Local Planning Resource Guide:

Linking Land Use and Transportation Planning

Developed by the North Dakota Department of Transportation
Planning/Asset Management Division
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1: INTRODUCTION

For several decades North Dakota's population remained relatively stable, although a general pattern of population migration from rural to urban areas was experienced within the State. The dynamic of population growth has been significantly altered in recent years due in large part to energy development in western North Dakota. Rural areas once experiencing slow population decline are now experiencing rapid population growth, bringing with it unique land use and transportation challenges and opportunities. The NDDOT recognizes the link between transportation and land use decisions and the influence these decisions have on the local and State's transportation systems. The NDDOT supports sound planning to achieve quality communities, as well as, safe and efficient transportation systems.

Use of This Document

This document is intended to serve as a resource to local jurisdictions which may engage in the planning process to address issues they are facing or goals they seek to attain. It is intended to be a "living document" which may be added to or modified over time as local jurisdictional needs shift and planning practice and theory evolve in North Dakota.

Communities, townships, and counties will need to determine what approach is appropriate for their individual jurisdiction. The information provided within this document is not intended to be a prescriptive solution for jurisdictions but rather provide a variety of options or tools that jurisdictions might consider while dealing with the opportunities and challenges of growth.

Why Plan

Jurisdictions plan in order to improve the quality of public choices and decisions. Primarily the planning profession has evolved to ensure the health, safety, and general welfare of jurisdictions.

Having a plan is worthwhile for the following reasons:

1. Planning is a means of preparing for the future. Planning enables us to look before we leap and avoid costly and sometimes embarrassing mistakes. Through planning, we come to understand what must be done now and in the future to achieve our goals.
2. Planning makes sense. For a jurisdiction, planning involves working together to balance competing interests. Planning also encourages people to think and organize their time, resources, and efforts.
3. Planning helps the jurisdiction recognize its priorities. With a plan, local officials can address the most urgent needs first.
4. Planning helps the jurisdiction set sound policies for development. A plan makes it easier for private developers and builders to respect and understand community desires and public policies as they develop their individual projects.

1: INTRODUCTION

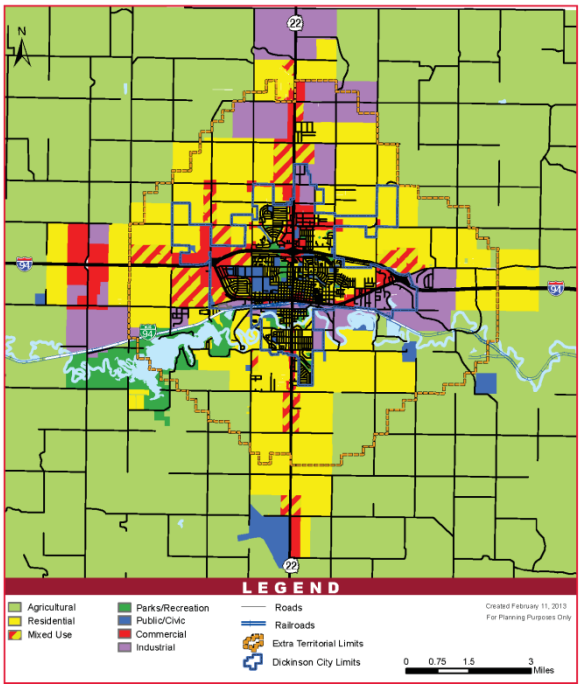
5. Planning helps identify both the positive and negative aspects of a jurisdiction. What is good should be protected; what is bad should be changed; what is possible should be pursued.
6. Planning helps to maintain a satisfactory quality of life. In locations with a decreasing population, planning may offer ways to maintain a positive quality of life and revitalize the area. In growing places, planning offers a way to protect and, if possible, enhance the quality of life.
7. The planning process is a means of empowering residents. Developing a plan provides an opportunity for public participation in the decision-making process.

From a jurisdictional perspective, entities will typically engage in both long range and current planning efforts. Both efforts help in the development of the jurisdiction. Long range planning establishes the future direction of the jurisdiction. Typically, long range plans look out from present day to 20 years into the future. Through the long range planning process, jurisdictional needs and desires are established based on local analysis and public input. Typically, through the long range planning process jurisdictional goals and objectives are established which guide recommendations developed in the process. Current planning assists in the implementation of the long range planning process and ensures that current development proposals are consistent with a jurisdiction's long range plans, as well as with a jurisdiction's land development regulations, which are guided by the long range planning process. Concepts of both long range planning and current planning will be described in further detail in the following chapters.

2: PLAN TYPES

Local jurisdictions may utilize a variety of different planning types to address their intended needs. This chapter describes a few commonly used planning types and how they might be used in the planning process.

Comprehensive Plan



Excerpt from the Dickinson Comprehensive Plan, 2013

What is it?

Historically, these types of documents may have been referred to as "Master Plans" or "General Plans", however most planning professionals refer to these subject plans as "Comprehensive Plans". The Comprehensive Plan is commonly used in many jurisdictions throughout the United States as the guiding document for future growth and development. The preparation of a comprehensive plan is the most ambitious undertaking of all plan types discussed in this document. Yet it is the most common and traditional approach to planning. It addresses all the relevant topics and issues affecting a jurisdiction's future and may include chapters on such topics as existing and future land use, education, transportation, economic development, open space/recreation, tourism, housing, public facilities, public infrastructure, or other topics as determined by the jurisdiction. It encompasses all of the geographic area of a subject jurisdiction and is long range in nature typically considering the present day characteristics of the jurisdiction, as well as issues and possibilities 20 to 30 years into the future.

The North Dakota Planning Association (NDPA) indicates the following general content of a comprehensive plan:

A comprehensive plan generally includes a strategy for development of land under the local jurisdiction.

- Often times this strategy is summarized in a "future land use map" which designates the general locations of differing types of land uses such as commercial, industrial, and residential areas. It also may identify locations for future public facilities such as water towers, fire stations, and parks. The strategy for land development may also address the phasing of future land development by designating some areas to be developed before other areas.
- In other instances a "comprehensive policy plan" is developed instead. In this type of comprehensive plan the "future land use map" may not be provided at all. Instead it might provide a more detailed set of goals, objectives, and policies to to provide guidance to the communities' development.

(*North Dakota Planning Handbook,* North Dakota Planning Association, 2005)

2: PLAN TYPES

Why conduct it?

Local jurisdictions prepare Comprehensive Plans for a variety of reasons which may include the following: allow jurisdictions to view the “big picture”; coordinate local decision making; give guidance to landowners and developers; establish sound, fact-based decision making; involve a broad array of interests in a discussion about the long-range future; and build informed constituency. The North Dakota Century Code (NDCC) identifies a Comprehensive Plan as “a statement in documented text setting forth explicit goals, objectives, policies, and standards of the jurisdiction to guide public and private development within its control” (NDCC 11-33-03, 40-47-03, and 58-03-12). Furthermore the NDCC indicates that zoning regulations for municipalities, townships, and counties must be in accordance with a comprehensive plan which generally requires certain elements be considered specific to each type of jurisdiction. Typically the comprehensive plan (in concert with zoning regulations) is developed to uphold the health, safety, and general welfare of the jurisdiction.

How to use it?

The comprehensive plan may be considered the guiding document for future development of a jurisdiction. It identifies where the jurisdiction currently is, where it would like to be, and how the jurisdiction might get there. The document is the foundation for establishing zoning and subdivision regulations, which might be considered the “tools” for implementing the comprehensive plan. Generally, a jurisdiction’s staff and/or elected and appointed officials will review development proposals (including but not limited to individual site developments, subdivisions, annexations, and zone map amendments) to the comprehensive plan for consistency to ensure the plan is implemented as adopted. Development proposals should be consistent with the comprehensive plan, however a comprehensive plan is a guiding document which can be amended over time if the recommendations from the plan are no longer consistent with the jurisdiction’s values. A comprehensive plan is generally updated when jurisdictional conditions such as population and/or employment change or natural events alter the character of the subject area. Many jurisdictions update their comprehensive plans on regular intervals. Depending on the size and amount of change the jurisdiction is facing this might be once every five to seven years.

Resources/Examples

Williams County Comprehensive Plan
http://www.williamsnd.com/usrfiles/WilliamsCountyCompPlan.pdf

City of Dickinson Comprehensive Plan
http://www.dickinsongov.com/Documents/Information%20Documents/Community%20Development/Dickinson%20Comprehensive%20Plan%20Final.pdf

For more information on Comprehensive Planning you may refer to work Vision West ND has developed at: http://www.visionwestnd.com/pdf/pz/Unit%202%20-%20Comprehensive%20Planning.pdf

North Dakota Planning Handbook, North Dakota Planning Association, 2005
http://www.ndplanning.org/uploads/6/3/5/8/6358136/fullcopy_reduced.pdf

Dynamic Community Impact Planning, NDSU Extension Service
http://www.ndlc.org/DocumentCenter/View/336

North Dakota Century Code, Titles 11, 40, and 58

The Small Town Planning Handbook, Daniels, Keller, and Lapping, 1988

Strategic Plan

What is it?
The basic characteristics of a strategic master plan are: (1) it is narrowly focused on what has been determined to be the most pressing and important issues of a jurisdiction; (2) it can be either short-range (2 to 5 years) or long-range (10 to 20 years) in scope; (3) it encompasses the entire area of the jurisdiction; and (4) the elements, or chapters, that are included in the plan are based on the priority issues identified by the community. These types of plans may be considered a "policy plan" which focuses on the goals, objectives, and policies a jurisdiction should follow rather than specific physical elements.

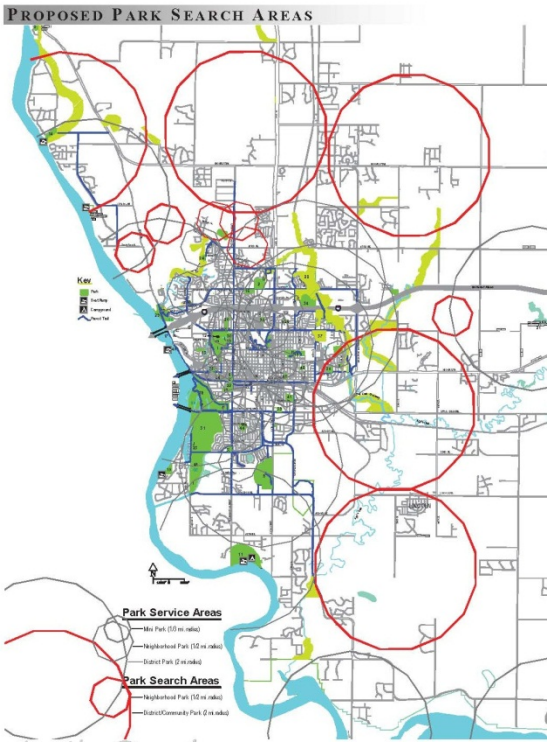
Why conduct it?
This type of plan may increase a jurisdictions competitive advantage by transforming perceived local weaknesses into strengths. Strategic planning may be appropriate for jurisdictions that are experiencing stagnation, decline, and/or diminishing investments and that need to think realistically about their options and to develop practical strategies in a regional context. Since these plans are typically more narrowly focused and can typically be completed faster than more traditional planning approaches this planning effort may be completed with fewer resources.

How to use it?
The strategic plan establishes direction to guide the jurisdiction or organization into the future. It allows a process for a local jurisdiction or an organization to build public consensus to establish "benchmarks" that can be used to measure progress toward the publically established vision and goals. The strategic plan commonly identifies the steps necessary to achieve the established vision and goals.

Resources/Examples
North Dakota Department of Transportation Long Range Transportation Plan Trans Action III)
http://www.dot.nd.gov/business/transactioniii/transactioniii.htm

2: PLAN TYPES

Functional Plan



Excerpt from Bismarck Park and Recreation District Plan, 2010

What is it?
A functional plan tends to focus on a certain operational or functional element of a jurisdiction. Sometimes these plans are referred to as “Master Plans” however generally focus on a specific functional physical element of a jurisdiction. Following are examples of functional plans commonly pursued: transportation plans (including long range transportation plans, public transportation plans, bicycle/pedestrian plans, and freight plans); water/sewer plans; park/open space plans; housing plans; and public facility plans. These tend to focus on specific functional elements throughout a subject jurisdiction and are long range plans which can focus on time frames ranging from present day to 20 to 30 years in the future. These types of plans may be conducted independently and by different agencies or departments however they should be coordinated to ensure consistency with the common jurisdictional goals and objectives.

Why conduct it?
Jurisdictions may opt to conduct a stand-alone functional plan as it provides a more detailed level of analysis related to a functional element of an area in comparison to a comprehensive plan. Jurisdictional departments which traditionally are not responsible for planning duties may engage in the development of functional plans such as parks/recreation, public works, or engineering departments.

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How to use it?
The jurisdiction may amend their comprehensive plan to incorporate a stand-alone functional plan or it may serve to inform the next update of the comprehensive plan. Local circumstances will usually determine whether these plans are suitable for inclusion as elements of a comprehensive plan, or whether they should be treated as stand-alone plans. Jurisdictions may review development proposals for consistency with a functional plan even if it is not specifically part of the comprehensive plan.

Resources/Examples
Fargo-Moorhead Metropolitan Council of Government Long Range Transportation Plan
http://www.fmmetrocog.org/new/assets/documents/LRTP/2014%20Long%20Range%20TransportationPlan%20-%20Metro%202040%20Approved%20071714.pdf

Bismarck Parks and Recreation District Plan
http://bisparks.org/wp-content/uploads/2012/04/Comprehensive-Plan-update2010.pdf

Subarea Plan

Excerpt from *Downtown Bismarck Subarea Study*, 2013

What is it?
A subarea plan may contain many of the same elements as a comprehensive plan, however it is typically conducted on a much smaller geographic scale, usually only a portion of a jurisdiction. Time frames for these plans can vary from present day to 20 to 30 years in the future.

Why conduct it?
These types of plans can provide a much more detailed analysis about a specific area or neighborhood in comparison to a comprehensive plan. Specific types of subareas of interest might include: a central business district (downtown revitalization); historic preservation districts; threatened open space preservation areas; redevelopment areas; high growth areas or areas where high growth is anticipated; and areas where there is a high interest in community design.

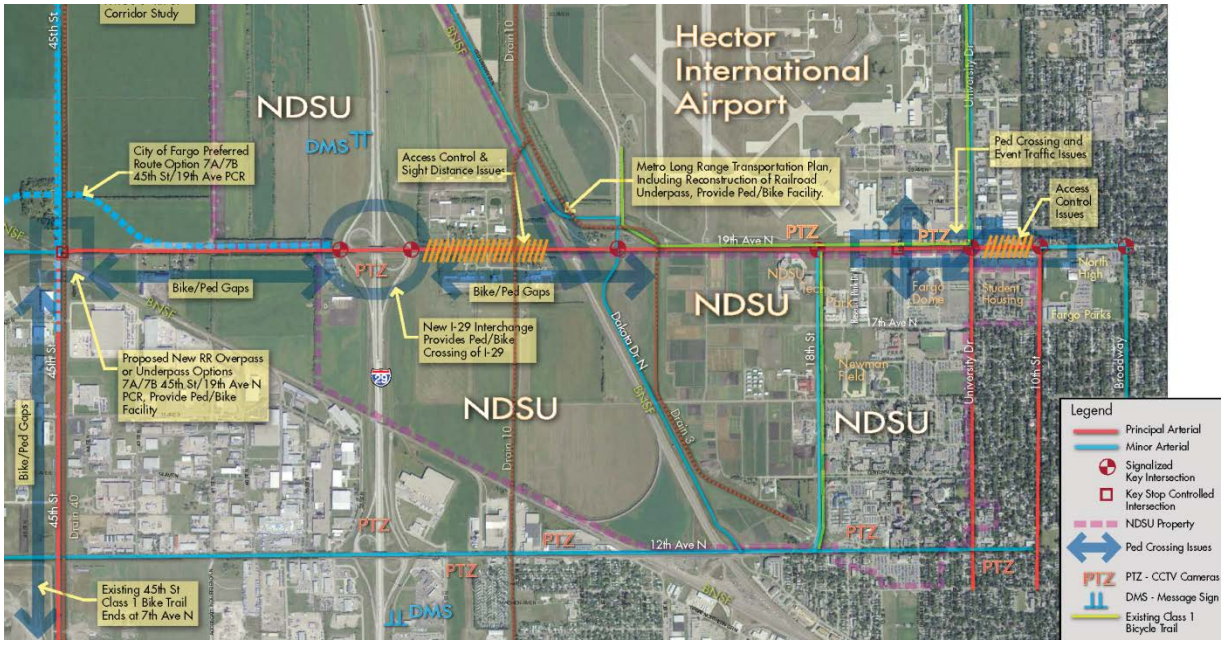
How to use it?
Jurisdictions may use this type of document to evaluate current development proposals for consistency with the plan or they may evaluate their existing zoning and subdivision regulations to further support implementation of the plan. This type of plan may be amended into to the jurisdiction's comprehensive plan or it may help to inform the next update of a jurisdiction's comprehensive plan.

