SECTION 2

EXISTING CONDITIONS ANALYSIS

Introduction

Transportation planning is an essential part of growing successful communities. The coordination of regional transportation planning is more important today than it has ever been. As boundaries between communities begin to merge and unincorporated Kootenai County continues to feel increased development pressure, the need to have a coordinated and comprehensive transportation plan becomes paramount to ensure the safe and efficient mobility of people and goods into and through Kootenai County.

In early 1995 a group of interested Kootenai County agencies recognized this need for more coordinated area-wide transportation planning. Thus, the Kootenai County Area Transportation Team (KCATT) was formed, which covered all of Kootenai County. The KCATT began a regional transportation planning process involving Kootenai County; the cities of Coeur d'Alene, Post Falls, Hayden, and Rathdrum; the highway districts of East Side, Worley, Post Falls, and Lakes; and the Idaho Transportation Department. This planning effort resulted in the Kootenai County Area Transportation Plan that was adopted in 1997.

Envisioned as a 20-year future plan from 1997 through 2017, the Kootenai County Area Transportation Plan (KCATP) completed an analysis of existing and future arterial transportation systems. Through a public facilitation process by KCATT and informational public meetings, the 20-Year Transportation Plan recommended priority improvements assigned to short-term (2003) and long-term (2017).

Since 1997, Kootenai County has experienced significant growth that went well beyond the estimates that were envisioned in the Plan. As a result of that growth, the area surrounding Coeur d'Alene, Post Falls, Dalton Gardens and Hayden became a federally designated Urbanized area by the U.S. Department of Commerce, Bureau of the Census. With this designation, Kootenai County became a formally designated metropolitan area, which resulted in the requirement to conduct transportation planning pursuant to Title 23 USC Subsection 134. This new designation meant that for the Idaho Transportation Department (ITD), local jurisdictions and agencies to continue to use Federal transportation funds, they must collectively develop a Metropolitan Transportation Plan (MTP) that meets the federal planning requirements.

Fortunately, due to the forward thinking of ITD and local jurisdictions creating KCATT, the transition from a voluntary association of agencies to the creation of Kootenai Metropolitan Planning Organization (KMPO) became less formidable than if they had began the transportation planning process from scratch. So, it is with this introduction, and a large appreciation to those that came before KMPO, specifically Carole Richardson of the Idaho Transportation Department, that we begin the process of updating the 1997 Kootenai County Area Transportation Plan to the Kootenai Metropolitan Transportation Plan. During the process of

transitioning from KCATT to the Kootenai Metropolitan Planning Organization structure, several public meetings were devoted to establishment of KMPO's focus given limited time and financial resources. Through that process, specific goals and objectives were identified, which are summarized as follows:

- **Develop a better understanding of Vehicular / Truck / Commuter /Tourism traffic in Kootenai County, and how they impact the different geographic areas of the County.**

Several transportation studies and traffic counts have been conducted in recent years or are ongoing in an effort to obtain this information. Development of a new KMPO Travel Demand Model is also in the works.

- **Continuously update changes in land use that affect traffic.**

This is an ongoing process. Updates are made as new information becomes available from traffic counts, transportation studies, and other sources.

- **Maintain & enhance Interjurisdictional coordination & communication thru KCATT.**

This is also a continuing process, although there is already a high level of interjurisdictional coordination among the agencies that make up Kootenai County.

- **Establish a future corridor preservation plan before the corridors disappear as a result of growth.**

This MTP is a step toward that goal, identifying where improvements are needed on the transportation system. In 2007, the KMPO Board also took steps to do this, voting to preserve right of way along Huetter Road in an effort to preserve land for a future corridor.

- **Establish county involvement in transportation planning process.**

The county has representation on KCATT and the KMPO Board and works with the other jurisdictions on projects.

- **Provide assistance in land use/transportation related policies being developed by agencies**

KMPO has a Transportation Planner on staff to provide this assistance.

- **Identify safety and hazard problems for funding future solutions**

KMPO works with the individual jurisdictions on funding for projects that may present safety and hazard problems. In addition, KMPO staff recently met with Kootenai County Office of Emergency Management staff to discuss how the two agencies can work together to better prepare for emergencies and disasters.

- **Address the emerging issues on SH 97 e.g. eagle watching, heavy truck traffic, rapid growth**

At the time of the writing of this MTP (2007), KMPO was conducting a SH 97 Route Development Plan.

- **Evaluate the impact of seasonal traffic problems, i.e., events, weather, tourism, recreation**

This is another ongoing process, although traffic studies such as the SH 97 Route Development Plan and the East Valley/West Rathdrum Prairie Transportation Study (both conducted in 2007) and traffic counts have helped to gather information used to evaluate these impacts.

- **Evaluate new bicycle corridors and missing links that tie bike paths to the Centennial Trail.**

Non-motorized transportation is becoming an important consideration for jurisdictions when competing for project funding. Every project is evaluated in the planning stage to see how bicycle and non-motorized facilities could be incorporated into construction.

