Appendix C: Transportation

Overview

The Minneapolis Plan is consistent with the policy directions of the Metropolitan Council. As described, in the 2030 Transportation Policy Plan, the Metropolitan Council's primary transportation policy directions are:

- Planning and investing in multi-modal transportation choices based on the full range of costs and benefits.
- Encouraging mixed-use development in centers along transportation corridors that better links housing, jobs and amenities, and reduces the need for single destination trips.
- Making more efficient use of the regional transportation system by encouraging flexible work hours, telecommuting, ridesharing and transit ridership.
- Focusing highway investments first on maintaining and managing the existing system, and second on slowing congestion.
- Building transit ridership by expanding the current bus system and developing a network of dedicated rail and/or bus "transitways."
- Encouraging local communities to implement a system of fully interconnected arterial and local streets, pathways and bikeways.

This Technical Appendix to *The Minneapolis Plan* includes required elements as described in the Metropolitan Council's *Local Planning Handbook*. The appendix is not intended to supplant the Transportation chapter of The Minneapolis Plan. Instead, it is intended to reinforce the plan's policies and provide enough detail so that the Metropolitan Council can conduct a review of adequacy of The Minneapolis Plan. The transportation technical appendix contains the following sections:

- Traffic analysis zone forecasts
- Highway and roads plan
- Bike and pedestrian plan
- Special situations plan
- Transit plan

- Aviation plan

Traffic Analysis Zone Forecasts

This section includes population, employment, and housing unit forecasts through 2030 for the City of Minneapolis by Traffic Analysis Zone (TAZ). This information is an important input into the development of regional traffic forecasts and planning for regional roads and highways.

See Maps 2.1, 2.2, and 2.3 and Appendix B for the TAZ forecasts for the entire city.

Citywide total forecasts are based on official Metropolitan Council projections. These forecasts were assigned to TAZs by using the city's knowledge of: current policy for directing and accommodating growth, existing and potential proposed development projects, availability of developable sites, and general knowledge of the commercial and residential real estate market.

It should be noted that there is an intent in *The Minneapolis Plan* to pursue an aggressive growth scenario for both population and jobs. In some TAZs, the estimates in the attached table could be exceeded. However, at this time, it is not practical to estimate on a TAZ level where that additional growth could occur. The City will track growth on an ongoing basis, and make policy changes when necessary.

Highway and Roads Plan

Highway and Road Network

See Map 2.4 for the functional classification of arterials and other major roads within the City. The functional classification system is based on the designations in the Metropolitan Council's *Transportation Policy Plan*.

The City has also developed a new street classification system through the Access Minneapolis Ten-Year Transportation Action Plan to aid in integrating transportation and land use planning and designing a multi-modal transportation system, though it doesn't supplant the functional classification system. The Access Minneapolis street classification system identifies different types of streets throughout the city based upon both transportation function as well as the kinds of places that exist along these routes. Use of the right-of-way is a balance between its role in the transportation system (e.g., priority for buses) and how it serves adjoining land uses (e.g., parking for businesses). This includes routes in the City's Primary Transit Network (PTN) as well as streets designated for automobile mobility (e.g., "commuter street"). Often there is a good match between the mode priority and adjoining land use (e.g., bus service along high density, mixed-use corridors), but sometimes there is not (e.g., commuter routes through low-density residential areas). The City will maintain guidelines for uses of the right-of-way that reflect a balance between its overall transportation role and its neighborhood context.

Existing traffic volume and forecasted traffic volume are also provided for all arterials within the City. The interstate system is also an integral part of the City's road network. However, the City recognizes that planning for, maintaining, and if necessary expanding the interstate system is a Minnesota Department of Transportation function, conducted at the regional and state level. Therefore, this plan will not give specific direction as to future plans for the interstate system, beyond the City's role in this process.

Traffic Forecasts

See Maps 2.6, 2.7, and 2.7a for current daily traffic counts and forecasted 2030 traffic volumes for arterials and other major roads in the City. Map 2.7 has forecasts from City-level analysis, while Map 2.7a has traffic forecasts from the travel demand model maintained by the Metropolitan Council.

As a developed city, Minneapolis has the option of using either modeled traffic forecasts or trend line analyses to determine future traffic levels. Both of these were reviewed when determining City transportation needs and priorities. A brief discussion of each is included below:

- **Modeled forecasts**. As shown on Map 2.7a, these forecasts are generated by a regional travel demand model maintained by Metropolitan Council. The TAZ socio-economic forecasts provided in the previous section are an input to the model. This forecasting comes with the caveat that priority is given to ensuring that major roads have the highest level of accuracy. As a result, traffic forecasts on more minor roads may be less accurate than using another forecasting technique. Due to the relatively limited changes to the road network expected in the future and the City's status as a fully developed community, the City elected not to modify the regional model, but rather to work on trend line projections.

- **Trend line projections**. These forecasts are shown on Map 2.7. As part of the Access Minneapolis planning process, the City did trend-line projections for traffic on roads throughout the City. A more detailed analysis, including turning movements, was done for the Downtown area. Projected 2030 traffic volumes were developed by applying annualized growth factors by sector of the city to the 2005 Average Annual Daily Traffic Counts. These annualized growth factors were derived from the Metropolitan Council's regional model for arterial and collector roadways in each sector. These growth factors are as follows: North Sector (0.50%), Northeast/Southeast Sector (0.40%), South Sector (0.60%), and Southwest Sector (0.50%).

Both of these methodologies yielded similar results: growth in traffic and congestion on most City streets is forecasted to be moderate, based on the fact that much of the City is fully built out. However, due to Minneapolis' central location, traffic levels on

its street network are greatly influenced by surrounding development, as residents and employees of surrounding communities travel into and through the City. This shows up particularly in volume increases along major routes leading into Downtown.

Outside of interstate projects managed at the state level, and incremental improvements associated with street reconstruction and maintenance, The City does not anticipate increasing capacity on most roads in the City to handle forecasted demand. Instead, the City's primary focus is on improvements to the transit network, along with operational improvements to make the existing system work more efficiently. Some capacity expansions may occur, but this is not the primary strategy for addressing increased travel demand.

Highway Improvements

See Map 2.8 for existing and proposed number of lanes on major routes in Minneapolis.

Three major highway projects located in Minneapolis are listed in the Metropolitan Council's *Transportation Policy Plan*:

Project	Description	Status
I-35W HOV lane from 66th St to 42nd St	Reconstruct TH 62 and I-35W and add the HOV lane	Constructed started May 2007, scheduled to be complete by 2010
TH 55, Hiawatha Ave	Reconstruct the 4-lane arterial from Crosstown to I-94	Project complete
I-35W from 46th St to I-94	Add HOV/transit priority lane and Lake St interchange	Northbound Priced Dynamic Shoulder Lane to be completed by the end of 2009, funded by the Urban Partnership Agreement. Additional Access to and from Lake Street is not funded or programmed.

Other City road improvement priorities include:

- *Granary Road two-lane divided extension* – The City intends to construct Granary Road, a new east-west roadway primarily north of University Avenue and 4th Street SE. This arterial roadway will augment the east-west roadway system for medium and longer length trips through the City and into St Paul. It will provide additional capacity and serve as a reliever to the University Avenue/4th Street one-way pair as well as to I-94 and Washington Avenue, a segment of which will be restricted to transit

vehicles only with the implementation of the Central Corridor Light Rail Transit. The eastern segment of Granary Road, from the city border to Oak Street, is identified as an A-Minor Augmenter on the approved regional Functional Classification Map. The City is seeking to have the western extension of this roadway, from Oak Street to 11th Avenue SE, added to the Functional Classification Map as an A-Minor augmenter as well. The formal application process for this change is underway.

- *Van White Boulevard two-lane extension* – This roadway is identified in the regional functional classification map as a Major Collector. It serves a major redevelopment area west of Downtown. Construction of the road and the surrounding development is already well underway.

- *Kasota Road two-lane realignment* – The existing alignment for Kasota Road serves an industrial area immediately adjacent to a low density residential neighborhood. The road is classified as a B-Minor Arterial on the regional functional classification map. The new alignment, located to the south of the existing one, will effectively replace the existing one as the primary route for industrial traffic, trucks, and thru traffic in the area. This will also open up access to new land for industrial redevelopment which is now only served by rail. It is proposed that the functional classification for the old Kasota alignment be transferred to the new one, as the new one will effectively replace its arterial function. The old alignment will remain in place, likely as a local street. The westernmost portion of the new alignment has been constructed, though the middle portion still needs to be completed. The City has not yet begun a formal application process for this change, but will as needed.

- *E River Pkwy extension* – There is currently a gap in the parkway system along the east bank of the Mississippi River between the ends of E River Pkwy and Main St SE. The City proposes connecting these two as a continuous route, which would be a major collector, as both existing roads already are. Like Granary Road, this would serve as an alternate route for the University Avenue/4th Street one-way pair as well as I-94 and Washington Avenue – though it would serve primarily as a parkway facility. An opening for this route has been constructed as part of the I-35W bridge reconstruction. The City has not yet begun a formal application process for this change, but will as needed.

There may be some other road extensions and connections, particularly as a means to improve connectivity within and between neighborhoods. However, most of these will be fairly small-scale and will not significantly impact the capacity of the overall road network. The need for these improvements will be evaluated as part of the City's regular capital improvements prioritization process.

Land Use and Transportation Connection

Travel demand is directly related to land use type and intensity. However, land use changes far outside the Minneapolis city limits are having more impact on travel demand in Minneapolis than changes to land use inside city limits.

Travel will increase in the city because the metropolitan area is growing, more people have access to cars, and there is generally more travel due to decentralization. The number of trips made in the metropolitan area has increased from 1.7 million in 1949 to 10.8 million in 2000. Trips are expected to continue to increase to 15 million by the year 2030.

Travel will also increase because The Minneapolis Plan calls for "growing the city" in population and employment. The population is projected to grow by more than 58,000 people by 2030, over a 15% increase. Employment is expected to grow by more than 39,000 jobs, over a 12% increase, over the same time period.

Table C.1: Forecasted Growth in Minneapolis

Year	Count	Cumulative Change
Population		
2000	382,174	
2010	405,329	23,155
2020	425,797	43,623
2030	441,143	58,969
Households		
2000	162,139	
2010	172,735	10,596
2020	181,975	19,836
2030	189,398	27,259
Employment		
2000	307,172	
2010	317,000	9,828
2020	332,500	25,328
2030	346,500	39,328

Source: City of Minneapolis

The plan calls for this growth to be directed to and along its designated land use features, including community corridors, neighborhood commercial nodes, commercial corridors, activity centers, and growth centers. These areas were selected in large part because they are already well-served by transportation infrastructure,

particularly high-frequency transit service and a walkable environment that invites non-motorized travel. Map 1.3 shows these areas. This policy direction is aligned with the *Transportation Policy Plan* approaches, as it will "encourage the intensification of development at key nodes and along major transportation corridors."

Minneapolis is well-suited to accommodate this new growth. Its central location, established transit and bike/pedestrian networks, and generally compact development patterns mean that it can accommodate new growth with significantly less traffic impacts than a similar scale of development would occur in a suburban or rural community.

Need to Expand Facilities

Traffic volumes will grow on city principal and minor arterials despite all planned pedestrian, bicycle, and transit improvements. This section quantifies the expected changes in traffic volume that are likely to develop.

Although congested segments of road may be a good indicator of where improvements to roadway capacity are needed, this is not always the case. In an urban center like Minneapolis, some level of congestion indicates a healthy vitality to the area. Areas without a sufficient level of activity may suffer economically, and be less appealing for residents and visitors. The intensity and vibrancy of an area can make it attractive, even when it is difficult to travel quickly.

Additionally, when traffic congestion does need to be addressed, the city's preferred strategy is to optimize traffic flow and encourage greater use of alternative modes (walking, bicycling, and transit). This is compatible with a sustainable approach to transportation planning. Minneapolis is a mature urban environment. The city is fully developed, in some cases for over a century, and the space available for transportation is limited. Widening roads, in most cases, is not an acceptable option due to the negative impacts on the urban character of the city, the exceedingly high costs for construction and relocation, and the reduced viability of walking, bicycling and transit.

Improvements to road capacity, therefore, will be limited and strategic. Most will focus on operational issues – including signal timing and other enhancements.

As noted above, the built-out character of Minneapolis means that future changes in traffic are generally incremental, and that most roads forecasted to be congested already have a certain level of congestion on them.

Occasionally, priority may be given to constructing new connecting roads in areas where the traditional grid system has been interrupted. The purpose of these new connections is not only to improve auto traffic flow, but to increase overall multi-modal connectivity – including bicycle and pedestrian – and to strengthen the City's traditional urban character.

Potential Safety Issues

Since Minneapolis is a fully developed city, growth comes almost exclusively on previously developed sites. Infrastructure improvements associated with new development, therefore, tend to be incremental and site-specific. However, new development does provide an opportunity to evaluate traffic issues in a certain area and to make needed improvements, based on either existing or future traffic conditions.

One of the main ways the city has for assessing and implementing needed safety improvements associated with new development is the Travel Demand Management (TDM) requirement. The city's zoning code requires non-residential developments of over 100,000 square feet to submit a TDM plan for approval by the Planning Director. TDM plans must disclose the expected transportation impacts and detail a mitigation plan.

For safety concerns that are not associated with specific new development projects, the city continuously collects and analyzes crash data, road condition data, and other information that identifies roadway safety hazards. This information is used, along with other criteria, to identify and prioritize projects for the city's capital improvements plan.

Access Management

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Access management includes several techniques that are designed to increase the capacity of these roads, manage congestion, and reduce crashes:

- Increasing spacing between signals and interchanges
- Driveway location, spacing, and design
- Use of exclusive turning lanes
- Median treatments, including two-way left turn lanes (TWLTL) that allow turn movements in multiple directions from a center lane and raised medians that prevent movements across a roadway
- Use of service and frontage roads
- Land use policies that limit right-of-way access to highways

The appropriate strategy to apply varies greatly by street type. At one end of the hierarchy of streets, a freeway emphasizes traffic movement while restricting access to adjacent land. At the other end of the hierarchy, a local street provides easy access to adjacent residential, commercial, and industrial land uses. Transportation

improvements developed in accordance with the street classification system will help to discourage higher speed "through" traffic from using local neighborhood streets, and local traffic from congesting regional travel facilities. This will not only improve the efficiency of the transportation system, but will also maintain the livability of city neighborhoods.

As new development and redevelopment occurs, Minneapolis will incrementally make improvements to access management along arterials. Depending on the road, this will involve applying MnDOT, Hennepin County, and City standards where appropriate. Additional information on state standards can be found here: http://www.oim.dot.state.mn.us/access/index.html. A copy of state access management policy is included as part of this appendix. Federal guidance can be found here: http://safety.fhwa.dot.gov/geometric/key_comp.htm#am.

The city's zoning ordinance addresses access management concerns in section 530.150, as part of the site plan review process. In addition to mitigating traffic impacts, the regulations emphasize minimizing conflicts with pedestrian traffic, reducing impacts on residential uses, and reducing impervious surface.

Bicycle and Pedestrian Plan

Bicycle and Pedestrian Policies

The primary objective of providing bicycle and pedestrian facilities is to provide an attractive alternative to the single occupant vehicle, as well as to provide high-quality bicycle and pedestrian access to transit. The Minneapolis Plan emphasizes bicycles and pedestrians as the foundation of the city's transportation system. Bicycles and walking will not entirely replace the automobile, but the pedestrian environment can be made more attractive to encourage Minneapolis residents to walk or bike for the short trips. This kind of behavior will reduce cold automobile starts which are the most polluting activity for a car. The use of the automobile can also be reduced if there are good bicycle and pedestrian facilities and land uses are sufficiently mixed to make biking and walking feasible.

Fortunately, Minneapolis has an excellent sidewalk system that is safe and convenient. This basic system is augmented by a skyway pedestrian system in downtown Minneapolis. Implementing steps in The Minneapolis Plan call for wide, high quality sidewalks and new developments that situate their front doors so that they open onto the public sidewalks.

As part of a non-motorized transportation system, bicycling is ideal for short trips that might ordinarily be made by car. It extends the reach of the transit system and improves the quality of life for residents who do not use cars. A bicyclist in the City can use a system of off-street trails, on-street lanes, and streets that have been identified as bike routes because of their characteristics (e.g., low volume roads with few physical hazards).

The city has also designated commuter bike lanes in downtown Minneapolis and in near-downtown neighborhoods where there is a conflict between bike riders and other vehicles. Map 2.9 identifies existing and planned bike routes in the City.

Ongoing planning and implementation efforts include the elimination of gaps in this system, ensuring adequate geographic coverage/spacing, and addressing safety conflicts in congested corridors, districts and street crossings. By doing so, the City hopes to make bicycling more attractive to more riders, in more places, and more of the time.

Both a citywide Pedestrian Master Plan and a citywide Bicycle Master Plan are currently under development and will be completed by the end of 2009. These plans will address existing and future bicycle and pedestrian demand, existing system deficiencies, capital improvement priorities, design guidelines for bicycle and pedestrian facilities, and funding and implementation strategies for new and existing facilities.

Bikeway Map

The City will plan for bicycle infrastructure under the framework of modal priorities and context. Bicycles cannot be accommodated the same way in all locations. In addition to funding constraints, competing priorities arise from limited rights-of-way that include the need for vehicle lanes, on-street parking, sidewalks and streetscape. Despite these challenges, bicycling throughout the City will become more transparent and obvious through a combination of interconnected infrastructure, signage, bicycle parking, respect for bicycle riders, and enforcement of traffic safety laws. Where there is the demand or potential for bicycle ridership, it will be matched by infrastructure investment and other support.

Map 2.9 shows the existing bicycle plan for the City of Minneapolis. This plan was developed several years back by the City, and has been used to guide investment in new facilities since then. Additional detailed maps are available on the City's website at http://www.ci.minneapolis.mn.us/bicycles/bicycle-plans.asp.

Access to Transit

High quality mass transit service depends in part on good pedestrian links at both ends of the bus trip. The city's extensive bicycle and pedestrian systems are well-situated to provide this level of access. It is convenient in most areas of the city to walk or bike to and from transit routes. Furthermore, enhancements to bicycle and pedestrian facilities often coincide with activity centers and commercial corridors which are already well-served by transit.

As part of its Ten-Year Transportation Action Plan the City has identified a network of primary transit corridors, which includes the potential regional transitways, as well as local transit service. Map 2.13 shows the location of the planned transitways. Over time, routes the Primary Transit Network (PTN) will be improved to meet

regional standards, some of which relate to safe and comfortable passenger facilities, access to stops, and traveler information.

Additionally, City policies ensure that, when new transit development occurs – such as LRT or downtown transit facilities – bicycle and pedestrian access are important considerations in the design of these facilities. Bicycles are accommodated on all transit vehicles in the City, including both LRT and bus. Increasing numbers of transit stops also include bicycle racks or lockers.

Special Situations Plan

Downtown

Overview

In June 2007 the Minneapolis City Council adopted the Downtown Action Plan, part of a citywide 10-year transportation planning effort called Access Minneapolis. The Downtown Action Plan identifies specific strategies that the City and its regional partners will undertake in order to improve the operational capacity of the downtown transportation system, with an emphasis on transit, bicycling, and walking.

Specific actions to be implemented in the next ten years include:

- Widen sidewalks in key locations, including areas with heavy transit use
- Close gaps in the pedestrian network
- Enhance the pedestrian experience through sidewalk greening and cleaning programs
- Improve vertical access to the skyway system
- Close gaps and increase capacity of the bicycle network, including off-street trails and on-street lanes
- Provide additional bicycle parking and shower facilities
- Consolidate bus service to a limited number of streets where transit is given modal priority and resources for transit services and facilities can be concentrated
- Improve intra-downtown circulation on Nicollet Mall
- Rearrange bus stops to be spaced no closer than every other block

- Provide better internal downtown auto circulation
- Optimize signal timing
- Update special event traffic management to address changes in transit operations and stadium locations
- Continue to support the efforts of the Minneapolis Transportation Management Organization (TMO)

More detail is provided below for transit, pedestrian, automobile, and parking improvements identified in the plan.

Transit

High quality transit service can ensure the continued intensification and growth of downtown, which in turn will support transit ridership. Service must be reliable and at frequent, regular intervals. Travel time must compete favorably with other modes, and facilities and amenities must be easily accessible to riders.

Despite the importance of planned rail service, buses operating on downtown streets make up the lion's share of transit use. The City, working with transit providers, will improve the readability and functioning of downtown buses by improving bus lanes and consolidating routes onto fewer streets. Access to these facilities via sidewalks and skyways will be improved. The City will also work in partnership with Metro Transit and Mn/DOT to ensure that connections to regional highways and HOV lanes will be improved.

Three transit spines in downtown will serve a majority of both regional express bus service as well as local Primary Transit Network (PTN) routes. They include the dominant north/south transit spines along Marquette/2nd Avenue and Nicollet Mall, a southwest transit spine along Hennepin Avenue and an east/west spine. Transit priority will take forms that range from buses operating in mixed traffic on Hennepin Avenue to expanded use of transit-only lanes along the north/south spine. City programs and regulations will ensure that conditions along these routes continue to improve in support of transit. Strategies include zoning and site plan requirements, economic development incentives, travel demand management (TDM), and curbside management.

As part of an economic and residential development strategy, transit will be improved to serve trips within downtown for visitors, residents and employees alike. It is anticipated that the strategies above will meet many of the needs for internal downtown circulation. Nevertheless, the City will work with Metro Transit and others to ensure that bus service on Nicollet Mall functions as a shuttle that connects the tourist, entertainment, recreational and retail destinations within its reach. Over time, streetcar routes may also be developed along key transit routes in ways that

leverage development and improves transit ridership.

Pedestrians and Skyways

Certain streets will be designated as routes with enhanced amenities that encourage and reward walking throughout downtown. These streets include but are not limited to PTN streets. These are places where public amenities and investment will be matched by expectations for new development. Treatments for the pedestrian/public realm will include wider sidewalks, enhanced streetscape, requirements for building frontages and pedestrian plazas. Building entrances and connections with the skyway shall be designed to create an openness and sense of connection with the street.

Automobiles

Automobile use of the street network will place emphasis on downtown circulation and making streets more understandable to visitors and customers. A central task is the designation of one-way versus two-way streets. Those streets that connect with freeway entrance/exit ramps and serve as efficient traffic arteries will continue to operate as pairs of one-way streets (e.g., 3rd and 4th Streets, 4th and 5th Avenues). Other streets will be designated as two-way streets. They include streets that have all-day activity, streets that function as the historic retail and entertainment main streets, and streets that have neighborhood connections (e.g., Hennepin Avenue, Nicollet Mall/Avenue, Washington Avenue, and 3rd/Central Avenue.) The City will work with Mn/DOT to improve freeway access to and from I-35W to the north, which is currently provided only via Washington Avenue.

Parking

Parking supply and regulation will based upon land use and transportation policy objectives for downtown. Long-term parking facilities should be located along freeway access routes and not along PTN routes. Parking facilities near freeway access points are preferable to new facilities inside the core of downtown. In all cases, parking should not dominate any precinct of downtown, and each facility shall be integrated with both ground floor and exterior uses wrapping the structure. This is especially important as peripheral districts become more residential. Long-term parking should become scarcer so that fees do not undermine the use of alternative modes. Car sharing programs for both office and residential uses will be encouraged or required.

University of Minnesota

With over 16,000 employees and 51,000 students on the East and West Bank campuses, the University of Minnesota is a major destination in Minneapolis and in the region. The University of Minnesota has jurisdiction over some traffic and transportation operations within its area. Other transportation facilities and operations are managed by the City and Hennepin County.

