Mountain View County
Province of Alberta

Bylaw No. LU 26/06

A BYLAW TO ADOPT THE OLDS DIDSBURY AIRPORT AND MOUNTAIN VIEW COUNTY AIRPARK AREA STRUCTURE PLAN.

101. Pursuant to the *Municipal Government Act*, S.A., 2000, M-26, as amended, Mountain View County Council has the authority to prepare and adopt an Area Structure Plan describing the land uses proposed for the Area Structure Plan, the sequence of development proposed, the land uses proposed, the population density proposed, the major transportation routes and public utilities proposed, and such other things Council considers necessary for the area, so that future development may be organized and implemented having regard for the requirements of this plan;

102. Mountain View County Council has authority, pursuant to the provisions of the *Municipal Government Act*, S.A., 2000, M-26, as amended, to designate the areas of the Municipality that would, in the opinion of Council, be suitable for any area structure plan together with such other matters as Council considers necessary; and

103. It is deemed desirable and in the best interests of the Mountain View County that an Area Structure Plan be adopted in order to clarify and control future development and redevelopment within a specified area of Mountain View County:

104. After due compliance with the relevant provisions of the *Municipal Government Act*, Chapter M-26, Revised Statutes of Alberta 2000, the Council of Mountain View County, in the Province of Alberta, duly assembled, enacts as follows:

    a. This Bylaw may be referred to as the "Olds Didsbury Airport and Mountain View County Airpark Area Structure Plan".

    b. The Council of Mountain View County does hereby adopt the Olds Didsbury Airport and Mountain View County Airpark Area Structure Plan, which is attached hereto and forms a part of this Bylaw.

Read the first time this 14th day of June 2006.

Read the second time this 9th day of August 2006.

Read the third time this 9th day of August 2006.

Reeve

Chief Administrative Officer

06/Sept/06
Date of Signing

Mountain View County

Olds Didsbury Airport and Mountain View County Airpark Area Structure Plan

Part of Bylaw No. LU 26/06
Adopted August 9, 2006

County of Mountain View

OLDS DIDSBURY AIRPORT AND MOUNTAIN VIEW COUNTY AIRPARK AREA STRUCTURE PLAN

9600230

August 2006

EBA Engineering Consultants Ltd.
p. 403.203.3355 • f. 403.203.3301
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Part of Bylaw No. LU 26/06
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APPENDIX

1.0 INTRODUCTION

This Area Structure Plan provides background information and the implementation policies for the Olds-Didsbury Airport and the Mountain View County Airpark for the growth and development of the facility and for the opportunities it will create for the community.

1.1 BACKGROUND

The airport is located in Mountain View County, Alberta, between the towns of Olds and Didsbury, just west of Highway 2A (see Figure 1). The surrounding land use is predominantly mixed agriculture with the recent construction (June 2005) of the new Mountain View County administration building located immediately to the east.

The land west of the airport has been identified for future business park with an airside component. The vision for the business park is for a high end, campus style development with both aviation and non-aviation related uses to serve as an economic development opportunity in the county.

The airport was originally constructed in 1982 by the Alberta Government. In 1996, ownership was transferred jointly to the Town of Olds and the Town of Didsbury. Ownership was then transferred to Mountain View County as of January 1, 2005 with an agreement with all current tenants and hangar owners to subdivide and sell the individual lots to the current tenants at a set price and all other lands to be sold at market value.

The Olds-Didsbury Airport (as it will continue to be known) has very few restrictions in terms of either air space or land. As such, there is land for future runway extension. The airport lands and the quarter section to the west are owned by the County. The half section to the north of the airport is in private ownership. Past economic development studies (Stantec and Preiksaitis) have identified this entire section of land for future development. The airport provides a focus for early phases of this development.

1.2 LAND OWNERSHIP

Currently the airport has 12 leased lots. The hangar owners expressed the desire to purchase the land their hangars are sitting on. When the County took over ownership of the airport, there was a commitment to these hangar owners to subdivide and sell the airport lots to them, while keeping the airport infrastructure under County ownership. The price of these lots was set at that time. This ASP sets the development guidelines to establish the framework for future lot subdivision and sales.

1.3 MUNICIPAL GOVERNMENT ACT

The Olds Didsbury Airport and Mountain View County Airpark Area Structure Plan has been prepared in accordance with the Municipal Government Act (MGA) (Statutes of Alberta, 1994, Chapter M-26. 1). The Act enables municipalities to adopt area structure plans to provide a framework for future subdivision and development of an area. Section 633 of the Act relates specifically to ASPs.

(1) For the purpose of providing a framework for subsequent subdivision and development of an area of land, a council may, by bylaw, adopt an area structure plan.

(2) An Area Structure Plan

a. Must describe:

i. the sequence of development proposed for an area

ii. the land uses proposed for the area, either generally or with respect to specific parts of the area; and

iii. the general location of major transportation routes and public utilities

b. May contain any other matters the council considers necessary.

The requirements of the Municipal Government Act have been followed in the preparation of the Olds Didsbury Airport and Mountain View County Airpark Area Structure Plan.

1.4 PROCESS

Mountain View County saw the need for a long-range plan, in order to encourage orderly development of the airport site. This Area Structure Plan (ASP) identifies the lands for future development, airport expansion, and operation and regulations to control future development both on the airport and in the adjoining business park.

It was determined that an ASP was the appropriate format for this long range plan as it is a statutory planning document and ensures a public process for adoption and amendment. This also places the document in the public for all future landowners to view and understand the guidelines and direction for all growth and development. The following summarizes the public consultation process.

1.4.1 Airport Steering Committee

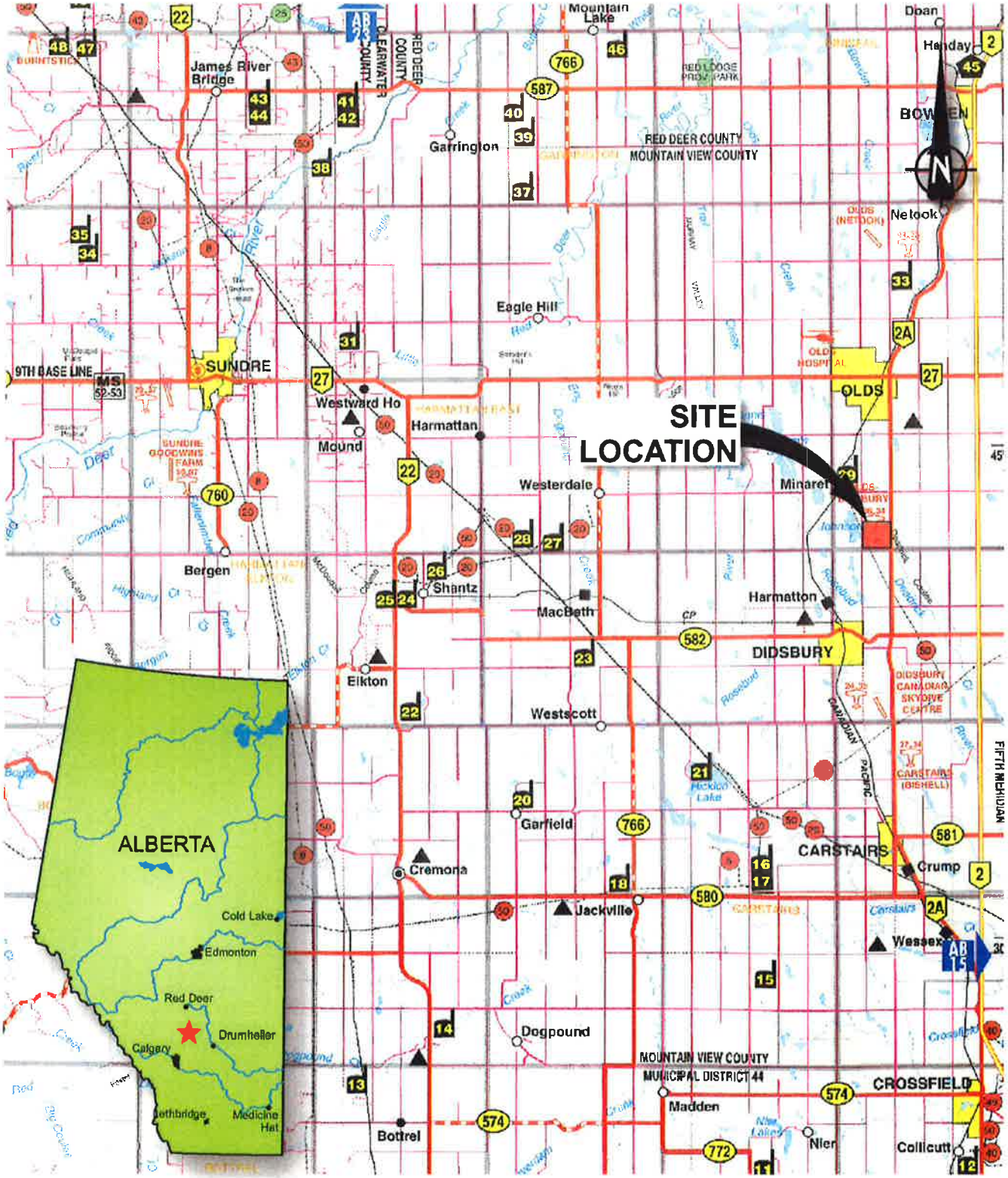
A Steering Committee was established at the onset of this process including County staff, elected councillors and two representatives from the Airport. This group reviewed the concepts, the land uses and the purchase agreements and assisted the consultant with the determination of final policy prior to presentation to the public and Council.

1.4.2 Open House #1

An open house was held on June 4, 2005. Over 50 people attended and 13 exit surveys were completed. The open house was considered a success and the majority of attendees supported the draft land use plan, the vision identified for the airport and zoning presented. At this open house, attendees were asked to comment on the name for the airport, it was determined that the "Olds Didsbury Airport", while it did not reflect the ownership and the jurisdiction, provided the location identifier important for airport users.

1.4.3 Open House #2

(to be completed if required)



BASE: CANADIAN OILFIELD GAS PLANT ATLAS - FOURTH EDITION

CLIENT/PROJECT DESCRIPTION

MOUNTAIN VIEW COUNTY
LAND USE AND DEVELOPMENT STRATEGY

EBA Engineering Consultants Ltd.

SCALE/EBA PROJECT NO.	DATE/DRAWN BY:	TITLE/EBA DRAWING NO.
1:300,000 9600230-006	06/01/06 DCH/PAM	**LOCATION PLAN** FIGURE 1

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1.4.4 Public Hearing

(to be completed after the public hearing)

1.5 ROLE OF THE AIRPORT

With both the Sundre and Olds-Didsbury Airports are under ownership and control of Mountain View County, it is important to clearly establish the role for each airport. In 2002, the Sundre Airport Development Plan was completed. This document determined that the role of the Sundre Airport was as the premier recreational airport in west central Alberta, providing opportunities for residential lots with connection to adjacent residential facilities and affordable recreational use (no landing fees).

Studies completed at the Olds-Didsbury Airport acknowledge that this site is well suited for business and economic development, building a supportive business infrastructure around the airport. Located in the Highway 2A corridor, halfway between the growing towns of Olds and Didsbury there are many opportunities for complimentary development. Therefore, the role of the Olds-Didsbury Airport is as a high-end air supported business park to serve south central Alberta. While scheduled passenger flights are not envisioned at the airport, a wide variety of opportunities exist for charter/business flights, small cargo, just in time delivery for the oil patch etc.

1.6 OBJECTIVES

When the airport was owned and operated by the Towns of Olds and Didsbury, a strategic planning session was held. At the time, the following values are given in the 2003 Strategic Plan:

1. That the airport be cost-effective and affordable to the local community.
2. That we encourage and support general aviation use, to include light commercial.
3. That we encourage and cooperate with the user community, including the Flying Association, to maintain and improve present standards of safety and appearance of the facility.

Mountain View County has not held a Strategic Planning session to update these objectives but they appear to reflect many of the actions and policies that Mountain View County has adopted.

1.7 GOALS

Based on the discussion of the Olds Didsbury Airport Committee, struck for the development of this plan preparation and to manage the subdivision and sale of the airside lots, the goals for the Olds Didsbury Airport are:

1. Develop Olds-Didsbury Airport to be an important community airport for recreational and business travel.

2. Improve maintenance and operation of the airport, including coordination with County emergency services.
3. Encourage development of airport property.
4. Improve bottom line financial picture.
5. Improve communication between owners and users of the Olds-Didsbury Airport.

The goals identified for the Mountain View County Airpark are:

1. Create an economic development opportunity for the County.
2. Compliment the businesses at the airport and in the towns of Olds and Didsbury.
3. Encourage high-end businesses with the opportunity for both aviation related and non-aviation related development.
4. Ensure sustainable development utilizing conservation principles.

1.8 GUIDING PRINCIPLES

An ASP directs future decision making for the future development of the airport and encourages efficient use of the lands. In order to accomplish the goals and objectives and the vision for the Olds Didsbury Airport and the Airpark, the following guiding principles are provided:

1. **Safety** – the primary guiding principle is the safe operation of the airport. The Airport Operator will ensure that the regulations will be met, that regular maintenance is under taken and that anyone on airport property follows the appropriate operational guidelines.
2. **Financial Viability** – the County will sell lots for a fair market value, charge each lot owner a fair annual maintenance fee and ensure that future developers build to County standards and contribute to infrastructure.
3. **Public Service** – the airport is not a private airport and is open and available to all pilots and aircraft. The airport will continue to be a registered aerodrome under Transport Canada regulations until such time as Transport Canada requires certification.
4. **Community Benefit** – the airport and associated business park development will benefit the community through taxes paid, services rendered and availability for public use and enjoyment.
5. **Sound Management** – the County will develop a management strategy for the airport that will ensure sound management and accountability for financial responsibility.

2.0 REGULATORY AND LEGISLATIVE PARAMETERS

2.1 MUNICIPAL

The Olds-Didsbury Airport has undergone an ownership transfer to the County of Mountain View. The County regulates land use and development through their Municipal Development Plan (MDP), ASPs, and the Land Use Bylaw. There are currently no ASPs for lands on or around the airport.

2.1.1 Municipal Development Plan (MDP)

The County of Mountain View adopted the MDP in 2004 (prior to the County ownership of the Olds-Didsbury Airport). The MDP is the long-range planning document for the municipality. It deals with all aspects of growth and development, without getting specific. The MDP remains general in order to provide strategic direction to the entire municipality.

There are three local airports in the County (Sundre, Netook, and Olds-Didsbury), and two references to airports in the MDP:

Policy 3.3.1 – "The County will promote and facilitate the growth and development of industrial and commercial business parks at strategic locations throughout the County. These strategic locations will largely focus on lands adjacent to provincial highway corridors and airports."

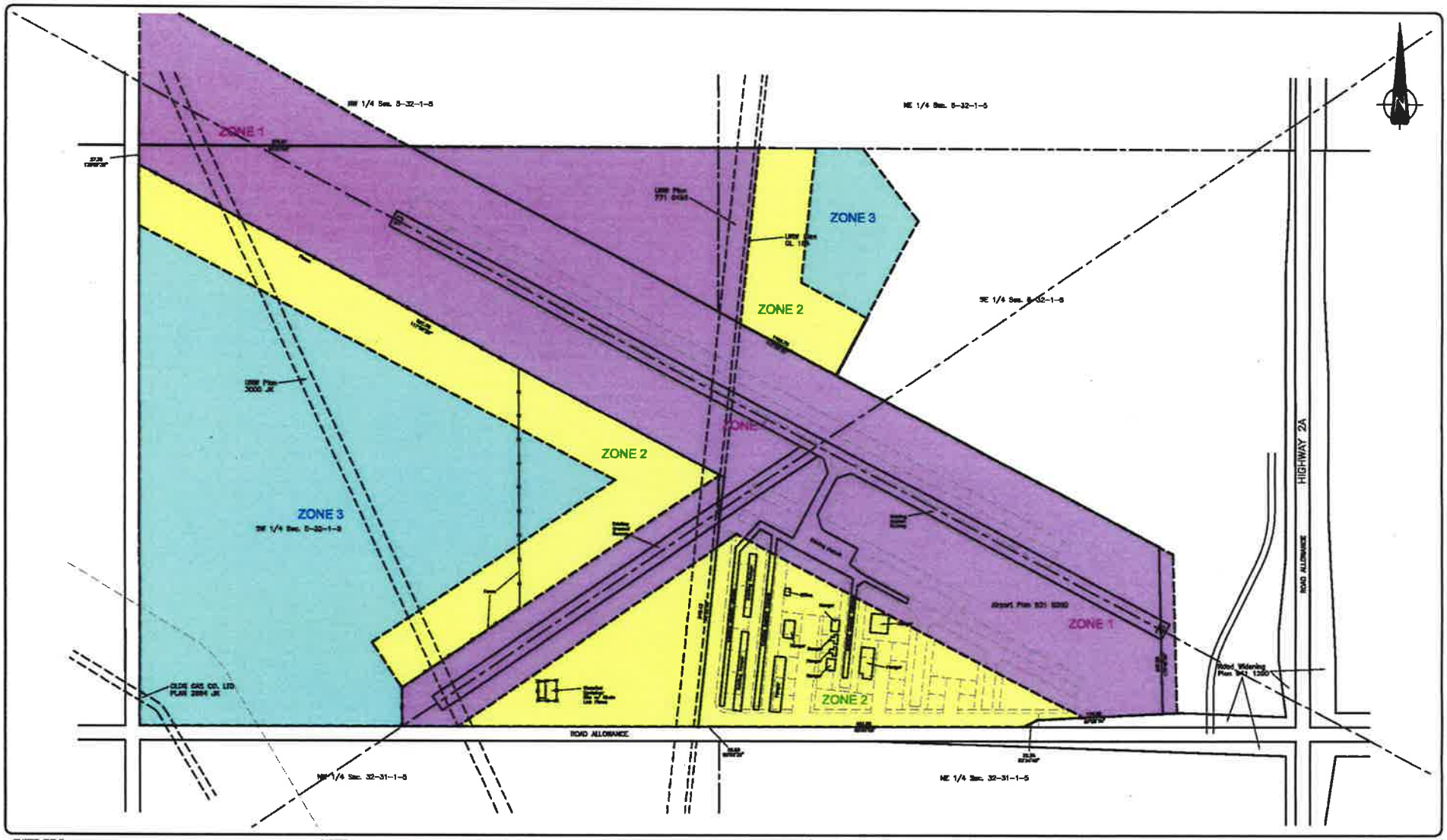
Policy 3.7.1 – "Subdivision and development proposals adjacent to an airport will consider impacts on the airport, including future expansion of the facility."

Due to the general nature of the MDP, the document does not specifically address the issues of the Olds-Didsbury Airport. The MDP does not provide policies regarding how airports should operate to achieve their economic and social goals. With the adoption of the Olds-Didsbury Airport Strategy, detailed policies will be created to guide the long-term development and economic benefits. In 2000, a land use plan was prepared for the Sundre airport and it is anticipated that Council will adopt the Sundre Plan as well.

At such time as the MDP is reviewed and revised, it is recommended that supportive policies be included in the document referencing the airports and the strategies for growth and development.

2.1.2 Land Use Bylaw

In October 2005, the entire study area was rezoned to reflect the new land use District prepared for these lands; County Airport District (AP-C) as illustrated on Figure 2. This land use district reflects three types of land uses on the property.



SHEET TITLE
MOUNTAIN VIEW COUNTY
LAND USE AND DEVELOPMENT STRATEGY

NOTES

DRAWN/CHECKED BY
ANS/DCH/PAM

DATE/EBA PROJECT NO.
06/01/06
9600230-006

EBA Engineering Consultants Ltd.

SCALE
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0 50 100 150 200 250m

TITLE/EBA DRAWING NO.
LAND USE DISTRICT
FIGURE 2

- Airport operational reserve – applied to the lands used for airport infrastructure such as runway, taxiway, and aprons, as well as the lands on airport property with highly restricted development potential due to take off and approach areas and transition areas. This land can be developed for any use required for the successful operation of the airport including terminal building and fueling facility. This land can also be used for extensive agricultural purposes until such time as it is required for airport use. This area also applies to land for future runway extensions. There is a portion of land that extends into the northwest quarter of the section that will be required for acquisition by the County at some time in the future to allow for runway extension.
- Airside development – applied to all land where development that needs direct access to apron, taxiway or runway will be developed. These uses are very specifically aviation related and primarily in the form of aircraft hangars for private or commercial uses.
- Groundside development – applied to lands that do not have a need for direct airside access. In the case of the Olds-Didsbury airport, this designation has been applied to the business park. Even though direct airside access is not provided, uses with aviation clientele and considered to be aviation related, can still locate here (catering, upholstering, avionics, etc.) In addition, the regulations controlling groundside development will not allow any use that negatively impacts the airport through smoke, steam, bird attraction or electronic interference.

The text for the land use district is included in Appendix A.

2.2 PROVINCIAL

Alberta Transportation originally built the airport in 1982 with little or no community consultation. While some neighbouring residents are concerned with the airport, the general community sees opportunities for growth, employment, and general economic benefit.

Provincial legislation does not regulate the operation of airports. However, provincial legislation does delegate the authority for a municipality to regulate land use through Part 17 of the Municipal Government Act. This allows a municipality to address land use conflicts and allows municipalities to restrict heights and types of structures. Provincial regulation does affect many of the issues surrounding the airport, such as the environment (particularly water quality and quantity and wildlife), provincial highways and access and impacts on adjacent public lands.

2.3 FEDERAL

While a municipality is regulated by the Province through the Municipal Government Act, an airport is regulated by the Federal Government through Transport Canada (TP312) and the Aeronautics Act. The following outline the federal jurisdictions.

2.3.1 Transport Canada

Transport Canada and the Aeronautical Act regulate air space and the safe operation of airports. They conduct audits and review traffic volumes. The airport is currently operating under TP 312 3rd edition regulations. This requires Transport Canada to make regular inspections of the facilities and require inspection reports on the equipment on the airport lands.

This airport was certified until 1998, at which time the Towns of Olds and Didsbury allowed the certification to lapse to a registered status. Should the County wish to recertify the airport, there will need to be significant changes to the operation of the airport to meet new guidelines and regulations.

2.3.2 NAV CANADA

In 1996, navigational and traffic control activities were privatized from the Federal Government and are now provided by a private organization. Any new navigational aids, lighting requirements, and development on airport land will be circulated to NAV CANADA to ensure that they do not interfere with the safe operation of the airport.

3.0 THE SITE

The Old-Didsbury Airport is located on the south half section of 05-32-01 W5M, west of Highway 2A between the Town of Olds and the Town of Didsbury. There are two runways and a taxiway located in the half section as well as aircraft hangars and airport buildings (see Figure 3). The aircraft hangars and airport buildings are located just north of Bergen Road. The site for the proposed development is generally agricultural on the north side and west side of the existing runways. A new municipal office building for Mountain View County is located just west of Highway 2A in the half section.

3.1 NATURAL FEATURES

It is important to know of the surrounding natural features of the Olds-Didsbury Airport. Airport lands are generally selected due to the flat topography and lack of special features. The topography surrounding the airport in the study area is low-lying land. The sections around the airport are generally flat agricultural land. There are two significant bodies of water located near the airport. The first is Deadrick Creek. The creek enters the airport site from the northeast and continues through to the southeast. The second body of water is Johnson Lake, located on the west side of Range Road 15, and is therefore, outside the northwest boarder of the airport. The existing natural features do not create any hazards to the Olds-Didsbury Airport.

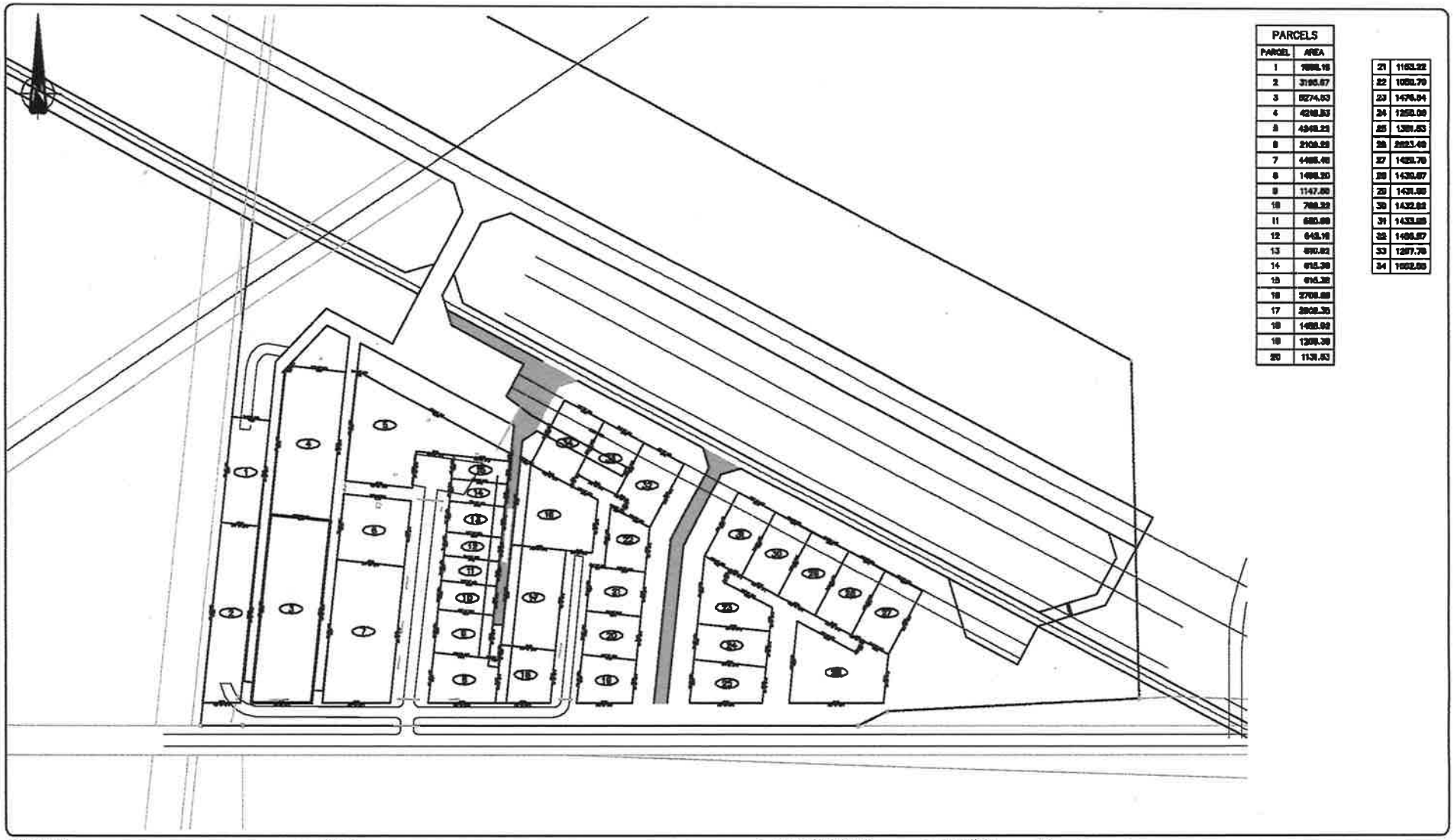
3.2 ADJACENT LAND USES

The adjacent land uses are controlled through the Mountain View County Municipal Development Plan and Land Use Bylaw. Redesignations in the County are applicant driven and generally the county does not take the initiative to determine the specific use of land. However, since the airport lands and business park are owned by the county, they can take the initiative to develop the airport and business park. The immediately adjacent lands primarily include farmland. Highway 2A is located to the east, and Bergen Road, a gravelled municipal road, forms the south boundary of the study area. The closest towns to the airport site are the towns of Olds to the north (approximately 8 km), and Didsbury to the south (approximately 5 km). The two towns are connected by Highway 2A. Future extension of the main Olds-Didsbury Airport runway will not create a negative impact on the adjacent land uses.

The access road constructed for the County Administrative Building connects the structure to Bergen Road. While being located at the end of the runway, the elevation of the road is 1,016.22 and therefore does not pose an obstruction to the safe operation of the runway.

3.3 REGIONAL ECONOMY

Throughout Mountain View County, there is a wide diversity of economic sectors. The sectors are agriculture, oil and gas, forestry and related products, mining, tourism, business and community services, manufacturing, etc. Agriculture is the foremost important industry



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4	4248.53
5	4348.23
6	2109.99
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9	1147.66
10	788.32
11	680.68
12	648.16
13	690.62
14	615.38
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19	1208.38
20	1138.53

21	1153.22
22	1088.79
23	1478.84
24	1268.08
25	1381.53
26	2883.48
27	1428.76
28	1430.87
29	1431.88
30	1432.82
31	1433.85
32	1488.87
33	1287.78
34	1882.88

SHEET TITLE

MOUNTAIN VIEW COUNTY
LAND USE AND DEVELOPMENT STRATEGY

NOTES

ALL AREAS SHOWN IN m^2

DRAWN/CHECKED BY: ANS/PAM

DATE/EBA PROJECT NO.: 06\05\12 9600230-006

SCALE: 1:2500 (0, 50, 100m)

EBA Engineering Consultants Ltd.

TITLE/EBA DRAWING NO.

PROPOSED LOT LAYOUT FOR AIRPORT
FIGURE 3

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in the Mountain View County. With 1,800 farms and 3,800 km of fertile soil and grazing land in the County, 34% of labour force is directly employed in agriculture and related service industries. The most common agricultural ventures are grain and cattle. However, there are other regional economic sectors in that are very significant.

The Town of Olds is home to major industries and established manufacturers such as Banner Pharmacaps, Premier Horticulture, Transfeeder, Westeel, Childspace Playgrounds, and Westward Products. A major sour gas plant is located southwest of Olds owned by Canadian 88 Energy. The Olds facility is the one of the company's top producers of sour gas. Oil and gas is a large contributor to the economic base of Mountain View County. Dozens of oil and gas wells are located near the airport and construction (height of rigs) and flaring are issues for airport operation. The County has many pipelines that transport oil and gas to facilities in Edmonton and other areas in North America. Olds is home to one of Canada's premier institutes for applied agriculture, horticulture, land and environmental management learning and applied research. Annually, Olds College enrols approximately 1,300 full-time students, and 5,300 part-time and extension students. The strong partnership between the college and the County will help sustain the future viability of the agricultural industry in Mountain View County.