- **Conduct corridor studies to evaluate new/alternate routes and new freeway interchanges.**

As of the writing of this MTP (2007), this is underway with the SH 97 Route Development Plan, and the East Valley/West Rathdrum Prairie Transportation Studies. In addition, construction was beginning on the Beck Road Interchange, to accommodate traffic to the new Cabelas store.

- **Evaluate impacts due to fuel costs, EPA air standards, and increased transit use.**

This happens on an ongoing basis, with discussion at KCATT and KMPO Board meetings, and KMPO's Transportation and Air Quality Planners monitoring the conditions and their impacts.

- **Identify and protect future arterial routes across the prairie.**

This is happening currently with a 2007 vote of the KMPO Board to preserve right of way along Huetter Road to build a corridor in the future.

- **Manage the Functional Classification System to develop an area-wide road network.**

This is currently happening, and continues to be refined as the KMPO Transportation Planner develops a new Kootenai County Travel Demand Model.

- **Develop a Metropolitan Area Public Transportation Plan for Kootenai County.**

This goal has been realized with the development and adoption of this document.

- **Public Education and involvement**

Public Education and Involvement is an ongoing process. KMPO shares a Public Education/Information Coordinator with Spokane Regional Transportation Council. It is the duty of that person to plan public meetings, assist with transportation studies, write news releases, update websites, send out notice of transportation activities to interested jurisdictions and citizens, and publicize any projects/meetings/activities related to transportation issues.

- **Evaluate and recommend local funding options available to address transportation needs.**

KMPO's Executive Director works with the Transportation Planner to find the best funding options for the individual jurisdictions.

- **Conduct a Home Interview Travel Survey to develop locally discrete travel information.**

This was achieved in 2005 with the Spokane and Kootenai County Regional Travel Survey.

- **Consider special land use impacts to the transportation system.**

This is done on an ongoing basis; KMPO's Executive Director and Transportation Planner work with individual jurisdictions to consider impacts as projects are proposed.

- **Timing and phasing of improvements.**

This is addressed in Section 5 of this document. Projects are programmed for either the short (2015) or long (2030) term.

- **Include state routes in plan.**

Relevant state routes are included in all plans and transportation studies. They are included in this MTP and there is a currently a Route Development Plan underway for SH 97.

- **Involve utility agencies in the development of transportation policies and projects.**

Utility companies are invited to many meetings involving the development of transportation policies and projects, and are consulted as to the location of their facilities during the planning of projects. They are also coordinated with when a

road will be torn up so that they can complete any needed repairs at the same time, instead of digging up the same road twice.

- **Incorporate railroad corridors in plans.**

Area railroad corridors are considered in all plans, and there are specific projects that address railroad corridors, such as the 'Bridging the Valley' series of projects that would grade separate train tracks and roadways.

- **Data collection**

KMPO continuously collects data through traffic counts, transportation studies and coordination with area agencies.

- **Involve agencies that use or interface with the regional transportation system.**

KMPO involves agencies in the transportation planning process through KCATT and KMPO Board meetings.

- **Involve private sector public transportation providers in the public transportation plan.**

Private sector public transportation providers are involved in planning through meetings, email distribution lists, and coordination on projects.

With the list of goals and objectives developed by the community, KCATT and the KMPO Board, this Metropolitan Transportation Plan Update sets out to develop a vision and a direction for the future transportation system of Kootenai County.

Existing Conditions

Assessment of the existing traffic conditions within the Metropolitan area is a substantial process built upon the collection of credible data and the evaluation of that information. The following existing information has either been collected or developed during the preparation of this plan:

Functional Classification System (Network of roadway eligible for Federal funding)
Average weekday daily traffic (AWDT) with peak hour volumes, percent trucks, and directional splits
Roadway geometrics (number of lanes, speeds, parking, etc.)
Intersection geometrics (lane uses, traffic control, lane widths, turning lane lengths, etc.)
Intelligent Transportation System (ITS) Deployment
Accident Location Data

Truck routes
Non-motorized trails and rail corridors
Land use characteristics (present and future)
Population and Employment Forecasts
Home Interview Survey for trip making characteristics

Functional Classification

Existing roadways are classified by how they function as an integrated network based on their ability to meet local, jurisdictional, intra-regional, inter-regional, and interstate needs. The KMPO Board, Idaho Transportation Department (ITD), and ultimately the Federal Highway Administration (FHWA) formally approve the classifications, which are then depicted on a map of Kootenai County. Federal highway funding programs are limited to roadways with functional classifications of rural major collector and above in rural areas, and roadways with classifications that are Collector or above in Urban areas. It is important to point out that private roads; local accesses and local streets and roads are not eligible to use Federal Highway funds. All functionally classified roadways, except local streets, are shown in Figures 2.1 (County), 2.1a (Coeur d'Alene), 2.1b (Post Falls), and 2.1c (Rathdrum).