The City, University, and regional partners employ a variety of strategies to manage transportation needs in the University area, including:

- Frequent campus shuttle service between the Twin Cities campuses and frequent local and regional express bus service to campus
- Discounted transit passes for U of M staff and students
- Coordination on Central Corridor LRT planning and design
- Traffic signal improvements
- Car-sharing program for students, faculty, and staff

Right-of-Way Preservation

Roads: As a fully developed city, Minneapolis does not often need to preserve right-of-way for new roads. However, there are a few identified:

- Granary Road extension
- Van While Boulevard extension
- Upper River road extensions
- East River Road extension

Bicycle Routes: The transportation chapter of The Minneapolis Plan shows the plan for bicycle route improvements (Map 2.9). Right-of-way needs to be preserved include:

- Granary Road corridor trail
- Upper River corridor trails
- East River Road corridor trail

Walkways: Walkway and trail preservation will be done in conjunction with the development of bikeways and greenways.

Transit Corridors. Most transitway improvements are planned within existing right of way. However, some limited right of way acquisition may be needed as the plans are developed.

Right of way preservation needs are shown on Map 2.10. However, some additional right of way may need to be acquired in conjunction with various transportation

projects. These acquisitions will generally be minor and incremental, consistent with the fully urbanized character of the City.

Corridor and Sub-Area Studies

There is only one study listed in Appendix G Transportation Policy Plan:

> **Northstar Commuter Rail Corridor Advanced Corridor Plan**: Metro Transit will begin operating the Twin Cities' first commuter rail line in late 2009. The Northstar commuter rail line will connect downtown Minneapolis with the northwest suburbs located along the Highway 10 corridor. Initially, there will be stations in Big Lake, Elk River, Anoka, Coon Rapids-Riverdale, Fridley and on the northwest edge of downtown Minneapolis. There will be five southbound morning trains and five northbound afternoon trains each weekday. There will also be one northbound morning train and one southbound afternoon train each weekday, along with limited weekend service. The Northstar Line is expected to carry 3,400 riders a day in the first year of operation and 4,100 at full maturity.

Other studies that have been underway since 2004, when the Transportation Policy Plan was adopted, include:

- Access Minneapolis, a citywide transportation action plan now underway
- Central Corridor LRT
- Northstar Commuter Rail
- Bottineau Corridor Transitway
- I-35W BRT
- Red Rock Corridor Transitway
- Southwest Transitway

Transit Plan

Existing Service

Public transit is a very important component of community life in Minneapolis. It is one of the city's defining features, as compared to the suburbs. Virtually all of the city is within a quarter mile of a bus line. This allows people to get to work at the city's primary job centers. The transit system is also a convenient and attractive alternative to the single-occupant vehicle.

Even more than being a part of community life, transit improvements are going to

be absolutely necessary if the city and the region are going to adequately contend with the traffic congestion that we will experience by 2030. The Minneapolis Plan, Access Minneapolis: Ten Year Transportation Action Plan, and the 2030 Transportation Policy Plan all concentrate on transit improvements as the primary way to contend with growing traffic congestion.

The section below provides a description of the transit services and facilities in Minneapolis that are needed to sustain the economy, environment, and lifestyle.

Minneapolis has a bus transit route system based on the streetcar system that began in the 1880s. Most of the routes are in the same place they were a hundred years ago or when they were first developed. Virtually all residential blocks in the city are within a few blocks of a bus line. A select number of these lines are part of the Primary Transit Network, with existing or planned high frequency service throughout the day and into the evening.

The Primary Transit Network, or PTN, is a limited set of transit corridors where the City and transit providers will focus efforts to maintain minimum standards for speed, frequency and passenger facilities. PTN routes are based upon existing and planned land use, connections between destinations, and spacing throughout the city. PTN routes include different technologies and roles. It may include service in dedicated corridors such as light rail transit (LRT) as well as local buses on key routes. It does not, however, include other important transit services like peak period express buses or commuter rail. The PTN is intended to become an easily understandable network that serves the entire City throughout the entire day with headways of 15 minutes or better. This readability may include marketing, such as maps, but also include "branding" efforts and increased levels of service amenities along these routes.

In addition, some of the most outlying parts of the city have morning and evening rush hour express service. This occurs in southwest, south central, and northwest Minneapolis. This service utilizes I-35W and I-94. Dedicated lanes allow buses to bypass ramp meters and congested lanes, improving travel time for transit riders. There is also limited direct bus service to the University of Minnesota in some parts of the city. Map 2.11 shows the existing transit route system.

Specialized paratransit services are also available in the city. This includes non-scheduled transit service provided to the elderly and persons with disabilities through Metro Mobility and other organizations such as the Minneapolis Age and Opportunity Center and the Fairview Foundation.

Transit Market Area

According to the 2030 Transportation Policy Plan, the central part of Minneapolis is in Transit Market I, and the remainder is in Transit Market II.

Transit Market I encompasses Downtown Minneapolis, the University of Minnesota

area, and some of the highest density neighborhoods in the city. It has among the highest concentrations of activity, housing, and jobs in the region. As a result, it has some of the most frequent and comprehensive transit service, with frequent local and express routes running long hours every day. Only Minneapolis and St Paul contain any Market I areas. The Transportation Policy Plan states that "Because this is the most productive transit service area in the region, it should also be the area that receives a prioritized investment of transit resources."

Transit Market II encompasses many largely residential areas of the city. It has a moderate concentration of jobs, housing, and activity. It is still well-served by transit, but at a lower frequency and more limited hours than Transit Market I.

These designations are reflection of the demand for high quality transit service in the city. The plan notes that strengthening service to key destinations such as central Minneapolis are "crucial to the health of the entire transportation network."

Determining Future Service

Minneapolis will work with the Metropolitan Council to determine transit services consistent with the municipality's transit market areas and its associated service standards and strategies.

The city has already undertaken an extensive process through Access Minneapolis in large part to assist with transit planning. Additionally, Minneapolis has worked directly with the Metropolitan Council recently on a series of studies for proposed LRT and BRT facilities serving the city, as well as with Metro Transit on recent transit service sector studies.

Existing and Planned Corridors

Minneapolis' basic approach to transit is described in detail in Access Minneapolis. That document states that Although all modes of transportation are important, transit is critical for maximizing the people carrying capacity of the transportation system. Access Minneapolis will result in a transit system that operates efficiently and effectively in downtown and throughout the city. Transit will become the mode of choice for Minneapolis residents, workers and visitors."

Specifically, the major planned improvements outlined in that plan, as well as the 2030 Transportation Policy Plan, are outlined below.

Transitways

Transitways on dedicated rights of way provide a travel-time advantage over the single-occupant vehicle, improve transit service reliability and maximize the potential for transit-oriented development and redevelopment. These may include bus rapid transit (BRT), light rail transit (LRT), or commuter rail facilities. The success of the Hiawatha LRT transitway has increased interest in and support for additional

corridors.

Minneapolis will seek development of transitways in the following corridors:

- **Hiawatha Corridor**. This is the city's one existing LRT line. Though largely complete, additional plans are being developed and implemented to enhance operations and promote compatible development adjacent to the LRT line.

- **Central Corridor**: This is the primary east-west transportation route between downtown Minneapolis, the University of Minnesota and downtown St. Paul. LRT has been identified as appropriate for this corridor, and work is ongoing on project development.

- **Northstar**: This commuter rail line operating on the Burlington Northern railroad line from downtown Minneapolis to Big Lake is currently under construction.

- **Bottineau Corridor**: This corridor parallels CSAH 81 between Minneapolis and either Brooklyn Park, Maple Grove, or Rogers. A preliminary scoping report is complete and an alternatives analysis is underway to determine the most feasible mode and alignments. The transitway may operate on a combination of dedicated right-of-way and in mixed traffic with transit advantages.

- **I-35W BRT**: I-35W south of downtown Minneapolis was the first Interstate highway in the Twin Cities with express bus service, beginning in the early 1970s. It is the principal arterial most heavily used by transit today. There is an HOV lane from TH 13 to I-494. As a result of funding from the Urban Partnership Agreement (UPA), the HOV lane will be converted to a High Occupancy Toll (HOT) lane and extended to the north (from I-494 to 42nd Street in south Minneapolis) and to the south (from TH 13 to Burnsville Parkway) and will be completely operational when reconstruction of the Crosstown interchange is completed. Also as part of the UPA, a Priced Dynamic Should Lane (PDSL) will be installed northbound from 42nd Street to Downtown Minneapolis. MnDOT, together with the Council and other transit providers, completed an I-35W study for the 2005 legislative session which contained details on station locations and operations plan.

- **Red Rock Corridor**: This corridor follows TH 61 and the Burlington Northern and Canadian Pacific railroads approximately 30 miles from Hastings through downtown St. Paul to downtown Minneapolis.

- **Southwest Transitway**: The Southwest corridor extends between the southwestern suburbs and Minneapolis, including the cities of Eden Prairie,

Minnetonka, Hopkins, and Saint Louis Park along railroad right-of-way acquired for future transit by the Hennepin County Regional Railroad Authority (HCRRA). Currently, the southwest LRT trail accommodates bicyclists and pedestrians throughout the corridor. Transit feasibility studies have been completed for this corridor and the adjoining Midtown Corridor that extends between the southwest Corridor and the Hiawatha LRT line.

- Other corridors being studied by the Metropolitan Council for potential transitway improvements

Primary Transit Network (PTN)

As part of its Ten-Year Transportation Action Plan the City has identified a network of primary transit corridors, which includes the planned regional transitways noted above, as well as local transit service. The PTN is a permanent network of all-day transit service – regardless of mode or agency – which meets a set of regional standards, including service that operates at least every 15 minute for at least 18 hours a day, seven days a week; that are reliable and have reasonable operating speeds and passenger loadings; and that are supported by safe and comfortable passenger facilities, access to stops, vehicles, and information.

The PTN's value, as well as its success, relies on a three-way interdependence among (1) density, (2) service quality, and (3) ridership. Density is achieved through City land use policies, design guidelines and economic development incentives. If the above standards are met, PTN service will appeal to a wide range of travelers, not only transit-dependent persons, but people who choose to use transit instead of driving their cars. Because PTN service attracts more riders, it also becomes more efficient and cost effective. With lower operating subsidies, the transit system spends less per passenger on the PTN than on other transit services.

The City will engage both its local and regional partners in implementing the PTN in a strategic, systematic way.

Other Transit Improvements

- Improvements to downtown transit service, including reconfiguration of routes to increase efficiency and quality of service. (See Special Situations section for more details.)

- Investigation of developing a streetcar along at least one of the identified potential corridors in the City, in a way that builds on other transit service and encourages economic development. To date, no plan for this has been officially approved by the City.

- Funding and implementation of the Primary Transit Network system, to provide permanent, reliable, high frequency service on key corridors

throughout the city.

- Improvements to transit amenities, including bus stops, signage, transit hubs, and others.

See Map 2.13 for the proposed transitway network, and Map 2.14 for the Primary Transit Network.

Existing and Planned Facilities

Minneapolis has three designated transit hubs in Uptown, downtown, and the University of Minnesota (see Map 2.11).

Transit Passenger Facilities

Transit passenger facilities are essential to providing convenient and attractive transit service. They range from the most basic (a bus stop with sign) to large and complex (a multi-route transit center). The city has five transit terminals in the downtown area. They are located in conjunction with peripheral parking garages in the Third Avenue Distributor, the Leamington Garage, and the Gateway Garage. Two additional transit centers are located in South Minneapolis: the Uptown Transit Center and the Chicago Lake Transit Center. Additionally, the city has several online shelters with passenger information, and numerous enclosed custom shelters, particularly in downtown. The City is currently working with regional partners to implement enhanced transit facilities and operations for regional express buses on 2nd and Marquette Avenues in Downtown.

Park and Ride

The city has one officially designated park and ride facility, at the Lake St/Midtown LRT station. The Park and Ride Facility Site Location Plan identifies a need for an additional 11,000 park and ride spaces to serve travelers to downtown Minneapolis by 2030. However, the plan also notes that new park and ride facilities are most appropriate in lower density areas that are not fully served by transit, but are on a major transit corridor. Since virtually all of Minneapolis is moderate to higher density and is well-served by transit, no additional park and ride facilities are planned within the city.

Transit Support Facilities

The regional transit system must have sufficient facilities to support efficient and cost-effective transit services. These support facilities include garages and bus maintenance facilities, bus layover facilities at the route terminal point, and dispatching and control centers. Special bus-related road features, often referred to as “transit advantages,” will also be required to maintain transit travel times which are competitive with the automobile.

Minneapolis does have several "transit advantages" in the form of HOV lanes, bus shoulder lanes, left turn lanes for buses, diamond lanes, transitways, transit hubs, park and ride lots, and meter bypasses (see Map 2.12).

In Downtown Minneapolis, priority bus lanes are currently provided on Nicollet Mall, 2nd Avenue S, Marquette Avenue, and 4th Street South. The City is currently working with regional partners to implement double-width transit lanes on 2nd and Marquette Avenues in downtown to more efficiently accommodate regional express buses in downtown and to reduce bus congestion on Nicollet Mall.

A transitway connects the St. Paul and main campuses of the University of Minnesota. This bus facility provides very speedy, convenient service between the two campuses. It also keeps intercampus buses off heavily traveled University Avenue and Como Ave. The busway provides additional capacity for automobiles and trucks on University Ave. and reduces the disruption of residential properties fronting on Como.

The only HOV lanes are located on I-394. These reversible lanes provide uncongested movement for buses and carpools in I-394.

Meter bypasses also provide preferred access to I-94 and I-35W for buses and carpools. Map 2.12 shows the location of the meter bypasses and the other transit advantages.

Portions of I-35W, I-94, and TH 62 feature authorized bus shoulder lanes that allow buses to bypass congestion when speeds drop below 35 miles per hour.

Managing Freight

Ensuring safe and efficient freight movement means providing adequate transportation infrastructure as well as coordinating land use policy with transportation planning. One strategy for achieving the latter is to concentrate land uses requiring freight infrastructure in a limited number of geographic locations, thereby reducing the number of freight-related trips and consolidating freight traffic on fewer transportation corridors. The Metropolitan Council supports this approach in its 2030 Transportation Policy Plan, and the City of Minneapolis will continue its efforts to encourage industrial users to locate in the Employment Districts outlined in the Land Use chapter of this document.

While consolidation will improve efficiency and reduce negative impacts of freight movement, demand for freight infrastructure will continue throughout the city. Railroads will continue to bisect residential areas, and trucks will deliver goods to scattered neighborhood destinations. The City of Minneapolis has designated a system of truck routes that direct truck traffic to a limited number of streets with appropriate weight limits. This practice reduces the impact of truck noise on residential areas and helps maintain pavement condition on streets not designed for

trucks.

Further reducing the impact of freight infrastructure on surrounding land uses is the Federal Railroad Administration Quiet Zone law, which allows the cessation of train whistles at railroad crossings where a series of safety improvements have been made. The City of Minneapolis will continue to invest in such safety improvements where the opportunities for reducing negative impacts on residential neighborhoods are greatest.

In a limited number of cases, freight infrastructure that has served the city well in the past will no longer be viable as national trends (increased reliance on trucks), and local evolution of land uses (more emphasis on housing) begin to take hold. For example, the city-owned Upper Harbor Terminal continues to lose money and serves very few users. The Above the Falls Master Plan calls for the Upper Harbor Terminal to close as part of a long-range vision for a new mixed-use neighborhood along the Upper Mississippi. The analysis that led to the adoption of this policy indicates that trucks could absorb the freight currently carried by barge traffic with negligible impact on local and regional roadways. Another example is the Hiawatha corridor, where land use policy calls for the replacement of some industrial uses with housing near light-rail transit stations. Over time, the railroad spur that serves these uses will no longer be needed.

MINNESOTA DEPARTMENT OF TRANSPORTATION
Program Support Group
Technical Memorandum No. 02-10-IM-01
March 20, 2002

To: Distributions

From: Richard Stehr
Director, Program Support Group
Assistant Commissioner

Subject: Access Management Policy: Highway Access Category System and Spacing Guidelines

Expiration
This Technical Memorandum shall continue in force indefinitely, unless superseded or suspended.

Applicability
These guidelines are adopted as policy for the Trunk Highway System Only. Their application to local streets and highways, including the municipal and county state aid systems, shall be at the discretion of the local road authority.

Implementation
This policy shall be effective on July 1, 2002.

Introduction
Access Management is the planning, design, and implementation of land use and transportation strategies that control the flow of traffic between the road and surrounding land. Appropriate spacing and design of public street intersections and private access to the Trunk Highway System is necessary to ensure the safety and mobility of the State Trunk Highway System while accommodating the access and accessibility needs of local communities.

Purpose
This policy sets forth Mn/DOT guidance for access management of the trunk highway system through adoption of the Highway Access Category System and Spacing Guidelines contained in Appendix A of this Technical Memorandum. Appendix A is intended to become a primary chapter of a future Mn/DOT Access Management Manual.

Mn/DOT personnel and consultants will reference these guidelines during the development of corridor plans, highway development, safety improvement projects, local development reviews (e.g., comprehensive plans, plats, and site plans), and access permit reviews.

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Adoption of these guidelines is intended to streamline decision-making while promoting statewide consistency and best practice in the planning, design, and regulation of access to the Trunk Highway System.

The Department recognizes that full implementation of these guidelines will require the close coordination and cooperation of local units of government exercising local road and land use authority. To promote this, Mn/DOT will share these guidelines with counties, cities, and townships encouraging their application to local land use and roadway decisions affecting the Trunk Highway System. Local governments are also encourage to use these guidelines as a reference in developing local access management policies and guidelines for the roadways under their management authority.

Questions regarding the content or implementation of this Technical Memorandum should be addressed to Peggy Reichert, Director of Land Use and Access Management, Office of Investment Management (651) 284-0501.

Questions regarding the publication or distribution of this Technical Memorandum should be referred to Mohammad Dehdashti, Design Standards Engineer at (651) 296-3023 or Jennifer Abernathy, Design Services Administrative Assistant at (651) 296-2381.

Attachment: Appendix A

-END-

Appendix A:
Access Category System
And
Spacing Guidelines

Minnesota Department of Transportation

Office of Investment Management

March 20, 2002

Table of Contents

List of Figures

I. Introduction

Access Management is the planning, design, and implementation of land use and transportation strategies that control the flow of traffic between the road and surrounding land. Appropriate spacing and design of public street intersections and private access to the trunk highway system is necessary to ensure the safety and mobility of the statewide traveling public while accommodating the access and accessibility needs of local communities.

A. Purpose

This Appendix supplements the basic policy guidance for access management of the trunk highway system established in Technical Memorandum 02-10-IM-01adopted March 20, 2002. It defines a system of access categories for the state trunk highways with associated guidelines for the spacing and design of public and private access.

The need for a common set of access guidelines applicable to all types of roads in all jurisdictions throughout Minnesota was a primary finding of the Department's 1997-99 Access Management Initiative. Mn/DOT published a preliminary set of guidelines in 1999 with the understanding that they would be further tested and refined in collaboration with our local partners before adoption as Department policy.

This version of the Category System and Spacing Guidelines is the result of that further testing and consultation with planners and engineers at both the state and local level. An intergovernmental technical committee of transportation engineers, planners, and policy analysts met periodically for almost two years to consider modifications and refinements to the preliminary system. Proposed revisions were also tested and reviewed internally by Mn/DOT Districts, Divisions, functional groups, and senior management. In addition, planners and engineers from a variety of cities and counties, as well as their statewide professional associations, identified issues and concerns.

B. Applicability

The guidelines set forth in this Appendix shall apply as policy to the State Trunk Highway System. Their application to local streets and highways, including the municipal and county state aid systems, shall be at the discretion of the local road authority.

The Department recognizes that full implementation of these guidelines will require the close coordination and cooperation of local units of government exercising local road and land use authority. To promote this, Mn/DOT will encourage cities, counties, and townships to consider the guidelines when making land use and roadway decisions that will affect the trunk highway system. Mn/DOT will also encourage local governments to use these guidelines as a reference in developing local access management policies and regulations for their local roadways.

Impact on Access Rights of Abutting Property Owners

Except in cases where access rights have been acquired, nothing in these guidelines is intended to deny the property owner the right to reasonably convenient and suitable access to the trunk highway system. However, the access rights of a property owner are subject to regulation for the public health, safety, and welfare, including the public's rights and interests in a safe, efficient highway. The right of an owner of property to access a state highway or to a particular means of access may be restricted if reasonable, alternative access is available or can be obtained from the general public street system.

Impact on Existing Access

All legally authorized public and private access to the trunk highway system that existed prior to the adoption of these guidelines, but does not fully comply with the recommended spacing or allowance of access for the applicable access category, shall be considered "grandfathered" and will be allowed to remain in use until such time as:

a.) There is a change in use requiring approval of a new access permit as set forth in Minnesota Rules 8810.5200, or

b.) Mn/DOT or the local unit of government initiates an improvement to the trunk highway or supporting road network that may involve changes in access.

In reviewing a permit for change of use or designing a highway and/or supporting roadway improvement plan, Mn/DOT will strive to promote conformance with the recommended access spacing and allowance applicable to that roadway's assigned access category while continuing to respect the property owner's right to reasonably convenient and suitable access.

Impact on Mn/DOT Planning, Project Development, Local Development Review and Access Permit Activities

Mn/DOT personnel and consultants should consult these guidelines in all transportation planning, design, and management activities involving access issues. Some common applications will include:

- Long range corridor plans
- Project development
- Local development reviews (local comprehensive plans, subdivisions and plats, site plans)
- Access permit reviews

More detailed information on the application of the access guidelines to these activities will be provided in future technical memorandums or chapters of the Access Management Manual. However, the planner or designer should consider the following general concepts:

- Successful implementation of these guidelines requires the development of an adequate supporting road network. Therefore, the most effective time to apply the guidelines will be in long-range corridor and community planning and development review.
- These are guidelines and not design standards. Many existing conditions, both natural and man-made, may make strict conformance with recommended access spacing and allowance infeasible. The guidelines provide alternative approaches to consider in these situations.
- Designers should apply the guidelines during the project development process. However, strict conformance is not required. Funding availability and the benefit-cost of access design alternatives will need to be considered in determining the appropriate access management strategy.
- In retrofit situations, coordinating the timing of access modifications with land redevelopment activities may be the most cost-effective approach and least disruptive to the community. Retrofit plans may identify a series of incremental projects to be carried out as redevelopment opportunities arise. State-local cooperative agreement projects may be effective in addressing these opportunities.
- Application of the guidelines to the access permitting process will continue to be problematic in areas without an adequately developed supporting road network. Access permit regulation must continue to respect the right of abutting property owners to reasonably convenient and suitable access. In the absence of collectors, local streets, and parallel arterials, an isolated arterial roadway must assume collector and local functions; no alternatives exist for access to adjacent property and the development that might occur. The guidelines reflect an acceptance of this condition in areas anticipated to remain rural over the long term and set forth considerations for safe location and design of the access. In urbanizing areas, however, the guidelines stress the need to provide access from the local supporting road network.

This version of the Access Category System and Spacing Guidelines, while representing the Department's policy and recommended best practice in access management, is still considered a work in progress. Its application to system planning, design, and permitting will continue to be evaluated over the next 18-24 months, likely resulting in further modifications and improvements.

C. Approach

The Access Category System and Spacing Guidelines are based on a series of policies, principles and technical considerations related to the goals of safety, mobility, and statewide economic growth. The key concepts underlying the guidelines include the following.

Roadway Functional Class

The Access Category System is based on the concept of roadway function, or the degree to which through traffic movement is given priority over land access. Roadway functional class (arterial, collector, local) is the conventional method used to describe traffic function and provides the basis for network planning by establishing a hierarchy of streets.