The Town of Didsbury is also an important economic sector. Agriculture and tourism are the two most important industries. One of the many tourist attractions is the Didsbury and District Museum. The major businesses products and services in Didsbury are Shur Gain Feeds (livestock), Oat Grouts (dog food), Foothills Dairy Products (cheddar cheese, camembert, brie, quark), Champion Hay Processors (cubed hay – exporter to Japan), and Contemporary Graphics Ltd. Commercial Printing. It is important to note the proximity of Olds and Didsbury are within an hour's drive of Calgary and a half hour drive from Red Deer.

4.0 FORECASTS

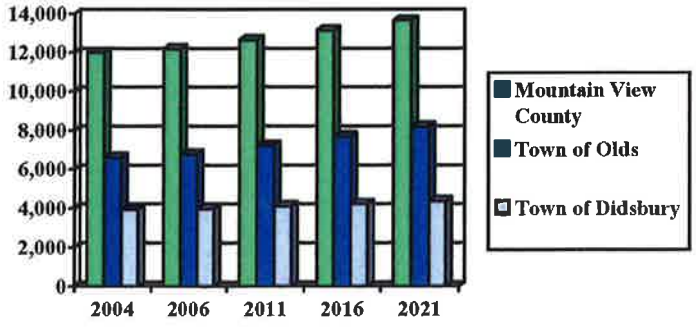
All projections are based on historical events and our knowledge of the future. In the case of the airport projections, there is no hard data on which to base projections. It is difficult to calculate growth in aircraft movements because, as an unmanned airport, there is no count of aircraft movements. Therefore, we have used population growth and comparable community airport traffic and calculated a conservative picture of steady and continued growth that will stand the test of time regardless of ups and downs in the regional economy.

4.1 POPULATION

The results of the 2001 Canadian Census demonstrated that the Central Alberta region is among the fastest growing populations in Canada. The Mountain View County is located in the heart of Central Alberta region. The Mountain View County has a rural population of 12,000. The combined the urban population of 15,000 (combining the communities of Olds, Didsbury, Sundre, Cremona and Carstairs) adds to the market and demand. The municipality's population has increased 3.8% from 1996 to 2001. At these growth rates, the County's population could reach almost 14,000 by 2021 (see illustration at the bottom of the page). In an era of rural depopulation, this is significant growth based on the opportunities available and the potential for subdivision and development.

The towns of Olds and Didsbury also have demonstrated an increase in population. The Town of Olds currently has the population of 6,607 (2004) and has shown an increase of 6.4% (from 1996 to 2001). The Town of Didsbury currently has the population of 3,932 (2004) and has shown an increase of 3.1% (1996 to 2001). This steady growth will allow the municipalities to keep up with the infrastructure demands and allow the commercial and industrial growth to lead the development of the communities and provide a tax base for the County and the towns to support the residential and institutional uses.

Population Projections



4.2 AIRCRAFT

Past studies have indicated that aircraft and passenger traffic is generally related to the regional population growth. Population size is an indicator of potential passengers. In addition, Transport Canada has completed projections that General Aviation in Canada will grow at a rate of 3.5% per year for the next 5 years. The potential for this growth in this region is particularly possible due to the extremely "hot" economy, the oil and gas development in the region and the desire to move small aircraft off the Calgary International Airport site.

The type of aircraft utilizing the Olds-Didsbury Airport is related to general aviation and comprises private recreational traffic, flight training, and corporate charters. There are no regularly scheduled passenger flights coming into Olds-Didsbury.

4.3 BUSINESSES

Given the regional economy of the County of Mountain View, it is reasonable to expect continued and strong business growth. The location of the airport, between the Town of Olds and the Town of Didsbury, adjacent to Highway 2A and close to Highway 2, is also advantageous for business.

The forecast for a development horizon on the land is difficult. Patterns and absorption rates observed for industrial development land in Central Alberta have not been predictable. During the late 70s and early 80s many municipal governments encouraged and/or undertook development of various types of industrial parks. Absorption of these developments has been slow and sporadic but there is some indication that this trend is changing somewhat. An extended period of buoyant Alberta economy over much of the late 90s has served to absorb substantial inventories of commercial and light industrial lands. Growth and residential development has concurrently served to create some additional competition for development lands.

5.0 LAND USE PLAN

The proposed land uses for the airport contain both aviation and non-aviation uses. The County is responsible for development both on and off the airport property. Key considerations are to ensure development is compatible with the airport and that development, buildings, or structures do not interfere with airport operations and provide opportunities. This means that set backs, height restrictions, and airport operational reserve lands must be implemented. Figure 2 illustrates the zoning on the lands and Figure 3 illustrates the proposed airport lot layout.

5.1 AIRPORT LAND USE DISTRICTS

Airport Operational Reserve Lands are those lands and structures directly associated with the operation of the airport. While some of these uses or infrastructure do not currently exist, the Airport Operational Reserve protects the land for the future development or expansion of the facilities. These lands must be identified to ensure that other development does not encroach and restrict future development and may be used as extensive agriculture in the interim. Appropriate airside reserve uses include: runways; taxiways; aprons; associated airfield infrastructure (lighting, signage, navigational aids, etc.); terminal building; parking; maintenance structures; meteorological installations; glycol catchment area; sewage treatment facilities; fuel dispensing operations; water treatment facilities; restricted agricultural practices; and other lands required in future for the ongoing operation and maintenance of the airport. This land use would also be appropriate for runway expansion areas.

5.2 AIRSIDE DEVELOPMENT

Airside development lands are those lands designated for tenants that will require direct access onto airfield aprons, taxiways, and runways. Occupants of these lands must conform to airside safety and security measures to ensure their activities do not jeopardize or threaten the security of the airport. The businesses requiring these lands are generally aircraft related and are one of the more important sources of revenue for the airport. It is critical that this land be protected for aviation uses and not compromised by those uses that do not require direct airside access. It is also important to provide separation of rotary and fixed wing aircraft. Appropriate airside aviation uses include the following: regularly scheduled and charter airlines; cargo operators; fixed base operators; hangar development; light aircraft manufacturing; flying club; aircraft storage; aircraft parts; air ambulance; aircraft service and maintenance; aircraft repair and sales; flight training schools; couriers; and aircraft fuel operators. All development should meet minimum standards for architectural controls, landscaping and on-site development to ensure the Olds-Didsbury Airport is an attractive facility that will continue to attract businesses and development to support the airport and the overall economy.

5.3 GROUNDSIDE DEVELOPMENT

Groundside development may be either aviation or non-aviation development that do not require direct access to runways, taxiways, or aprons. Groundside commercial and industrial development uses considered appropriate for these lands are: light manufacturing; warehousing; outdoor storage; distribution uses; agricultural processing operations; and forestry related uses. Transport Canada identifies aviation related uses as any use that may provide a service to the aviation industry. This could include hotel/motel, restaurants, retail, any form of service for the aircraft, passengers, pilot or users of the aircraft and office uses.

Appropriate groundside aviation uses include the following: businesses servicing the air industry (travel agents; aircraft upholstery, radio repair, etc.); offices for aviation related uses; gas stations; car washes; hotel/motel; food and beverage; museums; car rental facilities; retail sales (concession, souvenirs, gift shops, etc.); distribution centres; and warehouses.

The County shall dedicate municipal reserve land for the airport, uses such as stormwater management, utility access easement and providing a setback from a sour gas line that cuts through the southwest corner of the site. Such lands may be dedicated as municipal reserve or identified as public utility lots. The goal for the business park is to be a high tech, campus style development that incorporates open space, environmentally sound and sustainable development practices and a variety of businesses providing a wide range of employment opportunities for the residents of the region. Figure 4 illustrates the concept plan for the entire study area.

5.4 GROUND TRANSPORTATION

The airport is accessed from Bergen Road, a county road that will be upgraded as development occurs.

In 2005, EBA Engineering Consultants Ltd. (EBA) completed a traffic impact assessment that outlines the intersection upgrades and standards for the accesses into the Olds/Didsbury Airport and the Mountain View (County) Business Park. The traffic impact assessment is included in Appendix B.

5.5 SURROUNDING LAND USE (ADJACENT LANDS)

The lands adjacent to the airport are designated for agriculture and are currently utilized for farming. The lands in the quarter section to the north have been identified for future economic development. Until such time as the lands are designated for commercial uses, they will remain in agricultural, public, or quasi-public uses.

There is a portion of the northwest quarter section that will be required for future runway extension that will be acquired by Mountain View County. This land is included in the County Airport Land Use District.

6.0 UTILITIES

6.1 WATER

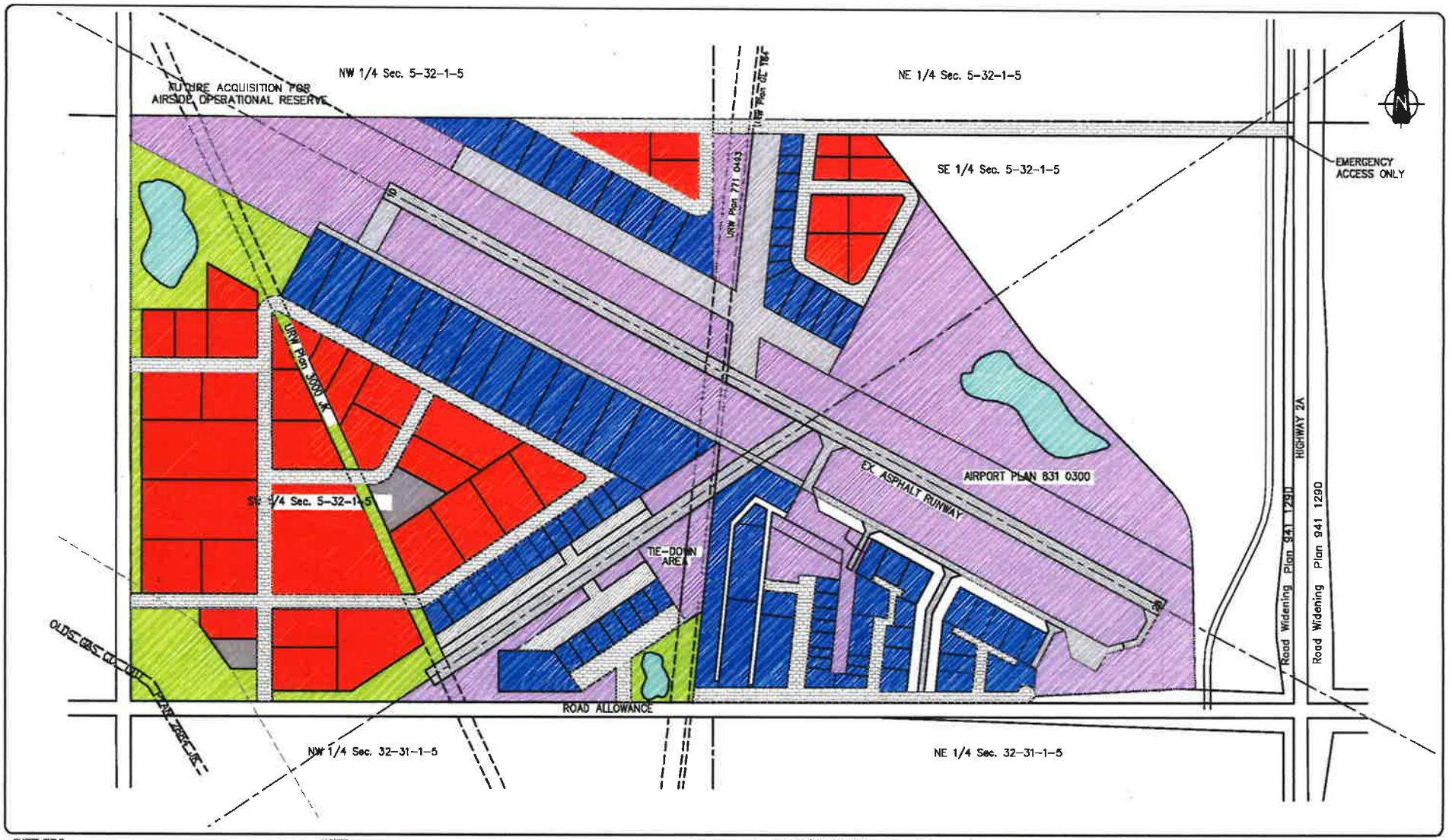
Currently, there are three drilled wells that supply water to the existing hangars at the airport providing a potable water source for the tenants. At this point, there is no fire protection service at the airport. As the airport grows, it is unlikely that this current communal well and distribution system will be sufficient to provide adequate water service to the entire airport and business park, particularly if fire protection is mandatory. Therefore, the County will determine an alternative for both potable water and fire protection services. This could take the form of a communal reservoir, and could include the provision of individual cisterns for rainwater catchment for fire protection.

There is a regional waterline that runs through the site, but it is not connected to the airport. The County is not a member of the regional waterline. However, the Regional Water Commission is considering twinning this line. If this occurs, it is anticipated that the County will be invited to become a member and piped water will be available to the airport

and business park. For the interim, the three current wells will provide water to the existing hangars and new development on the airport and in the business park will either drill wells or have water trucked in, with the provision of a deferred servicing agreement on the title of the property for mandatory tie in when the piped water service is available. Low water uses will be permitted until such time as a full piped municipal water source is available.

General aviation uses are considered to be low water users. It would also be the direction of the county to only allow low water users in the business park until such time as the piped system is available. High water users are considered to be car wash, restaurants, laundry facilities, and hotels. Low water users are aircraft hangars, warehousing, storage uses, and some manufacturing.

In anticipation of the full build out of the business park and the approval of high end, high tech uses, an estimate for a water reservoir has been provided. Currently there is no fire protection at the airport. It is assumed that as this airport and business park grow, fire protection will become a significant issue. Calculations for the construction of reservoir and distribution system for the airport and the Business Park demonstrate a total cost of approximately $3.5 million. While there are no standards for reservoir size, we have used the recommended Fire Underwriters sizing for these calculations. The flow is the governing factor in the sizing of a reservoir. The construction of the reservoir can be phased with the construction and the distribution system will follow the development – it is suggested that the reservoir be constructed in two phases. A one-acre parcel has been dedicated in the business park for this reservoir. The assumptions for the airport development (used for the calculation for the size of the reservoir) are that the total development area is 160 acres, with 30% building coverage. The total storage requirement for the full build out and 3.5-hour fire storage is 2.925 million litres and a buried concrete reservoir of 3,500 m^3 (which translates to a foot print of 35 m by 35 m).



SHEET TITLE
MOUNTAIN VIEW COUNTY
LAND USE AND DEVELOPMENT STRATEGY

NOTES
TAXIWAY
RUNWAY
ROADS
GROUNDSIDE
AIRSIDE
MUNICIPAL RESERVE
AIRPORT OPERATIONAL RESERVE

DRAWN/CHECKED BY
ANS/CDK/DCH/PAM

DATE/EBA PROJECT NO.
06/01/06
9600230-006

EBA Engineering Consultants Ltd.

SCALE
1:5000
0 50 100 150 200 250m

TITLE/EBA DRAWING NO.
PROPOSED CONCEPT PLAN
FIGURE 4

6.2 SEWER

The airport is serviced by three septic field systems. The location of these septic fields will be identified at the legal survey and subdivision stage.

Three options for servicing the airport and business park have been examined including:

1. The County purchase adjacent lands for the construction of a sewage lagoon to provide for the treatment of all wastewater from the airport and the business park. The wastewater can be used for irrigation of the green space and the airport lands rather than discharge into a creek or stream. The estimated cost for the purchase of the land and the construction of the sewage lagoon would be approximately $2.5 million.
2. The County negotiate the option of piping all sewage from the airport and business park to the Town of Didsbury sewage lagoons. Estimated cost for the construction of the pipe and lift station would be approximately $3 million.
3. The County will investigate the opportunity to tie into the proposed regional sewer line to the City of Red Deer.

6.3 STORMWATER

The purpose of a stormwater management plan is to ensure adequate drainage of the site. The objectives of stormwater management are to provide an acceptable level of flood protection for the development, and prevent adverse changes to downstream watercourses that may result from increased stormwater flow from land development. In the case of the Olds-Didsbury Airport, there were two other objectives:

- to protect the quality of water of Deadrick Creek; and
- to minimize the amount of standing water that could attract birds in close proximity to the airport and runways.

In August 2005, EBA completed the Conceptual Stormwater Management Plan; S1/2 Section 5-21-1 W5M (see Appendix C). This document identified three areas for storm water collection. These sites are identified on Figure 5. Site 1 is a natural wet area that will be enhanced for storm water. Site 2 will be developed as a dry pond.

Site 3 is an existing low area that will be developed as a pond to hold water and will be used for a water source for fire fighting.

6.4 SHALLOW UTILITIES

The airport is currently serviced with power and telephone. Natural gas and internet services will be installed at such time as the service is available and the cost will be borne by the future landowners.

7.0 ENVIRONMENT

7.1 NOISE

In the 1970s, the Province of Alberta prepared Airport Vicinity Protection Area Plans for many airports in the province, including the Olds-Didsbury Airport. One of the components of these plans was the creation of Noise Exposure Contours. However, the assumptions for the calculation of these noise contours was not accurate for these community airports and were based on more traffic than the airport had the capacity to handle. To calculate a Noise Exposure Contour, the computer model requires the number of flights per day, the time of day of the flights, the size and type of planes, the prevailing winds and other relevant information. Since the Olds-Didsbury Airport is unmanned and there is no record of aircraft movements there is no accurate way of determining the noise contours for this airport. In addition, noise contours are developed to provide the municipality with an indication of potential complaints from neighbours. There is very little residential development in close proximity to the airport.

For the Olds-Didsbury Airport, it is recommended that while aircraft noise can be an issue, particularly for residential development, the general land uses proposed for the vicinity are non residential. While there may be incidents of noise, it is will not be ongoing and regular. Generally, airports such as this do not have significant impact off airport property.

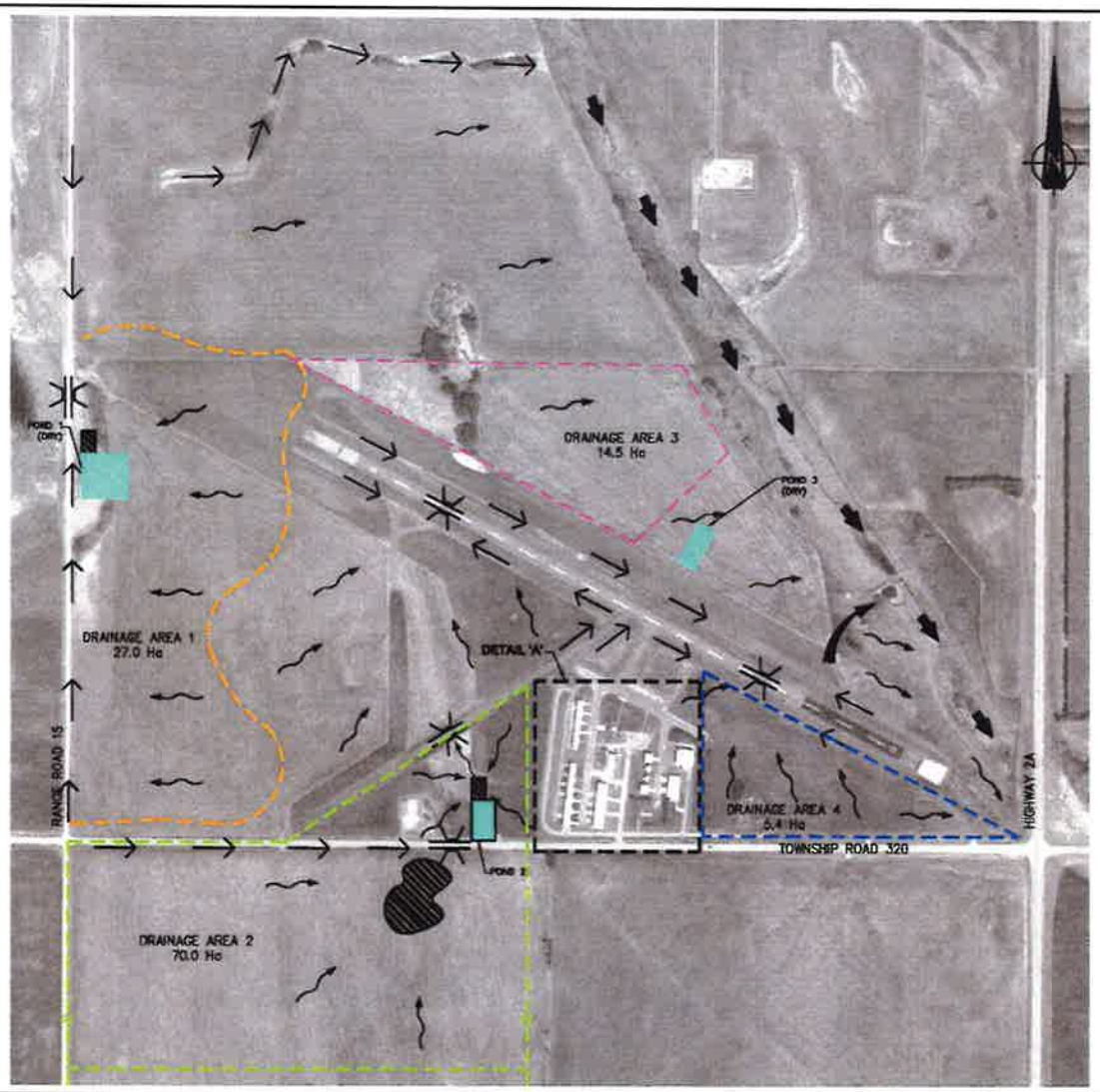
7.2 CHEMICAL STORAGE

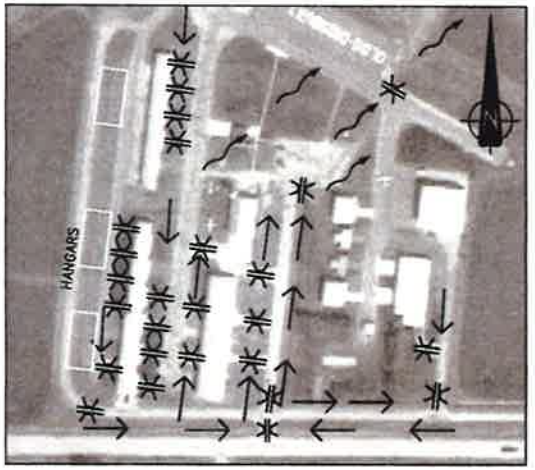
Presently, there is a chemical storage building located on the south part of the site. This site may be relocated to the regional landfill site. Future chemical storage on the airport will be monitored and regulated.

The Flying Club has recently made an application for a development permit to upgrade the fuel tanks at the airport. The Flying Club sells fuel on the airport. All future development permits will require environmental protection measures such as enviro tanks, berming around the tanks to capture any spills and contain them on site.

7.3 BIRD AND WILDLIFE CONTROL

The Olds-Didsbury Airport is not fenced and is surrounded by farmland. While there have been incidents of wildlife and bird interactions with aircraft, it has been a minimal issue. As traffic at the airport increases, the County will consider fencing the entire airport site to reduce wildlife intrusions and increase security for the airport.





DETAIL 'A'
1:3000

AIR PHOTO YEAR 2000
DRAWING ORIGINAL PRODUCED IN COLOR

SHEET TITLE
MOUNTAIN VIEW COUNTY
LAND USE AND DEVELOPMENT STRATEGY

LEGEND
- POND
- DRAINAGE AREA 1 (27.0 Ha)
- DRAINAGE AREA 2 (70.0 Ha)
- DRAINAGE AREA 3 (14.5 Ha)
- DRAINAGE AREA 4 (5.4 Ha)
- OVERLAND RUNOFF
- DITCH/SWALE FLOW
- CULVERT
- CREEK FLOW

DRAWN/CHECKED BY: CDK/DCH/SM

DATE/EBA PROJECT NO.: 06/01/06 9600230-006

EBA Engineering Consultants Ltd.

SCALE: 1:8000 (0, 80, 200, 400m)

TITLE/EBA DRAWING NO.: STORMWATER MANAGEMENT PLAN FIGURE 5

8.0 POLICIES AND IMPLEMENTATION

8.1 ADMINISTRATIVE POLICIES

a) The County is the owner, operator and developer of these lands and as such will endeavour to ensure that the greater public good is met, all transactions will be fair and equitable and the process will be open and transparent.

b) At such time as the MDP is reviewed and revised, policies regarding the role and development of the Olds-Didsbury Airport and Mountain View Business Park will be addressed.

c) The Airport Authority will annually present for review during the County budget process, a prioritized list of airport improvements as requested, including in the first year a request for an automated recording device to track the number of flights and types of aircraft utilizing the Olds-Didsbury Airport. Airport Authority means the body designated by Council to undertake advisory and/or operational responsibilities for the Olds-Didsbury Airport to the extent that those roles are delegated by Council.

d) Mountain View County will endeavour to work with individuals, groups, and organizations impacted by developments on and surrounding the Olds-Didsbury Airport based on a goal of providing economic benefit to the entire region.

8.2 LAND USE

a) Figure 4 represents the long-range concept plan for the Olds-Didsbury Airport.

b) The land use plan is conceptual and until a legal survey is completed, lot lines and layout may be altered without changing the form or intent of the land use concept.

c) Mountain View County will subdivide, service and sell the lots within the study area.

d) All development approved within this area must be in conformance with the policies and direction in this plan.

   i) No land use will create land use conflict with the airport or emit sufficient smoke, steam, or dust or cause sufficient electronic interference to inhibit or interfere with airport operations:

      - Heights of all buildings will be regulated by the Airport County Land Use District

      - All development at the airport will be required to apply for a development permit from Mountain View County

e) Airside uses are considered permitted and require a location permit.

   i) Triggers for infrastructure development or airport upgrades include:

- When the airport is functioning at a poor level of service, airport capital upgrades will be initiated as determined by the Airport Authority.
- When 80% of the lots in a single phase are sold and over 50% have new structures built, the next phase of development will be initiated.

8.3 INFRASTRUCTURE

a) The County will investigate wheather or not to assume responsibility for the provision of piped water at the airport including:

- Taking the ownership of the current private well and distribution system, taking utility easements on the properties and installing a distribution system.
- Negotiating membership and access to the regional water line.
- Dedicating a site for a future water reservoir and constructing the water reservoir and distribution lines as the airport and business park develop.
- Allowing interim water and sewer servicing with deferred servicing agreements until such time as the piped water and sewer system are available.

b) Should lots be subdivided and sold prior to the installation of the piped services, a deferred servicing agreement will be required to ensure the future connection of the services to the lots.

c) Future hook up to piped municipal services will be mandatory once the services are available. For development that existed at the time of airport transfer to the County, the landowner will be charged for this hook up through a Local Improvement Tax, amortized over 10 years.

d) Storm water management facilities will be installed by the County to generally conform with the Conceptual Stormwater Management Plan: S1/2 Section 5-21-2 W5M prepared by EBA Engineering Consultants Ltd. in 2005.

e) All development approved within this area must be in conformance with the policies and direction in this strategy.

f) Existing septic fields will be identified at time of legal survey for subdivision purposes.

g) The County will determine the most sustainable sanitary sewage collection and treatment system and install it at such time as individual septic fields are no longer feasible.

h) Solid waste management will be facilitated by the installation of waste bins that will be periodically emptied and hauled away. The cost of this service will be included in the annual maintenance charges.

i) The County will institute a utility charge for all users at such time as the piped water and sewer systems are installed and operational.

8.3.1 Lot Layout

a) Figure 4 illustrates a conceptual lot layout. The minimum lot size at the airport is 680 sq. m (7,320 sq. ft) and in the Mountain View Business Park the minimum lot size is 3,048 sq. m. (10,000 sq.ft) when full piped water and sewer services are available

b) The lot layout illustrated provides a conceptual layout and lot sizes that will be modified as lots are sold and surveyed without the need for an ASP amendment.

c) The Mountain View Business Park identifies a "hangar line" for airside uses. Prior to the subdivision of Phase III, an assessment of airside lot demand will be completed, allowing the opportunity for taxiway extension south into the park for servicing additional airside lots. At the time of subdivision of Phase III, if the demand is for groundside development, Figure 4 will guide the lot layout.

d) The lot layout incorporates public utility lots (water reservoir and storm ponds), open space (Municipal Reserve for trails and parks), public buildings (the allocation of a site for a future fire hall) and buffering (a green strip on the outside edges of the business park).

e) Lands in the western portion of the airport, adjacent to the turf strip, have been identified for small individual recreational hangars, while the lands east of this area have been identified primarily for larger hangars and businesses, generally requiring larger lots and fully paved surfaces. Future applications will be considered in this context.

8.3.2 Open Spaces and Park Places

a) As the owner and developer of the land, the County will provide Municipal Reserve in the form of land for three main components to be located within the Mountain View Business Park including:

   i) a green strip parallel to external roads a minimum of 6 metres wide with a maximum berm height of 1.5 metres to be designed in an undulating form with grouped planting of trees in low areas and the option for a pathway,

   ii) a central park in the business park linked with pathways with landscaping, benches and picnic tables for employees of the adjacent businesses, and

   iii) a series of trails, utilizing setbacks from pipeline easements, the buffer and linkages from other areas of the business park.

b) A lot will be dedicated for future construction of a fire hall. With the extent of the proposed development at the airport and business park, it may be a requirement.

8.3.3 Design Criteria

a) The airport should be developed in a rational, neat and efficient manner to allow for the continued development of a sustainable economic development opportunity.

b) While LEED certification is not a requirement, all development is encouraged to incorporate elements of LEED into their development. Appendix D provides a check list of LEED components.

c) The Business Park is to be developed as a "campus style" development with significant green space and landscaping, buildings designed with front faces on all street fronts, screening of parking and storage etc.

d) All new hangar development shall provide architectural drawings and description or samples of building materials for review by the approving authority.

e) Water and energy conservation measures must be demonstrated in every development application.

f) All development will minimize surface runoff by increasing the permeable materials, capturing rain water etc.

g) Each development application must provide a landscape plan to the satisfaction of the approving authority. Landscaping materials must be drought resistant or zero-scape, or the applicant must demonstrate an irrigation system utilizing rain water capture rather than well or potable treated piped water.

h) All outside storage will be screened and fenced. A plan for the consideration of the approving authority will be submitted at time of application.