From March through September 2003, KMPO, in association with local jurisdictions and agencies represented on KCATT, conducted a six-month evaluation process to update the Federal Functional Classification System for Kootenai County. As a result of being designated a Metropolitan Area, transportation agencies needed to re-assess the roads being placed in the Urbanized Area and ensure they had a corresponding designation in the area that remained rural. This was particularly true across the Rathdrum Prairie, where rapid growth is changing the character of land use and travel patterns. The new Functional Classification system was the first geographic information system (GIS) based submittal in the State of Idaho, which has been approved by FHWA.

Roadways are classified in relation to their function, with respect to continuity, connectivity, mobility and access. An interstate freeway provides a high degree of connectivity between cities and states; however, by design, provide poor access to adjacent property. On the opposite end of the transportation system, local streets provide a wide degree of access to adjacent property; however are not effective in the efficient movement of people and goods into and through metropolitan areas because of increased traffic control such as stop signs and traffic signals. The Federal Functional Classifications are generally defined as follows:

Interstate

The interstate system, I-90 specifically, is the major east-west corridor through Kootenai County. Interstates promote the efficient movement of people and

goods, with limited access, high speeds, divided highways, and grade-separated intersections. With approximately 36 miles of freeway through the county and fifteen interchanges, I-90 becomes a very attractive route for intra-regional, inter-regional, and interstate trips. The interstate freeway is essentially a highly specialized Principal Arterial with interstate and international importance.

Principal Arterial

Principal Arterials are generally the higher traffic volume roads within a metropolitan area. These roadways contain the greatest proportion of through or long-distance travel. Access should be limited to promote efficient traffic movement. On-street parking is usually prohibited on the highest volume streets in urban areas; however, context sensitive design can result in on-street parking so long as safety issues can be addressed. Speeds are generally in the 35 to 45 mph range. Within urban areas, principal arterials are spaced about a mile apart, but may, in denser urban settings be in the half-mile range. Many of the intersections are signalized, and the uniformity of signal placement and coordination are critical to the successful operation of the arterial. U.S. 95 through Coeur d'Alene and Hayden is an example of a higher order principal arterial.

Minor Arterial

Roadways that connect sub-regional geographic areas together or to principal arterials are generally considered minor arterials. The function of a minor arterial is to provide movement of through traffic, but they also provide considerably more access for local traffic that originates or is destined to commercial, retail, or activity centers along a corridor. Often minor arterials become boundaries to neighborhoods and serve less concentrated developments such as neighborhood shopping centers or schools.

Urban speeds are generally in the 35-mph range. Access may be restricted and parking is often more limiting in an urban situation. Minor arterials are found on the state highway and local roadway system within designated urbanized areas.

Collector

Functionally, a collector is intended to assemble and concentrate residential and rural traffic and direct it to the higher order arterial system. To preserve neighborhoods, collectors are generally spaced about a half-mile apart. Direct access to adjoining property is common and often essential. Operating speeds are in the 25 to 30 mph range. Parking is generally acceptable, but may be limited.

In rural areas, collectors are sub-categorized into major and minor collectors. Major collectors tend to connect important rural regional facilities directly to state highways or the Interstate system, while rural minor collectors usually connect to the local access roads. Most of the highway district roadways are classified as

collectors with a few of the urban roads classified as collector. No state highway roads are classified as collectors.

Local Streets

Local streets, while not shown on Figures 2.1 et al., make up the highest number of road miles in all of Kootenai County. They provide the most potential access to individual property.

Traffic Volumes

Critical to any successful transportation planning program is the accurate collection of traffic volumes throughout the metropolitan area. Traffic counts are used in part to determine which roads should be functionally classified; which roads are close to exceeding their designed capacity; whether traffic signals or turning lanes should be installed; and used to ensure KMPO's computerized regional travel demand model reasonably reflects actual traffic conditions for the entire region. The process of ensuring the accuracy of the model, also known as "calibration" requires that traffic counts be taken at key locations throughout the metropolitan area, and logged typically in 15 minute increments. This is done to determine when the highest peak hours of travel occur in the area for both morning (AM) and evening (PM) peak hours.

While most of the public is used to the concept of daily traffic volumes when they think of traffic, transportation planners and engineers look at peak hour conditions. Streets, roads, and highways are designed to meet an AM or PM peak hour capacity based on a 20-year design life. Therefore, actual traffic counts play a critical role in the transportation planning process for their use in ensuring the travel demand model is accurately predicting existing conditions prior to predicting travel demand on the future transportation system. Without them, predictions on where future transportation investments should be made would likely be faulty, thereby limiting the efficiency and effectiveness of limited transportation funding available for capital improvements.