Interregional Corridors

In addition to functional class, the Category System recognizes the strategic importance of certain highways in the statewide network as Interregional or Regional Corridors. The Interregional Corridor (IRC) system is a network of major highways that link the state's Primary Trade Centers to one another and to the Twin Cities Metropolitan Area. The system is comprised primarily of a subset of the highways functionally classed as Principal Arterials. Three new classes of roadways: High Priority Interregional Corridors, Medium Priority Interregional Corridors and High Priority Regional Corridors have been established. Performance standards have been established for these roads in terms of average peak hour corridor travel speeds *(1)*.

Community Context

The Access Category System is further delineated based on the existing and planned nature of development surrounding the corridor. This further delineation recognizes that different approaches to balancing access and mobility will be needed in different community contexts.

Consistency in Category Assignments

The guidelines include criteria and procedures for the consistent assignment of access categories and subcategories to the State Trunk Highway System. The process will involve consultation between Mn/DOT Districts/Metro Division, the affected local units of government, metropolitan planning organizations, and regional development commissions.

Network Connectivity

To promote the development of a hierarchical network of interconnected roads throughout the state, the guidelines use a tiered approach to access connections. On higher order highways, access is limited and reserved first for primary, full movement intersections connecting major public streets and highways. The guidelines provide for additional secondary public street intersections at one-half the spacing of full movement intersections under certain conditions. Private driveway access is generally discouraged and provided only where alternate access to a local street is not available.

Mobility on Interregional Corridors

With the development of the Interregional Corridor System, performance measures in terms of average peak hour corridor speeds have been established for roads of statewide and regional importance. To achieve and maintain these performance measures, the guidelines discourage signal proliferation and recommend 800 m to 1600 m (**½ mile to 1 mile**) intersection spacing depending on the access subcategory and traffic conditions *(1)*.

Mobility on Urban Arterials through Coordinated Signal Progression

To maintain mobility on arterials within Subcategory B, urban/urbanizing areas, the recommended spacing of primary, full movement intersections is directly related to the spacing of signals and the need to achieve signal progression. This is because every full movement intersection represents the potential for a traffic signal. When signalized intersections are uniformly and adequately spaced, however, platoons of vehicles can travel in both directions through the corridor at uniform speeds without needing to stop for each signal. This reduces delays for through movements and increases the carrying capacity of the roadway *(2,3).*

Balancing Access and Mobility in Urbanizing Areas

In addition to promoting mobility on highways and arterials through signal progression, the guidelines also recognize the need to accommodate greater travel demands within urban/urbanizing areas. State highways and major arterials extending through urban communities serve two customers with somewhat competing needs: the through trip driver who desires to travel through the community without undue speed reductions and signal delays, and the local trip driver who needs to cross or travel on a segment of the highway to get to home, work, and services within the community. To determine the optimal balance between these competing demands, corridor simulations were conducted to compare the mobility benefits of signal progression on the mainline with overall network travel time and delays at 1600 m, 800 m and 400 m (**1 mile, ½ mile and ¼ mile**) intersection spacing *(4)*.

The guidelines also make allowance for additional unsignalized intersections at one-half the spacing of signalized intersections, but restrict turning movements to right-in/right-out only on higher volume, divided roadways. This denser network of intersecting streets may disperse traffic among multiple access points and actually eliminate or delay the need for signalization at a single intersection. The additional street access also potentially reduces the need for individual private driveways by providing a denser supporting road network for the corridor.

Variation in Type and Volume of Access

In the initial 1999 version of the Department's access guidelines, every "connection" to the highway was treated equally, regardless of its access purpose or the volume of traffic utilizing the access. While crash rates generally increase as the number of access points along a roadway increase, the absolute number of crashes also increases as the traffic volume of the access point increases. To address the different types of safety and design concerns associated with different types of access, the guidelines divide private access into three types based on traffic volume and type of land use served. Public streets are divided into two categories based on average annual traffic volumes.

Variation in Rural Highway Traffic Volumes

The guidelines also address unique access issues on rural highways where traffic volumes may be low but roadway speeds are high and the supporting local road network will remain sparsely developed. Regardless of their functional classification as principal arterials or interregional corridors, these roadways are necessarily forced to serve the dual function of mobility and access. To determine where an additional intervening intersection or low volume private entrance may be reasonably accommodated in rural areas, a method for assessing conflict risk potential has been developed *(4)*.

Provision for Exceptions and Deviations

In the long run, responsible network planning and development is the key to successful implementation of the access management guidelines. However, in the short run, the absence of an adequate supporting road network will make strict application of the guidelines to existing roadways difficult. The access rights of abutting property owners, coupled with land development that precedes full development of supporting roadways, will inevitably create a need for flexibility in guideline application.

To accommodate this need for flexibility while still promoting statewide consistency, guidelines are provided for considering Exceptions and Deviations during access permit review. The Exception process, intended for low volume accesses on lower category roadways, involves a simple expansion of the typical permit review process. The Deviation process, applicable to higher intensity access on higher category roadways, is intended as a collaborative problem-solving approach involving Mn/DOT, the property owner/developer, and the local government authorities. The process involves more review and analysis and may require special studies to evaluate alternative approaches to providing the requested access. Differentiating between Exceptions and Deviations upfront is also intended to streamline the process, promote statewide consistency in permit reviews, and focus limited Mn/DOT and local partner resources on the higher priority access permit issues.

II. Access Category System

The Access Category System includes seven primary categories and five subcategories. The primary categories are based on the functional classification of the roadway and its strategic importance within the statewide highway system. The subcategories are used to address specific facility types and differing land use patterns that surround the primary roadway.

Figure 1 provides a summary matrix of the access categories and subcategories, along with the functional class and statewide strategic importance normally associated with each. Typical posted speed is also provided to describe the range of posted speeds that may be encountered in a subcategory. These speed ranges are meant purely as descriptors and are not speed standards or guidelines for a given category.

Figure 1 – Summary of Access Categories

Category	Area Type	Functional Classification	Statewide Strategic Importance	Typical Posted Speed
1	**High Priority Interregional Corridors**			
1F	All Areas	Interstate Highways	High Priority Interregional Corridor	90 – 110 km/h (**55 – 75 mph**)
1A-F	All Areas	Principal Arterials	High Priority Interregional Corridor	90 – 110 km/h (**55 – 65 mph**)
1A	All Areas	Principal Arterials	High Priority Interregional Corridor	90 – 110 km/h (**55 – 65 mph**)
2	**Medium Priority Interregional Corridors**			
2A-F	All Areas	Principal Arterials	Medium Priority Interregional Corridor	90 – 110 km/h (**55 – 65 mph**)
2A	Rural/Exurban/ Bypass	Principal Arterials	Medium Priority Interregional Corridor	90 – 110 km/h (**55 – 65 mph**)
2B	Urban/Urbanizing	Principal Arterials	Medium Priority Interregional Corridor	60 – 90 km/h (**40 – 55 mph**)
2C	Urban Core	Principal Arterials	Medium Priority Interregional Corridor	50 – 60 km/h (**30 – 40 mph**)
3	**High Priority Regional Corridors**			
3A-F	All Areas	Principal Arterials	High Priority Regional Corridor	90 – 110 km/h (**55 – 65 mph**)
3A	Rural/Exurban/ Bypass	Principal/Minor Arterials	High Priority Regional Corridor	70 – 110 km/h (**45 – 65 mph**)
3B	Urban/Urbanizing	Principal /Minor Arterials	High Priority Regional Corridor	60 – 70 km/h (**40 – 45 mph**)
3C	Urban Core	Principal/Minor Arterials	High Priority Regional Corridor	50 – 60 km/h (**30 – 40 mph**)
4	**Principal Arterials in Primary Trade Centers**			
4A-F	All Areas	Principal Arterials	Metro/Major Urban	90 – 110 km/h (**55 – 65 mph**)
4A	Rural/Exurban/ Bypass	Principal Arterials	Metro/Major Urban	70 – 90 km/h (**45 – 55 mph**)
4B	Urban/Urbanizing	Principal Arterials	Metro/Major Urban	60 – 70 km/h **(40 – 45 mph**)
4C	Urban Core	Principal Arterials	Metro/Major Urban	50 – 60 km/h (**30 – 40 mph**)
5	**Minor Arterials**			
5A	Rural/Exurban/ Bypass	Minor Arterials		70 – 90 km/h (**45 – 55 mph**)
5B	Urban/Urbanizing	Minor Arterials		60 – 70 km/h **(40 – 45 mph**)
5C	Urban Core	Minor Arterials		50 – 60 km/h (**30 – 40 mph**)
6	**Collectors**			
6A	Rural/Exurban/ Bypass	Collectors		70 – 90 km/h (**45 – 55 mph**)
6B	Urban/Urbanizing	Collectors		60 – 70 km/h **(40 – 45 mph**)
6C	Urban Core	Collectors		50 – 60 km/h (**30 – 40 mph**)
7	**Special Access Plan**			
7	All	All	All	All

Notes

A. Primary Category Descriptions

Category 1 – High Priority Interregional Corridors

Access Category 1 is intended for High Priority Interregional Corridors that connect Primary Trade Centers with the Twin Cities Metropolitan Area. According to the Interregional Corridor system plan, these roadways are key corridors providing interstate and intrastate travel. Performance measures for High Priority Interregional Corridors have been established and are based on an average peak hour corridor travel speed of 100 km/h (**60 mph**) or more. Access management along these corridors strongly emphasizes mobility. The functional class of these roadways is either Interstate or Principal Arterial.

Category 2 – Medium Priority Interregional Corridors

Access Category 2 is intended for Medium Priority Interregional Corridors that connect Secondary Trade Centers to Primary Centers. According to the Interregional Corridor System plan, these roadways are corridors of significant importance, providing interstate and intrastate travel. Performance measures for Medium Priority Interregional Corridors have been established and are based on average peak hour corridor travel speeds of 90 km/h (**55 mph**) or more. Access management along these corridors strongly emphasizes mobility. The functional class of roadways within this access category is Principal Arterial.

Category 3 – High Priority Regional Corridors

Access Category 3 is intended for Regional Corridors that connect the smaller trade centers to the rest of the state. The primary function of these roadways is to provide mobility between smaller communities within the state, though in some cases where a supporting road network or a hierarchical grid pattern has not been established, these roadways will also provide access to adjacent properties. Regional Corridors are expected to operate at an average peak hour speed of 80 km/h (**50 mph**) or more. The functional classification of these roadways may be either Principal Arterial or Minor Arterial.

Category 4 – Principal Arterials in Primary Trade Centers

Access Category 4 is intended primarily for roadways designated as Principal Arterials within the Twin Cities Metro Area and Primary Regional Trade Centers. These roadways are intended to provide the mobility element of a larger roadway network. Lower category roadways feed into these roadways. Within the Twin Cities Metropolitan Area, an average corridor travel speed of 65 km/h (**40 mph**) is the desired performance target. These roadways range from fully grade-separated facilities to two-lane urban streets.

Category 5 – Minor Arterials

Access Category 5 is intended primarily for roadways designated as Minor Arterials. These roadway segments can serve both as mobility corridors and as the primary road for accessibility. There is great variability among the roadways in Minnesota that are functionally classified as Minor Arterials. In fully developed urban cores and central business districts, they tend to carry high volumes of traffic and provide a high degree of access as well. As a result, posted speeds may be in the range of 50-55 km/h (**30-35 mph**), with much lower peak hour operating speeds due to congestion. In urban/urbanizing areas, Minor Arterials carry longer 5 to 8 km (**3 to 5 mile**) sub-regional trips with typical

posted speeds ranging from 65-90 km/h (**40-55 mph**). In these settings, access needs to be more carefully managed. In rural areas with much less dense development and no supporting road network, Minor Arterials may be required to accommodate higher travel speeds while also providing direct access to adjacent properties.

Category 6 – Collector

Access Category 6 is intended primarily for roadways designated as Collectors. Their primary function is to provide access to the adjacent land by serving as a connection between the local street network and the arterial roadways. Like Minor Arterials in rural areas, Collectors may be required to accommodate both higher speed travel and direct property access.

Category 7 – Specific Access Management Plans

This category is intended to address roadway segments where a specific access management plan has been developed. The specific plan approach may provide a long-term retrofit strategy in areas where existing developments do not meet recommended access spacing and allowance and will likely prevent future development from fully conforming to access guidelines. The specific access plan should identify all existing and proposed points of access, traffic signals, and roadway design elements. The plan should also address existing and proposed land use and the supporting road network. The specific access management plan should specify existing non-conforming access points and the conditions under which such access shall be brought into compliance with the plan. Category 7 Plans must be officially endorsed by Mn/DOT and the local land use and road authorities.

B. Access Subcategories

For each access category type discussed above, a range of subcategories is provided to address differing land use conditions along each roadway segment. With the understanding that a roadway may change character as it passes through or around a community, these subcategories were developed to recognize general land-use patterns adjacent to the roadway and the intended purpose of the roadway.

Subcategory F – Freeway

This subcategory is intended for roadway segments designated as Interstate Highways. This access designation is independent of the surrounding land use. No private access is permitted and public access will be permitted only at grade-separated interchanges.

Subcategory A-F – Full Grade Separation

This subcategory is intended for those roadway segments planned or designed to be fully grade separated. This access designation is independent of the surrounding land use. No private access is permitted and public access will be restricted to interchanges only. This subcategory will typically be associated with a segment of a four lane divided expressway as it passes through or around an urban center.

Subcategory A – Rural/Exurban/Bypass Areas

This subcategory is intended for road segments extending through agricultural or forested areas with limited development. It will also be assigned to areas planned as long term low-density exurban areas characterized by scattered large lot residential development and limited commercial and industrial land use. This sub-category is also intended for roadway segments that have been designed and constructed as high-speed urban bypasses. Roadways in this sub-category will generally be expected to operate at higher speeds, typically 80 km/h (**50 mph**) or more.

Subcategory B – Urban/Urbanizing Areas

This subcategory is intended for areas outside of urban cores that are either urbanized or planned for urbanization with a full range of urban services, especially a local supporting street network. This subcategory will generally apply to areas within municipal boundaries. In cases where this subcategory is applied to areas experiencing or anticipating urban development outside municipal boundaries, Mn/DOT will expect the local land use authority ---township or county--- to manage development and ensure property access is available through the local road network. In assigning Urban/Urbanizing designations to trunk highways, Mn/DOT will consider the adopted plans, development regulations, and local street extension plans and policies of the local community. This subcategory is not intended to be assigned to short roadway segments serving individual, isolated developments. Roadways in this sub-category will generally be expected to operate at a somewhat reduced speed compared to the overall corridor.

Subcategory C – Urban Core

In general, this designation is intended only for roadways extending through fully developed town centers and central business districts, characterized by short blocks and a grid system of intersecting streets. Individual lots will typically be small, 0.10 ha (**1/4 acre**) or less, with little or no on-site parking. Buildings will usually be situated close to the street. Sidewalks and on-street parking are common. In some larger urban areas, the major thoroughfare through the urban core no longer serves as the primary mobility corridor but has been supplemented by the construction of additional highways, arterials, and/or bypasses. Jurisdiction of the older roadway may have been transferred from Mn/DOT to the city or county. In some smaller communities or regional centers, however, additional roadways and by-passes will not be present due to the lack of overall travel demand or environmental constraints, and the major thoroughfare must accommodate both local and through trips. In this case, lower speeds on the highway through the urban core can be expected.

If a community desires to promote a new pedestrian-oriented urban core, such an area should be designed and oriented to attain access to the larger roadway network via lower category roads, such as Collectors and, perhaps, some Minor Arterials. Therefore, in general, new or expanded urban core area subcategory will only be assigned to roadways within Access Category 5 and 6.

III. Access Category Assignment Process

The access category assignment process will involve a two-phase process. In Phase 1, Mn/DOT will make preliminary assignments based on the category definitions outlined previously in Section II and the process outlined below. Preliminary category assignments will be completed in mid 2002 and adopted on an interim basis for use with the access spacing guidelines. Phase 2 will involve review and consultation with the affected local units of government to determine any further adjustments in category assignments to reflect local growth plans. This local consultation process should be completed by the end of 2002.

A. Phase I: Preliminary Assignments

In Phase 1, Mn/DOT will adopt a set of preliminary assignments. The Office of Investment Management will make the initial assignments based on the category definitions described in Section II of these Guidelines and the criteria outlined below. Districts and the Metro Division will then be asked to review and recommend further adjustments. To promote statewide consistency in approach, preliminary assignments will be reviewed and approved by the Directors of Program Support, District Operations, and the Metropolitan Division.

Primary Category Assignments

The primary access category will be based on the functional class of the roadway and its strategic importance within the statewide system. Category assignments should reflect the future or long-term function of the roadway over a 20-year planning horizon, rather than the existing condition of the roadway. Existing access conditions along the roadway need not conform to the recommended spacing or allowance for that roadway category.

Within growing urban areas, a roadway may be assigned to a higher access category than its current functional classification would suggest because of its potential future function within the larger network of roadways. For example, a roadway currently classified as a Minor Arterial may be identified as a future Principal Arterial in the long range District, Metropolitan, or Regional Transportation Plan.

In very low-density rural areas where urbanization is not anticipated, a roadway may need to serve a greater access function than normally associated with its functional classification. In these cases, a roadway classified functionally as a Minor Arterial may be assigned, for access management purposes, to the lower Access Category typically associated with a Collector road.

Decisions to assign a roadway to a higher or lower access category should be based on Mn/DOT's Statewide Transportation Plan, Mn/DOT District Plans, and the Metropolitan Divisions' Transportation System Plan, as well as applicable Metropolitan or Regional Growth Plans. Special care should be given to maintaining consistency in category assignments across District boundaries.

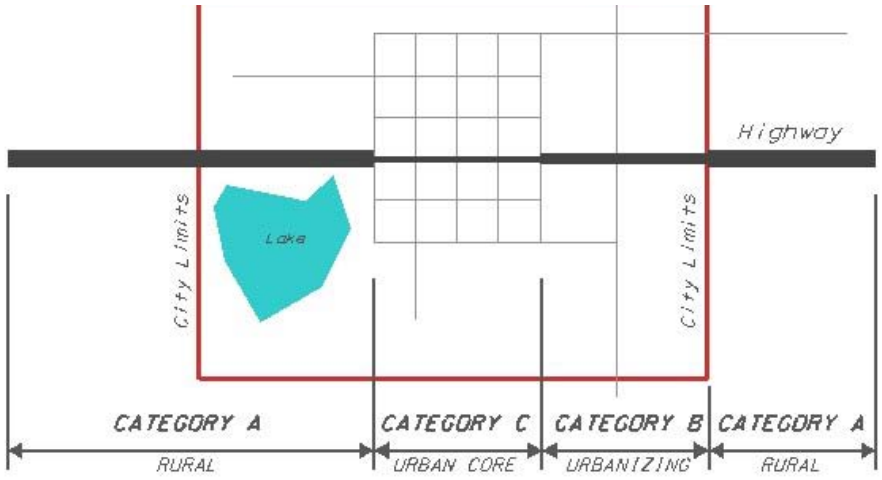
Subcategory Assignments

Subcategory assignments will reflect consideration of facility type, existing and planned municipal boundaries, and exiting and planned urbanization.

In assigning subcategories, the first consideration will be type of facility. If the roadway segment is part of the interstate freeway system, it will be assigned Subcategory F. If the roadway segment is fully grade separated, or planned to be fully grade separated based on a long-range corridor plan, that segment will be assigned to Subcategory A-F. Roadway segments identified as a High Priority Interregional Corridor (Access Category 1) but not planned for full grade separation will be assigned to Subcategory A, Rural/Exurban/Bypass, regardless of the surrounding land use.

The next consideration will be the existing or planned land use surrounding the roadway segment. Within municipalities, roadways will generally be assigned to Subcategory B, Urban/Urbanizing, or Subcategory C, Urban Core, consistent with the definitions established in Section II.B*, Access Subcategories*. Existing development patterns and local growth plans will be reviewed to determine the appropriate subcategory delineation. In some geographically large municipalities, such as incorporated former townships, full urbanization within the next 20+ years may not be anticipated. Road segments extending through areas of municipalities planned to remain rural will be assigned to Subcategory A, Rural.

Figure 2
Example of Subcategory Assignment Through a City



Roadway segments outside municipalities will generally be designated Rural (Subcategory A) unless the area is undergoing or planned for urban scale development. Special attention will be given to those transition areas on the fringe of growing municipalities where local zoning permits urban type development without corresponding requirements for streets and utilities. Since the recommended direct private access allowance in Rural Areas is more permissive than in Urban/Urbanizing areas, it will be important to categorize these fringe transition areas appropriately to maintain long-term safety and mobility goals on the corridor.

Within the Twin Cities Metropolitan Area, all land within the designated 2020 Metropolitan Urban Service Area, as well as the 2040 Urban Reserve, will be assigned to either the Urban/Urbanizing or Urban Core subcategory.

The Urban Core designation (Subcategory C) will generally apply to established town centers only. Within the Twin Cities Metropolitan Area, the Urban Core designation will generally apply to roadways within the Central Cities of Minneapolis and St. Paul, those first ring suburbs developed with a fine grain grid pattern of connecting streets, and older town centers in suburbs and freestanding growth centers.

If a community desires to promote a new pedestrian-oriented urban core, the new Core should be designed and oriented towards internal local streets, Collectors, and in some cases, Minor Arterials. Therefore, in general, a new or expanded urban core designation will only be assigned to roadways within Access Category 5 (Minor Arterials) and 6 (Collectors).

Additional Guidelines – The following additional criteria will be used in assigning access categories and subcategories.

- In most cases, all access category segments will begin at an intersection or access point. One exception may involve assigning Subcategory B, Urbanizing. In some cases, the termini will begin or end at the city limits.
- Interchanges will be considered a single access point for the purposes of determining the terminus of a roadway segment. If a roadway segment ends at an interchange, the terminus will be assigned to the centerline of the cross street intersecting the centerline of the major roadway.
- Interregional Corridors and Regional Corridors terminate at the I-694/I-494 beltway within the Twin Cities Metropolitan Area.
- The subcategory designation should not be changed for isolated anomalies (*e.g., a small developed, but unincorporated area along one side of a Subcategory A, Rural, roadway or an isolated interchange along a signalized corridor*).
- The subcategory designation should not be changed for roadway segments that are shorter than the recommended intersection spacing for the access category.
- The access category designation should reflect the desired access category for a roadway, not the existing conditions of the roadway.

B. Phase 2: Local Review and Consultation

Once the preliminary assignments are completed, review and consultation with the affected local units of governments will begin. In some cases, this review may actually commence during the preliminary assignment process as Districts or the Metropolitan Division consult with their local partners on growth plans. Metropolitan and Regional Planning Agencies will also be consulted during this process.

It is anticipated that this consultation process may lead some local communities to identify a need for additional long range planning in order to define areas of future urbanization. In these cases, Mn/DOT, in consultation with the local unit of government, will assign access categories on an interim basis pending the outcome of future planning.

Following completion of the local review and consultation process, the category assignments for the trunk highways will be adopted. The Office of Investment Management will maintain an inventory of the category assignments for the trunk highway system.

C. Amending Access Category Assignments

It is anticipated that amendments to the access category assignments may be warranted over time in response to the adoption of new comprehensive plans and municipal annexation agreements at the local level, the completion of Interregional Corridor Plans at the state level, or changes in road design or road authority at all levels.

For example, a municipality may adopt a new comprehensive plan with expanded urban growth boundaries. The plan may indicate the need to extend Subcategory B, Urbanizing, into a roadway segment previously assigned as Subcategory A, Rural. This amendment would be warranted provided it is consistent with the long range corridor plan adopted by Mn/DOT and the local government partners and the community has adopted clear plans, policies, and regulations to ensure that development in this growth area will be supported by adequate local roads.

