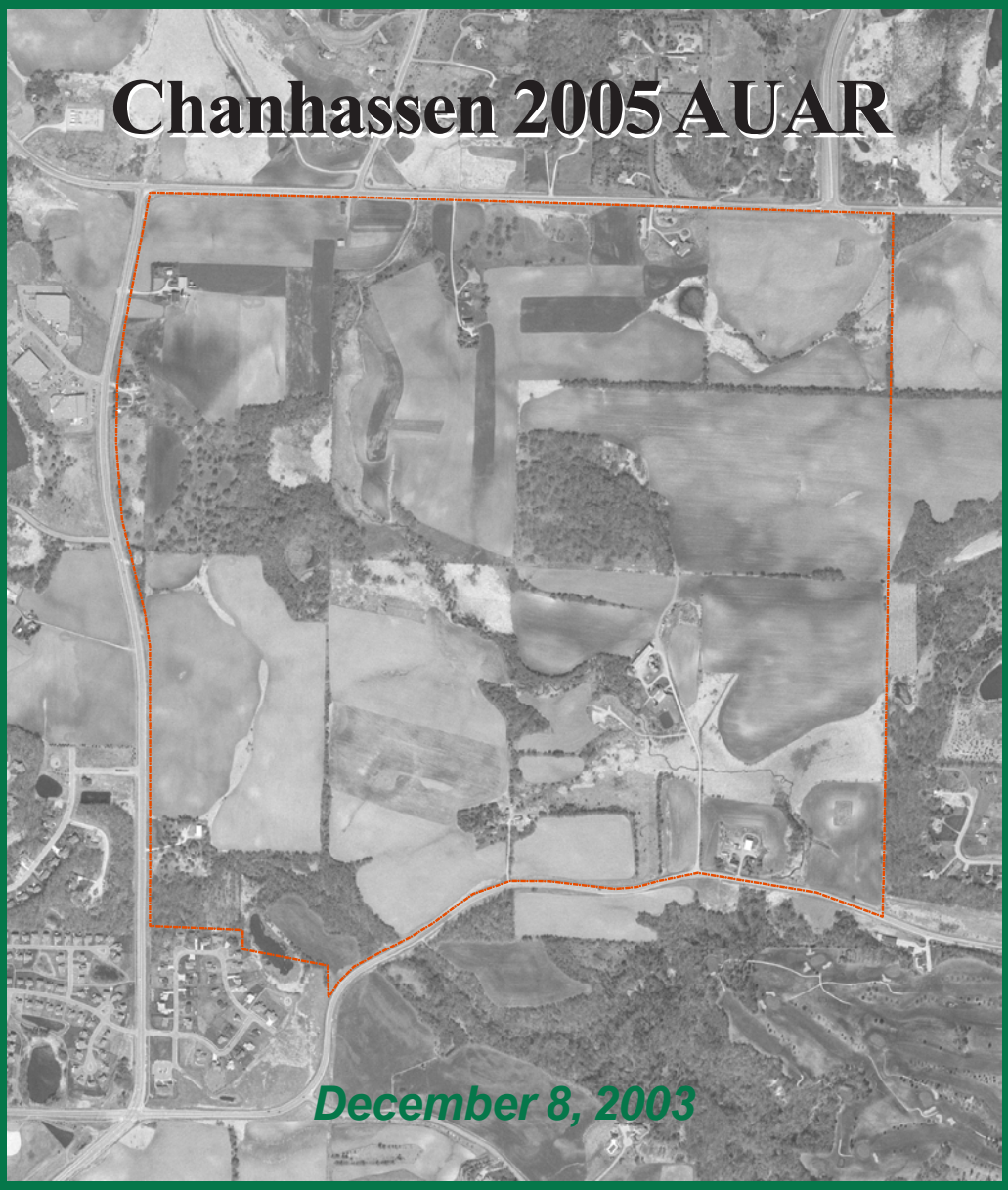
Chanhassen 2005 AUAR



Prepared for the City of Chanhassen
as the Responsible Governmental Unit (RGU)

CITY OF CHANHASSEN

Consultant Team:

Hoisington Koegler Group Inc.

Kimley Horn and Associates
Peterson Environmental Consulting
106 Group
HDR

Chanhassen 2005
Alternative Urban Areawide Review
(AUAR)

December 8, 2003

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EXECUTIVE SUMMARY

What is an AUAR?

An Alternative Urban Areawide Review (AUAR) is authorized under Minnesota Rules Chapter 4410.3610 as an alternative form of environmental review for development projects. Generally, the AUAR consists of a hypothetical development scenario, an inventory of environmental and cultural resources, an assessment of the "cumulative" impacts that the development scenario may have on these resources as well as public infrastructure services, and a set of mitigation measures that reduce or eliminate the potential impacts generated by the development. The AUAR is intended to address the "cumulative" impacts resulting from a sequence of related development projects as opposed to an Environmental Assessment Worksheet (EAW) or Environmental Impact Statement (EIS) which simply looks at a single project's impacts and does not attempt to outline mitigation initiatives.

Why an AUAR for this Project?

The 2020 Comprehensive Plan

The City of Chanhassen updated its comprehensive plan in 1998 and officially adopted the updated plan in June of 1999. The comprehensive plan evaluates land supply and projects growth of the community over a 20 year period. The plan identifies future land use patterns and a staging plan that depicts when municipal services (sewer and water) will be made available for future development. The plan identified the 2005 Metropolitan Urban Services Area (MUSA). Development within this area will begin in 2005 when services are made available. An AUAR study of the entire 2005 MUSA area will provide a better framework for making decisions including budgeting for improvements and more informed decision making. It will also provide a base of knowledge for developers intending to develop projects in the area.

Town and Country Homes Proposal

In July of 2002, an application was submitted to the City by Town and Country Homes to build 540 townhome units on 88.5 acres in the project area. The property, known as the Bernardi property, is located in the southwest corner of the AUAR project area adjacent to Audubon Road (within the W ½ of the NE ¼ of Section 27, Twp 116, Range 23 West). The proposal by Town and Country Homes met the mandatory requirements for preparation of an Environmental Assessment Worksheet. Over the years, staff has been made aware of other property owners expressing interests in future development. There also is interest in locating a new secondary school within the general area. Rather than just studying the subject property, city staff met with the State Environmental Quality Board (EQB) to discuss the possibility of studying the entire 2005 MUSA area through the AUAR process. The EQB supported this recommendation.

The Chaska School District 112

The Chaska School District 112 will be requesting a referendum in the fall of 2003 for future school facilities. This referendum is necessary to accommodate a growing region and not solely development in Chanhassen. Chanhassen is on the eastern edge of the school district and is not well served by Chaska School facilities. The City is in support of locating a school facility in Chanhassen. The AUAR process will help facilitate location of a school district within Chanhassen and serve a community need.

TH 212/312 Expansion Plans

A portion of the TH 212/312 project is located in the project area. Major road improvements within the local street network will be associated with the TH 212/312 project. Local roadway connections identified in the AUAR Development Scenario have been coordinated with TH 212/312 systems plans. The traffic analysis contained in this report includes Build and No-Build TH 212/312 scenarios for purposes of future traffic modeling.

How is an AUAR used?

An AUAR is used as a tool to help parties interested in development within the project area understand the existing environmental and cultural resources present on a site prior to initiating detailed planning and design. It is also used to identify key initiatives that must or should be undertaken to minimize negative impacts generated by proposed development.

Any proposed development in the project area would need to be reviewed for consistency with the AUAR and Mitigation Plan. If a development plan is not consistent with these documents or other statutory requirements, the developer may need to conduct additional environmental documentation or review or request an amendment to the AUAR. Natural and cultural inventory information in the AUAR and the Mitigation Plan will be used to guide development**.** Design and construction would proceed only after all approvals and appropriate agreements are complete.

Overview of the Chanhassen AUAR Process

City staff began exploring the concept of performing an AUAR for the project area in September and October of 2002 in response to heightened developer interest in the project area. The City hired a consulting team to assist with the preparation and assembled a task force to provide community input into the process. As part of the process, two meetings were held with the task force and a general open house was held prior to a planning commission public hearing. The process followed the statutory requirements for completion of an AUAR

Summary of Natural, Cultural and Physical Resources Inventoried

As part of the inventory work, field research was conducted on portions of the site while local and regional data sources were collected and analyzed for the remaining portions of the project area. The area that was subject to the more detailed field review was the Bernardi property or Town and Country Homes proposal. Wetlands on this site were physically delineated and documented in a report included as Appendix 2 of the AUAR. The City of Chanhassen Wetland Inventory and the National Wetland Inventory were consulted for the remainder of the project area. The natural resource base present in the project area essentially consists of twenty-seven different wetlands (11 on Bernardi property) of varying types and three significant wood stands consisting of mature maple, basswood, elm, red and white oaks and hop hornbeam. However, these wood stands have

been compromised over the years because of past agricultural use on and adjacent to the sites. The more pristine natural features are located within the primary zone or secondary zone of the Bluff Creek Overlay District. This district provides an existing layer of regulatory protection to the resources.

A Historical and Cultural Resource inventory was also conducted for the project area. This inventory included a search of local, regional and state historic and cultural resource data bases. The report is included as Appendix 3 of the AUAR. The findings of the Historical and Cultural Resource inventory included two pre-recorded archeological sites within the project area and seven others within a mile of the project area. These sites were not field checked, but their location would warrant field checking should any development be proposed near them. Based on the overall lack of disturbance of these sites, their proximity to significant water sources and previously reported sites, and their topographic prominence, the sites are considered to have high potential for intact precontact archaeological resources. The inventory also evaluated various farmsteads for architectural history. Most farmsteads exhibit building types commonly constructed during the 1910s and 1920s. Only one was found to maintain a complement of outbuildings consistent with farmsteads of this period. In some cases, the historical integrity of the primary buildings, such as the house or barn, have been significantly compromised. As a result, the farmsteads do not sufficiently convey their association with late nineteenth and early twentieth-century farming practices. Although several of the individual buildings retain good historical integrity, their styles are typical of the period and do not appear to be significant representations of architectural styles.

Description of the Development Scenario

Land Use

A hypothetical development scenario was generated for the project area. This scenario is based on the directions established within the 2020 Comprehensive Plan approved in June of 1999 with the exception of a school facility located on the northwest portion of the site. The school facility would be a middle or high school with enrollment of roughly 1,700 students. Besides the physical class room facility, recreation fields would be necessary. The Comprehensive Plan would permit land uses such as medium density residential, office, industrial and park and open space. Under the development scenario assumed for this project, development projections include roughly 1,500 new housing units (consisting of a mix of small lot single family, townhome and condominium type housing) and roughly 700,000 square feet of new light industrial/office space. These projections assume maximum densities and lot coverages based on existing comprehensive plan policies and zoning ordinance provisions.

Municipal Infrastructure

Municipal sewer and water facilities have been planned to serve this area consistent with the projections of the development scenario. Sanitary sewer service would be served through Lift Station #24 located at Lyman Boulevard and Audubon Road except for the portion of the project area lying east of TH 212/312. This area will require a new lift station and force main which will serve the next MUSA expansion area starting in 2010. No future wells are anticipated in the project area as a result of the development scenario. A distribution system would be built to serve new development with water supply from the Central Water Treatment Plant (site 10).

Storm sewer improvements would be built in conjunction with other infrastructure systems. The City's Storm Water Management Plan was adopted in 1994 and needs to be updated. The current plan illustrates a system of wetlands, ponds and pipes that, when linked together, provide sufficient capacity to serve the project area. The use of wetlands has been further regulated by changes to the Wetland Conservation Act and needs to be updated in the SWMP. New National Pollutant Discharge Elimination System (NPDES) Phase II requirements recently promulgated also regulate individual site development requirements.

Roadways

Roadways planned to serve the development project include a collector from east to west across the site. This roadway would connect the extension of Powers Boulevard to Audubon Road. Two legs would serve as connectors connecting the east-west collector to Lyman Boulevard on the north and Pioneer Trail on the south. Other roadway improvements would need to be completed to accommodate future growth in the project area. Lyman Boulevard and Audubon Road both have plans to be widened to four lane roadways and functional class changes to "A" Minor Arterials. TH 212/312 is scheduled to be completed in 2008. As part of the TH 212/312 project, Powers Boulevard would be extended north to Lyman Boulevard from Pioneer Trail. Access to TH 212/312 for the project area would be provided at two intersection locations with Powers Boulevard. Timing of TH 212/312 is important to the phasing of roadway improvements within the project area.

Identification of Potential Impacts Resulting from the Development Scenario

Environmental Impacts

Environmental impacts would normally result from construction activities and elements associated with development such as impervious surface coverages, lawns, and other urban treatments. However, the current use of the site as agriculture creates an impact on these features that when new development occurs, could be enhanced with proper environmental design. The City has existing tools in place with the Bluff Creek Ordinance and other provisions to ensure future development pays high respect to natural and cultural features.

Traffic Related Impacts

Approximately 22,000 average daily trips will be generated from the project area upon its full build out. At the time of full build out, planned roadway improvements will have been built to alleviate most traffic congestion problems. In the interim, however, the project will have to undergo minor traffic inconveniences associated with congested intersections particularly at the intersection of Audubon Road and Butternut Street in Chaska until warrants are met for installation of a traffic signal. Traffic generated from the site will be dispersed on various street systems and will not have a noticeable impact on intersections or roadways outside of the project area.

Mitigation Initiatives

A summary of Mitigation Initiatives will be included in the final AUAR. A draft mitigation plan will be included in the draft AUAR made available for public review and will include the following topic areas:

- General Mitigation Initiatives
- Fish, Wildlife and Ecologically Sensitive Resources
- Water Resources (wetlands, creeks, lakes) and Surface Water Management
- Erosion and Sedimentation
- Wastewater
- Water Supply
- Traffic/Transportation Mitigation Initiatives
- Land Use Management Initiatives

ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR) WORKSHEET FORM

This section consists of the Environmental Assessment Worksheet (EAW) form and response to questions as modified by Environmental Quality Board (EQB) AUAR Guidance as of October 2, 2000. The EAW question is shown in bold uppercase text, AUAR guidance is shown in faded italicized text, and the response to the question is shown as regular text.

AUAR Guidance as Revised by EQB staff 10-2-00

This guidance has been prepared by the EQB staff to assist in the preparation of AUAR documents. It is based on the directive of 4410.3610, subp. 4 that "the content and format [of an AUAR document] must be similar to that of an EAW, but must provide for a level of analysis comparable to that of an EIS for impacts typical of urban residential, commercial warehousing, and light industrial development and associated infrastructure."

General AUAR Guidance

This guidance is based on the items of the standard EAW form (February 1999 version and October 2000 revisions); the numbers listed below refer to the item numbers of that form. Except where stated otherwise, the information requested here is intended to augment (or clarify) the information asked for on the EAW form; therefore, the EAW form and the guidance booklet "EAW Guidelines" must be read along with this guidance.

The information requested must be supplied for each of the major development scenarios being analyzed, and it is important to clearly explain the differences in impacts between the various scenarios.

If this guidance indicates that an EAW item is not applicable to the AUAR, the item # and its title (the text in bold print on the EAW form) should be included with an indication that the EQB guidance indicates that no response is necessary in an AUAR (as opposed to just skipping reference to that item at all).

One general rule to keep in mind throughout the preparation of the AUAR document is that whenever a certain impact may or may not occur, depending on the exact design of future developments, the AUAR should cover the possible impacts through a "worst case scenario" analysis or else prevent the impacts through the provisions of the mitigation plan. Failure to cover possible impacts by one of these means risks the invalidation of the environmental review exemption for specific development projects.

1. PROJECT TITLE

Chanhassen 2005 Metropolitan Urban Service Area AUAR

2. PROPOSER

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4. REASON FOR EAW (AUAR) PREPARATION.