8.3.4 Airport Administration

a) As the land develops around the airport, Transport Canada may require the airport to certify. No development will be permitted that may jeopardize the future certification of the airport.

b) The County will develop an airport operations/emergency plan.

c) Lot owners are required to pay for the lot based on a market assessment, contribute to a one time payment for infrastructure installation and upgrades, pay municipal taxes, pay annual maintenance fees (based on the previous years actual costs plus a 5% administrative fee), and pay utility bills (including water, sanitary sewer and waste management).

d) The County aims to maintain the airport to a safe and acceptable standard including snow removal of runways, taxiways, aprons, access roads and public parking areas, maintain the terminal building, mow grass on public lands, maintain ditches, maintain airport infrastructure (including crack filling, painting, signs, equipment inspection etc.).

e) All maintenance and snow removal on individual lots is the sole responsibility of the lot owner.

f) Undeveloped portions of the study area and airport operational reserve can continue to be leased for hay operations until required for subdivision and development.

8.3.5 Phasing of Development

a) Figure 6 outlines the general phasing plan for the entire study area, including three phases of development.

b) The development phases will not be tied to years, but rather to the actual development and triggers for future development.

c) Land will be put on the market to meet demand but not at a rate that would flood the market, pose unnecessary competition to the towns or bring the value of the land down.

d) Phase I includes the build out of the existing airport including the lots currently developed and those currently undeveloped. The subdivision and survey of the lots will be completed by the County and sold to individual owners.

e) Phase I will also include minor improvements including:

   i) construction and upgrading of internal roads

   ii) construction of new apron and taxiways to service new lots

   iii) upgrade the public parking lot

   iv) improve drainage and ditches

   v) management agreements for fuel storage and sale

   vi) creation of a tie down area along the turf runway, and

   vii) register caveats on the lots created mandating deferred servicing agreements, mandatory management fee payment, and easements for water and sewer lines

f) Phase II includes both airside and groundside development west of the existing airport in the SW1/4 of Section 32.

g) Phase II will also include:

   i) development of a storm pond that will also serve as a fire fighting water source

   ii) survey and subdivision for the develop a combination of airside and groundside lots

   iii) two accesses off Bergen Road, one for the lots adjacent to the turf strip and to the business park

   iv) construction projects will include internal roads and taxiway extension

   v) relocate the container dump site, and

   vi) the trigger for Phase II will be when Phase I is 75% sold.

h) Phase III includes the development of the balance of the business park in the southwest quarter section as well as the lands on the north side of the runway that will access from the County Administration Building access road.

i) Phase III will also include:

   i) determination of demand for airside or groundside lots

   ii) survey and subdivide groundside and airside lots

   iii) internal road construction including two accesses off Range Road 15

   iv) completion of the water reservoir

   v) completion of a piped water and sewer system

8.3.6 Review and Amendment

a) Each lot owner will be required to apply for development permits to Mountain View County.

b) Each lot owner will be required to tie into piped water and sewer services when they are available.

c) All planting materials included in the approved landscaping plan must be maintained and/or replaced at the cost of the lot owner in perpetuity.

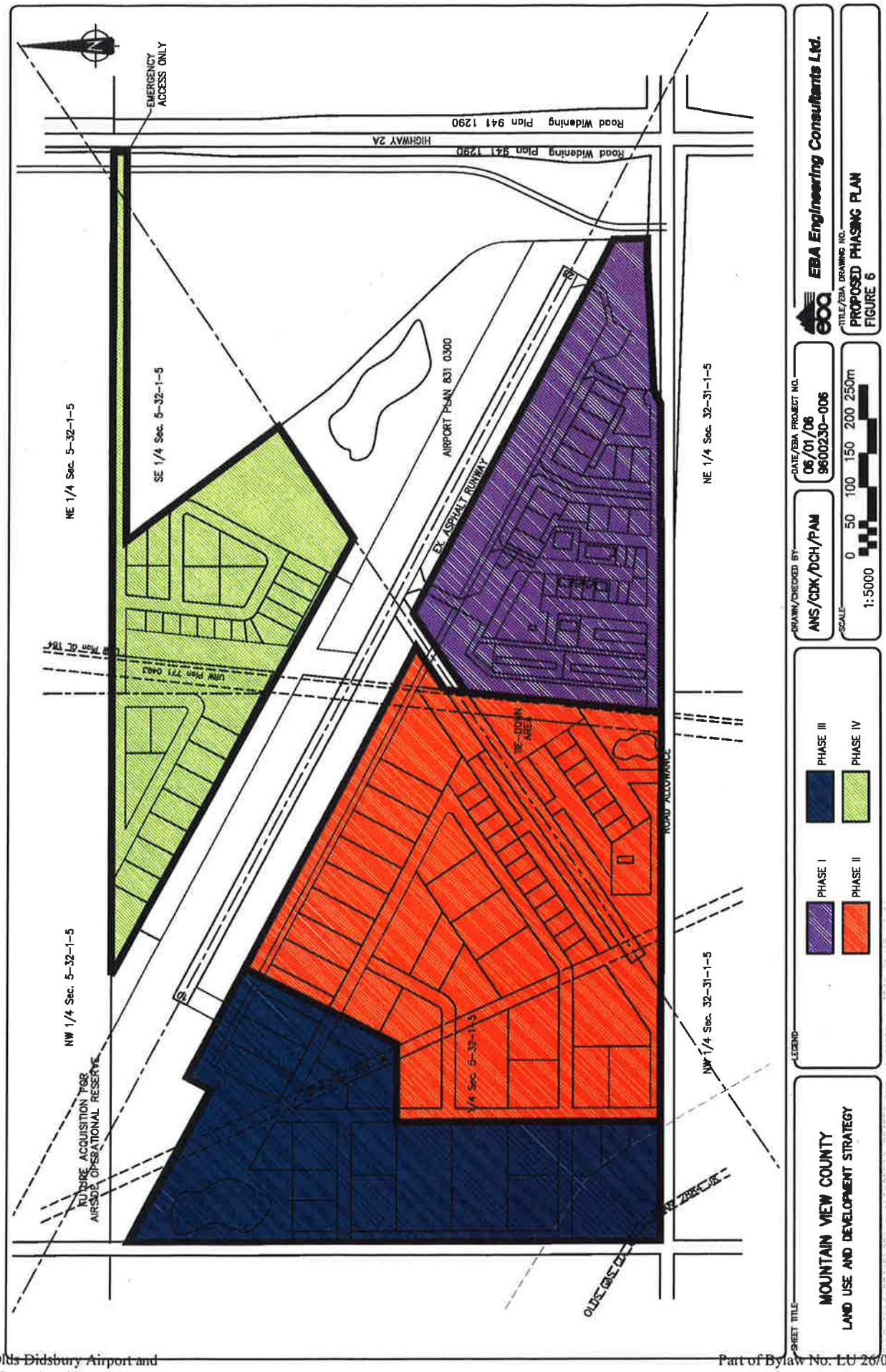
d) The County will refer all development applications within 4 km of the runway to Transport Canada and NavCanada for their comments.

e) The County will maintain dialogue with Transport Canada.

f) The County will ensure that all development within the airport is reviewed for land use compatibility.

g) The County will liase with Alberta Infrastructure and Transportation for future grant programs to upgrade and maintain the Olds Didsbury Airport to a high standard.

h) As a statutory document, this plan should be reviewed every five years to ensure that the vision is still relevant and to identify any changes in the environment that may require adjustments to the policies.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HIGHWAY 2A
Road Widening Plan 941 1290
NE 1/4 Sec. 5-32-1-5
SE 1/4 Sec. 5-32-1-5
NW 1/4 Sec. 5-32-1-5
NE 1/4 Sec. 32-31-1-5
NW 1/4 Sec. 32-31-1-5
AIRPORT PLAN 831 0300
EX. ASPHALT RUNWAY
ROAD ALLOWANCE
TO BE DOWN AREA
TO BE ACQUISITION FOR AIRSIDE OPERATIONAL RESERVE
LEGEND
PHASE I
PHASE II
PHASE III
PHASE IV
SCALE
1:5000
0 50 100 150 200 250m
DRAWN/CHECKED BY
ANS/CDK/DCH/PAM
DATE/EBA PROJECT NO.
06/01/06
9600230-006
EBA Engineering Consultants Ltd.
TITLE/EBA DRAWING NO.
PROPOSED PHASING PLAN
FIGURE 6
SHEET TITLE
MOUNTAIN VIEW COUNTY
LAND USE AND DEVELOPMENT STRATEGY

APPENDIX

APPENDIX A AIRPORT COUNTY LAND USE DISTRICT

The purpose of this district is to identify the appropriate uses and development on lands included in the Olds/Didsbury Airport Master Plans. The lands within the Master Plan areas are identified for three primary functions and as such the land use district divides the permitted and discretionary uses to reflect: airport operational reserve, airside development (requiring direct access to taxiways and runways) and groundside development (not requiring access to runways or taxiways). These areas are illustrated on Schedule A. Height restrictions are illustrated on Schedule B.

A. DEEMED APPROVED

Extensive Agriculture

B. PERMITTED USES OF LAND AND/OR BUILDINGS

The zones are illustrated on Schedule A.

1) Zone I – Airport Operational Reserve
   a) Runways
   b) Taxiways
   c) Aprons
   d) Navigational Aids
   e) Aviation Related Lighting
   f) Terminal Building
   g) Landscaping and Screening
2) Zone II – Airside Development
   a) Aircraft Hangars
   b) Aircraft Sales, Repairs and Rentals
   c) Aircraft Maintenance
   d) Charter Aircraft Companies (including offices and ticketing)
   e) Airport Related Commercial
   f) Airport Related Industrial
   g) Extensive Agriculture
3) Zone III – Groundside Development
   a) Business and Professional Offices
   b) Café, coffee shop and restaurant (not drive through)
   c) Commercial business, sales and service

d) Kennels and Facilities

e) Maintenance Buildings

f) Public and Quasi Public Buildings and Utilities

g) Holiday Trailers and Recreational Vehicles Sales, Leasing and Servicing

h) Oil and Gas Equipment Storage and Maintenance

i) Veterinary Clinic

j) Light Industrial manufacturing, processing, sales and distribution, service and repair

C. DISCRETIONARY USES OF LAND AND/OR BUILDINGS

1. Zone I – Airport Operational Reserve

   a) Café, coffee shop and restaurant (not drive through)

   b) Signs and advertising

   c) Public and quasi public buildings and utilities

   d) Ancillary Buildings

   e) Fences and Enclosures

2. Zone II – Airside Development

   a) Caretaker/Manager Suite

   b) Fuel storage and sales

3. Zone III – Groundside Development

   a) Agricultural Manufacturing and Processing

   b) Caretaker/Manager Suite

   c) Outdoor Storage

   d) Greenhouse and nursery

   e) Retail Sales

   f) Bulk oil and propane sales

   g) Trucking and Freight Terminal

   h) Transfer Station

D. DEVELOPMENT STANDARDS

1. Caretakers/Managers suite can be detached or attached

2. For Groundside Development, a Landscaping Plan will be required to the satisfaction of the County.

3. All development will be considered to be low water users until such time as piped water and sewer services are provided

4. Future piped water and sewer services may be constructed by the county or by a major landowner. Should an individual owner install the system, the county will collect proportionate payment from future landowners and developers through an endeavour to recover agreement as part of the Development Agreement as a latecomer payment for tie into the services.

4. Internal Roads will be constructed to a 6 m top, chip seal with drainage to the satisfaction of the County.

5. Structures existing at the time this land use bylaw amendment is adopted are not required to meet standards setbacks from the County Road.

6. Initial development may occur on pump out septic tank, trucked in water stored in cisterns, until such time as a piped water and sewer system is available, for hook up at the lot owners cost. The county will place a deferred servicing agreement on title to ensure that the servicing connection is made at the appropriate time.

7. No new development will create smoke, steam, electronic inference or any other off site impact that may affect adjacent development.

8. All structures will provide parking as follows:

   a) Personal Hangars - One parking stall provided per aircraft bay

   b) Personal Hangars - 0.5 visitor parking stalls provided per aircraft bay with a minimum of 1 stall

   c) Hangars for the purpose of business and charter operations – one stall per staff and .5 stalls per seat per plane.

E. REGULATIONS – SETBACKS AND SIZE

1. Minimum Setback from Centre Line of County Road – 125 feet (38.1 m)

2. Minimum Frontage – 75 feet (22.86 m)

3. Minimum Lot Depth – 100 feet (30.48 m)

4. Maximum Lot Coverage – 40%

5. Maximum Floor Area for a Caretakers/Managers Suite –1,200 sq. ft. (111.5 sq. m)

6. Minimum Set Back from Hangar to Taxiway – 114.83 feet (35 m)

7. Minimum Front Yard Setback – 32.8 feet (10 m)

8. Minimum Side Yard Setback – 2.46 feet (0.75 m) for every 3.28 feet (1.0 m) of height of structure

9. Minimum Rear Yard Setback – 16.4 feet (5 m)

F. HEIGHT RESTRICTIONS

1. Height restrictions for the Olds-Didsbury Airport are calculated at a Registered Code 2 Non Precision airport with a 4,000 ft. runway.

2. The reference point for the airport is 3,360 feet above sea level at the centre point of the runway.

3. The height restrictions for Olds/Didsbury Airports will be calculated based on the setback requirements illustrated on Schedule B.

G. UNSAFE, HAZARDOUS OR NOXIOUS DEVELOPMENT

1. Fuel storage will only be in environmentally friendly above ground tanks surrounded by berming to contain any spills on site.

2. Common party walls and zero lot lines may be approved by the MPC to allow for multiple bay hangar construction with separate ownership and individual title when approved firewalls are proposed.

3. Condominium ownership of hangars is permitted.

4. No use will be permitted that creates smoke, steam or other air borne contaminants that restrict visibility.

5. No use that includes an electronic device, apparatus, equipment or other thing that is operated for industrial scientific, medical or similar purposes or produces and utilizes radio frequency energy in its operations but is not used for radio communication.

6. No use that attracts birds will be permitted on the airport property. Storm water ponds will be located off of the take off and approach area and will be designed as dry ponds where possible

H. DEFINITIONS, FOR THE PURPOSE OF THIS SECTION

1. Airport: for the purpose of this section, airport includes all lands owned by Mountain View County in the vicinity and including the basic airstrip identified in an Area Structure Plan or Master Plan.

2. Take Off and Approach: areas of land associated with each end of the runway, (illustrated on Figure 1) and in each case the surface is imaginary and consists of an inclined plan that:

   - Commences at and abuts the end of the runway
   - Rises at a slope of 1:3 measured from the end of the runway

- Diverges outward on each side as it rises at a slope ratio of 1:15 as measured from the respective projected lateral limits of the runway, and
- Ends at its intersection with the outer surface

3. Transition Area: areas of land associated with each lateral limit of the runway (illustrated on Figure 1) and in each case the transitional surface is an imaginary surface consisting of an inclined plane that:
   - Commences at and abuts the lateral limit of the runway
   - Rises at a slope of 1:7 measured from the lateral limit of the runway, and
   - Ends at its intersection with the outer surface or a take-off and approach surface.
4. Outer Surface: the outer surface for the airport is an imaginary surface consisting of a common plane established at a constant elevation of 45 metres above the airport reference point (illustrated on Figure 1) and extending to a 4,000 m radius.
5. Aviation Related: any and all land uses that require airside access or provide a service or business used by anyone related to the ongoing operation of an airside access business and that has a need to be located on or near an airport.

I. SUPPLEMENTARY REGULATIONS

1. The area and location of the take-off and approach surfaces and transitional surfaces and outer surfaces are represented on Schedule B.
2. The Outer Surface does not apply until the runway has been extended and the airport is a Code 2 Non Precision Airport.
3. If any discrepancy exists between the description and the map, the description in this land use district prevails.

APPENDIX

APPENDIX B TRAFFIC IMPACT ASSESSMENT

TRAFFIC IMPACT ASSESSMENT
PROPOSED DEVELOPMENT OF OLDS-DIDSBURY AIRPORT
WEST OF HIGHWAY 2A:14
NORTH OF DIDSBURY

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.
Calgary, Alberta

Project No. 0906-9600230.002

FINAL – May 2005

EXECUTIVE SUMMARY

This report addresses the impacts of the proposed development of the Olds-Didsbury Airport Business Industrial Park in the south 1/2 Section 5 Township 32 Range 1 W5M and the associated traffic on the immediately adjacent and downstream roadway network. The proposed development includes an expansion of the existing airport infrastructure and the development of a business industrial park. Expansion of the existing airport infrastructure consists of developing and occupying several hangars with completion in 2008. Development of the business industrial park will consist of three phases. Phase 1 and Phase 2 consist of developing land to the west of the existing runway in the west portion of the half section. Completion of these phases is expected in 2015 for Phase 1 and 2025 for Phase 2. Phase 3 consists of developing land to the north of the existing runway with completion expected in 2035. The report considers the expansion of the existing airport infrastructure and all three phases of new development, and examines issues and possible impacts caused by traffic conflicts, traffic behaviour (volume and capacity) and cumulative impacts, and site access.

Traffic or trip generation rates are available from the ITE Trip Generation Manual (7th Edition). A rate of 57.46 trips per acre of development has been used to determine the traffic volumes on the roadway network due the various development phases. The breakdown of additional traffic with each expansion and phase of development is as follows:

Phase	Estimated Additional Traffic
Expansion of Airport Infrastructure	290 vpd
1	2705 vpd
2	1534 vpd
3	894 vpd

Additional traffic on the adjacent road network is 5,423 vehicles per day. These vehicles will be comprised of primarily passenger vehicles and single unit truck traffic due to the nature of the development.

The existing roadway system in the vicinity of the proposed development includes a network of local roads and provincial highways. Access to the area is available from the east via Highway 2A and from the west via Range Road 20. Of interest in this study is Highway 2, Highway 2A, Highway 27, Highway 582, Bergen Road, Range Road 15 and Range Road 20.

From the analysis and discussion presented, the following can be concluded:

- No improvements to the local road network are required based on existing traffic volumes.

- The introduction of traffic from the various development expansion and phases requires additional improvements.

Based on the analysis and discussion presented, it is recommended that the following improvements to the roadway network be undertaken for the proposed development.

Although it is desirable that these improvements be considered at the start of each phase, it is understood that these improvements may be made during the development of the site. The improvements should therefore, be made as early as possible in preparation for an increase in traffic volumes due to the proposed development.

Phase 1:

- Increase the road width of Bergen Road to 9.0 m between Range Road 15 and Range Road 20 to accommodate all phases of development.
- Provide a paved width of 9.0 m along Range Road 15 between Bergen Road and the northwest access to the park to accommodate all phases of development.
- Upgrade the intersection of Highway 2A and Bergen Road to a Type IV. Providing an adequate storage length of 50 m for Phase 2 should be considered at this time.
- Provide a Type II intersection treatment at the intersections of Bergen Road and the Olds-Didsbury Airport access, Bergen Road and the south access to the park, Bergen Road and the southwest access to the park, Bergen Road and the northwest access to the park, and Bergen Road and Range Road 20.
- Increase the road width of Bergen Road to 11.8 m between highway 2A and Range Road 15 to accommodate all phases of development.
- Provide a Type III intersection treatment at the intersection of Bergen Road and Range Road 15 and at the intersection of Range Road 15 and the west access to the park.

Phase 2:

- An increase in the paved width on Highway 582 to 11.8 m is likely required due to the projected growth in traffic volume and traffic from the proposed development. This increase in paved width may be considered within Alberta Infrastructure and Transportation's overall program.

Phase 3:

- Provide a Type IV intersection treatment at the intersection of Highway 2A and the east access to the park.

Should Alberta Infrastructure and Transportation consider twinning Highway 2A, a Major Road Intersection on a Four-Lane Divided Highway at the intersection of Highway 2A and Bergen Road, and a Major "T" Intersection on a Four-Lane Divided Highway at the intersection of Highway 2A and the east access to the proposed development should be provided during the upgrade to the highway.

Improvements to the roadway network due to Phase 2 and Phase 3 should be confirmed considering future growth rates in traffic and additional developments in the general area.

The 10-year increments used in the analysis above are for phase planning purposes only. Completion of the various stages of the proposed development may occur sooner than these dates suggest. An annual traffic count conducted along Bergen Road and at the intersection of Highway 2A and Bergen Road during construction of the proposed development would confirm these recommended improvements.

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1.0 INTRODUCTION

This report addresses the impacts of the proposed development of the Olds-Didsbury Airport Business Industrial Park in the south 1/2 Section 5 Township 32 Range 1 W5M and the associated traffic on the immediately adjacent and downstream roadway network. The proposed development includes an expansion of the existing airport infrastructure and the development of a business industrial park. Expansion of the existing airport infrastructure consists of developing and occupying several hangars with completion in 2008. Development of the business industrial park will consist of three phases. Phase 1 and Phase 2 consist of developing land to the west of the existing runway in the west portion of the half section. Completion of these phases is expected in 2015 for Phase 1 and 2025 for Phase 2. Phase 3 consists of developing land to the north of the existing runway with completion expected in 2035. The report considers the expansion of the existing airport infrastructure and all three phases of new development, and examines issues and possible impacts caused by traffic conflicts, traffic behaviour (volume and capacity) and cumulative impacts, and site access.

2.0 OBJECTIVE

The objectives of the study are:

- identify the areas of significant traffic impact and expected changes in traffic volumes, composition and type within that area;
- identify possible deficiencies in the existing transportation infrastructure immediately adjacent to and in the immediate vicinity of the site; and
- identify, review and evaluate access management plans to prevent, minimize or mitigate adverse transportation effects and maintain acceptable levels of service.

3.0 METHODOLOGY

The assessment was undertaken through the completion of two tasks.

Task 1 – Site Investigation and Data Compilation

This task included travel to the site, visual observations, minor on-site measurements and collection of traffic, geometric and collision data from published sources within the Alberta Government. No traffic counts, surveys or other formal data collection exercises were undertaken.

Task 2 – Analysis

This task included the analysis of the additional traffic (volume and composition) to the existing traffic on Highway 2, Highway 2A, Highway 27, Highway 582, Bergen Road (Township Road 320), Range Road 15 and Range Road 20 with respect to safety and operation of the intersections and access to the property. The intersectional analysis at the intersections was completed with respect to the *Alberta Transportation Highway Geometric Design Guide (1999)* and other guidelines from the Transportation Association of Canada were referred to. Detailed analysis using the Highway Capacity Software (2000) based on the Highway Capacity Manual (HCM 2000) was not included in this work.

4.0 EXISTING CONDITIONS

4.1 Site Location

The proposed development is located along Bergen Road between Highway 2A and Range Road 15. Bergen Road is located along Highway 2A approximately 4.8 km north of Highway 582 and Didsbury. The proposed development of the Old-Didsbury Airport Business Industrial Park is located west of Highway 2A. The Old-Didsbury Airport is located on the south half section of 05-32-01 W5M. There are two runways and a taxiway located in the half section as well as aircraft hangars and airport buildings. The aircraft hangars and airport buildings are located just north of Bergen Road with access provided along Bergen Road approximately 700 m west of Highway 2A. The proposed development is to be located north of Bergen Road and east of Range Road 15. The site for the proposed development is generally agricultural on the north and west side of the existing runways. A new office building for Mountain View County is currently under construction and is located just west of Highway 2A in the half section. Access to this office building is provided along Bergen Road approximately 130 m west of Highway 2A. Figure 1 illustrates the general location of the site with respect to the local transportation system. Figure 2 shows the proposed site plan for the business industrial park.

4.2 Adjacent Roadway Network

The existing roadway system in the vicinity of the proposed development includes a network of local roads and provincial highways. Access to the area is available from the east via Highway 2A and from the west via Range Road 20. Of interest in this study is Highway 2, Highway 2A, Highway 27, Highway 582, Bergen Road, Range Road 15, and Range Road 20. Photographs of these roadways are included in the attachments.

Highway 2 is a four-lane, divided highway in the Class 1A service category. It is a major north-south trade route providing access throughout the province.

Highway 2A is a two-lane, undivided highway in the Class 2 service category. It is a north-south roadway providing access to local developments and communities within the region. This highway commences at the interchange with Highway 2 and Highway 72, south of Crossfield and terminates at the interchange with Highway 2 at Bowden.

Highway 27 is a two-lane, undivided highway in the Class 1B service category. It is an east-west roadway providing access to local developments and communities within the region. This highway commences at the intersection with Highway 22 and terminates at the intersection with Highway 21. The intersection of Highway 2A and Highway 27 is located within the Town of Olds, north of the proposed development site.

Highway 582 is a two-lane, undivided highway in the Class 2 service category. It is an east-west roadway providing access to local developments and communities within the region. This highway commences at the intersection with Highway 22 and terminates at the intersection with Highway 21 and Highway 27. The intersection of Highway 2A and Highway 582 is located just east of Didsbury, south of the proposed development site.

Bergen Road (Township Road 320) is a local road that extends through Mountain View County in an east-west direction. It connects to Highway 2A approximately 4.8 km north of Highway 582 and Didsbury, and to Highway 2 approximately 4.8 km east of Highway 2A. It provides access to farmstead developments within Mountain View County and provides the only access to the Olds-Didsbury Airport. Bergen Road west of Highway 2 to Range Road 13, east of Highway 2A is a gravel road. West of Range Road 13, Bergen Road is paved. This paved section of Bergen Road is likely an important roadway within Mountain View County.

Range Road 15 is a local gravel road that extends in a north-south direction. It connects to 57 Avenue in Olds and to Highway 582 in Didsbury. Range Road 15 is located approximately 1.6 km west of Highway 2A. It provides access to farmstead developments within Mountain View County.

Range Road 20 is a local paved road that extends in a north-south direction. It connects to 70 Avenue in Olds and to Highway 582 in Didsbury. Range Road 20 is located approximately 3.2 km west of Highway 2A. It provides access to farmstead developments within Mountain View County and to Didsbury hospital.

The existing access road to the Olds-Didsbury Airport will not provide access to the proposed development. Four access points are to be constructed providing access to the proposed development, one provided along Highway 2A, one along Bergen Road and two along Range Road 15.

4.3 Safety Record

For the purpose of this analysis, the safety record at the intersection of Highway 2A and Bergen Road for the recent five-year period has been investigated. Alberta Infrastructure and Transportation (AIT) has provided data on the reported collisions for the period 1998 to 2002, which is included in the attachments.

There have been a total of five collisions reported at or near the intersection of Highway 2A and Bergen Road. Two of these collisions are reported as animal strikes. Of the remaining three collisions, there is no trend with respect to the collision type, severity, roadway and environmental conditions, or time of day. Two of these three collisions are identical. A summary of the non-animal strikes follows:

2000/02/09 1630 hrs Fatality
Object 1 travelling northbound hit icy patch then entered east ditch and struck a fence.

2001/12/07 1300 hrs Property damage only
Vehicle 1 travelling northbound, struck guardrail that was bent onto the roadway by grader.

2001/12/07 1300 hrs Property damage only
Vehicle 1 travelling northbound, struck guardrail that was bent onto the roadway by grader.

This intersection is operating similar to other highway intersections throughout the province. This intersection is not listed in AIT's special monitoring locations.

4.4 Traffic Control and Geometry

The existing traffic control and geometry is summarized in the following tables:

Main Roadways

Road and Section	Description
Highway 2	- Northbound 12.9 m wide paved road - Southbound 12.9 m wide paved road - Generally flat vertical profile in vicinity of Bergen Road - Straight - Posted speed limit of 110 km/h
Highway 2A	- 11.6 m wide paved road - Undulating vertical profile in vicinity of Bergen Road - Straight - Posted speed limit of 100 km/h

Main Roadways continued

Road and Section	Description
Highway 27 - Through the Town of Olds	- 14.5 m wide paved road - Vertical crest curve at intersection with Highway 2A - Vertical sag curve west of Highway 2A - Straight - Posted speed limit of 50 km/h
Highway 582	- 10 m wide paved road - Undulating vertical profile in vicinity of Highway 2A - Straight in vicinity of Highway 2A - Posted speed limit of 100 km/h
Bergen Road - Range Road 20 to Range Road 13	- 8.5 m wide paved road - Generally flat - Straight - Posted speed limit of 90 km/h - Subject to road bans
Bergen Road - Range Road 13 to Highway 2	- 7.0 m wide gravel road - Undulating vertical profile - Straight - Posted speed limit of 90 km/h - Subject to road bans
Range Road 15	- 7.5 m wide gravel road - Minor undulations in vertical profile - Straight - Posted speed limit of 80 km/h - Subject to road bans
Range Road 20	- 8.0 m wide paved road - Minor undulations in vertical profile - Straight - Posted speed limit of 80 km/h - Subject to road bans

Main Intersections

Intersection	Description
Highway 2 and Bergen Road	- Minor road intersection on four-lane divided highway at approximately 90° - Bergen Road is controlled by STOP Signs on the east and west approach - Generally agricultural land use in all four quadrants
Highway 2A and Highway 27	- 4 legged intersection at approx. 90° - 4 lanes on each leg of intersection - Signalized
Highway 2A and Highway 582	- 4 legged intersection at approx. 90° - Four-way Stop controlled - Right turn lanes and acceleration lanes on all legs of intersection - Two residences located in the northwest quadrant of the intersection - Industrial developments located in the southwest quadrant of the intersection

Main Intersections continued

Intersection	Description
Highway 2A and Bergen Road	- 4 legged intersection at approximately 90° - Type IIId intersection treatment - East and west legs of the intersection are controlled by STOP Signs - Intersection located on a south to north downhill grade - Intersection sight distance is unrestricted to the north, and approx 360 m for a passenger vehicle and 470 m for tractor-trailer unit to the south - Access to Mountain View County office building is located approximately 130 m west of the intersection
Bergen Road and Range Road 15	- 4 legged intersection at approximately 90° - No intersection treatment - Bergen Road is the through road - Range Road 15 is controlled by STOP Signs on the north and south approach - Intersection sight distance is unrestricted in both east and west directions - Generally agricultural land use in all four quadrants
Bergen Road and Range Road 20	- 4 legged intersection at approximately 90° - No intersection treatment - Range Road 20 is the through road - Bergen Road is controlled by STOP Signs on the east and west approach - Intersection sight distance is unrestricted in both north and south directions - Farmstead located in northwest quadrant, generally agricultural land use in all other quadrants
Bergen Road and access to Olds-Didsbury Airport	- 3 legged, "T" intersection at approximately 90° - No intersection treatment - Bergen Road is the through road - Airport access road is controlled by a STOP Sign on the north leg - Intersection sight distance is unrestricted in both east and west directions - Generally agricultural land use south of Bergen Road - Airport located north of Bergen Road

4.5 Traffic

Where available, traffic data has been compiled from existing Alberta Government Sources.

