

Chapter 6. Land Use Compatibility



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Chapter 6 Land Use Compatibility

6.1 INTRODUCTION

Land use compatibility for Airports and their surrounding environments is a significant component of the planning process. Successfully developing airports requires coordination among airport operators, state, city, and local governments to ensure any future development considers the needs of the surrounding populations.

Airport operators and municipalities are both responsible for the ongoing development of public assets that serve the greater public interest. City governments ensure the responsible development and enhancement of city infrastructure in the same way that airport operators oversee the development and enhancement of our nation's airport system. This coordination among airport operators and local governments is essential to ensure that any future project considers the land use consequences of decisions made regarding airport development.

This chapter evaluates the land use implications of the operation and development of the 2040 Long-Term Plan (LTP).

6.2 LAND USE COMPATIBILITY

In 14 C.F.R. Part 150, the Federal Aviation Administration (FAA) has outlined criteria for land use compatibility, determining permissible land uses around airports through the assessment of noise impacts, measured in terms of Day-Night Sound Level (DNL). For airports located in the Minneapolis-Saint Paul Metropolitan Area, additional criteria also must be evaluated in relation to noise exposure as established by the Metropolitan Council's Transportation Policy Plan (TPP).

6.2.1 FAA Land Use Compatibility Guidelines

Compatible land use under federal guidelines use aviation noise as a factor for allowable development near an airport. Independent efforts by the FAA, U.S. Department of Housing and Urban Development, U.S. Air Force, U.S. Navy, U.S. Environmental Protection Agency, and other Federal agencies to develop compatible land use criteria were melded into a single effort by the Federal Interagency Committee on Urban Noise (FICUN) in 1979. The combination of criteria were codified in the FICUN guidelines document in 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 the 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.¹

In 1985 the FAA adopted 14 C.F.R. Part 150 outlining land use compatibility guidelines around airports. **Table 6-1** provides the land use compatibility guidelines as established by the FAA.

¹ Federal Interagency Committee On Noise (FICUN), "Federal Agency Review of Selected Airport Noise Analysis Issues," (1992), pp. 2-6 to 2-7.

According to FAA standards, areas with noise levels less than 65 DNL are considered compatible with residential development.

6.2.2 Metropolitan Council Land Use Compatibility Guidelines

The Metropolitan Council has developed a set of land-use planning guidelines for responsible community development in the Minneapolis-Saint Paul Metropolitan Area. The intent is to provide city governments with a comprehensive resource for 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 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 the land use designation; zoning must be consistent with that designation. Thus, the communities had to re-evaluate designated use, permitted uses within the designation, zoning classifications, and adequacy.

Table 6-1: FAA Aircraft Noise and Land Use Compatibility Guidelines

Land Use	DNL Contour Interval (dB)					
	Less than 65	65 69	70 74	75 79	80 84	Greater than 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N (1)	N (1)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N (1)	N (1)	N (1)	N	N
Public use						
Schools	Y	N (1)	N (1)	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 (2)	Y (3)	Y (4)	Y (4)
Parking	Y	Y	Y (2)	Y (3)	Y (4)	Y
Commercial use						
Offices, business, and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware, and farm equipment	Y	Y	Y (2)	Y (3)	Y (4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y (2)	Y (3)	Y (4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and production						
Manufacturing (general)	Y	Y	Y (2)	Y (3)	Y (4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y (6)	Y (7)	Y (8)	Y (8)	Y (8)
Livestock farming and breeding	Y	Y (6)	Y (7)	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 (5)	Y (5)	N	N	N
Outdoor music shells and 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	Y	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

KEY:

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.

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:

See following page for Notes.

NOTES: 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 locally 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.

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (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.
- (2) 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.
- (3) 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.
- (4) 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.
- (5) Land use compatible provided special sound reinforcement systems are installed.
- (6) Residential buildings require an NLR of 25.
- (7) Residential buildings require an NLR of 30.
- (8) Residential buildings not permitted.

In 2004 the Metropolitan Council incorporated its Aviation Policy Plan into the Transportation Policy Plan (TPP) of the Metropolitan Development Guide. It was updated in January 2009. Land use compatibility guidelines for all metropolitan system airports are included in the TPP. The 2040 TPP was adopted in 2015 and amended in 2020. 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.²
- **Zone 2** – Noise impacts are generally sustained, especially close to the ends of runways. 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.³
- **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

² Metropolitan Council 2040 Transportation Policy Plan – 2020 Update, Appendix L, 2020.

³ Ibid.

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.⁴

- **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.⁵
- **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 DNL 55 is optional at those reliever airports with noise policy areas outside the Metropolitan Urban Service Area (MUSA).⁶

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 6-2**.

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 (2007 – 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 on page 20:

“The overall noise reduction level (NRL) required within a given noise zone can be determined by subtracting the desired level (45 dBA) from the highest noise level within that contour. For example, in Noise Zone 4 (60 to 64 dBA), the required reduction is calculated as $64 - 45 = 19$ dBA.⁷

⁴ Metropolitan Council 2040 Transportation Policy Plan – 2020 Update, Appendix L, 2020.

⁵ Ibid

⁶ Ibid

⁷ The Metropolitan Council's NRL calculation approach is consistent with the FAA's calculations in 14 C.F.R. Part 150.

