAA has recommended or approved the use of the Airbus A330-343 as a substitute for the B787. Characteristics of the Lancair Legacy 2000 and the Bombardier CS-300 were reviewed to recommend appropriate substitution aircraft from the INM standard database. Since no noise data has been published for either aircraft, their weight, size, number of engines and operating characteristics were considered.

Both the GASEPF and the GASEPV single engine propeller aircraft were considered in identifying an appropriate substitution for the Lancair Legacy 2000. The GASEPF has the most similar MTOW to the Lancair Legacy 2000. However, unlike the Lancair Legacy 2000, it is not a variable pitch aircraft. Therefore, although the weight of the GASEPV is greater, it was identified as a more appropriate substitution.

The Boeing 717-200 was identified as a potentially suitable aircraft substitution for the Bombardier CS-300, based on the Maximum Take-Off Weight (MTOW), Maximum Landing Weight (MLW) and thrust. **Table 2** depicts the range of aircraft considered as potential substitutes, and highlights our recommendation.

Table 2. Bombardier CS-300 and Similar Aircraft

	Manufacturer	Model	MTOW	MLW	Engine Model		Thrust		Flaps		Noise Level (EPNdB)			
			1000#	1000#		NO.	1000#	BPR	TO	AP	TO	SL	AP	Stage
Aircraft in Fleetmix	Bombardier	CS300	131.3	122	PW1500G	2	21							
	AIRBUS	A320-211	162	142.2	CFM56-5A1	2	25	6	10	35	87.8	94.3	96.4	3
	AIRBUS	A320-232/233	171.96	145.5	V2527-A5	2	26.5	4.8	10	40	84.9	91.3	94.4	4
Recommendation	BOEING	B-717-200	121	110	BR700-715A1-30	2	18	4.66	5	40	84	89	91.6	3
	BOEING	B-737-300	124.5	110	CFM56-3-B1	2	20	5	1	40	84.4	90.4	99.6	3
	BOEING	B-737-300	139.5	121	CFM56-3-B1	2	20	5	1	40	87.5	89.9	100	3
	BOEING	B-737-500	139	114	CFM56-3-B1	2	20	5	5	40	87.3	90	100	3
	BOEING	B-737-500	132.8	114	CFM56-3-B1(R)	2	18.5	5	5	40	87.7	88.9	100	3

Source: Aircraft Noise Data for United States Certificated Turbojet Powered Airplanes, AC36-1H Appendix 1

The MAC respectfully requests AEE's concurrence with our recommendation to substitute the Airbus A330-343 for the Boeing 787, the Boeing 717-200 for the Bombardier CS-300 and the GASEPV for the Lancair Legacy 2000 in the INM analysis. However, if AEE has identified another aircraft type in the INM database that would be a better substitution, please notify the MAC. Feel free to contact me at the phone number provided below if you have any questions or concerns regarding this request.

Sincerely,

Chad Leqve
Manager – Noise, Environment and Planning
Metropolitan Airports Commission
Phone # (612) 725-6326

Attachment 2:

Metropolitan Council Meeting Minutes,
MSP LTCP Approval

Metropolitan Council

Metropolitan Council Meeting

Wednesday,
June 23, 2010
Robert Street Council Chambers
4:00 P.M.

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Metropolitan Council Meeting
Wednesday, June 23, 2010
Council Chambers
4:00 P.M.

Part I - Narrative

Attendance:

Roger Scherer, Tony Pistilli, Robert McFarlin, Craig Peterson, Polly Bowles, Lynette Wittsack, Natalie Steffen, Kris Sanda, Georgeanne Hilker, Sherry Broecker, Rick Aguilar, Kirstin Sersland Beach, Daniel Wolter, Wendy Wulff

Members absent: Peter Bell, Peggy Leppik, Annette Meeks

Call to Order and Approval of Agenda

A quorum being present, Acting Chair Scherer called the regular meeting of the Metropolitan Council to order at 4:03 p.m. Acting Chair Scherer moved items 2010-205, 2010-221, and 2010-222 from the Consent List to the Report of the Transportation Committee. It was moved by Steffen, seconded by Sanda, to approve the agenda, as amended. Motion carried.

Minutes

It was moved by Broecker, seconded by Wolter, to approve the minutes of the Metropolitan Council Meeting of May 26, 2010. Motion carried.

Motion to amend May 26, 2010 minutes
It was moved by Wulff and seconded by Sersland Beach

"That the Metropolitan Council authorize the following correction to the May 26, 2010 Council minutes:

2010-160 - Adoption of 2030 Transportation Policy Plan Amendments for Southwest Transitway LPA and I-94 Corridor

Motion carried, with Wulff, Sersland Beach, Meeks, and Peterson dissenting.

Public Invitation

Joan Johnson, Joan's Minority Owned Supplier, Minneapolis, asked the Council to consider more ethnic diversity when awarding contracts.

Part II - Exhibits

Business

Committee Consent List

2010-157 - Right-of-Way Acquisition Loan Fund (RALF) Program Review

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council suspend granting RALF loans pending completion of the Metropolitan Highway System Investment Study (MHSIS) and reassessment of the RALF program."

Motion carried.

2010-198 - 2010-2013 TIP Amendment: Ramsey County SP#91-595-24, Union Depot Multimodal transit Facility (TAB Action 2010-37)

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council concur with the Transportation Advisory Board (TAB) action to amend the 2010-2013 Transportation Improvement Program (TIP) to include Ramsey County project SP#91-595-24, Union Depot Multimodal Transit Facility."

Motion carried.

2010-199 - 2010-2013 TIP Amendment: Hennepin Couty SP#TRF-HENN-10, Planning for Bottineau Transitway (TAB Action 2010-35)

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council concur with the Transportation Advisory Board (TAB) action to amend the 2010-2013 Transportation Improvement Program (TIP) to include Hennepin County SP#TRF-HENN-10, Planning for Bottineau Transitway."

Motion carried.

2010-200 - 2010-2013 TIP Amendment: Include MnDOT SP#7080-49, New Market Rest Area Building Site Health and Safety Corrections (TAB Action 2010-36)

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council concur with the Transportation Advisory Board (TAB) action to amend the 2010-2013 Transportation Improvement Program (TIP) to include MnDOT SP#7080-49, New Market Rest Area Building Site Health and Safety Corrections."

Motion carried.

2010-202 - Minnesota State Retirement System Program Unclassified Retirement Plan; Resolution 2010-14

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council approve changes to the position and incumbent list for the Minnesota State Retirement System Unclassified Plan, as reflected in Resolution No. 2010-14."

Motion carried.

2010-204 - Authorization to Amend Lease Between Metropolitan Council and Griggs Midway Corporation

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council authorize the Regional Administrator to negotiate and execute a second amendment to the lease agreement between the Metropolitan Council and Griggs Midway Corporation to exercise options for leasing a 6,500 sq. ft. area for the 28-month period from September 1, 2010 through December 31, 2012 in an amount not to exceed $273,522."

Motion carried.

2010-208 - Authorization to Amend Contract 08P190 with Anoka County

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council authorize the Regional Administrator to amend contract number 08P190 with Anoka County to extend the term from June 30, 2010, to July 31, 2010."

Motion carried.

2010-209 - Authority to Execute Agreements with MVTA and Dakota County

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council authorizes the Regional Administrator to execute a grant with MVTA for up to $335,000 and Dakota County Regional Rail Authority (DCRRA) for up to $800,000 for several tasks associated with the Cedar Avenue BRT project."

Motion carried.

2010-212 - MTS Camera System Installation Contract

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council authorize the Regional Administrator to award and execute a contract with VSIS Incorporated for the installation of digital video recording systems for MTS fixed route and dial-a-ride buses in the amount of $329,550."

Motion carried.

2010-219 - Authorization to Award and Execute Construction Contract for Metro Plant Aeration Tank No. 9-12 Air Diffuser Equipment, MCES Project No. 805941, Contract No. 09P137A

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council authorizes its Regional Administrator to award and execute a construction contract for Metro Plant Aeration Tank Nos. 9-12 Air Diffuser Equipment, MCES Project No. 805941, Contract No. 09P173A, to Magney Construction in the amount of $1,001,635."

Motion carried.

2010-220 - Approval of Municipal Publicly-Owned Infrastructure Infiltration/Inflow (I/I) Grant Program and Program Guidelines

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council approves the municipal publicly-owned infrastructure infiltration/inflow (I/I) grant program and program guidelines."

Motion carried.

2010-224 - Authorization to Award Contract for Anoka County Regular Route Service

It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council authorize the Regional Administrator to execute a two-year contract with Anoka County to provide regular route transit service in Anoka County beginning August 2010 in an amount not to exceed $5,475,000."

Motion carried.

Report of the Environment Committee

All Environment Committees items are included on the Consent List and the Joint Report.

Joint Report of the Community Development and Environment Committees

Single Motion - 2010-216SW, 2010-217SW, 2010-218SW

It was moved by Pistilli and seconded by Hilker

"That the Metropolitan Council adopt the advisory comments, review records, and the recommendations of the Community Development and Environment Committees for the Comprehensive Plan Updates and Tier II Comprehensive Sewer Plans for the cities of Little Canada (2010-216SW), Robbinsdale (2010-217SW), and Woodbury (2010-218SW)."

Motion carried.

2010-216 SW - City of Little Canada 2010 Comprehensive Plan Update, Review No. 20562-1, Tier II Comprehensive Sewer Plan

It was moved by Pistilli and seconded by Hilker

"That the Metropolitan Council adopt the attached Advisory Comments and Review Record, and the following:

1. authorize the City of Little Canada to put its 2030 Comprehensive Plan Update into effect;

2. advise the City to implement the advisory comments noted in the Review Record for Surface Water Management, ISTS, Transportation, and Land Use;
3. approve the City of Little Canada's Tier II Comprehensive Sewer Plan."

Motion carried.

2010-217 SW - City of Robbinsdale 2030 Comprehensive Plan Update, Review No. 20613-1, Tier II Comprehensive Sewer Plan

It was moved by Pistilli and seconded by Hilker

"That the Metropolitan Council adopt the attached Advisory Comments and Review Record, and the following:

1. authorize the City of Robbinsdale to put its 2030 Comprehensive Plan Update into effect;
2. advise the City to:
   a) Adopt the revised forecasts for population, households and employment;
   b) Participate in Council activities to monitor redevelopment and infill in Developed communities;
   c) Address advisory comments for Surface Water Management;
3. approve the City of Robbinsdale's Tier II Comprehensive Sewer Plan."

Motion carried.

2010-218 SW - City of Woodbury 2030 Comprehensive Plan Update, Review No. 20607-1, Tier II Comprehensive Sewer Plan

It was moved by Pistilli and seconded by Hilker

"That the Metropolitan Council adopt the attached Advisory Comments and Review Record, and the following:

1. authorize the City of Woodbury to put its 2030 Comprehensive Plan Update into effect;
2. advise the City to implement advisory comments in the Review Record for Transportation;
3. approve the City of Woodbury's Tier II Comprehensive Sewer Plan."

Motion carried.

Report of the Community Development Committee

2010-226 SW - Park Acquisition Opportunity Grant for Elm Creek Park Reserve, Three Rivers Park District

It was moved by Pistilli and seconded by Steffen

"That the Metropolitan Council authorize a grant of $198,750 from the Parks and Trails Fund Acquisition Account in the Park Acquisition Opportunity Fund to Three Rivers Park District to partially finance the acquisition of 1.4 acres (Zopfi parcel 12208 W. Hayden Lake Rd.) for Elm Creek Park Reserve. The grant should be financed with:

- $119,250 from the State Fiscal Year 2011 Parks and Trails Fund appropriation;
- $79,500 from Metropolitan Council bonds."

Motion carried, with McFarlin abstaining.

2010-227 SW - Park Acquisition Opportunity Grant for St. Croix Valley Regional Trail, Washington County

It was moved by Pistilli and seconded by Broecker

"That the Metropolitan Council authorize a grant of $198,436 from the Environment and Natural Resources Trust Fund Acquisition Account in the Park Acquisition Opportunity Fund to Washington County to partially finance the acquisition of 1.8 acres of the Pontius property for the St. Croix Valley Regional Trail. The grant should be financed with:

- $64,823 balance of the 2008 Environment and Natural Resources Trust Fund appropriation;
- $54,239 from the 2009 Environment and Natural Resources Trust Fund appropriation;
- $79,374 Metropolitan Council bonds."

Motion carried.

2010-232 SW - City of Edina Comprehensive Plan Amendment, Review No. 20413-2

It was moved by Pistilli and seconded by Sanda

"That the Metropolitan Council:

1. adopts the attached review record and allows the City of Edina to put The Waters comprehensive plan amendment (CPA) into effect;

2. finds that the CPA does not change the City's forecasts."

Bowles reiterated the Metropolitan Council reviews comprehensive plan amendments to see they conform to regional system plans, are consistent with Council policies and compatible with the plans of other local communities and school districts, but that each City has the authority to identify and implement their planned development.

Motion carried.

Report of the Management Committee

2010-235 SW - Authorization to Enter into a Labor Agreement with American Federation of State, County and Municipal Employees (AFSCME)

It was moved by Wittsack and seconded by Pistilli

> "That the Metropolitan Council authorize the Regional Administrator to enter into a labor agreement with the American Federation of State, County and Municipal Employees District Council 5, Local Union No. 668 AFL-CIO (AFSCME), effective January 1, 2010 through December 31, 2011."

Motion carried.

2010-238 SW - Conflict Waiver - Industrial Discharge Permit

It was moved by Wittsack and seconded by Sanda

> "That the Metropolitan Council:
> - waive any conflict of interest and consent to Dorsey & Whitney LLP representing and advising Seagate Technology LLC in responding to the Metropolitan Council Environmental Services' Petrofluorochemical (PFC) and Fluorotelomer Inventory Form that was sent on April 30, 2010 to MCES permit holders including Seagate; and,
> - authorize the General Council to execute any documents necessary to effectuate such waiver."

Motion carried.

2010-243 SW - Authorization to procure Property Insurance (Builder's Risk) for the Construction of the Central Corridor LRT

It was moved by Wittsack and seconded by Pistilli

> "That the Metropolitan Council authorizes the procurement of insurance providing coverage for property damage that may occur during the construction of Central Corridor LRT."

Motion carried, with Wolter recusing himself from discussion and vote on the item.

Report of the Transportation Committee

2010-205 - Amendments to the Minnesota Valley Transit Authority and University of Minnesota Urban Partnership Agreement Subrecipient Grant Agreements

It was moved by McFarlin and seconded by Peterson

> "That the Metropolitan Council Authorize the Regional Administrator to negotiate and execute amendments to the Subrecipient Grant Agreements (SGA) with the Minnesota Valley Transit Authority (MVTA) and the University of Minnesota (U of M) for the Driver Assist System (DAS) as identified in the Urban Partnership Agreement (UPA) between the Council and US Department of Transportation (USDOT) in the total amount of $165,000."

Motion carried, with Wolter recusing himself from discussion and vote on the item

2010-221 - Central Corridor Light Rail Transit: Environmental Testing and Monitoring During Construction

It was moved by McFarlin and seconded by Sanda

"That the Metropolitan Council Authorize the Regional Administrator to negotiate and execute a contract with Braun Intertec to conduct environmental testing and monitoring services during construction of the Central Corridor Light Rail Transit (CCLRT) Project for an amount not to exceed $800,000."

Motion carried, with Wolter recusing himself from discussion and vote on the item.

2010-222 - Central Corridor Light Rail Transit: Subordinate Funding Agreement with Ramsey County

It was moved by McFarlin and seconded by Peterson

"That the Metropolitan Council authorize the Regional Administrator to negotiate and execute a Subordinate Funding Agreement with Ramsey County relative to the Civil East Construction in Saint Paul for $350,000."

Motion carried, with Wolter recusing himself from discussion and vote on the item

2010-214 - MSP Airport Long Term Comprehensive Plan (LTCP) (TAB Action 2010-34)

It was moved by McFarlin and seconded by Wulff

"That the Metropolitan Council finds that the Metropolitan Airport Commission's 2030 Long Term Comprehensive Plan for MSP International Airport is consistent with the Council's 2030 *Transportation Policy Plan*, if the following issues are addressed in the final plan:

1) the LTCP should note that MAC will update the plan every five years and that MAC will budget for this in the appropriate years to ensure that the first update is prepared by 2015;

2) MAC should initiate a capacity study two years in advance of when MSP is expected to have 540,000 annual operations and incorporate the results of this study into the following LTCP update;

3) MAC should initiate an FAA Part 150 study update (which includes a comprehensive noise analysis and mitigation program), in consultation with the MSP Noise Oversight Committee (NOC), when the forecast level of operations five years into the future exceeds the levels mitigated in the Consent Decree (582,366 annual operations). The results of this study should be incorporated into the first subsequent LTCP Update;

4) MAC shall continue to work with all appropriate agencies to implement the Interstate 494/34th Avenue, Trunk Highway 5/Glumack Drive and Trunk Highway 5/Post Road interchange modifications included in the 2030 Concept Plan, including preliminary environmental scoping and analysis. These highway modifications are not currently included in the region's

fiscally-constrained 2030 highway plan;

5) the LTCP needs to acknowledge that storm water from MSP detention ponds discharges to the reaches of the Minnesota and Mississippi Rivers that are identified as water-quality impaired for a number of pollutants and stressors;

6) the LTCP should include a general discussion of financial assumptions and funding mechanisms available to implement the proposed development."

Motion carried.

<u>2010-177 - Northstar Subordinate Funding Agreement #17, BNSF Crew Facilities</u>
It was moved by McFarlin and seconded by Sanda

"That the Metropolitan Council authorize the Regional Administrator to negotiate and execute a subordinate funding agreement with the Minnesota Department of Transportation (MnDOT), in an amount not to exceed $459,000, for reimbursement of costs incurred by the Metropolitan Council for Construction services related to the BNSF Crew Facilities."

Motion carried, with Pistilli dissenting.

<u>2010-201 - Use of Northstar Supplemental Contingency Funds and Subordinate Funding Agreement #18, Sixth Locomotive</u>
It was moved by McFarlin and seconded by Steffen

"That the Metropolitan Council:

1. authorize the use of Northstar Project Supplemental Contingency Funds in the amount of $1,150,000 to supplement base contingency funds for the purchase of and costs associated with a sixth locomotive for Northstar Commuter Rail, and;

2. authorize the Regional Administrator to negotiate and execute a subordinate funding agreement with the Minnesota Department of Transportation (MnDOT), in an amount not to exceed $2,850,000, for reimbursement of costs incurred by Metropolitan Council for the procurement and painting of a sixth locomotive, and;

3. authorize the Regional Administrator to negotiate and execute a purchase agreement with the Utah Transit Authority for an MP-36 locomotive currently under lease to the Metropolitan Council in the not-to-exceed amount of $2,798,536 for the Northstar Commuter Rail service.

Motion carried, with Pistilli dissenting.

<u>2010-211 - Central Corridor Light Rail Transit: Civil East Construction</u>
It was moved by McFarlin and seconded by Sersland Beach

"That the Metropolitan Council Authorize the Regional Administrator to

- award and execute a contract with the lowest responsive and responsible bidder, Walsh Construction, for the Central Corridor Light Rail Transit (CCLRT) Civil East Construction in St. Paul, Minnesota at a cost of $205,111,234.05;
- issue a Limited Notice to Proceed in an amount of $20,000,000."

Award of this contract and issuance of a Limited Notice to Proceed are contingent upon the receipt of a Letter of No Prejudice (LONP) from the Federal Transit Administration (FTA) expected prior to the end of June.

Mark Fuhrmann, Metro Transit Deputy Manager, is hopeful the FTA will award the Full Funding Grant Agreement (FFGA) by the end of the calendar year.

Motion carried.

2010-223 - Authorization to Initiate Eminent Domain Proceedings for the Acquisition of Parcels 1 (M. Rasior Ltd) and 1A (Diamond Products) for the Central Corridor Light Rail Transit Operations and Maintenance Facility (OMF) Resolution 2010-15

It was moved by McFarlin and seconded by Hilker

"That the Metropolitan Council authorize the initiation of eminent domain proceedings for the acquisition of the fee and leasehold interests to the M. Rasoir Ltd. property identified on the attached resolution and the initiation of eminent domain proceedings for the acquisition of a temporary easement on that portion of the Diamond Products property identified on the attached resolution."

Motion carried, with Wolter recusing himself from discussion and vote on the item.

Other Business

2010-194 SW - Unified Capital Program Amendment

It was moved by Wittsack and seconded by Sanda

"That the Metropolitan Council:

1. Amend the 2010 Authorized Capital Program (multi-year authorization) by adding spending authority as follows:

Metro Transit	$ 42,272,173
Parks and Open Space	$ 15,140,000

2. Amend the 2010 Capital Budget (annual appropriation) by increasing appropriation as follows:

Metro Transit	$ 8,247,723
Parks and Open Space	$ 6,945,500

3. Approve the changes to capital projects as detailed in Attachment 1

Motion carried on the following roll call vote:

	Yes			Absent	No	Abstain
	Scherer	Bowles	Hilker	Leppik		
	Pistilli	Wittsack	Aguilar	Meeks		
	McFarlin	Steffen	Sersland Beach	Broecker		
	Peterson	Sanda	Wolter	Bell		
			Wulff			
TOTAL		**13**		**4**		

<u>2010-197 SW - Small Business Disruption Loan Program and 2010 Unified Operating Budget Amendment</u>

It was moved by Wittsack and seconded by Pistilli

"That the Metropolitan Council (1) authorize the Chair to execute and the Regional Administrator to negotiate a Joint Exercise of Powers Agreement with the City of St. Paul to help implement an unforgiveable loan program for small businesses that may experience disruptions from construction activities associated with the Central Corridor Light Rail Transit (CCLRT) Project; and (2) amend the 2010 Unified Operating Budget by authorizing an increase of $1,000,0000 in expenditure authority in Community Development."

The proposed joint powers agreement referenced in item 2010-197SW, anticipates that interest-free loans made with Council-provided funds will be repayable. Future Councils may take action making this a "forgivable loan program".

Motion carried on the following roll call vote:

	Yes			Absent	No	Abstain
	Scherer	Bowles	Broecker	Leppik		Wolter
	Pistilli	Wittsack	Aguilar	Meeks		
	McFarlin	Steffen	Sersland Beach	Bell		
	Peterson	Sanda	Wulff			
		Hilker				
TOTAL		**13**		**4**		

<u>2010-213 - Metropolitan Council Member Committee Assignments</u>

It was moved by Sanda and seconded by Bowles

"That the Metropolitan Council approve the following committee assignments recommended by the Chair Pursuant to Council Bylaws, Article III.1

Transportation	Community Dev.	Environment	Management
***McFarlin**, Chair*	***Pistilli**, Chair*	*Leppik, Chair*	*Scherer, Chair*
Aguilar	**Aguilar, Vice-Chair**	Beach	Broecker
Beach	Bowles	Bowles	McFarlin
Hilker	Broecker	Peterson	Peterson
Leppik	Hilker	Scherer	Pistilli

Meeks, ~~Chair~~	Meeks	Wittsack	Sanda
Peterson, Vice Chair	Sanda	Wolter, Vice Chair	Wittsack, Vice Chair
Scherer	Steffen, ~~Chair~~	Wulff	
Steffen	Wolter		
	Wulff		

Motion carried.

<u>2010-240 - Appointments to the Livable Communities Advisory Committee</u>
It was moved by Steffen and seconded by Sanda

"That the Metropolitan Council approve Chair Bell's recommendation to appoint the following persons to the Livable Communities Advisory Committee to terms as noted:

Chair	**Ruth Grendahl,** Apple Valley (reappointment, serves at the pleasure of the Council)
The following persons are recommended for appointment to three-year terms in the listed expertise categories, effective July 1, 2010:	
Development finance – private finance	**Orlena Iversen** Greater Metropolitan Housing Corporation – lending operations and underwriting (new appointment)
Development – redevelopment	**Peggy Lucas** Principal, Brighton Development (reappointment)
Site Design – architecture or land planning	**Lance Neckar** Chair, Dept. of Landscape Architecture and Urban Design, University of Minnesota (reappointment)
Local government – planning, economic or community development	**Blair Tremere** Public Affairs Consulting (reappointment)
Transportation and development relationship	**Charleen Zimmer** Zan Associates – independent consultant on integration of transportation infrastructure and development (reappointment)

Motion carried.

Reports

Chair

There was no report from Acting Chair Scherer. Chair Bell is attending a CCLRT–related meeting in Washington, D.C.

Council Members

Council member Aguilar reported Matt Kramer has been named the new president of the St. Paul Area Chamber of Commerce.

Regional Administrator

Regional Administrator Weaver reported participating in the Joint MC/U of Mn CCLRT Mediation session, with sessions scheduled for Thursday, Friday and possibly next week. The hope is that mediation will be completed so the University of Minnesota Board of Regents can vote on the MOU2 at their July 7, 2010 meeting.

General Counsel

General Counsel Mueting had nothing to report.

Adjournment

Business completed, the meeting adjourned at 5:03 p.m.

Part III - Certification

I hereby certify that the foregoing narrative and exhibits constitute a true and accurate record of the Metropolitan Council Meeting of June 23, 2010.

Approved this 14th day of July 2010.

Respectfully submitted,

Pat Curtiss

Pat Curtiss
Secretary

Attachment 3:

FAA AEE Letter to FAA Great Lakes Region,
INM Substitutions Response

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Environment and Energy

800 Independence Ave., S.W.
Washington, D.C. 20591

Date: January 5, 2012

Lindsay Guttilla
Regional Environmental Specialist
Great Lakes Region
Federal Aviation Administration

Dear Lindsay,

The Office of Environment and Energy (AEE) has received your email dated November 28th, 2011, requesting approval of modeling three aircraft that do not have Integrated Noise Model (INM) standard substitutions. This request is to evaluate noise in support of an Environmental Assessment (EA) at the Minneapolis-St.Paul International Airport (MSP).

AEE concurs with the use of the INM aircraft Airbus A330-343 as a substitute for the Boeing 787 aircraft. AEE also concurs with the use of the generic INM aircraft GASEPV in modeling the noise of the Lancair Legacy 2000 propeller driven aircraft. AEE does not approve the use of the INM Boeing 717-200 aircraft in modeling the new Bombardier CS-300 aircraft, because the Boeing 717-200 has engines mounted to the fuselage while the CS-300 has engines mounted on the wings. Instead, AEE recommends the use of the INM aircraft Airbus 320-232 in modeling CS300 aircraft noise. The AEE's review is based on an analysis of several different candidate aircraft, comparing each in terms of design configuration, aircraft performance, and aircraft noise certification levels. In addition, AEE examines noise contour areas of certain aircraft to support the review.

Please understand that this approval is limited to this particular project for MSP. Any additional projects or non-standard INM input at MSP will require separate approval.

Sincerely,

James Skalecky, Acting Manager
AEE/Noise Division
cc: Jim Byers, APP-400

Attachment 4:

FAA NADP Submittal to AEE

Federal Aviation Administration

Memorandum

Date: June 14, 2012

To: Lindsay Guttilla, AGL-640

From: Kandice Krull, MSP-ADO

Subject: Noise Abatement Departure Profiles (NADP) for aircraft operations at the Minneapolis-St Paul International Airport (MSP)

The Metropolitan Airports Commission (MAC) submitted the attached NADP for review. The MAC plans on using the custom INM profiles from the NADP in developing the noise contours in the 2020 Environmental Assessment (EA) currently underway.

Could you please forward this report to the appropriate person in the Office of Environment and Energy (AEE) for their review and concurrence of the custom INM profiles described in the NADP?

Please let me know if you need any additional information.

Thanks so much,
Kandice

METROPOLITAN AIRPORTS COMMISSION

Minneapolis-Saint Paul International Airport
6040 - 28th Avenue South • Minneapolis, MN 55450-2799
Phone (612) 726-8100

June 14, 2012

Ms. Kandice Krull
Environmental Protection Specialist
Federal Aviation Administration
Minneapolis Airports District Office MSP-ADO-600
6020 28th Avenue South, Suite 102
Minneapolis, MN 55450

Ms. Krull,

The Metropolitan Airports Commission (MAC) is requesting FAA review of the development and use of a series of Noise Abatement Departure Profiles (NADP) for aircraft operations at the Minneapolis-St. Paul International Airport (MSP). Following the process identified in Appendix B of the Integrated Noise Model (INM) version 7.0 User's Guide, this Technical Memorandum provides background information, a statement of benefit, an analysis demonstrating potential benefit, information on aircraft performance, and a comparison with the INM standard methodology.

Section 1. Background

The MAC is in the process of preparing an environmental assessment (EA) to evaluate and disclose the potential environmental impacts of proposed development at MSP.

As part of preparing the EA, the MAC is analyzing potential noise impacts in accordance with FAA's Order 1050.1E, Environmental Impacts: Policy and Procedures and a detailed noise analysis is being conducted using the FAA's INM, version 7.0c. The intent of this exercise is to identify any potential cumulative noise benefits with the use of Close-In or Distant departures for individual runway ends at MSP. A series of conceptual Noise Abatement Departure Procedure (NADP) flight profiles have been developed for a selection of noise model aircraft projected to be in operation at MSP. A total of 20 aircraft with 82 unique stage lengths were identified, resulting in a total of 288 custom profiles, for the following aircraft: 737700, 737800, 747200, 747400, 757300, 767300, 767400, 777200, 757PW, A319-131, A320-211, A321-232, A330-301, CL601 (CLREGJ), DC1010, DC9Q9, 737500 (EMB170), MD11GE, MD81, MD9025. Custom profiles were developed and reviewed for aircraft operated by Delta Air Lines (Delta), the predominant carrier at MSP, and for other operators using FAA-prescribed methodologies.

Section 2. Statement of Benefit

The MSP Noise Oversight Committee (NOC) discusses strategies for reducing noise exposure around MSP. Recently, at the request of the City of Minneapolis, the Committee agreed to evaluate the effectiveness of the current use of the Distant NADP on all runways at MSP. Specifically, the City has expressed interest in evaluating whether or not use of the Close-In NADP off Runways 30L and 30R might provide a higher degree of noise reduction in South Minneapolis. In July 2012 the NOC will analyze if use of the Close-In NADP would benefit any particular runway end. Following guidance in the INM User's Guide and coordination with a local Chief Pilot, a series of Close-In and Distant profiles were developed for both Delta and non-Delta "generic" aircraft for use in the NOC and 2020 EA analyses. If the NOC determines that a change in NADP is recommended, and the MAC concurs, the proposed change will be evaluated as part of the 2020 EA.

The custom INM procedural NADP profiles (Delta and non-Delta "generic") were constructed from INM Standard profiles to reflect aircraft operational criteria and were constructed in accordance with the INM User's Guide and information obtained from Delta to the greatest extent possible using the following methodology:

Delta Close-In NADP

- The start of the Close-In NADP is the takeoff roll and acceleration down the runway at takeoff thrust with takeoff flaps. The aircraft then lifts off and climbs to 1,500' above field elevation (AFE) (or 1,000' AFE, depending on aircraft type), at which point the thrust setting is reduced to climb thrust. The aircraft continues to climb to 3,000' AFE at climb thrust with takeoff flaps. At 3,000' AFE, the nose is lowered and the aircraft accelerates to 250 knots as flaps are retracted on schedule. The aircraft then climbs to 10,000' AFE.

Delta Distant NADP

- The start of the Distant NADP is the takeoff roll at takeoff thrust with takeoff flaps. The aircraft lifts off, and begins climbing at takeoff thrust until reaching 1,000' AGL, where the thrust setting is reduced to climb thrust. The aircraft then lowers the nose and accelerates to 250 knots (or more depending on aircraft type), retracting flaps on schedule. After reaching final climb speed, the aircraft climbs to 5,500', 7,500', and 10,000' maintaining the same airspeed.

Non-Delta NADP

- These additional NADP profiles are generally similar to those developed for Delta, and reflect INM methodologies, including the use of INM Standard and ICAO profiles. Generic Close-In NADP profiles differ from Delta Close-In NADP profiles in that the reduction to a climb thrust setting generally occurs at 1,000' AFE rather than 1,500' AFE. Generic Distant NADP profiles differ from the Delta Distant NADP profiles in that for certain aircraft, the acceleration height is greater than 1,000' AFE. Also, takeoff thrust may be maintained for a longer duration than in the Delta Distant NADP profiles developed.

Section 3. Analysis Demonstrating Benefit

The intent of the development of NADPs for the fleet at MSP is to determine the potential cumulative noise benefit of using either profile on a runway end. Accordingly, not all profiles are expected to reduce the noise environment. **Tables A-1** through **A-20**, shown in **Attachment A**, depict the SEL values for a series of grid points spaced 0.5 nautical miles apart underneath a 50 NM straight-out departure flight track for a single event. This is shown for the 20 aircraft included in the NADP profile development for stage length 1 only. In cases where NADP profiles were developed for multiple stage lengths, all NADP profiles very closely resemble the Stage Length 1 profile. The differences are the result of slight variations in speeds and climb rates during acceleration steps. These were all taken directly from the standard profiles for the respective Stage Length.

Generally, the Close-In NADP profiles as developed in INM provide a noise reduction ranging from less than 1 dB to 5 dB from approximately 1.5 to 4 nautical miles from the start of the takeoff roll compared to the INM Standard profiles. The Distant NADP profiles show less change for most profiles, as thrust levels were not modified unless Max Takeoff thrust was not being reduced to Max Climb thrust after full retraction of the flaps in the INM Standard profiles. Overall, the Distant NADP profiles and INM Standard profiles are similar.

Section 4. Concurrence on Aircraft Performance

In order to develop the NADP profiles for the range of aircraft, data provided by Delta and guidance on the development of NADPs available in the version 7.0 INM User's Guide were referenced. Delta provided information on NADP profile data for a selection of aircraft for both the Distant and Close-In NADPs. The data include information pertaining to speeds, thrust settings and specific aircraft operational data. The INM User's Guide provides generic instructions for editing an INM Standard profile to meet general parameters for both the Close-In and Distant NADP. Sample departure profiles for two aircraft types from the noise model (767300, 757PW) were provided to Delta for comment and feedback, and a series of INM step procedures were reviewed for all Delta aircraft. A series of graphs representing thrust, altitude, and speed, all compared to distance, were included, for the noise model INM Standard profile, the Close-In profile, and the Distant profile. Feedback was incorporated into revised NADPs.

Section 5. Certification of New Parameters

No new aircraft performance coefficient data for the procedural profiles was developed for this project.

Section 6. Graphical and Tabular Comparison

Attachment B, at the conclusion of this memorandum, includes a series of graphs that depict a comparison of altitude, speed, and thrust for the Close-In NADP, Distant NADP, and INM Standard profiles. Each graphic depicts the range of stage lengths modeled for each unique aircraft. **Table B-1** shows the aircraft and respective stage lengths for which custom profiles were developed.

The MAC respectfully requests FAA AEE review/concurrence with the custom INM profiles described herein for use in developing noise contours in the 2020 EA. Feel free to contact me at the phone number provided below if you have any questions or concerns regarding this request.

Sincerely,

Chad E. Leqve
Manager – Noise, Environment and Planning
Metropolitan Airports Commission
Phone # (612) 725-6326

Attachments: Attachment A.
Attachment B. Graphical and Tabular Comparison
INM_MSP_NADP_FAA.zip (delivered electronically)

Cc: Roy Fuhrmann – MAC Director of Environment

Attachment A

Analysis Demonstrating Benefit

Table A-1

INM Aicraft Model:		737700	Profile Weight:		120000
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	127.0	127.0	0.0	127.0	0.0
1.0	98.9	99.0	0.1	98.9	0.0
1.5	93.8	94.2	0.4	93.8	0.0
2.0	90.8	90.6	-0.2	90.8	0.0
2.5	88.3	88.6	0.3	88.3	0.0
3.0	86.4	86.9	0.5	86.4	0.0
3.5	85.0	85.1	0.1	85.0	0.0
4.0	83.6	83.7	0.1	83.6	0.0
4.5	82.4	82.5	0.1	82.4	0.0
5.0	81.2	81.4	0.2	81.2	0.0
5.5	80.2	80.4	0.2	80.2	0.0
6.0	79.4	79.4	0.0	79.4	0.0
6.5	78.7	78.7	0.0	78.7	0.0
7.0	78.1	78.0	-0.1	78.1	0.0
7.5	77.5	77.5	0.0	77.5	0.0
8.0	76.8	76.8	0.0	76.8	0.0
8.5	76.2	76.2	0.0	76.2	0.0
9.0	75.6	75.6	0.0	75.6	0.0
9.5	75.1	75.1	0.0	75.1	0.0
10.0	74.5	74.5	0.0	74.5	0.0

Table A-2

INM Aicraft Model:		737800	Profile Weight:		133300				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	129.7	129.7	0.0	129.7	0.0	129.7	0.0	129.7	0.0
1.0	102.1	102.2	0.1	102.1	0.0	102.2	0.1	102.1	0.0
1.5	96.8	96.6	-0.2	96.8	0.0	96.6	-0.2	95.0	-1.8
2.0	93.8	91.1	-2.7	93.8	0.0	91.1	-2.7	91.3	-2.5
2.5	91.1	88.7	-2.4	91.1	0.0	88.7	-2.4	89.2	-1.9
3.0	87.1	87.5	0.4	87.1	0.0	87.4	0.3	87.5	0.4
3.5	85.3	86.0	0.7	85.3	0.0	86.0	0.7	86.0	0.7
4.0	84.1	84.6	0.5	84.1	0.0	84.7	0.6	84.8	0.7
4.5	83.0	83.4	0.4	83.0	0.0	83.6	0.6	83.5	0.5
5.0	82.0	82.5	0.5	82.0	0.0	82.6	0.6	82.5	0.5
5.5	80.9	81.5	0.6	80.9	0.0	81.7	0.8	81.6	0.7
6.0	80.2	80.6	0.4	80.2	0.0	80.8	0.6	80.6	0.4
6.5	79.5	79.7	0.2	79.5	0.0	79.9	0.4	79.9	0.4
7.0	78.9	79.1	0.2	78.9	0.0	79.1	0.2	79.3	0.4
7.5	78.3	78.4	0.1	78.3	0.0	78.4	0.1	78.6	0.3
8.0	77.8	77.9	0.1	77.8	0.0	77.9	0.1	78.1	0.3
8.5	77.2	77.4	0.2	77.2	0.0	77.4	0.2	77.6	0.4
9.0	76.7	76.9	0.2	76.7	0.0	76.8	0.1	77.0	0.3
9.5	76.1	76.3	0.2	76.1	0.0	76.3	0.2	76.5	0.4
10.0	75.6	75.8	0.2	75.6	0.0	75.8	0.2	75.9	0.3

Table A-3

INM Aicraft Model:		747200	Profile Weight:		525000
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	135.8	135.8	0.0	135.8	0.0
1.0	112.8	112.8	0.0	112.8	0.0
1.5	104.3	104.3	0.0	104.3	0.0
2.0	100.3	99.1	-1.2	99.1	-1.2
2.5	98.0	96.8	-1.2	97.1	-0.9
3.0	96.0	95.1	-0.9	95.5	-0.5
3.5	94.1	93.6	-0.5	94.2	0.1
4.0	91.9	92.2	0.3	92.8	0.9
4.5	90.8	91.1	0.3	91.4	0.6
5.0	89.8	90.0	0.2	90.3	0.5
5.5	88.9	89.3	0.4	89.4	0.5
6.0	87.9	88.6	0.7	88.6	0.7
6.5	87.1	87.9	0.8	87.9	0.8
7.0	86.1	87.0	0.9	87.0	0.9
7.5	85.4	86.2	0.8	86.2	0.8
8.0	84.7	85.6	0.9	85.5	0.8
8.5	83.9	85.0	1.1	84.8	0.9
9.0	83.2	84.5	1.3	84.2	1.0
9.5	82.6	84.0	1.4	83.5	0.9
10.0	81.9	83.3	1.4	82.7	0.8

Table A-4

INM Aicraft Model:		747400	Profile Weight:		545000				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	133.2	133.2	0.0	133.2	0.0	133.2	0.0	133.2	0.0
1.0	105.7	105.7	0.0	105.7	0.0	105.7	0.0	105.7	0.0
1.5	98.8	100.7	1.9	98.8	0.0	100.7	1.9	98.8	0.0
2.0	95.2	95.0	-0.2	95.2	0.0	95.2	0.0	95.2	0.0
2.5	93.2	92.4	-0.8	93.2	0.0	92.8	-0.4	93.2	0.0
3.0	91.7	90.9	-0.8	91.7	0.0	91.4	-0.3	91.7	0.0
3.5	90.2	89.6	-0.6	90.2	0.0	90.3	0.1	90.2	0.0
4.0	89.0	88.3	-0.7	89.0	0.0	88.9	-0.1	89.0	0.0
4.5	87.7	87.2	-0.5	87.7	0.0	87.7	0.0	87.7	0.0
5.0	86.5	86.2	-0.3	86.5	0.0	86.7	0.2	86.5	0.0
5.5	85.6	85.2	-0.4	85.6	0.0	85.8	0.2	85.6	0.0
6.0	84.8	84.4	-0.4	84.8	0.0	84.8	0.0	84.8	0.0
6.5	83.8	83.5	-0.3	83.8	0.0	84.1	0.3	83.8	0.0
7.0	82.9	82.8	-0.1	82.9	0.0	83.3	0.4	82.9	0.0
7.5	82.2	82.2	0.0	82.2	0.0	82.5	0.3	82.2	0.0
8.0	81.5	81.6	0.1	81.5	0.0	81.8	0.3	81.5	0.0
8.5	80.9	80.9	0.0	80.9	0.0	81.1	0.2	80.9	0.0
9.0	80.3	80.2	-0.1	80.3	0.0	80.6	0.3	80.3	0.0
9.5	79.8	79.7	-0.1	79.8	0.0	80.0	0.2	79.8	0.0
10.0	79.2	79.1	-0.1	79.2	0.0	79.5	0.3	79.2	0.0