Traffic counts on Bergen Road were provided by Mountain View County. These counts are based on the average of 12-hour counts conducted between March 21, 2005 and March 30, 2005 and are not the Average Annual Daily Traffic (AADT) for that road. These counts are included in the attachments.

Traffic data is included in the attachments and is summarized as follows:

Road and Section	Traffic Volume*	Proportion of Truck Traffic**	Historical Growth Rate (% Yr)
Hwy 2A, N of Hwy 582	3110 vpd (2004)	7.3 %	5.1 %
Hwy 2A, S of Hwy 582	1850 vpd (2004)	10.0 %	6.9 %
Hwy 582, E of Hwy 2A	1640 vpd (2004)	11.6 %	1.5 %
Hwy 582, W of Hwy 2A	1610 vpd (2004)	7.2 %	0.5 %
Hwy 2A, N of Bergen Rd	3210 vpd (2004)	6.7 %	5.9 %
Hwy 2A, S of Bergen Rd	3170 vpd (2004)	6.7 %	5.7 %
Bergen Rd, E of Hwy 2A	100 vpd (2004)	11.0 %	Estimate 0 %
Bergen Rd, W of Hwy 2A	200 vpd (2004)	6.5 %	Estimate 0 %
Bergen Rd, W of airport access	Not Available Estimate 157 vpd	6.5 %	Estimate 0 %
Bergen Rd at Olds-Didsbury Airport	14 vph (2005)	6.5 %	Estimate 0 %
Hwy 2A, N of Hwy 27	4290 vpd (2004)	8.2 %	3.9 %
Hwy 2A, S of Hwy 27	5030 vpd (2004)	7.1 %	3.9 %
Hwy 27, E of Hwy 2A	6520 vpd (2004)	9.6 %	2.4 %
Hwy 27, W of Hwy 2A	9600 vpd (2004)	7.4 %	3.4 %
Airport access road	Not Available Estimate 50 vpd	Estimate less than 1 %	Estimate less than 1.0 %
Range Rd 15, N of Bergen Rd	Not Available Estimate 50 vpd	Estimate less than 1 %	Estimate 0 %
Range Rd 15, S of Bergen Rd	Not Available Estimate 50 vpd	Estimate less than 1 %	Estimate 0 %
Range Rd 20, N of Bergen Rd	Not Available Estimate 200 vpd	Estimate less than 1 %	Estimate 0 %
Range Rd 20, S of Bergen Rd	Not Available Estimate 200 vpd	Estimate less than 1 %	Estimate 0 %

* Year traffic count was conducted is shown in brackets.
** Single Units and Tractor Trailers.

The traffic volume estimate for Bergen Road west of the Olds-Didsbury Airport access is 157 vpd. This considers the traffic volume on the airport access road and estimates an 85:15 directional split east : west.

AIT staff has provided information with respect to the future plans for the intersection of Highway 2 and Bergen Road. It is likely that this intersection is will be closed; however, no time frame was provided as to when this may occur. Therefore, the impact of any additional traffic volumes at this intersection or east of Highway 2A on Bergen Road due to the proposed development has not been considered.

5.0 PROPOSED DEVELOPMENT

The proposed development is illustrated in Figure 2. It includes the expansion to the existing airport infrastructure and the three phases of the business industrial park development.

Phase	Estimated Acreage of Development (Hectares)	Year of Completion
Expansion of Airport Infrastructure	5.04 (2.04)	2008
1	47.07 (19.05)	2015
2	26.69 (10.80)	2025
3	15.57 (6.30)	2035

The 10-year increments used in the analysis are for phase planning purposes only.

Access will be provided for Phase 1 and Phase 2 along Bergen Road and Range Road 15. An additional access will be built with Phase 3 along Highway 2A approximately 800 m north of Bergen Road.

Review of the internal road network has not been included in this assessment.

6.0 TRAFFIC IMPACT ASSESSMENT

Access to the business industrial park will be provided along Bergen Road between the airport access and Range Road 15 (south access), Range Road 15 north of Bergen Road (southwest and northwest access), and Highway 2A north of Bergen Road (east access). Bergen Road and Range Road 15 will provide access to Phase 1 and Phase 2 of the proposed development. Highway 2A will provide access to Phase 3 of the proposed development.

Access to the expansion of the airport infrastructure will be provided from the current airport access road along Bergen Road.

It is estimated that the majority of vehicles to and from the proposed development will consist of commuter traffic from Olds or from Didsbury. Impact to the operation of Highway 2 is not considered significant due to the existing level of service on that roadway; therefore, the impact on Highway 2 is not considered further.

It is estimated that 85% of vehicles from the developments located along Bergen Road will travel east along Bergen Road to the intersection with Highway 2A. Of this 85%, it is estimated that 50% of vehicles travelling east along Bergen Road will turn north and 50% of vehicles will turn south onto Highway 2A. The remaining 15% of vehicles from the developments located along Bergen Road are estimated to travel west along Bergen Road to the intersection with Range Road 20. Of this 15%, it is estimated that the

majority of vehicles travelling west along Bergen Road will turn north and south onto Range Road 20. Only minor volumes are estimated to continue west along Bergen Road west of Range Road 20 and are not considered significant.

The directional split in traffic volumes at the intersection of Highway 2A with Highway 27 and Highway 582 are estimated to follow current turning movements as indicated in the 2004 AADT Turning Movement Summary Diagrams. The Turning Movement Summary Diagram for the intersection of Highway 2A and Highway 27 indicates that 45% of northbound vehicles turn west, 29% turn east and 26% continue north. The Turning Movement Summary Diagram for the intersection of Highway 2A and Highway 582 indicates that 52% of southbound vehicles turn west, 13% turn east and 35% continue south.

The directional split in traffic volumes at the east access to the business industrial park is estimated that 50% will turn north and 50% will turn south.

No additional traffic volumes have been projected from the development on Range Road 15 south of Bergen Road or north of the northwest access to the proposed development located along Range Road 15. A few vehicles are estimated to travel along these roads to access other local developments; however, these volumes are minor and not considered significant.

In a traffic impact assessment completed by AMEC Infrastructure Limited for the access to the Mountain View County administration office located in the northeast of the half section, it was identified that 125 vpd would access the office from Bergen Road. This is the only access to the office.

6.1 Trip Generation Rates

Traffic or trip generation rates are available from the ITE Trip Generation Manual (7th Edition). For the purposes of this study, the average trips per acre for an industrial park land use (63.11 trips per acre of development) and general light industrial land use (51.80 trips per acre of development) have been consulted. The average of these rates, 57.46 trips per acre of development, has been used to determine the traffic volumes on the roadway network due the various development phases. The breakdown of additional traffic with each expansion and phase of development is as follows:

Phase	Estimated Additional Traffic
Expansion of Airport Infrastructure	290 vpd
1	2705 vpd
2	1534 vpd
3	894 vpd

Additional traffic on the adjacent road network is 5,423 vehicles per day. These vehicles will be comprised of primarily passenger vehicles and single unit truck traffic due to the nature of the development.

The ITE Trip Generation Manual estimates that the proportion of truck traffic from an industrial park is 8.0%. This proportion is estimated on the local roadway network.

6.2 Impact on the Roadway Network

The impact on the roadway network for the expansion of the existing airport infrastructure and Phase 1 of development considers the historical growth rate as shown in Section 4.5 above for each highway between 2004 and the year of completion for each stage of development.

The impact on the roadway network for Phase 2 of development considers an average growth rate between the historical growth rate and the provincial average growth rate of 2.0% for each highway between 2015 and 2025 with exception to Highway 582 east and west of Highway 2A which considers the highway provincial average growth rate of 2.0%. For Highway 2A, north of Highway 582, a growth rate of 3.5% was considered.

The impact on the roadway network for Phase 3 of development considers the highway provincial average growth rate of 2.0% for each highway between 2025 and 2035.

The traffic volumes associated with the completion of the Mountain View County office are included in the projected traffic volumes for each year of completion for the proposed development.

Projected traffic volumes with the addition of the estimated volumes from the proposed development include traffic volumes for all previous development expansion and phases up to that year of completion.

Traffic volumes are summarized in Table 1.

Table 1
Projected Traffic Volumes

	2004 AADT	Projected 2008 Traffic Volume	Projected 2008 Traffic Volume + Expansion to Airport Infrastructure	Projected 2015 Traffic Volume	Projected 2015 Traffic Volume + Phase 1	Projected 2025 Traffic Volume	Projected 2025 Traffic Volume + Phase 2	Projected 2035 Traffic Volume	Projected 2035 Traffic Volume + Phase 3
Hwy 2A, N of Hwy 582	3,110 vpd	3,837 vpd	3,971 vpd	5,551 vpd	6,701 vpd	8,908 vpd	9,560 vpd	11,220 vpd	11,667 vpd
Hwy 2A, S of Hwy 582	1,850 vpd	2,431 vpd	2,477 vpd	3,915 vpd	4,318 vpd	6,449 vpd	6,677 vpd	7,988 vpd	8,145 vpd
Hwy 582, E of Hwy 2A	1,640 vpd	1,719 vpd	1,737 vpd	1,955 vpd	2,391 vpd	2,527 vpd	2,612 vpd	3,128 vpd	3,186 vpd
Hwy 582, W of Hwy 2A	1,610 vpd	1,664 vpd	1,734 vpd	1,793 vpd	2,104 vpd	2,764 vpd	3,103 vpd	3,557 vpd	3,789 vpd
Hwy 2A, N of Hwy 27	4,290 vpd	5,014 vpd	5,045 vpd	6,581 vpd	6,880 vpd	9,127 vpd	9,296 vpd	11,219 vpd	11,335 vpd
Hwy 2A, S of Hwy 27	5,030 vpd	5,915 vpd	6,039 vpd	7,839 vpd	8,988 vpd	11,623 vpd	12,275 vpd	14,530 vpd	14,977 vpd
Hwy 27, E of Hwy 2A	6,520 vpd	7,183 vpd	7,220 vpd	8,514 vpd	8,847 vpd	10,904 vpd	11,094 vpd	13,398 vpd	13,528 vpd
Hwy 27, W of Hwy 2A	9,600 vpd	10,998 vpd	11,054 vpd	13,947 vpd	14,464 vpd	18,697 vpd	18,990 vpd	22,954 vpd	23,155 vpd
Hwy 2A, N of E park acc.	3,210 vpd	4,090 vpd	4,214 vpd	6,208 vpd	7,357 vpd	10,253 vpd	10,905 vpd	12,860 vpd	13,307 vpd

Table 1 continued
Projected Traffic Volumes

	2004 AADT	Projected 2008 Traffic Volume	Projected 2008 Traffic Volume + Expansion to Airport Infrastructure	Projected 2015 Traffic Volume	Projected 2015 Traffic Volume + Phase 1	Projected 2025 Traffic Volume	Projected 2025 Traffic Volume + Phase 2	Projected 2035 Traffic Volume	Projected 2035 Traffic Volume + Phase 3
Hwy 2A, east park acc. to Bergen Rd	3,210 vpd	4,090 vpd	4,214 vpd	6,208 vpd	7,357 vpd	10,253 vpd	10,905 vpd	12,860 vpd	13,307 vpd
Hwy 2A, S of Bergen Rd	3,170 vpd	3,999 vpd	4,133 vpd	6,009 vpd	7,159 vpd	9,796 vpd	10,448 vpd	12,303 vpd	12,750 vpd
Bergen Rd, E of Hwy 2A	100 vpd	100 vpd	100 vpd	100 vpd	100 vpd	100 vpd	100 vpd	100 vpd	100 vpd
Bergen Rd, W of Hwy 2A to Mountain View County Office acc.	200 vpd	306 vpd	533 vpd	533 vpd	2,852 vpd	2,852 vpd	4,156 vpd	4,156 vpd	4,156 vpd
Bergen Rd, Mountain View County Office acc. to airport acc.	200 vpd	219 vpd	466 vpd	466 vpd	2,765 vpd	2,765 vpd	4,069 vpd	4,069 vpd	4,069 vpd
Airport acc. road	Not Available Estimate 50 vpd	50 vpd	340 vpd	340 vpd	340 vpd	340 vpd	340 vpd	340 vpd	340 vpd
Bergen Rd, airport acc. to S park acc.	Not Available Estimate 157 vpd	176 vpd	219 vpd	219 vpd	2,518 vpd	2,518 vpd	3,822 vpd	3,822 vpd	3,822 vpd

Table 1 continued
Projected Traffic Volumes

	2004 AADT	Projected 2008 Traffic Volume	Projected 2008 Traffic Volume + Expansion to Airport Infrastructure	Projected 2015 Traffic Volume	Projected 2015 Traffic Volume + Phase 1	Projected 2025 Traffic Volume	Projected 2025 Traffic Volume + Phase 2	Projected 2035 Traffic Volume	Projected 2035 Traffic Volume + Phase 3
Bergen Rd, S park acc. to Range Rd 15	Not Available Estimate 157 vpd	176 vpd	219 vpd	219 vpd	908 vpd	908 vpd	1,675 vpd	1,675 vpd	1,675 vpd
Range Rd 15, N of Bergen Rd to SW park acc.	Not Available Estimate 50 vpd	50 vpd	50 vpd	50 vpd	455 vpd	455 vpd	1,222 vpd	1,222 vpd	1,222 vpd
Range Rd 15, SW park acc. to NW park acc.	Not Available Estimate 50 vpd	50 vpd	50 vpd	50 vpd	320 vpd	320 vpd	576 vpd	576 vpd	576 vpd
Range Rd 15, N of NW park access	Not Available Estimate 50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd
Range Rd 15, S of Bergen Rd	Not Available Estimate 50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd	50 vpd
Bergen Rd, Range Road 15 to Range Rd 20	Not Available Estimate 157 vpd	176 vpd	219 vpd	219 vpd	625 vpd	625 vpd	855 vpd	855 vpd	855 vpd
Range Rd 20, N of Bergen Rd	Not Available Estimate 200 vpd	200 vpd	231 vpd	231 vpd	434 vpd	434 vpd	549 vpd	549 vpd	549 vpd
Range Rd 20, S of Bergen Rd	Not Available Estimate 200 vpd	200 vpd	231 vpd	231 vpd	434 vpd	434 vpd	549 vpd	549 vpd	549 vpd

7.0 RECOMMENDED IMPROVEMENTS

7.1 Improvement Criteria

Preliminary analysis of the proposed routes providing access onto Highway 2A has been completed. Consideration of safety and level of service along the routes and at the key intersections has been made with respect to volume.

The design criteria as contained in the Alberta Infrastructure and Transportation Highway Geometric Design Guide, Chapter H, Local Roads considers pavement width, maximum gradient, minimum stopping sight distance, minimum passing sight distance and minimum curve radius based on traffic volume. This guide has been consulted to determine the improvement requirements for the roadway network.

Chapter D, Intersection Elements of the design guide has been consulted to determine the improvement requirements to the intersections.

All provincial highways are controlled and managed by Alberta Infrastructure and Transportation, and any improvements to these highways fall under their jurisdiction.

Although it is desirable that these improvements be considered at the start of each phase, it is understood that these improvements may be made during the development of the site. The improvements should therefore, be made as early as possible in preparation for an increase in traffic volumes due to the proposed development.

The improvement requirements are summarized in Table 2.

Table 2
Recommended Improvements

	Existing Conditions	Projected 2008 Traffic Volume	Expansion to Airport Infrastructure	Projected 2015 Traffic Volume	Phase 1	Projected 2025 Traffic Volume	Phase 2	Projected 2035 Traffic Volume	Phase 3
Highway 2A	11.6 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Twinning of Highway Required	Nothing Additional Required
Highway 27	14.5 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Highway 582	10 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	11.8 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Bergen Rd (W of Hwy 2A to RR 15)	8.5 m paved roadway	Nothing Additional Required	9.0 m paved roadway	Nothing Additional Required	11.8 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Bergen Rd (W of Hwy 2A, RR 15 to RR 20)	8.5 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	9.0 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Bergen Rd (E of Hwy 2A to RR 13)	8.5 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
RR 15 (N of Bergen Rd to NW park acc.)	7.5 m gravel roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	9.0 m paved roadway	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Intersection of Hwy 2A and Bergen Rd	Type III Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Type IV Intersection Treatment	Type IV Intersection Treatment with Additional Storage Length of 15	Type IV Intersection Treatment with Additional Storage Length of 40	Type IV Intersection Treatment with Additional Storage Length of 50	Major Road Intersection on Four-Lane Divided Highway	Nothing Additional Required

Table 2 continued
Recommended Improvements

	Existing Conditions	Projected 2008 Traffic Volume	Expansion to Airport Infrastructure	Projected 2015 Traffic Volume	Phase 1	Projected 2025 Traffic Volume	Phase 2	Projected 2035 Traffic Volume	Phase 3
Intersection of Hwy 2A and Hwy 27	Signalized Intersection	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Intersection of Hwy 2A and Hwy 582	Controlled by Four-Way Stop, Exclusive Right Turn Lanes on Each Leg	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Intersection of Bergen Rd and Airport acc.	Type I Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Type II Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Intersection of Bergen Rd and S park acc.	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Type II Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Intersection of Bergen Rd and RR 15	Type I Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Type II Intersection Treatment	Nothing Additional Required	Type III Intersection Treatment	Nothing Additional Required	Nothing Additional Required
Intersection of Bergen Rd and RR 20	Type I Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Type II Intersection Treatment	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required	Nothing Additional Required
Intersection of RR 15 and SW park acc.	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Type I Intersection Treatment	Nothing Additional Required	Type II Intersection Treatment	Nothing Additional Required	Nothing Additional Required
Intersection of RR 15 and NW park acc.	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Type I Intersection Treatment	Nothing Additional Required	Type II Intersection Treatment	Nothing Additional Required	Nothing Additional Required
Intersection of Hwy 2A and E park acc.	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Development of Intersection not yet required	Major "T" Intersection on Four-Lane Divided Highway
Intersection Treatments as per Alberta Infrastructure and Transportation Highway Geometric Design Guidelines									

The south, southwest and northwest accesses to the business park all require a Type II intersection treatment during development of the park. A Type II intersection treatment plan is available from Alberta Infrastructure and Transportation and has been included in the appendices.

7.2 Existing Roadway Network and Existing Traffic Volumes

The existing road width on Highway 2A varies from 11.6 m to 12.5 m between the intersections with Highway 27 and Highway 582. This road width is considered adequate for the current traffic volume on Highway 2A.

No improvements to the roadway network are required at this time due to the existing traffic volume.

7.3 Expansion to the Airport Infrastructure – 2005 to 2008

Chapter H of the Design Guide indicates that road width should be at least 9 m for traffic volumes between 200 and 1,500 vehicles per day. The paved width of Bergen Road is approximately 8.5 m. Due to the expansion of the airport infrastructure to be completed in 2008, a paved width of 9 m is likely required; however, the existing pavement width is considered adequate until further upgrades are required due to an increase in the traffic volume from future phases of the proposed development.

No additional improvements to the roadway network are required at this time due to the expansion of the airport infrastructure.

7.4 Phase 1 of the Proposed Development – 2005 to 2015

Due to the projected traffic volume on Highway 2A and Bergen Road, a Type IV intersection treatment is likely warranted.

Using Figure D-7.4 of the design guide with the projected 2015 traffic volumes and estimated traffic volumes along the local roads, the following intersections likely require upgrading due to the completion of phase one of the proposed development:

- Highway 2A and Bergen Road requires a storage length of 15 m for northbound to westbound movements;
- Bergen Road and Olds-Didsbury airport access, upgrade to a Type II intersection treatment;
- Bergen Road and the south access to the proposed development, construct a Type II intersection treatment;

- Bergen Road and Range Road 15, upgrade to a Type II intersection treatment;
- Bergen Road and Range Road 20, upgrade to a Type II intersection treatment;
- Range Road 15 and the southwest access to the proposed development, construct a Type I intersection treatment; and
- Range Road 15 and the northwest access to the proposed development, construct a Type I intersection treatment.

A road width of 11.8 m is likely required along Bergen Road west of Highway 2A to Range Road 15 due to the completion of Phase 1. A road width of 9 m is likely required along Bergen Road between Range Road 15 and Range Road 20 and along Range Road 15 between Bergen Road and the northwest access to the park due to the completion of Phase 1.

7.5 Phase 2 of the Proposed Development – 2015 to 2025

Due to the projected traffic volume on Highway 2A and Bergen Road, a storage length of 40 m is likely warranted at the intersection of Highway 2A and Bergen Road for northbound to westbound movements. A road width of 11.8 m is likely required along Highway 582 due to the projected traffic volume in 2025.

Using Figure D-7.4 of the design guide with the projected 2025 traffic volumes and estimated traffic volumes along the local roads, the following intersections likely require upgrading due to the completion of Phase 2 of the proposed development:

- Highway 2A and Bergen Road requires a storage length of 50 m for northbound to westbound movements;
- Bergen Road and Range Road 15, upgrade to a Type III intersection treatment;
- Range Road 15 and the southwest access to the proposed development, upgrade to a Type II intersection treatment; and
- Range Road 15 and the northwest access to the proposed development, upgrade to a Type II intersection treatment.

7.6 Phase 3 of the Proposed Development – 2025 to 2035

Due to the projected traffic volumes in 2035, twinning is likely warranted on Highway 2A. Alberta Infrastructure and Transportation begins to look at the requirement to twin a highway once the AADT exceeds 6,000 vpd. It is likely the AADT on Highway 2A will exceed 6,000 vpd in 2015. Twinning would also require the

construction of a Major Road Intersection on a Four-Lane Divided Highway at the intersection of Highway 2A and Bergen Road.

A new access onto Highway 2A approximately 800 m north of Bergen Road is required to access Phase 3 developments. Phase 3 likely requires the construction of a Type IV intersection treatment with a storage length of 15 m for northbound to westbound movements along Highway 2A to form the east access to the proposed development. However, due to the likely warrant of twinning, a Major "T" Intersection on a Four-Lane Divided Highway is required.

8.0 ADDITIONAL ITEMS

Improvements to the roadway network are determined using available 2004 AADT. Projections of traffic volumes greater than 10 years are likely not accurate and any improvements to the roadway network based on the 2004 AADT greater than 10 years (i.e.; Phase 2 and Phase 3) should be revisited with the available AADT relevant to the completion of the various phases of development.

The 10-year increments used in the analysis above are for phase planning purposes only. Completion of the various stages of the proposed development may occur sooner than these dates suggest. An annual traffic count conducted along Bergen Road and at the intersection of Highway 2A and Bergen Road during construction of the proposed development would confirm the appropriate upgrades to the roadway network considering future growth rates in traffic and additional developments in the general area.

The warrant for the installation of traffic control signals as contained in the *Manual of Uniform Traffic Control Devices* was considered at the intersections of Highway 2A with Bergen Road and Highway 582. The warrant was not met for either intersection at any stage of the proposed development. The warrant should be revisited as traffic volumes on these roadways may increase due to future growth of Didsbury or additional proposed developments in the area.

9.0 CONCLUSIONS

From the analysis and discussion presented, the following can be concluded:

- No improvements to the local road network are required based on existing traffic volumes.

- The introduction of traffic from the various development expansion and phases requires additional improvements.

10.0 RECOMMENDATIONS

Based on the analysis and discussion presented, it is recommended that the following improvements to the roadway network be undertaken for the proposed development.

Although it is desirable that these improvements be considered at the start of each phase, it is understood that these improvements may be made during the development of the site. The improvements should therefore, be made as early as possible in preparation for an increase in traffic volumes due to the proposed development.

Phase 1:

- Increase the road width of Bergen Road to 9.0 m between Range Road 15 and Range Road 20 to accommodate all phases of development.
- Provide a paved width of 9.0 m along Range Road 15 between Bergen Road and the northwest access to the park to accommodate all phases of development.
- Upgrade the intersection of Highway 2A and Bergen Road to a Type IV. Providing an adequate storage length of 50 m for Phase 2 should be considered at this time.
- Provide a Type II intersection treatment at the intersections of Bergen Road and the Olds-Didsbury Airport access, Bergen Road and the south access to the park, Bergen Road and the southwest access to the park, Bergen Road and the northwest access to the park, and Bergen Road and Range Road 20.
- Increase the road width of Bergen Road to 11.8 m between highway 2A and Range Road 15 to accommodate all phases of development.
- Provide a Type III intersection treatment at the intersection of Bergen Road and Range Road 15 and at the intersection of Range Road 15 and the west access to the park.

Phase 2:

- An increase in the paved width on Highway 582 to 11.8 m is likely required due to the projected growth in traffic volume and traffic from the proposed development. This increase in paved width may be considered within Alberta Infrastructure and Transportation's overall program.

Phase 3:

- Provide a Type IV intersection treatment at the intersection of Highway 2A and the east access to the park.

Should Alberta Infrastructure and Transportation consider twinning Highway 2A, a Major Road Intersection on a Four-Lane Divided Highway at the intersection of Highway 2A and Bergen Road, and a Major "T" Intersection on a Four-Lane Divided Highway at the intersection of Highway 2A and the east access to the proposed development should be provided during the upgrade to the highway.

Improvements to the roadway network due to Phase 2 and Phase 3 should be confirmed considering future growth rates in traffic and additional developments in the general area.

The 10-year increments used in the analysis above are for phase planning purposes only. Completion of the various stages of the proposed development may occur sooner than these dates suggest. An annual traffic count conducted along Bergen Road and at the intersection of Highway 2A and Bergen Road during construction of the proposed development would confirm these recommended improvements.

11.0 CLOSURE

This report has been prepared within the quality management requirements of EBA Engineering Consultants Ltd.

Respectfully submitted,

EBA Engineering Consultants Ltd.

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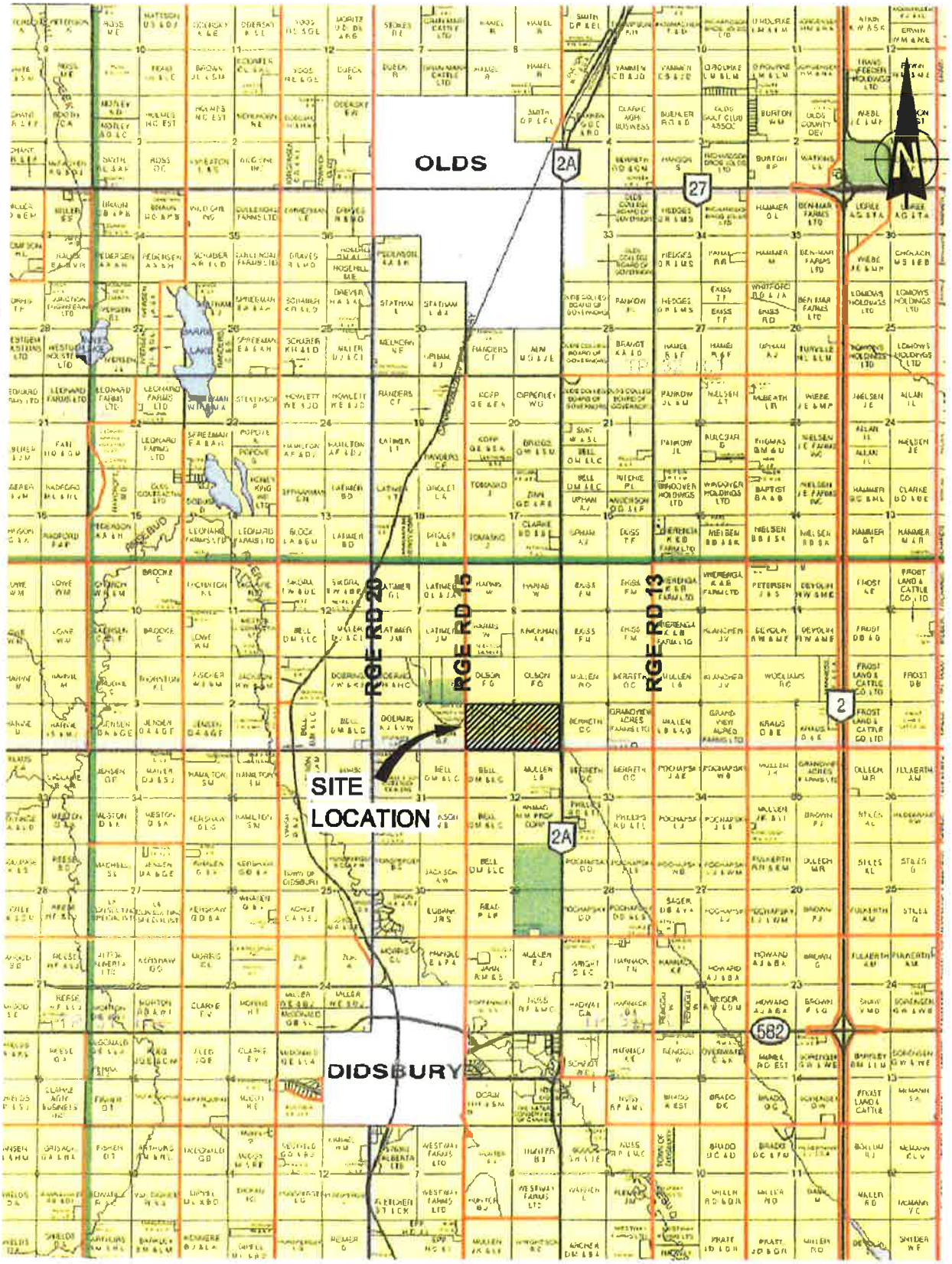
Senior Transportation Engineer

PHS:RVM:AC/ms

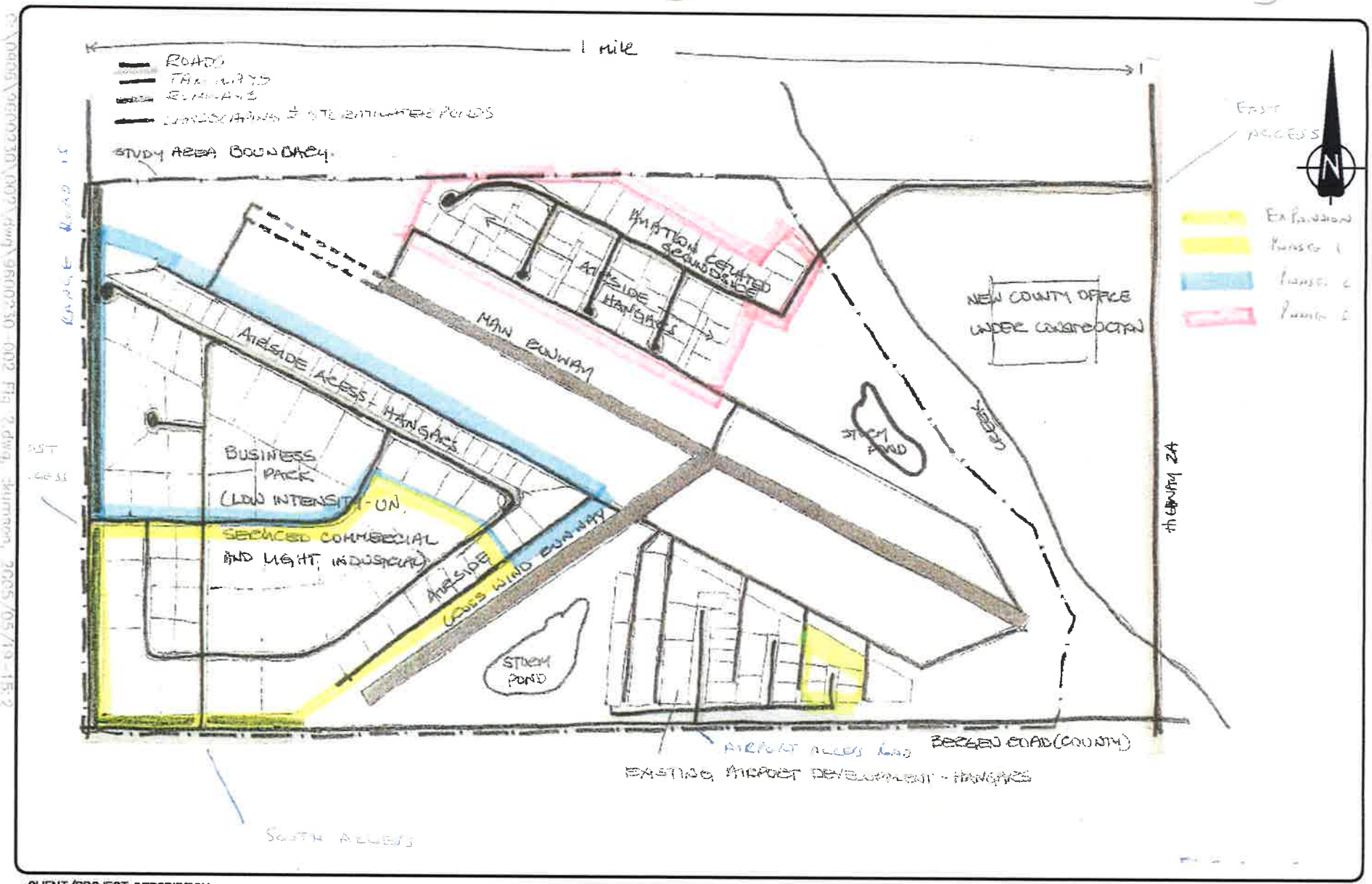
FIGURES



DATA SOURCE: MOUNTAIN VIEW COUNTY, WAY TO INTEGRATION AND CONSULTING INC.