Table 6-2: Metropolitan Council Land Use Compatibility Guidelines for Aircraft Noise

Type of Development	Noise Exposure Zones									
	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	
Multiples/apartment with shared entrance	INCO	INCO	COND	PROV		COND	COND	PROV	PROV	
Mobile home	INCO	INCO	INCO	COND		COND	COND	COND	COND	
Educational, medical, school, churches, hospitals, and nursing homes	INCO	INCO	INCO	COND		COND	COND	COND	PROV	
Cultural, entertainment, and recreation										
Indoor	COND	COND	COND	PROV		COND	COND	COND	PROV	
Outdoor	COND	COND	COND	COND		COND	COND	COND	COMP	
Office, commercial, retail, and services	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, and utilities	PROV	COMP	COMP	COMP		PROV	COMP	COMP	COMP	
Agriculture, land/water area, and resource extraction	COMP	COMP	COMP	COMP		COMP	COMP	COMP	COMP	

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, uses must meet certain structural performance standards to be acceptable according to MS 473.192 (Metropolitan Area Noise Attenuation Act). Structures built after December 1983 shall be acoustically constructed so as to achieve the interior sound levels described in Metropolitan Council's 2040 Transportation Policy Plan, Appendix L, Table L-4. Each local governmental unit having land within the airport noise zones is responsible for implementing and enforcing the structure 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 factors described in Metropolitan Council's 2040 Transportation Policy Plan, Appendix L, Table L-3.

INCO/Incompatible – uses that are not acceptable even if acoustical treatment were incorporated into the structure and outside uses restricted.

6.3 RUNWAY SAFETY ZONING CONSIDERATIONS

At the Federal level, the FAA is the agency primarily responsible for land use compatibility around airports. Although the FAA does not play a direct role in the zoning and land use planning practices around United States airports, it provides critical land use planning guidance, technical assistance, and funding to airports. In this capacity, the FAA issues a variety of regulations and guidance documents under federal law that affect land use planning around airports.

FAA land use guidance focuses on two areas: (1) runway protection zones; and (2) airspace protection.

6.3.1 Federal Runway Protection Zones

Runway Protection Zones (RPZs) are defined in FAA Advisory Circular 150/5300-13, *Airport Design*. RPZs are trapezoid shapes centered on the approximate extended runway centerline radiating from the end of a runway. The dimensions of an RPZ are a function of the type of aircraft using the runway and approach visibility minimums associated with the runway end. The intent of RPZs is to provide safety for people and property on the ground in the vicinity of runway ends at airports. The FAA accomplishes this goal through land use controls in RPZs designed to maintain areas near the ends of airport runways that are free of incompatible objects and activities.

6.3.2 Federal Airspace Protection

Federal Aviation Regulation Part 77, *Objects Affecting Navigable Airspace*, establishes standards for determining obstructions to navigable airspace and the effects of such obstructions on the safe and efficient use of that airspace.

The height limitations associated with Part 77 are defined in terms of imaginary surfaces in the airspace surrounding an airport. These surfaces extend from about two to three miles from the airport, except for runways with precision instrument approaches, in which case the surfaces extend approximately 9.5 miles from the runway end. The various imaginary surfaces include the primary surface, transitional surface, horizontal surface, conical surface, and the approach surface.

Under Part 77, the FAA has established a process for reviewing and evaluating proposed structures in the vicinity of airports. FAA Advisory Circular 7460 establishes an airspace review process and provides information to individuals wishing to erect or alter structures that may affect navigable airspace around an airport. In administering 14 CFR Part 77, the FAA's main objective is to ensure the safe and efficient use of navigable airspace around airports.

The FAA has established five different thresholds for evaluating whether a structure may affect navigable airspace around an airport. If any one of these thresholds is reached, the FAA requests that an individual wishing to erect or alter a structure seek its approval before commencing construction. One of the FAA thresholds applies if a structure is within "20,000 feet of an airport or seaplane base with at least one runway more than 3,200 feet in length and the object would exceed a slope of 100:1 horizontally (100 feet horizontally for each 1 foot vertically) from the nearest point of the nearest runway."

After receiving a request for approval, the FAA will typically issue one of the following three determinations:

- **Determination of No Hazard to Air Navigation** – “The subject construction does not exceed obstruction standards and marking/lighting is not required.”
- **Conditional Determination** – “The proposed construction/alteration would be acceptable contingent upon implementing mitigating measures (marking and lighting etc.).”
- **Objectionable** – “The proposed construction/alteration is determined to be a hazard and is thus objectionable. The reasons for this determination are outlines to the proponent.”

By establishing threshold criteria and then requiring a detailed airspace hazard analysis, the FAA process provides a safety buffer. In certain circumstances, the FAA’s detailed airspace hazard analysis results in FAA approval for developments near airports that may be in excess of the general height limitations set forth in 14 CFR Part 77.

6.3.3 State Model Zoning Ordinance

On January 1, 1946, the State of Minnesota enacted its first model airport zoning ordinance. By 1958 the State designated Safety Zones A, B and C as part of the model airport zoning standard. In 1973, local protective airport zoning was made a condition for receiving federal and state funds. Minnesota is one of the few states that has land use safety controls for airports that go beyond the requirements of FAA regulations.

6.3.3.1 State Runway Safety Zones

The State Safety Zone A is a trapezoidal shape at the end of a runway, beginning at the edge of the primary surface and flaring outward to approximately 2/3 of the runway length. State Safety Zone B is a trapezoidal shape, with the same flare as Zone A, extending outward from the end of Zone A to approximately 1/3 of the runway length. The extent of State Safety Zone C is coincidental with the extent of the horizontal airspace surface.

Under Minnesota law, Zone A must not contain buildings, temporary structures, exposed transmission lines, or other similar above-ground land use structural hazards. Land uses in Zone A are restricted to those uses that will not create, attract, or bring together an assembly of persons. Permitted uses in Zone A include, but are not limited to, agriculture (seasonal crops), horticulture, animal husbandry, raising of livestock, wildlife habitat, light outdoor recreation (non-spectator), cemeteries, and automobile parking.