To ensure accurate traffic count information, KMPO contracted with the Spokane Regional Transportation Council (SRTC) and the Washington State Department of Transportation (WSDOT) to conduct an area wide traffic count program for Spokane and Kootenai Counties in the spring of 2003 and again in 2007. Approximately 120 Automated road tube counters were placed at over 70 locations at key locations on the regional transportation system to assess the movement of people and goods into and through Kootenai County. Springtime or fall traffic counts are typically representative of average daily traffic, otherwise summer time/construction impacts or holiday season traffic can bias the traffic data and provide unrealistic traffic conditions. From these counts, AM and PM peak hour traffic conditions can be determined. The peak hour varies slightly at locations throughout the county. Volumes during the p.m. peak hour are also generally heavier than the a.m. peak or the noontime peak. Directional peak hour traffic counts are essential to the development of a computer traffic model. For the purpose of developing the KMPO Travel Demand Model, the AM and PM peak hour periods were used.

In addition, KMPO coordinates with Idaho Transportation Department on traffic counts in order to maintain consistent data.

The AM average daily traffic volumes from KMPO's Travel Demand Model and traffic counts are depicted in Figure 2.2 (County), 2.2a (Coeur d'Alene), 2.2b (Post Falls), and 1.2c (Rathdrum) for representative areas. The PM average daily traffic volumes are depicted in Figures 2.3, (County) 2.3a (Coeur d'Alene), 2.3b (Post Falls), and 2.3c (Rathdrum). Detailed traffic volume data is available through KMPO or the individual agencies conducting the counts.

Intersection Operation

Traffic control devices such as traffic signals, stop signs, or yield signs are an essential element of the operation of an intersection. Some intersections are uncontrolled, while some have more sophisticated electronic systems that can detect the presence of a vehicle.

Intersection operation plays an important role in the regional travel demand model because each traffic control device at an intersection introduces delay to a vehicles' travel on the transportation system. Based on the traffic volume, stop signed controlled intersections give preference to the non-controlled direction. As a result, the time it takes to wait for an opening to proceed is highly dependent on the traffic volumes at any given time during the day. For traffic signals, traffic engineers can meter traffic from competing directions, thereby setting a transportation policy by how they allocate the amount of green time to any given direction. As an example, traffic signals on U.S. 95 North of Interstate 90 generally operate on signal cycle lengths ranging from approximately 120 to 180 seconds. This means every two to three minutes a motorist will get a green light to proceed.

When an informed and experienced driver chooses a path to travel into and through Kootenai County, significant consideration is given to the travel time to make the trip. Each traffic control device, be it a stop sign or traffic signal, introduces delay that adds time to make a trip. Research shows motorists can reasonably estimate the travel time between two known points. Adding the traffic control type of each intersection represented in the model then introduces the additional travel time it takes to make a trip. This more realistically represents how people travel in the real world.

KMPO, through KCATT, identified key intersections in the metropolitan area, where turning movement counts were collected, as well as corner radii, pedestrian presence, adjacent parking, signal phasing, cycle lengths, etc. This information was used in the KMPO Regional Travel Demand Model as part of the model calibration process. The actual traffic signal control type for every intersection on the regional transportation system was coded into the travel demand model.

Traffic Safety

Intersections

When it comes to traffic safety, intersections play a large role in collisions, simply because there are many points where two or more cars have the potential to collide. The Idaho Transportation Department and Kootenai County have provided KMPO with the most recent collision data for the years 1998-2007. Table 3 below shows the top 25 highest collision locations and intersections in Kootenai County.

The intersections shown should be reviewed on an individual basis for improvements that may be needed.

Table 3. High Collision Locations, Intersections in Kootenai County*

Intersection Location Description	Jurisdiction	# of Accidents
US 95 & Appleway Ave.	Coeur d'Alene	98
3rd St. & Locust Ave.	Coeur d'Alene	66
Appleway Ave. & Government Way	Coeur d'Alene	63
Neider Ave. & Government Way	Coeur d'Alene	62
US 95 & Honeysuckle Ave.	Hayden	62
3rd St. & Harrison Ave.	Coeur d'Alene	60
US 95 & Hayden Ave.	Hayden	55
US 95 & Prairie Ave.	Hayden	55
Lunceford Ln. & Honeysuckle Ave.	Coeur d'Alene	54
Northwest Blvd. & Ironwood Dr.	Coeur d'Alene	52
SH 41 & Mullan Ave.	Post Falls	49
US. 95 & Kathleen Ave.	ITD/ Coeur d'Alene	44
4th St. & Harrison Ave.	Coeur d'Alene	44
Ross Point Rd. & Seltice Way	Post Falls	43
SH 41 & Prairie Ave.	Post Falls Highway District	42
US 95 & Garwood Rd.	Kootenai County	40
Ramsey Rd. & Kathleen Ave.	Coeur d'Alene	40
US 95 & Government Way	Kootenai County	39
US 95 & Dalton Way	Coeur d'Alene	38
US 95 & Appleway Ave.	ITD / Coeur d'Alene	38
US 95 & Wyoming Ave.	Hayden / ITD	36
US 95 & Miles Ave.	Hayden / ITD	36
4th St. & Locust Ave.	Coeur d'Alene	35
SH 41 & Hayden Ave.	Post Falls Highway District	34
Government Way & Margaret/Kathleen Ave.	Coeur d'Alene	33

* Frequency of accidents from 1999-2005 per intersection

Truck Routes

An important characteristic of the Kootenai County Area Transportation network is its ability to move freight and goods to market. A transportation network's ability to provide efficient freight mobility is instrumental to economic development. Presently, freight routes within the county are not readily defined beyond the State Highway System.