Table A-5

INM Aicraft Model:		757300	Profile Weight:		203900				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	130.3	130.3	0.0	130.3	0.0	130.3	0.0	130.3	0.0
1.0	104.0	104.0	0.0	104.0	0.0	104.0	0.0	103.9	-0.1
1.5	97.7	97.6	-0.1	97.7	0.0	97.6	-0.1	95.9	-1.8
2.0	94.6	90.6	-4.0	94.6	0.0	90.6	-4.0	90.3	-4.3
2.5	92.0	87.4	-4.6	92.0	0.0	87.4	-4.6	88.6	-3.4
3.0	89.5	85.9	-3.6	89.5	0.0	85.9	-3.6	87.2	-2.3
3.5	84.7	84.7	0.0	84.7	0.0	84.6	-0.1	85.7	1.0
4.0	82.6	83.6	1.0	82.6	0.0	83.6	1.0	84.5	1.9
4.5	81.4	82.6	1.2	81.4	0.0	82.8	1.4	83.5	2.1
5.0	80.6	81.8	1.2	80.6	0.0	82.1	1.5	82.5	1.9
5.5	79.7	80.9	1.2	79.7	0.0	81.5	1.8	81.6	1.9
6.0	78.9	80.1	1.2	78.9	0.0	80.7	1.8	80.7	1.8
6.5	78.1	79.3	1.2	78.1	0.0	80.0	1.9	80.0	1.9
7.0	77.5	78.5	1.0	77.5	0.0	79.3	1.8	79.3	1.8
7.5	76.8	77.8	1.0	76.8	0.0	78.8	2.0	78.6	1.8
8.0	76.3	77.1	0.8	76.3	0.0	78.3	2.0	77.9	1.6
8.5	75.7	76.5	0.8	75.7	0.0	77.8	2.1	77.2	1.5
9.0	75.2	76.0	0.8	75.2	0.0	77.2	2.0	76.6	1.4
9.5	74.8	75.5	0.7	74.8	0.0	76.7	1.9	76.0	1.2
10.0	74.3	75.0	0.7	74.3	0.0	76.3	2.0	75.5	1.2

Table A-6

INM Aicraft Model:		767300	Profile Weight:		265000				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	116.8	116.8	0.0	116.8	0.0	116.9	0.1	116.8	0.0
1.0	103.3	103.2	-0.1	103.2	-0.1	103.2	-0.1	103.2	-0.1
1.5	99.3	95.7	-3.6	95.9	-3.4	97.7	-1.6	95.9	-3.4
2.0	93.4	93.5	0.1	93.7	0.3	93.1	-0.3	93.7	0.3
2.5	91.6	91.6	0.0	91.7	0.1	91.2	-0.4	91.7	0.1
3.0	89.9	90.0	0.1	90.1	0.2	89.7	-0.2	90.1	0.2
3.5	88.0	88.4	0.4	88.4	0.4	88.2	0.2	88.4	0.4
4.0	86.6	87.1	0.5	87.1	0.5	86.8	0.2	87.1	0.5
4.5	85.0	85.6	0.6	85.3	0.3	85.4	0.4	85.3	0.3
5.0	84.0	84.4	0.4	84.3	0.3	84.2	0.2	84.3	0.3
5.5	82.9	83.2	0.3	83.2	0.3	82.9	0.0	83.2	0.3
6.0	82.0	82.1	0.1	82.2	0.2	82.0	0.0	82.2	0.2
6.5	81.1	81.4	0.3	81.3	0.2	81.3	0.2	81.3	0.2
7.0	80.3	80.6	0.3	80.5	0.2	80.5	0.2	80.5	0.2
7.5	79.6	79.9	0.3	79.8	0.2	79.8	0.2	79.8	0.2
8.0	78.9	79.2	0.3	79.1	0.2	79.1	0.2	79.1	0.2
8.5	78.2	78.6	0.4	78.4	0.2	78.4	0.2	78.4	0.2
9.0	77.7	77.9	0.2	77.8	0.1	77.8	0.1	77.8	0.1
9.5	77.1	77.4	0.3	77.2	0.1	77.2	0.1	77.2	0.1
10.0	76.5	76.8	0.3	76.7	0.2	76.7	0.2	76.7	0.2

Table A-7

INM Aicraft Model:		767400	Profile Weight:		288818				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	131.3	131.3	0.0	131.3	0.0	131.3	0.0	131.3	0.0
1.0	102.0	101.9	-0.1	102.0	0.0	101.9	-0.1	102.0	0.0
1.5	92.8	96.0	3.2	92.8	0.0	96.0	3.2	92.8	0.0
2.0	90.4	89.5	-0.9	90.4	0.0	89.6	-0.8	90.4	0.0
2.5	88.6	87.9	-0.7	88.6	0.0	87.9	-0.7	88.6	0.0
3.0	86.8	86.5	-0.3	86.8	0.0	86.6	-0.2	86.8	0.0
3.5	85.3	84.9	-0.4	85.3	0.0	85.1	-0.2	85.3	0.0
4.0	84.0	83.6	-0.4	84.0	0.0	83.8	-0.2	84.0	0.0
4.5	82.8	82.4	-0.4	82.8	0.0	82.7	-0.1	82.8	0.0
5.0	81.8	81.5	-0.3	81.8	0.0	81.7	-0.1	81.8	0.0
5.5	80.8	80.6	-0.2	80.8	0.0	80.8	0.0	80.8	0.0
6.0	79.9	79.8	-0.1	79.9	0.0	80.0	0.1	79.9	0.0
6.5	79.2	78.9	-0.3	79.2	0.0	79.1	-0.1	79.2	0.0
7.0	78.4	78.1	-0.3	78.4	0.0	78.4	0.0	78.4	0.0
7.5	77.8	77.6	-0.2	77.8	0.0	77.8	0.0	77.8	0.0
8.0	77.2	77.0	-0.2	77.2	0.0	77.2	0.0	77.2	0.0
8.5	76.6	76.4	-0.2	76.6	0.0	76.6	0.0	76.6	0.0
9.0	76.0	75.9	-0.1	76.0	0.0	76.0	0.0	76.0	0.0
9.5	75.5	75.4	-0.1	75.5	0.0	75.5	0.0	75.5	0.0
10.0	75.0	74.9	-0.1	75.0	0.0	75.1	0.1	75.0	0.0

Table A-8

INM Aicraft Model:		777200	Profile Weight:		429900				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	129.6	129.6	0.0	129.6	0.0	129.6	0.0	129.6	0.0
1.0	100.5	100.6	0.1	100.5	0.0	100.6	0.1	100.6	0.1
1.5	92.4	95.8	3.4	92.4	0.0	95.8	3.4	92.4	0.0
2.0	89.7	88.7	-1.0	89.7	0.0	89.0	-0.7	89.9	0.2
2.5	87.7	86.4	-1.3	87.7	0.0	87.1	-0.6	87.8	0.1
3.0	85.9	84.9	-1.0	85.9	0.0	85.6	-0.3	86.1	0.2
3.5	84.1	83.4	-0.7	84.1	0.0	84.2	0.1	84.2	0.1
4.0	82.8	82.1	-0.7	82.8	0.0	82.8	0.0	82.8	0.0
4.5	81.5	81.0	-0.5	81.5	0.0	81.6	0.1	81.6	0.1
5.0	80.5	80.0	-0.5	80.5	0.0	80.5	0.0	80.5	0.0
5.5	79.4	79.0	-0.4	79.4	0.0	79.4	0.0	79.4	0.0
6.0	78.5	78.1	-0.4	78.5	0.0	78.5	0.0	78.5	0.0
6.5	77.6	77.2	-0.4	77.6	0.0	77.6	0.0	77.6	0.0
7.0	76.8	76.5	-0.3	76.8	0.0	76.8	0.0	76.9	0.1
7.5	76.0	75.7	-0.3	76.0	0.0	76.0	0.0	76.1	0.1
8.0	75.4	75.1	-0.3	75.4	0.0	75.4	0.0	75.5	0.1
8.5	74.7	74.5	-0.2	74.7	0.0	74.8	0.1	74.8	0.1
9.0	74.1	73.9	-0.2	74.1	0.0	74.2	0.1	74.2	0.1
9.5	73.5	73.3	-0.2	73.5	0.0	73.6	0.1	73.6	0.1
10.0	72.9	72.7	-0.2	72.9	0.0	73.0	0.1	73.0	0.1

Table A-9

INM Aicraft Model:		757PW	Profile Weight:		183200				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	125.5	125.5	0.0	125.5	0.0	125.5	0.0	125.5	0.0
1.0	97.7	97.7	0.0	97.7	0.0	97.7	0.0	97.7	0.0
1.5	90.0	92.4	2.4	90.0	0.0	92.4	2.4	90.0	0.0
2.0	87.3	85.9	-1.4	87.3	0.0	86.0	-1.3	87.3	0.0
2.5	85.3	83.5	-1.8	85.3	0.0	83.5	-1.8	85.3	0.0
3.0	83.5	81.8	-1.7	83.5	0.0	81.9	-1.6	83.5	0.0
3.5	81.4	80.1	-1.3	81.4	0.0	80.3	-1.1	81.4	0.0
4.0	79.8	78.8	-1.0	79.8	0.0	78.9	-0.9	79.8	0.0
4.5	78.5	77.7	-0.8	78.5	0.0	77.7	-0.8	78.5	0.0
5.0	77.4	76.6	-0.8	77.4	0.0	76.7	-0.7	77.4	0.0
5.5	76.4	75.7	-0.7	76.4	0.0	75.7	-0.7	76.4	0.0
6.0	75.3	74.8	-0.5	75.3	0.0	74.9	-0.4	75.3	0.0
6.5	74.5	74.0	-0.5	74.5	0.0	74.1	-0.4	74.5	0.0
7.0	73.5	73.1	-0.4	73.5	0.0	73.1	-0.4	73.5	0.0
7.5	72.7	72.4	-0.3	72.7	0.0	72.4	-0.3	72.7	0.0
8.0	71.9	71.6	-0.3	71.9	0.0	71.7	-0.2	71.9	0.0
8.5	71.2	70.9	-0.3	71.2	0.0	71.0	-0.2	71.2	0.0
9.0	70.5	70.3	-0.2	70.5	0.0	70.3	-0.2	70.5	0.0
9.5	69.9	69.7	-0.2	69.9	0.0	69.8	-0.1	69.9	0.0
10.0	69.3	69.1	-0.2	69.3	0.0	69.2	-0.1	69.3	0.0

Table A-10

INM Aicraft Model:		A319-131	Profile Weight:		125900				
Grid Points (nmi)	INM Standard Profile (SEL dB)	Non-Delta Close-In Profile (SEL dB)	Non-Delta Close-In NADP Difference (dB)	Non-Delta Distant Profile (SEL dB)	Non-Delta Distant NADP Difference (dB)	Delta Close-In Profile (SEL dB)	Delta Close-In NADP Difference (dB)	Delta Distant Profile (SEL dB)	Delta Distant NADP Difference (dB)
0.5	125.8	125.8	0.0	125.8	0.0	125.8	0.0	125.8	0.0
1.0	96.9	97.1	0.2	96.9	0.0	96.9	0.0	96.9	0.0
1.5	92.7	92.1	-0.6	92.7	0.0	88.4	-4.3	88.8	-3.9
2.0	90.3	85.3	-5.0	90.3	0.0	85.4	-4.9	86.9	-3.4
2.5	87.9	82.9	-5.0	87.9	0.0	83.6	-4.3	85.8	-2.1
3.0	83.6	81.4	-2.2	83.6	0.0	82.0	-1.6	84.9	1.3
3.5	81.7	80.3	-1.4	81.7	0.0	80.6	-1.1	83.2	1.5
4.0	80.2	79.7	-0.5	80.2	0.0	79.8	-0.4	81.4	1.2
4.5	79.6	79.2	-0.4	79.6	0.0	79.2	-0.4	80.1	0.5
5.0	79.2	78.8	-0.4	79.2	0.0	78.7	-0.5	79.6	0.4
5.5	78.6	78.4	-0.2	78.6	0.0	78.2	-0.4	79.1	0.5
6.0	77.7	78.1	0.4	77.7	0.0	77.8	0.1	78.5	0.8
6.5	76.7	77.8	1.1	76.7	0.0	77.5	0.8	77.6	0.9
7.0	75.8	77.2	1.4	75.8	0.0	77.2	1.4	76.6	0.8
7.5	74.9	76.4	1.5	74.9	0.0	76.7	1.8	75.7	0.8
8.0	74.3	75.5	1.2	74.3	0.0	76.0	1.7	74.8	0.5
8.5	73.5	74.7	1.2	73.5	0.0	75.1	1.6	74.2	0.7
9.0	72.8	74.0	1.2	72.8	0.0	74.4	1.6	73.4	0.6
9.5	72.1	73.3	1.2	72.1	0.0	73.7	1.6	72.7	0.6
10.0	71.4	72.5	1.1	71.4	0.0	73.0	1.6	72.0	0.6

Table A-11

INM Aicraft Model:		A320-211	Profile Weight:		133400				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	128.1	128.1	0.0	128.1	0.0	128.1	0.0	128.1	0.0
1.0	99.6	99.7	0.1	99.6	0.0	99.6	0.0	99.6	0.0
1.5	94.6	94.1	-0.5	94.6	0.0	91.7	-2.9	92.2	-2.4
2.0	91.9	88.2	-3.7	91.9	0.0	88.5	-3.4	89.8	-2.1
2.5	89.3	85.8	-3.5	89.3	0.0	86.4	-2.9	88.0	-1.3
3.0	85.1	84.3	-0.8	85.1	0.0	84.8	-0.3	86.6	1.5
3.5	83.3	83.1	-0.2	83.3	0.0	83.4	0.1	84.6	1.3
4.0	81.9	82.1	0.2	81.9	0.0	82.3	0.4	83.0	1.1
4.5	81.0	81.2	0.2	81.0	0.0	81.3	0.3	81.7	0.7
5.0	80.2	80.3	0.1	80.2	0.0	80.4	0.2	80.8	0.6
5.5	79.3	79.6	0.3	79.3	0.0	79.6	0.3	80.0	0.7
6.0	78.4	78.9	0.5	78.4	0.0	78.9	0.5	79.1	0.7
6.5	77.4	78.1	0.7	77.4	0.0	78.2	0.8	78.1	0.7
7.0	76.6	77.3	0.7	76.6	0.0	77.5	0.9	77.2	0.6
7.5	75.9	76.4	0.5	75.9	0.0	76.8	0.9	76.5	0.6
8.0	75.1	75.7	0.6	75.1	0.0	76.0	0.9	75.7	0.6
8.5	74.6	75.0	0.4	74.6	0.0	75.2	0.6	75.0	0.4
9.0	73.9	74.4	0.5	73.9	0.0	74.7	0.8	74.4	0.5
9.5	73.3	73.8	0.5	73.3	0.0	74.0	0.7	73.8	0.5
10.0	72.7	73.2	0.5	72.7	0.0	73.5	0.8	73.2	0.5

Table A-12

INM Aicraft Model:		A321-232	Profile Weight:		156800
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	128.4	128.4	0.0	128.4	0.0
1.0	101.3	101.2	-0.1	101.3	0.0
1.5	96.1	95.6	-0.5	96.1	0.0
2.0	93.4	89.1	-4.3	93.4	0.0
2.5	91.2	86.4	-4.8	91.2	0.0
3.0	85.1	84.9	-0.2	85.1	0.0
3.5	83.0	83.7	0.7	83.0	0.0
4.0	81.7	82.5	0.8	81.7	0.0
4.5	80.7	81.3	0.6	80.7	0.0
5.0	79.7	80.4	0.7	79.7	0.0
5.5	78.7	79.5	0.8	78.7	0.0
6.0	77.9	78.6	0.7	77.9	0.0
6.5	77.1	77.7	0.6	77.1	0.0
7.0	76.3	77.0	0.7	76.3	0.0
7.5	75.7	76.2	0.5	75.7	0.0
8.0	75.0	75.5	0.5	75.0	0.0
8.5	74.4	74.8	0.4	74.4	0.0
9.0	73.8	74.3	0.5	73.8	0.0
9.5	73.2	73.7	0.5	73.2	0.0
10.0	72.7	73.2	0.5	72.7	0.0

Table A-13

INM Aicraft Model:		A330-301	Profile Weight:		367000				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	132.1	132.1	0.0	132.1	0.0	132.1	0.0	132.1	0.0
1.0	104.2	104.1	-0.1	104.2	0.0	104.1	-0.1	104.1	-0.1
1.5	99.1	98.7	-0.4	99.1	0.0	98.7	-0.4	98.7	-0.4
2.0	96.3	92.5	-3.8	96.3	0.0	92.5	-3.8	92.7	-3.6
2.5	93.1	89.9	-3.2	93.1	0.0	89.9	-3.2	90.7	-2.4
3.0	89.4	88.3	-1.1	89.4	0.0	88.3	-1.1	89.5	0.1
3.5	87.6	87.1	-0.5	87.6	0.0	87.1	-0.5	88.5	0.9
4.0	86.3	86.3	0.0	86.3	0.0	86.2	-0.1	87.4	1.1
4.5	85.5	85.6	0.1	85.5	0.0	85.4	-0.1	86.1	0.6
5.0	84.8	85.0	0.2	84.8	0.0	84.7	-0.1	85.3	0.5
5.5	84.1	84.4	0.3	84.1	0.0	84.0	-0.1	84.7	0.6
6.0	83.2	83.8	0.6	83.2	0.0	83.5	0.3	83.9	0.7
6.5	82.3	83.3	1.0	82.3	0.0	82.9	0.6	83.1	0.8
7.0	81.4	82.5	1.1	81.4	0.0	82.4	1.0	82.1	0.7
7.5	80.7	81.6	0.9	80.7	0.0	81.7	1.0	81.3	0.6
8.0	79.9	80.8	0.9	79.9	0.0	81.1	1.2	80.5	0.6
8.5	79.3	80.0	0.7	79.3	0.0	80.2	0.9	79.8	0.5
9.0	78.6	79.4	0.8	78.6	0.0	79.6	1.0	79.2	0.6
9.5	78.0	78.8	0.8	78.0	0.0	79.0	1.0	78.5	0.5
10.0	77.3	78.1	0.8	77.3	0.0	78.3	1.0	77.9	0.6

Table A-14

INM Aicraft Model:		CL601 (CLREGJ)	Profile Weight:		43100
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	121.5	121.5	0.0	121.5	0.0
1.0	103.0	100.2	-2.8	103.0	0.0
1.5	92.9	90.7	-2.2	92.9	0.0
2.0	87.5	85.4	-2.1	87.1	-0.4
2.5	84.4	83.0	-1.4	84.1	-0.3
3.0	82.2	81.0	-1.2	81.9	-0.3
3.5	79.1	79.3	0.2	79.9	0.8
4.0	77.6	77.8	0.2	78.2	0.6
4.5	76.3	76.7	0.4	76.8	0.5
5.0	75.4	75.6	0.2	75.7	0.3
5.5	74.4	74.6	0.2	74.7	0.3
6.0	73.6	73.7	0.1	73.9	0.3
6.5	72.7	72.8	0.1	73.0	0.3
7.0	71.8	72.0	0.2	72.1	0.3
7.5	71.0	71.2	0.2	71.3	0.3
8.0	70.3	70.4	0.1	70.5	0.2
8.5	69.6	69.7	0.1	69.9	0.3
9.0	68.9	69.0	0.1	69.1	0.2
9.5	68.3	68.5	0.2	68.5	0.2
10.0	67.7	67.9	0.2	67.9	0.2

Table A-15

INM Aicraft Model:		DC1010	Profile Weight:		325000
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	132.9	132.9	0.0	132.9	0.0
1.0	107.3	107.3	0.0	107.3	0.0
1.5	100.3	100.3	0.0	100.3	0.0
2.0	96.9	95.7	-1.2	95.8	-1.1
2.5	94.4	93.6	-0.8	93.7	-0.7
3.0	91.3	91.9	0.6	91.9	0.6
3.5	89.3	90.3	1.0	90.4	1.1
4.0	87.5	88.9	1.4	89.0	1.5
4.5	86.2	87.7	1.5	87.6	1.4
5.0	85.1	86.7	1.6	86.2	1.1
5.5	84.2	85.8	1.6	85.2	1.0
6.0	83.5	84.9	1.4	84.3	0.8
6.5	82.7	84.0	1.3	83.5	0.8
7.0	81.9	83.1	1.2	82.8	0.9
7.5	81.0	82.3	1.3	81.9	0.9
8.0	80.1	81.5	1.4	81.0	0.9
8.5	79.3	80.8	1.5	80.2	0.9
9.0	78.6	80.1	1.5	79.4	0.8
9.5	77.9	79.5	1.6	78.6	0.7
10.0	77.2	78.9	1.7	77.9	0.7

Table A-16

INM Aicraft Model:		DC9Q9	Profile Weight:		93500				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	136.5	136.5	0.0	136.5	0.0	136.5	0.0	136.5	0.0
1.0	112.6	112.6	0.0	112.6	0.0	112.6	0.0	112.6	0.0
1.5	107.5	107.5	0.0	107.5	0.0	107.5	0.0	107.5	0.0
2.0	104.7	100.9	-3.8	100.9	-3.8	100.9	-3.8	100.9	-3.8
2.5	100.9	99.1	-1.8	99.2	-1.7	99.1	-1.8	99.2	-1.7
3.0	97.6	97.7	0.1	97.7	0.1	97.7	0.1	97.7	0.1
3.5	96.3	96.2	-0.1	96.3	0.0	96.2	-0.1	96.3	0.0
4.0	94.8	95.0	0.2	95.2	0.4	95.0	0.2	95.2	0.4
4.5	93.4	93.8	0.4	94.0	0.6	93.8	0.4	94.0	0.6
5.0	92.3	92.9	0.6	92.9	0.6	92.9	0.6	92.9	0.6
5.5	91.4	92.2	0.8	91.9	0.5	92.2	0.8	91.9	0.5
6.0	90.6	91.2	0.6	91.1	0.5	91.2	0.6	91.1	0.5
6.5	89.9	90.4	0.5	90.4	0.5	90.4	0.5	90.4	0.5
7.0	89.1	89.6	0.5	89.7	0.6	89.6	0.5	89.7	0.6
7.5	88.4	88.9	0.5	88.9	0.5	88.9	0.5	88.9	0.5
8.0	87.7	88.3	0.6	88.2	0.5	88.3	0.6	88.2	0.5
8.5	86.9	87.6	0.7	87.4	0.5	87.6	0.7	87.4	0.5
9.0	86.2	87.0	0.8	86.7	0.5	87.0	0.8	86.7	0.5
9.5	85.5	86.5	1.0	85.9	0.4	86.5	1.0	85.9	0.4
10.0	84.8	85.9	1.1	85.3	0.5	85.9	1.1	85.3	0.5

Table A-17

INM Aicraft Model:		737500 (EMB170)	Profile Weight:		103400
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	125.5	125.5	0.0	125.5	0.0
1.0	98.4	98.5	0.1	98.4	0.0
1.5	92.9	93.0	0.1	92.9	0.0
2.0	89.7	89.1	-0.6	89.7	0.0
2.5	87.7	86.8	-0.9	87.7	0.0
3.0	85.8	85.4	-0.4	85.8	0.0
3.5	84.2	84.0	-0.2	84.2	0.0
4.0	83.0	82.7	-0.3	83.0	0.0
4.5	81.7	81.6	-0.1	81.7	0.0
5.0	80.7	80.6	-0.1	80.7	0.0
5.5	79.7	79.6	-0.1	79.7	0.0
6.0	78.8	78.7	-0.1	78.8	0.0
6.5	77.9	77.8	-0.1	77.9	0.0
7.0	77.1	77.0	-0.1	77.1	0.0
7.5	76.4	76.3	-0.1	76.4	0.0
8.0	75.8	75.7	-0.1	75.8	0.0
8.5	75.1	75.1	0.0	75.1	0.0
9.0	74.5	74.5	0.0	74.5	0.0
9.5	73.9	73.9	0.0	73.9	0.0
10.0	73.3	73.3	0.0	73.3	0.0

Table A-18

INM Aicraft Model:		MD11GE	Profile Weight:		395000
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	131.1	131.1	0.0	131.1	0.0
1.0	103.6	103.6	0.0	103.6	0.0
1.5	98.4	96.2	-2.2	96.2	-2.2
2.0	95.5	91.8	-3.7	92.1	-3.4
2.5	89.8	90.1	0.3	90.3	0.5
3.0	87.4	88.5	1.1	88.6	1.2
3.5	85.7	87.2	1.5	87.1	1.4
4.0	84.5	86.0	1.5	85.6	1.1
4.5	83.4	84.7	1.3	84.4	1.0
5.0	82.4	83.6	1.2	83.3	0.9
5.5	81.5	82.6	1.1	82.3	0.8
6.0	80.5	81.7	1.2	81.4	0.9
6.5	79.7	80.8	1.1	80.5	0.8
7.0	78.9	79.9	1.0	79.6	0.7
7.5	78.1	79.1	1.0	78.8	0.7
8.0	77.4	78.1	0.7	78.0	0.6
8.5	76.7	77.5	0.8	77.3	0.6
9.0	76.1	76.9	0.8	76.7	0.6
9.5	75.5	76.2	0.7	76.1	0.6
10.0	74.8	75.7	0.9	75.4	0.6

Table A-19

INM Aicraft Model:		MD81	Profile Weight:		120680				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	131.6	131.6	0.0	131.6	0.0	131.4	-0.2	131.4	-0.2
1.0	107.0	107.1	0.1	107.0	0.0	106.7	-0.3	106.6	-0.4
1.5	101.7	101.5	-0.2	101.7	0.0	101.1	-0.6	101.4	-0.3
2.0	96.9	98.3	1.4	96.9	0.0	97.5	0.6	96.7	-0.2
2.5	95.1	94.2	-0.9	95.1	0.0	93.9	-1.2	94.9	-0.2
3.0	93.5	92.7	-0.8	93.5	0.0	92.3	-1.2	93.4	-0.1
3.5	92.1	91.5	-0.6	92.1	0.0	91.1	-1.0	92.0	-0.1
4.0	90.6	90.2	-0.4	90.6	0.0	89.8	-0.8	90.4	-0.2
4.5	89.3	89.0	-0.3	89.3	0.0	88.7	-0.6	89.2	-0.1
5.0	88.2	88.0	-0.2	88.2	0.0	87.7	-0.5	88.0	-0.2
5.5	87.2	87.1	-0.1	87.2	0.0	86.9	-0.3	87.1	-0.1
6.0	86.4	86.3	-0.1	86.4	0.0	86.0	-0.4	86.3	-0.1
6.5	85.5	85.5	0.0	85.5	0.0	85.2	-0.3	85.4	-0.1
7.0	84.7	84.6	-0.1	84.7	0.0	84.5	-0.2	84.6	-0.1
7.5	83.9	83.9	0.0	83.9	0.0	83.8	-0.1	83.9	0.0
8.0	83.2	83.3	0.1	83.2	0.0	83.0	-0.2	83.2	0.0
8.5	82.6	82.6	0.0	82.6	0.0	82.4	-0.2	82.5	-0.1
9.0	81.9	81.9	0.0	81.9	0.0	81.8	-0.1	81.8	-0.1
9.5	81.3	81.3	0.0	81.3	0.0	81.3	0.0	81.2	-0.1
10.0	80.7	80.8	0.1	80.7	0.0	80.8	0.1	80.7	0.0

Table A-20

INM Aicraft Model:		MD9025	Profile Weight:		131021				
Grid Points	INM Standard Profile	Non-Delta Close-In Profile	Non-Delta Close-In NADP Difference	Non-Delta Distant Profile	Non-Delta Distant NADP Difference	Delta Close-In Profile	Delta Close-In NADP Difference	Delta Distant Profile	Delta Distant NADP Difference
(nmi)	(SEL dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)	(SEL dB)	(dB)
0.5	124.9	124.9	0.0	124.9	0.0	124.9	0.0	124.9	0.0
1.0	100.7	100.7	0.0	100.7	0.0	100.6	-0.1	100.7	0.0
1.5	94.1	94.0	-0.1	94.1	0.0	94.0	-0.1	94.1	0.0
2.0	90.8	90.2	-0.6	90.4	-0.4	90.5	-0.3	90.4	-0.4
2.5	88.1	88.1	0.0	87.7	-0.4	87.9	-0.2	87.8	-0.3
3.0	85.3	86.3	1.0	85.5	0.2	86.2	0.9	85.9	0.6
3.5	83.8	84.5	0.7	83.9	0.1	84.5	0.7	84.3	0.5
4.0	82.1	82.9	0.8	82.3	0.2	82.8	0.7	82.7	0.6
4.5	80.8	81.5	0.7	80.9	0.1	81.4	0.6	81.4	0.6
5.0	79.6	80.1	0.5	79.7	0.1	80.0	0.4	80.4	0.8
5.5	78.8	78.9	0.1	78.8	0.0	78.9	0.1	79.4	0.6
6.0	78.0	77.9	-0.1	78.0	0.0	77.8	-0.2	78.6	0.6
6.5	77.3	77.1	-0.2	77.3	0.0	77.0	-0.3	77.8	0.5
7.0	76.6	76.4	-0.2	76.7	0.1	76.4	-0.2	77.0	0.4
7.5	76.0	75.9	-0.1	76.0	0.0	75.9	-0.1	76.4	0.4
8.0	75.5	75.4	-0.1	75.5	0.0	75.3	-0.2	75.7	0.2
8.5	74.7	74.8	0.1	74.8	0.1	74.7	0.0	74.9	0.2
9.0	74.0	74.1	0.1	74.0	0.0	74.1	0.1	74.2	0.2
9.5	73.3	73.4	0.1	73.4	0.1	73.4	0.1	73.6	0.3
10.0	72.8	72.8	0.0	72.8	0.0	72.8	0.0	73.0	0.2

Attachment B

Graphical and Tabular Comparison

Table B-1
Proposed Custom Profile Aircraft Operations

Aircraft Type	NADP Profiles Required for Stage Lengths (Mark with "X")								
	1	2	3	4	5	6	7	8	9
737700	x	x	x	x	x		■	■	■
737800	x	x	x	x	x		■	■	■
747200	x	x	x					■	■
747400	x	x	x	x		x	x		
757300	x	x	x	x	x		■	■	■
767300	x	x	x	x	x			■	■
767400	x	x	x		x	x		■	■
777200	x	x		x		x	x		
757PW	x	x	x	x	x			■	■
A319-131	x	x	x	x		■	■	■	■
A320-211	x	x	x	x	x	■	■	■	■
A321-232	x	x	x	x		■	■	■	■
A330-301	x	x	x	x	x	x		■	■
CL601 (CLREGJ)*	x	■	■	■	■	■	■	■	■
DC1010	x	x		x			■	■	■
DC9Q9	x	x	x	■	■	■	■	■	■
737500 (EMB170)**	x					■	■	■	■
MD11GE	x	x	x					■	■
MD81	x	x	x	x	■	■	■	■	■
MD9025	x	x	x	x		■	■	■	■

Source: MAC, 2012; INM

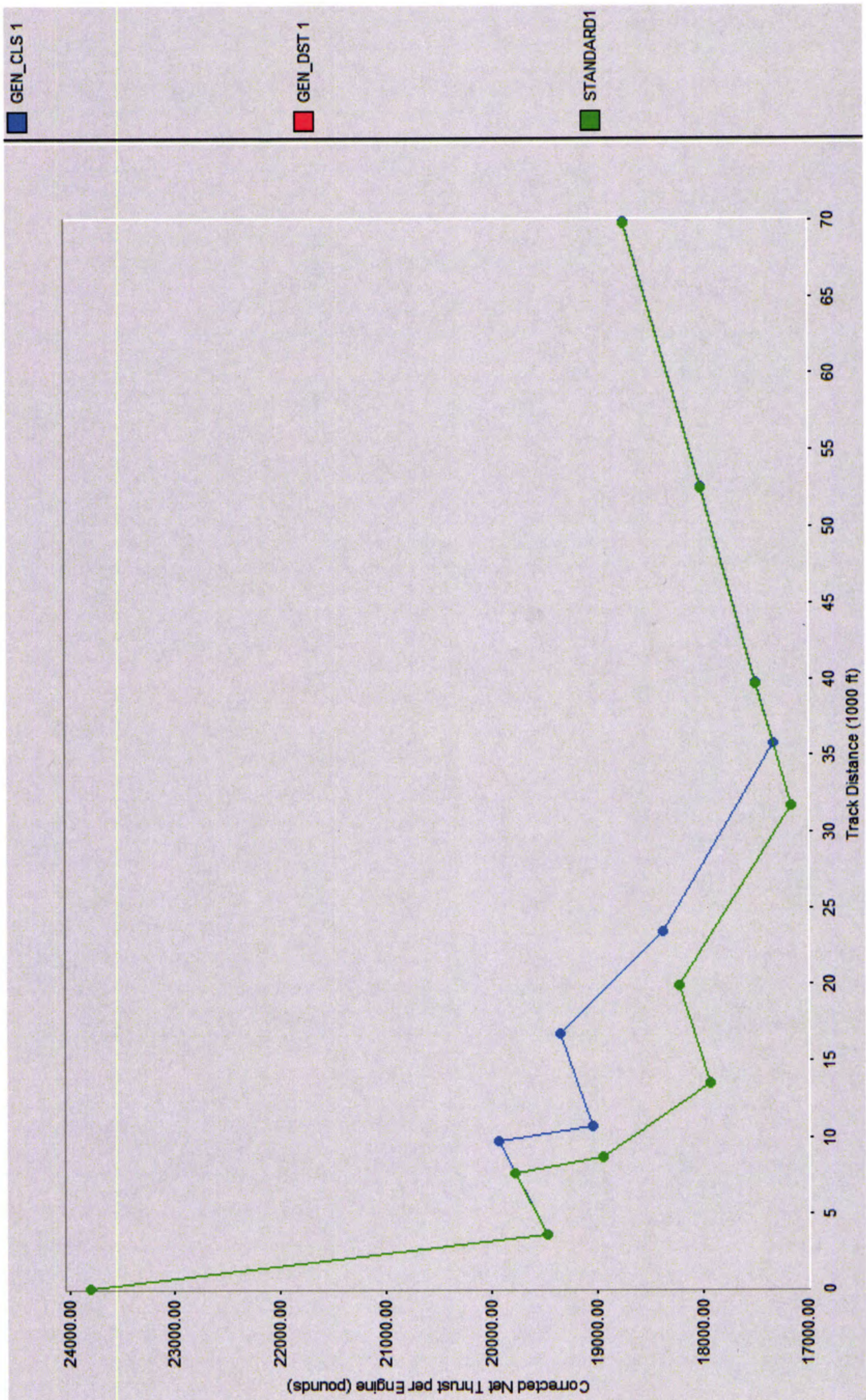
* Original data tables included aircraft type CLREGJ. Close-in and distant profiles were created based on CL601

** Original data tables included aircraft type EMB170. Close-in and distant profiles were created based on 737500

■ Indicates no stage length available in INM

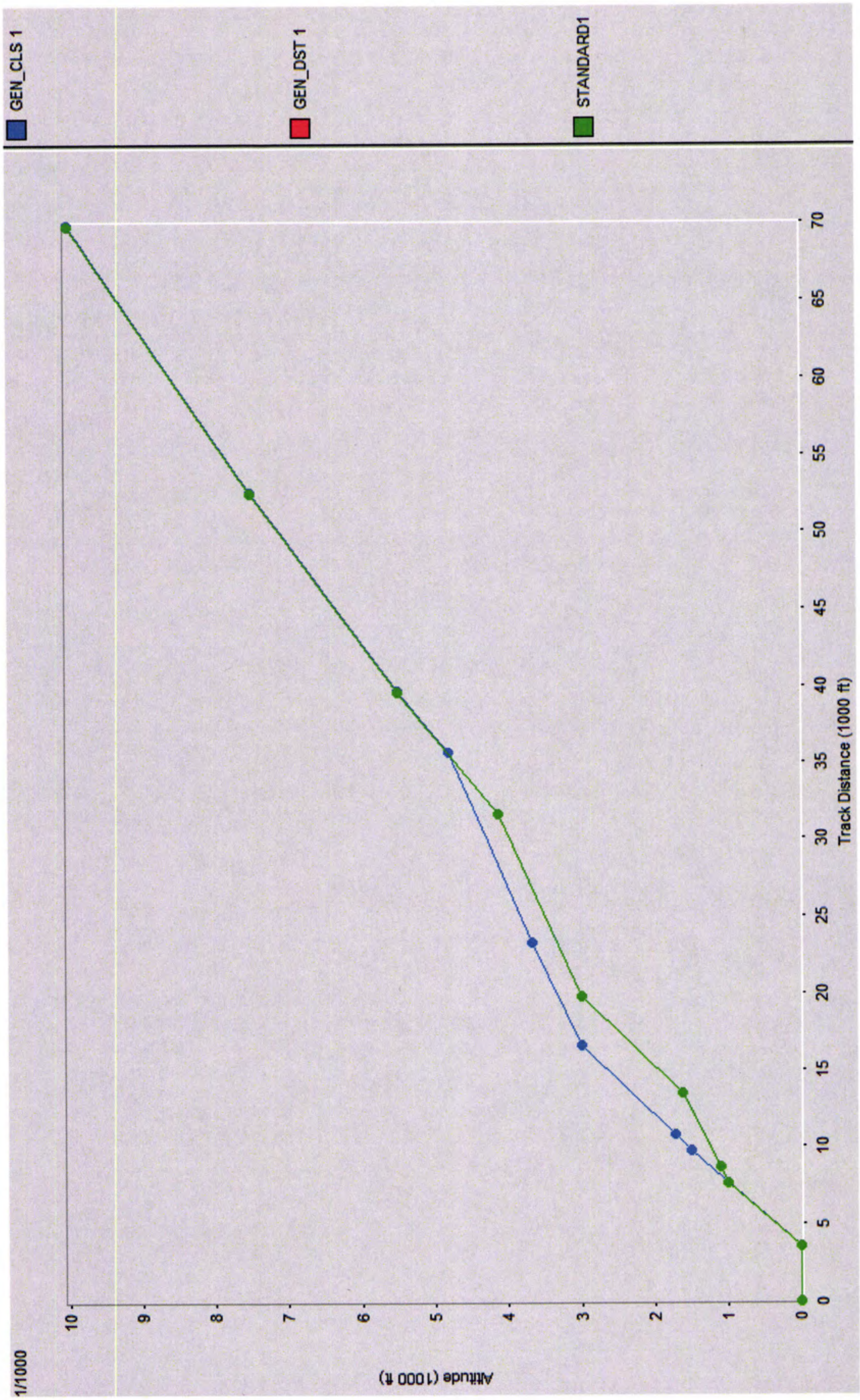
B-2

737700 Thrust Comparison



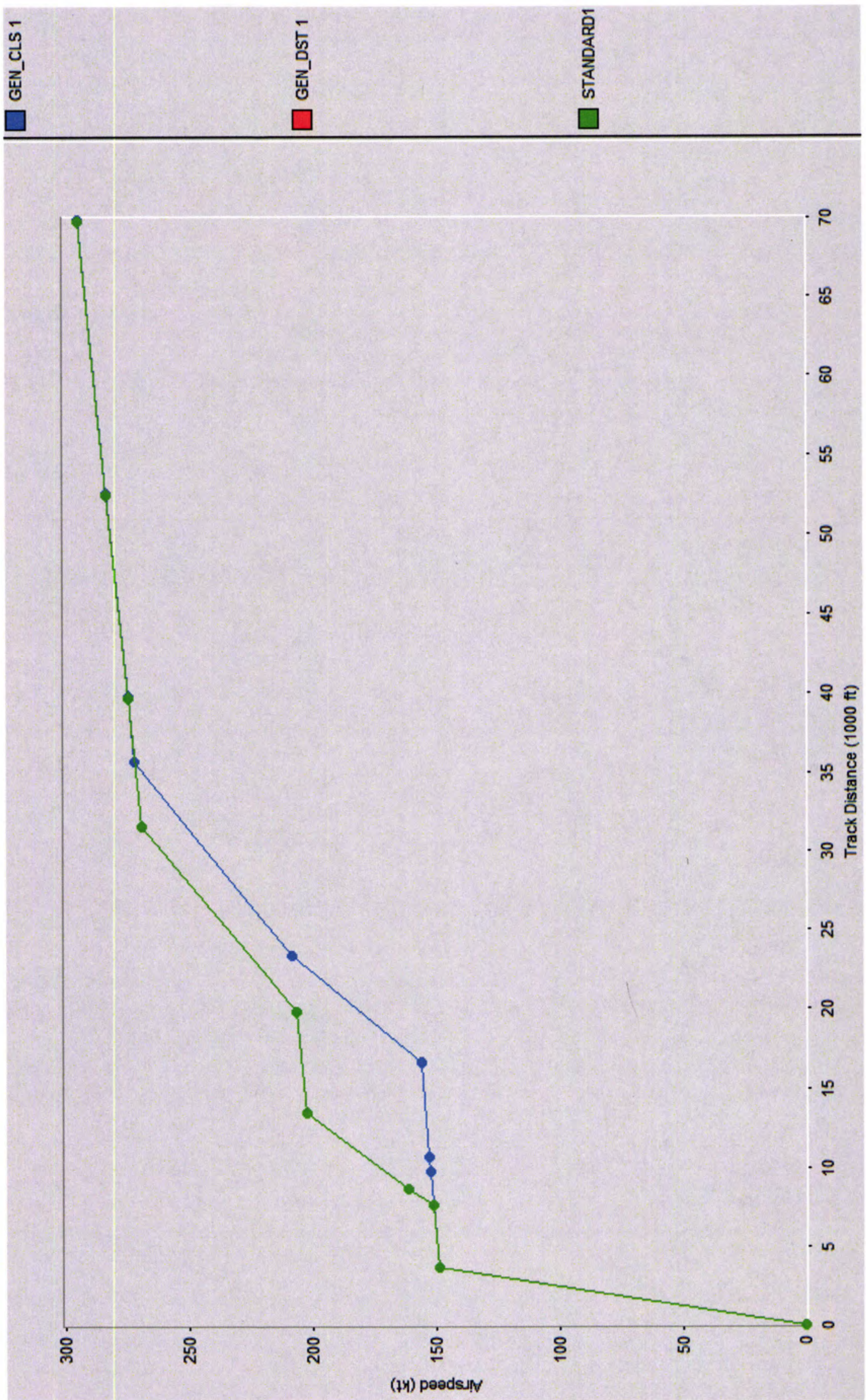
B-3

737700 Altitude Comparison

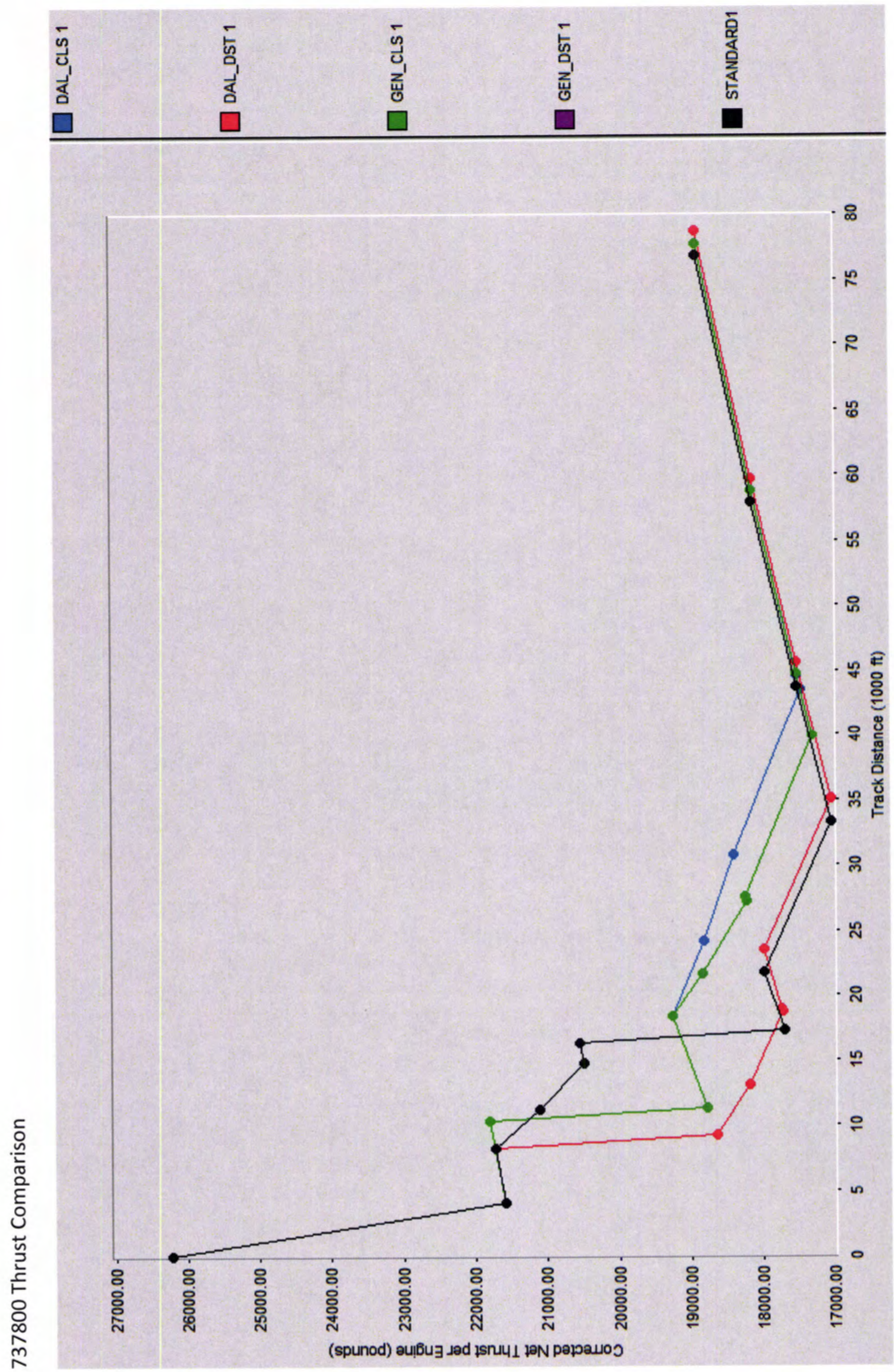


B-4

737700 Airspeed Comparison



B-5


737800 Thrust Comparison
Corrected Net Thrust per Engine (pounds)
27000.00
26000.00
25000.00
24000.00
23000.00
22000.00
21000.00
20000.00
19000.00
18000.00
17000.00
Track Distance (1000 ft)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
DAL_CLS 1
DAL_DST 1
GEN_CLS 1
GEN_DST 1
STANDARD1