Resources/Examples
Downtown Bismarck Subarea Study
http://www.downtownbismarckstudy.com/

Corridor Plan

What is it?

A corridor plan may contain similar elements which may be included in a comprehensive plan or subarea plan; however, it will usually include a strong transportation component. Typically a corridor study will include the following elements: a clearly defined reason for conducting the study; a definition of the study area boundary; goals, objectives, and evaluation measures for a corridor; alternative strategies to address an identified problem; an evaluation of projected or forecasted impacts of identified alternatives; an evaluation of how each recommended alternative addresses the identified problem, as well as how the alternatives address the goals and objectives of the corridor. According to the Federal Highway Administration (FHWA), "these planning activities are often an intermediary step between the broader long-range planning process and the more detailed work of project development" (*Guidance on Using Corridor and Subarea Planning to Inform NEPA,* Federal Highway Administration, 2011). Corridor studies can be long range planning tools and commonly consider time frames ranging from present day to 20 years in the future.



Excerpt from the Fargo-Moorhead Council of Governments *19th Avenue North Corridor Study*, 2012

Why conduct it?

A corridor study may be conducted prior to a major roadway reconstruction to develop a range of alternatives or it may be conducted to develop a long range plan for a corridor. If federal transportation funding is anticipated to be used for corridor improvements, a corridor study may be of value depending on the complexity of possible improvement options, as well as the dynamics of the area influenced by the corridor. The FHWA indicates, "corridor and subarea planning studies are often conceptual level studies that can help determine whether there

is a need for a transportation project. The basis for the study is an accurate and inclusive identification of the environment and community goals for the area. The studies can help to identify the purpose and need or the vision, goals, and objectives of the corridor or subarea. The geographic limits of the study, the basic description of the environmental setting, development trends, or changes in land use, modes, or alternatives may also be identified. A study engages the community and stakeholders in a process of thinking about the area's future and then documents those results as the basis for future planning and project development" (*Guidance on Using Corridor and Subarea Planning to Inform NEPA*, Federal Highway Administration, 2011).

How to use it?

If federal transportation funds are anticipated for potential improvements within a corridor the corridor study may help to identify and possibly eliminate alternatives for further consideration to help expedite the project development process. However, if using federal transportation funds, limitations may exist as to the elements included/evaluated and the level of detail related to the alternative development process. Regardless if federal transportation funding is anticipated, it can help identify community goals, objectives, and expectations associated with the corridor. Improvements recommended from a corridor plan may be amended into or help inform the development of a long range transportation plan or a comprehensive plan.

Resources/Examples

Grand Forks-East Grand Forks South Washington Street Corridor Study
http://www.theforksmpo.org/Pages/WashStreetCorridorStudy2.htm

Fargo-Moorhead Metropolitan Council of Governments 19th Avenue North Corridor Study
http://www.fmmetrocog.org/new/index.php?id=364

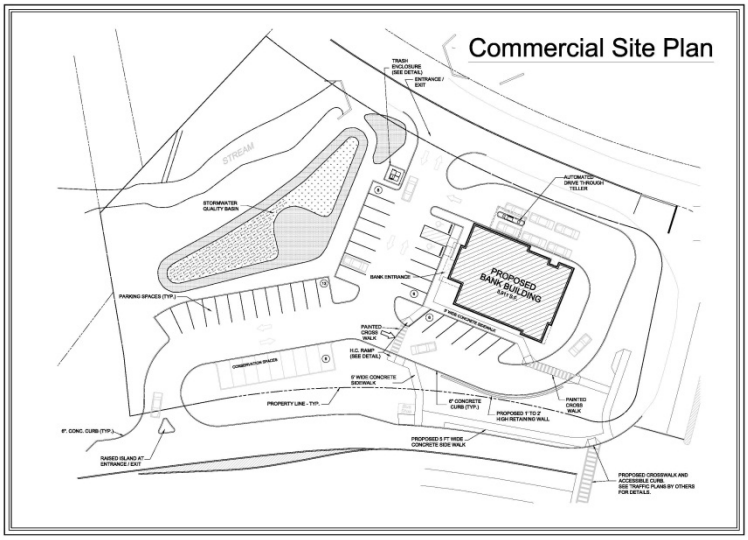
Bismarck-Mandan Metropolitan Planning Organization US Highway 83 Corridor Study
http://www.us83study.com/

Guidance on Using Corridor and Subarea Planning to Inform NEPA, Federal Highway Administration, 2011

Site Plan

What is it?

The site plan is the smallest scale plan discussed in this document. As the name implies it may only be limited in geographic scope to a specific site in a jurisdiction. According to the American Planning Association (APA), "A site plan is a scaled drawing that shows the layout and arrangement of buildings and open space, including parking and yard areas, the provision for access to and from the public street system, connections to adjacent properties, and, often, the location of facilities such as water and sewer lines, and storm drainage" (*Planning and Urban Design Standards*, American Planning Association, 2006). Additionally, the site plan will depict lot or property lines associated with the site and often building elevations.



Example of a site plan from Site Design Consultants, www.sitedesignconsultants.com/engg-sp-commercial.html

Why conduct it?

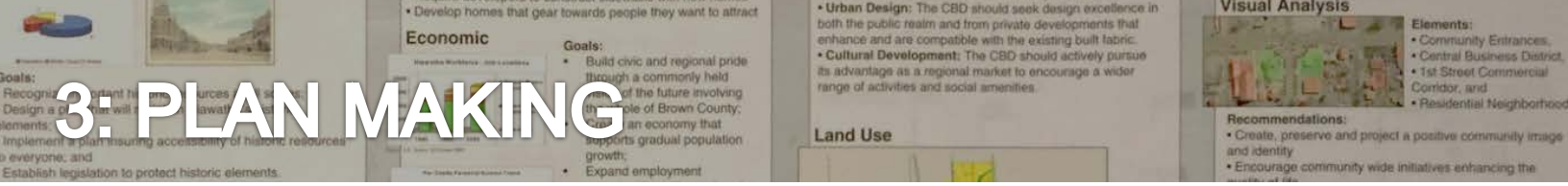
A variety of North Dakota jurisdictions may require the development community to submit a site plan in association with their specific development review process. Each jurisdiction may have different thresholds for when a site plan may be required and what elements must be included. Site plans are often necessary to ensure consistency of development proposals with a jurisdiction's zoning regulations, comprehensive plan, and/or other jurisdictional planning efforts and policies.

How to use it?

The site planning process is where current development meets long range planning efforts (such as the comprehensive, subarea, corridor, or strategic plans). Through the site planning process a jurisdiction can further implementation of various long range plans the jurisdiction has developed. A jurisdiction would typically check the proposed site plan against the current land development regulations, jurisdictional policies, and any applicable long range plans.

Resources/Examples

A variety of North Dakota jurisdictions have some form of site plan review process including the cities of Bismarck, Fargo, Grand Forks, and Minot.



3: PLAN MAKING

Everybody plans – we all make financial plans, travel plans, and work plans to help us achieve personal goals and objectives. Organizations and firms plan for strategic reasons and to gain a competitive edge. Plans help us to organize our time and to work toward our goals in a step-by-step fashion.

People from all walks of life, businesses, and public organizations from local jurisdictions to the federal government use this method to prepare for the future, solve problems, clarify needs and objectives, set priorities, and achieve goals. The following is a definition of a plan by the American Planning Association (APA):

A plan is an adopted statement of policy, in the form of text, maps, and graphics, used to guide public and private actions that affect the future. A plan provides decision makers with the information they need to make informed decisions affecting the long-range social, economic, and physical growth…
(Planning and Urban Design Standards, American Planning Association, 2006)

Planning is a widely used process that generally includes the steps in **Figure 1**.

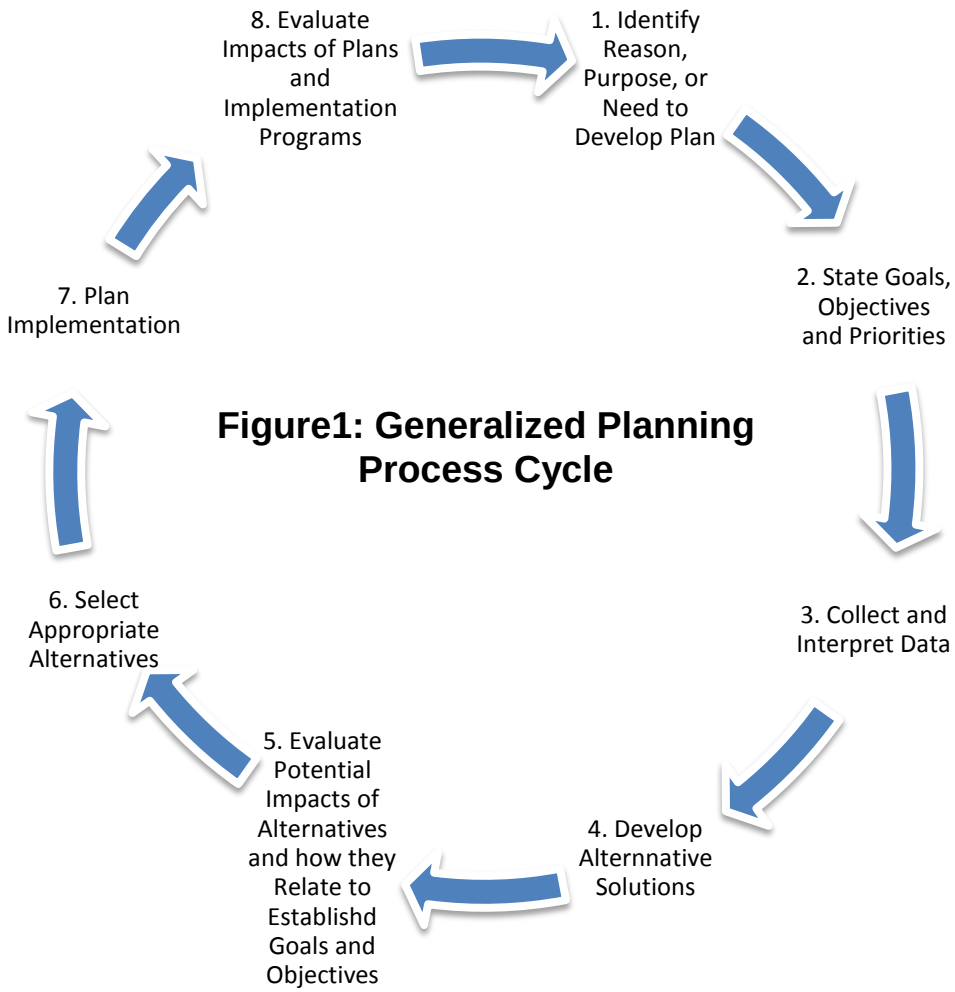
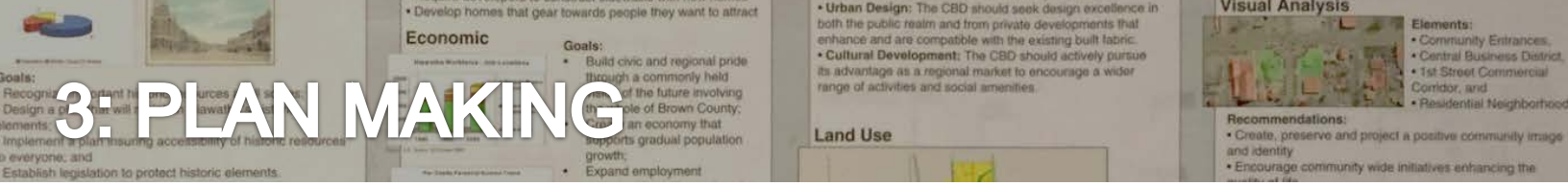


Figure1: Generalized Planning Process Cycle



3: PLAN MAKING

Professional planners use the planning process as a procedure to address a broad range of issues in a pragmatic, impartial, and rational way. A planner may use the planning process when addressing a single subject or a wide range of subjects, such as capital improvements, housing, or transportation. Jurisdiction volunteers and planning board members can employ the same planning process that professional planners use. As the preceding definitions suggest, when local jurisdictions engage in planning, they seek answers to such fundamentally important questions as:

- What are the common goals and objectives of my jurisdiction?
- What might happen to my jurisdiction in the future?
- What do we want to happen?
- How best can we achieve the future outcome we desire?

The first step identified in **Figure 1** is critical to the planning process. It is essential to understanding: the purpose for why the plan is being developed; the scope of the plan in terms of content, geographic, and temporal extent; and how the plan will be used.

Plan Structure

There are typically common elements associated with all plan types. The American Planning Association identifies the following “core” elements typically associated with plans:

- A statement of authority to prepare and adopt a plan
- Background data, including area history, existing conditions and trends, and data projections
- Documentation of stakeholder interests and stakeholder involvement process
- A vision statement or statement of goals and objectives for future conditions
- An evaluation of plan and design alternatives
- A program of implementation

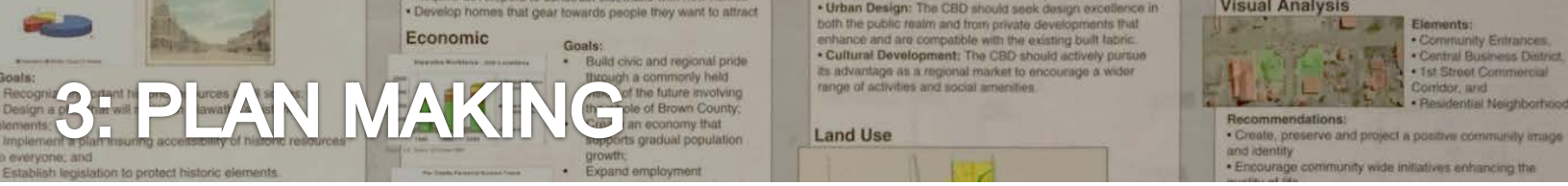
(*Planning and Urban Design Standards*, American Planning Association, 2006)

Goals and objectives are typically paramount to all plan types. Goals and objectives provide strategic direction with respect to plan outcomes and are reflective of local values. Often times the goals and objectives will guide the decision making for recommendations of identified alternatives developed in a planning process. A goal is typically considered a general statement that identifies a desired future condition. Objectives typically accompany a goal and provide a more specific statement of the future condition identified.

Data Needs for Plan Development

Data needs may vary depending on plan type; however, following are examples of data needs associated with the preparation of a variety of plan types:

- Maps and Images (such as base maps, aerial photographs, Geographic Information System (GIS) map layers)



3: PLAN MAKING

- Natural Environment (such as climate, topography, soils, vegetation, water features, habitat areas, natural hazards)
- Existing Land Use (such as residential, commercial, industrial, open-space lands, vacant land, farmland)
- Housing (such as an inventory of existing housing, existing housing conditions, vacancy rate, affordability)
- Transportation (such as street network, street capacity, traffic flow volumes, parking supply and demand, transit facilities, bicycle/pedestrian networks)
- Public Utilities (such as water supply, wastewater disposal, stormwater management, solid waste management, telecommunication services)
- Community Services (such as administrative facilities, education facilities, parks and recreation facilities, health services, public safety facilities)
- Population and Employment (such as population size, population characteristics, vital statistics, labor force characteristics)
- Local Economy (such as employment, retail sales, cost of living)
- Special Topics (historic sites and buildings, archaeological sites, urban design features, existing zoning)

The preceding was modified from the American Planning Association Planning and Urban Design Standards publication (Planning and Urban Design Standards, American Planning Association, 2006).