Recent information on trucking and truck routes comes from a Kootenai County trucking survey conducted in the late 1990's to identify key existing and future characteristics of the system. The goal of the survey was two-fold: 1) Determine the existing and anticipated future employees and truck trips throughout the county; and 2) Determine existing and preferred routes. To determine the route characteristics, a ten-question survey was sent to 42 area truck traffic generators. 33% of the surveys were returned. Detailed results of the surveys are presented in Appendix 1. Figures 1.5 (County) and 1.5a (Coeur d'Alene) highlight the key roadways used by the truck traffic generators. The survey can be found as an appendix to this report. A summary of survey results follows:

- Employees: 694 (1998), 863 (2017) – 24% increase
- Truck trips: 1,453 (1998), 1,939 (2017) – 33% increase
- Periods of heavy use: 7 a.m. to 9 a.m. (23%), 9 a.m. to 4 p.m. (39%)
- Major daily destinations:
  - City of Coeur d'Alene……19(17%)
  - Kootenai County……19(17%)
  - Post Falls……14(12%)
  - Spokane…….. 13(11%)
  - Hayden……12(10%)
  - Montana…….. 11(10%)
  - Out-of-State (other)……. 40(35%)
- Major Roadways Used
  - US 95
  - SH 41
  - Atlas Road
  - Seltice Way
  - Hayden Avenue
- Roadways to Avoid
  - US 95
  - SH 41
  - Northwest Boulevard
  - Ramsey Road
- Suggested Routes needing improvement
  - US 95 (Bypass and/or Signal Optimization)
  - SH 41 (Post Falls to Spirit Lake)
  - Interstate 90 too rough
  - Government Way, North Ramsey Road
  - Connection between Dalton Avenue and Hanley Avenue

Figure 2.5. Kootenai County Truck Routes

Figure 2.5a. Coeur d’Alene Area Truck Routes

Figure 2.5b. Post Falls Area Truck Routes

Non-Motorized and Rail Corridors

Non-Motorized

The communities in Kootenai County have all contributed to the development of the Centennial Trail, a non-motorized trail stretching from the Washington State Line to Higgins Point on Lake Coeur d'Alene. Bikers, walkers, joggers, and in-line skaters all use the Trail, both for recreation and as a safe way to commute, avoiding busy roadways such as Interstate 90.

Aside from this trail, all bike and pedestrian paths have been constructed independent of an overall master plan, leaving gaps in the trail system as it passes from one community to the next. A trend toward converting old rail lines to trails provides opportunities to remedy this however.

Rail Corridors

An abandoned rail corridor in south Kootenai County along SH 3 has been converted into about 72 miles of bike paths for recreational rides. Figures 1.6 (County), 1.6a (Coeur d'Alene), 1.6b (Post Falls), and 1.6c (Rathdrum) illustrate the existing bike and rail routes known within the county. Future planning should take these routes into account to provide a countywide network of alternate transportation routes.

The current rail facilities in the Kootenai County area are comprised in general of two main spur links, two main lines, and the Burlington Northern Santa Fe Railway Refueling Depot on the Rathdrum Prairie.

The spur links historically provide service to the lumber mill sites in Post Falls and Coeur d'Alene along the Spokane River. The heavier used main line track runs along SH 53 through Rathdrum and Athol. The main line has expanded with the addition of parallel track lines and the construction of the depot in Rathdrum in 2004.

The other main line crosses Prairie Avenue and follows U.S. 95 up through Athol. This also services lumber mills along the way with short spur links. The future of this line and the potential for growth is uncertain at this time and it currently has very limited daily use.

Freight is also distributed through a series of truck routes through Kootenai County. More information on trucking and truck routes is available on page 29 of this section.

There is no passenger rail service directly available in Coeur d'Alene. North Idaho citizens can access Amtrak services and destinations by boarding trains at the Intermodal Center thirty miles west of Coeur d'Alene in Spokane.

Figure 2.6. Kootenai County Non-Motorized and Rail

Figure 2.6a. Coeur d’Alene Urban Non-Motorized and Rail

Figure 2.6b. Post Falls Urban Non-Motorized and Rail

Figure 2.6c. Rathdrum Urban Non-Motorized and Rail

Land Use Analysis

A critical element of transportation modeling is determining existing and future land uses and consideration of social, political, or economic issues that could affect development trends. The computer traffic simulation model used in this plan, VISUM, requires significant analysis of existing and future land uses within each Traffic Analysis Zone (TAZ). TAZ's are geographic areas strategically identified throughout the study area (Kootenai County) used in countywide transportation needs analysis.