Zone B uses are restricted as follows:

- Each use must be on a site whose area is not less than 3 acres.
- Each use must not create, attract, or bring together a site population that would exceed 15 times that of the site acreage.
- Each site must have no more than one building plot upon which any number of structures may be erected.
- A building plot must be a single, uniform, and non-contrived area, whose shape is uncomplicated and whose area must not exceed minimum ratios with respect to the total site area.

The following uses are specifically prohibited in Zone B:

- Churches, hospitals, schools, theaters, stadiums, hotels, motels, trailer courts, campgrounds, and other places of frequent public or semi-public assembly.

In Zone C, no use may be made of any land that creates or causes interference with the operations of radio or electronic facilities on the airport or with radio or electronic communications between the airport and aircraft. In addition, Zone C prohibits land uses that make it difficult for pilots to distinguish between airport lights and other lights, result in glare in the eyes of pilots using the airport, impair visibility in the vicinity of the airport, or otherwise endanger the landing, taking off, or maneuvering of aircraft. All structure heights in Zone C are limited to 150 feet above the primary surface at the airport.

6.3.3.2 State Model Zoning Ordinance Airspace Protection

The State Model Zoning Ordinance height restrictions are predicated directly on the FAA's Part 77 imaginary airspace surfaces.

6.4 MSP ZONING ORDINANCE

Minnesota law establishes that airports in the state must adopt airport zoning ordinances. To do this, the statutes spell out the formation of a Joint Airport Board comprised of two members from each jurisdiction with land use control in the areas affected by airport zoning, as well as the airport proprietor.

In 2003, the MSP Joint Airport Zoning Board recommended a revised MSP zoning ordinance in light of the construction of Runway 17-35. An important part of this process was balancing the land use controls needed to provide safety while at the same time considering the social and economic impacts related to prospective land use controls. Minn. Stat. §360.066, subd. 1 is particularly instructive when addressing the question of zoning around complex urbanized airports such as MSP. The statute also addresses the concept of "reasonableness" when balancing the variables to be considered in the zoning process. Specifically, Minn. Stat. §360.066, subd. 1 states:

"Reasonableness Standards of the commissioner defining airport hazard areas and the categories of uses permitted and airport zoning regulations adopted under sections 360.011 to 360.076, shall be reasonable, and none shall impose a requirement or restriction which is not reasonably necessary to effectuate the purposes of sections 360.011 to 360.076. In determining what minimum airport zoning regulations may be adopted, the commissioner and a local airport zoning authority shall consider, among other things, the character of the flying operations expected to be conducted at the airport, the location of the airport, the nature of the terrain within the airport hazard area, the existing land uses and character of the neighborhood around the airport, the uses to which the property to be zoned are planned and adaptable, and the social and economic costs of restricting land uses versus the benefits derived from a strict application of the standards of the commissioner."

Consistent with the guidance provided in Minn. Stat. §360.066, subd. 1, the MSP Joint Airport Zoning Board focused its discussion on the land use controls that were necessary to ensure a

reasonable degree of safety around MSP. Based on the substantial property development and/or structural modification restrictions that would be placed on the largely urbanized and developed areas around the airport, the MSP Joint Airport Zoning Board turned its focus to safety. The MSP Joint Airport Zoning Board directed staff to conduct a risk analysis to provide the Board with further clarification on the question of zoning requirements necessary to ensure a “reasonable standard of safety.”

In short, the analysis found that within State Safety Zones A and B, but outside the federal RPZ, the accident probability at MSP was less than the FAA standard of one accident in 10 million operations. Additionally, based on the accident rate calculations, the MSP Joint Airport Zoning Board determined that the likelihood of a fatality from an accident in State Safety Zones A and B outside the RPZ is extremely remote or extremely improbable, based on FAA criteria.

In addition to the risk analysis, the MSP Joint Airport Zoning Board focused on addressing the economic considerations as the statute requires. The Board relied on the analyses and information that were provided by the respective cities with jurisdiction over the land uses and concluded that there were significant financial costs associated with implementation of the State Model Zoning Ordinance.

In summary, based on the findings of the Safety Study and the Economic Analysis, the Board adopted the following changes to the State Model Zoning Ordinance:

- **Safety Zone A** – is co-terminus with the Federal Runway Protection Zone (RPZ).
- **Safety Zone B** – use restrictions do not include site acre/structure limitations and site-area-to-building-plot-area ratios and population criteria.
- **Exemption for Established Residential Neighborhoods** – allows for the improvement, expansion, and development of new residential uses in and adjacent to Established Residential Neighborhoods in Safety Zone B.

In 2004 the Commissioner of Transportation for the State of Minnesota approved the MSP Joint Airport Zoning Board’s recommended ordinance.

6.5 LAND USE COMPATIBILITY ANALYSIS

MSP is in Hennepin County. The airport is bordered to the northwest by the City of Minneapolis, to the west by the City of Richfield, to the south by the City of Bloomington, to the southeast by the cities of Eagan and Mendota Heights, and to the north by the City of St. Paul. The airport is bordered by residential land uses to the north, northwest, and west. A combination of mixed-use industrial, commercial, and single-family residential exists to the south and southeast of the airport.

The following sections detail land use considerations in the context of existing and planned land uses around MSP focusing on airport noise and runway safety zones.

6.5.1 Existing Condition Land Use Compatibility

In general, the area around the airport is primarily residential to the north, northwest, and east and to the south and southeast a combination of commercial/industrial and park/open space land uses. The Runway Protection Zones (RPZ) and State Safety Zones for MSP are shown on **Exhibit 6-1**.

