

Introduction

This document, the Comprehensive Plan for the City of Duluth, sets forth the vision, principles, policies, and recommended strategies that have been embraced by the City to shape its future. This Plan is Duluth's first adopted Comprehensive Plan since 1927. As comprehensive plans typically look forward approximately 20 years, the City has been operating without a common vision or framework on development and protection policies for 60 years. Change has not, however, taken a 60-year hiatus, and the lack of a comprehensive plan foundation has led to difficult and controversial decision-making. Regulatory structure that was created 50 years ago frequently does not lead to efficient growth patterns and hampers efforts to apply sustainable development and protection strategies. Sub-area and neighborhood planning efforts have captured components of the overall vision, but lack the foundation upon which such efforts can cohesively tie together city-wide systems and investments. With the adoption of this Comprehensive Plan the City has now restored its foundation from which it can now shape its own future.

Over the last thirty years the City of Duluth has witnessed a dramatic transformation of its local and regional economy, a refocusing on natural resource assets as a defining element of its community character, and a resurgence of community and neighborhood pride. The City desires a plan to guide development and protection decisions and to direct infrastructure choices in an era where capital is scarce.

Legal Basis for Comprehensive Planning

The power for Minnesota municipalities to create and implement a comprehensive plan is well established in State Law. In the 1925 Minnesota Supreme Court case *Berry v. Houghton* the Court sanctioned the use of comprehensive planning and zoning as legitimate tools for promoting the general welfare of the public. In 1939 the Minnesota State Legislature established the legislative foundation for land use planning with the Township Planning and Zoning Act. In 1965 the legislature passed the existing state law that grants specific comprehensive planning and land use regulatory powers to Minnesota cities. Minnesota Statutes, Sections 462.351 to 462.365 identify the planning powers granted to Minnesota cities. Specifically, Section 462.353, Subd.1 authorizes cities to conduct comprehensive planning activities for the purpose of guiding development, to create a comprehensive plan, to adopt the plan as official policy, and to implement the plan by ordinance or other measure.

Introduction Legal Basis for Comprehensive Planning



Municipal Comprehensive Plans

A municipality (i.e., a city or township) may carry on comprehensive planning activities for guiding its future development and improvement, including proposed development densities. It may prepare, adopt and amend a comprehensive municipal plan and implement the plan by ordinance and other official actions in accordance with the provisions of Minnesota Statutes, Sections 462.351 to 462.365. In exercising these powers, a municipality may collect and analyze data, prepare maps, charts, tables and other illustrations and displays, and conduct necessary studies. A municipality may publicize its purposes, suggestions and findings on planning matters, distribute reports about them and advise the public.

Source: *Under Construction: Tools and Techniques for Local Planning, Minnesota Planning, 2002, p. 12*

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Previous Comprehensive Plans

“It is almost useless to prepare such plans as these unless they are to become a guide for development. Therefore we urge you study them carefully, together with the fundamental arguments that are advanced in the report, and adopt them as a basis for street extensions and transit orders.”

Source: *Cover letter to the Preliminary Major Street Plan and Transit Plan, City of Duluth, 1927*

The role of comprehensive planning in local and regional decision-making has expanded over the last four decades. The comprehensive plan is, for instance, recognized as the primary local land use authority in determining whether a specific development project passes Minnesota’s environmental review process (EIS/EAW/AUAR). Minnesota case law has emphasized the critical role that comprehensive plans play in justifying regulatory decisions, and that local governments have an obligation to be consistent with their comprehensive plan when enacting regulations or granting approvals.

The Plan is the foundation upon which Duluth’s regulatory tools (zoning, subdivision, shoreland, floodplain and other ordinances) and Duluth’s capital improvement programs rest. The Plan’s content, including the principles, policies, future land use map, and strategies, define how development, redevelopment, and preservation decisions are made.

Previous Comprehensive Plans

Duluth has engaged in three previous comprehensive planning processes over its history, only one of which (the 1927 plan) resulted in a formally adopted plan. The 1927 plan pre-dated formal legislative recognition of comprehensive planning, and was focused primarily on directing the City’s public investment in streets and transit systems. This plan described the intent and reason for comprehensive planning; reasoning that holds true to this day. The 1927 plan notes the following on page 1:

The purpose of these studies is to discover why Duluth has taken its present form, how its physical make-up aids or hinders those normal activities for which the city exists, and what advantageous changes may be effected in the structure of the city by intelligent planning for and control of future development.

In 1958 the City completed a new Comprehensive Plan. While the City did not formally adopt the plan as its comprehensive planning foundation, the plan did become the foundation for the new zoning ordinance. The 1958 plan and ordinance relied on the concept of segregating distinct land uses in order to avoid nuisances, such as separating residential from commercial or industrial uses, and segregating single family and multi-family housing uses. The 1958 ordinance continues to be the basis for the City’s land use regulation almost 40 years later.

In the 1990s, the City recognized that the long range plan was hopelessly out of date and started preparing for creating a long range vision. Duluth completed a city-wide visioning process, called “2001 and beyond,” that engaged Duluth’s citizens and businesses to create a long-term vision for Duluth’s future. The vision statement was to describe, in general terms, the desired future condition and preferred decision-making criteria for public and private actions and investments. In addition to the primary vision statement (see text box), the Vision was broken into three primary guiding principles with additional definition and description:

1. Preserving and Enhancing the Environment
2. Investing in People, Neighborhoods, and Community
3. Building a Strong Economic Base

Each principle was further defined with three or four goal statements, and a series of committees created to recommend action steps, one of which was the creation of a new comprehensive plan.

The City started, in 2000, a new comprehensive plan process. The process started working with the ten neighborhood planning districts and engaging residents and businesses in these districts to complete District Plans. The District Plans were then to inform a city-wide plan that reflected both district details and the “2001 and beyond” vision. The process was, however, terminated by the City prior to completion of a comprehensive plan document.

In 2004, the City restarted the comprehensive planning process, as described in the Process section following this introduction.

Structure of the Comprehensive Plan

The Comprehensive Plan includes a number of inter-related sections. These sections are:

- **Governing Principles.** The Governing Principles section describes the overarching principles by which the City of Duluth will make land use, infrastructure, and programmatic decisions.
- **Future Land Use Map.** The Future Land Use Map section shows the 20-year vision for the preferred mix of land uses across the city.
- **Policies.** The Policies section describes how the principles and future land use map should be interpreted given the variety of circumstances that City decision-makers

A Vision for Duluth

Duluth’s unique physical beauty and diverse cultural environment create our competitive advantage. Our people will work together, with respect for each other, to ensure that development is consistent with Duluth’s future as an urban wilderness, as a neighborly and safe place to live, and as a place of high-skilled, high-wage employment.

Source: “2001 and beyond” *Vision Statement*

Create a New Comprehensive Plan

The City Council will, by the end of 1998, have caused to be adopted a Comprehensive Plan for the City of Duluth including a land use plan, which among other things, defines that public green space to receive permanent protection from development and identifies areas available for future development.

Source: “2001 and beyond” *Action Plan Recommendation 23*

Introduction

Structure of the Comprehensive Plan



will face. The policies bridge both the long range future of the map and the immediate actions in the implementation section, and the general language of the principles and the land use future expressed on the map.

- **Implementation.** The Implementation section recommends the preferred types of strategies and some specific actions that will need to take place in order to realize the future described in the principles, future land use map, and policies.

The sections are distinguished from each other primarily by the kind of detail they provide the reader regarding the City's long range preferences. This is critical to understanding the Comprehensive Plan and to correctly using the Plan. Each section provides details about the City's endorsed vision that need to be taken in perspective with other sections. The future land use map and associated text, for instance, cannot be understood or correctly applied without also referencing the governing principles, the policies, and the recommended strategies. Similarly, the written policies must be interpreted within the intent of the governing principles, the geographic future portrayed on the land use map, and the actions recommended in the Implementation section.

Several of the sections also include subsections:

- The Land Use Map section is broken into seven distinct sections - Map Components, Understanding the Map, Land Use Categories, Summary Statistics of the Map, Using the Map, Limitations of the Map, and the Future Land Use Map. The subsections are designed to help the reader understand what the future land use map does, and does not, represent.
- The Policies section is broken into six substantive policy areas, so that the reader can, for example, reference policies for natural resource, urban design, or transportation.
- The Implementation section is similarly divided into three substantive subsections (Land Use, Transportation, and Capital Improvements and Facilities), that are then broken into further subsections to help the reader find information by topic or geography.

A complete listing of sections and subsections is provided in the table of contents.

In addition to the Comprehensive Plan itself, there are ten background profiles that provided context to the decision-making process and described some of the issues that the Comprehensive Plan could address. The ten background profiles are:

1. Demographics
2. Historic Development Patterns
3. Natural Systems, and the Natural Resource Assessment
4. Land Use
5. Transportation
6. Public Utilities/Services
7. Parks and Recreation
8. Economics
9. Housing
10. Schools

The background profiles were written during the first and second phase of the project. The profiles do not reflect the final outcomes, but did pose questions that directed some of the discussion during the decision-making process.



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Planning Process

In October of 2004, the City of Duluth restarted its stalled comprehensive planning process by issuing a Request for Proposals for a consultant to assist in the completion of a comprehensive plan, and by forming a citizen and stakeholder body to oversee the planning process. The process was to run on an accelerated schedule approximately a year in length, include substantial opportunity for public review and comment, and result in a comprehensive plan with an emphasis on city-wide land use patterns and systems.

Citizen and Stakeholder Oversight

Duluth is a city with a long history of citizen involvement. A transparent and inclusive planning process was critical to the successful development of a new Comprehensive Plan. To meet this goal multiple opportunities for citizen and stakeholder oversight were built into the planning process:

- Oversight by a stakeholder steering committee
- Regular public meetings
- Listening session presentation before the committee

In addition to these venues, other forums were created to garner public input, including a public website with process and draft materials and outreach by staff and consultant team to local organizations and businesses.

The Comprehensive Plan Committee

The Comprehensive Plan Committee (CPC) was created as the primary public review body for the planning process. The CPC included 27 individuals representing a wide variety of perspectives, interest groups, and appointed and elected officials. The CPC included Planning Commission members and City Councilors, representatives from business organizations such as the Chamber of Commerce and institutions such as the University of Minnesota, a variety of interest groups such as historic preservation and parks and open space organizations, representatives of neighborhood districts, and other citizen and civic organizations (a complete list of CPC members is on the Acknowledgements page). The CPC was to oversee the hiring of a consultant team, review the content of the draft plan, and ultimately make a recommendation to the Planning Commission and City Council on a plan to be adopted. The Planning Commission is the statutory body responsible for overseeing the planning process, and the City Council responsible for final approval, modification, or rejection of the final plan.



Planning Process

Citizen and Stakeholder Oversight

Duluth Comprehensive Plan Committee Schedule

Meeting Date	24-May	15-Jun	5-Jul	20-Jul	2-Aug	17-Aug	6-Sep	13-Sep	26-Sep
Phase 1	Present process	Public Meeting	Listening Session	Summary and distribution of draft background material	Listening Session	Presentation and discussion of background	Listening Session	Planning Commission Meeting	City Council Meeting
	Present public meeting role			Presentation of Issue Inventory from Pub Meeting		Presentation of draft Governing Principles	Governing Principles discussion	Discussion and approval of Governing Principles	Discussion and approval of Governing Principles
				Create Governing Principle categories		Modify Governing Principle language			
Meeting Date	21-Sep	4-Oct	Late October	1-Nov	16-Nov	6-Dec	3-Jan	18-Jan	7-Feb
Phase 2	Set parameters for alternative land use scenarios based	Listening Session	First round of Area-wide meetings	Present results of public meetings, including final draft land use scenarios	Discuss land use categories for use in the land use map	Present natural systems, infrastr. cost analyses, maps	Listening Session	Present draft future land use map	Discuss future land use, overlay districts
	Identify priorities for additional background information		Present Land Use Concepts and draft undeveloped lands	Present results of public meetings	Discuss policy categories and priorities	Modify goals and recommend policies based on CPC discussion	Hist/Cultural; Trails/Rec; MIC Regional Utilities	Discussion of land use policies and overlay districts	Finalize City-wide policy language
Meeting Date	15-Feb	Late Feb.	7-Mar	15-Mar	30-Mar	4-Apr	19-Apr	2-May	17-May
Phase 3	Discuss map, prepare for public meetings	Second round of Area-wide meetings	Review findings of public meeting comments	Discuss policy changes and map adjustments	Discuss subcommittee recommendation	Discuss subcommittee recommendations	Finalize policies, land use map	Discuss land use implementation strategies	Discuss transportation implementation strategies
	Present final draft map and policies	Presenting final draft map and policies for review and comment	Discuss policy and map responses to public comment	Create subcommittees for particular topics	Discuss future land use map	Policy changes	Introduce strategies	Present capital improvements and public facilities considerations	Present draft implementation section
Meeting Date	25-May	6-Jun	19-Jun	26-Jun					
Phase 4	Final Public Meeting	Review public meeting results	Planning Commission meeting	City Council Meeting					
	Present draft plan	Discuss final changes to plan map and	Recommend Plan	Adopt Plan					

Planning Process



During the planning process the CPC worked with Planning department staff and the consultant team to craft draft and final plan language and future land use map. The CPC evaluated background material compiled by staff and the consultant team, considered substantive presentations by stakeholders, attended public meetings and reviewed public comments, and offered comments and recommendations for changes to draft documents. CPC members attended over 25 officials meetings during the year-long process in addition to briefing their respective constituencies on the process, attended subcommittee meetings to advise the larger group on specific topics, assisted in the facilitation process at public meetings, and spent considerable time reviewing documents and draft away from the meetings.

Public meetings

The year-long process included four points of public meeting outreach and presentation:

1. The kickoff meeting, held in June of 2005. This meeting included presentation of background material, a review of the function of a comprehensive plan in city decision making, and the process to be managed by the consultant team for facilitating the creation of a comprehensive plan. The CPC members then facilitated an issue identification process in small groups. The issue inventory was the start of substantive discussion for the content of the Plan.
2. The first round of area meetings, held in late October of 2005. Three area meetings (in the west, central, and east areas of Duluth) were held over the week to present the initial draft material of the comprehensive plan. After presentation, meeting attendees completed an exercise on what they believed to be the opportunities and risks presented by the draft material. Each meeting included extensive comment and discussion by participants. Written comments were also taken both at the meeting and after the meetings for people who were unable to attend.
3. The second round of area meetings, held in late February of 2006. Three more area meetings were held over a week to present the first complete draft of the future land use map and the Plan policies. Meeting participants identified those components of the future land use map or the policies with which they agreed, and those that raised questions or reservations. Participants then discussed their reservations and approval in small groups facilitated by CPC members, staff, and the consultant team. Written comments were also collected at and after the meetings.



Planning Process

Citizen and Stakeholder Oversight

4. A final public meeting, held in May of 2006. This meeting presented the revised future land use map, policies, and implementation strategies, and demonstrated the link between the four elements (principles, policies, map, strategies) of the draft Comprehensive Plan. After a presentation on the plan elements, participants engaged staff, consultants, and CPC members in individuals discussions at four stations. Written comments were also solicited and accepted.

At the final public meeting, the Planning Commission held a public hearing on the draft plan, and recommended the Plan for adoption by the City Council.

Listening sessions

The review by the CPC was the primary means by which citizen and stakeholder perspectives were incorporated into the Plan process. In order to ensure that CPC members were hearing from a broad range of constituencies, the process included a number of 'listening sessions' when interested groups could present their priorities and concerns to the CPC. Six listening sessions were held, one per month for the first six months, at which the CPC would hear the presentation of up to three organizations and have the opportunity to ask questions.

Presentations were made by large institutions such as the Airport and Port authorities and St. Luke's Hospital, open space and trail advocacy organizations, affordable housing organizations, advocates for sustainable development and eco-industrial development, and infrastructure-related entities including Minnesota Power, Comfort Systems, and the Minnesota Pollution Control Agency.



Principles and Plan

The process was designed around the creation of two separate documents that would be combined in the final Plan. First, the process would develop a set of governing principles to guide the development of a comprehensive plan. The Governing Principles section was to be adopted by the City Council before moving ahead with the larger task of creating the body of the comprehensive plan. Creating the principles allowed the decision makers, reviewers, and staff to come to an initial agreement about the general content and concepts.

Creating the principles took the first three months of the process. The Planning Commission and City Council then weighed in with modifications. The principles were adopted by the Planning Commission on September 21, 2005 and by the City Council on October 24, 2005.

The subsequent process of creating the future land use map, policies, and strategies, which took approximately 9 months and 18 CPC meetings, was based on the governing principles. The CPC, staff, and consultant team started with defining land use categories, focusing on mixes of land uses rather than single use categories. In using the land use categories on the future land use map, the the CPC endorsed the concept of first setting aside the city's green infrastructure in order to determine where to direct development. This concept follows a 'no-regrets' approach to identifying the best areas for development; decisions to conserve undeveloped land are relatively easily undone, but decisions to develop are difficult to undo. Complementing this concept is the emphasis that priority development areas focus first on redevelopment, infill development, and neighborhood extensions. Greenfield development is to be staged carefully to ensure an efficient expansion of gray infrastructure.

The policies were compiled, discussed and reviewed over three months of meetings in order to define how the governing principles affect the built and natural landscape. In the final month of the process, the CPC, staff, and consultant team moved from policies to implementation, by selecting the preferred strategies to bring the Plan's principles into the day-to-day operations of the City.



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Governing Principles

The first phase of the Comprehensive Plan process was to create a set of governing principles. The principles are to guide not only the Comprehensive Plan process but the implementation of the Plan over time.

Duluth's Comprehensive Plan process began with the development of an over arching governing set of principles. The governing principles set the foundation for the entire framework of the Comprehensive Plan by providing the fundamental concepts by which physical planning needs to take place. These principles guided the development of the future land use map, Plan policies and the recommended implementation strategies. As the foundation of the Comprehensive Plan the principles will serve as a constant reminder and guide for land use decisions and future planning. The principles can provide direction when the details of the Plan are insufficient to clearly resolve issues or make decisions. Continual reference to the principles will make sure that the concepts of the Comprehensive Plan are held in place over time.

The Comprehensive Plan Committee worked for several months in the design and wording of the following twelve principles. The work began with a review of principle language from other communities as well as Duluth's past visioning exercises. The draft principles were then viewed through alternative development scenarios. The scenarios were designed to assess the range of development and preservation opportunities within the principle language, and provide guidance to how the principles should be reflected in Duluth's natural and developed landscapes. Through this work the Committee strengthened the principle language to maximize opportunities and minimize risks associated with land use decisions.

Since the principles serve as the foundation for the Plan, it was important to the validity of the remaining process to have the City Council approve the principles before building the Comprehensive Plan's other elements (future land use map, policies, and strategies). The principles were formally adopted by the City Council on October 24, 2005.

The number of the principles is for reference and does not imply a rank order.

05-0730R

RESOLUTION ADOPTING GOVERNING PRINCIPLES FOR THE COMPREHENSIVE PLAN.

BY COUNCILOR GILBERT:

WHEREAS, a foundational element of the comprehensive plan process is to formulate governing principles to guide plan development; and

WHEREAS, the comprehensive planning committee, in conjunction with the planning consultant and city planning staff, have developed 12 governing principles; and

WHEREAS, these principles have been reviewed by the comprehensive planning committee and approved by the planning commission;

RESOLVED, the principles set forth in Public Document No. 05-1024-025 are adopted for the purpose of guiding the city as it proceeds with the development of a comprehensive plan.

STATEMENT OF PURPOSE: This resolution adopts planning principles prepared by the comprehensive planning committee, consultant and staff. The principles were presented to the planning commission at its September 21, 2005, meeting. The planning commission recommends approval.

Principle #1 - Reuse previously developed lands

Reuse of previously developed lands, including adaptive reuse of existing building stock and historic resources, directs new investment to sites which have the potential to perform at a higher level than their current state. This strengthens neighborhoods and is preferred to a dispersed development pattern with attendant alteration of natural landscapes and extensions of public services. Site preparation or building modification costs are offset by savings in existing public infrastructure such as streets, utilities, and transit, fire and police services.

Previously developed lands include a range of sizes, locations, with and without structures: large 'brownfield' sites such as U.S. Steel; smaller industrial sites in a neighborhood context such as Clyde Iron; vacant 'infill' sites with streets and utilities, commercial buildings no longer in viable service, residential structures suitable for rehabilitation, (creates individual improvement as well as contributes to neighborhood vitality) and scattered vacant parcels.

Principle #2 - Declare the necessity and secure the future of undeveloped places

Undeveloped areas are an essential part of Duluth's municipal fabric - urban plazas, neighborhood parks, large tracts of public ownership and private lands zoned for minimal development. These minimally or undeveloped areas collectively create an open space system. These areas contribute to Duluth's cultural, health, recreational, and economic value and community identity. This open space system provides vistas, encourages active recreation, provides natural infrastructure as storm water retention, plant and animal habitat and water quality, and is the strongest visual element defining Duluth's sense of place.

Duluth contains a great diversity of land form. Areas where construction is less challenging have largely been developed. Much of Duluth's open areas were private lands, now tax forfeit. Areas often presumed to be public parks are tax forfeit lands and are subject to possible auction and sale. Other lands presumed to be public, are private. Legal status, common usage and public perception frequently do not match. Securing the future for key parcels of open space is critical to Duluth's identity and economic base.

Principle #3 - Support traditional economic base

Supporting Duluth's traditional economic foundation maintains jobs, tax base, and opportunity. Economic activity with specific location requirements may be subject to displacement or site competition with changes in real estate values. This traditional economic activity faces change as result of global economic patterns, changing markets, new regulation and aging of extensive infrastructure. Nevertheless, fundamentals remain and the economic contribution, sometimes taken for granted, is significant.

The traditional economic base includes port operations, transportation services, manufacturing, bulk commodity handling and related support services. Locational considerations include docks, shipping channels, railroad rights-of-way, Interstate highway and airport.

Governing Principles

Growth sectors can be as small as a new sole-proprietorship or as large as a medical complex or UMD. What they share in common is a contribution to Duluth's economic diversity which did not exist thirty years ago. Changes in technology and transportation allow business location here attracted by a disciplined work force, Lake Superior, natural landscapes, relatively low real estate prices and cultural features. Linkages between these emerging sectors and the traditional economic base will strengthen both.

Support neighborhood scale commercial areas, neighborhood parks with links to the larger city-wide parks and trails system, varieties of housing, both in cost and building types and a street pattern which places arterials on the edges of neighborhoods rather than bisecting them. Avoid large scale, non-neighborhood based activity within the core of a neighborhood.

Climate-specific materials and design; repair and use of historic walls, bridges and buildings; Lake Superior, St. Louis River and streams; walkable scale neighborhood commercial districts, parks and residential areas; cultural references and traditional events are all defining elements that reinforce the place-specific.

Principle #4 - Support emerging economic growth sectors

Emerging economic sectors add economic, cultural and social diversity. These include higher education, medical, value-added manufacturing, commercial outdoor recreation, historic resources interpretation, arts and music, information technology and visitor services.

Principle #5 - Strengthen neighborhoods

The present city is an historical amalgam of villages and other independent units of government, contributing to the present condition of Duluth being strongly defined by its neighborhoods. This condition should be reinforced through land use, transportation and public service delivery patterns which strengthen neighborhood identity. New institutional expansions, major public infrastructure or large commercial or industrial uses should not divide historic neighborhood patterns.

Principle #6 - Reinforce the place-specific

Public and private actions should reinforce cultural, physical and economic features which have traditionally defined Duluth, its open space and its neighborhoods. This includes commercial areas providing neighborhood goods and services, ravine parks and other natural features that define neighborhood edges and view corridors to the Lake or River which serve to provide location and context.

Principle #7 - Create and maintain connectivity

Connectivity is established through our streets and highways, transit system, sidewalks, bike-ways and trails, (local and regional). The non-vehicular modes should be considered more than recreation. They are important components of an overall transportation system. Winter maintenance of sidewalks and other public ways is critical to creation of usable pedestrian systems.

The dominant system of streets, roads and highways; historic parkway and trail systems such as Skyline, Lincoln Park, Chester Park, Lester-Amity Park; regional trails such as Munger, Superior Hiking Trail and snowmobile trails; and the transit system. Not always viewed as a system but increasingly so, are sidewalks, stairs, ramps and facilities for pedestrians and the disabled which need to be maintained all year to create a system which will grow in usage.

Principle #8 - Encourage mix of activities, uses and densities

Cities have evolved as a mix of land uses, building types, housing types, and activities. Accommodating choice while protecting investment is a balance to strike in land use regulation. Mixed uses provide opportunity for a diversity of activity that segregated, uniform uses do not provide.

Examples of mixed development include integration of housing, commercial, entertainment and recreational uses. Business and light industrial can blend with residential in larger complexes. Mix also refers to residential building types and income ranges, which can provide housing choices for persons who may wish to stay within a neighborhood throughout their lifetime. Neighborhood-oriented commercial uses reinforce local identity in ways that regional commercial or auto-oriented commercial centers do not.

Principle #9 - Support private actions that contribute to the public realm

Private building construction and site design influences activity in adjacent public areas. Building form, height, setbacks and detailing effect the adjacent areas. The uses and activity contained in the buildings directly impacts the surroundings. Public areas should benefit from adjacent private investment.

Blank walls, undirected lighting, parking areas right at sidewalk line, loading areas in a public way, are examples of features which detract from public areas. Standards are appropriate to apply in areas where private actions about public areas so that these actions not only do not detract, but enhance the public areas.

Governing Principles

Building types and materials that reduce resource consumption and load on the waste stream such as used at Hartley Nature Center are becoming mainstream. HRA's Hawk Ridge development preserves tree canopy and requires building materials and design to consider raptors. Fuel for transportation and space heating come from outside our region and reduction in consumption in this area improves our regional "balance of payments."

Neighborhood-based schools promote walkable, safe communities and reduce transportation expense. School closings or consolidations changes community connectivity. Creation of new neighborhoods can either strain or relieve transportation budgets. The number of K-12 students in the city will dictate the total facilities required but where the students live should influence which schools are in service. For higher education, housing opportunities that integrate students into the larger community are generally desirable however, the impacts of badly integrated student housing can be very destructive to established neighborhoods.

Utilizing existing water, wastewater, and storm sewer system capacity before expanding the system; when replacing aging infrastructure add additional capacity in location where development is encouraged and consideration of the cost of extending emergency service to undeveloped area. Tax base alone does not off-set the cost of these services, therefore, the pattern of development, and resultant public service costs, are important considerations.

Principle #10 - **Take sustainable actions**

Initiate land use, site design, transportation, building design and materials policies which reduce consumption of finite resources, generation of solid waste and introduction of toxic materials to land, air or waters.

Principle #11 - **Include consideration for education systems in land use actions**

For K-12 and higher education both, there is a connection between land use patterns and educational facilities. School locations in neighborhoods and housing opportunities for higher education students require consideration of impacts on transportation systems, housing densities, parking and non-student uses.

Principle #12 - **Create efficiencies in delivery of public services**

The costs of public service must be considered in land use decisions. Street construction and maintenance, utilities, libraries, fire, police, snowplowing and recreation facilities are services directly related to the physical location of development. Infrastructure should help prescribe development location rather than react to it.

Comprehensive Plan Future Land Use Map

The Comprehensive Plan Land Use Map presents a geographic representation of the City's preferred future land use scenario. The map summarizes the community's discussion of how development, preservation, and public realm investment should play out over the next twenty years. Being able to see a picture of the end result is helpful in directing the myriad large and small decisions and investments over the next twenty years. While the map does not identify the implementation process or interim results it does show the end point, sometimes called the 'desired future condition,' of the next twenty years of development activity and land use decisions.

The land use map is intended to be used in conjunction with the written content of the Plan. The map shows the geographic layout of Duluth's preferred land uses in twenty years, but does not capture the full detail of Comprehensive Plan policies, identify the full range of recommended strategies, or present any staging of development priorities. The governing principles, the Plan's land use policies, and the strategies recommended in the Implementation section provide additional direction on staging of growth, on priorities within land use categories, and on implementation preferences.

The following section includes:

- Identification of the Comprehensive Plan future land use map components and land use categories;
- Summary statistics for land use categories;
- Description of the appropriate use of the map;
- Description of the limitations of the map;

Map Components

The future land use map shows three discrete elements of Duluth's preferred future: land uses, resource overlay districts, and future study areas. Other characteristics of the landscape, such as natural features, existing development, and infrastructure are not shown on this map.

Desired Future Condition

An explicit description of the physical characteristics of a specific area believed necessary to meet the community's principles and policies.

Comprehensive Plan Future Land Use Map

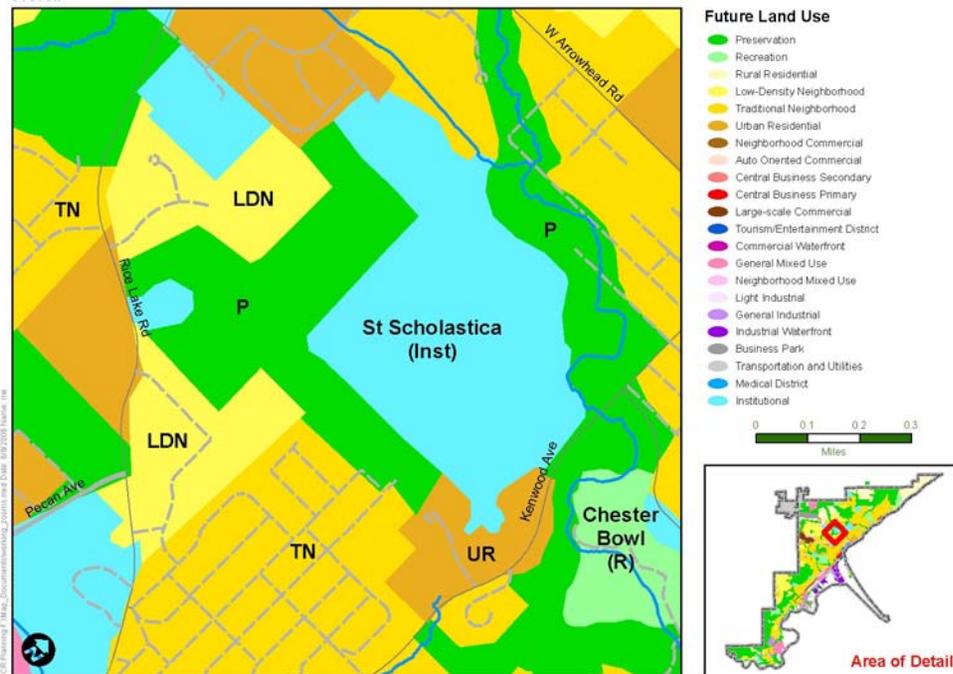
Map Components

Preferred land uses

The preferred land uses, represented by the distinct blocks of colors, represent different mixes of land uses rather than single category land uses. Land use areas are fairly general, not getting any more detailed than a city-block; map users should think of the map as showing the City land uses from a perspective of 30,000 feet over the City.

For example, several areas shown in Figure LUM-1 are identified on the land use map as Traditional Neighborhood residential use (the darker yellow color labeled “TN”). This area is planned, within approximately twenty years, to have primarily residential land uses with interconnected streets, three to six units per acre typical density, and typically including some lots with other land uses such as multi-family and commercial buildings, in addition to open space, parks, and trails. The land use map shows Traditional Neighborhood areas in currently undeveloped or partly undeveloped areas, and in fully developed existing traditional neighborhoods.

Figure LUM-1: Future Land Use



Understanding the Future Land Use Map

The Comprehensive Plan uses several overlay districts that identify special considerations for development or preservation activities that relate to Duluth’s physical form and physical assets. The overlay districts are not land uses, but indicate that the underlying land uses must address special opportunities and risks associated with the overlay.

Sensitive Land Overlay

For clarity, only one of the overlay districts is shown on the future land use map – the Sensitive Land Overlay (SLO). The same area from Figure LUM-1 is shown in Figure LUM-2, this time partly covered by the Sensitive Lands Overlay. The overlay does not change the mix of land uses that are preferred for the area. The overlay does indicate a preference for a development pattern that clusters buildings and impervious surfaces away from sensitive natural resources, incorporates more open space than would normally be found in the base land use category, preserves more of the existing tree cover, uses more innovative storm water management, or incorpo-

Comprehensive Plan Future Land Use Map Understanding the Future Land Use Map

rates other methods that preserve natural qualities of the land or other important assets while allowing development. The overall density may be lower than otherwise found in the base land use area, and the street pattern may be altered to accommodate natural resources protection or impervious surface limitations. The mix of land uses and many of the building form characteristics, however, will match the base land use description.

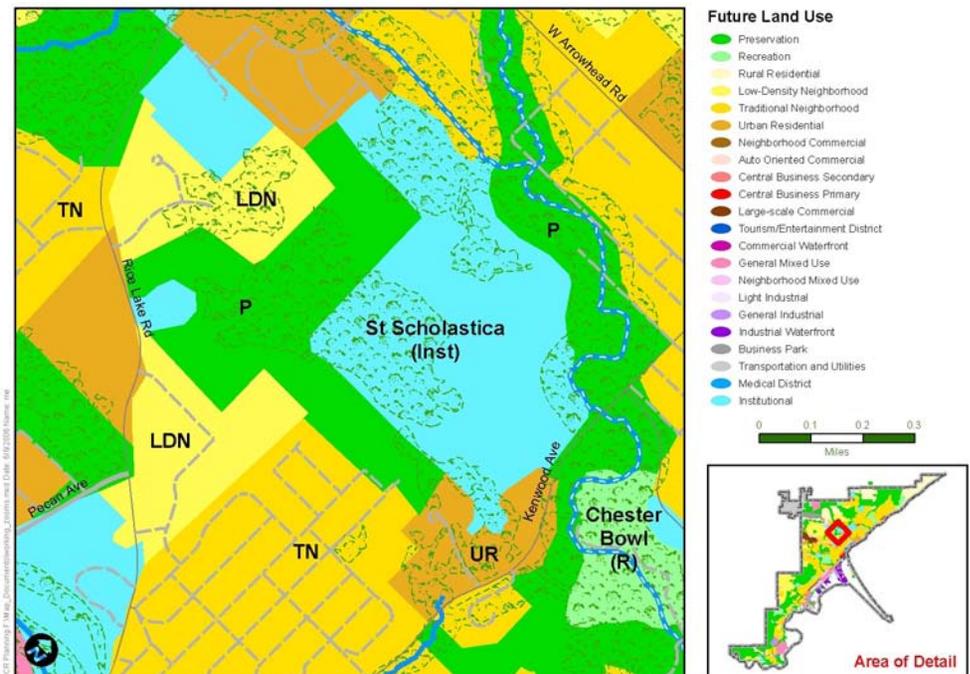
The Comprehensive Plan policies also refer to two additional overlay districts - the Higher Education and Historic (HEO and HISTO). These areas are represented on maps that follow the Future Land Use map.

Higher Education Overlay

With almost 20,000 students enrolled in higher education in Duluth, there are clear institutional impacts, both negative and positive, from this presence in the community. This is a significant new “industry” in Duluth and **Principle #4, Support emerging economic growth sectors**, makes clear reference to the economic, cultural and social benefits of this presence. However, traditional neighborhoods are being dramatically altered by conversion of single family homes to what are essentially rooming houses, with multiple, unrelated occupants. In most cases, these are business enterprises, the owner is not a resident. Houses constructed at a time when one car per household was the norm are now surrounded by cars parked in yards and on the street. New housing, catering to students, is also being constructed, often times remote from campuses.

These trends give rise to the Higher Education Overlay. These are areas where the presence of the educational institution is strong and related commercial, entertainment, service and housing functions would benefit from regulations and incentives specific to the student and young professional market base being served. In addition, and related to student housing, city-wide standards should be considered regarding the density of rental properties in residential zone districts. The preservation of neighborhoods and support of student populations is both a supply and demand process. It would not be appropriate to regulate alone, without encouraging provision of alternatives.