In July of 2002, an application was submitted to the City by Town and Country Homes to build 540 townhome units on 88.5 acres in the project area. The property, known as the Bernardi property, is located in the southwest corner of the AUAR project area adjacent to Audubon Road (within the W ½ of the NE ¼ of Section 27, Twp 116, Range 23 West). The proposal by Town and Country Homes met the mandatory requirements for preparation of an Environmental Assessment Worksheet. Over the years, staff has been made aware of other property owners expressing interests in future development. There also is interest in locating a new secondary school within the general area. Rather than just studying the subject property, city staff met with the State Environmental Quality Board (EQB) to discuss the possibility of studying the entire 2005 MUSA area through the AUAR process. The EQB supported this recommendation.

A study of the entire 2005 MUSA area will provide a better framework for making decisions including budgeting for improvements and more informed decision making.

5. PROJECT LOCATION AND MAPS.

a. The country map is not needed for an AUAR.
b. The USGS map should be included.
c. Instead of a site plan, include:

(1) a map clearly depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis;

(2) land use and planning and zoning maps as required in conjunction with items 9 and 27; and

(3) a cover type map as required for item 10. Additional maps may be included throughout the document wherever maps are useful for displaying relevant information.

The projects general location is southwestern Chanhassen bounded by Lyman Boulevard on the north, Audubon Road on the west, Pioneer Trail on the south and on the east, the extension of Powers Boulevard southerly of Lyman to Pioneer Trail. The western boundary of the project area is the corporate limits between the cities of Chanhassen and Chaska. For project location maps see Figures 1 and 2.

County: Carver City: Chanhassen
Sections: SE ¼ of Section 22, SW ¼ of Section 23, NW ¼ of Section 26 and NE ¼ of Section 27
Township: 116
Range: 23

The following figures are included within this AUAR.

- Figure 1—Project Location
- Figure 2—AUAR Project Boundary
- Figure 3—USGS Map
- Figure 4—Primary Habitat Areas
- Figure 5—NWI Wetlands by Type and Delineated
- Figure 6—City Wetland Classification
- Figure 7—Surface Water Features
- Figure 8—Geologic Inventory
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- Figure 11—Existing Land Use
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- Figure 13—Land Use Plan and 2005 MUSA Staging Area
- Figure 14—AUAR Development Scenario
- Figure 15—Existing Utilities
- Figure 16—Future Utilities
- Figure 17—Conceptual Surface Water Management Plan
- Figure 18—Development Scenario TAZ Boundaries
- Figure 19—Future Roadway Network
- Figure 20—2010 Site Generated Traffic Assignments
- Figure 21—2010 Background Traffic
- Figure 22—2003 No-Build & Build
- Figure 23—2010 No-Build & Build
- Figure 24—Existing Lane Use and Traffic Control
- Figure 25—Proposed Lane Use and Traffic Control
- Figure 26—2010 Total Traffic
- Figure 27—Individual Sewer Treatment Systems (ISTS) and Well Sites

6. DESCRIPTION.

Instead of the information called for on the form, the description section of an AUAR should include the following elements for each major development scenario included:
-anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area;
-infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.) Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More "arterial" types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary;
-information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule.

The Chanhassen AUAR is being prepared to address the cumulative impacts of future development in the next planned growth area of the City. This area contains significant environmental features primarily along the Bluff Creek corridor and the proposed US Highway 212 expansion. The Bluff Creek Corridor is identified as a significant natural resource area. To protect its natural resources, the city completed the Bluff Creek Watershed Natural Resources

Management Plan (adopted in 1996) and subsequently adopted an ordinance to implement the plan. The City's 2020 Comprehensive Plan adopted on June 28th, 1999 provides the basis for this AUAR.

The Comprehensive Plan

The 2020 Comprehensive Plan establishes the future growth plans for the community over an approximate 20 year period. The plan acknowledges the city's dominant single-family residential character and establishes goals and policies that seek to achieve a balance of uses. The plan includes polices that:

- Strive for a mixture of development that will work towards financial well being;
- Preservation and enhancement of significant natural features;
- Encourage development through a PUD process to enable flexibility in design in order to achieve community objectives;
- Encourage a diversity of housing types by designating areas for medium and high density housing;
- Encourage commercial development to focus within or adjacent to the downtown area unless they are mixed use developments or PUDs while discouraging the arrangement of commercial facilities in a strip mall orientation;
- Minimize environmental and traffic impacts on neighborhoods;
- Make the most efficient use of the regional highway system;
- Phase future development based on the City's ability to provide adequate public services; and
- Promote coordination with other entities for the adequate and efficient provision of public services such as transit, recreation and education.

The plan establishes a future land use map that identifies the location of various types of anticipated future development. The comprehensive land use plan is illustrated in Figure 13.

Bluff Creek Watershed Natural Resources Management Plan

The Project Area is in the lower-middle reach of the Bluff Creek watershed where the natural resources are primarily lowland plant communities. The natural resource goal for this section of the creek *"...is to restore and expand where possible the natural areas to their pre-settlement condition while still providing recreational opportunities and hydrologic control of stormwater."* Development recommendations are to incorporate Watershed Based Zoning, Cluster/Open Space Zoning or other tools intended to protect the primary and secondary zones. Land use recommendations are provided in this section as shown in the land use plan. The book, Site Planning for Urban Stream Protection, is referenced. To provide continuity of natural features, primary and secondary corridors are mapped and generally described as follows (see Figure 12):

The Primary Zone

The Primary Zone is a buffer zone for direct impacts that would affect the creek. This area is intended to be preserved in its natural state. First choice is City ownership of this area. A number of flexible land use techniques such as conservation zoning, conservation easements, public purchase, cluster development, transfer of development rights and public dedication are noted as appropriate tools to achieve community objectives.

The Secondary Zone

The Secondary Zone is a management zone where limited development is recommended and would be achieved through conservation measures to balance the ecosystem. Conservation areas, impervious surface reductions and land stewardship are high priorities in this zone.

The plan sites Tom Schueler's book, *Site Planning for Urban Stream Protection,* as a model for appropriate development guidelines to use in the Bluff Creek Watershed. The plan "suggests" that the average impervious cover in undeveloped areas should not exceed 20%. This is also the percent of the watershed that was developed in 1996. The plan responds to this by identifying subwatersheds that should be managed based on their impervious cover as follows:

- Sensitive Subwatershed (1-10 percent impervious cover)
- Degrading Subwatershed (11-25 percent impervious cover)
- Non-supporting Subwatershed (26-100 percent impervious cover)

Design and location of creek crossings need to be sensitive to significant habitat areas and preservation of corridors for wildlife movement.

The Development Scenario

The development scenario has been developed (in order to evaluate impacts) based on the City's 2020 Comprehensive Plan. The project area includes an area of approximately 624 acres. The AUAR project area includes all of the land contained in the 2005 expansion of the Metropolitan Urban Service Area (MUSA). The area is currently used for agricultural purposes, most of it tilled for row crop production. The only development in the area is the few associated farmsteads and City of Chanhassen Lift Station #24 which is located along Lyman Boulevard at its intersection with the northerly segment of Audubon Road.

The development scenario assessed in this AUAR reflects land uses in more detail than illustrated in the land use plan of the comprehensive plan. The comprehensive plan identifies multiple land uses that overlap one another. For example, a site may be identified as either low density residential or medium density residential. Where land use categories are shown as overlapping in the land use plan, one land use pattern that would generate the greatest impact while maintaining consistency with the comprehensive plan was selected. This scenario represents the "worst case" development scenario.

One area to specifically note is the school designation for the site at the intersection of Lyman and Audubon. This site is guided as Office/Industrial Park/Open Space in the comprehensive plan. As described earlier, a school facility is a possibility for the site but not certain. For purposes of the AUAR, a school facility is being used due to the higher traffic impacts. Details of the school site are described below in the School section and in question #21 - Traffic.

The Development Scenario is illustrated in Figure 14.

Types and Intensity of Development anticipated within the AUAR Project Area

Within the project area the Comprehensive Plan anticipates a mix of residential, office, office/industrial uses, institutional, and park land uses at varying densities or intensity levels. The types and intensity levels expressed in the comprehensive plan are defined as follows:

Low Density Residential – Single family detached housing is the predominant building type in the category, with a maximum density of 4 units per acre.

Medium Density Residential – The medium density designation is intended to accommodate multiple units including duplexes, townhouses, and lower density apartments with net density ranging between 4.0 to 8.0 units per acre.

Office – Office uses include professional trade and service uses generally in one or two-story arrangements. Floor area ratios are assumed at 0.35.

Office/Industrial – Office/Industrial includes larger scale light industrial, warehouse, and manufacturing uses. Floor area ratios are assumed at 0.30.

Park/Open Space –This category includes natural areas primarily along Bluff Creek intended predominantly for passive park activities and open space protection. However, some active community park like facilities may be appropriately located within this land use designation. Park and open space opportunities are directed towards the Bluff Creek Overlay districts.

School—The School designation is not identified as a land use category in the Comprehensive Plan. However, it appears in the Development Scenario. The Chaska School District (#112) Master Facilities Plan identifies the need for additional elementary and secondary school sites to address its growing enrollment. The Chanhassen City Council adopted Resolution # 2003-54 in June of 2003 expressing its desire to have the District locate a middle or high school facility in the City of Chanhassen. The resolution is included in Appendix 1. There currently are no schools of this type in the eastern portion of the Chaska School District. The AUAR project area has been identified as a potential location with access preferably from Lyman Boulevard. The City also sees the opportunity for a joint School/Park facility. Estimated land needs for this complex are about 60 to 80 acres. The School District has suggested they would be looking for a facility that could accommodate up to 1,700 students.

Development Staging

The Comprehensive Plan has identified the project area as receiving public utilities beginning in 2005. Development is anticipated to begin in the southwesterly portion of the site due to the expressed interest of property owners. Sanitary sewer service would be extended from the Lift Station #24 located at Lyman Boulevard and Audubon Road to this area.

Bernardi/Town and County Homes—An application was submitted to the City by Town and Country Homes to build 540 townhome units on 88.5 acres in the project area. The property, known as the Bernardi property, is located in the southwest corner of the AUAR project area adjacent to Audubon Road (within the W ½ of the NE ¼ of Section 27, Twp 116, Range 23 West). The City granted concept approval of the project through the Planned Unit Development process in August of 2002. In the Staff Report (included without attachments as Appendix 4), the issue of appropriate land use for the property is addressed. The Comprehensive Plan has guided the property for both medium density residential or office/industrial. The staff report discusses the need to weigh issues of land use compatibility and tax revenue generated by each type of development. The development scenario has identified this property as Medium Density Residential.

Other Property Owners have explored to varying degrees a variety of concepts including a mix of residential, office, commercial, industrial, institutional, and park uses. However, none have been formally submitted to the City for review.

It is anticipated that the majority of the project area will develop over a five year period between 2005 and 2010 except the piece south of TH 212/312 and west of the Powers Boulevard extension which is anticipated to develop after 2010. This is a reasonable assumption based on the City of Chanhassen's historical building permit volume ranging from 250 and 300 permits per year over the last 15 to 20 years.

The Comprehensive Plan anticipates that the City will achieve full build out by 2020.

Transportation Improvements

The transportation chapter of the comprehensive plan identifies several planned roadway improvements and system deficiencies relevant to the project area. In addition, it is assumed that at least three local collector roadway features will be necessary within the project area. One that stretches from east to west across the entire project area connecting Audubon Road with Powers Boulevard; one segment that connects the east west collector to Pioneer Trail and a third segment that connects the east west collector with Lyman Boulevard. A loop road connecting Audubon Boulevard and Lyman Road is shown in Transportation Analysis Zone (TAZ) 1. Ultimately, this roadway may not be public under certain circumstances. The public road alternative is a drive with the identified connections at Audubon Boulevard and Lyman Road. Classification and design of this roadway would depend on the type of use for the site, either office/industrial or school facility. If developed as office/industrial, one or two businesses may not necessitate a public road. A school facility would probably have a private road as well, with connections at Audubon Boulevard and Lyman Road as identified. An office/industrial area with more than two businesses would likely need a public roadway through that area to better connect uses and facilitate traffic flow. The following roadway improvements are included in this analysis:

- TH 212/312 proposed expansion. An EIS has been prepared for this project. Right-of-way for the corridor is in the process of being acquired. Funding for the completion of the project has been allocated by the State. The project is scheduled for completion in 2008.
- Powers Blvd. (CSAH 117) will be extended south from Lyman (CSAH 18) to Pioneer Trail (CR 14) as part of the TH 212/312 expansion project. An interchange at Powers Boulevard and future TH 212/312 is planned.
- The Audubon Road/Lyman Boulevard intersection is identified as a system deficiency. Long queues during peak hours for west bound traffic turning south cause delays. Improvements to reduce delays and improve flow are cited as needs. Carver County has planned improvements to Lyman Boulevard to a four lane roadway but have not identified or secured funding.
- Audubon Road is a two lane roadway that is approaching its capacity. Existing traffic volumes in 1996 were 9,400 vehicles per day (vpd). Planned improvements to Audubon Road include expansion to a four lane roadway; however, no funding has been secured.
- The Carver County Transportation Plan includes functional classification upgrades from "B" to "A" minor arterials include Audubon Road (CSAH 17), Lyman Boulevard (CSAH 18), and Powers Boulevard (CSAH 17).
- A series of north/south connectors and an east/west collector street have been identified for the AUAR project area that would provide access through the project area and to the adjacent arterial/collector roadway system.

Sanitary Sewer Improvements

Chanhassen Lift Station #24 is located off of Lyman Boulevard. Lift Station 24 routes flows north to the Lake Ann Interceptor MSB-7138. Capacity exists within this system to handle the growth anticipated in the project area. A system of pipes will be extended through the project area principally along existing and planned roadway corridors wherever possible in order to minimize additional vegetative disturbances. The Comprehensive Plan illustrates three sewer sub-districts that comprise the project area. They are all of BC-2 and BC-3 and the western portion of LB-1. Flows from BC sub districts are routed north through lift station #24 to the Lake Ann Interceptor while flows from the LB-1 sub-district will be routed to the east along Pioneer Trail through future trunk sewer to the Shorewood II Interceptor MSB-7017. Servicing the LB-1 sub-district will require a lift station, force main, and trunk sewer which will eventually provide service to the next MUSA staging area beyond 2010.

See Figures 15 and 16 for location of existing and future utility services in the project area.

Public Water Supply Improvements

The Comprehensive Plan identifies a future elevated water tower storage site near Lyman Boulevard and Powers Boulevard and future trunk water main systems generally following the major roadway corridors of Lyman Boulevard, Audubon Road, Pioneer Trail and the extension of Powers Boulevard. The City is currently working on an update to the comprehensive water supply and distribution plan. The draft plans anticipate that the project area may be served by the Central Water Treatment Plant (site 10). If this is the case, the future elevated water tower may be eliminated.

See Figures 15 and 16 for location of existing and future utility services in the project area.

Storm Sewer Improvements

The Chanhassen Surface Water Management Plan (SWMP) was adopted in March 1994. The project area is located within the Bluff Creek and Lake Susan Storm Drainage Districts. Stormwater improvements within the project area and outside of the TH 212 right-of-way show the utilization of selected agricultural/urban wetlands for nutrient traps to improve water quality. Additional areas throughout the site are designated for stormwater sediment traps and stormwater quantity ponds. However, due to changes in the Minnesota Wetland Conservation Act (WCA), jurisdictional wetlands can no longer be used for storm water management without mitigation or an approved comprehensive wetland management plan (which the City does not have at this time) Sediment traps and water quantity control facilities within the TH 212 right-of-way would handle run-off from portions of the project area. Future stormwater improvements are likely to include smaller parcel specific stormwater ponds to assure compliance with National Pollutant Discharge Elimination System (NPDES) Phase II stormwater requirements.

The Surface Water Management Plan includes a conceptual surface water management plan that identifies locations and sizes of pipes, open channels and ponds to facilitate drainage throughout the AUAR project area. Although the proposed sizes of the improvements will need additional review in the AUAR Mitigation Section and at the time of development, they provide a basis for attaining water quality standards expected by the plan. Stormwater ponds in the project area consist of nutrient traps, sediment traps, and quality ponds. Because the plan is in need of updating, newer stormwater management techniques may be considered for mitigation measures as needed.