6.5.1.1 Land Use Compatibility and Airport Noise Considerations

As detailed in Chapter 5, Section 5.3.8, the 2018 Base Year noise contours contain 638 acres within the 75 DNL contour, which is entirely contained on airport property. The 70 DNL contour contains approximately 1,588 acres. The 65 DNL contour contains approximately 4,444 acres. The 60 DNL contour contains approximately 11,323 acres.

Exhibit 6-2 provides the 2018 Base Year 60 DNL and greater noise contours around MSP with existing land use data provided by the Metropolitan Council.

6.5.1.2 Land Use Compatibility and Existing Runway Protection/Safety Zones

The existing RPZs and State Safety Zones A and B at MSP are depicted in **Exhibit 6-3** with the existing land uses around the airport.

Each RPZ/State Safety Zone A at MSP Contains 78.9 acres. **Table 6-3** provides existing land use acreage. The airport RPZ/State Safety Zone A areas do not contain any residential structures.

Table 6-3: RPZ/State Zone A Land Use Acreages

Land Use Acreage	RWY 4	RWY 17	RWY 22	RWY 35	RWY 12L	RWY 12R	RWY 30L	RWY 30R
Runway Protection Zone / State Zone A (Acres)	78.9	78.9	78.9	78.9	78.9	78.9	78.9	78.9
Airport	76.5	66.5	0.9	58.2	70.5	74.4	19.8	6.9
Agricultural								
Industrial and utility			27.4					
Institutional								
Major highway	2.1	3.5	41.2	16.7	6.9		10.7	8.9
Multi-family residential					0.1			
Open water		9.0				4.5	8.2	45.9
Park, recreational, or preserve			3.7		1.4		40.1	17.2
Railway			5.6					
Retail and other commercial	0.2			2.4				
Single family attached								
Undeveloped				1.5				

Notes: Totals may not add due to rounding.

Source: Minnesota Geospatial Commons, January 2023 (Land Uses and Parcels); Metropolitan Airports Commission, April 2023 (State Safety Zones and Analysis)

Each State Safety Zone B at MSP contains 250.3 acres. **Table 6-4** provides existing land use acreages and a count of residential structures encompassed by each State Safety Zone B.

Table 6-4: State Zone B Land Use Acreages

Land Use Acreage	RWY 4	RWY 17	RWY 22	RWY 35	RWY 12L	RWY 12R	RWY 30L	RWY 30R
State Safety Zone B (Acres)	250.3	250.3	250.3	250.3	250.3	250.3	250.3	250.3
Airport	8.3	16.3		2.6	19.0	77.0		
Agricultural				55.8				
Farmstead				3.2				
Industrial and utility	9.0			30.3		0.1		30.8
Institutional	2.2	1.4	2.2		5.0			3.3
Major highway	52.6	27.8	5.9		21.6	49.2	4.6	0.3
Mixed-use industrial	17.7							
Mixed-use residential			0.5					
Multi-family	17.5		2.8					
Office	14.8			11.9				14.6
Open water		75.0	16.2	4.2	20.2	18.0	137.6	92.4
Park, recreational, or preserve	10.4	60.3	127.9	34.9	44.5	26.5	108.1	108.9
Railway			6.4	12.4				
Retail and other commercial	54.4	1.6		51.7	0.1	0.1		
Single family attached	28.3	3.5	2.5		1.9	3.9		
Single family detached	30.9	63.9	80.4		137.9	75.3		
Undeveloped	4.1	0.6	5.4	43.3	0.2	0.2		
<i>Count of single-family structures</i>	<i>116</i>	<i>316</i>	<i>324</i>	<i>1</i>	<i>751</i>	<i>365</i>		
<i>Count of multi-family structures</i>	<i>46</i>		<i>11</i>					

Notes: Totals may not add due to rounding.

Source: Minnesota Geospatial Commons, January 2023 (Land Uses and Parcels); Metropolitan Airports Commission, April 2023 (State Safety Zones and Analysis)

6.5.2 2040 Preferred Alternative Land Use Compatibility

The preferred development alternative at MSP maintains the existing runway infrastructure. The anticipated increase in overall operations and nighttime flights results in larger noise contours around MSP.

6.5.2.1 2040 Baseline Forecast Land Use Compatibility and Airport Noise Considerations

As detailed in Chapter 5, Section 5.3.9, the 2040 Baseline Forecast noise contours contain 826 acres within the 75 DNL contour, which is entirely contained on airport property. The 70 DNL contour contains approximately 2,212 acres. The 65 DNL contour contains approximately 5,933 acres. The 60 DNL contour contains approximately 15,775 acres.

Exhibit 6-4 provides the 2040 Baseline Forecast noise contours around MSP with existing land use data provided by the Metropolitan Council.