Figure LUM-2: Sensitive Land Overlay



Comprehensive Plan Future Land Use Map

Understanding the Future Land Use Map

Historic Overlay

Duluth is fortunate in having an inventory structures; residential, commercial and industrial, built during periods which were significant in the history of the community and the region. Plan principles speak to the treatment of these resources. With Principle #1, **Reuse previously developed lands**, reuse applies to buildings as well as sites, and Principle #6, **Reinforce the place specific**, speaks directly to securing the future of structures which define Duluth. Many of these are physical representations of Duluth's reason for being. They provide an identity that other contemporary cities have lost to freeways, urban development, rapid growth and changing economics.

The Historic Overlay identifies concentrations of structures to be inventoried, surveyed or evaluated for significance and possible designation at the federal or local level. The overlay was applied to areas representing one or more of the following criteria:

1. It has character, interest or value as part of the development, heritage or cultural characteristics of Duluth, Minnesota or the nation.
2. Its location is the site of a significant historical event.
3. It is identified with a person or persons who significantly contributed to the cultural development of Duluth, Minnesota or the nation.
4. It embodies a distinguishing characteristic of an architectural type.
5. It is identified as the work of an architect or master builder whose individual work has influenced the development of Duluth or Minnesota.
6. It embodies elements of architectural design, detail, materials and craftsmanship which represent significant architectural innovation.
7. Its unique location or singular physical characteristics represent an established and familiar visual feature of a neighborhood, community or City as a whole.

In addition, there are many worthy individual structures. The map does not attempt to locate every significant structure.

Comprehensive Plan Future Land Use Map Understanding the Future Land Use Map

Future study areas

Finally, the future land use map shows a number of future study areas, denoted by dashed lines that surround 12 distinct areas on the map. Future study areas acknowledge the sometimes high level of uncertainty about long term, or even short term, land use preferences. Where uncertainty about market conditions, ownership patterns, or infrastructural capacity is particularly high, the Comprehensive Plan recommends additional study to guide possible modifications to the future land use map. The studies take one of two general forms, as described in the Plan policies and implementation recommendations: master planning areas and study areas.

Master planning areas are recommended in the policies as being areas where development or redevelopment should be planned, coordinated and phased for a single large area. Study areas can also be master planned as a single site, but generally have a broader range of ownership and building form issues. Study areas are more likely to need site specific decisions on preferred forms, design themes, and resolving transitions between the study area and adjacent land use areas and between existing land uses and the preferred land uses.

Figure LUM-3 shows the western port future study area. The goal is to master plan this area and integrate a wide range of land uses (hence the general mixed use designation) into the final form. The uncertainties about coupling brownfield mitigation with future industrial potential, solving infrastructure issues as discussed in the Implementation section, expanding Duluth's shore housing areas, and restoring natural systems leads to the designation of this area for future master planning.

Land Use Categories

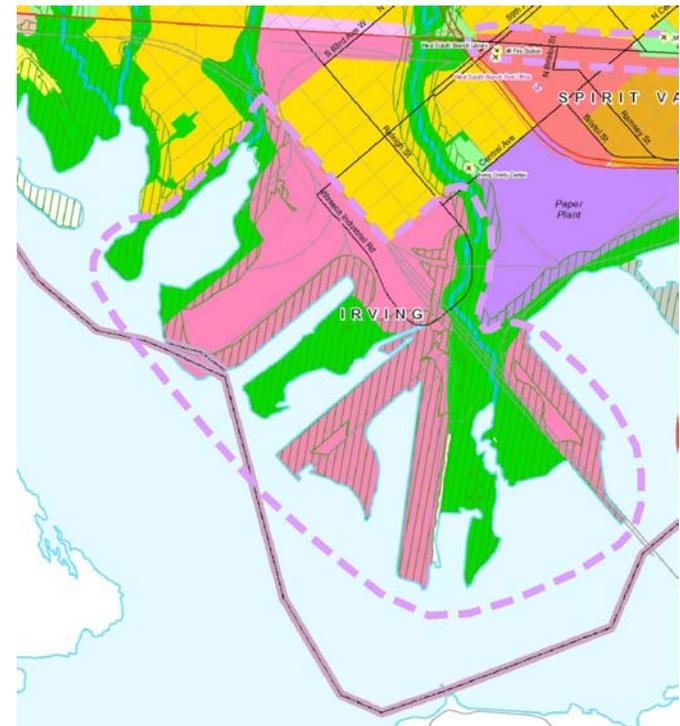
Each land use category is described on the following pages including the following descriptive information for each land use category:

- The preferred primary and secondary land uses and approximate mix of uses that could be found within the district;
- The approximate or typical density and intensity;
- The relationship to transportation infrastructure; and
- The type of performance standards or design considerations that may apply to particular land uses in that district.

Future Study Areas Designated on Land Use Map

<u>Study Areas</u>	<u>Master Plan Areas</u>
Oneota Industrial Park	Antenna/Tower Farm
Airpark Business Park	U.S. Steel Site
Eastern Port Area	Western Port Area
London Road (10 th -26 th)	
Central Entrance	
Grand Avenue	
Superior Street (Lincoln Park)	
Superior Street (Lakeside-Lester)	
Commonwealth Avenue (Gary-New Duluth)	
Arrowhead Road and Rice Lake Road	

Figure LUM-3: Future Study Area, Western Port Area



Comprehensive Plan Future Land Use Map

Land Use Categories



a. Central Business Primary

Code – CBP



b. Central Business Secondary

Code – CBS



c. Medical District

Code – MD



d. Tourism/ Entertainment

Code - TE



CBD Land Use Categories	Description	Density / Intensity / Design
<p>a. Central Business Primary</p> <p>Code – CBP</p> 	<p>Encompasses a broad range of uses and intensities:</p> <ul style="list-style-type: none"> • Governmental campus • Significant retail • Entertainment and lodging • Opportunities for high-density housing • Central plaza, public/open space • Public parking facilities 	<ul style="list-style-type: none"> • High height and density limits • Protection of historic buildings or building groups • Form-based guidelines • Pedestrian-oriented design • No off-street parking required, but loading required • Avenue lake views are protected
<p>b. Central Business Secondary</p> <p>Code – CBS</p> 	<p>An area adjacent to and supporting the primary central business area or a stand-alone area providing a similar mix of destination land uses but at a lower intensity than the primary CB area. Includes mixed regional and neighborhood retail, employment centers, public spaces, medium density residential, and public parking facilities.</p>	<ul style="list-style-type: none"> • Medium densities; multi-story and mixed-use buildings are encouraged. • Form-based guidelines • Pedestrian-oriented design • Limited off-street parking required, loading facilities required
<p>c. Medical District</p> <p>Code – MD</p> 	<p>An area encompassing the medical campuses and adjacent areas that support them, with related commercial, office uses and residential uses in the fringe areas of the district.</p>	<ul style="list-style-type: none"> • Density increasing from fringe to taller buildings in core • Form-based guidelines to transition between core and fringe, preserve viewsheds • Pedestrian-oriented design, transit facilities, and parking • Relationship to institutional master plans
<p>d. Tourism/ Entertainment</p> <p>Code - TE</p> 	<p>Retail, entertainment and lodging facilities, meeting facilities, waterfront-related uses, open space uses.</p>	<ul style="list-style-type: none"> • Medium densities and building heights • Design standards and design review

Comprehensive Plan Future Land Use Map Land Use Categories

Commercial Land Use Categories	Description	Density / Intensity / Design
<p>a. Neighborhood Commercial</p> <p>Code – NC</p> <div style="text-align: right; width: 20px; height: 20px; background-color: #8b4513; margin-left: auto;"></div>	<p>Small- to moderate scale commercial, serving primarily the adjacent neighborhood(s). May include specialty retail; community gathering businesses such as coffee shops or lower intensity entertainment; offices; studios or housing above retail (storefront retail with vertical mixed use). Typically situated in or adjacent to residential neighborhoods. May transition to neighborhood mixed use.</p>	<ul style="list-style-type: none"> FAR: 0.3 to 0.5 Building footprints generally less than 20,000 sq. ft., individual storefronts as small as 3,000 sq. ft. Larger stores with liner buildings Parking is less prominent than pedestrian or bicycle features Generally a ‘node’ rather than strictly a corridor Edge or buffer standards along residential areas
<p>b. Auto-Oriented Commercial</p> <p>Code - AOC</p> <div style="text-align: right; width: 20px; height: 20px; background-color: #f4a460; margin-left: auto;"></div>	<p>Commercial and office development focused primarily on needs and convenience of the motorist, without losing pedestrian access and connection. No residential uses. Situated along arterial roads. Can include a mix of auto- and neighborhood-oriented commercial uses or transition into neighborhood commercial.</p>	<ul style="list-style-type: none"> FAR: 0.2 to 0.3 Building footprints less than 50,000 sq. ft. Site design includes landscaping of parking areas, pedestrian walkways, buffering of adjacent residential Parking requirements
<p>c. Large-Scale Commercial</p> <p>Code - LSC</p> <div style="text-align: right; width: 20px; height: 20px; background-color: #652e2e; margin-left: auto;"></div>	<p>Mall, shopping center and big box retail development, with associated surrounding retail and service uses, but only ancillary office uses and no residential uses. Oriented primarily to the motorist, with planned internal circulation patterns while still accommodating pedestrian movement. Requires access to regional transportation routes. May include regional green infrastructure for watershed protection.</p>	<ul style="list-style-type: none"> FAR: 0.2 to 0.3 Building footprints exceed 50,000 sq. ft. Site design includes generous landscaping of parking areas; Buffering of adjacent residential, improved pedestrian connections to and through sites



Land Use Map

Comprehensive Plan Future Land Use Map

Land Use Categories



a. General Mixed Use

Code - GMU



The broadest mix of uses, including light industrial, office, commercial, and residential use, with performance standards to ensure compatibility. Includes areas that are in transition from industrial uses and large redevelopments that require master plans and phased development. General or heavy industrial can be included when a large site is master planned to allow appropriate separation of uses.

- FAR: 0.3 to 0
- Pedestrian circulation and open space amenities should be provided for larger sites
- Master planning for large sites



b. Neighborhood Mixed Use

Code - NMU



A transitional use between more intensive commercial uses and purely residential neighborhoods. Includes conversions of houses to office or live-work spaces. May include limited commercial-only space oriented to neighborhood or specialty retail markets.

- Site design should maintain a largely residential building character
- Commercial-only uses should be adjacent to non-residential or other mixed use areas



c. Commercial Waterfront

Code - CW



Waterfront-dependent commercial uses, sometimes mixed with residential or adjacent to higher density residential. Includes tourist- or recreation-oriented uses. Commercial areas can be adjacent to industrial waterfront. Abuts other commercial uses and recreation areas, preservation areas. Access to regional arterial traffic and water access.

- Variable densities
- Performance standards, including buffer between residential and non-residential uses
- Design standards protect water quality, shoreland areas, adjacent preservation areas

Comprehensive Plan Future Land Use Map Land Use Categories

Residential Categories	Description	Density / Intensity / Design
<p>a. Rural Residential</p> <p style="text-align: center;">Code - RR</p> <div style="background-color: #fff9c4; width: 20px; height: 20px; margin-left: auto; margin-right: auto;"></div>	<p>Areas of single-family lots of at least five acres. Limits the extension of municipal utilities for new development. Includes existing rural density areas with lots as small as an acre now served by municipal utilities but not planned for further subdivision.</p>	<ul style="list-style-type: none"> 1 unit/5 or more acres (may vary depending on soils) Conservation development encouraged or required Undeveloped areas of large lots are used to complement open space patterns (viewsheds, buffers)
<p>b. Low-density Neighborhood</p> <p style="text-align: center;">Code - LDN</p> <div style="background-color: #ffff00; width: 20px; height: 20px; margin-left: auto; margin-right: auto;"></div>	<p>Single-family housing with urban services. Typified by curvilinear streets, houses with longer side parallel to street, and attached garages. Includes a range of house sizes and lot sizes. Non-residential uses are mainly uses such as schools and churches. Parks and open space are located within or adjacent to the neighborhood.</p>	<ul style="list-style-type: none"> 3-4 units/acre Conservation development an option, required with SLO Limited number of secondary/granny flats
<p>c. Traditional Neighborhood</p> <p style="text-align: center;">Code - TN</p> <div style="background-color: #ffcc00; width: 20px; height: 20px; margin-left: auto; margin-right: auto;"></div>	<p>Characterized by grid or connected street pattern, houses oriented with shorter dimension to the street and detached garages, some with alleys. Limited commercial, schools, churches, and home-businesses. Parks and open space areas are scattered through or adjacent to the neighborhood. Includes many of Duluth's older neighborhoods, infill projects and neighborhood extensions, and new traditional neighborhood areas.</p>	<ul style="list-style-type: none"> 4-8 units/acre Form standards and conservation development an option Mix of housing types (i.e. town homes and 4-plexes) at corners Limited commercial uses (i.e., 'corner store') serving neighborhood market
<p>d. Urban Residential</p> <p style="text-align: center;">Code - UR</p> <div style="background-color: #e69a00; width: 20px; height: 20px; margin-left: auto; margin-right: auto;"></div>	<p>Greatest variety of building types, medium to high densities. Applicable to larger infill areas close to downtown, entertainment or activity centers, and waterfront residential areas. May include student housing areas, live/work units, and limited neighborhood retail. Connected or adjacent to parks and open space.</p>	<ul style="list-style-type: none"> 8 units/acre and up Form standards ensure pedestrian orientation and mix of housing Commercial uses that serve neighborhood market Waterfront areas with access to docks or landings



Land Use Map

Comprehensive Plan Future Land Use Map

Land Use Categories



Industrial Categories	Description	Density / Intensity / Design
a. General Industrial Code - GI 	<p>Areas for manufacturing, processing and other activities that may have off-site impacts and are generally isolated from other uses or buffered from them. Sites should have direct access to major regional transportation facilities and other infrastructure.</p>	<ul style="list-style-type: none"> • Larger parcels • Variable densities • Performance standards for environmental effects and nuisance mitigation
b. Light Industrial Code - LI 	<p>Areas for manufacturing, warehousing and distribution; uses that have few outside impacts, and can be located in relative proximity to non-industrial uses.</p>	<ul style="list-style-type: none"> • Variable densities • Performance standards
c. Business Park Code - BP 	<p>Primarily office and light industrial areas developed in a unified manner, with standards for site design and circulation patterns, signage, landscaping and building design.</p>	<ul style="list-style-type: none"> • Variable densities • Performance standards
d. Industrial Waterfront Code - IW 	<p>Waterfront- or port-dependent industrial uses. May co-exist in proximity to other waterfront-related uses. Should have access to regional roads or rail.</p>	<ul style="list-style-type: none"> • Variable densities • Performance standards for environmental effects and nuisance mitigation
Transportation/Utilities	Description	Density / Intensity / Design
Transportation and Utilities Code - TU 	<p>Applicable to airports, the Port terminals, large highway rights-of-way and similar uses.</p>	<ul style="list-style-type: none"> • Will apply primarily to existing facilities • Low densities

Comprehensive Plan Future Land Use Map Land Use Categories

Institutional	Description	Density / Intensity / Design
Institutional Code - INST	<p>Applicable to university and college and public school campuses, large religious facilities or governmental campuses, cemeteries, etc. Applies primarily to existing facilities.</p>	<ul style="list-style-type: none"> Relationship to institutional master plans, which should guide expansions and ancillary land uses in adjacent land use areas Based on current land use pattern
Open Space Categories	Description	Density / Intensity / Design
a. Preservation Code - P	<p>Lands with substantial restrictions. High natural resource or scenic value, or severe development limitations. Primarily public lands but limited private use is anticipated subject to use and design controls. Examples include: most city parklands and primary viewsheds; shorelands of lake, rivers, streams; wetlands and floodplains; high-value habitat; low-intensity private or public uses.</p>	<ul style="list-style-type: none"> Low intensity uses such as trails predominate Viewshed protection and access Water access for passive use (fishing, canoe/kayak with limited parking)
b. Recreation Code - R	<p>Park and open space areas dedicated to active recreation, such as neighborhood parks, community centers, downhill ski areas, playgrounds, ball fields, water recreation, and associated facilities such as parking.</p>	<ul style="list-style-type: none"> Higher human impacts than preservation areas Water access with parking, supporting facilities



Land Use Map

Comprehensive Plan Future Land Use Map

Land Use Categories

Overlay Categories	Description	Density / Intensity / Design
<p>a. Sensitive Lands Overlay</p> <p>Code - SLO</p> 	<p>High resource value lands or natural resources that may be developed under conservation design standards, transfer of development rights program designs, or low-impact performance standards.</p>	<p>Policies specific to the overlay area guide implementation decisions.</p> <ul style="list-style-type: none"> • Varying densities and land uses • Intensity is concentrated where natural carrying capacity is sufficient, or moved to other parcels via TDR-type program • Conservation subdivision and design • Natural resource performance standards.
<p>b. Higher Education Overlay</p> <p>Code – HEO</p> 	<p>Institutional expansion or ancillary commercial or residential development is accommodated, regulated, and balanced with Plan preferences. Includes institutional planning areas and larger impact zone of land uses associated with university or college markets.</p>	<ul style="list-style-type: none"> • Varying densities and land uses • Commercial, residential higher intensity uses are regulated to buffer owner-occupied areas • Related to institutional master plans.
<p>c. Historic Resources Overlay</p> <p>Code - HISTO</p> 	<p>High resource value cultural/ historic areas and buildings. Redevelopment focuses primarily on adaptive reuse and new development is based on design standards.</p>	<ul style="list-style-type: none"> • Adaptive reuse standards • Design review

Summary Statistics of the Future Land Use Map

The draft future land use map shows the preferred future mix of land uses for the City of Duluth, looking out approximately 20 years. Duluth’s total land base, approximately 43,000 acres, is divided into the 22 future land use categories described in the previous section. Figure LUM-4 shows the approximate distribution of land by land use category.

The 2001 existing land use map showed that approximately 15,400 acres of the City (36%) was undeveloped. Undeveloped lands included both public and private ownership. The draft future land use map identifies land use categories for the entire City, including the existing undeveloped land. No land in the future land use map is designated as ‘undeveloped.’

Figure LUM-5 shows the approximate assignment of undeveloped lands into the proposed land use categories. Assignment of undeveloped land into developable land use categories does not indicate that these lands will be developed in the next 20 years. Given market trends, demographic projections, and the City’s stated preference for infill, redevelopment, and neighborhood extension, some of the land assigned a ‘developed’ category will likely remain undeveloped over the next 20 years.

Figure LUM-4: Total Land Base by Land Use Category

Future Land Use Category	Total Acres
Central Business Primary	104
Central Business Secondary	235
Medical District	81
Tourism/Entertainment District	95
Neighborhood Commercial	276
Auto Oriented Commercial	168
Large-scale commercial	404
Neighborhood Mixed Use	624
Commercial Waterfront	45
General Mixed Use	1,503
Rural Residential	3,868
Low-density Neighborhood	4,183
Traditional Neighborhood	10,103
Urban Residential	1,184
Business Park	557
Light Industrial	159
General Industrial	600
Industrial Waterfront	705
Institutional	1,465
Transportation and Utilities	2,525
Recreation	1,834
Preservation	12,485
Total	43,217

Figure LUM-5: Undeveloped Land Base by Land Use Category

Future Land Use Category	Undeveloped Areas (2001)
Central Business Primary	2
Central Business Secondary	20
Medical District	0
Tourism/Entertainment District	2
Neighborhood Commercial	41
Auto Oriented Commercial	31
Large-scale commercial	61
Neighborhood Mixed Use	101
Commercial Waterfront	11
General Mixed Use	312
Rural Residential	1,945
Low-density Neighborhood	2,083
Traditional Neighborhood	2,049
Urban Residential	316
Business Park	285
Light Industrial	13
General Industrial	216
Industrial Waterfront	111
Institutional	178
Transportation and Utilities	1,307
Recreation	48
Preservation	6,234
Total	15,364

Comprehensive Plan Future Land Use Map
Summary Statistics of the Future Land Use Map

Sensitive Land Overlay

Figure LUM-6: Undeveloped Land with SLO

Future Land Use Category	Undeveloped With SLO
Central Business Primary	0
Central Business Secondary	0
Medical District	0
Tourism/Entertainment District	0
Neighborhood Commercial	14
Auto Oriented Commercial	10
Large-scale commercial	32
Neighborhood Mixed Use	21
Commercial Waterfront	7
General Mixed Use	199
Rural Residential	1,386
Low-density Neighborhood	935
Traditional Neighborhood	983
Urban Residential	189
Business Park	15
Light Industrial	1
General Industrial	39
Industrial Waterfront	46
Institutional	118
Transportation and Utilities	378
Total	4,376

A critical element of land use planning is setting aside the community’s ‘green infrastructure’ before identifying where development is preferred. Green infrastructure includes a variety of natural systems, such as groundwater recharge and storm water infiltration; habitat for unusual or desirable plant and animal communities; passive and active recreation areas; and viewsheds and open space that sustain quality of life and help maintain property values of adjacent developed lands. Duluth has identified areas where natural functions and systems need to be preserved or restored, yet can also sustain some development. Over these areas the future land use map shows a sensitive land overlay. The overlay lies on both developed and undeveloped lands, covering almost half the City’s land base (21,283 acres, or 48%), including all Duluth’s shoreland (streams, rivers, and Lake Superior).

Approximately 60% of the City’s undeveloped lands are assigned the SLO designation. Figure LUM-6 shows the breakdown of undeveloped lands that have been assigned a ‘developable’ land use category, but also have an SLO designation. Figure LUM-7 shows the proposed breakdown of undeveloped lands by developed land use categories, undeveloped (preservation and recreation) land use categories, and the land that is assigned both a developed and SLO designation.

Figure LUM-7: Undeveloped Land Base

Existing Undeveloped Land	Acres	% of Total
Total	15,364	100%
Assigned a Developed LU Cat.	9,082	59%
Assigned a Pres./Rec LU Cat.	6,282	41%
Assigned an SLO overlay	9,376	61%
Assigned as Developed and SLO	4,376	28%

Using the Land Use Map

Understanding and using the land use map requires an understanding of the difference between comprehensive planning and other land use planning activities, such as zoning, that helps move Duluth toward the Plan's goals, or master planning, that prescribes parcel specific development patterns. A land use map must not be confused with a zoning map, even though the two are inextricably linked.

The land use map, in conjunction with the governing principles, and strategies policies, provides direction to land owners, developers, government staff and elected officials as they make land use decisions. Development investment, preservation activities, infrastructure and regulatory decisions should ideally move the community toward the 'desired future condition' shown on the land use map, and should not conflict or preclude the desired future condition.

On the following pages are several examples of how the land use map can inform decisions by land owners, developers, City staff, and the general public. The examples are for illustration only and not intended to be recommendations for any action.

Not a Zoning Map . . .

Land Use Map – a 20-year distant snapshot of the community's preferred future mix of land uses. The map shows what the community *prefers* – the map guides land use decisions for the next 20 years.

Zoning Map – a regulatory map for the immediate future. The map shows what the community has already decided to *allow* today.

Figure LUM-8: Illustrative Land Use Map (see pages 39-41 for larger scale)



Comprehensive Plan Future Land Use Map Using the Land Use Map

Situation - Within an area that has been designated Traditional Neighborhood in the Plan, there is an existing land use, such as an office building or a warehouse, that does not fit within the Traditional Neighborhood land use category.



Using the Land Use Map

The City is considering appropriate land use strategies to move toward the desired goal in this area, which is a mix of land uses consistent with the Traditional Neighborhood category. The desired end (a mix of land uses reflecting the Traditional Neighborhood category) could be met under a variety of strategies:

- Regulatory changes through the zoning ordinance, such as making the office or warehouse land use non-conforming;
- Allowing the land use to remain, but offering an incentive for the land or business owner to move to another site;
- Deciding that the market will ultimately convert the inconsistent land use to one compatible with a traditional neighborhood category because the property is more valuable as a residential land use;
- Deciding that the existing land use could remain, but needs buffers or must adhere to performance standards that protect the primary land use (traditional neighborhood residential).

Any of these strategies will move the City toward its desired future mix of land uses. Some of these actions are regulatory, and would show up on a zoning map or in land use regulations. Some are non-regulatory – no change is made to the zoning or land use regulation, and no enforcement actions are necessary.

Both private and public decision-makers use the land use map to identify the end result, but still have to select an appropriate strategy. The map does not dictate the choice of strategy, only the desired end result of the strategy.

Situation - The TN area is currently undeveloped, or lightly developed as large lot residential, and under existing zoning would preclude TN density and land uses. The City is considering zoning revisions that would make the Zoning Ordinance and map consistent with the Comprehensive Plan.



Using the Land Use Map

The Planning Commission examines the Comprehensive Plan map and the accompanying policies to determine what revisions, if any, are warranted to move the City toward its land use goals. The desired end (a mix of land uses reflecting the Traditional Neighborhood category) could be met under a variety of strategies:

- Rezone the area from large-lot residential to a zoning category that allows 3-6 units per acre.
- Rezone the area parcel by parcel, as specific development proposals are advanced that have appropriate building forms and site designs;
- Rezone the area after the City has the capital to extend infrastructure into the area;
- Rezone portions of the area as an incentive to entice TN development proposals that include extending public infrastructure into the area;
- Extending infrastructure, and allowing zoning changes, only after infill opportunities in existing TN neighborhoods are fully developed.

Situation - A development proposal is advanced to build a 50-unit, 4-story, multi-family building in a Traditional Neighborhood land use area. The development would, consistent with the Plan, require a rezoning, variance, or possibly conditional use permit.



Using the Land Use Map

Staff, Planning Commission, and City Council review the proposal, considering whether the proposed land use is consistent with the Comprehensive Plan. As the Traditional Neighborhood mix of land uses does not include large multi-family land uses, the permit application is not consistent with moving the City toward its land use goals. Decision-makers could take several distinct approaches to the application:

- Reject the application outright
- Require modification of the application to make it conform to TN building and site forms, or
- Consider a Plan amendment, based on new information that justifies such a development, and allow the project to proceed.

Comprehensive Plan Future Land Use Map Summary Statistics of the Future Land Use Map

Situation - A proposal is advanced to consolidate and permanently protect a large area of undeveloped land as a nature preserve in an area designed Traditional Neighborhood, and not covered by the Sensitive Land Overlay. The proposal does not require rezoning, but does require City sign off, investment, or transfer of City-owned land.

Using the Land Use Map

Staff, Commission, and City Council review would consider whether the proposed land use is consistent with the Comprehensive Plan. The Traditional Neighborhood mix of land uses does include open space but only as a secondary land use to single-family residential housing. Decision makers could take several distinct approaches to the proposal:

- Decline to sign off, fund, or transfer City land;
- Work to move the project to an area covered by a sensitive land overlay, and to make the protection area part of a limited development proposal that preserves utility right-of-ways so as to allow development of the remaining Traditional Neighborhood area;
- Amend the Plan, based on new information that justifies preservation, to allow the project to proceed.

In all these examples, the land use map specifies the end result, directing the decisions in regard to interim land uses, staging of development or investment in infrastructure. When land owners look to their development or preservation options, the land use map outlines the kind of options that are consistent with the community's long-range goals. When City staff or elected officials are making implementation choices, and identifying interim development or preservation priorities, the land use map begs the question – is this action leading Duluth to its goals, or does the action detract from the goals?

Moving to implementation

The most immediate ramification of the land use map will be in the review and overhaul of the City's development ordinances (zoning, subdivision, floodplain, shoreland, and others). As noted previously, zoning and land use maps are distinctly different, as are the zoning district descriptions and land use categories. Yet regulatory structures such as zoning must be consistent with the Plan and the Plan's land use map. As the City creates or modifies zoning districts and the zoning map, each decision must be evaluated against the yardstick of the Comprehensive Plan; does the proposed change rationally move the City toward the land use future portrayed in the land use map? Or does the proposed change conflict with the Plan and the Plan map?

Limitations of the Land Use Map

The land use map is a critical component of the Comprehensive Plan. When using the map in decision-making or evaluating potential development or preservation investments, several limitations must be kept in mind:

- The land use descriptions are, as noted earlier, preferred land uses. The descriptions are not regulatory in nature or prescriptive, as distinguished from zoning districts or other regulatory districts. Long range land use maps are necessarily more general than specific area plans, master plans for specific parcels, or regulatory maps such as zoning. The user must keep in mind that the land use map identifies the *preferred* mix of land uses, not the *allowed* mix of land uses.
- The map only shows land uses at a point in time 20-years distant. A similar snapshot of Duluth's land uses at an interim point in time, such as in five years or ten years, would not portray the same mix of uses or extent of development, preservation, or public investment activities. The user must keep in mind that the land use map shows the preferred uses in *20 years*, not necessarily the preferred uses for *tomorrow*.
- The map shows general land use categories that include, in almost every designation, a mix of land uses, building forms, development patterns, and green and gray infrastructure. As noted in Governing Principle #8:

Cities have evolved as a mix of land uses, building types, housing types, and activities. Accommodating choice while protecting investment is a balance to strike in land use regulation. Mixed uses provide opportunity for a diversity of activity that segregated, uniform uses do not provide.

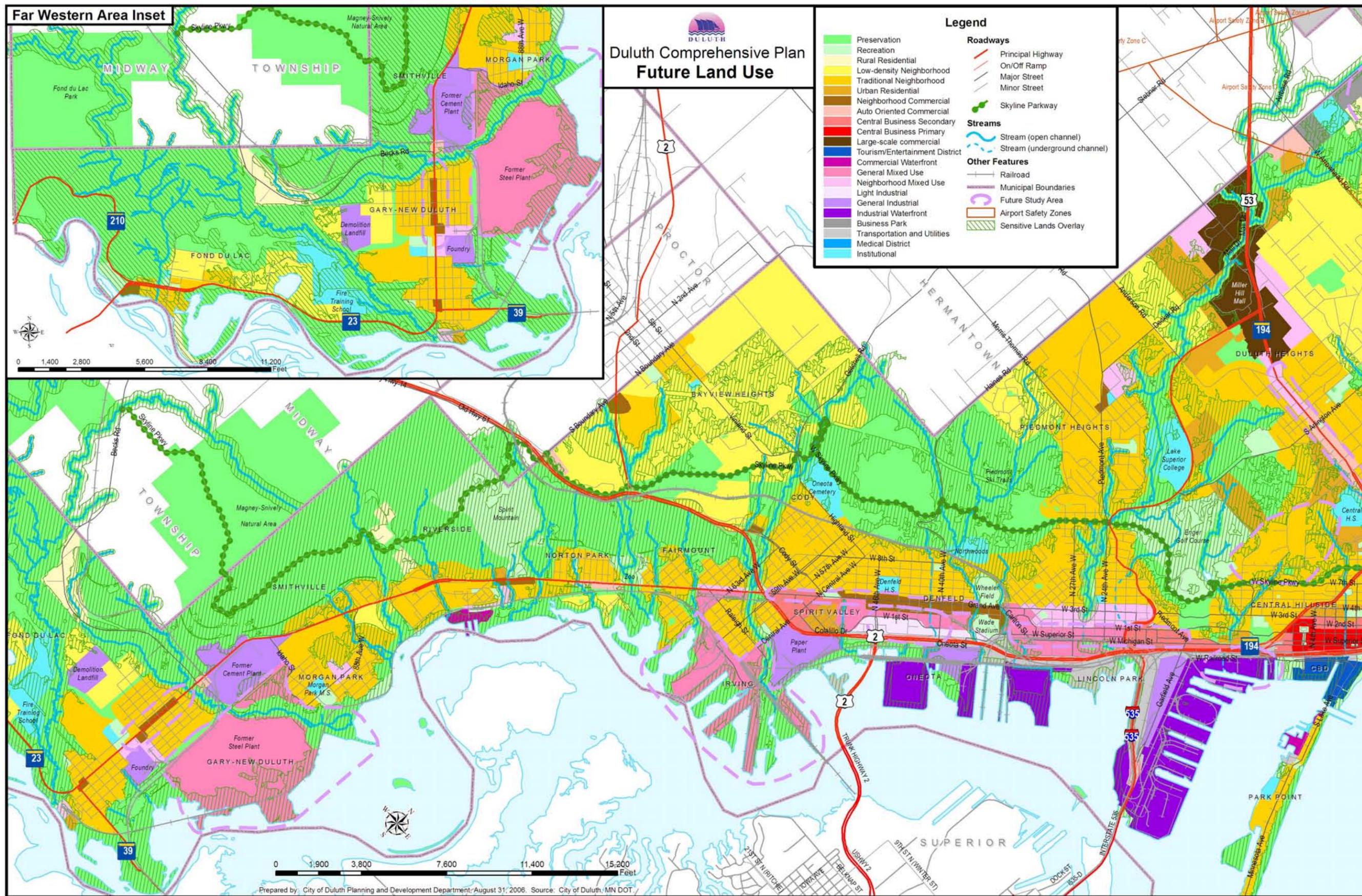
Two areas with the same land use designation will not necessary look the same or have the identical mix of land uses. The land use categories are intended to reflect the unique opportunities and assets associated with neighborhoods, natural resources, and public infrastructure. The user must keep in mind that land use designations reflect a *general mix* of land uses, not *specific design* for development or preservation.

- The map shows land use categories. Other qualities of the land such as natural functions, issues of neighborhood character or building design, or policies relating to connectivity (roads and trails) may not be clearly portrayed by land use categories. The user must keep in mind that in implementing the land use map it must be used *in conjunction with* the Plan's governing principles, other maps from the Plan, Plan policies, Plan implementation recommendations, and other data sources and maps.