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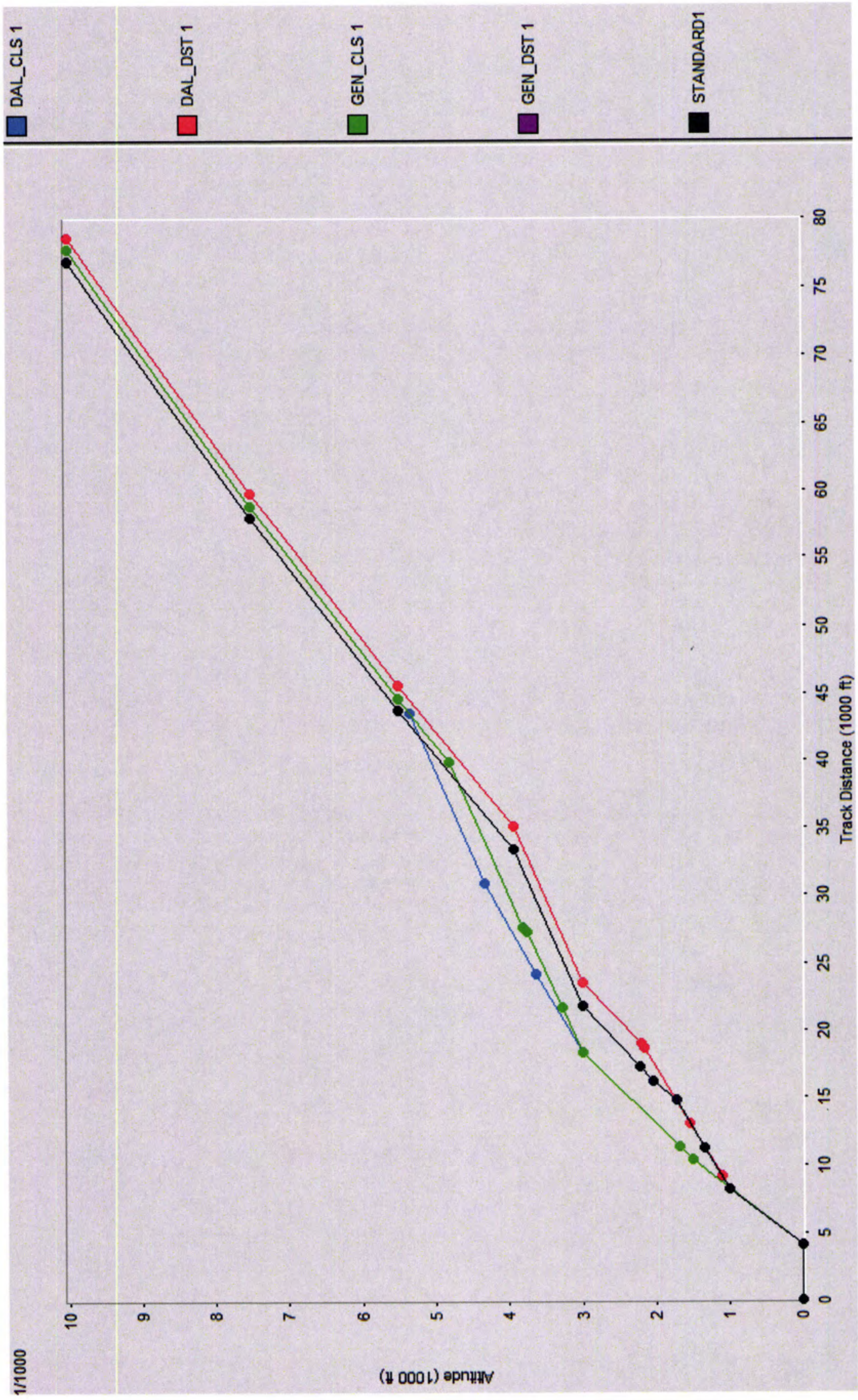
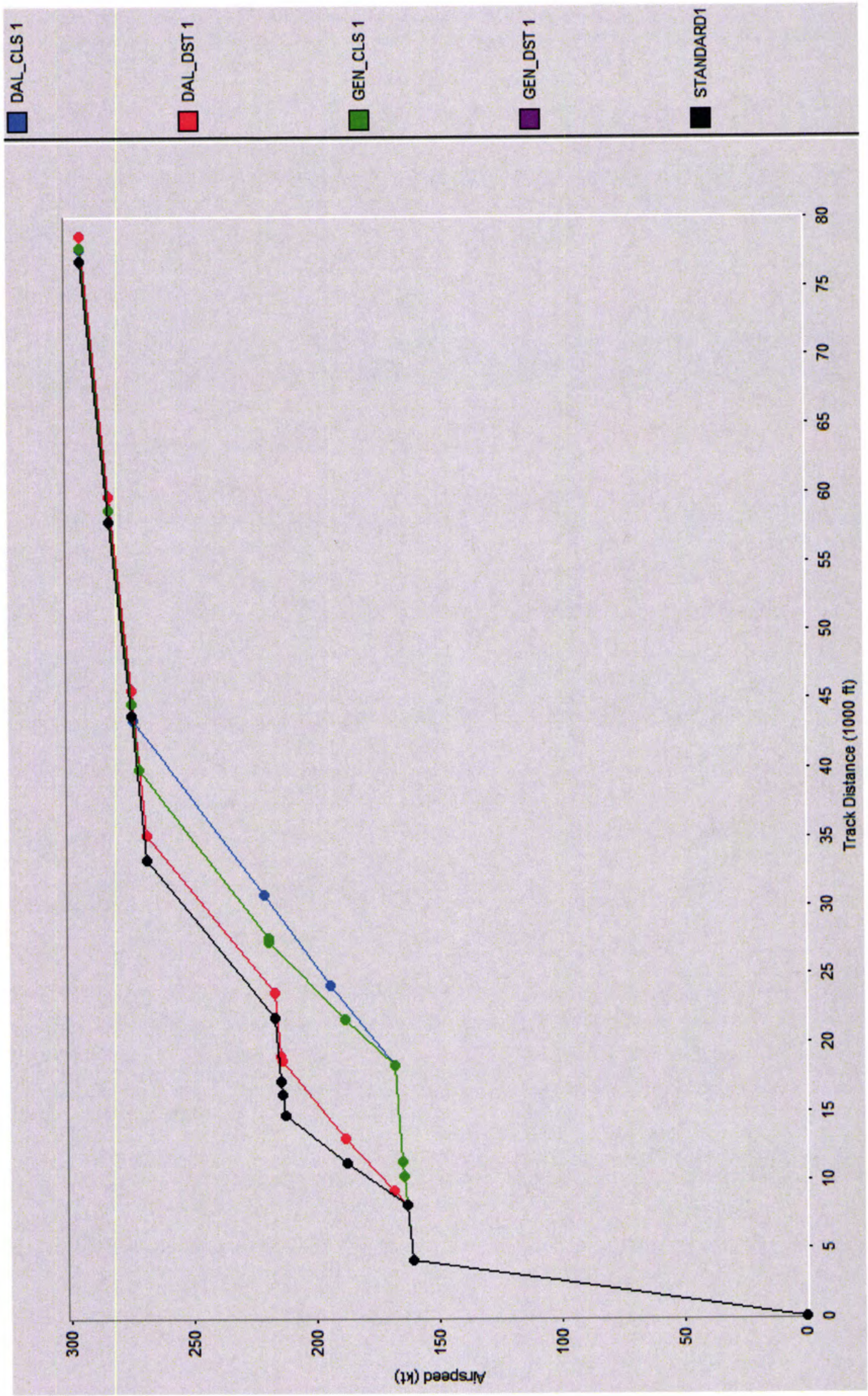
737800 Altitude Comparison