POTENTIAL DATA SOURCES

Mapping Information

North Dakota Geographic Information Systems Hub
http://www.nd.gov/gis/

United States Geological Survey
http://www.usgs.gov/

United State Census Bureau Topographically Integrated Geographic Encoding and Referencing (TIGER)
https://www.census.gov/geo/maps-data/data/tiger.html

North Dakota Department of Mineral Resources Oil and Gas Division (GIS Map Server)
https://www.dmr.nd.gov/oilgas/

United States Department of Housing and Urban Development Community Planning and Development (CPD) Maps
http://egis.hud.gov/cpdmaps/

Socio-Economic Information

North Dakota Census Office
http://www.commerce.nd.gov/census/

North Dakota Compass
http://www.ndcompass.org/

Socio-Economic Information Contd.

North Dakota Job Service
http://www.jobsnd.com/

North Dakota Housing and Finance Agency
https://www.ndhfa.org/

United State Census Bureau
http://www.census.gov/

Transportation Information

North Dakota Department of Transportation
http://www.dot.nd.gov/

Natural and Cultural Resource Information

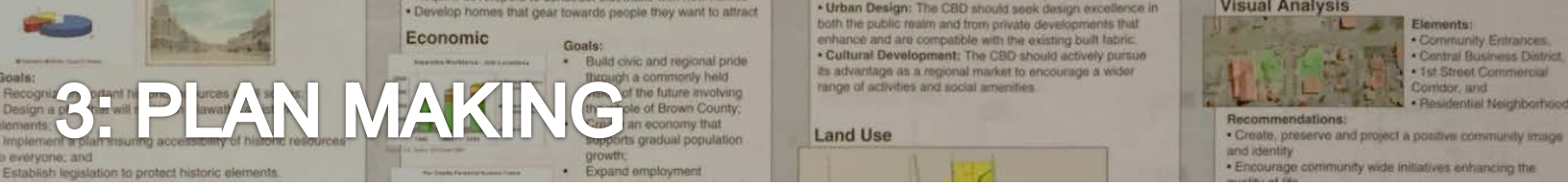
North Dakota Department of Health
https://www.ndhealth.gov/

North Dakota State Historic Preservation Office
http://www.history.nd.gov/hp/

North Dakota Game and Fish Department
http://gf.nd.gov/

United States Army Corps of Engineers
http://www.usace.army.mil/

United States Fish and Wildlife Service
http://www.fws.gov/

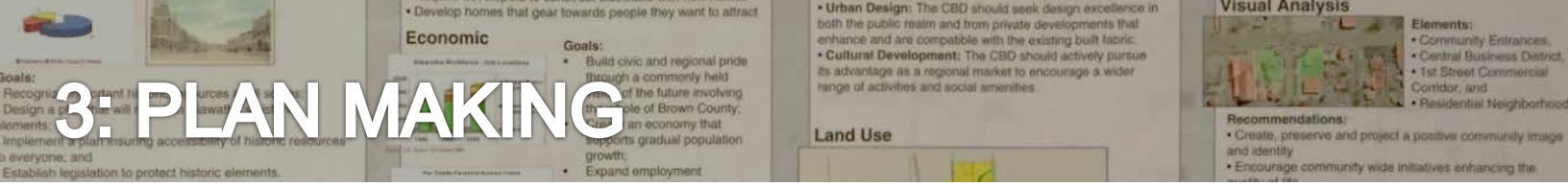


3: PLAN MAKING

Public Involvement

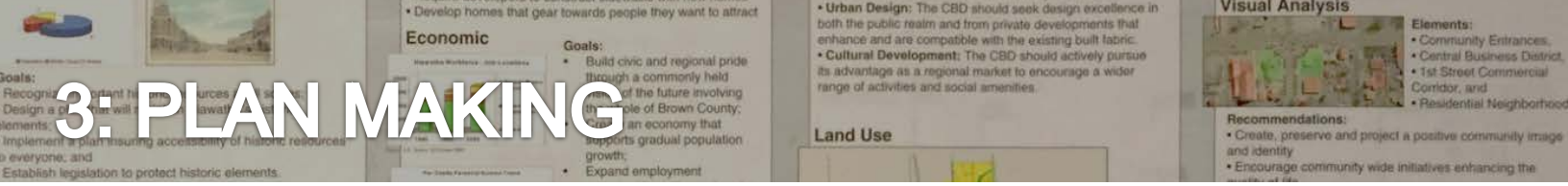
Public involvement is critical in the development of a plan that's reflective of the local jurisdiction's values, interests, and insights. Local, state, or national policy/regulation may require certain public involvement processes, such as a public hearing(s), in the development of certain types of plans and a jurisdiction should be aware of any subject requirements before engaging in the planning and associated public involvement process. Planners may use a variety of techniques to involve members of the public which may include the following:

- **Public Involvement Meetings** – It is helpful and may be required to hold a public meeting in association with a planning process. Commonly, public meetings are held at strategic times throughout the development of the planning process. Meetings early in the process allow for planners to obtain jurisdictional insights for the needs and values related to the issues to be resolved in the planning process. Often at the initial meetings, goals and objectives begin to be formulated to guide the planning process. Meetings held mid-way through the process allow for the jurisdiction to assist in the development of the universe of alternatives to address planning related issues to be resolved. Meetings held at the end of the process allow the jurisdiction to react to the refined alternatives identified to address the jurisdictional needs within the planning process. Depending on the size of the jurisdiction often times meetings may be held in different locations such as different neighborhoods or communities to enhance convenience for members of the public. Also different portions of the planning area may have different values and insights related to issues to be resolved within the plan. Meetings might also be held at different times of the day to accommodate typical work schedules of the area. The array of meetings should inform the public about the planning process, explain how residents can participate in the process, describe how the plan will impact them, and indicate the importance of public input in plan development. Public involvement meetings may take a variety of forms which may include a formal presentation and input period or may be an "open-house" style format. Caution should be used in obtaining input from public meetings as it may not be representative of the jurisdiction at large but rather be representative of special interest groups willing to attend and provide input at public meetings. Although generally recommended with the planning process, increasingly planners are finding traditional public meetings to be ineffective alone, in gathering broad, meaningful, and representative public input so may look to other means to involve the public.
- **Media Outlets** – Use of media outlets can take many forms. For instance, press releases can be provided to local newspapers or cable television stations. Interviews can be arranged or articles developed to inform local media outlets about the subject plan.
- **Focus Group** – Focus groups can be a public involvement tool to try to capture representative and meaningful public input. Focus groups could be a randomly selected group of residents or could be strategically targeted for broad and



diverse representation. Often much of the same information might be presented to a focus group as would be presented at a public meeting, however a focus group is intended to capture more representative input of the jurisdiction at large. This group may be used as a “sounding board” for ideas or alternatives developed through the planning process. Identifying appropriate representation for a focus group can greatly increase the success of this form of public involvement.

- **Targeted Interviews** – Identifying key stakeholders in the development of a plan and interviewing them is a common public involvement technique. A stakeholder might be considered a person, business, or other entity that has a direct interest in the recommendations developed through the planning process. Identifying the “key” stakeholders and having their trust is critical to this public involvement technique.
- **Charrette** – A charrette is an intense, interactive, problem-solving process conducted through meetings held to focus on a specific issue involving planners, designers, and members of the public or others. A charrette should be interactive, with significant involvement from the attendees in trying to develop suggested solutions to problems or issues identified. Commonly, a facilitator is used to guide the process. It is important to make attendees feel as though they are part of the process. Often a charrette is held near the location of the issue to be addressed and the facilitators will set up working offices at the location so suggestions established through the process can be developed, tested, or, presented at the charrette. These events are typically a collaborative problem solving process that encourages the active participation of all attendees.
- **Surveys** – Surveys can be an effective tool in obtaining meaningful and representative public input. A statistically valid random sample survey often can provide the most representative input related to jurisdictional values and insights. This method is also effective in obtaining public input as it is more convenient for the participant to participate and since the identity of survey participants are often hidden, a more honest perspective may be provided. Special attention must be paid to the questions that are asked and the way the questions are asked in the development of a survey. Surveys may come in many forms such as a form mailed to individual dwellings and businesses or a telephone based survey. These more traditional survey methods are effective but can add cost to the planning process. Often the use of websites are associated with the planning process and there are many cost effective electronic web-based survey forms that may be used. However, caution should be used through the use of electronic web-based surveys as the input obtained may not be representative of the jurisdiction.
- **Websites and Social Media** – The use of websites and social media outlets to disseminate and obtain input are commonly used given their relative cost effectiveness and convenience to members of the public. These forms of public input can be highly effective, however it should be cautioned that input obtained through this technique may not be representative of the jurisdiction.



3: PLAN MAKING

The preceding techniques represent commonly used public involvement techniques. As it can often be challenging to obtain meaningful public input, planners may explore and utilize innovative and unique methods. Innovation and creativity in obtaining meaningful public involvement should be considered if not encouraged through the planning process.

Who Should Develop the Plan

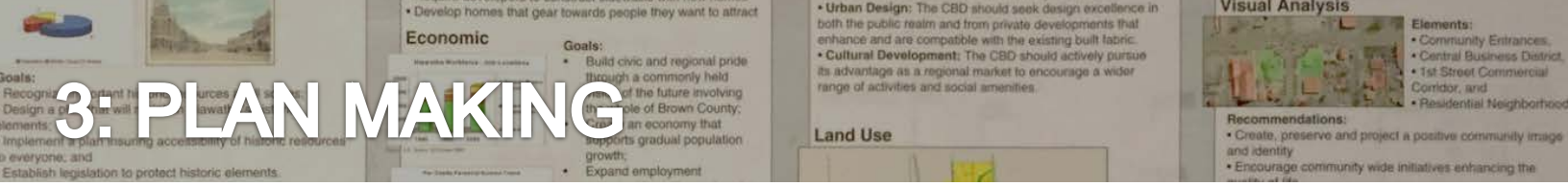
Plans might be developed by local jurisdictional staff, professional planning consultants, or local jurisdictional volunteers. The decision of whom should develop a plan will likely depend on the expertise and time available by local jurisdictional in-house staff or local volunteers, balanced with the amount of money a local jurisdiction may have to pay for outside professional planning consultants.

Plan Costs

The cost to develop a plan can vary considerably, depending on the type of plan, who will be developing the document, nature, and duration of the planning process. If an outside consultant will be assisting with development of the plan, one way to estimate how much the plan costs might be to inquire with neighboring, or other similar-sized jurisdictions which have recently engaged in a similar planning effort. This estimate can then be refined based on what might be included in the plan. In an effort to determine a plan budget, it will be helpful to decide on the contents of the plan, the type of plan to be pursued, and what planning approach including public involvement may work best for the jurisdiction.

The following are some factors which can influence the cost of developing a plan:

- The amount of citizen participation and the number of meetings and events held during the planning process
- The level of agreement or disagreement related to key planning issues in the jurisdiction (that is, how fragmented or divided the community is on key issues)
- The geographic scope of the plan and the amount of geographic information which may need to be created for analysis associated with the plan
- The amount of effort put into different methods of disseminating information to the citizens at all stages of the planning process, and the number of different methods employed
- The extent to which the community uses computer technology to increase citizen involvement in the planning process (by creating an interactive webpage and/or making use of email)
- The form in which the plan is published, the number of copies of different versions (full versions and executive summaries), whether it contains color maps and photographs, and whether copies of the plan are given away or whether a fee is charged
- The length of time allotted to the planning process

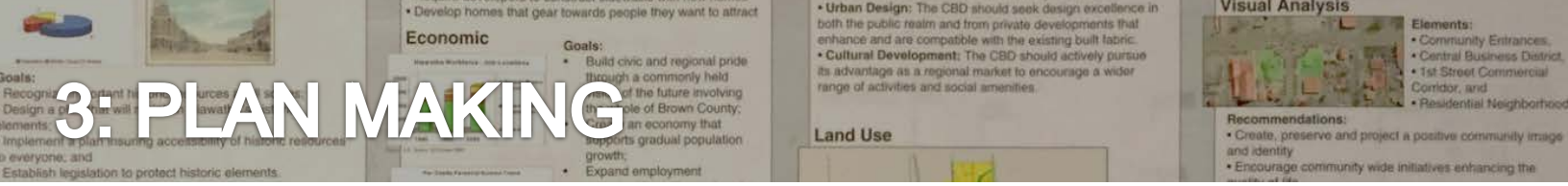


3: PLAN MAKING

Depending on the type and location of the plan, state, regional, and federal financial and staffing resources may be available to complete parts or the entire subject plan. The following represent some planning assistance opportunities for local jurisdictions.

- NDDOT/FHWA/FTA – Planning funds administered through the NDDOT from the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) can be used to fund transportation related elements of local plans. For eligibility and availability of funding contact the Local Government Division of the NDDOT.
- North Dakota MPOs – The Bismarck, Fargo, and Grand Forks areas are located in Metropolitan Planning Organization (MPO) areas and staff and/or funds from these organizations may be used to assist transportation related local planning efforts as well. For jurisdictions located within a North Dakota MPO area contact the respective staff for assistance with local planning efforts.
- North Dakota Division of Community Services – The Community Development Block Grant (CDBG) program provides a limited source of financial planning assistance. This program is competitive for local jurisdictional planning efforts. Contact the North Dakota Department of Community Services for eligibility and requirements related to the CDBG program.
- US Environmental Protection Agency – The Environmental Protection Agency (EPA) offers a variety of programs including the Smart Growth in Rural Communities, Smart Growth Grants and Other Funding, Building Blocks, Smart Growth Implementation Assistance, Climate Resilience Evaluation and Awareness Tool (CREAT), Brownfields Area Wide Planning Grant and Partnership for Brownfields Pilot, Green America's Capitals, and the Climate Ready Water Utilities programs. These programs offer resources, technical assistance, and funding opportunities with a focus on improving the quality of development and protecting human health and the environment. Contact the EPA Region 8 office for more information regarding these programs.
- US Department of Housing and Urban Development – The US Department of Housing and Urban Development (HUD) offers a variety of local assistance opportunities including the Choice Neighborhoods Planning and Implementation Grants, Sustainable Communities Regional Planning Grants, and Community Challenge Grants. For more information contact the US Department of Housing and Urban Development.
- US Department of Transportation (USDOT) – In addition to other programs mentioned earlier the USDOT offers the Livability Initiative, providing a number of resources which may aid local jurisdictions in the planning process.
- Partnership for Sustainable Communities – This program is a partnership between the federal departments of Housing and Urban Development, the United States Department of Transportation, and the Environmental Protection Agency. This partnership program periodically offers grants, technical assistance, and other programs to assist local jurisdictions.

Likely limitations will exist with any of the identified assistance opportunities. For instance funding for local transportation planning efforts associated with the NDDOT and the North Dakota MPO areas typically cannot fund a comprehensive plan in its



entirety but may be able to fund transportation related elements associated with a comprehensive plan. Additionally, a local financial match is typically required for many of the assistance programs discussed. It is recommended to contact the specific agency responsible for administration of the identified programs directly. Contact information can be found in the following Resources/Examples section.