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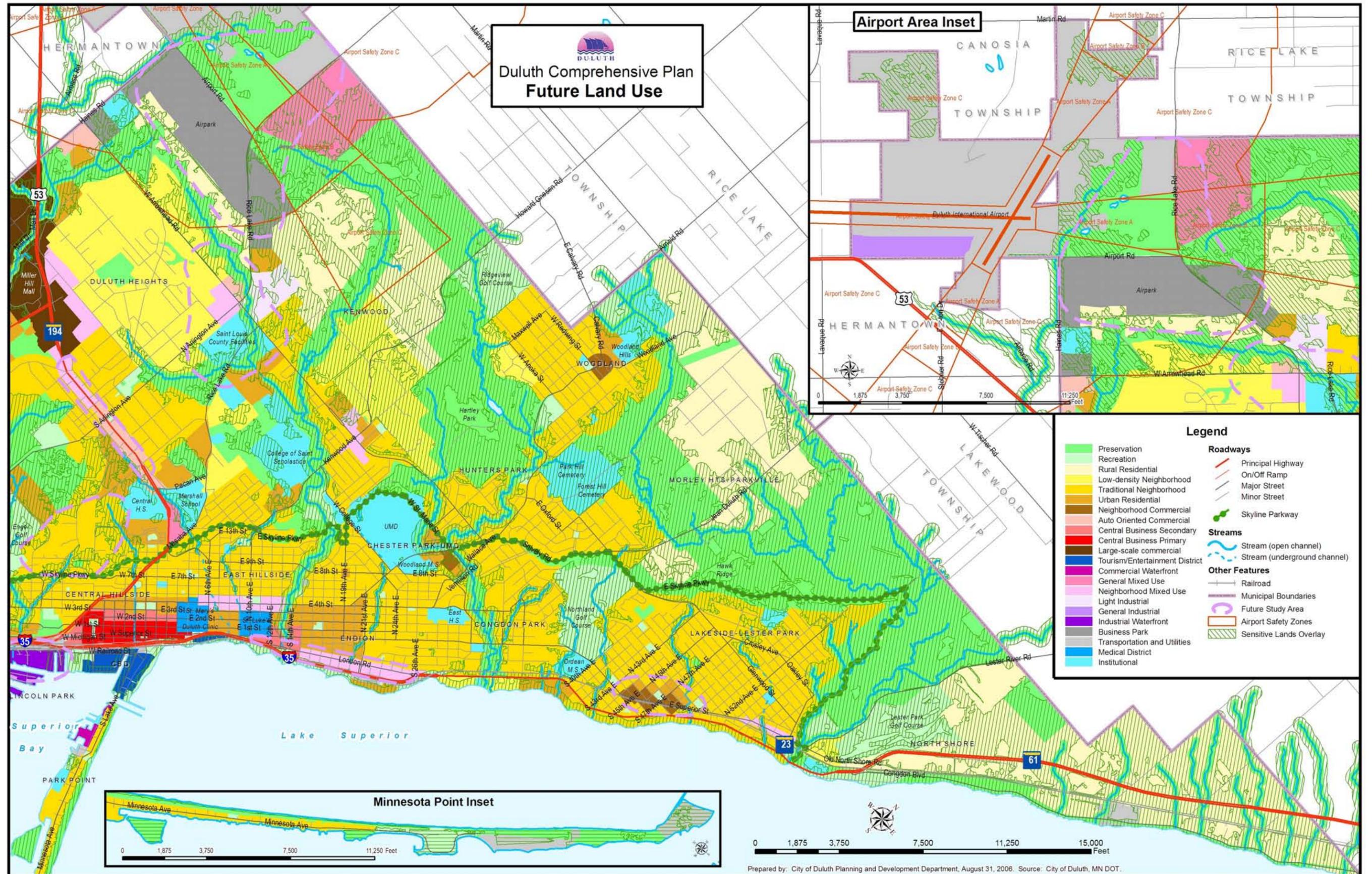
Figure LUM-9: Western Half of Land Use Map



Land Use Map

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Figure LUM-10: Eastern Half of Land Use Map

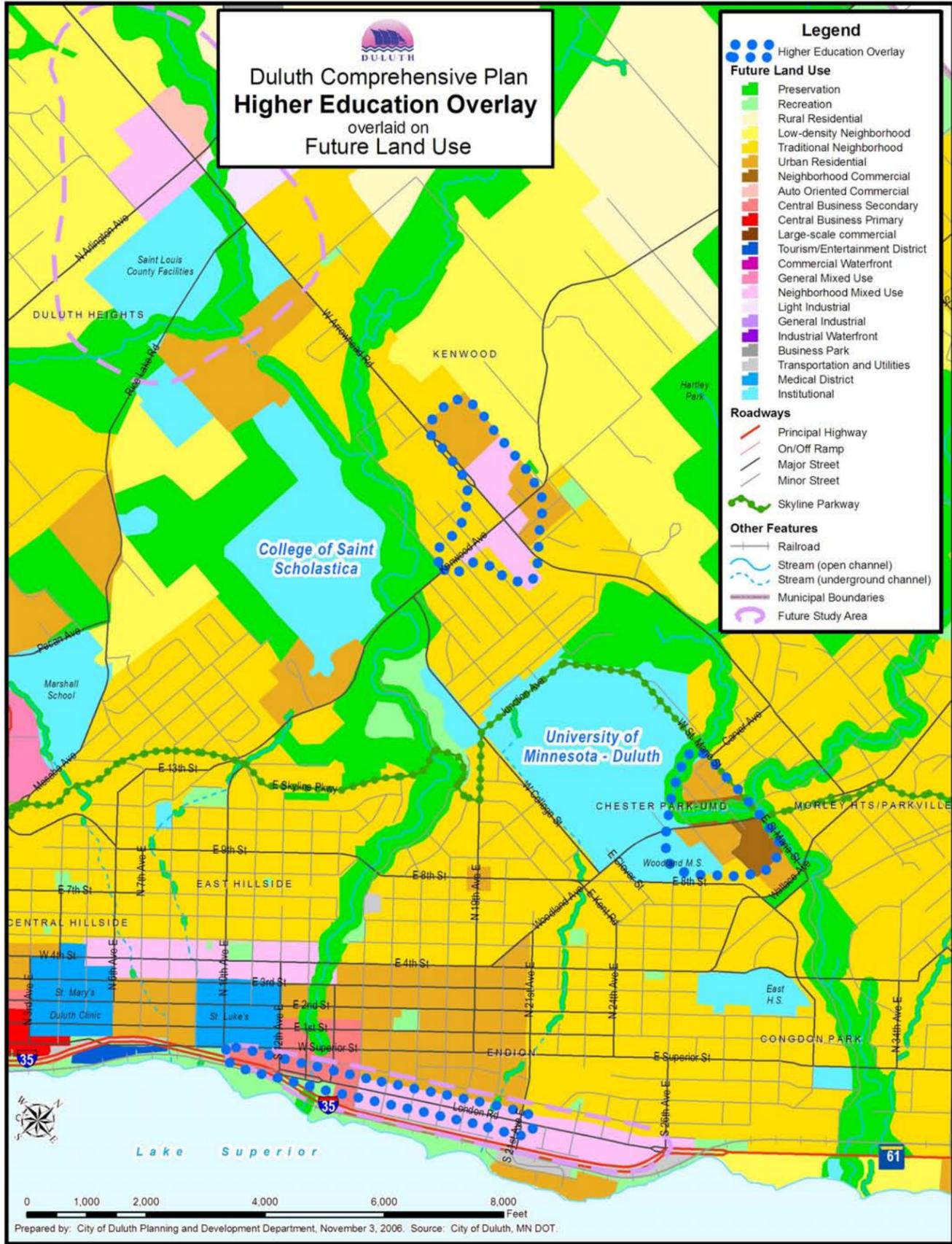


Land Use Map



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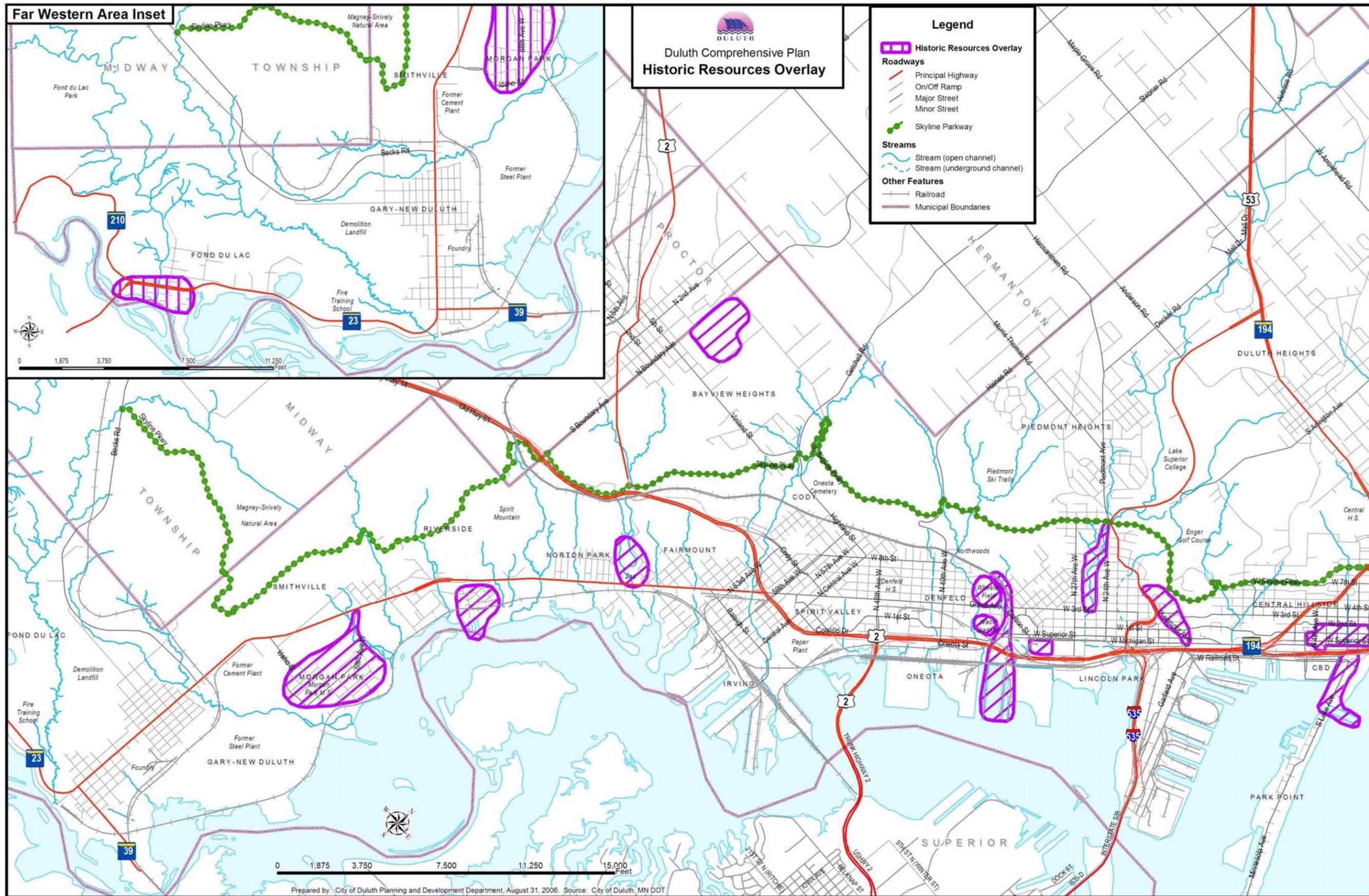
Figure LUM-11: Higher Education Overlay Map



Land Use Map

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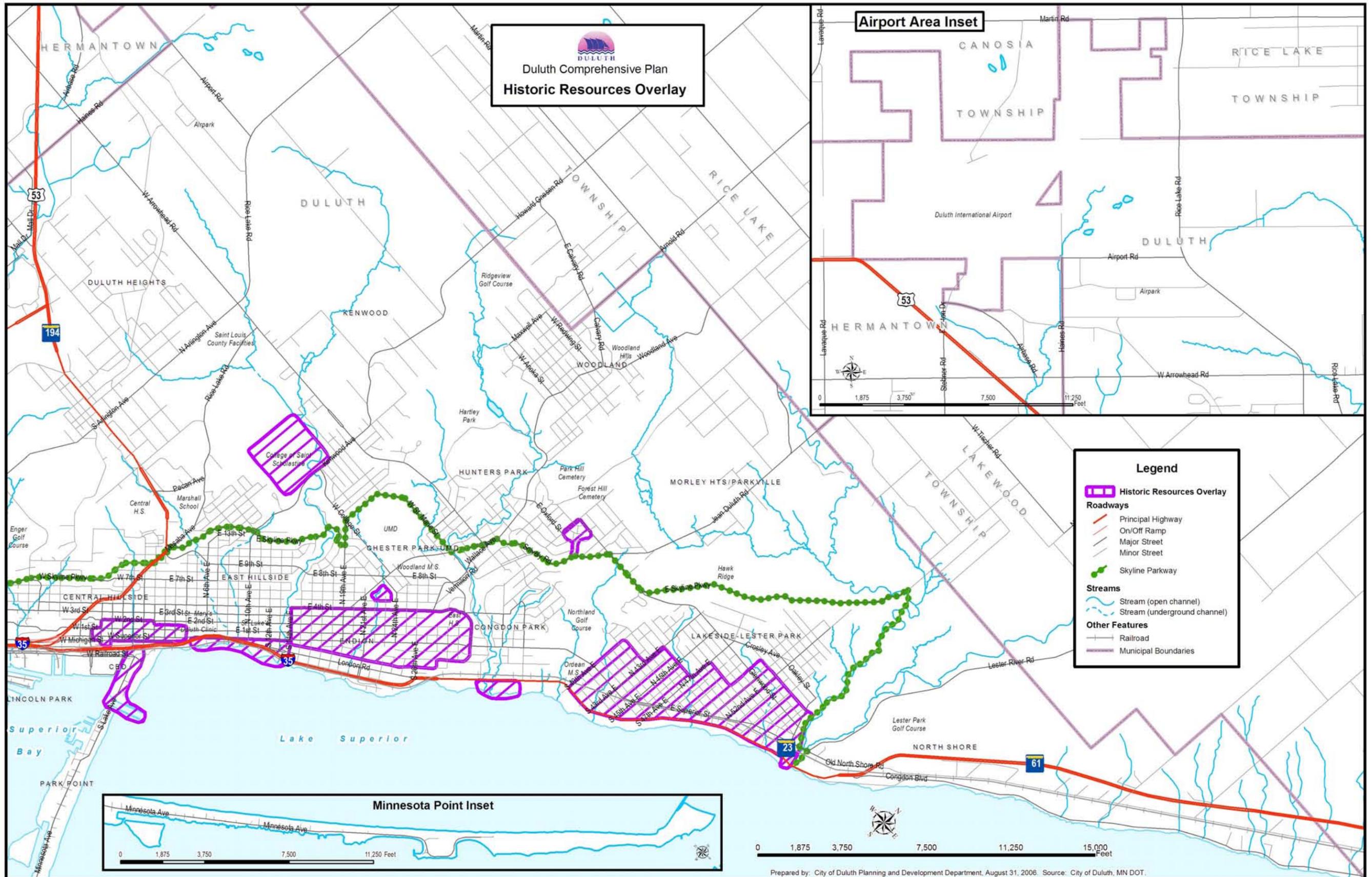
Figure LUM-12: Western Half of Historic Resources Overlay Map



Land Use Map

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Figure LUM-13: Eastern Half of Historic Resources Overlay Map



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Comprehensive Plan Policies

Principles, Policies, and the Future Land Use Map

The Comprehensive Plan includes general principles, land use policies, maps that depict desired future land use, and strategies and priorities for implementation. None of these components stand alone. Each component of the Plan must be considered in the context of the other components, and interpretation of any one component during application of this plan must include consideration of all components.

This section introduces the policies which give greater detail in the interpretation of the principles and future land use map. The policies are organized by linking them to relevant governing principles. The policies frequently reference land use map categories or specific places on the future land use map.

The policy categories are presented to provide structure to the wide range of issues that are addressed in the Comprehensive Plan. The categories are not, however, exclusive; the purpose of the policies is frequently to address the overlap between different issues. For instance, policies that affect decisions about trails may be found in the transportation, parks and recreation, housing, or preservation and protection categories.

P&P (Preservation and Protection) Policies

The Plan's governing principles are clear and strong regarding protection of natural and cultural resources. Natural and managed open spaces, rare natural habitat, water courses and shorelines, historic buildings and cultural resources, prominent viewsheds, and similar assets are part of the City's heritage and values. The following policies, along with the governing principles and future land use map, define the protection and preservation priorities for natural resources, cultural resources, and viewsheds.

Comprehensive Plan Policy Categories

- **P&P** (Preservation & Protection)
 - Natural resources
 - Cultural resources
 - Viewsheds
- **I&PS** (Infrastructure & Public Services)
- **UD** (Urban Design)
 - Mixed Use
 - Housing
 - Site Design
- **ED** (Economic Development)
- **P&R** (Parks & Recreation)
- **T** (Transportation)
 - Roads and Highways
 - Traffic Calming
 - Trails and Pedestrian Access
 - Parking
 - Transit
 - Commercial/Freight
- **DP** (Development Process)

Policies

Preservation and Protection Policies

Principle #2 - Declare the necessity and secure the future of undeveloped lands.

Undeveloped areas are an essential part of Duluth's municipal fabric - urban plazas, neighborhood parks, large tracts of public ownership and private lands zoned for minimal development. These minimally or undeveloped areas collectively create an open space system. These areas contribute to Duluth's cultural, health, recreational, and economic value and community identity. This open space system provides vistas, encourages active recreation, provides natural infrastructure as storm water retention, plant and animal habitat and water quality, and is the strongest visual element defining Duluth's sense of place.

Sense of Place

"A sense of place results gradually and unconsciously from inhabiting a landscape over time, becoming familiar with its physical properties, accruing history within its confines."

Source: Ryden, K. C. (1993). Mapping the Invisible Landscape. Iowa City: U of Iowa Press: 38.

Natural resources

Principle #2 – **Declare the necessity and secure the future of undeveloped lands** – describes the economic, cultural, and natural resource value of protecting public and open space areas, and creating new public spaces as development takes place. Similarly, Principle #6, **Reinforce the place-specific**, describes the importance of both cultural and natural resources in defining the 'sense of place' that distinguishes Duluth from other cities, and distinguishes places within the City from each other. Principle #11 – **Take sustainable actions** – identifies that decisions must protect land, water, and air, while Principle #4 – **Support emerging economic growth sectors** – includes Duluth's natural resources as an economic asset supporting the recreation and tourism industries.

In order to realize the natural resource and open space vision articulated in the Plan's governing principles, the City of Duluth will use the following policies to guide development, protection, and management decisions:

- P&P 1.** Water is a defining element in Duluth's physical and cultural landscape. Consistent with the sensitive lands overlay on all stream corridors and shorelines, the City will protect and enhance the quality of streams, rivers, and Lake Superior. The City will:
- A.** work to increase the number of public access points to Duluth's public waterways and Lake Superior,
 - B.** consider, in land use decisions, shorelines as critical protection areas, including beaches and shorelines of Lake Superior, Superior Bay, St. Louis Bay, St. Louis River, and stream and river corridors within the City,
 - C.** protect and reinforce the recreational, visual and cultural aspects of stream corridors as natural breaks in the development pattern,
 - D.** in land use regulations and actions managing public lands, identify and apply stream protection standards, including vegetative buffers, protective easements, watershed-focused performance standards, and other requirements in watersheds where water quality or watershed function are at risk,
 - E.** take steps through education programs, incentives, and regulation to improve water quality where nonpoint source pollution (erosion and sedimentation, temperature, nutrients, toxicants, debris) degrades water quality,

- F. in stream headwaters, buffers of stream corridors, and watersheds with limited storage capacity use wetland mitigation standards that maximize wetland protection and enhance or restore damaged wetlands to improve wetland functions.

P&P 2. Skyline Parkway is a historic, cultural, scenic, recreational, and viewshed corridor stretching across the city. Consistent with the protection corridor designated on the land use map, the City will treat Skyline Parkway and related corridors as a system to connect adjacent undeveloped lands, neighborhoods, recreation areas, natural parks, and scenic vistas in land management and development actions. The City will:

- A. treat lands adjacent to Skyline Parkway, 200 feet on the uphill side and 300 feet on the downhill side, measured horizontally from centerline, in a manner that strengthens the continuity of this corridor. The City will consider tools including; public acquisition of undeveloped private lands through transferable development rights and similar mechanisms with willing landowners, establishing development standards along the entire corridor, improving signage or other wayfinding devices to increase legibility of the Parkway through developed areas of the City, and incentives for owners of developed property to participate in reinforcing the continuity of this corridor,
- B. adopt and utilize recommendations of the Skyline Parkway Corridor Management Plan to prioritize viewshed and cultural resource protection, improve connectivity, and guide public investment,
- C. implement Parkway landscape treatments appropriate to the development intensity of each segment of the Parkway to create a greenway image along the entire corridor.

P&P 3. Duluth has an abundance of valuable natural areas, some in near pristine condition, others in need of restoration. To achieve preservation outcomes identified in the principles and on the future land use map, the City will utilize scientifically-based resource indicators in preservation priorities including:

- A. connectivity,
- B. water resource and ecosystem viability and diversity,



Policies

Preservation and Protection Policies

Viable Ecological System

An ecological system for which its “key ecological factors” are intact and functioning within natural ranges of variation. Key ecological factors include critical patterns of biological structure and composition and critical ecological processes, environmental regimes, and other environmental constraints that give shape to these patterns and their natural variation over space and time.

Source: Conserving The Integrity Of Ecological Systems: A Proposed Conservation Area Planning Framework (draft). The Nature Conservancy. 2001

Duluth Natural Area Program

Section 2-148 Statement of Purpose

The City Council finds that the City of Duluth is the owner of a substantial number of tracts of real estate, both inside and outside the City, some of which are of special or unique ecological or environmental significance to the community, which properties should be considered for conservation designation in order to protect those values. Said council further finds that there may be other tracts of land in private ownership or owned by other governmental entities which should be similarly protected if the cooperation of those owning such tracts can be secured. The purpose of this Article is to create a program to protect and preserve the natural heritage of the Duluth area which will include mechanisms for identifying those properties, whether owned by the City or by others, and for establishing a means to protect such properties from development or exploitation inconsistent with such values.

Source: 2002 Duluth City Code, Article XXVIII

- C. water resource protection for both quality and flood control,
- D. presence of endangered, rare or threatened species,
- E. high quality plant and animal communities, and
- F. compatibility of protected areas with nearby development or infrastructure.

P&P 4. The City will prioritize for permanent protection viable (self-sustaining) ecosystems and areas critical for sustaining those ecosystems but in need of restoration. The preservation areas and the sensitive lands overlay areas on the future land use map identify areas with high natural resource value qualities. The City will consider a variety of protection strategies including, but not limited to:

- A. fee acquisition of undeveloped land through purchase or land exchange,
- B. transfer of development rights,
- C. third party conservation easements, and
- D. regulatory and incentive programs to promote low-impact recreational land uses.

P&P 5. The qualities of natural lands can frequently be preserved in conjunction with land development. To meet the preservation goals of the sensitive lands overlay, the City will create and use appropriate development standards that protect the natural functions of the land regardless of ownership patterns. Standards should protect or enhance:

- A. watershed functioning for both water quality and flood control,
- B. targeted watersheds, such as Miller Creek, suffering from degradation,
- C. wetland areas and headwater areas,
- D. high value ecosystems, rare or unusual plant or animal communities and urban forests (defined as sum of all woody and associated vegetation in and around dense human settlements),
- E. resources defined by Duluth’s Natural Area Program (DNAP),
- F. areas critical for maintaining connectivity between high value eco-systems.

- P&P 6.** Open space, natural areas, and recreational areas are more valuable if interconnected. The City will strive to connect its green space and recreational areas through natural corridors on public or private land, trail systems, and creation of boulevard corridors on public right-of-ways.
- P&P 7.** The City will develop, in consultation with the Duluth Tree Commission, an urban forest management plan, to include priorities, standards and strategies for enhancing tree cover in developed and undeveloped areas, on public and private lands.
- P&P 8.** The City will consider performance standards and incentives related to site design, building design, building materials and use of consumable materials to contribute to protection of natural resources through reducing production of toxic materials and their discharge into air, soil and water.
- P&P 9.** The City will work cooperatively with institutional land owners in development of physical master plans which address the ways that the institution interfaces with the larger community, including elements that meet natural system goals. Plans should address:
 - A.** effects on natural resources, both within and outside of the institution’s ownership,
 - B.** inclusion of public trail access and strong bicycle and pedestrian connectivity,
 - C.** sale of any surplus land in a manner which contributes to the desired future land use identified in this plan,
 - D.** in the case major vehicular traffic generators, detailed consideration of traffic movements to and from the institution, both at the immediate edges of the institution as well as city and regional-wide considerations.
- P&P 10.** The City should initiate a transfer of development rights (TDR) program that creates a market for development rights through use of selected tax forfeit parcels or surplus public lands as receiving areas for development rights.

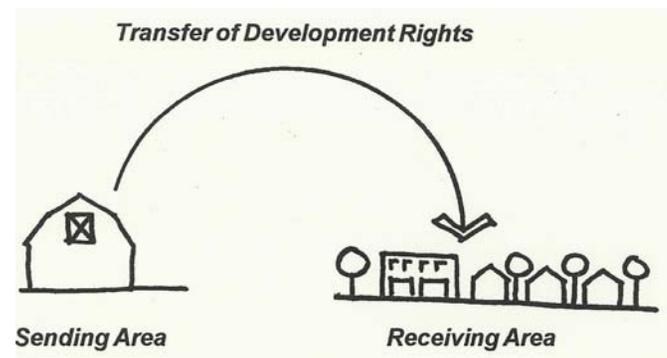
Institutional Land Uses

Public buildings and government offices, fairgrounds, military facilities, prisons and jails, performance centers, orphanages, group homes, museums, churches, service organizations, and community clubs.

Source: Duluth Land Use Categories

Transfer of Development Rights

The removal of the right to develop or build, expressed in dwelling units per acre or floor area, from land in one zoning district to land in another district where such transfer is permitted.



Policies

Preservation and Protection Policies

Cultural Resources

Definite locations of past human activity, occupation, or use. . . The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional, cultural, or religious importance to specified social and/or cultural groups.

Source: U.S. Bureau of Land Management www.blm.gov/nbp/pubs/rewards/1999/5es.htm

Standards for Rehabilitation

These standards address the most prevalent type of preservation: “rehabilitation, which is defined as “the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values.” Originally developed for use in the Federal Historic Preservation Tax Incentives program, the Standards are now widely used by state and local officials in reviewing both Federal and nonfederal rehabilitation proposals.

Source: U.S. Sec. of Interior, 36 CFR 67, www.cr.nps.gov/hps/tps/tax/rhb/stand.htm

Cultural resources

Cultural and historic resources, as noted in the Plan’s governing principles, also define Duluth’s sense of place and create both economic and social value. *Principle #1 - Reuse previously developed lands* – calls attention to “adaptive reuse of existing building stock and historic resources.” *Principle #9 – Support private actions that contribute to the public realm* – notes the importance of matching private building form to surrounding assets, including cultural assets. *Principle #6 – Reinforce the place-specific* – states that cultural features define Duluth’s sense of place, while *Principle #4 - Support emerging economic sectors* - speaks to the economic value of cultural resources.

The City will, in its regulations, actions and promotions, implement the following policies protecting and enhancing cultural resources.

- P&P 11.** The City will encourage reinvestment in Duluth’s primary and secondary central business areas through historic designation of districts and individual buildings that provides incentives for private investment through tax credits, and take preservation actions adhering to the Secretary of Interior’s Standards for Rehabilitation.
- P&P 12.** The City will inventory historic resources to establish a base line, prioritize public investment in the City’s cultural heritage and promote nomination of eligible buildings and districts for appropriate designations, whether national or local.
- P&P 13.** The City will consider historical context of the area or neighborhood in public projects or in evaluating developments where the City is a financial partner and will use design, materials and detailing consistent with the surrounding character.
- P&P 14.** In historic overlay areas the City will establish building standards to protect and enhance cultural resources while allowing for economic use of buildings and land. Techniques could include:
- A.** allowing for vertical mixed uses in historic structures to enhance market opportunities,
 - B.** working with state officials on building code flexibility to maximize opportunities while limiting risks of property owners,

- C. providing pre-approved façade design templates to minimize regulatory risk in adapting historic buildings or creating new buildings adjacent to historic sites,
- D. use of façade easements,
- E. use of transferable development credits.

Viewsheds

Duluth’s viewsheds are among its most defining features and distinguish the city from all other urban areas in the upper Midwest, if not the nation. The view corridors provide identity to city and neighborhoods alike. The Plan’s governing principles attend closely to protecting Duluth’s sweeping vistas and its subtler avenue view connections in the historic street grid. *Principle #6 – Reinforce the place-specific* – notes the importance of view corridors in providing context. *Principle #2 – Declare the necessity and secure the future of undeveloped places* – describes Duluth’s vistas as a defining element of its open space system.

The City of Duluth adopts the following policies to guide protection of unique view corridors, vistas, and sightlines.

- P&P 15.** The City will implement development standards to protect Duluth’s viewsheds, both looking down from above and up from below, including retention or selective clearing of tree cover, maintaining prominent rock faces, bluffs and historic stone-built walls and bridges, and using building form standards to provide for a strong presentation of Duluth’s urban and natural lakefront qualities.
- P&P 16.** The City will create standards for land owner access to elements that provide economic value to individual properties, such as views and solar access.

Principle #9 – Support private actions that contribute to the public realm.

Private building construction and site design influences activity in adjacent public areas. Building form, height, setbacks and detailing affect the adjacent areas. The uses and activity contained in the buildings directly impacts the surroundings. Public areas should benefit from adjacent private investment.

Principle #6 - Reinforce the place-specific.

Public and private actions should reinforce cultural, physical and economic features which have traditionally defined Duluth, its open space and its neighborhoods. This includes commercial areas providing neighborhood goods and services, ravine parks and other natural features that define neighborhood edges and view corridors to the Lake or River which serve to provide location and context.

Policies

Infrastructure and Public Services Policies

Principle #12 - Create efficiencies in delivery of public services.

The costs of public service must be considered in land use decisions. Street construction and maintenance, utilities, libraries, fire, police, snowplowing and recreation facilities are services directly related to the physical location of development. Infrastructure should help prescribe development location rather than react to it.

Principle #2 - Reuse previously developed lands.

Reuse of previously developed lands, including adaptive reuse of existing building stock and historic resources, directs new investment to sites which have the potential to perform at a higher level than their current state. This strengthens neighborhoods and is preferred to a dispersed development pattern with attendant alteration of natural landscapes and extensions of public services. Site preparation or building modification costs are offset by savings in existing public infrastructure such as streets, utilities, and transit, fire and police services.

I&PS (Infrastructure and Public Services) Policies

The Plan's governing principles emphasize the relationship between land use decisions and public services. Public services frequently have defined minimum levels of service that need to be maintained. Land use choices, for both development and preservation, affect the quality and cost of public services. Land use choices can erode or enhance the level of service on Duluth's roads, in police and other emergency response times, and in the performance of water, wastewater, and gas utilities.

I&PS 1. Prioritize areas for development, restoration, or adaptive reuse that increase utilization of Duluth's existing infrastructure and favor maintenance and reconstruction of older infrastructure over infrastructure expansions. Priority areas include:

- A. vacant or underutilized industrial areas such as the U.S. Steel, Cement Plant, Clyde Iron, Rice's Point, and scattered infill sites,
- B. waterfront industrial areas for uses requiring water-borne transportation,
- C. commercial properties in the primary and secondary downtown areas,
- D. redevelopment sites for more intensive housing and mixed use development in areas where existing development is underperforming its potential.

I&PS 2. Land that will ultimately support some form of development should be developed in a staged, orderly manner. The City will set standards for the staging of development on greenfield sites (undeveloped land) that:

- A. encourage appropriate investment on previously developed lands. The City should consider the use of adequate public facilities standards and minimum density standards to codify its staging goals,
- B. recognize market opportunities and market limitations when creating or modifying the zoning map or considering public infrastructure extensions,
- C. prioritize public infrastructure extensions that minimize both construction and operating costs,
- D. consider that impact of greenfield development on the cost and level of service for police, fire, and emergency response services,
- E. favor infill development over greenfield development when staging development or providing public support or investment.

2006 City of Duluth Comprehensive Plan

- I&PS 3.** Public investment in streets and other infrastructure should support continued private reinvestment in housing stock, neighborhood commercial districts, and new mixed use areas, emphasizing that:
- A.** priority for public investment should be in existing systems that promote reuse of developed lands and infill projects, including mixed neighborhood redevelopment,
 - B.** public investment supporting greenfield development should focus on neighborhood extensions and expanding existing commercial and industrial areas.
- I&PS 4.** Priority should be given to development where required utility services can be provided at average or less than average cost, while development in locations where the initial installation and provision of utility services is more costly than average or requires lengthy extensions without intermediate connections should be discouraged.
- I&PS 5.** Air emissions of toxics such as mercury, fine particles, and other pollutants disperse throughout the City and the region. The City will provide leadership through its management of City facilities and programs to provide for better, cleaner air both locally and regionally and to mitigate short and long term impacts on human health and the natural environment.
- I&PS 6.** Implement the City's stormwater management goals and policies (adopted by City Council, 2005) through:
- A.** staging of development and use of design standards,
 - B.** education programs demonstrating the connection between impervious surfaces on private and public lands and water quality,
 - C.** wetland mitigation within the same major stream or river watershed as the impacted area,
 - D.** protection or restoration of wetlands,
 - E.** review of best management practices to address specific conditions of Duluth's topography, soils, and infrastructure carrying capacity,

Duluth's Storm Water Pollution Prevention Program

The City of Duluth has developed a Storm Water Pollution Prevention Program (SWPPP) as part of their submission to be part of the State of Minnesota's General Permit MNR04000 Authorization to discharge storm water associated with municipal separate storm sewer systems (MS4) under the National Pollution Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit for Small Municipal Separate Storm Sewer Systems.

Duluth's SWPPP contains 61 Best Management Practices (BMPs) that address the six minimum control measures (MCMs) as specified in the permit. As outlined in the SWPPP, table of contents many BMPs have elements related to several MCMs.

The Stormwater permit is a City wide permit and City personnel in various departments are participating in managing specific BMPs. To reduce duplication and paperwork, data is compiled by the responsible party and maintained at the appropriate departmental location. Responsible parties will provide summaries as appropriate and locations of data as part of their SWPPP review for the annual report. Each year prior to the annual report a staff meeting will be held with all responsible parties to insure data is collected. Where appropriate procedures and programs will be filed with permit data. However all master copies will be maintained in the responsible department in order to keep information readily available for review and keep data files current.

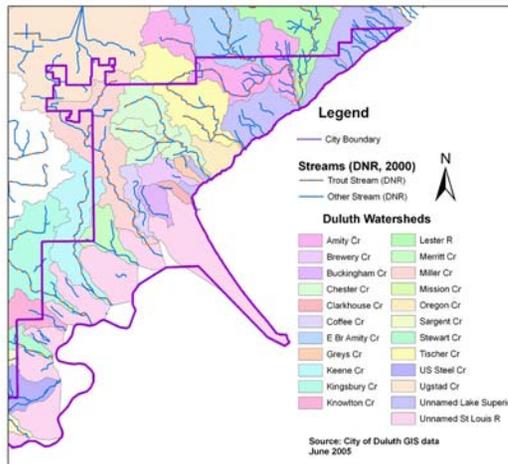
Source: City of Duluth 2006 General Stormwater Permit (MS4s), P. 70

Policies

Urban Design Policies

Major Stream Watershed

Major stream watersheds include the watersheds that wholly encompass each of the 43 major streams as identified in the City's current natural resource inventory (for a larger version of the map see the Natural Resources Profile).



Principle #8 – Encourage a mix of activities, uses, and densities.

Cities have evolved as a mix of land uses, building types, housing types, and activities. Accommodating choice while protecting investment is a balance to strike in land use regulation. Mixed uses provide opportunity for a diversity of activity that segregated, uniform uses do not provide.

- F. establishing appropriate conditions for a reduced street width standard to reduce impervious surface,
- G. public investment in areas to support carrying capacity of stormwater infrastructure.

I&PS 7. The City will work with governmental units sharing in watersheds which pass through Duluth to protect and enhance natural resources in the entire watershed, through education, enforcement, incentives, and acquisition.

I&PS 8. The City will work with adjacent units of government and County, regional and state entities to ensure efficient provision of water, wastewater, transportation, energy, and communications infrastructure.

UD (Urban Design) Policies

Urban design is an orientation toward the physical environment as well as a professional discipline. It touches almost every aspect of the built and natural physical form of the city including land use, housing, transportation, parks and open space. More so in Duluth than many other cities, the natural landforms – Lake Superior, St. Louis River, creek ravines, hillside and escarpment – create both opportunity and difficulty in construction. How design of built features responds to this context makes urban design in Duluth an exercise in large scale massing as well as intricate detail. *Principle #6 – Reinforce the place-specific* – is the underpinning for all urban design policies. *Principle #9 – Support private actions that contribute to the public realm* – addresses the need for private investments in building and site improvements to support broader city-building goals. The following policies address certain aspects of urban design: mixed use, housing, and site design. Other urban design concepts are addressed in other sections, including cultural resources, viewsheds, and transportation.

Mixed Use

Principle #8 – Encourage a mix of activities, uses, and densities – is consistent with historical development patterns, although much of the planning and zoning of the 20th century focused on separating uses. The following policies encourage compatible mixed use development.

- UD1.** To ensure that different land uses “mix well,” compatible building scale and sensitivity to neighborhood context is essential. The City will develop form-based standards and design guidelines that:
- A.** allow a variety of land uses to coexist within buildings when the building is of appropriate size and character,
 - B.** recognize and reflect unique or traditional neighborhood building patterns and street and block layouts,
 - C.** provide adequate transitions to lower-density neighborhoods and districts,
 - D.** keep sufficient separation between clearly incompatible uses, such as between intensive industrial or auto-oriented commercial and residential neighborhoods.

