A Process for County Road Planning

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April 2006

Acknowledgments

This case study would not have been possible without the financial assistance from the several funding sources listed below. Furthermore, the study could not have been completed without the cooperation of Cass County, N.D., and Mendocino County, Calif.

In addition, the authors extend their heartfelt thanks to the following individuals who made important contributions to this effort: Ray McCormick, for providing strategic direction; and Keith Berndt, Steve Busek, Gene Calvert, Bill Evans, and Barry Schuchard, for agreeing to review and critique the work.

Funding Sources

- Local Technical Assistance Program (LTAP), Federal Highway Administration, US Department of Transportation
- Mountain-Plains Consortium, North Dakota State University
- Cass County, North Dakota
- Mendocino County, California

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Table of Contents

List of Figures

Abstract

A county road planning process was developed that would facilitate the best use of scarce resources and that could be easily adapted to a county's unique situation. The planning process was used to create a county road plan for Cass County, North Dakota, and the process was modified during the project to reflect what was learned as the county's road plan was being developed.

The planning process recommended in this report consists of five basic steps with 15 associated activities. The process is intended to be used not only by county transportation administrators, but also by consultants and state Local Technical Assistance Program (LTAP) personnel. Consultants and LTAP personnel can provide counties with valuable assistance in using the recommended planning process and in developing county road plans.

1. Introduction

County roads and highways are critical components of the U.S. surface transportation system. The surface transportation system can be characterized as the integration of discrete subsystems that are developed and managed by four political subdivisions—namely, states, counties, townships, and cities. Collectively, these roads and highways are the infrastructure for movements by automobiles, trucks, and buses, which provide the mobility necessary for our nation.

Mobility—the ability to safely and efficiently transport people and goods—is one of the most important criteria for success in our advanced socioeconomic system. Whether it is the commercial mobility of goods and services or the personal mobility so prized by individuals, our socioeconomic system requires a well-developed transportation system.

Transportation is as important and necessary as education, health care, housing, and food. Without a well-planned, advanced transportation system, none of the important activities in daily life would be possible. For instance, without transportation and the mobility that it provides, it would be virtually impossible for individuals or businesses to fully participate in, or benefit from, our economic system. Mobility enables people to work, shop, socialize, and participate in the political process, religious services, and numerous other life-enriching activities. Without an advanced transportation system and related industry, none of the most basic socioeconomic functions would be achievable at any desired level of quality. It is obvious to even the most casual observer that our transportation system serves as arteries for commerce and as the web that connects all facets of our society.

Transportation is a major industrial sector in its own right. As socioeconomic systems become more complex and as the global economy continues to expand, our dependence on a sophisticated and technically advanced transportation system will continue to intensify at an increasing rate. Mobility is indeed a first-order necessity for socioeconomic success.

The resources needed to achieve the essential and desired level of mobility are, however, scarce. That scarcity results in associated costs for mobility. These costs are composed of obvious costs and other, more subtle costs that are just as real, but that are more difficult to recognize and to account for.

The obvious costs are those associated with developing and operating the transportation infrastructure–the roads and bridges. It is relatively easy for a planner to prioritize the use of resources for those activities because the resources are effectively and efficiently priced by the market. In contrast, the hidden, or less obvious costs, such as environmental costs, lack an efficient market system for allocating resources; thus assessing and quantifying these hidden costs should be a major component of the planning process.

The county road systems link much of rural America to the state highway systems and thus to cities. The county road systems also provide a means for residents of urban areas to access recreational, sport, scenic, and business opportunities in rural areas. The county road system is as important as the state and city road systems, and each of these systems is only as strong the other–they are highly interdependent. Counties must thus develop both long-term and short-term plans for improving and operating their transportation systems in order to maximize mobility while minimizing any deleterious effects on the environment or communities.

The aim of transportation planning is to satisfy the mobility goals and objectives of a community, subject to feasibility, resource, and impact constraints.[1] Transportation planning is the mechanism for maximizing, within the constraints of limited resources, opportunities for mobility of goods, services, and people.

The transportation plan must meet the needs of three groups that have a great deal at stake in the county road transportation system, but that may also have different viewpoints.[2] These groups are the operators of the system, the users of the system, and those who do not use the system but who are affected by it (nonusers). *Operators* are usually concerned with issues such as capital costs, operating costs, revenues, technical merit of the plan, relationships with other government agencies and private-sector organizations, and workforce issues. *Users*, on the other hand, are more concerned with the cost of transportation, ease of access, travel times, and ride quality. *Nonuser*s are usually concerned with how externalities resulting from the construction, maintenance, and use of the system affect their lives in a negative or positive manner. These externalities include noise, visual intrusion, economic impacts, and social disruption.

Balancing the interests of the users, the operators, and the nonusers while meeting the need for mobility and heeding funding, environmental, and other constraints is an extremely complex challenge. That is why the planning function–and the selection of the planning process--is so important to the long-term viability of the transportation system and the mobility that it provides.

1.1 Examples of the Planning Process

There are four main elements that must be addressed in developing a county transportation plan.[3] The first element concerns the overriding goal of providing optimal mobility and access for people and goods. The second element is to the need to achieve this mobility in coordination and collaboration with the stakeholders. The third element is the emphasis on maximizing system performance and preservation so as to provide mobility in the most efficient way possible. The fourth element is an emphasis on preserving the environment and maintaining quality of life. A more detailed look at these elements can be used as a checklist throughout the planning process.

- Mobility and Access for People and Goods
  - Access across international borders, allowing travel to ports and other transportation facilities
  - Access to major freight distribution routes and other demand areas, such as national parks
  - The county's long-term needs for the efficient movement of people and goods
  - Appropriate methods to expand and enhance the use of transit services and facilities

[1] Paul H. Wright and Norman J. Ashford *Transportation Engineering Planning and Design*, 4th ed. John Wiley & Sons, 1998, p 189.

[2] Ibid., p 192.

[3] *Statewide Transportation Planning Under ISTEA—A New Framework for Decisionmaking*, Federal Highway Administration and Federal Transit Administration, Publication No. FHWA-PD-97-001, p 10.

- Coordination and Collaboration Among Stakeholders
  - Coordination between county and statewide plans and programs to ensure connectivity
  - Use of innovative financing mechanisms, including improved cash flow tools
  - Consideration of needs of nonmetropolitan areas

- System Performance and Preservation
  - Transportation system management techniques that make the most efficient use of existing transportation facilities
  - Methods to prevent or reduce traffic congestion
  - Identification and preservation of rights-of-way for future projects, or for future transportation corridors
  - Use of life-cycle costs in design and engineering of pavement, bridges, and tunnels

- Environment and Quality of Life
  - Recreational travel and tourism
  - The social, economic, energy, and environmental effects of transportation decisions
  - Strategies for incorporating bicycle transportation facilities and pedestrian walkways in appropriate projects
  - Strategies for identifying and implementing transportation enhancements, where appropriate
  - Effects of transportation decisions on land development and use

A sound planning process is necessary to address these four all-important elements, particularly because there are several ways to achieve the same objective. Examples of two approaches to developing a planning process are shown in Figures 1 and 2.

Figure 1 combines the philosophical aspects of values, goals, and objectives with operational issues.[4] In this case, *values* represent the socioeconomic system that the people of the county want for themselves. This is a rather abstract notion, and it may not be necessary or even possible to identify such values. Nonetheless, they should at least be considered in a conceptual and informative way. (Vision may be a more appropriate, or at least an alternative, term that could be used as it is applied here.)

The *goals* represent the desired end at which the planning process is aimed. Goals can be difficult or impossible to measure. *Objectives*, on the other hand, are measurable operational statements of individual goals. When the objectives are achieved, the goals should also be reached, assuming a logical relationship has been correctly defined beforehand and the situational environment has not changed.

Criteria simply refer to the method by which the achievement of objectives is measured. Tasks could also be added to this list, to define work assignments that result in the achievement of the objectives.

[4] Paul H. Wright and Norman J. Ashford, *Transportation Engineering Planning and Design*, 4th ed., John Wiley & Sons, 1998, p. 190.

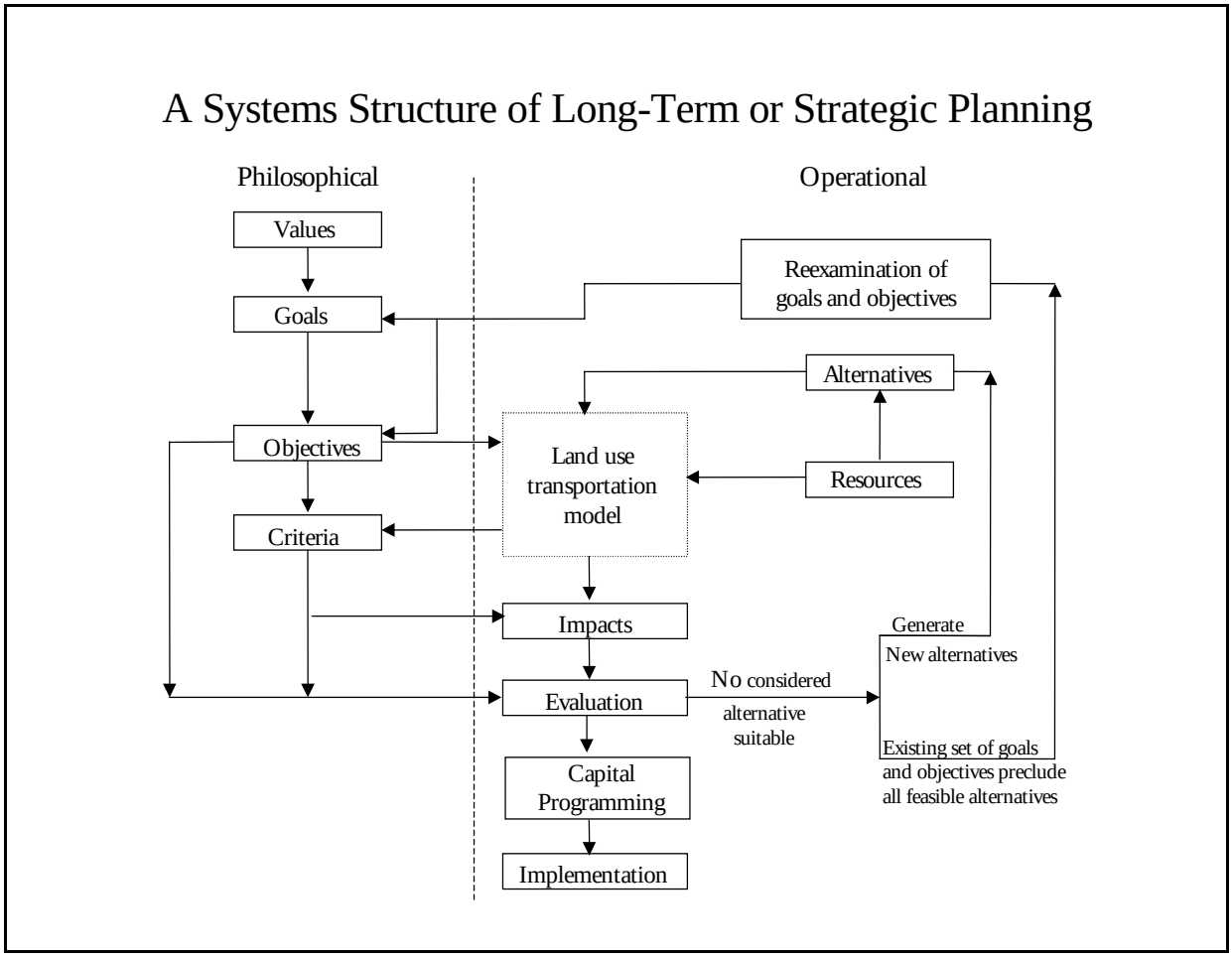

Figure 1. One Model for Developing a Planning Process (Source: Meyer and Miller, 2000)

Figure 2 shows an alternative model that could be considered for developing the planning process. This model, one used by Puget Sound, combines basic planning studies with an inventory analysis, and the results are synthesized into a plan using several different analytical and planning processes.[5]

The purpose of introducing these models is not to recommend one or the other, but to use different elements of each to fashion a planning process that works for rural county road systems. The development of the planning process is the first and most important step in the development of a county road and highway transportation plan; the selection of the planning process determines to a great extent the outcome of the plan. The selection of the process to be used is probably more important than the application of the process itself.

[5] Paul H. Wright and Norman J. Ashford, *Transportation Engineering Planning and Design*, 4th ed., John Wiley & Sons, 1998, p. 216.

The examples given above seem too complex for the rural county environment, where few if any staff have knowledge and training in the transportation planning function. In addition, because county transportation systems are rarely as complex as other systems, such as statewide systems or systems in large metropolitan areas, a more straightforward planning process may be more appropriate. A more direct approach has thus been developed as a suggested planning process for rural areas.