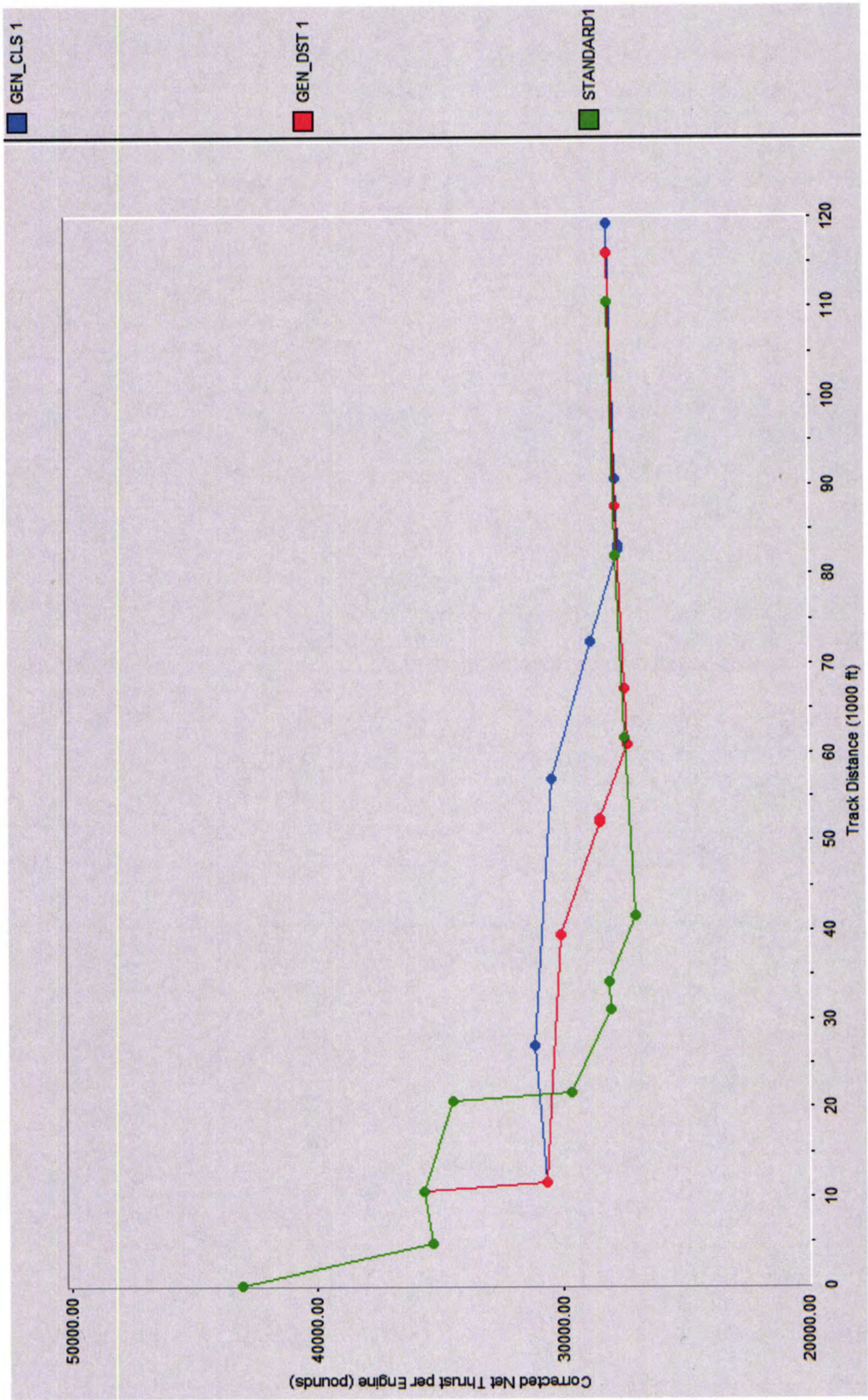
B-7

737800 Airspeed Comparison



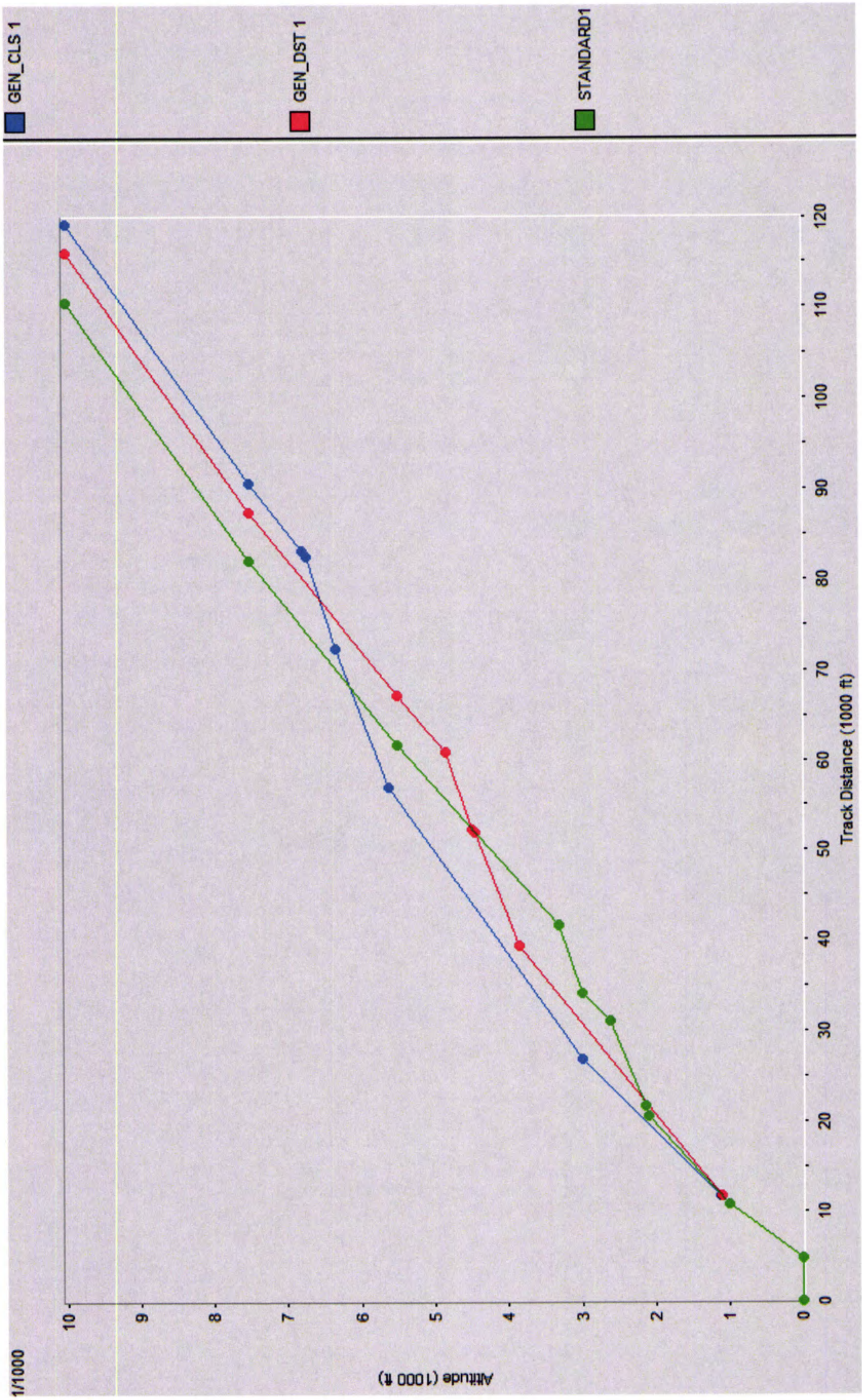
B-8

747200 Thrust Comparison



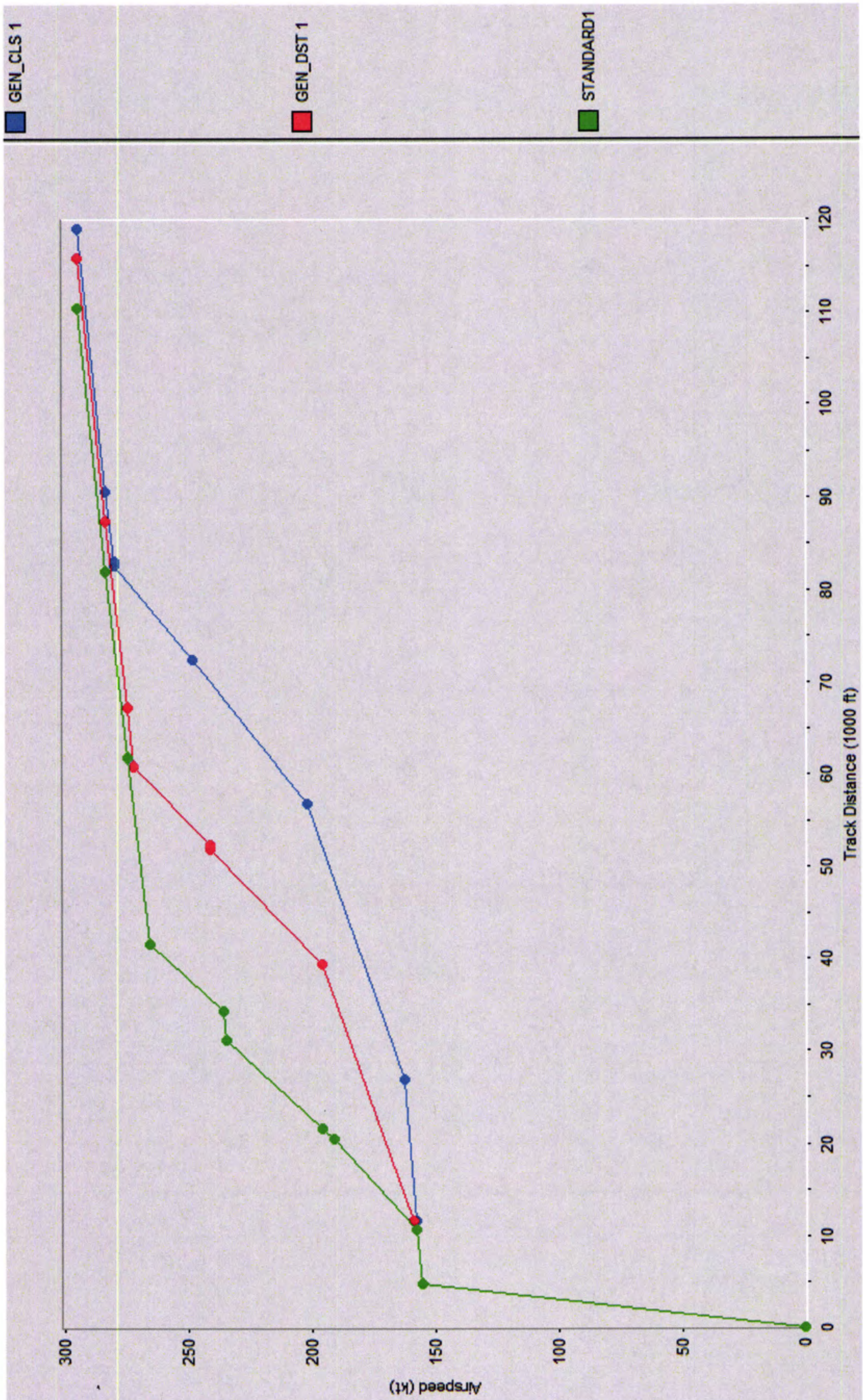
B-9

747200 Altitude Comparison



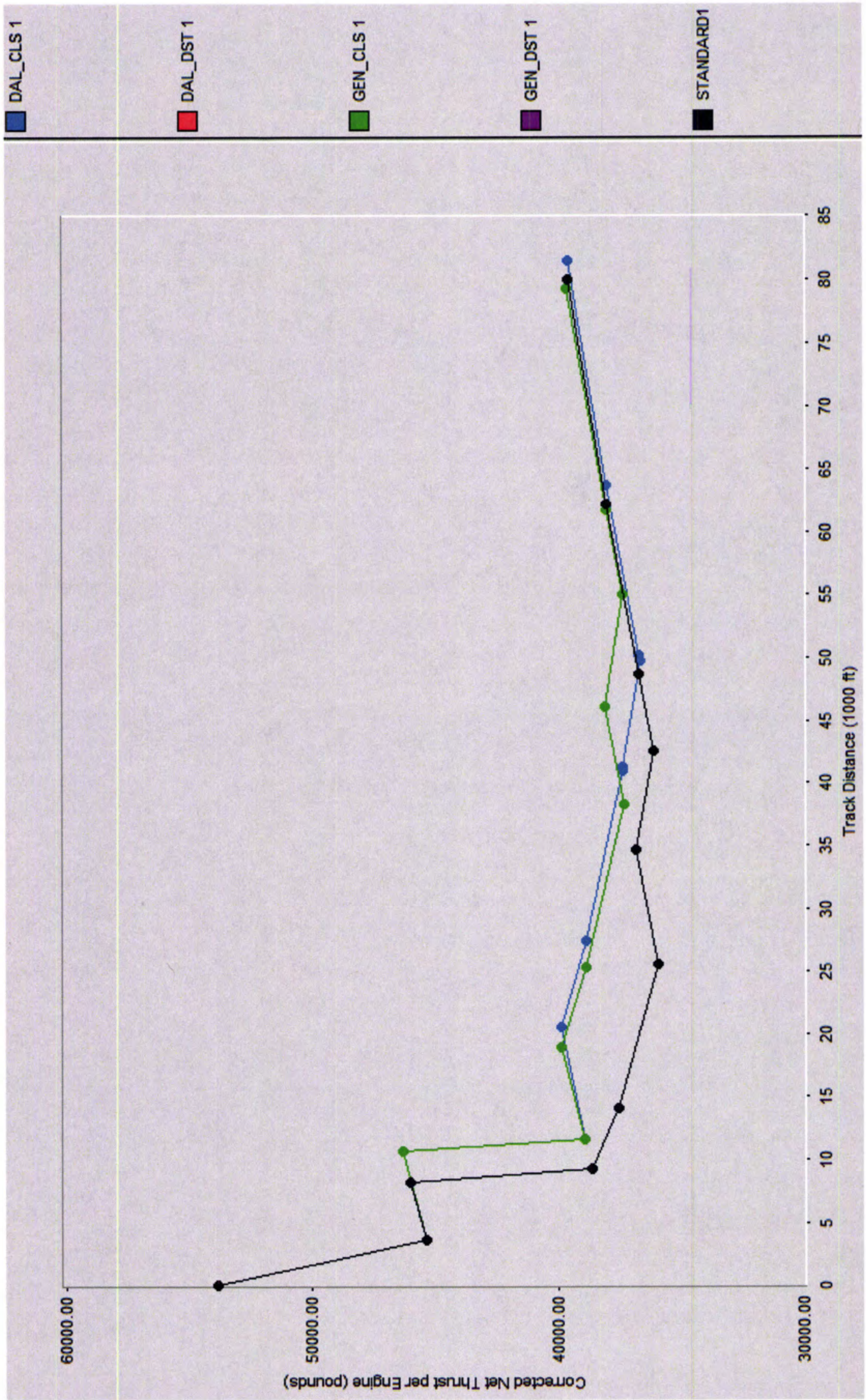
B-10

747200 Airspeed Comparison



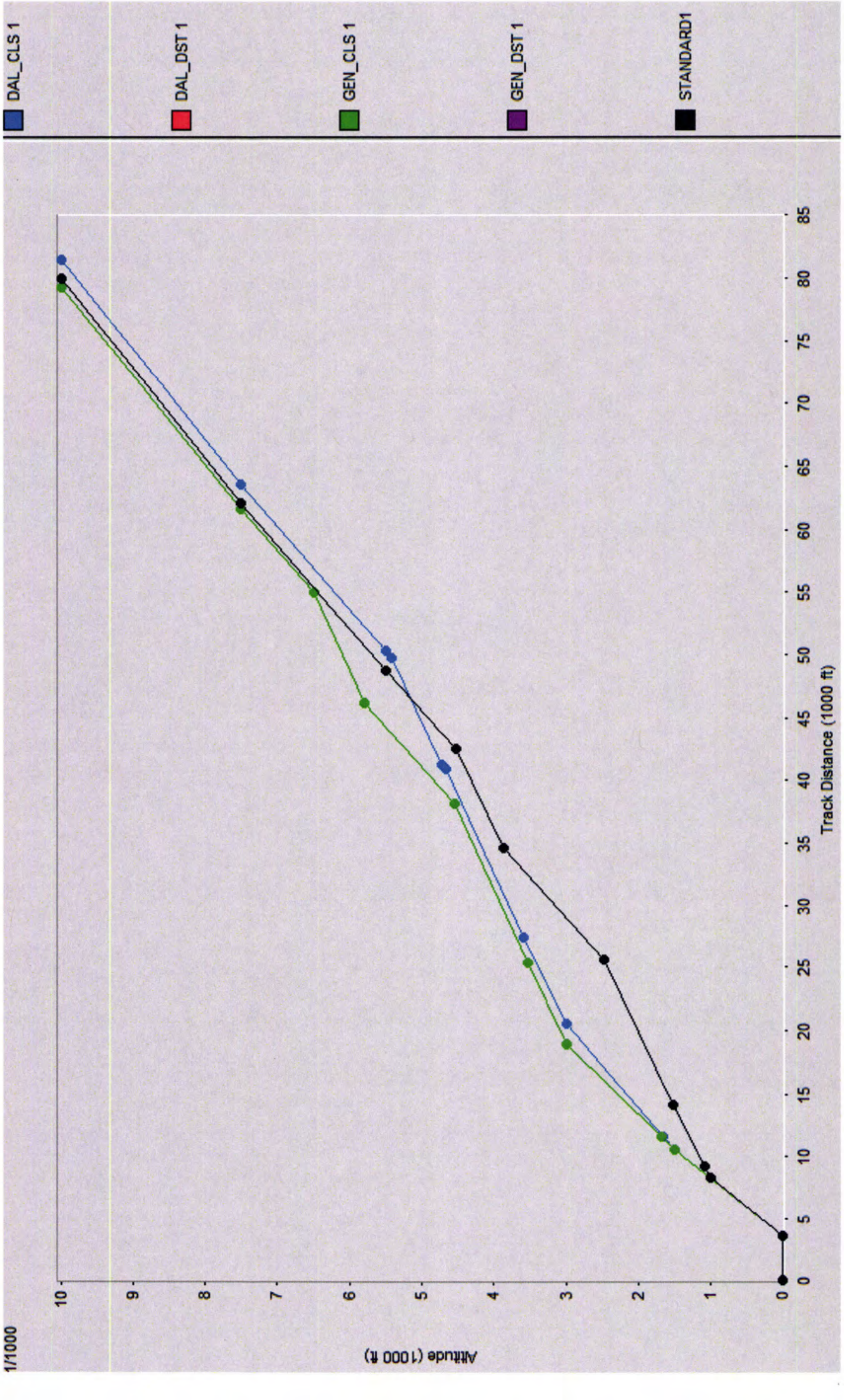
B-11

747400 Thrust Comparison



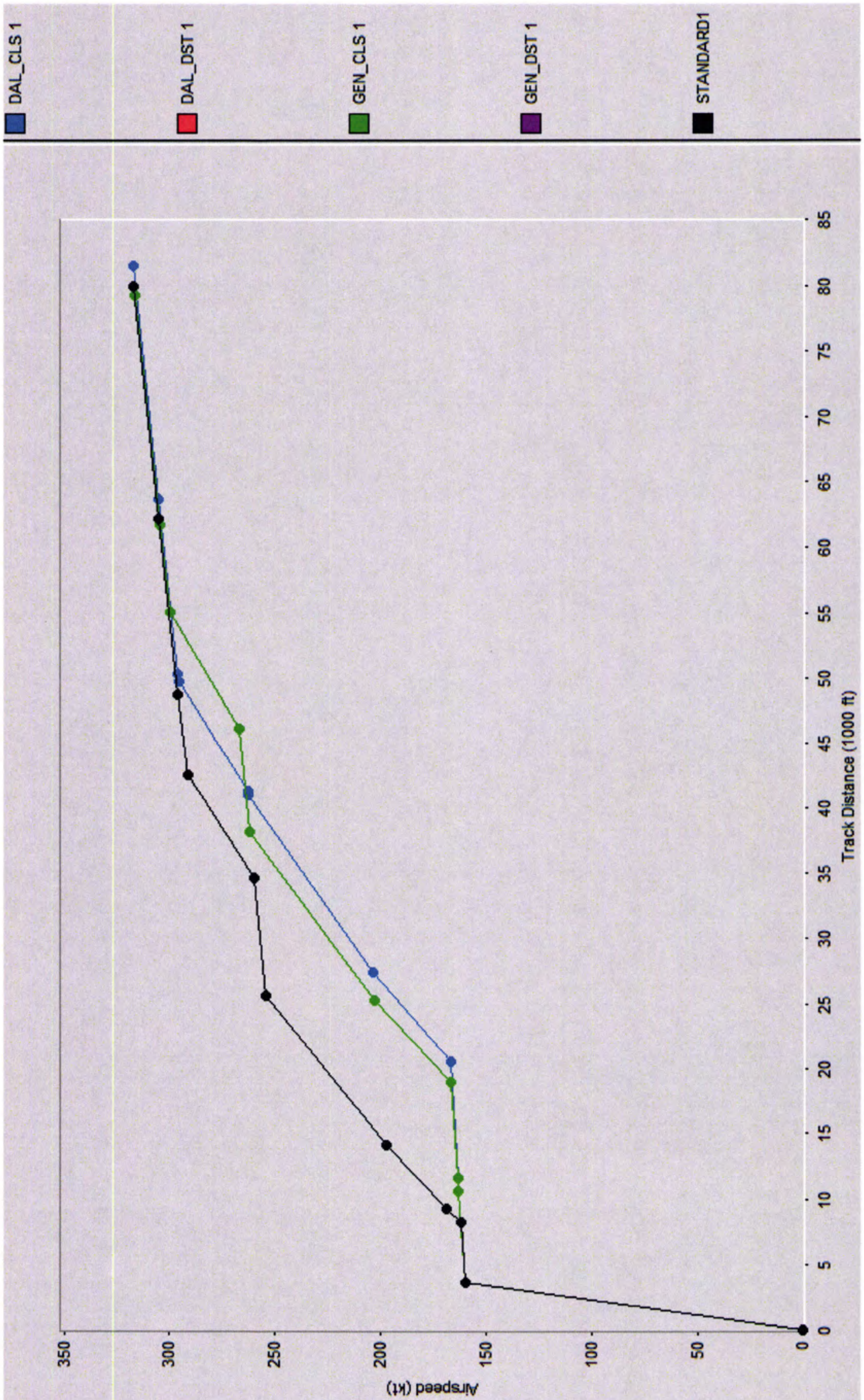
B-12

747400 Altitude Comparison



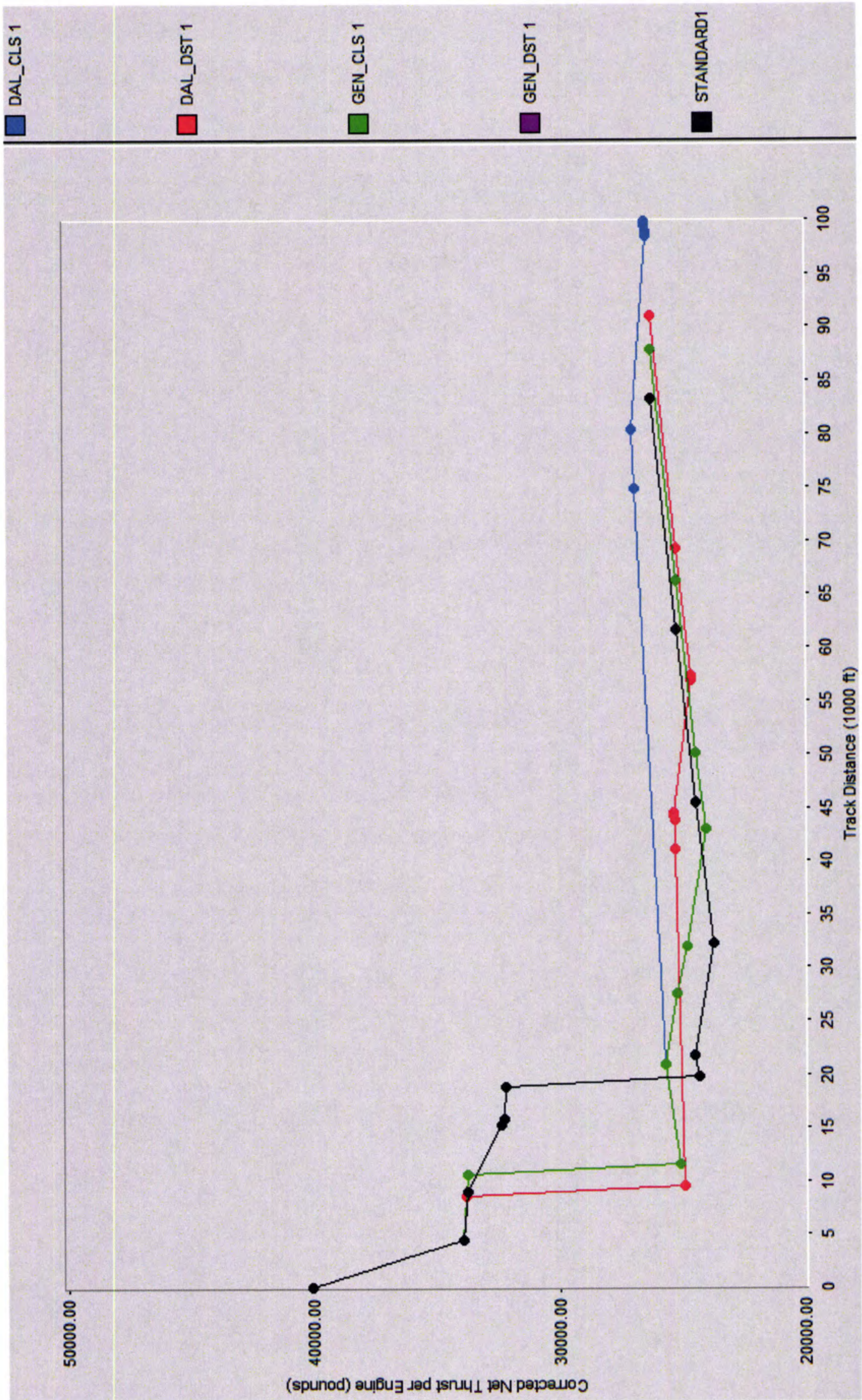
B-13

747400 Airspeed Comparison



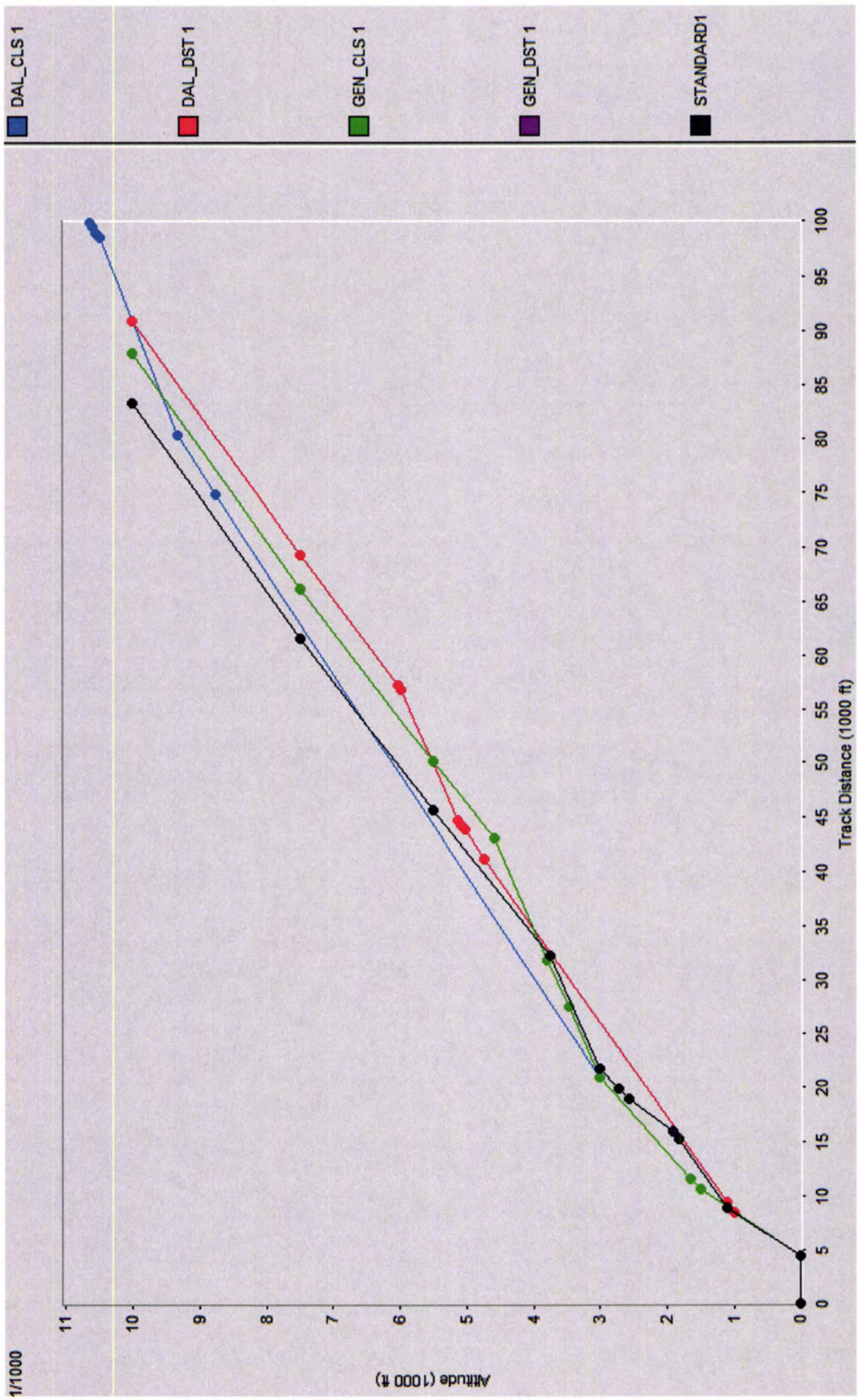
B-14

757300 Thrust Comparison



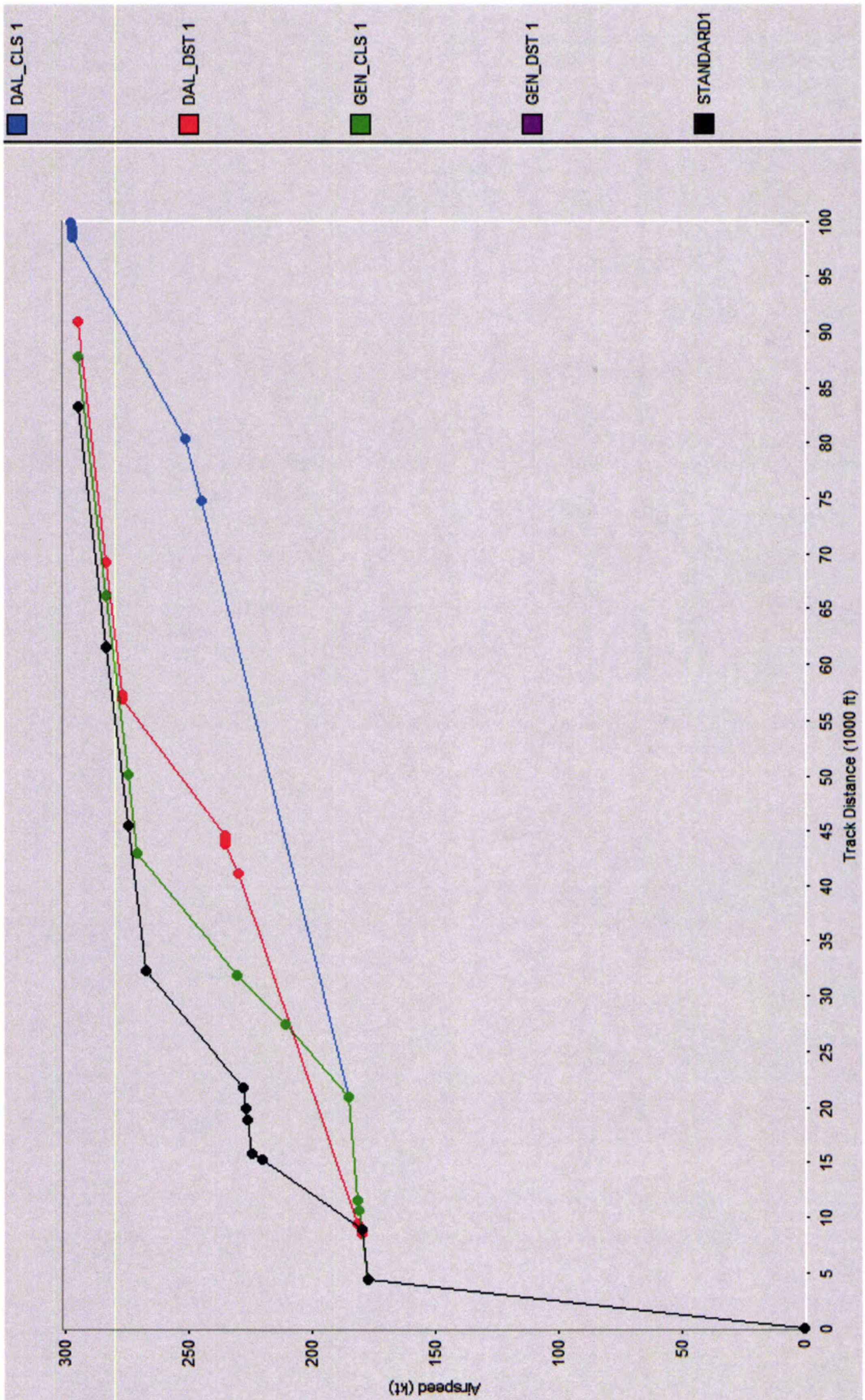
B-15

757300 Altitude Comparison

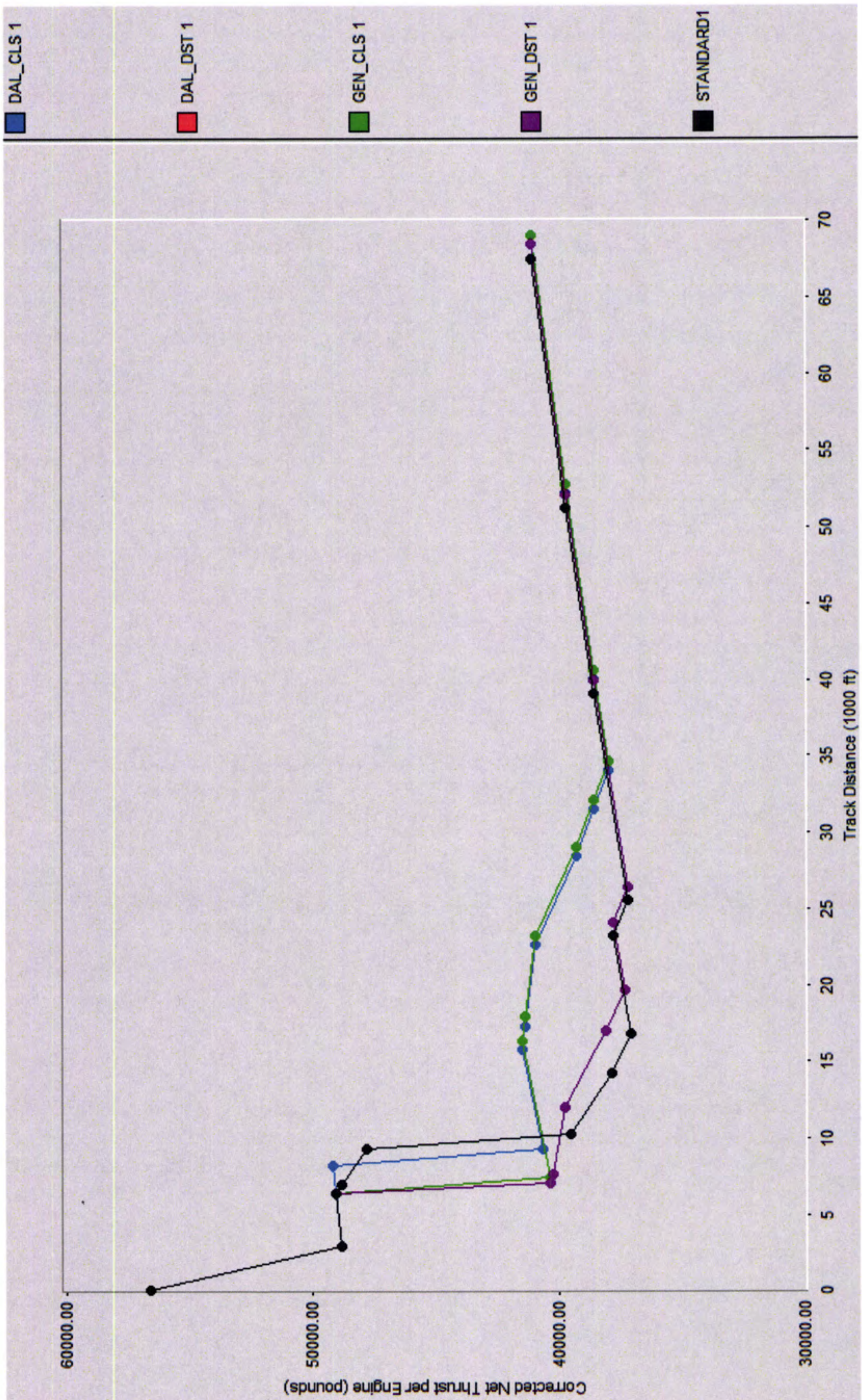


B-16

757300 Airspeed Comparison

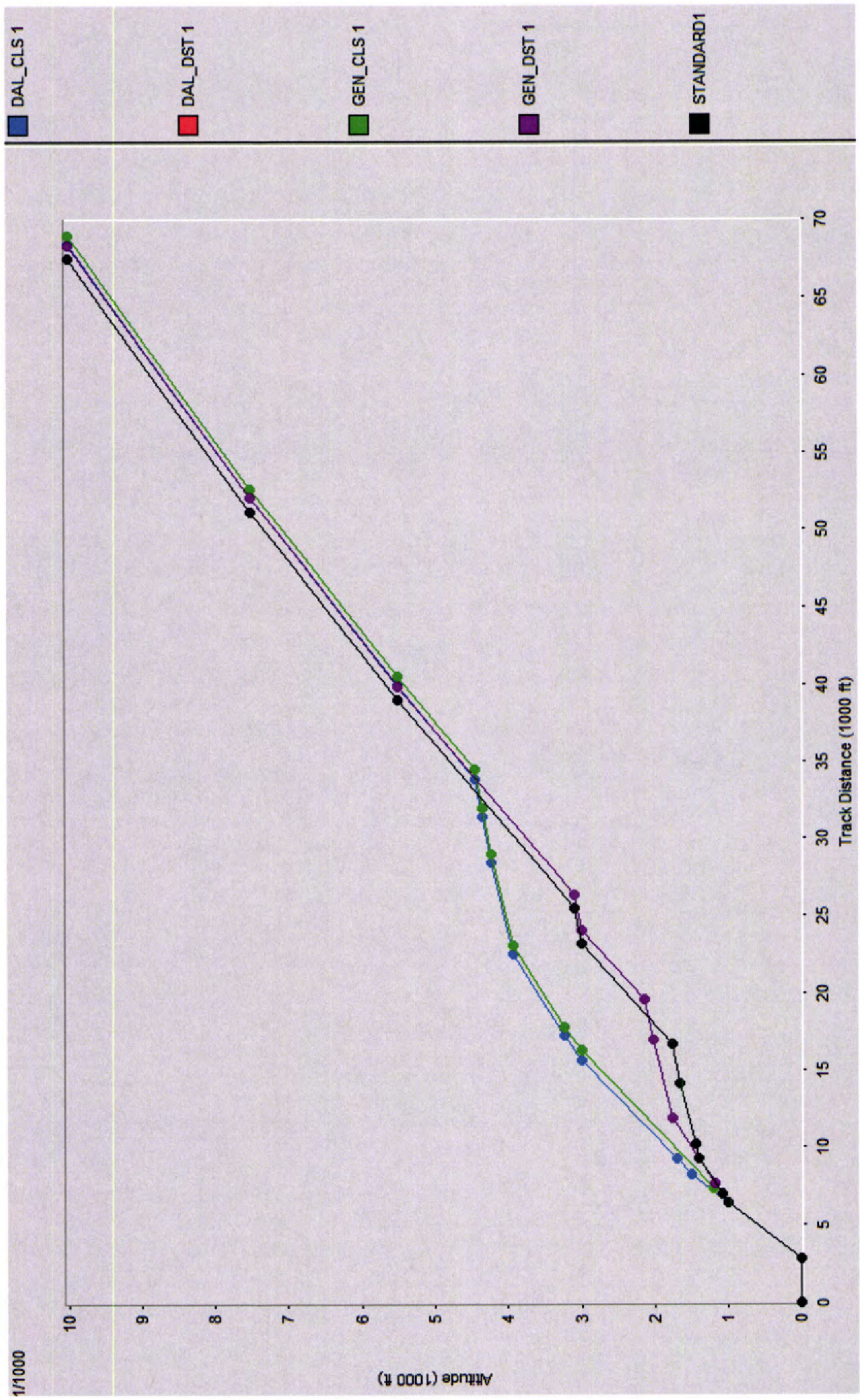


767300 Thrust Comparison



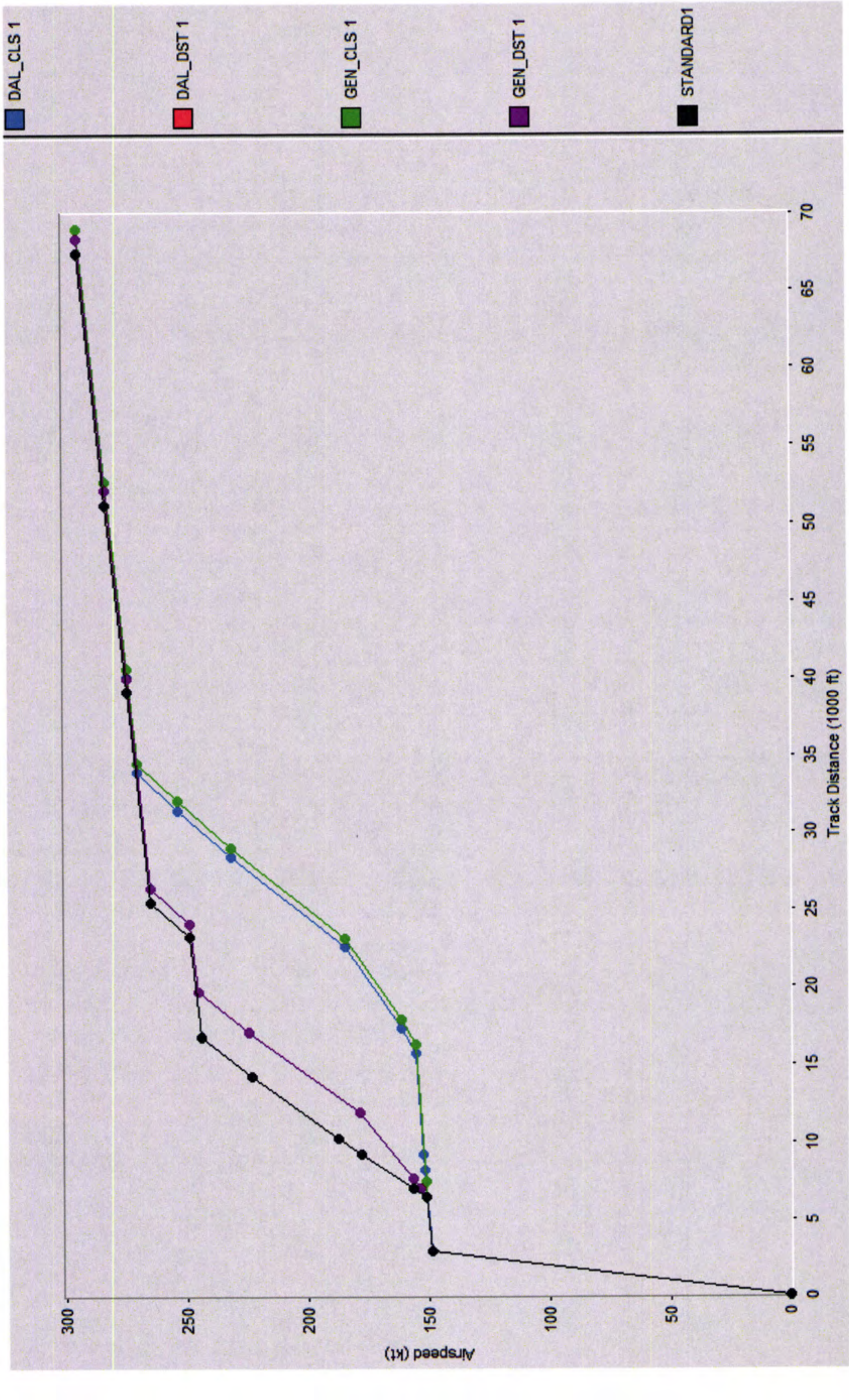
B-18

767300 Altitude Comparison

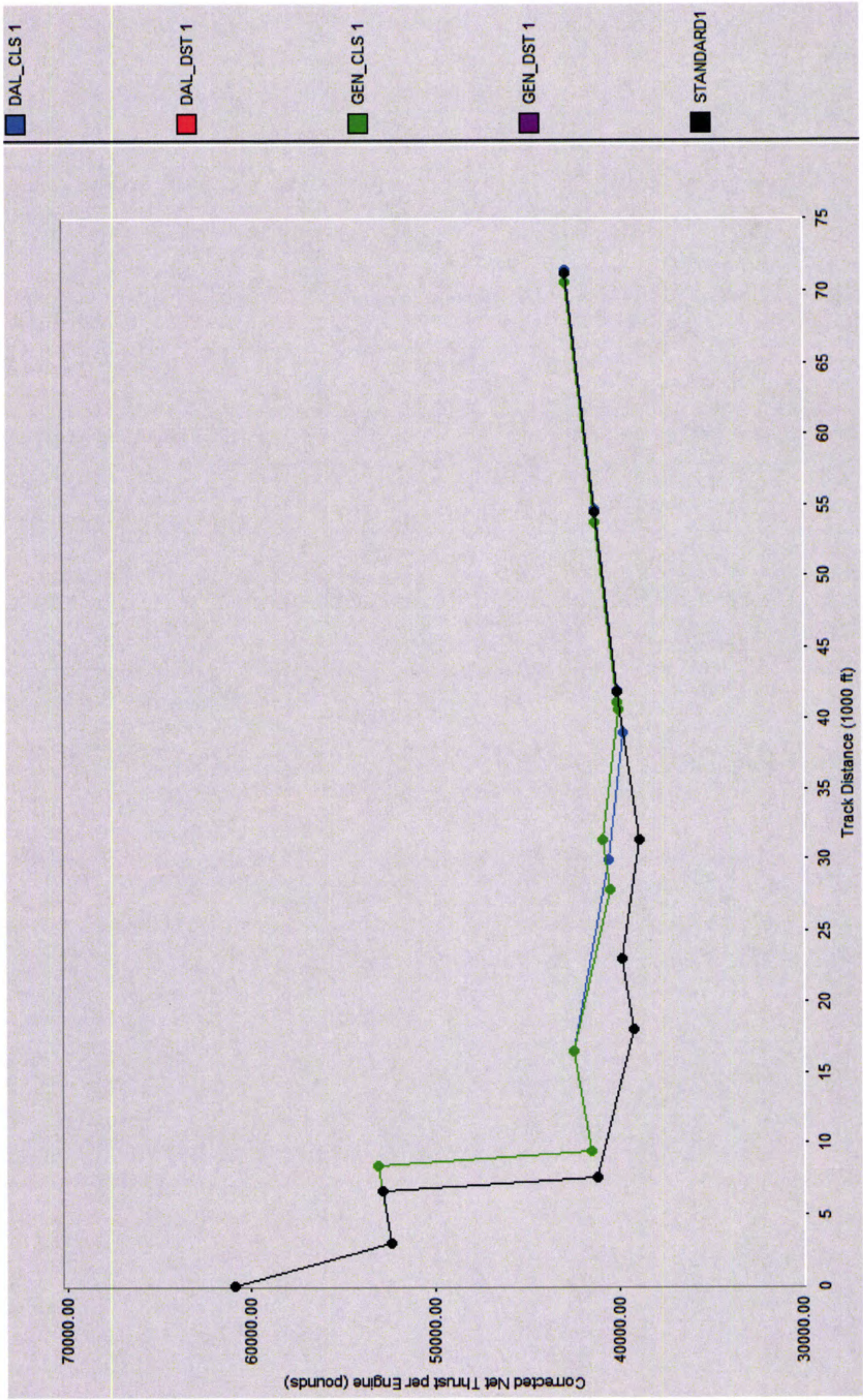


B-19

767300 Airspeed Comparison

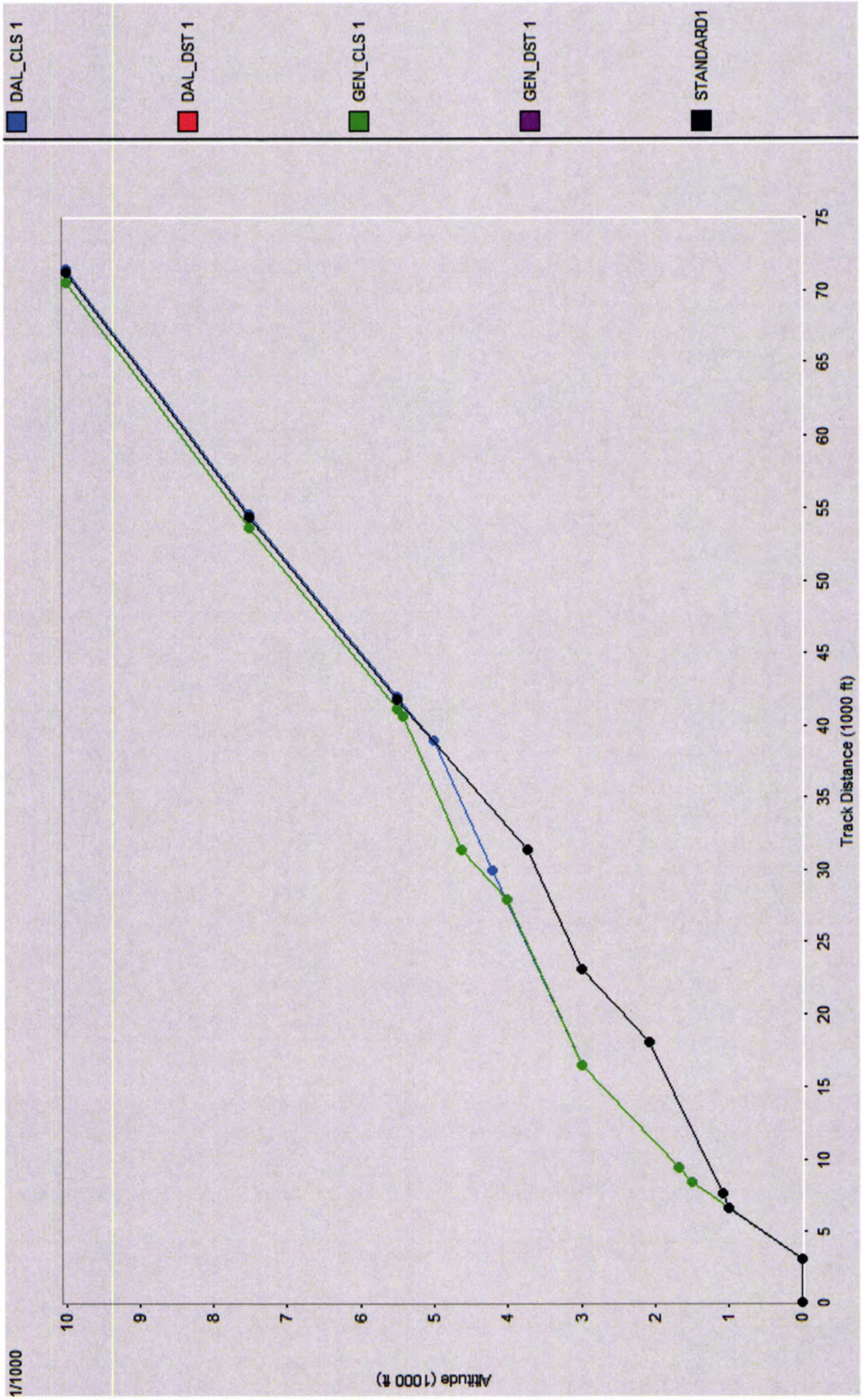


767400 Thrust Comparison



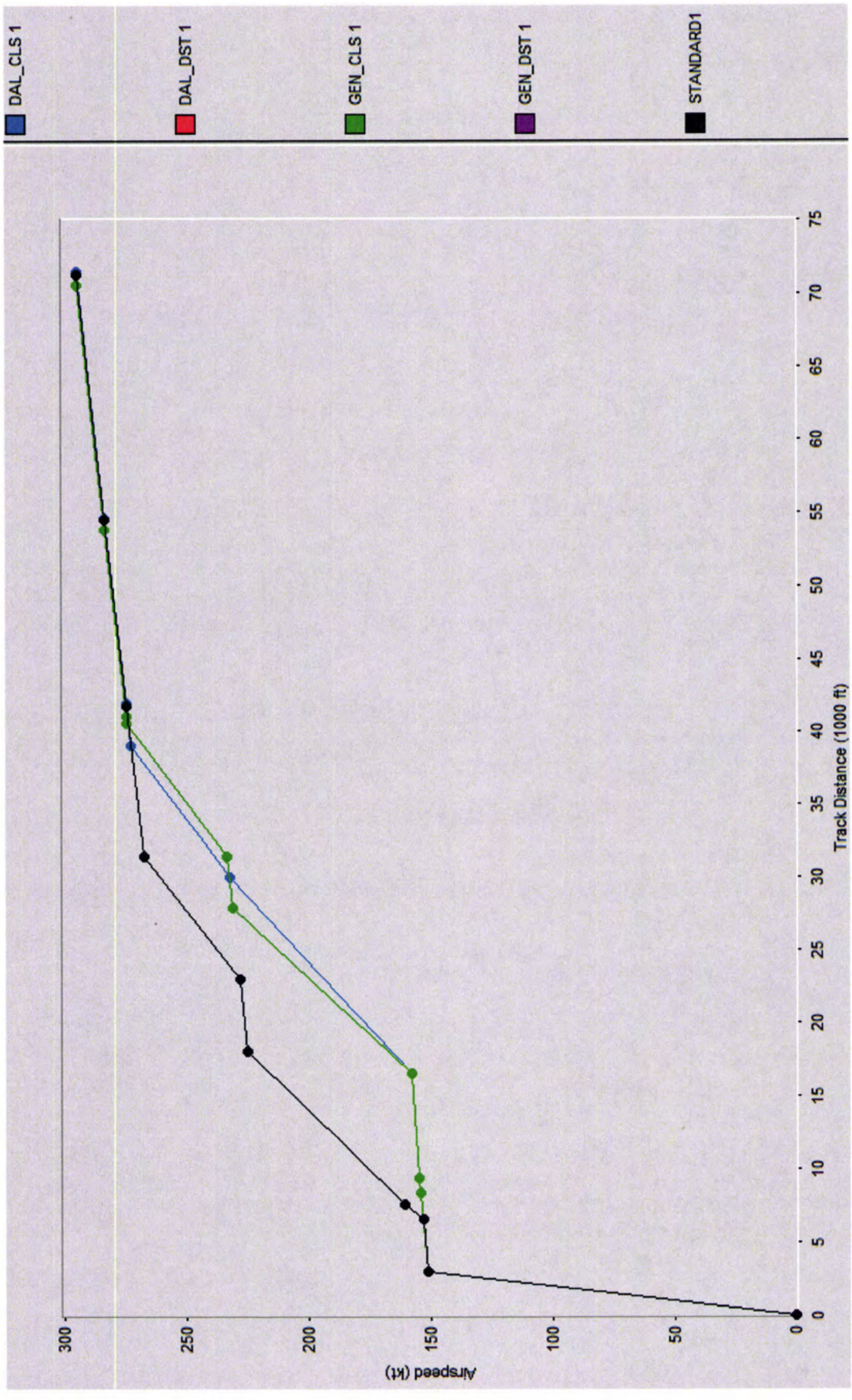
B-21

767400 Altitude Comparison



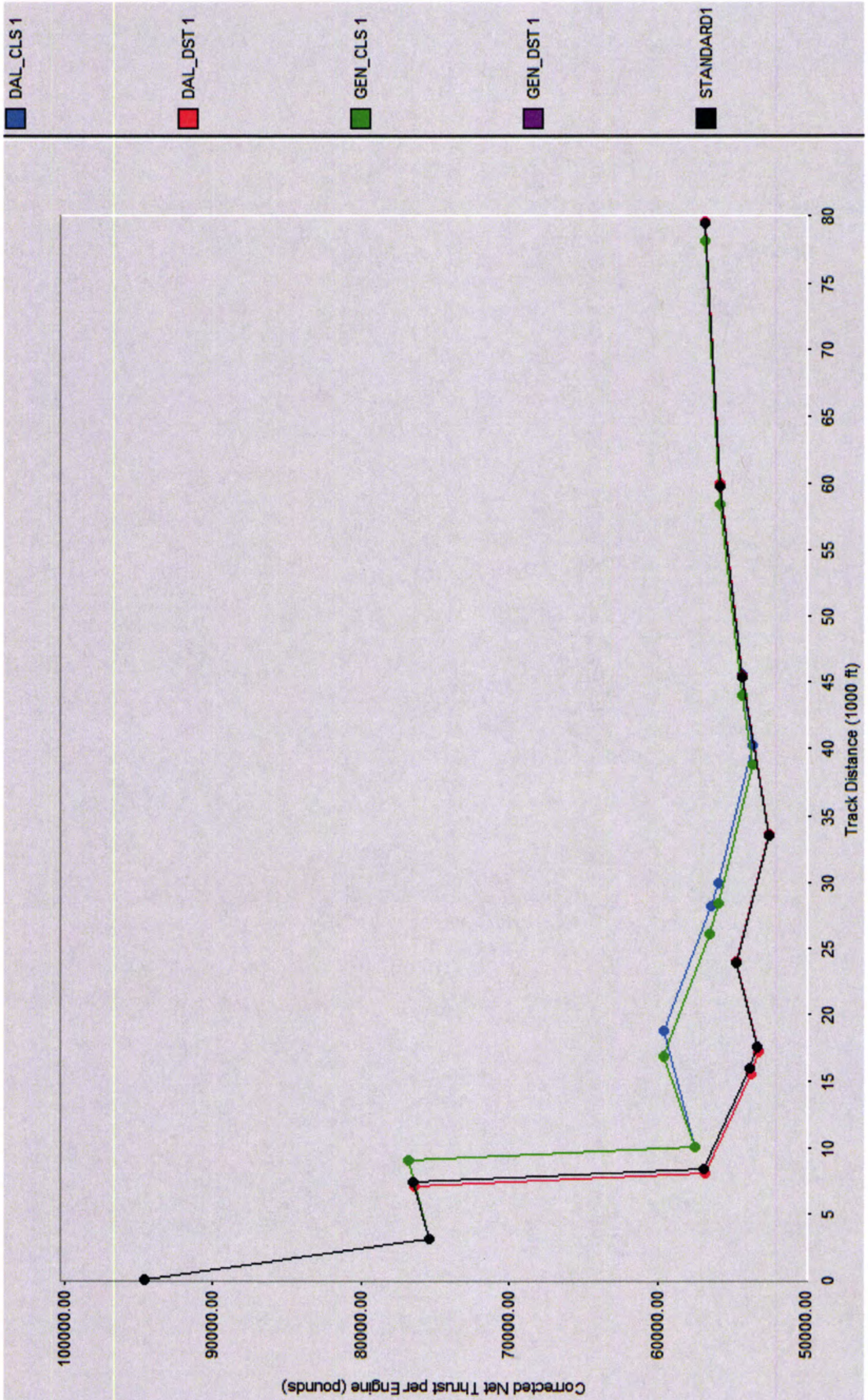
B-22

767400 Airspeed Comparison