- UD2.** Large mixed-use development sites, such as the U.S. Steel site, the tower farm, and other sites identified as master-planned areas on the future land use map, will require master planning as market forces start to define possible new uses in these areas. Master plans should:
- A.** be developed in close collaboration with affected neighborhoods and other stakeholders,
 - B.** protect critical natural functions,
 - C.** enhance off-site natural systems where possible,
 - D.** include internal open space and trail corridors and connections to external trail corridors,
 - E.** protect cultural resources and viewsheds,
 - F.** provide for neighborhood recreation or open space areas in residential or commercial areas,
 - G.** provide a transition from more intensive to less intensive adjoining uses neighborhoods through stepping-down of building heights, reduction in building bulk, and similar techniques.

Form-Based Code

A method of regulating development to achieve a specific urban form. Form-Based Codes create a predictable public realm by controlling physical form primarily, and land uses secondarily, through city or county regulations.

Source: Form-Based Codes Institute website, www.formbasedcodes.org/

Figure PO-1: U.S. Steel Master Plan Area



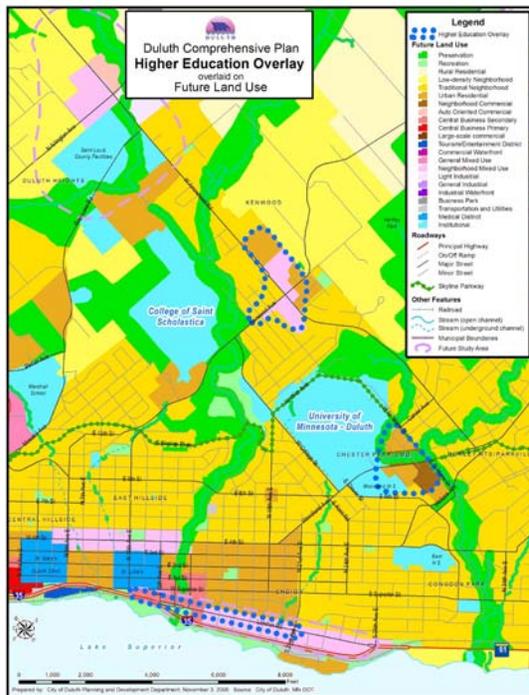
Policies

Urban Design Policies

Principle #5 – Strengthen neighborhoods.

The present city is an historical amalgam of villages and other independent units of government, contributing to the present condition of Duluth being strongly defined by its neighborhoods. This condition should be reinforced through land use, transportation and public service delivery patterns which strengthen neighborhood identity. New institutional expansions, major public infrastructure or large commercial or industrial uses should not divide historic neighborhood patterns.

Figure PO-2: Higher Education Overlay



Housing

Residential land uses occupy more land area than any other general land use category in the City. Duluth’s housing density ranges from a single home on many acres to multi-family high-rises. Where new housing investment is made and at what densities will have a tremendous impact on overall land use patterns and infrastructure needs.

Most of the governing principles provide guidance on the preferred shape of the housing ‘system’ that sets housing priorities in the land use plan. For instance *Principle #8 – Encourage a mix of activities, uses, and densities* - describes a mix of housing types not only within the City, but within neighborhoods. *Principle #5 – Strengthen neighborhoods* – identifies the importance of maintaining neighborhood integrity and historic neighborhood patterns. *Principle #10 – Take sustainable actions* – identifies the importance of designing buildings that reduce each household’s impact on the environment. Principles 1, 11, and 12 identify how Duluth’s housing investment should be geographically directed: prioritizing previously developed lands for new development, conjoining housing and education facilities, and recognizing the impact of housing development choices on the performance and cost of City infrastructure and services.

The following policies direct housing investment, new construction, rehabilitation and building conversions for public and private benefit.

UD3. The City will encourage a mix of housing densities and housing types within existing neighborhoods to diversify housing stock and bring new vitality to existing neighborhoods. Considerations that affect the appropriate mix of housing types within neighborhoods include:

- A. achieve a mix of housing types and densities while respecting neighborhood character and continuity of building styles, such as the historic street layout of Morgan Park, the architectural diversity of single family building styles in East Area neighborhoods, or the massing and historic look of Central Hillside’s building stock,
- B. carefully distribute higher-density housing and new housing types in limited quantities within residential neighborhoods, to sustain the primary land use and housing style and limit impacts from more intensive uses. These might include accessory dwellings, small groups of attached units, or small multi-family buildings designed to resemble single-family houses,

- C. in designated areas, create form and material standards based on an area's context, as established by predominant building character, street pattern, and land use,
- D. develop standards for off-site institutional and rental housing to allow for choice of housing types and neighborhoods, accommodate institutional growth and protect or enhance neighborhood integrity.

UD4. Expand housing opportunities in and around the primary downtown district through various public actions, including code changes to support rehabilitation, mixed use goals, or change of use of historic building stock.

UD5. Housing development should be staged to follow governing principles and infrastructure policies. The City will promote new infill development, consistent with a designated density, enhancing residential character and housing choice within neighborhoods, and promote neighborhood extensions that efficiently use public infrastructure.

UD6. The City will promote a mix of affordability ranges in housing stock:

- A. include an affordability element in subdivisions or major redevelopment projects utilizing public subsidy or other public action to assemble land or other form of project assistance,
- B. encourage private investment in support of affordable housing,
- C. ensure that affordable units are designed to be compatible in size, scale, materials and building form with market-rate units,
- D. support the creation of permanently affordable owner-occupied housing.

UD7. The City will identify priority areas and set standards for conservation and low impact development. Areas designed within the Sensitive Lands Overlay shown on the future land use map should enhance the qualities of the landscape and natural systems:

- A. protect the connectivity of undeveloped lands adjacent to stream corridors and that protect core areas of high quality natural stands,
- B. provide a buffer between development and public preservation areas,



Sensitive Lands Overlay

High resource value lands or natural resources that may be developed under conservation design standards, TDR program designs, or low-impact performance standards.

- Varying densities and land uses
- Intensity is concentrated where natural carrying capacity is sufficient, or moved to other parcels via TDR-type program
- Conservation subdivision and design
- Natural resource performance standards.

Policies

Urban Design Policies



Place Making

Community design is about place-making. The physical layout of the community can and should connect people with each other, with the community, and with the surrounding countryside.

Source: Daniels, T. (1999). *When City and County Collide*. Washington, D.C.: Island Press: 87.

Context Sensitive Design (CSD)

The process of creating public works projects that meet the needs of the users, the neighboring communities, and the environment. CSD integrates projects into the context or setting in a sensitive manner through careful planning, consideration of different perspectives, and tailoring designs to particular project circumstances. Most commonly used in transportation planning, context sensitive design is also applicable to other infrastructure and development projects.

Source: www.vtpi.org/tdm/tdm57.htm

- C. ensure that new subdivisions or neighborhood extensions include access to trails or alignments for designated trail extensions,
- D. retain reasonable tree cover on development sites to protect viewsheds and mitigate stormwater risk,
- E. create parkland dedication standards for areas with limited access to appropriate park and recreation facilities.

Site Design

Successful place-making, mixed use developments, and mixing of varied housing types all require high standards for site planning and design. Site and design standards should include building and parking placement, pedestrian connections, signage and landscape improvements. The City will adopt site design standards or guidelines that enhance place-making:

- UD8.** Strengthen pedestrian movement between compatible land uses with sidewalks in street rights of way, sidewalks and paths independent of streets, and attractive connections to parking areas and building entrances. Institutional land owners should be encouraged to connect with pedestrian systems on the perimeter of their properties.
- UD9.** Encourage site design which shares elements pedestrian access, parking, coordinated landscaping, linked open space and green infrastructure for stormwater management and water quality improvement.
- UD10.** Protect natural features and systems, as discussed above under Natural Resources, including protection or enhancement of public realm natural systems such as the urban forest (street trees).
- UD11.** Avoid surface parking between buildings and the street to reduce the visual impact of parking lots and provide landscape screening from public areas for all surface parking areas.

- UD12.** Create pedestrian-oriented environments by placing buildings and building entrances close to the street, providing windows along street frontages, and enlivening building facades with creative use of architectural detail or materials.
- UD13.** Encourage transit and bicycle use by providing facilities such as transit stops, comfortable shelters, and bicycle access and parking in convenient and visible locations.
- UD14.** Implement ‘light pollution’ standards for street and security (parking lots and buildings) lighting through:
- A.** the use of downlighting design that directs light toward sidewalks, streets, parking lots, building entrances, and yard features, and away from neighboring properties and the sky,
 - B.** the use of street, parking lot, and building security lights designed to direct light toward only the security points and away from the night sky,
 - C.** addition of shields to existing lights.



Light Pollution

Any adverse effect of man-made light including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste.

ED (Economic Development) Policies

Land use and infrastructure decisions affect areas of the City that are attractive for economic investment. The Plan’s governing principles identify the importance of both the City’s traditional economic base and emerging economic opportunities. *Principle #3 – Support traditional economic base* – recognizes the necessity of preserving Duluth’s location-dependent economic infrastructure (port facilities, access to shipping channels, railroad, airport). *Principle #4 – Support emerging economic sectors* – recognizes Duluth’s current economic engines and that land use and infrastructure must be responsive to new economic opportunity.

Other principles also guide land use relating to economic activity. *Principle #9 – Support private actions that contribute to the public realm* – prioritizes investment that enhances the physical form of Duluth’s streets, public areas, and open space. *Principle #10 – Take sustainable actions* – encourages economic development that minimizes its ecological footprint through better site design, waste minimization, and continuously reducing risks to air, water, and land.

Principle #3 - Support traditional economic base.

Supporting Duluth’s traditional economic foundation maintains jobs, tax base, and opportunity. Economic activity with specific location requirements may be subject to displacement or site competition with changes in real estate values. This traditional economic activity faces change as result of global economic patterns, changing markets, new regulation and aging of extensive infrastructure. Nevertheless, fundamentals remain and the economic contribution, sometimes taken for granted, is significant.

Policies

Economic Development Policies

Principle #4 - Support emerging economic sectors.

Emerging economic sectors add economic, cultural and social diversity. These include higher education, medical, value-added manufacturing, commercial outdoor recreation, historic resources interpretation, arts and music, information technology and visitor services.



Higher Education Overlay

Institutional expansion or ancillary commercial or residential development is accommodated, regulated, and balanced with Plan preferences. Includes institutional planning areas and larger impact zone of land uses associated with university or college markets.

- Varying densities and land uses
- Commercial, residential higher intensity uses are regulated to buffer owner-occupied areas
- Related to institutional master plans.

The following policies enhance Duluth's economic opportunities and reduce economic risk from land use decisions.

- ED1.** Duluth will encourage economic expansion and increase economic diversity to support the local and regional economies.
- ED2.** Duluth will protect location-dependent economic uses, including port, railroad, and airport facilities, from encroachment by uses that are incompatible or not location-dependent.
- A.** reserve areas for expansion of airport facilities,
 - B.** reserve or require buffer areas between waterfront industrial areas and other waterfront uses,
 - C.** establish the primacy of port operations and water transportation-dependent uses in designated areas of the lower and upper harbors,
 - D.** work with the Port Authority, natural resource agencies, community groups, recreational interests and other related parties to monitor and improve the coexistence of recreation, port operations and enhancement of natural resources in the St. Louis River estuary, St. Louis Bay, Superior Bay and Lake Superior.
- ED3.** The City encourages economic growth consistent with the staging of development identified in the Comprehensive Plan. Priority will be given to investment that reuses previously developed lands, limits increases in utility operation or maintenance costs, and takes advantage of underutilized utility or transportation capacity and funded capital improvements.
- ED4.** The City will work cooperatively with higher education institutions on development within the Higher Education Overlay to include institutional expansions and housing, commercial or other uses appropriate to an area with strong student orientation. Policies addressing the overlay include:
- A.** encourage master planning to enhance public benefits, create opportunity for private investment and reduce risk to community character,
 - B.** make transportation and infrastructure investments that better integrate institutions into the community fabric,

- C. encourage campus improvements that contribute to the public realm and sustain the City's natural and social assets,
- D. enhance campus neighborhoods by planning for new housing and commercial investment that retains neighborhood integrity and preserves the primary land uses identified on the future land use map.

ED5. The City will work cooperatively with medical institutions to accommodate their growth within medical districts, including the following policies:

- A. support new investment within the medical district,
- B. improve physical, social and business connections with the larger community,
- C. support housing affordability and choice within and adjacent to the medical district,
- D. support medical district improvements and neighborhood transitions identified in sub-area plans developed with significant public involvement,
- E. preserve, restore, and reuse historic structures.

ED6. The City will work with private landowners, other units of government and institutions in areas with significant changes in land use or large redevelopment projects, such as U.S. Steel site, antenna farm, Stryker Bay remediation area, Bayfront to Rice's Point area of the waterfront, and other areas where master planning is justified, to create master plans that:

- A. address community stakeholders and neighborhood concerns for institutional expansion,
- B. create mixes of new land uses that sustain investment over the long term,
- C. use existing infrastructure capacity,
- D. meet the goals of the sensitive lands and higher education overlays (SLO and HEO),
- E. include natural area corridors through or around development and consider community and public uses including, but not limited to parks, recreational facilities, and schools or educational facilities.



Policies

Economic Development Policies

Brownfield

... 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Source: Public Law 107-118 (H.R. 2869), 2002.

Eco-Industrial Development

Networks of businesses that work with each other and in conjunction with their communities to improve resource productivity, expand markets, eliminate pollution, and catalyze economic growth through enhanced profits, wages and local investment.

Source: Eco-Industrial Development Council membership brochure, www.eco-industry.org

Local Historic Designation

Ordinance 8938 (Chapter 28A of the Duluth City Code) authorizes the Heritage Preservation Commission to recommend designation of heritage preservation landmarks and district to the City Council, who is responsible for the actual designation. Since 1989, when the ordinance was adopted, seven properties have been designated as Duluth Heritage Landmarks, and 8 additional properties on the National Register have also been given local designation.

- ED7.** The City will use its resources and influence to direct private investment towards redevelopment in older industrial areas and brownfields to reduce blight, create economic and social activity in the central corridor of the city and promote preservation or reuse of historic commercial or industrial structures.
- ED8.** The City will support expansion of industrial parks where infrastructure capacity exists.
- ED9.** The City will apply eco-industrial principles in economic redevelopment and in creating mixed use areas with industrial, commercial, and residential uses whenever possible.
- ED10.** The City will continue to enhance tourism and recreation business opportunities;
- A.** emphasize tourism and recreational development which brings visitors in late fall, winter weekdays and early spring and, which creates longer visitor stays as a means to increase private and public revenue spread more consistently throughout the year without adding to service and infrastructure needs at peak visitor times,
 - B.** cluster recreational and tourism businesses to maximize pedestrian and non-motorized access,
 - C.** identify recreation or tourism opportunities along Duluth's waterfront that work in synergy with port operations and waterfront neighborhoods,
 - D.** identify historic commercial structures, encourage their preservation and promote adaptive reuse, and include interpretation of the original use of the structure, to promote awareness of and education about Duluth's rich commercial and industrial past.
- ED11.** The City will work to sustain primary and secondary downtown areas, neighborhood commercial nodes, commercial corridors, large scale regional commercial assets, and mixed use commercial/residential development with:
- A.** land use regulation which distinguishes types of commercial uses that are appropriate for surrounding land uses, such as specific retail or entertainment activities that integrate well with traditional neighborhood areas,

- B. a mix of commercial uses at commercial nodes that create synergy and sustain the nodes over the long term,
- C. planning for potential expansion area for regional commercial areas, such as the Miller Hill Mall area, while buffering adjacent neighborhoods,
- D. housing density in UR and TN neighborhoods at the higher end of the density range near commercial nodes to enhance local market size and better sustain commercial investment,
- E. preservation, restoration, or commercial reuse of historic structures by creating flexible restoration and reuse standards,
- F. allowing low-intensity commercial uses in residential neighborhoods, designed with attention to context and subject to performance standards. Land use regulation should acknowledge the desirability of mixed use in most neighborhoods, while retaining the primary protection for the preferred land use designated on the future land use map,
- G. areas of mixed land use that allow higher residential densities along with commercial land uses and vertical mixed use buildings,
- H. form-based standards to enhance the character of prominent commercial areas, such as primary and secondary downtown areas, Plaza district and nearby residential areas in downtown and East Hillside.

Commercial node

A grouping or cluster of commercial land uses that spread outward in all directions from a single point or center, usually an intersection of two streets.

Commercial corridor

A grouping of commercial land uses that spread outward in two directions, typically along a road and not necessarily having a clear center or focal point.

P&R (Parks and Recreation) Policies

Duluth’s parks and recreation areas enhance residents’ quality of life, provide economic opportunity for Duluth’s businesses, and attract tens of thousands of visitors each year. Several of the Plan’s governing principles address park and recreation goals. *Principle #2 – Declare the necessity and secure the future of undeveloped places* – emphasizes the critical role of Duluth’s park areas as the backbone connecting other undeveloped land and private open space. *Principle #4 – Support emerging economic growth sectors* – speaks to the economic importance of recreational and open space areas. *Principle #7 – Create and maintain connectivity* – describes how trail systems serve not only recreational needs but provide connectivity and the doorstep connections that help make for healthy lifestyles.

The following policies enhance park and recreation opportunities and guide future planning efforts and public investment.

Preserving and Enhancing the Environment

- Duluthians will preserve the “Natural Heritage System” of Lake Superior, woodlands, wetlands, St. Louis River, creeks, hillsides - and expand the system for future generations.
- Doorstep recreation opportunities will provide activities and promote healthy lifestyles. Resources, which provide for the study and enjoyment of nature, will be accessible to all.

Source: 2001 and beyond guiding principles

Policies

Parks and Recreation Policies



P&R1. Duluth has a great deal of open space and unbuilt land. But not all open space is parkland, access to some parks is limited, and some neighborhoods have few park options within typical park service areas. The City will:

- A.** work to ensure reasonable access to parks and levels of service for recreational programs by type of park: passive (wilderness) parks, playgrounds, community centers, and recreational fields,
- B.** create a level of service goal for access to various types of parks,
- C.** assess the need for a park dedication provision that serves to improve recreation and open space levels of service in underserved neighborhood areas,
- D.** consider modifying the functional classification of its park areas to better meet the needs of residents and visitors,
- E.** consider land exchanges that improve recreation, park, and open space levels of service.

P&R2. Create a park and recreation plan to identify specific needs and investments to serve those needs, create level of service standards for parks and open space access, and develop design guidelines for high priority recreation facilities.

P&R3. Create a Master Plan for guiding investment, recreation, restoration, and protection for the Spirit Mountain Recreation Area.

P&R4. Trails provide both recreational opportunities and alternative travel modes to the automobile. The City will enhance its trail system to improve connectivity, including:

- A.** connecting the major trail networks with each other, including the Munger Trail, Lakewalk and Superior Hiking Trail,
- B.** connecting neighborhoods, parks and commercial areas to the major trail network through the use of trail spurs,
- C.** improving trail connections to major institutions, particularly higher education facilities, but also destination retail (such as Miller Hill and Lincoln Park's secondary downtown area) and employment centers (such as the medical district and primary downtown area),

- D. protect designated trails with easements or other legal definition of the corridor.

P&R5. Create a trail plan to identify a hierarchy of trail types based on their function, standards for each class, priorities for corridor acquisition and trail build-out for each class of trail.

P&R6. The City will evaluate capital improvement and maintenance needs of the park system in order to ensure quality active and passive recreational and cultural opportunities:

- A. consider maintenance of existing community and recreation facilities before expanding the system,
- B. create maintenance standards and procedures based on type of park and level of usage,
- C. work to maintain, restore and interpret historic structures in parks and on trails, including buildings, retaining walls, and bridges.

T (Transportation) Policies

Duluth's transportation system has a strong relationship to the City's land use pattern. The location and capacity of transportation infrastructure acts in synergy with the location, type, and density of land uses. Transportation decisions can enable or prevent land use goals from being met. *Principle #7 – Create and maintain connectivity* – emphasizes the importance of addressing transportation issues, including both automobile and non-motorized modes of travel, in development decisions. A frequent planning dilemma is that enhancing connectivity for some people or businesses may limit connectivity for others; a busy highway creates connectivity along its path, but simultaneously creates a barrier across its path.

Connectivity concepts are also advanced in other principles: *Principle #6 – Reinforce the place-specific* – uses pedestrian accessibility as a defining element of what is a “place,” emphasizing that pedestrian movement has a higher priority than automobile movement in some locations. Neighborhoods are similarly defined in *Principle #5 – Strengthen neighborhoods* – in that public infrastructure such as roads or highways that divide neighborhoods can diminish neighborhood quality of life. Principles 11 and 12 address the environmental and



Principle #7 – Create and maintain connectivity.

Connectivity is established through our streets and highways, transit system, sidewalks, bikeways and trails, (local and regional). The non-vehicular modes should be considered more than recreation. They are important components of an overall transportation system. Winter maintenance of sidewalks and other public ways is critical to creation of usable pedestrian systems.

Policies

Transportation Policies

Principle #11 - Include consideration for education systems in land use actions.

For K-12 and higher education both, there is a connection between land use patterns and educational facilities. School locations in neighborhoods and housing opportunities for higher education students require consideration of impacts on transportation systems, housing densities, parking and non-student uses.



Level of Service

A standardized measure of infrastructure operating conditions, eg, traffic flow on a highway; generally defined with reference to a benchmark; a measure of effectiveness.

Source: www.ecostructure.com/res_glossary.html

social aspects of transportation decisions, from making sustainable transportation decisions to ensuring walkable connections between families and schools. Finally, *Principle #3 – Support traditional economic base* – emphasizes the importance of maintaining economic connectivity by protecting access to shipping channels and protecting intermodal industrial connectivity (railroad, trucking and air transportation).

The following policies guide transportation decisions, transportation investment, and land use choices to result in rational connectivity outcomes.

Roads and Highways

The road system is designed to meet a variety of distinct functions. Roads provide both local neighborhood access and move vehicles through or around neighborhoods to destination areas such as employment or shopping centers. An interconnected network of local streets, as is found in most of the City's traditional neighborhoods, offers a variety of travel routes for all modes of travel while keeping local traffic off the arterial road network. The City will balance the need for maintaining traffic flow on arterial roads with the importance of maintaining a high level of service and safety for neighborhood travel and pedestrian and non-motorized travel.

- T1. Coordinate road and regional non-road improvements with the Metropolitan Interstate Commission's (MIC) Long-Range Plan.
- T2. Road and traffic planning investments should address cut-through traffic in residential neighborhoods. The City will support creation of new arterials, such as the Joshua extension in Duluth Heights, and will study other areas where cut-through traffic degrades quality of life.
- T3. The City will develop a pedestrian level-of-service standard.
- T4. Arterial roads should move traffic along the edges of neighborhoods rather than within neighborhoods. The City will preserve arterial functions by managing land use along arterial roads and utilizing access limitations along arterial corridors.

- T5.** Road construction and street improvements plans shall consider retaining existing trees and leaving adequate space for tree planting.
- T6.** The network of one-way streets in and around the primary and secondary downtown areas and the medical district are a vestige of pre-Interstate traffic planning. The City will limit or reduce one-way streets in these areas, including:
- A.** participating with MIC in modeling the effects of eliminating one-way streets on vehicle, pedestrian and bicycle movement,
 - B.** reviewing commercial parking and loading limitations to converting one-ways to two-way in the primary downtown area and similar areas where commercial uses predominate.
- T7.** Interstate 35 ends at 26th Avenue E., channeling a large volume of commercial traffic into a residential neighborhood. The City will continue to evaluate options for reducing risk to the neighborhood and to the arterial function of London Road. All mitigation options come with high costs, as does the ‘no-action’ option. Actions should include evaluation of alternative alignments/routes and working with state and federal agencies to secure funding assistance that recognizes the need for risk mitigation.



Traffic Calming

The purpose of traffic calming is to increase neighborhood livability and slow traffic to create a safe environment, particularly for children, seniors, and the disabled. While traffic calming measures are usually applied to local residential streets, traffic calming is also appropriate for functionally classified streets in residential areas, pedestrian activity areas, and older commercial areas where buildings and sidewalks are close to the street.

- T8.** The City will evaluate traffic calming strategies as a means of reducing cut-through traffic and increasing pedestrian safety. The City will focus traffic calming strategies in appropriate situations, including:
- A.** where requested by residents,
 - B.** when needed to address new development in an existing neighborhood,
 - C.** when considering Street Improvement Program guidelines in areas of the City with narrow streets and mature street trees,

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Traffic Calming

Traffic calming is “the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.”

Source - The Institute of Transportation Engineers

Policies

Transportation Policies

Wayfinding

What is wayfinding? Wayfinding exists in many scales and environments. It navigates readers through a city, hospital corridor or airport, calls attention to a storefront, or provides information about a exhibit.

Wayfinding is essentially a succession of clues comprising visual, audible and tactile elements. The components of any visual wayfinding system exceed signs to encompass architecture, lighting, landscape and landmarks. Good wayfinding helps users experience an environment in a positive way and facilitates getting from point A to point B. When executed successfully, the system can reassure users and create a welcoming environment, as well as answer questions before users even ask them.

However, too much information can be as ineffective as too little. Developing a hierarchy of information is a critical component of wayfinding, with users being the primary consideration. The speed, visual environment and distance from which the information will be viewed are key considerations.

Less information on a sign can be read by a driver at 50 mph than by a pedestrian standing 3 ft. away. This may seem obvious, but consider how many times you've driven past a sign that bears more information than you could absorb. "More" is not necessarily better; even a well-designed program can get lost in visual clutter.

Source: Patrick Gallagher, President of the Society for Environmental Graphic Design, www.signweb.com/index.php/channel/6/id/1426/

- D. when evaluating on-street parking standards,
- E. when traffic calming will slow traffic to appropriate speeds and not divert traffic from one neighborhood street to another,
- F. where a lack of street trees contributes to excessive speeds.

Trails and Pedestrian Access

Trail systems create vital connectivity and sustain property values by linking housing, commercial and open space destinations. Dedicated pedestrian access along neighborhood streets and between destination businesses will reduce short automobile trips and lessen congestion. Such access must be planned into new development and redevelopment projects, and existing trail and pedestrian routes must be maintained as important infrastructure.

- T9.** Create a trail network to encourage non-motorized commuting and errand trips, as well as recreational activities. To implement this policy, the City will work with non-profit trail groups to secure trail connections and trail construction, and to enhance existing trail systems.
 - A. develop connections through trails and corridors linking neighborhoods to the parks and green spaces offered for recreational enjoyment,
 - B. create trail right-of-ways and links to existing or planned trail systems in new subdivisions, recognizing that informal trails on undeveloped land often demonstrate a neighborhood need for recreational use or connectivity,
 - C. connect Duluth trails to trail systems in neighboring communities.
- T10.** Adopt procedures and enforce ordinances to keep sidewalks adjacent to public and private property clear of obstructions, snow, and ice.
- T11.** Identify standards for improving bicycle safety and encouraging greater bicycle commuting through street design improvements, identification of bicycle arterial routes, and maintenance needs to extend bicycling seasons.
- T12.** Skyline Parkway, as the scenic transportation connection across the city, requires increased legibility though developed portions of the city, view protection

(especially on the lower side), a wayfinding system for visitors, and better maintenance, all with pedestrian and bicycle users as well as vehicles in mind.

- T13.** The City will create a schedule for improving pedestrian access in critical pedestrian areas as identified in Metropolitan Interstate Commission pedestrian access plans.
- T14.** The City will emphasize Duluth's stream corridors as natural non-motorized access corridors that define and link neighborhoods, and connect people to the Skyline Parkway corridor and the St. Louis River/Lake Superior corridor.

Parking

Parking is both a land use and a transportation issue. An average parking space and the drive-ways serving it consume about 320 square feet of land. Large surface parking lots can act as barriers to pedestrians and discourage walking and transit trips.

- T15.** The City will meet parking needs through use of shared parking facilities, buildings that incorporate parking within the building footprint, and co-funding of public parking facilities with private development partners.
- T16.** Within areas of higher density, the City will work with land owners and businesses to attempt to meet parking needs through transportation planning that incorporates creative parking solutions, use of transit, accommodation of shared vehicles or bicycles, and pedestrian access.
- T17.** Within existing business or mixed use areas, the City will encourage the use of vacant lots, rear yard areas, institutional lots, and other creative solutions for providing public or shared off-street parking.
- T18.** The City will encourage incorporating parking into the building footprint for higher density developments and as part of infill opportunities that take the place of surface parking areas.



Policies

Transportation Policies



Transit

Public transit works best when housing is clustered within a convenient and comfortable walking distance of transit stops, and major employment, retail and entertainment destinations are located in a pedestrian-oriented environment with good connections to transit. The greater the density of activity, the more cost-effective it is for transit to serve. Therefore, implementing the land use plan, as shown on the future land use map, will increase the attractiveness and viability of public transit in Duluth.

The City will encourage and reinforce transit use through the following policies:

- T19.** Incorporate pedestrian and public transit options in regional commercial areas when developing or redeveloping and when making transportation system improvements.
- T20.** Assess the potential for transit service to future development, especially on new ‘greenfield’ sites, and work with the DTA to extend transit service to new development where feasible.
- T21.** Evaluate parking policies and decisions, public and private, for their impacts on the viability of public transit. Subsidized parking, when provided to commuters and consumers, lessens their incentive to walk, bike or use transit. The City’s parking authority should work with the DTA to promote transit use among commuters and maximize efficient use of both parking and transit investments.
- T22.** Investigate the potential for light rail, streetcar or commuter rail in and around the City of Duluth, including the potential for new transit-oriented development that can help to sustain these new transit options.
- T23.** Evaluate inter-community transit options, such as commuter rail options both north and south and a rail connection with the Twin Cities metropolitan area.

Commercial/Freight Transportation

Duluth started as a commercial transportation center. The construction of the Sault Ste. Marie canal in 1855 allowed ships to move from Lake Superior to the rest of the Great Lakes, and a hundred years later allowed Duluth to become a seaport. The construction of the railroad in 1869 similarly made Duluth the focal point of grain, timber, and ultimately iron ore shipping. Duluth continues to be a shipping center for the upper Midwest, and the City’s transportation policies must address the port, rail, and airport facilities that support Duluth’s economic base.

Duluth is also a regional retail center, the gateway to some of the most popular tourist destinations in Minnesota, and a major tourist destination in its own right. Maintaining a reasonable level of service on Duluth’s inter-regional corridors is an ongoing challenge given the limitations of Duluth’s topography and regional traffic that is growing more quickly than local traffic demands. The following policies address freight, shipping, and commercial-oriented transportation issues:

- T24.** The City will continue to work with the Duluth Seaway Port Authority, Army Corps of Engineers, Coast Guard, and stakeholder groups to maintain Duluth’s shipping channels and intermodal port facilities. The City will work to protect the shipping corridor while also supporting environment- and community-sensitive solutions to dredging, water traffic conflicts, and water quality issues of ongoing port operations.
- T25.** Freight movement needs ready access to both water and land-based freight movement systems. The City will continue to protect freight corridors and intermodal facilities that link water-borne shipping with rail and truck shipping.
- T26.** The Duluth International Airport (DIA) is planning for expansion. The City will work with the DIA to implement the DIA Master Plan (2000) and the Duluth Airport Land Use Plan (MIC, 2001), balancing expansion goals with the noise, natural systems, and road transportation issues associated with expansion.
- T27.** Congestion associated with commercial activities such as tourist traffic in and around Canal Park and on London Road (U.S. Hwy 61) are identified in MIC long-range modeling as likely long-term problems. The City will consider public investments to reduce tourist-related bottlenecks through improved signage to alternative routes, improved pedestrian access in tourism/entertainment areas, and selected road improvements.

Figure PO-3 Shipping Protection



Policies

Development Process Policies



DP (Development Process) Policies

Development and redevelopment is an element of long-term sustainability, and the development process must have clear guidance as to how to value and incorporate important natural and cultural resources. As part of the rewrite of its zoning, subdivision, shoreland, floodplain, and other development and protection regulations, the City will identify a clear and consistent development standards and development approval process through the following policies:

- DP 1.** Ensure that land use regulation sets clear expectations for development, redevelopment, and protection of Duluth's natural, cultural, economic, and social assets.
- DP 2.** In order to keep the regulatory burden reasonable, the City will implement the Comprehensive Plan through cooperation, incentives, and education in addition to regulation,
- DP 3.** Explicitly base land use decisions, including development and environmental review, Planning Commission and Board of Adjustment administrative decisions, and public realm investment, on Comprehensive Plan principles and policies,
- DP 4.** Provide for public review and comment on development, preservation, and investment proposals, and meaningfully address public responses.

Implementation Implementation Tools

The City has a number of tools at its disposal to shape development patterns, protect natural and human infrastructure, and protect the quality of life for residents. Implementation strategies can be separated into several distinct ‘tool’ categories. Each tool has distinct characteristics suitable for specific goals and circumstances. The tools available to the City that comprise the City’s implementation portfolio include:

- *Education and Promotion* – Formal programs or informal efforts undertaken by the City or in conjunction with the City to encourage voluntary actions by individuals or businesses that help fulfill the City’s desired future conditions as described in this Comprehensive Plan.
- *Incentives and Incentive Regulation* – Inducements offered by the City or in conjunction with the City to elicit actions by individuals or businesses that move the City toward its desired future conditions. The inducements or incentives may include:
 - Direct financial assistance such as cost sharing
 - Indirect financial assistance such as tax breaks or infrastructure improvements
 - Regulatory incentives such as density bonuses or flexible regulatory options
 - Professional assistance incentives such as technical assistance in façade or infrastructure design, integration of historic elements, or meeting State or Federal regulatory standards
- *City Ordinances and Other Regulation* – City ordinances, including zoning, subdivision, environmental, etc., as well as the administrative approvals process. Regulation includes:
 - Threshold standards such as minimum or maximum lot sizes, height requirements, natural resource functional values, etc.
 - Performance standards that regulate development impacts such as erosion
 - Administrative standards such as information or analyses required for a development
 - Application and the order and timing of approvals by regulating authorities

Implementation Implementation Tools



Implementation

Implementation Tools

Comprehensive Plan Goal

The City will consider historical context of the area or neighborhood in public projects or in evaluating developments where the City is a financial partner and will use design, materials and detailing consistent with the surrounding character (Policy P&P 13).

Strategies

Education and Promotion – Inventory historic resources and promote the results of the inventory to educate citizens and visitors on Duluth’s varied and valuable historic assets.

Incentives and Incentive Regulation – Create regulatory incentives such as façade improvement grants, tax deferments, transferable development credits, or design assistance with building code issues.

Ordinances and Other Regulation – Create form-based standards for areas that are characterized by historic buildings and traditional building forms

Managing Public Processes and Resources – Adopt context-sensitive flexibility in street design standards to enhance historic character.

- *Managing Public Resources, Lands and Processes* – Public investments and management decisions for infrastructure, public services, public lands, and public processes. Such investment or decisions may include:
 - Capital improvements planning coordination between departments to meet Comprehensive Plan goals
 - Water, wastewater, and transportation investments made by the City or ultimately managed by the City
 - Land acquisition, sale, or exchange for the purpose of preservation or development
 - Economically viable management decisions and expenditures for public resources such as streets, parks and property management, and deployment of public services
 - Enhancing or modifying the Comprehensive Plan or supporting documents based on new information from studies, decisions, etc.

Rarely will a single tool or category of tools be sufficient to achieve Comprehensive Plan goals. Most policies, and preferred mix of land uses shown on the future land use map, require the use of several tools from different categories in order to be realized and sustained. The City must take a ‘portfolio’ approach in its implementation choices, recognizing that each category of tools has unique strengths and weaknesses.

The accompanying text boxes, showing a Plan goal and possible strategies, describe how a variety of strategies can work toward a single goal.

Land Use

Implementation of the Comprehensive Plan is discussed in three sections: 1) land use strategies, 2) transportation strategies, and 3) public facilities and capital improvements. The land use section presents the strategies needed to implement the Comprehensive Plan's land use policies and goals. The transportation implementation and the public facilities and capital improvements sections follow.

The three strategy sections present an inter-related framework for achieving the future condition represented by the future land use map and the policies. The following strategy recommendations do not represent the only possible strategy options available.