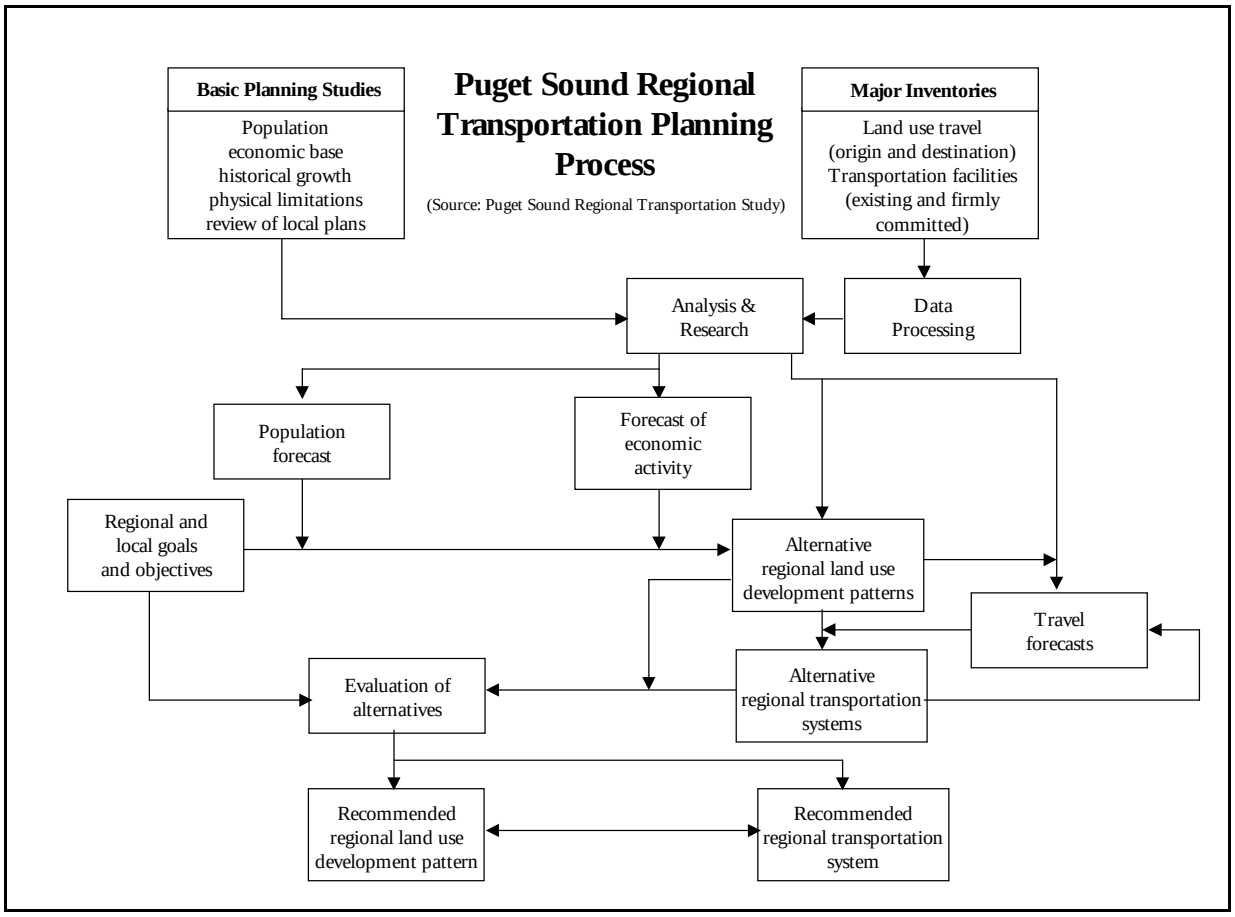

Figure 2. Puget Sound's Model for Developing a Planning Process (Source: Meyer and Miller, 2000)

1.2. Organization of the Remainder of the Report

Chapter 2 provides a conceptual explanation of the planning process proposed for counties to use in developing transportation plans. Chapter 3 provides a detailed discussion of the actual objectives and tasks associated with each planning step, along with a set of instructions for achieving the objectives of each goal. Chapter 4 consists of the results of a case study—what worked, what did not work, and what should be modified. Chapter 5 contains the summary and conclusions.

It is not necessary for the entire planning team to read this entire publication. The facilitator and the planning team leader(s) should, however, review this report to optimize the use of the proposed planning process.

2. PLANNING PROCESS

Before discussing the process for developing a county road plan, it is important to understand the purpose of such a plan. In addition to addressing the four elements identified in the previous chapter (mobility, coordination and collaboration among stakeholders, system performance and preservation, and environment and quality of life), a county road plan should also serve five fundamental functions for the county policy-making body (county commissioners/supervisors) and those responsible for developing, reconstructing, and maintaining the county road system:

1. Serve as a means of communicating with the public
2. Provide management with a tool for designing, planning, and budgeting projects
3. Serve as mechanism for prioritizing projects and operations
4. Provide an internal benchmarking mechanism (performance measures)
5. Serve as an activity scheduling tool

If the planning process and the resultant road plan provide the county board and the county road department with the tools and mechanisms for serving these functions, the effort, money, and time spent developing the road plan will be well worth it.

2.1 Basic Planning Steps and Activities

The planning process that has been developed and suggested for rural counties is composed of five basic steps (Figure 3). These five basic steps are, in turn, made up of several very detailed planning activities, which are identified and explained in the next section of this chapter. The process is presented in such a way as to make it less intimidating to, and easier to understand by, those who do not normally deal with transportation planning.

Step 1. Develop a Planning Process

The first and most basic activity in Step 1 involves creating a foundation for a successful planning process by inviting and encouraging elected county officials, stakeholders, and the media to participate in the development of the plan.

The next activity in Step 1 is to develop a process for developing the transportation plan, Once the process has been developed, the planning team can be formed. The team should then review the planning process and modify it as necessary; it is imperative that the process incorporate sufficient direction so that the planning team will neither waste time or effort addressing unrelated issues nor ignore relevant issues. This review and modification activity is key to preventing the planning team from becoming frustrated, which could in turn prevent them from developing a plan or cause them to develop a plan that is inadequate or inappropriate. Once the planning process–the basic planning steps and the corresponding activities–has been reviewed, a timetable for the development of the plan should be adopted.

Step 2. Identify Transportation Goals

The second step involves identifying the current status of the county transportation system and determining what the system should look like in the future. The first activity in Step 2 is to articulate the vision, mission, and goals of the county road department. The second activity is to identify those issues the county road system is perceived to be facing and to collect data and information that swill shed additional light on those issues. The third activity is to develop a list of proposed road projects for transforming the county from where it is today to where it needs and wants to be tomorrow.

Step 3. Develop the Transportation Plan

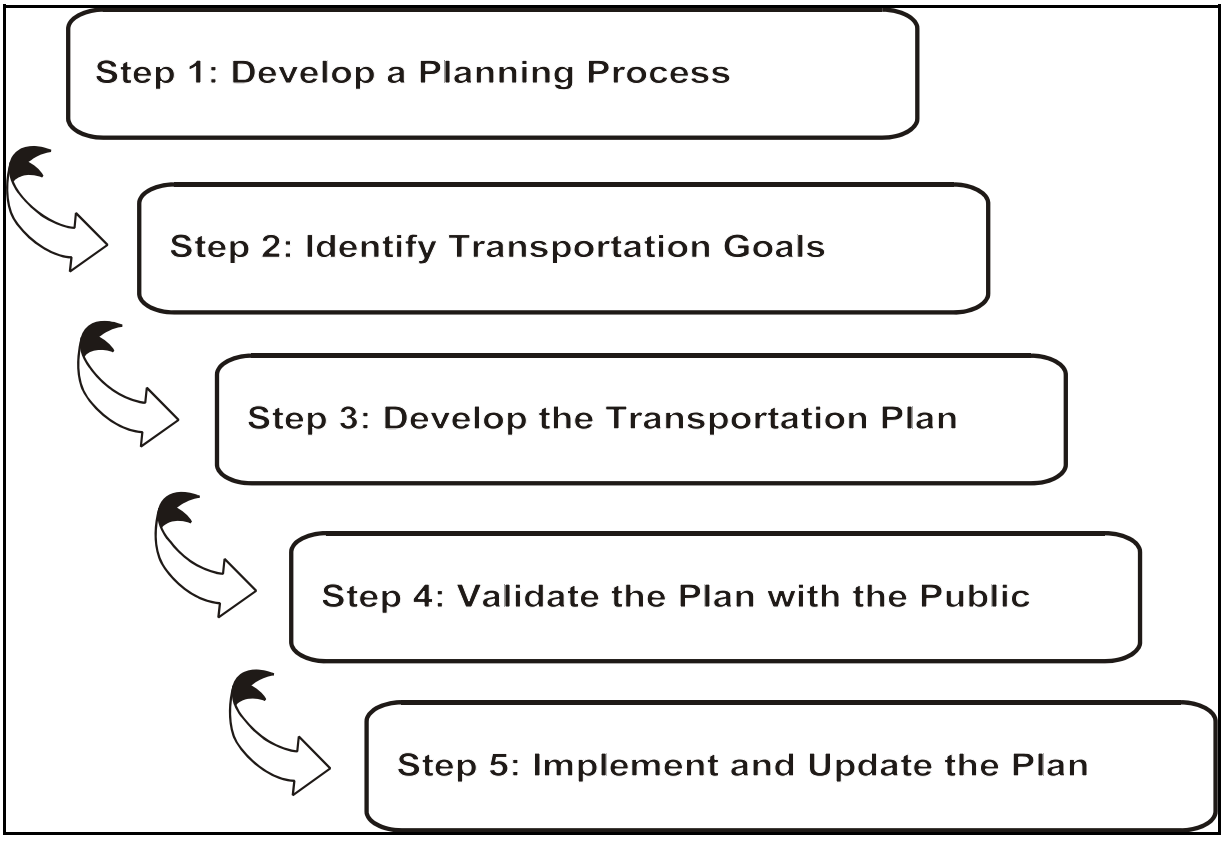

Figure 3. Steps in Developing a County Road Plan

The public must be invited to comment on the proposed vision, mission, and goals for the county road system. If this activity is not carried out, or if it is carried out poorly, the entire plan may be put at risk because of public opposition. After public comment is received, the planning team should modify the list of proposed projects as necessary and then begin the planning analysis that is at the core of the transportation plan. The planning analysis will consist of an evaluation of the needs versus constraints, an assessment of quality of life and environment issues, and a determination of project feasibility. It will also set the priority order for the various projects. In short, the transportation analysis will lead to a transportation plan that will lay out a program for achieving the goals agreed on by the county and the public.

Step 4. Validate the Plan with the Public

The transportation plan must be accepted by the public before it can be implemented. Without the public's buy-in, there is high risk of a group of individuals—or even one individual—delaying or blocking implementation of the plan. Public hearings must thus be held to explain the proposed plan and to give the public a second chance to review and comment on it. Input gathered through this process should be used to modify the plan as necessary before the final plan is adopted. The local news media can be very helpful in making the public aware of the draft and final plans.

Step 5. Implement and Update the Plan

The final step involves implementing the plan. Once the plan is implemented, the results must be monitored so that the planning team can adjust and update the plan as necessary to ensure the goals for the county transportation system are being met.

2.2 Suggested Planning Process

There are three criteria for a successful planning process. First, the process must be acceptable to the individuals involved in developing the road plan, including county leaders and officials. If they are not convinced of the value and integrity of the process, it will be difficult–if not impossible–to develop a county road plan.

The planning process must be logical, and even somewhat intuitive. Each step should sequentially lead to the next. The process should be understood in concept by county officials and should be understood in detail by the planning team. In short, the process must be logical, understandable, fiscally viable, and salable.

The suggested planning process is a collection of 15 very specific activities within the 5 planning steps. The activities are designed to be carried out sequentially (Figure 4). This linear process can be easily grasped by individuals with little or no training or experience in transportation planning. If designed properly, the process can be interrupted at any stage and still provide information that will be useful in the management of the county road system. Furthermore, it may be possible to skip some of the steps, depending on the complexity of the system being evaluated and the degree of sophistication desired.

There are three fundamental principles that underpin the planning process. The first is a heavy reliance on the team concept. A planning team is the heart of the process for developing the county road plan. Several minds working cooperatively together yield better ideas and solutions. A planning team that is representative of the county transportation stakeholders will increase the probability that a number of different views will be considered as the plan is being developed.

The second principle is the need for public involvement in the development of the plan. In today's world of unparalleled mobility, communication, and access to information, it is essential that the public be involved with and approve the road plan. After all, the road system exists to serve the public's need for mobility. The public represents the county road transportation system's customers.

The third principle is the requirement for support and commitment from county leaders. The elected commissioners/supervisors must have an appreciation for the process and a firm belief in the value of developing a county road plan, if the plan is to have any hope of successful implementation.

The remaining part of this chapter is devoted to a conceptual explanation of each of the planning activities, as well as a discussion of how the activities relate to one another. It is important that the planner and other key

people involved in the planning effort have a good understanding of the concepts prior to getting into the details of the objectives and tasks (Chapter 3).

2.3 General Description of the Planning Process

Step 1. Develop a Planning Process

Activity 1 ➔ ***Create a Planning Foundation***

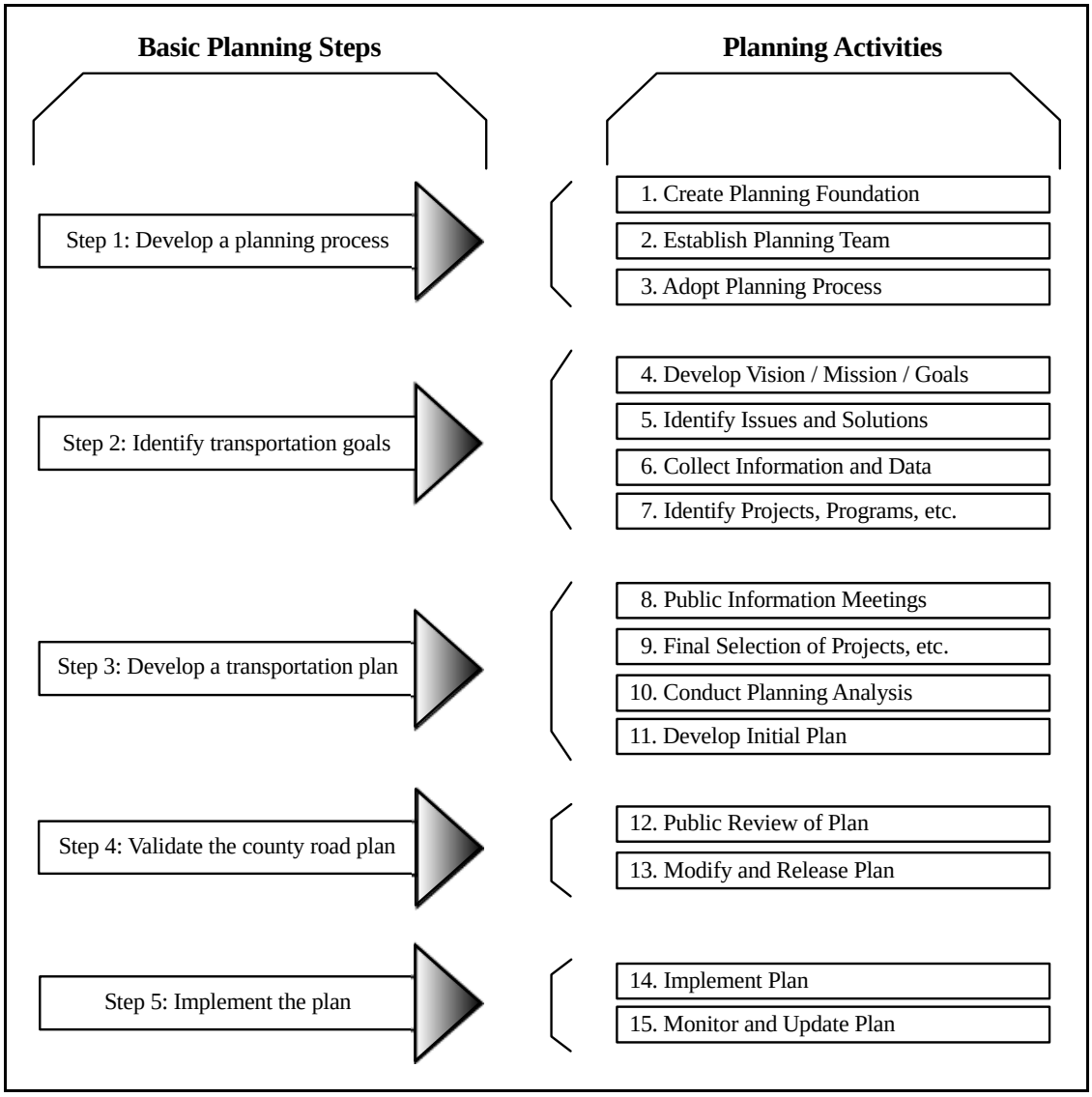

Figure 4. Planning Activities Classified by Five Basic Planning Steps

The first activity in the planning process is creating a firm foundation for developing the plan. This consists of soliciting and gaining the support of three groups that are important to the success of the planning process: elected county commissioners/supervisors, core client groups/users, and, the media. The buy-in and cooperation of these three groups is critical for reasons unique to each group.