IRC Management Plans may also identify the need to amend category assignments. Through the corridor planning process, access category assignments will be reviewed and either confirmed or amended. For example, a Corridor Management Plan may conclude that continued development supported by at-grade signalized intersections will no longer provide the desired level of mobility in the corridor. The plan may indicate that a segment of the roadway extending through a high growth community that is currently designated as an Access Category 2B roadway should be reconstructed as a fully grade separated segment. The access category would then be amended to Category 2A-F to guide future planning and development of the area.

Specific access management plans developed by Mn/DOT in partnership with the affected local governments may also lead to amendments in access category assignments. In many cases, a specific Category 7 plan and designation may be the outcome.

While amendments to the category assignments are to be expected, they should be the result of careful planning and consultation among all the corridor partners. Local units of government and regional or metropolitan planning organizations may also initiate modifications to the category assignments for state highways extending through their jurisdictions. Under no circumstances will a change in access category assignment be made solely to accommodate a specific access request or to allow the permitting of access connections that would otherwise be in conflict with these guidelines. All requests should include information pertaining to the criteria for access category assignments set forth above and an explanation for the requested change.

IV. Access Types

Access types have been developed to differentiate among access connections based on the type of access connection, whether public or private, and the volume of traffic generated.

A. Access Type Descriptions

The five access types are described below and summarized in Figure 3.

Figure 3
Summary of Access Types

Access Type	Land Use	Access Description
1	Residential/ Agricultural/ Field Access	For access to Single Family Dwellings, Multifamily Dwellings of 3 or Fewer Dwelling Units, Agricultural Land and Field Entrances
2	Low Volume Private Entrances	Small Commercial, Industrial, and Institutional Developments and Small Residential Complexes and Subdivisions (less than 100 trips per day)
3	High Volume Private Entrances	Large Commercial, Industrial, and Institutional Developments, Shopping Centers, Industrial and Office Parks, Colleges and Large Residential Complexes and Subdivisions (100 trips per day or more)
4	Low Volume Public Streets	New Public Streets and Roadways with a Projected 20-year Traffic Volume less than 2,500 AADT
5	High Volume Public Streets	New Public Streets and Roadways with a Projected 20-year Traffic Volume greater than or equal to 2,500 AADT

Notes:

Trip – A trip is a one-way movement. Typically 100 trips per day would mean 50 vehicles entering an access and 50 vehicles exiting an access.

AADT – Average Annual Daily Traffic volume

Access Type 1 – Residential, Agricultural and Field Entrances

Type 1 accesses are private driveways to single-family residences, multifamily residential dwellings of three dwelling units or less, and field or agricultural entrances. These entrances may serve either small lots or large tracts of agricultural land, but always generate low traffic volumes.

Access Type 2 – Minor Private Entrances

Type 2 accesses are private entrances to small commercial, industrial, or institutional developments and small residential complexes and subdivisions. Developments served by Type 2 entrances generate less than 100 trips per day. These access points may be designed as driveways, entrances, or in some cases, private streets.

Access Type 3 – Major Private Entrances

Type 3 accesses are private accesses to large commercial, industrial, or institutional developments and large residential complexes and subdivisions. Developments served by Type 3 entrances generate 100 trips per day or more. These access points may be designed as driveways, entrances, or private streets.

Access Type 4 – Minor Public Roadways

Type 4 accesses are public streets with an estimated 20-year AADT of less than 2,500. These public streets are intended to be part of a larger street network and to serve multiple properties.

Access Type 5 – Major Public Roadways

Type 5 accesses are public streets with an estimated 20-year AADT of more than 2,500. Accesses generating traffic volumes in this range may require signalization. These public streets are intended to be part of a larger street network and to serve multiple properties.

B. Estimating Trip Generation

Estimates of daily one-way trips generated from development generally may be determined by using the Institute of Transportation Engineers' *Trip Generation Manual (5).* Some examples of the trip generation typically associated with common land uses are provided in Figure 4. When the ITE *Trip Generation Manual* is available, it should be consulted to estimate daily trips.

In some cases, the *Trip Generation Manual (5)* does not reference the specific type of development in question or does not have sufficient studies to provide a valid estimate of daily trips. This is especially true for freestanding small businesses. In these cases, the daily trips generated by a business may be estimated by adding together the following:

1. The number of trips made by employees coming to work, going home, going to lunch, etc.

2. The number of trips made by customers, both coming and going

3. The number of deliveries, both inbound and outbound

Larger or more complex land uses may require a study to determine the daily trip generation rate. The study should include examples of similar development types and sizes.

Figure 4 –Trip Generation for Selected Land Uses

Land Use	ITE Code (a)	Size	Daily Trips
Single Family Home	210	1 dwelling unit	10
4 Unit Residential Subdivision	210	4 dwelling units	40
Apartment	220	1 dwelling unit	7
Small Service or Retail (Antique shop, snowmobile repair shop, florist, etc…) **Total**		2 employees 4 deliveries 30 customers	8 8 60 **76**
General Office Building	710	30 employees	100
Mini-Warehouse	151	100 Storage Units	30
Golf Course Townhouses **Total**	430 230	18 holes 30 homes	675 315 **990**
Motel	320	50 rooms	300
Junior/Senior High School	522 & 530	1,000 students	1,600
Small Supper Club (Low turnover, quality restaurant)	831	450 m2 (**5000 sf**) 160 seats	450
Chain Restaurant (Perkins, Applebees, etc.) (High turnover, under an hour)	832	450 m2 (**5000 sf**) 135 seats	650
Sub Shop/Fast Food (Subway, etc.)	833	90 m2 (**1000 sf**)	600
Fast Food Restaurant with Drive-Through	834	270 m2 (**3,000 sf**)	1,500
Gas Station or Gas Station Convenience	844/845	8 pumps	1,350
Video Rental	(Note b)	450 m2 (**5000 sf**)	550
Bank with Drive-Through Window	912	270 m2 (**3,000 sf**)	800
Office Building	715	4500 m2 (**50,000 sf**) 150 employees	550
Strip Mall with Retail, Restaurant & Small Offices	814	1800 m2 (**20,000 sf**)	800
Supermarket	850	4500 m2 (**50,000 sf**)	5,500
New Car Sales	841	2300 m2 (**25,000 sf**)	950
Building Supply & Lumber Store	812	900 m2 (**10,000 sf**)	400
Electronics Superstore	863	2700 m2 (**30,000 sf**)	1,350
Target™ Store	(Note b)	11 700 m2 (**126,000 sf**)	7,400
General Light Industrial	110	4 ha (**10 acres**)	500
Industrial Park	130	4 ha (**10 acres**)	625

Notes:

(a) ITE Code refers to the land use code from *Trip Generation*, Sixth Edition *(5)*.

(b) Trip Generation based on study for the City of Northfield by Yaggy/Colby

V. Access Spacing Guidelines

For each access category, guidelines have been developed for the recommended spacing of public intersections, as well as private driveways and entrances. The recommended spacing by access category is summarized in Figure 5 and 5M. Additional guidelines for applying these recommendations to specific situations are provided below. In addition, guidelines have been developed for the recommended spacing and timing of traffic signals on the higher category roadways.

Figure 5 – Summary of Recommended Access Spacing and Allowance

Category	Area or Facility Type	Typical Functional Class	Intersection Spacing		Signal Spacing	Private Access
			Primary Full Movement Intersection	Conditional Secondary Intersection		
1	**High Priority Interregional Corridors**					
1F	Freeway	Principal Arterials	Interchange Access Only		⊘	⊘
1A-F	Full Grade Separation		Interchange Access Only		⊘	⊘
1A	Rural, ExUrban & By Pass		1 mile	1/2 mile	INTERIM ONLY By Deviation Only	By Deviation Only
2	**Medium Priority Interregional Corridors**					
2A-F	Full Grade Separation	Principal Arterials	Interchange Access Only		⊘	⊘
2A	Rural, ExUrban & By Pass		1 mile	1/2 mile	STRONGLY DISCOURAGED By Deviation Only	By Exception or Deviation Only
2B	Urban Urbanizing		1/2 mile	1/4 mile	STRONGLY DISCOURAGED By Deviation Only	By Exception or Deviation Only
2C	Urban Core		300-660 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
3	**High Priority Regional Corridors**					
3A-F	Full Grade Separation	Principal and Minor Arterials	Interchange Access Only		⊘	⊘
3A	Rural, ExUrban & By Pass		1 mile	1/2 mile	1 mile	Permitted Subject to Conditions
3B	Urban Urbanizing		1/2 mile	1/4 mile	1/2 mile	By Exception or Deviation Only
3C	Urban Core		300-660 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
4	**Principal Arterials in Primary Trade Centers**					
4A-F	Full Grade Separation	Principal Arterials	Interchange Access Only		⊘	⊘
4A	Rural, ExUrban & By Pass		1 mile	1/2 mile	1 mile	By Deviation Only
4B	Urban Urbanizing		1/2 mile	1/4 mile	1/2 mile	By Exception or Deviation Only
4C	Urban Core		300-660 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
5	**Minor Arterials**					
5A	Rural, ExUrban & By Pass	Minor Arterials	1/2 mile	1/4 mile	1/2 mile	Permitted Subject to Conditions
5B	Urban Urbanizing		1/4 mile	1/8 mile	1/4 mile	By Exception or Deviation Only
5C	Urban Core		300-660 feet dependent upon block length		1/4 mile	Permitted Subject to Conditions
6	**Collectors**					
6A	Rural, ExUrban & By Pass	Collectors	1/2 mile	1/4 mile	1/2 mile	Permitted Subject to Conditions
6B	Urban Urbanizing		1/8 mile	Not Applicable	1/4 mile	
6C	Urban Core		300-660 feet dependent upon block length		1/8 mile	
7	**Specific Access Plan**					
7	All	All	By Adopted Plan			

Figure 5M – Summary of Recommended Access Spacing and Allowance

Category	Area or Facility Type	Typical Functional Class	Intersection Spacing		Signal Spacing	Private Access
			Primary Full Movement Intersection	Conditional Secondary Intersection		
1	**High Priority Interregional Corridors**					
1F	Freeway	Principal Arterials	Interchange Access Only		⊘	⊘
1A-F	Full Grade Separation		Interchange Access Only		⊘	⊘
1A	Rural, ExUrban & By Pass		1.6 km	800 m	INTERIM ONLY By Deviation Only	By Deviation Only
2	**Medium Priority Interregional Corridors**					
2A-F	Full Grade Separation	Principal Arterials	Interchange Access Only		⊘	⊘
2A	Rural, ExUrban & By Pass		1.6 km	800 m	STRONGLY DISCOURAGED By Deviation Only	By Exception or Deviation Only
2B	Urban Urbanizing		800 m	400 m	STRONGLY DISCOURAGED By Deviation Only	By Exception or Deviation Only
2C	Urban Core		90 m to 200 m dependent upon block length		400 m	Permitted Subject to Conditions
3	**High Priority Regional Corridors**					
3A-F	Full Grade Separation	Principal and Minor Arterials	Interchange Access Only		⊘	⊘
3A	Rural, ExUrban & By Pass		1.6 km	800 m	1.6 km	Permitted Subject to Conditions
3B	Urban Urbanizing		800 m	400 m	800 m	By Exception or Deviation Only
3C	Urban Core		90 m to 200 m dependent upon block length		400 m	Permitted Subject to Conditions
4	**Principal Arterials in Primary Trade Centers**					
4A-F	Full Grade Separation	Principal Arterials	Interchange Access Only		⊘	⊘
4A	Rural, ExUrban & By Pass		1.6 km	800 m	1.6 km	By Deviation Only
4B	Urban Urbanizing		800 m	400 m	800 m	By Exception or Deviation Only
4C	Urban Core		90 m to 200 m dependent upon block length		400 m	Permitted Subject to Conditions
5	**Minor Arterials**					
5A	Rural, ExUrban & By Pass	Minor Arterials	800 m	400 m	800 m	Permitted Subject to Conditions
5B	Urban Urbanizing		400 m	200 m	400 m	By Exception or Deviation Only
5C	Urban Core		90 m to 200 m dependent upon block length		400 m	Permitted Subject to Conditions
6	**Collectors**					
6A	Rural, ExUrban & By Pass	Collectors	800 m	400 m	800 m	Permitted Subject to Conditions
6B	Urban Urbanizing		200 m	Not Applicable	400 m	
6C	Urban Core		90 m to 200 m dependent upon block length		200 m	
7	**Specific Access Plan**					
7	All	All	By Adopted Plan			

A. Public Intersection Spacing

General Guidelines for all Access Categories

1. The location of intersections should conform to the recommended spacing for the access category assigned to the roadway segment. All access requests for public intersections that do not conform to the recommended spacing will be approved only as an Exception or Deviation per Section VI of these guidelines.

2. The intersecting street should be planned as a public way connecting to the existing or planned extension of the local street network. Intersections serving short isolated public street networks or cul-de-sacs should only be provided if necessary to provide reasonable access to the highway system due to existing topographic constraints or historic development patterns.

3. All intersection locations should meet the minimum intersection sight distance requirements set forth in the Mn/DOT Road Design Manual *(7)*, Section 5-2.02.

4. Intersection spacing should be measured from cross street centerline to cross street centerline along the primary highway. Minor variance, within 5% of the recommended spacing, should be considered to constitute conformance to the spacing guidelines if required to accommodate topographical constraints or connectivity to the established road network. Intersection spacing within 5% of the recommended distance should, in most cases, provide sufficient space to accommodate turn lanes, weaving maneuvers, and signal progression.

5. Breaks in existing access control to construct a new intersection consistent with these guidelines may be considered if necessary to provide reasonable access and network connectivity to the surrounding area. However, existing access control should not be interrupted on Category 1F, 1A-F, 2A-F, 3A-F, and 4A-F roadways.

6. Private entrances may be considered as public intersections if they are designed to serve a large development area encompassing multiple properties or buildings with a clearly defined system of internal private streets connected by cross access agreements and they do not negatively impact the accessibility of adjacent land areas by disrupting the connectivity of the local supporting street network.

Category 1F **(High Priority Interregional Corridors – Freeway)**

1. At-grade intersections are not permitted. Category 1F roadways are interstate freeways. Access is provided by grade-separated interchanges only.

Category 1A-F **(High Priority Interregional Corridors – Full Grade Separated)**
Category 2A-F **(Medium Priority Interregional Corridors – Full Grade Separated)**
Category 3A-F **(High Priority Regional Corridors – Full Grade Separated)**
Category 4A-F **(Principal Arterials in Primary Trade Centers – Full Grade Separated)**

1. At-grade intersections should not be permitted. Access should be provided by grade-separated interchanges only. Interchange spacing should be based on an overall corridor management plan.

2. On existing roadway segments that are planned to transition to A-F over time, full movement at-grade intersections may be provided at 1.6 km (**1 mile**) spacing on an interim basis if a plan is established for eventual replacement by an interchange or closure and connection to the supporting road network.

3. On existing roadway segments that are planned to transition to A-F over time, additional right-in/right-out intersections may be provided 800 m (**½ mile**) from full movement intersections on an interim basis if there is a plan established for eventual closure and connection to the supporting road network.

4. The first full movement public street intersection on the mainline outside of the A-F segment should be spaced 1.6 km (**1 mile**) from the cross street of the last interchange. There should be no intervening access within this transition area.

Category 1A **(High Priority Interregional Corridors – Rural, Exurban, Bypass)**
Category 2A **(Medium Priority Interregional Corridors – Rural, Exurban, Bypass)**
Category 3A **(High Priority Regional Corridors – Rural, Exurban, Bypass)**
Category 4A **(Principal Arterials in Primary Trade Centers – Rural, Exurban, Bypass)**

1. Primary, full movement intersections should be spaced at 1.6 km (**1 mile**) intervals.

2. Intervening secondary intersections may be provided 800 m (**½ mile**) from primary full movement intersections if all of the following conditions are met:

    a. On existing or planned two-lane undivided highways, an intervening intersection may be provided if the analysis of future traffic conditions, per Section *D., Gap Analysis Procedure,* indicates a low risk conflict condition can be maintained. If the analysis indicates a high risk conflict condition is anticipated, the intervening intersection should not be allowed.

    b. On existing or planned divided highways, the intervening secondary intersection may provide full movement if the analysis of future traffic conditions per Section *D., Gap Analysis Procedure*, indicates a low risk conflict condition can be maintained. A full movement, intervening secondary intersection will be subject to future conversion to a right-in/right-out or ¾ movement (right-in/right-out/left-in only) intersection if increased traffic growth creates a high risk conflict potential.

If the analysis indicates that a full movement intersection would create a high risk conflict condition, further analysis per Section *D., Gap Analysis Procedure,* should be conducted to determine if restricting the intersection to right-in/right-out only would maintain a low risk conflict condition. If the analysis indicates that a high risk conflict condition would still be created, the intervening intersection should not be allowed, or it should be restricted to a right-in only if practical given the supporting road network.

Category 5A (Minor Arterials – Rural, Exurban, Bypass)
Category 6A (Collectors – Rural, Exurban, Bypass)

1. Primary full movement intersections should be spaced at 800 m (½ **mile**) intervals.

2. Intervening secondary intersections may be provided 400 m (¼ **mile**) from primary full movement intersections if all of the following conditions are met:

   a. On existing or planned two-lane undivided highways, an intervening intersection may be provided if the analysis of future traffic conditions, per Section *D., Gap Analysis Procedure,* indicates a low risk conflict condition can be maintained. If the analysis indicates a high risk conflict condition is anticipated, the intervening intersection should not be allowed.

   b. On existing or planned divided highways, the intervening secondary intersection may provide full movement if the analysis of future traffic conditions, per Section *D., Gap Analysis Procedure,* indicates a low risk conflict condition can be maintained. A full movement, intervening secondary intersection will be subject to future conversion to a right-in/right-out or ¾ movement (right-in/right-out/left-in only) intersection if increased traffic growth creates a high risk conflict potential.

      If the analysis indicates that a full movement intersection would create a high risk conflict condition, further analysis per Section *D., Gap Analysis Procedure,* should be conducted to determine if restricting the intersection to right-in/right-out only would maintain a low risk conflict condition. If the analysis indicates that a high risk conflict condition would still be created, the intervening intersection should not be allowed, or restricted to a right-in only if practical given the supporting road network.

Category 2B **(Medium Priority Interregional Corridors – Urban, Urbanizing)**
Category 3B **(High Priority Regional Corridors – Urban, Urbanizing)**
Category 4B **(Principal Arterials in Primary Trade Centers – Urban, Urbanizing)**

1. Primary full movement intersections should be spaced at 800 m (½ **mile**) intervals.

2. Intervening secondary intersections may be provided 400 m (¼ **mile**) from primary, full movement intersections under the following conditions:

   a. On existing or planned two-lane undivided highways, an intervening intersection may be provided if the analysis of future traffic conditions, per Section *D., Gap Analysis Procedure,* indicates a low risk conflict condition can be maintained. If the analysis indicates a high risk conflict condition is anticipated, the intervening intersection should not be provided.

      Note: The gap analysis methodology for two-lane undivided roadways can be applied in urban/urbanizing areas, based on the assumption that the roadway corridor will have a limited number of signals and, therefore, operate under a condition of random arrivals.

   b. On existing or planned divided highways, the intervening secondary intersection should be restricted to right-in/right-out only. Alternatively, to relieve left-turn demand at adjacent signalized intersections, the intervening intersection may be designed for ¾ movement (right-in/right-out/left-in only) movement upon recommendation of the District/Division Engineer.

      *Note: The gap analysis methodology for divided roadways is not applicable to divided roadways in urban/urbanizing areas because it assumes a random arrival condition. In Subcategory B areas, it is assumed that the primary intersections may require signalization at some point. Coordinated signal progression at 800 m (½ **mile**) spacing would prevent full access at 400 m (¼ **mile**) spacing because platooning traffic flow would never create a gap in both directions at the same time. However, the platooning effect of coordinated signal progression should provide adequate gaps to accommodate right-in/right-out and ¾ movement (right-in/right-out/left-in only) intersections.*

Category 5B (Minor Arterials – Urban, Urbanizing)

1. Primary, full movement intersections should be spaced at 400 m (¼ **mile**) intervals.

2. Intervening secondary intersections may be provided 200 m (⅛ **mile**) from primary, full movement intersections under the following conditions:

   a. On existing or planned two-lane undivided highways, an intervening intersection may be provided if the analysis of future traffic conditions, per Section *D., Gap Analysis Procedure*, indicates a low risk conflict condition can be maintained. If the analysis indicates a high risk conflict condition is anticipated, the intervening intersection should not be provided.

      Note: The gap analysis methodology for two-lane undivided roadways can be applied in urban/urbanizing areas, based on the assumption that the corridor will have limited number of signals and, therefore, operate under a condition of random arrivals.

   b. On existing divided roadways, the intervening secondary intersection should be restricted to right-in/right-out only. On planned divided roadways, access should be limited to right-in/right-out movements when the median is constructed.

Category 6B (Collectors – Urban, Urbanizing)

1. Full movement intersections should be spaced at 200 m (⅛ **mile**) intervals.

2. Intervening secondary intersections are not recommended due to the close spacing of the full movement intersections on these roadways.

Category 2C (Medium Priority Interregional Corridors – Urban Core)
Category 3C (High Priority Regional Corridors – Urban Core)
Category 4C (Principal Arterials in Primary Trade Centers – Urban Core)
Category 5C (Minor Arterial – Urban Core)
Category 6C (Collectors – Urban Core)

1. Full movement intersections should be spaced at intervals ranging from 90 m to 200 m (**300 feet to 660 feet**), depending on the established block length of the existing street grid system.

B. Signal Spacing and Operation Guidelines

The signal spacing guidelines have been developed to promote the balance between mobility and accessibility. For both isolated traffic signals and coordinated systems, the recommended spacing of signals is consistent with the recommended spacing of full movement intersections, with two exceptions: Interregional Corridors and Urban Core Areas.

In addition to spacing considerations, all signals must conform to the guidelines established in the Minnesota Manual of Uniform Traffic Control Devices (MN MUTCD) *(6)*.

Signalized access should generally be reserved for public street intersections that provide access to the adjacent land area through an interconnected network of public streets. Signalized access to a private entrance should only be considered if:

1. The proposed signalized access is designed to serve a large development area encompassing multiple properties or buildings with a system of internal private roadways connected by cross access easements;

2. The access does not negatively impact the accessibility of adjacent land areas by disrupting the connectivity of the local supporting road network;

3. The proposed signalized access conforms to the full movement intersection spacing guidelines in Section *V.A, Public Intersection Spacing*.

The recommended spacing for signalized intersections is shown below. Signal requests for new or existing access points that would not conform to the recommended signal spacing will be approved only as a Deviation (for a Type 3 or 5 Access) per Section *VI, Exceptions and Deviations*.

Category 1F (High Priority Interregional Corridors – Freeway)

Access is provided by grade-separated interchange only. No signals are allowed on freeways.

Category 1A-F (High Priority Interregional Corridors – Full Grade Separated)
Category 2A-F (Medium Priority Interregional Corridors – Full Grade Separated)
Category 3A-F (High Priority Regional Corridors – Full Grade Separated)
Category 4A-F (Principal Arterials in Primary Trade Centers – Full Grade Separated)

Access is provided by grade-separated interchange only. No signals are allowed on fully-grade separated roadway segments.

On existing roadway segments that are planned to transition to Subcategory A-F over time, signalized intersections at 1.6 km (**1 mile**) spacing may be provided on an interim basis if there is a plan established for eventual replacement by an interchange or closure and connection to the supporting road network. Interim signals should only be considered after all other alternatives have been examined.

Category 1A (High Priority Interregional Corridors – Rural, Exurban, Bypass)

Traffic signals are strongly discouraged on High Priority Interregional Corridors. A signal will only be considered upon approval of a Deviation, and only after other management and access options have been exhausted. If it is determined that a signal is required for safety or other reasons, it should conform to the corridor management plan and be approved on an interim basis only, with a plan established for its replacement with a grade separation or interchange.