The strategies are organized as follows:

- Land Use Regulation
- Development Review Process
- Staging of Infrastructure and Services
- Environmental and Resource Management
- Public Realm Improvements and City Investments
- Comprehensive Plan Enhancements

These categories draw on a variety of tools discussed above. The primary focus of the first three categories is on incentives, and regulation, and development review processes. The remaining categories include the full range of implementation tools.

Land use regulation

The primary recommendation of this section is to re-write the City's zoning ordinance. While that effort will require more thorough analysis and more detailed recommendations than those presented here, the following general strategies should be pursued as part of the process:

- A form-based code approach where appropriate

Comprehensive Plan Goal

Meeting the mixed use development goals in the three master planning areas identified on the future land use map (U.S. Steel site, western port area, antennae/tower farm area);

Strategies

Education and Promotion – Create and promote conceptual development concepts for redevelopment areas to remove some of the uncertainty facing developers.

Incentives and Incentive Regulation – Use tax increment financing (TIF), interest write-downs, tax-free zones, selective co-funding, or similar economic development incentives targeted to high-priority redevelopment sites on the future land use map such as the master-planned sites.

Ordinances and Other Regulation – Create a master plan for redevelopment sites and codify the preferred mix of uses and preferred site and building design in the applicable zoning district(s), using form-based standards.

Managing Public Resources, Lands and Processes – Make proactive infrastructure improvements (streets, sewer, water, improvements or consolidation of public open space) to encourage private investments in underused, blighted, or contaminated commercial and industrial areas.

Implementation

Land Use

- Introduction of mixed use in many locations
- Conservation design to protect natural resources and open space networks
- Overlay districts for resource and view protection
- Specific districts or standards for large institutions and large redevelopment projects
- Regulatory priority given to some economic resources
- Site plan review for the majority of development projects

Zoning ordinance

The central component of land use regulation is the zoning ordinance. Duluth's zoning ordinance dates back to 1958, with continuing amendments and revisions up to the present. It reveals its evolution in its organization, and in the different standards and review procedures that apply to individual zoning districts.

The existing zoning ordinance has 'base districts' that are Suburban through R-4 residential districts, the C-1 through C-4 commercial districts, and the M1, M-2 and W-2 industrial and port districts. These districts contain minimal plan review requirements, no design standards (except for those that were later added for specific uses such as townhouses) and are 'pyramidal' in nature – that is, each successive district within each category contains all the permitted uses in the preceding (less intense) districts. This type of "Euclidean" zoning is now considered seriously outdated and ineffective.

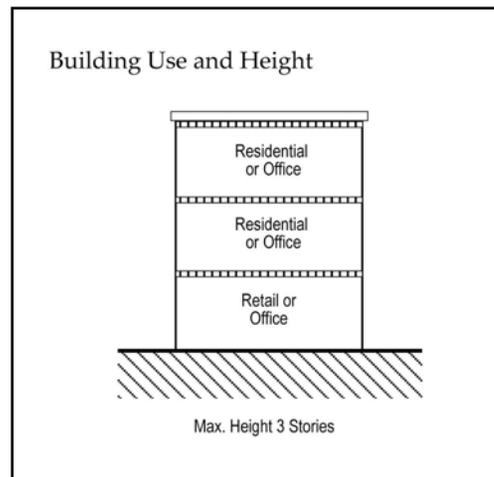
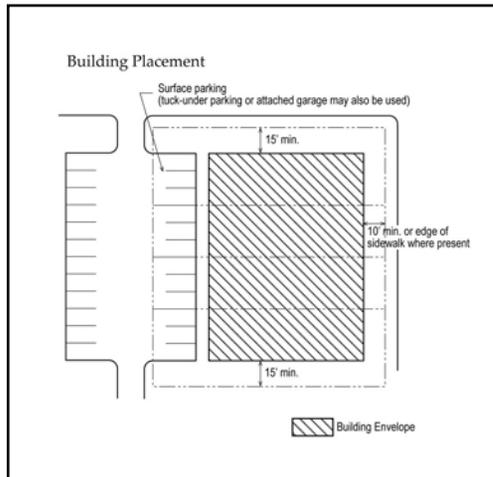
By contrast, the newer districts such as the Medical Center and Planned Commercial districts, have more detailed and specific standards for uses and activities. For example, the Downtown Waterfront Mixed Use-Design Review District is, as the name implies, a highly specific district with detailed design standards and a design review process with a technical advisory committee. While these individual districts set high standards in certain areas, the ordinance as a whole is obsolete and has been amended so many times that it lacks internal consistency, making it very difficult to use for development review.

Form-based code

Consistent with the Plan’s governing principles, the City is prepared to develop a form-based zoning code for some of the higher density mixed use areas, such as the downtown, East Hill-side, and Lincoln Park. Form-based regulation is an outgrowth of an increasing awareness that the concept of ‘place’ is of vital importance to sustaining cities over time (see definition in sidebar). The governing principles speak directly to the importance of enhancing sense of place, creating synergies through a mix of land uses, and building the concept of form into land use regulation. Similarly, the future land use map is explicitly based on a mixed use concept and recognizes the importance of building form in all land use categories.

Typical form-based codes include the following features:

- *Coding by district and/or by street* - Some codes link building types to street types so that, for example, storefront-type mixed use buildings are located along collector streets but not local streets. Others use a district-based approach similar to conventional zoning, or combine both aspects.
- *Highly graphic* - Aspects such as building height, building footprint, parking location, and even uses on different floors can all be shown graphically, making the requirements easier to visualize. Graphics cannot, however, replace all text.



Examples of form-based code graphics for a mixed-use building

Form-based code

A form-based code is a regulatory tool that places primary emphasis on the physical form of the built environment with the end goal of producing a specific type of “place.”

Conventional zoning strictly controls land-use, through abstract regulatory statistics, which can result in very different physical environments. The base principle of form-based coding is that design is more important than use. Simple and clear graphic prescriptions for building height, how a building is placed on site, and building elements (such as location of windows, doors, etc) are used to control development. Land-use is not ignored, but regulated using broad parameters that can respond to market economics, while also prohibiting undesirable uses.

Source: City of Farmers Branch, Texas, www.ci.farmers-branch.tx.us/Planning/codes7FAQs.html

Implementation

Land Use

Regulating code (form-based code)

Develop a form-based code to replace the outdated zoning ordinance. The form-based code should encourage development that is consistent with the downtown's historic character and pedestrian scale, while allowing for more intensive, urban, mixed-use development in appropriate locations per the urban analysis, master plan, and urban design proposals produced during the charrette. The code should define and protect the character of the distinct neighborhoods, corridors, and districts identified within the study area, which vary in terms of the intensity, height, and mix of development. The code should specify the residential, commercial, and mixed-use building types permitted; the types of frontages permitted; the siting of buildings on lots; the location of parking to the side and rear of buildings, in parking courts in the interior of blocks, and in structured parking lined with habitable space for housing, retail, and office along the perimeter of parking lots and structures; and set a minimum standard for screening and tree planting for parking lots.

Recommendation From Community Building Strategies, in *The Town Paper, Duluth Post-Charrette Edition*, Spring 2006

- *Focus on streetscape* - As buildings are defined, so are streets – the building frontage and the street combine to produce a public place. Therefore, street cross-sections and other design standards may be included in the code.
- *Uses* - Form-based codes do not ignore land use, but rather regulate it in a more flexible manner designed to encourage mixed use at many scales and locations.

Where are form-based codes appropriate?

Because the form-based code is carefully calibrated to existing conditions, the coding process is a detailed one, involving analysis of all the elements of a district or corridor – built form, streetscape, parking and land use. The process can be time-consuming and expensive. Most form-based codes developed to date have focused on specific corridors or districts, rather than an entire city. Many codes are developed in conjunction with a master plan or specific area plan for a district or corridor. In Duluth, a sample code for the Lower Chester Creek corridor was developed as a follow-up to the 2005 Knight Charrette plan. Form-based codes may also be used in some larger redevelopment areas, such as the U.S. Steel site, and some residential areas with unique historic elements such as Morgan Park.

Strategies for incorporating form-base code concepts into the City's revised zoning ordinance include the following:

- Form codes 1.** Develop form-based standards for specific districts and corridors where higher intensities, a diversity of uses, or a more pedestrian-oriented environment are desired. These include:
- A. Central Business Primary and Secondary areas.
 - B. Urban Residential areas in and around Duluth's downtown and East Hillside, in keeping with the charrette recommendations.
 - C. Commercial corridors such as London Road between 10th and 26th Avenues or the Grand Avenue business district. These two areas, and seven others, are identified for further future study on the future land use map (see Comprehensive Plan Enhancement subsection). The studies can shed considerable light whether and how form-based codes could be created.
 - D. East Hillside neighborhood, as described in the 2005 Knight Charrette recommendations.

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- E. Large redevelopment sites, in conjunction with master plans for those areas. Three areas are identified on the future land use map as needing master planning.

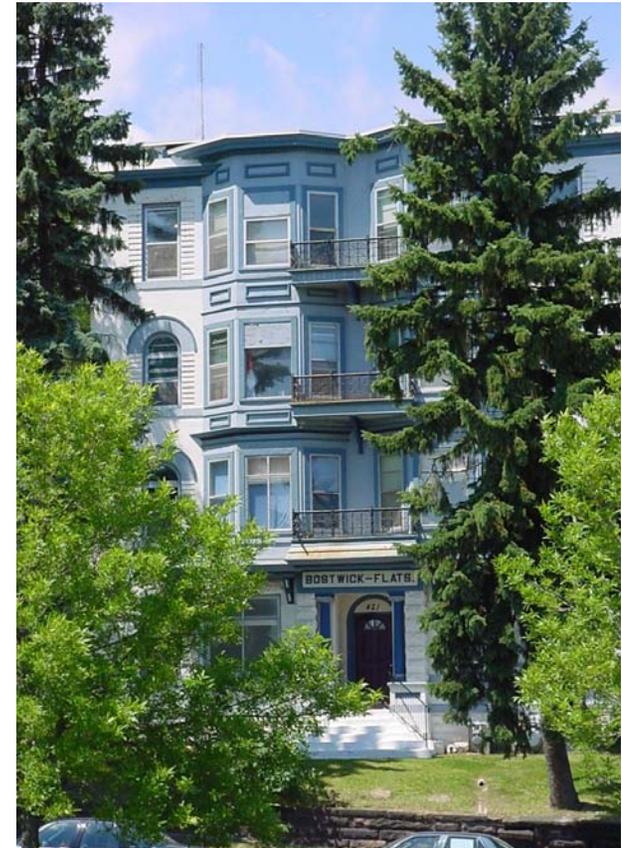
Form codes 2. Develop form-based standards for historic districts and resources, incorporating results of historic resource inventories, and allowing for some flexibility to accommodate adaptive reuse of historic buildings. These areas include:

- A. Historic districts where detailed standards for infill and renovation are appropriate, particularly those areas designed for future study (on the future land use map) and noted as having historic resources (on the historic resource overlay map).
- B. Areas that are characterized by historic buildings and traditional building forms (i.e., the Cenral Business District Core and Fringe, Grand Avenue Business District, etc.).
- C. Historic buildings, such as the Armory, where private investment should be encouraged.

Form codes 3. Develop form-based standards to accommodate the mix of uses and range of densities needed to support Duluth's medical institutions:

- A. Identify expansion areas for medical facilities on the zoning map.
- B. Set flexible form standards, including height standards, for the medical district that protect viewsheds in areas uphill of the medical district.
- C. Identify parking and transportation strategies that restrict parking as a stand-alone land use.
- D. Set form standards for neighborhood transitions between medical and commercial, residential, and mixed use areas.

Form codes 4. Develop form-based elements that are more general in nature In many other parts of the city; For example, certain preferred building types might be encouraged along certain street types.



Implementation Land Use

- Form codes 5.** Incentive programs can work to enhance form-based codes just as with traditional use-based codes. Consider creating a design assistance center within the City or supported by the City to provide technical assistance for developers in creating master plans and site plans that are consistent with the City's plans and regulations.

Mixed use

Many of the land use categories on the future land use map are intended to combine, rather than separate, compatible uses. These include the Primary and Secondary downtown areas, Neighborhood Mixed-Use nodes, and most commercial corridors. Even residential categories are intended to include small-scale retail, institutional, or office uses where appropriate. This encouragement of combined rather than segregated land uses can be achieved in several ways:

- Form-based coding standards (as described above) can control elements such as ground floor and upper story uses and building frontage (how the building meets the street).
- Introduce standards for compatibility between specific uses or buffering between less-compatible uses (i.e., industrial and residential) as part of the zoning rewrite.
- Develop master plans for large redevelopment sites, as described above and in the upcoming Comprehensive Plan Enhancement strategy section.

Specific regulatory strategies to meet the Comprehensive Plan's mixed use policies include the following:

- Mixed use 1.** Create mixed use synergies to support commercial investment:
- A.** Encourage a housing density, in both Urban Residential and Traditional Neighborhoods, at the higher end of the preferred density range near targeted commercial nodes.
 - B.** Create density incentives or regulatory flexibility for infill around existing Neighborhood Commercial nodes, including Lakeside-Lester, Woodland, Commonwealth Avenue in Gary-New Duluth, and Central Entrance.

Mixed use 2. Allow low-intensity commercial land uses in residential neighborhoods, if designed with attention to context and subject to performance standards.

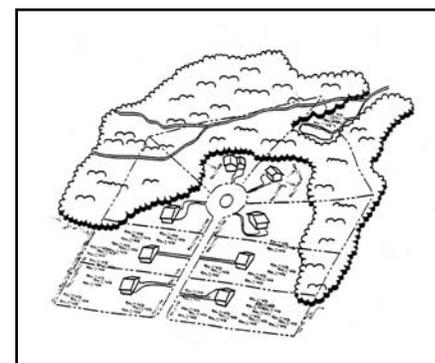
- A.** Land use regulation should acknowledge the mixed use nature of most neighborhoods, while retaining the primary protection for the preferred land use as designated on the future land use map.
- B.** Identify mixed land use areas that allow for higher residential densities with commercial land uses and vertical mixed use buildings.

Mixed use 3. Create model design templates that demonstrate mixed use and form preferences for priority redevelopment areas in order to reduce uncertainty about regulatory approvals.

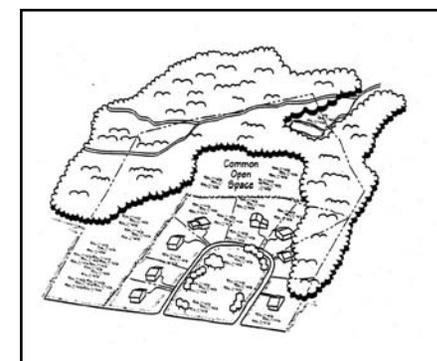
Conservation design

The City will require conservation design for privately-owned properties that fall within the Sensitive Lands Overlay, in whole or in part, and encourage conservation design throughout the City. Conservation design, one form of which is called ‘cluster development,’ is a technique for open space and natural resource preservation on a parcel-by-parcel basis. In a conservation subdivision, houses are clustered on relatively small lots, while the remainder of the site is protected as open space. Essentially, conservation subdivision concentrates allowed density on the most suitable portions of a site, while protecting sensitive natural features and, in some cases, productive farmland. Advantages of conservation subdivision include:

- Greater design flexibility in siting houses and other development features such as roads and utilities. Frequently the length of roads and utility runs can be reduced, and the amount of site clearance minimized.
- Preserving scenic views and reducing the visual impact of new development by maintaining landscaped buffer areas along roads.
- Providing housing units with direct visual and physical access to common open space.
- Creating environmental corridors by connecting open space between adjacent properties.
- Allowing for continuation of forestry or agricultural uses, where these can be adequately buffered from nearby residential uses.



Conventional development, above, consumes the entire parcel with house lots, while conservation design, below, protects natural features and provides residents with common recreational areas.



Implementation

Land Use

- Allowing active and passive recreational use of common open space by residents and/or the public.

Protected open space in a conservation subdivision is typically placed under a conservation easement, to ensure that it remains undeveloped. It can be managed by a homeowners' association, land trust or by a government agency.

Conservation design 1. The City will develop conservation design standards for zoning districts within the Sensitive Lands Overlay and include the following elements:

- A. Inventory and assessment of natural and scenic features on each site prior to development (consistent with the Natural Resource Assessment and future land use map), so that site design can respond to these features. Site design examples include vegetative management appropriate to on-site or adjacent resources, stormwater management that protects streams and adjacent properties, setbacks and buffers consistent with established natural resource management standards.
- B. Performance standards that allow some flexibility for mitigating risk to scenic and natural features (as identified in the site inventory).
- C. Consolidation of permitted development (housing units or nonresidential floor area) outside of sensitive natural areas on the site, or conditionally within some natural areas if performance standards are met that will remove the impact to sensitive resources.
- D. Requirements for how much open space must be preserved in projects requiring subdivision approval, guided by the future land use map categories. As a general guideline, Rural Residential areas should have 50% open space not including protected wetland and shoreland areas, while higher density categories will have progressively smaller requirements.
- E. Standards that group housing units in coherent and interconnected neighborhoods with adequate visual and physical access to open space. As a general guideline, neighborhood clusters should be limited in size and oriented toward a natural feature or amenity such as

a greenway, a park, parkway with median, wetland, woodlands, etc.

- F. Design connections between open space on adjacent parcels, to provide continuity of habitat corridors and other interconnected resources.

Conservation design 2. Create a portfolio of strategies for managing Duluth’s green infrastructure to mitigate existing stormwater and water quality problems in conjunction with the existing stormwater rules.

- A. Implement the City of Duluth’s Stormwater Management Goals and Policies (June 2005).
- B. Set impervious surface standards for subdivision review and for plan approvals for existing built lots,
- C. Offer performance standard alternatives for stormwater management and consider transferable stormwater mitigation to focus resources on the most critical areas within a watershed. (Work with Duluth’s Stormwater Utility to identify the critical areas within each watershed).
- D. Consider incentives such as tax breaks for reducing and disconnecting impervious surfaces in impacted watersheds or at places where predevelopment runoff is already a problem,
- E. Work with the Northland NEMO program and the Regional Stormwater protection Team to provide educational programs and materials that encourage landowners to protect water quality.

Conservation design 3. Allow the use of innovative conservation building and site design elements:

- A. Develop building standards that allow and encourage incorporating ‘green roofs’ into building designs to improve stormwater management and reduce energy usage,
- B. Set performance standards for use of recycled or reused building materials
- C. Allow the use of solar technologies, with appropriate design stan-



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dards, in all areas of the city, and identify appropriate areas and standards for use of on-site wind energy and other renewable energy technologies,

- D. Create standards to allow the use of rain gardens, engineered swales, and other stormwater infiltration techniques instead of conventional ponding and conveyance.

Overlay districts

Viewshed and historic resource protection has been identified as an important policy. Viewsheds and historic landscapes are clearly imbued with Duluth's unique character and sense of place, across most of the city's hillside and lakeshore areas, particularly along the Skyline Parkway corridor. Viewshed policies can be incorporated into zoning codes both through form-based standards and viewshed protection overlay districts. A view protection overlay would incorporate review of visual impacts into the development review process (see discussion below) and could establish controls such as maximum heights and building widths along specific view corridors.



- Viewsheds 1.** The City will adopt viewshed protection techniques such as the following:
- A. Tree retention on development sites.
 - B. Identifying and maintaining prominent rock faces, bluffs and historic stone-built walls and bridges, to provide for a strong presentation of Duluth's urban and natural lakefront qualities.
 - C. Creating a standard GIS-based tool for viewshed analysis to minimize development uncertainty.
 - D. Siting of higher buildings at the lowest elevation within the primary downtown district and medical district, so that hillside viewsheds of adjacent land uses are not affected.
 - E. Limiting encroachment into the Avenue viewsheds, while enhancing the viewshed through strategic stepping back of tall buildings in redevelopment projects within the historic grid.

- Viewsheds 2.** Develop a viewshed protection overlay on lands within the 200- to 300-foot buffer on either side of Skyline Parkway. Underlying land uses would

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likely remain the same, while provisions could include:

- A.** A review process to assess impacts of new development on viewsheds.
- B.** Limitations on building width as a percentage of lot width, and building height, (depending on what is allowed by the underlying zoning).
- C.** Incentives such as additional height or floor area to encourage design that protects viewsheds and retains/enhances existing vegetation. Note the issue of vegetation management is one of the most controversial in this and other scenic corridors, since vegetation can either obscure or soften and enhance views from above and below, depending on one's perspective. Case-by-case solutions may be required.

Historic buildings and landscapes are, like Duluth's viewsheds, imbued with the community's sense of place. The proposed form-based codes and historic resource inventory (described elsewhere) are the primary means through which historic buildings can be integrated into development and redevelopment efforts. The following additional steps should be incorporated into the City's regulations and incentive programs.

- Historic 1.** Set standards that encourage adaptive reuse in order to capture the tourism value of historic commercial structures.
 - A.** Create flexible restoration and reuse standards for historic structures or buildings eligible for historic designation.
 - B.** Promote and encourage interpretation of historic structures or buildings in order to increase public awareness of and education about Duluth's rich commercial /industrial past.
- Historic 2.** Adopt preservation and restoration standards for locally-designated historic buildings.
 - A.** Standards should be consistent with the Secretary of Interior's Standards for Rehabilitation.
 - B.** Flexibility in building uses, densities, coverage or similar incentives should be considered to encourage compliance and minimize redevelopment costs.



Implementation Land Use



Development tiers and staging

A primary tenet of this Comprehensive Plan is the ‘no-regrets’ strategy that first sets aside the City’s green infrastructure when designating preferred development patterns. The future land use map designates the City’s most critical green infrastructure for preservation. At the same time, the map designates large areas of currently undeveloped land within City boundaries for some level of development. The staging of this development is critical for two reasons: 1) to ensure that the City’s green infrastructure is protected through efficient and resource-sensitive development patterns; and 2) to minimize the cost to the City of road and utility extensions and emergency services that new greenfield development often requires. Thus, the staging policy is one of the essential elements of this plan, in conjunction with the future land use map and other policies.

Staging districts will guide the designation of zoning districts on the zoning map, the development review process, and the City’s own public improvements and expansions. The following staging districts, or similar staging concepts, should be addressed in the City’s new zoning and subdivision ordinances or unified development code.

Tier 1: Neighborhood infill and extensions, generally within the historic street grid, well-served by streets and utilities: the fewest limitations; a streamlined approval process. May include reduced parking standards along transit corridors, and waiving of park dedication requirements where existing access to open space is sufficient.

Tier 1 also includes large-scale redevelopment of priority sites – brown-field sites, port sites, downtown commercial properties and institutional sites. Master plans may be required (may involve City assistance) which may involve a charrette or similar public involvement process. May include reduced parking standards, waiver of certain other requirements, or direct public assistance with infrastructure, site assembly, etc.

Tier 2: New neighborhoods or commercial centers that can be served fairly easily by street or utility extensions that will not unduly burden the existing infrastructure or emergency response systems and includes a regular approval process and developer(s) must bear cost of all utility extensions and street improvements, including those necessary to alleviate any traffic problems. City will maintain infrastructure post development.

Tier 3: New neighborhoods or commercial/industrial development that will require extensive street or utility extensions and will place burdens on emergency services, includes a special (conditional) approval process and developers may be required to maintain infrastructure post development.

Rural residential: Rural development beyond utility networks and some (defined) distance from existing streets. Essentially a rural zone – where City street maintenance may be waived and assigned as a homeowner responsibility for on-site utilities. Emergency services would probably need to be provided, but with longer response times. School busing might be provided from the nearest collector street. Special approval process requires review by City departments, acceptance of these conditions, and homeowner notification.

Staging considerations can be incorporated into the zoning ordinance, subdivision ordinances and/or unified development code in several ways:

Staging 1. Limit development opportunities in Tiers II and III until staging criteria are met, through the following or similar means:

- A.** Apply large lot zoning districts in areas not ready for infrastructure expansion, while ensuring that large lot development patterns can accommodate infill as urban staging expands.
- B.** Consider rural (20-40 acre lot size) and exurban (3-10 acre lot size) in all Rural Residential zones, with density bonuses if cluster standards are met.
- C.** Re-evaluate development tiers every 5 years, or in response to changing conditions, to assess whether tiered areas should be changed to a different level.

Staging 2. Use a Land Evaluation Suitability Analysis (LESA) program to guide staging of development:

- A.** Create standards for desired access to public infrastructure capacity, including water and wastewater systems, distance from public roads, and the capability of the City to provide emergency services.

Stag-ing. (staj'ing) v.tr. To arrange and carry out: stage an invasion.
Source: The American Heritage Dictionary

Implementation

Land Use



Staging 3.

- B. Identify natural resource standards that are linked to the City's Natural Resource Assessment to keep undeveloped land in relatively contiguous blocks.
- C. Use the LESA analysis to guide responses to re-zoning requests and to proactively up-zone areas as they become ready for the next stage of development according to identified indicators.

Protect undeveloped or lightly developed land from inappropriate 'leap-frog' development:

- A. Identify staging thresholds that could trigger rezoning opportunities or public infrastructure investments.
- B. Limit public infrastructure extensions in areas disconnected from existing development.
- C. Use large lot zoning districts in areas not meeting staging thresholds.
- D. Set development standards for building placement and road development that allow for future connectivity and logical subdivision for areas not yet meeting staging thresholds.

Staging 4.

Create an adequate public facilities standard for greenfield development:

- A. Consider a minimum net density standard (after removing green space and natural areas) in the subdivision ordinance to justify utility extensions or capacity enhancements.
- B. Use levels of service standards for water, wastewater, roads, and access to schools to guide decisions on re-zoning applications.
- C. Evaluate the cost of extending emergency services to greenfield areas.

Staging 5.

Stage zoning for Large Scale Commercial (LSC) areas:

- A. Reserve some existing low intensity areas around regional commercial areas for future expansion, buffers between neighborhoods and Large Scale Commercial areas, and green infrastructure.

- B.** Create incentives, such as density bonuses, shared parking requirements, or other regulatory flexibility, to encourage re-development of older 'big box' or strip commercial facilities within the Large Scale Commercial areas and Central Business Secondary areas.

Staging considerations are also closely related to public infrastructure management. The Capital Improvements and Public Facilities section identifies areas where particular infrastructure investments or limitations will need to be considered in order to meet the Comprehensive Plan staging goals. Generally, however, the priority public investment areas are described in the following strategy:

Staging 6.

Set priorities for supporting development and re-development efforts with infrastructure expansion or extensions. Develop criteria for comparing sites. Highest priorities include the following:

- A.** Vacant or underutilized industrial areas such as the U.S. Steel, Cement Plant, and Clyde Iron sites.
- B.** Underutilized waterfront and general industrial areas in the port area.
- C.** Commercial properties in the Primary and Secondary Central Business areas.
- D.** Re-development sites for more higher density housing and mixed use development within the Higher Education Overlay, Secondary Central Business, and Urban Residential areas adjacent to downtown.
- E.** Expansion or re-development of the airpark and industrial park area.
- F.** Neighborhood extensions where infrastructure capacity (utilities, roads, green infrastructure) is readily available.



Large institutions

The City will develop specific zoning standards and districts applicable to institutions on large sites, or those that attract large user populations. Requirements will include on-going master planning, in collaboration with the City and affected neighborhoods, so that institutional expansion plans are recognized and coordinated with City neighborhood or corridor plans and public improvement projects.

The use of transitional standards along the borders between large institutions and adjacent neighborhoods should be considered as well. Transitional standards might require building heights to ‘step down’ to adjacent building heights, additional landscaping, or street improvements consistent with neighborhood or corridor plans.

Institutions 1. Work with institutions of higher education on planned expansions to provide supporting services and private investment in a coherent, planned manner:

- A.** Restrict land uses that are not appropriate for traditional neighborhoods.
- B.** Set performance standards for secondary land uses that minimize nuisances to the primary land use.

Institutions 2. Cooperate in master planning processes with institutions, large corporate entities, and governmental entities with responsibilities for land use and large facilities planning:

- A.** Identify assistance (infrastructure expansion, road improvements or management) by which the City can support institutional expansion.
- B.** Identify common goals of the institution and City.
- C.** Address the cumulative impacts of the expansion and the changes needed in land use regulation, and infrastructure to prevent impacts.
- D.** Identify opportunities for institutional improvements to contribute to the public realm and sustain the City’s natural and social assets.

- E. Identify areas for new housing investment and associated transportation or infrastructure improvements.
- F. Create a cooperative planning process with the School District to take advantage of land use synergies such as between residential neighborhoods and school locations.

- Institutions 3.** Create a separate institutional district within the zoning ordinance rather than including large institutions as an allowed or conditional use in other zones.
- A. Recognize the synergy between residential land uses and schools by limiting review of proposed school sites in residential districts to transportation impacts.
 - B. Plan cooperatively for transitions of institutional land ownership from public to private hands to maximize value consistent with the future land use map.

Other development regulations

In addition to the zoning ordinance re-write, Duluth's other development regulations should be evaluated and revised or re-written in light of the Plan policies. These include the subdivision ordinance (used when new lots are subdivided), the building code, street standards, and regulations for grading, stormwater management and erosion control. Regulations should be evaluated in light of the policies of the Plan, and in relation to the new zoning ordinance.

Development review and approval

Duluth's development review and approval process needs to be streamlined in order to efficiently move development that is consistent with the Comprehensive Plan through the approval process. The development review and approval process also needs to offer clear opportunities for proposals to be modified in order to meet Plan policies and goals. An inefficient, confusing, or ad hoc process could be a major obstacle to the Plan's re-development and development goals. The review and approvals process should include the following elements:

Implementation

Land Use

- A pre-development concept meeting with city staff from all departments
- A formal policy or procedure for development review by staff from various city departments
- Clear threshold decision points, such as a formal letter or memo prepared for applicants or the Planning Commission outlining the city's position, staff recommendations, or issues of concern after a conceptual review
- A formal processes for re-zonings that safeguards the public's interest in site design, building form or appearance, and issues such as view preservation and natural resource protection
- Requirements for a development agreement or contract that will preclude changes in design or site plan after re-zoning.
- A time frame requirement for project construction and completion after regulatory approvals.

One component of the development approval process is site plan review: the detailed review of development plans for compliance with the requirements of the zoning ordinance and other regulations. Most cities use site plan review routinely, often dividing it into minor (administrative) and major (Planning Commission) review processes. Review criteria can include, in addition to regulatory thresholds, the policies and design standards established by comprehensive plans or area plans.

The newer districts in Duluth's zoning ordinance call for site plan review, but without a consistent set of standards or procedures, while the older districts have no such requirements. The zoning ordinance re-write should establish city-wide standards and procedures for site plan review, applicable to developments with any nonresidential, mixed use or higher-density housing components, as well as projects within viewshed or other resource protection areas.

In addition to the above development review standards, several alternative development review and approval concepts should be considered:

- Development review 1.** Clear integration of site plan review into the zoning ordinance. This gives the City a standard tool for reviewing all major development proposals in an objective manner. Going a step farther and integrating the development review process into a unified

development code that integrates subdivision or replatting approvals, design review, and building permit could streamline the approval process and reduce risk of unsatisfactory results.

- Development review 2.** A charrette-based alternative to traditional design and review. Standards for when such a process is appropriate, and how it should be conducted, should include:
- A.** A pre-application meeting with city staff (i.e. planning, engineering, fire, etc.) where the applicant presents a concept/sketch plan.
 - B.** A formal review of the concept by city staff, outlining issues of concern in regard to code compliance and consistency with the Comprehensive Plan,
 - C.** Staff and planning commission confirmation of the development site as one that is appropriate for charrette-based review.
 - D.** A public charrette that meets performance standards for neighborhood and other stakeholder participation, to create design, intensity, and to address issues of staff, planning commission, and neighborhood concern.
 - E.** Limited, expedited final review by staff and the planning commission that recognizes the value of the charrette process, but ensures that the project meets other City requirements.

Natural resources

Many of the Comprehensive Plan policies address environmental and natural resource management. In order to sustainably manage the City's green infrastructure, protection of natural resource functions must be considered in regulation and development review and through the use of other implementation tools such as incentives and promotional programs.

Some of the environmental and natural resource management policies will be implemented through regulatory changes to the City's ordinances. Examples include:

- Natural resource mgmt 1.** Develop performance standards, as part of the zoning ordinance, for those areas covered by the Sensitive Lands Overlay.

Implementation

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Natural resource mgmt 2. Incorporate Low Impact Development (LID) standards into new development ordinances:

- A.** Create standards for impervious surfaces, wetland protection, and vegetative management geared toward the sensitivity of the watershed.
- B.** Create performance standards for protection and management of defined natural resources covered by the SLO. Defined natural resources may include specific functional categories:
 - i.** Watershed function for water quality, flood control, and habitat protection or enhancement.
 - ii.** Wetland functions and stream headwaters.
 - iii.** High value ecosystems or rare or unusual plant or animal communities as described by Duluth's Natural Area Program (DNAP).
 - iv.** Critical connectivity areas, as identified in the Natural Resource Assessment.
- C.** Consider opportunities to use the development and re-development process to create regional or area-wide stormwater management best management practices for areas larger than proposed development sites.

Natural resource mgmt 3. Codify the Natural Resource Assessment (or some form of it) as the standard for identifying ecologically significant areas in the development review process.

- A.** Create a natural resource studies process similar to commercial corridor or transportation project studies to guide development in areas that meet or are approaching staging thresholds and update the Sensitive Lands Overlay as warranted.
- B.** Periodically consider opportunities to modify the preferred land use designations, to protect green infrastructure not currently designated

for preservation on the future land use map, or to allow sensitive development to occur in areas currently designated for preservation.

- C. Develop tools to use the Natural Resource Assessment information to evaluate development impacts and guide both development and site plan review.
- D. Periodically update the Natural Resource Assessment to help the City recognize and incorporate better data, new connectivity priorities, and address Duluth's evolving watershed and water quality issues.
- E. Conduct a functional value assessment of the City's wetlands and woodlands.

Natural resource mgmt 4. Update the shoreland, floodplain, and water resource management ordinances and integrate with the new zoning ordinance.

Environmental and resource management goals can also be achieved using incentive tools. Examples include:

Natural resource mgmt 5. Create a Transfer of Development Rights (TDR) program with designated sending areas on privately-owned land that has been assigned a preservation category on the future land use map.

- A. Receiving areas could include tax-forfeit lands that have been designated for development or specific locations where development pressure is known to be high.
- B. Ensure market demand by creating mandatory participation in the TDR program for proposed developments using tax-forfeit parcels.
- C. Link the TDR program to the zoning ordinance, perhaps by requiring participation in the TDR program in specific districts.

Natural resource mgmt 6. Create a Purchase of Development Rights (PDR) program to acquire conservation easements from willing landowners in Preservation areas.

- A. Identify an appropriate entity to hold the easements, a source of

Wetland Assessment Techniques

Several assessment approaches can be applied to characterize existing functions of wetlands and riparian areas. Some examples include:

- Minnesota Routine Assessment Method
- Hydrogeomorphic Approach to the Functional Assessment of Wetlands (HGM) was developed by the USACE Waterways Experiment Station (USACE Waterways Experiment Station, 1995)
- EPA's Office of Wetlands has several Fact Sheets available that provide information on protecting and monitoring wetlands. See the EPA Office of Wetlands' website, <http://www.epa.gov/owow/wetlands/facts/contents.html> for a complete list of wetlands fact sheets and other technical information.

Implementation

Land Use

Buffer Concepts

Based on the majority of scientific findings, land use practitioners should plan for buffer strips that are a minimum of 25 meters in width to provide nutrient and pollutant removal; a minimum of 30 meters to provide temperature and microclimate regulation and sediment removal; a minimum of 50 meters to provide detrital input and bank stabilization; and over 100 meters to provide for wildlife habitat functions. To provide water quality and wildlife protection, buffers of at least 100 meters are recommended

Excerpt from Conservation Thresholds for Land Use Planners, The Environmental Law Institute, 2003, Washington D.C.

funding for purchase, and criteria by which applications for participation could be evaluated.

- B. Consider creating a public entity managed by the most appropriate city department to manage conservation easements.