Elected county officials must eventually approve the plan; therefore, it is necessary to have their support prior to beginning the effort. What's more, as elected representatives of the body politic, elected officials have an obligation to represent the citizens' interests in the process. Thus they should not only support the planning effort, they should also have some involvement in it.

Engendering acceptance of the effort from county road user client groups should also be part of laying a firm foundation for the planning process. After all, they represent individuals and organizations with a major stake in any changes that might result from the planning process.

Finally, the media can and should play an important role in keeping the citizens of the county informed. They can also play a role in soliciting and encouraging citizen involvement in the planning process, such as through attendance at meetings and participation in information-gathering activities.

Activity 2 ➔ ***Establish Planning Team***

Once a firm foundation has been created, the planning team can be established. The team should be composed of a variety of individuals with a stake in any changes to the county road system, including users of the county road system. The team approach has several positive attributes that significantly enhance the planning process, as well as the plan's eventual implementation. First, it provides a mechanism and opportunity for stakeholders to have ownership in the plan. This will improve the buy-in from the stakeholder groups that have an interest in the development of a sound county road plan. These groups represent the general public, businesses , county road employees, and others.

Second, the team approach affords the opportunity for a variety of ideas from different sources. The product of a set of collective minds will typically be greater than that of a single mind. Almost everyone involved in the development and operation of the county road system, from equipment operators and maintenance employees to elected county officials and their constituents, can make a positive contribution to the development of the plan.

Third, a variety of perspectives will result in a better plan by including all aspects of the management of the county road system (maintenance, construction, finance, personnel, management, etc.) For a planning effort to be successful, the planning must provide the team with direction and guidance that will ensure the right activities are undertaken to develop a sound county road plan.

Activity 3 ➔ ***Adopt Planning Process***

The first–and very important–task of the planning team is to adopt a planning process that will facilitate the development of a well-founded county road plan. The process should serve as a road map to the final transportation plan. The process suggested by the planning team should be reviewed and modified as necessary to meet local needs and to reflect the local economic, social, and political environment. It should be emphasized that the recommended planning process can be modified to reflect unforeseen problems, changed circumstances, or new information once the planning process itself is under way. In addition, the sequence of activities can also be modified to reflect the uniqueness of a local situation.

There are two important parts of the planning process that deserve mention at this point: the timetable for developing the plan and the planning horizon for the actual transportation plan. The timetable provides a mechanism for setting deadlines and monitoring progress of the development of the plan. The planning horizon identifies how far into the future the plan is expected to remain valid–for example, for 3 years or for 5 years.

Step 2. Identify Transportation Goals

Activity 4 ➔ ***Develop Vision, Mission, and Goals***

Development of the vision, mission, and goals for the county transportation system is a very critical activity in the development of the plan. Without some idea of where one wants to go, it is difficult to develop a plan for how to get there. Although the vision is not as critical as are the mission and goals to the outcome of this activity, it is strongly recommended that a vision be developed. The vision statement for the county road department should be long-term in nature, futuristic, challenging, and broad; it should state where the county should focus its efforts to best address the needs of the road users (i.e., to meet the socioeconomic needs for mobility by residents and nonresidents). It should define the ideal system in the judgment of transportation professionals, elected leaders, and road users.

The mission statement, on the other hand, should be more short-term and operational in nature. It could, and probably should, match the duration of the plan (planning horizon). It should be general in nature and should embody both the importance of mobility to the county road users and the values of the county residents (e.g., safety, environment). Representatives of the county commission/board should be involved in the process of developing the vision and mission for the county road system, and the entire commission/board should approve the vision and mission. After all, the vision and mission are very fundamental statements of values, and as such, they need the support and buy-in of those people elected to represent the citizens.

One important aspect of both the vision and the mission that needs to be emphasized is that neither is measurable. It is difficult to develop performance measures that apply directly to broad statements of purpose found in a mission or vision statement. Measurement usually takes place as some subsequent level in the planning process.

After a vision and mission have been established, the goals for the county road system must be articulated. The goals should be derived from the mission. They should be more specific than the mission statement, but still be rather broad and general in nature. There are two fundamental reasons for developing goals for the county road system. The first is that there are normally several alternatives in quality, level of service, network size, maintenance level, and so forth when it comes to county road systems. These alternatives are difficult to

evaluate unless they are articulated as specific goals that can be analyzed and prioritized by the planners and the county citizens.

Second, and equally as important, county citizens should have the opportunity to comment on the process for developing the county road plan. If goals are established prior to soliciting input from citizens, the public will likely judge the process as being driven by the county road staff. County citizens are not, however, likely to have the skills, knowledge, time, or inclination to develop proposed goals for the county road system. It is therefore incumbent on the planning team to develop a set of proposed goals as a starting point for discussion with the citizens of the county.

Goals, like vision and mission statements, can be difficult to measure. Nonetheless, there should be a conceptual link between the goals and mission such that when the goals have been achieved, the mission will have been accomplished.

Activity 5 ➔ ***Identify Issues and Solutions***

Matters, concerns, problems, and dilemmas that could interfere with achieving the goals and accomplishing the mission of the county road system should be identified. The eventual selection of potential projects, programs, policies, and procedures to meet the goals for the county road system will be driven in large part by the critical issues identified by the planning team in this important activity. The issues should be identified by the planning team, as part of a group exercise. This is not an impartial process; it is based on personal knowledge of each of the planning team members.

The main reason for identifying the major issues facing the county road system is to narrow the focus of the planning effort and provide direction for the remainder of the activities in the process. It makes little sense, for example, to put a lot of effort into collecting data, conducting analyses, and planning improvements to ease traffic congestion if the effort will not contribute to meetng the goals of the county road system. The identification of issues will drive many of the remaining activities, including data collection and project selection. Although it may seem that identifying these critical issues would be a relatively easy activity, experience has found it to be otherwise. A classification system has thus been suggested to provide discipline and focus to the activity of identifying the major issues for a county. (This classification system is discussed in detail in the next chapter.)

Once the issues have been identified, refined, and articulated, alternative solutions to the issues need to be developed, becausethere may be more than one way to address an issue. The solutions should be as broad as possible; i.e., they should not constitute projects or policies, which are developed in a subsequent activity. This also allows elected county officials, as well as the county road system managers, to make a more informed decision on how to best provide for the mobility needs of the citizens.

Activity 6 ➔ ***Collect Information and Data***

The planning process up to this point has been quite subjective. Data and information must thus be collected to shed more light on the issues and goals and to provide the necessary underpinning for objective analysis in subsequent activities.

Basic qualitative and quantitative data and information need to be collected and developed relative to the issues and alternative solutions that have been identified. The data collection process should be developed with a keen eye on the eventual analysis of the data, as it does little good to collect data that cannot be analyzed. The data and information should be associated with the present condition of the county road system and should indicate how the present condition differs from the goals for the system.

Information gleaned from the data should provide a quantitative and qualitative understanding of the issues. This is extremely important, given that the process of issue identification is quite subjective. The data should be relevant to the major issues identified and contribute to the understanding of those issues. The data should also validate the selection of the major issues. If the data and information do not confirm the importance of an issue, then further evaluation should be conducted to determine if the issue is really significant or if it is an issue that is difficult to quantify.

The data and information will prove valuable in informing and educating county citizens, whose support is essential for the implementation of a plan that departs from the status quo.

The data collected and the information developed will consist of two types–primary and secondary. Primary data is that collected from scratch, such as through a survey of county residents. Secondary information consists of existing information that has to be identified and then put in the necessary form for it to be useful to the planning process. This could include maps, traffic data, previous reports on transportation issues, and other items.

A survey of county road stakeholders should be conducted to ensure that the issues and potential solutions are consistent with the attitudes and expectations of county residents. Four groups should be surveyed–specific stakeholders, opinion leaders, emergency services and the general public. Different questionnaires could be developed for each group, to reflect their roles and responsibilities, provided certain baseline questions are included in all surveys so that a comparison can be made among the groups. Although resource-intensive and time consuming, the survey is crucial to the successful development of a county road plan that will provide the necessary resources to manage and further develop a county road system that will meet the needs of the citizens. It provides the basis for the planning team to develop a set of potential county road projects, programs, policies, and procedures to address the critical issues and, in turn, lead to the achievement of the goals for the system.

Activity 7 ➔ ***Identify Projects, Programs, Policies, and Procedures***

The planning team should conduct one or more planning sessions to identify potential projects, programs, policies, and procedures that best fit the proposed solutions. This activity will ideally involve at least three major tasks.

First, the *issues* should be reviewed in light of the primary data collected from stakeholders, opinion leaders, and the general public. This serves as a mechanism for validating the issues that were identified by the planning team. Second, the *solutions* need to be reviewed to ensure that they are consistent with those issues. This serves not only to validate the proposed solutions, but also provides an opportunity to adjust the solutions to reflect

any changes in the issues. Third, the planning team should identify potential projects, programs, and procedures that fit the solutions and resolve the issues.

Step 3. Develop a Transportation Plan

Activity 8 ➔ ***Hold Public Information Meetings***

Soliciting public input is extremely important for several reasons. The citizens of the county are responsible, in part, for financing the county road system, either directly or indirectly. Furthermore, the county road system will have an effect on their lives in one fashion or another. They are the ultimate customer. Without the support of the citizens who pay for the system and who are impacted by the system, it is unlikely that any significant goals will be achieved. Thus it is vital to understand what the perceptions of the county citizens are regarding the county road system and the way it is managed. In addition, it is important to find out what county citizens want their road system to be. This is not simply a matter of asking them; it will probably involve, to some extent, an education process as well. Without input from the citizens of the county, it will be difficult to gain their support for significant changes or even to maintain the status quo.

There are several methods that can be used for this activity. At a minimum, several public meetings should be held throughout the county to gather input from the citizens. At this point in the planning process, the vision, mission, goals, issues, and alternative solutions, as well as potential projects, programs, policies, and procedures, should be well articulated and documented. A printed document should be prepared for review and circulated to interested parties. It should also be posted on the county's website.

A series of meetings should be scheduled to outline the vision, mission, goals, issues, solutions, projects, programs, policies, and procedures that will lead to a better county road system. The public's input will facilitate the selection of projects, programs, policies, and procedures that will be evaluated in the actual planning analysis.

Activity 9 ➔ ***Make Final Selection of Projects***

Much of the work conducted up to this point forms the basis for defining potential road projects for the period covered by the plan (the planning horizon). The development of the vision, mission, and goals and the identification of the major issues provided the initial direction for the planning effort. The basic information supported the selection of the issues, as well as provided insight into the issues. This in turn formed the basis for the citizens of the county to provide the necessary input that allowed the planning team to modify the vision, mission, goals, issues, solutions, projects, programs, procedures, and policies consistent with the desires of the county citizens.

Public input serves most importantly to identify those potential county road projects, programs, procedures, and policies that would most likely be supported by the public as part of the planning analysis. The input will also, it is hoped, lead to the public support necessary to implement the final plan.

This activity involves development of a tight definition of projects that could be implemented during the life of the plan, together with the necessary supporting documentation that allows for a well-directed planning analysis. Examples of projects include bridge replacement, overlays, chip and seal treatments, reconstruction, graveling, and shaping. Each potential project should be evaluated based on at least three criteria:

1. Is the project consistent with the vision and mission and goals for the county road system?
2. Does it address the issues that have been identified?
3. Is it consistent with the desires of the citizens of the county?

Ultimately, the projects must be achievable within the constraints imposed on the county road system.

Activity 10 ➔ ***Conduct Planning Analysis***

The purpose of this activity is to provide a framework for the planning team to evaluate alternative scenarios for achieving county goals. Once the projects, programs, policies, and procedures for the plan have been identified, different scenarios for combinations of projects can be construed that will result in progress toward goals (the goals will most likely not be able to be fully realized because of a lack of resources). The different scenarios must be fully analyzed in regard to costs and benefits. Criteria must be developed for measuring the benefits of any project considered for the plan (i.e., is the project strategically critical to the road system? How many people does it serve? Does it improve the county economy?).

Next, the projected project costs need to be calculated. This can be facilitated by developing a logical set of objectives and tasks for each project. Costs for each of the objectives and tasks can be developed, forming the basis for the total project cost.

The next task is to determine if the scenarios and associated projects are feasible, how they should be implemented, and how they relate to one another. The feasibility review should include fiscal, engineering, environmental, and business measures. An analysis of how the projects should be implemented is also necessary and should involve consideration of revenue flows, scheduling conflicts, seasonal factors, and environmental concerns, as well as issues involving businesses that might be interrupted. The interrelationships among goals must also be evaluated.

This process should be repeated until a possible solution is found.