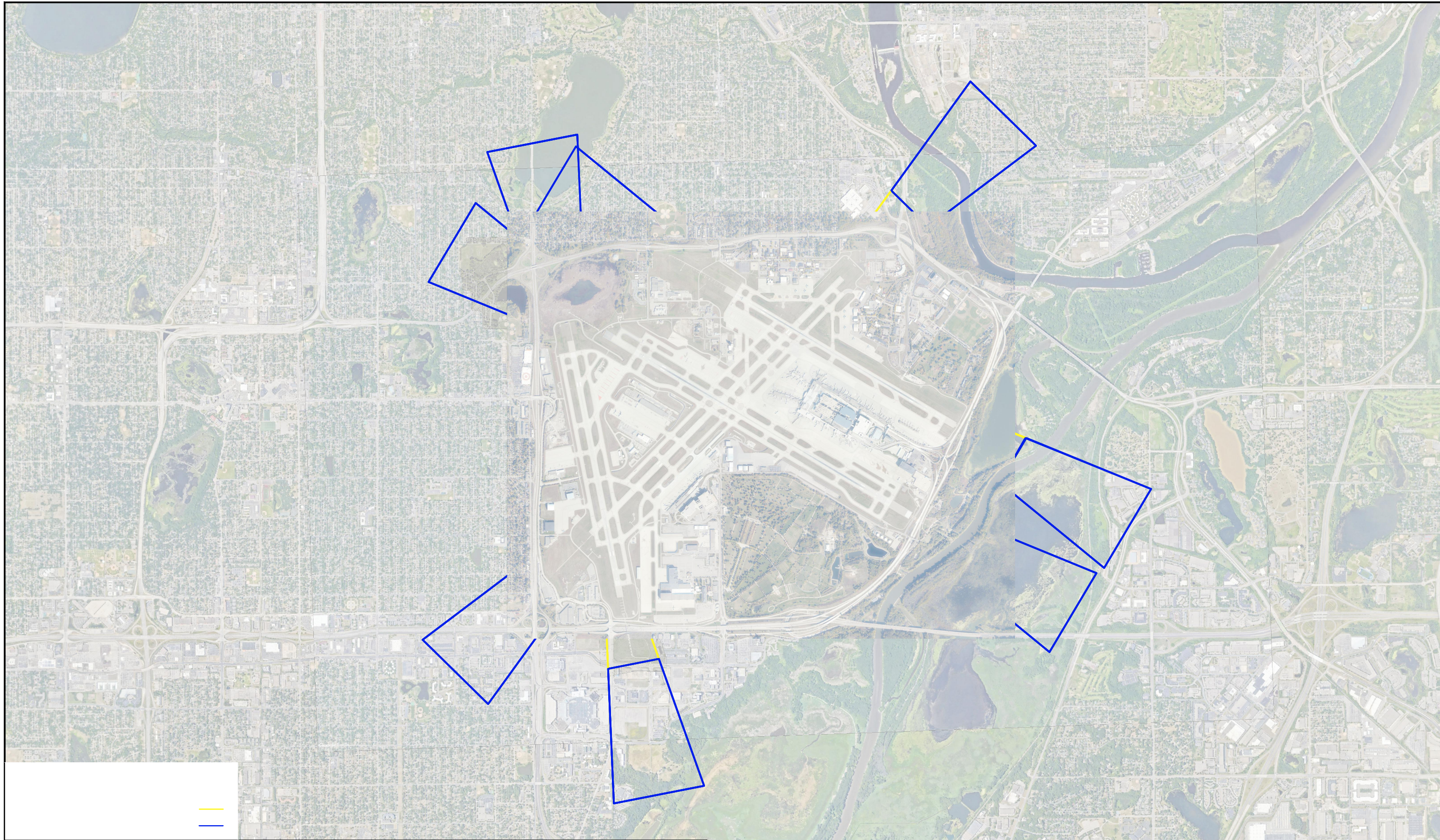
6.5.2.2 2040 Baseline Forecast Land Use Compatibility and Runway Protection/Safety Zones

The 2040 Baseline Forecast RPZs and State Safety Zones A and B are the same as the 2018 Base Year RPZs and State Safety Zones, as depicted in **Exhibit 6-3**.

Additional analysis was conducted relative to the planned land uses around MSP as provided by the Metropolitan Council. **Exhibit 6-5** provides the RPZ and State Safety Zones A and B with planned land uses.

Proposed changes occur in State Safety Zone B off Runways 4, 12L, 12R and 17 where single-family detached homes become multi-optional development. Additionally, undeveloped land in Runway 35 State Safety Zone B becomes commercial and multi-optional development and undeveloped land in Runway 30R State Safety Zone B changes to industrial land use.

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SOURCE: TDKA, 2023 (State Zones); Google Earth, July 2022 (Aerial Imagery); Ricondo & Associates, Inc., April 2023.