Natural resource mgmt 7. Use density bonuses or regulatory flexibility within the zoning code to encourage conservation easements within or adjacent to preservation areas where public purchase or use of TDRs are not practicable.

The City's regulatory implementation efforts need to be complemented with promotional and educational efforts that help residents, businesses, and developers understand the basis for regulations. Successful education efforts can reduce the need for regulation, and make even limited regulation more effective. Promotional and educational programs, furthermore, can be undertaken by non-City entities such as non-profit organizations and businesses. Examples of promotional and educational efforts include:

Natural resource mgmt 8. Create educational and promotional programs that demonstrate how best to meet Comprehensive Plan principles, policies, and desired future land uses.

- A. Create and publicize model conservation designs, such as conservation subdivision and resource-sensitive development techniques, to encourage proactive design changes in new developments.
- B. Provide packets to new and existing homeowners and renters on ways to protect the City's water resources from nonpoint source pollutants, including design and installation of infiltration areas, proper disposal of solid waste, appropriate lawn care practices, and sump system disconnects.
- C. Publicize the link between dumping and degradation of water quality.
- D. Emphasize the cumulative impacts to guide setback and impervious surface standards for shoreland areas.

- E. Recognize and promote voluntary business-driven programs that encourage pollution prevention exceeding regulatory minimums.
- F. Continue to support Duluth's Cities for Climate Protection program.

Natural resource mgmt 9. Create dialogue and opportunities for joint action with other units of government on improving impaired waters:

- A. Work closely with the Minnesota Pollution Control Agency and nearby communities to restore Duluth's impaired waters.
- B. Target other waters that have watershed boundaries outside Duluth for early action to avoid these waters being listed as impaired in the future.

Watershed Strategy

A watershed approach is a useful framework to prevent pollution, achieve and sustain environmental improvements, and meet other Comprehensive Plan goals. Although watershed approaches vary in terms of specific objectives, priorities, elements, timing, and resources, successful efforts are based on the following principles:

Partnerships. Those people most affected by management decisions are involved throughout and shape key decisions. This ensures that environmental objectives are well integrated with those for economic stability and other social and cultural goals. Partnerships also ensure that the people who depend on the natural resources within the watersheds are well informed and participate in planning and implementation activities.

Geographic focus. Activities are directed within the areas that drain to the City's streams. Cooperation between multiple landowners and political jurisdictions is essential.

Sound management techniques based on strong science and data. Collectively, watershed stakeholders employ sound scientific data, tools, and techniques in an interactive decision-making process. This process should include:

- Assessment and characterization of the natural resources (i.e. wetland functions, channel morphology, vegetation type, etc.) and the communities that depend on them.
- Goal setting and identification of environmental objectives based on the condition or vulnerability of resources and the needs of the aquatic ecosystem and the people in the community.
- Identification of priority watersheds across the City and the specific problems within these priority watersheds.
- Development of specific management options and action plans.
- Implementation.
- Evaluation of effectiveness (monitoring) and revision of plans.

The nature of the watershed approach encourages partners to set goals and targets and to make progress based on available information while continuing analysis and verification where information is incomplete.

Implementation

Land Use

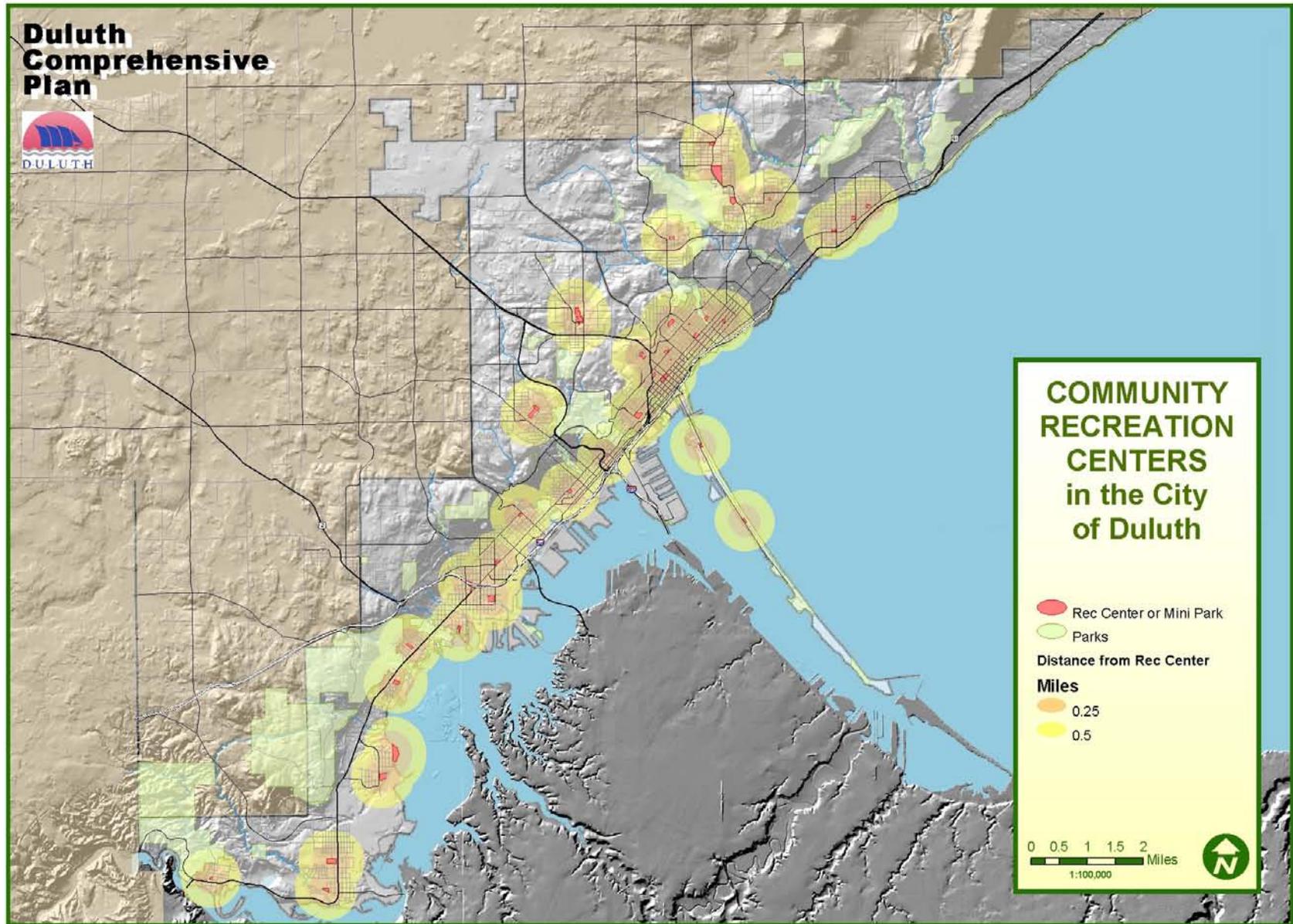


Public lands and infrastructure management

Investment in infrastructure, including streets, wastewater and water systems, trails, transit facilities, and park and open space improvements, are among the City's primary tools for managing development and improving the quality of life. City investments in land, whether through purchase or the use of easements or land exchange, can improve the natural resource or recreational value of public land and can achieve goals for both preservation and economic development. City investments in historic buildings and sites, or City assistance in restoration, can help to implement the plan's preservation and revitalization policies. Public improvement or investment strategies should include:

- Public lands 1.** Revise the City's Street Improvement Program to align with the transportation improvement, historic and natural resource protection, and urban design priorities of the Comprehensive Plan.
- A.** Public right-of-way and street design standards should address traffic safety, street management costs, neighborhood character and historic resources, impact on other infrastructure such as stormwater facilities, and alternatives to automobile travel.
 - B.** Use pedestrian level of service standards to evaluate development proposals and roadway improvement projects.
- Public lands 2.** Establish priorities for park and trail improvements and align these with the priorities of the Comprehensive Plan.
- A.** Create a park and open space plan and a trails master plan are needed to assess access to parks and trails, prioritize investments, create connectivity, and improve linear green spaces and connectivity for habitat (see discussion in Comprehensive Plan Enhancements).
 - B.** A park dedication requirement within the subdivision process or within an integrated development review and approval process could provide either funds or land to meet capital needs for park and trail development.
 - C.** Work with St. Louis County to identify tax forfeit parcels that should be conveyed to the City as park or recreation areas. Prioritize those areas that already have a clearly defined recreational or natural system value.

Figure I-1: Community Recreation Centers



Prepared by: CR Planning, Inc with data from the City of Duluth

Implementation

Land Use

- D. Evaluate City-owned or managed areas that serve as informal park or recreation areas to be designated as official parkland.

Public lands 3. Provide for community recreation centers where service area gaps exist and maintain and staff existing community recreation centers.

Public lands 4. Create assistance and incentive programs for renovation of historic buildings, such as façade improvement grants, transferable development rights, the purchase of façade easements, and design assistance with building code issues.

Public lands 5. Identify proactive infrastructure investments to encourage private investment in blighted or contaminated commercial and industrial areas. Consider investments such as:

- A. Water and wastewater capacity improvements or extensions.
- B. Transportation improvements including transit facilities.
- C. Green infrastructure including stormwater management.
- D. Facilities that can act as recreational or visual assets to future development.

Public lands 6. Use tax increment financing (TIF), interest write-downs, tax-free zones, selective co-funding, or similar economic development incentives to encourage private investment in targeted high-priority re-development sites on the future land use map. Limit the use of such tools in areas that are not priorities or fail to meet staging thresholds.

Figure I-2: Grand Avenue/Michigan Street



Plan enhancements

A number of decisions are made in the Comprehensive Plan process in the face of uncertainty. The assignment of land use categories on the future land use map cannot anticipate evolving housing and commercial markets, regional economic changes that call for more or different infrastructure, and resolution of transportation or natural resource issues that change the assumptions upon which the Comprehensive Plan is based. A number of sites are identified on the future land use map where such uncertainties are known to exist.

2006 City of Duluth Comprehensive Plan

- Plan enhancements 1.** Revisit the Comprehensive Plan at least every five years to identify and adopt necessary updates and modifications.
- A. The Planning Commission should initiate and lead the update process,
 - B. The process should include public input and participation in the decision-making process by a breadth of stakeholders,
 - C. The process should incorporate the results of newly completed studies and master plans identified below.

- Plan enhancements 2.** The City will initiate studies for expanded industrial areas or mixed use centers that can ultimately guide Comprehensive Plan revisions:

- A. *Oneota Industrial Park* - Consider whether where infrastructure capacity is sufficient for expansion and where natural systems can be enhanced or restored in expansion areas. Consider both on-site and off-site remediation strategies.
- B. *Airpark Business Park* - Consider wetland mitigation, headwaters protection, and airport noise and safety zone delineations.
- C. *Eastern Port area, including Slip 2 and the Georgia Pacific Site* - Consider linkages to Lincoln Park business area, possible commercial waterfront and tourism investment, recreation or tourism opportunities that work in synergy with port operations and waterfront neighborhoods, and buffers or other methods to protect adjacent shipping activities and waterfront industrial uses from encroachment or nuisance complaints.
- D. Consider designating new areas or expansion areas for eco-industrial planning, investment and development.

- Plan enhancements 3.** The City will initiate studies to better guide the scope of commercial and mixed use development and to assist in creating form-based standards:

- A. London Rd (10th-26th Ave. E., including the plaza district by the Armory).

Figure I-3: Superior Street



Figure I-4: London Road/Endion



Implementation Land Use

Figure I-5: Antennae Farm

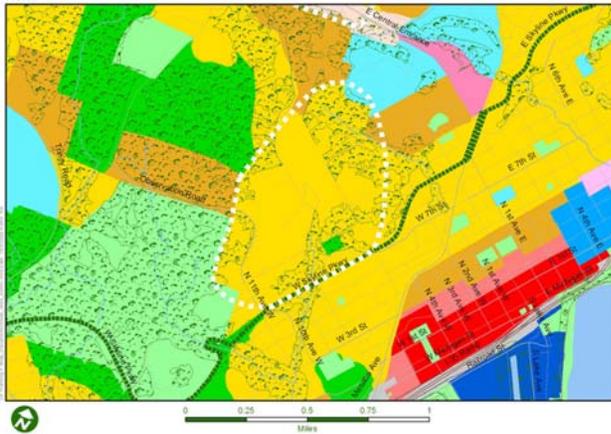
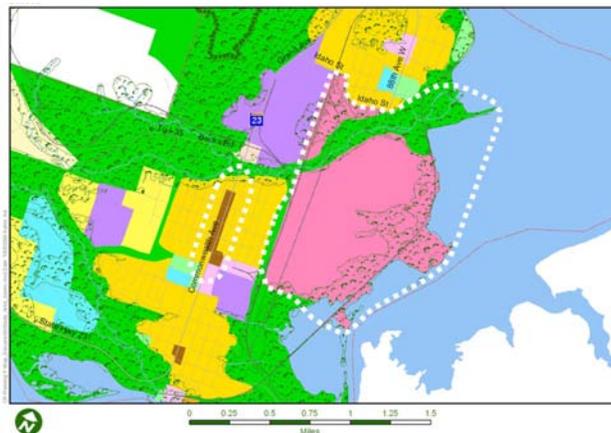


Figure I-6: Commonwealth Ave/US Steel Site



- B. Central Entrance.
- C. Grand Avenue.
- D. Superior St. (Lincoln Park).
- E. Superior St. (Lakeside-Lester Park).
- F. Commonwealth Ave. (Gary-New Duluth).
- G. Arrowhead Road and Rice Lake Road (Northwest Corner).

Plan enhancements 4. The City will require master plans for large development sites, consistent with plan policies, including three sites identified on the future land use map:

- A. *U.S. Steel Site* - Including evaluations for limited development of St. Louis River shoreland and opportunities for meeting preservation goals along most of the River,
- B. *Western Port Area* - Including incorporation of planned remediation areas and buffering industrial areas from adjacent residential.
- C. *'Antennae Farm' Area* - includes primarily residential land uses, protection of open space areas, and protection of viewsheds at the crest of the ridge.
- D. *Higher Educational Facilities* - Work with institutions on expansion plans
- E. *Other Large Development Projects Exceeding 100 Acres* - and requiring environmental review.

Plan enhancements 5. The City will evaluate its shoreland areas along Lake Superior and the St. Louis River for development or preservation potential:

- A. Coordinate evaluation with specific area plans along the shoreline areas, including the U.S. Steel Site, the east and west Port areas, and other studies and plans for the shipping channel and Port facilities and the St. Louis River estuary.
- B. Identify shoreland development and preservation priorities within the general categories portrayed on the future land use map.

- C. Preserve public access opportunities and identify future public access opportunities. Map public access points to and from the water and map shoreline natural resource areas.
- D. Recommend strategies specific to shoreline areas (i.e., protection buffers based on natural resource functions) for ensuring that development responds to the natural, cultural, and recreational aspects of the shoreline.

Plan enhancements 6. The City will evaluate appropriate integration of undeveloped land owned (fee-title) by non-City public entities (i.e. St. Louis County and the School District), into the Comprehensive Plan should the land be placed on the open market:

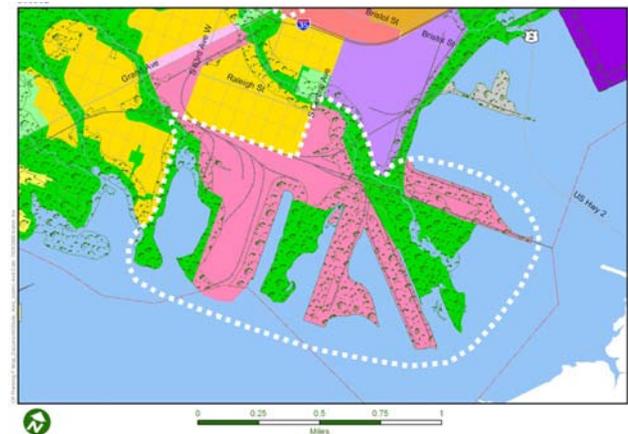
- A. Consider fiscal impacts on the local government unit and on the City of Duluth,
- B. Assess opportunities for retaining historic public use or benefits of undeveloped public land, including informal historic uses,
- C. Identify opportunities for land exchange
- D. Consider master planning to ensure consistency of potential non-public development with the Comprehensive Plan policies and future land use map.

In addition to those areas where uncertainty requires additional study as part of the implementation process, specific additional studies or planning efforts are necessary to follow the Plan's governing principles:

Plan enhancements 7. The City will create a park and open space plan to guide investment, management, and program development. The park plan should:

- A. Prioritize investment in existing facilities.
- B. Identify criteria for creating additional facilities in areas underserved by the existing park system.
- C. Identify criteria for land exchanges with private land owners that enhance doorstep recreational opportunities for residents and visitors.

Figure I-7: Riverfront



Implementation

Land Use

- D. Identify funding mechanisms to allow ongoing maintenance improvements.
- E. Conduct a needs analysis for both facilities and programs.

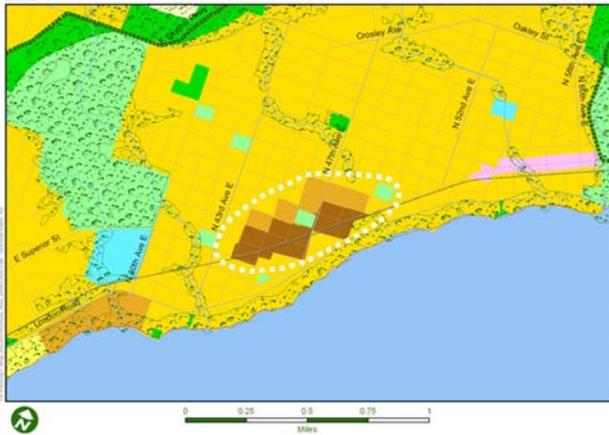
Plan enhancements 8. The City will create a trails plan to:

- A. Meet the transportation aspects of Duluth's trail network (described in the Transportation Implementation section)
- B. Meet recreational trail needs to accommodate a variety of user groups and need for specific types of trails (bicycle, snowmobile, cross country skiing, hiking, etc).
- C. Work cooperatively on trail planning, creation, and maintenance with non-profit trail organizations and clubs.

Plan enhancements 9. The City will conduct inventories of its historic buildings and places to:

- A. Better inform the geographic definition of the Comprehensive Plan historic overlay.
- B. Guide and support local historic designation efforts.
- C. Guide and support nomination of eligible properties and districts to the National Register of Historic Places.
- D. Assist in fund raising efforts for meeting historic protection policies.
- E. Integrate the existing and planned historic inventories into a more cohesive and comprehensive planning framework.

Figure I-8: Lakeside-Lester Park



Transportation

The Comprehensive Plan provides guidance to City decisions not only on land use but on infrastructure investments and planning. Transportation infrastructure (roads, trails, transit) connects land uses within the City and between land uses inside the City with critical transportation routes outside the City. Road infrastructure is frequently the key that opens an undeveloped area to development pressure. Extending transportation infrastructure, and roads in particular, creates a long-term maintenance commitment for the City, as the road must be plowed, cleaned, repaired, and ultimately rebuilt.

Transportation and the future land use map and policies

The future land use map shows the preferred mix of land uses but does not detail the complex set of issues related to connectivity. This section of the plan addresses the broad issue of connectivity and the infrastructure that supports connectivity.

Connectivity includes several infrastructure components, including the following:

- Automobile and truck routes, including the network of streets and highways of varying types, the associated parking facilities necessary for automobile travel, and the facilities for public transit.
- Pedestrian routes, including trails and sidewalks throughout the year.
- Bicycle routes, including co-use of streets with motorized vehicles, on-street trails, and dedicated trails.
- Rail and air travel, both for freight and passenger transport.
- Water transportation, primarily commodities and freight using the harbor facilities and Great Lakes shipping routes, but also including passenger service.
- Other connectivity, including a variety of trail types and uses.

Duluth, more than most cities, needs a reliable topographic survey of the area over which future growth will spread. The lack of such surveys has been largely responsible for many of the indefensible stupidities encountered in attempting to get about the city..

Source: *Major Street Plan, 1927, P.7*

Implementation Transportation

Implementation priorities for the transportation policies in the plan that focus on these connectivity components are frequently overlapping. For example, pedestrian issues are inextricably linked to road and highway issues and transit issues. Rail and water transportation issues are tied both to each other and to highway connectivity. This section presents implementation priorities in the following categories:

1. Automobile, pedestrian, and transit connectivity
2. Trail network and bicycle access
3. Economic connectivity

Automobile, pedestrian, and transit connectivity

Of all the connectivity components, streets, highways, sidewalks, and transit system are Duluth's largest public infrastructure investment in both geographic extent and cost. The City's 530 miles of streets and highways comprise over 10% of its total land cover. Access to a street is a requirement for every single home or business in the City.

This implementation section examines the road, pedestrian, and transit issues that were raised in Comprehensive Plan meetings, neighborhood district plans, the Metropolitan Interstate Commission's (MIC) Long Range Transportation Plan, and a myriad of smaller transportation studies. Some of the issues are the focus of on-going studies, while others have only been identified as needing study or action.

The site-specific transportation issues discussed in this section are not intended to be a complete inventory of City's automobile, pedestrian, and transit issues. The plan does, however, need to address the complex interplay of transportation infrastructure and the preferred land use patterns expressed in the Plan. These issues represent decision points regarding transportation infrastructure investments that relate to both the connectivity issues and the future land use map. The Comprehensive Plan sets the policy foundation for making public infrastructure decisions – the plan does not supplant future decision-making, but identifies the context and priorities that should guide future decisions. The following transportation issues provide a context to guide not only decisions for these specific issues, but also to shed light on addressing other issues not mentioned or not yet to be identified.

This section presents three general categories of road and highway issues:

1. Issues that have been considered in recent (generally post 2000) studies or are currently being studied by the City, MIC or MnDOT. Some of the issues addressed in these studies have been resolved and improvements are planned or under construction. Others remain to be resolved, and this section offers strategies or implementation recommendations to address these issues with future transportation infrastructure investment.
2. Issues that are geographically specific and that have not been the focus of regional or area studies. The neighborhood district plans, produced in the first phase of the planning process in 2001, identified some of these issues, while others were raised during the current process. This section includes preliminary strategic or implementation recommendations on these issues.
3. Issues that are general in nature and geographically widespread (i.e., traffic calming and parking management). The specific application of these issues are too detailed for comprehensive plan recommendations. Such general issues are best addressed at the policy level, where policies are structured to guide future planning and investment decisions.

Figure I-10 (Transportation Implementation Examples Map) shows the geographic locations associated with each of these transportation issues. Each issue is assigned a number on the map. The following discussion identifies the number on the map for each transportation issue.

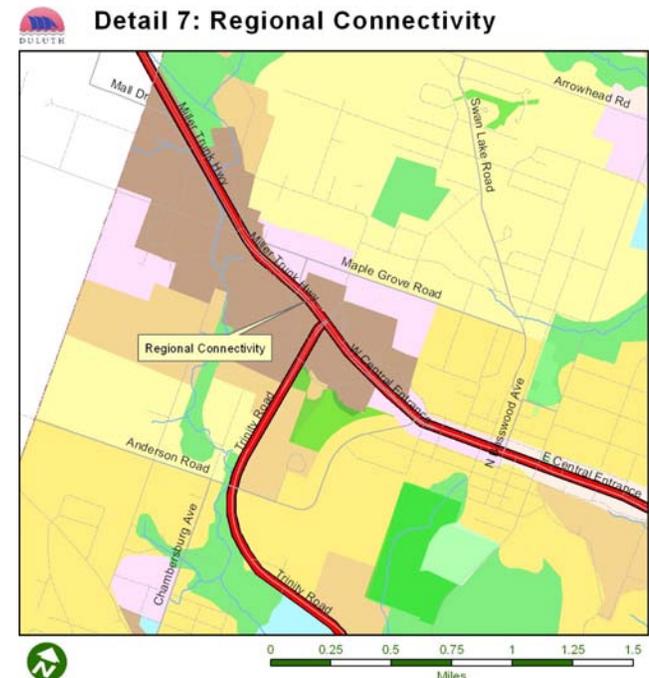
Prior or ongoing transportation studies

The following examples illustrate the issues relating to corridor management and the difficult balance of maintaining potentially conflicting connectivity goals within a single right of way. The studies conducted for these areas are largely consistent with the land uses proposed in the Comprehensive Plan, but additional consideration needs to be given to integrating multiple modes of transportation either within or across the following areas.

T1. Enhancing regional connectivity. Duluth is a regional center. Maintaining connectivity between regional destinations, such as between Duluth and Iron Range communities, is a primary consideration of a number of transportation investments. One example, MnDOT’s **Miller Trunk Highway Access Management Plan** study, demonstrates how regional connectivity and land use choices are inter-related: (Transportation Implementation Examples Map #7, shown in Figure 1-9).

- A. **Miller Trunk Highway** has several intersection improvements and proposed backage/circulator roads serving the Miller Hill Mall and surrounding areas.

Figure I-9



Implementation Transportation

Figure I-10: Transportation Implementation Examples



Implementation

These improvements are already programmed and are consistent with the regional destination and density of the land uses identified on the future land use map. Trunk Highway 53 is, furthermore, designated by the MnDOT as an Inter-Regional Corridor (IRC) with priority connectivity given to regional traffic. *Regional connectivity does, however, need to be balanced with the need for local automobile and transit access and enhancement of non-motorized modes of travel. Future infrastructure improvements that improve pedestrian and transit access are warranted as housing density increases.*

- B. Central Entrance** is proposed to be reconstructed by 2010. The initial proposal has four through-lanes and a raised median/left turn lane and 10 foot wide sidewalks on both sides. The preliminary study includes potential improvements for Palm Street as a parallel route. *Improvements in this area have not been finalized, and should support existing and planned land uses (primarily auto-oriented commercial) with improved streetscaping, consolidating access points, and pedestrian improvements that acknowledge the Traditional Neighborhood designations on either side of the corridor.*
- C. Trinity Road** is proposed to be converted to four through-lanes plus a continuous two-way left-turn lane. This project is underway and supports the proposed land use pattern presented on the future land use map.

T2. Historic pattern of one-way streets. Duluth has an extensive system of one-way streets that were designed to move traffic efficiently through commercial areas prior to the construction of Interstate 35. Two recent studies make recommendations to modify the pattern of one-ways to reflect current traffic patterns. Both the 2001 *East Hillside Transportation Study* and the draft recommendations from the 2005 *Knight Charterette* addressed the use of one-way streets on 1st, 2nd, 3rd, and 12th and 14th (Transportation Implementation Examples Map #10, shown in Figure I-11). The east-west one-ways were used to carry heavy traffic volumes prior to the completion of I-35. Since then, traffic volumes have been relatively low for one-way streets. These streets are wide (3-lanes on sections of 2nd Street). One-ways are not warranted for the measured traffic volumes and result in high speeds through the East Hillside and Endion neighborhoods. Initially, eliminating 1st Street as one way east of 6th Ave was recommended as a test, as this street was not part of a one-way pair, and a portion of 1st will be converted to two-way traffic this year. *In order to meet the Comprehensive Plan goals for housing and commercial redevelopment the remaining one-way streets (2nd and 3rd Streets, 12th and 14th Avenues) should be returned to two-way status where the future land use map shows residential or*

Figure I-11

Detail 10: Redesigning One-Way Street Patterns



Implementation Transportation

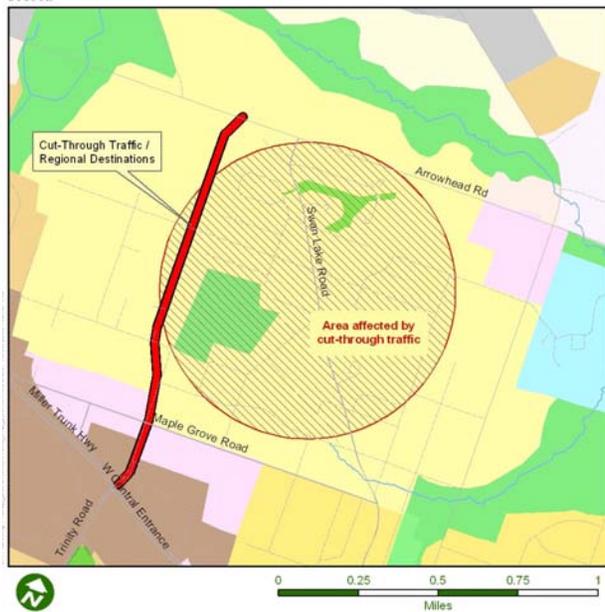
mixed use land uses. Two way traffic patterns will improve the livability and pedestrian environment of these corridors and supports the future land use plan designations of these areas: Central Business Secondary, Medical District, Urban Residential and Neighborhood Mixed Use (See also Policy T6).

Medical facilities in the area of one-way streets have designed entrance and parking facilities around the existing street pattern: change to these medical complexes and changes in streets serving them must be designed in concert. Primary downtown areas or where commercial land uses are dominant, in contrast, will likely still require one-way access to allow for loading and unloading and on-street parking while allowing steady traffic flow.

The implementation strategy discussed above also applies in other areas of the City, including transforming the one-ways in Lincoln Park and areas to the west that parallel Interstate 35 where one-ways are no longer justified by traffic volume. The City should, moreover, work toward a consistency in one-way street patterns, ultimately eliminating the one-way/two-way/one-way patterns (such as now found on 1st Avenue) that are found in several areas of the historic grid, both east and west of the downtown.

Figure I-12

Detail 8: Cut-Through Traffic / Regional Destinations



T3. Cut through traffic near regional destinations. Cut-through traffic in residential neighborhoods near regional destinations reduces livability. Areas such as the **Duluth Heights neighborhood** near Miller Hill Mall (Transportation Implementation Examples Map #8, shown in Figure I-12) and neighborhoods around the universities (UMD, St. Scholastica, Lake Superior College) have been struggling with cut-through traffic for years. The Duluth Heights area is currently being studied by MIC. This area sees a significant amount of cut-through traffic for drivers going between Miller Hill Mall and Miller Trunk Highway commercial area and eastern neighborhoods via Arrowhead Road. One solution being considered is to provide a more direct connection by creating a new arterial extending Trinity Road at Miller Trunk Highway north along Joshua Street to Arrowhead Road. This improvement would support the future land use map designation of Duluth Heights as Traditional and Low-Density Neighborhood. The new arterial is proposed to eliminate traffic cutting through residential neighborhoods from Arrowhead Road to the Miller Hill Mall area (additional traffic modeling info may be available soon from MIC). *Consistent with the Comprehensive Plan, the proposed arterial should include access management standards that preserve the arterial function while allowing some access from the neighborhood (see Policy T4). Considerations should also be given to pedestrian movement in the ultimate road and intersection designs.*

T4. Balancing local and regional connectivity. Balancing the goals of improving regional connections while protecting local access presents a dilemma for land use and transportation planning. The **Rice Lake Road Corridor** (Transportation Implementation Examples Map #9), currently being studied by MIC, provides an example of this dilemma. Rice Lake Road will also likely warrant a 5-lane configuration in the future. South of Arrowhead there are pedestrian/bike concerns and safety issues related to Lowell Elementary School. The future land use map shows higher density housing south of Arrowhead Road and business park expansion north of Arrowhead. *The possible improvements (five-lane configuration and intersection improvements) would support proposed land uses along the corridor. Additional consideration needs to be given to bicycle safety (it is a designated but unsigned bicycle route), transit facilities associated with Urban Residential areas, and pedestrian level of service around Lowell School and the Urban Residential areas.*

T5. Improving pedestrian and transit access in areas with Neighborhood Commercial and Mixed Use designations. The **Lincoln Park Transportation Assessment** (Transportation Implementation Examples Map #5) identified **3rd Street** for needed traffic calming and pedestrian improvements, including boulevard trees and curb bulb-outs. The study also identified sidewalks in need of upgrading and recommended parking management strategies. *The Lincoln Park area is an example of where investments in public facilities and improved management of parking could meet the Neighborhood Commercial and Neighborhood Mixed Use goals shown on the future land use map. Lincoln Park Commercial District is a relatively pedestrian friendly area that would be enhanced by the recommended improvements, all of which are consistent with the future land use map designations of Neighborhood Mixed Use and Traditional Neighborhood.*

T6. Addressing regional connectivity in a topographically constrained landscape. Duluth's topography has created some significant challenges in managing transportation risk. **London Road (26th Avenue E. to 60th Avenue E.)** (Transportation Implementation Examples Map #16, shown in Figure I-13) provides the connection from I-35 to State Trunk Highway 61 expressway through a largely residential neighborhood. The future land use map designates most of this stretch as Traditional Neighborhood with some areas of Urban Residential. While average traffic volume through the neighborhood is relatively manageable, peak volumes with tourist traffic can be quite a bit higher (2002 AADT at 26th Avenue E. was

Figure I-13

Detail 16: Topographic Constraints (London Road)



Implementation Transportation

19,600), and significant safety concerns with commercial traffic further raises the risks of the existing configuration. Potential solutions, studied over the last twenty years, are all problematic and enormously expensive. Alternative routes for commercial vehicles are similarly in conflict with the future land use map. *MnDOT has initiated a new study to examine potential mitigating strategies for the heavy traffic/congestion issues. The findings of this study should be assessed when they become available. (See also Policy T7).*

Local and geographically specific issues

The following issues come from comments at Comprehensive Plan meetings identified where local or geographically specific connectivity issues are closely integrated with the Plan's future land use map and policies recommendations. These issues are also identified on the Transportation Issues Map.