Activity 11 ➔ ***Develop Draft Plan***

The planning analysis (Activity 10) leads, when complete, to the development of the preliminary county road plan. The county road plan is based in large part on the results of the planning analysis. The plan should not, however, be merely a restatement of the analysis and other work that has been accomplished to this point. The plan needs to be a concise and readable statement of the goals for the county road system and how those goals add value to the lives of the county's citizens. It should also describe the projects selected and include a discussion of how those projects were selected, how they will be accomplished and at what cost, and the project schedules and timelines. Supporting documentation, such as technical data, should be included as an appendix or listed as footnotes citing, for example, work papers filed in the county road office.

The preliminary road plan must fulfill several purposes, including serving as a document that can be used to publicize the overarching mission of the county road system, as well as explain how this mission can be achieved by accomplishing the stated goals. The plan must be free of jargon and must be understandable to a lay audience, so that county citizens will be encouraged to review and comment on it. Furthermore, it should have the support of elected officials.

The draft plan should then be made available for public review to verify that the public's initial input was considered and incorporated into the plan and to garner further public support.

Step 4. Validate the County Road Pan

Activity 12 ➔ ***Invite Public Review of Plan***

The first effort to gain public input (Activity 8) was related to the proposed mission, goals, issues, projects, programs, policies, and procedures that could be pursued for the county road system. That information was needed to develop a plan that would address the issues and concerns of the citizens of the county.

This activity involves seeking the public's input on, and support for, the preliminary plan, with the intent of further solidifying support for the vision, mission, and goals for the county road system, as well as gaining a useful critique of the plan and associated projects. This will help ensure that the plan as developed is consistent with county residents' desires regarding mobility. In cases where the plan is counter to the initial public input, the differences should be explained so that the public can be reassured that their input was sought, welcomed, and considered in the development of the preliminary plan.

Activity 13 ➔ ***Modify and Release the Plan***

The preliminary plan should be revised to reflect any legitimate concerns voiced by county citizens in Activity 12. Once any necessary modifications have been made and the plan has been endorsed by the appropriate county officials, the plan can be released to the public, ideally through the media (local television news outlets, newspapers, and radio stations).

Step 5. Implement the Plan

Activity 14 ➔ ***Implement the Plan***

The next activity is to implement the county road plan. Poor execution of the plan can result in a failure to achieve the intended goals or to contribute to the mission and vision for the county road system. A good plan with poor execution is a recipe for failure, as is a poor plan that is well executed.

Activity 15 ➔ ***Monitor Results and Update Plan***

The final activity in the planning process is to monitor the results of implementation and to update the county plan as necessary. Specific measures should be developed to provide an objective means of monitoring results. As circumstances change in response to situations that were not anticipated or accounted for during the original planning process, the plan should be updated. The plan should also be updated near the end of the original planning horizon.

This chapter was intended to provide the planning team with an overview of the planning process prior to undertaking the tasks of developing the county road plan. The next chapter is devoted to a detailed description of the objectives and related tasks for each activity.

3. Planning Objectives and Work Tasks

Each activity in the planning process has one or more objectives, as well as several work tasks associated with each objective. Objectives are defined as measurable operational statements. Tasks are defined as measurable actions that achieve specific objectives. Although these objectives and work tasks are organized in sequential manner, they do not always have to be carried out in that order. When the work tasks and thus the corresponding objectives have been completed, the purpose of the planning activity should have been achieved.

Each of the 15 planning activities is addressed in this section in detail, together with assigned planning objectives and associated work tasks. As with the planning process itself, the individual objectives and work tasks can be modified to meet an individual county's unique situation.

Activity 1 → Create a Planning Foundation — Creating a foundation for the planning process is critical to a successful effort. It is important that a good job is done on this activity; a poor job may doom the process from the start. The expectations created by a firm foundation will help motivate those responsible for moving the planning process along and meeting deadlines.

Objective 1: Gain the support and involvement of elected county officials

Task 1: Conduct discussions with key county board members, such as the chairperson and the supervisor/commissioner responsible for the road portfolio, about the need for and benefits of developing a county road plan.

Task 2: Make a presentation to the county board on the process that you are thinking about using to develop the plan.

Task 3: Request the board's public endorsement of the planning process.

Task 4: Gain a commitment from one or more of the board members to participate in the process.

Objective 2: Gain support and involvement of core client groups/users

Task 1: Identify the core client groups/users of the county road system and a contact person (representative) for each group.

Task 2: Develop and send a letter to those representatives, informing them of the planning activity and why it is important to them.

Task 3: Contact representatives of the core client groups and solicit their support for the planning effort and identify how you would like them to be involved in the process consists (e.g., provide moral support, be actively involved on the planning committee, or endorse the process).

Task 4: Arrange for specific individuals to serve on the planning team.

Objective 3: Involve the local media

Task 1: Identify local newspapers and radio and television stations that play a significant role in keeping the citizens of the county informed about local issues.

Task 2: Draft a letter to the editors of these media outlets, informing them of the proposed process and ask them if they would like to be kept informed as the process moves forward.

Activity 2 → Establish the Planning Team — As was pointed out earlier, the formation of the planning team is a crucial activity in the planning process. It provides the opportunity to garner a variety of opinions and ideas, to build consensus, and to engender buy-in from county staff and elected officials, as well as from county citizens. The team should be created by a small steering committee of key management personnel (this committee could also serve as an executive committee throughout the planning process, making decisions in instances when the involvement of the full planning team is not necessary).

The planning team should be representative of the broad range of staff and skills necessary for a county road department to function. It is also recommended that the planning team include at least one elected or appointed county official and at least one citizen who represents county road stakeholders(see Appendix A).

Objective 1: Create a small steering committee

Task 1: Identify two to five individuals to assist in creating the planning team and to serve as an executive committee throughout the planning process.

Task 2: Hold an initial meeting of the steering committee to lay out the concept, get the committee members' reaction, and determine if they want to participate in the process.

Task 3: Provide each member of the executive committee with a copy of this report and ask them to familiarize themselves with the material.

Task 4. Review the suggested planning process shown in Figures 3 and 4 and the planning terms listed in Appendix B.

Objective 2: Create the planning team

Task 1: Schedule a steering committee meeting to assist in establishing the planning team.

Task 2: Determine which client groups (see Appendix A) should be represented on the planning team (e.g., county road department employees, elected and/or appointed county officials, county citizens).

Task 3: Determine the size of the planning team(this can vary, but should be no more than 20 individuals).

Task 4: Identify and list all of the job functions of the county road department, such as maintenance supervisor, equipment operator, equipment maintenance manager, and construction manager.

Task 5: Identify county officials who should be invited to serve on the planning team. Consider an open invitation to all elected officials, so as not to appear partial, or invite those official(s) who have responsibility for the transportation system.

Task 6: Identify citizens who have an interest in transportation, who represent some of the stakeholder groups, and who would be helpful in publicizing the plan and providing credibility to the process.

Task 7: Develop a list of prospective members of the planning team.

Task 8: Speak informally, if possible, with each prospective team member and let them know that you would appreciate their participation in the planning process and what would be expected of them.

Task 9: Send a formal letter to each prospective team member, inviting him or her to participate on the planning team and emphasizing the importance of the team member's role.

Task 10: Organize and conduct the initial planning team meeting (see sample agenda in Appendix C).

The initial planning meeting should accomplish several objectives, including acquainting the team members with one another, conveying the importance of the planning activity, assuring them that their input is important regardless of their position, and, of course, reviewing the planning process with them.

Activity 3 → Adopt a Planning Process — This is the first major responsibility of the planning team. As pointed out earlier, this is a critical step in the development of a county road plan. The planning process will provide the framework necessary to develop a plan that is responsive to the needs and desires of the citizens. It also provides a mechanism to produce a plan in an orderly manner, while minimizing the amount of resources required. It is suggested that a trained facilitator lead the first planning team meeting. This will allow all the participants, including the steering committee, to fully participate. It also provides an opportunity for a third party to draw out the attitudes and perceptions of the planning team members.

Objective 1: Identify/develop a proposed planning process and associated planning horizon for the plan for review by the planning team

Task 1: Steering committee review of alternative planning processes.

Task 2: Hold a meeting of the steering committee to discuss the pros and cons of the proposed process and to adopt a proposed process.

Task 3: Discuss and identify/develop, with the steering committee, a proposed planning horizon (i.e., how many years the plan should cover).

Objective 2: Adopt a planning process, planning timetable, and an a time period that reflects a reasonable planning horizon for the plan

Task 1: Set a date for a planning team meeting convenient for a majority of the planning team members.

Task 2: Explain the role of the planning team in the development of the county road plan.

Task 3: Describe the proposed process to the planning team and encourage discussion of the process. Encourage questions, modify the process if necessary, and ask for adoption of the process (the objectives and tasks must be modified if the planning process is different than the one suggested here).

Task 4: Adopt a planning horizon for the plan. This is simply the time period for implementation and evaluation of plan. This could be 3 years, 5 years, or another time period.

Task 4: Identify tentative timelines for the various activities (Appendix D).

Task 5: Set a tentative date for the next meeting and assign any work that is necessary to the planning team members.

Activity 4 → Develop Vision, Mission, and Goals—As stated earlier, this activity is extremely critical to the planning process. Without some idea of where one wants to go, it is difficult to develop a plan for how to get there. The vision should be just that–visionary. It should indicate where the county road system should ideally be in the future. The mission, on the other hand, should be more immediate and operational. It should address the needs and concerns of the client groups (stakeholders). After the vison and mission have been developed, the goals for the county road system should be developed by the planning team.

Goals should be broad and general in nature. They should reflect the perceived mobility needs of the county citizens. The proposed nature of the goals is an effort to stimulate discussion by the planning team and among county road stakeholders. This process of determining where we are and where we want to be should involve some form of creative tension (stretch goals) (Figure 5). Stretch goals, as the name implies, are goals for which one must stretch to achieve. Goals that are within easy reach are not goals--they are simply a statement of where you know you will be in the future. The central question that must be asked is: have we developed a county road system that contributes optimally to the lives of the citizens of the county and visitors? The county road goals will provide the necessary direction, along with the mission, for the remainder of the planning effort.

Objective 1: Develop a vision and mission statement for the county road system

Task 1: Develop one or more suggested vision and mission statements for review by the planning team (see Appendix E for examples).

Task 2: Schedule a planning team meeting.

Task 3: Review the suggested vision statement with the planning team and seek consensus on a modified vision statement that is consistent with the need and desire for mobility, the culture, the socioeconomic system, and the environmental goals of the county.

Task 4: Review the suggested mission statement with the planning team and seek their input; modify the mission statement as necessary to reflect the mobility needs of the users of the system.

Task 5: Informally review the adopted vision and mission with others outside the planning team to maximize the potential for acceptance.

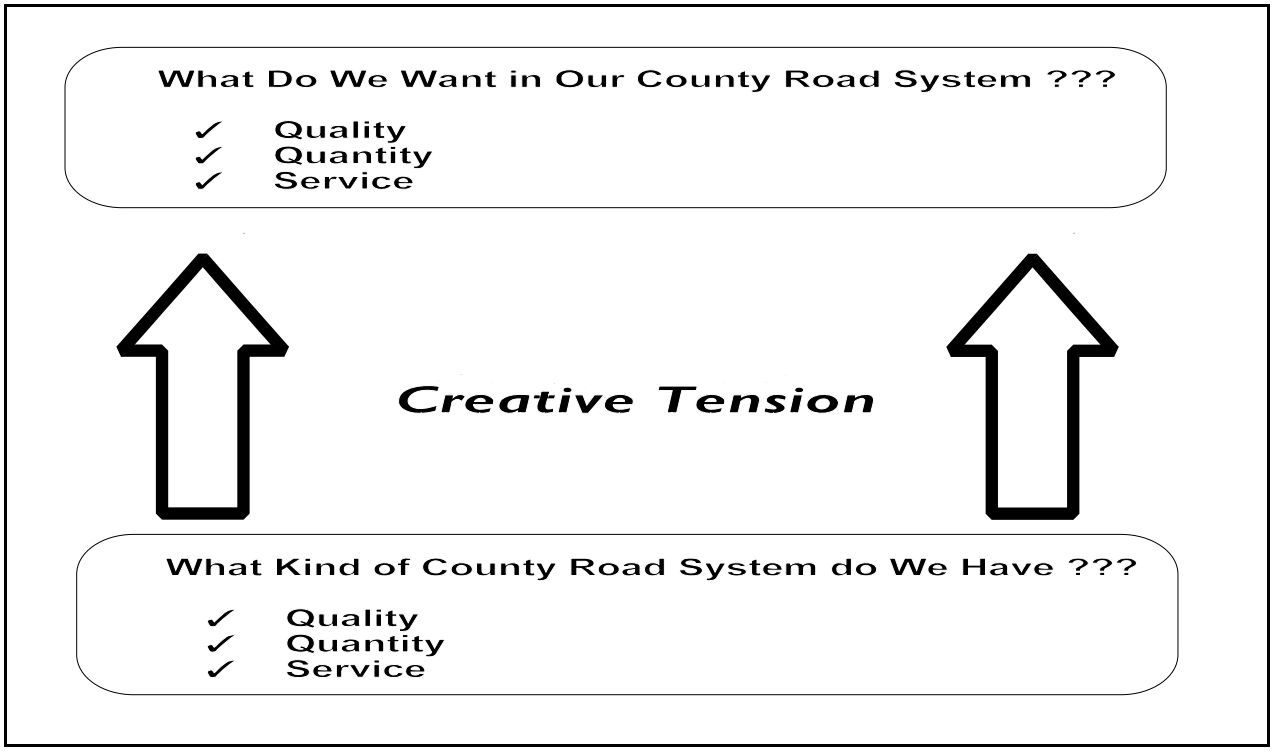

Figure 5. Development of Stretch Goals through Creative Tension.

Objective 2: Develop Proposed Goals for the County Road System

Task 1: Identify key areas of concern for quality, capacity, and safety.

Task 2: Develop one or more suggested goal statements for review by the planning team (see Appendix F for examples).

Task 3: Schedule a planning team meeting

Task 4: Review the suggested goal statement with the planning team and seek consensus on a modified statement that is consistent with the mission statement. The goals should also be compatible with the culture, socioeconomic system, and environmental concerns of the county.

Task 5: Informally review the adopted goals with others outside the planning team to maximize the potential for acceptance.

Activity 5 → Identify Issues and Solutions — This activity is probably the most critical element of the planning process, chiefly because it embodies the main reasons for planning in the first place. The whole idea of planning revolves around several fundamental principles: (1) limited resources relative to demands, (2) important issues regarding quality of life, (3) importance and influence of transportation on the economy, (4) stewardship of public resources, and most important, (5) an improvement in county residents' mobility. The issues that are identified should be those that fundamentally inhibit or prevent the county from achieving its mission and goals for the road system.