Resources/Examples

North Dakota Department of Transportation Local Government Division
http://www.dot.nd.gov/

North Dakota Division of Community Services
http://www.communityservices.nd.gov/

Bismarck-Mandan Metropolitan Planning Organization
http://bismarck.org/mpo

Fargo-Moorhead Metropolitan Council of Governments
http://www.fmmetrocog.org/new/

Grand Forks-East Grand Forks Metropolitan Planning Organization
http://www.theforksmpo.org/

Environmental Protection Agency (EPA) Region 8
http://www2.epa.gov/aboutepa/epa-region-8-mountains-and-plains

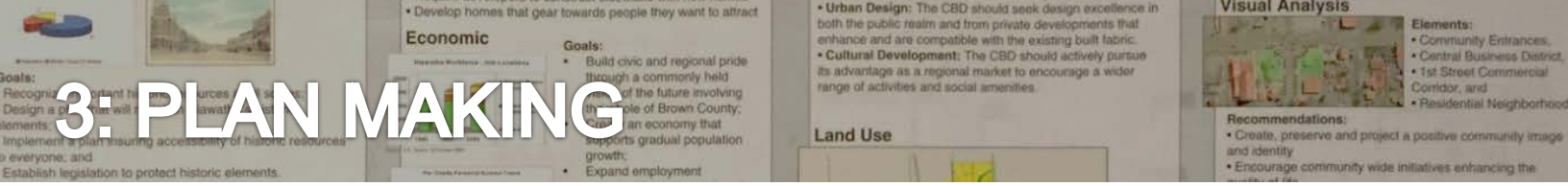
US Department of Housing and Urban Development
http://portal.hud.gov/hudportal/HUD

US Department of Transportation Livability Initiative
http://www.dot.gov/livability

Partnership for Sustainable Communities
http://www.sustainablecommunities.gov/

Time to Develop a Plan

The type of plan developed, the complexity of the issues addressed, the geographic and temporal scope, and the amount of data needed to be collected or developed will have a direct bearing on the length of the planning process. Generally, Comprehensive Plans typically take much longer to prepare than plans that focus on a limited number of key issues or that pertain only to a limited part of the jurisdiction. A Comprehensive Plan may take up to a year and a half to three years to complete while other planning types may be completed in a much shorter period of time.



3: PLAN MAKING

Following are some factors which can influence the amount of time to develop a plan:

- The geographic size and diversity of the jurisdiction
- The complexity of issues to be resolved through the planning process within the jurisdiction
- The degree of agreement or disagreement within the jurisdiction related to pressing problems, priorities, and possible courses of action
- The jurisdictions experience with planning
- The amount of public involvement needed in the development of the plan

There may be a tendency for individuals involved to feel that it is imperative to get the plan finished as quickly as possible. Often this feeling of urgency is based on a fear of what might happen in the interim, while the plan is being prepared. The desire to complete the plan quickly can also be motivated by a desire to reduce costs. However, if the planning process is too short, it may undermine public support for the plan in the long run. It should also be noted that if the planning process is too long it may lose momentum from the public. Jurisdictions should take as much time as appropriate to prepare a plan that is useful and has broad-based public support.

4: CURRENT PLANNING

As previously stated, current planning evaluates current development proposals in comparison to a jurisdiction's land development regulations, as well as a jurisdiction's established/adopted long range plans. For purposes of this document current planning generally refers to the review and consideration of development proposals by a public sector entity.

Development Regulations

While the long range plan may be viewed as the "blueprint" for development of a jurisdiction the local development regulations may be viewed as the "tools" to implement the plan. Long range plans typically provide broad guidance for a jurisdiction's future identifying goals, objectives, policies, and/or standards for development. A more specific set of development regulations are often necessary to ensure the intent of the long range plan is typically implemented through the use of locally developed land use regulations. In North Dakota, those locally developed land use regulations typically consist of zoning and subdivision regulations.

Zoning Regulation

An important distinction should be made between the concepts of "land use" and "zoning". Often land use and zoning are represented by maps created and maintained by the local jurisdiction. Land use is a term that refers to the general pattern of existing or future development. An existing or future land use map might document or define general uses of land such as residential, industrial, commercial, institutional, or recreational for instance. Recommended future land use maps are often established through the long range planning process. Typically, some level of analysis, through the long range planning process, has been conducted to determine the suitability of recommended future land uses to ensure a compatible pattern of land development, as well as to ensure the type of use recommended is appropriate for the subject location.

Zoning is a concept which refers to specific land use requirements which regulate, typically by ordinance, the appropriate use, height, bulk, density, and other characteristics appropriate for a subject location. According to the Planning and Zoning Training document developed by Vision West ND, "zoning is the tool that allows a local jurisdiction to regulate the use of land in a manner that protects the general health, safety, and welfare of a community." The NDCC provides enabling legislation for cities, counties, and organized townships in North Dakota to utilize zoning authority to guide jurisdictional development. According to the North Dakota Planning Association, the general components of a zoning ordinance include the following:

- Zoning map – illustrates the boundaries of zoning districts and the geographic extent of the jurisdiction's zoning authority.
- Zoning district regulations – identify the purpose of each zoning district, describe types of uses allowed in each district, and establish standards specific to uses within each district.

- Administrative and enforcement procedures – explains the processes that must be followed for compliance with zoning regulations including permits, rezoning requests, variance requests, and conditional use requests.
- General provisions – include definitions of key words, rules of interpretation, (other sections which are applicable to the document or the jurisdiction as a whole instead of pertaining only to a specific zoning district), and the geographic extent of its authority.
- Introductory provisions – include things like the title and purpose of the ordinance, the legal basis for its authority, and the effective date.
- Other parts typically address non-conforming uses: conflict with other laws: and violations and penalties.

North Dakota Planning Handbook, North Dakota Planning Association, 2005

More information regarding zoning in North Dakota can be found by visiting the web-links provided in the following Resources/Examples section.

Resources/Examples
Planning and Zoning Workshop Resources, Vision West North Dakota
http://www.visionwestnd.com/pz.php

North Dakota Century Code, Chapters 11, 40, and 58
http://www.legis.nd.gov/general-information/north-dakota-century-code

North Dakota Planning Handbook, North Dakota Planning Association, 2005
http://www.ndplanning.org/ndpa-handbook.html

Subdivision Regulation

Subdivision regulations typically define the standards and process for the division of land for building and/or development purposes. Similar to zoning, subdivision regulations are typically in the form of an ordinance and influence the physical layout of the jurisdiction. Sometimes jurisdictions choose to combine the zoning and subdivision ordinances into a single set of regulations. The term “plat” or platting process is commonly associated with subdivision regulations. A plat is essentially a scale map or plan depicting elements required in a jurisdiction’s subdivision regulations. According to the North Dakota Planning Association the following are general considerations addressed by subdivision regulation:

- Subdivision location and layout consistency with the city/county comprehensive plan
- Street locations and continuity, and capacity to facilitate fire protection
- Drainage and utility easements or rights-of-way
- Dedication and reservation of land for public use
- Hazard mitigation
- Standards for public improvements such as streets, curb and gutters, water and sewage facilities

- Provisions to ensure completion of public improvements
- Provisions for recreation, light, air, avoidance of congestion
- Easements for building setback lines

North Dakota Planning Handbook, North Dakota Planning Association, 2005

Additionally, the North Dakota Planning Association has identified the following general components of subdivision regulations:

- Design standards for land parcels – establish minimum lot sizes, easements required, minimum right-of-way widths and other street requirements, drainage plan requirements, and other similar types of requirements.
- Criteria establishing the conditions under which the division of land will be allowed – identify the circumstances under which platting is required; define the types of improvements which must be provided before land can be divided or sold; and similar types of requirements.
- Contents of the plat – define what the plat must contain including such details as the relationship of the land to one hundred year flood elevations; adjacent land parcels; existing and proposed easements; proposed property lines and pins; property descriptions; standards of measurement; and similar types of requirements.
- Administrative and enforcement procedures – explain the processes that must be followed for the review and approval of plats; establish procedures to deal with cases where plats are not developed in accordance with approved plans; and establish guidelines pertaining to variances.
- General provisions – include definitions of key words, and the geographic extent of its authority.
- Introductory provisions – include items such as the title and purpose of the ordinance; the legal basis for its authority; and the effective date.
- Exactions – the required dedication of land for easements, right-of-way, and park land or other public uses.

North Dakota Planning Handbook, North Dakota Planning Association, 2005

More information regarding subdivision regulations in North Dakota can be found by visiting the web-links provided in the following Resources/Examples section.

Resources/Examples

Planning and Zoning Workshop Resources, Vision West North Dakota
http://www.visionwestnd.com/pz.php

North Dakota Century Code, Chapters 11 and 40
http://www.legis.nd.gov/general-information/north-dakota-century-code

North Dakota Planning Handbook, North Dakota Planning Association, 2005
http://www.ndplanning.org/ndpa-handbook.html

Extraterritorial Authority

The North Dakota Century Code enables North Dakota cities to establish zoning and subdivision regulations beyond their municipal boundaries. The distance from the municipal boundary that cities can exercise extraterritorial authority is established by population of the subject city and negotiation with impacted townships and counties.

More information regarding extraterritorial authority in North Dakota can be found by visiting the web-links provided in the following Resources/Examples section.

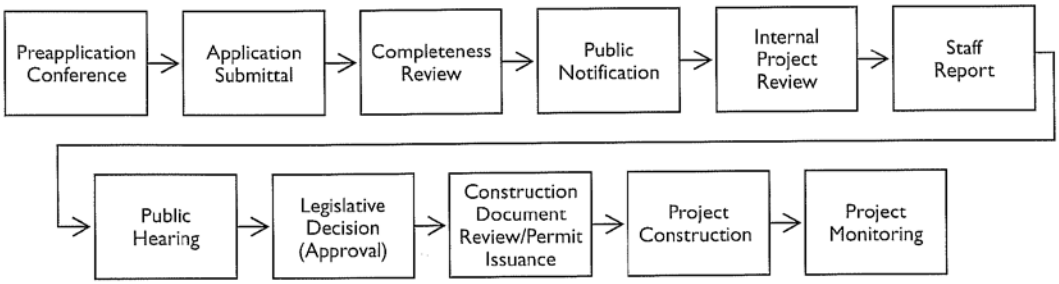
Resources/Examples
North Dakota Century Code, Chapter 40-47
http://www.legis.nd.gov/general-information/north-dakota-century-code

North Dakota Planning Handbook, North Dakota Planning Association, 2005
http://www.ndplanning.org/ndpa-handbook.html

Development Review Process

Typically, different groups of interested parties or stakeholders will be concerned with current planning and include staff or consulting staff reviewing development proposals/applications, the applicant or developer, and the public that might be impacted by the development proposal. Varying levels of review or steps might be involved depending on the jurisdiction and the type of development proposal, however the American Planning Association (APA) provides a generalized development review process in the following **Figure 2**:

Figure 2:



TYPICAL CONSOLIDATED DEVELOPMENT REVIEW PROCESS

Source: William Trimm. *Planning and Urban Design Standards*, American Planning Association, 2006

Preapplication Conference – Prior to submitting a formal application it may be advisable for the applicant and staff to have an informal discussion related to a development proposal. Through this meeting staff can discuss general consistency with the development proposal to existing land development regulations, policies, and plans.

4: CURRENT PLANNING

Application Submittal – Often jurisdictions will have a standardized application process associated with the development review process. In addition to a standardized application there are typically requirements of attachments which must be included with the application for review of the development proposal. According to the APA, "General requirements for proposals involving physical land development typically include a written description of the proposal, anticipated impacts to the natural and built environment and how such impacts will be mitigated. Maps and descriptive material defining the planned development intensity, transportation and circulation system, infrastructure, and how the proposal is consistent with the community plan and development regulations should be included in the submittal. The intent of the application submittal is to clearly define the proposal so that staff have adequate information in which to prepare a report evaluating its consistency with the community plan and development regulations" (*Planning and Urban Design Standards*, American Planning Association, 2006).

Completeness Review – This step, as the name implies, generally requires development review staff to ensure the application submittal contains all of the necessary information requested. If the application is not complete the development review staff may not be able to proceed with the review of the application.

Public Notification – Often public notification will be required as part of the development review process depending on the type of development and local and state public notice requirements. Typically, there are minimum time frames necessary for public notification. Commonly there is a public hearing associated with the development proposal and the public notification will identify the nature and location of the development proposal and the timing of the associated public hearing. Each local jurisdiction may have different public notification requirements and depending on the type of development proposal the North Dakota Century Code may have additional public notice requirements. Depending on the defined process a jurisdiction has established generally some or all of the public notification responsibilities are carried out by the development review staff. Some examples of public notification include: information signs posted at the property associated with the development proposal; newspaper notices; announcements on jurisdictional websites; and direct mailings to neighboring property owners within a defined distance of the subject property associated with the development proposal. Public notification is a critical step. If the public is not properly notified by local or state defined requirements, the development review process may be invalidated.

Internal Project Review – This step involves the review of development review staff for consistency with applicable local and state regulations. In addition to development review staff, typically jurisdictions will request that other city/county departments to review a development proposal such as: Engineering; Fire; Police; Parks; and Public Works departments. Generally, each department will develop a list of comments related to how the development proposal meets local and state regulation related to each department's specific area of interest. If a development proposal has influence on elements beyond the jurisdiction's control, often jurisdictions will solicit comments from

agencies that do exercise control over those elements. For instance, if a development proposal will have an impact on a State Highway, it would be appropriate for the jurisdiction to seek comment from the NDDOT related to the subject proposal.

Staff Report – In most jurisdictions it's common for development review staff to prepare a staff report associated with a development proposal application. Typically the staff reports provide the findings or findings of fact, comments, and recommendations from all reviewing entities and provide a staff recommendation to approve, deny, continue, or table an application. The staff report should indicate consistency with local and if appropriate state or other regulations, as well as consistency with other policies and plan's (specifically the Comprehensive Plan).

Public Hearing – The public hearing is the opportunity for the findings and recommendations of the staff report to be presented for consideration by the local decision making body. This step also allows for the public to provide formal testimony in relation to the development proposal. The APA indicates "The basic elements of an open record hearing include an introductory presentation by staff, testimony by the applicant, affected agencies and the public, rebuttal and deliberation, and a decision by the hearing body. Depending on the nature of the proposal, the decision by the hearing body may be final or advisory to the legislative body. If advisory to the legislative body, an additional hearing and final decision would be rendered. The official record created at the hearing(s) is the primary documentation and the basis for the final project decision and any subsequent administrative or judicial appeals" (*Planning and Urban Design Standards*, American Planning Association, 2006).

Review of Construction Documents – After a development proposal application has received approval, the applicant will typically prepare engineering and architectural plans for the installation of infrastructure and building activity. The plans are prepared in accordance with local, state, and federal requirements. Appropriate jurisdictional staff will review the plans in accordance with applicable local, state, and federal requirements. Building permits are typically issued upon a favorable inspection of infrastructure improvements and a review of site and/or building plans.

Project Monitoring – This is typically a last step in the development review process conducted by appropriate jurisdictional staff. This stage ensures that conditions identified earlier in the process were implemented with construction of the development proposal.

The preceding section was based on information from *Planning and Urban Design Standards*, American Planning Association, 2006.

Vision West North Dakota has also developed a Planning and Zoning Training series which contains information on process and procedural consideration and can be found at the following location:
http://www.visionwestnd.com/pz.php

4: CURRENT PLANNING

Site Plan Review

As previously indicated, a site plan is a scaled drawing which depicts pertinent information related to the development of a specific site. Typically jurisdictions will have thresholds as to when they may require a site plan to be submitted for review. Typically site plans might be required for more complex site specific developments such as multiple family dwelling units or commercial or industrial developments. Jurisdictions may have a similar process or a scaled down process to the development review process previously described. Generally, the intent of the site plan review process is to ensure consistency with local land development regulations and policies and planning documents (specifically the Comprehensive Plan).