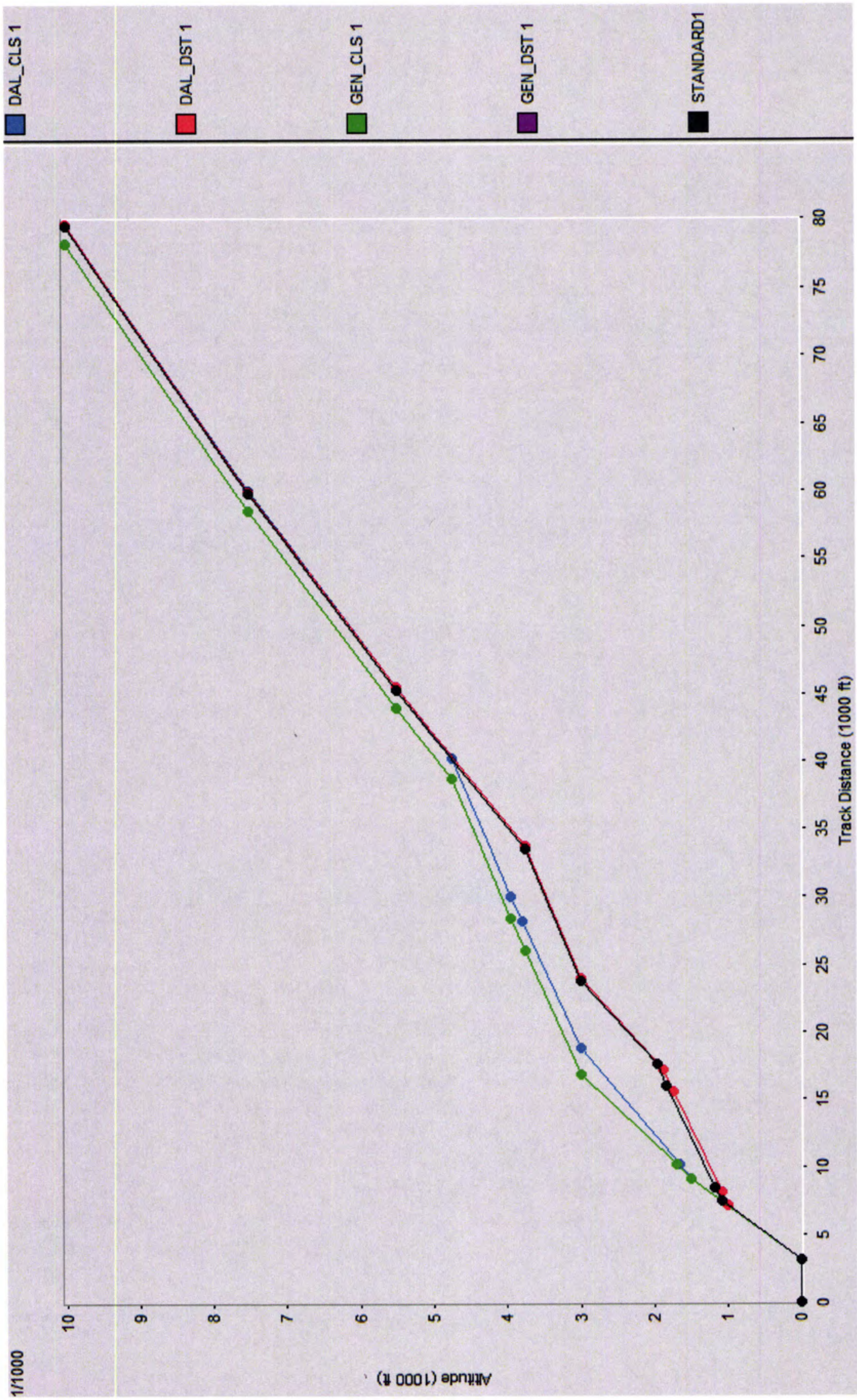
B-23

777200 Thrust Comparison



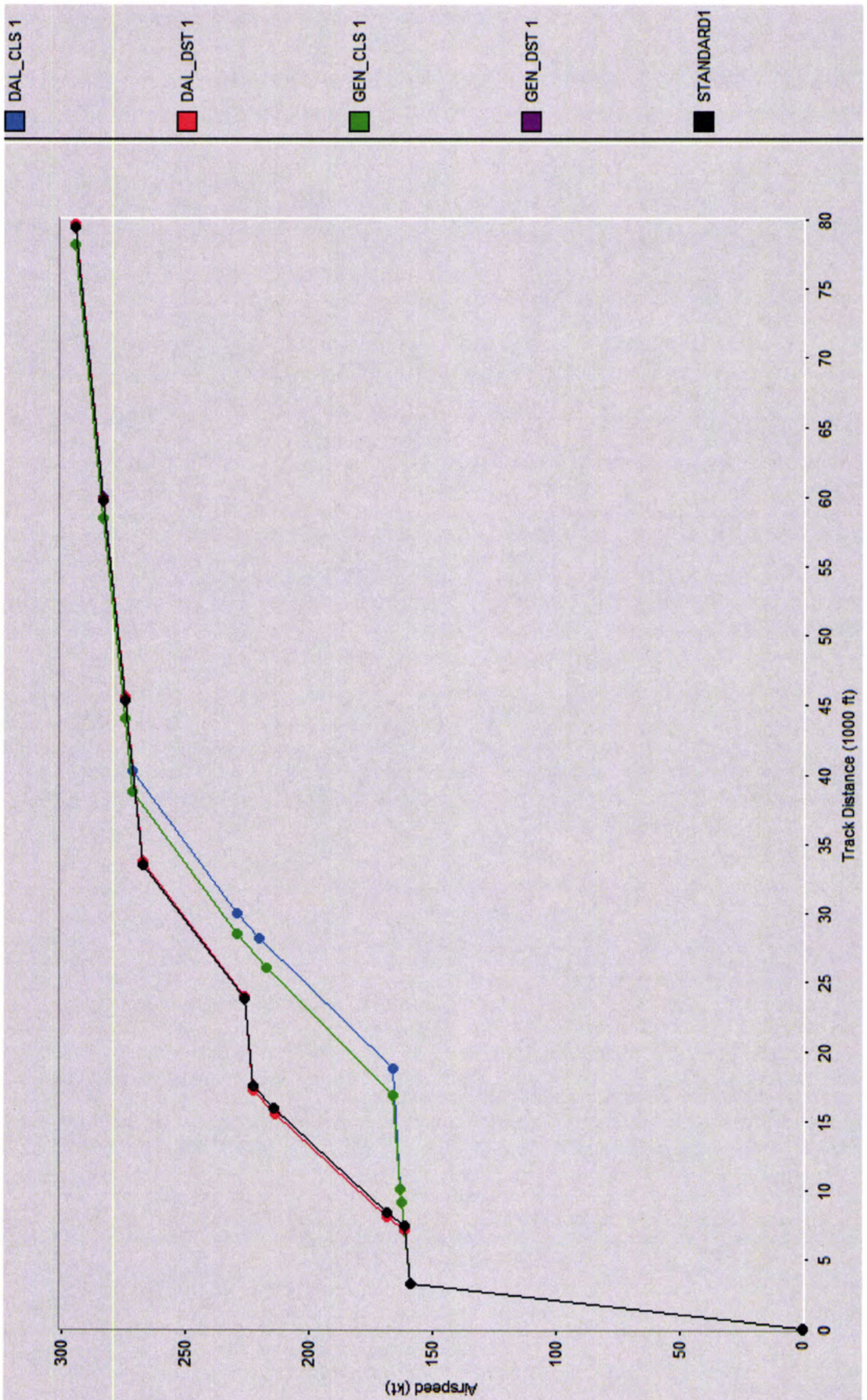
B-24

777200 Altitude Comparison



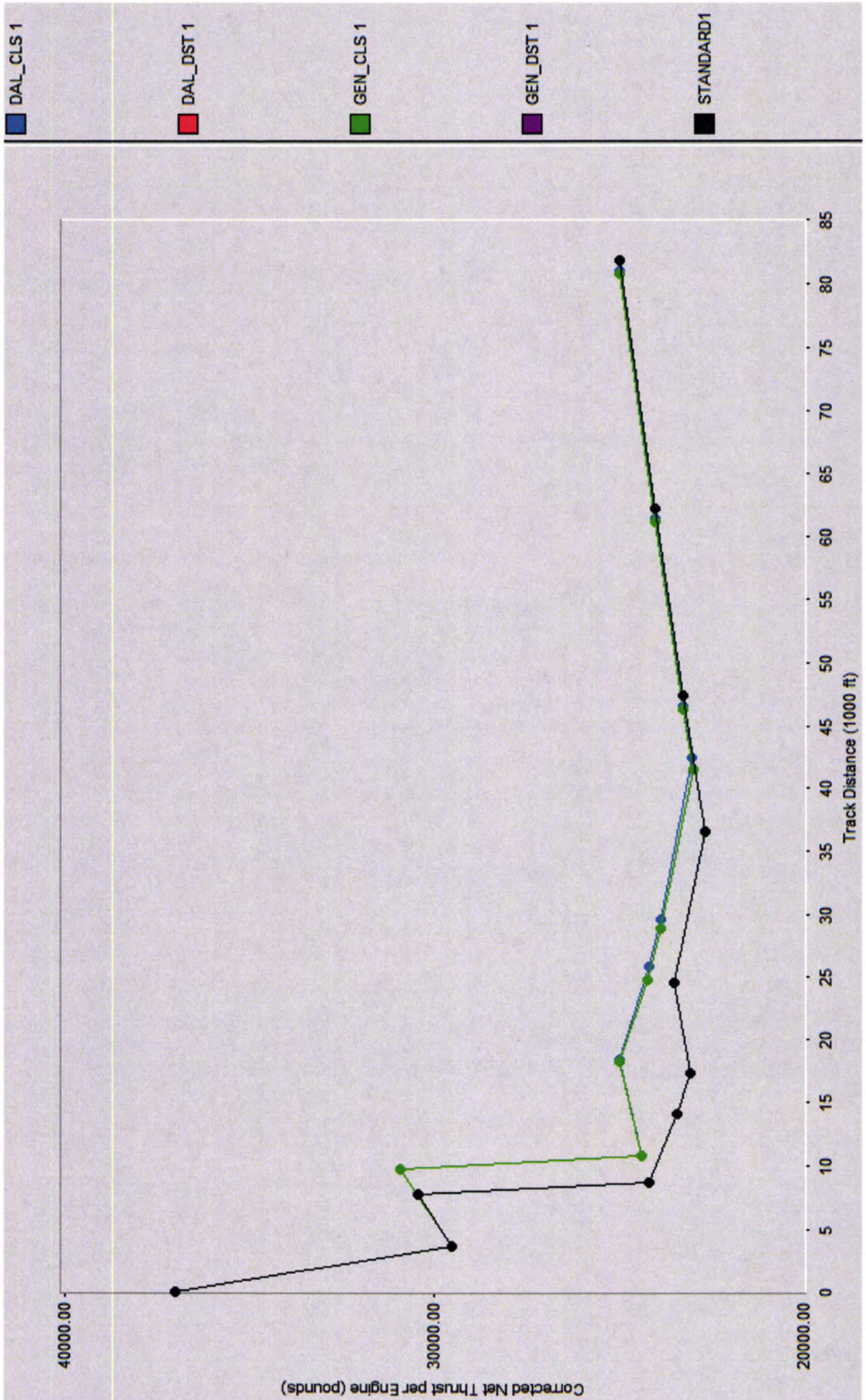
B-25

777200 Airspeed Comparison



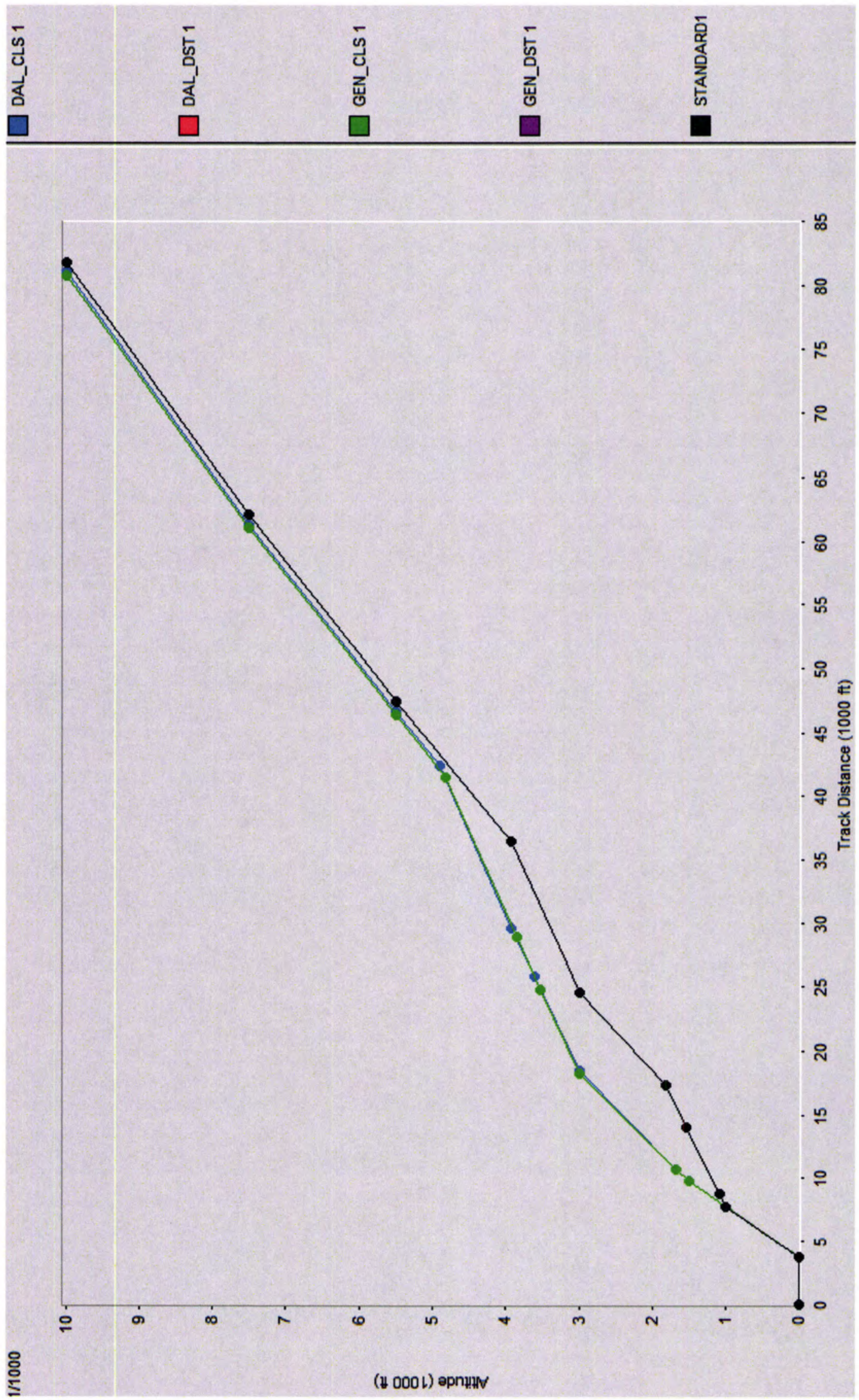
B-26

757PW Thrust Comparison



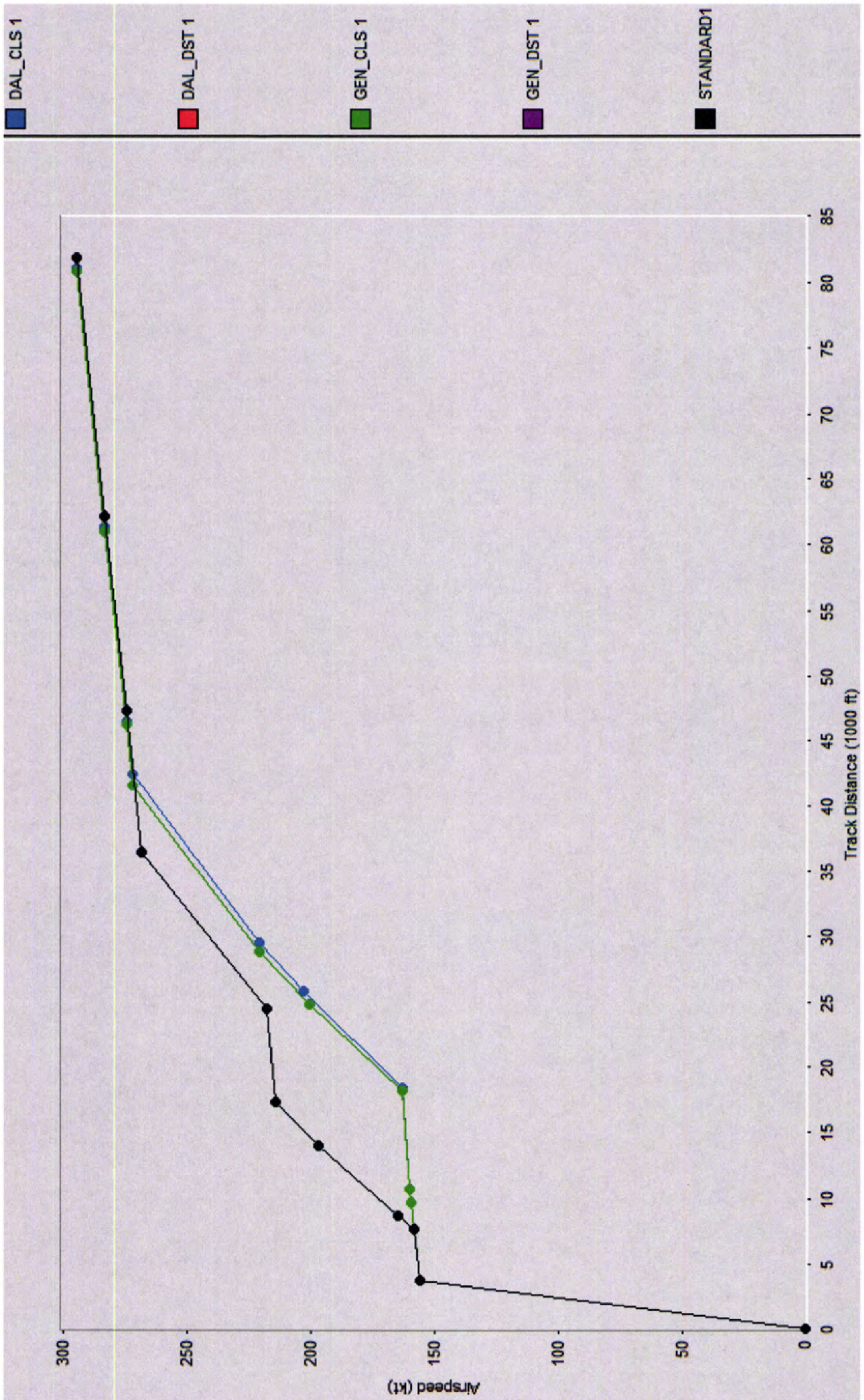
B-27

757PW Altitude Comparison



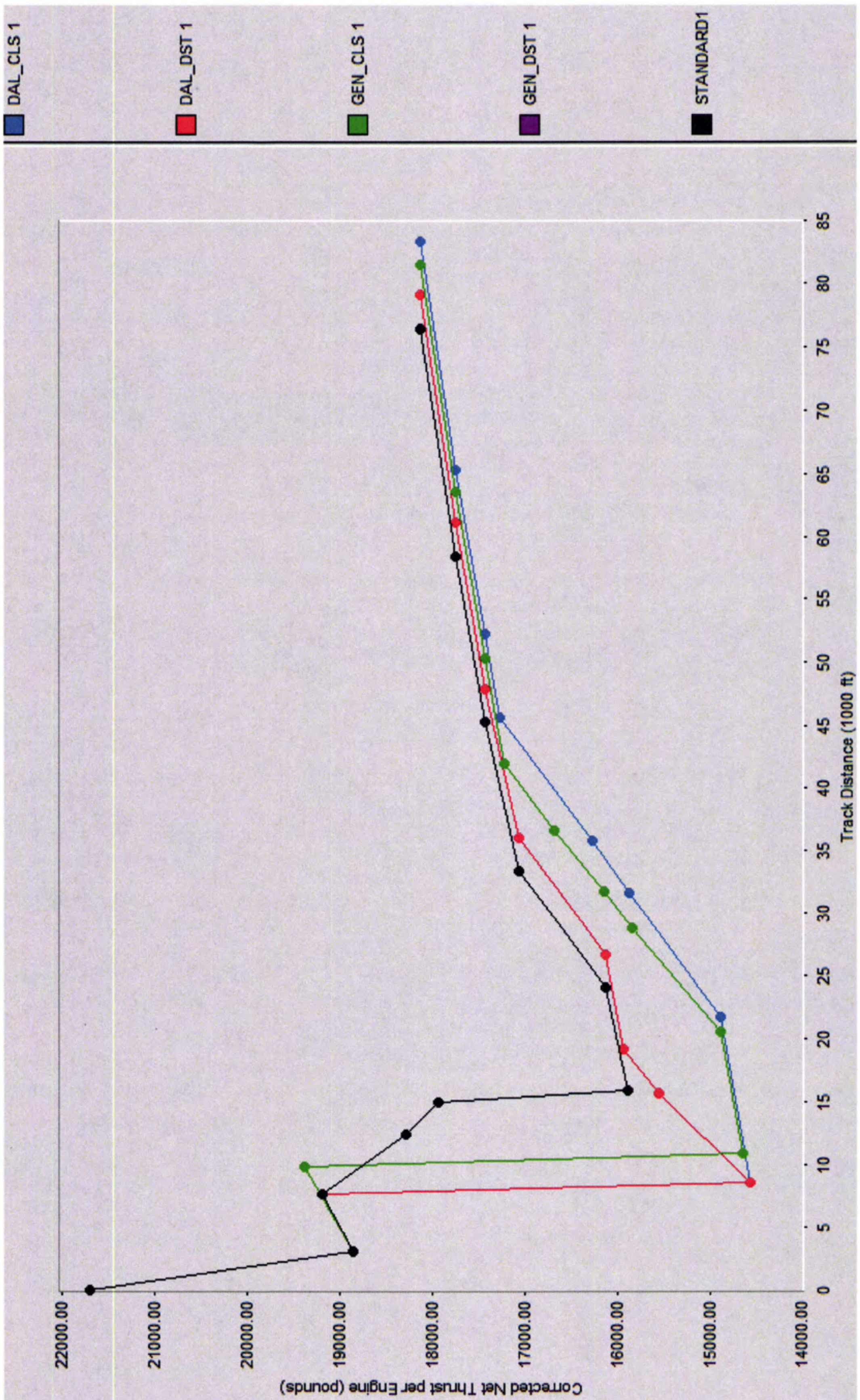
B-28

757PW Airspeed Comparison



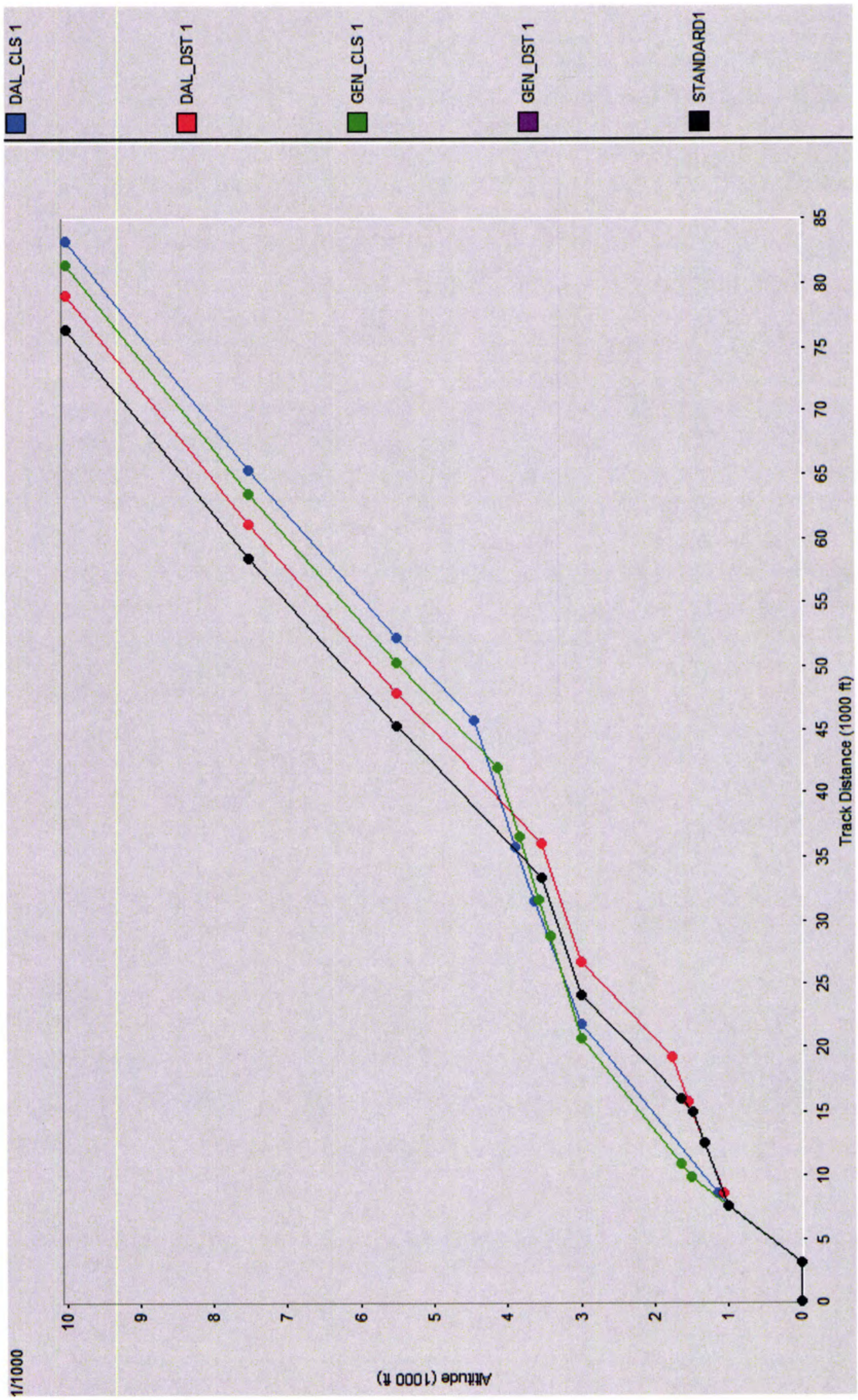
B-29

A319-131 Thrust Comparison

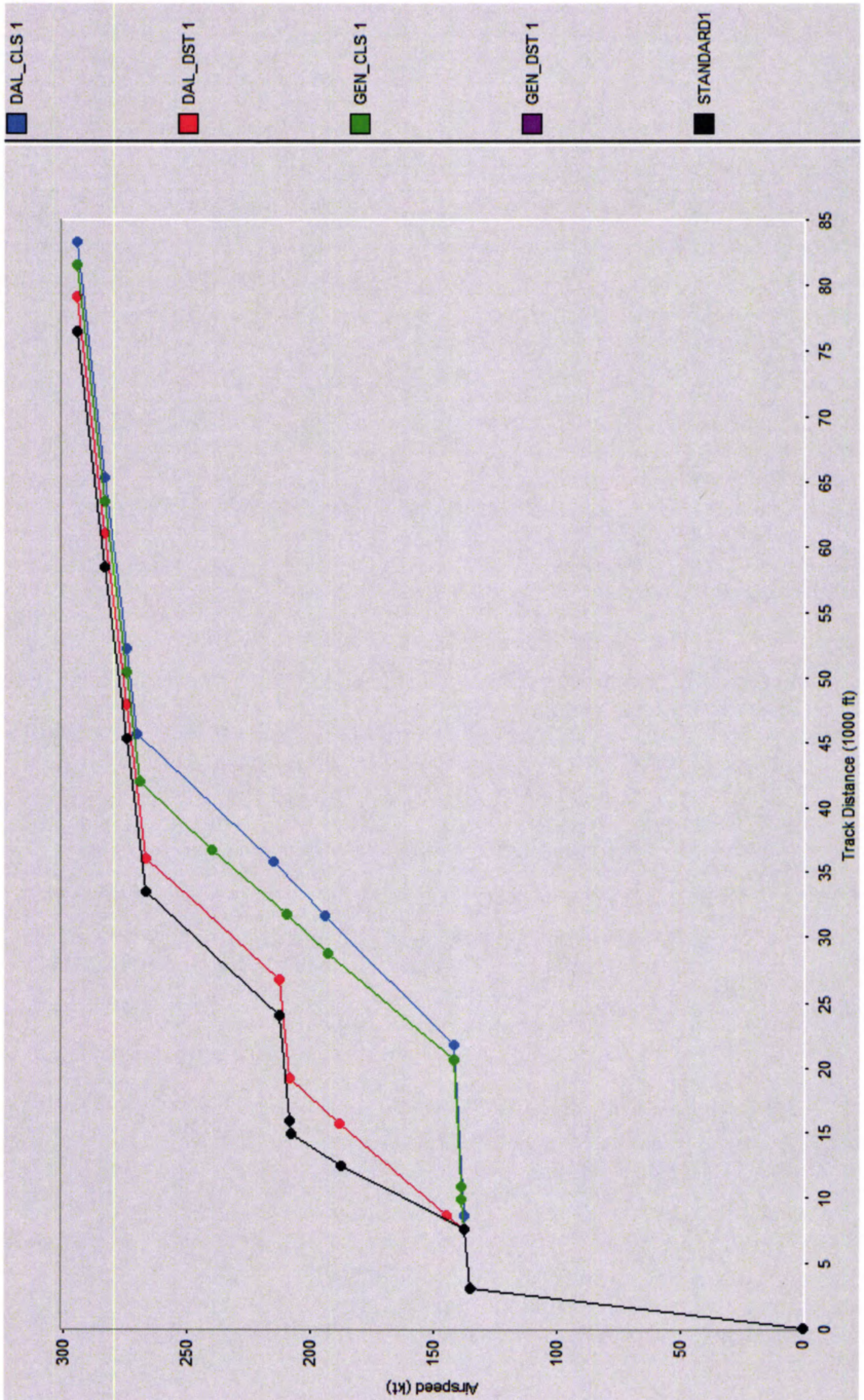


B-30

A319-131 Altitude Comparison

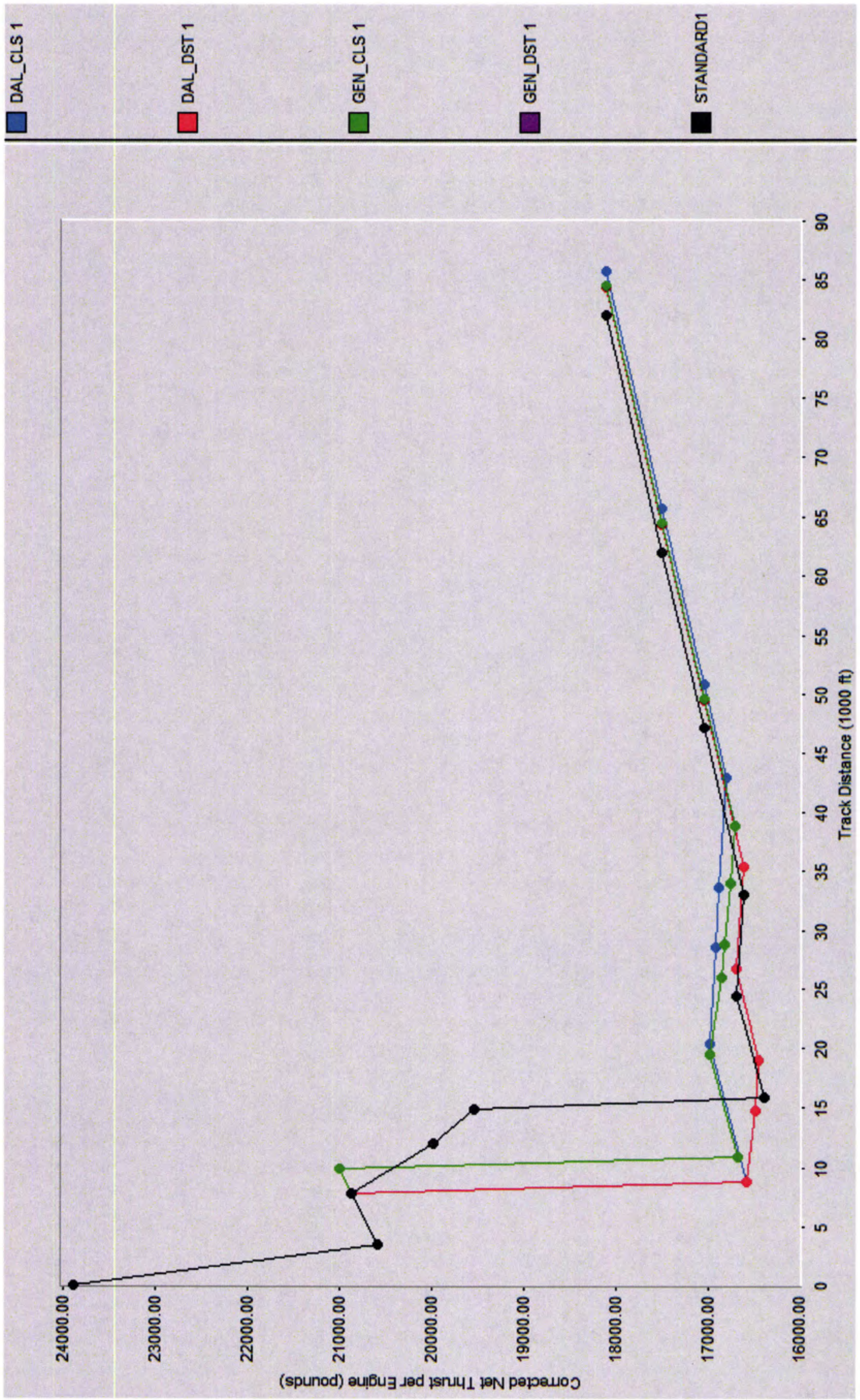


A319-131 Airspeed Comparison



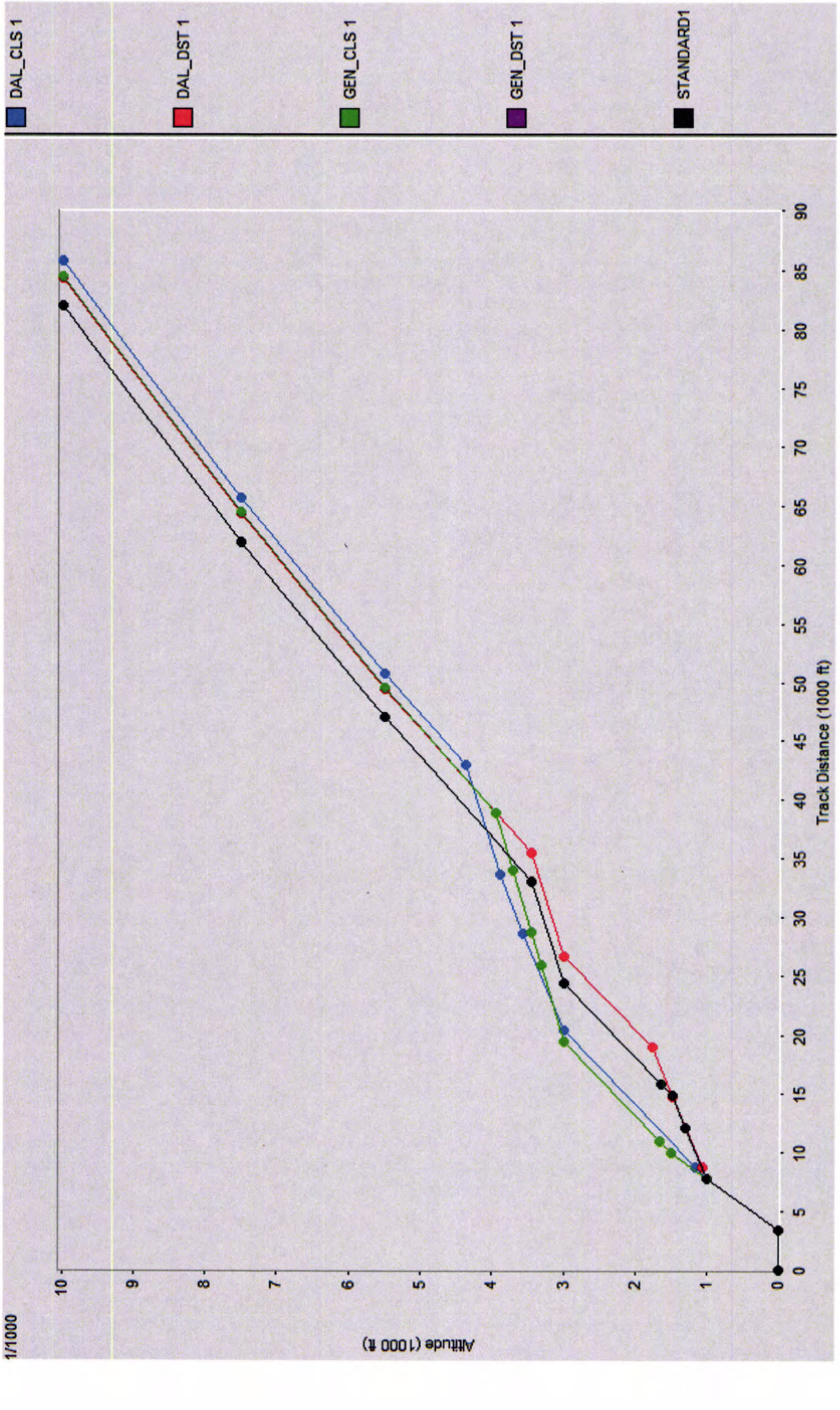
B-32

A320-211 Thrust Comparison

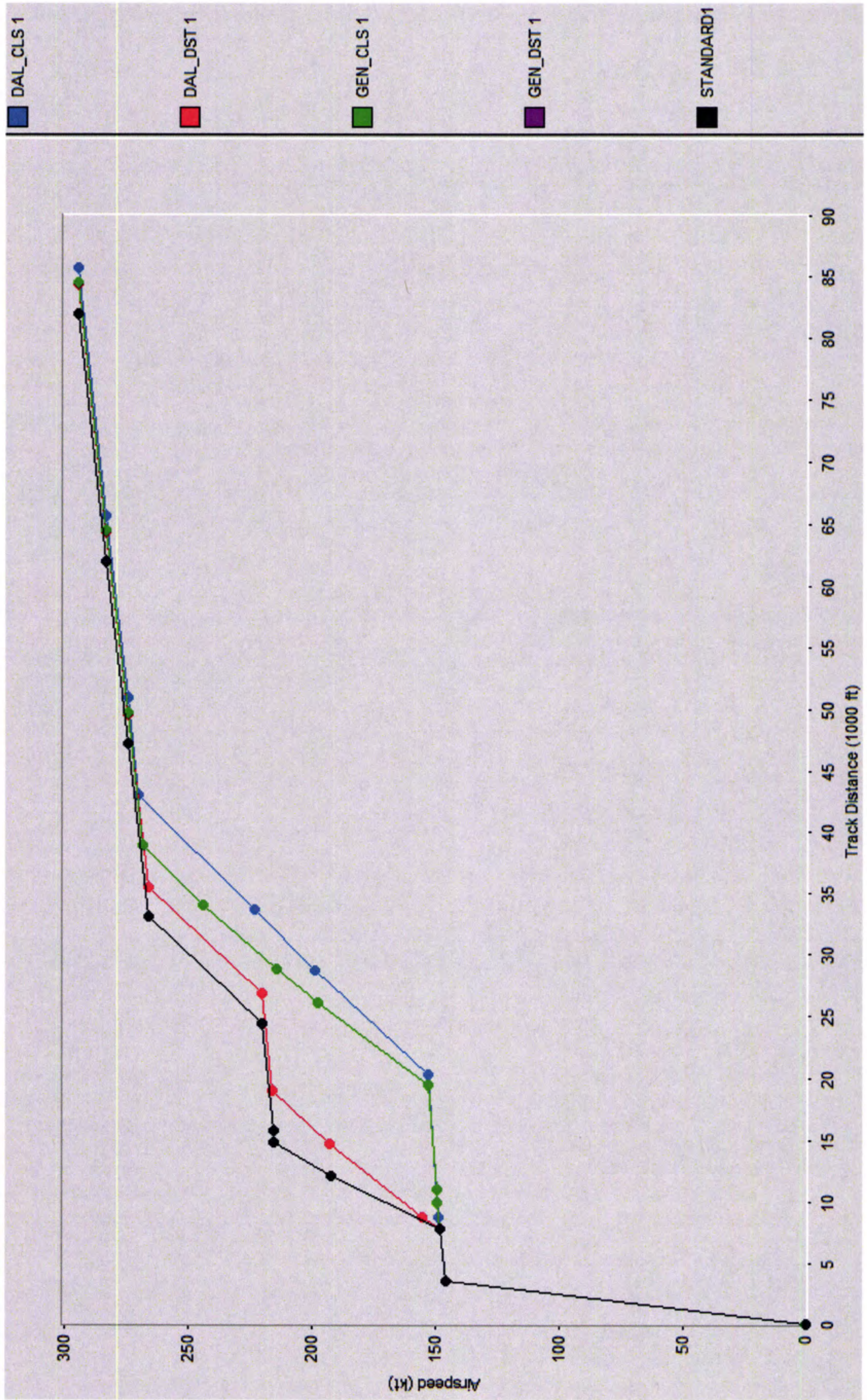


B-33

A320-211 Altitude Comparison

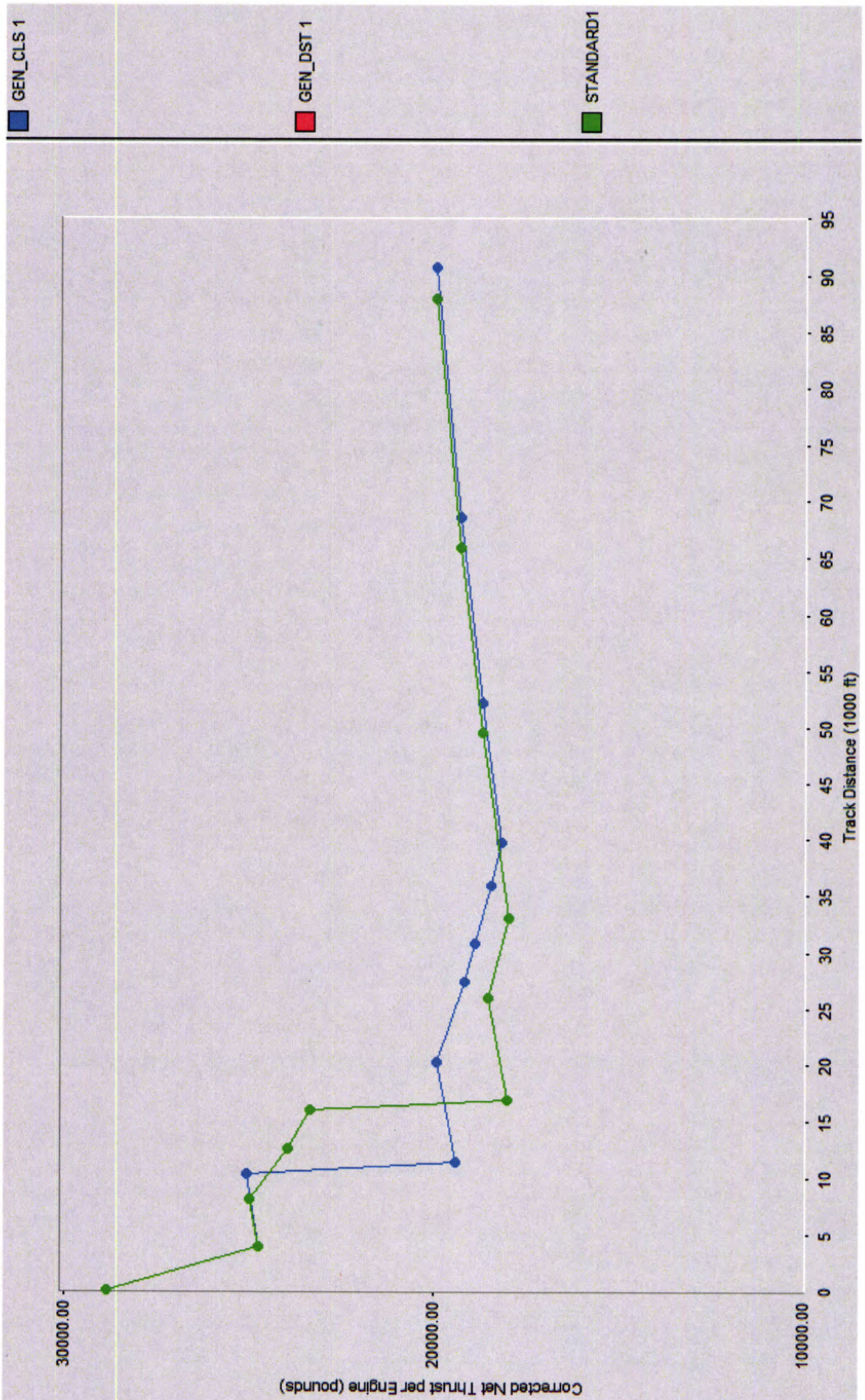


A320-211 Airspeed Comparison



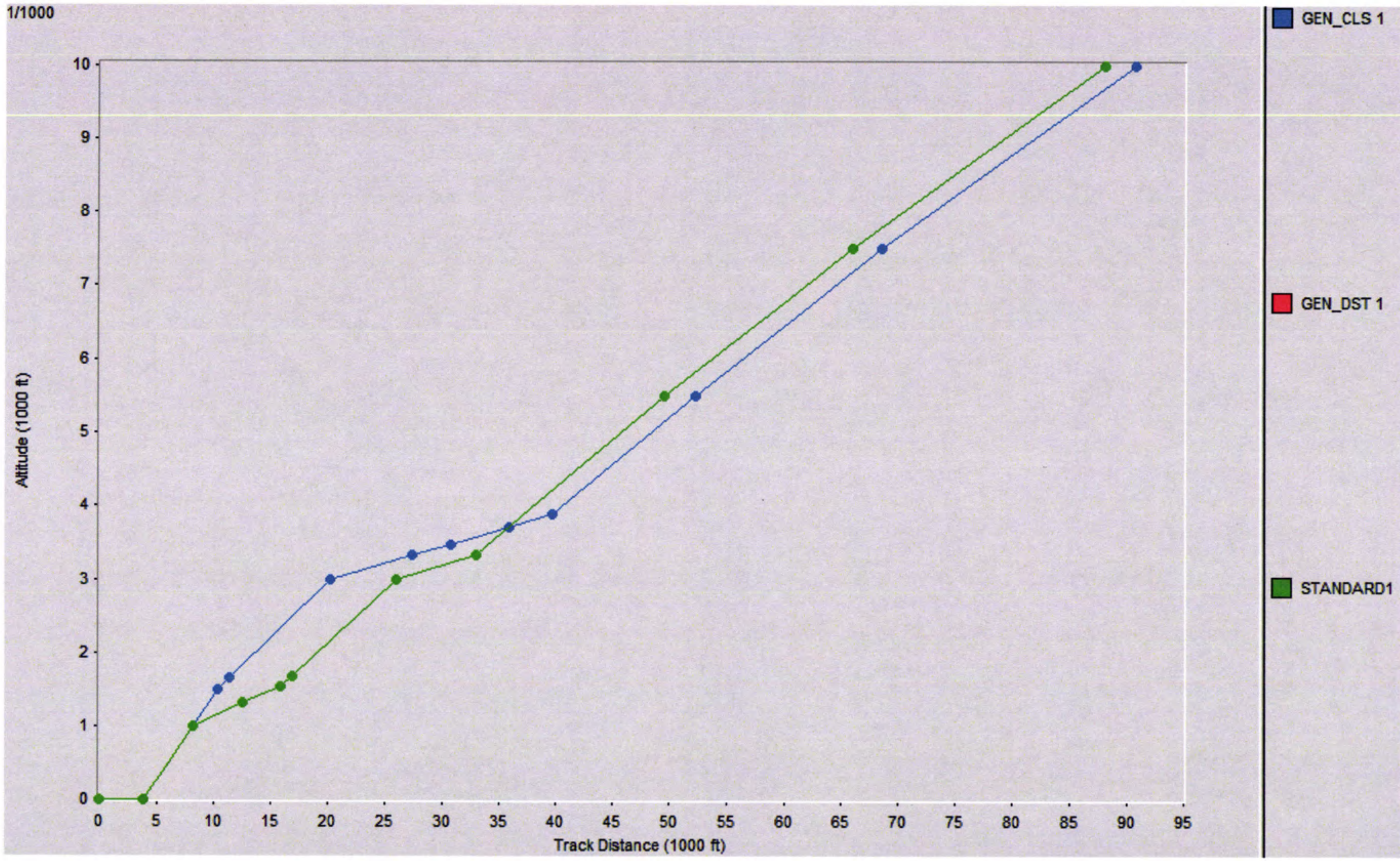
B-35

A321-232 Thrust Comparison

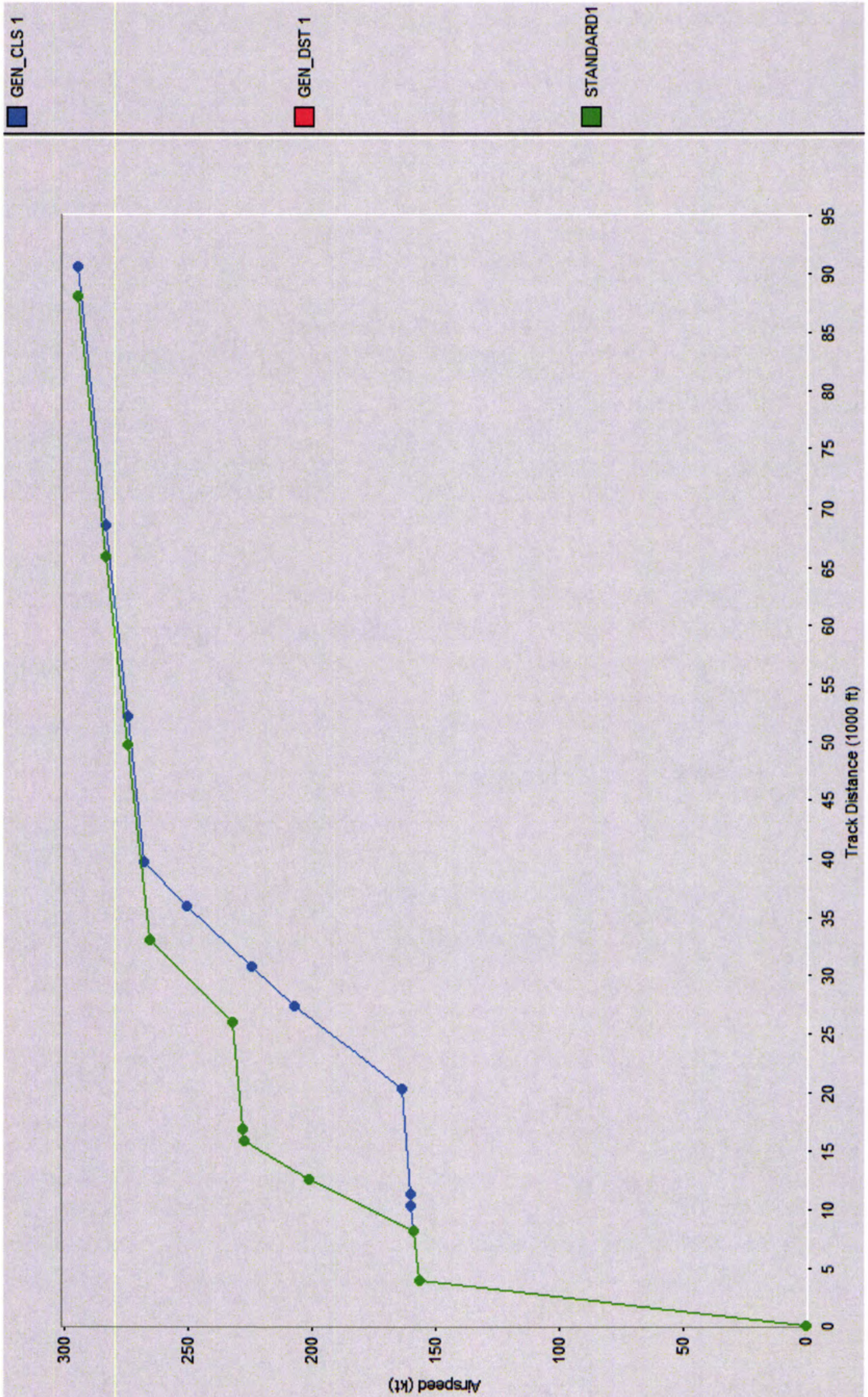


B-36

A321-232 Altitude Comparison

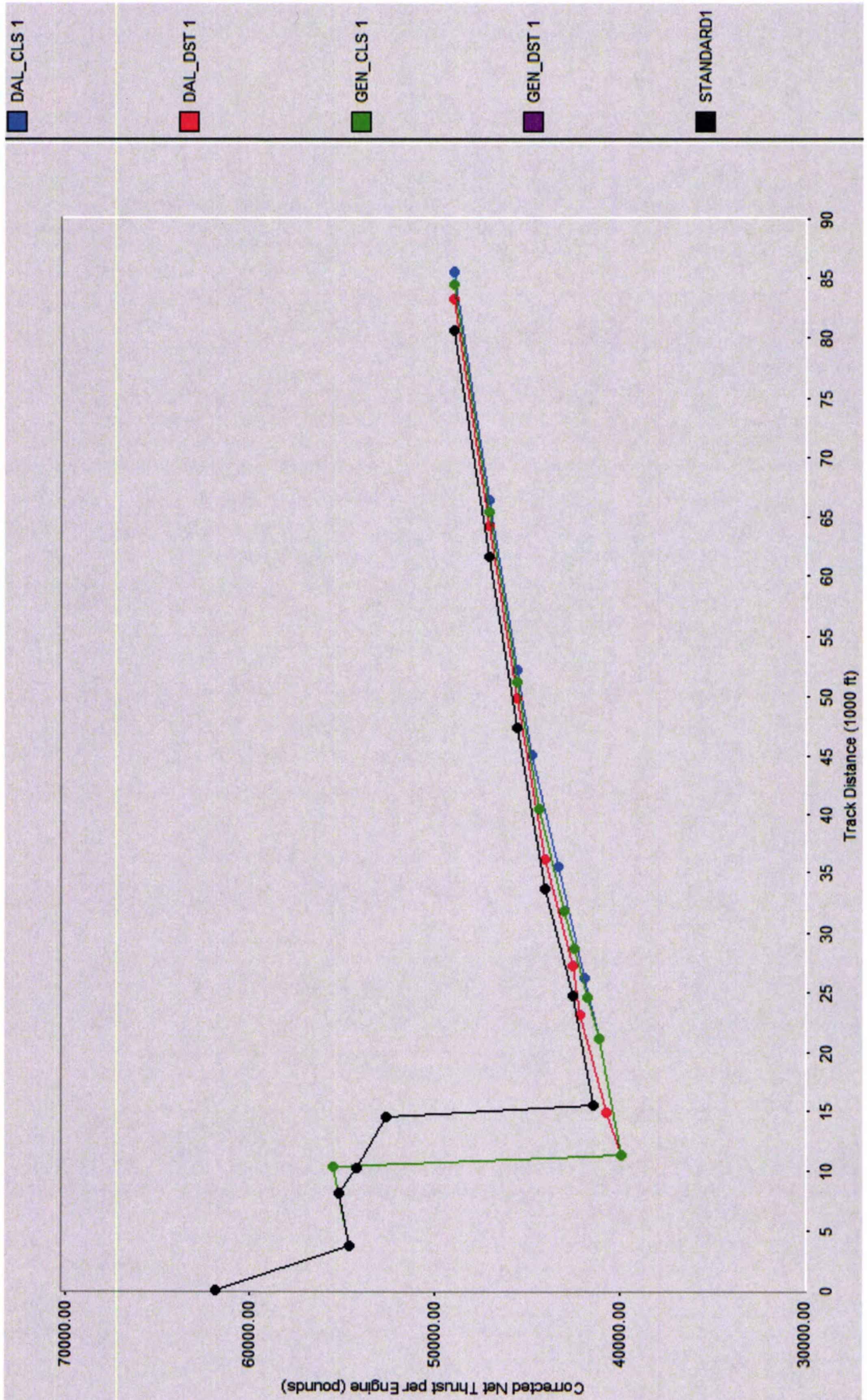


A321-232 Airspeed Comparison

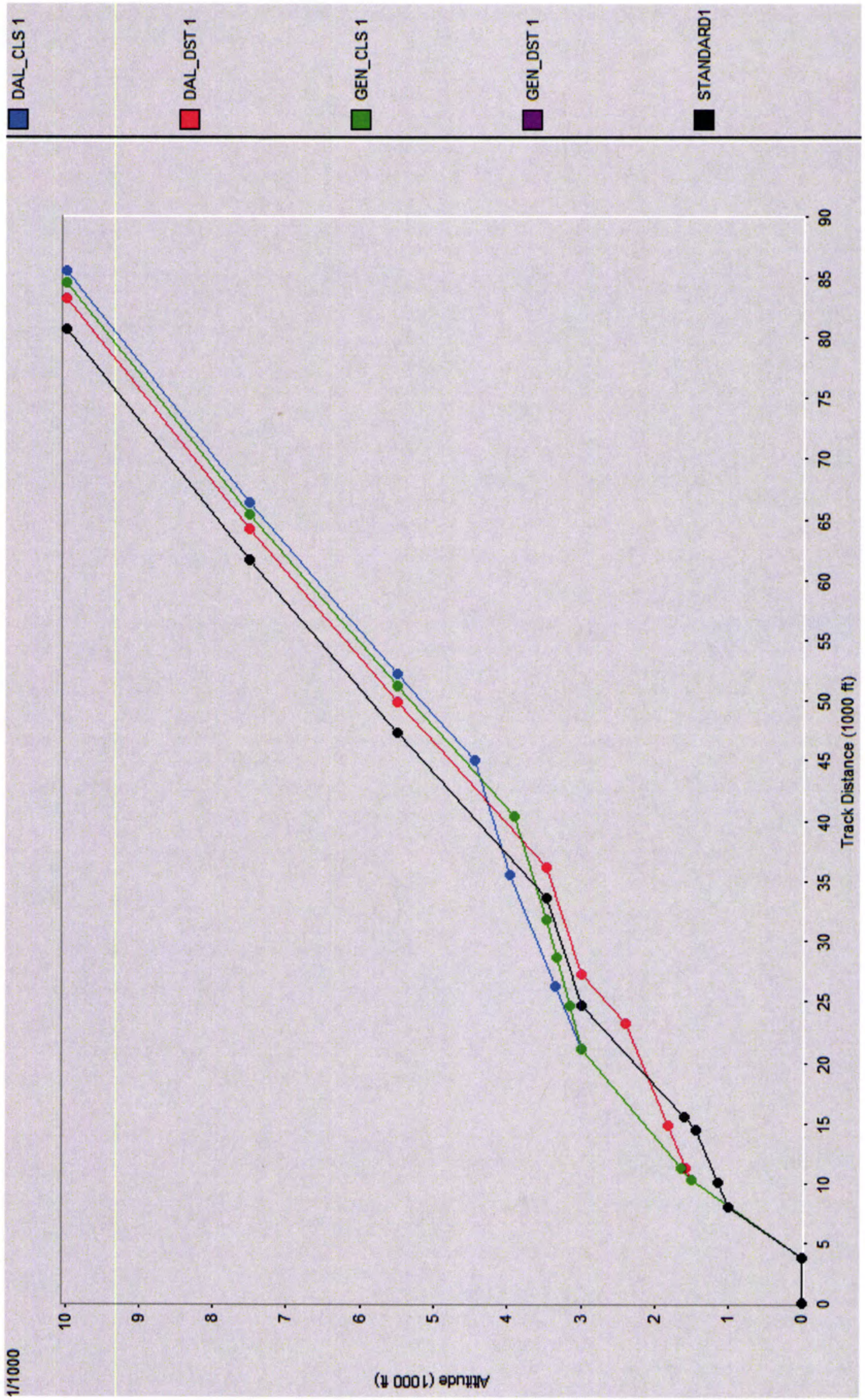