Category 2A (Medium Priority Interregional Corridors – Rural, Exurban, Bypass)

Traffic signals are strongly discouraged on Medium Priority Interregional Corridors. A signal should only be approved as a Deviation after all other management and access options have been exhausted. If it is determined that a signal is required for safety or other reasons, it should conform to the corridor management plan and may be approved on an interim basis only, with a plan established for its replacement with a grade separation or interchange.

Minimum spacing between interim signals should be 1.6 km (**1 mile**). At 1.6 km (**1 mile**) spacing, signals tend to be operated in isolation, therefore, signal timing should favor through movements along the corridor.

Category 2B (Medium Priority Interregional Corridors – Urban, Urbanizing)

Traffic signals are strongly discouraged on Medium Priority Interregional Corridors. A signal should only be approved as a Deviation after all other management and access options have been exhausted. If it is determined that a signal is required for safety or other reasons, it should conform to the corridor management plan and may be approved on an interim basis only, with a plan established for its replacement with a grade separation or interchange.

Minimum spacing between interim signals should be 800 m **(½ mile**). Signals spaced at 800 m (**½ mile**) should be coordinated with adjacent signals to promote progression along the corridor.

Category 3A (High Priority Regional Corridors – Rural, Exurban, Bypass)
Category 4A (Principal Arterials in Primary Trade Centers – Rural, Exurban, Bypass)
Category 5A (Minor Arterials – Rural, Exurban, Bypass)
Category 6A (Collectors – Rural, Exurban, Bypass)

In rural and exurban areas, signalized intersections are not anticipated except in rare instances involving the intersection of two high volume Principal and/or Minor Arterials. If a signal is required, it will tend to operate in isolation, therefore, its timing should favor through movement along the higher category roadway.

In bypass areas, signal spacing should coincide with the spacing of primary full movement intersections.

Category 3B **(High Priority Regional Corridors – Urban, Urbanizing)**
Category 4B **(Principal Arterials in Primary Trade Centers – Urban, Urbanizing)**

If signalized, signals should be uniformly spaced at 800 m (½ **mile**) intervals. Adjacent signals should be coordinated to provide progression for through traffic along the corridor.

Category 5B **(Minor Arterials – Urban, Urbanizing)**
Category 6B **(Collectors – Urban, Urbanizing)**

If signalized, signals should be uniformly spaced at 400 m (¼ **mile**) intervals. Adjacent signals should be coordinated to provide progression for through traffic along the corridor.

Category 2C **(Medium Priority Interregional Corridors – Urban Core)**
Category 3C **(High Priority Regional Corridors – Urban Core)**
Category 4C **(Principal Arterials in Primary Trade Centers – Urban Core)**
Category 5C **(Minor Arterial – Urban Core)**

Each public intersection is likely to be a full movement intersection. However, to promote signal progression, signals on arterials through urban core areas should be spaced at 400 m (¼ **mile**) intervals.

Category 6C **(Collectors – Urban Core)**

Each public intersection is likely to be a full movement intersection with intersection spacing dependent on the established block length of the community. Signals on collectors through urban core areas should be spaced at 200 m (⅛ **mile**) intervals.

C. Private Access

Category 1F (High Priority Interregional Corridors – Freeway)

Type 1, 2 and 3 – Private entrances are not permitted.

Category 1A-F (High Priority Interregional Corridors – Full Grade Separated)
Category 2A-F (Medium Priority Interregional Corridors – Full Grade Separated)
Category 3A-F (High Priority Regional Corridors – Full Grade Separated)
Category 4A-F (Principal Arterials in Primary Trade Centers – Full Grade Separated)

Type 1, 2 and 3 – Private entrances are not permitted on fully developed Subcategory A-F roadways. On existing roadway segments that are planned to transition to Subcategory A-F over time, new private access may be approved on an interim basis only as a Deviation, provided there is a plan for its eventual closure and connection to the supporting road network.

Category 1A (High Priority Interregional Corridors – Rural, Exurban, Bypass)
Category 2A (Medium Priority Interregional Corridors – Rural, Exurban, Bypass)
Category 4A (Principal Arterials in Primary Trade Centers – Rural, Exurban, Bypass)

Type 1, 2 and 3 – Private driveways and entrances are not recommended. New or modified driveways and entrances will be approved only as an Exception or Deviation per Section *VI, Exceptions and Deviations*.

Category 2B (Medium Priority Interregional Corridors – Urban, Urbanizing)
Category 3B (High Priority Regional Corridors – Urban, Urbanizing)
Category 4B (Principal Arterials in Primary Trade Centers – Urban, Urbanizing)
Category 5B (Minor Arterials – Urban, Urbanizing)

Type 1, 2 and 3 – Private driveways and entrances are not recommended. Access should be provided from a supporting street network. New or modified entrances will be approved only as an Exception or Deviation per Section *VI, Exceptions and Deviations*.

Category 3A (High Priority Regional Corridors – Rural, Exurban, Bypass)
Category 5A (Minor Arterials – Rural, Exurban, Bypass)
Category 6A (Collectors – Rural, Exurban, Bypass)

Type 1 and 2 – New or modified Type 1 and 2 entrances will be permitted based on the following findings:

1. Access control has not been acquired and the affected property retains the right of access.

2. Reasonably convenient and suitable access is not available or attainable from the local street network or by shared entrance with an adjacent parcel. If a property abuts two or more public roads, access should be provided from the lower category roadway.

3. An analysis of the future traffic conditions, per Section *D., Gap Analysis Procedure*, indicates the entrance will not create a high risk conflict condition.

Type 1 and 2 entrances should conform to the following conditions:

1. Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and/or that such access would maintain or improve the safety and operations of the roadway. Multiple entrances should be spaced to meet the minimum stopping sight distance shown in Figure 6 or 6M. The additional access may be restricted to specific movements.

2. The entrance should not be located within the functional area of an intersection or within the turn lanes to another private entrance.

3. On existing divided roadways, the entrance should be limited to right-in/right-out only. On planned divided roadways, access should be limited to right-in/right-out movements when the median is constructed.

4. Spacing between Type 2 entrances should be consistent with the stopping sight distance for the posted speed as shown in Figure 6 or 6M. If possible, the entrance should be located on the property line to promote shared access with adjacent future development.

5. The entrance should meet intersection sight distance requirements per Mn/DOT Road Design Manual *(7)*, Section 5-2.02.

6. Turn lanes should be provided for Type 2 entrances per the Mn/DOT Road Design Manual *(7)*, Sections 5-3.01 and 5-4.01.

All Type 1 and 2 entrance requests that do not meet the above findings or conditions will be approved only as an Exception per Section *VI, Exceptions and Deviations*.

Type 3 – Type 3 entrances are not recommended and will be approved only as a Deviation per Section *VI, Exceptions and Deviations*.

Category 2C **(Medium Priority Interregional Corridors – Urban Core)**
Category 3C **(High Priority Regional Corridors – Urban Core)**
Category 4C **(Principal Arterials in Primary Trade Centers – Urban Core)**
Category 5C **(Minor Arterial – Urban Core)**
Category 6B **(Collectors – Urban, Urbanizing)**
Category 6C **(Collectors – Urban Core)**

Type 1 – Private driveways and entrances are permitted subject to the following conditions:

1. Reasonably convenient and suitable access is not available or attainable from the local street network. If a property abuts two or more public roads, access should be provided from the lower category roadway.

2. Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and that such additional access will not negatively impact the safety and operations of the roadway.

3. The entrance should not be located within the functional area of an intersection or within the turn lanes to another private entrance.

4. The entrance should be located on the property to meet the intersection sight distance requirements per Mn/DOT Road Design Manual *(7)*, Section 5-2.02.

5. On existing divided roadways, the entrance should be limited to right-in/right-out only. On planned divided roadways, access will be limited to right-in/right-out movements when the median is constructed.

Type 2 and 3 – Private driveways and entrances are permitted, subject to the following conditions:

1. Reasonably convenient and suitable access is not available or attainable from the local street network or by shared entrance with an adjacent parcel. If a property abuts two or more public roads, access should be provided from the lower category roadway.

2. Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and that such additional access will not negatively impact the safety and operations of the roadway. Multiple entrances should be spaced to meet minimum stopping sight distance shown in Figure 6 or 6M.

3. The entrance should not be located within the functional area of an intersection or within the turn lanes to another private entrance.

4. On existing divided roadways, the entrance should be limited to right-in/right-out only. On planned divided roadways, access will be limited to right-in/right-out movements when the median is constructed.

5. Spacing between entrances should be consistent with the stopping sight distance for the posted speed as shown in Figure 6 or 6M. Figures 6 and 6M represent a minimum spacing requirement and may be superceded by the need to accommodate turn lanes or avoid intrusion on the functional area of the intersection. Joint entrances and cross access agreements should be promoted in order to maintain spacing standards over time. Access points should be located near property lines to facilitate future joint use.

Figure 6 – Minimum Stopping Sight Distance [1]

Speed Limit (mph)	Stopping Sight Distance (feet) [2][3][4]
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

(1) Stopping Sight Distance based on AASHTO Green Book 2001 *(8)*.

(2) The values shown in this table may be superceded to avoid the functional area of adjacent intersections and driveways, or to accommodate turn lanes for the proposed access.

(3) Stopping Sight Distance is based on a level roadway without any horizontal curvature. In areas with vertical and horizontal curves, additional distance may be needed.

(4) The stopping sight distance is measured from the nearest edges of two adjacent entrances. On two-lane undivided roadways, adjacent entrances may be on opposite sides of the roadway.

Figure 6M – Minimum Stopping Sight Distance [1]

Speed Limit (km/h)	Stopping Sight Distance (m) [2][3][4]
20	20
30	35
40	50
50	65
60	85
70	105
80	130
90	160
100	185
110	220
120	250
130	285

(1) Stopping Sight Distance based on AASHTO Green Book 2001 *(8).*

(2) The values shown in this table may be superceded to avoid the functional area of adjacent intersections and driveways, or to accommodate turn lanes for the proposed access.

(3) Stopping Sight Distance is based on a level roadway without any horizontal curvature. In areas with vertical and horizontal curves, additional distance may be needed.

(4) The stopping sight distance is measured from the nearest edges of two adjacent entrances. On two-lane undivided roadways, adjacent entrances may be on opposite sides of the roadway.

6. The entrance should be located on the property to meet the intersection sight distance requirements per Mn/DOT Road Design Manual *(7)*, Section 5-2.02.

7. The entrance should not create the need for a signal.

8. Turn lanes should be provided per the Mn/DOT Road Design Manual *(7)*, Sections 5-3.01 and 5-4.01.

Private entrance requests that do not meet the above findings and conditions will be approved only as an Exception per Section *VI, Exceptions and Deviations*.

D. Gap Analysis Procedure

One of the factors to be evaluated when considering the provision of a secondary intervening intersection or private entrance is the ability of vehicles at the access location to find adequate gaps in mainline flows. If conflicting volumes provide insufficient gaps, longer queues and delays will be experienced and the potential for greater risk taking will occur. In low volume areas, there will be fewer conflicting vehicles and many more gaps available. These low-volume areas provide for easier decision-making and less judgment by the driver. To identify potential high risk areas where additional access is not advised, a simplified approach to gap analysis has been developed for application to unsignalized corridors.

The gap analysis is intended for use when looking at access on Category 1A, 2A, 3A, 4A, 5A and 6A (rural, exurban and bypass areas) roadways. It may also be used on two-lane unsignalized roadways in Category 2B, 3B, 4B and 5B (urbanizing areas).

Risk Conflict Graphs

Risk conflict graphs have been developed for specific roadway designs based on methodology in the *Highway Capacity Manual 2000 (9)*. The methodology includes the following assumptions:

- Side streets are stop controlled.
- Traffic along the highway is operating under a condition of random arrival. For this reason, the risk conflict graphs are primarily applicable to unsignalized roadway segments.
- Traffic from nearby intersections does not impact the subject intersection or access point.
- Under wide median conditions (Figure 9), vehicles entering and crossing the mainline may use a two-step maneuver.

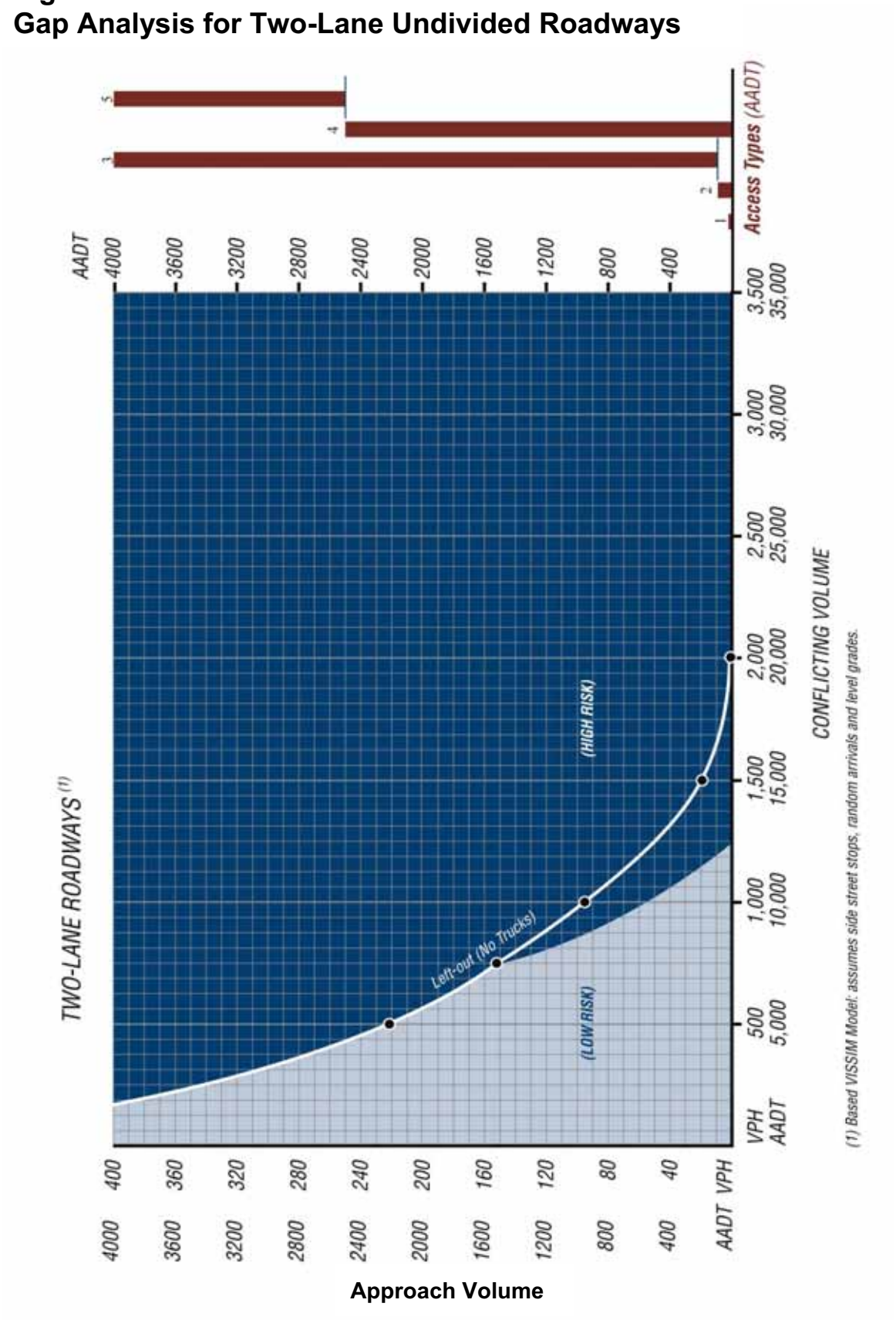
Figures 7, 8 and 9 represent risk conflict conditions based on the roadway design. The selection of the appropriate Figure to use is based on the type of median on the primary highway.

Figure 7 – Undivided Two-Lane Roadways – Figure 7 is used for all two-lane undivided roadways. Use this Figure if there is no median along the primary highway.

Figure 8 – Divided Four-lane Roadways (with Narrow Median) – Figure 8 is used for divided roadways with a narrow median. A narrow median is defined as having no storage space. Narrow medians require all vehicles crossing or turning left from the cross street to complete the maneuver as a single movement. This Figure is also used when looking at right-in/right-out intersections.

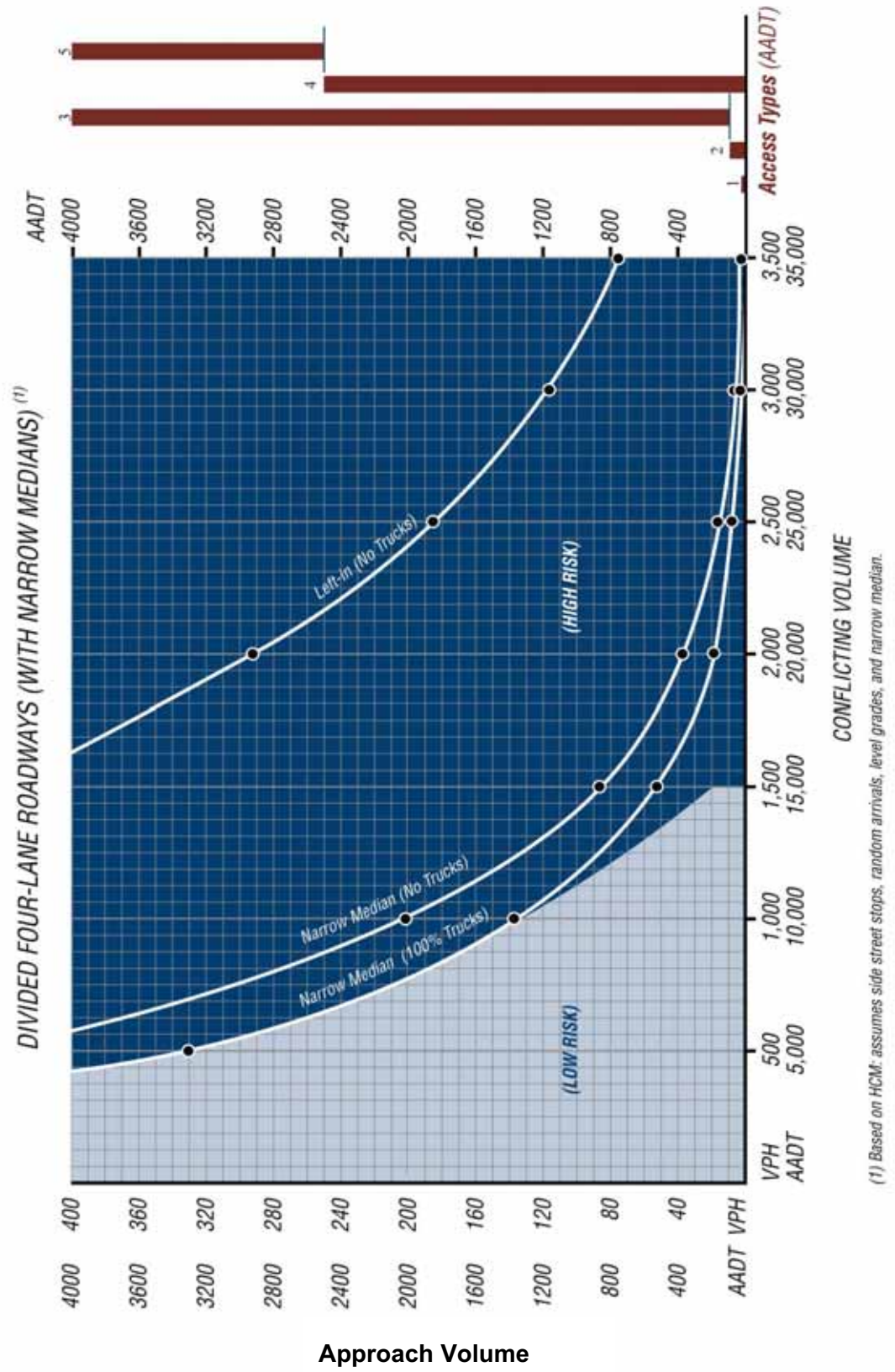
Figure 9 – Divided Four-Lane Roadways (with Wide Median) – Figure 9 is used for divided roadways with wide medians. A wide median is defined to have storage for up to two vehicles in the median. This allows vehicles crossing or turning left from a side street to complete the maneuver in two steps.