Traffic Impact Analysis

Often local jurisdictions will require a traffic impact analysis be conducted with a current development proposal (depending on the scale of development). According to the Institute of Transportation Engineers (ITE), "transportation access and impact studies (1) analyze the likely changes and affects that result from new land development and (2) recommend off-site transportation improvements to ameliorate expected impacts. They are concerned with site traffic generation, how these trips arrive and depart and the paths taken through the transportation network. They identify public safety requirements and the transportation needs of the site and surrounding road system" (*Transportation Planning Handbook 3rd Edition*, Institute of Transportation Engineers, 2008). Traffic impact studies are a critical element of the development review process as they are used in determining the need for access permits and transportation improvements both off and on-site. Studies can help local jurisdictions with the following issues:

- Forecast the transportation (traffic) impacts created by proposed development based on accepted practices
- Determine needed transport improvements to accommodate proposed developments
- Allocate funds more efficiently
- Provide a basis for determining developers' responsibility for specific off-site improvements
- Evaluate the number, location and design of access points

Jurisdictions may have differing thresholds for when a traffic impact analysis may be required. The local jurisdiction should determine what conditions are necessary to require a traffic impact analysis; however, the NDDOT uses the following information as general guidance to determine at what point a traffic impact analysis is needed, as well as the information that should be included for various scale developments adjacent to North Dakota State roadways:

<u>Less than 100 trips per day and less than 30% trucks</u>
A traffic engineering study is typically not necessary (except at the professional discretion of the district engineer based on issues such as terrain, sight distance or

other engineering judgment), turn lanes or other traffic control modifications are typically not necessary. The developer should provide in writing:

- Size of property in acres and a description of how the property will be used.
- The number of proposed buildings with square footages.
- Number of employees/residents expected when the property is fully developed.
- The expected number of trips per day (including number of truck trips).
- What hour of the day will generate the highest number of trips and how many trips are expected during that time period.

<u>100 to 1,000 trips per day or truck percentage greater than 30%</u>

A written traffic engineering study should include the items above and also provide the following:

- Verify the expected number of trips per day generated by the development (typically done through the ITE “Trip Generation Manual).
- Discussion and/or diagrams showing site circulation (site plan).
- Sight distance evaluation at study intersections.
- Study intersection design
    - Include a recommendation on the need for right and/or left turn lanes. This recommendation should follow NDDOT’s “Guidelines for the Installation of Turn Lanes along State Highways”.
    - If turn lanes are recommended, the study should use NDDOT design practices to indicate the length of the proposed turn lanes including tapers, etc.

<u>1,000 to 5,000 trips per day</u>

In addition to items above, the written traffic study should provide:

- Capacity analysis at study intersections.
- Crash data analysis at existing study intersections (NDDOT will provide the crash data per the developer’s request).
- Trip distribution (evaluate number, location, and spacing of access points). Provide expected directional distribution of trips (for example, 30% from the west, 70% from the east) and indicate if the truck directional distribution varies from the vehicle directional distribution.

<u>Greater than 5,000 trips per day</u>

In addition to items listed above, the written traffic study should provide:

- Background traffic growth and evaluation of future traffic.
- Traffic signal warrant analysis – with a recommendation for signalization*, roundabout or other traffic control devices.
- Lighting analysis at study intersections.
- Evaluate adjacent intersections that may be impacted by the development (capacity analysis, crash history, etc.). The study shall take into consideration any applicable transportation plans in the area.

**Where a signal is recommended, the study shall provide further recommendations on the proposed signal timing and phasing, left turn phase type (protected, permissive), and coordination with other traffic signals.*

4: CURRENT PLANNING

The geographic scope of the study area will vary, however according to ITE, a common approach in determining the location of the study area is to conduct analysis of locations where site generated traffic will represent five percent or more of the roadway's peak hour approach capacity.

Planning horizon years for traffic impact analysis may vary depending on the size and complexity of the development proposal, however a general guide suggested by ITE is to set a planning horizon when proposed developments would operate at their expected target operation which might be three to five years after opening day. It should be taken into account if the development will be phased and when each phase of development will be at full build-out.

If improvements are needed based on the results of the traffic impact analysis, cost estimates should be provided. The developer, permitting jurisdiction, and if associated with a North Dakota State roadway the NDDOT should discuss funding responsibilities and assumptions for identified improvements.

Portions of the preceding Traffic Impact Analysis section was either incorporated by direct reference or amended from the *Transportation Planning Handbook 3rd Edition*, Institute of Transportation Engineers, 2008

Resources/Examples

Vision West ND at the following link:
http://www.visionwestnd.com/pdf/pz/Unit%206%20%20Process%20and%20Proper%20Procedures.pdf

Planning and Urban Design Standards, American Planning Association, 2006

Transportation Planning Handbook 3rd Addition, Institute of Transportation Engineers, 2008

5: LAND USE AND TRANSPORTATION CONNECTION

Land use and transportation decisions are intertwined. Each has influence on the other. However, in conventional planning practice it is not uncommon for these issues to be looked at independently. In part, the intent of this document is to begin to identify the influence land use and transportation decisions have on each other related to some foundational transportation planning concepts.

The following information provides some foundational concepts related to transportation planning and represents key areas where transportation and land use planning converge and have influence on each other.

Role of Roadways in a Network

"The Sustainable street network consists of all types of streets that accommodate many different travel modes. Some streets are designed to serve traffic in all forms. Others are designed to be quiet with only the occasional vehicle. Some span across a city, while others are less continuous to control traffic speed and volume. In a sustainable street network, all streets have a role and are designed to serve the people of the community-today and well into the future" (*Sustainable Street Network Principles*, Congress for the New Urbanism, 2012).

Roadways provide a framework for the movement of people and goods within a jurisdiction. There are varying levels of roadway types that accommodate the movement of people and goods throughout a jurisdiction. Some roadways are intended to provide continuous movement that spans across a city or county while others might provide for short trips intended to serve a few homes or a farmstead.

Although the roadway network may provide a variety of needs, it is generally considered that two of the major functions of streets are to: 1. Provide for the movement of people and goods and 2. Provide access to people and goods to adjoining properties.
Often roadways within a jurisdictional network are characterized by the function each serve. The function of a roadway within the transportation network provides for the balance of mobility and access. The Federal Highway Administration (FHWA) has defined the "Highway Functional Classification" system and often local jurisdictions incorporate a similar system of functionally classified roadways which might include the following:

- **Interstate** – These facilities generally provide for the longest uninterrupted distances, providing the highest speeds with controlled access.
- **Arterials** – These roadways are intended to facilitate through traffic. In communities these roadways might span the length of the community and link lower level roadways to the Interstate. In rural areas these facilities might serve as major thoroughfares connecting communities and major traffic generators. Access is generally limited on these types of roadways as a higher degree of mobility is expected of these types of facilities. The FHWA functional

classification further breaks down arterials into Principle and Minor Arterial roadways.

- **Collectors** – Generally serve to move traffic from localized areas to higher level roadways in the network such as arterials. Distances served by these facilities are generally medium distance movements. In cities collectors might link neighborhoods to arterials or major traffic generators. In rural areas collectors serve the most important intracounty movements and might link smaller towns to rural arterial roadways. Access is generally more prevalent than arterials providing a balance between mobility and access to adjacent properties. Collectors still provide for through movements so lower density developments which require frequent access points are typically not associated with these types of facilities. The FHWA Functional Classification further breaks down collectors into Major and Minor Collector roadways.
- **Locals** – These roadways serve the most localized movements in a jurisdiction. The shortest trips tend to be made on these facilities and provide the most frequent access opportunities to adjacent properties. The primary role of these facilities is to access local properties and mobility is of lesser importance. In a city these roadways might provide direct access to a single family residential home. In a rural area these facilities might link a farmstead to a higher system roadway.

The following **Figure 3** identifies general characteristics of each functional type of roadway according to the FHWA (*Highway Functional Classification Concepts, Criteria and Procedures*, Federal Highway Administration, 2013).

Figure 3: Relationship of Functional Classification to Travel Characteristics

Functional Classification	Distance Served (and Length of Route)	Access Points	Speed Limit	Distance between Routes	Usage (AADT and DVMT)	Significance	Number of Travel Lanes
Arterial	Longest	Few	Highest	Longest	Highest	Statewide	More
Collector	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Local	Shortest	Many	Lowest	Shortest	Lowest	Local	Fewer

Given the interconnected nature of the roadway network continuity of each system is an important consideration. The functions of roadways serve different continuity needs with generally arterials serving the longest continuous movements, local roads serving the shortest movements and allowing for direct property access, and collectors serving moderate distance movements linking local roads to arterial system roadways. The following **Figure 4** developed by the FHWA represents the concept of continuity comparing functional roadway type.

5: LAND USE AND TRANSPORTATION CONNECTION

An appropriate balance is typically established related to mileage associated with each functional type roadway. Not all roadways can be arterials and not all roadways should be locals given the function carried out by each. The FHWA suggests a percentage range jurisdictions should consider when establishing or modifying a functional network of roadways. Typically, there is an inverse relationship by the highest functioning roadway mileage and the amount of traffic served by the roadway. The following **Figures 5** and **6** indicate the inverse relationship based on 2013 traffic information in North Dakota. Interstate and arterials tend to carry the largest amount of traffic yet comprise the smallest amount of system mileage. Conversely, local and collector roads tend to carry the least amount of traffic yet comprise the bulk of the transportation system mileage.

Figure 4: Concept of Continuity by Roadway Functional Type

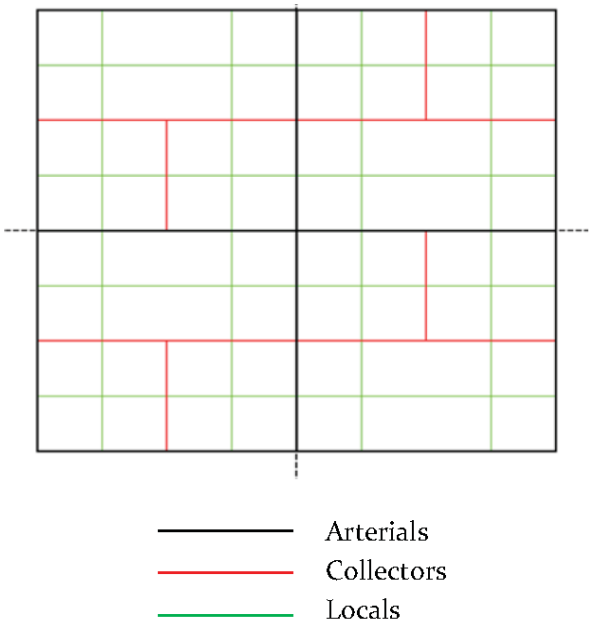


Figure 5: North Dakota Percent Functional System Mileage, 2013

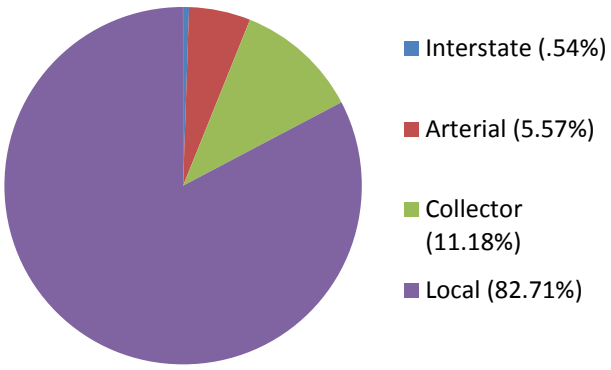
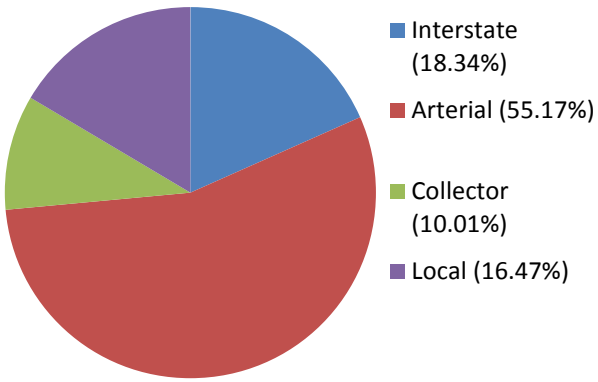


Figure 6: North Dakota Percent Vehicle Miles traveled by Functional Class, 2013



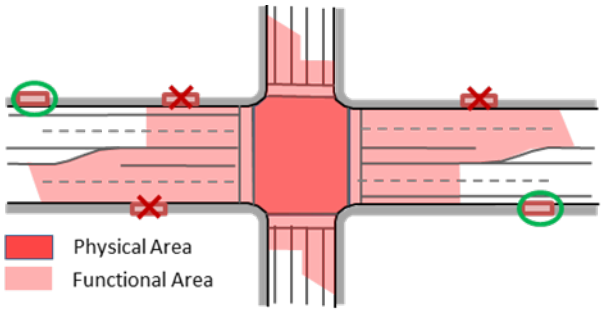
As communities and counties experience growth, attention should be given to the adjacent roadway networks and the anticipated continuity and mobility function of the impacted roadways. Through long range planning efforts, future land uses and the transportation network supporting the future land use concept can be identified. Through these efforts the extension of the functional network of roadways can be

identified. By conducting this analysis jurisdictions may more effectively prepare to adequately address current development proposals in relation to the appropriate extension of the roadway network maintaining continued mobility and continuity of the transportation system.

Access

As previously indicated an efficiently functioning transportation system provides a balance between access and mobility. In an effort to ensure mobility, on roadways intending to provide for high degrees of mobility jurisdictions often utilize the concept of access management. Access management refers to the design, placement, and management of entry and exit points (i.e., driveways, entrances or exits) between roadways and adjacent properties. These entry and exit points can be managed by careful planning regarding their location, the types of turning movements allowed, and if appropriate, medians that provide or prohibit access to the driveways. The configuration of land use can influence access locations. For instance, developments can be configured in a manner which allow for frontage or backage roads minimizing direct access onto the adjacent street. Following are some general choices to consider when addressing access issues:

- **Locate driveways on appropriate roadway type** – Providing access onto roadways with the lowest traffic volumes and speeds, generally improves safety near intersections.
- **Avoid Driveways within the functional area of an intersection** – Functions such as lanes for turning and merging, stacking needs, reaction time, stopping distance, future expansion and road conditions need to be considered when determining the size of functional areas of intersections. Driveways in these areas contribute to accidents and congestion.



Functional and Physical Areas of an Intersection.

- **Reducing crashes by limiting the number and type of access** – It is desirable to minimize the number of conflict points created with existing and future driveways since more conflict points increase the risk of a crash occurring. Research over the past several decades has consistently shown that crash rates increase as driveway density increases on the roadway.
- **Minimize left-turn movements at driveways** – In considering higher functioning roadways, when possible, restrict turning movements to and from a driveway. It is most beneficial from a safety perspective to prohibit left-turning movements.
- **Use medians to improve safety** – One method to manage or limit left turns to and from driveways is with the proper use of medians. Proper use of medians

has been found to improve roadway safety significantly relative to undivided roadways.

- **Plan intersections and safe access points along a corridor** – Appropriate spacing of signalized intersections should be considered. In urbanized areas the spacing of signals may vary depending on the function of the roadway, the configuration of the adjoining roadway network, and the density of development. Frontage or backage roads along busy corridors could be used to provide access to commercial property to control the number and location of access points to the highway. Align all streets and driveways opposite one another to create a logical pattern of ingress/egress.

Since the proliferation of access points onto a roadway can contribute to both safety and operational concerns, many jurisdictions have policies or regulations related to access management.

Resources/Examples

North Dakota's Urban Areas (communities over 5,000 population) have established a functional network of roadways. Many of these communities have engaged in long range planning efforts that would consider the logical extension of the functional network of roadways. Additionally, some of North Dakota's larger urbanized areas such as but not limited to Bismarck, Grand Forks, and Minot have developed some form of access management policy or regulation.