Portions of the project area drain to and will utilize ponds constructed within the proposed TH 212/312 right-of-way. Stormwater improvements will need to be reviewed with MnDOT to ensure storm water facilities are properly sized based on the recently revised roadway alignment (August 2003).

***Note**: the RGU must assure that the development described complies with the requirements of 4410.3610, subpart 3 (and also that it properly orders the AUAR and sets the description in that order as required by 4410.3610, subpart 3).*

City of Chanhassen Resolution # 2003-70 ordering the preparation of the AUAR is included as Appendix 1. The Order for Review was passed by the Chanhassen City Council on Monday, August 11, 2003 consistent with the requirements of Minnesota Rules Section 4410.3610, subpart 3.

7. PROJECT MAGNITUDE DATA.

The cumulative totals of the parameters called for should be given for each major development scenario, except that information on "manufacturing," "other industrial," "institutional," and "agricultural."

The following data represents the anticipated types and intensity/density of residential, office, office/industrial, and institutional development throughout the AUAR area based on the development scenario described in question 6.

TABLE 7.1 PROJECT MAGNITUDE DATA

LAND USE DESIGNATION	TOTAL NET DEVELOPABLE ACRES	MAXIMUM INTENSITY OF DEVELOPMENT	PROJECT MAGNITUDE DATA
Medium Density Residential/Low Density Residential	120	8 du/acre	954 units
Medium Density Residential	66	8 du/acre	680 units
Office	17	0.35 FAR	270,00 square feet *
Office/Industrial	34	0.30 FAR	450,000 square feet*
Park/Open Space	45	Passive Park	
Park	35	Athletic Fields	
Institutional	36	Middle/High	1,700 Students

* rounded to nearest 5,000 square feet

Developable land inventory is that land area that is unconstrained by steep slopes as defined by the City of Chanhassen GIS Steep Slope dataset (slopes greater than 18%), National Wetland Inventory, Peterson Environmental delineated wetlands, floodplain (100 year and floodway), the right-of-way for proposed Highway 212 and the collector roadway concept alignment for the AUAR (for purposes of estimating project magnitude data, the collector roadway ROW is assumed at a 60' width consistent with Chanhassen's residential collector standards).

Key assumptions made to arrive at a net land area for development include the following:

- Park and Open Space (P/OS) areas were determined based on the City's adopted Comprehensive Land Use Plan

- Park areas (Park) are identified adjacent to the east side of Bluff Creek south of Lyman Boulevard. This space would be a joint space shared with a new school for athletic fields and a community park. Additional Park area is identified south of the school site. This area is intended as a passive park use with trails and interpretive development only. This park could also serve as an outdoor classroom for the school. The majority of the site is within the primary district of the Bluff Creek Corridor.
- Medium Density Residential/Low Density Residential (MDR/LDR) land use will consist predominantly of single family detached homes and attached townhome type structures.
- Medium Density Residential (MDR) land use will consist of all attached homes
- Office (O) uses will generally consist of one or two story office buildings.
- Office/Industry (O/I) uses are typically warehouse or manufacturing uses with a limited area (less than 30%) used for office space.
- A new school is identified on the northwest quadrant of the site. The School District has indicated the facility will be a middle or high school with an enrollment of approximately 1,700 students. The facility would be connected to the athletic fields across Bluff Creek with a pedestrian bridge crossing to access athletic fields.
- The location of the school site is currently guided as "Park Open Space\Office Industrial." A minor comprehensive plan amendment may be necessary for this use. Furthermore, as we are evaluating the "worst case scenario" it is assumed that the greatest impacts to the area will be generated by traffic and a school will have equal or greater traffic generating potential than an office/industrial use.
- Where the comprehensive plan identified overlapping land use patterns, the most intense land use pattern was chosen in order to quantify potential development.

8. PERMITS AND APPROVALS REQUIRED.

A listing of major approvals and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given. This list will help orient reviewers to framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

Table 8.1 presents a list of known local, state, and federal permits and approvals. Table 2-8 provides a list of known infrastructure and public financial assistance.

TABLE 8.1 PERMITS AND REGULATORY REVIEW/APPROVALS

UNIT OF GOVERNMENT	TYPE OF PERMIT/REVIEW OR APPROVAL	REGULATORY CITATION (AS MAY BE NOTED)
City of Chanhassen	Subdivision Approval	City Code Chapter 18
	Planned Unit Development Approval	City Code Chapter 20, Article VIII
	Rezoning	City Code Chapter 20, Article II, Div. 2
	Bluff Creek Overlay	City Code Chapter 20 Article XXXI
	Conditional Use Permit Approval	City Code Chapter 20, Article IV
	Grading Permit	City Code Chapter 7, Article III
	Site Plan Review Approval	City Code Chapter 20, Article II, Div. 6
	Wetland Alteration Permit	City Code Chapter 20, Article VI
	Comprehensive Plan Amendments	

UNIT OF GOVERNMENT	TYPE OF PERMIT/REVIEW OR APPROVAL	REGULATORY CITATION (AS MAY BE NOTED)
	Zoning Ordinance Amendments	City Code Chapter 20, Article II, Div. 2
Carver County	Roadway Access Permit	
	Comprehensive Plan Amendment Review	
Minnesota Department of Natural Resources	Utility Crossings Permit	MN Statute 103G, MN Rules 6115.0810
	Natural Heritage Program Coordination	Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988; MN Statutes Chapter 84.0895; MN Rules Chapter 6134
U.S. Army Corps of Engineers	Clean Water Act Section 404/10 Wetland Permits	Section 404 Of The Clean Water Act Title 33CFR26 - Water Pollution Prevention and Control Subchapter IV - Permits and Licenses
Minnesota Department of Health	Water Main Plan Review	MN Rules 4720
Minnesota Pollution Control Agency	NPDES Permit	MN Statute 115, MN Rules 7002
	Sanitary Sewer Extension Permit	
	401 Water Quality Certificate	
	Surface Water Discharge Permit	
	Wastewater Permit	
	Indirect Source Permit (ISP)	
Riley, Purgatory, Bluff Creek Watershed District	Grading Permit	
Metropolitan Council Environmental Services	Sanitary Sewer Plan Approval	
Minnesota State Historic Preservation Office	Cultural Resource Coordination	Section 106 of the Historic Preservation Act, Protection of Historic Properties" (36 CFR Part 800), MN Statutes 138.31-.42, MN Private Cemeteries Act- MN Statute 307.08
Metropolitan Council	Comprehensive Plan Amendment	Metropolitan Land Planning Act Minnesota Statutes Section ____
Minnesota Environmental Quality Board (EQB)	Environmental Assessments (AUAR)	Minnesota Rules 4410

9. LAND USE.

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

- *Discuss past and current land use at the project's site.*
- *Generally, "proximity" means within a mile or so of the project; however, the distance can be greater in specific instances.*
- *If a site assessment for past contamination has been done, include a brief summary of the results.*
- *Discuss what is adjacent to the site (all directions).*
- *Note any nearby features of concern, including areas where vulnerable populations live or visit such as nursing homes, schools, day care centers, water resources, parks, etc.*
- *Indicate the distance and direction to the nearest residential receptor. Since air and water contamination can potentially travel in any direction, please include all residential areas surrounding the site. You may need to contact the city or county in which the project is located for information.*

Past and current land use in the project area has been agricultural based uses, mostly row crops. Six operating farmsteads exist and generally consist of a residential structure and various outbuildings such as barns, sheds or silos. Two large lot residential estate properties are located in the project area (Figure 11). Private individual septic treatment systems and private wells are utilized by existing uses (Figure 27). The following table provides a breakdown of existing land use in the project area.

TABLE 9.1 EXISTING LAND USE CALCULATIONS

Existing Land Use (*based on assessors code)	
GROSS ACRES TOTAL	624 ACRES
Agriculture Use (row crop or pasture)	442 Acres
Agriculture, Residential	174 Acres
Residential Estate	9 Acres
Other Area Calculations	
T.H. 212 Right-Of-Way (approximate area)	125 Acres
Wetlands (Chanhassen Wetland Inventory—45.2 acres and Bernardi Property delineated—8.8 acres)	54 Acres
Floodways (100 year floodplain)	78 Acres
Steep Slopes (Chanhassen inventory of 18% or greater slopes)	19 Acres
Bluff Creek Overlay Primary District	200 Acres

Adjacent land uses consist of a combination of suburban and rural residential land uses and industrial park uses. To the northwest is an industrial park use in Chaska. This area is generally on the north side of Hazeltine Lake and is accessed off of Audubon Road at Lakeview Drive and off of Lyman Boulevard at Hazeltine Drive. Directly north of the project area are several large lot

residential home sites that access local streets such as Sunset Trail, Sunridge Court and Oak Side Circle and some that directly access Lyman Boulevard. The Bluff Creek Corridor also continues to extend north of the project area following Bluff Creek. To the east of the project area is the proposed TH 212/312 right of way and adjacent environmental features that again are part of the Bluff Creek Corridor. A rural residential subdivision is located adjacent to the southeast portion of the site. This subdivision accesses the regional roadway system at Pioneer Trail. Also southeast of the site is the Bluff Creek Golf Course. The more pristine environmental features near the project area can be found to the south of the site within the Bluff Creek Corridor. More suburban residential uses are found to the southwest and west of the project area in Chaska. Directly to the west is Lake Hazeltine and the Hazeltine Country Club and Golf Course. This area includes many suburban residential developments.

Future land use guided for adjacent land uses includes a continued pattern of development with municipal services. Future patterns are generally low density residential with the exception of roughly 5 acres in Chaska at the northwest quadrant of Autumn Woods Drive which is designated for High Density Residential.

10. COVER TYPES.

The following information should be provided instead:

a) cover type map, at least at the scale of a USGS topographic map, depicting:

-wetlands – identified by type (Circular 39)
-watercourses – rivers, streams, creeks, ditches
-lakes – identify protected waters status and shoreland management classification
-woodlands – breakdown by classes where possible
-grassland – identify native and old field
-cropland
-current development

b) an "overlay" map showing anticipated development in relation to the cover types; this map should also depict any "protection areas," existing or proposed, that will preserve sensitive cover types. Separate maps for each major development scenario should generally be provided.

The following cover types are illustrated in their respective figures including Figure 14 illustrating the development scenario in relation to the natural features:

- Figure 4 Primary Habitat Areas as identified by Peterson Environmental Consulting
- Figure 5 NWI Wetlands by Type
- Figure 6 The City of Chanhassen Wetland Inventory.
- Figure 7 Surface Water Features (including shoreland management districts and flood plain)
- Figure 11 Existing Land Use Pattern
- Figure 14 Development Scenario with natural features overlay

11. FISH, WILDLIFE, AND ECOLOGICALLY SENSITIVE RESOURCES.

a) The description of wildlife and fish resources should be related to the habitat types depicted on the cover types maps (of item 10). Any differences in impacts between development scenarios should be highlighted in the discussion.

Although the AUAR project area consists primarily of actively cultivated crop land, other cover types are present. The site is utilized by a variety of wildlife species typical of streams, wetlands, cropland, and fragmented woodlands. The primary areas of wildlife habitat on the project site fall within the Bluff Creek Corridor and are: (1) a portion of Bluff Creek (tributary to the Minnesota

River) flowing north to south through the heart of the AUAR examination area, (2) a riparian wetland along Bluff Creek with one distinct lobe projecting west from the creek, including a forested wetland, (3) an isolated wetland surrounded by upland maple-basswood forest which is the highest quality wetland on the site, (4) three upland woodlands (see Figure 4) that are dominated by mature maple, basswood, elm, red and white oaks and hop hornbeam, but none having a developed shrub or herbaceous layer because of past agricultural use (i.e., grazing), (5) eighteen flow through type wetlands located along agricultural drainage paths, (6) eight isolated wetlands that are currently cultivated, and (7) currently cultivated cropland wetlands (corn, soybeans and hayland) comprising the majority of the site. The plant communities and wildlife habitat characteristics of these communities are as follows:

Stream/Riparian

Bluff Creek is a small, first-order (headwater) tributary of the Minnesota River system. It primarily receives drainage from agricultural land, so nutrient loading, turbidity, sedimentation, and fecal coliform bacteria are ongoing concerns for the river system. The portion of Bluff Creek on the project property receives drainage from Lyman Boulevard, Audubon Road, Pioneer Trail, numerous residential streets, a large area of cropland, and receives its main channel flow from the upstream reach via a culvert under Lyman Boulevard. Primarily mature boxelder trees, elms and green ash with moderately developed understory shrubs and herbaceous plants inhabit the corridor, although the community consists largely of species that are invasive and/or indicative of disturbance, such as common buckthorn and stinging nettle. Streambanks are relatively steep and muddy, suggesting variability in stage height. Some reaches of the creek and associated drainage swales exhibit signs of excessive erosion. The creek bottom consists of sand and silt with a relatively small cobble component, providing relatively poor invertebrate habitat and suggesting substantial siltation impacts. The stream is relatively low-gradient, and at the time of site visit in July, 2003, flow was slow to moderate, the channel was shallow (<1' to 3') and narrow (~10'), and was at least 2 ft. below bank-full stage height. The City has developed the Bluff Creek Overlay Zoning District to assist in management and preservation of the Bluff Creek habitat.

The Minnesota River system lies downstream from the assessment area and supports a warm water fishery. Fishes known to inhabit the river include channel catfish, flathead catfish, black crappie, northern pike, walleye, sauger, largemouth and rock bass, sunfishes, and a variety of "rough" and "forage" fish such as bullhead, carp, chubs, suckers, sheepshead, redhorse, and various species of dace, minnow, and shiner. Erosion and nutrient contributions from industries further upstream have degraded the status of the system and limits the habitat quality for many fish species.

No construction or landscaping is planned in or directly adjacent to Bluff Creek (as preserved through the Primary District of the Bluff Creek Overlay), or in the riparian zone or the wooded corridor with the exception of a bridge and potential utility crossings near the southeast corner of the Bernardi site to facilitate the development of the east west collector roadway. Temporary construction-related siltation would affect Bluff Creek and the river, temporarily increasing siltation and nutrients to downstream habitats, but appropriate management practices would minimize this impact.

Wetlands

Eleven wetlands were identified on the Bernardi (Town and Country Homes) property by Peterson Environmental Consulting, Inc. wetland delineation (designated Wetlands A through K on the Delineated Wetlands map as included in Appendix 2) and sixteen more are located on

properties within the assessment area but outside the Bernardi Property boundaries (see Appendix 2). These wetlands are of various types and degradation levels. In general, all the wetlands except wetlands B and C (see full descriptions under Physical Impacts on Water Resources) are quite degraded by sustained human activities. These include several sections of the drainage swales connected to Bluff Creek (Wetlands C, D, E, F, G, H, I, J and K), which are cultivated and show evidence of severe siltation and erosion. Wetland B is high quality floating vegetative mat surrounded by a shallow open water area. Wetland C also exhibits abundant ecological integrity with several different wetland types including a closed-canopy forested and shrub/scrub wetland with considerable habitat value for forest and swamp wildlife species.

Sixteen other wetlands exist within the project area adjacent the Bernardi Site. These wetlands were identified using the National Wetland Inventory (NWI) map for Shakopee, Minnesota and the City of Chanhassen Wetland Inventory and Classification Map. Most of these wetlands have been effectively drained or impacted by human activities such as development and agriculture. The ramps associated with the TH 212 expansion project, and feeder streets are located along the southeast edge of the assessment area and will impact up to four of the identified wetlands. Silt fencing and other management practices would be used to prevent siltation of Bluff Creek and nearby wetlands.