Figure 7
Gap Analysis for Two-Lane Undivided Roadways



Based on estimated 20-year AADT

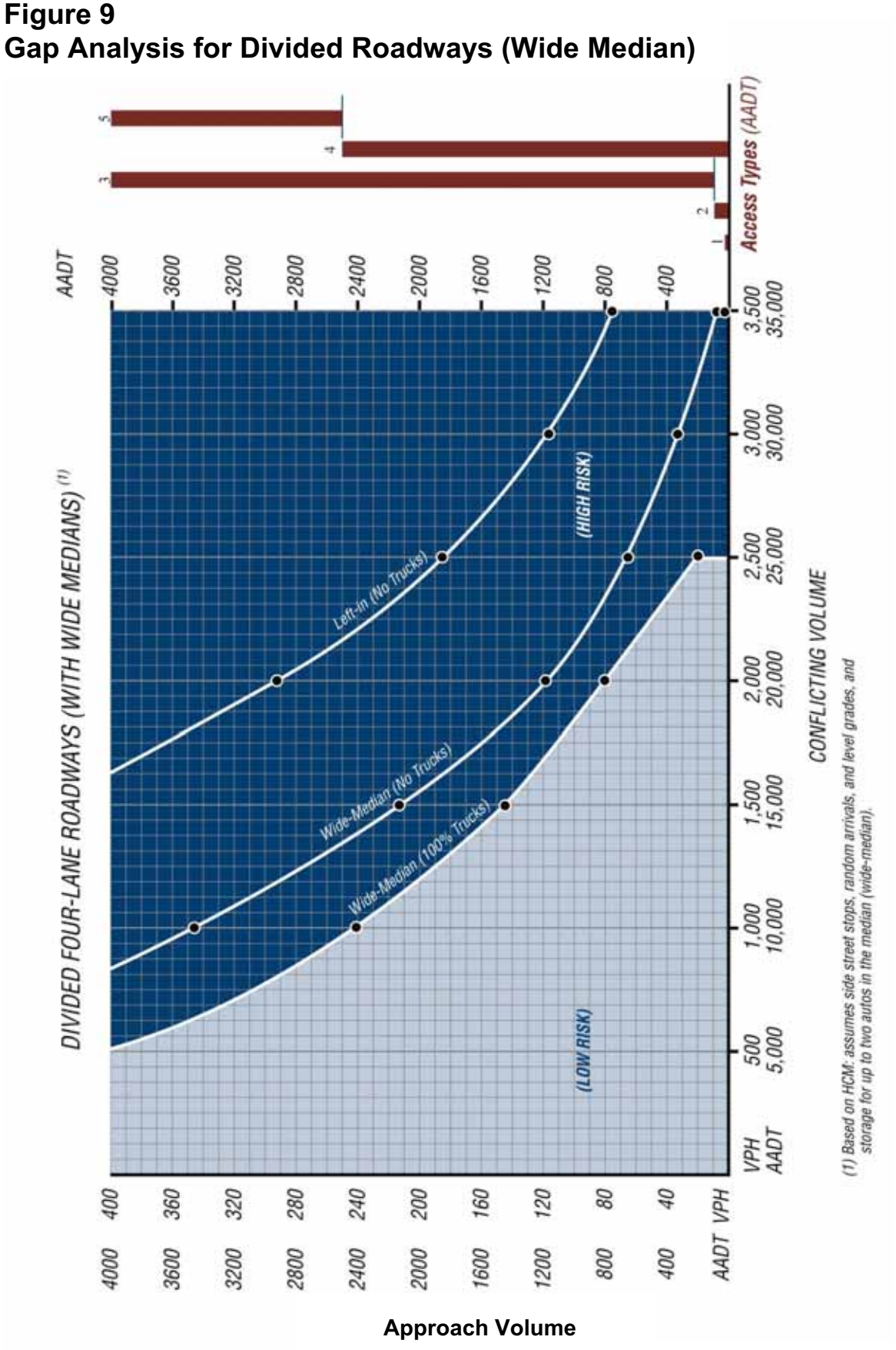
Figure 8
Gap Analysis for Divided Roadways (Narrow Median)



Approach Volume

Based on estimated 20-year AADT

Figure 9
Gap Analysis for Divided Roadways (Wide Median)



Approach Volume

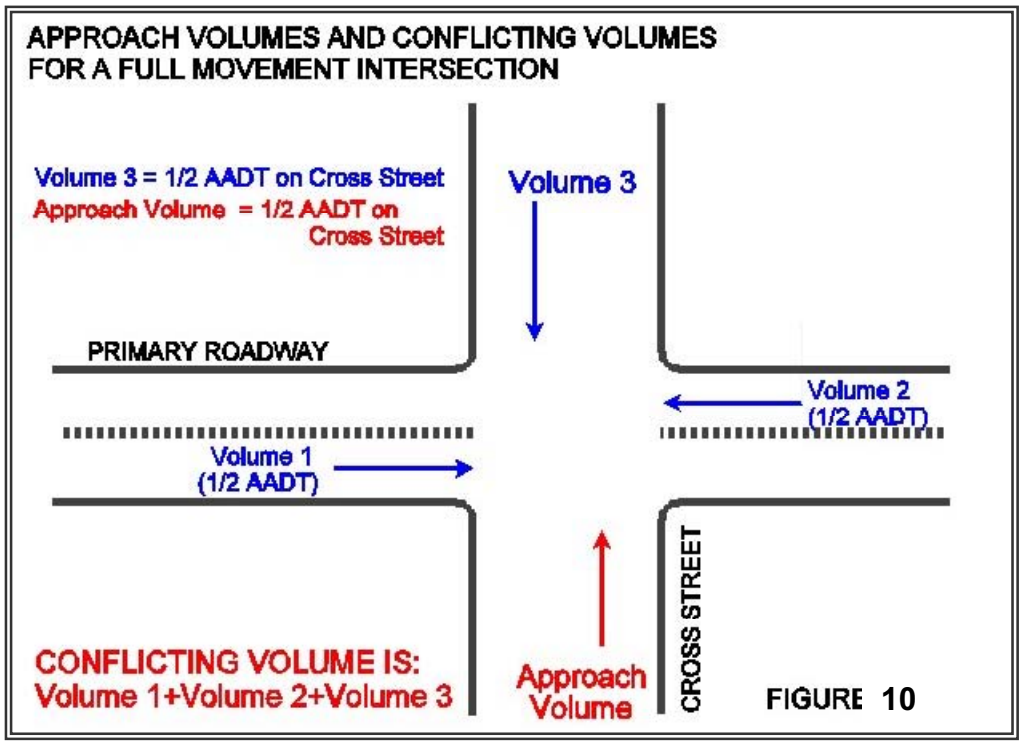
Based on estimated 20-year AADT

Full Movement Intersection Analysis

The Conflicting Volume (horizontal axis on Figure 7, 8 or 9) is the estimated 20-year AADT of the primary roadway plus ½ of the 20-year cross street AADT (*in Figure 10, the Conflicting Volume is Volume 1 + Volume 2 + Volume 3*). At T-intersections, the horizontal axis of the graphs is only the estimated 20-year AADT of the primary roadway (*in Figure 10, the Conflicting Volume is Volume 1 + Volume 2*).

The Approach Volume (vertical axis on Figure 7, 8 or 9) is one-half of the estimated 20-year AADT of the cross street or access point.

If actual traffic data is available, that data should be used to determine the approach volume and the conflicting volumes.



Compare the Approach Volume (vertical axis) with the Conflicting Volume (horizontal axis) to determine the intersection condition. If the intersection falls within the low risk conflict condition, a full movement intersection may be allowed.

If the intersection falls within the high risk conflict condition and is located on a divided roadway, the intersection should be analyzed a second time to determine if a right-in/right-out only intersection is acceptable.

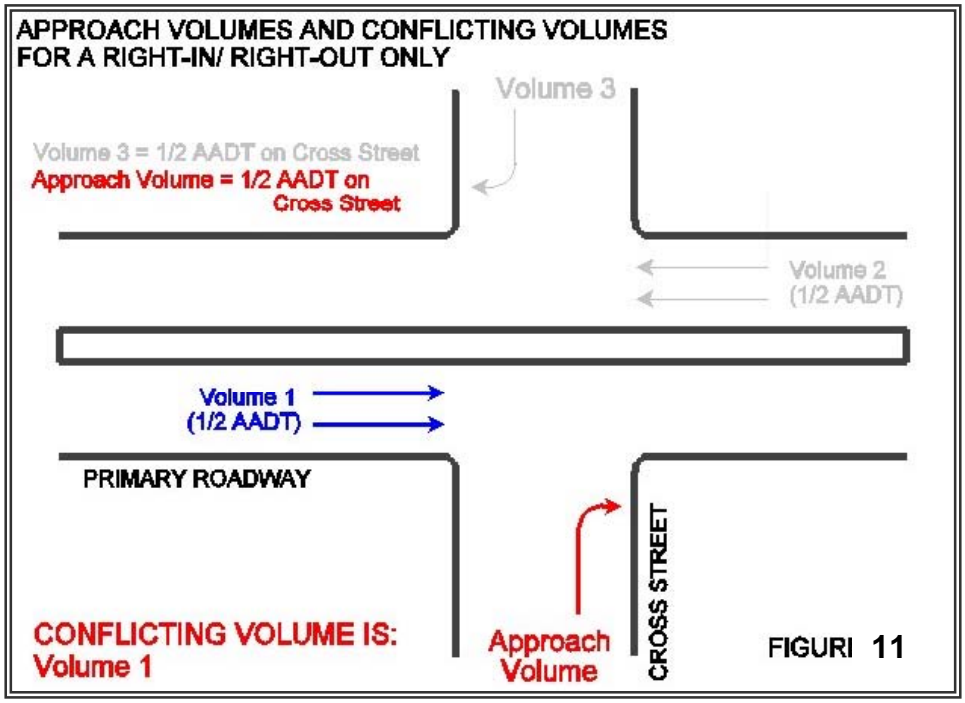
If the intersection or access point falls within the high risk conflict condition and is located on a two-lane undivided roadway, the intersection or access point should not be allowed.

Right-in/Right-out Only Intersection Analysis

Figure 8 represents the risk conflict conditions for right-in/right-out only intersections.

The Conflicting Volume (horizontal axis on Figure 8) is the one-half of the estimated 20-year AADT of the primary roadway (*in Figure 11, the Conflicting Volume is Volume 1*).

The Approach Volume (vertical axis on Figure 8) is one-half of the estimated 20-year AADT of the cross street or access point.



Compare the Approach Volume (vertical axis) with the Conflicting Volume (horizontal axis) to determine the intersection condition. If the intersection falls within the low risk conflict condition, a right-in/right out only intersection may be allowed. If the intersection falls within the high risk conflict condition, no intersection should be allowed. Alternatively, a right-in only intersection may be considered if connectivity to the supporting street network provides full circulation and return movements.

VI. Exceptions and Deviations

A. Need for Exceptions and Deviations

Exception and Deviation provisions have been developed to recognize that the complete network of roadways required for full conformance with the access spacing guidelines may not always be available. In very low-density rural areas, a complete hierarchy of roads may never be developed. In these cases, direct property access to the highway may be necessary, but the access should be designed to maximize safety and minimize impacts on through traffic. In urbanizing areas, more opportunity exists to develop the land and the supporting road network concurrently. However, there will be circumstances when the timing of property development will precede development of the supporting road system. In these cases, the Exception and Deviation process serves to accommodate the immediate access needs of the development while providing for the transition to alternate access at a future time.

1. Applicability to Access Permits and Development Reviews

Exception and Deviation procedures are intended to apply primarily to the administration of access permits. The procedures interject a broader planning and analysis approach into the permit review process in order to determine the best alternative to accommodate an otherwise non-conforming access. Since more options are usually available if access is considered early in the development process, the analysis associated with Exceptions and Deviations may be most effective if conducted as part of a related development review (e.g., subdivision/plat review, site plan review, conditional use permit, etc.).

The Exception provision is intended to address lower volume access requests. Consideration of an Exception involves local consultation, the review of the proposed access and the surrounding conditions, and minimal traffic analysis.

The Deviation provision is intended for higher volume and more complex access requests that may pose a greater potential impact on the safety and operations of the highway. Consideration of a Deviation requires additional review and analysis to determine the appropriate location and design of the access, as well as potential short and long-term modification to the surrounding road network.

If the location of a requested access is inconsistent with the applicable access guidelines, District staff should determine whether consideration as an Exception or Deviation is appropriate per Figure 12.

2. Applicability to Corridor Plans and Construction Project Development

When applying the access categories and spacing guidelines to corridor planning and road design projects, strict application of the spacing guidelines may not be feasible in all circumstances. Analysis of each individual access as an Exception or Deviation is not necessary, but inconsistencies with the access categories and spacing guidelines should be addressed in the corridor management plan or project study report. In some cases, adoption of a Category 7 Specific Access Plan by Mn/DOT and the local government partners may serve as the vehicle to formally approve and memorialize decisions related to the need for future Exceptions and Deviations along a corridor or roadway segment.

Figure 12 – Exception and Deviation Requirements

Category Type	Access Type				
	Private Entrances			Public Streets	
	Type 1 Residential Agricultural Field Access	Type 2 Low Volume	Type 3 High Volume	Type 4 Low Volume	Type 5 High Volume
1F	Not Permitted			*Interchange Only*	
1A-F	Deviation	Deviation	Deviation	Deviation	Deviation
1A	Deviation	Deviation	Deviation	Deviation	Deviation
2A-F	Deviation	Deviation	Deviation	Deviation	Deviation
2A	Exception	Exception	Deviation	Deviation	Deviation
2B	Exception	Exception	Deviation	Deviation	Deviation
2C	Permitted subject to Conditions (1)			Exception	Deviation
3A-F	Deviation	Deviation	Deviation	Deviation	Deviation
3A	Permitted subject to Conditions (1)	Permitted subject to Conditions (1)	Deviation	Exception	Deviation
3B	Exception	Exception	Deviation	Exception	Deviation
3C	Permitted subject to Conditions (1)			Exception	Deviation
4A-F	Deviation	Deviation	Deviation	Deviation	Deviation
4A	Deviation	Deviation	Deviation	Exception	Deviation
4B	Exception	Exception	Deviation	Exception	Deviation
4C	Permitted subject to Conditions (1)			Exception	Deviation
5A	Permitted subject to Conditions (1)	Permitted subject to Conditions (1)	Deviation	Exception	Deviation
5B	Exception	Exception	Deviation	Exception	Deviation
5C	Permitted subject to Conditions (1)			Exception	Deviation
6A	Permitted subject to Conditions (1)	Permitted subject to Conditions (1)	Deviation	Exception	Deviation
6B	Permitted subject to Conditions (1)			Exception	Deviation
6C	Permitted subject to Conditions (1)			Exception	Deviation

Notes:

(1) Access Permitted subject to Condition – If conditions are not met, the access may be approved as an Exception.

B. Exception Process

The Exception Process involves a minor expansion of the routine permit review process. It defines an additional level of criteria for the permitting process that promotes responsible land use and access management. An access may be approved as an Exception if it meets the Required Findings set forth in Section *D., Findings and Conditions of Approval for Exceptions and Deviations*. Additional conditions may also be imposed on the proposed access.

To determine if the Required Findings are met, local Mn/DOT staff responsible for permit reviews will consult with the local land use and road authorities to evaluate the current or potential availability of alternate access via local roads. This consultation will also provide an opportunity to discuss whether there is additional development anticipated in the area and how the general land use, local circulation, and access in the area should be managed in the future. Existing and planned access to adjacent properties should also be examined to determine the potential for consolidating access through joint or cross access arrangements. If the Exception is a request for a public street, the review should include an examination of the planned connectivity of the street to the supporting road network.

C. Deviation Process

The Deviation Process is similar to the Exception Process in that there are Required Findings for approval. However, the Deviation Process applies to access locations where safety and operational concerns should be more thoroughly explored. In order to reach conclusions about the Required Findings, a more detailed analysis of the proposal within the context of the surrounding area will be needed. This analysis should focus not only on identifying the best option for accommodating the access needs of the immediate project, but determining how it fits into longer term circulation and access plans for the roadway segment and the surrounding area. Therefore, approval as a Deviation will involve some level of planning for future operations along the affected roadways, including the existing and future land use and circulation of the surrounding area.

The issues and options to be addressed through the Deviation study process will need to be defined in each instance. District staff responsible for this phase of the access permitting process should meet with the applicant, the local unit of government, and any other affected road authorities to define the scope of the study. Some of the issues to be addressed include:

- Geographic area to be included
- Existing and future land use assumptions
- Planning and analysis time frames (e.g., 1 year, 5 year, 20 year)
- Alternatives to be evaluated, which could involve not only alternative road design and supporting road networks, but also alternative land use arrangements or site plan layouts
- Traffic generation and growth rate assumptions
- Corridor traffic impacts and performance measures to be evaluated
- Short and long term funding assumptions for potential state and local improvements
- Responsibilities for study funding and oversight
- Schedule for study completion
- The format and extent of the Deviation Study

Generally, the results of the Deviation process will be one of the following outcomes:

- **Approval of a Conforming Alternative Access:** An access alternative may be identified that conforms to access management guidelines. This may include locating the access on a local street or frontage road or combining it with an existing conforming access.
- **Approval of a Non-Conforming Interim Access with Plans for a Conforming Future Access:** An interim plan may be developed that allows a non-conforming access in the short term, but is tied to a long-term plan for future access that conforms with access spacing guidelines. While the interim access may not conform to spacing guidelines, it should be considered safe and minimize corridor impacts to the greatest degree possible. A schedule for transition to the planned conforming access should be developed and included as part of the permit. Timing may be tied to a future road project or development of surrounding properties. Affected sites should be developed in a manner that facilitates transition to the alternate access without significant rearrangement of building and parking layouts. The access permit should include all conditions or special provisions for both the interim access and the future access.
- **Approval of a Non-Conforming Access:** The study could lead to the conclusion that there is no feasible short or long-term alternative to the proposed access. For example, environmental constraints may prohibit development of an interconnected supporting road network to serve the affected property. However, the analysis may identify geometric or operational modifications that would maintain safety and mobility, such as the addition of turn lanes, closure of medians, modification of signal timing, etc. In this case, provision of the modifications by the applicant may become conditions of approval as a Deviation.
- **Denial of Access:** The analysis could conclude that there is no feasible alternative and that construction of the proposed access would create an unacceptable situation from a safety perspective. In this case, Mn/DOT and the affected local unit of government may agree that the access must be denied. The local government authority may also deny approval of a plat, subdivision, rezoning, or conditional use permit proposal.

D. Findings and Conditions of Approval for Exceptions and Deviations

Access Type 1 (Residential/Agricultural/Field Access)

The approval of a Type 1 entrance as an Exception or Deviation should be based on the following findings and considerations:

Required Findings

- Access control has not been acquired and the affected property retains the right of access.
- Reasonably convenient and suitable access is not available or attainable from the local street network or by shared entrance with an adjacent parcel. The local governmental unit should be contacted to determine if alternative access is currently available or planned.
- The proposed entrance conforms to the access spacing guidelines, design standards, and sight distance requirements to the greatest degree possible. This finding may take into account topographical restrictions, unique natural features, the lack of a supporting street network, and historical land use and street patterns.
- The proposed entrance is consistent with any corridor plans adopted for the roadway corridor or the surrounding area.

Considerations and Potential Conditions of Approval

- The entrance should not be located within the functional area of a public intersection or within a turn lane for another private entrance. If inadequate lot frontage makes this physically infeasible, shared or cross access easements to provide access via adjacent parcels should be explored. If these options are not available, the proposed entrance should be located at the greatest distance feasible from the adjacent public intersection or private entrance.
- The entrance may be approved as an interim access if it is determined that alternative access will be available in the future. If the entrance is an interim access, the access permit should contain provisions stating that the access will be closed when alternate access becomes available. The anticipated schedule of availability of the future access, if known, should also be included in the permit. The site should be designed to accommodate transition to the future access with minimal disruption to the building and parking layout.
- Only one entrance per parcel should be provided. An additional entrance may be permitted if it is determined that the property cannot otherwise be reasonably developed or utilized and that such access will not negatively impact the safety and operations of the roadway. Multiple entrances should be spaced to meet minimum stopping sight distance shown in Figure 6 or 6M.

- On existing divided roadways, the entrance should be limited to right-in/right-out only, unless weaving or other traffic operations indicate the need for further restrictions on turning movements (e.g. right-in only or right-out only). On planned divided roadways, access will be limited to right-in/right-out movements when the median is constructed. This future condition should be noted in the permit.
- Private entrances on opposing sides of undivided roadways should be aligned.
- The entrance should meet intersection sight distance requirements per Mn/DOT Road Design Manual *(7)*, Section 5-2.02.

Access Type 2 (Low Volume Private Entrances)

The approval of a Type 2 entrance as an Exception or Deviation should be based on the following findings and considerations:

Required Findings

- All of the findings for Type 1 entrances apply.

Considerations and Potential Conditions of Approval

- All of the considerations for Type 1 entrances apply.
- Shared entrances or cross access easements should be promoted as a way to achieve conformance with the recommended spacing for private entrances, as summarized in Figures 6 and 6M. Along corridors where additional development is anticipated, access should be located on property lines to facilitate shared and cross access with adjacent property.
- Turn lanes should be provided per the Mn/DOT Road Design Manual *(7)*, Sections 5-3.01 and 5-4.01.

Access Type 3 (High Volume Private Entrances)

The approval of a Type 3 entrance as a Deviation should be based on the following findings and considerations:

Required Findings

- All of the findings for Type 2 entrances apply.

Considerations and Potential Conditions of Approval

- All of the considerations for Type 2 entrances apply.
- If the entrance is located in an area of potential development, the entrance should be evaluated to determine the feasibility of developing it as a public street serving the greater surrounding area.
- Residential, commercial, industrial or institutional uses may be granted additional access if it is determined to benefit site circulation and overall corridor operations. If multiple access points are being considered, the additional access points may be limited to ¾ movement (right-in/right-out/left-in only), right-in/right-out only, right-in only, or right-out only. The Deviation study

process should address operational and safety issues to determine the recommended number, location, and design of the accesses.

- Spacing between entrances should be consistent with the stopping sight distance for the posted speed as shown in Figure 6 or 6M. Figures 6 and 6M represent a minimum spacing requirement and may be superceded by the need to accommodate turn lanes or avoid intrusion on the functional area of the intersection. Joint entrances and cross easement agreements should be promoted in order to maintain spacing standards over time. Access points should be located near property lines to facilitate future joint use.
- The request for a Type 3 entrance may also involve a request for a signal. If so, the Deviation Study should include a Signal Justification Report addressing the following:
    - The signal meets appropriate MN MUTCD signal warrants and the signal is justified.
    - Traffic signals on Category 1 roadways (High Priority Interregional Corridors) will be considered only on an interim basis, after all other alternatives have been considered. Approval of a signalized access should include a specific plan and schedule for its removal.
    - Traffic signals on Category 2 roadways (Medium Priority Interregional Corridors) will be considered only if no other alternatives are feasible. The Signal Justification Report should assess the corridor impacts of restricting turning movements to right-in/right-out only or ¾ movement (right-in/right-out/left-in only) design. Approval of a signalized access may include a plan for its eventual removal.
    - Signalized access should only be permitted if it serves a large development area designed to serve multiple properties with a system of well-developed internal private roadways connected by cross access easements, and it meets the spacing guidelines for signalized intersections. For signal requests that do not meet the intersection spacing guidelines, the Signal Justification Report should address the feasibility and impacts of developing the access as a public street connecting to the supporting local road network.
    - If the proposed signal is adjacent to another traffic signal, the signals should be interconnected to facilitate signal coordination.
    - If the proposed signal would be introduced into a corridor segment with an established coordinated signal system, the Signal Justification Report should include analysis and recommendations for optimizing corridor signal timing to maintain corridor performance.
    - If the proposed signal would be located at an isolated intersection, greater than 1.6 km (**1 mile**) from the nearest existing or planned signalized intersection, green time for the through traffic along the primary corridor should be maximized.

Access Type 4 (Low Volume Public Streets)

The approval of an Exception or Deviation for a Type 4 intersection should be based on the following findings and considerations:

Required Findings

- The proposed intersection is necessary to provide reasonable connectivity to the supporting road network or to provide public access to an isolated land area due to topographical restrictions, unique natural features, or historical land use and street patterns.
- The proposed intersection conforms to access spacing guidelines, design standards, and applicable intersection and stopping sight distance requirements to the greatest degree possible.
- The proposed intersection will not create a major obstacle to the long-term implementation of the corridor management plan.

Considerations and Potential Conditions of Approval

- The Exception or Deviation study should evaluate the potential traffic volume generated at the intersection given the intensity of anticipated future development. If the study determines that the estimated 20-year AADT exceeds 2500, the access request should be evaluated as a Type 5 Access.
- An intersection approved as an Exception or Deviation may be an interim access if it is determined that alternative access will be available in the future. If the intersection is an interim access, the access permit should provide that the access would be closed when alternate access becomes available. The anticipated schedule of availability of the future access, if known, should also be included in the permit. The street and property served by the access should be designed to accommodate transition to the future access with minimal disruption to the established lot and street layout.
- Streets should be designed to connect to the supporting road network. If the proposed street is serving a single, isolated development, it should be designed to provide future access to adjacent parcels via outlots or extension of stubbed streets.
- On existing divided roadways, the intersection should be limited to right-in/right-out movements only. On planned divided roadways, the intersection will be limited to right-in/right-out movements when the median is constructed. This future condition should be noted in the permit.
- Turn lanes should be provided per the Mn/DOT Road Design Manual *(7)*, Section 5-3.01 and 5-4.01.

Access Type 5 (High Volume Public Streets)

The approval of a Deviation for a Type 5 intersection should be based on the following findings and considerations:

Required Findings

- All of the findings for a Type 4 intersection apply.

Considerations and Potential Conditions of Approval

- All of the Considerations for a Type 4 intersection apply.
- All Type 5 intersections pose the potential for signalization at some point. If a signal is proposed, the Deviation study should include a Signal Justification Report to address the following considerations:
    - The signal meets appropriate MN MUTCD signal warrants and the signal is justified.
    - Traffic signals on Category 1 roadways (High Priority Interregional Corridors) will be considered only on an interim basis, after all other alternatives have been considered. Approval of a signalized access should include a specific plan and schedule for its removal.
    - Traffic signals on Category 2 roadways (Medium Priority Interregional Corridors) will be considered only if no other alternatives are feasible. The Signal Justification Report should assess the corridor impacts of restricting turning movements to right-in/right-out only or ¾ movement (right-in/right-out/left-in only) design. Approval of a signalized access may include a plan for its eventual removal.
    - If the proposed signal is adjacent to another traffic signal, the signals should be interconnected to facilitate signal coordination.
    - If the proposed signal would be introduced into a corridor segment with an established coordinated signal system, the Signal Justification Report should include analysis and recommendations for optimizing corridor signal timing to maintain corridor performance.
    - If the proposed signal would be located at an isolated intersection, greater than 1.6 km (**1 mile**) from the nearest existing or planned signalized intersection, green time for the through traffic along the primary corridor should be maximized.