Highway Functional Classification Concepts, Criteria and Procedures, US Department of Transportation Federal Highway Administration, 2013
http://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section00.cfm

Planning and Urban Design Standards, American Planning Association, 2006

Planning the Built Environment, Anderson, 2000

The Small Town Planning Handbook, Daniels, Keller, Lapping, 1995

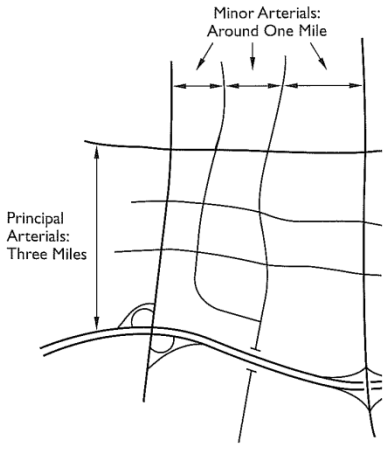
Sustainable Street Network Principles, Congress of the New Urbanism, 2012
http://www.cnu.org/sites/www.cnu.org/files/sustainable_street_network_principles_op.pdf

Transportation Planning Handbook 3rd Edition, Institute of Transportation Engineers, 2009

Spacing of Roadways in a Network

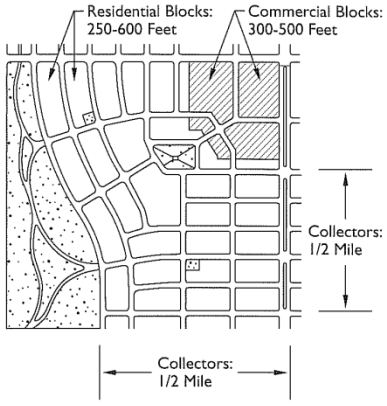
The spacing of roadways is a reflection of the type of function the roadway serves and the development density or level of demand to be served by the subject roadway. With respect to development density and travel demand typically spacing of like functioning roadways would occur at regular intervals. The FHWA indicates, "Arterials are typically spaced at greater intervals than collectors, which are spaced at much greater intervals than locals. This spacing varies considerably for different areas; in densely populated urban areas spacing of all route types is smaller and generally more consistent than the spacing in sparsely developed rural areas. Geographic barriers greatly influence the layout and spacing of roadways" (*Highway Functional Classification Concepts, Criteria and Procedures*, Federal Highway Administration, 2013). Although local land use characteristic and corresponding travel demand will dictate roadway spacing, in an urban setting some publications indicate that principal arterials should be generally spaced every three to four miles with minor arterials spaced every one mile. Collector roadways might generally be spaced every ½ mile from an arterial roadway (*Planning and Urban Design Standards*, American Planning Association, 2006). **Figure 7** illustrates general spacing characteristics in an urban setting by functional type of roadway.

Figure 7:



SPACING CRITERIA, PRINCIPAL ARTERIAL STREETS

Source: Walter Kulash.



SPACING CRITERIA, COLLECTOR AND LOCAL STREETS

Source: Walter Kulash.

Resources/Examples

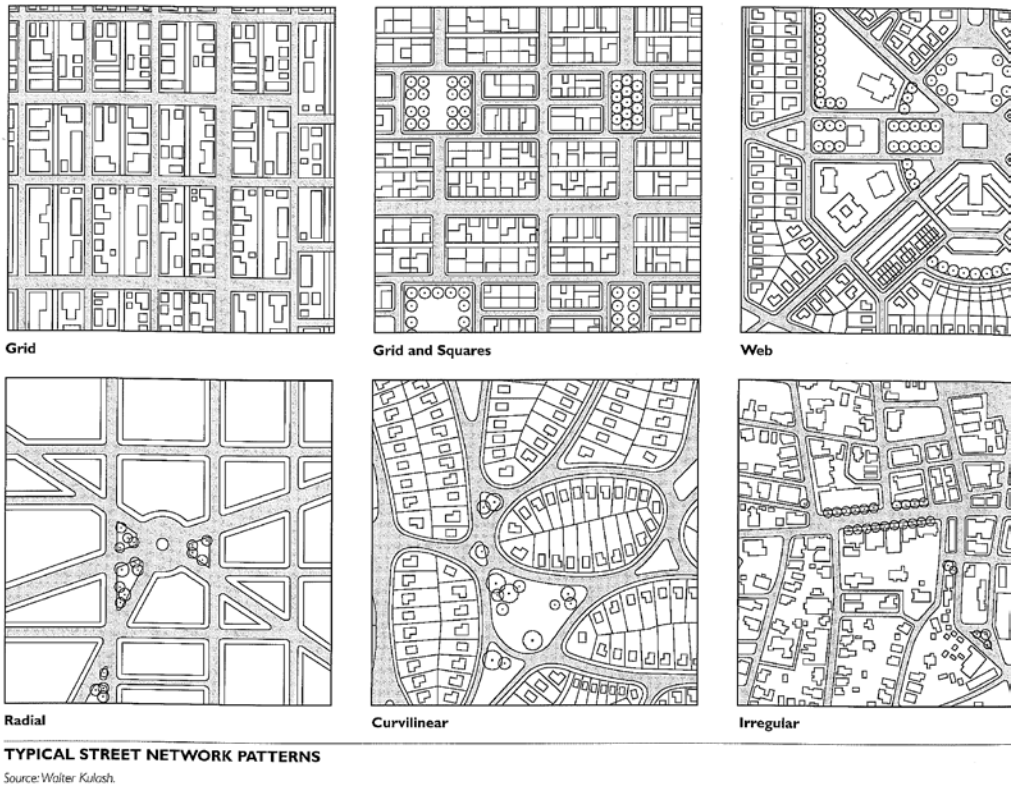
Some communities in North Dakota, as well as across the United States have land use regulations which regulate block lengths, which can influence spacing of roadways. Refer to the following Connectivity section for examples.

5: LAND USE AND TRANSPORTATION CONNECTION

Connectivity

"Well-connected street networks improve mobility by allowing people to travel more directly. This makes destinations more accessible by walking, and enlarges the capture area surrounding transit stations. Such highly connected street networks have been shown to reduce vehicle miles traveled, traffic congestion, and vehicle delay. They permit traffic to diffuse across the larger street network when demand becomes excessive on any individual route. They have also been proven to reduce emergency response times" (*Sustainable Street Network Principles*, Congress for the New Urbanism, 2012).

Figure 8:



TYPICAL STREET NETWORK PATTERNS

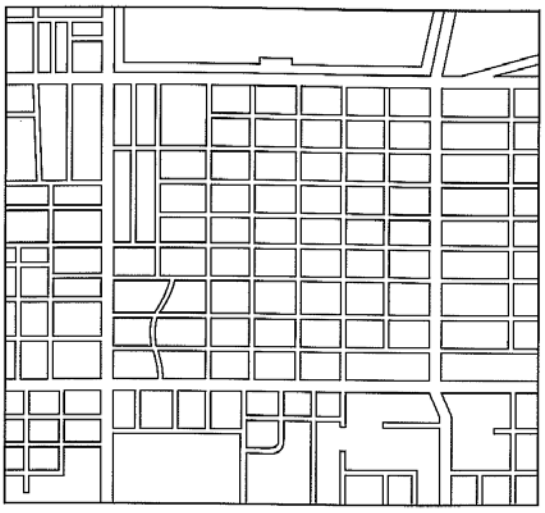
Source: Walter Kulash.

A connected transportation system is a key characteristic of a jurisdiction. Jurisdictions may have developed based on a wide variety of roadway network patterns as indicated in **Figure 8;** however, more important than pattern is the connectivity of the system.

An important role of the transportation system is to provide connections from one place to another. Traditional community development in the United States was historically based on the rectilinear grid system, similar to the "High-Connectivity Network identified in **Figure 9**. Contemporary subdivision design has focused on a curvilinear network of streets with the introduction of cul-de-sacs similar to the "Low-Connectivity Network" Identified in **Figure 9**. A visual review of the contrasting connectivity patterns helps exemplify how the urban form can influence accessibility and even modal choice. The highly connected network in **Figure 9** offers numerous options to navigate through the network and in turn, may provide convenient transportation options by using a car, bike, or walking. Conversely, unless bicycle/pedestrian connections are incorporated into the unconnected street network areas the only convenient option for many trips might be the car in the low–connectivity network in **Figure 9**. Additionally, the highly connected

network offers multiple routes to disperse traffic compared to the low-connectivity network which may concentrate traffic onto only a few routes.

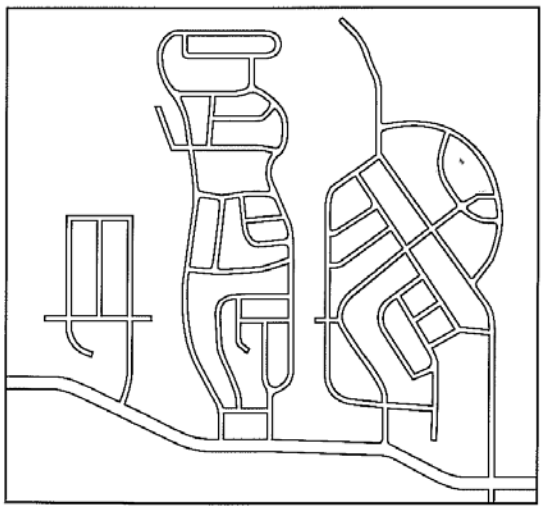
Figure 9:



A traditional rectilinear street grid provides relatively direct connections and multiple routes, thus has high connectivity.

HIGH-CONNECTIVITY NETWORK

Source: Handy, Paterson, and Butler 2003.



Curvilinear networks dominated by cul-de-sacs often provide relatively indirect connections and few routes, thus have low connectivity.

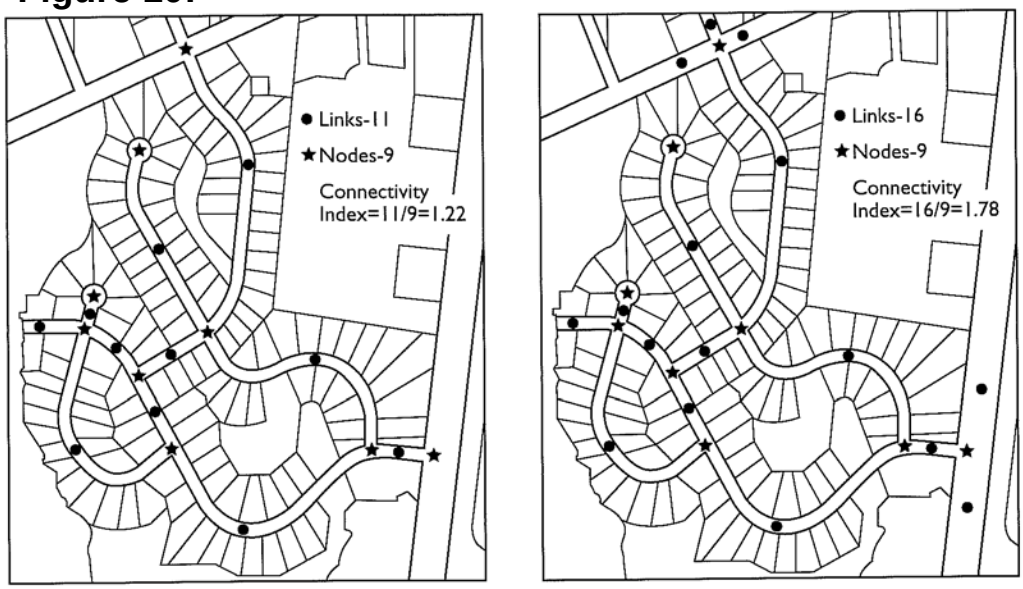
LOW-CONNECTIVITY NETWORK

Source: Handy, Paterson, and Butler 2003.

Walter Kulash, P.E., Glatting Jackson Kercher Anglin Lopez Rinehart, Inc., Orlando, Florida; Susan Handy, Ph.D., University of California at Davis, Davis, California

The jurisdictional roadway network is a reflection of local land development regulations (zoning and subdivision regulations) and land development practices. Nationally jurisdictions are beginning to regulate transportation network connectivity through means such as maximum allowable block lengths and connectivity standards. The maximum allowable block length essentially functions as a means to control the spacing of roadways and may provide enhanced connectivity within the jurisdiction, neighborhood, or subdivision. The APA indicates that typical maximum block lengths may fall in a range of 300 to 600 feet (*Planning and Urban Design Standards*, American Planning Association, 2006). A more complex method of enhancing connectivity is to utilize a “connectivity index” which is essentially a ratio of the number of links (a roadway segment) to nodes (an intersection of roadway segments). However, as **Figure 10** illustrates different jurisdictions may interpret how to calculate the ratio of links to nodes differently.

Figure 10:



Include Nodes with Arterials But No External Links

Include Nodes with Arterials and One Link Beyond Last Node

Cities have established different rules for counting nodes and links at the boundary of the area of interest, and these different rules lead to slightly different values of the index for the same network, as shown in the illustration.

COMPARISON OF RULES FOR CONNECTING NODES AND LINKS

Source: Handy, Paterson, and Butler 2003.

In addition to connectivity standards it may be common for jurisdictions to adopt a "narrow streets" standard to avoid a net increase in the amount of paved surface area, as well as to discourage through traffic on residential streets.

Resources/Examples

North Dakota communities such as Bismarck, Fargo, and Grand Forks have some requirements limiting block lengths.

Planning and Urban Design Standards, American Planning Association, 2006

The Small Town Planning Handbook, Daniels, Keller, Lapping, 1995

Sustainable Street Network Principles, Congress of the New Urbanism, 2012
http://www.cnu.org/sites/www.cnu.org/files/sustainable_street_network_principles_op.pdf

Transportation Planning Handbook 3rd Edition, Institute of Transportation Engineers, 2009

5: LAND USE AND TRANSPORTATION CONNECTION

Multi-Modal Planning Considerations

A balanced transportation network provides transportation opportunities and options and lessens dependence on any one mode of transport. Although, historically a significant amount of transportation planning efforts have revolved around motorized forms of travel, over the past several decades increasing attention has been paid to accommodate other modes. Many individuals in a jurisdiction may not have access or the ability to operate a motorized vehicle. The combination of land use and transportation policies may influence the opportunity and convenience to move around a community via multiple modes of transport. In addition to other modes such as bicycle, pedestrian, and transit planning freight movement is also a special consideration that may be influenced by both land use and transportation planning efforts. Transportation planning for all of the modes described in this section use consistent processes as previously discussed in this document however they have a specific functional consideration. The following provides a brief discussion of fundamental planning considerations related to some of the significant modes of transport in North Dakota.

Motorized Transport

Historically transportation planning has focused significantly on motorized forms of transport. Transportation planning concepts discussed earlier in this document significantly relate to planning for motorized transportation. Typically planning for motorized transport is incorporated into a jurisdiction's Comprehensive Plan or Long Range Transportation Plan. Most motorized transportation planning efforts generally include, but are not limited to the following:

- Goals of the motorized transportation system (does the jurisdiction want to focus on preservation of the transportation system, the expansion of the transportation system, safety, or economic development concerns for example)
- An assessment of the existing roadway infrastructure
- Identification of existing vehicle capacity or operational issues
- Projection or forecast of vehicle capacity or operational issues if improvements are not made to the roadway system
- Identification of existing safety areas such as high crash locations
- Existing and if possible, projected roadway conditions
- Development of a range of alternatives and selection of the most appropriate alternatives to address capacity, operations, safety, pavement condition, or other issues identified based on reasonably expected funding availability
- Cost estimates and identification of funding sources to implement recommended alternatives (generally it is assumed that funding should be based on reasonable projected funding amounts available by year of expenditure for the subject alternative)
- Expected construction time frame of proposed improvements

Travel demand on the transportation system can be influenced by land use decisions. Earlier in this document potential site specific issues related to the influence land use has on the transportation system were discussed. From a broader perspective, land use patterns may have influence on the larger transportation system. Focusing development or redevelopment in the core part of an urbanized area for instance has been shown to

have impact on limiting growth in vehicle miles traveled. Conventional development patterns on the fringe areas of a community conversely tends to contribute additional vehicle miles traveled and can add to traffic congestion and operational issues. Development patterns such as mixed-use, Neotraditional, New Urbanist, or Transit Oriented Development patterns tend to include higher densities with a mix of uses encouraging transit and bicycle/pedestrian modes of travel and may also have influence in limiting the growth of vehicle miles traveled.