In the long run, the agricultural wetlands would provide greater functions and values than they do at present, because they would no longer be impacted by cultivation and most of the runoff contribution would be treated in on-site detention ponds or other surface water management practices. They could continue to receive nutrient inputs, depending on development densities, but it is likely that inputs would be lower than those occurring under intensive cultivation of the site. Other wetlands that were not as highly impacted by agricultural practices would be protected by the Bluff Creek Corridor management area. In a full development scenario numerous wetlands could receive increased road pollutants, but it is likely that these inputs would not increase as a pollution source to Bluff Creek.

Wooded/Forest

Three mature wooded areas exist within the assessment area (see Figure 4), combined with the stream riparian area and several wooded fence rows, supports wildlife species that are well adapted to fragmented forest and forest edges in agricultural areas. This includes mammals such as white-tailed deer, eastern chipmunks, raccoons, gray squirrels, cottontail rabbits, woodchucks, and red foxes. Bird species include American crows, red-tailed hawks, downy woodpeckers, blue jays, black-capped chickadees, mourning doves, great horned owls, American robins, eastern wood-pewees, eastern phoebes, great crested flycatchers, chimney swifts, white breasted nuthatches, house wrens, gray catbirds, brown thrashers, cedar waxwings, northern cardinals, Baltimore orioles, warbling and red-eyed vireos, indigo buntings, chipping sparrows, song sparrows and American goldfinches. Reptiles and amphibians occurring in this portion of the site probably include garter snakes, ring-necked snakes, spring peepers, leopard frogs and gray treefrogs.

The wooded areas show signs of previous disturbance, so the plant community composition is not consistent with a native climax community. This undoubtedly has had some effect on animal communities as well, but the area provides considerable habitat resources nonetheless, including some protection for Wetlands B, C and Bluff creek. With the application of proper land use management strategies that are largely already in place, future development within the project is not likely to adversely affect the three major wooded areas, and may create long-term benefits

because cultivation will no longer occur at the forest margins, surrounding land will be continuously vegetated.

Cropland

The majority of the AUAR project area and the Bernardi property are cropland, including much of the existing wetland area. With the exception of the previously mentioned wooded areas the bulk of the remaining land cover is in existing cultivated fields. The cropland on the site is currently planted in corn and soybean monocultures, so habitat value is very limited. Relatively few wildlife species use such areas as habitat, and none of these species exclusively use cropland as habitat. However, cropland, and especially the more diverse margins, can provide substantial foraging opportunities for many raptors, songbirds, small mammals, and snakes.

The cropland area of the site would ultimately be altered in its entirety. All structures, impervious surfaces, and associated entrance ramps would be constructed on land that is presently under cultivation. The area would be excavated and graded, creating a potential short-term sedimentation risk to wetlands, and any wildlife habitat values presently occurring in this area would be indefinitely lost. The cultivated areas have the poorest wildlife habitat quality on the site, but they would be replaced with a constructed environment that would have minimal wildlife habitat value.

b) For an AUAR, prior consultation with the DNR Natural Heritage program for information about reports of rare plant and animal species in the vicinity is required. If such consultation indicates the need, an on-site habitat survey for rare species in the appropriate portions of the AUAR area is required. Areas of on-site surveys should be depicted on a map, as should any "protection zones" established as a result.

The Minnesota Department of Natural Resources Natural Heritage Rare Features Database was obtained from the DNR. Phone conversations were held with DNR staff members Sarah Hoffman (Data Delivery Specialist / End. Spp. Env. Rev. Coordinator) and Shannon Flynn (GIS Specialist) regarding the project area and associated natural resource information. No coordination letter (Sarah Hoffman personal communication) was sent. DNR Natural Heritage and Nongame Research Program staff will review the AUAR for accuracy of data interpretation.

There were no occurrences of rare features or species identified in the AUAR Project Area. However, there were numerous sites identified within a mile or so to the south of the project area and within the downstream stretches of Bluff Creek. Species that were identified are illustrated in Table 11.1.

TABLE 11.1 NATURAL RARE FEATURES DATABASE –SITES WITHIN A MILE OF THE PROJECT AREA

Common Name (common name accepted by the Natural Heritage & Nongame Research Program)	Element Occurrence Records
AMERICAN BROOK LAMPREY	1
AMERICAN GINSENG	1
BEAKED SPIKE-RUSH	1
CALCAREOUS SEEPAGE FEN (CENTRAL) PRAIRIE SUBTYPE	2
DRY PRAIRIE (CENTRAL) HILL SUBTYPE	1

Common Name (common name accepted by the Natural Heritage & Nongame Research Program)	Element Occurrence Records
HAIR-LIKE BEAK-RUSH	1
LOWLAND HARDWOOD FOREST	1
MAPLE-BASSWOOD FOREST (BIG WOODS)	3
OAK FOREST (BIG WOODS) MESIC SUBTYPE	1
SMALL WHITE LADY'S-SLIPPER	1
STERILE SEDGE	2
TWIG-RUSH	1
VALERIAN	1
WET MEADOW	1
WHORLED NUT-RUSH	1

The Environmental Impact Statement for the TH 212/312 expansion project contains additional information on these resources.

12. PHYSICAL IMPACTS ON WATER RESOURCES.

The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenarios, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a "worst case scenario" or else prevent impacts through the provisions of the mitigation plan.

The project site encompasses 27 wetlands covering 54 acres. Characteristics of each delineated wetland are given below and are further elaborated on in Appendix 2.

Wetland A:

Wetland A is located near the northwest corner of the Bernardi site. It is a Type 1/2, PEMA/Bd wetland that has been substantially affected by row-crop cultivation and siltation. At the time of site visit On June 2, 2003, severe erosion was noted entering the basin from the west and at the northern end of the basin where an eroded gully was at least 12 feet deep. Other portions showed clear signs of recent plowing, despite its not supporting row crops at the time. Invasive trees, grasses and forbs dominated this portion of the wetland. The wetland appeared to provide limited wildlife habitat value because the non-cultivated area was small and obviously disturbed, with only sparse vegetation.

Wetland B:

Wetland B includes portions of Bluff Creek, its riparian area and the wetland extensions of the riparian zone. The western portion of Wetland B is a Type 2 PEMC emergent floodplain. The northern portion of Wetland B is a Type 7 PFO1B forested floodplain (It has well-developed forest vegetation, but the community consists primarily of disturbance indicators: wood nettle, horsetail, nightshade, and boxelder. The proposed project would likely provide benefits to this wetland by allowing it to revert to more natural conditions and to provide greater runoff retention and filtration for Bluff Creek.

Wetland C

Wetland C is an isolated basin surrounded by mature upland woods. Although the understory is degraded and generally devoid of sediment trapping herbaceous species the wetland maintains very high ecological integrity. Wetland C is a Type 3/4 PEMC/F semipermanently flooded emergent wetland. Native grasses, sedges and forbes that are located on a floating vegetative mat dominate most of the wetland. The surrounding area is open water bordered by abrupt upland slopes. The proposed project would likely provide benefits to this wetland by allowing it to revert to more natural conditions and to provide greater runoff retention and filtration for Bluff Creek.

Wetlands/D, E, F, G, H, I, J, K and most other wetlands located outside the Bernardi Property:

These wetlands comprise isolated basins or waterways that ultimately drain into Bluff Creek. These basins are highly affected by agricultural practices, such as plowing, draining or tilling and most have plant communities indicative of high levels of nutrient inputs, sedimentation or effective drainage. Many of these basins are planted in most years and many showed no indication of crop stress from wetness. Those that were delineated on the Bernardi property were dominated by invasive species such as: reed canary grass, cattails, or stinging nettles. Habitat value is somewhat limited as a result of the small size, relatively low plant diversity, and pollutant inputs. Various development scenarios could directly affect these wetlands.

13. WATER USE.

If the area requires new water supply wells specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.

New Water supply wells are not planned or needed in the AUAR area. The City of Chanhassen is completing their Water Supply, Treatment and Distribution System Master Plan. Water supply will be provided thru existing and proposed wells, the Central Water Treatment Plan and a combination of existing and proposed trunk water lines.

Water Supply to the AUAR area will require the construction of new water supply lines. The current Draft Master Plan shows the following:

- New 12" watermain on Audubon Road - Lyman Blvd. to Pioneer Trail
- New 12" watermain on Pioneer Trail - Audubon Rd. to future Powers Blvd.
- New 16" watermain on future Powers Blvd. - Lyman Blvd. to Pioneer Trail
- New 16" watermain on Lyman Blvd. - Audubon Rd. to Powers Blvd.
- In addition, the City will need to construct new wells to meet the additional demand.

Internal water supply to the AUAR area will connect to the future Trunk Watermains and be constructed generally within roadway right-of-ways within the development at the time of the development.

A single Bluff Creek crossing is anticipated in the roadway fill associated with the major east-west collector."

Figure 16 shows future water supply line sizes and locations.

14. WATER-RELATED LAND USE MANAGEMENT DISTRICTS.

Such districts should be delineated on appropriate maps and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed.

The project area includes two shoreland designations. The Bluff Creek is a protected stream that falls under the regulations of the shoreland district for property within 300 feet of the ordinary high water mark. Hazeltine Lake in Chaska is also covered by the shoreland ordinance within 1,000 feet of the ordinary high water mark. Other land use restrictions include the FEMA flood plain district regulations. These districts are mapped on Figure 7—Surface Water Features.

15. WATER SURFACE USE.

This item need only be addressed if the AUAR area would include or adjoin recreational water bodies.

There are no recreational water bodies in the AUAR project area.

16. EROSION AND SEDIMENTATION.

The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included.

The Development Scenario described in question 6 includes development of roadway systems and municipal utility systems to accommodate development of roughly 1,500 housing units, a school facility, park facilities and just over 700,000 square feet of industrial/office development. While it is premature to determine the detailed earthmoving requirements for the general development pattern described above and in question 6, typical earthwork recommendations are that the topsoil and soft alluvial soils within the study area be removed prior to construction of the buildings. More removal of existing soils and placement of engineered soils may be required in areas near wetlands. A detailed site grading plan will be required as part of the plan submittals for City approval of specific development proposals in the AUAR area. Also, a detailed erosion control mitigation plan will be prepared and approved prior to the City's issuance of site grading permits.

Preparation of preliminary site development plans will include consultation with an urban forester to identify important specimens that should be preserved and/or existing trees that could be relocated within the development, using a tree spade. The details of the transplanting as well as an overall tree/landscape plan will be completed and reviewed by City staff for conformance to the City's tree ordinance as part of the preliminary and final site review. Similarly, City and watershed district regulations require maintenance of a minimum width of natural vegetation buffer around all wetlands. This buffer area promotes protection of natural vegetative cover to minimize erosion and sedimentation as part of site development plans.

The Bluff Creek Overlay District zoning overlay places restrictions on grading and site preparation activities in order to minimize erosion and sedimentation.

The potential for erosion of soils exposed during development of the AUAR study area will be minimized by using Best Management Practices (BMPs) during and after construction. Examples of possible BMPs include:

- Installation of erosion control measures prior to grading operations and maintaining them until all areas disturbed have been restored.
- Construction of detention ponds prior to site mass grading, to contain construction-related runoff/sediment.
- Sweeping streets as necessary where construction sediment has been deposited.
- After construction, paving or vegetating all disturbed areas to eliminate exposed soil surfaces.
- Delaying removal of erosion control measures until all disturbed areas have been stabilized.
- Preservation of existing vegetation adjacent to wetlands and the Bluff Creek.

Specific erosion control practices will be identified in final grading and construction plans for each proposed development project as required by the National Pollutant Discharge Elimination System (NPDES) permit the City of Chanhassen and the Regional Watershed Management Districts erosion/sedimentation control standards.

17. WATER QUALITY-STORMWATER RUNOFF.

For an AUAR the following additional guidance should be followed in addition to that in "EAW Guidelines":
-it is expected that an AUAR will have a detailed analysis of stormwater issues;
-a map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided;
-the description of the stormwater systems would identify on-site and "regional" detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.
-if present in or adjoining the AUAR area, the following types of water bodies must be given special analyses:

> *-<u>lakes:</u> within the Twin Cities metro area a nutrient budget analysis must be prepared for any "priority lake" identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs;*
> *-<u>trout streams:</u> if stormwater discharges will enter or affect a trout stream an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included; National Pollutant Discharge Elimination System (NPDES)*

As noted above, City and watershed regulations as well as recently adopted National Pollutant Discharge Elimination System (NPDES) Phase II regulations (administered by the Minnesota Pollution Control Agency (MPCA)), establish the standard for surface water conveyance, detention and mitigation for any development proposed in the AUAR study area. Mitigation requirements include:

- Maintaining discharge rates at or below current levels.
- Pre-treatment of runoff prior to discharge to wetlands, in accordance with wetland classification requirements.
- Conformance to NURP standards.
- Stormwater quality and quantity treatment by site.

City and watershed guidelines, as well as Best Management Practices (BMPs), also promote use of additional infiltration facilities (such as rain gardens) in new development areas, where feasible, to decrease runoff volumes and increase groundwater recharge.

In 1994 the City developed and adopted a "Surface Water Management Plan" (SWMP) to guide the development and implementation of a storm water collection and treatment system within the City. Figure 17 illustrates a conceptual surface water management plan for the AUAR study area, including anticipated drainage sub-areas, flow directions, and locations of non development specific regional detention/treatment ponds relative to existing wetland areas. As development plans are refined, developer and City/watershed staff will work together to refine the storm water management plan, including sizing and location of ponds and identification of potential additional infiltration areas. This plan will include a detailed storm water analysis for water quality discharges, including demonstration of conformance to National Pollutant Discharge Elimination System (NPDES) Phase II regulations and City water treatment standards for total system discharges. The storm plan will also review wetland 'bounce' effects from storm water discharges as well as assessment of potential storm water impacts on wetland quality.

18. WATER QUALITY-WASTEWATER.

Observe the following points of guidance in an AUAR:
-only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process;
-wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained;
-the major sewer system features should be shown on a map and the expected flows should be identified;
-if not explained under item 6, the expected staging of the sewer system construction should be described;
-the relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described;
-if on-site systems will serve part of the AUAR the guidance in "EAW Guidelines" (pages 16-17) should be followed.

The City has reviewed the estimated sewer needs for the AUAR development and determined that the impact of additional flow on the existing municipal sewer system infrastructure is acceptable due to available or planned capacity. The estimated wastewater generation for the AUAR study area is approximately 640,000 gallons per day which is consistent with the projected daily flow identified for this area (in the Comprehensive Sewer Policy Plan which forms the sanitary sewer component of the City's Comprehensive Plan). Any major wastewater flow changes for this area will have to be updated to reflect the additional sewer needs for the AUAR study area in the City's Comprehensive Sewer Policy plan and in coordination with Metropolitan Council Environmental Services (MCES).

19. GEOLOGIC HAZARDS AND SOIL CONDITIONS.

A map should be included to show any groundwater hazards identified. A standard soils map for the area should be included.

The County Well Index (CWI) was searched data regarding water-well contractors' logs of geologic materials encountered during drilling by quarter section in the project area. Records

indicate that the deepest well in the project area is 278 feet and did not experience bedrock during drilling. The Geologic Inventory map illustrating bedrock and surficial geologic information is included as Figure 8. A map illustrating soil types is included as Figure 9. Appendix 7 contains a code to the soil types identified on the map.

20. (A) SOLID WASTES; (B) HAZARDOUS WASTES; (C) STORAGE TANKS.

For a, generally only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included. No response is necessary for b. For c, potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).

(A) Solid Wastes

The project area will develop with residential, office/industrial, and institutional uses that will generate municipal solid waste (MSW), recycling products, and hazardous waste. Carver County Environmental Services logs the amount of waste generated within the County on an annual basis. The City of Chanhassen licenses 12 collection companies to collect and transport waste and recyclables to landfill sites at various locations in the metropolitan area. Residents and businesses contract with collection companies from those licensed to operate in the city. Waste is either stored at those landfill locations or transported to other locations in Minnesota or to facilities located in Wisconsin and Iowa.

According to 2002 Carver County data, the average person in Chanhassen generated 0.369 tons (738 pounds) of MSW per year. Recyclable materials generation was 0.088 tons/person/year (176 pounds) based on county-wide data.