B-38

A330-301 Thrust Comparison

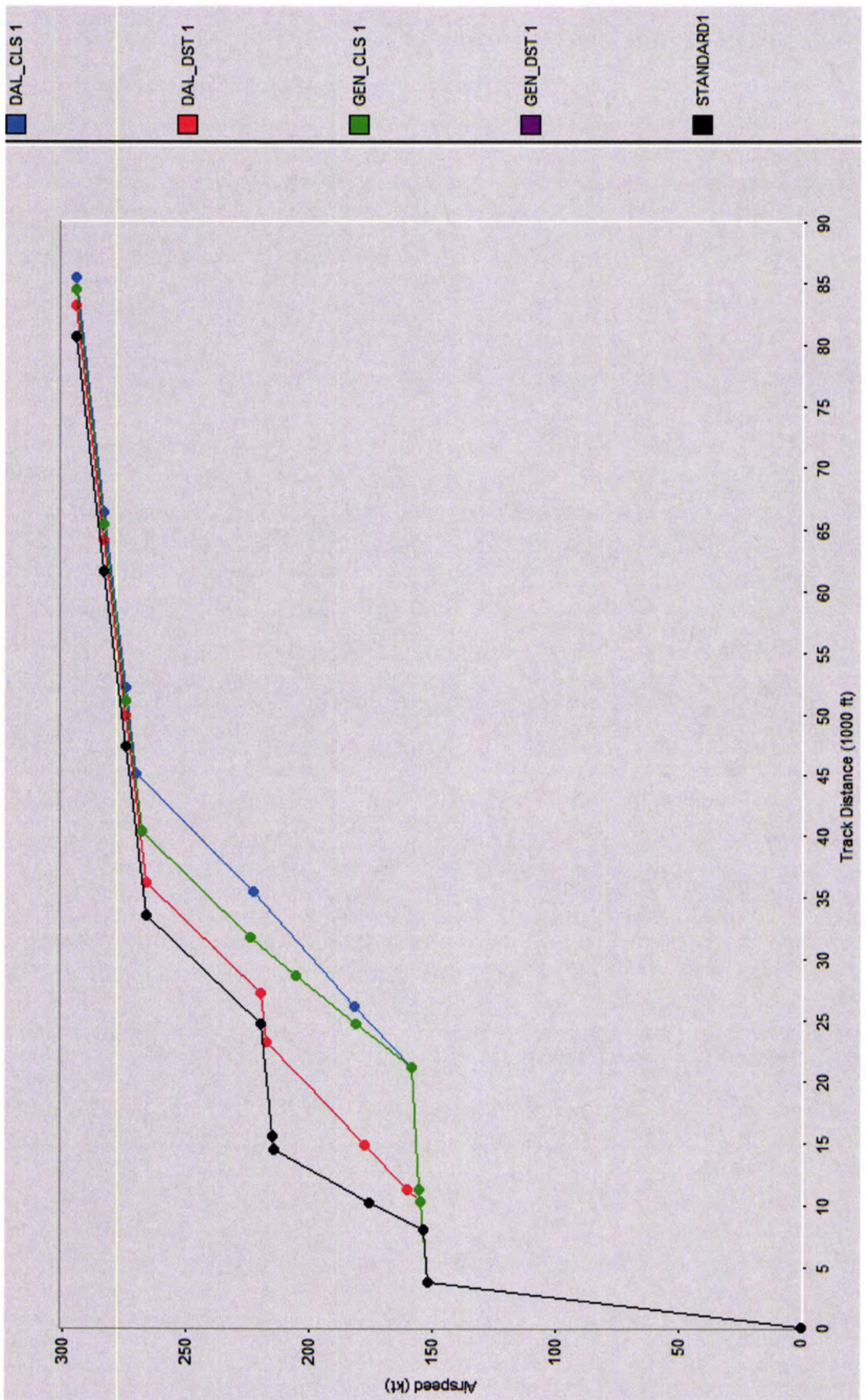


A330-301 Altitude Comparison



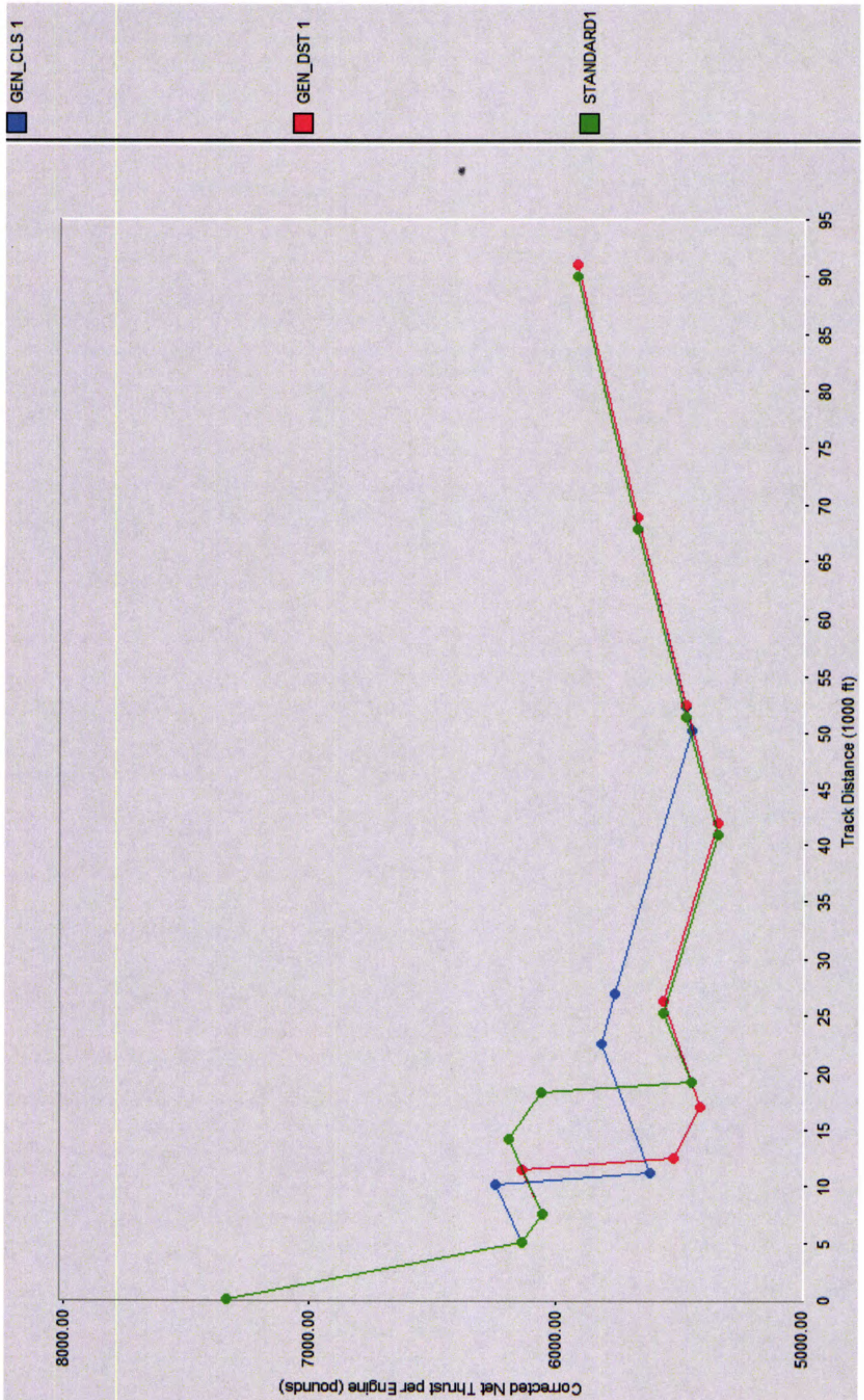
B-40

A330-301 Airspeed Comparison



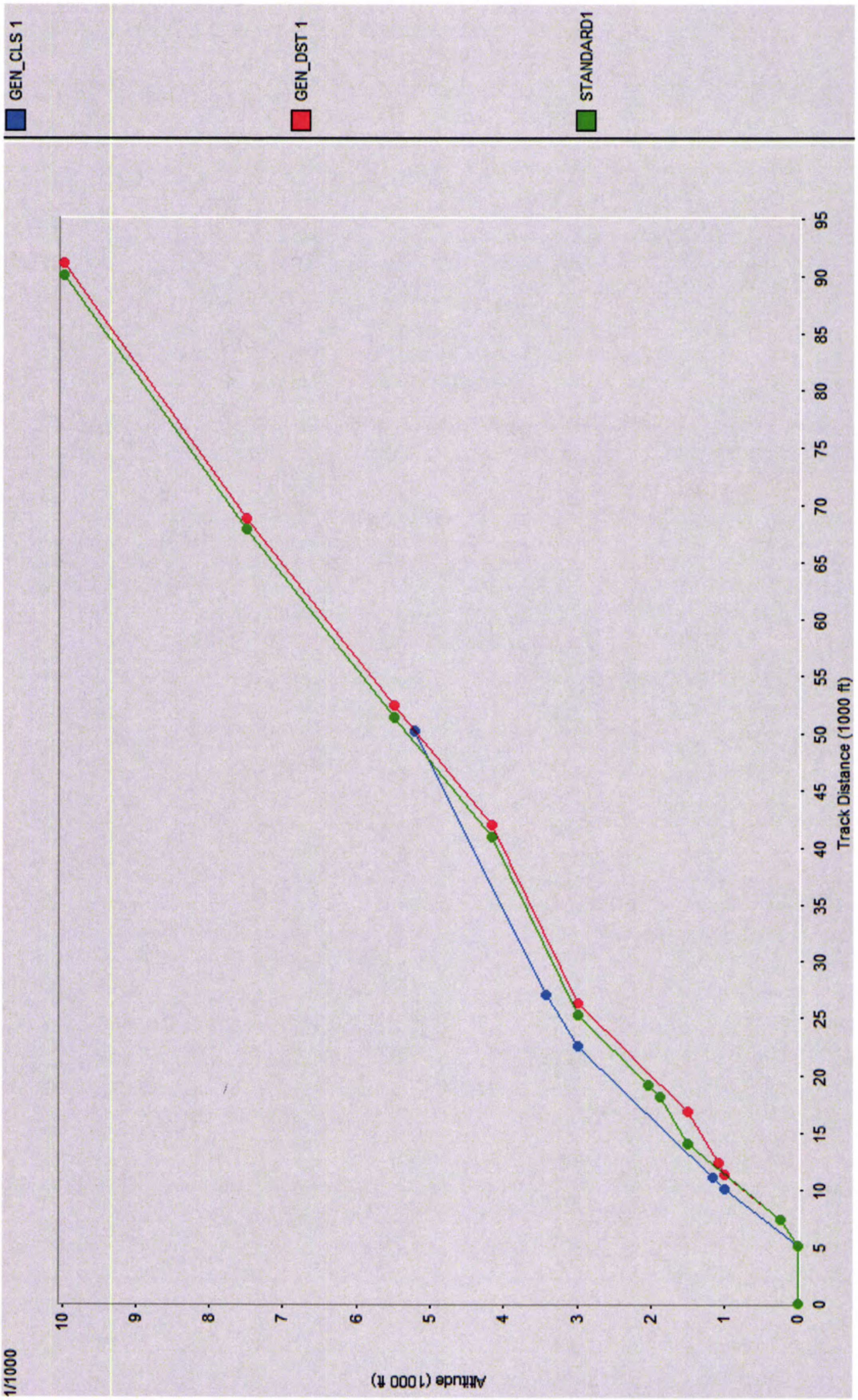
B-41

CL601 Thrust Comparison



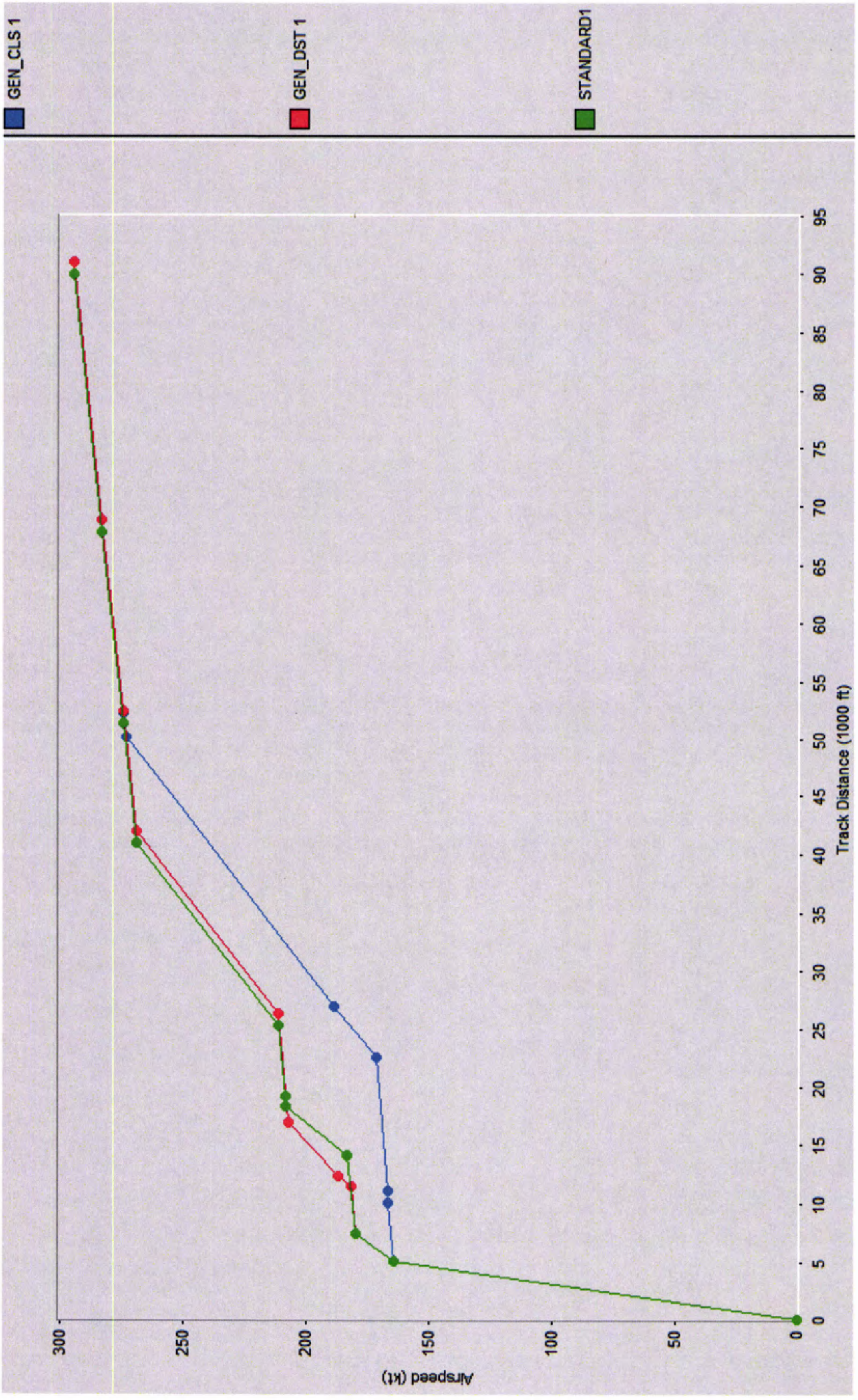
B-42

CL601 Altitude Comparison



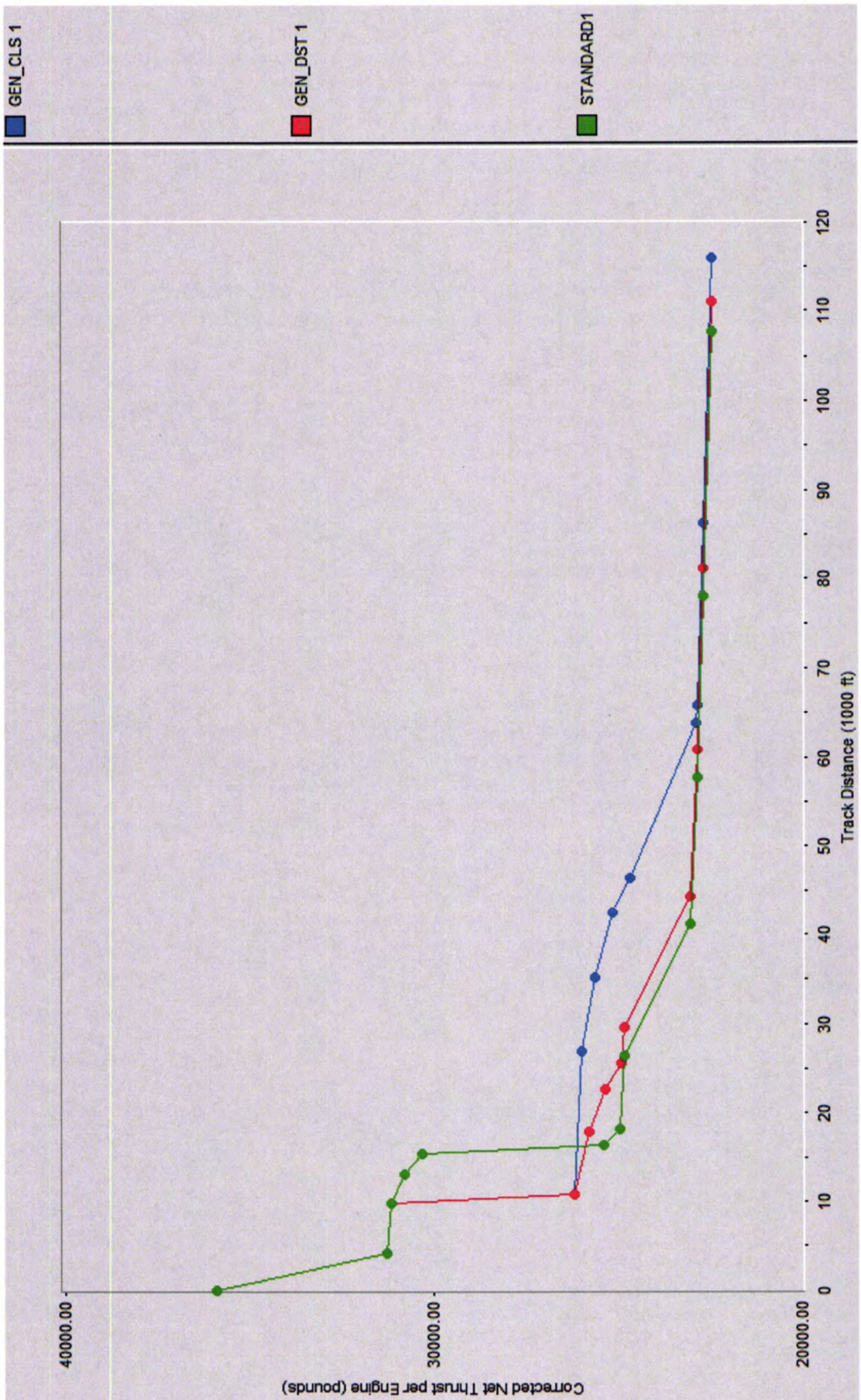
B-43

CL601 Airspeed Comparison



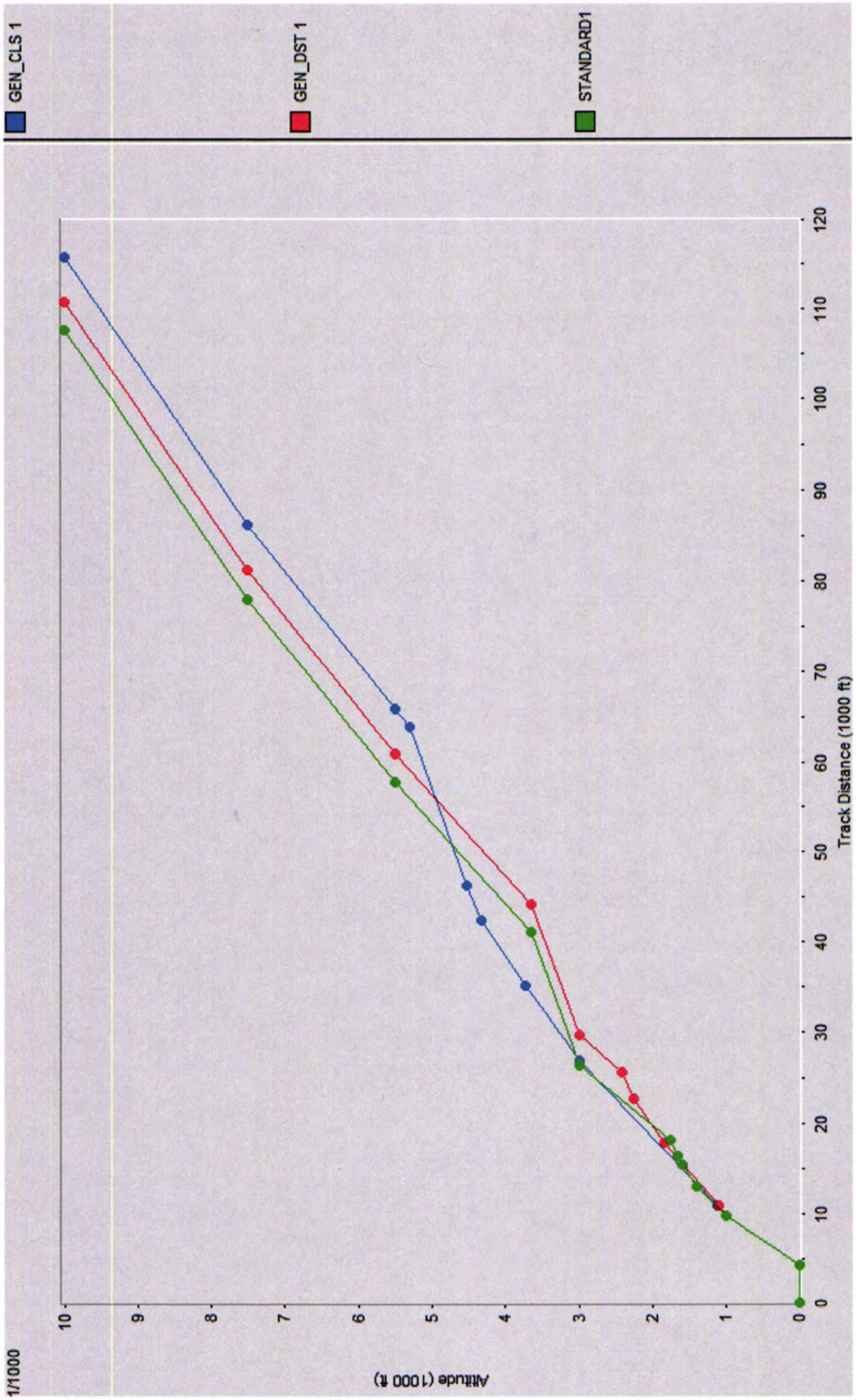
B-44

DC1010 Thrust Comparison



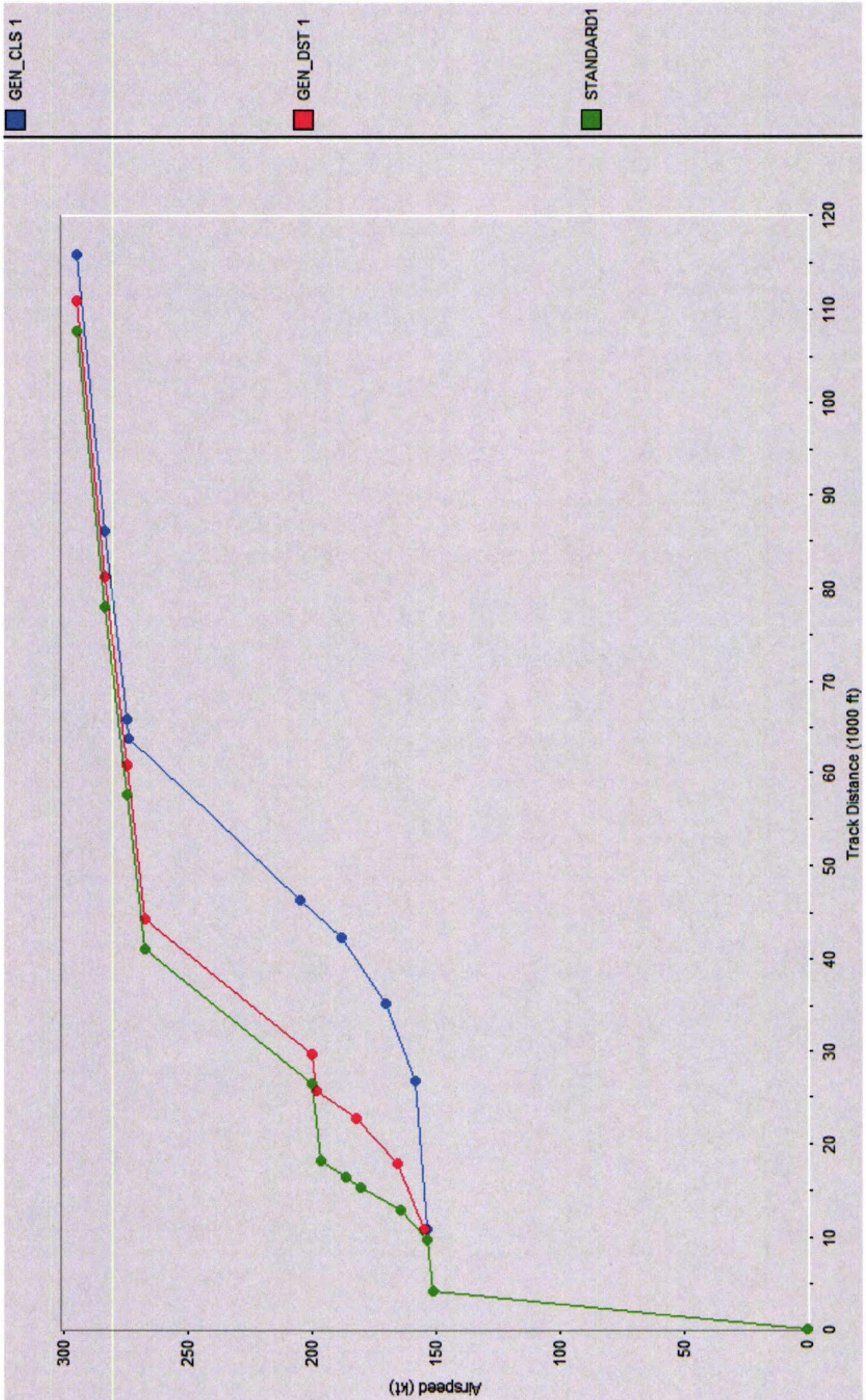
B-45

DC1010 Altitude Comparison



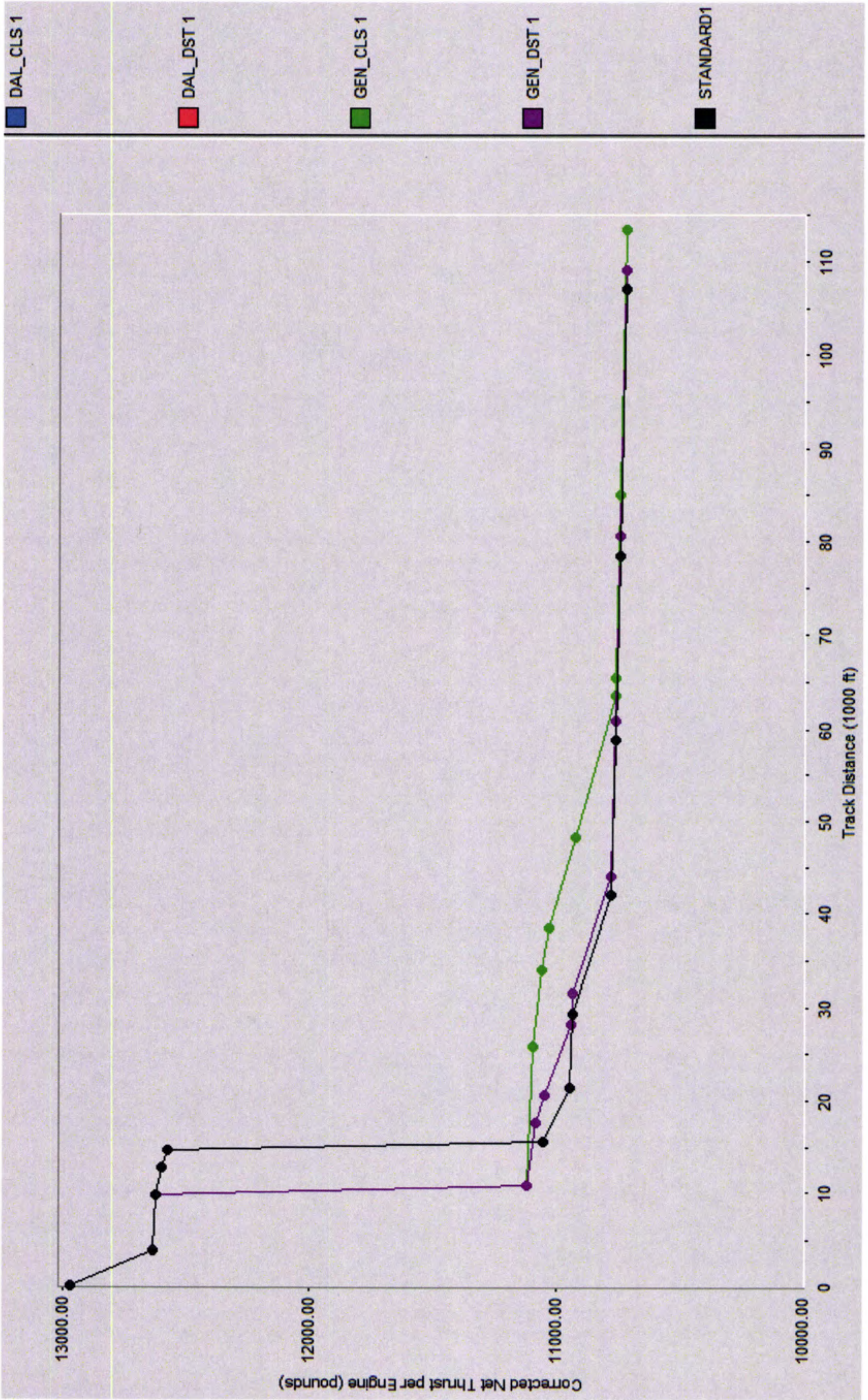
B-46

DC1010 Airspeed Comparison



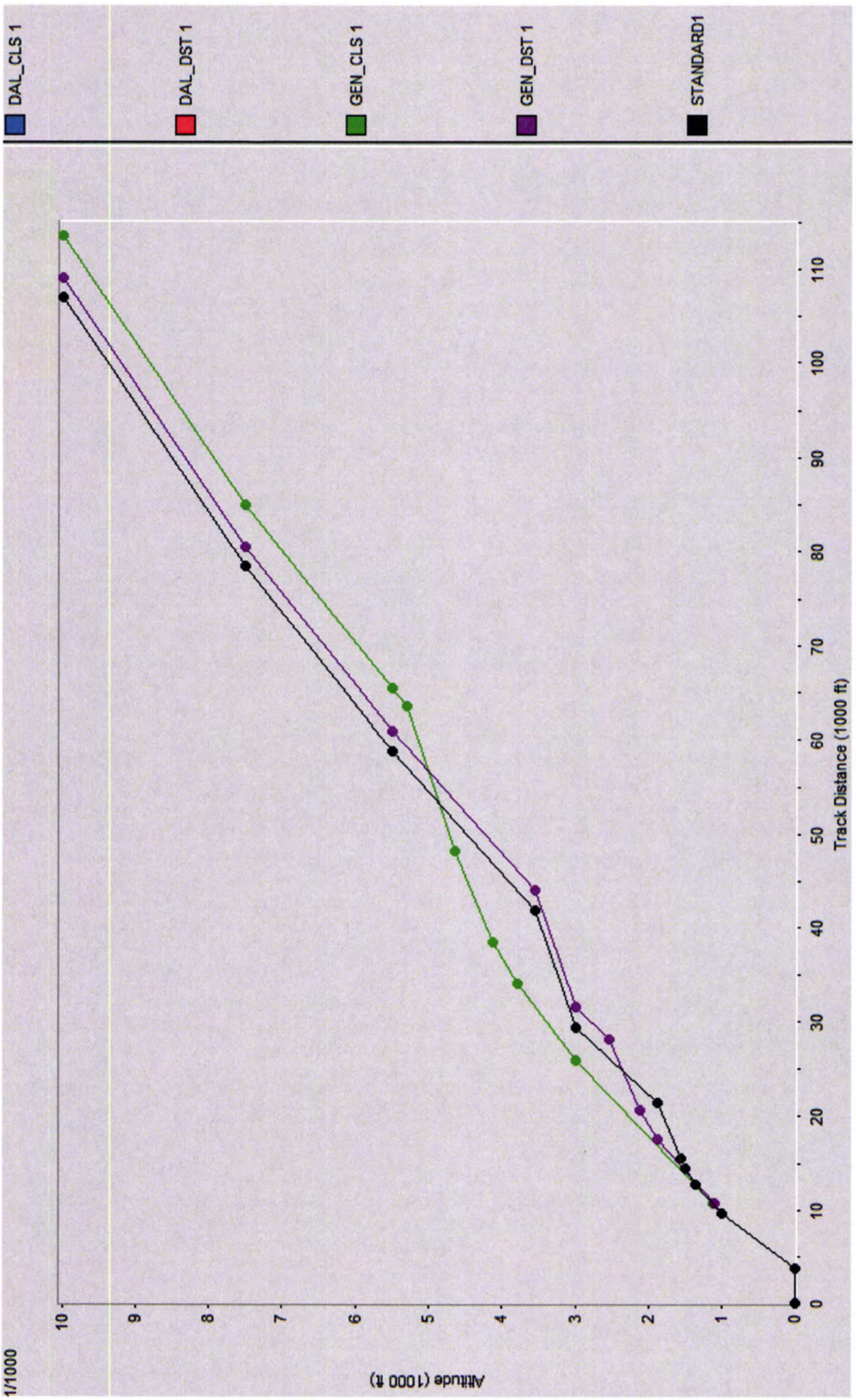
B-47

DC9Q9 Thrust Comparison



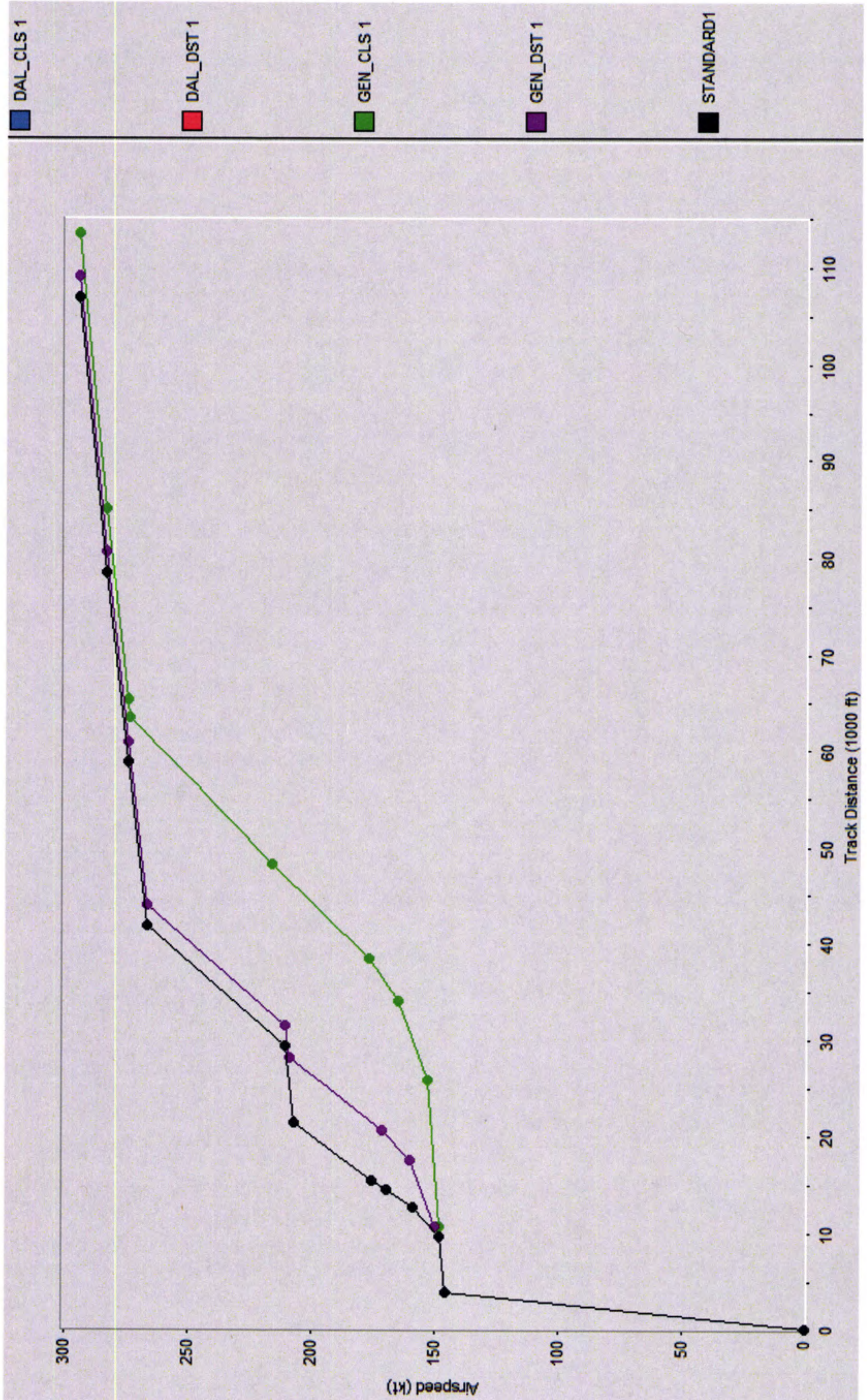
B-48

DC9Q9 Altitude Comparison



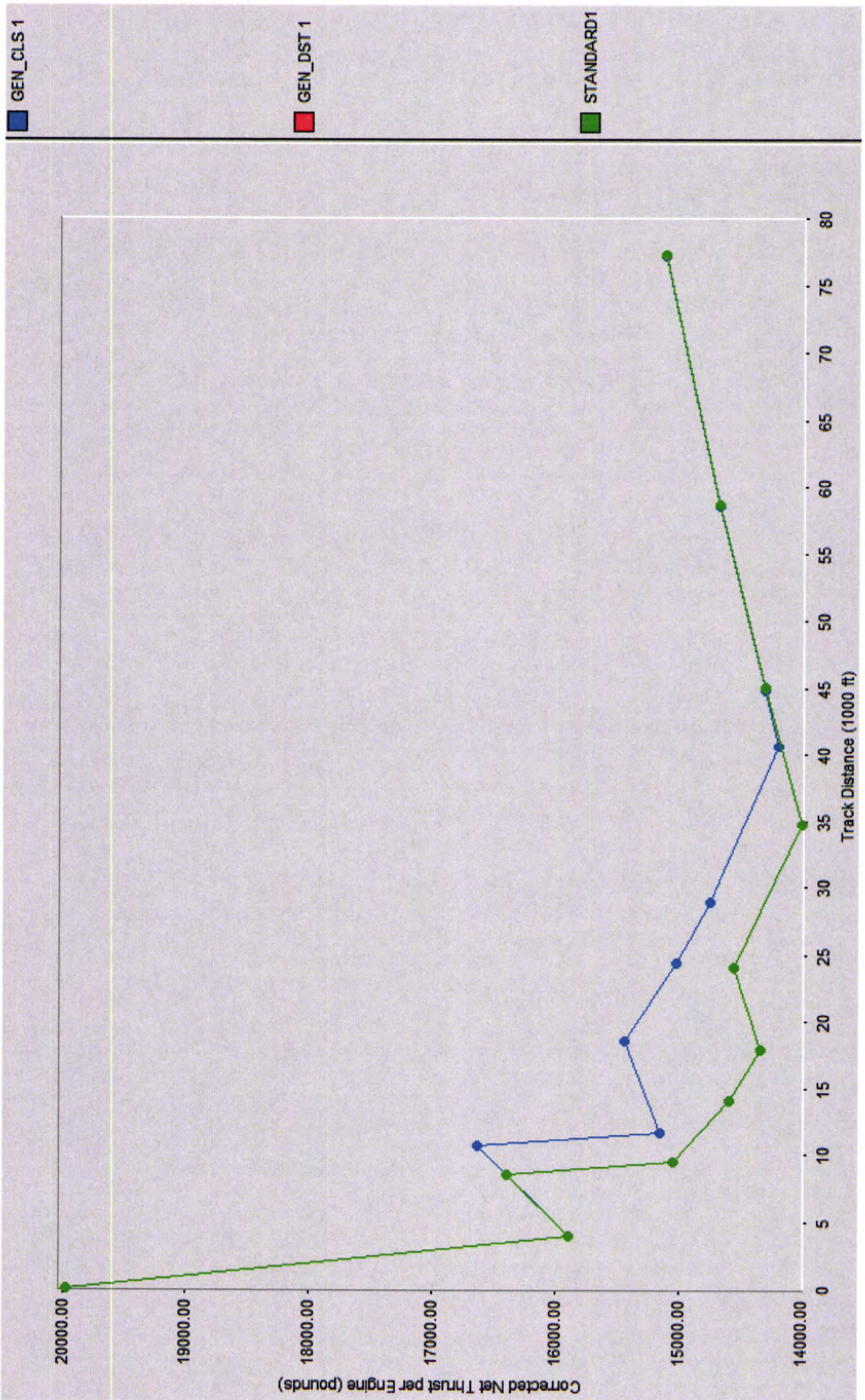
B-49

DC9Q9 Airspeed Comparison



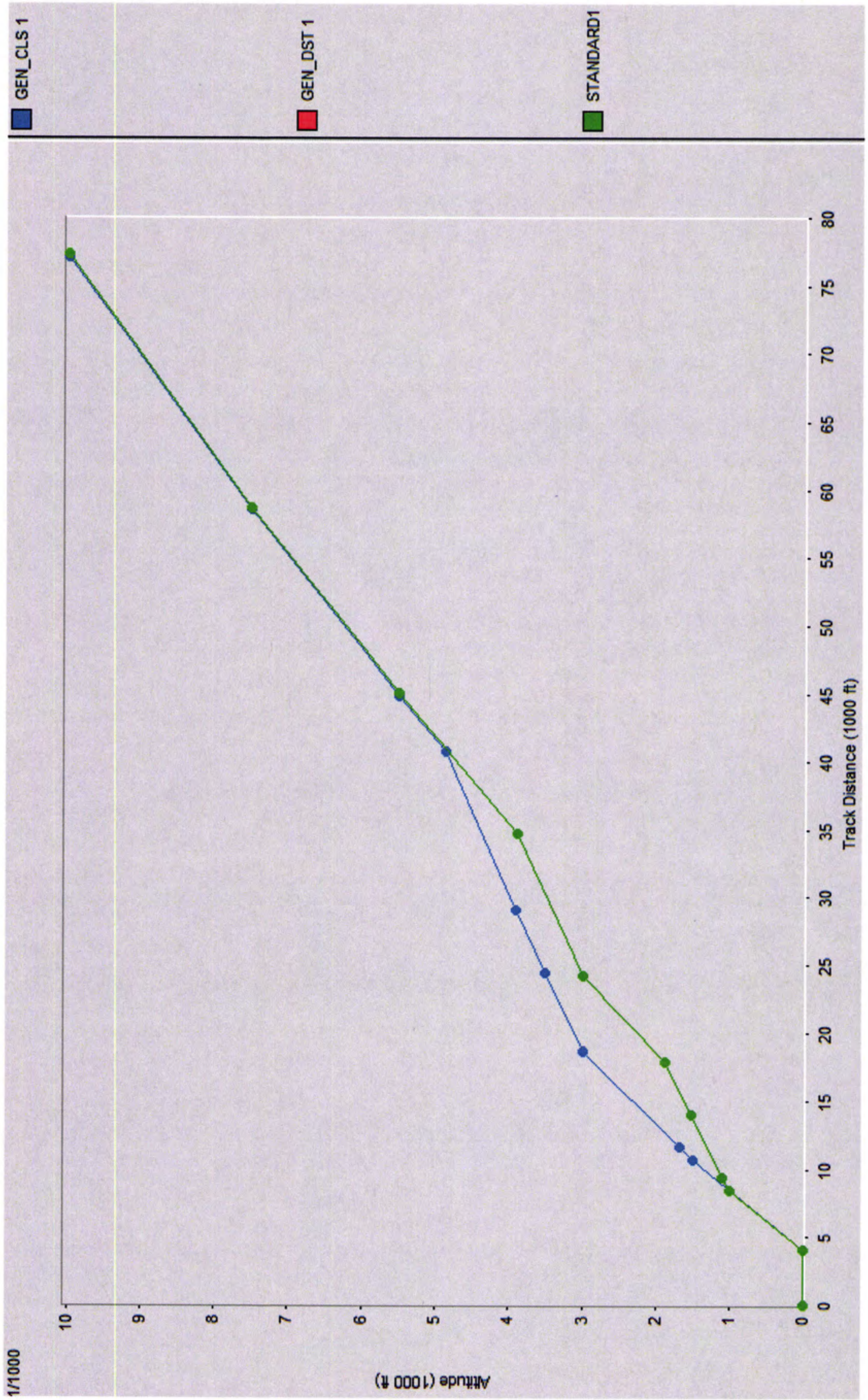
B-50

737500 Thrust Comparison



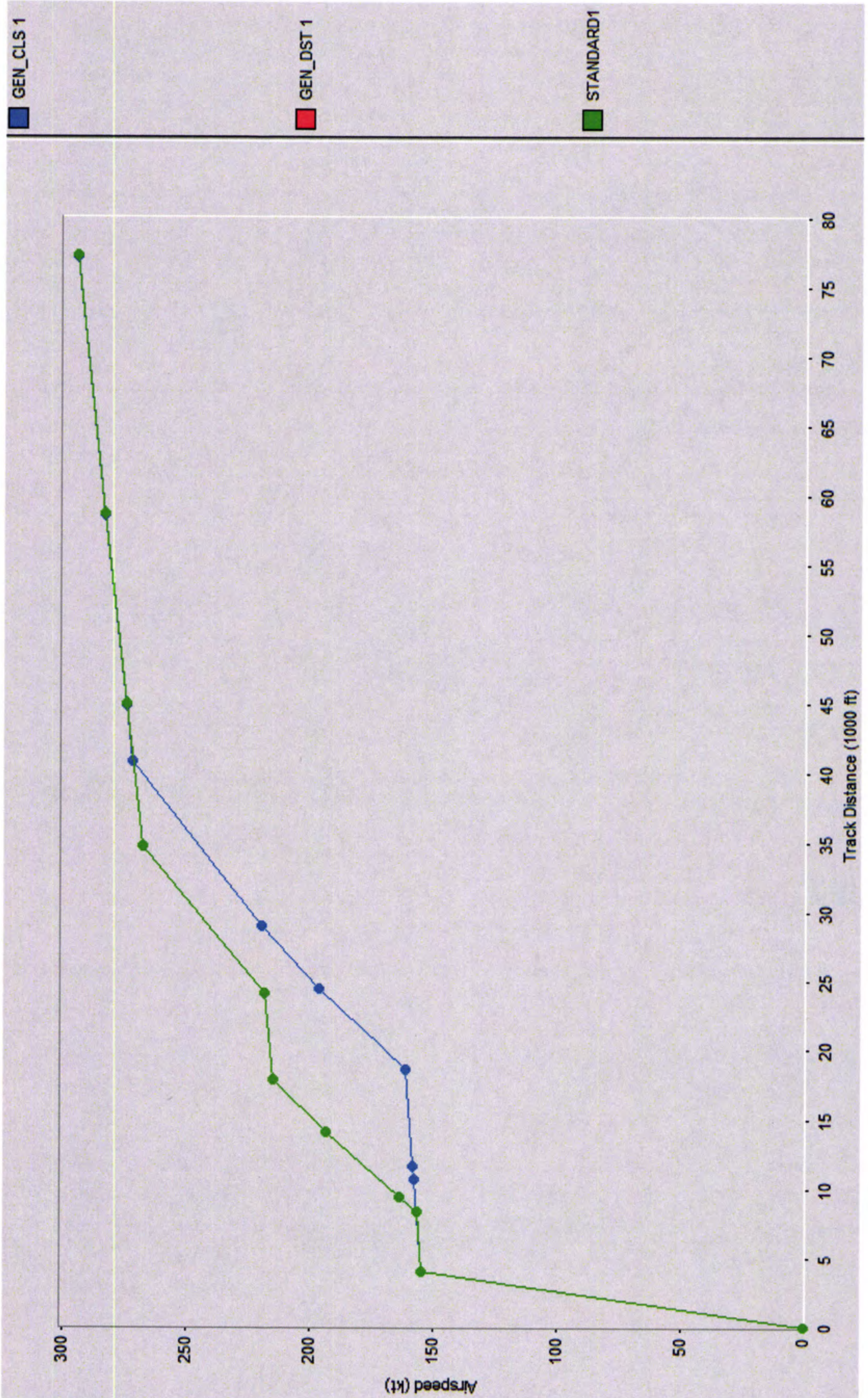
B-51

737500 Altitude Comparison



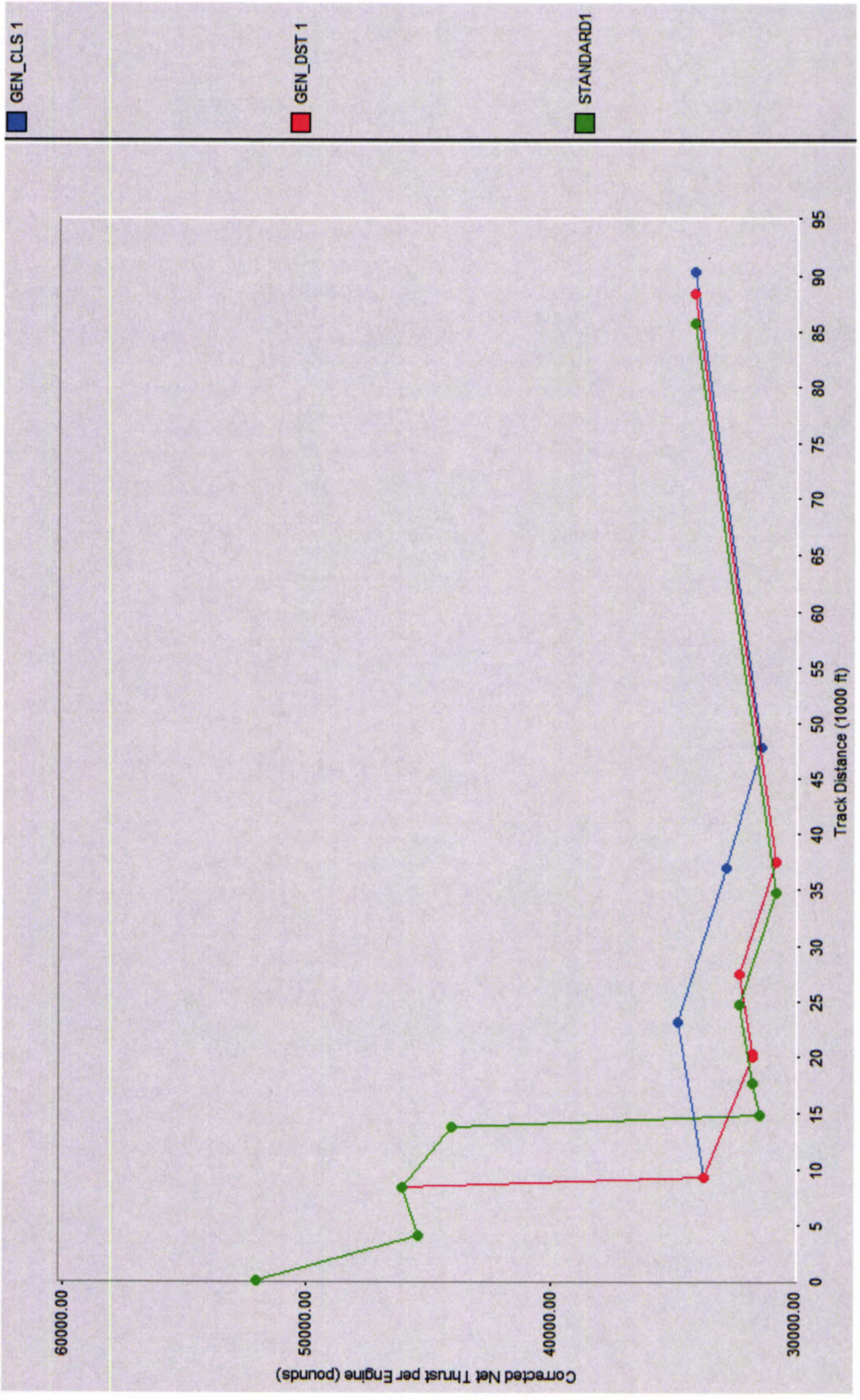
B-52

737500 Airspeed Comparison



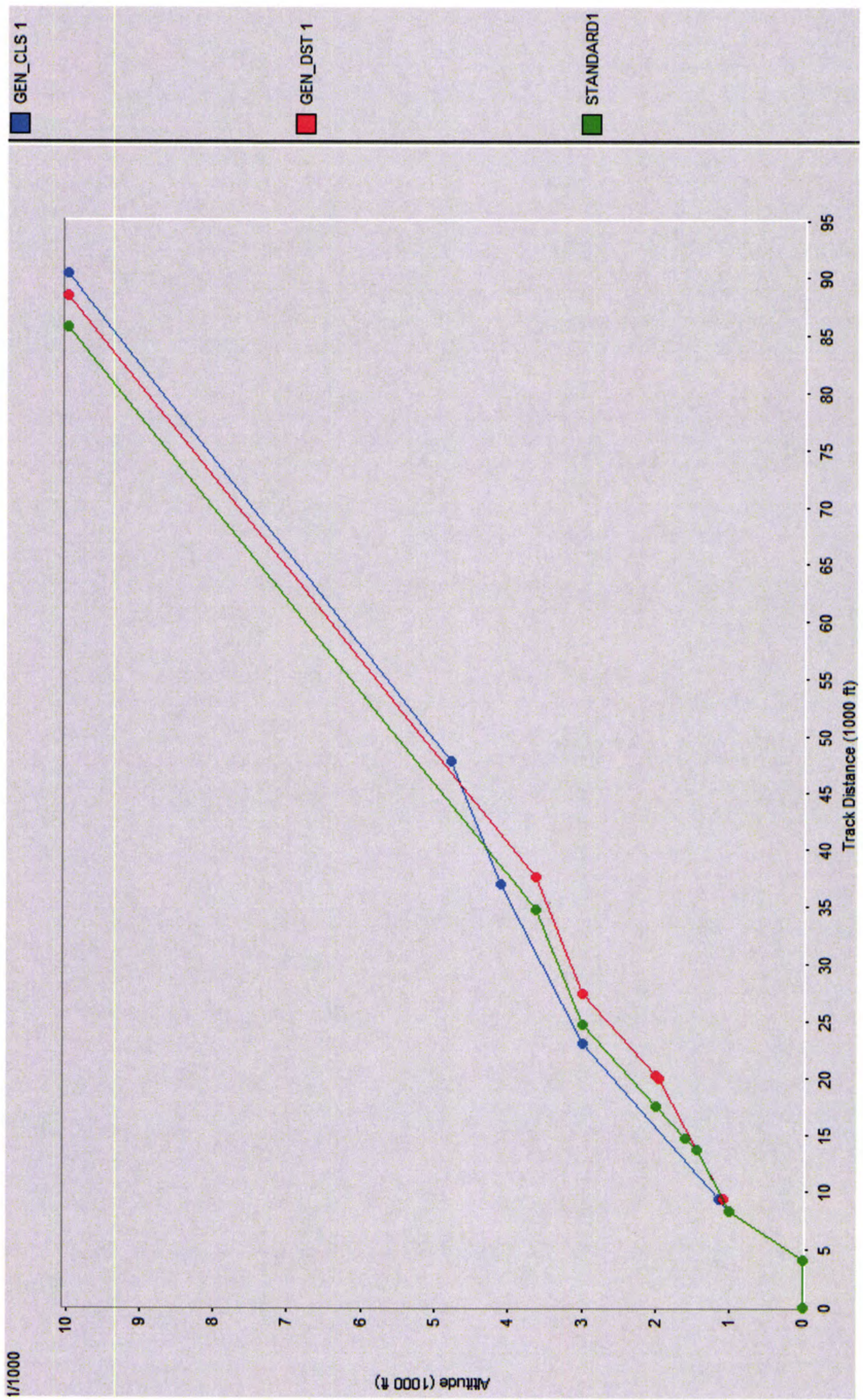
B-53

MD11GE Thrust Comparison