One way to approach this activity is to first review the critical issues for the county road system with the planning team. Examples of such issues can be found in Appendix G. Although this list does not include every possible major issue that a county may face, it is quite comprehensive and a good starting point for discussion by the planning team. It should be pointed out that the list developed should include all those issues that affect the road system and the mobility of county residents, without consideration of resource constraints. The list will be pared down later in the planning analysis.

It would seem that the procedure for identifying important issues for a particular county would be quite simple. The reality is just the opposite; it is a very complex process. There are at least a couple of reasons for this. First of all, there are as many different perceptions of *which* problems are important as there are people involved in the process. Second, it is very easy to misidentify issues as *problems*, when they are really *symptoms* of the real problem. A good example is the lack of funding, which is routinely identified as a major problem. Although it is generally true that many counties lack the funds to develop their transportation system to a level and quality desired, funding is symptomatic of a more basic problem. The question that needs to be asked is, *funding for what*? For instance, a county might lack sufficient funds to properly sign the county road system. This problem might be classified as a lack of funding, but it should really be classified as a safety problem resulting from the insufficient signing. Most issues require funding; however, funding is not usually the problem in and of itself. (Exceptions are issues that concern funding sources and the ability of a county to tax its citizens for development and maintenance of the county road system.)

It will be helpful to the identification process to focus the planning team's discussion around certain aspects of the county road system. Four elements have been identified to help direct the identification of issues (see Appendix H):

- size and configuration of the system
- quality of the system
- system capacity
- safety

Discussion of these four aspects of the county road system should promote a thought process consistent with some key elements relevant to the users of the county road system. These four elements constitute the major areas of concern about the county road system and, if addressed, will presumably result in meeting the mobility needs of the citizens. An additional element--environment--could also be added if it is deemed important to the community.

Furthermore, issues can be classified by a taxonomy consisting of the goals previously established. This should be done after the key issues affecting the mobility of county road users have been identified. This will often simplify the process of identifying solutions to issues by focusing the discussion of the planning team in a specific area, such as safety, maintenance, capital improvements, or administration (see Appendix I for an example). Without such a mechanism to provide some discipline, it will be difficult to identify issues and propose solutions.

A word of caution concerning the term *critical county road issues*: The term is subject to interpretation by whichever group is conducting the planning. It will thus be up to the planning committee to decide what is really important and what is just a part of a larger wish list. Deciding what is important can be facilitated through a process for prioritizing issues. Identification of major county road issues is critical to mission and goal achievement because it provides the focus necessary to keep the planning process under control. If an unlimited number of issues were to be addressed, the process would be too complex and would require too many resources.

Developing general solutions that address the issues that have been identified is the second objective of this planning activity. Solutions should be general in nature, rather than specific projects, programs, policies, or procedures. There are several reasons for keeping solutions as general as possible at this point in the process. First, there may be more than one possible remedy to an issue. Second, an issue may require a number of actions for it to be properly resolved. Third, keeping solutions as general as possible at this point allows for a more in-depth and thoughtful approach because it requires one to think in broad terms, lessening the risk of rushing to inappropriate conclusions. A series of three meetings is recommended for this activity– an initial meeting of the planning team, followed by two meetings of the steering committee.

Objective 1: Identify the major issues facing the county road system

Task 1: Set up a planning committee meeting to identify major issues. This can be done in conjunction with the initial planning team meeting (when the planning process is adopted) or at a subsequent meeting.

Task 2: Provide the planning team with a list of possible issues (see Appendix G) for review prior to the meeting.

Task 3: Begin the planning team meeting by reviewing the method that will be used to focus the discussion on identifying the major issues facing the county road system (it is suggested that the discussion focus around system attributes important to the users–namely, system size and configuration, system quality, system capacity, and safety.

Task 4: Ask each of the meeting participants to give their opinion of the county road system, including its shortcomings and strengths and suggestions for improvement.

Task 5: Take notes of the issues raised and work with the meeting participants to refine them as much as possible. This can be done in several rounds, with each round addressing a specific area (such as system size and configuration, system quality, system capacity, and safety).

Task 6: Review the compiled list of major issues with the planning team, encouraging discussion for purposes of further refining each issue and asking for additions to the list.

Task 7: Have the planning team rank the issues in order of importance using a simple questionnaire.

Task 8: Tabulate the results (including frequency distributions) and provide them to the planning team for their review. Ask the group if they would like to redo the process in light of the rankings.

Objective 2: Classify issues by the goals that have been previously established

Task 1: Once the major issues have been identified, schedule an executive committee meeting to classify the issues by the goals that had been previously set.

Task 2: Distribute the set of refined issues, along with the goals, to the executive committee and ask them to review them prior to the next meeting and to begin to think about how they would classify them.

Task 3: Begin the executive committee meeting with a review of the goals and the major issues that had previously been identified.

Task 4: Discuss each issue and ask for suggestions under which goal it would fit (e.g., safety, maintenance, administration and planning, and capital improvements).

Task 5: Transcribe the dicussion of the issues as they have been classified under goals and print out copies for each of the executive committee members.

Task 6: Review the classification with the committee members to ensure that the issues have been properly classified.

Objective 3: Identify potential solutions that will resolve or mitigate the issues

Task 1: Schedule an executive committee or planning committee meeting (or a meeting with some combination of planning committee members and executive committee members) subsequent to identifying the major issues and classifying them by goal.

Task 2: Distribute the set of classified and refined issues to the planning team and ask them to review them prior to the next meeting and to begin to think about possible solutions.

Task 3: Begin the planning meeting by reviewing the major issues and potential solutions that have been previously identified (see Appendix J).

Task 4: Go through each issue by goal and ask the committee members to suggest how those issues can best be resolved (there may be more than one solution to a issue).

Task 5: Discuss the solutions with the committee.

Task 6: Schedule a subsequent meeting of the committee, if warranted, to ensure that all potential solutions have been identified.

Activity 6 → Collect Basic Information and Data—The next activity follows directly from the identification and prioritization of the major issues facing the county road system. Two broad types of information and data need to be collected–information general to the study and information specific to the issues. As stated earlier, the collection of data serves two major purposes: (1) it should validate your selection of major issues (i.e., the data support your contention that an issue is important), and (2) it should increase understanding of the issues themselves and how they may relate to one another.

Data can be classified into two major groups–primary data and secondary data. Primary data is information that you collect yourself–it does not already exist in the literature or in the records. For example, primary data would be the opinions and perceptions you collect, through surveys and interviews, from county residents about such matters as county road staff or road system quality. Secondary data, on the other hand, is information that *does* already exist and is published in some form or is available in records. Data collection can be a very resource-intensive and expensive exercise in any planning effort. A good deal of thought should therefore be put into what the data needs actually are, and then limiting data collection to only that which is necessary.

Objective 1: Define the data needs for the planning effort

Task 1: Schedule a meeting of the executive committee to discuss the data needs for the planning effort.

Task 2: Classify the data needs as either baseline data or issue-specific data (this will help focus thinking on the relevance of the data and how it will be used). Baseline data provides a general understanding of the county road system, while issue-specific data provides an in-depth understanding of the challenges facing the county road department.

Task 3: Determine whether the data to be collected will come from primary or secondary sources.

Task 4: Identify sources and methods for obtaining the secondary data and assign responsibilities and deadlines for its collection.

Task 5: Determine the optimal method for collecting the primary data; assign responsibilities, design the data collection instrument, and set a timetable.

Objective 2: Develop a survey instrument for determining the road needs of county road users

Task 1: Determine how to administer the questionnaire. Possible survey mechanisms include phone, mail, personal interview, Internet, and newspaper. There are advantages and disadvantages to each type.

- A telephone survey or a mail questionnaire is probably the most appropriate method to use for rural counties. Telephone surveys are more time consuming, as individuals are needed to place the calls, ask the questions, and record the responses. In addition, it is important to consider the time of day the survey will be administered to reach the greatest number of people.
- Mail surveys are probably the easiest to administer and can reach the highest number of citizens. Getting those citizens to complete and return the survey can be a challenge, however. This is why a concise, well-written, engaging cover letter is so important, as it must succinctly explain the importance of the survey and elicit a response from the citizen.
- Personal interviews are very time consuming to administer. Although this method may be effective at public meetings if enough county residents are present, it is generally not recommended in other circumstances.
- Surveys posted on the Internet or in newspapers are relatively easy to administer and are less costly than other options. Both methods have, however, a higher probability of the sample being biased since not all residents will have access to the Internet or will read the newspaper on a regular basis.

Task 2: Develop questions to include in the survey (See Appendix K for a sample questionnaire).

Task 3: Determine a representative sample size that will ensure a statistically valid response rate.

Objective 3: Collect the data and information

Task 1: Administer the survey and record the primary baseline and issue-specific data.

Task 2: Collect baseline and issue-specific data from secondary sources.

Task 3: Analyze the results to develop a list of potential projects the would help meet the road needs of county residents.

Task 4: Compare the needs identified by the residents with the list of potential solutions developed by the planning committee and road department personnel to assess, for internal purposes, how well the county perceives the road needs of its residents.

Activity 7 → Identify Potential Projects, Programs, Policies, and Procedures — Once the planning team has determined possible solutions to the issues facing the county, the team should focus on identifying how best to achieve those solutions.

Task 1: Hold a planning team meeting to review the data and information collected in the survey.

Task 2: Review the solutions previously identified by the planning team to ensure that they are in line with the issues raised in the survey.

Task 3: Identify potential projects, programs, policies, and procedures for achieving those solutions and thus meeting the needs of the county road users.

Activity 8 → Hold Public Information Meetings—The overall objective of the public meeting is to build support for the county road plan and reaffirm the county's goals. Such a meeting will give the public an opportunity to review the projects identified by the county and comment on them. Before the meeting is scheduled, the planning team should meet to discuss the format and dynamics of the meeting. The committee needs to identify the desired outcome of the meeting and decide on a format for the meeting (i.e., formal presentations, group discussions, a combination of both). The committee may also want to consider options for keeping order at the meeting (such as techniques to prevent individuals from monopolizing the discussion and ways of calming any individuals who might become upset during the discussion).

Objective 1: Schedule public input meeting(s)

Task 1: Determine how many meetings will be necessary to ensure that the public has an opportunity to review the projects and provide the county with adequate input and comment. The number of meetings will often be dictated by the geographic size of the county (i.e., to encourage citizen participation, meetings should be held within a reasonable driving distance of the population).

Task 2: Decide on the best day of the week to hold the meeting. It may be appropriate to schedule meetings on different days of the week in order to give citizens more opportunity to participate.

Task 3: Determine the best time of the day to hold the meeting to facilitate greater citizen participation (some citizens may prefer daytime meetings, while others may prefer evening meetings because of conflicts with work and family schedules).

Task 4: Select easily accessible, comfortable, appropriately sized facilities for hosting the meetings. Community centers, school buildings, and conference rooms at local hotels are options to consider.

Objective 2: Advertise the meeting

Task 1: Decide on the best methods to circulate invitations to the public. Local newspapers, as well as local radio and television stations, are excellent means of advertising the events.

Task 2: Consider sending special invitations to specific stakeholders in the community. (See Appendix A for a list of potential stakeholders.)

Objective 3: Make preparations for the meeting

Task 1: Prepare handout materials, such as a list of county goals, the county road system's mission statement, a list of potential projects, and a comment/feedback form.

Task 2: Determine what audio and visual equipment will be needed and make arrangements for the equipment to be at the meeting.

Task 3: Make sure the seating arrangements and air flow/temperature in the rooms will be comfortable.

Objective 4: Hold the Public Input Meeting(s)

Activity 9 → Make the Final Selection of Projects, Programs, Policies, and Procedures— Current information about the road network and the condition of the road system will help decision makers prioritize projects while balancing critical needs and program constraints (budget and other resources).

Objective 1: Set up a special meeting with road department personnel

Task 1: Review the data collected in Activity 6 to help determine potential projects

Task 2: Hold a brainstorming session with the planning team and road department personnel to identify potential projects needing attention.

Task 3: Determine if the list of potential projects is consistent with the goals developed by the planning committee.

Task 4: Prioritize the projects based on need–immediate, short-term, and long-term.

Objective 2: Develop a list of criteria to be used in selecting projects.

Task 1: The criteria should include the following questions: Which projects will serve the most needs within the limited budget? Do critical links in the network exist to meet personal and business needs for mobility?

Task 2: Look for analytical or quantitative procedures for assessing an optimal plan. This may include conducting benefit cost analysis, internal rate of return, net present worth, etc.

Activity 10 → Conduct Planning Analysis —Through the planning analysis activity, the county staff and planning team will identify the optimal transportation projects or programs from a set of alternatives for achieving the county's road system goals. At the heart of this activity is a benefit-cost analysis, which weighs the benefits to be gained from each project against the financial, economic, technical, environmental, and societal costs of the project.

Task 1: Develop a set of criteria for assessing the benefits of each proposed project (e.g., how many people will the project serve, does it improve the local economy, does it improve safety).

Task 2: Outline objectives and tasks for each proposed project.

Task 3: Calculate the estimated costs for each objective and task to determine a total cost (financial, economic, environmental, societal, etc.) for each project.

Task 4: Evaluate each project in light of the criteria identified for assessing project benefits.

Task 5: Conduct a feasibility study to evaluate each project's potential for meeting the road system's goals.

Task 6: Analyze the calculated benefits and costs of each project in light of the issues identified and the solutions proposed to determine which projects should be a part of the county road plan, and in what priority order.

Activity 11 → Develop Draft Plan — The results of the planning analysis provide the planning team with sufficient information and knowledge to prepare the draft county road plan. The plan should incorporate the goals established for the county road system and should describe how the achievement of these goals will benefit the county's citizens, economy, and quality of life.

Task 1: Charge a subcommittee of county staff members and planning team members with drafting the text of the county road plan. The plan should include the following key elements (see Appendix L):

- Letter of Endorsement from county commission or board
- Executive Summary
- Overview of Planning Process and Planning Team
- Overview of County (including vision, mission, goals)
- Issues, Solutions, and Potential Projects
- Planning Analysis
- County Road Plan
- Summary, Conclusions, and Recommendations
- Appendices

Task 2: Have the full planning team and the county road staff review the plan to ensure the product complies with determined needs and fits within budget and other restraints.