Resources/Examples
Following are links to some examples of motorized transportation plans:

Dickinson Transportation Master Plan
http://www.dickinsongov.com/Documents/Information%20Documents/Community%20Development/Dickinson%20Transportation%20Plan%20Final.pdf

Bismarck-Mandan Metropolitan Planning Organization 2010-2035 Long Range Transportation Plan
http://bismarck.org/DocumentCenter/View/4139

Planning and Urban Design Standards, American Planning Association, 2006

The Small Town Planning Handbook, Daniels, Keller, Lapping, 1995

Transportation Planning Handbook 3rd Edition, Institute of Transportation Engineers, 2009

Bicycle and Pedestrian Transport
Often jurisdictions may incorporate bicycle and pedestrian accommodation into their comprehensive plan, as part of a long range transportation plan or as a stand-alone Functional Plan. Most bicycle and pedestrian planning efforts may generally include but are not limited to the following:

- Goals of the bicycle/pedestrian system (does the jurisdiction want to focus on a system that supports non-motorized commuters or recreational users)
- An assessment of the existing bicycle/pedestrian facilities and usage
- Identification of potential bicycle/pedestrian generators or locations that would produce or attract bicycle/pedestrian trips
- An identification of existing gaps in the bicycle/pedestrian system
- Consideration of future land use plans for the future expansion of a jurisdiction's bicycle/pedestrian network
- An evaluation of the jurisdiction's current policies and regulations related to the provision of bicycle/pedestrian accommodations, as well as an evaluation of a jurisdictions land development regulations which may influence walkability/bikabilty
- Development and recommendation of alternatives to identify bicycle/pedestrian system needs

- An estimate of costs for developing new bicycle/pedestrian facilities and general timeframes new facilities should be implemented

Bicycle/pedestrian planning can occur in both urban and rural settings however each planning effort may have different intended purposes. In the urban setting bicycle/pedestrian planning may serve multiple needs such as providing alternate modes of transportation for people who choose to bike/walk for multiple trip reasons or are dependent on biking/walking to meet their trip needs, as well as for recreational purposes. Given that greater distances are typically involved, bicycle/pedestrian planning may meet more recreational needs in the rural setting.

A number of land use and transportation factors contribute to the ease or interest of biking or walking in a given location. Following are a few factors which may influence walking and biking trip behavior:

- **Distance** – Generally, comfortable walking distances are assumed to be destinations within ¼ to ½ mile. Comfortable cycling distances may be longer.
- **Mix of Uses** – Providing a mix of uses which are attractive destinations within a neighborhood in a comfortable walking distance may have an influence on trip behavior.
- **Safety** – The perceived safety of an environment has influence on modal choice. For instance, a busy street with no pedestrian/bicycle accommodations may not be an attractive or inviting place to bicycle or walk.
- **Facilities** – Bicycle and pedestrian facilities may come in many different forms such as sidewalks, mutli-use paths, roadways with wide outside travel lanes, or roadways with shoulders, on-street way finding signage and pavement markings, bicycle lanes, or buffered bicycle lanes for example. The provision of facilities are intended to enhance safety and induce/encourage bicycle/walking modes of transport. Not all facilities are appropriate for all locations. The type of facility chosen for a given location should be based on acceptable design guidance (some resources have been provided in the Resources/Examples area of this section) and professional judgment.
- **Roadway and Urban Design** – The combination of roadway design in relation to the context of the surrounding environment outside of the right-of-way contribute to interesting and attractive places which may encourage walking and/or bicycling.

Resources/Examples

Locations across North Dakota are beginning to utilize a variety of methods to accommodate and encourage walking and bicycling. Many rural and urban locations in the State require sidewalks and integrate the bicycle/pedestrian network into the larger transportation system.

Following are links to some bicycle and/or pedestrian plans that are either stand-alone documents or incorporated with other planning efforts:

Fargo-Moorhead Metropolitan Bicycle and Pedestrian Plan
http://fmmetrocog.org/new/assets/documents/bike%20plan/January_2012_body.pdf

Bicycle and Pedestrian Master Plan element of the Grand Forks-East Grand Forks Metropolitan Planning Organization 2040 Long Range Transportation Plan http://www.theforksmpo.org/PDFS/2040BikePedPlan2013draftfinal.pdf

Guide for the Development of Bicycle Facilities 4th Edition, American Association of State and Highway Transportation Officials, 2012

Guide for the Planning, Design, and Operation of Pedestrian Facilities, American Association of State and Highway Transportation Officials, 2004

National Association of City Transportation Officials Urban Bikeway Design Guide http://nacto.org/cities-for-cycling/design-guide/

Planning and Urban Design Standards, American Planning Association, 2006

Transportation Planning Handbook 3rd Edition, Institute of Transportation Engineers, 2009

Public Transportation

In North Dakota public transportation options are provided in both urban and rural settings. Although public transportation may come in many forms, in North Dakota most public transportation is provided by motorized bus or van. Generally there are two primary types of public transportation services offered in North Dakota and include the following:

1. **Demand Response** – This service may also be known as a para-transit or curb-to-curb service. This can be supportive of other fixed route service in a jurisdiction. This service does not typically have route structures but rather provides service on demand. Typically rides are customized to origin and destination with rides scheduled in advance. Riders may have to qualify to be eligible for demand response services in North Dakota. Often times eligibility is limited to mobility challenged individuals with a physical or medical hardship. Other non-profit organizations or private for profit taxi service may also operate and provide demand response service in a jurisdiction which may or may not have eligibility requirements.
2. **Fixed-Route** – This service is found in some form in both urban and rural parts of the State and includes passenger buses that travel the same route structure, have bus stops or consistent repetitive stopping points, and operate the same route structure on consistent intervals. This form of public transportation can be more efficient than the demand response from a cost perspective but a large enough ridership market must be available to realize efficiencies. Special attention needs to be paid for the route structure architecture whether the intent is to provide consistent geographic coverage of a jurisdiction/region or whether it is a structure developed to capitalize on maximizing ridership by focusing on strategic areas of the jurisdiction/region. In rural areas generally much greater distances are covered and service is not as frequent. However, rural transit

provides a valuable transportation option for residents outside of North Dakota's urban areas.

There are a number of factors to consider when establishing a public transportation system. In general, attention should be paid to the ridership intended to be served. In public transportation planning riders typically fall into two general categories a "captive rider" or a "choice rider". Captive riders are typically mobility challenged individuals with limited or no access to a private automobile and are dependent on other means of transportation such as public transportation. A "choice rider" is typically an individual with mobility options and uses public transportation by choice. If a transit operation is intending to serve captive riders the service it may want to focus, is on affordable service that concentrates in locations with a higher concentration of captive rider's origins and destinations with appropriate hours of operation. A service focusing on attracting choice riders will want to make the service as convenient as possible serving many diverse locations within a jurisdiction/region.

Land use patterns may have an influence on ridership of transit service. In fact the early growth of some of North Dakota's urbanized areas was influenced by public transportation services such as trolley or street car lines. Generally, areas with the propensity to attract ridership are more densely populated with a mix of uses within comfortable walking distances from a transit stop or route. Single use low density development patterns are typically challenging for public transportation systems to efficiently serve.

Resource/Examples
Bismarck-Mandan Transit Development Plan
http://bismarck.org/DocumentCenter/Home/View/4346

Planning and Urban Design Standards, American Planning Association, 2006

Transportation Planning Handbook 3rd Edition, Institute of Transportation Engineers, 2009

Freight Transportation

The economies of jurisdictions depend on how goods travel into, out of, and through them. Much of the freight transported in North Dakota is handled by private firms, however the infrastructure in which goods move in North Dakota is the responsibility of local, state, federal, and private entities. Freight planning may be associated with a jurisdiction's comprehensive plan, long range transportation plan, or as a stand-alone document.

Generally, freight is transported by multiple modes in North Dakota including roadway, rail, air, and pipeline. In North Dakota the modes that jurisdictions have the greatest ability to plan for, construct, and maintain include the roadway network and supporting structures and to some degree air freight infrastructure. The following represent general freight planning considerations:

- **Identify the freight related needs, concerns, and trends** – This may involve interviewing or surveying local freight providers and industries or businesses dependent on the movement of freight into and out of the jurisdiction. This exercise should identify not only existing but should also attempt to understand future or emerging freight needs, concerns, and trends.
- **Define what constitutes a significant freight generator** – The ability of a business or industry to generate freight may be measured by the amount of truck trips per day. All businesses may require occasional deliveries/pick-ups but not all businesses might be considered to generate significant amounts of freight. Defining significant freight generators can help locate these areas in a jurisdiction. Interviewing or surveying local business and industry may provide an understanding of the types of uses which generate significant amounts of freight. Not every business may need to be interviewed or surveyed but a cross section of diverse business and industry may provide a general idea of what types of businesses are significant freight generators.
- **Identify locations which generate or attract freight** – Locations should be identified that have a propensity to generate freight. These areas may be a single use or business or it may be a location with many small freight generators clustered together which collectively generate significant freight movements. Site where freight interacts with other modes, such as rail or pipeline terminals or airports may be possible locations. Land use patterns may be an indication of areas which have the propensity to generate freight such as industrial areas. Also, once a significant freight generating type of business is identified, similar types of businesses tend to generate consistent levels of freight.
- **Create an inventory of the existing transportation infrastructure** – Related to the roadway and associated bridge network this may involve an inventory of roadway/bridge widths, load carrying capacity, pavement type, pavement condition, traffic control devices (stop lights), bridge heights, and intersection turning radius. This exercise may be helpful in understanding issues associated with the development of a freight network.
- **Establish a recommended freight network** – The movement of freight may have unique infrastructure needs such as large turning radii, width and height clearances, and increased load carrying capacity for instance. Since some of these features may be costly to implement not every roadway in the jurisdiction needs to be built to carry significant volumes of freight. However, for areas within the jurisdiction dependent on freight movement it is beneficial to establish a network of roadways to serve the subject areas. Consultation with the local freight industry and significant freight generating businesses can help to inform or define a network. Special attention should be paid to existing and future land use not only to identify existing and future freight generating areas but also to avoid land uses which may be in conflict with goods movement. For instance, siting freight facilities through predominately residential areas should be avoided if possible to minimize adverse impacts to residents.
- **Identify "bottlenecks" or impediments to freight movement** – Once a network has been established bottlenecks can be identified. Bottlenecks can be identified through a variety of methods such as surveying local freight industries

or through analysis of conditions which may contribute to freight bottlenecks. Some conditions which may lead to freight bottlenecks could be but are not limited to width, structure height, load carrying capacity, or areas of congestion.

Additionally some jurisdictions may focus on the transport of hazardous material. Hazardous materials are generally considered to be materials or substances which could adversely affect the health and safety of the public. Some jurisdictions opt to define routes for the transport of hazardous materials into, out of, and through the jurisdiction to minimize risk and exposure of these materials to the public. For purposes of transportation Title 49 172.101 of the Code of Federal Regulations (CRF) designates a list of hazardous materials. The Pipeline and Hazardous Material Safety Administration maintains this list which can be found in the following Resource/Examples section.

Effective coordination between land use and freight planning activities can help to minimize conflict with negative impacts while maintaining the economic benefits associated with the movement of goods. Freight generating land uses might include agricultural, mining and natural resource extraction, construction, warehousing, manufacturing, and logistics. Often negative externalities may be associated with these uses such as air and light pollution, noise, odor, and vibration. Local jurisdictions may utilize a variety of tools to minimize negative externalities such as: establishing buffers between industrial and sensitive land uses; influencing location and design choices through zoning and land use planning; preserving existing industrial land uses; and promoting context sensitive solutions for site and building design.

Resources/Example

FHWA Freight and Land Use Hand Book, United States Department of Transportation Federal Highway Administration, 2012

Planning and Urban Design Standards, American Planning Association, 2006

The Small Town Planning Handbook, Daniels, Keller, and Lapping, 1988

Transportation Planning Handbook 3rd Edition, Institute of Transportation Engineers, 2008

City of Minot has established a hazardous material routing network

North Dakota State Freight Plan, North Dakota Department of Transportation
http://www.dot.nd.gov/divisions/planning/freight/

Pipeline and Hazardous Material Safety Administration table of hazardous materials
http://phmsa.dot.gov/portal/site/PHMSA/menuitem.6f23687cf7b00b0f22e4c6962d9c8789/?vgnextoid=d84ddf479bd7d110VgnVCM1000009ed07898RCRD&vgnextchannel=4f347fd9b896b110VgnVCM1000009ed07898RCRD&vgnextfmt=print

6: EMERGING LAND USE AND TRANSPORTATION PLANNING CONCEPTS

New planning concepts are beginning to influence the interaction between land use and transportation throughout the United States, as well as the way the public is informed and involved in the planning process.

Improved techniques in community organizing, study groups and visioning are also being developed to achieve greater public participation in the planning process. Advances in communication technology – Internet applications, powerful mapping, and geographic information systems, desktop graphics, and visualization software – are also being used to facilitate informed public decisions, enhance the design and the appearance of the plan, and market the plan to the public.

The publication of planning documents is changing as well. Jurisdictional plans, surveys, and maps are being placed on the Internet. This allows for substantial savings on printing and publication costs and it gives communities greater exposure and accountability.

The following provides more information regarding land use and transportation concepts that are emerging throughout the region and country. Land use decisions in North Dakota are controlled at the local jurisdictional level. The following examples of land use and transportation concepts are not intended to be recommendations but rather are provided to demonstrate evolving land use and transportation planning concepts.

Growth Management

Growth management is a planning approach that addresses the problems of rapid development. It is an approach that uses a variety of techniques to try to ensure that adequate public facilities will be available to meet the demands of growth. The concept is as much a philosophy as it is a collection of tools and techniques. While it uses many traditional planning tools, such as the comprehensive plan, it uses them in new ways to guide how and where the jurisdiction's share of expected growth is to occur. This helps to ensure that growth takes place in a way that is acceptable and beneficial to the jurisdiction, while reducing negative effects. Commonly growth management is an approach which ties growth to the adequate provision of public services, through ordinance and/or other means.

Resources/Examples
City of Bismarck Growth Management Plan
http://www.bismarckgrowthplan.com/

Planning and Urban Design Standards, American Planning Association, 2006

6: EMERGING LAND USE AND TRANSPORTATION PLANNING CONCEPTS

Scenario Planning

This planning concept analyses a variety of potential future scenarios that might influence a jurisdiction to develop a shared vision. The concept tests a variety of future alternatives that might face the jurisdiction or that may meet the goals the jurisdiction seeks to attain. Through the planning process, scenario planning seeks to inform the jurisdiction about growth trends and tradeoffs by incorporating jurisdiction values and feedback into future plans. Commonly jurisdictions will evaluate a range of population and employment scenarios that might face a jurisdiction to better assess jurisdictional needs for infrastructure, housing, and land use. The FHWA has developed a scenario planning guidebook to assist transportation agencies with pursuing a scenario planning process. The FHWA Scenario Planning Guidebook suggests 6 phases which include:

- **Phase 1: How should we Get Started?** – Focuses on developing objectives and identifying the resources needed for the process
- **Phase 2: Where are We Now?** – Establishes a baseline for analysis by identifying factors influencing the jurisdictional area
- **Phase 3: Who are We and Where do We Want to Go?** – Establishes future goals and aspirations based on values of the jurisdictioin
- **Phase 4: What Could the Future Look Like?** – Creates a variety of alternative scenarios
- **Phase 5: What Impacts Will Scenarios Have?** – Assesses scenario impacts, influences, and effects
- **Phase 6: How Will We Reach Our Desired Future?** Develops a jurisdictional vision identifying strategic actions and performance measures.

Resiliency Planning

A form of scenario planning, resiliency planning tends to focus on risks that may face a jurisdiction and identifies measures to minimize or respond to those risk(s). Risks may range from demographic/economic trends to natural or manmade disasters which may face a jurisdiction. Given the robust nature of risk it is difficult to prepare/plan for all risks which may impact a jurisdiction. A key step in the resiliency planning process is identifying the risks likely to face a jurisdiction and assess the extent those risks may impact the jurisdiction. Local jurisdictions may consider incorporating hazard mitigation into their planning process to minimize the impact of potential risks. The Federal Emergency Management Agency (FEMA) suggests that, “hazard mitigation works best as a policy objective of local planning when it is so completely integrated into the comprehensive plan that it becomes a normal assumption behind all daily planning activities” (*Integrating Hazard Mitigation Into the Local Comprehensive Plan*, Federal Emergency Management Agency). Through the planning process, policies can be developed and future land uses, transportation infrastructure, housing, economic development opportunities, public facilities, and other public infrastructure can be located away from areas of known hazards.