LOCATION PLAN - OLDS - DIDSBURY AIRPORT	DRAWING	DATE
TRAFFIC IMPACT ASSESSMENT	9600230F02	MAY 2005
EBA Engineering Consultants Ltd.	DWN. BY:	CHK. BY:
	MS	PS

Q:\Foothills\Graphics\Land Projects-R2\0906-projects\9600230\9600230F02.dwg MAY 09, 2005 9:03 am

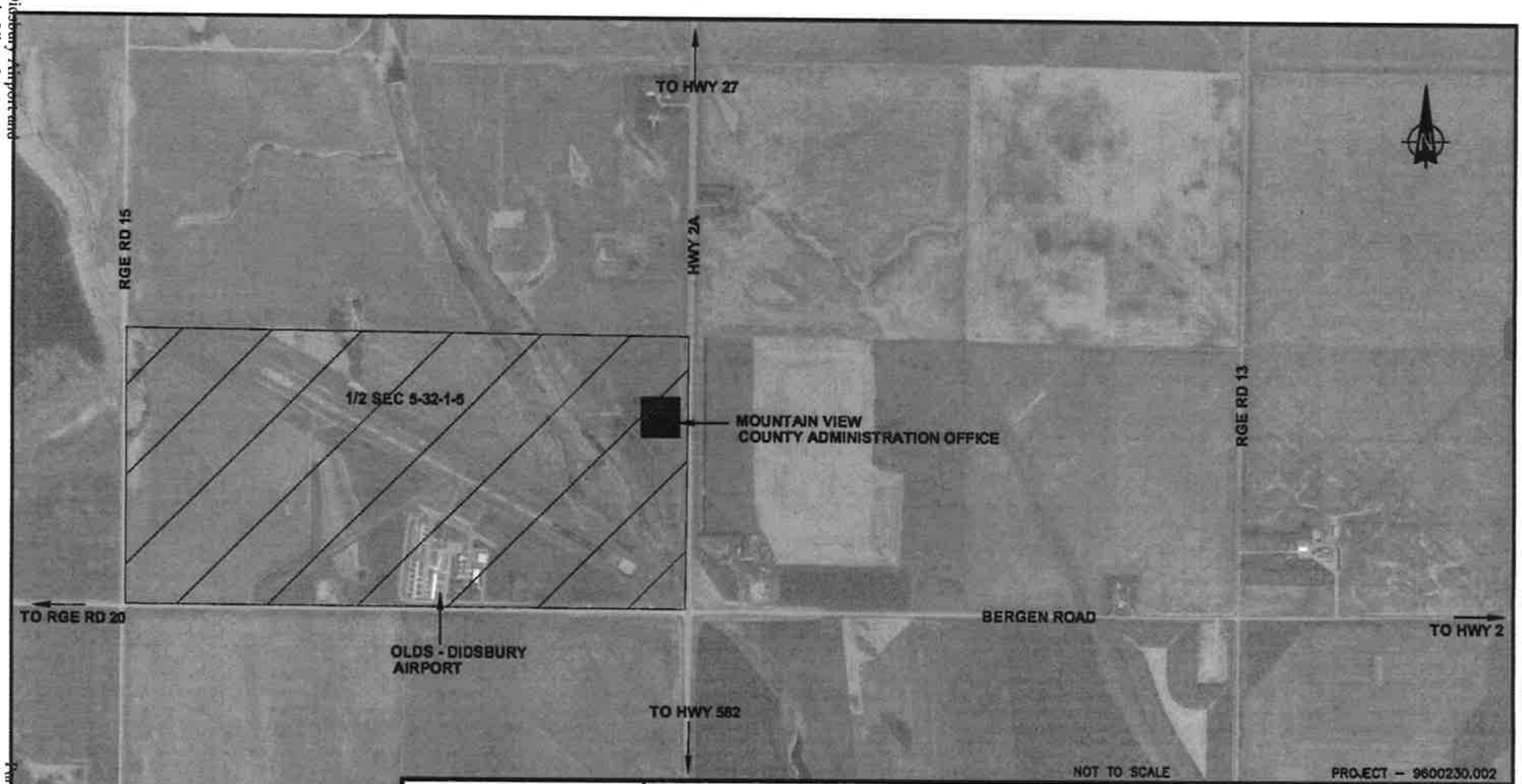


CLIENT/PROJECT DESCRIPTION

MOUNTIAN VIEW COUNTY
OLDS DIDSBURY AIRPORT
PROPOSED LAND USE & LOT LAYOUT

EBA Engineering Consultants Ltd.

SCALE	EBA PROJECT NO.	DATE/DRAWN BY:	TITLE/EBA DRAWING NO.
NTS	9600230-002	05/05/19 CDK/PHS	SITE PLAN FIGURE 2



	TRAFFIC IMPACT ASSESSMENT	DATE	DWG
	OLDS – DIDSBURY AIRPORT	MAY 2005	9600230F01
	EBA Engineering Consultants Ltd.	Dwn.By:	Chk By:
		MS	PS

APPENDIX A

PHOTOGRAPHS

Photo 1
Looking north along Highway 2A, at the intersection with Bergen Road.

Photo 2
Looking south along Highway 2A, at the intersection with Bergen Road.

Photo 3
Looking west along Bergen Road, from the intersection with Highway 2A.

Photo 4
Looking east along Bergen Road, from the intersection with Highway 2A.

Photo 5
Looking north along Highway 2A, at the intersection with Highway 27.

Photo 6
Looking south along Highway 2A, at the intersection with Highway 27.

Photo 7
Looking west along Highway 27, at the intersection with Highway 2A.

Photo 8
Looking east along Highway 27, at the intersection with Highway 2A.

Photo 9
Looking north along Highway 2A, from the intersection with Highway 582.

Photo 10
Looking south along Highway 2A, from the intersection with Highway 582.

Photo 11
Looking west along Highway 582, from the intersection with Highway 2A.

Photo 12
Looking east along Highway 582, from the intersection with Highway 2A.

Photo 13
Looking west along Bergen Road at the access to the Mountain View County Administration Office, west of Highway 2A.

Photo 14
Looking north at the access to the Mountain View County Administration Office located along Bergen Road, west of Highway 2A.

Photo 15
Looking east along Bergen Road at the access to the Mountain View County Administration Office and at the intersection with Highway 2A.

Photo 16
Looking west along Bergen Road at the access to the Olds-Didsbury Airport, west of Highway 2A.

Photo 17
Looking north at the access to the Olds-Didsbury Airport located along Bergen Road, west of Highway 2A. Access to the expansion of the airport infrastructure will be located along the service road east of this access road.

Photo 18
Looking east along Bergen Road at the access to the Olds-Didsbury Airport, west of Highway 2A. Shows existing airport infrastructure located north of Bergen Road.

Photo 19
Looking west along Bergen Road at the intersection with Range Road 15, west of Highway 2A.

Photo 20
Looking east along Bergen Road at the intersection with Range Road 15, west of Highway 2A.

Photo 21
Looking south along Range Road 15 at the intersection with Bergen Road, west of Highway 2A.

Photo 22
Looking north along Range Road 15 south of the intersection with Bergen Road, west of Highway 2A.

Photo 23
Looking north along Range Road 15 at the intersection with Bergen Road, west of Highway 2A.

Photo 24
Looking west along Bergen Road at the intersection with Range Road 20, west of Highway 2A.

Photo 25
Looking east along Bergen Road at the intersection with Range Road 20, west of Highway 2A.

Photo 26
Looking south along Range Road 20 from the intersection with Bergen Road, west of Highway 2A.

Photo 27
Looking north along Range Road 20 from the intersection with Bergen Road, west of Highway 2A.

Photo 28
Looking southwest at the current land use for the proposed development from the northbound shoulder of Highway 2A, north of Bergen Road.

Photo 29
Looking northeast at the current land use for the proposed development from the intersection of Bergen Road and Range Road 15, west of Highway 2A.

Photo 30
Looking east at the current land use for the proposed development from Range Road 15, west of Highway 2A.

Photo 31
Looking south along Highway 2A from the north limit of the proposed development, north of the intersection with Bergen Road.

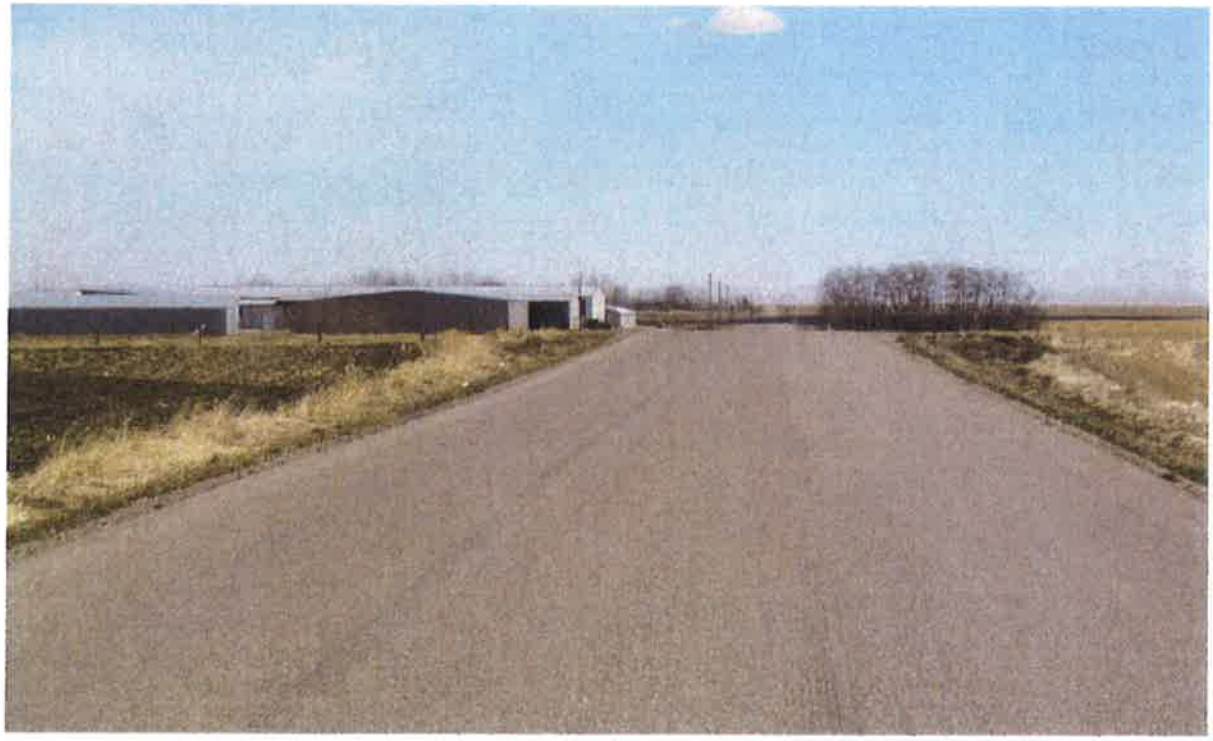


Photo 32
Looking east along Bergen Road, east of Range Road 15 and west of Highway 2A.

Photo 33
Looking north along Range Road 15 towards the north limit of the proposed development, north of the intersection with Bergen Road, west of Highway 2A.

APPENDIX B

COLLISION DATA

Highway 2A:14 1998-2002

01/05/05

No.	Year	Case Number	Obj. No.	Police Service	In/ Near	Place Name	On Hwy	At Int. With Hwy	OR At Int. with Street/Ave	Not At Int. Dist.	Dir.	Km /m	Not at int., Reference Point Dscrp	Special Reference Location Description	Occurrence Date	Occurrence Hour 24 hd.	Col. Sev.	Pri. Event	Veh 1 Dir. Of Travel	Veh 2 Dir. Of Travel	Veh 1 Mnvr	Veh 2 Mnvr	Col. Type	Hwy No.	Mjr. Ctrl. Sctn.	Safety Sctn.	Km Post	Env. Cond.	Surf. Cond.
1	2001	Z373932		3216	2	DIDSBURY	2A		TWP 3200	100.00	S	M	SKYDIVE CENTER		2001/12/28	18:30	3	1	5		47		94	2A	14	5	4.80		
2	2001	Z374040		3265	2	OLDS	2A			20.00	N	M	BERGEN ROAD		2001/12/29	07:30	3	1	1		47		94	2A	14	5	4.90		
3	2001	Z389201		3265	2	OLDS	2A			100.00	N	M	BERGEN ROAD		2001/12/07	13:00	3	9	1		47		68	2A	14	5	5.00		
4	2001	Z389202		3265	2	OLDS	2A			100.00	N	M	BERGEN ROAD		2001/12/07	13:00	3	9	1		47		68	2A	14	5	5.00		
5	2000	Z231993		3265	2	OLDS	2A			0.50	N	K	BERGEN RD		2000/02/09	16:30	3	9	1		47		68	2A	14	5	5.349		

Collision Description:

1 2001Z373932 VEH 1 SB STRUCK DEER.
2 2001Z374040 VEH 1 NB STRUCK DEER.
3 2001Z389201 VEH 1 NB, GUARDRAIL BENT ONTO RD BY GRADER, VEH 1 STRUCK GUARDRAIL.
4 2001Z389202 VEH 1 NB, GUARDRAIL BENT ONTO RD BY GRADER, VEH 1 STRUCK GUARDRAIL.
5 2000Z231993 OBJ 1 NB, HIT ICY PATCH, ENTERED E DITCH AND STRUCK A FENCE.

Olds Didsbury Airport and Mountain View County Airpark Area Structure Plan

Part of Bylaw No. LU 26/06 Adopted August 9, 2006

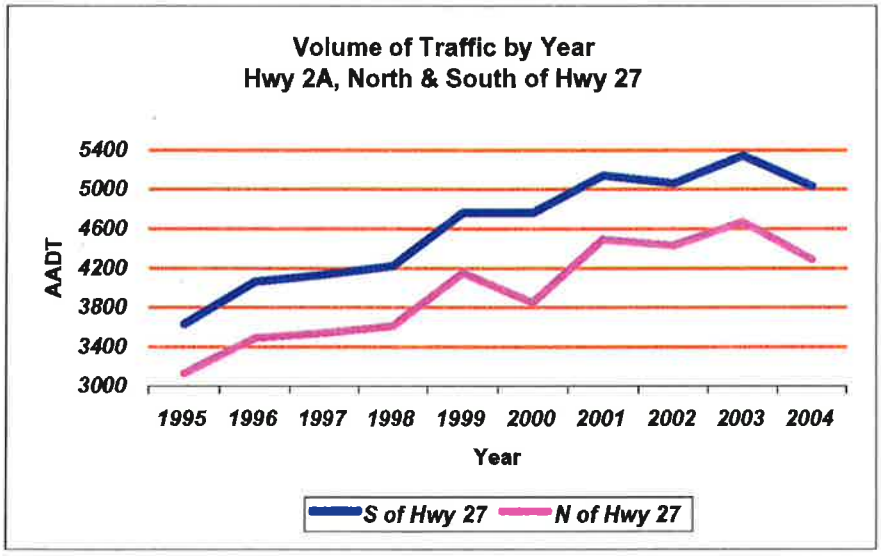
APPENDIX C

TRAFFIC DATA

EBA Project No. 9600230
Highway 2A:14
Intersection of Highway 2A and Highway 27

Traffic Data Summary for Highway 2A

	AADT									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
S of Hwy 27	3630	4060	4130	4220	4760	4760	5140	5060	5340	5030
N of Hwy 27	3130	3490	3540	3610	4150	3850	4490	4430	4670	4290



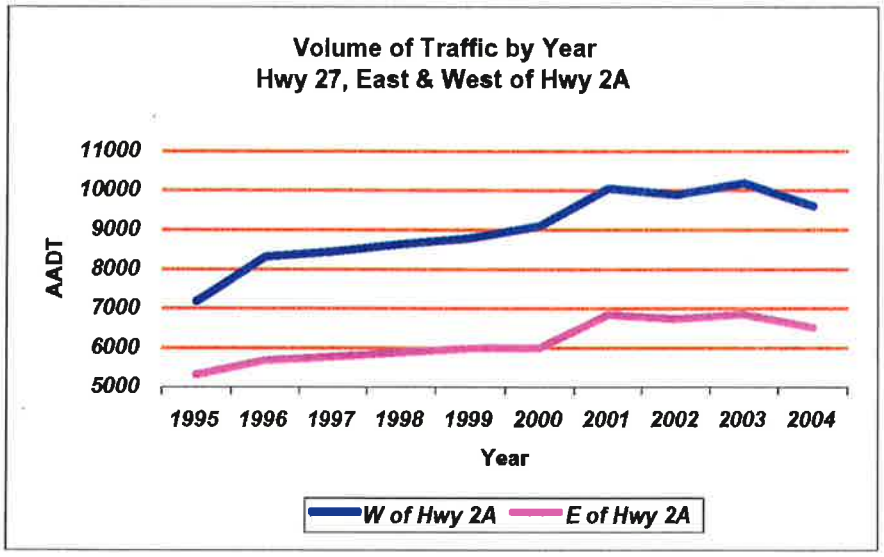
Average Percent Increase in Traffic Volume Each Year:

	For the ten year period
S of Hwy 27	3.9%
N of Hwy 27	3.9%

EBA Project No. 9600230
Highway 2A:14
Intersection of Highway 2A and Highway 582

Traffic Data Summary for Highway 27

	AADT									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
W of Hwy 2A	7180	8310	8440	8630	8780	9090	10050	9890	10180	9600
E of Hwy 2A	5320	5680	5770	5880	5990	6000	6840	6740	6850	6520



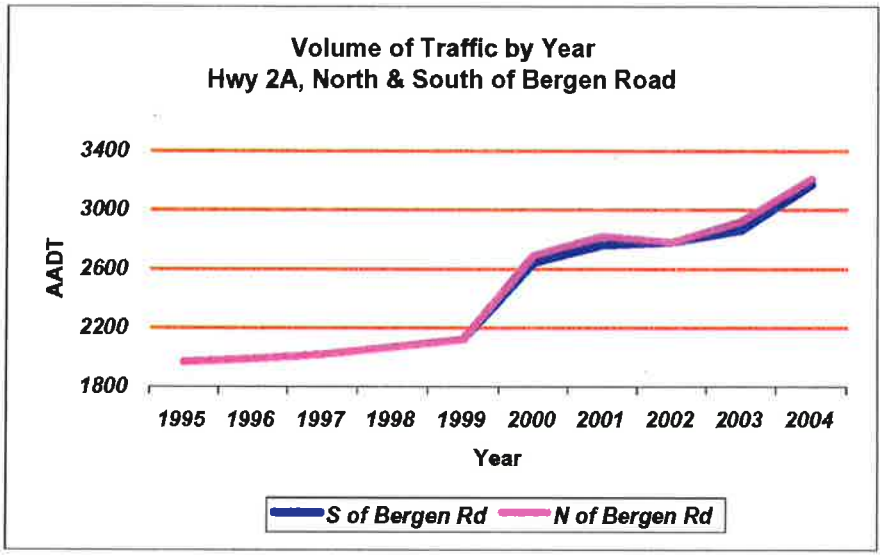
Average Percent Increase in Traffic Volume Each Year:

	For the ten year period
W of Hwy 2A	3.4%
E of Hwy 2A	2.4%

EBA Project No. 9600230
Highway 2A:14
Intersection of Highway 2A and Bergen Road (Olds Airport Acc)

Traffic Data Summary for Highway 2A

	AADT									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
S of Bergen Rd	1970	1990	2020	2070	2120	2640	2760	2780	2860	3170
N of Bergen Rd	1970	1990	2020	2070	2120	2690	2820	2780	2920	3210



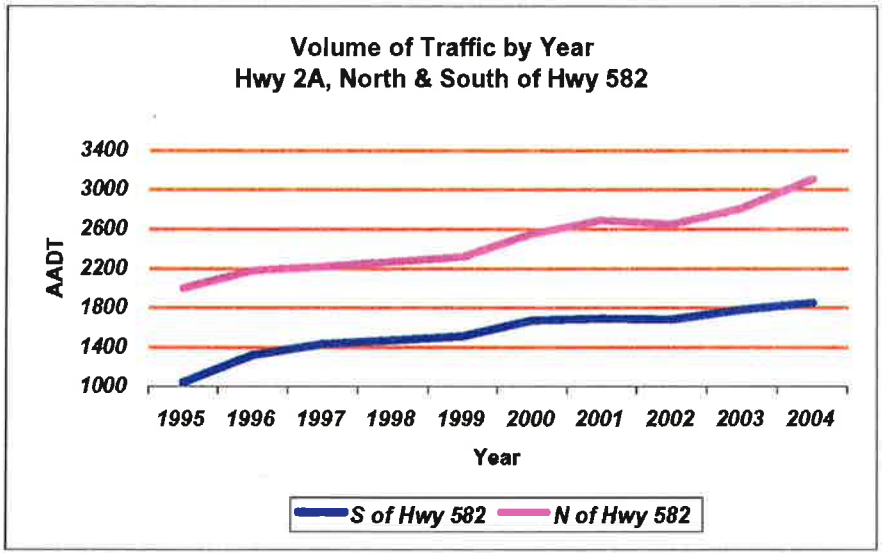
Average Percent Increase in Traffic Volume Each Year:

	For the ten year period
S of Bergen Rd	5.7%
N of Bergen Rd	5.9%

EBA Project No. 9600230
Highway 2A:14
Intersection of Highway 2A and Highway 582

Traffic Data Summary for Highway 2A

	AADT									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
S of Hwy 582	1040	1320	1430	1470	1510	1670	1690	1680	1780	1850
N of Hwy 582	2000	2180	2220	2270	2320	2550	2690	2650	2810	3110



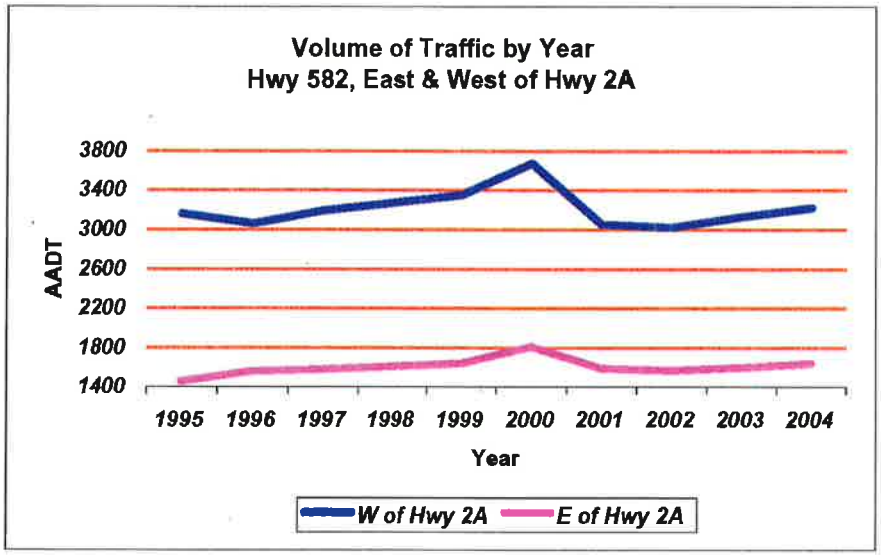
Average Percent Increase in Traffic Volume Each Year:

	For the ten year period
S of Hwy 582	6.9%
N of Hwy 582	5.1%

EBA Project No. 9600230
Highway 2A:14
Intersection of Highway 2A and Highway 582

Traffic Data Summary for Highway 582

	AADT									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Location	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
W of Hwy 2A	3160	3060	3190	3270	3350	3670	3050	3020	3130	3220
E of Hwy 2A	1460	1560	1580	1610	1640	1810	1590	1570	1600	1640



Average Percent Increase in Traffic Volume Each Year:

	For the ten year period
W of Hwy 2A	0.5%
E of Hwy 2A	1.5%

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME HISTORY 1995 - 2004

Alberta Infrastructure and Transportation
Program Management Branch
Highway Asset Management Section

Produced: 15-Feb-2005 By CornerStone Solutions Inc.