Task 3: Have the report edited to ensure it is understandable to a lay audience.

Task 4: Submit the draft report to the county commission/board with a request for a letter of endorsement.

Activity 12 → Invite Public Review of Plan — This activity is necessary to assure the public that their concerns have been addressed and to solicit the public's support for the draft plan. The planning team must be prepared to discuss any instances where the plan seemingly does not agree with the public's suggestions.

Task 1: Determine the optimal strategy for reaching out to the public and soliciting their input on, and support for, the draft plan. Options might include advertisements and articles in the local newspaper, postings on the county's website, letters to targeted stakeholder groups, and public information hearings.

Task 2: Assign members of the planning team to record the public's comments and feedback on the plan.

Task 3: Compile and summarize the comments received.

Activity 13 → Modify and Release the Plan — The public's comments on the proposed plan must be evaluated to determine if there are any legitimate concerns that require revisions to the draft plan.

Task 1: Review the public's comments to determine if any changes to the draft plan are required.

Task 2: Modify the draft plan as necessary.

Task 3: Secure the endorsement of the county officials for the revised plan.

Task 4: Publish the final plan and enlist the local media's help in making it readily available to the public.

Task 5: Post the final plan on the county's website.

Task 6: Assign a member of the county road staff to be responsible for recording any comments that subsequently come from the public.

Activity 14 → Implement the Plan — No matter how solid the plan, the eventual success or failure in meeting the county's road needs will be determined by how well the plan is implemented.

Task 1: Assign the county road staff to develop a detailed workplan and schedule for delivering the projects and programs set forth in the county road plan.

Activity 15 → Monitor Results and Update Plan — Once the implementation of the plan is under way, the county road staff should continuously monitor the plan's projects to ensure that the goals set forth in the plan remain timely in light of evolving mobility needs, land use patterns, transportation safety, economic conditions, and societal conditions. The county road plan is a living document, reflecting real-world conditions. As such, it will occasionally require updating and revision.

Task 1: Assign county road staff to track project progress and to monitor county conditions.

Task 2: If there is any evidence or hint of impending significant changes in the county's mobility needs, land use patterns, transportation safety, economic conditions, or societal conditions, the planning team must be assess whether those changes portend changes in the county road plan.

Task 3: The county road plan should be revised and modified as necessary to keep up with changing conditions and goals in the county.

4. Case Study Results

Cass County is located in the Red River Valley in southeastern North Dakota. The county has a total area of more than 1.1 million acres, and it measures 42 miles from north to south and 44 miles from east to west. Most of the county's land is still used for agricultural purposes. Fargo, located in the eastern portion of the county and along the Red River, is the county seat and the county's largest city, with a population of over 90,000.

The county's population growth is atypical for the region. While the state's population has slightly decreased since 2000, the county has continued to grow, reaching a total of 128,615 in 2004. The county's population is expected to continue to grow, totaling more than 200,000 by 2030.

Cass County's transportation system consists of one commercial and seven general aviation airports, 300 miles of railroad tracks, and 4,200 miles of roads. The county's road network includes roads of varying sizes, functions, and conditions built and maintained by several different agencies. There are more than 650 miles of county-maintained roads covering more than 1,700 square miles. Nearly half (321 miles) are hard surfaced, consisting predominantly of asphalt concrete pavement; the other half are surfaced with gravel.

4.1 Planning Process

Cass County used the five-step process outlined in this report to develop its county road plan.

The planning team was composed of the following individuals involved with the county road system:

Robyn Sorum, Cass County Commission
Mark Johnson, Road Advisory Committee
Jugen Suhr, Road Advisory Committee
Dennis Rust, Road Advisory Committee
Rich Seig, Superintendent of the Cass County Highway Department
Conrad Grindberg, Maintenance Foreman, Cass County Highway Department
Bruce Reidinger, Bridge Foreman, Cass County Highway Department
Randy Walker, Gravel Foreman, Cass County Highway Department
F. Alan Hall, Motor Grader Operator, Cass County Highway Department (Argusville)
Dean Krabbenhoft, Motor Grader Operator, Cass County Highway Department (Davenport)
Paul Tinjum, Motor Grader Operator, Cass County Highway Department (Buffalo)
Mike Zimney, Planner, Cass County Highway Department
Keith Berndt, Cass County Engineer

4.2 Vision, Mission, and Goals

The planning team developed and adopted the following vision and mission statements for the Cass County road system:

> **Vision** – To be recognized as a premier county road program in the Northern Plains states.
>
> **Mission** – To provide and maintain an efficient, safe, environmentally sensitive, and cost-effective county road system that effectively meets the citizens' needs for personal mobility and the movement of freight consistent with the importance of the economy.

The goals that the team subsequently developed for the county road system are more specific than the mission statement, but are still rather broad and general in nature. The goals are intended to assist the planners and citizens in evaluating, selecting, and prioritizing road projects.

The Cass County goals can be categorized in four areas:

Safety–Enhance the safety of the traveling public, county residents, and the employees of the department.

Maintenance–Protect the public's investment in infrastructure by providing environmentally sound and timely maintenance of the county transportation system to ensure safe and efficient travel.

Administration and Planning–Develop a management and operations system responsive to the citizens' needs for a safe and efficient county transportation system.

Improvements–Construct improvements and enhancements to the county transportation system to meet the current and future needs of the transportation system users within the constraints of resources available.

4.3 Potential Programs and Projects

A comprehensive list of potential programs, projects, and policies for advancing mobility in Cass County were then identified through four processes: (1) meetings of the planning team, (2) a survey of county residents, (3) public meetings, and (4) review of projects already identified by the executive planning committee. Each potential activity was categorized in one of the four goal areas (safety, maintenance, administration and planning, and improvements) and then further identified as a program, project, policy or nonrecurring activity.

Program – Programs focus long-term, ongoing attention on transportation issues and require continual updates on progress, changes in the situation, and application of resources.

Project – Capital projects involve one-time expenditures of funds in the short to medium term and are considered investments in the county's infrastructure, equipment, and buildings. They constitute the physical capital of the county road system and are critical to sustaining mobility on a long-term basis.

Policy – Policies consist of rules, regulations, and procedures prescribed by management and/or county commissioners/supervisors and guide the overall development and operation of the county road system.

Nonrecurring Activity – Nonrecurring activities include those efforts that are not intended to be repeated in the short or medium term and that do not fit into the other three classifications.

The planning team met twice to identify issues facing the Cass County road system and to refine those issues. Once the issues were identified and refined, the planning team met again to identify possible solutions to those issues. The potential solutions are listed here, categorized into the four goal areas.

Safety

1. Dirt slide problems/embankment failures
    a. Identify all potential problem areas
    b. Identify specific projects and develop associated costs
2. Safety problems resulting from increased suburban traffic
    a. Identify specific problem areas
        i. County 17 from I-94 to Horace
        ii. County 6 from I-29 to County 17
        iii. County 20 from I-29 to Red River
        iv. County 81 from Fargo to Wild Rice River
    b. Identify possible solutions
        i. Implement recommendations of County 17 corridor study
        ii. County 6–widen shoulders to 8 feet and build right and left turning lanes at major intersections
        iii. County 20–conduct corridor study and implement short-term solutions
        iv. County 81–monitor the impact of improvements
        v. Increase lane capacity as necessary
        vi. Discuss cost sharing with cities
3. Residents in close proximity to gravel roads are adversely impacted by dust
    a. Identify potential problem areas
    b. Identify possible options and develop associated costs
    c. Develop proposed written policy
        i. Consider county-wide setbacks–zoning authority conflict with townships is an issue, need to work with them, especially in suburban areas.
4. Liability issues resulting from crashes on county roads
    a. Conduct safety audit of county road system (signing management programs)
    b. Conduct an evaluation of crash sites
5. Narrow roads with steep inslopes
    a. Identify specific problem areas
    b. Develop potential projects to alleviate problems and associated costs
6. Vandalism of signs
    a. Develop sign management program

Maintenance

7. Degradation and failure of gravel road base
    a. Conduct an inventory of problem areas\
    b. Develop a method for prioritizing potential projects
    c. Develop a costing model that estimates repair expenditures
8. Increasing width of gravel roads because of traffic
    a. Inventory problem areas
    b. Develop schedule for reshaping problem areas and estimate associated costs
    c. Periodically pull in shoulders/schedule
9. Improper ditch cleaning by private citizens, resulting in drain problems
    a. Improve monitoring
    b. Identify potential problem areas
    c. Develop written policy regarding private ditch cleaning
10. Road damage caused by overweight vehicles
    a. Adopt county ordinance
    b. Develop policy and fee schedule for overload permits
11. Competition for funds for maintenance and improvements, resulting in lack of preventative maintenance
    a. Create a guide for developing annual quotas for chip seals, overlays, and crack sealing
12. Accelerated deterioration/aging of bridges
    a. Implement bridge maintenance program
13. Rotation of equipment/maintenance
    a. Continue established equipment rotation program

Administration and Planning

14. Increased cost responsibility due to developing urban fringe infrastructure resulting from a lack of policy for turning county roads over to city as new areas incorporate
    a. Develop a joint policy with cities where this is an issue
15. Roads that don't belong on county road system
    a. Develop criteria for inclusion of roads on county road system
    b. Identify specific roads and costs associated with maintaining them
    c. Meet with affected parties to discuss specific problem areas
16. Evaluation of county road system for road surface and gravel
    a. Review criteria for hard surfacing a road
    b. Conduct a countywide assessment of the road network

Improvements

17. Poor drainage that results in degradation of pavement base, damage to crops, and insect issues in homes
    a. Identify specific problem areas
    b. Establish standards, minimum grade rule–0.1% grade, 5 foot drop per mile = 1 inch per 100 feet
18. Traffic levels that warrant hard surfacing
    a. Follow guidelines developed in #16 in Administration and Planning category

19. Increased traffic due to industrial development
    a. Identify specific areas
        i. Sunflower crushing plan on County 38 near Enderlin
        ii. Planned and future location of 110-car grain loading facilities
20. Horizontal alignment problems
    a. Inventory problem areas identified in safety audit and by Cass County transportation department employees
    b. Develop a list of potential projects and associated costs
    c. Evaluate projects as part of the planning process

4.4 Public Input

To further identify problems with and concerns about the Cass County road system, a survey was conducted of county road users. The survey was based on a questionnaire originally developed by the Upper Great Plains Transportation Institute (UGPTI) for collecting data on the perceptions of rural road users in the mid-1990s. The Cass County advisory board reviewed those questions and suggested revisions. The revised survey (Appendix K) included questions on where respondents lived, how many miles they travel per day, the number of trips they make per day, what type of roads they drive on (paved or unpaved), and their perceptions of the road signage, road conditions, and funding. Respondents were also asked to name improvements they would like to see on the roads they most frequently travel.

The survey was mailed in fall 2001 to rural road users. To increase awareness and generate more responses, the Cass County Highway Department publicized the survey in public service announcements and feature stories in local newspapers. Individuals were given the option of completing the paper copy of the survey or completing the survey online at the UGPTI website.

By early 2002, 198 surveys had been completed and returned. The survey responses were analyzed using SAS statistical software. Most (67%) of the respondents resided in the country, rather than in towns or cities. Most (68%) traveled more than 20 miles per day, with the most common destination being Fargo. None of the respondents used public transportation. Work was the most commonly cited trip generator (67%).

The respondents had a favorable view of the overall county road system. Yet a number of respondents (64%) said road conditions reduced their speed of travel and (39%) increased their vehicle maintenance costs.

The respondents identified 128 activities that could improve the county road system. These were considered in developing the list of programs, projects, policies, and nonrecurring activities that were eventually screened in the planning analysis.

In addition, four public input meetings were held throughout the county. The comments received at these meetings verified the issues identified by the planning team and the survey of road users.

The executive planning committee then generated another list of potential improvements based on the committee members' personal knowledge of the county road system.

4.5 Screening Process

A composite list of programs, projects, policies, and nonrecurring activities was then developed based on the suggestions made by the public, the planning team, and others. This list consisted of activities that would result in an ideal county road system, provided there were no limitations on resources. This list was then subjected to a preliminary screening by the executive planning committee, with the purpose of deleting those activities that had no reasonable chance of being implemented.

Each of the programs, projects, policies, and nonrecurring activities was reviewed in light of five basic criteria:

Mobility – How much does the project contribute to improved mobility of freight and people?

Economic Activity – Does the project serve some industry or firm that is important to the county's economy?

Safety – Does the project improve safety?

Affordability – Is the project affordable within the planning horizon of the county road plan? (This is a twofold question, as it relates to the cost of individual projects and to the cumulative cost of all projects.)

Major Connector – Does the project connect one or more cities, firms, or other parts of the road/highway network that are important to mobility.

The screeners were provided information on resource requirements (human capital, operating funds, and project financial capital), as well as average daily traffic, pavement condition index, roadway length, population density, and total population. Existing budget constrains were similarly provided.

Each of the executive planning committee members rated each activity as 1, 2, or 3 (see Figure 6), with 1 indicating "no, the activity should not be implemented," 2 indicating"maybe," and 3 indicating"yes." The ratings were totaled and an average was then calculated for each activity. Only those activities that had an average of 2 or higher were retained for further analysis.

The resulting revised list was then subjected to a planning analysis that led to a five-year county road plan.

4.6 Planning Analysis

In the planning analysis, the activities were further screened in light of environmental, financial, operational, and political constraints and included the following considerations:

- projected person-carrying capacity
- potential person-carrying capacity
- maximum link utilization
- number of users
- system utilization (regional basis)
- corridor congestion
- travel times
- regional delay
- travel time reliability
- impact on goods movement

- Impacts on
  - wetlands
  - parks, historic properties, wildlife refuges
  - air quality
  - endangered species
  - environmental justice
  - displacements
  - neighborhood disruption/community cohesion
  - hazardous materials

Consideration was also given to the following three options for achieving the road plan goals:

- Maintain the quality and quantity of the existing pavement (doing so will consume all of the existing revenues)
- Increase revenues so that sufficient funds are available to maintain existing pavement and make a limited number of improvements (such as applying a hard surface to some gravel roads)
- Maintain revenue at existing levels and add a few projects, accepting that a limited amount of degradation of the existing system will occur.