Resources/Examples

Climate Change and Extreme Weather Vulnerability Assessment Framework, FHWA
https://www.fhwa.dot.gov/environment/climate_change/adaptation/publications_and_tools/vulnerability_assessment_framework/

FHWA Scenario Planning Guidebook, FHWA
https://www.fhwa.dot.gov/planning/scenario_and_visualization/scenario_planning/scenario_planning_guidebook/ch00.cfm

Integrating Hazard Mitigation Into the Local Comprehensive Plan, FEMA
http://www.fema.gov/media-library-data/20130726-1908-25045-9918/factsheet1.pdf

The Built Environment and Public Health

The planning profession largely arose from public health concerns of the 19th century. The industrial revolution brought workers and families from rural areas to cities, leading to conditions of overcrowded housing which was often located next to factories discharging a variety of pollutants. Overcrowding and poor sanitation led to high rates of infectious disease. Early building codes and zoning ordinances arose in an attempt to address the poor living conditions experienced during this time. These policies and ordinances were effective in addressing public health concerns at the time. As public health concerns faded, jurisdictions began to focus less on the connection of health and safety as a result of the built environment. Largely since the end of World War II, transportation technology and local and federal policies have led to built environments which research indicates may be contributing to a rise in other health related issues. Increasingly research is focusing on how today's built environment influences public health concerns such as physical inactivity, air quality, water quality, and traffic safety.

Resources/Examples
American Planning Association, Built Environment and Public Health Clearinghouse
https://www.planning.org/nationalcenters/health/bephc/

Center for Disease, Designing and Building Healthy Places
http://www.cdc.gov/healthyplaces/

Healthy Plan Making-Integrating Health into the Comprehensive Planning Process: An Analysis of Seven Case Studies and Recommendations for Change, American Planning Association
https://www.planning.org/research/publichealth/pdf/healthyplanningreport.pdf

Land Use Planning for Public Health: The Role of Local Boards of Health in Community Design and Development, National Association of Local Boards of Health, 2006
http://www.cdc.gov/healthyplaces/publications/landuseNALBOH.pdf

Understanding the Relationship Between Public Health and the Built Environment, Ewing and Kreutzer, 2006
http://www.usgbc.org/Docs/Archive/General/Docs1480.pdf

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Mixed-Use, Neotraditional Development, or Traditional Neighborhood Development

This concept attempts to utilize characteristics based on historical/traditional neighborhood development practices, typically utilized in pre-World War II development in communities in the United States including a well-connected, mixed-use, and compact development pattern. There appears to be some evidence related to consumer preference toward neighborhoods exhibiting mixed-use or traditional neighborhood design characteristics. The National Association of Realtors indicates that nationally roughly 60 percent of survey respondents favor neighborhoods with a mix of houses and stores and other businesses that are easy to walk to, rather than neighborhoods that require more driving between home, work and recreation.

The type of development patterns described above may have a variety of names including mixed-use, Neotraditional development, Traditional Neighborhood Development, or New Urbanism. Regardless of the name these development patterns have general characteristics associated with them:

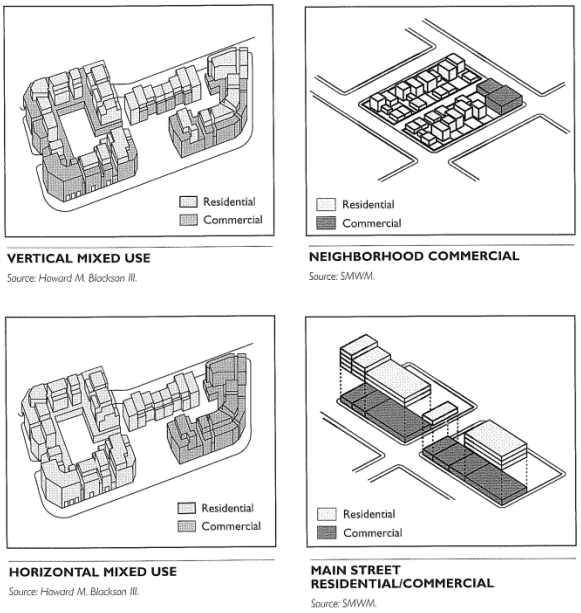
Image courtesy of www.baxterwestbozeman.com

1. A mix of land uses to make walking for some errands more attractive and feasible.
2. Reduced lot sizes. Traditional neighborhoods typically have lots that are a third to a quarter of the size of conventional suburban neighborhoods.
3. Reduced building distance from the street. Minimize distances between building entrances and transit stops.
4. Abundant free parking is typically discouraged.
5. Generous landscaping, paved sidewalks, and safe street crossings are typically provided. Roadways are designed to serve pedestrians at least as much as they serve motor vehicles.
6. Build streets that are narrower than conventional subdivision streets; require sidewalks, trees, and other pedestrian amenities.
7. Neighborhoods within walking distance of shopping, recreation, and/or activity centers.
8. A “density gradient,” may be established in which higher densities are located near activity centers and transit stops (if available), with

densities becoming lower as one moves away from those centers. This encourages clustering of buildings in centers, shared parking facilities, and pedestrian/bike pathways connecting centers.

9. A well connected roadway network is provided. A grid or modified grid street layout that provides alternative routes to destinations.
10. Multiple connections are typically provided to neighboring developments to avoid "islands" of development that depend on collector streets for all travel between them.

Figure 11:



Planning and Urban Design Standards, American Planning Association, 2006

The integration of different uses is one of the key characteristics identified with this development concept. Mixing of uses could occur vertically or horizontally. **Figure 11** illustrates different ways to mix or integrate uses.

Resources/Examples

There is a variety of individual site specific mixed-use projects which have recently been developed across North Dakota. Neighborhood scale Neotraditional/Traditional Neighborhood/New Urbanist/Mixed-Use developments are beginning to emerge within the region and include but are not limited to: Baxter Meadows development in Bozeman, Montana; Liberty on the Lakes in Stillwater, Minnesota; and Stapleton, Colorado.

Conservation Development

Conservation Development is a site planning approach that is an alternative to conventional subdivision development commonly associated with rural areas rich with agricultural, forest, wetland, or other natural or recreational amenities. It is a practice that groups residential properties in a proposed subdivision closer together in order to utilize the rest of the land for open space, recreation or agriculture. Commonly, the preserved space is legally protected from development by a conservation easement or similar means.

Following represent some characteristics of Conservation Development:

1. The primary purpose is to preserve significant natural features, environmentally sensitive areas, agricultural land, and open space.
2. Integrated site design that is considerate to the natural features and topography.

3. Non-point source pollution may be minimized through reducing the area of impervious surfaces on site.
4. Reduced infrastructure and maintenance costs due to decreased pavement area, as well as decreased distance that utilities need to be provided.

Figure 12 provides a visual representation of the Conservation Development concept in comparison to more conventional rural residential development patterns.

Figure 12:

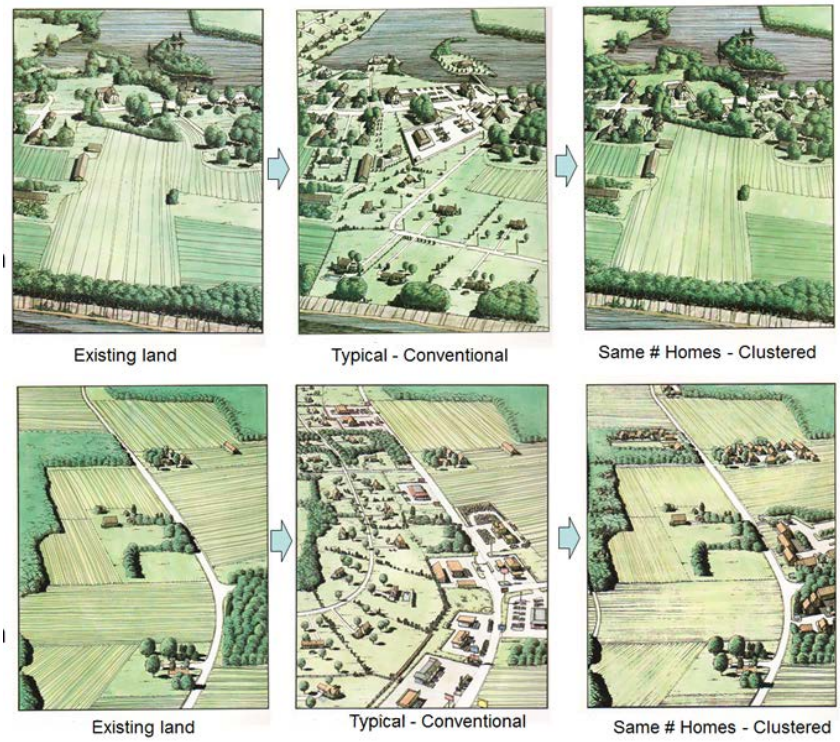


Image courtesy of www.greenerprospects.com/bio.html

Resources/Examples

Planning and Urban Design Standards, American Planning Association, 2006

Context Sensitive Solutions (CSS) or Context Sensitive Design

The context or surrounding of an environment can both influence and be influenced by the design of transportation facilities provided. Often times there are trade-offs which need to be considered between the function the transportation facility is intending to serve with respect to impacts to the adjacent built or natural environment. According to the Institute of Transportation Engineers (ITE), “Applying the principles of CSS enhances the planning and design process by addressing objectives and considerations not only for the transportation facility but also for the surrounding area and its land uses, developments, economic and other activities and environmental conditions. With a thorough understanding of the CSS principles and design process, the practitioner planning or designing a thoroughfare seeks to integrate community objectives, accommodate all users and make decisions based on an understanding of the trade-offs that frequently accompany multiple or conflicting needs. Applying the principles of CSS in the transportation planning or project development process identifies objectives, issues and trade-offs based on stakeholder and community input starting at the regional planning process and continuing through each level of planning and project

development" (*Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, Institute of Transportation Engineers, 2010).
The ITE indicates the following represent some of the basic principles of CSS:

- Meet the needs of all users
- Are compatible with their setting and preserve scenic, aesthetic, historic and environmental resources
- Respect design objectives for safety, efficiency, multimodal mobility, capacity and maintenance
- Integrate community objectives and values relating to compatibility, livability, sense of place, urban design, cost and environmental impacts

Resources/Examples

City of Fargo Broadway reconstruction in downtown Fargo.

Image courtesy of Minneapolis Star Tribune

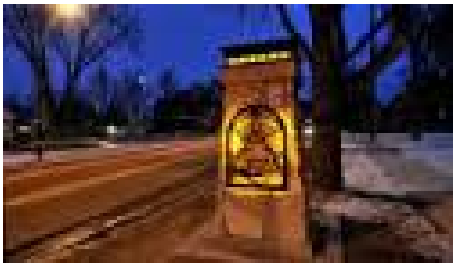


Image courtesy of RDG Planning and Design

City of Bismarck Washington Street reconstruction in the Cathedral District

Institute of Transportation Engineers Context Sensitive Solutions
http://www.ite.org/css/

Designing Walkable Urban Thoroughfares: A Context Sensitive Approach, Institute of Transportation Engineers, 2010
http://www.ite.org/css/RP-036A-E.pdf

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Complete Streets

“Complete streets are streets for everyone. They are designed and operated to enable safe access for all users. People of all ages and abilities are able to safely move along and across streets in a community, regardless of how they are traveling. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations” (National Complete Streets Coalition).

The Complete Streets concept is more a design philosophy than a design standard. Much like the Context Sensitive Solutions concept, it relies heavily on identifying and accommodating the diverse transportation needs of the stakeholders along a given corridor. The historic approach to transportation planning focused primarily on accommodation of the automobile, however this approach attempts to provide accommodation to all relevant and appropriate users of a given corridor. It is a concept which essentially promotes communication and thought related to all transportation needs of a given corridor. Complete Streets may look very differently even within the same jurisdiction. Depending on the users being served some streets may have bicycle lanes and bus pullouts while others simply have a sidewalk. A complete street in an urban setting might look completely different than a complete street in a rural setting. The important concept is to ensure that the user’s needs of the specific corridor will be addressed in the design process.

Many state departments of transportation and local jurisdictions have begun to adopt “Complete Street Policies” across the country and within the region. The adoption of the policy helps to ensure that all appropriate users will be considered in the development and design of a project.

Resources/Examples

Some of the jurisdictions which have adopted Complete Streets policies within the region include but are not limited to: the Fargo-Moorhead Metropolitan Council of Governments; Dilworth, MN; Clay County, MN; Breckenridge, MN; the Minnesota Department of Transportation; Billings, MT; Bozeman, MT; Helena, MT; Missoula, MT; Shelby, MT; and Sydney, MT.

For a complete listing of all policies around the country and for more information on Complete Streets please visit the National Complete Streets Coalition: http://www.smartgrowthamerica.org/complete-streets

7: RESOURCE ORGANIZATIONS

A variety of national, regional, and statewide planning organizations exist which may offer valuable resources and information to local jurisdictions engaged in the planning process. The following section provides information and website links to some planning organizations that may be relevant to North Dakota jurisdictions.

National, Regional, and Statewide Planning Organizations

American Planning Association (APA) – The APA is the independent not-for-profit educational organization for the planning profession. It offers a certification or professional licensing program for planners to ensure they meet minimum criteria for proficiency as a professional planner while ensuring continuing education and ethical standards are met. The APA develops regular periodic publications providing insight into current issues facing the planning profession which include: *Planning* magazine; the *Journal of the American Planning Association*; *Planning and Environmental Law*; *Zoning Practice*; and the *Planners Advisory Service Reports*. In addition the APA has a variety of publications it has developed on specific planning related topics which are available for purchase through the APA website. The APA hosts a variety of educational opportunities including webinars and a national conference held each year to showcase the state of the practice in the planning profession. Individual state and/or regional chapters have been established to provide local planning related networking and educational opportunities. For more information visit the APA website at: www.planning.org

Western Planner – The Western Planner is a collection of a variety of western states including: Alaska; Arizona; Colorado; Idaho; Montana; New Mexico; North Dakota; Oregon; South Dakota; Utah; Washington; and Wyoming. It has been established to provide information and education, related to planning issues, unique to western states. The Western Planner develops the *Western Planner* Journal which is published five times per year and hosts an annual conference. For more information visit the Western Planner website at: http://westernplanner.org/about-us/

West Central Chapter of the American Planning Association (WCC) – The WCC is the local regional chapter of the APA and is comprised of the states of Montana, North Dakota, South Dakota, and Wyoming. It is a 300 plus member organization and provides local networking and educational planning related opportunities specific to the four state area. For more information visit the WCC website at: http://www.wccapa.org/

North Dakota Planning Association (NDPA) – The NDPA was formed in 1973 and serves a diverse membership including professional planners, economic developers, regional council board members, city and county planning board members, private individuals, businesses and utilities. The NDPA seeks to be a forum for the exchange of planning related ideas, educational opportunities, legislative information and lobbying activities specific to North Dakota. The NDPA has developed a number of training opportunities and resources including the 2005 North Dakota Planning Handbook. The

NDPA hosts an annual conference. For more information visit the NDPA website at: http://www.ndplanning.org/

Vision West ND – The Vision West ND initiative was established in response to the rapid pace of growth due in large part to energy development in western North Dakota. It has been funded in part by grants from the US Department of Housing and Urban Development and North Dakota Energy Development Infrastructure and Impact Grant Fund programs and is focused on the oil producing areas of the State. The primary goals of the project are to address the immediate short-term needs of the area in meeting growth management challenges and establish a diversified economy through development of local regional strategic plans. Through the initiative a variety of planning products have been developed including: local economic development strategic plans; local infrastructure assessments; planning and zoning resources; project level schematic renderings; and a regional plan for the oil producing area of North Dakota. For more information visit the Vision West ND website at: http://www.visionwestnd.com/index.php

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