T7. The following areas are recommended for specific investment actions or planning:

- A. Upgrade the Morgan Park Loop** (Transportation Implementation Examples Map #2). The Morgan Park loop could be upgraded by improving Idaho Street and determining the feasibility of removing the DM&IR trestle over it. Morgan Park is recognized for its historic resources not only in building form but in the planned layout of the neighborhood and the relationship of buildings to streets. *Traffic patterns and the preferred future land uses in the Morgan Park area support upgrading this road. Should residential development be part of the U.S. Steel Site re-development the loop could be a reasonable means of connecting these neighborhoods, but non-residential land uses should not be connected to the Morgan Park Loop. Potential site connections, as well as transitions or barriers between uses should be specific elements of the U.S. Steel Site master plan.*
- B. Connect the U.S. Steel re-development/ master planning site** to Commonwealth Avenue and Beck's Road (Transportation Implementation Examples Map #1) The Comprehensive Plan has designated the U.S. Steel Site as a General Mixed Use site in need of a master plan. Future land uses could include business and job center activities as well as residential, commercial waterfront, and preservation and recreation areas. *The significant public and private investment in this large area will require substantial transportation planning to connect the site to regional arterials (most notably Commonwealth Avenue and Beck's Road). The master plan needs to incorporate these connections, in addition to trail and pedestrian connections with existing and planned trail corridors and, if warranted, adjacent residential areas.*

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- C. **Develop a second vehicular exit from Riverside neighborhood** (Transportation Implementation Examples Map #3). The future land use map identifies expansion and re-development of the Riverside marina, and improved connections to the lower Spirit Mountain area with recreation focused developments. *The second access to Riverside will improve connectivity and access, for public safety reasons, to a relatively dense urban neighborhood. Investing in infrastructure for a second access point will enhance the likelihood of meeting Comprehensive Plan goals both in Riverside and adjacent areas.*
- D. **Improve traffic flow and pedestrian-friendly environment on Grand Avenue.** Grand Ave, a wide east-west arterial does not provide a pedestrian/transit friendly environment (Transportation Implementation Examples Map #4, shown in Figure I-14). However, the City is re-striping the West Duluth Commercial area to 3-lanes, in part to slow traffic and help improve the pedestrian environment. *The on-going City efforts will improve the pedestrian and transit environment. The City should continue pedestrian improvements and re-striping between Lincoln Park and the bny 23's I-35 interchange.*
- E. **Kenwood Avenue** is a four-lane road, with significant volume of traffic (11,300 AADT) and essentially terminates at a 7-legged intersection with Skyline Parkway (Transportation Implementation Examples Map #11). The intersection was recently converted to all-way stop (which has been successful in improving safety). Connecting Kenwood more directly to 6th Avenue has long been discussed and included in plans, including the East Hillside Transportation Study. A number of configurations have been studied, most of which were ultimately rejected. Remaining mitigating issues include the future status of Grant Elementary School. *The proposed connection would improve traffic flow and remove some traffic from neighborhood streets. The ultimate alignment needs to be designed to have minimum impact on existing neighborhood land uses. Additional discussion and joint planning with the School District in regard to the status of Grant School will improve decision-making. After resolution of the future of Grant School, final planning should proceed and the improvement should be implemented.*
- F. **London Road between 12th Ave and 26th Ave** (Transportation Implementation Examples Map #15, shown in Figure I-15) is a commercial area with very wide pavement, which upon completion of I-35 is no longer warranted by traffic demand. The planned land use, shown on the future land use map, is primarily Neighborhood Mixed Use. Making the area more pedestrian-friendly directly encourages the type of land use priorities in the Plan, and should im-

Figure I-14



Implementation Transportation

Figure I-15

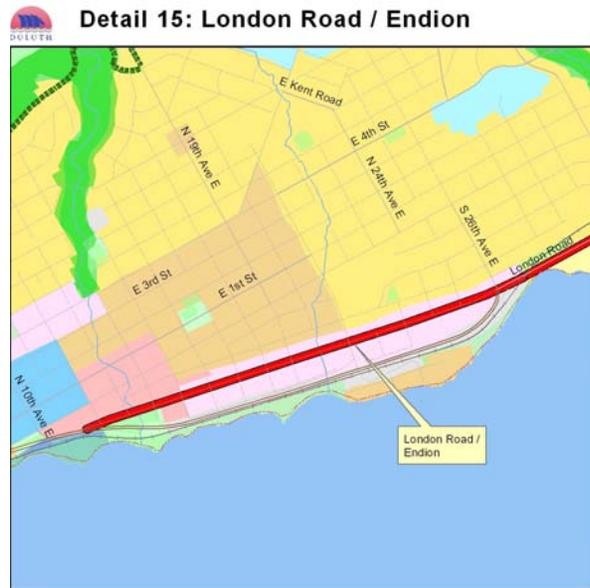


Figure I-16



prove the business environment for the commercial investment along this corridor. The City previously studied the corridor aesthetics, streetscape, business environment, and pedestrian-friendliness (the 1995 Endion Plan), but chose not to move ahead with the recommendations. *The City should revisit the Endion Plan recommendations and re-assess potential for street narrowing and other streetscape/pedestrian improvements. A staged plan for business reinvestment and public realm improvements could transform this area over time to meet Comprehensive Plan goals.*

T8. Study areas for optimal transportation solutions. Some geographically specific transportation issues clearly warrant attention, given the Plan’s preferred land uses and policies. However, the potential solutions carry risks that may out-weigh the opportunities that could be realized by making transportation investments. These issues are recommended for further study:

A. The **Woodland Avenue and Arrowhead Road** corridors are projected to continue to worsen in regard to traffic flow. The Metropolitan Interstate Commission (MIC) should examine and make recommendations for flow improvements and potential new connecting corridors. These include:

i. A connection from Anoka St./Maxwell Ave. to Howard Gnesen Road (“**Woodland Backdoor,**” Transportation Implementation Examples Map #12) may relieve some traffic on Arrowhead Road and offer new connectivity in an area that has some potential for infill growth. *This proposal would improve connectivity for a Traditional Neighborhood area, and could allow for infill and neighborhood expansion consistent with Comprehensive Plan governing principles. The proposal may also, however, have substantial environmental impacts, as the new corridor would have to cross sensitive lands including a stream. Additional traffic modeling, evaluation of wetland mitigation and habitat impacts, and costs of sufficiently mitigating impacts to the stream corridor need to be considered in order to make an informed decision on this potential transportation infrastructure investment.*

ii. **Woodland Avenue, 21st Avenue E. to Arrowhead Road** (Transportation Implementation Examples Map #13, shown in Figure I-16). Heavy traffic and relatively high speeds along Woodland Avenue have affected pedestrian movement and livability of adjacent residential neighborhoods. Much of the traffic is related to the nearby colleges (UMD and St. Scholastica). These corridors are not as pedestrian friendly as desired, given the land uses served by this corridor, including UMD, St. Scholastica, neighborhood commercial businesses, and the corridor’s role as a transit

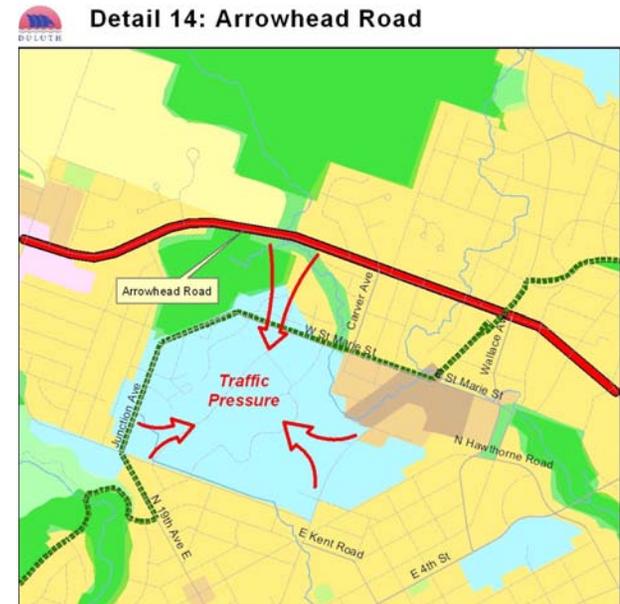
route. Additional concerns along St. Marie and College Street are linked to this corridor. UMD's proposed new entrance on Woodland may ease some problems on College Street, but will create the need for more signals and additional left turns on Woodland. *Methods of alleviating congestion and conflicts between travel modes have been and continue to be evaluated. Alternative routes have potential conflicts with neighborhood land uses. Increased emphasis on alternative modes of travel (pedestrian, bicycle, transit) will improve travel options but are unlikely to reduce congestion.*

iii. **Congestion/heavy traffic on Arrowhead Rd** (Transportation Implementation Examples Map #14, shown in Figure I-17) between Woodland and Kenwood Avenue. Arrowhead becomes 4-lane west of Kenwood, but is two-lanes to the east. The limited right-of-way restricts adding lanes or buffering adjacent residential neighborhood from increased traffic or higher traffic speeds. UMD is a major destination in this area, but has no direct access from Arrowhead. *Transportation and road planning in this area needs to consider UMD as a regional destination with traffic converging from all directions. The City should engage in further study, in conjunction with UMD, to consider new entrance concepts, including a north entrance from Arrowhead that would remove traffic from Woodland and the Carver/Arrowhead intersection. Additional exploration is warranted for streetscape improvements for traffic calming, improved pedestrian and bicycle connections and facilities, and supporting existing and new transit connections based on the origins and destinations for Arrowhead Road traffic flow.*

B. **Commuter rail service.** The **North Shore Railroad line** (Transportation Implementation Examples Map #19) currently used for scenic train rides, provides a potential commuter rail corridor. The Duluth Transit Authority (DTA) recently utilized the 'Budd Car,' a self powered rail passenger car, for a test trial of such a service. The DTA serves a significant number of transit riders compared to other Midwestern cities of similar size. *Given the city's density and its linear east-west orientation, some type of fixed guideway transit option may be viable, warranting further study. The City should continue to study rail options, including commuter rail, streetcar, and other fixed guideway technologies.*

C. **Inter-city passenger service.** Duluth does not have an inter-city passenger rail connection. Growing interest in rail service is apparent in the success of revived regional service in the Twin Cities metropolitan region. *To diversify Duluth's automobile connection with the Twin Cities markets, Duluth should*

Figure I-17



study potential future connections with the commuter rail system in the Twin Cities.

Policy-level transportation issues

Several policy issues raised in neighborhood district plans and at Comprehensive Plan meetings apply in a number of areas across Duluth. These concerns have a strong connection to the Comprehensive Plan policies and the future land use map.

- T9. Reduce or calm traffic where pedestrian and automobile traffic volumes are high.** There are several locations identified where traffic calming is an important issue including Park Point, Canal Park and the Aerial Lift Bridge, Mesaba, 6th Avenue East, Lake Avenue at the freeway entrance, and the Medical District.

Traffic calming is addressed in the Policies section of the Plan (Policy T8): “While traffic calming measures are usually applied to local residential streets, traffic calming is also appropriate for functionally classified streets in residential areas, pedestrian activity areas, and older commercial areas where buildings and sidewalks are close to the street.” Many of the areas listed as part of this recommendation are arterial or collector streets or busy commercial/entertainment areas such as Canal Park.

The City can achieve traffic calming in these areas through a combination of the following strategies:

- A.** Streetscape improvements, parking management and wayfinding signage that allows motorists to park once and move through the area as pedestrians.
- B.** Implementing the Site Design policies (UD8 through UD14) to enhance the pedestrian environment and help to calm or even reduce traffic.
- C.** For predominantly residential areas (including much of Park Point), the City should create criteria to evaluate traffic calming requests and identify the most appropriate traffic calming techniques, in response to residents’ requests or safety issues. For example, traffic calming should not divert traffic from one neighborhood street to another.

- T10. Parking management.** Parking has been studied in many locations, notably in the

downtown, Canal Park, and the Medical District (Transportation Issues Map #6). In each case, the issue is less one of supply than of demand management such as managing employee parking or public parking through pricing/incentives, improving wayfinding signage to assist in locating long-term parking, or using permit parking to discourage employee parking in residential neighborhoods.

Addressing parking through the use of the demand management techniques noted above is critical to encouraging the redevelopment efforts in these core areas. The City should pursue the information/educational management strategies (such as wayfinding), and consider a package of strategies for parking management. Strategies could include:

- A. The use of parking revenue for commercial district enhancements in order to increase business and customer support for parking fees,
- B. Encourage or provide incentives for developments that create shared on-site parking to increase capacity for the larger area,
- C. Require travel demand management plans for new developments in areas with parking dilemmas.

T11. Encouraging pedestrian traffic. Pedestrian traffic is a component of several of the geographic issues on the Transportation Issues map. Duluth has a significant number of households that have no access, or only limited access, to an automobile. Students at the institutions of higher education, lower income households, and senior households all have a greater reliance on non-motorized and transit modes of travel. Employment centers, such as the Primary Downtown, the Medical District, the colleges and university, and the Tourism and Entertainment area in Canal Park function much better if relatively easy, year-round pedestrian connections are available between parking areas and the locations of jobs, housing, and errands. Thus Duluth has a significant demand for pedestrian facilities. Two issues have been identified in the Comprehensive Plan process in relationship to pedestrian access; the lack of reasonable facilities in some high demand areas, and the poor condition of existing facilities particularly in winter. Pedestrian access is poorly served, particularly along or across some busy arterials near the campuses, and the downtown, and along Skyline Parkway. The MIC conducted a sidewalk survey of existing facilities and found that many of the high demand areas had infrastructure in poor condition (see Figure I-19). The poor physical condition

Components of a Travel Demand Management (TDM) Plan

The components of a TDM Plan include the following (for a smaller project, not all of the elements will be needed):

1. **Project description:** A description that includes both existing and proposed site characteristics and a complete description of the project with attention to uses that generate trips and parking demand.
2. **City transportation goals and objectives:** A description of the applicable City goals and objectives.
3. **Project TDM goals and objectives:** A description of the goals of the TDM Plan and how these goals are consistent with the City's transportation goals. City staff will work with the applicant to develop the project goals.
4. **Mode split:** Current and future mode splits for single occupant vehicles (SOV), transit, car and van pools, bicyclists, pedestrians, and telecommuters. City staff will work with the applicant to establish future mode splits based on the project TDM Plan goals.
5. **Project impacts:** A description of the transportation impacts of the development.
6. **Mitigating measures:** A description of mitigating measures designed to minimize the transportation impacts of the development.

Source: *Minneapolis TDM Plan Requirement*

Implementation Transportation

of pedestrian infrastructure is exacerbated by inadequate (or non-existent) snow removal.

The City should implement the following strategies to improve opportunities for people to walk to their destinations:

- A. Develop a pedestrian level-of-service standard with which to evaluate proposed transportation projects and new development projects, balancing the level-of-service standards for automobile travel with equivalent pedestrian standards.
- B. Maintain existing shoveling ordinance provisions, and create an enforcement plan. Conduct education or promotional efforts to alert public and private land owners about their responsibilities in regard to snow shoveling.
- C. Invest in pedestrian access (trails and sidewalks) along Skyline Parkway.
- D. Invest in pedestrian facilities in high priority areas identified by the MIC and in additional areas assigned a mixed use category on the future land use map. Create a schedule for improving sidewalks in poor condition (as per the MIC sidewalk study), improving sidewalks as part of the Street Improvement Program, and requiring sidewalks in mixed use development or redevelopment site plans.
- E. Continue to link the skyway system to the street pedestrian network, and set incentives for new skyway connections for re-developments within or on the edge of the Primary Central Business district.
- F. Improve the formal trail network to connect all areas of the City with dedicated paths that pedestrians can use (see trails section).

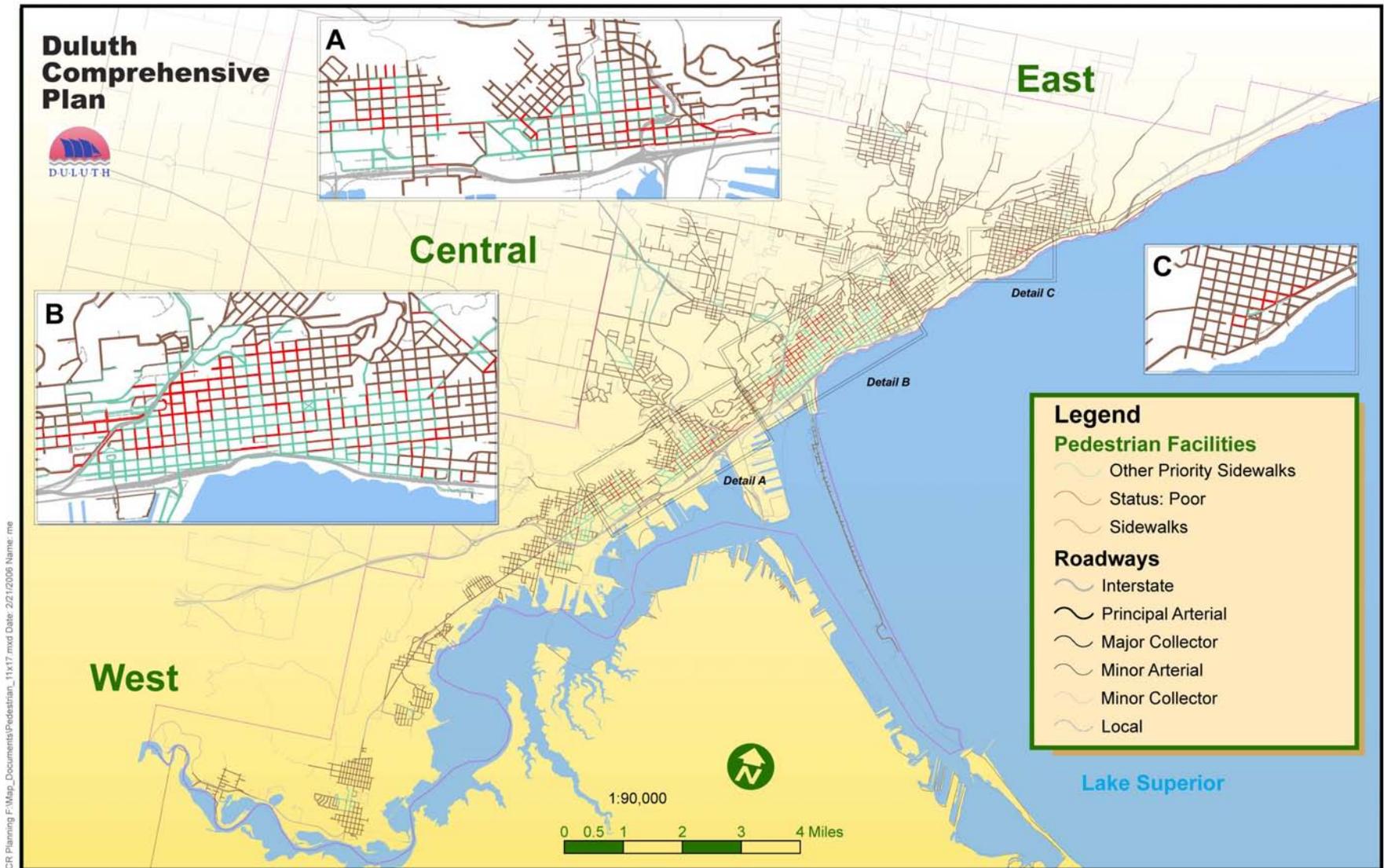
Figure I-18: Duluth Transit Map



T12. Transit Issues. The Duluth Transit Authority (DTA) provides almost three million rides per year. The transit services are a critical link in maintaining the quality of life for many Duluth residents, and in relieving congestion around many of the City's primary destinations.

The City should consider a range of implementation issues that will enhance transit opportunities, including the following:

Figure I-19: Condition of Sidewalks High Priority Routes



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Implementation Transportation

- A. Make public infrastructure investments in transit facilities along transit corridors where neighborhood commercial nodes have been designated on the future land use map, and provide for improvements in facilities at regional commercial centers.
- B. Consider incentives such as density bonuses to encourage infill and appropriate redevelopment along transit corridors.
- C. Promote transit use to large employers along transit corridors and at major destinations through publicizing federal tax incentives.
- D. Consider additional incentive tools that DTA could use, such as direct incentives to employers, continued promotional efforts to higher education student populations, and targeted incentive programs for higher density residential buildings along transit routes.
- E. Create a travel demand management planning ordinance, applying to all large development projects, and incorporate the requirements into the development review process.
- F. Create transit-oriented development standards within the new zoning ordinance and work with the DTA to identify locations along transit corridors where the standards should apply.

Trail network and bicycle access

Trail systems create vital connectivity and sustain property values by linking housing with linear green spaces and commercial and open space destinations. Trails also provide recreational opportunities, enhance tourism businesses and markets, and put downward pressure on the growth of automobile use. The City of Duluth needs to treat its trail system as an important component of the City's infrastructure system. The City has adopted a number of trail policies, and has a variety of implementation options for realizing its Comprehensive Plan goals.

- T13.** Create a trails and greenways master plan that identifies standards for trail connectivity, links origins and destinations, and identifies priorities for trail categories, user groups, and investments:
- A. Work with non-profit trail groups to identify trail connections and to leverage public funds with volunteer trail construction and enhancement of existing trails and greenways.

- B.** Link neighborhoods to the parks and green spaces offered for recreational enjoyment.
- C.** Identify trail right-of-way needs and potential links to existing or planned trail systems across undeveloped lands.
- D.** Incorporate the existing informal trail system across undeveloped lands.
- E.** Create a trail network map showing connections, trail types and surfaces, easement and right-of-way search corridors, and priority investments. A conceptual trail connections system is portrayed in Figure I-20. Trail types and surfaces should relate to a clear hierarchy of trail users and the potential need for 1-lane or 2-lane trails, and possible upgrading of trails and rights-of-way in the future.

T14. Connect Duluth trails to trail systems in neighboring communities and regional trails. As part of creating a trails master plan, the City should identify preferred alignments for the following connections:

- A.** Connect the Munger trail to the route of the scenic highway passing through Duluth and eventually with the Gitchi Gammi trail system being built along the North Shore.
- B.** Connect Duluth trails to the Superior Hiking Trail system via the high bridge with a paved two lane trail.
- C.** Connect the Proctor bike trail to the Munger Trail.
- D.** Connect Hermantown trails to the Duluth trail system.
- E.** Consider an ATV trail connection in Duluth to regional ATV trails.

T15. Build trails along waterways to connect the people of Duluth to the waters that surround them:

- A.** Create right of way reservation standards for subdividing riparian land, particularly in areas that are tax-forfeit, to reserve space for public trails and access along streams, rivers, and lake.
- B.** Stop vacation of right of ways that extend to lake and waterways. Use the rights of way to accommodate trails and water access.
- C.** Plan for a trail that connects lower Chester Creek (4th Street) to the Lakewalk.

Lake Superior Water Trail

Legislation establishing the Lake Superior Water Trail was enacted in 1993.

[85.0155] LAKE SUPERIOR WATER TRAIL.

Subdivision 1. CREATION. A water trail is created along the Lake Superior shoreline from Park Point in Duluth to the border with Canada. The trail must be primarily developed for kayakers and campers, using existing public lands for designated rest areas.

Subdivision 2. COMMISSIONER'S DUTIES. The commissioner of natural resources must coordinate the creation of the water trail by placing signs for rest areas along the lake and working with other public agencies and private resorts owning land along the lake to do the same. At the earliest opportunity, the commissioner shall make available a water trail map depicting the designated rest areas for the touring public.

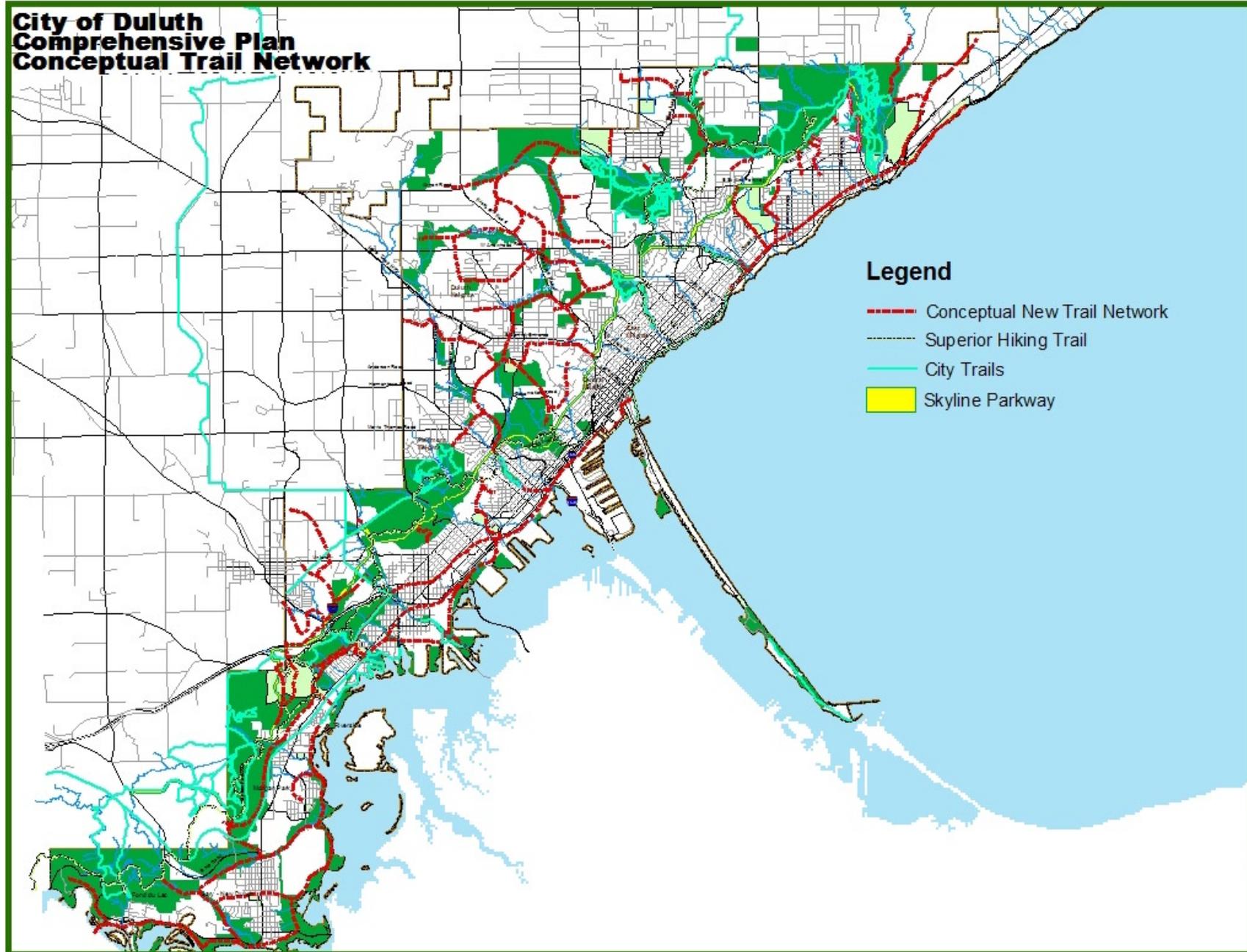
Subdivision 3. GIFTS; DONATIONS. The commissioner of natural resources is authorized to accept donations of land, or easements in land, for rest areas along the Lake Superior water trail, and may seek and accept money for this purpose from other public and private sources.

Source: *Lake Superior Water Trail Master Plan*

Implementation

Transportation

Figure I-20: Conceptual Trail Network



- D. Create a water trail network with specific access points and amenities for kayaks, canoes, and other non-motorized boats that links to and enhances the Lake Superior Water Trail.

T16. Make Skyline Parkway more pedestrian and bike friendly:

- A. Create Skyline Parkway-specific goals and guidelines for designing, designating, and building bike/pedestrian lanes.
- B. Prioritize improvements based on recommendations of the Skyline Parkway Corridor Management Plan.
- C. Investigate co-funding options with other communities, state and federal agencies, and local institutions and businesses.
- D. Investigate options for lowering the speed limit.

T17. Keep trail maintenance costs low in the following ways:

- A. Work to enhance existing volunteer efforts and publicly recognize the volunteers from non-profit user groups that perform trail maintenance and building (i.e. Cyclists of the Gitchee Gummee Shores, Lake Superior Hiking Trail Association, Duluth XC Ski Club, Sustainable Trails Alliance, etc.).
- B. Keep most trails in the system as single track multi-use, but create rights-of-way that allow for widening as trail usage increases or the need for separation between user types warrants additional width.
- C. Only pave trails when high volume warrants, such as on the Lakewalk,
- D. Use crushed limestone or similar material as a trail base where moderate volumes of usage warrant,
- E. Close unpaved trails during extremely muddy conditions to protect the trail from erosion and damage. Close ski trails from multi-use during fall freeze up.

Required Bicycle Facilities for New Downtown Construction
(Minneapolis Ordinance Example)

Minimum Required Facilities	Building Area				
	At Least 500,000 sq. ft.	At Least 750,000 sq. ft.	At Least 1,000,000 sq. ft.	At Least 1,250,000 sq. ft.	At Least 1,500,000 sq. ft.
Bicycle Parking Spaces	30	45	60	75	90
Showers*	4	5	6	7	8
Full-Size Lockers*	15	22	30	37	45

*The minimum required shall be distributed between men's and women's facilities.

T18. Encourage commuting by bicycle:

- A.** Identify arterial routes for bicycle and include consideration of bike traffic flow when designing intersections, timing signals, and signing roads.
- B.** Develop bicycle-friendly street design standards, including:
 - i.** keeping storm water covers perpendicular to street.
 - ii.** creating standards for marked bicycle lanes and incorporate into street design standards.
- C.** Encourage downtown businesses to incorporate bike station concepts in travel demand management plans. Consider co-funding incentives, aggregation of business contributions, or other funding techniques to create centralized bicycle facilities downtown,
- D.** Consider zoning requirements for provision of bicycle parking for most non-residential development and for bicycle facilities in large commercial or employment center buildings.

T19. Promote Duluth's trail system and trail connections to the region.

- A.** Advertise trails to residents, visitors, and in business recruitment efforts.
- B.** Sell maps of the Duluth trail systems for a nominal fee to visitors and use the proceeds to maintain and improve the trail system.

[Economic connectivity](#)

While most of the connectivity issues in the City address the needs of individuals, households, and retail markets (services and goods), the Comprehensive Plan also addresses economic

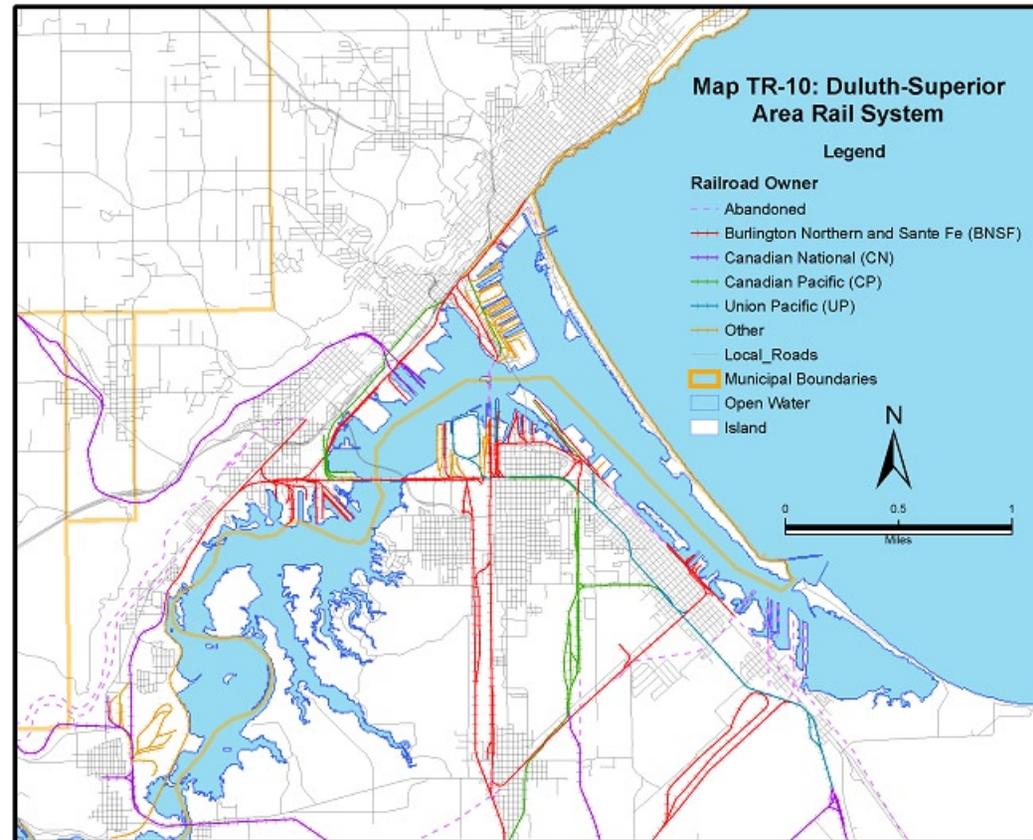
connectivity. The City's shipping, rail, and air facilities, in addition to the intermodal infrastructure that connects to the national highway system, are key elements in sustaining Duluth's economic position and ultimately the quality of life for Duluth residents.

The City has adopted governing principles relating to economic connectivity, incorporated land use needs of the water, rail, and air transport into its future land use map, and identified policies for sustaining economic transportation capabilities. The following implementation strategies will help the City achieve its economic connectivity goals.

T20. Continue to work with the Seaway Port Authority, Army Corps of Engineers, Coast Guard, land owners and businesses, and resident stakeholder groups to maintain Duluth's shipping channels and intermodal port facilities (Transportation Implementation Examples Map #18).

- A. Protect the viability of the shipping corridor through guiding appropriate land uses to, and restricting inappropriate uses from, sites with access to the channel,
- B. Support decision-making processes that create environment- and community-sensitive solutions to dredging, water traffic conflicts, and water quality issues of on-going port operation,
- C. Plan for facilities that could be used for passenger transportation, including docking of a variety of vessel types and the intermodal considerations necessary for passenger travel.

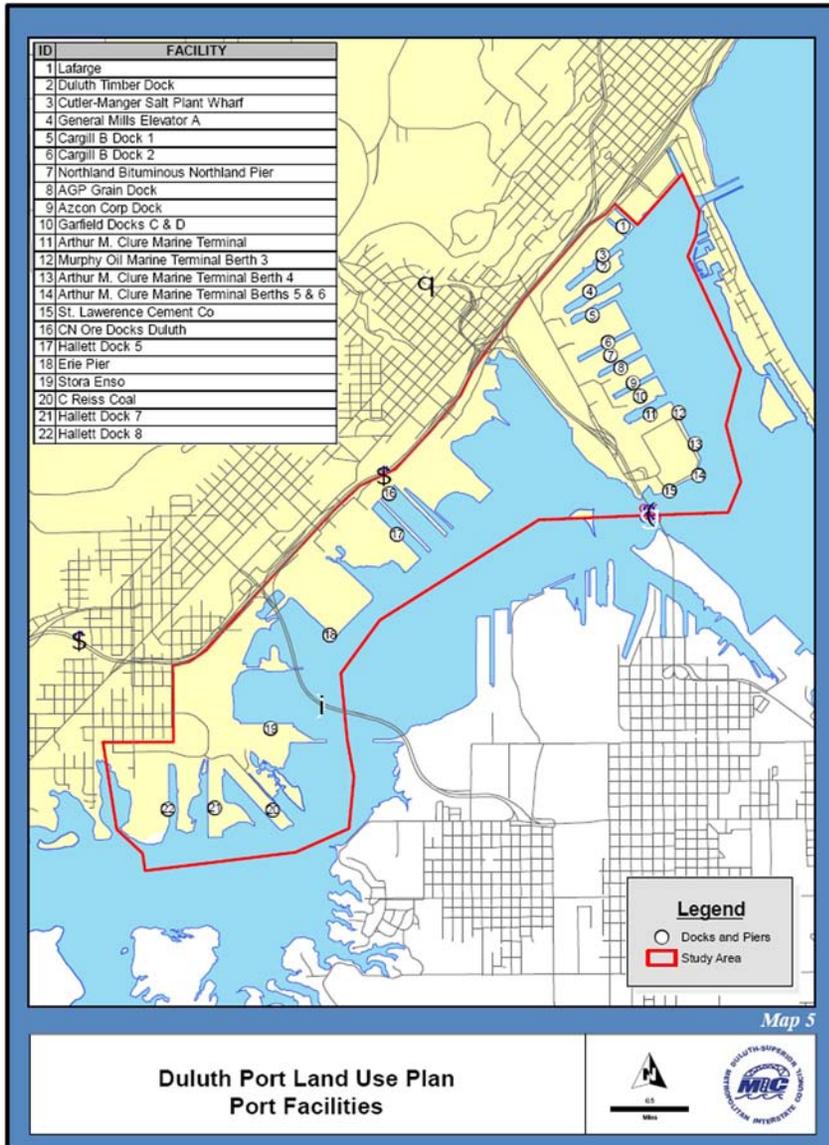
Figure I-22: Duluth-Superior Railroads



Source: *Duluth-Superior Long Range Transportation Plan*, P. 191, MIC, 2005

Implementation Transportation

Figure I-21: Port Facilities



Source: *Duluth Port Land Use Plan*, P. 29, MIC, 2005

T21. The City will continue to protect freight corridors and intermodal facilities that link water-borne shipping with rail and truck shipping. Investigate potential financial partnerships and land use issues for creating new intermodal facilities linking rail, truck, and port transportation.

T22. Continue to work with the Duluth Airport Authority to implement the Duluth International Airport Master Plan and the Duluth Airport Land Use Plan (#17 on the Transportation Issues Map). Proposed land uses around the airport should not conflict with the primary land use needs of the airport, including addressing the restrictions and recommendations associated with Federal safety zones and noise contours.

- A.** Investigate rail connections to the Duluth International Airport and the potential for intermodal facilities to expand air freight markets and support industrial expansion.
- B.** Improve the wayfinding system around Duluth International Airport to help air passengers and freight haulers access and use existing connections to the regional highway system.

Capital Improvement and Public Facilities

The Comprehensive Plan portrays the preferred mix of land uses at a point 20 years in the future. Achieving this mix of land uses does not, however, occur all at once. Development and preservation actions are strongly linked to market pressure, implementation of local land use policies, and availability of infrastructure capacity. In order to portray how the City should implement its future land use preferences over time, a conceptual development staging map was developed (Figure I-23) showing the preferred order of development rather than the preferred type of development.