Hwy	CS	TCS	Muni	From	1995 AADT	1996 AADT	1997 AADT	1998 AADT	1999 AADT	2000 AADT	2001 AADT	2002 AADT	2003 AADT	2004 AADT	2004 ASDT
2A	12	4	MntV	S OF 580 S OF CARSTAIRS	2190	2190	2370	2160	2830	3100	3230	3050	3280	3340	3650
2A	12	8	MntV	N OF 580 S OF CARSTAIRS	1890	1890	2050	2070	2440	2670	2780	2550	2700	2740	2990
2A	12	8	MntV	S OF 580 & 581 AT CARSTAIRS	2180	2180	2370	2060	2830	3090	3220	2760	2910	2950	3220
2A	12	12	MntV	N OF 580 & 581 AT CARSTAIRS	2140	2140	2320	2280	2770	3030	3150	2380	2500	2520	2750
2A	12	16	MntV	S OF 582 E OF DIDSBURY	1040	1320	1430	1470	1510	1670	1690	1680	1780	1850	2020
2A	14	4	MntV	N OF 582 E OF DIDSBURY	2000	2180	2220	2270	2320	2550	2690	2650	2810	3110	3260
2A	14	4	MntV	S OF OLDS AIRPORT ACC 32-31-1-500000000	1970	1990	2020	2070	2120	2640	2760	2720	2860	3170	3330
2A	14	4	MntV	N OF OLDS AIRPORT ACC 32-31-1-500000000	1970	1990	2020	2070	2120	2690	2820	2780	2920	3210	3370
2A	14	4	MntV	S OF AMERADA RD 8-32-1-500000000	1930	1950	2110	2150	2190	2610	2730	2760	2900	3190	3350
2A	14	4	MntV	N OF AMERADA RD 8-32-1-500000000	2100	2120	2370	2410	2450	2900	3040	2970	3130	3400	3570
2A	14	8	MntV	4.0 KM S OF 2A & 27 OLDS	2370	2390	2430	2490	3030	3040	3190	3150	3350	3430	3600
2A	14	8	MntV	S OF 27 AT OLDS	3630	4060	4130	4220	4760	4760	5140	5060	5340	5030	5280
2A	14	12	MntV	N OF 27 AT OLDS	3130	3490	3540	3610	4150	3850	4490	4430	4670	4290	4500
2A	14	16	RdDr	W OF 2A S OF BOWDEN	1620	1640	1660	1700	2210	2280	2470	2430	2570	2390	2510
2A	14	18	RdDr	E OF 2A S OF BOWDEN	760	770	780	800	1140	1150	1240	1220	1290	1190	1250
2A	14	18	RdDr	N OF 2A S OF BOWDEN	880	890	900	920	1090	1150	1250	1230	1300	1220	1280
2A	14	18	RdDr	W OF 2 & 587 E OF BOWDEN	2460	2480	2520	3210	3270	3500	3530	3070	3100	3210	3370
2A	16	4	RdDr	W OF 2 AT INNISFAIL	810	820	480	500	500	600	700	1010	1020	1080	1140
2A	16	4	RdDr	S OF 54 AT INNISFAIL	3480	3520	4420	4870	4690	4770	5450	4690	4940	5040	5410
2A	16	8	RdDr	N OF 54 AT INNISFAIL	2800	2840	2960	3120	3120	3180	3640	3230	3390	3440	3690
2A	16	8	RdDr	S OF 42 & 592 N OF PENHOLD	3220	3220	3360	3540	3550	3650	4220	4070	4250	3920	4210
2A	16	12	RdDr	N OF 42 & 592 N OF PENHOLD	3260	3260	3380	3560	3680	3780	4530	4390	4580	4520	4850
2A	16	12	RdDr	0.8 KM N OF 2A & 42 PENHOLD	3170	3160	3290	3460	3620	3720	4470	4370	4560	4640	4970
2A	16	12	RdDr	S OF LOCAL RD 12-37-28-402000000	2950	2950	3070	3240	3390	3480	4070	3930	4310	4390	4710
2A	16	12	RdDr	N OF LOCAL RD 12-37-28-402000000	3500	3500	3640	3830	4010	4120	4810	4660	5140	5240	5630
2A	16	12	RdDr	S OF MCKENZIE RD 19-37-27-406500000				4950	5170	5270	5330	5150	5770	5890	6320
2A	16	12	RdDr	N OF MCKENZIE RD 19-37-27-406500000				5250	5470	5580	5650	5460	6530	6660	7150
2A	16	99	CoRD	W OF 2 & TAYLOR DR IN RED DEER								7310	7680	7840	8420
2A	18	16	RdDr	N OF 11A AT RED DEER	11300	11230	10990	12660	13490	13180	13320	13160	13140	13370	14160
2A	18	16	RdDr	S OF CENTRAL PARK RD 3-39-27-406000000	9390	9280	9880	11390	12000	12260	12390	12690	12730	12940	13700
2A	18	16	RdDr	N OF CENTRAL PARK RD 3-39-27-406000000	8890	8780	9340	10770	11460	11770	11900	12190	12160	12370	13100
2A	18	16	RdDr	1.6 KM N OF 2A & 11A RED DEER	8890	8780	9340	10760	11460	12210	12340	12180	12130	12480	13070
2A	18	16	RdDr	S OF NORTHLAND IND ACC 14-39-27-414251400					10520	10250	10360	10250	10230	10410	11020
2A	18	16	RdDr	N OF NORTHLAND IND ACC 14-39-27-414251400					10440	10170	10280	10170	10150	10330	10940
2A	18	16	Laco	S OF 597 S OF BLACKFALDS	7920	7820	8320	8450	9000	9500	9600	10110	10090	10220	10820
2A	18	20	Laco	N OF 597 S OF BLACKFALDS	7460	7380	7870	7540	8040	8470	8550	9440	9420	9910	10500
2A	18	20	Laco	S OF INDIANA ST IN BLACKFALDS 26-39-27-413401350	6980	6890	7330	7440	7930	8010	8090	9240	9220	9750	10330
2A	18	20	Laco	N OF INDIANA ST IN BLACKFALDS 26-39-27-413401350	5870	5800	6160	6250	6660	6480	6540	7620	7600	8150	8630
2A	18	20	Laco	S OF PARK ST IN BLACKFALDS 26-39-27-413101230								7620	7600	8150	8630
2A	18	20	Laco	N OF PARK ST IN BLACKFALDS 26-39-27-413101230								6740	6720	7030	7450
2A	18	20	Laco	S OF GREGG ST IN BLACKFALDS 26-39-27-411750805	5500	5440	5800	5890	6220	6410	6480	6670	6650	7030	7450

Part of Bylaw No. LU 26/06
Adopted August 9, 2006

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME HISTORY 1995 - 2004

Alberta Infrastructure and Transportation
Program Management Branch
Highway Asset Management Section

Produced: 15-Feb-2005 By CornerStone Solutions Inc.

Hwy	CS	TCS	Muni	From	1995 AADT	1996 AADT	1997 AADT	1998 AADT	1999 AADT	2000 AADT	2001 AADT	2002 AADT	2003 AADT	2004 AADT	2004 ASDT
27	6	8	MntV	1.2 KM E OF 22 & 27 SUNDRE EJ	2650	2570	2780	2940	2990	3040	3090	3100	3200	3290	3750
27	6	8	MntV	W OF HARMATTAN RD 36-32-4-501000750	3250	3170	3430	3510	3570	3010	3050	3050	3130	3210	3690
27	6	8	MntV	E OF HARMATTAN RD 36-32-4-501000750	3170	3090	3350	3430	3490	2960	3000	3000	3080	3150	3620
27	6	8	MntV	W OF 766 W OF OLDS	3110	3030	3270	3350	3130	3200	3250	3250	3330	3430	3950
27	6	12	MntV	E OF 766 W OF OLDS	3430	3350	3630	3710	3400	3450	3500	3500	3580	3670	4220
27	6	16	MntV	W OF 57 AVE IN OLDS 31-32-1-500000000			7680	7840	10310	10430	10810	8780	9040	9360	9820
27	6	16	MntV	E OF 57 AVE IN OLDS 31-32-1-500000000			8520	8710	11450	11570	11790	9600	9890	10240	10750
27	6	16	MntV	W OF 52 AVE IN OLDS WJ 32-32-1-509300000										11480	12050
27	6	16	MntV	E OF 52 AVE IN OLDS WJ 32-32-1-509300000										11440	12010
27	6	16	MntV	W OF 52 AVE IN OLDS EJ 32-32-1-507000000										11590	12170
27	6	16	MntV	E OF 52 AVE IN OLDS EJ 32-32-1-507000000										10490	11010
27	6	16	MntV	W OF 50 AVE IN OLDS 32-32-1-505150000			9730	9960	11690	11830	12040	9660	9940	10250	10760
27	6	16	MntV	E OF 50 AVE IN OLDS 32-32-1-505150000			9680	9900	11640	11800	12000	9380	9650	9940	10430
27	6	16	MntV	W OF 48 AVE IN OLDS 32-33-1-502000000	8140	7990	8110	8290	10080	10240	10830	9760	10040	10120	10620
27	6	16	MntV	E OF 48 AVE IN OLDS 32-33-1-502000000	7950	7820	7940	8120	9850	10010	10680	9630	9910	9990	10490
27	6	16	MntV	W OF 2A AT OLDS	7180	8310	8440	8630	8780	9090	10050	9890	10180	9600	10080
27	6	16	MntV	E OF 2A AT OLDS	5320	5680	5770	5880	5990	6000	6840	6740	6850	6520	6840
27	6	20	MntV	W OF 2 E OF OLDS	6060	6300	6680	6010	6120	6130	6340	6610	6700	6940	7280
27	8	4	MntV	E OF 2 E OF OLDS	2740	2750	2820	2750	2790	2800	2920	2530	2560	2580	2940
27	8	4	MntV	W OF 791 W OF TORRINGTON	1540	1500	1500	1430	1470	1470	1410	1320	1340	1360	1560
27	8	8	MntV	E OF 791 W OF TORRINGTON	1330	1290	1290	1260	1290	1290	1230	1100	1120	1140	1310
27	8	8	Knee	W OF 805 E OF TORRINGTON	1090	1190	1190	1210	1230	1230	1080	1060	1070	1080	1240
27	8	12	Knee	E OF 805 E OF TORRINGTON	750	800	800	820	840	840	780	760	770	780	890
27	8	12	Knee	5.0 KM W OF 21 & 27 TROCHU NJ	850	800	800	820	850	830	840	820	820	850	950
27	8	12	Knee	W OF 21 S OF TROCHU NJ	840	820	820	840	860	840	860	830	840	850	970
27	10	4	Knee	E OF 21 & 582 S OF THREE HILLS	1450	1540	1610	1670	1750	1810	1770	1770	1840	1870	2140
27	10	4	Knee	W OF 836 S OF GHOST PINE CREEK	1370	1550	1620	1640	1720	1800	1680	1680	1700	1740	1990
27	10	8	Knee	E OF 836 S OF GHOST PINE CREEK	1440	1530	1600	1620	1700	1780	1690	1690	1710	1750	2000
27	10	8	Knee	W OF 837 NW OF NACMINE	1470	1470	1460	1480	1500	1570	1570	1570	1670	1590	1820
27	10	12	Knee	E OF 837 NW OF NACMINE	1410	1410	1390	1410	1430	1500	1500	1470	1460	1480	1690
27	10	12	Stri	W OF LOCAL RD 11-31-21-400000000	1400	1410	1390	1410	1430	1500	1410	1500	1480	1500	1710
27	10	12	Stri	E OF LOCAL RD 11-31-21-400000000	1410	1420	1350	1370	1390	1450	1370	1500	1460	1480	1690
27	10	12	Stri	W OF 839 SW OF MORRIN	1410	1420	1350	1370	1390	1450	1450	1500	1460	1480	1690
27	10	16	Stri	E OF 839 SW OF MORRIN	1500	1510	1520	1540	1560	1640	1640	1630	1590	1610	1840
27	10	16	Stri	5.6 KM W 9 & 27 & 56 MORRIN	1500	1510	1580	1600	1620	1700	1700	1700	1660	1700	1930
27	10	16	Stri	W OF 9 & 56 SE OF MORRIN	1690	1700	1780	1710	1790	1870	1860	1860	1830	1860	2120
28	2	8	Stur	S OF RGE RD 244 8-54-25-400000500	12900	12660	13400	13760	14700	14740	14140	13430	12910	13580	15320
28	2	12	Stur	N OF RGE RD 244 8-54-25-400000500	6940	6820	7220	7420	7170	7190	6900	6310	7210	7810	8810
28	2	12	Stur	S OF 195 AVE IN NAMAO 8-54-24-403500050	6940	6820	7220	7420	7180	7200	6920	6310	7210	7810	8810
28	2	12	Stur	N OF 195 AVE IN NAMAO 8-54-24-403500050	6670	6550	6910	7090	6700	6720	6460	5900	6740	7390	8330
28	2	12	Stur	S OF STURGEON VALLEY RD 20-54-24-408050000	6710	6590	6980	7160	7060	7080	6760	6160	7120	7210	8130

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME HISTORY 1995 - 2004

Alberta Infrastructure and Transportation
Program Management Branch
Highway Asset Management Section

Produced: 15-Feb-2005 By CornerStone Solutions Inc.

Hwy	CS	TCS	Muni	From	1995 AADT	1996 AADT	1997 AADT	1998 AADT	1999 AADT	2000 AADT	2001 AADT	2002 AADT	2003 AADT	2004 AADT	2004 ASDT
575	4	8	Knee	W OF 837 NW OF KIRKPATRICK			720	720	830	850	860	820	820	840	970
575	4	12	Knee	E OF 837 NW OF KIRKPATRICK			810	810	970	990	1000	960	1040	1060	1230
576	2	4	Strl	E OF 9 AT DRUMHELLER	510	430	430	430	430	430	590	590	550	570	660
576	2	4	Strl	W OF 849 NE OF DRUMHELLER WJ			310	460	460	460	530	530	500	510	590
576	2	6	Strl	E OF 849 NE OF DRUMHELLER WJ			290	520	520	530	530	530	530	530	610
576	2	6	Strl	W OF 849 E OF DRUMHELLER EJ			320	500	510	560	560	560	560	560	650
576	2	8	Strl	E OF 849 E OF DRUMHELLER EJ			300	470	470	460	460	460	490	490	570
576	2	8	Strl	W OF 851 E OF DRUMHELLER WJ			250	380	410	420	420	420	480	480	560
576	2	12	Strl	E OF 851 E OF DRUMHELLER WJ			140	220	50	60	60	60	160	160	190
576	2	12	Strl	W OF 851 N OF LITTLE FISH LAKE EJ			60	120	40	50	50	50	60	60	70
577	2	4	SA#2	E OF 36 NW OF SHEERNESS	70	90	100	40	40	40	40	50	80	80	90
579	2	4	Bigh	E OF 40 W OF WATER VALLEY	20	60	60	60	60	70	40	50	60	60	90
579	2	4	MntV	W OF RGE RD 54 AT WATER VALLEY 22-29-5-500000000						1030	1030	1010	1010	1010	1230
579	2	4	MntV	E OF RGE RD 54 AT WATER VALLEY 22-29-5-500000000						900	900	880	880	880	1070
579	2	4	MntV	W OF 22 S OF CREMONA	850	720	930	990	1030	1030	1030	990	990	990	1190
580	2	4	MntV	E OF 22 NW OF CREMONA	2380	2330	2530	2690	2870	2870	2830	2830	2740	2740	3330
580	2	6	MntV	W OF 766 SE OF WESTCOTT			950	920	980	1020	1020	1020	940	940	1080
580	2	8	MntV	E OF 766 SE OF WESTCOTT			920	890	980	1010	1010	1010	980	980	1130
580	2	8	MntV	W OF 580 S OF CARSTAIRS			1110	960	1190	1300	1310	1330	1290	1300	1420
580	2	12	MntV	E OF 580 S OF CARSTAIRS			710	610	840	920	950	1140	1170	1200	1310
580	2	12	MntV	W OF 2A S OF CARSTAIRS	640	640	700	600	840	920	960	1170	1200	1220	1330
580	4	4	MntV	N OF 580 S OF CARSTAIRS			820	690	720	790	800	850	870	840	920
580	4	4	MntV	W OF 2A & 581 AT CARSTAIRS	3270	3270	3540	2680	4230	4620	4810	2850	2900	2940	3210
581	2	4	MntV	E OF 2A & 580 AT CARSTAIRS	2550	2550	2770	2180	3310	3620	3780	2030	2050	2070	2260
581	2	4	MntV	W OF 2 E OF CARSTAIRS	1480	1540	1660	1140	1200	1200	1260	1250	1250	1250	1430
581	2	8	MntV	E OF 2 E OF CARSTAIRS	970	990	1090	690	720	720	740	990	990	990	1130
581	2	8	MntV	W OF 791 E OF CARSTAIRS			550	360	400	400	430	430	430	430	490
582	2	4	MntV	E OF 22 E OF ELKTON	130	120	120	120	120	360	360	360	360	550	670
582	2	4	MntV	N OF LOCAL RD 13-31-4-500000000				500	500	560	560	560	570	570	690
582	2	4	MntV	E OF LOCAL RD 13-31-4-500000000				510	500	640	570	570	590	590	720
582	2	4	MntV	W OF RGE RD 35 18-31-3-500000000			460	480	480	560	640	640	640	620	750
582	2	4	MntV	E OF RGE RD 35 18-31-3-500000000			780	800	800	820	800	760	800	820	1000
582	2	4	Mtnv	W OF 766 N OF WESTCOTT WJ			780	800	820	680	680	720	870	890	1080
582	2	8	Mtnv	E OF 766 N OF WESTCOTT WJ			870	890	910	740	740	740	930	950	1160
582	2	8	MntV	W OF 766 NE OF WESTCOTT EJ			880	900	920	790	790	790	940	960	1170
582	2	12	MntV	E OF 766 NE OF WESTCOTT EJ			910	930	960	820	820	820	960	980	1190
582	2	16	MntV	W OF 2A E OF DIDSBURY	3160	3060	3190	3270	3350	3670	3050	3020	3130	3220	3380
582	2	20	MntV	E OF 2A E OF DIDSBURY	1460	1560	1580	1610	1640	1810	1590	1570	1600	1640	1720
582	2	20	MntV	W OF 2 E OF DIDSBURY	1950	2320	2520	2610	2660	2780	2730	3000	3020	3070	3220
582	4	4	MntV	E OF 2 E OF DIDSBURY	750	910	1000	1110	1130	1170	1160	1140	1140	1140	1300
582	4	4	MntV	W OF 791 NE OF NEAPOLIS			370	370	390	390	410	410	410	470	540

Part of Bylaw No. LU 26/06
Adopted August 9, 2006

Mountain View
COUNTY

MEMORANDUM

TO: Allison Williams
Senior Planner

FROM: Jayson Nelson
Senior Constable

DATE: April 1, 2005

RE: **Traffic Count – Bergen Road @ Olds/Didsbury Airport**

As per your request, traffic was counted on following roads:

Bergen Road (TR 320) west of Hwy 2A @ OD Airport

Count between March 21st and 30th, 2005

avg km/h	85th	ttl veh	com veh	pass veh	12 hour avg
82	**99**	**2026**	**u/k**	**u/k**	**176**

Notes:

- 12 hour counts are conducted from 07:00 hrs to 19:00 hrs.
- Counts were conducted by automated traffic classifier.
- More in-depth details relating to hourly volumes and directions of travel are also available.

P.O. Bag 100, 1601-15 Avenue, Didsbury AB T0M 0W0 • T (403) 335-3311 • Toll Free 1 (877) 264-9754 • F (403) 335-9207
E mvadmin@mountainviewcounty.com • www.mountainviewcounty.com

MEMORANDUM

TO: John Russling
Planning Dept.

FROM: Jayson Nelson
Senior Constable

DATE: April 15, 2003

RE: **Traffic Count – Bergen Road @ Olds/Didsbury Airport**

As per your request, traffic was counted on following roads:

Bergen Road west of Hwy 2A @ OD Airport
48 Hour Count, from Jan 29th, 2003 to 11:00 hrs on Jan 31, 2003

Limit	avg km/h	85th	ttl veh	com veh	pass veh	Hrly Avg
90 Km/h	71.8	86	527	1	526	11

Bergen Road west of Hwy 2A @ OD Airport
12 Hour Count, on Jan 30th, 2003

Limit	avg km/h	85th	ttl veh	com veh	pass veh	Hrly Avg
90 Km/h	69.8	86	251	0	251	21

Average Hourly Count Comparisons:

- Rge Rd 5-00 north of SH 579: **4.9 veh/hr**
- Rge Rd 2-00 @ Latimers: **17 veh/hr**
- Eagle Hill Rd (Twp Rd 34-00) East of Rge Rd 2-05: **14.25 veh/hr**
- Bergathal Rd (Twp Rd 31-00) @ Rge Rd 28-05: **17.75 veh/hr**
- Rge Rd 4-04 north of Hwy 27: **39 veh/hr**

Notes:

- 12 hour counts are conducted from 07:00 hrs to 19:00 hrs.
- Counts were conducted by laser traffic classifier.
- Commercial Vehicles (com veh) are vehicles detected as more than 6 meters long and may include school busses and recreational vehicles
- More in-depth details relating to hourly volumes and directions of travel are also available.

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME, VEHICLE CLASSIFICATION, TRAVEL and ESAL STATISTICS REPORT
2004

Alberta Infrastructure and Transportation
Program Management Branch
Highway Asset Management Section

Produced: 15-Feb-2005 By CornerStone Solutions Inc. Updated 08-Mar-2005 By P. Kilburn P.Eng.

Hwy		CS	TCS	Muni	From	To	Length	Volume		Classifications						Travel MVKM		ESAL / Day / Dir		
							In Km	WAADT	WASDT	%PV	%RV	%BU	%SU	%TT	%CM	Annual	Summer	SU	TC	Total
2	A	10	04	Rkyv	W OF 2 & 72 E OF CROSSFIELD	S OF 574 AT CROSSFIELD	6.344	3530	3850	84.7	2.0	0.5	5.8	7.0	13.3	8.2	3.7	90.2	256.1	346.3
2	A	10	08	Rkyv	N OF 574 AT CROSSFIELD	S OF 2 AT ACME ROAD	4.936	2130	2330	83.0	2.6	0.6	7.9	5.9	14.4	3.8	1.8	74.1	130.3	204.4
2	A	10			W OF 2 & 72 E OF CROSSFIELD	S OF 2 AT ACME ROAD	11.280	2917	3185	84.2	2.2	0.5	6.5	6.6	13.6	12.0	5.5	83.5	199.5	283.0
2	A	12	04	MntV	N OF 2 AT ACME ROAD	S OF 580 S OF CARSTAIRS	7.689	3520	3810	89.8	1.8	0.4	3.6	4.5	8.4	9.9	4.5	54.3	164.2	218.5
2	A	12	08	MntV	N OF 580 S OF CARSTAIRS	S OF 581 AT CARSTAIRS	4.198	2850	3110	88.5	2.4	0.5	4.4	4.2	9.1	4.4	2.0	55.2	124.1	179.3
2	A	12	12	MntV	N OF 581 AT CARSTAIRS	CARSTAIRS N.C.L.	1.150	2620	2750	84.6	2.8	0.7	7.8	4.1	12.6	1.1	0.5	86.6	107.1	193.7
2	A	12	16	MntV	CARSTAIRS N.C.L.	S OF 582 E OF DIDSBURY	9.518	1850	2020	85.2	3.2	0.4	6.6	4.6	11.6	6.4	2.9	53.8	88.2	142.0
2	A	12			N OF 2 AT ACME ROAD	S OF 582 E OF DIDSBURY	22.555	2640	2870	88.0	2.4	0.4	4.8	4.4	9.5	21.8	9.9	55.8	120.4	176.2
2	A	14	04	MntV	N OF 582 E OF DIDSBURY	OLDS S.C.L.	12.112	3240	3400	90.6	1.8	0.7	3.9	3.1	7.5	14.4	6.3	54.2	104.1	158.3
2	A	14	08	MntV	OLDS S.C.L.	S OF 27 AT OLDS	2.338	4320	4530	89.7	2.7	0.4	4.4	2.8	7.5	3.7	1.6	83.7	125.4	209.1
2	A	14	12	MntV	N OF 27 AT OLDS	OLDS N.C.L.	0.810	4290	4500	85.0	3.6	0.4	7.6	3.4	11.4	1.3	0.6	143.6	151.2	294.8
2	A	14	16	MntV	OLDS N.C.L.	S OF 2A S OF BOWDEN	13.201	2390	2510	91.5	1.7	0.6	2.7	3.5	6.8	11.5	5.1	28.4	86.7	115.1
2	A	14	18	RdDr	W OF 2A S OF BOWDEN	W OF 2 & 597 E OF BOWDEN	4.608	2220	2330	84.4	3.8	1.4	5.1	5.3	11.8	3.7	1.8	49.9	122.0	171.9
2	A	14			N OF 582 E OF DIDSBURY	W OF 2 & 597 E OF BOWDEN	33.069	2861	3002	90.0	2.1	0.7	3.8	3.4	7.9	34.6	15.2	47.9	100.8	148.7
2	A	16	04	RdDr	W OF 2 AT INNISFAIL	S OF 54 AT INNISFAIL	2.436	3050	3280	89.7	2.5	0.3	3.5	4.2	8.0	2.7	1.2	47.0	132.8	179.8
2	A	16	08	RdDr	N OF 54 AT INNISFAIL	S OF 42 & 592 N OF PENHOLD	13.798	3680	3950	90.9	1.2	0.4	4.2	3.3	7.9	18.4	8.3	68.1	125.9	194.0
2	A	16	12	RdDr	N OF 42 & 592 N OF PENHOLD	RED DEER S.C.L.	10.096	5620	6030	95.7	0.9	0.5	2.1	0.8	3.4	20.6	9.2	52.0	46.6	98.6
2	A	16			W OF 2 AT INNISFAIL	RED DEER S.C.L.	26.330	4366	4686	93.3	1.1	0.4	3.1	2.1	5.6	41.7	18.7	59.6	95.0	154.6
2	A	18	16	RdDr	RED DEER N.C.L.	S OF 597 S OF BLACKFALDS	6.366	11620	12280	89.6	1.0	0.3	5.4	3.7	9.4	27.1	12.0	276.4	445.6	722.0
2	A	18	20	Laco	N OF 597 S OF BLACKFALDS	S OF 12 AT LACOMBE	12.342	6920	7330	92.4	1.0	0.4	3.8	2.4	6.6	31.3	13.9	115.8	172.1	287.9
2	A	18			RED DEER N.C.L.	S OF 12 AT LACOMBE	18.708	8519	9014	91.1	1.0	0.4	4.5	3.0	7.9	58.4	25.8	168.9	264.9	433.8
2	A	20	04	Laco	N OF 12 AT LACOMBE	E OF 2 NE OF LACOMBE	6.567	5270	5710	91.8	1.4	0.4	3.9	2.5	6.8	12.6	5.7	90.5	136.6	227.1
2	A	20			N OF 12 AT LACOMBE	E OF 2 NE OF LACOMBE	6.567	5270	5710	91.8	1.4	0.4	3.9	2.5	6.8	12.6	5.7	90.5	136.6	227.1
2	A	22	04	Laco	E OF 2 SW OF MORNINGSIDE	S OF 604 N OF MORNINGSIDE	3.387	4120	4530	88.3	3.0	0.4	3.1	5.2	8.7	5.1	2.3	56.3	222.1	278.4
2	A	22	08	Pnka	N OF 604 N OF MORNINGSIDE	PONOKA S.C.L.	10.299	4570	5040	87.5	2.5	0.4	4.3	5.2	9.9	17.2	8.0	86.6	246.3	332.9
2	A	22	12	Pnka	PONOKA S.C.L.	S OF 53 AT PONOKA	0.913	9260	9980	89.4	1.9	1.0	4.6	3.1	8.7	3.1	1.4	197.6	297.5	495.1
2	A	22			E OF 2 SW OF MORNINGSIDE	S OF 53 AT PONOKA	14.599	4759	5231	87.9	2.6	0.5	4.1	4.9	9.5	25.5	11.7	85.9	241.7	327.6
2	A	24	04	Pnka	N OF 53 AT PONOKA	PONOKA N.C.L.	2.640	5860	6310	87.8	2.3	1.2	4.7	4.0	9.9	5.7	2.5	121.3	243.0	364.3
2	A	24	08	Pnka	PONOKA N.C.L.	S OF 611 AT HOBBEMA SJ	16.489	2890	3110	86.1	3.2	1.3	4.3	5.1	10.7	17.4	7.8	54.7	152.8	207.5
2	A	24	10	Pnka	N OF 611 AT HOBBEMA SJ	S OF 611 N OF HOBBEMA NJ	2.823	5550	5980	93.0	0.9	1.3	2.5	2.3	6.1	5.7	2.6	51.1	132.3	193.4
2	A	24	12	Weta	N OF 611 N OF HOBBEMA NJ	WETASKIWIN S.C.L.	12.547	5030	5420	90.9	1.9	0.9	3.1	3.2	7.2	23.1	10.4	68.7	166.8	235.5
2	A	24			N OF 53 AT PONOKA	WETASKIWIN S.C.L.	34.499	4113	4430	89.2	2.3	1.1	3.6	3.8	8.5	51.9	23.4	65.2	162.0	227.2
2	A	26	04	Weta	WETASKIWIN N.C.L.	S OF 13 N OF WETASKIWIN NJ	0.815	7510	7900	90.6	1.9	0.4	2.6	4.5	7.5	2.2	1.0	66.0	350.3	436.3
2	A	26	08	Weta	N OF 13 N OF WETASKIWIN NJ	S OF 616 AT MILLET SJ	12.446	6800	7150	90.7	2.3	0.4	3.6	3.0	7.0	31.0	13.8	107.8	211.4	319.2
2	A	26	12	Ledc	N OF 616 N AT MILLET SJ	S OF 616 N OF MILLET NJ	5.710	6360	6680	88.6	1.4	0.5	4.1	5.4	10.0	13.3	5.8	114.9	356.0	470.9
2	A	26	16	Ledc	N OF 616 N OF MILLET NJ	LEDUC S.C.L.	11.402	6580	6890	89.6	2.2	0.6	3.7	3.9	8.2	27.5	12.0	107.2	266.0	373.2
2	A	26			WETASKIWIN N.C.L.	LEDUC S.C.L.	30.373	6654	6984	89.9	2.1	0.5	3.7	3.8	8.0	74.0	32.5	108.5	262.1	370.6
2	A	36	04	Peac	S OF 2 W OF PEACE RIVER	E OF 2 AT GRIMSHAW	11.656	1300	1460	95.4	0.4	0.9	2.0	1.3	4.2	5.5	2.6	11.5	17.5	29.0
2	A	36			S OF 2 W OF PEACE RIVER	E OF 2 AT GRIMSHAW	11.656	1300	1460	95.4	0.4	0.9	2.0	1.3	4.2	5.5	2.6	11.5	17.5	29.0
2	A	44	04	Less	E OF 2 S OF HONDO	SMITH	14.707	470	500	90.0	4.5	0.0	3.3	2.2	5.5	2.5	1.1	6.8	10.7	17.5

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME, VEHICLE CLASSIFICATION, TRAVEL and ESAL STATISTICS REPORT
2004

Alberta Infrastructure and Transportation
Program Management Branch
Highway Asset Management Section

Produced: 15-Feb-2005 By CornerStone Solutions Inc. Updated 08-Mar-2005 By P. Kilburn P.Eng.