4.7 Plan Outline

After all the analysis was done, a description of the process and a summary of the findings were published as the Cass County road plan. The plan had the following elements:

1. Letter of Endorsement from Cass County Commission

2. Executive Summary

3. Introduction
   a. Need and purpose
   b. Brief description of the planning process
   c. Planning team

4. Cass County Profile
   a. Description of Cass County
   b. Current conditions of the county road system
   c. Vision and mission
   d. Goals
   e. Options on how to achieve goals

5. Issues, Solutions, and Potential Projects
    a. Summary of survey results and possible projects
    b. Issues identified by planning team and possible solutions
    c. Existing internally identified projects
    d. Synthesized list of projects, programs, and policies
    e. Pre-screening criteria
    f. Pre-screening of projects

6. Planning Analysis
    a. Constraints
        i. Environmental
        ii. Financial
        iii. Operational
        iv. Political
    b. Detailed evaluation process
    c. Detailed evaluation of projects

7. County Road Plan
    a. Planning horizon
    b. Project, programs, and policies
    c. County road plan

8. Summary, Conclusions, and Recommendations

9. Appendices

5. Summary and Conclusions

The goal of this study was to lay out a process that county road departments, and the consultants who work with them, could use to develop a county road plan. Developing a road plan that meets a community's need for mobility while balancing the interests of users, operators, and nonusers of the system and heeding funding, environmental, and other constraints is an extremely complex challenge. Because the planning function is critical to the long-term health of our transportation system, it is important that counties select a planning process that is thorough and inclusive, yet realistic.

This report is intended to provide an easy-to-follow, step-by-step approach for counties, consultants, and LTAP personnel to use in developing a road plan. The five steps outlined in this report, and the 15 activities associated with those tasks, will guide a county road department through the complex process and lead to a road plan that is feasible and that has the support of the public and of various groups who otherwise have a stake in the quality, safety, and efficiency of the transportation system.

To test the practicality of the guidance in this report, Cass County (North Dakota) followed the steps and activities presented herein and found that the process led to a vetted, realistic, and comprehensive road plan.

Appendix A. Potential County Road System Community Stakeholders

Source: Borich, T.O., and J. Ayres. T*ransportation Action: A Local Input Model to Engage Community Transportation Planning*. RRD 174. North Central Regional Center for Rural Development, Iowa State University, Ames, 1996.

Stakeholder Groups	**Individual Stakeholders**
Airport Board	
Agriculture Industry Groups	
Citrus	
Timber	
Winery	
Other	
Americans With Disabilities	
Banks/Financial Institutions	
Bicycle and Pedestrian Advocates	
Bus Lines	
Chamber of Commerce	
Civic Organizations	
Community Improvement Groups	
Commuter Airlines	
County Engineer	
County Highway Department	
Environmental Groups	
Health Care Providers	
Industry	
Local Government ((town, city, county boards and comm.)	
Post Office	
Professionals (attorneys, accountants, architects, etc.)	
Railroad	
Retail Businesses	
Schools	
Senior Citizens	
State Transportation Department (local office)	
Transit Provider	

Taxi
Truckers
Unions
Volunteer Transportation Providers

Appendix B. Definitions of Selected Planning Terms (as used in this report)

Vision — A statement articulating where the county road system should ideally be in the future. The statement should be a stretch from the status quo unless the state of the county road system is currently optimal, in which case the vision should be to improve with changes in technology, environmental values, and the socioeconomic system.

Mission — The mission statement should address the more near-term needs for mobility of the users of the county road system. It should be general in nature but it should not exclude any of the stakeholders.

Issues — Issues are those concerns that prevent or inhibit the attainment of the mission and/or vision. They are those challenges that must be overcome to achieve the development and maintenance of the system that the public desires.

Goals — Goals are a concise statement of the actions necessary to overcome or mitigate the issues. They are the idealized desired end at which the planning process is aimed. Goals need to be developed consistent with the issues.

Objectives — Objectives are measurable operational statements of individual goals defined without reference to attainability in terms of budgetary or other resource constraints. When each of the objectives have been achieved for a specific goal, the goal itself should be attained.

Tasks — Very specific operational statements that can be measured with a great degree certainty. These measurable actions achieve specific objectives.

Appendix C. Example of Initial Planning Team Meeting Agenda

Mendocino County, California

Initial Planning Meeting
April 1-2, 1998

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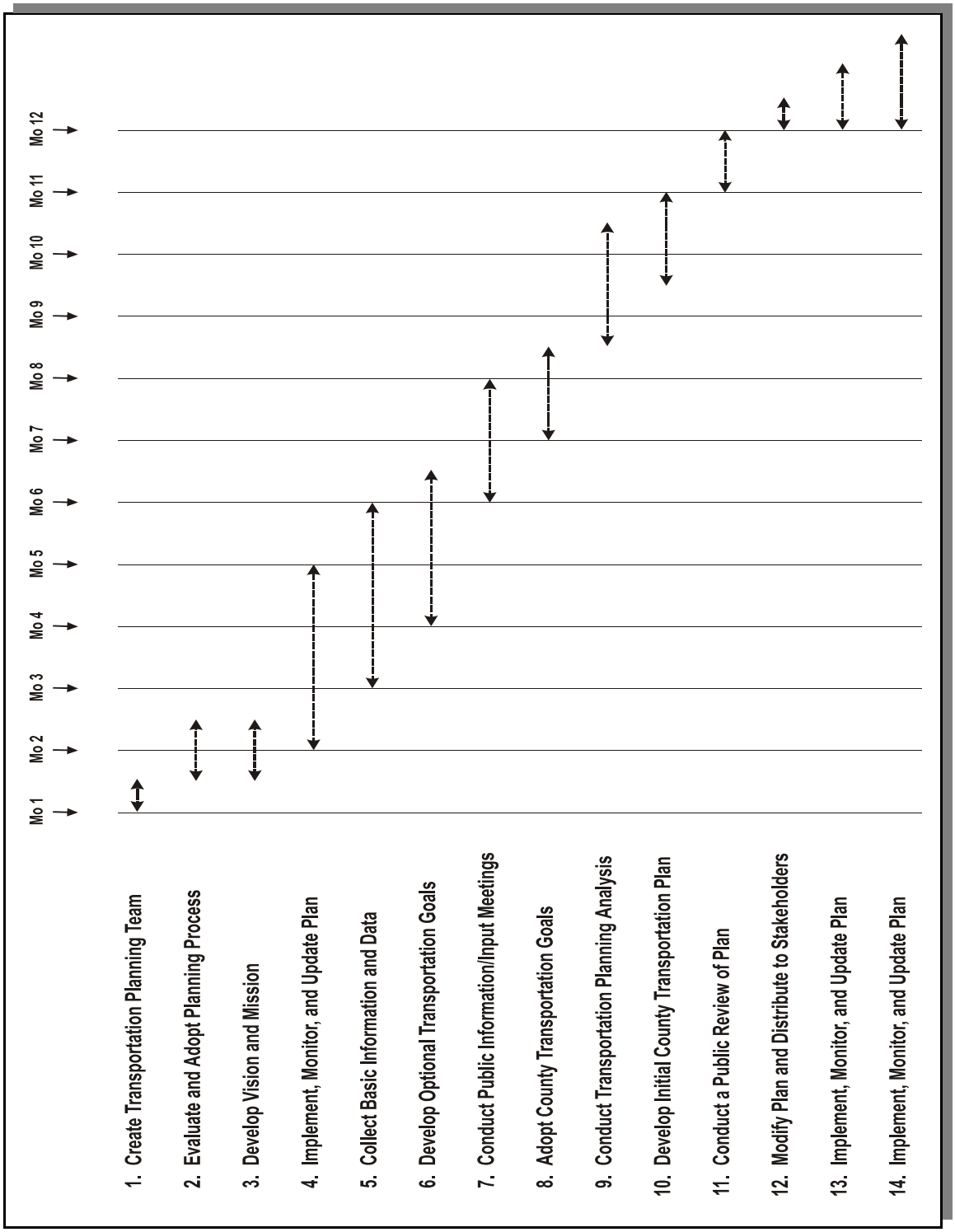
1. Introductions
2. Upper Great Plains Transportation Institute and MPC
3. Project description and background
4. Review of proposed planning process
5. Familiarization with county
6. Perceptions of the county
7. Modification/adoption of process
8. Development of details of process sub-elements
9. Next steps

Appendix D. Planning Timetable



Appendix E. Selected Examples of Vision and Mission Statements

Mendocino County, California

Vision — To be recognized as one of the best maintained, planned, and managed county transportation systems in California. (When people think of county transportation, they think of Mendocino County.)

Mission — To enhance the quality of life in Mendocino County in partnership with other county agencies by meeting the commercial, public, and personal mobility needs for the county transportation users in an efficient, safe, and environmentally sound manner.

Cass County, North Dakota

Vision — To be recognized as a premiere county road program in the Northern Plain states. (When people in the know mention county road systems and issues, they think of Cass County.)

Mission — To provide an efficient, safe, environmentally sensitive, and cost-effective county transportation system to effectively meet citizen's needs for personal mobility and movement of goods consistent with the importance of transportation.

Appendix F. Examples of County Road System Goals

Mendocino County, California

1. Safety — Enhance the safety of the traveling public and the employees of the department.

2. Maintenance — Provide environmentally sound road maintenance that ensures safe and efficient travel.

3. Management — Improve the management and operations of the department in order to meet the demand for safe and efficient transportation.

4. Improvements — Construct improvements to the county transportation system to meet the current and future needs of the transportation users.

5. Traffic Operations — Create a countywide transportation system that will minimize the adverse impact to the environment and will reduce the congestion and conflict among the various modes of transportation.

Cass County, North Dakota

1. Safety — Enhance the safety of the traveling public, county residents, and the employees of the road department.

2. Maintenance — Protect the public's previous infrastructure investment by providing environmentally sound and timely maintenance to the county transportation system to ensure safe and efficient travel.

3. Administration and Planning — Develop a citizen driven management and operations system responsive to the needs of the county road users for a safe and efficient county transportation system.

4. Improvements — Construct improvements and enhancements to the county transportation system to meet the current and future needs of the transportation system users within the constraints of resources available to the county.

Appendix G. Examples of County Road Issues (in no order of importance)

1. Deferred Maintenance
2. Congestion
3. Demands resulting from urban/suburban growth
4. Demands resulting from industrial growth
5. Upgrading/rebuilding infrastructure
6. Transportation enhancements (e.g., bikeways)
7. Agricultural Access
8. Overdeveloped infrastructure
9. Unnecessary infrastructure
10. Inflation of construction and maintenance costs
11. Availability of funds
12. Perceptions of the public
13. Road safety

Examples of County Road Issues by Goal Area (in no order of importance)

Safety

1. Exposure of county employees to unnecessary risk in work zones.
2. Non-compliance with traffic laws resulting in increased dangers to the traveling public.
3. Highway/road safety problems resulting from inadequate or improper signage.
4. Visibility impairment due to brush along the roadway.

Maintenance & Repair

1. Untimely maintenance of roads resulting in increased long-term maintenance costs, reduced safety, and increased vehicle maintenance and operating costs.
2. Poorly maintained bridges resulting in increased long-term bridge maintenance, replacement costs, and decreased safety.
3. Failure to properly maintain equipment, resulting in increased long-term maintenance and replacement costs.
4. Poor ditch and culvert drainage, resulting in degradation to the roadway.
5. Traffic-induced dust on gravel roads, resulting in poor visibility, potential health problems, public nuisance, and degradation of the road surface.
6. Erosion of right-of-way ditches, side slopes and road surfaces resulting in increased maintenance costs, investment, and environmental degradation.
7. Environmental impact resulting from inadequate policies and procedures

Management

1. Lack of adequate workforce skills and knowledge to work as effectively and efficiently as possible.
2. Effective use of pavement management system.
3. Lack of understanding by the public of the importance and value of the road system.
4. Exposure to liability, potentially resulting in actual and punitive damages.
5 Insufficient coordination with cities and towns, resulting in poorly integrated transportation systems.
6. Inadequate equipment management system, resulting in inappropriate or lack of equipment replacement schedule.
7. Awareness of changes in environmental policy and regulations that affect county road system and operations.
8. Lack of intermediate and long-term planning for urban fringe and rural growth, resulting in poor investment strategies.
9. Lack of a sound management strategy to meet regulatory agency, requirements resulting in delay of project delivery.
10. Excessive road damage caused by overweight vehicles.
11. Oversized (height, width, length) vehicles causing traffic delays and congestion.
12. Increased traffic resulting from diversion from state routes to county routes.
13. Inadequate coordination with land developers and utility companies resulting in project delays and mistrust of the road department.

Capital Improvements

1. Drainage systems have reached the end of their useful life resulting in degradation of the environment and infrastructure.
2. Lack of funding to maintain regularly scheduled reconstruction of county road and bridge infrastructure resulting in increased long-run investment requirements, increased maintenance costs, and unsafe conditions.
3. Lack of funding to extend the life of county road system by rehabilitation using asphalt concrete overlays.
4. Lack of funding to increase capacity in congested areas.
5. Lack of funding to make safety improvements consistent with the safety concerns of county citizens.
6. Provide multimodal transportation enhancements.
7. Lack of funding to make improvements to the highway system to address environmental requirements regarding fisheries and wildlife habitat.
8. Improperly designed roads for existing traffic levels.
9. Lack of a broad strategy for funding to meet the needs of county road system.