MSP



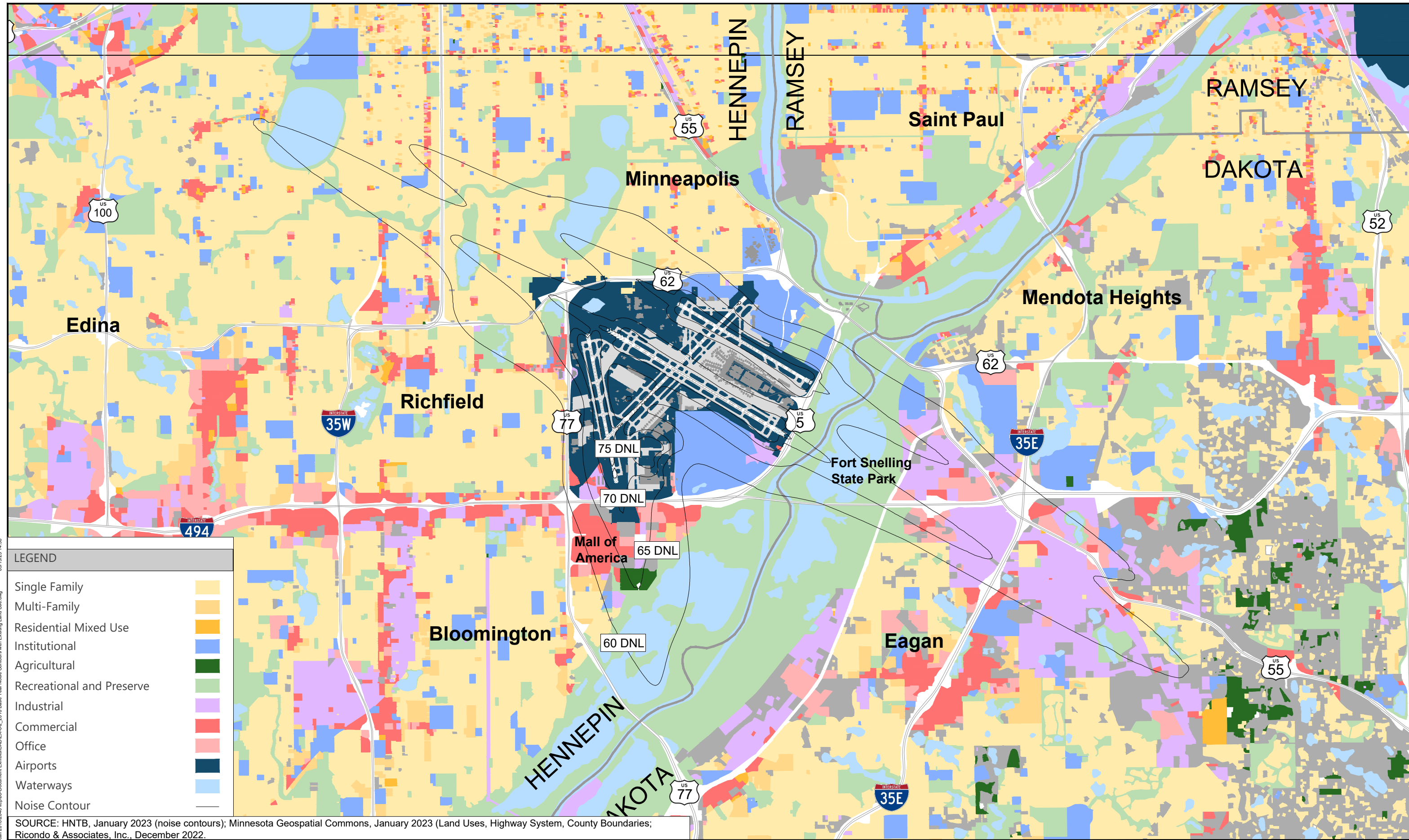
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2040 LONG-TERM PLAN