Hwy	CS	TCS	Muni	From	To	Length In Km	Volume WAADT	Volume WASDT	Classifications %PV	%RV	%BU	%SU	%TT	%CM	Travel MVKM Annual	Travel MVKM Summer	ESAL / Day / Dir SU	ESAL / Day / Dir TC	ESAL / Day / Dir Total
25				**N OF 3 AT LETHBRIDGE**	**S OF 526 & 847 SW OF ENCHANT**	**72.163**	**1601**	**1761**	**83.7**	**1.1**	**0.7**	**6.8**	**7.7**	**15.2**	**42.3**	**19.7**	**48.0**	**127.8**	**175.8**
26	10	04	Camr	CAMROSE E.C.L.	W OF 834 E OF CAMROSE	10.579	2590	2660	85.0	3.3	0.3	4.9	8.5	11.7	10.0	4.6	55.9	174.5	230.4
26	10	08	Camr	E OF 834 E OF CAMROSE	W OF 854 E OF CAMROSE	13.019	1800	1980	78.8	6.2	0.1	4.9	9.0	14.0	8.6	3.9	38.9	167.9	205.8
26	10	12	Camr	E OF 854 E OF CAMROSE	W OF 855 S OF HOLDEN	12.945	1420	1570	80.3	9.7	0.1	2.6	7.3	10.0	6.7	3.1	16.3	107.4	123.7
26	10			CAMROSE E.C.L.	W OF 855 S OF HOLDEN	36.543	1894	2090	81.9	6.0	0.2	4.3	7.6	12.1	25.3	11.7	35.9	149.2	185.1
26	12	04	Beav	E OF 855 S OF HOLDEN	W OF 36 SW OF VIKING	27.349	1200	1380	78.0	6.8	0.2	6.6	8.4	15.2	12.0	5.8	34.9	104.5	139.4
26	12			E OF 855 S OF HOLDEN	W OF 36 SW OF VIKING	27.349	1200	1380	78.0	6.8	0.2	6.6	8.4	15.2	12.0	5.8	34.9	104.5	139.4
26				**CAMROSE E.C.L.**	**W OF 36 SW OF VIKING**	**63.891**	**1597**	**1786**	**80.6**	**6.3**	**0.2**	**5.0**	**7.9**	**13.1**	**37.3**	**17.5**	**35.2**	**130.8**	**166.0**
27	06	02	MntV	E OF 22 AT SUNDRE	W OF 760 E OF SUNDRE	2.280	8020	9220	88.4	2.7	0.4	4.1	4.4	6.9	6.7	3.2	144.8	365.8	510.6
27	06	04	MntV	E OF 760 E OF SUNDRE	W OF 22 N OF WESTWARD HO EJ	10.204	5150	5920	82.3	6.1	0.4	5.1	6.1	11.6	19.2	9.2	115.7	325.6	441.3
27	06	08	MntV	E OF 22 N OF WESTWARD HO EJ	W OF 766 W OF OLDS	10.854	3280	3770	78.4	6.9	0.4	4.8	9.5	14.7	13.0	6.3	69.4	323.0	392.4
27	06	12	MntV	E OF 766 W OF OLDS	OLDS W.C.L.	13.147	3670	4220	80.7	3.5	0.3	4.5	11.0	15.8	17.7	8.5	72.7	418.4	491.1
27	06	16	MntV	OLDS W.C.L.	W OF 2A AT OLDS	3.239	9440	9910	88.5	2.9	0.3	4.0	4.0	8.3	11.2	4.9	166.3	391.4	557.7
27	06	20	MntV	E OF 2A AT OLDS	W OF 2 E OF OLDS	4.899	6940	7280	81.2	4.2	0.8	5.1	8.7	14.6	12.4	5.5	155.9	625.8	781.7
27	06			E OF 22 AT SUNDRE	W OF 2 E OF OLDS	44.623	4914	5504	82.6	4.6	0.4	4.7	7.7	12.8	80.3	37.6	101.7	392.2	493.9
27	08	04	MntV	E OF 2 E OF OLDS	W OF 791 W OF TORRINGTON	15.017	1970	2250	76.3	6.0	0.8	5.9	9.0	15.7	10.8	5.2	51.2	183.8	235.0
27	08	08	MntV	E OF 791 W OF TORRINGTON	W OF 805 AT TORRINGTON	14.667	1110	1280	75.4	7.4	0.1	6.1	11.0	17.2	6.0	2.9	29.8	126.6	156.4
27	08	12	Knee	E OF 805 AT TORRINGTON	W OF 21 S OF TROCHU NJ	24.438	820	930	71.1	7.2	0.3	6.5	14.9	21.7	7.3	3.5	23.5	126.6	150.1
27	08			E OF 2 E OF OLDS	W OF 21 S OF TROCHU NJ	54.122	1216	1391	75.4	6.7	0.5	6.1	11.3	17.9	24.1	11.5	32.7	142.7	175.4
27	10	04	Knee	E OF 21 & 582 S OF THREE HILLS SJ	W OF 838 S OF GHOST PINE CREEK	11.431	1810	2070	77.0	7.9	0.3	4.8	10.0	15.1	7.6	3.6	38.3	187.6	225.9
27	10	08	Knee	E OF 838 S OF GHOST PINE CREEK	W OF 837 NW OF NACMINE	8.514	1670	1910	76.4	8.0	0.1	4.6	10.9	15.6	4.0	1.9	33.8	188.7	222.6
27	10	12	Knee	E OF 837 NW OF NACMINE	W OF 839 SW OF MORRIN	10.853	1490	1700	78.7	8.5	0.0	5.3	9.5	14.8	5.9	2.8	34.8	146.7	181.5
27	10	16	Strl	E OF 839 SW OF MORRIN	W OF 9 & 56 SE OF MORRIN	8.158	1730	1970	77.9	4.9	0.3	5.4	11.5	17.2	5.2	2.5	41.2	206.2	247.4
27	10			E OF 21 & 582 S OF THREE HILLS SJ	W OF 9 & 56 SE OF MORRIN	36.956	1674	1911	77.0	7.4	0.2	5.0	10.4	15.6	22.6	10.8	36.9	180.5	217.4
27				**E OF 22 AT SUNDRE**	**W OF 9 & 56 SE OF MORRIN**	**135.701**	**2558**	**2885**	**80.2**	**5.5**	**0.4**	**5.0**	**8.9**	**14.3**	**127.0**	**59.9**	**56.3**	**236.0**	**292.3**
28	02	08	Stur	EDMONTON N.C.L.	S OF 28A S OF LANCASTER PARK	0.530	13580	15320	94.6	0.4	0.5	3.0	1.5	5.0	2.6	1.2	178.5	211.1	389.6
28	02	12	Stur	N OF 28A S OF LANCASTER PARK	S OF 37 W OF NAMAO	7.270	7360	8290	92.6	1.7	0.6	2.8	2.3	5.7	19.6	9.2	90.8	175.5	266.3
28	02	16	Stur	N OF 37 W OF NAMAO	S OF 642 N OF EXCELSIOR	10.016	3940	4440	90.2	2.1	0.8	2.6	4.3	7.7	14.4	6.8	45.1	175.6	220.7
28	02	20	Stur	N OF 642 N OF EXCELSIOR	S OF 803 W OF BON ACCORD	2.557	4930	5570	88.9	2.0	0.6	4.7	3.8	9.1	4.8	2.3	102.1	194.2	296.3
28	02	24	Stur	N OF 803 W OF BON ACCORD	W OF 28A N OF GIBBONS	12.502	3690	4160	85.6	2.7	1.0	4.0	6.7	11.7	16.9	8.0	65.0	256.3	321.3
28	02			EDMONTON N.C.L.	W OF 28A N OF GIBBONS	32.985	4634	5449	89.6	2.1	0.8	3.3	4.2	8.3	58.4	27.5	70.3	210.4	280.7
28	04	04	Stur	N OF 28A N OF GIBBONS	W OF 851 E OF REDWATER	13.458	5180	5830	88.4	2.9	0.6	2.4	5.7	8.7	25.5	12.0	54.8	306.0	360.8
28	04	08	Stur	E OF 851 W OF REDWATER	W OF 38 W OF REDWATER	7.582	4930	5560	88.0	3.3	0.6	3.0	5.1	8.7	13.7	6.4	55.1	260.6	325.7
28	04	12	Thor	N OF 38 W OF REDWATER	W OF 827 S OF EGREMONT	8.988	3470	4070	85.0	7.8	0.3	2.2	4.7	7.2	11.4	5.6	33.6	169.0	202.6
28	04	16	Thor	E OF 827 S OF EGREMONT	W OF 63 & 829 S OF RADWAY	6.558	3000	3520	85.0	8.3	0.3	2.0	4.4	6.7	7.3	3.6	26.4	136.8	163.2
28	04			N OF 28A N OF GIBBONS	W OF 63 & 829 S OF RADWAY	38.696	4313	4923	87.2	4.6	0.5	2.5	5.2	8.2	57.9	27.6	47.5	232.5	280.0
28	06	04	Thor	E OF 63 & 829 SW OF RADWAY	W OF 831 N OF WASKATENAU	16.616	2230	2590	85.9	6.0	0.3	2.9	4.9	8.1	13.6	6.6	28.5	113.3	141.8
28	06	08	SmkL	E OF 831 N OF WASKATENAU	NORTH OF WARSPITE	11.491	3050	3510	83.0	5.7	0.1	3.6	7.6	11.3	12.9	6.2	48.5	241.0	289.5
28	06			E OF 63 & 829 SW OF RADWAY	NORTH OF WARSPITE	28.107	2569	2968	84.5	5.9	0.2	3.2	6.2	9.6	26.4	12.8	36.2	165.1	201.3

Part of Bylaw No. LU 26/06
Adopted August 9, 2006

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME, VEHICLE CLASSIFICATION, TRAVEL and ESAL STATISTICS REPORT
2004

Alberta Infrastructure and Transportation
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Hwy	CS	TCS	Muni	From	To	Length	Volume		Classifications						Travel MVKM		ESAL / Day / Dir		
						In Km	WAADT	WASDT	%PV	%RV	%BU	%SU	%TT	%CM	Annual	Summer	SU	TC	Total
575	02	04	Knee	E OF 791 N OF KERSEY	W OF 806 NW OF ACME WJ	21.184	590	680	80.9	1.1	0.4	8.6	9.0	18.0	4.6	2.2	22.4	55.0	77.4
575	02	08	Knee	E OF 806 NW OF ACME WJ	W OF 806 N OF ACME EJ	1.221	1210	1380	80.2	2.0	0.2	7.7	9.9	17.8	0.5	0.3	41.0	124.2	165.2
575	02	12	Knee	E OF 806 N OF ACME EJ	W OF 21 NW OF CARBON	18.560	860	990	79.2	3.2	0.7	6.2	10.7	17.6	5.8	2.8	23.5	95.4	118.9
575	02			E OF 791 N OF KERSEY	W OF 21 NW OF CARBON	40.965	731	841	80.0	2.3	0.5	7.3	9.9	17.7	11.0	5.3	23.5	75.0	98.5
575	04	04	Knee	E OF 21 NW OF CARBON	W OF 836 N OF SHARPLES	12.469	970	1130	82.1	2.1	0.7	8.3	6.8	15.8	4.1	2.0	35.5	68.4	103.9
575	04	08	Knee	E OF 836 N OF SHARPLES	W OF 837 NW OF KIRKPATRICK	15.469	860	1020	83.4	2.8	0.1	8.4	7.3	13.8	4.6	2.3	24.8	66.6	91.4
575	04	12	Knee	E OF 837 NW OF KIRKPATRICK	DRUMHELLER WEST BOUNDARY	10.764	1050	1230	85.1	2.6	0.1	7.2	5.0	12.3	3.9	1.9	33.6	54.9	88.5
575	04			E OF 21 NW OF CARBON	DRUMHELLER WEST BOUNDARY	38.702	959	1114	83.5	2.5	0.3	7.3	6.4	14.0	12.7	6.2	30.8	63.6	94.4
575				**E OF 791 N OF KERSEY**	**DRUMHELLER WEST BOUNDARY**	**79.667**	**836**	**969**	**81.9**	**2.4**	**0.4**	**7.3**	**8.0**	**15.7**	**23.6**	**11.4**	**26.9**	**69.5**	**96.4**
576	02	04	Strl	E OF 9 N OF DRUMHELLER	W OF 849 NE OF DRUMHELLER WJ	12.574	540	630	72.3	1.5	1.3	10.4	14.5	26.2	2.5	1.2	24.7	81.2	105.9
576	02	08	Strl	E OF 849 NE OF DRUMHELLER WJ	W OF 849 E OF DRUMHELLER EJ	1.633	550	630	70.9	2.5	1.0	7.7	17.9	26.6	0.3	0.2	18.7	102.0	120.7
576	02	08	Strl	E OF 849 E OF DRUMHELLER EJ	W OF 851 E OF DRUMHELLER WJ	14.840	490	570	70.2	3.3	0.5	7.7	18.3	26.5	2.7	1.3	16.6	92.9	109.5
576	02	12	Strl	E OF 851 E OF DRUMHELLER WJ	W OF 851 N OF LTL FISH LK EJ	7.943	110	130	68.4	2.2	2.8	14.4	12.2	29.4	0.3	0.2	7.0	13.9	20.9
576	02			E OF 9 N OF DRUMHELLER	W OF 851 N OF LTL FISH LK EJ	36.990	426	499	71.1	2.4	1.0	9.2	16.3	26.5	5.8	2.8	17.3	72.3	89.6
576				**E OF 9 N OF DRUMHELLER**	**W OF 851 N OF LTL FISH LK EJ**	**36.990**	**426**	**499**	**71.1**	**2.4**	**1.0**	**9.2**	**16.3**	**26.5**	**5.8**	**2.8**	**17.3**	**72.3**	**89.6**
577	02	04	SA#2	E OF 36 NW OF SHEERNESS	SHEERNESS	10.208	80	90	82.4	0.0	0.0	15.8	1.8	17.6	0.3	0.1	5.6	1.5	7.1
577	02			E OF 36 NW OF SHEERNESS	SHEERNESS	10.208	80	90	82.4	0.0	0.0	15.8	1.8	17.6	0.3	0.1	5.6	1.5	7.1
577				**E OF 36 NW OF SHEERNESS**	**SHEERNESS**	**10.208**	**80**	**90**	**82.4**	**0.0**	**0.0**	**15.8**	**1.8**	**17.6**	**0.3**	**0.1**	**5.6**	**1.5**	**7.1**
579	02	04	Bgh	E OF HIGHWAY 40	W OF 22 S OF CREMONA	49.070	600	730	84.0	6.4	2.3	5.1	2.2	9.6	10.8	5.5	13.5	13.7	27.2
579	02			E OF HIGHWAY 40	W OF 22 S OF CREMONA	49.070	600	730	84.0	6.4	2.3	5.1	2.2	9.6	10.8	5.5	13.5	13.7	27.2
579				**E OF HIGHWAY 40**	**W OF 22 S OF CREMONA**	**49.070**	**600**	**730**	**84.0**	**6.4**	**2.3**	**5.1**	**2.2**	**9.6**	**10.8**	**5.5**	**13.5**	**13.7**	**27.2**
580	02	04	MntV	E OF 22 NW OF CREMONA	E.C.L. OF CREMONA	0.430	2740	3330	86.6	2.2	2.5	5.4	3.3	11.2	0.4	0.2	65.2	93.7	158.9
580	02	08	MntV	E.C.L. OF CREMONA	W OF 766 SE OF WESCOTT	13.129	940	1080	82.5	5.6	0.5	6.6	4.8	11.9	4.5	2.2	27.3	46.8	74.1
580	02	08	MntV	E OF 766 SE OF WESCOTT	W OF 580 S OF CARSTAIRS	14.624	1140	1280	82.5	3.6	0.5	6.3	7.1	13.9	6.1	2.9	31.6	83.9	115.5
580	02	12	MntV	E OF 580 S OF CARSTAIRS	W OF 2A S OF CARSTAIRS	1.494	1210	1320	78.8	2.5	0.5	6.5	11.6	18.7	0.7	0.3	35.2	145.5	180.7
580	02			E OF 22 NW OF CREMONA	W OF 2A S OF CARSTAIRS	29.677	1078	1223	82.4	4.3	0.6	6.4	6.3	13.3	11.7	5.6	30.4	70.4	100.8
580	04	04	MntV	N OF 580:02 W OF CRUMP	JUNCTION HWY 2A AT CARSTAIRS	3.369	1890	2070	93.0	1.6	0.9	3.4	1.1	5.4	2.3	1.1	28.3	21.5	49.8
580	04			N OF 580:02 W OF CRUMP	JUNCTION HWY 2A AT CARSTAIRS	3.369	1890	2070	93.0	1.6	0.9	3.4	1.1	5.4	2.3	1.1	28.3	21.5	49.8
580				**E OF 22 NW OF CREMONA**	**JUNCTION HWY 2A AT CARSTAIRS**	**33.046**	**1161**	**1309**	**84.2**	**3.9**	**0.6**	**5.9**	**5.4**	**11.9**	**14.0**	**6.6**	**30.2**	**65.0**	**95.2**
581	02	04	MntV	E OF 2A AT CARSTAIRS	W OF 2 E OF CARSTAIRS	4.858	1660	1850	82.2	4.0	1.6	5.8	6.4	13.8	3.0	1.4	42.4	110.1	152.5
581	02	08	MntV	E OF 2 E OF CARSTAIRS	W OF 791 E OF CARSTAIRS	13.825	730	810	76.5	4.3	0.8	9.0	9.4	19.2	3.6	1.7	28.1	69.2	97.3
581	02			E OF 2A AT CARSTAIRS	W OF 791 E OF CARSTAIRS	18.693	957	1081	79.0	4.2	1.2	7.6	8.0	16.8	6.6	3.1	32.0	79.4	111.4
581				**E OF 2A AT CARSTAIRS**	**W OF 791 E OF CARSTAIRS**	**18.693**	**957**	**1081**	**79.0**	**4.2**	**1.2**	**7.6**	**8.0**	**16.8**	**6.6**	**3.1**	**32.0**	**79.4**	**111.4**
582	02	04	MntV	E OF 22 E OF ELKTON	W OF 766 N OF WESCOTT WJ	13.087	680	820	76.9	4.0	0.8	9.0	9.3	19.1	3.3	1.6	27.0	65.5	92.5
582	02	08	Mtnv	E OF 766 N OF WESCOTT WJ	W OF 766 NE OF WESCOTT EJ	1.626	960	1170	70.5	3.4	0.9	15.2	10.0	26.1	0.6	0.3	64.3	99.5	163.8
582	02	12	MntV	E OF 766 NE OF WESCOTT EJ	W.C.L. OF DIDSBURY	10.307	980	1190	67.2	2.1	1.5	17.5	11.7	30.7	3.7	1.9	75.5	118.8	194.3
582	02	16	MntV	W.C.L. OF DIDSBURY	W OF 2A E OF DIDSBURY	4.614	3220	3380	89.8	2.0	0.5	4.8	3.1	8.4	5.4	2.4	68.1	103.6	171.8

Part of Bylaw No. LU 26/06
Adopted August 9, 2006

ALBERTA HIGHWAYS 1 TO 986
TRAFFIC VOLUME, VEHICLE CLASSIFICATION, TRAVEL and ESAL STATISTICS REPORT
2004

Alberta Infrastructure and Transportation
Program Management Branch
Highway Asset Management Section

Produced: 15-Feb-2005 By CornerStone Solutions Inc. Updated 08-Mar-2005 By P. Kilburn P.Eng.

Hwy	CS	TCS	Muni	From	To	Length	Volume		Classifications						Travel MVKM		ESAL / Day / Dir		
						In Km	WAADT	WASDT	%PV	%RV	%BU	%SU	%TT	%CM	Annual	Summer	SU	TC	Total
582	02	20	MntV	E OF 2A E OF DIDSBURY	W OF 2 E OF DIDSBURY	4.697	2360	2470	84.2	2.8	0.9	8.6	5.5	13.0	4.0	1.8	68.6	134.5	203.1
582	02			E OF 22 E OF ELKTON	W OF 2 E OF DIDSBURY	34.321	1354	1517	80.4	2.6	0.9	9.1	7.0	17.0	17.0	8.0	54.3	98.2	152.5
582	04	04	MntV	E OF 2 E OF DIDSBURY	W OF 791 NE OF NEAPOLIS	15.049	810	920	82.3	3.3	1.9	7.6	4.9	14.4	4.5	2.1	27.1	41.1	68.2
582	04	08	Knee	E OF 791 NE OF NEAPOLIS	W OF 806 E OF SUNNYSLOPE	22.942	380	440	83.7	3.0	1.0	7.4	4.9	13.3	3.2	1.5	12.4	19.3	31.7
582	04	12	Knee	E OF 806 E OF SUNNYSLOPE	W OF 21 & 27 S OF THREE HILLS	17.895	380	430	77.2	3.7	1.4	11.5	6.2	19.1	2.5	1.2	19.2	24.4	43.6
582	04			E OF 2 E OF DIDSBURY	W OF 21 & 27 S OF THREE HILLS	55.886	496	566	81.5	3.3	1.5	8.6	5.2	15.2	10.1	4.9	18.6	26.7	45.3
582				**E OF 22 E OF ELKTON**	**W OF 21 & 27 S OF THREE HILLS**	**90.207**	**822**	**928**	**80.8**	**2.9**	**1.1**	**8.9**	**6.3**	**16.3**	**27.1**	**12.8**	**32.2**	**53.7**	**85.9**
583	02	04	Knee	E OF 805 AT ALLINGHAM	W OF 806 NE OF SUNNYSLOPE	6.600	540	610	81.5	0.4	1.6	9.5	7.0	18.1	1.3	0.6	22.8	39.2	61.8
583	02	08	Knee	E OF 806 NE OF SUNNYSLOPE	W OF 21 E OF THREE HILLS	17.950	2120	2430	86.9	3.1	0.5	5.4	4.1	10.0	13.9	6.7	50.4	90.1	140.5
583	02	12	Knee	E OF 21 E OF THREE HILLS	W OF 836 AT GHOST PINE CR WJ	11.430	350	400	88.7	1.3	1.3	6.8	1.9	10.0	1.5	0.7	10.5	6.9	17.4
583	02	16	Knee	E OF 836 AT GHOST PINE CR WJ	W OF 836 AT GHOST PINE CR EJ	1.551	200	230	72.7	0.2	1.7	23.9	1.5	27.1	0.1	0.1	21.1	3.1	24.2
583	02			E OF 805 AT ALLINGHAM	W OF 836 AT GHOST PINE CR EJ	37.441	1226	1403	86.5	2.7	0.7	6.0	4.1	10.8	16.8	8.0	32.4	52.1	84.5
583				**E OF 805 AT ALLINGHAM**	**W OF 836 AT GHOST PINE CR EJ**	**37.441**	**1226**	**1403**	**86.5**	**2.7**	**0.7**	**6.0**	**4.1**	**10.8**	**16.8**	**8.0**	**32.4**	**52.1**	**84.5**
584	02	04	Clrw	E OF 734 NW OF BEARBERRY	BEARBERRY	17.850	260	330	71.8	8.6	2.5	7.0	10.1	19.6	1.7	0.9	8.0	27.2	35.2
584	02	08	MntV	BEARBERRY	W OF LOCAL RD NE33-32-6-5	15.580	490	590	71.9	3.4	0.7	9.8	14.4	24.7	2.8	1.4	20.7	73.1	93.8
584	02	12	MntV	E OF LOCAL RD NE33-32-6-5	W OF 22 W OF SUNDRE	8.478	2270	2570	77.2	2.9	0.5	8.1	11.3	19.9	7.0	3.3	61.0	285.9	346.9
584	02			E OF 734 NW OF BEARBERRY	W OF 22 W OF SUNDRE	41.908	752	880	75.1	3.9	0.8	8.3	11.9	21.0	11.5	5.6	27.5	92.8	120.3
584				**E OF 734 NW OF BEARBERRY**	**W OF 22 W OF SUNDRE**	**41.908**	**752**	**880**	**75.1**	**3.9**	**0.8**	**8.3**	**11.9**	**21.0**	**11.5**	**5.6**	**27.5**	**92.8**	**120.3**
585	02	04	Knee	E OF 21 AT TROCHU	E.C.L. OF TROCHU	1.150	2550	2920	68.2	0.6	0.1	7.0	4.1	11.2	1.1	0.5	78.6	108.4	187.0
585	02	08	Knee	E.C.L. OF TROCHU	W OF 836 E OF TROCHU	10.120	470	600	78.2	2.3	1.5	9.3	8.7	19.5	1.7	0.9	18.3	42.4	61.7
585	02	12	Strl	E OF 836 E OF TROCHU	W OF 839 N OF RUMSEY	20.160	390	500	84.7	3.6	0.6	7.0	4.1	11.7	2.9	1.5	12.0	16.6	28.6
585	02	16	Strl	E OF 839 N OF RUMSEY	W OF 56 E OF RUMSEY	8.219	280	360	79.5	6.4	0.0	6.7	7.4	14.1	0.8	0.5	8.3	21.5	29.8
585	02			E OF 21 AT TROCHU	W OF 56 E OF RUMSEY	39.659	451	567	82.9	3.1	0.7	7.6	5.7	14.0	6.5	3.4	15.1	26.6	41.7
585				**E OF 21 AT TROCHU**	**W OF 56 E OF RUMSEY**	**39.659**	**451**	**567**	**82.9**	**3.1**	**0.7**	**7.6**	**5.7**	**14.0**	**6.5**	**3.4**	**15.1**	**26.6**	**41.7**
586	01	04	SA#2	E OF 36 AT SPONDIN	W OF 872 E OF SPONDIN	31.323	130	140	85.3	2.1	0.6	4.5	7.6	12.6	1.5	0.7	2.6	10.1	12.7
586	01			E OF 36 AT SPONDIN	W OF 872 E OF SPONDIN	31.323	130	140	85.3	2.1	0.6	4.5	7.6	12.6	1.5	0.7	2.6	10.1	12.7
586	02	04	SA#2	E OF 872 E OF SPONDIN	W OF 884 N OF HAMARUKA	25.087	60	70	92.2	0.0	0.0	5.6	2.2	7.8	0.6	0.3	1.5	1.4	2.9
586	02			E OF 872 E OF SPONDIN	W OF 884 N OF HAMARUKA	25.087	60	70	92.2	0.0	0.0	5.6	2.2	7.8	0.6	0.3	1.5	1.4	2.9
586				**E OF 36 AT SPONDIN**	**W OF 884 N OF HAMARUKA**	**56.410**	**99**	**109**	**87.2**	**1.5**	**0.4**	**4.8**	**6.1**	**11.3**	**2.0**	**0.9**	**2.1**	**6.3**	**8.4**
587	02	04	Clrw	E OF 22 W OF JAMES RIVER BRDG	W OF 766 NE OF EAGLE HILL	21.367	730	820	78.6	7.7	0.4	6.1	7.2	13.7	5.7	2.7	19.6	54.5	74.1
587	02	08	RdDr	E OF 766 NE OF EAGLE HILL	W OF 2A E OF BOWDEN	22.334	810	910	79.4	8.8	0.0	5.6	6.2	11.8	6.6	3.1	20.0	52.1	72.1
587	02			E OF 22 W OF JAMES RIVER BRDG	W OF 2A E OF BOWDEN	43.701	771	866	79.0	8.3	0.2	5.8	6.7	12.7	12.3	5.8	19.7	53.5	73.2
587	03	04	RdDr	E OF 2 E OF BOWDEN	W OF 791 SW OF KNEE HILL VAL N	14.981	460	530	73.4	7.5	2.5	9.1	7.5	19.1	2.5	1.2	18.4	35.8	54.2
587	03			E OF 2 E OF BOWDEN	W OF 791 SW OF KNEE HILL VAL N	14.981	460	530	73.4	7.5	2.5	9.1	7.5	19.1	2.5	1.2	18.4	35.8	54.2
587	04	04	RdDr	E OF 791 SW OF KNEE HL VAL SJ	W OF 805 N OF WIMBORNE	14.960	90	100	68.5	1.8	1.3	17.6	12.8	31.7	0.5	0.2	7.0	11.9	18.9
587	04	08	Knee	E OF 805 N OF WIMBORNE	W OF 21 SW OF HUXLEY	24.070	260	300	77.3	1.7	1.0	9.4	10.6	21.0	2.3	1.1	10.8	28.6	39.4
587	04			E OF 791 SW OF KNEE HL VAL SJ	W OF 21 SW OF HUXLEY	39.030	195	223	75.4	1.7	1.1	10.8	11.0	22.9	2.8	1.3	9.3	22.2	31.5

Part of Bylaw No. LU 26/06
Adopted August 9, 2006

Turning Movement Summary Diagram

Reference No.: 990133

Intersection of:
2A & 27 AT OLDS

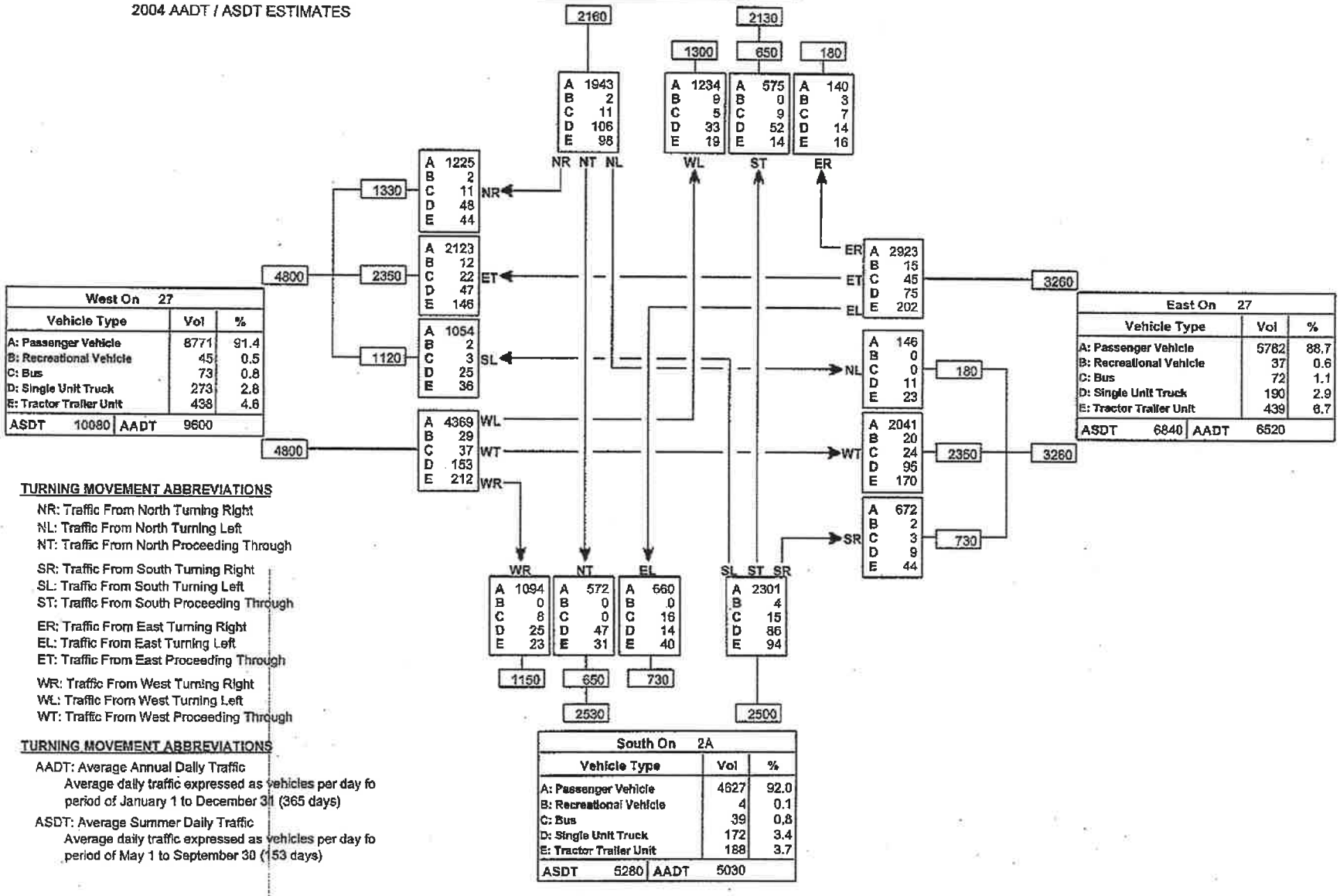
2004 AADT / ASDT ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	3892	90.7
B: Recreational Vehicle	14	0.3
C: Bus	32	0.7
D: Single Unit Truck	205	4.8
E: Tractor Trailer Unit	147	3.4
ASDT 4500	AADT	4280