The conceptual staging map was based on the following assumptions:

- Re-development and infill development is the City’s top development priority, consistent with the Plan’s **Principle #1 – Reuse previously developed lands**.
- The order of development should retain the integrity of the City’s green infrastructure, consistent with the Plan’s **Principle #2 – Declare the necessity and secure the future of undeveloped places** - including undeveloped lands being held in reserve until needed to meet demand for housing or commercial/industrial development.
- Development should occur in a manner that allows for cost-efficient investment and management of public gray and green infrastructure, consistent with the Plan’s **Principle #12 – Create efficiencies in the delivery of public services**.

The conceptual staging map shows three staged development categories:

- A. **Tier 1** - Comprises the existing developed areas in the City (or previously developed areas) where gray infrastructure exists or can be easily extended.
- B. **Tier 2** - Areas largely within existing service basins for water and wastewater services, and served by or close to the existing road network.
- C. **Tier 3** - Areas of the City that have been assigned a developed land use category on the future land use map, but are outside infrastructure and service basins and likely to require greater investment in public gray infrastructure in order for development to occur.

In addition to the three staged development categories, the staging map shows areas designated for development but not for the provision of most public services. These areas are designated as Rural Residential and will be developed consistent with conserving green infrastructure (using conservation design standards) as described elsewhere in the implementation section.

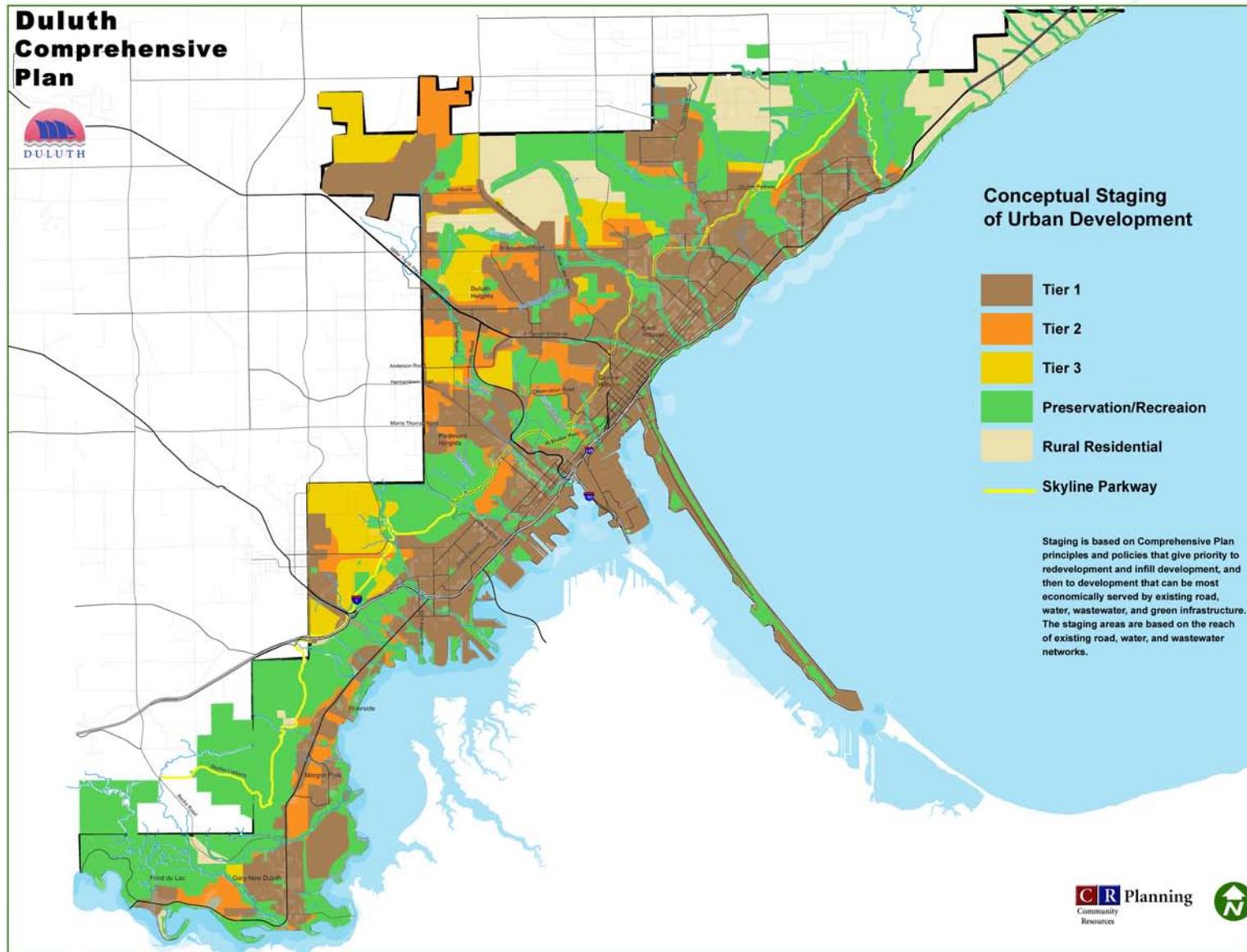
“Studies of Duluth tend to show that the chief present need from a city planning standpoint is not so much spectacular and expensive corrective measures, such as street widenings and openings, as the ability to control new growth along proper lines. This fundamentally is the purpose of a city plan.”

Preliminary Major Street Plan and Transit Plan, City Planning Commission, Duluth, 1927, p. 1

Implementation

Capital Improvement and Public Facilities

Figure I-23: Conceptual Staging of Urban Development



Implementation



The following conceptual facilities plan is based on the conceptual staging map, Plan policies, and the future land use map. The City will need to create clear tier standards, as described in the land use implementation section in order to provide additional guidance to future infrastructure decisions.

Conceptual facilities plan

Adequate infrastructure capacity, particularly of gray infrastructure systems, is necessary to meet staging goals of redevelopment, infill development, and protecting the integrity of the green infrastructure system. Furthermore, as neighborhood extensions reach the limits of existing water and wastewater service basins, larger public investments such as lift stations will become necessary to meet development priorities. These are significant planning issues that should be considered as the Comprehensive Plan is implemented.

The following section examines the potential ramifications of the conceptual staging plan on the need for new public infrastructure investments or better infrastructure management. This analysis is divided into three study areas that match the East, Central, and West Comprehensive Plan areas.

East planning area

North Shore - The farthest east end of the City, extending along the North Shore of Lake Superior, recently had water and sewer extensions completed as a result of failed on-site systems and contaminated drinking water supplies. The Western Lake Superior Sanitary District, planning with the City of Duluth, Lakewood and Duluth Townships, supported a project to supply wastewater collection to the rural east side of the City as well as portions of the townships east of Duluth. A new sanitary district, the Duluth/North Shore Sanitary District (D/NSSD) covers the City of Duluth from Lester River to the community of Knife River and from the Highway 61 expressway to the shoreline. This wastewater system utilizes individual grinder pump stations transmitting wastewater to a combination of pressurized and conventional gravity sewer with treatment at the Western Lake Superior Sanitary District in Duluth. Sufficient capacity is available in the system for continued growth in this area. The Duluth portion of the Sanitary District is, however, designated as Rural Residential on the future land use map. Protection of the North Shore green infrastructure - sensitive shoreline, recreation areas, and designated scenic viewsheds is inconsistent with urban densities and is the limiting factor for development within the D/NSSD service territory. The wastewater system will not, due to the Sanitary District ordinance, be extended above the expressway (Highway 61), an area that is also designated Rural Residential.

Gray Infrastructure Investments to Protect Green Infrastructure

Investing in new drinking water storage capacity in strategic areas will allow the City to better meet its infill and neighborhood extension staging goals. Encouraging investment in infill and neighborhood extensions helps direct development market pressure to areas already served by existing emergency services, recreational facilities, schools, and streets. Meeting infill and neighborhood extension goals also directs development pressure away from undeveloped areas where the green infrastructure systems are largely intact.

Implementation

Capital Improvement and Public Facilities



West of Lester River - In the upper Lakeside area the staging map shows Tier 1 and 2 areas between Seven Bridges Road and 42nd Ave. East. These areas will require additional water infrastructure to allow for residential infill (Tier 1) and neighborhood extension (Tier 2). The area is currently served by adequate water distribution lines but has pressure loss and total flow limitations that inhibit build-out scenarios. Fire protection and adequate storage capacities will require a water booster station and increase in existing storage capacity or additional sub-surface storage tanks.

This area has, in the past, seen wastewater collection system overflows and pump station bypasses that resulted in untreated wastewater flowing into Lake Superior. Both the WLSSD and Environmental Protection Agency placed restrictions on sewer extensions or development that would increase flows within these basins. Any private development project would have to include construction of a wastewater storage facility to divert flows for storage during a heavy rain or fast snowmelt condition. Due to the recent completion of two subsurface inflow and infiltration storage facilities and rebuilt pump stations, wastewater overflows in this area have been alleviated. The addition of this 2.2 million gallons of surge capacity will generally allow further infill development in the upper Lakeside area, consistent with the future land use map, without significant private investment in wastewater storage retention



The future land use map indicates development at urban densities (requiring centralized water and wastewater facilities) east of Arnold Road to Woodland Ave. This area is designated as Tier 1 and some Tier 2 development on the conceptual staging map. Sections of this area are currently serviced by individual septic systems and some individual drinking water wells. Municipal wastewater services are limited in this area and would require extensions of the wastewater collection system to support additional residential development.

Drinking water is not as limited east of Arnold Road. Where water services are provided adequate pressure and capacity exists in most, but not all areas. The eastern edge of this area, designated as Tier 1, will require a water pressure boosting station and additional water storage. Comfort Systems (the City's water and gas department) has identified this improvement on its list of capital improvements (*Water System Potential Growth – 20 Year Plan*), calling for a new storage tank at Skyline and London Road between 2009 and 2013. This Tier 1 area will not, therefore, be ready for development in the near term unless the project is moved forward.

The Tier 3 areas within the Eastern section are generally easily served by wastewater service, but are limited for drinking water due to capacity limitations. The Tier 3 areas would require additional water storage and transmission investment in order to develop at urban densities. Comfort Systems does not have a plan to extend services to this area within its existing 20-year list of projects.

Emergency Services

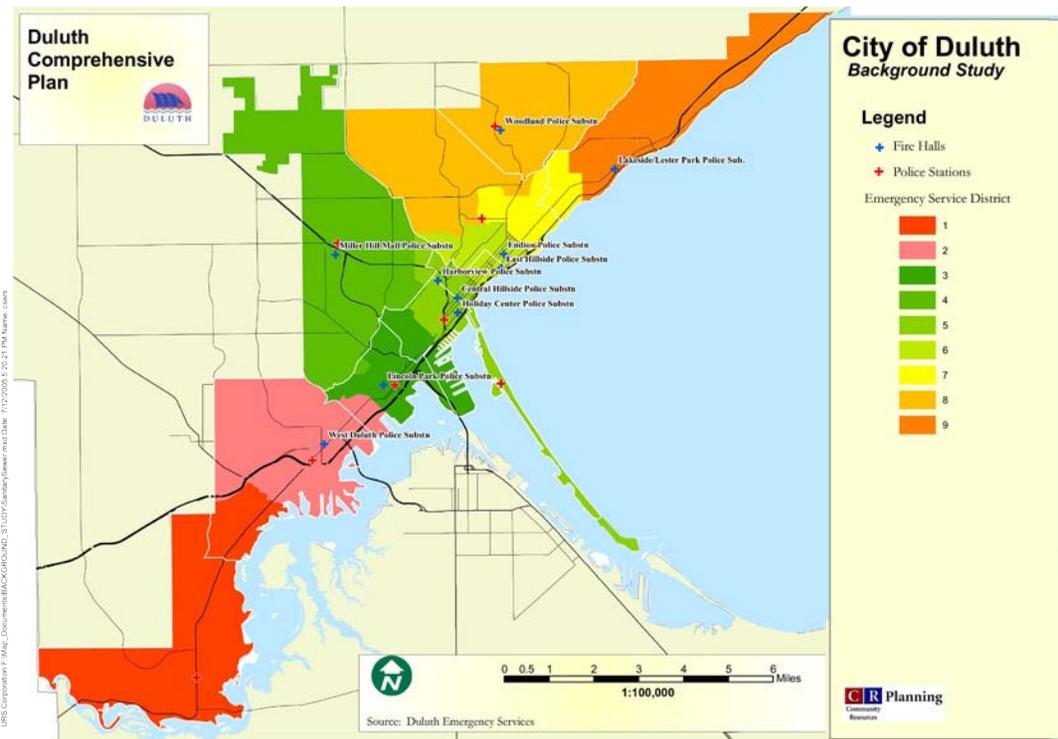
The East planning area is served by three fire response areas and two police squad areas. The most remote and difficult to serve areas have been designated Rural Residential on the future land use map and are thus unlikely (if developed) to create substantial new burdens on existing emergency service capability and level of service. Access to some of the Rural Residential areas is, however, difficult and the geographic size of the existing squad and response districts is large, particularly in the City’s North Shore area (east of Lester River). Some staging decisions may, therefore, need to be made in regard to Rural Residential development.

Central Planning Area

In order to meet the preferred mix of land uses shown on the future land use map for the Central Planning area, a number of extensive infrastructure improvements will be required. The Central area is the most densely developed area and also has the oldest infrastructure of the three planning areas. The existing wastewater collection system (the gravity mains and collectors) in much of the area is antiquated and suffers from inflow and infiltration (I&I) of clear water during times of snowmelt and heavy rain. Comfort Systems staff estimated the cost of rebuilding the older system to range between \$53 and \$75 million. Significant regular investment is needed to replace the existing pipes simply in order to support existing development.

In order to keep rates from increasing substantially, the rebuilding of the system must compete with investment needed to allow new Tier 1 and Tier 2 development elsewhere in the City, and

Figure I-24: Emergency Service Districts



“The fire department has placed fire stations in neighborhoods to quickly respond to areas where historically we have the most runs while still insuring an adequate response to the entire city. The fire department is participating in neighborhood meetings and looks forward to the comprehensive plan process. Completion of the comprehensive plan will require an assessment of future fire station staffing and location. Both are good tools to identify public safety needs.”

Fire Department Service Review, 2004, p. 65

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Figure I-25: Water Pressure



may require public investment to increase pressure. Adequate pressure and capacity are in place just above (uphill from) this area to meet the City's infill development goals. Wastewater infrastructure is adequate both in term of dry weather capacity and for extensions into the planned development areas.

Some areas within the Central Planning area, such as North Road and Middle Road along Howard Gnesen Road, are described as Tier 1 development opportunities. These areas are 30 feet lower than the nearest wastewater pump station and would require a small diameter force main or the addition of another wastewater pump station in order to meet Tier 1 development goals. These solutions significantly increase both upfront capital costs and on-going maintenance costs, putting upward pressure on rates for the entire system.

The airport area has wastewater service but very limited water capacity and pressure available. Growth in the immediate Tier I development area will require significant water infrastructure up-grades in the form of booster pump stations and possibly a water storage facility. Special

storage capacity investments needed to reduce peak flows. Replacement of the pipes may not, however, address the capacity shortfalls described above.

Although significant strides have been made to alleviate the I&I problems, wastewater overflows and bypasses continue to occur at the Endion pumping station located at the bottom of 18th Avenue East and Water Street. The persistence of these overflows has prompted the City to continue with its program of building large I&I storage basins in priority areas. The Endion station is planned as next location for such a structure. Planned for completion in late 2007, the storage facility will provide capacity for additional development in the Central planning area.

Residential and commercial development identified on the future land use map in the 4th to 5th street area from approximately 12th Ave. E. to 6th Ave. W. is limited by isolated water pressure deficiencies – the pressure and capacity may not meet fire suppression requirements. Infill opportunities, particularly in the area of 1st Ave. E. and 4th Street where there is a cluster of fire hydrants with substandard pressure,

provisions were made for the Cirrus Aviation group to meet the existing fire suppression codes, but would not be feasible for the remaining area.

The Tier 2 and 3 development areas north and east of the airport, delineated between Ridgeway Road south to Martin Road, are not serviced by water or wastewater infrastructure. Development in these areas would require pipe extensions to provide water and wastewater services. Water service to this area would be the most costly, requiring additional transmission lines as well as a booster pumping station and a water storage component. Moreover, some areas within this Tier 2 development area are more than 30 feet below the nearest sewage pumping station, thus requiring a small diameter force main solution or additional wastewater collection lines that would feed an additional wastewater pump station. Strategic site planning could avoid having to place additional lift stations in those areas.

In the Observation Road area, bordered by Trinity Road and East Central Entrance, there is a large area that currently has no water or wastewater utility service and has severe slopes and rock outcroppings preventing development to date. Development pressure to build high-end homes with a view has revived near-term interest in developing this area. Sections of the Observation Road area lie within Tier 1 and 2 developable areas. The City has discussed the installation of a water loop to assist in serving this area. Comfort Systems' long-range capital improvement plan identifies this improvement within the short term planning horizon.

The 20-year plan calls for a 6 inch to 16 inch water extension on Trinity Road from Home Depot to Anderson Road to Chambersberg Avenue in 2006. Bedrock at the surface and significant slopes has hindered the installation of infrastructure and consequent development in this area.

Tier 3 development opportunities in the Central area would require extensive water and wastewater infrastructure investments. The presence of bedrock outcrops and severe slopes create special challenges both from an engineering perspective and a financial one. Furthermore, the upper (northern) reaches of the Central area quickly exceed the 30 foot pumping requirement for wastewater transmission, and would require very long reaches of pipe.

Emergency Services

The Central planning area includes both the City's most densely developed areas and some of its most remote. Three police squad areas and five fire response areas (including partial areas) cover the Central planning area. The average response times for police and fire across this area reflect the breadth of topography and density. The large Tier 2 and 3 areas in the north

“Much of Duluth is built on a hill. This increases response time and the need to have more stations – some located on the bottom of the hill and some on top. With Duluth's long winter road conditions, it is difficult to get to and work around buildings. While nothing can be done to change the terrain, recognizing the challenges and adjusting station districting allows for the best response time and protection of all areas of the city.”

Fire Department Service Review, 2004, p. 35

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and northwest portions of the City present significant challenges for maintaining acceptable levels of service for emergency response. If these areas become fully developed, additional stations and equipment are likely to be needed, increasing not only capital bonding needs but annual budgets for staff and equipment. The Rural Residential areas in Fire Response Area 4 (west of Howard Gnesen Road) could also present service difficulties due to access and distance from existing fire halls and police stations.

West Planning Area

St. Louis River shore areas. Significant portions of land between 40th Avenue and 62nd Avenue West along the St. Louis River are designated as Tier 1 for urban development. As waterfront property, these areas are highly sought after for development, but exhibit challenges for utility extension. Currently, little of this area is served with water and wastewater utilities. The Tier 1 area is, furthermore, not contiguous, comprising separate peninsulas of land jutting out into the river. Traditional gravity sewer in this area would be cost-prohibitive and could require separate sections of interceptor pipes and corresponding pump stations. Depending on the number of homes or businesses in any one such peninsula of land, small diameter force mains may be utilized with individual grinder pump stations, but the total lift in feet to the existing interceptor lines may be a difficult engineering or cost barrier to overcome. Lines can be ‘jack-bored’ under sections of water line, allowing for a one line collection main with subsequent laterals to service individual homes.

Comfort Systems’ current policy is that the City will maintain, but not install small diameter force main systems that require individual grinder pump stations for each home or business. But the operation and maintenance of grinder pump stations and the laterals connecting a house to the main would be the responsibility of the homeowner or developer of the area. Homeowners or businesses are thus responsible for maintaining their wastewater infrastructure over time, similar to individual maintenance requirements for a septic system. The only exception to the City’s policy is the small diameter system located in Fond-du-Lac neighborhood. This project was funded through State of Minnesota funds and as a requirement of these funds, operation and maintenance performed by the City. The North Shore region in the East Area also has a pressurized system with individual grinder pumps, but this system is operated and maintained by a third party, the D/NSSD, not the City. If the use of individual grinder pump stations and small diameter pressure mains continues as a wastewater collection solution, joint maintenance and operation is a possibility for the areas along the St. Louis River, but costs per household or per business would likely be substantial. Such areas might be served using the D/NSSD model (a separate sanitary district for the collection system),

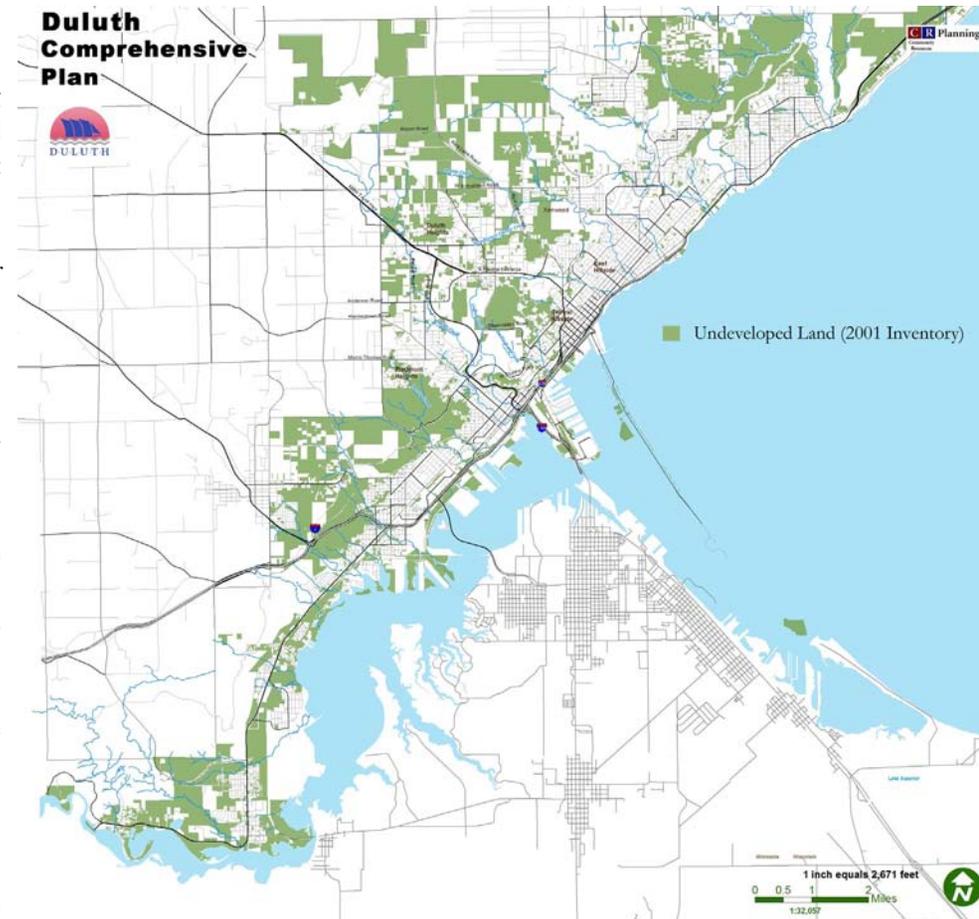
if costs do not put development outside the range of market prices.

While water infrastructure is not readily available along the St. Louis River development areas, water service is less of an obstacle to development than in some other parts of the City. Being lower in elevation than existing water lines, gravity would feed individual developments along the shoreline. The water district in this area has adequate pressure and capacity already available, so water service would be relatively inexpensive compared to wastewater service. *The Water System Potential Growth – 20 Year Plan* calls for a new Arlington Reservoir and a new Highland Avenue tank to be built between 2009 – 2013, although the Arlington Reservoir project is being reconsidered.

St. Louis River Road to Proctor. The area adjacent to the City of Proctor, between the St. Louis River Road, Vinland Street, down through West Skyline Parkway to the Proctor City limits, includes Tier 1, 2, and 3 areas. Further development in this area would need to be examined carefully as the City of Hermantown has negotiated for sewer capacity with Western Lake Superior Sanitary District reducing the amount of capacity available for other expansion. The original intent of this up-graded interceptor was to alleviate over-capacity issues on Haines Road and divert wastewater flow further west. This plan corresponded with the City of Hermantown's three-phase wastewater collection system up-grades and extension plans. The total capacity allocation to the City of Hermantown, as well as the additional flow from the Pike Lake collection system may not leave much capacity for additional development along this interceptor within Duluth's city limits.

Riverside to Fond du Lac. The conceptual staging map indicates there are considerable areas available to support higher density housing or commercial development from the Riverside neighborhood out through the Fond-du-Lac neighborhood. Wastewater infrastructure capacity in these areas is adequate to support new development since wet weather surge protection is provided by a one million gallon storm water storage facility located in Gary-New Duluth.

Figure I-26: Potential Greenfield Development Areas (2001)



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Water storage capacity and adequate pressure becomes a limiting factor for further development due to the area's location (far western fringes of the City). Water storage capacity limitations are particularly significant with regard to brownfield re-development opportunities for sites such as the vacant Atlas Cement facility and the U.S. Steel site located in Morgan Park. The latter site is designated as a mixed use redevelopment site that should include a diverse range of uses, from residential to light industrial. Both of these sites are problematic due to existing water pressure and capacity to meet fire protection needs. Water storage facilities as well as a water pressure boosting station would need to be constructed to meet pressure requirements. The large size of these areas can help to address water storage issues— a large master-planned redevelopment effort could provide sufficient private capital to justify new public infrastructure, if densities and market demand are both high enough to justify such a large investment.

Tier 3 development areas in Gary New-Duluth include challenging sections that are significantly higher in elevation than existing water lines and thus present pressure and capacity limitations. Wastewater additions are also complicated by the need to utilize grinder pumps and small diameter force mains already in use in this area. Additional grinder pump stations would be required and would create operation and maintenance issues for the City.

Emergency Services

The West planning area includes three fire response areas and two police squad areas. Response times are currently within acceptable parameters, but topography and access makes coverage for some outlying areas problematic. However, most of the Tier 2 and 3 areas do not expand the coverage area significantly, since coverage is already spread out along Highway 23 and adjacent to the City of Proctor. Emergency service staging issues are more likely to involve adequate staffing and equipping of existing facilities rather than creation of new stations. The greatest uncertainty for emergency services lies in the type and extent of large redevelopment areas, such as the U.S. Steel site, particularly if a significant cluster of homes or small businesses is developed on the site. Other potential new clusters of density, including sites such as those at the foot of Spirit Mountain or in Riverside's commercial waterfront area, could potentially create 'high risk' areas for fire response planning.

Capital Improvement Plan

The above analysis shows that the City will need to carefully evaluate infill and re-development priorities as they relate to capital expenditures and new infrastructure management

2006 City of Duluth Comprehensive Plan

High Risk Areas

A few examples of high risk areas in Duluth are the business districts of downtown and Spirit Valley. Those areas have large structures that are side by side and need more firefighters and equipment to respond. While firefighters from outside those areas can respond to assist, the initial attack on these types of fires can be critical to containing the fire quickly and stopping the fire from spreading to another building.

Fire Department Service Review, 2004, p. 65

responsibilities. Development assistance, public investments in infrastructure, tax increment financing, and other incentives are available to meet the City's staging goals and follow the Comprehensive Plan Governing Principles. Areas that can be developed without having to invest in new infrastructure or take on additional maintenance responsibilities should be a top priority for the City. For instance there are vacant lots and dilapidated or abandoned structures within the City limits. Redeveloping unused, underused, or blighted sites would yield property with infrastructure and public services readily available, from utilities to streets, emergency services and recreation amenities. The public costs, if any, may be limited to the removal of old structures and any necessary remediation.

Urban infill areas and neighborhood extension areas within Tier 1 may need to be prioritized according to their locations relative to existing infrastructure. The further a specific development is from underground utilities, the higher the costs to provide services, both in primary construction and the associated operation and maintenance costs. Tier 1 developmental 'rings' could be delineated on a conceptual map that would outline a strategy for phased urbanization. Implementation priorities for the Tier/area include:

- Construction of I&I surge basins for the wastewater collection system, and continued abatement of I&I sources, will enhance service opportunities for existing neighborhoods and businesses while allowing further development within the City limits.
- Older wastewater and water systems must be rebuilt to maintain reasonable quality of service to existing developed areas; this can also provide incentives for infill and neighborhood extensions by building capacity into utility basins or districts designated for expansion on the future land use map.
- Continuing to improve the existing transportation systems, including the multi-modal road system, pedestrian rights-of-way, and trails, will expand capacity for infill and neighborhood extensions.

Neighborhood extensions and new neighborhoods in Tier 2, and virtually the entire area in Tier 3, will require the City to commit to substantial extensions of water and wastewater systems, and to consider when larger investments in pumping stations are justified. Adding to the existing road and trail network also increases the City's maintenance responsibilities and ultimate rebuilding costs. But the primary consideration in extending services into the Tier 2 and 3 areas lies in capitalizing water transmission infrastructure improvements. The financial investment and the magnitude of costs will dictate where urban-density residential or commercial development occurs.

"Duluth's shape has a major impact on the fire protection needs and cost. Most modern cities are relatively square with streets and utilities in a grid pattern. Duluth's shape not only increases the cost of our infrastructure, it also increases the number of fire stations necessary to provide a timely response to all areas of the city. A community similar in population and smaller in size might require fewer fire stations."

Fire Department Service Review, 2004, p. 35

Implementation

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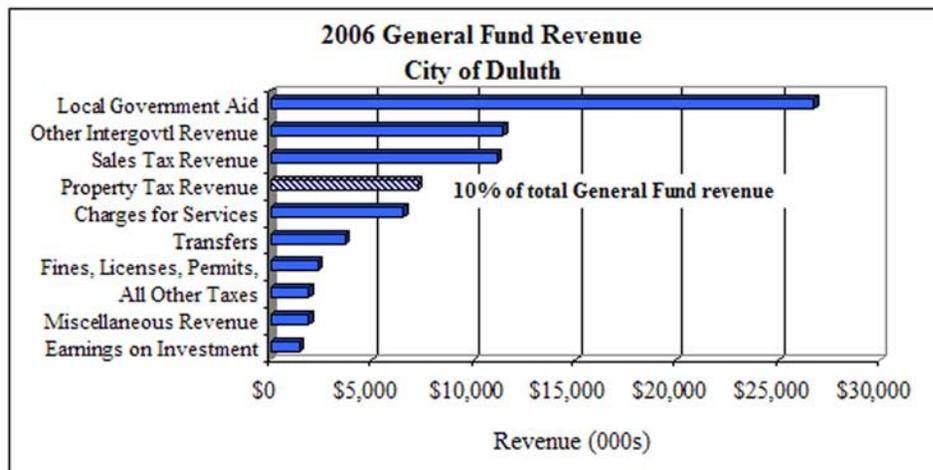
The City has some capacity for more detailed hydraulic modeling in order to better link development staging and infrastructure expansion. An evaluation of the hydraulic water model will also need to take place, as this data will directly affect plans for infill. The software, called EPA-NET, is a network analysis tool with the capability to compute water distribution pressure and flow differentials throughout the City, using different variables.

Capital and maintenance costs

Development requires both new infrastructure and maintenance of infrastructure over time. While property taxes generated from development support some of the ongoing costs of maintenance and repair, property tax revenues are unlikely to wholly support the ongoing infrastructure maintenance and rebuilding costs faced by the City. The following outlines some of the financial implications of adding new infrastructure to meet staging goals outlined in the Comprehensive Plan.

- A wastewater lift station ranges in cost from \$180,000 to \$220,000 (in 2006 dollars), depending on the sophistication of the electronic equipment installed into the station. This includes the telemetric, skada systems and controls (remote and manual) installations.
- A drinking water booster station ranges in cost from \$250,000 to 300,000. The additional costs are due to the increased mechanical and pump requirements to maintain needed water pressures.

Figure I-27: 2006 General Fund Revenue Sources



- Wastewater pumping stations ranging in cost from \$150,000 to \$250,000. Electricity for pumping is a major operating expense for both the water and wastewater systems. Adding additional infrastructure adds costs not only for the initial construction but for annual maintenance and accounting for depreciation (rebuilding). Duluth's topography does not lend itself to a philosophy of reducing utility fees by encouraging development in green field locations.
- The average annual cost per mile of street for snow plowing and routine maintenance is approximately \$11,000, in 2006 dollars, (excluding street sweeping and stormwater related maintenance). These costs are incurred regardless of the number of homes or business located along the street.

- Emergency services (police and fire departments) constitute 40% (2006) of the city's expenditures. The 2004 budget for police services was over \$12 million, while fire services cost almost \$10 million, excluding pension costs and other costs ultimately paid by the State of Minnesota. The distribution of homes and businesses has a significant impact on the cost of providing services, and the effectiveness of services as measured in terms of response times. Building and staffing new fire and police stations is much more expensive than adding staff or equipment to existing stations (the analysis of marginal costs to compare these scenarios is quite complex).

The following chart demonstrates the range of costs for discrete kinds of projects, based on historic data for similar projects in Duluth. The costs have been adjusted to 2006 dollars.

Figure I-28: Gray Infrastructure Capital Costs

Gray Infrastructure Capital Costs										
	(1) (2)	INFRASTRUCTURE COMPONENTS								
Project Description	Cost / Lin. Ft.	Urban Bituminous Street	Urban Concrete Street	Watermain & Hydrants	Water Services	Sanitary Sewer & MH's	Sanitary Services	Storm Sewer & MH's	Storm Leads & CB's	Gas Main & Services
Local Street Reconstruct	\$290	X			O		O		X	
Local Street Reconstruct (With Water)	\$355	X		X	X		O		X	
Local Street Reconstruct (Water, Sanitary)	\$410	X		X	X	X	X		X	
Local Street Reconstruct (Water, Sanitary, Storm)	\$465	X		X	X	X	X	X	X	
Local Street Reconstruct (Water, Sanitary, Storm, Gas)	\$490	X		X	X	X	X	X	X	X
Rural to Urban Street Reconstruct	\$340	X		O	O	O	O	X	X	O
Rural to Urban Street Reconstruct w/Rock	\$375	X		O	O	O	O	X	X	O
New Local Street (Water, Sanitary, Storm, Gas)	\$450	X		X	X	X	X	X	X	X
New Local Street (Water, Sanitary, Storm, Gas, w/Rock)	\$500	X		X	X	X	X	X	X	X
State-Aid Collector Street Reconstruct	\$375		X		O	O	O	O	X	
State-Aid Arterial Street Reconstruct	\$400		X		O	O	O	O	X	
Watermain Reconstruction Local Street	\$85	O		X	X					
Watermain Reconstruction Local Street w/Rock	\$105	O		X	X		O			O
Watermain Reconstruction State Aid Street	\$100		O	X	X					

Implementation

Capital Improvement and Public Facilities

Gray Infrastructure Capital Costs										
	(1) (2)	INFRASTRUCTURE COMPONENTS								
Project Description	Cost / Lin. Ft.	Urban Bituminous Street	Urban Concrete Street	Watermain & Hydrants	Water Services	Sanitary Sewer & MH's	Sanitary Services	Storm Sewer & MH's	Storm Leads & CB's	Gas Main & Services
New 2" HDPE High Pressure Gas Main	\$25									X
New 3" HDPE High Pressure Gas Main	\$30									X
New 6" HDPE High Pressure Gas Main	\$75	O								X
Sanitary Sewer Trenchless Rehabilitation	\$65					O	O			
Sanitary Sewer Reconstruction	\$85	O				X	X			
Sanitary Sewer Reconstruction w/Rock	\$105	O			O	X	X			O
New Sanitary Sewer Extension	\$95	O				X	X			
New Sanitary Sewer Extension w/Rock	\$135	O				X	X			
	O	Partial Replacement, Upgrades, or Restoration								
	X	New or Complete Replacement								

Notes:

- 1) The Cost Rate is shown in terms of Dollars per Linear Foot of the improvement along the length of the corridor. The cost rate shown includes: construction costs, design/construction engineering, and city administration of project. This cost rate does NOT include operations and/or maintenance costs, but does demonstrate a budget cost to the City for each category of public infrastructure improvement.
- 2) Costs are based on 2006 Construction Dollars
- 3) MH = manhole, CB = catch basin