The process begins with the creation of TAZs, then a detailed identification of land use, demographics, population and employment data within each TAZ. Data collected as part of the 2000 Census was supplemented by building permits, County Assessor records and State employment data, to form the basis of existing land use inventories for 2004. Work completed by Intermountain Demographics in 2005, in association with Kootenai County, City of Coeur d'Alene, City of Hayden, City of Post Falls, Highway Districts, Cities, School Districts, and outside demographic sources, developed the 2030 population and employment forecasts for each TAZ in Kootenai County. The KMPO Board adopted the forecasts in March 2005.

The KMPO Board recognizes that actual growth and development will not occur exactly as they are allocated in the forecasts due to market and infrastructure availability; however, given the continuous update process used by KMPO, the allocations will be adjusted annually to reflect building and platting activity approved by local agencies and jurisdictions.

Transportation Analysis Zones

TAZs represent geographic areas within which estimates are made for the volume of traffic generated and received by various land uses found within the TAZ. These estimates are made for both existing and future conditions. The total volume of traffic generated or attracted by a TAZ is then distributed throughout the study area based on factors that were developed through research conducted by NuStats on behalf of KMPO. Each trip leaving the zone has a corresponding destination in some other zone based on the trips' purpose and length of trip (home-to-work, -to school, etc.). VISUM assigns all of these trips onto the transportation network based on the factors such as roadway capacity, speed, travel time, and functional classification of the roadway.

The accumulation of all trips on each roadway segment creates the average traffic volume estimate. In the case of the KMPO travel demand model, KMPO characterizes and reports traffic volume estimates for morning and evening peak hour traffic. While most people expect to see average daily traffic volumes, transportation plans are based on the ability to address peak hour conditions.

This is because even in highly congested areas such as Seattle, Portland, and even Los Angeles roadways seldom exceed their 24-hour roadway capacity.

The Kootenai County Study Area is subdivided into 215 individual TAZs. Each of the TAZs are numbered and identified on Figures 2.7 (Kootenai County), 2.7a (Coeur d'Alene), 2.7b (Post Falls) and 2.7c (Rathdrum).

The following guidelines were used for the delineation of TAZs:

Number of Zones- In general, more zones allow a more detailed analysis when considering existing and future traffic conditions. The desire for in-depth analysis however, must be balanced with the level of effort necessary to compile, analyze, maintain, and assess the results. The selection of TAZs was based on the unique attributes of the different geographic areas in Kootenai County, the density of population and employment, availability of a transportation network that gives drivers choices, and the 2000 Census Block Group definitions which allow a direct connection between the model need and U.S. Census information.

Internal Homogeneity- Generally, within each zone is comprised of similar activities. Each zone has a prominent land use or activity. This characteristic differentiates the area within the zone from other adjacent areas. Prominent characteristics may include one of the following examples of activities:

A residential neighborhood
Retail business area
A recreational destination
A transportation terminal or hub
An industrial or agricultural area

Future land uses were estimated for each of the zones by Intermountain Demographics, based on known and committed development trends, as well as significant interaction with local jurisdictions and agencies that have oversight of the respective geographic areas. These estimates of growth are considered existing conditions, as well as the likelihood that areas may transition in use during the next 25 years. For example, if within a given area the land use was prominently agriculture; however, development pressure and land prices begin to show a trend to housing, the expectation is that it will likely continue to develop as a residential area. However, if it was expected that a part of that zone may alter its land use to industrial, two zones were created to reflect the contrasting trip making characteristics between residential and industrial development.

Significant Generation/Attraction- Each designated zone generates or attracts some amount of traffic based on its land use characteristic. When a "significant" development occurs within a zone that is not consistent with the general activities of the zone, a special generator is defined in the TAZ. The decision to use the special generator attribute is subjective and typically used to address out of

context land uses such as theme parks in rural areas, destination resorts or exclusive communities in rural areas.

Traffic Shed Characteristics- Most traffic will use an arterial in order to make a trip. Conversely, most traffic entering the zone is likely to follow one or more arterials before dispersing onto collectors and local streets. The TAZs analyzed for this plan in general, have minor or principal arterials on the perimeter of the zones to provide the opportunity for both north-south and east-west access. In rural areas, zones have been typically defined by geographic barriers, which isolate the ability to travel in various locations.

Boundaries- TAZ's boundaries do not overlap. An attempt has been made to maintain continuity with Census geography and jurisdictional boundaries, but travel is not based on the jurisdiction of a road, but what the road serves.

Size of Zone- There is no strict rule regarding the optimum zone size. The most important consideration is that zone size should be related to the volume of traffic within it. Areas with intense traffic and dense land use activities will have smaller zones and dispersed land use areas are generally larger zones.