TABLE 20.1. SUMMARY OF CURRENT AND FUTURE RESIDENTIAL WASTE GENERATION

Residential Waste Generation Rates	Current Population Estimate	Current Estimate of MSW/year	Future Population Estimate	Future Estimate of MSW/year
0.369 tons of MSW/person/year	20	7.38 tons	3904	1440 tons
0.088 tons of recycling/person/year	20	1.76 tons	3904	344 tons

Notes:
1) MSW generation based on 2002 data for the City of Chanhassen from Carver County Environmental Services.
2) Recycling materials generation based on 2002 county-wide data.
3) 2002 Chanhassen population estimate – 21,345 (Metropolitan Council).
4) 2002 Carver County population estimate – 75,312 (Metropolitan Council).
5) 2010 Chanhassen population forecast – 27,000; household forecast - 10,000; 2.7 persons/household (Metropolitan Council).
6) 2010 Carver County population forecast – 95,950; household forecast – 36,020; 2.66 persons/household (Metropolitan Council).

TABLE 20.2. SUMMARY OF CURRENT AND FUTURE COMMERCIAL WASTE GENERATION

Commercial Waste Generation Rates	Current Employment Estimate	Current Estimate of MSW/year	Future Employment Estimate	Future Estimate of MSW/year
1.59 tons of MSW/employee/year	0	0 tons	2087	3318 tons
1.1 tons of	0	0 tons	2087	2296 tons

recycling/employee/year				

Notes:
1) MSW generation based on 2002 data for the City of Chanhassen from Carver County Environmental Services.
2) Recycling materials generation based on 2002 county-wide data.
3) Assumes office employment @ 4 employees/1000 square feet and office/industrial employment @ 2.31 employees/1000 square feet.

TABLE 20.3. SUMMARY OF CURRENT AND FUTURE SCHOOL WASTE GENERATION

School Waste Generation Rates	Current Enrollment Estimate	Current Estimate of MSW/year	Future Enrollment Estimate	Future Estimate of MSW/year
1.59 tons of MSW/student/year	0	0 tons	1700	2703 tons
1.1 tons of recycling/student/year	0	0 tons	1700	1870 tons

Notes:
1) School Facility MSW generation based on 2002 Commercial MSW from Carver County Environmental Services.
2) School Facility recycling materials generation based on 2002 county-wide data.

(B) Hazardous Wastes

No response necessary for this section.

(C) Storage Tanks

The Minnesota Pollution Control Agency maintains a database of all identified leaking under/above ground storage tanks. The Leaking Underground Storage Tank (LUST) program database was searched for leaking tanks within the project area. No sites within the project area were identified.

Farming operations within the project area do however create the potential for petroleum soil contamination in and around farmsteads.

The land use plan does not anticipate commercial development in the project area that might utilize underground storage tanks as part of operations. Office businesses would likely not need tanks. A future middle/high school facility would not likely have fueling facilities on-site. Bus refueling would occur elsewhere off-site. However, should one develop, it would be required to apply with MPCA and other applicable standards.

21. TRAFFIC.

For most AUAR reviews a relatively detailed traffic analysis will be needed, especially if there is to be much commercial development in the AUAR area or if there are major congested roadways in the vicinity. The results of the traffic analysis must be used in the response to item 22 and to the noise aspect of item 24.

Instead of responding to the information called for in item 21, the following information should be provided:

- *A description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This*

information should include existing and proposed roadway capacities and existing and projected background (i.e., without the AUAR development) traffic volumes (SEE FIGURES 22 AND 23);

- *Trip generation data —trip generation rates and trip totals—for each major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;*

- *Analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Levels of Service and delay times at critical points (if any);*

- *A discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems;*

Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs.

A traffic analysis was completed for the AUAR study area. The complete traffic study for the AUAR study area is located in the Appendix. This section presents a summary of key findings and focuses on traffic impacts and measures to mitigate impacts for the AUAR development scenario and the initial phase of development—Town and Country parcels, Traffic Analysis Zones (TAZ) 2 and 3.

Study Intersections and Roadways

Figures 24 and 25 show the existing and future roadway network in the AUAR development study area. This figure shows the proposed Trunk Highway 212/312 (TH 212/312) extension, the conceptual AUAR development network, an extension of Powers Boulevard, and an extension of Pioneer Trail.

Proposed State Trunk Highway 212/312

TH 212/312 is a proposed 10-mile freeway that would extend from I-494 in Eden Prairie to Dahlgren Township in Carver County. This freeway would pass through the cities of Eden Prairie, Chanhassen, Chaska, and Carver in Hennepin and Carver Counties and provide an additional travel route between the southwest metro area and the inner suburb rings. Although one section of the project has already been completed—I-494 to CSAH 4 in Eden Prairie—the majority of the proposed freeway is in the planning and right-of-way acquisition phase.

In the Chanhassen section of this facility, two new interchanges will be constructed at TH 101 and CSAH 17 (extension of Powers Boulevard) and two grade separations (no interchange) will be constructed at CR 14 (Pioneer Trail) and CSAH 18 (Lyman Boulevard).

The total cost of the proposed freeway is $225.4 million. The proposed extension of TH 212/312 is eligible to be funded under the National Corridor Planning and Development Program and the Coordinated Border Infrastructure Program, more commonly known as the borders and corridors

programs. These programs are funded from a single source—discretionary funding categories administered by the Federal Highway Administration (FHWA).

Study Intersections

The AUAR development network shows several new roadways in study area. These new roadways are proposed to connect to existing streets at the following locations:

- County Road 17 (Audubon Road) at Butternut Drive
- Audubon Road at Lakeview Drive
- County Road 18 (Lyman Boulevard) at the intersection of the segment of Audubon Road north of Lyman Boulevard
- Lyman Boulevard between Audubon Road and Sunset Trail (North Connector).

In addition to connections with the existing roadway network, the AUAR development proposes connections with the future roadway network. The future roadway network includes the Pioneer Trail realignment, the future Powers Boulevard extension, and the TH 212/312 extension. Development-related connections include:

- Pioneer Trail and the proposed South Connector
- Pioneer Trail at relocated Bluff Creek Drive
- Powers Boulevard at the westbound TH 212/312 ramp (north ramp)
- Powers Boulevard at the eastbound TH 212/312 ramp (south ramp)

In addition to the aforementioned locations, the following additional intersections are included in this analysis:

- Audubon Road/Lyman Boulevard
- Audubon Road/Pioneer Trail
- Powers Boulevard/Lyman Boulevard
- Powers Boulevard/Pioneer Trail

In the early stages of development (Town and Country parcel), traffic will access Audubon Road at the Audubon Road/Butternut Drive intersection. In later stages of development, a proposed east-west collector street will extend from Audubon Road to the proposed Powers Boulevard extension. Assuming that TH 212/312 is complete and that this connection is provided, some through traffic is likely to divert to the east-west collector street to access the planned TH 212/312/Powers Boulevard extension interchange.

TRIP GENERATION

Trip generation for daily and the AM and PM peak hour was calculated for the proposed development based on trip generation rates published by the Institute of Transportation Engineers (ITE) in Trip Generation, 6th Edition. The assumed AUAR development's land uses and corresponding trip generation is shown in Table 21.1.

TABLE 21.1 – TRIP GENERATION ESTIMATES

TAZ	Land Use	ITE Code	Size		Daily Total	AM Peak In	AM Peak Out	PM Peak In	PM Peak Out
1	High School(1)	530	1,700	students	2,401	472	210	87	127
2	Single-Family Detached Housing	210	224	units	2,144	42	126	145	81
2	General Light Industrial	110	56,584	sq. ft.	394	46	6	7	48
3	Single-Family Detached Housing	210	163	units	1,560	31	91	106	59
3	General Light Industrial	110	236,531	sq. ft.	1,649	192	26	28	204
4	General Light Industrial	110	153,026	sq. ft.	1,067	124	17	18	132
5	Single-Family Detached Housing	210	11	Units	105	2	6	7	4
5	General Office	710	264,975	sq. ft.	2,917	363	50	67	328
6	Single-Family Detached Housing	210	401	Units	3,838	75	226	259	146
7	Single-Family Detached Housing	210	207	Units	1,981	39	116	134	75
8	Single-Family Detached Housing	210	336	Units	3,216	63	189	217	122
Total Trip Generation					**21,272**	**1,449**	**1,063**	**1,075**	**1,326**

(1) The school includes a reduction between home and school trips – 21% of school trips OR 5% of the home trips – equates to 642 total daily trips

Traffic Analysis

A traffic analysis was completed for 2003 and 2010 with and without the proposed AUAR development. Background traffic volumes for 2010 were developed by applying a 1.5% to 2.0% annual growth rate to existing (2003) traffic volumes throughout the study area. Scenarios included in this analysis are shown in Table 21.2.

TABLE 21.2 – TRAFFIC ANALYSIS SCENARIOS

Scenario	Analysis
Without AUAR Development	
E-1	2003 Existing Traffic; Existing Network
F-1	2010 Projected Traffic; includes TH 212/312
With AUAR Development	
E-2	2003 Existing Traffic; Partial AUAR Development (TAZ 2 and 3); Audubon Road/Butternut Connection Only; does not include extended TH 212/312
F-2	2010 Projected Traffic; Full AUAR Development; includes all internal roads and construction of TH 212/312

Traffic generated for the proposed development (Table 21.1) was assigned to existing and future roadway networks. From this traffic assignment that included background traffic growth, potential future traffic impacts were determined.

The analysis of Scenario E-2 was used to assess developmental-related traffic impacts of the construction of the southwestern parcels (TAZ's 2 and 3) and to identify necessary roadway improvements to mitigate traffic impacts. Scenarios F-1 and F-2 demonstrate future conditions (include 1.5% to 2% background traffic growth) with and without the AUAR development and with TH 212/312. These were used to demonstrate the combined impact of background traffic growth and the proposed AUAR development.

Level of Service Analysis

Level of service (LOS) analysis was conducted for the AM (7 to 9 AM) and PM (4 to 6 PM) peak hours at each study intersection. LOS is a qualitative measure used by traffic engineers to describe the operations of an intersection. It ranges from A to F, with A being the best and F being the worst level of operation. LOS A conditions are characterized by minimal vehicle delay and free-flow conditions, while LOS F is characterized by long vehicle delay—usually when demand exceeds available roadway capacity. Although LOS E is defined as at-capacity, LOS D is generally the minimum acceptable level of operation at an intersection.

Each study intersection was analyzed for each analysis scenario based on the Highway Capacity Manual. For comparison purposes, analysis results of signalized and unsignalized intersections for each scenario are shown in Table 21.3 and Table 21.4, respectively.

TABLE 21.3 – SIGNALIZED INTERSECTION LEVEL OF SERVICE

Intersection	Scenario E-1		Scenario E-2		Scenario F-1		Scenario F-2	
	AM	PM	AM	PM	AM	PM	AM	PM
Lyman/Audubon (2)	C	E	E	F	C	C	C	C
Audubon/Pioneer	D	C	D	D	C	C	C	C
Powers/Lyman	NA	NA	NA	NA	C	C	C	C
Pioneer/Powers	NA	NA	NA	NA	C	C	C	C
Powers/ TH 212/312 North Ramp	NA	NA	NA	NA	C	C	C	C
Powers/ TH 212/312 South Ramp	NA	NA	NA	NA	C	C	C	C
Pioneer/Bluff Creek	NA	NA	NA	NA	C	C	C	C

(1) NA = Not Applicable.
(2) LOS improves to acceptable levels with the addition of a second left turn lane in the westbound direction on Lyman. A second lane will be required on southbound Audubon to accept this additional turning movement at Lyman.

TABLE 21.4 – UNSIGNALIZED INTERSECTION LEVEL OF SERVICE

Intersection	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Powers/Lyman												
AM – Scenario E-1				D		A	A	-			-	-
PM – Scenario E-1				C		B	A	-			-	-
AM – Scenario E-2				F		B	A	-			-	-
PM – Scenario E-2				D		C	A	-			-	-
Pioneer/Bluff Creek												
AM – Scenario E-1	C		B					-	-	A	-	
PM – Scenario E-1	C		B					-	-	A	-	
AM – Scenario E-2	C		B					-	-	A	-	
PM – Scenario E-2	C		B					-	-	A	-	
Audubon/Butternut												
AM – Scenario E-1	A	-			-	-	F		B			
PM – Scenario E-1	A	-			-	-	E		B			

AM – Scenario E-2	A	-	-	B	-	-	F	-	B	F	-	D
PM – Scenario E-2	A	-	-	A	-	-	F	-	B	F	-	C
AM – Scenario F-1	A	-	-	A	-	-	C	-	A	C	-	A
PM – Scenario F-1	A	-	-	A	-	-	C	-	A	C	-	A
AM – Scenario F-2	A	-	-	A	-	-	F	-	B	F	-	B
PM – Scenario F-2	A	-	-	A	-	-	E	-	B	E	-	B
Lyman/North Audubon												
AM – Scenario F-1				D		B	A	-			-	-
PM – Scenario F-1				C		C	A	-			-	-
AM – Scenario F-2	F	-	B	F	-	B	A	-	-	B	-	-
PM – Scenario F-2	F	-	B	F	-	C	A	-	-	A	-	-
Lyman/TAZ 7/8												
AM – Scenario F-2	E		C					-	-	A	-	
PM – Scenario F-2	D		B					-	-	A	-	
Audubon/Lakeview												
AM – Scenario F-2	A	-	-	A	-	-	-	-	-	C	-	B
PM – Scenario F-2	A	-	-	A	-	-	-	-	-	C	-	B
Pioneer/South Connector												
AM – Scenario F-2				D		B	A	-			-	-
PM – Scenario F-2				F		B	A	-			-	-
Collector/South Connector												
AM – Scenario F-2	C		A					-	-	A	-	
PM – Scenario F-2	C		B					-	-	A	-	
Collector/North Connector												
AM – Scenario F-2				C		B	A	-			-	-
PM – Scenario F-2				C		B	A	-			-	-
Powers/TAZ 5												
AM – Scenario F-2	B	-			-	-	C		B			
PM – Scenario F-2	A	-			-	-	C		B			

(1) "-" = Not Applicable.
(2) Darkened boxes = movement not available.

2003 Level of Service Analysis

This analysis was completed to determine the impact of existing traffic volumes on the existing roadway network with and without the proposed Town and Country development (TAZ 2 and 3), assuming that roadway improvements recommended in this study are implemented. Results of the traffic analysis are the following:

- With the exception of the intersection of Lyman and Audubon the signalized intersections operate at acceptable LOS for the both the existing (Scenario E-1) and initial development (Scenario E-2). The westbound left-turn at Lyman and Audubon currently experiences significant queuing and excessive delay. Signal phasing and/or signal timing modifications at this intersection may mitigate these adverse impacts. It is anticipated that dual left-turn lanes will be required to accommodate total traffic conditions for Scenario E-2. This would require the construction of two travel lanes for southbound Audubon traffic south of Lyman.
- The unsignalized intersections of Powers/Lyman and Pioneer/Bluff Creek operate at acceptable LOS for both the existing (Scenario E-1) and initial development (Scenario E-2).
- The eastbound left turn movement at the unsignalized intersection of Audubon/Butternut operates at a poor LOS under Scenario E-1 conditions.

- For Scenario E-2 conditions, both the eastbound and westbound left turn movements at the intersection of Audubon/Butternut operate poorly, with the addition of northbound and southbound left turn lanes. It should be noted that this condition improves once the Collector Road is extended to the east to the Powers Boulevard alignment.

2010 Level of Service Analysis

In addition to 2003 analyses, an analysis of 2010 conditions was completed. This analysis was completed to determine the impact of future traffic volumes on the future roadway network with and without the proposed AUAR development, assuming that roadway improvements recommended in this study are implemented.