Appendix H. Proposed Method for Classifying County Road Issues

SIZE AND CONFIGURATION		
Capital Investments	**Planning & Administration**	**Operational**
Turn select roads over to state	New developments	Pave some county roads
Turn select roads over to township		Returning some paved roads to gravel
Configure County Road 13		
Rural development - roads in growth area that are beyond township's ability to maintain		
QUALITY		
Capital Investments	**Planning & Administration**	**Operational**
Continue to build base/reshape gravel roads	Educate public about load limits and their impact on roads	Locating and fixing isolated soft spots
Improve drainage in problem areas	Appropriately monitoring of private ditch cleaning	Horizontal alignment
Hard surface Old 10 from Buffalo to Wheatland	Consistency in weight limits and enforcement	
	Program sufficient funds for preventive maintenance	
CAPACITY		
Capital Investments	**Planning & Administration**	**Operational**
	Plan for roads on urban fringe (county roads 20, 6, 17, & 81)	
	Appropriate monitoring of private ditch cleaning	Consistency in weight limits and enforcement
SAFETY		
Capital Investments	**Planning & Administration**	**Operational**
Access in Tower Township	County Road 17; 6 expand to four lanes (Fargo-Moorhead Metropolitan Council of Governments projection)	Widen shoulders
Dirt slide problems / embankment failures	Develop definite policy on dust control	Add/widen turn lanes
	Liability problems	

Appendix I. Road System Issues Classified by Key County Road Elements

SIZE AND CONFIGURATION

- County road system too large because some roads belong on the township system
- Oversized county road system resulting from some county roads really belonging on the state system
- Insufficient access to new suburban and rural housing deployments

QUALITY

- Continue to build base/reshape gravel roads
- Educate public on load limits and their impacts
- Locate and fix isolated soft spots
- Improve drainage in problem areas
- Appropriately monitor private ditch cleaning
- Improve horizontal alignment
- Consistency in weight limits and enforcement
- Program sufficient funds for preventive maintenance

CAPACITY

- Plan for roads on urban fringe
- Consistency in weight limits and enforcement

SAFETY

- Widen county roads as necessary; expand to four lanes
- Widen shoulders
- Address dirt slide problems / embankment failures
- Develop definite policy on dust control
- Add/widen turn lanes
- Address liability problems

Appendix J. Examples of Solutions to Issues by Goal Area

Safety

1. Exposure of county employees to unnecessary risk in work zones.
   a. Flagger training
   b. Work zone traffic control training
   c. Provide proper safety equipment
   d. Equipment operator training
   e. Training of on-site supervisors
   f. Public information campaigns
   g. Law enforcement/better enforcement
   h. Scheduling/timing of operations
   i. Upgrade to proper equipment
   j. Periodic inspection of work zones

2. Private-sector work zone safety
   a. Outreach/training to private companies
   b. Require proof of training

3. Non-compliance with traffic laws resulting in increased dangers to the traveling public.
   a. Increase law enforcement
   b. Public information/awareness campaigns (schools)
   c. Interdepartmental awareness campaign
   d. Analysis of chronic problem road segments

4. Highway/road safety problems resulting from inadequate or improper signage.
   a. Road safety evaluations
   b. Develop reporting system of improper or missing signs (e.g., Web-based)
   c. More thorough safety review of all new road plans
   d. External road safety audits

5. Visibility impairment due to brush along the roadway
   a. Evaluation of problem areas and coordination with maintenance to address areas
   b. Work with private land owners where there is adjoining ownership of problem areas
   c. Evaluate realignment needs to mitigate visibility impairments

Maintenance & Repair

1. Untimely maintenance of roads resulting in increased long-term maintenance costs, reduced safety, and increased vehicle maintenance and operating costs
   a. Evaluation of maintenance and repair needs of the county road system that is supported by county road supervisors and believable by the public.
   b. Develop maintenance schedule that optimizes maintenance of county road system within budget limitations.
   c. Develop a public awareness campaign for explaining the need for maintenance and repair which has resulted from inadequate funding.
   d. Enhance staffing and equipment to meet the maintenance and repair needs.
2. Poorly maintained bridges resulting in long-term bridge maintenance needs, increased replacement costs, and decreased safety.
   a. Evaluation of maintenance and repair needs of the county bridge system that is supported by county road supervisors and believable by the public.

b. Develop maintenance schedule that optimizes maintenance of county bridge system within budget limitations.
c. Implement a bridge management system program (similar to pavement management system)
d. Develop a public awareness campaign explaining how inadequate funding leads to increased maintenance and repair costs in the long run.

3. Excessive maintenance costs due to inadequate replacement schedules.
   a. Improve equipment replacement schedule.

4. Poor ditch and culvert drainage resulting in degradation to the roadway.
   a. Documentation of problem areas.
   b. Develop long-term ditch maintenance plan.
   c. Evaluate different techniques, technologies, and equipment and disposal materials.

5. Traffic-induced dust on gravel roads resulting in poor visibility, potential health problems, public nuisance, and degradation of the road surface.
   a. Prioritization of problem areas.
   b. Timely applications of dust-control products.
   c. Annual evaluation of progress
   d. Identify future needs on an annual basis
   e. Seek long-term agreement from air-quality district for financial assistance.
   f. Encourage public-private partnerships (e.g., private pay for chemical and county cover application costs)

6. Erosion of right-of-way ditches, side slopes, and road surfaces resulting in increased maintenance costs, investment, and environmental degradation.
   a. Installation of cross culverts
   b. Develop comprehensive drainage plan for segments of road
   c. Implement best management practices and training
   d. Plans to handle emergencies (e.g., training for emergency response to slides, etc.)
   e. Bituminous surfacing on road surface

7. Environmental impact resulting from inadequate policies and procedures
   a. Develop policies and procedures to address environmental impacts
   b. Develop relationship with regulatory agencies
   c. Develop rapport with environmental groups

Management

1. Lack of adequate workforce skills and knowledge to work as effectively and efficiently as possible.
   a. Scan of training needed
   b. Identify venders for training needs
   c. Develop internal training programs
   d. Ensure training budget available to meet the training needs
   e. Budget time for workers to attend training

2. Effective use of pavement management system
   a. Annual update of pavement management evaluation
   b. Periodic refresher training on pavement management system
   c. Supervisory training of how program will work

3. Lack of understanding by the public of the importance and value of the road system.

a. Public relations outreach, such as a speakers bureau, where some employees make themselves available to public service clubs and provide information packets on issues (e.g., local issues and their impact on mobility)
b. Coordinated open house among the districts (have supervisors present and welcome public to come and visit).
c. Publish news story in local papers (commission good news story by local freelance writer).
d. Develop a "popularized" annual report
e. Develop a "good roads" committee/council
f. Develop a formal citizens advisory group (include one or more individuals from each supervisory group)

4. Exposure to liability, potentially resulting in actual and punitive damages.
   a. Development of liability program.
   b. Develop program for reporting incidences, for all staff members.

5. Insufficient coordination with cities and towns resulting in poorly integrated transportation systems.
   a. Establish an annual meeting with each of the cities (director) to discuss issues of coordination.
   b. Inter-county coordination with each contiguous county - (Directors could meet once a year to discuss and work on better coordination among counties)

6. Inadequate equipment replacement resulting in excessive replacement cost.
   a. Analyze the costs incurred under different scenarios of replacement schedules
   b. Evaluate productivity gains resulting from replacement of equipment with new or better equipment

7. Awareness of changes in environmental policy and regulations that impact county road system and operations.
   a. Identify accurate sources of information
   b. Create clearinghouse activity by department head or individual
   c. Disseminate information/clear routing of information to people that need to know

8. Lack of intermediate and long-term planning for urban fringe and rural growth resulting in poor investment strategies.
   a. Improve coordination with county planning department
   b. Evaluate opportunities for public-private partnership for development of roads

9. Lack of a sound management strategy to meet regulatory agency requirements resulting in delay of project delivery.
   a. Better awareness or tighter watch of regulatory requirements or changes in requirements
   b. Identify other counties or agencies with similar problems and coordinate efforts
   c. Try to expand or enhance local assistance through California Department of Transportation (Caltrans)
10. Excessive road damage caused by overweight vehicles (legal load limit).
    a. Identify specific problem areas and probable causes
    b. Better enforcement
    c. Capital investment in key roads
    d. Seasonal road restrictions

11. Oversized vehicles causing traffic delays and congestion.
    a. Review of county roads capability to handle truck traffic with oversized loads
    b. Restrict height and weight on specific roads

12. Increased traffic resulting from diversion from state routes to county routes.

a. Partnership or agreement with Caltrans to formally designate re-routed traffic

13. Inadequate coordination with land developers and utility companies resulting in project delays and mistrust of the department.
    a. Better coordination among designate individual(s) that work with utility companies
    b. Conduct internal meetings of all stakeholder groups
    c. Better coordination with county economic development coordinator

Capital Improvements

1. Drainage systems have reached the end of their useful life resulting in degradation of the environment and infrastructure.
    a. Identify and conduct evaluation for cross-drain culverts (Mendocino has about 15,000 culverts that are about 30 years old)
    b. Develop prioritization scheme for replacement
    c. Identify funding sources for replacement projects

2. Lack of funding to maintain regularly scheduled reconstruction of county road and bridge infrastructure resulting in increased long-run investment requirements, increased maintenance costs, and unsafe conditions.
    a. Identify scope of the problem (what are the safety implications, etc.)
    b. Develop prioritization based upon identified parameters (e.g., is it a critical portion of the system)
    c. Identify available funding programs and possible new sources of funds (projects eligible for federal funding)

3. Lack of funding to extend the life of the county road system by rehabilitating the pavement with asphalt concrete overlays.
    a. Develop good explanation so public understands what this means (difference between reconstruction, rehabilitation, repair, etc.)
    b. Identify scope of the problem (what are the safety implications, etc?)
    c. Prioritization
    d. Identify available funding programs and possible new sources of funds

4. Lack of funding to increase capacity in congested areas.
    a. Identify problem areas
    b. Prioritization of projects
    c. Identify available funding programs and possible new sources of funds
5. Lack of funding to make safety improvements consistent with the safety concerns of county citizens.
    a. Identify specific areas where improvements could make a difference in safety
    b. Prioritize project
    c. Allocate within existing budget necessary funds that make the greatest contribution to improving safety
    d. Identify sources of additional funds to improve safety and mobility in the county as needed.

6. Provide multimodal transportation enhancements.
    a. Identify demand and location
    b. Identify existing sources of funding
    c. Multimodal enhancements (transit, bike, bus stops interfaced with airports)

7. Lake of funding to make improvements to the highway system to address environmental requirements regarding fisheries and wildlife habitat
    a. Identify needed improvements

b. Prioritization of needs
c. Sources of funding

8. Improperly designed roads for existing traffic levels
   a. Perform various traffic studies and demographic projections
   b. Investigate coordination with redevelopment strategies with other agencies
   c. Investigate development impact fees

9. Lack of a broad strategy for funding to meet the needs of county road system
   a. Conduct an analysis of the gap between existing resources and future needs
   b. Create a strategy team of interested citizens, businesses that are major stakeholders in the county road system, county supervisors, and key road department employees
   c. Develop a strategy to improve long term funding
   d. Implement the strategy

Appendix K. Example Survey

CASS COUNTY ROAD QUESTIONNAIRE

1. Which best describes where you live? □ country □ rural subdivision □ urban fringe □ town _____

   Please specify

   a. If you live in the country, a rural subdivision, or urban fringe, please specify your nearest community. _____

2. How long have you lived in this setting in this county (please circle one of the ranges below)?

   □ 0-1 years □ 2-4 years □ 4-6 years □ 6- 10 years □ over 10 years

3. How many miles, on average, do you travel in one day?

   □ Less than 2 miles □ 2-5 miles □ 5-10 miles □ 10-20 miles □ over 20 miles

4. Where is your most common destination, e.g.,

   Fargo?_____

5. On average, how many **daily** trips do you make to your most common destination?

   □ Less than 1 □ 1-3 □ 4 -5 □ More than 6

6. How many miles do you live from your most common destination?

   □ Less than 2 miles □ 2-5 miles □ 5-10 miles □ 10-20 miles □ over 20 miles

7. Are the majority of the roads leading to the nearest community paved? □ YES □ NO

8. Do you use public transportation? □ YES □ NO

   a. If Yes, how frequent do you use the service?

   □ Less than once a week □ 0-2 times/wk □3-5 times/wk □ more than 5 times/wk

9. Do you find the public transportation services adequate? □ YES □ NO(please explain)

   a. If No, please explain:
   _____
   _____

10. Do you consider the number of bike trails or biking right of way adequate? □ YES □ NO(please explain)

    a. If No, please explain:
    _____
    _____

11. Would you support additional taxes to fund bike trails and biking right of way? □ YES □ NO

12. What percentage of your weekly travel is related to the following i.e., 50% to work, 20% shopping, etc:

work_____ shopping_____ social events_____ recreation_____ school_____ other_____

13. Do you feel there is adequate signing on the COUNTY roads you travel most frequently to warn motorists of potential hazards e.g., curves, bridges, etc. ☐ YES ☐ NO

a. If NO, which of the following sign types are missing/damaged?

☐ stop ☐ yield ☐ speed limit ☐ narrow bridge ☐ no passing ☐ railroad crossing ☐ services
☐ recreation information ☐ route designations ☐ Other (please specify) _____

14. Do you report problems you encounter (e.g., pot holes, etc.,) along your roadway to your county road office or some other official? ☐YES ☐ NO

a. If YES, who do you report to?

☐ County Engineer ☐ Highway Patrol ☐ Local Law Enforcement ☐ Other (please specify)
_____

15. Do you feel the emergency services, e.g., 911, ambulance, etc. in your area are effective? ☐ YES ☐ NO

a. If NO, please explain what would make the services more effective
_____

16. Do certain elements of the roads that you routinely drive reduce the normal operating speed of your vehicle? ☐ YES ☐ NO

a. If YES, please select all that apply that are causing the reduced operating speed:

☐ potholes ☐ sight distance ☐ surface roughness ☐ traffic congestion ☐ Other _____

17. Have you noticed unusual wear and tear on your vehicle as a result of the condition of the roads you most frequently travel? ☐ YES ☐ NO

a. If YES, what do you think is causing the additional wear and tear?

☐ potholes ☐ rutting ☐ shoulder condition ☐ surface roughness ☐ washboard
☐ other _____

18. On a scale of 1 to 6 please rate the following road services and features for the local roads you most frequently travel.

	Very Good	Good	Fair	Bad	Very Bad	Not Applicable
Snow removal during the winter months	1	2	3	4	5	6
Adequate roadway signing	1	2	3	4	5	6
Road maintenance (patching, blading of gravel, etc.)	1	2	3	4	5	6
Bridge maintenance	1	2	3	4	5	6
Road width	1	2	3	4	5	6
Ditch steepness (slopes)	1	2	3	4	5	6
Road shoulder - availability, width, surface	1	2	3	4	5	6

19. Do you believe that county road funds are being properly spent? □ YES □ NO

a. If No, please explain why not?

_____

_____

20. Please check which tax increases you would support to improve road conditions in your **local** area?

□ Sales Tax □ Fuel Tax □ Property Tax □ None □ OTHER _____

21. Please list what improvements you would like to see on the roads on which you most frequently travel in order of priority (please be as specific as possible about which roads and which improvements you would like).

1. _____

2. _____

3. _____

4. _____

OTHER COMMENTS:

THANK YOU FOR YOUR ASSISTANCE