Existing Land Use Data

Table 4 identifies the categories of land use data collected within each TAZ. This data is comprised of first generation data from the Kootenai County Assessors Office, cities and schools, and confirmation of observations obtained from a 1997 aerial map.

Table 4. Land Use Categories

Land Use Type	Description	Unit Measurement
1	Single Family Housing	# of units / zone
2	Multi-family Housing	# of units / zone
3	Retail Space	gross square footage / zone
4	Commercial Space (Office Space)	gross square footage / zone
5	Industrial / Other Space	square footage / zone
6	Schools	# of students or employees / zone
7	Hotel/Motel	# of units / zone
8	Recreation	# of spaces / zone
9	Outer Single Family Residential	# of units / zone
10	Post Secondary Schools	# of students / zone
11	Agriculture	# of acres / zone
12	Waterfront Units	# of units / zone
13	Publicly Owned Land	# of acres / zone
14	Utilities and Transportation	# of employees / zone
15	Medical	# of employees / zone
16	Government	# of employees / zone

For this Plan, the Kootenai County mapping department provided a database of all tax assessed structures in Kootenai County referenced with an approximate location. From this database, several databases were created, each of which referenced the structures that related to the model's land use categories. These databases were then imported into a Geographic Information System (ArcView GIS), which contained a layer delineating the Traffic Analysis Zone map. GIS software was then used to query each database for the existing land uses that fell within each TAZ. The resulting data was confirmed using a 2006 aerial map and first hand knowledge of Kootenai County and city employees. A detailed inventory of each TAZ land use, by category, can be acquired by contacting KMPO.

Figure 2.7. Kootenai County Transportation Analysis Zones

Figure 2.7a. Coeur d’Alene Urban Transportation Analysis Zones

Figure 2.7b. Post Falls Urban Transportation Analysis Zones

Figure 2.7c. Rathdrum Urban Transportation Analysis Zones

Levels of Service

Level of Service (LOS) is a measure of the performance of an element of a transportation infrastructure. An intersection, a rural roadway, a freeway ramp, an arterial, or a freeway segment can all be graded on the adequacy of their performance under given traffic conditions.

Level of Service is a description of different operating conditions that occur on a roadway or at an intersection when accommodating various traffic volumes. It is a qualitative measure of the effect of traffic flow factors such as speed and travel time, interruptions and delays, freedom to maneuver, and driver comfort and convenience. For this Plan, KMPO used the volume to capacity ratio from the KMPO Travel Demand Model to determine level of service for intersections and roadways..

The determination of Level of Service for roadways, signalized intersections, and unsignalized intersections is derived as follows:

Roadways

Roadway and traffic conditions, ranging from "ideal" to “forced" flow, have been divided into six levels of service for qualitative evaluation. Rural roadway level of service is defined when the traffic flow is "uninterrupted". In an urban situation the roadways are not uninterrupted. They are constrained by traffic control at intersections, lower speed limits, numerous approaches, and probably parking. Most of the roadways within the county qualify as rural for their level of service evaluation. The level of service for most of the urban roadways will be restricted by the performance of the intersections on the roadway.

Level A- 0.00 to 0.60

Free flow, low volumes and densities, high speeds. Drivers can maintain their desired speeds with little or no delays.

Level B- .61 to .7

Stable flow, operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed. Suitable for rural design standards.

Level C- 0.71 to 0.80

Stable flow, but speeds and higher volumes more closely control maneuverability. Suitable for urban design standards.

Level D- 0.81 to 0.90

Approaches unstable flow, tolerable operating speeds that are, however, considerably affected by operating conditions. Drivers have little freedom to maneuver.

Level E- 0.91 to 1.00

Unstable flow, with yet lower operating speeds and, perhaps, stoppages of momentary duration. Volumes at or near capacity.

Level F- Greater than 1.00

Forced flow, both speed and volumes can drop to zero. Stoppages may occur for short or long periods. These conditions usually result from queues of vehicles backing up from a restriction downstream.

Source: Fundamentals of Traffic Engineering, 9th Ed., by Wolfgang S. Homburger, James H. Kell

Urban Roadways

Urban roadways LOS is based upon street classification and average travel speed HCM 15-2 SOMA. At lower speeds, below 50 mph, the intersections generally dictate the capacity of an urban roadway section. It is, however, always useful to evaluate an overall urban roadway in simplistic form.

Rural Roadways

Rural roadways usually operate at higher rates of speed than urban areas, do not have curb and gutter, and have minimal access points.

Table 5 shows the road sections in Kootenai County that are currently (as of 2005) performing at equal to or greater than 75% capacity.