Area traffic forecasts were computed for full development conditions and also on an initial-phase basis to determine the timing of needed roadway improvements. Results of the traffic analysis are the following:

- With improvements already planned, the proposed TH 212/312 interchange on the east side of the AUAR Development will be able to accommodate project traffic at acceptable levels of service.
- Improvements to Lyman Boulevard to accommodate increased traffic volumes include adding right- and left-turn lanes on the eastbound and westbound (Lyman Boulevard) approaches to intersections with North Audubon Road, the North Collector, and Powers Boulevard.
- Improvements to Audubon Road include adding right- and left-turn lanes on the northbound and southbound (Audubon Road) approaches to intersections with Butternut Drive and Lakeview Drive.
- Improvements to the Pioneer Trail realignment include adding right- and left-turn lanes on the eastbound and westbound (Pioneer Trail realignment) approaches to intersections with the South Connector, Bluff Creek Drive, and Powers Boulevard.
- Powers Boulevard between Lyman Boulevard and Pioneer Trail will require a four-lane cross section with right- and left-turn lanes at intersections with Lyman Boulevard, the westbound TH 212/312 Ramp, the eastbound TH 212/312 Ramp, and Pioneer Trail.
- When signal warrants are met, the following intersections will need to be signalized prior to the full build out of the proposed AUAR development:

  Powers Boulevard/Lyman Boulevard
  Powers Boulevard/westbound TH 212/312 Ramp
  Powers Boulevard/eastbound TH 212/312 Ramp
  Pioneer Trail/Bluff Creek Drive

- The following intersections may need to be signalized at or following full build out of the proposed AUAR development:

  Pioneer Trail/Powers Boulevard
  Pioneer Trail/South Connector
  Lyman Boulevard/North Connector
  Lyman Boulevard/North Audubon Road
  Audubon Road/Butternut Drive
  Audubon Road/Lakeview Drive

It is recommended to periodically review the aforementioned intersections to determine when signal warrants are met.

Proposed Roadway Improvement Analysis

Figures 22 and 23 illustrate average traffic volumes on each roadway in the study area. These volumes are formatted with one value representing the current capacity of the roadway, the middle value representing the No-Build traffic volume on the link and the third value is the projected volume of traffic on the link with the completed proposed AUAR development (Build). If an improvement to the roadway is planned, the proposed future capacity is shown.

22. VEHICLE-RELATED AIR EMISSIONS.

The guidance provided in "EAW Guidelines: should also be followed for an AUAR. Mitigation proposed to eliminate any potential problems may be presented under item 21 and merely referenced here. The MPCA staff should be consulted regarding possible ISP requirements for certain proposed developments; although the RGU may not want to assume responsibility for applying for an ISP for specific developments, it may be desirable to coordinate the AUAR and ISP analyses closely.

Development of the project site will contribute additional traffic to internal and external roadways that will contribute additional pollutants. Of concern are carbon monoxide and particulate matter under 10 microns in size. Pollutant concentrations are subject to the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards (NAAQS). Carver County does not have monitoring data available so Hennepin County carbon monoxide and particulate matter data was used. Monitored concentrations in Hennepin County are well below the limits established by NAAQS. There are also no EPA or Minnesota Pollution Control Agency (MPCA) requirements for particulate matter analysis and dispersion modeling for roadway projects.

The MPCA requires carbon monoxide modeling if a project affects traffic at an identified carbon monoxide hot-spot or produces more than 77,200 vehicles per day. The air quality evaluation used in this study is based on MnDOT's hot-spot screening procedure in accordance with federal Transportation Conformity Rules. None of the MnDOT listed hot-spot intersections that would require carbon monoxide modeling are in or around the project area. The 2025 traffic forecasts for the identified intersections in the project area show that levels are well below what would be needed to require modeling. Roadway construction within the project area will not receive federal funding, is not subject to federal Transportation Conformity rules, and therefore, does not require any analysis pursuant to these rules.

The full air quality study is included in Appendix 6.

23. STATIONARY SOURCE AIR EMISSIONS.

This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.

24. DUST, ODORS, NOISE.

Dust, odors, and construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control or construction noise ordinances in effect.

If the area will include or adjoin major noise sources a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of item 21.

Noise monitoring was performed by HDR to measure existing traffic noise levels and model future impacts based on the TH 212/312 Build alternative. Existing noise monitoring was performed at two locations along Lyman Boulevard and one location along Audubon Road on August 20 and 22, 2003 during morning and afternoon peak traffic times. The levels recorded exceed both day and night thresholds established by the MPCA for receiver residential uses as illustrated in Table 24.1 below.

TABLE 24.1 – UNSIGNALIZED INTERSECTION LEVEL OF SERVICE

Daytime Noise Monitoring Summary								
Site	**Date Sampled**	**Time Sampled**	**Distance From CL**	**L10 (dBA)**	**L50 (dBA)**	**MPCA Daytime**		**Exceednce (Yes/No)**
						L10 (dBA)	**L50 (dBA)**	
1	August 20, 2003	4:00-5:00 p.m.	≈ 81’	67	62	65	60	Yes
2	August 20, 2003	4:08-5:08 p.m.	≈ 62’	66	60	65	60	Yes
3	August 20, 2003	5:05-6:05 p.m.	≈ 81’	73	64	65	60	Yes
Nighttime Noise Monitoring Summary								
Site	**Date Sampled**	**Time a) Sampled**	**Distance From CL**	**L10 (dBA)**	**L50 (dBA)**	**MPCA Nighttime**		**Exceedance (Yes/No)**
						L10 (dBA)	**L50 (dBA)**	
1	August 22, 2003	4:57-5:57 a.m.	≈ 81’	73	64	55	50	Yes
2	August 22, 2003	5:57-6:57 a.m.	≈ 62’	69	62	55	50	Yes
3	August 22, 2003	6:00-7:00 a.m.	≈ 81’	65	59	55	50	Yes

Modeling of existing noise levels was performed using MnDOTs MINNOISE traffic model. Peak hour projected traffic volumes (PHV) for year 2025 based on the Build alternative were used. It should be noted that TH 212/312 noise modeling was not incorporated into the model as it was included in the TH 212 Final Environmental Impact Statement (FEIS).

Results of modeling illustrated in Table 24.2 indicate future traffic noise levels will likely exceed MPCA’s maximum allowable levels for the residential areas adjacent to Audubon Road and Lyman Boulevard. Table 7 in the report identifies the approximate distance from the roadway centerline where daytime and nighttime L10 and L50 noise contours are predicted. The City of Chanhassen has the obligation to ensure that daytime and nighttime noise levels are below the MPCA thresholds. Modeling indicates that those adjacent residential areas within noise contours exceeding established thresholds will need to attenuate roadway noise. Design techniques such as fences or berms are some of the typical methods used in these situations. As properties develop, specific noise analysis should be performed during subdivision design to better address noise conditions.

TABLE 24.2 – UNSIGNALIZED INTERSECTION LEVEL OF SERVICE

Daytime Noise Modeling Results at Monitoring Locations					
Site	**L10 (dBA)**	**L50 (dBA)**	**MPCA Daytime Limits**		**Exceedance (Yes/No)**
			L10 (dBA)	**L50 (dBA)**	
1	69	62	65	60	Yes
2	72	65	65	60	Yes
3	70	63	65	60	Yes
Nighttime Noise Modeling Results at Monitoring Locations					
Site	**L10 (dBA)**	**L50 (dBA)**	**MPCA Nightime Limits**		**Exceedance (Yes/No)**
			L10 (dBA)	**L50 (dBA)**	
1	64	54	55	50	Yes
2	66	57	55	50	Yes
3	64	55	55	50	Yes

The full traffic noise study is included in Appendix 6.

25. SENSITIVE RESOURCES:

Archeological, historic, and architectural resources. For an AUAR, contact with the State Historic Preservation Office is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified.

On May 21, 2003, The 106 Group Ltd. (The 106 Group) conducted a cultural resources assessment for the Chanhassen AUAR. The report provides preliminary cultural resources information for completion of the AUAR and to assist in future compliance requirements under federal and state law. If the regulatory review for this project is at the state or local level, consultation with the Minnesota State Historic Preservation Office (SHPO) is appropriate. If there will be any federal involvement in the future (for example, through funding or permitting), consultation with the applicable federal agency and SHPO is required.

The purpose of this cultural resources assessment was to identify any historic properties within the study area of the Chanhassen AUAR that require further investigation in order to determine their potential eligibility for listing on the National Register of Historic Places (NRHP) and to eliminate those properties that are clearly not eligible. In addition, the survey assessed the project area's potential for containing previously unidentified archaeological resources. Should the boundaries of the Chanhassen AUAR be altered from their current configuration, the study area for architecture-history and archaeological resources will need to be adjusted as appropriate.

The cultural resources assessment for the AUAR included background research, a visual reconnaissance of the entire study area, assessment of archaeological potentials within the study area, and photographic documentation of buildings and structures 50 years of age or older within

the study area. The study area for archaeological and architecture-history resources was approximately 650 acres (263 hectares). The full report is included in Appendix 3.

Two reported (not field checked) archaeological sites (21CRaj, 21CRak) are located within the study area for the Chanhassen AUAR (Table 25.1; see Figure 10 and Appendix 3). There are seven additional previously recorded (confirmed) archaeological sites (21CR14, 21CR15, 21CR97, 21CR103, 21CR104, 21CR108, 21CR109) within a one-mile (1.6-km) radius of the study area (Table 25.2).

TABLE 25.1. ARCHAEOLOGICAL SITES WITHIN STUDY AREA

Site No.	Site Name	T	R	S	¼ Sec.	Description	NRHP Status
21CRaj	unnamed	116N	23W	23	SE-SW-SW-SW	Reported mound group	Not evaluated
21CRak	unnamed	116N	23W	23	SE-SE-SE-SW	Reported burial	Not evaluated

TABLE 25.2. ARCHAEOLOGICAL SITES WITHIN ONE MILE OF STUDY AREA

Site No.	Site Name	T	R	S	¼ Sec.	Description	NRHP Status
21CR14	unnamed	116N	23W	22	N-SW-SW-SW	Artifact scatter	Not evaluated
21CR15	unnamed	116N	23W	22	W-NE-SE-SW	Lithic scatter	Not evaluated
21CR97	unnamed	116N	23W	21	NW-NW-NE-SE	Single flake	Not evaluated
21CR103	unnamed	116N	23W	27	SE-NW-SE	Lithic scatter	Determined not eligible
21CR104	unnamed	116N	23W	27	SW-NE-NE-SE	Lithic scatter	Not evaluated
21CR108	Lake Susan-Riley Creek	116N	23W	14	N-NW-NE-SE and S-SW-SE-NE	Lithic scatter	Not evaluated
21CR109	Lake Susan SW Shore	116N	23W	14/23	C-S-S-SE/ NE-NW-NE	Lithic scatter and possible mound group	Not evaluated

No properties have been previously inventoried within the study area. A total of three farmsteads/houses have been inventoried within one mile (1.6 km) of the project area. These farmsteads, located just north of the project area on Audubon Road, are indicative of the types of properties that may be considered to be significant within the study area. Each of the farmsteads (CR-CHC-004, CR-CHC-005, and CR-CHC-006) has a house made of Chaska brick and constructed circa 1890. Chaska brick is a locally manufactured brick known for its cream color. The Albertine and Fred Heck House (CR-CHC-006) is listed on the NRHP under Criterion A "as a well-preserved example of a building constructed of Chaska brick" (Albertine and Fred Heck House NRHP nomination, on file at the Minnesota SHPO, St. Paul). It is located adjacent to the project area.

The 106 Group inventoried eight properties within the study area that contained buildings 50 years of age or older. All of the properties are associated with farmsteads in this agricultural region. Building types include frame houses, barns, silos, granaries, chicken houses, and other outbuildings dating to the late nineteenth and early twentieth centuries. House styles include a Queen Anne, a Craftsman-style bungalow, and American Foursquares.

Due to its proximity to Chaska, this area is known for its houses constructed of Chaska brick, a distinctive cream-colored brick associated with the region. Three previously recorded properties constructed in the 1890s, located just north of the project area, are examples of the use of Chaska

brick. None of the properties located within the study area utilized this building material. Most farmsteads exhibit building types commonly constructed during the 1910s and 1920s. One exception is 1600 Pioneer Trail, which features a Queen Anne style house, more typical of the late nineteenth century.

None of the farmsteads retain a complete complement of agricultural outbuildings typical of farms from this period, such as a granary, a chicken house, and other sheds. Some only retain the original house and barn. In some cases, the historical integrity of the primary buildings, such as the house or barn, have been significantly compromised. As a result, the farmsteads do not sufficiently convey their association with late nineteenth- and early twentieth-century farming practices.

Although several of the individual buildings retain good historical integrity, their styles are typical of the period and do not appear to be significant representations of architectural styles.

One property listed on the NRHP is located adjacent to the project area (CR-CHC-006; the Albertine and Fred Heck House). Should the Chanhassen AUAR project involve a federal agency in the future, this house should be considered when assessing effects to historical properties.

Prime or unique farmlands. The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed.

It is not anticipated that existing farmlands will be protected through special programs, deed restrictions, conservation easements, or other means. Currently, one property within the project area is enrolled in the Ag Preserve program: however, this property is seeking to remove the Ag Preserve designation. It is expected that the project area will fully develop.

Designated parks, recreation areas, or trails. If development of the AUAR will interfere or change the use of any existing such resource, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area.

There are currently no park, recreation areas or trails in the AUAR project area. A number of park, open space, recreation, and interpretive areas will be developed as elements of future developments within the project area. The development scenario described in question #6 includes a discussion of shared park facilities between the school district and the City. If the School district were not to go forward and develop a school in the project area, the City would plan to develop a Neighborhood Park in the range of 10 to 25 acres as detailed in the Comprehensive Plan. Other park and recreation areas may be more passive in nature comprise areas within the Primary and Secondary District of the Bluff Creek Overlay. Trail connections would provide linkages to recreational areas generally following roadway corridors and the Bluff Creek. A pedestrian connection/trail would also be necessary crossing the Bluff Creek to connect the School facilities west of the creek with recreational open space areas on the east side of the Bluff Creek.

Scenic views and vistas. Any impacts on such resources present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. "EAW Guidelines: contains a list of possible scenic resources (page 20).

It is a goal of the community to protect the physical and visual resources of the Bluff Creek Corridor as identified in the Bluff Creek Watershed Natural Resources Management Plan. This

will be accomplished through land use management practices and strategies that protect key areas within the Primary and Secondary Districts of the Bluff Creek Corridor.

26. ADVERSE VISUAL IMPACTS.

If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.

The AUAR anticipates a development pattern similar to those uses in the surrounding area. Building height and placement will be reviewed as part of the development process in a manner that preserves high quality views and vistas.

27. COMPATIBILITY WITH PLANS.

The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at 4410.3610, subpart 1. The AUAR document should discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to items 6, 9, 18, 21, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.

The City of Chanhassen maintains an updated Comprehensive Plan that is consistent with regional policy. The current comprehensive plan was updated in 1998 and approved in July of 1999. The plan contains the following elements:

- Land use
- Housing
- Natural resources
- Park and open space
- Transportation
- Sewer and Water
- Capital Investment Program

In addition to these elements of the Comprehensive Plan, the City is currently updating its Public Water Supply and Distribution System Plan. The City has a Surface Water Management Plan (SWMP) that was adopted in 1994 and provides guidance on surface water management issues. A Natural Resource Management Plan for the Bluff Creek Watershed was prepared in 1996 that provides a thorough inventory of natural resources along the Bluff Creek Corridor. This plan formed the basis for development of the Bluff Creek Overlay district, which helps implement the Management Plan and general goals/policies of the Comprehensive Plan.

The development scenario described in Question #6 is based on the general directions outlined in the above mentioned official plans and studies. However, the notion of a school site located on the northwest quadrant of the study area may be perceived as inconsistent with the land use map in the Comprehensive Plan. While locating a school in this area serves a larger community interest and advances the vision, goals and policies of the Comprehensive Plan in many respects, a land use map amendment should be made if and when the school district moves forward with plans to build on this site.

28. IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES.

This item should first of all summarize information on physical infrastructure presented under items (such 6, 17, 18 and 21). Other major infrastructure or public services not covered under other items should be discussed as well — this includes major social services such as schools, police, fire, etc. The RGU must be careful to include project-associated infrastructure as an explicit part of the AUAR review if it is to exempt from project-specific review in the future.

Physical infrastructure systems that will be impacted include municipal sanitary sewer, municipal water supply, storm sewer, and transportation facilities including transit facilities.

Municipal Infrastructure Systems

Impacts on sanitary sewer systems, storm sewer systems and public water supply systems as a result of the projected development outlined in question 6 will be significant but consistent with City planning. The City has identified in its planning efforts improvements to its municipal infrastructure associated with anticipated development of the 2005 MUSA area according to the 2020 Comprehensive Plan. Trunk sanitary sewer will be extended from the Lift Station #24 to serve the land area generally west of the TH 212/312 expansion. A new lift station, force main and trunk sewer will be required to serve the portion of the project area east of TH 212/312 extension. A water distribution system will be developed to serve future development in the project area with water supply from the Central Water Treatment Plant (site 10). No new wells are anticipated. The City SWMP outlines general strategies for managing stormwater. However, this plan is outdated and should be updated to reflect changes in law regarding the use of wetlands for storm water management and the recently adopted National Pollutant Discharge Elimination System (NPDES) Phase II requirements for stormwater management. A strong position on environmental site design is outlined by existing City polices and ordinances.

School District Facilities

The development scenario identifies the northwest portion of the project area as a future school site to accommodate a Chaska School District Middle or High School facility. This AUAR will facilitate environmental review for locating a school facility in this location. The City intends to be a partner with the school district in facilitating the development of the school in conjunction with potential park and recreation uses.

Park System

The project area is park deficient. Park needs in the project area will have to be met by park dedication and other unique land development practices such as transfer of development rights, land trusts or other. As mentioned above, the City is interested in working with the school district to site a park facility in conjunction with potential recreation uses of the school district.

Transit Facilities

The project area is currently not served by public transit facilities. The City of Chanhassen is served by Southwest Metro Transit. Location of a park-and-ride facility has been discussed within or near the project area with good access to TH 212/312. Specific sites or capacity have not been identified. Development of 1,500 housing units and 700,000 square feet of industrial/office uses would support transit facilities in or near the project area.

Fire and Police

Police services in Chanhassen are provided by the Carver County Sheriff. This would not change. Fire services are located north of the project area. Discussions have occurred with Chaska and Eden Prairie regarding locating a fire station to serve portions of all three communities. If a fire substation location were to be incorporated into the site, it will be on a smaller site, generally an acre or two and will need to be located with good access to major roadways. Development of 1,500 housing units will place a greater demand on improved emergency response times to this area.

29. CUMULATIVE IMPACTS.

This item does not require a response for an AUAR since the entire AUAR process deals with cumulative impacts from related developments within the AUAR area.

No response required.

30. OTHER POTENTIAL ENVIRONMENTAL IMPACTS.

If applicable, this item should be answered as requested by the EAW form.

The projected development described in question 6 will not generate any environmental impacts beyond those described in this AUAR.

31. SUMMARY OF ISSUES.

The RGU may answer this question as asked by the form, or instead may choose to provide an Executive Summary to the document that basically covers the same information. Either way, the major emphasis should be on: potentially significant impacts, the differences in impacts between major development scenarios, and the proposed mitigation.

See Executive Summary

MITIGATION INITIATIVES

> ***Mitigation Plan.*** *The final AUAR document must include an explicit mitigation plan. At the RGU's option, a draft plan may be include in the draft AUAR document; of course, whether or not there is a separate item for a draft mitigation plan, proposed mitigation must be addressed through the document.*
>
> *It must be understood that the mitigation plan in the final document takes on the nature of a commitment by the RGU to prevent potentially significant impacts from occurring from specific projects. It is more than just a list of ways to reduce impacts—it must include information about how the mitigation will be applied and assurance that it will. Otherwise, the AUAR may not be adequate and/or specific projects may lose their exemption from the individual review. The RGU's final action on the AUAR must specifically adopt the mitigation plan; therefore, the plan has a "political" as well as a technical dimension.*

This Mitigation Plan identifies initiatives that address potential impacts resulting from future development within the AUAR Project area. This mitigation plan specifies the controls, procedures, and other steps that may be implemented to protect or minimize potential negative impacts. In order to mitigate the potential environmental impacts identified in the Chanhassen AUAR, The City of Chanhassen will commit to implementing the mitigation initiatives identified in this plan.

Intent of Mitigation Plan

New development generates impacts on the environment and on existing development. These impacts result from construction activities associated with new development (i.e. erosion, dust, noise) as well as post construction associated with the activities and design of the development (i.e. traffic, runoff, pollution, infrastructure demand). This plan identifies existing tools and policies that the City of Chanhassen has in place to address the types of impacts that may result through development of the Chanhassen AUAR project area. The plan also identifies additional initiatives that will need to be implemented to mitigate potential environmental impacts resulting from projected development of the project area.

There are multiple ways in which Mitigation Initiatives may be implemented such as:

- Enforcing existing zoning and subdivision ordinances and other development regulations at the time of development concept submittals, preliminary and final platting, and during construction monitoring activities;
- Referencing and implementing policy directions during the review and approvals of development projects;
- Facilitating additional study as regional transportation planning initiatives become more finalized or as other regional developments alter travel patterns/behaviors.
- Planning and building public infrastructure (local roads, parks, trunk sewer systems and water systems) in conjunction with private development initiatives;
- Maintaining and updating of existing plans and studies for the community;
- Requiring additional field work/investigations as part of pre development planning where potential environmental or cultural resources may exist but have not been verified.

General Mitigation Initiatives

This section identifies a series of mitigation initiatives that are general in nature and apply to all public and private development within the AUAR.

1. All permits identified in the AUAR (See question #8) as well as other necessary permits that may be required will be secured by the City, or private parties as appropriate, for all development activities within the project area.
2. The City will follow its own regulations, ordinances, plans, and policies currently in place in the review and approval of all development activities within the project area. These items include *The 2020 Comprehensive Land Use Plan, the official zoning and subdivision ordinances* and *the Bluff Creek Overlay ordinance.* In addition, the *Bluff Creek Watershed Natural Resource Management Plan, the Surface Water Management Plan, the Public Water Supply and Distribution System Plan (currently being revised) and the Comprehensive Sewer Policy Plan* will be used as technical resources in reviewing development activities and developing associated public infrastructure.
3. The City will extend public sewer and water services in a manner consistent with existing plans and policies for delivering trunk sanitary sewer service and water main systems. Abandonment and closure of individual well and septic systems will follow existing local and state regulations.
4. The City will work with Mn/DOT and Carver County to periodically monitor traffic as generated from development within the project area as well as regional development initiatives that will affect the project area. Regional roadway improvements such as TH 212/312 and improvements to County Roads (Audubon Rd., Lyman Blvd., Pioneer Trail and future Powers Blvd. extension) will alter travel patterns. Performing traffic counts and monitoring traffic movements will help in facilitating future local roadway improvements.
5. The City will provide for adequate regional and local stormwater ponds and trunk facilities to protect water resources and water quality as guided by the *Storm Water Management Plan* and *Bluff Creek Watershed Natural Resource Management Plan*. [National Pollutant Discharge Elimination System (NPDES) Phase II with individual site development]
6. The City will implement a development tracking mechanism to monitor development within the AUAR Project Area and its conformance with the development scenario.
7. The City will enforce its parkland dedication practices consistent with the goals and policies outlined in the *2020 Comprehensive Plan* and the *Bluff Creek Watershed Natural Resource Management Plan* and the requirements of the subdivision ordinance.
8. The City will follow existing zoning regulations including Floodplain Overlay (Article V), Wetland Protection (Article VI), Shoreland Management (Article VII), Bluff Protection (Article XXVIII) and Bluff Creek Overlay (Article XXXI) to protect natural and environmental resources from potential impacts resulting from the Development Scenario. The City will reference policies and strategies outlined in the

2020 Comprehensive Plan, Comprehensive Stormwater Management Plan and *Bluff Creek Watershed Natural Resource Management Plan* as technical resources during the review of specific development projects.

Focused Mitigation Initiatives

Mitigation initiatives that are explicitly intended to mitigate or minimize impacts on a particular resource or action are outlined by topic in this section.

Fish, Wildlife and Ecologically Sensitive Resources

The bluff creek ordinance contains provisions that require a detailed analysis of habitat conditions prior to development. This analysis is provided as part of the preparation of development plans. Staff will verify the findings of the work and will work with developers to design projects in a manner that protects and preserves these habitat areas. Implementation of the bluff creek ordinance will protect resources within the bluff creek corridor (See Figure 4 Significant Habitat Areas of the AUAR Document.)

Other areas within the project area maintain significant wildlife or ecologically sensitive resources. The most prominent resources are identified in Figure 4. The identification of these areas provide advance notice to developers to plan developments in a manner that protects their ecological function. The *City's 2020 Comprehensive Plan, the Bluff Creek Watershed Natural Resources Management Plan,* the Bluff Creek zoning overlay and the Planned Unit Development (PUD) zoning mechanism (Article VIII) provide the City with the necessary tools to be flexible with subdivision design in order to preserve these areas. A cooperative approach to planning and design will be implemented to protect other wildlife and sensitive resources.

In addition to implementing existing plans, policies and regulations, the City will actively work with non-profit groups focused on preserving quality open spaces and environmental resources that are identified with this AUAR and future more detailed development planning initiatives.

Water Resources (wetlands, creeks, lakes) and Surface Water Management

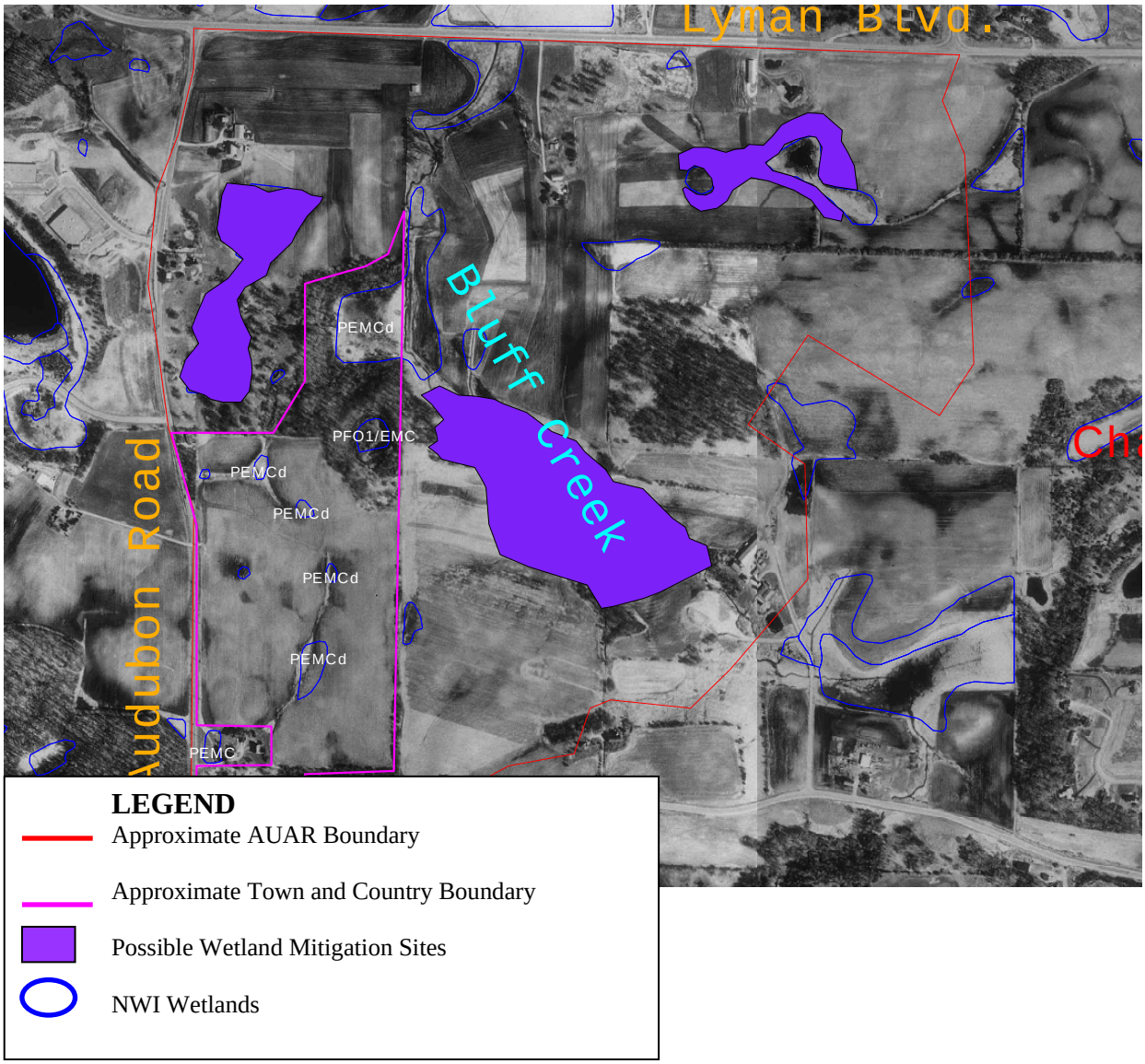
Increased stormwater runoff will result from future development in the project area. *The Surface Water Management Plan* and watershed regulations establish standards for surface water runoff. Key policy directives relative to the protection of water resources and the management of surface water runoff include:

- Maintaining discharge rates at or below current levels.
- Pre-treatment of runoff prior to discharge to wetlands, in accordance with wetland classification requirements.
- Conformance to NURP (National Urban Runoff Pond) standards.
- Conformance to NPDES Phase II requirements as outlined in the EPA Clean Water Act.

Additional strategies and policies that direct development in a manner that minimizes impervious surface coverage are outlined in the *2020 Comprehensive Plan, The Bluff Creek Watershed Natural Resource Management Plan, the Wetland Conservation Act and the City's Wetland Protection Ordinance.*

Projects within the AUAR that impact wetlands will be subject to regulation under the City of Chanhassen Wetland Ordinance, Wetland Conservation Act, Chapter 103G Waters of the State (i.e. Department of Natural Resources), and possibly Section 404 of the Clean Water Act (i.e. the U. S. Army Corps of Engineers). Should wetland impacts be part of a project within the AUAR these regulatory programs have sequencing requirements which require applicants to demonstrate that wetlands impacts have been avoided and minimized to the extent practicable and if impacts cannot be avoided these programs require replacement of wetlands impacted by fill or excavation.

The City of Chanhassen will also examine the feasibility of creating a wetland bank within the AUAR as described in Minn. Rules 8420.0700 Subpart 8. Three areas within the AUAR could be utilized to create a wetland bank. These areas are located where wetlands have been drained by agricultural activity and could be restored by breaking drain tiles, adjacent to existing wetlands where topography allows for creation of new wetlands and along the Bluff Creek floodplain where agricultural drain tiles could be disabled to restore emergent wetland. The general location of these areas are illustrated below.



Erosion and Sedimentation

The City of Chanhassen utilizes "Best Management Practices" as outlined in various resources and by the Metropolitan Pollution Control Agency (MPCA). During construction activities and prior to the maturing of vegetative cover over disturbed ground, proper techniques will be used to control erosion and sedimentation. The City's existing code provides the regulatory tools for this initiative. Land use management and zoning tools (PUD, density transfers, Bluff Creek Overlay) will be implemented to direct development to less erosion prone areas of the site.