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MARCH 2023

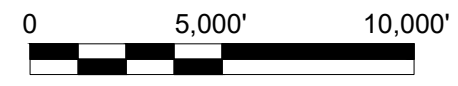
EXHIBIT 6-1
RPZs and State Safety Zones



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2040 LONG-TERM PLAN

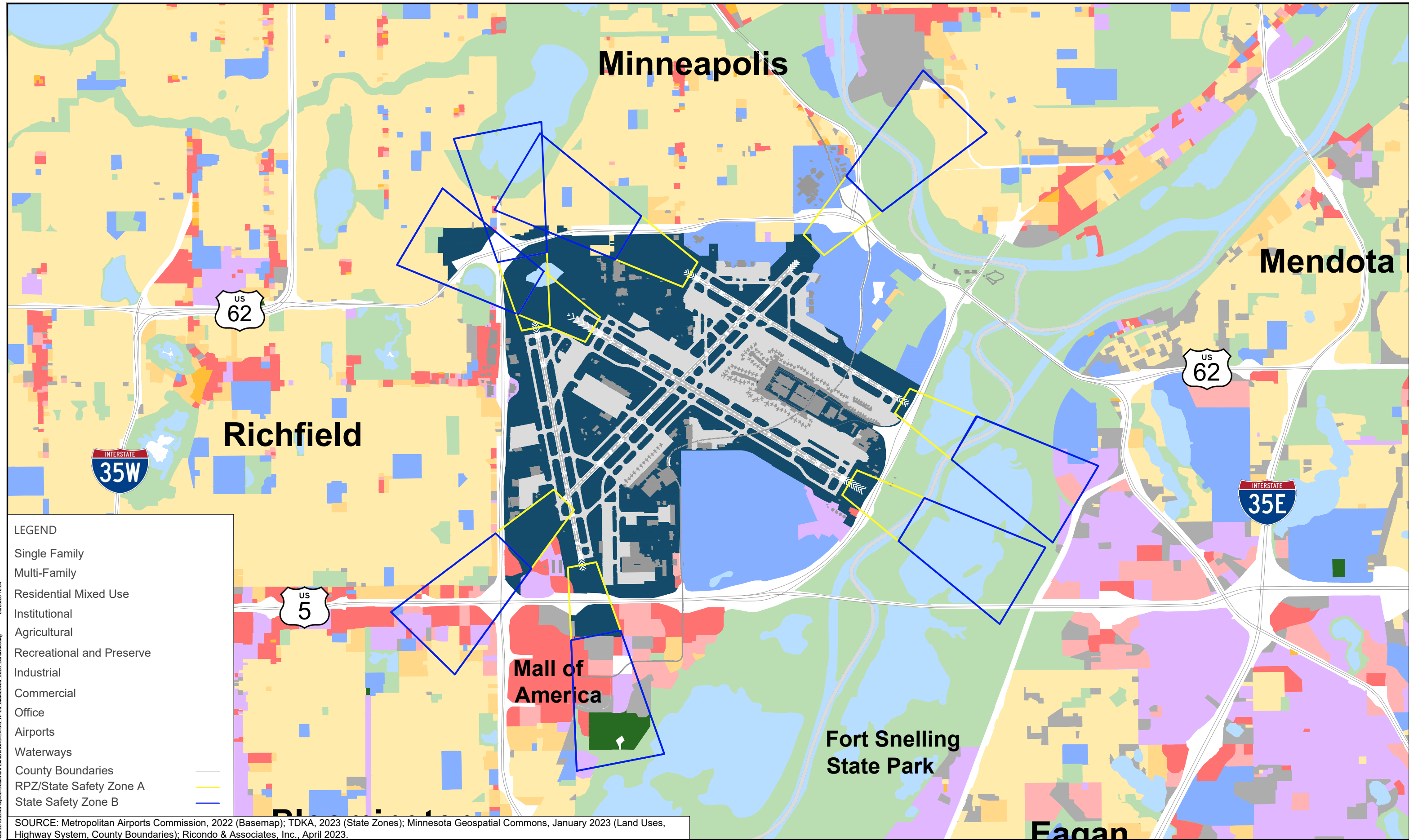


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EXHIBIT 6-2

2018 Base Year Noise Contours with Existing Land Use

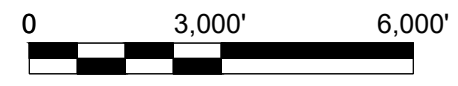


- LEGEND
- Single Family
 - Multi-Family
 - Residential Mixed Use
 - Institutional
 - Agricultural
 - Recreational and Preserve
 - Industrial
 - Commercial
 - Office
 - Airports
 - Waterways
 - County Boundaries
 - RPZ/State Safety Zone A
 - State Safety Zone B

SOURCE: Metropolitan Airports Commission, 2022 (Basemap); TDKA, 2023 (State Zones); Minnesota Geospatial Commons, January 2023 (Land Uses, Highway System, County Boundaries); Ricondo & Associates, Inc., April 2023.



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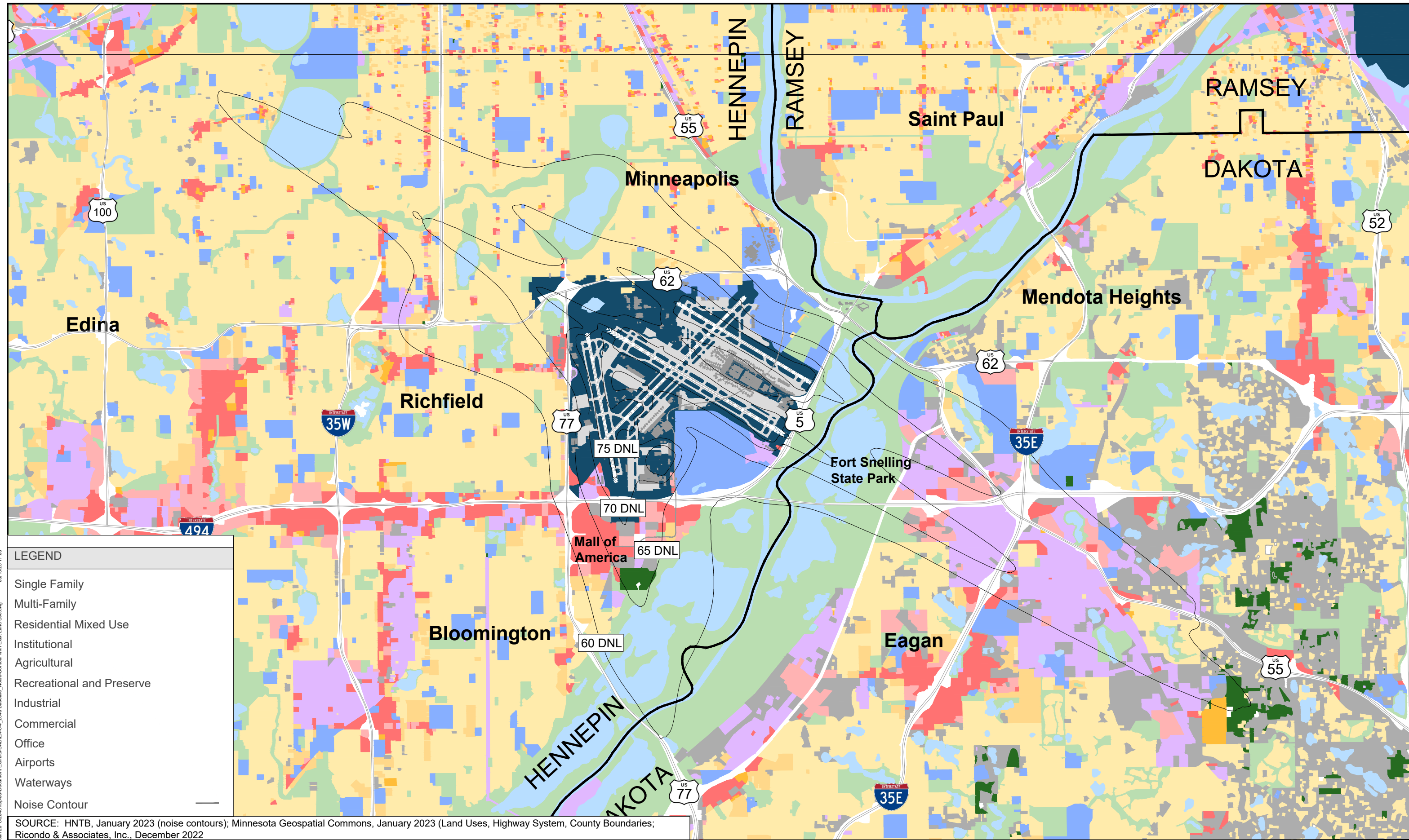
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EXHIBIT 6-3