VII. References

Works Cited

1. *Moving Minnesota From 2000 to 2020,* Minnesota Statewide Transportation Plan, January 2000.

2. *National Cooperative Highway Research Program Report 420: Impacts of Access Management Techniques*, Transportation Research Board, 1999.

3. *National Cooperative Highway Research Program Report 426: Driveway and Street Intersection Spacing,* Transportation Research Board, 1996.

4. "*Access Operations: Gap Analysis and Signal Spacing*", SRF Consulting for the Minnesota Department of Transportation, 2002.

5. *Trip Generation Manual, 6th Edition*, Institute of Transportation Engineers, 1997.

6. *Minnesota Manual on Uniform Traffic Control Devices*, Minnesota Department of Transportation, 1991.

7. *Road Design Manual, Part I & Part II,* Minnesota Department of Transportation, as amended through May 2001.

8. *A Policy on Geometric Design of Highways and Streets*, *4th Edition*, American Association of State Highway and Transportation Officials, 2001.

9. *Highway Capacity Manual 2000,* Transportation Research Board.

Other References

Access Categories and Spacing Guidelines, Meyer, Mohaddes Associates for the Minnesota Department of Transportation, February 2001.

Access Management System and Standards, Nevada Department of Transportation, July 1999.

Highway Approaches, Access Control, Spacing Standards and Medians, Division 51 Rules, State of Oregon.

Interregional Corridors: A Guide for Plan Development and Corridor Management, Minnesota Department of Transportation, September 2000.

Manual of Uniform Traffic Control Devices, U.S. Department of Transportation and Federal Highway Administration, 1988.

National Cooperative Highway Research Program Report 383: Intersection Sight Distance, Transportation Research Board, 1996.

National Cooperative Highway Research Program Report 400: Determination of Stopping Sight Distance, Transportation Research Board, 1997.

Platoon Dispersion Concept for Critical Block Length, Institute of Transportation Engineers 1993 compendium of Technical Papers, September 1993.

State Highway Access Code, Volume 2, Code of Colorado Regulations 601-1, State of Colorado, August 31, 1998.

State Highway Access Management Manual, Ohio Office of Roadway Engineering and Office of Traffic Engineering, 1998.

State Highway System Access Management Classification System and Standards, Rules of the Florida Department of Transportation Chapter 14-97

Statewide Interregional Corridor Study, SRF Consulting for the Minnesota Department of Transportation, November 1999.

Traffic Access and Impact Studies for Site Development: A Recommended Practice, Institute of Transportation Engineers, 1991.

Traffic Engineering Handbook, 4th Edition, Institute of Transportation Engineers, 1992.

Toward an Access Classification System and Spacing Guidelines, Minnesota Department of Transportation, February 1999.

Appendix C: Aviation

Background

Aviation is a component of the Metropolitan Council's 2030 Transportation Policy Plan. Several aviation-related topics are required to be included in the City's comprehensive plan. These include:

- Airspace protection, as reflected in federal regulations
- Land use compatibility within Airport Influence Areas
- City regulations regarding heliports
- Reference to any special aviation facilities within the City

Most aviation guidance for the City of Minneapolis relates to the Minneapolis-St. Paul International Airport. Although the airport is located outside of Minneapolis, the City is within its Airport Influence Area.

Policy guidance for aviation is located both within Chapter 2 Transportation (related to its role as part of the regional transportation system) and Chapter 6 Environment (related to its noise impacts on the City).

Regional Airspace

The current City of Minneapolis Zoning Code contains provisions for the protection of regional airspace, referred to as the airport zoning ordinance, through the placement of height restrictions on development in proximity to the airport. The regulations are as follows:

> From Title 20, Zoning Code
>
> 535.60. Height near airport. The following special height limitations shall apply to areas within two (2) miles of the boundary lines of Minneapolis - St. Paul International Airport, except where the primary zoning district is more restrictive:
>
> (1) Within seven thousand five hundred (7,500) feet of the nearest airport runway boundary, no structure, object of natural growth or portion thereof shall exceed a height of twenty-five (25) feet or one (1) foot for each fifty (50) feet that such structure or object is located away from such runway boundary, whichever height is greater.
>
> (2) Between seven thousand five hundred (7,500) feet and two (2) miles

from the nearest airport runway boundary, no structure, object of natural growth or portion thereof shall exceed a height of one hundred fifty (150) feet.

The City of Minneapolis also recognizes requirements regarding the protection of the region's general airspace. The relevant notification criteria for airspace obstruction as defined under the Minnesota Aeronautic Rules and Regulations is as follows:

> Notification: Any sponsor who proposes any construction or alteration that would exceed a height of 200 feet above ground level at the site, or any construction or alteration of greater height than an imaginary surface extending upward and outward at a slope of 100:1 from the nearest point of the nearest runway of a public airport shall notify the Commissioner [note: Minnesota Department of Transportation] at least 30 days in advance.

This local reporting requirement is in addition to the Federal permitting/review process involving proposal where FAA Form 7460-8 is required.

The Metropolitan Council has outlined in the *2030 Transportation Policy Plan* the Land Use Compatibility Guidelines for communities surrounding the Minneapolis/St. Paul International Airport. A copy of Table 3 of these guidelines is included in this appendix, and the guidelines are herein incorporated into the City's comprehensive plan.

Table 3

Land Use Compatibility Guidelines for Aircraft Noise

Land Use Category	Compatibility with Aircraft Noise Levels									
Type of Development	New Development and Major Redevelopment					Infill Development and Reconstruction or Additions to Existing Structures				
Noise Exposure Zones	1 DNL 75+	2 DNL 74-70	3 DNL 69-65	4 DNL 64-60	Buffer Zone*	1 DNL 75+	2 DNL 75-70	3 DNL 70-65	4 DNL 65-60	Buffer Zone *
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/Recreational										
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 & Educational Services	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Other Services	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Industrial/Communication/Utility	PROV	COMP	COMP	COMP		PROV	COMP	COMP	COMP	
Agriculture Land/Water Areas/Resource Extraction	COMP	COMP	COMP	COMP		COMP	COMP	COMP	COMP	

*

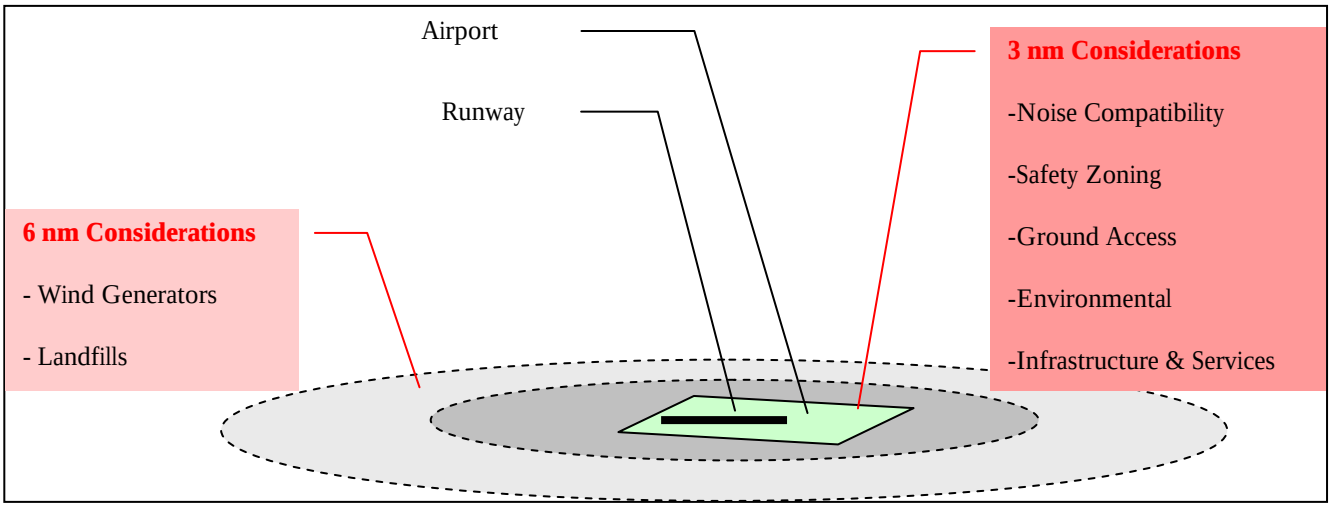
Airport Influence Area

Both MnDOT Aeronautics and Metropolitan Council have identified "airport influence areas". MnDOT's defined area is based on height limitation and avoiding potential hazards or obstructions to air navigation. At MSP this is approximately defined by a 10,000' radius from each runway end and extending outward into the approach paths of each runway a distance of two miles. All projects of significance within these boundaries are to be coordinated with MnDOT for height limitation evaluation.

Metropolitan Council's "airport influence area" is based on noise impacts associated with four noise policy zones. Zone 1 is the noisiest impact area at 75+ DNL and Zone 4 is the lowest noise impact area at 60-65 DNL. Land Use compatibility within each of the four noise policy zones is indicated in the table above. Since the City is well developed within the airport influence area, the land use restrictions above are largely applicable to infill development or major redevelopment.

The two agencies have designated an Airport Coordination Area around MSP which identifies specific topics of concern within designated areas.

AIRPORT COORDINATION AREA



Planning and Development Considerations

Land Use

Minneapolis-St. Paul International Airport, one of the 20 busiest airports in the world, is an economic driver in the region and the state. Operational activity conflicts with existing neighborhoods in Minneapolis which are predominantly single family residential in the airport vicinity. These neighborhoods were developed before the airport, thus there are few preventive measures available to ensure a greater degree of land use compatibility with the airport. The City has and will continue to aggressively advocate for corrective measures to mitigate noise impacts on residents. The three primary strategies that the City pursues in this regard are:

- Advocate for a 5 decibel sound insulation package for all dwelling units exposed to the airport's 60 DNL and greater noise contour area.
- Advocate noise abatement measures to better manage and reduce noise impacts on a day to day basis.
- Advocate for a long term statewide aviation strategy which allows the metropolitan area to be competitive with other regions and serves all residents of the state with a safe, sustainable and environmentally acceptable aviation system.

The City is currently updating the City Code to incorporate the amended MSP Joint Airport Zoning Board Ordinance. The ordinance addresses both land use safety zoning and height limitation zoning. Additionally, consideration is being given to require additional noise attenuation for expansion of residences that have received sound insulation program measures from the Metropolitan Airports Commission. Table 3 of Appendix H of Metropolitan Council's *Transportation Policy Plan* provides guidance for land use compatibility for both new and infill development.

As shown, any new single family residential development or major redevelopment in areas exposed to noise levels above 60 DNL (annualized average day, night level) are incompatible land uses. Infill development or additions to existing structures within areas exposed to 60 DNL or greater noise levels are deemed conditional land uses if additional noise attenuation is incorporated into the structures. As a matter of federal policy, no new structures constructed after October 1, 1998 within a noise impact area can become eligible for noise mitigation using federal funds.

Airport Height Limitation Zoning

The current City of Minneapolis Zoning Code provides for height limitation restrictions in proximity to Minneapolis-St. Paul International Airport which are more restrictive than either state or federal guidelines. As provided in Title 20 of the code:

535.60. Height near airport. The following special height limitations shall apply to areas within two (2) miles of the boundary lines of Minneapolis - St. Paul International Airport, except where the primary zoning district is more restrictive:

(1) Within seven thousand five hundred (7,500) feet of the nearest airport runway boundary, no structure, object of natural growth or portion thereof shall exceed a height of twenty-five (25) feet or one (1) foot for each fifty (50) feet that such structure or object is located away from such runway boundary, whichever height is greater.

(2) Between seven thousand five hundred (7,500) feet and two (2) miles from the nearest airport runway boundary, no structure, object of natural growth or portion thereof shall exceed a height of one hundred fifty (150) feet.

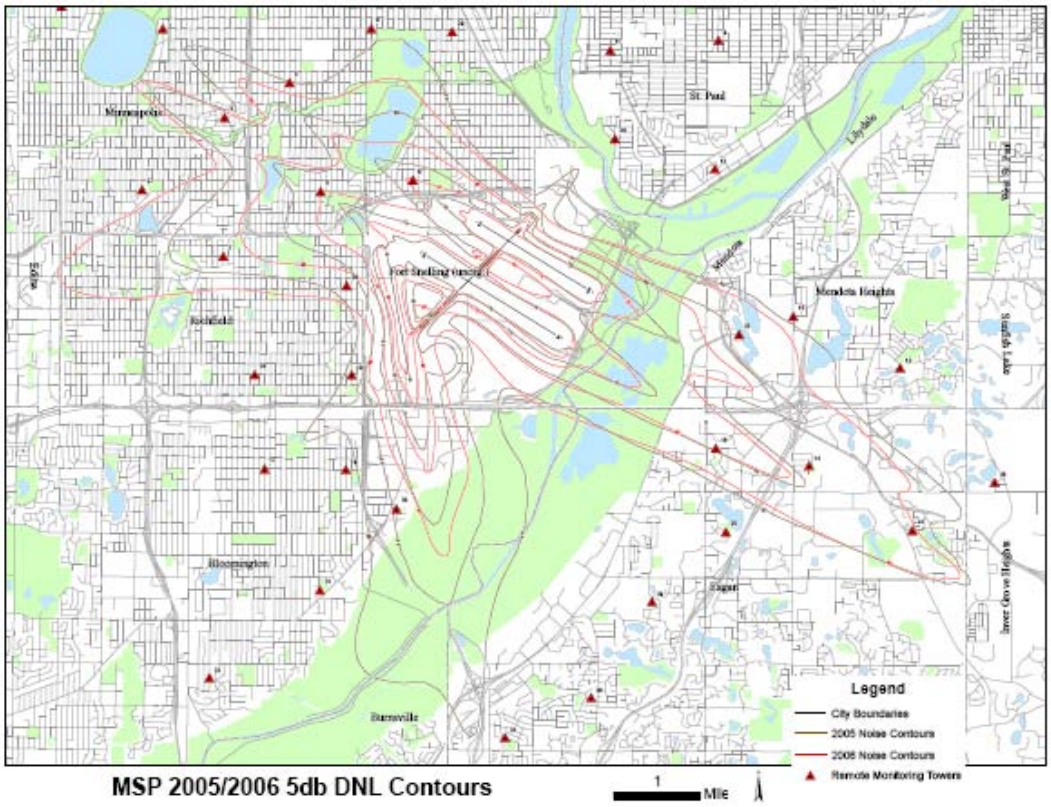
The City of Minneapolis is currently considering modifying this section of the code to more closely reflect the language of height limitation zoning as adopted by the MSP Joint Airport Zoning Board in 2004.

Airport Noise

The Minneapolis-Saint Paul International Airport (MSP) plays an important role in our region's economy and livability, but the airport also creates environmental impacts, such as noise and air pollution, which are particular concerns for those who live nearby. Airport noise is one of the City's sustainability indicators and is monitored to determine whether noise impacts on the community are getting worse or better. While the City has no direct control over airport operations, it actively encourages and advocates measures to reduce noise impacts in the airport environs. The City's goal is to reduce the average annual noise levels by at least three decibels, the minimum change that is perceptible to the average person's ear, from 2004 levels at all nine monitored locations in Minneapolis.

Trend Analysis

Despite a 10.6% reduction in air operations from 2005 to 2006 and a continued reduction of older planes, no significant reduction in noise levels was experienced in Minneapolis. Underutilization of the new north south runway resulted in higher than projected use of runways that direct traffic over southwest Minneapolis neighborhoods. The map below illustrates the projected 2005 noise contours as well as the actual noise contours for 2006. As is readily apparent, less noise went to the south than was anticipated resulting in more noise associated with operations off of the parallel runways.



MSP 2005/2006 5db DNL Contours

Multi-Modal

Minneapolis-St. Paul International Airport is part of our multi-modal system providing global access for freight and passengers. Additionally, the airport is served by light rail, bus, and automobile. The heavily trafficked ring roads around the perimeter of the airport make bike and pedestrian access nearly impossible.

The City implemented a program in 2007 which allows airport users to park in specified downtown City owned parking ramps and use LRT to access the airport. While the program is in its infancy, this proactive step ultimately should help to reduce both congestion and emissions from vehicles particularly those originating from north of the airport.

Cargo

Air cargo is an important aspect of service provided at MSP. Cargo includes heavier freight, small package and mail service. Regional commuters carry a small percentage of cargo, but the bulk of cargo is shipped in the belly holds of passenger aircraft or in all-cargo carriers. Nearly 59 percent of cargo was shipped via passenger aircraft while all-cargo carriers shipped about 40 percent. The volume of cargo shipped through MSP remained relatively stable in the 1990's. Since 2000, mail and cargo volumes have been relatively flat reflecting a regional weakness as well as the economic climate.

The Federal Aviation Administration (FAA) and Metropolitan Airports Commission project a 4% annual average growth rate for all cargo tonnage shipped through MSP. This would reflect a growth from 375,874 tons shipped in 2002 to 556,385 tons in 2010 and 823,586 tons by 2020.

The City has supported the development of a Regional Cargo Distribution Center which combined with a foreign trade zone enhance the capability to serve exporters and importers with time saving and cost effective international shipping capacity. At present and for the foreseeable future most air cargo is shipped to/from Chicago by truck due to the significant network advantage that Chicago (314 weekly international passenger flights) holds over Minneapolis-St. Paul (41 weekly international flights).

Heliports

There are no heliports in the City nor does the City of Minneapolis Zoning Code provide for the establishment of such use. Medical helistops are allowed as a conditional use on the property of a hospital under Chapter 522.40, 538.910 and 540.450 of the City Code and in conformance with state and federal regulations.

There are four licensed helistops in Minneapolis:

- Hennepin County Medical Center
- Abbott Northwestern Hospital
- Fairview Riverside Medical Center
- Fairview University Hospital

Seaplane Operations

Seaplane activity is prohibited on metropolitan area lakes unless designated by Minnesota Rules 8800.2800. No seaplane activity is allowed on any lakes in the City.

Navigational Aids and Special Facilities

There are no aviation navigational aids or special aviation facilities located in the City.

Appendix H.
Land Use Compatibility Guidelines
For Airport And Heliport Noise

A significant, on-going, environmental issue of public concern in the Twin Cities region is the noise generated by airplanes and helicopters operating in-and-out of the regional system of airports and heliports. There are three methods in which aircraft noise control is focused:

- Reduction of noise at the source,
- Abatement, through alteration of operational procedures, and
- Mitigation - preventive and corrective, making land uses more compatible.

The regional, *Land Use Compatibility Guidelines for Aircraft Noise* have been prepared to assist communities in preventive and corrective mitigation efforts that focus on compatible land use. The compatibility guidelines are one of several aviation system elements to be addressed in the comprehensive plans and plan amendments of communities affected by aircraft and facility operational impacts. The Metropolitan Land Planning Act (MLPA), requires all local governmental units to prepare a comprehensive plan for submittal to the Metropolitan Council for review. The MLPA requires periodic update of community comprehensive plans; the next update is scheduled for 2008. The following overall process and schedule applies:

- In 2003 the Council adopted the *Development Framework* chapter of the Metropolitan Development Guide (MDG),

- In 2004 the Transportation Policy/System Plan (TPP) chapter of the MDG is updated and includes the revised *land use compatibility guidelines for aircraft noise,*

- In 2005, after adoption of the new TPP, the Council transmits new *Systems Statements* to each metro community,

- Within nine months after receipt of the *Systems Statements* each community reviews its comprehensive plan and determines if a plan amendment is needed to ensure consistency with the MDG. If an amendment is needed the community prepares a plan amendment and submits it to the Council for review,

- Each community affected by aircraft noise and airport owner jointly prepare a noise program to reduce, prevent or mitigate aircraft noise impacts on land uses that are incompatible with the guidelines; both operational and land use measures should be evaluated. Communities should assess their noise impact areas and include noise program in their 2008 comprehensive plan update. Owners/Operators of system airports should include their part of the noise program in preparation or update of each airports long-term comprehensive plan (LTCP). See Table 1 for listing of noise affected airports and communities.

- Council reviews community plan submittal and approves, or requires a plan modification.

- Airport owner submits long-term comprehensive airport plan or plan update, including noise mitigation program, for Council review and approval. A schedule for updates of LTCP's is included in the TPP.

Table 1
Noise Impacted Communities

Airport	Community
MSP International	Minneapolis, Bloomington, Richfield, Mendota Heights, Mendota, Eagan, Burnsville
St. Paul Downtown	St. Paul
Anoka County - Blaine	Blaine
Flying Cloud	Eden Prairie
Crystal	Crystal
Airlake	Eureka Twp., Lakeville
South St. Paul	So. St. Paul, Inver Grove Heights
Lake Elmo	Baytown, West Lakeland, Lake Elmo

I. AIRPORT NOISE

Both the airport and heliport sections of the land use compatibility guidelines assume:

- ✓ Programs for reduction of noise at its source (engines, airframes),
- ✓ Operational noise abatement measures/plan in place,
- ✓ Community comprehensive plans reflect compatible land use efforts occurring through land acquisition, "preventive" land use measures, or "corrective" land use measures,
- ✓ Availability of an approved noise policy map for the facility under consideration. The noise exposure maps identify where, geographically, the land use compatibility guidelines are to be applied.

Preventive and Corrective Land Use Measures:
Airport noise programs, and the application of land use compatibility guidelines for aircraft noise, are developed within the context of both local community comprehensive plans, and individual airport long-term comprehensive plans (LTCP's). Both the airport and community plans should be structured around an overall scheme of preventive and corrective measures. Table 2 depicts the land use measures adopted as part of the MSP Part-150 noise compatibility program for 2007.

The status of noise programs at other system airports, in relation to the land use measures adopted at MSP, are also included to indicate the extent of the current noise control effort on a system-wide basis. Other land use measures may also need to be considered at the reliever airports. The level and extent of noise impacts vary widely between the airports and therefore not all land use measures may be appropriate or the level of emphasis may need to be different for neighborhoods within the same community.

The compatibility guidelines indicate that some uses be 'Discouraged". Prior to applying the guidelines the comprehensive plan or plan amendment needs to assess what has been or can be done to discourage noise sensitive uses. This should be done when the overall preventive and corrective land use measures are being assessed as part of the overall comprehensive plan.

Table 2
LAND USE MEASURES

PREVENTIVE LAND -USE MEASURES			CORRECTIVE LAND -USE MEASURES		
	MSP International Airport Communities	Other Regional Airport Communities		MSP International Airport Communities	Other Regional Airport Communities
❑ **Amend local land use plans to bring them into conformance with regional land use compatibility guidelines for Aircraft noise.**	YES	YES	❑ **Acquire developed property.** - within RPZ's - within runway safety zones - within DNL 70.	 YES YES YES	YES FCM & STP Airports.
❑ **Apply zoning performance standards.**	YES	YES	❑ **Part –150 sound insulation program.**	YES (MAC 5db criteria)	NO
❑ **Establish a public information program.**	[YES] Policy Plan, LTCP, EIS, CIP	[YES] Policy Plan, LTCP, EIS, CIP	❑ **Property purchase guarantee.**	NO (Not supported by communities)	NO
❑ **Revise building code.**	YES MS 473.192 Builders Guide	YES MS 473.192 Builders Guide	❑ **Creation of sound barriers.** - walls, - Berms, - ground runup enclosures	 YES YES YES	[YES]Proposed in the FCM & ANE LTCP's.
❑ **Fair property disclosure policy.**	[YES] Usually applied by developer or builder.	[YES] Usually applied by developer or builder.			
❑ **Dedication of avigation easements.**	YES	YES			
❑ **Transfer of development rights.**	NO	NO			
❑ **Land banking.** (acquisition of undeveloped property)	NO	NO			

The land use compatibility guidelines (contained in Table 3) are defined and described below. Land uses are categorized according to whether they are considered new/major redevelopment or in-fill/redevelopment.