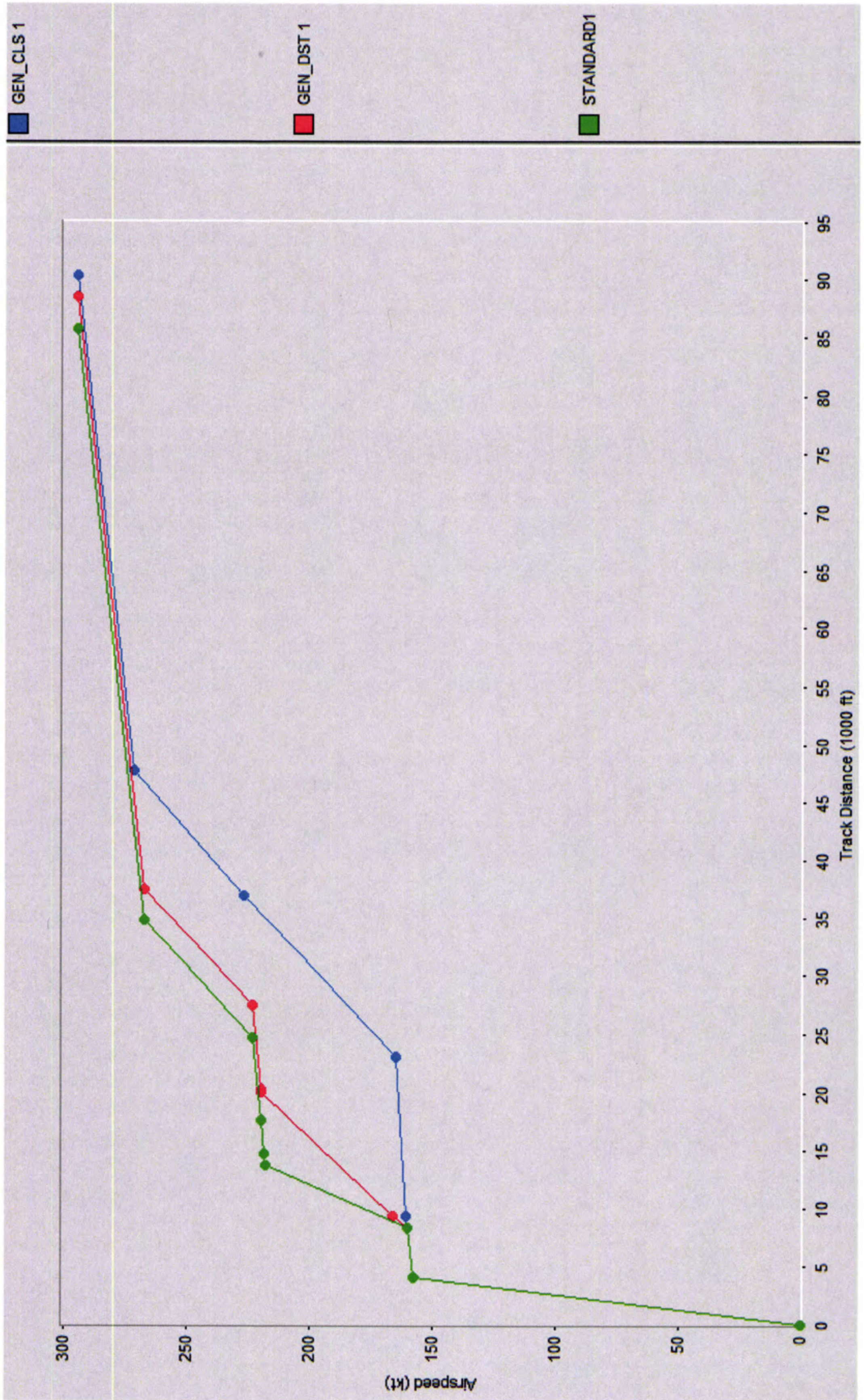
B-54

MD11GE Altitude Comparison



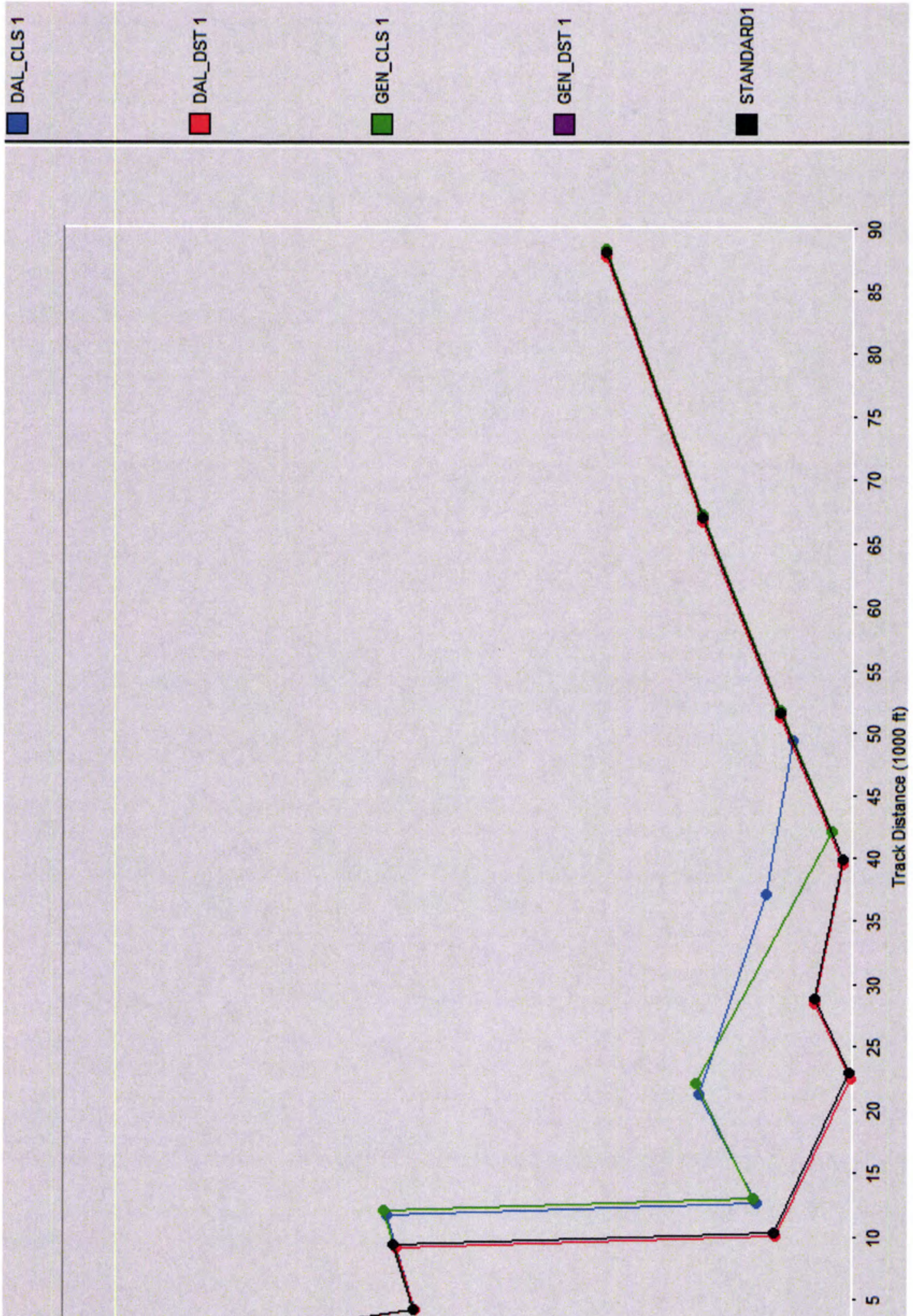
B-55

MD11GE Airspeed Comparison



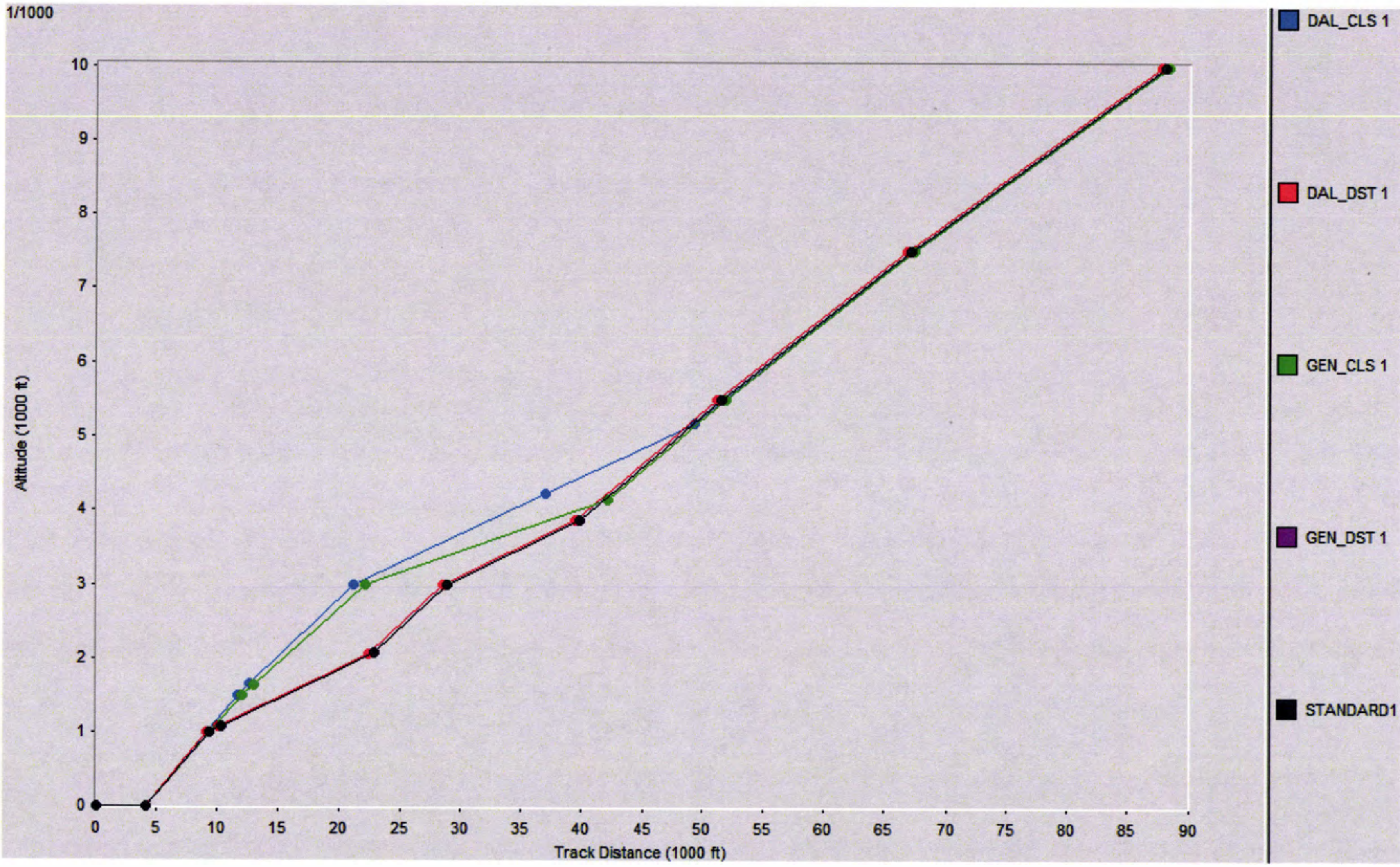
B-56

MD81 Thrust Comparison

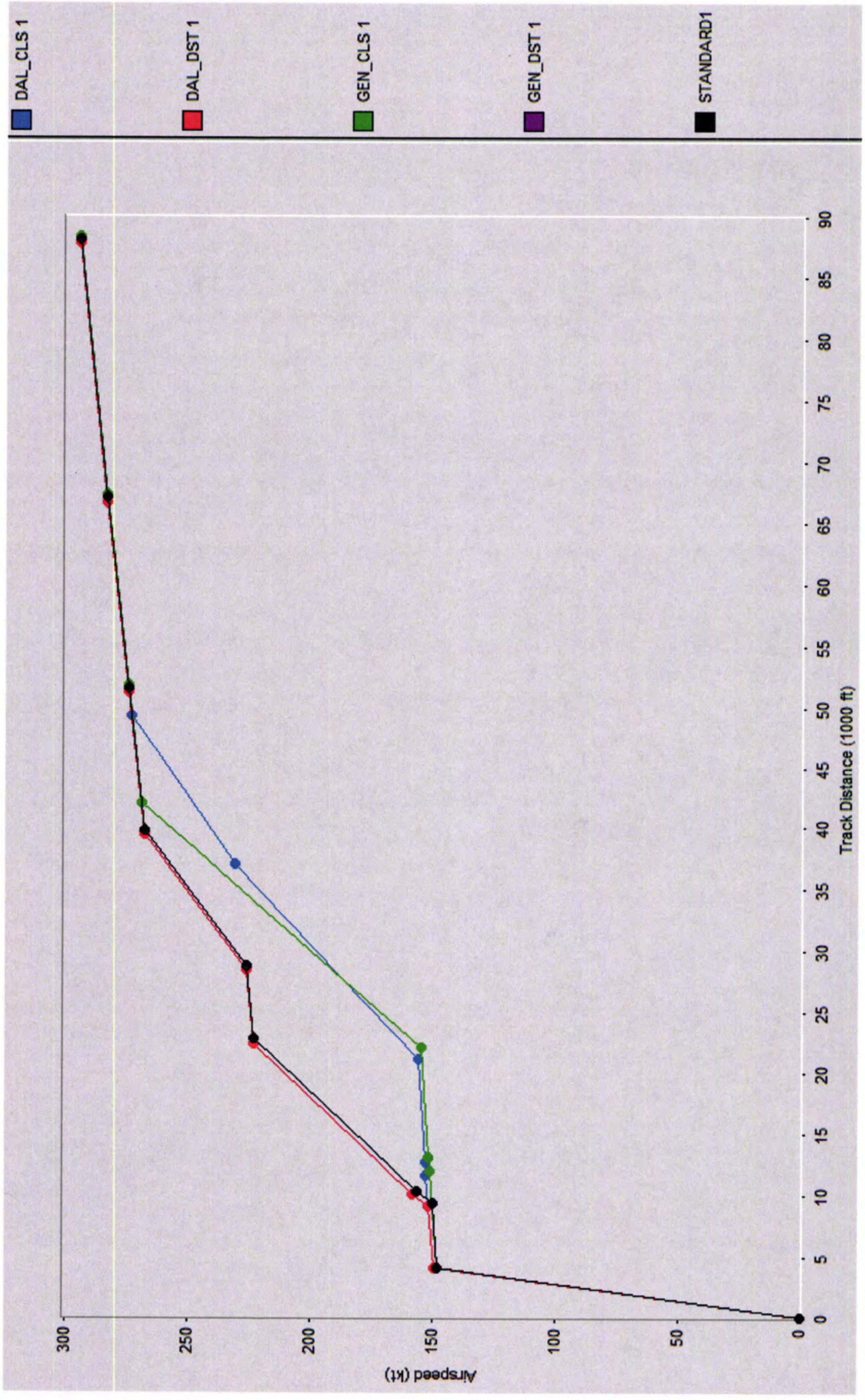


B-57

MD81 Altitude Comparison

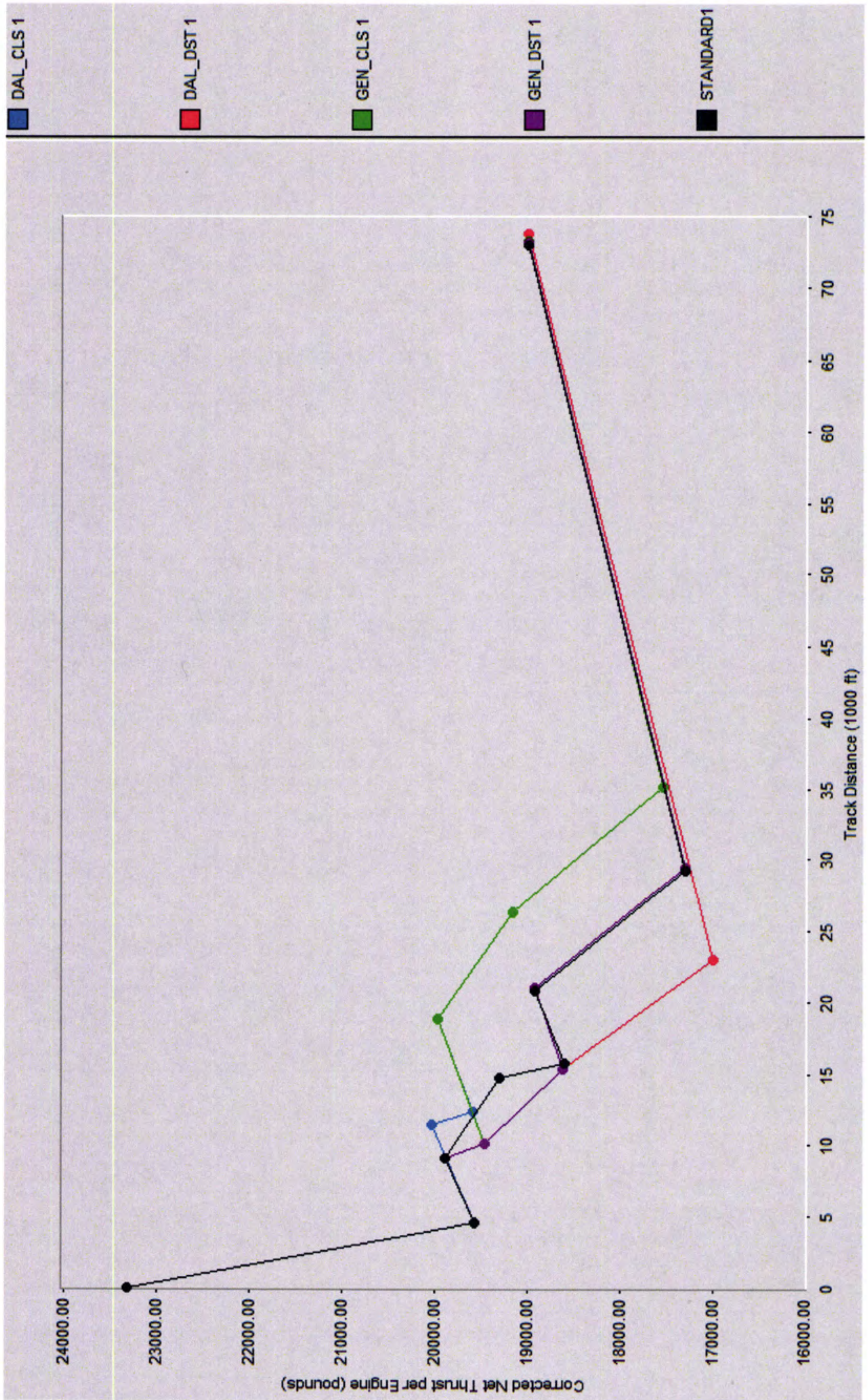


MD81 Airspeed Comparison



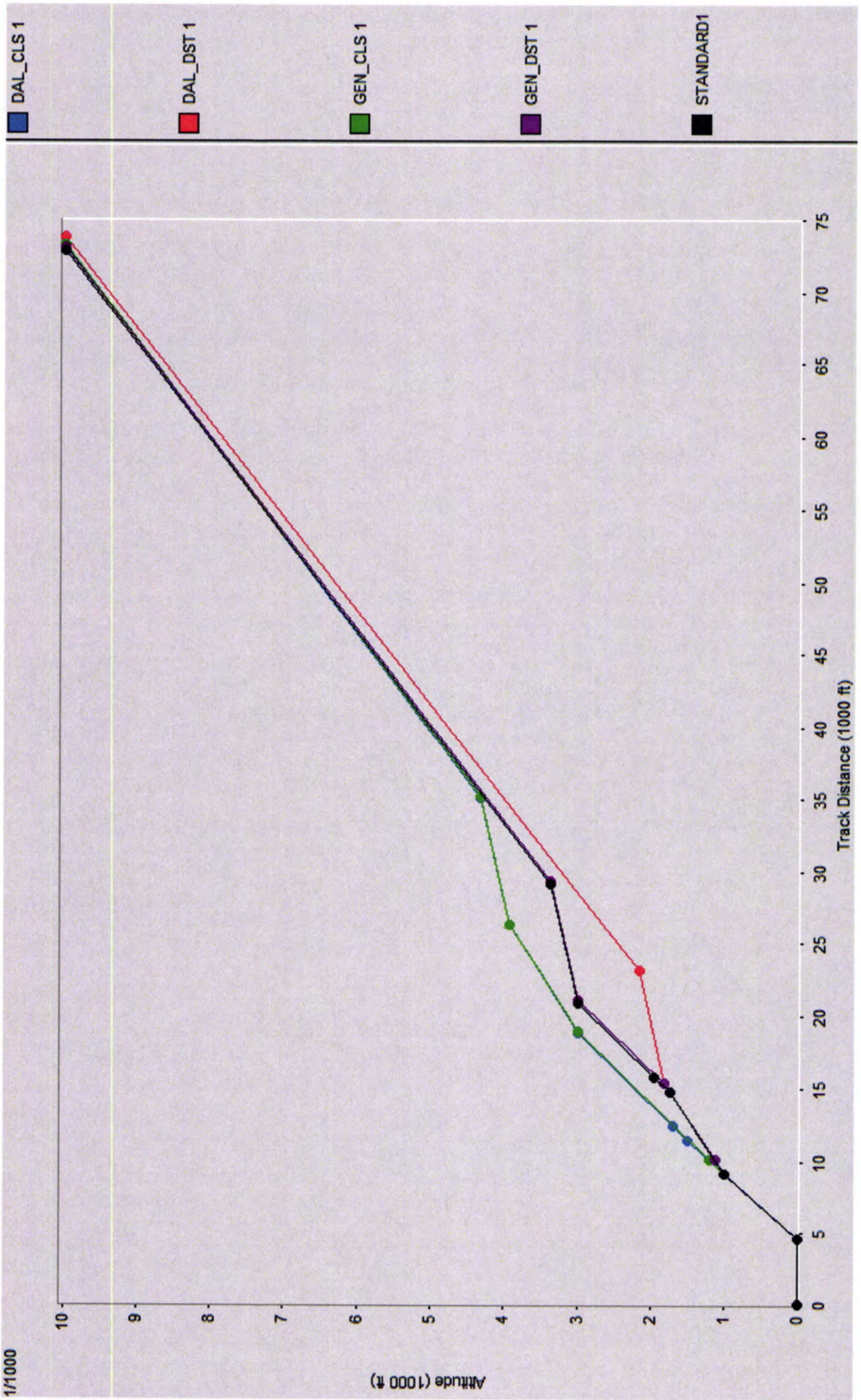
B-59

MD9025 Thrust Comparison

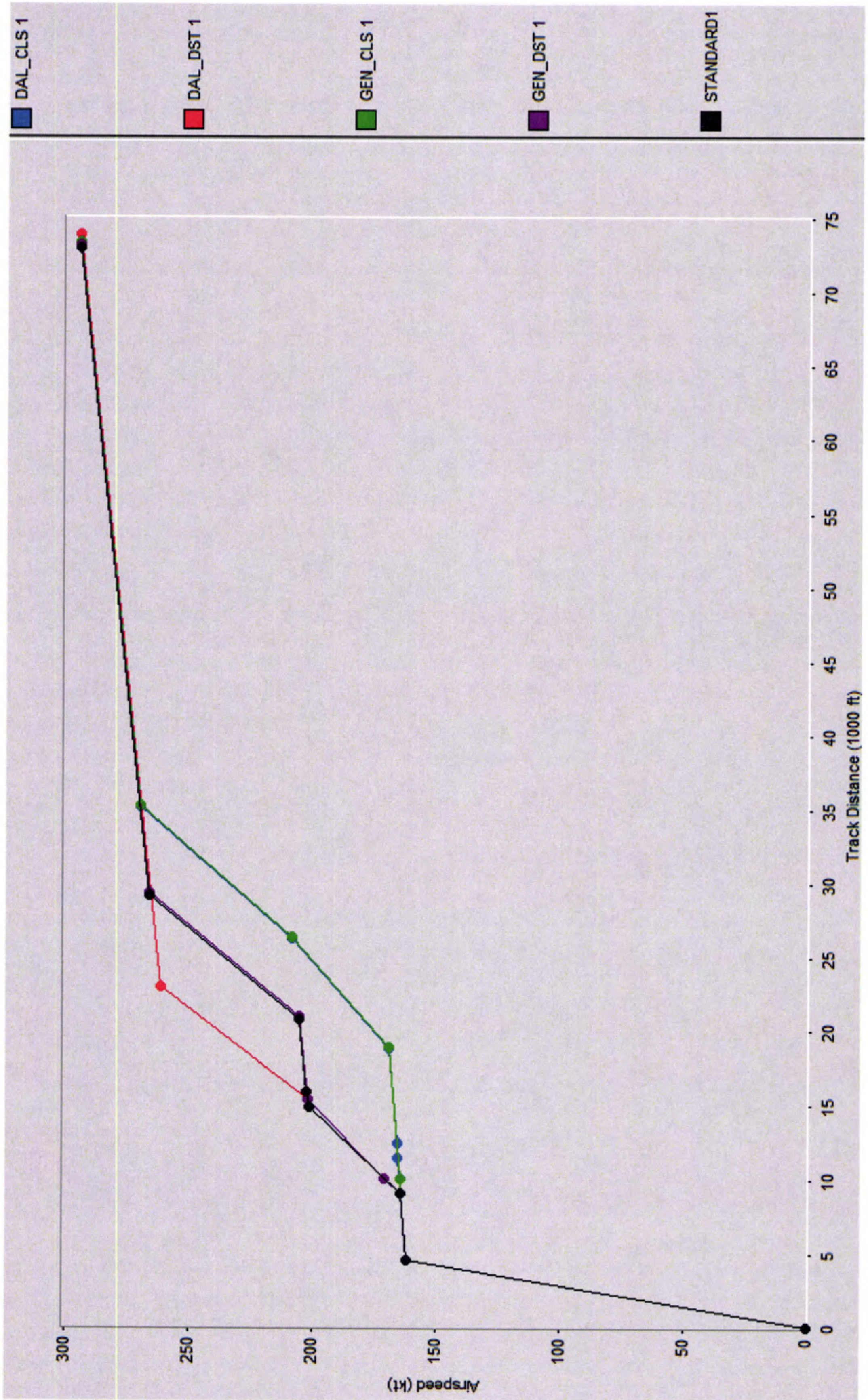


B-60

MD9025 Altitude Comparison



MD9025 Airspeed Comparison



B-62

Attachment 5:

FAA Categorical Exclusion Declaration

Federal Aviation Administration
Categorical Exclusion Declaration
Proposed Heading Changes at MSP

Description of Action:
The Metropolitan Airports Commission (MAC) has requested FAA to move approximately 32 daily operations from a 360 heading to a 340 heading for those opeations from Runway 30R going to destinations such as Duluth, International Falls, Winnipeg, etc. In addition MAC has requested that FAA implement the use of three divergent headings (360, 340, and 320 (for north bound departure operations off Runway 30R. See the MAC letter requesting FAA to implement these proposed changes.