Wastewater

The development scenarios identified in this AUAR are consistent with the *City of Chanhassen Comprehensive Sewer Policy Plan* dated November, 1998. The City of Chanhassen through its site development plan review process will monitor and verify estimated wastewater flows for general conformance to the Sewer Policy Plan. In addition each development will be responsible for the following:

- Conformance to the City of Chanhassen Comprehensive Sewer Policy Plan.
- Metropolitan Council Environmental Services (MCES) Sanitary Sewer Extension Permit(s)
- Sewer Access Charges (SAC) related to their proposed development.
- The proportional share of the costs of Trunk Sanitary Sewer Mains.
- Construction of local sewer mains to serve the development.

Water Supply

Public water supply will be provided to the study area by the extension of trunk water lines to be constructed through a process to be determined and implemented by the City of Chanhassen. Existing water lines are located to the North of the project study area. The City of Chanhassen through their draft *Water Supply, Treatment, and distribution System Master Plan* have identified the need to install a 12-inch regional trunk water line along Audubon and Pioneer Trail, and a 16-inch regional trunk water line along future Powers Blvd and Lyman Blvd. These trunk water lines will be used to supply water to the development area through a local system of water lines to be constructed as development occurs. The phasing of trunk water lines will be dependent upon the area's to be developed, the size, density and type of land use that occurs. Trunk water supply infrastructure needs will be determined by the City of Chanhassen. Each development will be responsible for the following:

- Conformance to the City of Chanhassen Water Supply, Treatment and Distribution System Master Plan (Draft).
- Minnesota Department of Health permit(s) for the extension of water supply systems.
- Water Access Charges (WAC) related to their development.
- The proportional share of the costs of Trunk Water Supply lines.
- Construction of local water supply lines.

Public Infrastructure

Questions have been raised about the timing of future private development projects relative to the timing of public infrastructure improvements. In many cases where development is occurring contiguous to the City's developed area, the extension of public improvements occurs in conjunction with the proposed development project. In the case of the AUAR project area, pressures for development suggest that projects may occur in a non-contiguous pattern. Also, the timing of the construction of new TH 212/312 will potentially impact the timing of needed roadway improvements in areas where development may not occur for several years. To address this issue, a mitigation initiative will be for the City to examine the feasibility of building key public infrastructure (east/west and north/south collector roadways, trunk sanitary and storm sewer and primary water mains) as a public improvement project prior to development. This type of feasibility study will require funding that can be provided out of the City's budget.

As part of the infrastructure mitigation initiatives, the City will update its storm water management plan to address storm water management in the AUAR project area in greater detail.

Traffic/Transportation Mitigation Initiatives

There are a number of specific traffic/transportation initiatives needed to adequately address potential development impacts. As discussed in the AUAR Question 21-Traffic and Appendix 5-Traffic Analysis, the mitigation approaches outlined below depend on a Build/No-Build of TH 212/312 as well as consideration of the Town and County Homes Concept Plan as approved.

1. Proposed improvements to accommodate Scenario E-2[1] (the Town and Country Homes development proposal or TAZ 2 and 3) traffic include the following:

    a. Construct the East-West Collector road from the eastern boundary of TAZ's 2 and 3 to Audubon Road at Butternut Drive prior to development of TAZ's 2 and/or 3.

    b. Construct dual westbound left-turn lanes on Lyman at Audubon and provide two southbound through lanes on Audubon.

    c. Construct dedicated northbound and southbound left turn lanes and a northbound right turn lane at the intersection of Audubon/Butternut.

    d. Prior to construction of any additional TAZ's adjacent to the East-West Collector Road, it is recommended that the Collector Road be extended to Powers Boulevard.

    e. It is not expected that signalization will be required at the intersection of Audubon/Butternut when the Collector Road is extended to Powers Boulevard, but it should be monitored periodically to determine if it meets signal warrants.

    f. Consider reviewing the signal timing of the Audubon/Pioneer Trail intersection to minimize delay on southbound/westbound Audubon.

[1] Scenario E-2 is used to refer to traffic generated by the Town and Country development proposal. This development was evaluated in greater detail because it is assumed that this will be the first project to develop.

2. Proposed improvements to accommodate the AUAR development traffic include the following:

    a. With the improvements already planned, the planned TH 212/312 interchange at the east end of the AUAR Development will be able to accommodate project traffic at acceptable levels of service.

    b. Improvements to Lyman Boulevard to include adding right- and left-turn lanes on the eastbound and westbound (Lyman Boulevard) approaches to intersections with North Audubon Road, the North Connector, and Powers Boulevard.

    c. Improvements to Audubon Road include adding right- and left-turn lanes on the northbound and southbound (Audubon Road) approaches to the intersection with Lakeview Drive.

    d. Improvements recommended for the Pioneer Trail realignment include adding right- and left-turn lanes on the eastbound and westbound (Pioneer Trail) approaches to intersections with the South Connector, Bluff Creek Drive, and Powers Boulevard.

    e. Powers Boulevard between Lyman Boulevard and Pioneer Trail will require a four-lane cross section with exclusive right- and left-turn lanes at intersections with Lyman Boulevard, the westbound 212/312 Ramp, the eastbound TH 212/312 Ramp, and Pioneer Trail. The Highway Capacity Manual recommends that dual left-turn lanes be installed when volumes exceed 300 vehicles per hour; however, it is not always the optimal situation and should be evaluated on a case-by-case basis. Although Mn/DOT may typically require that dual left-turn lanes be provided when left-turn volumes exceed 300 vehicles per hour, proposed operational conditions at the Powers Boulevard/TH 212/312 ramp do not necessitate this provision. Based on the proposed configuration of this intersection combined with the low volume of opposing and side street traffic volumes the southbound left-turn volumes can be served by a single lane.

    f. When signal warrants are met, the following intersections will need to be signalized prior to the full build out of the proposed AUAR development:

        - Powers Boulevard/Lyman Boulevard
        - Powers Boulevard/westbound TH 212/312 Ramp
        - Powers Boulevard/eastbound TH 212/312 Ramp
        - Pioneer Trail/Bluff Creek Drive

    g. The following intersections may need to be signalized at or following full build out of the proposed AUAR development:

        - Pioneer Trail/Powers Boulevard
        - Pioneer Trail/South Connector
        - Lyman Boulevard/North Connector
        - Lyman Boulevard/North Audubon Road
        - Audubon Road/Butternut Drive
        - Audubon Road/Lakeview Drive

        It is recommended to periodically review the aforementioned intersections to determine when signal warrants are met.

3. When plans for reconstruction of existing roads or construction of new roads are developed, incorporate design considerations that will mitigate noise impacts. These design considerations would include landscaping, berming and speed limit controls.

4. Coordinate development of perimeter road connections (such as where a collector roadway within the project area connects to Audubon, Lyman or Pioneer Trail) with Carver County, the City of Chaska and adjacent neighborhoods.

5. Southwest Metro Transit is planning for a park and ride lot on the southeast corner of Hwy 101 and TH 212/312. The City of Chanhassen maintains a strong relationship with SW Metro Transit and will ensure site plans are reviewed by SW Metro Transit and transit oriented design is considered as part of subdivision design. This initiative will evaluate the possibility of providing circulator service to new developments within the project area to reduce single occupant auto trips.

6. Ensure subdivisions include plans for Pedestrian and Bicycle movement in and through the project area as well as linkages to the greater community. Roadway designs will meet the City's current design standards for on-street and off-street trail connections. The City will work with Carver County to preserve Right-of-Way (ROW) for off road trails.

TH 212/312 Impacts

The building of TH 212/312 will have a significant impact on the project area. The TH 212/312 project has an extensive inventory of environmental documentation that includes a number of mitigation measures. The "TH 212 Southwest Corridor Final Environmental Impact Statement Section 4 (f) Evaluation" was completed in June of 1993. This documentation is currently being updated and should be referenced in conjunction with the Chanhassen AUAR relative to impacts generated by TH 212/312.

Land Use Management Initiatives

The project area is unique because of its topographical features and the Bluff Creek corridor. This uniqueness poses challenges to development. Efforts to minimize impacts on the Bluff Creek corridor and to maintain as much of the pristine environmental presence of the site will have to come from combined public and private actions. The City of Chanhassen is well positioned from a regulatory position to guide development in a manner that achieves the objectives of the *2020 Comprehensive Plan* and *Bluff Creek Watershed Natural Resource Management Plan.* Specific strategies that enable the City to achieve these objectives include:

- Transfer of density—this approach to development would enable a developer to move units within a development project from areas that are desired to be preserved (such as the high quality woodland in the center of the project area shown in Figure 4) to areas that are less sensitive. The developer would not loose density in the project by interjecting a broader mix of units and lot sizes.
- Clustering of housing units—this is a conservation development approach used to minimize development impacts on adjacent resource areas. Although it is more widely used in rural developments, it can be used in urban settings to obtain the same resource protection results. Clustering in an urban setting will also reduce infrastructure thereby reducing up front and longer term maintenance costs. In general terms, clustering requires smaller lot sizes, reduced street widths to balance increased protection areas. This would likely be used in conjunction with a transfer of

density when properties have environmental protection areas and involve a Planned Unit Development (PUD) process.

As the project area develops, there will be a need for park improvements. If the Chaska School District is to locate a school facility in the project area, the City will work with the school district to jointly develop a community park in conjunction with open space and recreation needs of the school facility. If the Chaska School district decides not to locate a school facility in the project area, the City will still build a park facility; however, the park facility may be smaller in area (5 to 10 acres) with the remaining portions of the land area reverting to a residential use. The City will use its existing park dedication policies to help fund these improvements.

Monitoring of Development in the AUAR Area and Future Updates to the AUAR

The AUAR assumes a hypothetical development scenario. Because it is based on assumptions, it is important that actual development be monitored and compared to the development that was assumed in the development scenario. Tracking of this development will be done through the City's existing GIS system. The developer as part of the final plat process will submit electronic plats consistent with city development requirements in a compatible form to the City's GIS system. This data will enable the City to maintain an ongoing inventory of platted lots and the ability to directly tie building permits to the lots so that occupied housing units could be tracked in the development area. The City's existing GIS system has the capacity to perform this task.

As required by Minnesota Rule 4410.3610 Subpart 7, to remain valid, the AUAR must be updated if any of the following events should occur:

- Five years have passed since the AUAR and mitigation plan were adopted and all development within the project area has not been given final approval.
- A comprehensive plan amendment is proposed that would allow an increase in development than what was assumed in the development scenario.
- Total development within the area would exceed the maximum levels assumed in the environmental analysis document.
- Development within any subarea delineated in the AUAR would exceed the maximum levels assumed for that subarea in the document.
- A substantial change is proposed in public facilities intended to service development in the area that may result in increased adverse impacts on the environment.
- Development or construction of public facilities will occur differently than assumed in the development scenario such that it will postpone or alter mitigation plans or increase the development magnitude.
- New information demonstrates that important assumptions or background conditions used in the analysis presented in the AUAR are substantially in error and that environmental impacts have consequently been substantially underestimated.
- The RGU determines that other substantial changes have occurred that may affect the potential for, or magnitude of, adverse environmental impacts.

APPENDIX 1—

- **Resolution Ordering the AUAR**
- **City of Chanhassen Resolution # 2003-54**

APPENDIX 2—Wetland Delineation Report: Town and Country Development

Report is available and will be provided upon request

APPENDIX 3—Cultural Resources Assessment

APPENDIX 4—Town and Country Homes Development Proposal Staff Report

APPENDIX 5—Traffic Analysis

APPENDIX 6—Air and Noise Analysis

APPENDIX 7—Soil Classifications

SYMBOL	NAME
Hm	Hamel Loam
TeB	Terril Loam, 0 to 6 %
HcE3	Lester-Kilkenny Clay Loams, 18 to 25 %, sev. eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaF	Lester-Kilkenny Loams, 25 to 40 %
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaD	Lester-Kilkenny Loams, 12 to 18 %
HaF	Lester-Kilkenny Loams, 25 to 40 %
Pd	Houghton and Muskego Mucks
HaF	Lester-Kilkenny Loams, 25 to 40 %
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
Hm	Hamel Loam
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaF	Lester-Kilkenny Loams, 25 to 40 %
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaD	Lester-Kilkenny Loams, 12 to 18 %
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
Hm	Hamel Loam
Ge	Glencoe Loam
HaF	Lester-Kilkenny Loams, 25 to 40 %
Cw	Cordova and Webster Loams
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaD	Lester-Kilkenny Loams, 12 to 18 %
TeB	Terril Loam, 0 to 6 %
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
TeB	Terril Loam, 0 to 6 %

SYMBOL	NAME
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaF	Lester-Kilkenny Loams, 25 to 40 %
Hm	Hamel Loam
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
Pm	Palms Muck
Hm	Hamel Loam
TeB	Terril Loam, 0 to 6 %
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
Hm	Hamel Loam
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
Hm	Hamel Loam
Pd	Houghton and Muskego Mucks
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaF	Lester-Kilkenny Loams, 25 to 40 %
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
Hm	Hamel Loam
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
TeB	Terril Loam, 0 to 6 %
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
TeB	Terril Loam, 0 to 6 %
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
Ge	Glencoe Loam
TeB	Terril Loam, 0 to 6 %
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
Hm	Hamel Loam
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
TeB	Terril Loam, 0 to 6 %
Hm	Hamel Loam
Pd	Houghton and Muskego Mucks
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded

SYMBOL	NAME
TeB	Terril Loam, 0 to 6 %
Ge	Glencoe Loam
Pm	Palms Muck
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
Cd	Canisteo Silty Clay Loam, Depressional
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HcE3	Lester-Kilkenny Clay Loams, 18 to 25 %, sev. eroded
HaD	Lester-Kilkenny Loams, 12 to 18 %
HcC3	Lester-Kilkenny Clay Loams, 12 to 18 %, sev. eroded
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
Pd	Houghton and Muskego Mucks
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
Hm	Hamel Loam
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
Ge	Glencoe Loam
TeC	Terril Loam, 6 to 12 %
TeB	Terril Loam, 0 to 6 %
TeB	Terril Loam, 0 to 6 %
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HaF	Lester-Kilkenny Loams, 25 to 40 %
Pd	Houghton and Muskego Mucks
Hm	Hamel Loam
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HcC3	Lester-Kilkenny Clay Loams, 12 to 18 %, sev. eroded
Ge	Glencoe Loam
HcE3	Lester-Kilkenny Clay Loams, 18 to 25 %, sev. eroded
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
Hm	Hamel Loam
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
Hm	Hamel Loam
Hm	Hamel Loam
Pd	Houghton and Muskego Mucks
HaF	Lester-Kilkenny Loams, 25 to 40 %
HaF	Lester-Kilkenny Loams, 25 to 40 %
HcE3	Lester-Kilkenny Clay Loams, 18 to 25 %, sev. eroded
Pm	Palms Muck
HaF	Lester-Kilkenny Loams, 25 to 40 %
Hm	Hamel Loam
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HcC3	Lester-Kilkenny Clay Loams, 12 to 18 %, sev. eroded
Ge	Glencoe Loam
Ge	Glencoe Loam
Pm	Palms Muck
HcE3	Lester-Kilkenny Clay Loams, 18 to 25 %, sev. eroded

SYMBOL	NAME
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaD	Lester-Kilkenny Loams, 12 to 18 %
Ge	Glencoe Loam
HcE3	Lester-Kilkenny Clay Loams, 18 to 25 %, sev. eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaD2	Lester-Kilkenny Loams, 12 to 18 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded
Ge	Glencoe Loam
HaF	Lester-Kilkenny Loams, 25 to 40 %
Hm	Hamel Loam
HaC/LaC	Lester-Kilkenny Loams, 6 to 12 %
Hm	Hamel Loam
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HaB/LaB	Kilkenny-Lester Loams, 2 to 6 %
HcC3	Lester-Kilkenny Clay Loams, 12 to 18 %, sev. eroded
HaC2/LaC2	Lester-Kilkenny Loams, 6 to 12 %, eroded
HcC3	Lester-Kilkenny Clay Loams, 12 to 18 %, sev. eroded
HaE2	Lester-Kilkenny Loams, 18 to 25 %, eroded
HaB2/LaB2	Lester-Kilkenny Loams, 2 to 6 %, eroded