New Development/Major Redevelopment - or - Infill/Reconstruction

- **"New Development"** - means a relatively large, undeveloped tract of land proposed for development. For example, a residential subdivision, industrial park, or shopping center.

- **"Major Redevelopment"** - means a relatively large parcel of land with old structures proposed for extensive rehabilitation or demolition and different uses. For example, demolition of an entire block of old office or hotel buildings for new housing, office, commercial uses; conversion of warehouse to office and commercial uses.

- **"Infill Development"** - pertains to an undeveloped parcel or parcels of land proposed for development, similar to or less noise-sensitive than the developed parcels surrounding it. For example, a new house on a vacant lot in a residential neighborhood, or a new industry on a vacant parcel in an established industrial area.

- **"Reconstruction or Additions to Existing Structures"** - pertains to replacing a structure destroyed by fire, age, etc., to accommodate the same use that existed before destruction, or expanding a structure to accommodate increased demand for existing use (for example, rebuilding and modernizing an old hotel, or adding a room to a house). Decks, patios and swimming pools are considered allowable uses in all cases.

Definition of Compatible Land Use

The four land use ratings in land use compatibility Table 3 are explained as follows:

- **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 Aircraft Noise Attenuation Act). Structures built after December 1983 shall be acoustically constructed so as to achieve the interior sound levels described in Table 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 Table 5.

- **INCO - "Incompatible" -** Land uses that are not acceptable even if acoustical treatment were incorporated in the structure and outside uses restricted.

Noise Policy Area A noise policy area is defined for each system airport and includes - aircraft noise exposure zones; a buffer zone; and , the preventive and corrective land use measures that apply to that facility.

Noise Exposure Zones:

- **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.

- **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.

- **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.

- **Zone 4** - Defined as a transitional area where noise exposure might be considered moderate. Noise levels are in the 60-64DNL 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.

- **Noise Buffer Zones:**

Additional area that can be protected at 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 DNL60 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 MUSA.

Table 3

Land Use Compatibility Guidelines for Aircraft Noise										
Land Use Category	**Compatibility with Aircraft Noise Levels**									
Type of Development	New Development and Major Redevelopment					Infill Development and Reconstruction or Additions to Existing Structures				
Noise Exposure Zones	**1** DNL 75+	**2** DNL 74-70	**3** DNL 69-65	**4** DNL 64-60	Buffer Zone*	**1** DNL 75+	**2** DNL 75-70	**3** DNL 70-65	**4** DNL 65-60	Buffer Zone *
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/Recreational										
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 & Educational Services	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Other Services	COND	PROV	PROV	COMP		COND	PROV	PROV	COMP	
Industrial/Communication/Utility	PROV	COMP	COMP	COMP		PROV	COMP	COMP	COMP	
Agriculture Land/Water Areas/Resource Extraction	COMP	COMP	COMP	COMP		COMP	COMP	COMP	COMP	

*

Table 4

Structure Performance Standards [1]	
Land Use	Interior Sound Level [2]
- Residential	45dBa
- Educational/Medical	45dBa
- Cultural/Entertainment/Recreational	50dBa [3]
- Office/Commercial/Retail	50dBa
- Services	50dBa
- Industrial/Communications/Utility	60dBa
- Agricultural Land/Water Area/Resource Extraction	60dBa

1 Do not apply to buildings, accessory buildings, or portions of buildings that are not normally occupied by people.
2 The federal DNL descriptor is used to delineate all the system airport noise policy zones.
3 Special attention is required for certain noise sensitive uses, for example, concert halls.

MSP Airport Noise Policy Area:
The noise policy area for MSP International Airport reflects the Part-150 Update process to redefine the MSP aircraft fleet information. That update projects the noise exposure anticipated in 2007 and is included for purposes of planning and review. The noise exposure map and Part-150 document is anticipated to be approved by the MAC and submitted to the FAA for its approval in 2004.

St. Paul Downtown Airport Noise Policy Area:
The noise policy area for St. Paul Downtown Airport reflects the noise exposure map generated in updating of the airport's long-term comprehensive plan in 2001. The map depicts the noise exposure projected for year 2020 aircraft operations. The MAC has not submitted the plan for Council review pending resolution of environmental and funding issues associated with flood protection of the airport.

Anoka County-Blaine Airport Noise Policy Area:
The noise policy area for the Anoka Co.-Blaine airport reflects the noise exposure map prepared as part of the final EIS in 2003 for the airport's long-term development. The map depicts the noise exposure expected for the year 2015 aircraft operations.

Flying Cloud Airport Noise Policy Area:
The noise policy area for the Flying Cloud Airport reflects the noise exposure map developed as part of the airport's environmental analysis and input from the City of Eden Prairie in finalizing the airport's long-term comprehensive plan. The map depicts the noise exposure projected for the year 2010 aircraft operations. A final EIS has been prepared on the airport development and a federal record of decision (ROD) is expected in 2005.

Airlake Airport Noise Policy Area:
The noise policy area for Airlake airport reflects the noise exposure map developed as part of the approved long-term development plan. The map depicts the noise exposure projected for the year 2015 aircraft operations. Land acquisition for the proposed cross runway has not occurred.

South St. Paul Airport Noise Policy Area:
The noise policy area for the So. St. Paul airport has not yet been updated and remains the same as depicted in the 1996 Aviation Policy Plan.

Crystal Airport Noise Policy Area:
The noise policy area for the Crystal airport has not been updated and remains the same as depicted in the 1996 Aviation Policy Plan.

Lake Elmo Airport Noise Policy Area:
The noise policy area for the Lake Elmo airport reflects the long-term comprehensive development plan approved in 1994. The noise exposure map depicts impact of year 2010 aircraft operations. The noise map in the 1996 Aviation Policy Plan has not been changed, with the exception that application of noise zone D was made optional at the communities discretion.

Special Purpose Airports:
Noise policy areas are not depicted for special purpose airport facilities since they generally do not have sufficient levels of activity to generate an annualized noise contour.

Table 5
Conditional Land Use Review Factors

Land Use Review Factor	**Residential:**		**Education/ Medical**	**Cultural / Entertainment / Recreational**		**Office/ Commercial /Retail**	**Services**
	Single, Multiplex with Individual Entrance, Mobile Home,	Multiplex/ Apartment, with Shared Entrance	Schools, Churches, Hospitals, and Nursing Homes	Indoor	Outdoor		
1. Indoor Sound level: Proposed construction design will provide outdoor to indoor attenuation required by structure performance standard in Table 2.	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
2. Location: Located under major departure flight track used by jets.	Incompatible[1]	Compatible	Incompatible	Compatible	Compatible	Compatible	Compatible
3. Location: Located parallel to primary runway used by jets.	Incompatible	Incompatible	Incompatible	Incompatible	Incompatible	Incompatible	Depends upon proposed use.
4. Location: Located parallel to runway to be used for unsheilded engine run-ups.	Incompatible	Compatible	Incompatible	Compatible	Probably Incompatible, depends upon proposed use.	Compatible	Compatible
5. Planning Considerations: Consistent with adjacent land use ambient noise; consistent with the overall comprehensive plan.	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible
6. Method of Disclosure: Local government has adopted effective method to inform future occupants of aircraft noise exposure (notice in property deed, truth in housing, informational bulletin, and permit notice).	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible	Compatible

[1] Incompatible for new development: compatible for redevelopment & infill development if the municipality determines that Factor 5 is satisfied & Factors 1&6 will be enforced

II. HELIPORTS

Rotorcraft, including helicopters, can operate at the region's airports; however, one of the key attributes of a helicopter is its ability to be used in very small and hard to reach areas. Often times the landing area is within private property and appropriate operating corridors or buffer area is not adequate. Therefore, a separate model ordinance has been prepared by the Council to assist communities in responding to heliport proposals. The model ordinance is intended to provide the basis for a community to establish appropriate land-use controls (for noise and safety purposes) and administrative procedures for siting a freestanding heliport facility.

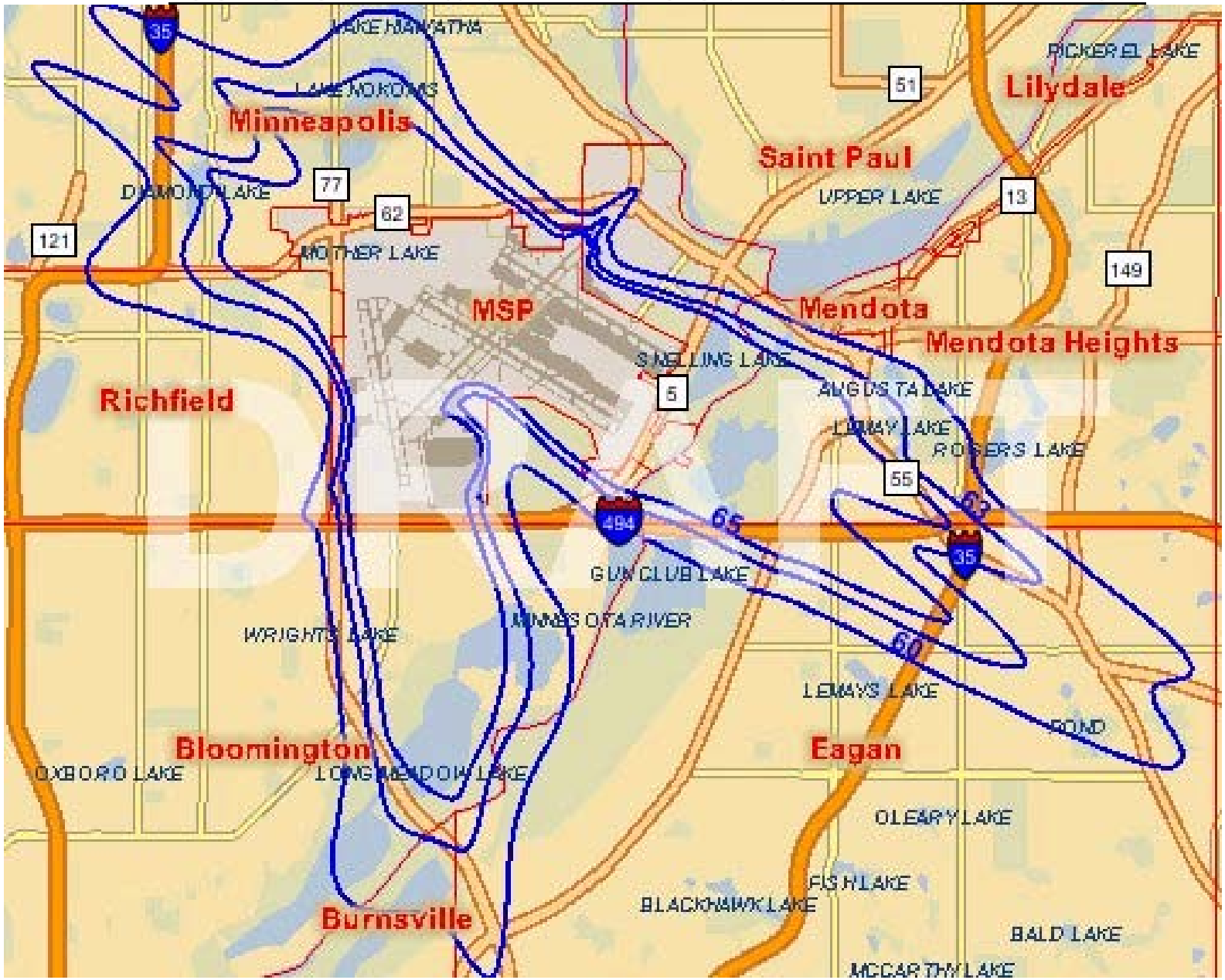
The Federal Aviation Administration (FAA) has an advisory circular (AC 150-5020-2) to provide technical guidance for communities and heliport operators in calculating the acoustic environment at heliports, helistops, or helipads. In lieu of adopted federal standards for helicopter noise, the circular is intended to provide assistance in preliminary evaluation of the noise compatibility for new helicopter sites.

A general discussion of the various helicopter facilities and activities is included in the airport system plan.

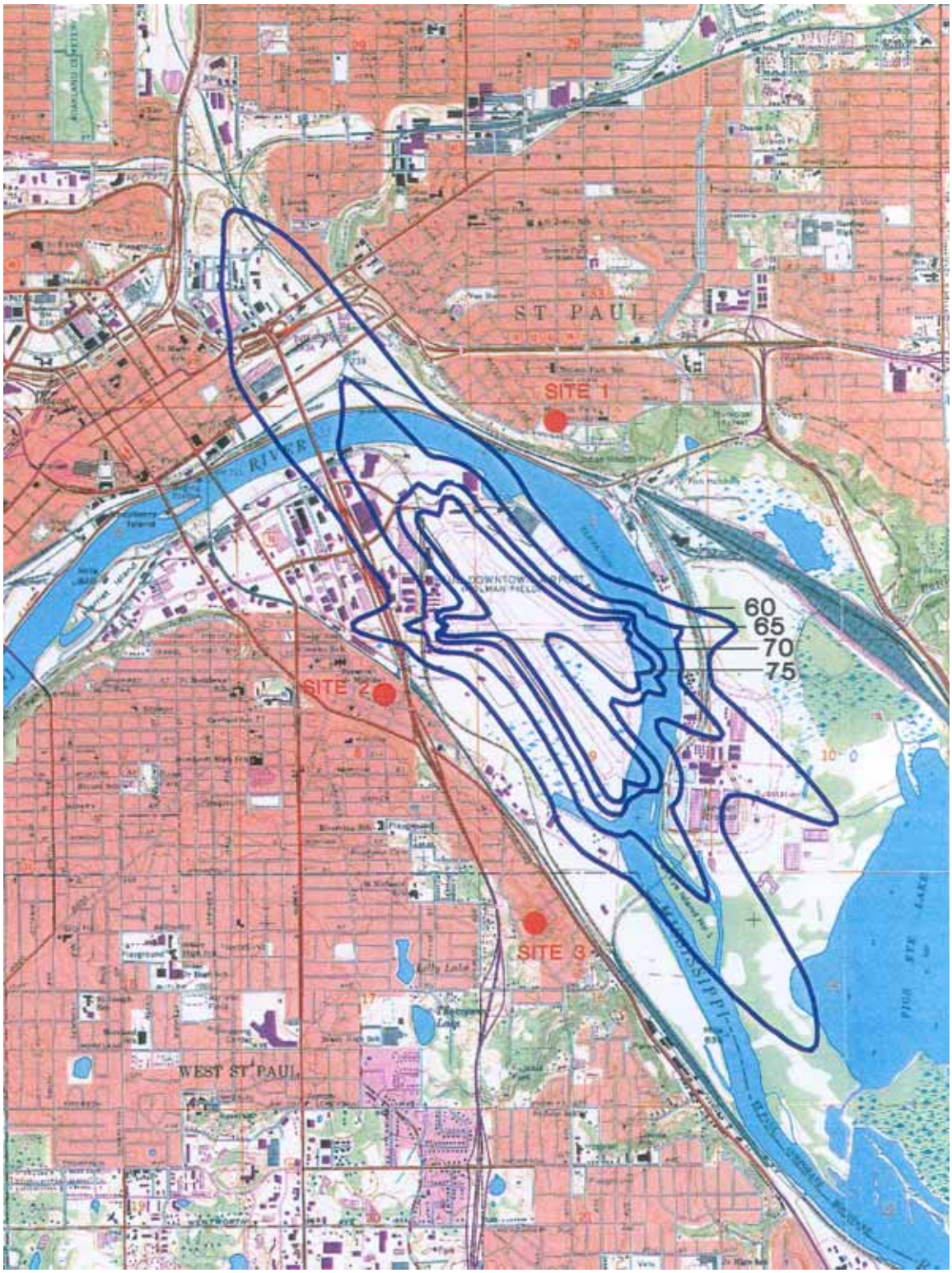
IMPLEMENTATION RESPONSIBILITIES

AIRPORTS	HELIPORTS
• **Metropolitan Council** - Encourage federal and state cooperation to reduce source noise. - Define noise policy area for system airports. - Encourage cooperation among airport operators and affected communities to develop and implement airport operations plans and community noise mitigation programs - Provide general guidance, planning and technical assistance, in application of the guidelines. - Review comprehensive plans and land-use agreements. - Monitor and evaluate changing conditions in land use, zoning, and operations that might affect the viability of the land use compatibility program.	• Metropolitan Council - Proposal for any major or intermediate heliport to be reviewed by the Council prior to local approvals. - Development of a minor heliport will not require Council review or comprehensive plan amendment.
• **Airport Owners/Operators** - The MAC and other airport operators should prepare operational plans for each system airport. Airport operating procedures can reduce noise on and off-airport, while distribution of aircraft operations can reduce numbers of people affected by aircraft noise. - Participate in preparation and financing of programs to address existing incompatible land uses. The mitigation program should be reflected in the operators capital improvement program.	• Airport Owners/Operators - Include a helicopter element in each airport development and noise abatement operations plan. - All heliports proposed to be located within five nautical miles of a System airport is to be reviewed by affected airport manager.
• **Affected Communities** - Adopt land use compatibility guidelines to prevent incompatible development. - Develop and implement local codes and ordinances. - Implement land use planning strategies, such as: - Insulate structures in noise sensitive areas - Adopt building noise attenuation standards. - Disclose degree of noise exposure to prospective home buyers. - Develop policies on location, relocation and closing of public structures. - Develop policies on extension of utilities into noise policy areas. - Zone or rezone properties. - Redevelop appropriate areas.	• Affected Communities - Prepare major or intermediate heliport development plans for any heliports approved by city, but not located at a system airport. - Heliport plans submitted to the Council must adequately addresses: - Participation in planning of persons potentially affected by proposal. - Identification of potential users, type and frequency of operations. - Environmental evaluation of land use compatibility. - Description of facility design, operations and mitigation measures.

NOISE POLICY AREA 2007 : MINNEAPOLIS - ST. PAUL INTERNATIONAL AIRPORT



NOISE POLICY AREA : ST. PAUL DOWNTOWN AIRPORT



NOISE POLICY AREA : ANOKA COUNTY-BLAINE AIRPORT

NOISE POLICY AREA : FLYING CLOUD AIRPORT

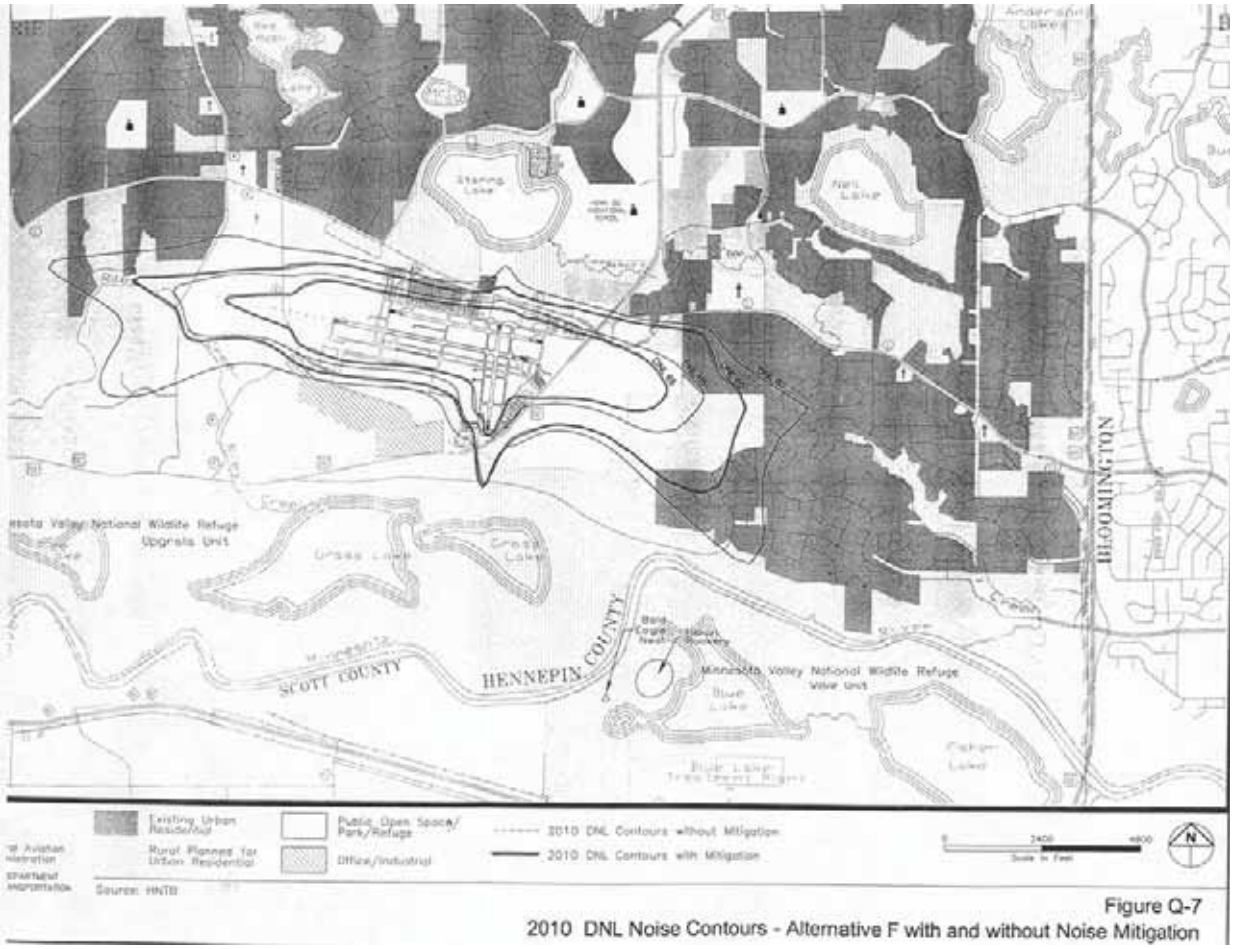


Figure Q-7
2010 DNL Noise Contours - Alternative F with and without Noise Mitigation

Table 5

TYPICAL LAND USE BY STANDARD LAND USE CODING MAUNAL CODES (SLUCM)

TYPE OF LAND USE	CODE NUMBERS AND SPECIFIC USES	
Residential		
- Single/Multiplex with Individual Entrance	11	Household units
	11.11	Single units - detached
	11.12	Single units - semi detached
	11.13	Single units - attached row
	11.21	Two units - side-by-side
	11.22	Two units - one above the other
- Multiplex/Apartment with Shared Entrance	11.31	Apartments - walk-up
	11.32	Apartments - elevator
	12	Group quarters
	13	Residential hotels
	14	Mobil home parks or courts
- Educational and Medical Schools, Churches, Nursing Homes	65.1	Hospital
	68	Nursing homes
Educational Services	69.1	Religious activities
	71	Cultural activities (including churches)
Cultural, Entertainment, Recreational		
- Indoor	72	Public assembly
	72.1	Auditoriums, concert halls
- Outdoor	74	Recreational activities (golf courses, riding stables, water recreation)
	75	Resorts and group camps
	76	Parks
Office, Commercial, Retail Services	52	Retail trade - building materials, hardware and farm equipment
	53	Retail trade - general merchandise
	54	Retail trade - food
	55	Retail trade - automotive, marine craft, aircraft and accessories
	56	Retail trade - apparel and accessories
	57	Retail trade - furniture, home furnishings, and equipment
	58	Retail trade - eating and drinking establishments
	59	Other retail trade
-TransportationPassenger Facilities	40	Transportation, communication and utilities
-Transient Lodging	15	Transient lodging
-Other Medical, Health, Educational Services	60	Services
	61	Finance, insurance and real estate services
	62	Personal services
	63	Business services
	64	Repair services
	65	Professional services
	35	Professional, scientific and controlling instruments; photographic and optical goods; watches and clocks manufacturing