Table 5: Kootenai County Current Conditions Road Sections => 75% Capacity

Road Section	Jurisdiction	=> 75% Capacity
Sunshine St. from Sunburst Ave. to Hanley Ave.	Coeur d'Alene	103%
Mullan Rd. from Park Dr. to Govt. Way	Coeur d'Alene	84%
Honeysuckle Ave. from 4th St. to Strahorn Rd.	Hayden	80%
Best Ave. from 4th St. to Honeysuckle Dr.	Coeur d'Alene	80%
4th St. from Honeysuckle Ave. to Prairie Ave.	Hayden	79%
I-90 from Stateline to Pleasantview Rd.	ITD	80%

Signalized Intersections

Level of Service (LOS) for signalized intersections is based upon control delay. Delay is the additional travel time experienced by a driver, passenger or pedestrian. Specifically, level of service criteria is stated in terms of the average stopped delay per entering vehicle for a 15-minute analysis period.

Delay may be measured in the field, or may be estimated using procedures described in the 2000 Highway Capacity Manual. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, driver decision and reaction times, the cycle length, the green ratio, and the volume to capacity ratio (v/c) for the lane group or approach in question.

The levels of delay are described below:

Level A- Describes operation with very low delay, i.e., averaging less than .60 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase of a signalized intersection. Short cycle lengths also contribute to low delay.

Level B- Describes operations with average delay in the range of .61 to 0.70 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level C- Describes operations with average delay in the range of 0.71 to 0.80 seconds per vehicle. These higher delays may result from fair progressions and/or longer cycle lengths .Individual cycle issues may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level D- Describes operations with an average delay from 0.81 to 0.90 seconds per vehicle.At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from combinations of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle issues are noticeable.

Level E- Describes operations with delay in the range of 0.91 to 1.00 seconds per vehicle. This is the limit of acceptable delay. These delay values indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level F- Describes operations with delay greater than 1.00 per vehicle. This is considered unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It

may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing causes to such delays.

Unsignalized Intersections

Level of Service at unsignalized intersections is determined for all movements that must stop or yield to through traffic. As with signalized intersections, the level of service for a two-way stop-controlled (TWSC) intersection is based on the amount of average delay for each movement:

Unsignalized Intersections Average Total Delay

Level of Service	Seconds per Vehicle
A	< 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	Greater than 1.00

Source: HCM Exhibit 17-2 (TWSC), 17-22 (AWSC) LOS for TWSC Intersections; 2000 Highway Capacity Manual.

When demand volume exceeds lane capacity, extreme delays are encountered with queuing, which may cause severe congestion affecting other traffic movements in the intersection. This condition usually warrants intersection improvements.

Table 6 shows the road sections in Kootenai County that are currently (as of 2005) performing at equal to or greater than 75% capacity.

Table 6: Kootenai County Current Conditions Intersections => 75% Capacity

Intersection	Jurisdiction	=> 75% v/c
7th St. & Best Ave.	Coeur d'Alene	98%
9th St. & Best Ave.	Coeur d'Alene	98%
4th St. & Honeysuckle Ave.	Hayden	96%
15th St. & Harrison Ave.	Coeur d'Alene	93%
Strahorn Rd. & Honeysuckle Ave.	Hayden	93%
US 95 & NB Ramp to NW Blvd.	Coeur d'Alene	92%
4th St. & Harrison Ave.	Coeur d'Alene	87%
Honeysuckle Dr. & Best Ave.	Coeur d'Alene	87%
US 95 & Wilbur Ave.	Coeur d'Alene / ITD	86%
15th St. & Hazel Ave.	Coeur d'Alene	83%
Park Dr. & Garden Ave.	Coeur d'Alene	82%
Government Way & Ironwood Dr.	Coeur d'Alene	81%
Idaho St. & Polston Ave.	Post Falls	81%
US 95 & Hanley Ave.	Coeur d'Alene / ITD	81%
US 95 & I-90 E12 EB on/off Ramps	Coeur d'Alene / ITD	79%
4th St. & Lunceford Ln.	Coeur d'Alene	77%
Northwest Blvd. & Ironwood Dr.	Coeur d'Alene	77%
15th St. & Nettleton Gulch Rd.	Coeur d'Alene	76%
US 95 & Honeysuckle Ave.	Hayden	76%
Northwest Blvd. & I-90 E11 EB on/off Ramps	Coeur d'Alene / ITD	75%
US 95 & Prairie Ave.	Hayden	75%

At the present time, most of the facilities analyzed are operating at acceptable levels of service. Those facilities operating at 75% or above are graphically depicted on Figures 2.8 (Kootenai County), 2.8a (Coeur d'Alene), and 2.8b (Post Falls).

It is important to use the results of Level of Service analysis more as a confirmation of existing conditions than an absolute situation. Do the intersections or roadways identified with low Level of Service seem correct? Are there areas that indicate no problems, yet experience has shown the roadway operates poorly? Having accurate and complete data at the existing conditions stage provides for better results from the computer model for future conditions analysis.

Figure 2.8. Kootenai County Existing Conditions

Figure 2.8a. Coeur d’Alene Area Existing Conditions

Figure 2.8b. Post Falls Area Existing Conditions

Figure 2.8c. Rathdrum Area Existing Conditions.