RPZs and State Safety Zones with Existing Land Use

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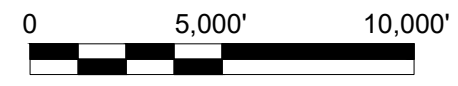
LEGEND

- Single Family
- Multi-Family
- Residential Mixed Use
- Institutional
- Agricultural
- Recreational and Preserve
- Industrial
- Commercial
- Office
- Airports
- Waterways
- Noise Contour

SOURCE: HNTB, January 2023 (noise contours); Minnesota Geospatial Commons, January 2023 (Land Uses, Highway System, County Boundaries); Ricondo & Associates, Inc., December 2022



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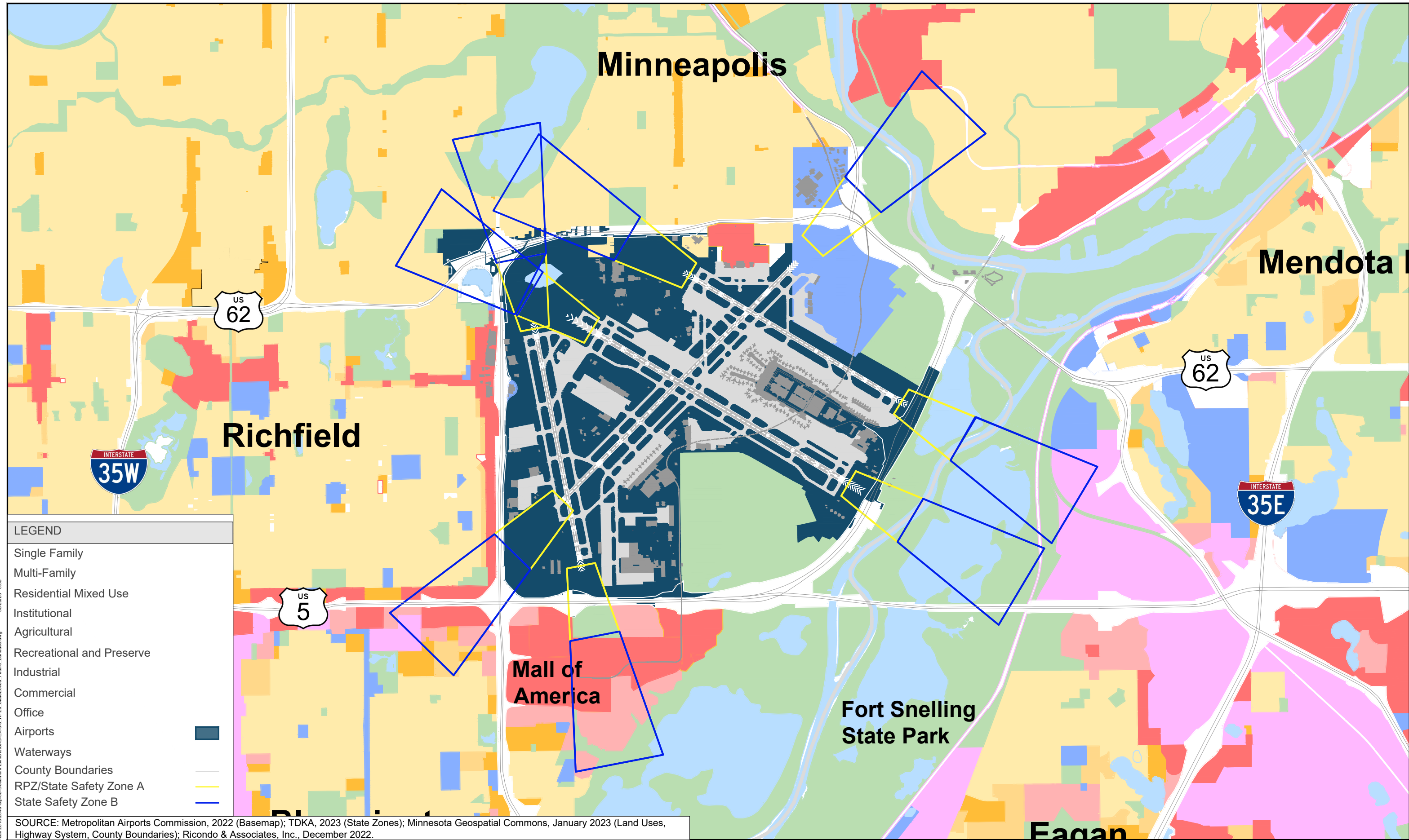
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EXHIBIT 6-4

2040 Baseline Forecast Noise Contours with Existing Land Use

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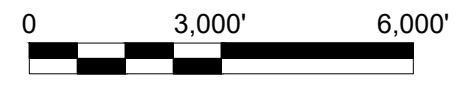
LEGEND

- Single Family
- Multi-Family
- Residential Mixed Use
- Institutional
- Agricultural
- Recreational and Preserve
- Industrial
- Commercial
- Office
- Airports
- Waterways
- County Boundaries
- RPZ/State Safety Zone A
- State Safety Zone B

SOURCE: Metropolitan Airports Commission, 2022 (Basemap); TDKA, 2023 (State Zones); Minnesota Geospatial Commons, January 2023 (Land Uses, Highway System, County Boundaries); Ricondo & Associates, Inc., December 2022.



MINNEAPOLIS-SAINT PAUL INTERNATIONAL AIRPORT
2040 LONG-TERM PLAN



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EXHIBIT 6-5

RPZs and State Safety Zones with Planned Land Use

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