*The above two items were analyzed together, and considered as one analysis.

Declaration of Exclusion:
The FAA has reviewed the above referenced proposed action and it has been determined, by the undersigned, to be categorically excluded from further environmental documentation according to Order 1050.1E, "Environmental Impacts: Policies and Procedures". The implementation of this action will not result in any extraordinary circumstances in accordance with Order 1050.1E. See the attached Intial Environmental Review for this proposed action.

Basis for this Determination:
This review was conducted in accordance with policies and procedures in FAA Order 1050.1E.

The applicable categorical exclusion(s) is: FAA Order 1050.1E,
311i. Establishment of new or revised air traffic control procedures conducted at 3,000 feet or more above ground level (AGL); instrument procedures conducted below 3,000 feet (AGL) that do not cause traffic to be routinely routed over noise sensitive areas; modifications to currently approved instrument procedures conducted below 3,000 feet (AGL) that do not significantly increase noise over noise sensitive areas; and increases in minimum altitudes and landing minima. For Air Traffic modifications to procedures at or above 3,000 feet (AGL), the Air Traffic Noise Screening Procedure (ATNS) should be applied. (ATO, AFS, AVN)

The attached noise report indicates that there is not a significant noise impact with the proposed changes.

Recommended by:

[signature] Date: 7-6-12
Dawn Ingraham - District Manager, Northern Lights District

Concurrence:
[signature] Date: 7-6-12
Nan L. Terry - Service Area Environmental Specialist

Approved by:
[signature] Date: 7-6-12
Paul Sheridan - Service Area Director (or Designee)

AIR TRAFFIC INITIAL ENVIRONMENTAL REVIEW
Request from Minneapolis

Facility/Office:Minneapolis TRACON Date: July 2012

Prepared by: Nan Terry Phone: 817-321-7736 Fax:

(Also see Section X for the complete listing of preparers.)

===

This initial environmental review should provide some basic information about the proposed project to better assist in preparing for the environmental analysis phase. Although it requests information in several categories, not all the data may be available initially. However, it does represent information, in accordance with FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures," which ultimately will be needed for preparation of the environmental document.

I. Project Description

A. At the March 21, 2012, the Noise Oversight Committe recommended the following operational measures be taken and the Minneapolis Airport Commission responded by sending a letter to the FAA on April 23, 2012. On June 21, 2012, FAA met with representatives of MAC and the city of Minneapolis to present the findings of the noise screen. At this meeting, both MAC and the city representatives requested FAA implement these headings.

- *Move approximately 32 daily departure operations from a 360° heading to a 340° heading for those operations from Runway 30R going to destinations such as Duluth, International Falls, Winnipeg, etc.*
- *Implement the use of three divergent headings (360°, 340°, 320°) for north bound departure operations off Runway 30R.*

*The above two items were analyzed together, and considered as one analysis.

B. Has airspace modeling been conducted using SDAT, TAAM, TARGETS, or other airspace/air traffic design tool? Yes No XX Model: __TARGETS___ o No If yes, provide a summary of the output from the modeling.

C. Describe the present (no action alternative) procedure in full detail. Provide the necessary chart(s) depicting the current procedure. Describe the typical fleet mix, quantifying (if possible) the number of aircraft on the route and depict their altitude(s) along the route.

Air Traffic predominantly uses the 360 heading. The change will simply put the COULT departures on a 360 heading, the Brainerd, Duluth and WLSTN departures on a 340 and the the 320 is the northwest bound SIDs we use today. There is no change to what we use today for the 320s.

D. Describe the proposed project, providing the necessary chart(s) depicting changes. Describe changes to the fleet mix, numbers of aircraft on the new route, and their altitude(s), if any.

See attached noise screen results.

1. Will there be actions affecting changes in aircraft flights between the hours of 10 p.m. – 7 a.m. local? X Yes No

2. Is a preferential runway use program presently in effect for the affected airport(s), formal or informal? X Yes No Will airport preferential runway configuration use change as a result of the proposed project? Yes X No

3. Is the proposed project primarily designed for Visual Flight Rules (VFR), Instrument Flight Rules (IFR) operations, or both? VFR X IFR o Both If this specifically involves a charted visual approach (CVA) procedure, provide a detailed local map indicating the route of the CVA, along with a discussion of the rationale for how the route was chosen.

4. Will there be a change in takeoff power requirements? o Yes X No If so, what types if aircraft are involved, i.e., general aviation propeller-driven versus large air carrier jets?

5. Will all changes occur above 3,000 feet above ground level (AGL)? o Yes X No What is the lowest altitude change on newly proposed routes or on existing routes that will receive an increase in operations? Surface

6. Will there be actions involving civil jet aircraft (heavier than 75,000 pounds gross weight) arrival procedures between 3,000-7,000 feet AGL or departures between 3,000-10,000 feet AGL? X Yes No Attach a copy of the completed Air Traffic Noise Screening (ATNS) Model report. (Please note that FAA has replaced the ATNS with the Noise Screening Tool.)
See the Attached Noise Screening Tool.

7. If noise analysis was already performed using the FAA's Integrated Noise Model (INM) or Noise Integrated Routing System (NIRS), provide a summary of the results.

II. Purpose and Need

A. Describe the purpose and need for the proposed project. If detailed background information is available, summarize here and provide a copy as an attachment to this review.

The purpose of the proposed action is to create divergent tracks for aircraft to follow off runway 30R. As the fleet mix has decreased in variety, the tracks have become more concentrated.

B. What operational/economic/environmental benefits will result if this project is implemented?

Use of additional headings will disperse noise.

1. If a delay reduction is anticipated, can the reduction be quantified?
o Yes X No o N/A

2.Can reduced fuel costs/natural energy consumption be quantified? o Yes X No o N/A

If not quantifiable, describe the approximate anticipated benefits in lay terms. N/A

C. Is the proposed project the result of a user or community request or regulatory mandate? X Community Request Regulatory Mandate If not, what necessitates this action?

These procedures are a result of a vote by the Minneapolis Noise Oversight Committee on March 21, 2012. See letter from Minneapolis Airport Commission, dated April 23, 2012. On June 21, 2012, FAA met with representatives of MAC and the city of Minneapolis to present the findings of the noise screen. At this meeting, both MAC and the city representatives requested FAA implement these headings.

III. Describe the Affected Environment

A. Provide a description of the existing land use in the vicinity of the proposed project.

The areas in question are residential.

B. Will the proposed project introduce air traffic over noise sensitive areas not now affected? Yes X No Will they be affected to a greater or lesser extent? Similar impacts. See noise report.

As the exsiting tracks show (see noise report), these neighborhoods currently have aircraft overflights. The proposed changes will provide greater divergence.

Note: An area is noise sensitive if aircraft noise may interfere with the normal activities associated with the use of the land. See Order 1050.1E for full definition of noise sensitive areas.

C. Are wildlife refuge/management areas within the affected area of the proposed project?

Yes X No

If so, has there been any communication with the appropriate wildlife management regulatory (federal or state) agencies to determine if endangered or protected species inhabit the area?

Yes X No

1. At what altitude would aircraft overfly these habitats?

2. During what times of the day would operations be more/less frequent?

D. Are there cultural or scenic resources, of national, state, or local significance, such as national parks, outdoor amphitheaters, or stadiums in the affected area?

Yes X No

If so, during what time(s) of the day would operations occur that may impact these areas?

E. Has there been communication with air quality regulatory agencies to determine if the affected area is a non-attainment area (an area which exceeds the National Ambient Air Quality Standards for ozone, carbon monoxide, lead, particulate matter, sulfur dioxide, or nitrogen dioxide) or maintenance area (an area which was in non-attainment but subsequently upgraded to an attainment area) concerning air quality?
Yes X No

If yes, please explain:

F. Are there reservoirs or other public water supply systems in the affected area?
Yes X No

IV.Community Involvement

Formal community involvement or public meetings/hearings may be required for the proposed project. Make a determination if the proposed project has the potential to become highly controversial. The effects of an action are considered highly controversial when reasonable disagreement exists over the project's risks of causing environmental harm. Opposition on environmental grounds by a Federal, State or local government agency or by a Tribe, or by a substantial number of the person affected by the action should be considered in determining whether reasonable disagreement regarding the effects of a proposed action exists (see 1050.1E, paragraph 304i).

A. Have persons/officials who might have some need to know about the proposed project due to their location or by their function in the community been notified, consulted, or otherwise informed of this project? X Yes o No

The MAC established the MSP Noise Oversight Committee (NOC) in August 2002 to bring industry and community representatives together to address aircraft noise issues at MSP and to bring policy recommendations to the Metropolitan Airports Commission. At the March 21, 2012, the Noise Oversight Committe recommended the following operational measures be taken and the Minneapolis Airport Commission responded by sending a letter to the FAA on April 23, 2012. On June 21, 2012, FAA met with representatives of MAC and the city of Minneapolis to present the findings of the noise screen. (See attached for MSP ATCT/TRACON Visitor Log.) At this meeting, both MAC and the city representatives requested FAA implement these headings.

1. Are local citizens and community leaders aware of the proposed project?
X Yes o No o Unsure

The FAA briefed representatives of the City of Minneapolis and MAC on June 21, 2012 on the noise report showing the FAA noise screen of the proposed change to headings. These leaders expressed support for the project.

Are any o opposed to or X o supporting it? If so, identify the parties and indicate the level of opposition and/or support.

a. If they are opposed, what is the basis of their opposition?

b. Has the FAA received one or more comments objecting to the proposed project on environmental grounds from local citizens or elected officials? o Yes X No If so, state the nature of the comment and how the FAA was notified (e.g. resolution, Congressional, Public meeting/workshop, etc.).

1. Are the airport proprietor and users providing general support for the proposed project?X Yes o No

2. Is the proposed project consistent with local plans and development efforts?

X Yes o No

3. Has there been any previous aircraft-related environmental or noise analysis, including

FAR Part 150 Studies, conducted at this location? X Yes o No
If so, was the study reviewed as a part of this initial review?
Yes o No X N/A

MAC and the NOC have requested FAA take this proposed action.

V. Extraordinary Circumstances

The determination of whether a proposed action may have a significant environmental effect is made by considering any requirements applicable to the specific resource (see 1050.1E, Appendix A).

A. Will implementation of the proposed project result in any of the following? As stated in 1050.1E, paragraph 304, extraordinary circumstances exist when a proposed action involves any of the following circumstances AND may have a significant effect (40 CFR 1508.4).

1. An adverse effect on cultural resources protected under the National Historic Preservation Act of 1966, as amended (see 1050.1E, paragraph 304a).
   Yes X No Possibly

Comment:

2. An impact on properties protected under section 4(f) of the Department of Transportation Act (see paragraph 304b).

   Yes X No Possibly

Comment: .

3. An impact on natural, ecological (e.g. invasive species) or scenic resources of Federal, Tribal, State, or local significance (for example, Federally listed or proposed endangered, threatened, or candidate species or proposed or designated critical habitat under the Endangered Species Act); resources protected by the Fish and Wildlife Coordination Act; wetlands; floodplains; prime, unique, State, or locally important farmlands; energy supply and natural resources; wild and scenic rivers, including study or eligible river segments; and solid waste management. (See paragraph 304c)

   Yes X No Possibly

Comment:

4. A division or disruption of an established community; a disruption of orderly, planned development; or an inconsistency with plans or goals that have been adopted by the community in which the project is located (see paragraph 304d).
   Yes X No Possibly

Comment: .

5. An increase in congestion from surface transportation, by causing a decrease in the Level of Service below the acceptable level determined by the appropriate transportation agency (i.e., a highway agency). (See paragraph 304e.) o Yes
   Yes X No Possibly

Comment:

6. An impact on noise levels of noise-sensitive areas (see paragraph 304f).
   Yes X No Possibly

Comment: **Noise study indicates no significant changes over noise sensitive areas.**

7. An impact on air quality or a violation of local, State, Tribal, or Federal air quality standards under the Clean Air Act amendments of 1990 (see paragraph 304g).
   Yes X No Possibly

   Comment:

8. An impact on water quality, sole source aquifers, a public water supply system, or State or Tribal water quality standards established under the Clean Water Act and the Safe Drinking Water Act (see paragraph 304h).
   Yes X No Possibly

   Comment:

9. Effects on the quality of the human environment that are likely to be highly controversial on environmental grounds (see paragraph 304i).
   Yes X No Possibly

   Comment:

10. Likelihood of an inconsistency with any Federal, State, Tribal, or local law relating to the environmental aspects of the proposed action (see paragraph 304j).
    Yes X No Possibly

    Comment:

11. Likelihood of directly, indirectly, or cumulatively, creating a significant impact on the human environment (see paragraph 304k
    Yes X No Possibly

    Comment:

VI. Alternatives

A.Are there alternatives to the proposed project? Yes X No If yes, describe any alternatives to the proposed action.

B. Please provide a summary description of alternatives eliminated and why.

No additional changes were requested by MAC.

VII. Mitigation

Are there measures, which can be implemented that might mitigate any of the potential impacts, i.e., GPS/FMS plans, NAVAIDS, etc.? o Yes X No o N/A

VIII. Cumulative Impacts

What other projects (FAA, non-FAA, or non-aviation) are known to be planned, have been previously implemented, or are ongoing in the affected area that would contribute to the proposed project's environmental impact?

There are two projects with independent utility ongoing at MSP. In addition to this proposal, the FAA is developing new Performance Based Navigation procedures. The Airport is preparing an Environmental Assessment for landside terminal development. This change of headings will be incorporated in the existing conditions for the above.

IX. References/Correspondence

Attach written correspondence, summarized phone contacts using Memorandums for the File, etc.

X. Additional Preparers

The person(s) listed below, in addition to the preparer indicated on page 1, are responsible for all or part of the information and representations contained herein:

Name	Title	Facility/Agency/Company	Telephone Number
Scott Shelerud	Support Specialist	MSP	(612) 713-4031

XI. Facility/Service Area Conclusions

The undersigned have determined that the proposed project may qualifies as a categorically excluded action in accordance with Order 1050.1E, and on this basis, recommend that further environmental review be conducted before the proposed project is implemented.

Facility Manager Review/Concurrence

Signature: DM Ingraham Date: 7-6-12

Name: Dawn Ingraham

District Manager, Northern Lights District

Service Area Environmental Specialist Review/Concurrence

Signature: ______________________ Date: 7/6/2012

Name: Nan L. Terry

Environmental Specialist, CSA OSG______________

- Service Area Director Review/Concurrence, if necessary

Signature: ______________________ Date: 7/6/2012

Name: Paul Sheridan

Director of Terminal Operations, CSA______________________

Wide Grid Large

DATE: Wed Jun 13 09:00:04 CDT 2012

Project Location: MSP

Project Description: None

Facility Conducting Review: MSP ATCT

Name/Title of Reviewer: Scott Shelerud, Support Specialist

RECOMMENDATION RESULTS

The noise impact results showed that 2% of the grid points between 45 to 60 DNL experienced an increase greater than or equal to 5.0 DNL, and 98% of the grid points did not register any changes in noise exposure.

RECOMMENDATION DATA

Baseline Routes

Traffic Route Bundle Name: BaseTrafficRoutes

Traffic Route Bundle Description:

Traffic Routes: 9685

Traffic Events

Time Of Day	Small Acft Traffic Events	Large Acft Traffic Events	Heavy Acft Traffic Events	Unknown Acft Traffic Events	Total Traffic Events	Total Traffic Operations
Day	301	5521	464	0	6286	6286.0
Night	186	2925	288	0	3399	3399.0

Traffic Bundle References

id	Bundle Name	Event Distribution %	Total Routes	Unmodelable Routes	Failed Routes	Route Success %
222	L	100.0%	173	0	0	100.0%
223	H	100.0%	4	0	0	100.0%
224	S	100.0%	3	0	0	100.0%
225	L	100.0%	0	0	0	0.0%
226	S	100.0%	0	0	0	0.0%
227	H	100.0%	0	0	0	0.0%
228	S	100.0%	3	0	0	100.0%
229	L	100.0%	45	0	0	100.0%

230 H	100.0%	28	0	0	100.0%
231 L	100.0%	363	0	18	95.04%
232 S	100.0%	17	0	7	58.82%
233 H	100.0%	37	0	4	89.19%
234 S	100.0%	4	0	0	100.0%
235 L	100.0%	1	0	0	100.0%
294 dll	100.0%	371	0	0	100.0%
295 WLSTN	100.0%	132	0	0	100.0%
296 BRD DLH	100.0%	109	0	0	100.0%
311 LEINY	100.0%	120	0	0	100.0%
312 HRBEK	100.0%	110	0	2	98.18%
313 GEO_MEDIUM_3	100.0%	10	0	0	100.0%
314 GEO_MEDIUM_4	100.0%	10	0	0	100.0%
315 GEO_MEDIUM_5	100.0%	4	0	0	100.0%
316 GEO_MEDIUM_6	100.0%	8	0	0	100.0%
290 GEO_COARSE_1	100.0%	461	0	0	100.0%
291 GEO_COARSE_2	100.0%	363	0	0	100.0%
297 LEINY	100.0%	33	0	0	100.0%
298 HRBEK	100.0%	16	0	0	100.0%
299 GEO_COARSE_3	100.0%	6	0	0	100.0%
318 WLSTN	100.0%	15	0	0	100.0%
319 BRD DLH	100.0%	9	0	0	100.0%
242 S	100.0%	7	0	0	100.0%
243 L	100.0%	15	0	1	93.33%
244 H	100.0%	1	0	0	100.0%
245 S	100.0%	1	0	0	100.0%
246 S	100.0%	1	0	0	100.0%
247 L	100.0%	2	0	0	100.0%
259 L	100.0%	0	0	0	0.0%
260 H	100.0%	0	0	0	0.0%
261 S	100.0%	0	0	0	0.0%
262 L	100.0%	305	0	6	98.03%
263 S	100.0%	9	0	0	100.0%
264 H	100.0%	8	0	0	100.0%
265 S	100.0%	21	0	0	100.0%
266 L	100.0%	244	0	2	99.18%
267 H	100.0%	40	0	0	100.0%
268 L	100.0%	4	0	0	100.0%
269 H	100.0%	1	0	0	100.0%
270 S	100.0%	1	0	0	100.0%
271					

S	100.0%	1	0	0	100.0%
272 L	100.0%	569	0	109	80.84%
273 S	100.0%	10	0	0	100.0%
274 H	100.0%	15	0	3	80.0%
275 L	100.0%	388	0	27	93.04%
276 H	100.0%	77	0	2	97.4%
277 S	100.0%	40	0	2	95.0%
278 L	100.0%	427	0	238	44.26%
279 H	100.0%	40	0	17	57.5%
280 S	100.0%	42	0	7	83.33%
281 L	100.0%	3	0	0	100.0%
282 L	100.0%	1	0	0	100.0%
283 S	100.0%	1	0	1	0.0%
285 L	100.0%	3	0	0	100.0%
Overall		4732	0	446	90.57%

Alternative Routes

Traffic Route Bundle Name: AltTrafficRoutes

Traffic Route Bundle Description:

Traffic Routes: 9498

Traffic Events

Time Of Day	Small Acft Traffic Events	Large Acft Traffic Events	Heavy Acft Traffic Events	Unknown Acft Traffic Events	Total Traffic Events	Total Traffic Operations
Day	287	5438	447	0	6172	5921.9
Night	183	2863	280	0	3326	3209.4

Traffic Bundle References

id	Bundle Name	Event Distribution %	Total Routes	Unmodelable Routes	Failed Routes	Route Success %
222	L	100.0%	173	0	0	100.0%
223	H	100.0%	4	0	0	100.0%
224	S	100.0%	3	0	0	100.0%
225	L	100.0%	0	0	0	0.0%
226	S	100.0%	0	0	0	0.0%
227	H	100.0%	0	0	0	0.0%
228	S	100.0%	3	0	0	100.0%
229	L	100.0%	45	0	0	100.0%
230	H	100.0%	28	0	0	100.0%
231	L	100.0%	363	0	18	95.04%
232	S	100.0%	17	0	7	58.82%
233	H	100.0%	37	0	4	89.19%
294	dll	100.0%	371	0	0	100.0%
295	WLSTN	10.0%	132	0	0	100.0%
296	BRD DLH	5.0%	109	0	0	100.0%
312	HRBEK	5.0%	110	0	2	98.18%
313	GEO_MEDIUM_3	100.0%	10	0	0	100.0%
314	GEO_MEDIUM_4	100.0%	10	0	0	100.0%
315	GEO_MEDIUM_5	100.0%	4	0	0	100.0%
316	GEO_MEDIUM_6	100.0%	8	0	0	100.0%
290	GEO_COARSE_1	100.0%	461	0	0	100.0%
291	GEO_COARSE_2	100.0%	363	0	0	100.0%
298	HRBEK	5.0%	16	0	0	100.0%
299	GEO_COARSE_3	100.0%	6	0	0	100.0%
318	WLSTN	5.0%	15	0	0	100.0%
319	BRD DLH	5.0%	9	0	0	100.0%
259	L	100.0%	0	0	0	0.0%
260	H	100.0%	0	0	0	0.0%
261	S	100.0%	0	0	0	0.0%
262	L	100.0%	305	0	6	98.03%
263	S	100.0%	9	0	0	100.0%
264	H	100.0%	8	0	0	100.0%
265	S	100.0%	21	0	0	100.0%
266	L	100.0%	244	0	2	99.18%
267	H	100.0%	40	0	0	100.0%
268	L	100.0%	4	0	0	100.0%
269	H	100.0%	1	0	0	100.0%

270 S	100.0%	1	0	0	100.0%
272 L	100.0%	569	0	109	80.84%
273 S	100.0%	10	0	0	100.0%
274 H	100.0%	15	0	3	80.0%
275 L	100.0%	388	0	27	93.04%
276 H	100.0%	77	0	2	97.4%
277 S	100.0%	40	0	2	95.0%
278 L	100.0%	427	0	238	44.26%
279 H	100.0%	40	0	17	57.5%
280 S	100.0%	42	0	7	83.33%
281 L	100.0%	3	0	0	100.0%
282 L	100.0%	1	0	0	100.0%
283 S	100.0%	1	0	1	0.0%
285 L	100.0%	3	0	0	100.0%
Overall		4546	0	445	90.21%

Grids

Grid Name: Grid 1
Grid Description: None
Grid Type: Quiet Suburb

Results

Baseline Exposure

Name	Type	% 65+ dB	% 65-60 dB	% 60-55 dB	% 55-50 dB	% 50-45 dB	% 45 dB
Grid 1	Quiet Suburb	6.6	6.7	15.1	22.6	23.9	24.8
Overall		6.6	6.7	15.1	22.6	23.9	24.8

Alternative Exposure

Name	Type	% 65+ dB	% 65-60 dB	% 60-55 dB	% 55-50 dB	% 50-45 dB	% 45 dB
Grid 1	Quiet Suburb	6.2	6.6	14.5	23.6	25.6	23.2
Overall		6.2	6.6	14.5	23.6	25.6	23.2

Impact

Name	Type	% Red	% Orange	% Yellow	% NoChange	% Green	% Blue	% Purple
Grid 1	Quiet Suburb	0.0	0.0	1.5	98.4	0.0	0.0	0.0
Overall		0.0	0.0	1.5	98.4	0.0	0.0	0.0

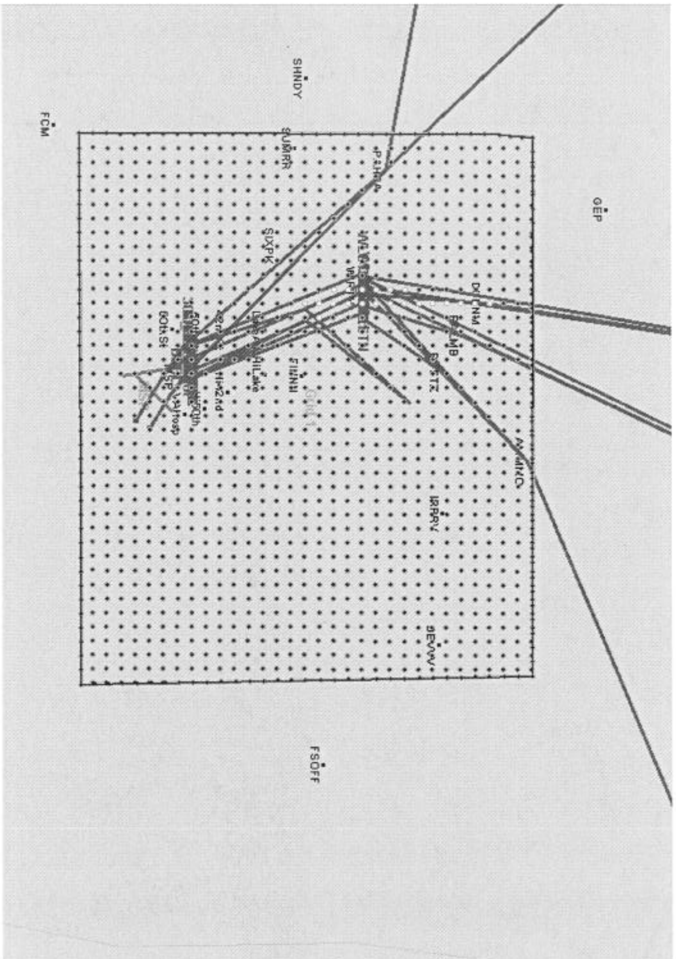
Below is a table defining the criteria for identifying noise changes:

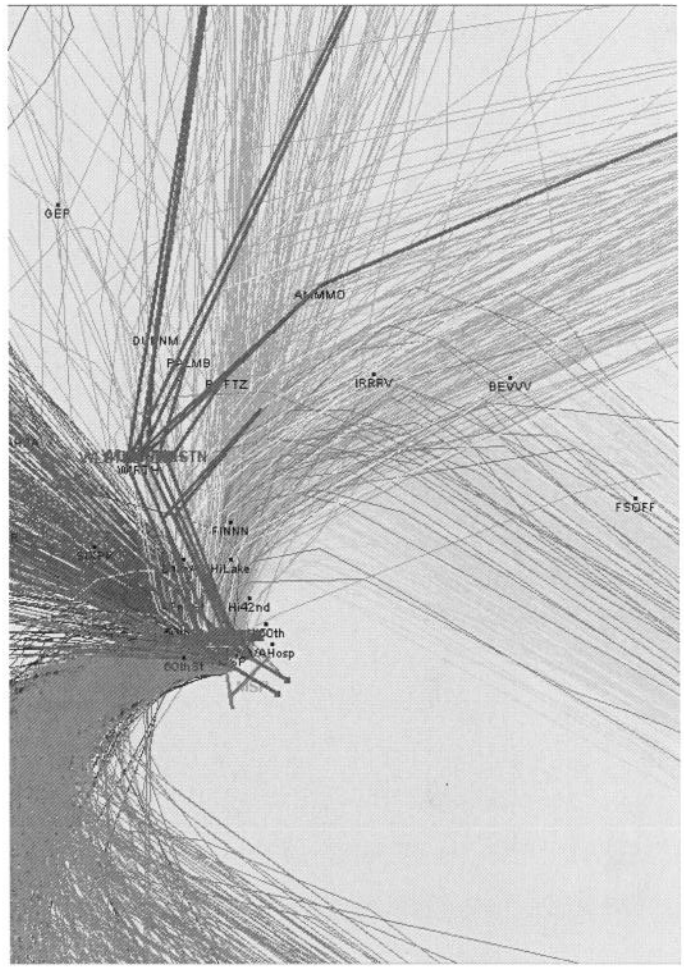
Color	DNL Noise Exposure	Minimum Change in DNL	Change in Noise Exposure Level
Noise Increase			
Yellow	45 to 60 DNL	>= 5.0 DNL Increase	Slight to Moderate Affect
Orange	60 to 65 DNL	>= 3.0 DNL Increase	Slight to Moderate Affect
Red	65 DNL or higher	>= 1.5 DNL Increase	Exceeds Threshold of Significance
Noise Decrease			
Purple	45 to 60 DNL	>= 5.0 DNL Decrease	Slight to Moderately Relieved
Blue	60 to 65 DNL	>= 3.0 DNL Decrease	Slight to Moderately Relieved
Green	65 DNL or higher	>= 1.5 DNL Decrease	Substantially Relieved

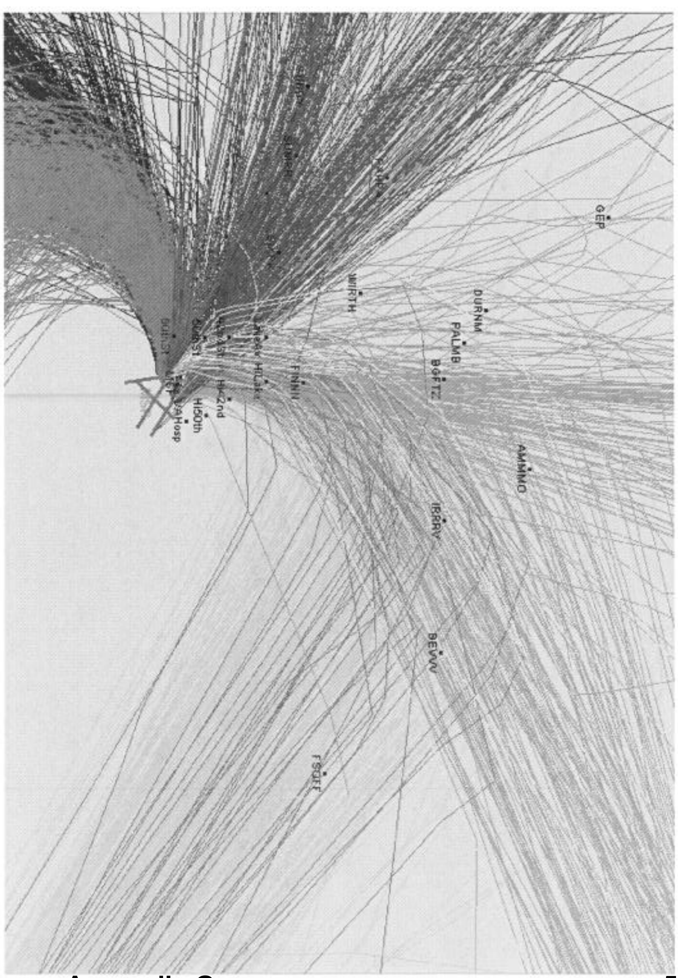
Fuel Burn

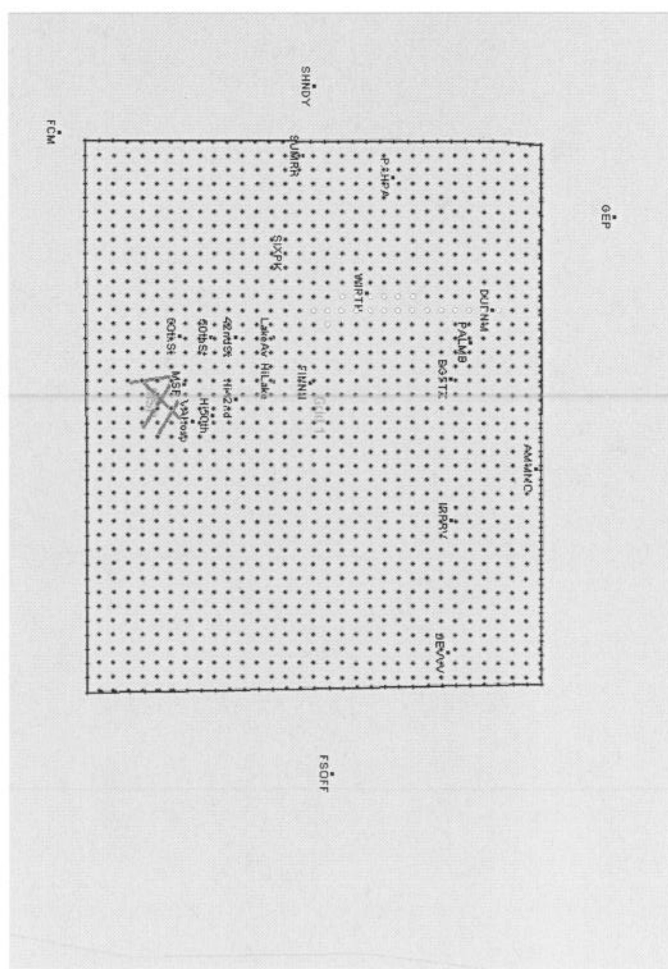
The amount of fuel burn between the alternative and baseline routes decreased by 7.25%

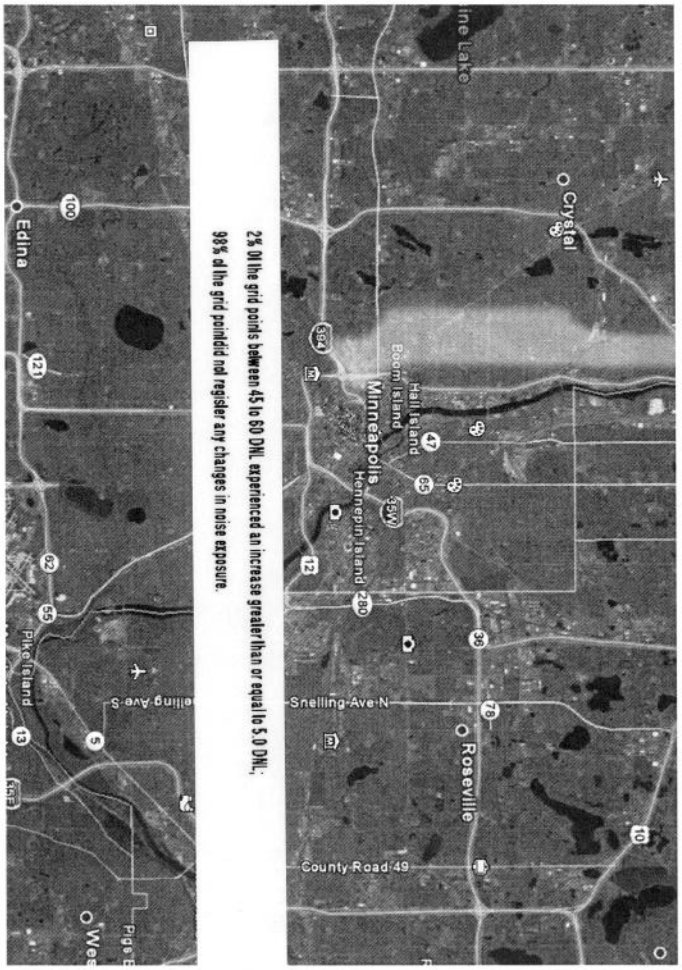
Scenario	Fuel Burn (lbs)
Baseline	2,490,764.5
Alternative	2,310,306


FCM
SHNDY
GEP
FSOFF
AMMMO
IRRRV
BEVVV


GEP
AMMMO
DURNM
PALMB
IRRRV
BEVVV
FSOFF
FINNN
H/Lake
Hi42nd
60th St


GEP
DURNM
PALMB
AMMMO
IRRRV
BEVVV
FSOFF


FCM
SHNDY
GEP
DURNM
AMMMO
IRRRV
BEVVV
FSOFF


2% Of the grid points between 45 to 60 DNL experienced an increase greater than or equal to 5.0 DNL;
98% of the grid points did not register any changes in noise exposure.
Edina
Crystal
Minneapolis
Boom Island
Hall Island
Hennepin Island
Roseville
Pike Island
Snelling Ave N
County Road 49

MSP ATCT/TRACON VISITOR LOG

Date	Name	ID NO	Company/ Phone NO	Point of Contact Purpose of Visit	Time In	Time Out	Badge NO
6/20	Jeff [illegible]		WX 1	CWO	1046p	7am	FAA
6/21	Craig Berget		" "	" "	0647		FAA
6/21	Kandice Krull		FAA	Carl - Mtg	1115		
6/21	Erica Prosser		City of Mpls	Carl	12:30	1:30	272542
6/21	Vernell Thomas		city of mpls	Carl	12:30	1:30	206489
6/21	John Quincy		"	Carl	12:30	1:30	206480
6/21	John Dybvig		"	Carl	12:30	1:30	272513
6/21	[illegible]		11	Carl	12:3		MAC
6/21	Jeff Baumgartner		WxOps	CWO	1432		FAA
6/21	Nan Terry		FAA CSA		1000	1445	FAA

MSP ATCT Form 1600-3 (8/06) supercedes previous form
MSP TO Form 1600-3 (8/06) supercedes previous form

METROPOLITAN AIRPORTS COMMISSION

Minneapolis-Saint Paul International Airport
6040 - 28th Avenue South • Minneapolis, MN 55450-2799
Phone (612) 726-8100

April 23, 2012

Minneapolis Airport FAA ATCT
Attn: Mr. Carl Rydeen
Assistant Air Traffic Manager
6311 34th Avenue South
Minneapolis, MN 55450

Dear Mr. Rydeen,

As I know you are aware, there has been ongoing concern in the City of Minneapolis related to departure operations over areas located under the 360-degree departure heading off Runway 30R. Specifically, residents from the Ericsson, Keewaydin and Standish neighborhoods have been expressing continuing concerns about an increase in the concentration of departing aircraft over their neighborhoods.

On this topic, I would like to begin by thanking you. Your willingness to work collaboratively with the communities, airlines and the airport through the Noise Oversight Committee (NOC) continues to be a critical element in our ability to effectively address aircraft noise at Minneapolis-St. Paul International Airport (MSP). Your work on this issue in the form of evaluating existing operations and formulating options for community and NOC consideration is an extraordinary example of effective collaboration that considers all stakeholders.

Based on the options provided by the FAA to Minneapolis elected officials, they reached consensus with their constituents on a recommended path forward. At the March 21, 2012 NOC meeting the Committee unanimously supported the City's position by passing the following action:

"Request that the MAC Planning and Environment Committee endorse these action items:

- *Move approximately 32 daily departure operations from a 360° heading to a 340° heading for those operations from Runway 30R going to destinations such as Duluth, International Falls, Winnipeg, etc.*
- *Implement the use of three divergent headings (360°, 340°, 320°) for north bound departure operations off Runway 30R.*
- *Continue adherence to the Runway Use System (RUS) at all times when traffic levels and prevailing winds allow.*

Further request that MAC send a letter to the FAA requesting implementation of the above operational measures as soon as is possible.

Additionally, request that MAC staff conduct an analysis of NADP on 30R and 30L and report the effects of each NADP procedure at the next NOC meeting in May."

On April 16, 2012 the MAC Full Commission took action in support of the NOC request. As such, I am requesting that the FAA take the necessary actions to implement the above operational measures at MSP as soon as is possible.

Again, thank you for your continued willingness to help address aircraft noise concerns at MSP and for your consideration of this important request.

Sincerely,

Daniel Boivin
Chairman
Metropolitan Airports Commission

Attachment 6:

AEE Response to Noise Abatement Departure Profiles (NADPs)

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Environment and Energy

800 Independence Ave., S.W.
Washington, D.C. 20591

Date: September 13, 2012

Lindsay Guttilla
Regional Environmental Specialist
Great Lakes Region
Federal Aviation Administration

Dear Lindsay,

The Office of Environment and Energy (AEE) has received the memorandum dated July 12, 2012 requesting approval of the use of custom Integrated Noise Model (INM) aircraft profiles to model Noise Abatement Departure Profiles (NADPs). This request is to evaluate noise in support of an Environmental Assessment (EA) at the Minneapolis-St.Paul International Airport (MSP).

The Metropolitan Airports Commission (MAC) prepared the request following the guidelines in Appendix B if the INM version 7.0 User's Guide. AEE reviewed the request and asked that additional information be provided. Specifically, AEE asked that the e-mail communication from Delta Airlines confirming the reasonableness of the INM custom profiles be included in the request. HNTB, assisting in the preparation of the EA, provided the additional information via e-mail on September 12, 2012. Based on the information provided in the original request and the additional confirmation from Delta, AEE approves the use of the custom profiles in modeling the NADPs at MSP.

Please understand that this approval is limited to this particular project for MSP. Any additional projects or non-standard INM input at MSP or any other site will require separate approval.

Sincerely,

Rebecca Cointin, Manager
AEE/Noise Division

Cc: Jim Byers, APP-400