West On 27		
Vehicle Type	Vol	%
A: Passenger Vehicle	8771	91.4
B: Recreational Vehicle	45	0.5
C: Bus	73	0.8
D: Single Unit Truck	273	2.8
E: Tractor Trailer Unit	438	4.6
ASDT 10080	AADT	9600

East On 27		
Vehicle Type	Vol	%
A: Passenger Vehicle	5782	88.7
B: Recreational Vehicle	37	0.6
C: Bus	72	1.1
D: Single Unit Truck	190	2.9
E: Tractor Trailer Unit	439	6.7
ASDT 6840	AADT	6520

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	4627	92.0
B: Recreational Vehicle	4	0.1
C: Bus	39	0.8
D: Single Unit Truck	172	3.4
E: Tractor Trailer Unit	188	3.7
ASDT 5280	AADT	5030



TURNING MOVEMENT ABBREVIATIONS

NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

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TURNING MOVEMENT ABBREVIATIONS

AADT: Average Annual Daily Traffic
Average daily traffic expressed as vehicles per day fo
period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic
Average daily traffic expressed as vehicles per day fo
period of May 1 to September 30 (153 days)

Turning Movement Summary Diagram

Reference No.: 990133

Intersection of:
2A & 27 AT OLDS

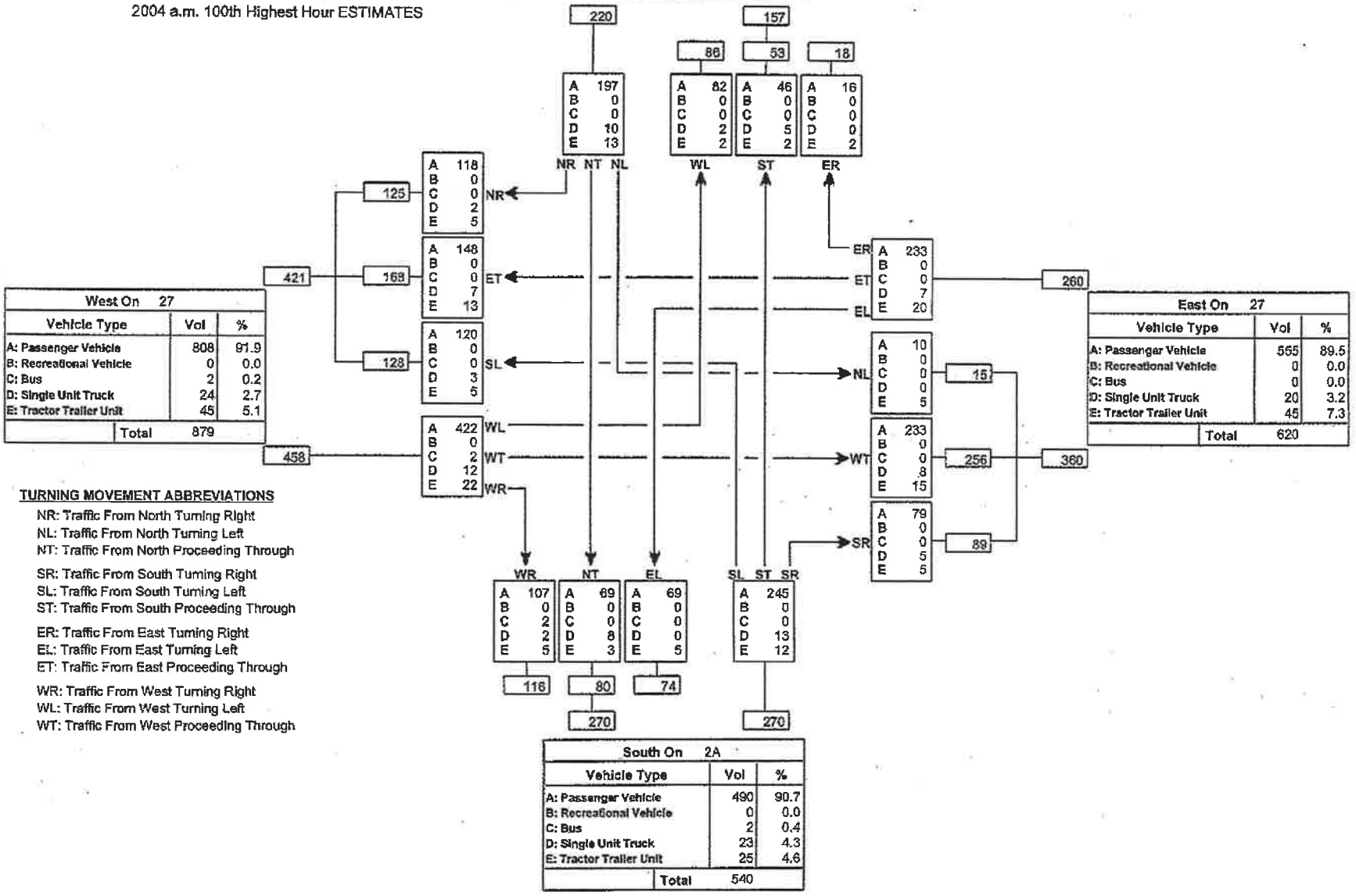
2004 a.m. 100th Highest Hour ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	341	90.5
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	17	4.5
E: Tractor Trailer Unit	19	5.0
Total	377	

West On 27		
Vehicle Type	Vol	%
A: Passenger Vehicle	808	91.9
B: Recreational Vehicle	0	0.0
C: Bus	2	0.2
D: Single Unit Truck	24	2.7
E: Tractor Trailer Unit	45	5.1
Total	879	

East On 27		
Vehicle Type	Vol	%
A: Passenger Vehicle	555	89.5
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	20	3.2
E: Tractor Trailer Unit	45	7.3
Total	620	

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	490	90.7
B: Recreational Vehicle	0	0.0
C: Bus	2	0.4
D: Single Unit Truck	23	4.3
E: Tractor Trailer Unit	25	4.6
Total	540	



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Turning Movement Summary Diagram

Reference No.: 990133
Intersection of:
2A & 27 AT OLDS

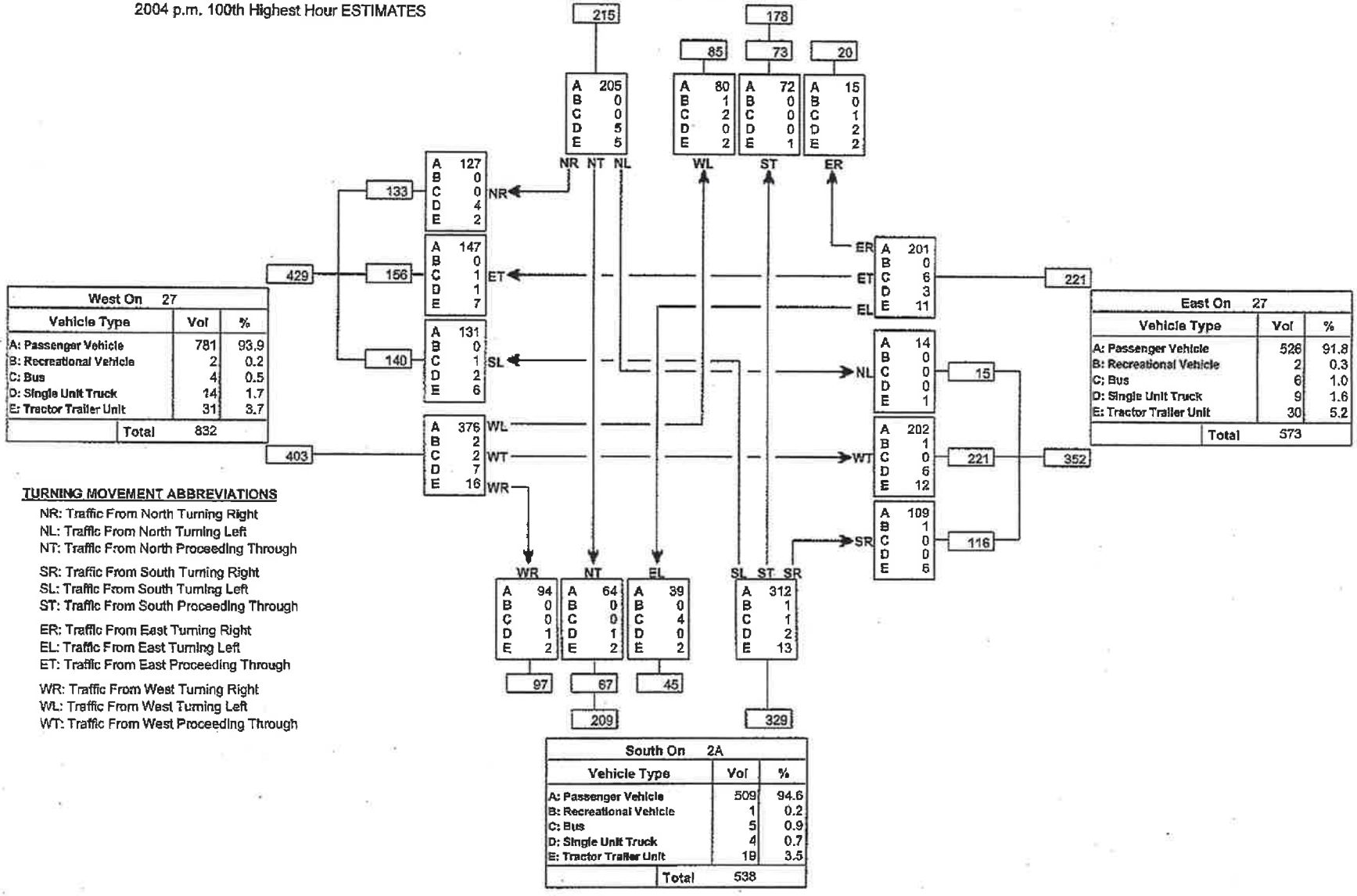
2004 p.m. 100th Highest Hour ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	372	94.7
B: Recreational Vehicle	1	0.3
C: Bus	3	0.8
D: Single Unit Truck	7	1.8
E: Tractor Trailer Unit	10	2.5
Total	393	

West On 27		
Vehicle Type	Vol	%
A: Passenger Vehicle	781	93.9
B: Recreational Vehicle	2	0.2
C: Bus	4	0.5
D: Single Unit Truck	14	1.7
E: Tractor Trailer Unit	31	3.7
Total	832	

East On 27		
Vehicle Type	Vol	%
A: Passenger Vehicle	528	91.8
B: Recreational Vehicle	2	0.3
C: Bus	6	1.0
D: Single Unit Truck	9	1.6
E: Tractor Trailer Unit	30	5.2
Total	573	

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	509	94.6
B: Recreational Vehicle	1	0.2
C: Bus	5	0.9
D: Single Unit Truck	4	0.7
E: Tractor Trailer Unit	19	3.5
Total	538	



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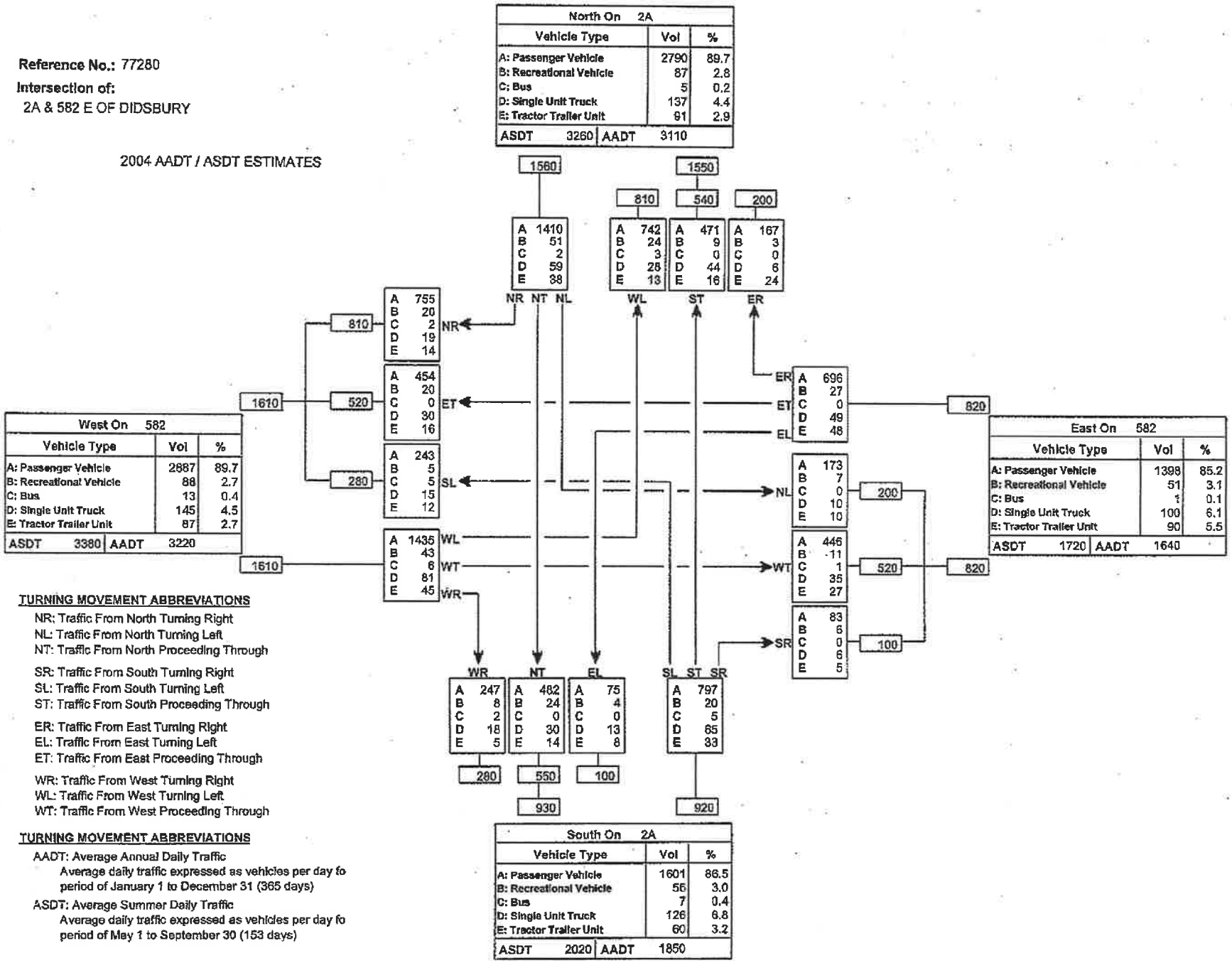
Reference No.: 77280
Intersection of:
2A & 582 E OF DIDSBURY

2004 AADT / ASDT ESTIMATES

Turning Movement Summary Diagram



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TURNING MOVEMENT ABBREVIATIONS

AADT: Average Annual Daily Traffic
Average daily traffic expressed as vehicles per day fo period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic
Average daily traffic expressed as vehicles per day fo period of May 1 to September 30 (153 days)

Turning Movement Summary Diagram

Reference No.: 77280

Intersection of:
2A & 582 E OF DIDSBURY

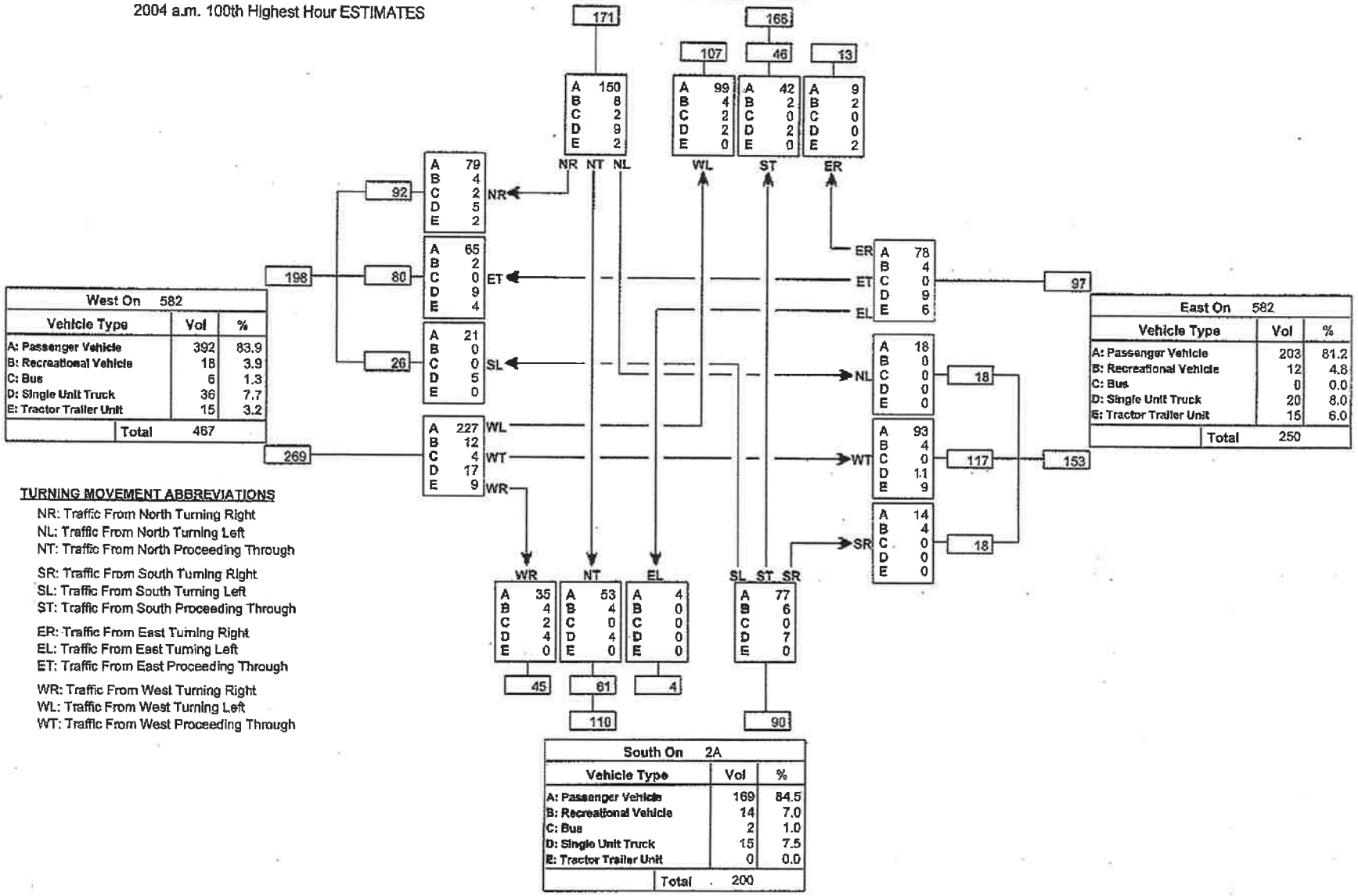
2004 a.m. 100th Highest Hour ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	300	89.0
B: Recreational Vehicle	16	4.7
C: Bus	4	1.2
D: Single Unit Truck	13	3.9
E: Tractor Trailer Unit	4	1.2
Total	337	

West On 582		
Vehicle Type	Vol	%
A: Passenger Vehicle	392	83.9
B: Recreational Vehicle	18	3.9
C: Bus	6	1.3
D: Single Unit Truck	36	7.7
E: Tractor Trailer Unit	15	3.2
Total	467	

East On 582		
Vehicle Type	Vol	%
A: Passenger Vehicle	203	81.2
B: Recreational Vehicle	12	4.8
C: Bus	0	0.0
D: Single Unit Truck	20	8.0
E: Tractor Trailer Unit	15	6.0
Total	250	

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	169	84.5
B: Recreational Vehicle	14	7.0
C: Bus	2	1.0
D: Single Unit Truck	15	7.5
E: Tractor Trailer Unit	0	0.0
Total	200	



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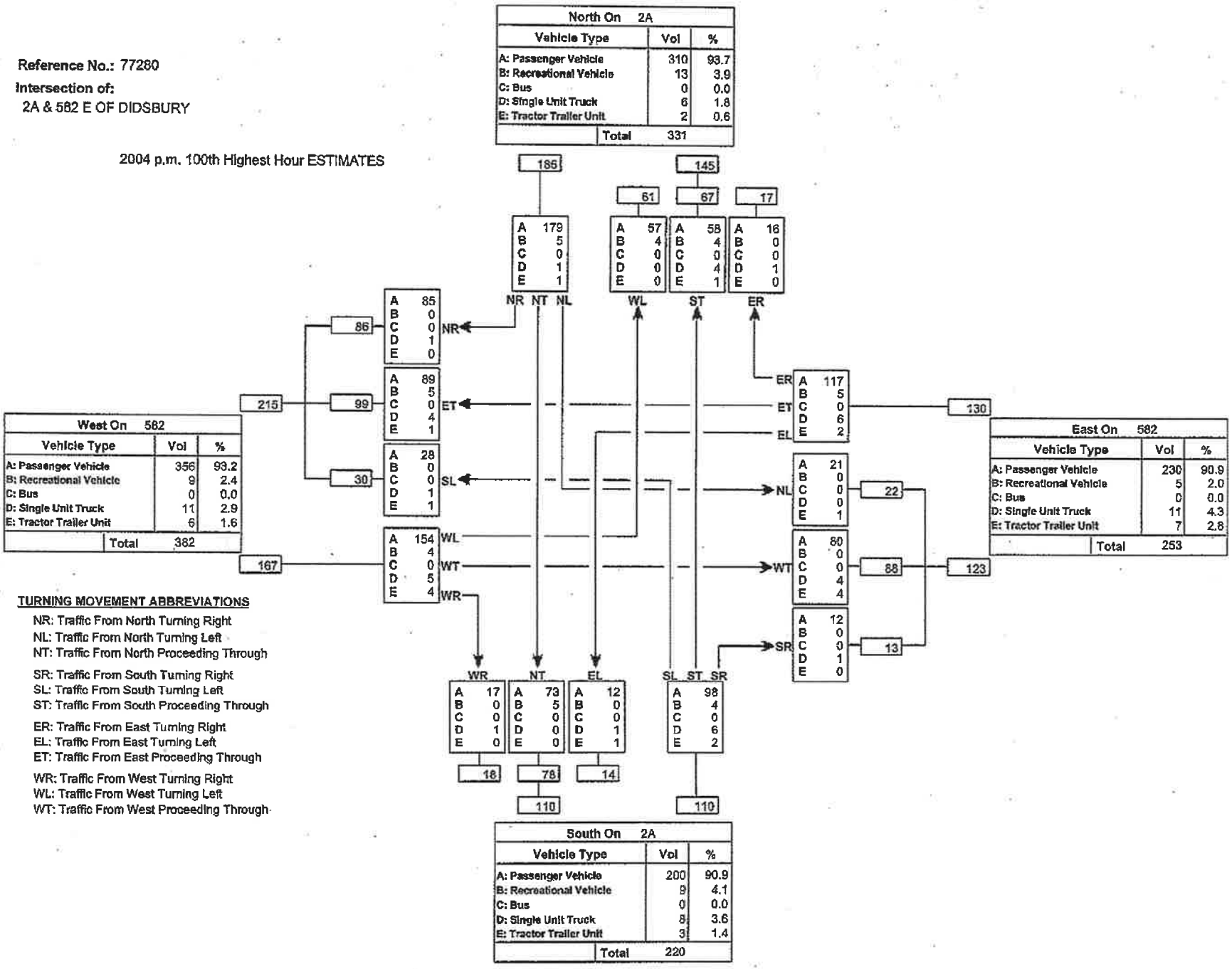
Turning Movement Summary Diagram

Reference No.: 77280
Intersection of:
2A & 582 E OF DIDSBURY

2004 p.m. 100th Highest Hour ESTIMATES



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WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

Turning Movement Summary Diagram

Reference No.: 77281

Intersection of:
2A & OLDS AIRPORT ACC 32-31-1-500000000

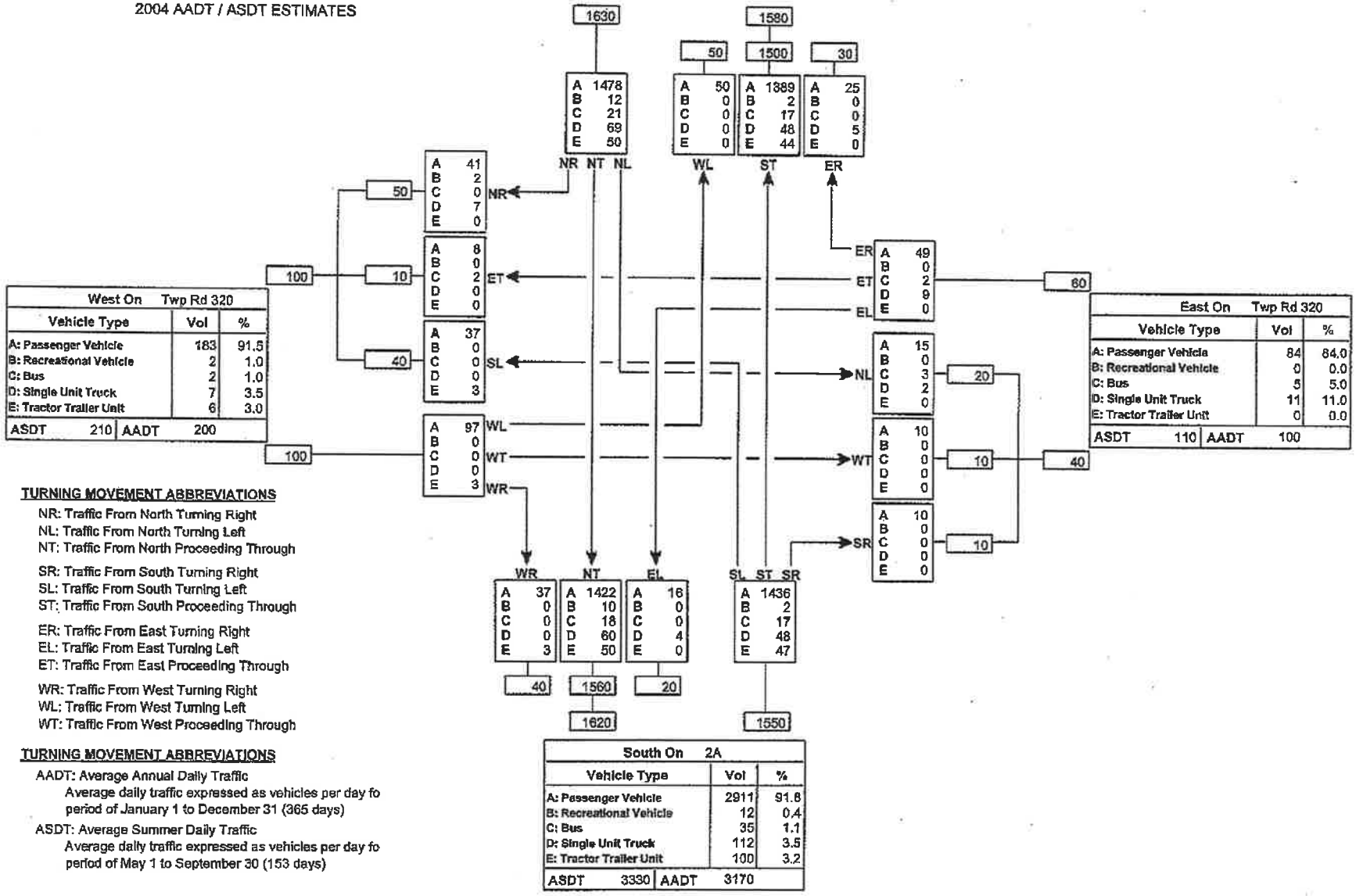
2004 AADT / ASDT ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	2942	91.7
B: Recreational Vehicle	14	0.4
C: Bus	38	1.2
D: Single Unit Truck	122	3.8
E: Tractor Trailer Unit	94	2.9
ASDT 3370	AADT 3210	

West On Twp Rd 320		
Vehicle Type	Vol	%
A: Passenger Vehicle	183	91.5
B: Recreational Vehicle	2	1.0
C: Bus	2	1.0
D: Single Unit Truck	7	3.5
E: Tractor Trailer Unit	6	3.0
ASDT 210	AADT 200	

East On Twp Rd 320		
Vehicle Type	Vol	%
A: Passenger Vehicle	84	84.0
B: Recreational Vehicle	0	0.0
C: Bus	5	5.0
D: Single Unit Truck	11	11.0
E: Tractor Trailer Unit	0	0.0
ASDT 110	AADT 100	

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	2911	91.8
B: Recreational Vehicle	12	0.4
C: Bus	35	1.1
D: Single Unit Truck	112	3.5
E: Tractor Trailer Unit	100	3.2
ASDT 3330	AADT 3170	



TURNING MOVEMENT ABBREVIATIONS

NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right
SL: Traffic From South Turning Left
ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right
EL: Traffic From East Turning Left
ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right
WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

TURNING MOVEMENT ABBREVIATIONS

AADT: Average Annual Daily Traffic
Average daily traffic expressed as vehicles per day fo
period of January 1 to December 31 (365 days)

ASDT: Average Summer Daily Traffic
Average daily traffic expressed as vehicles per day fo
period of May 1 to September 30 (153 days)

Turning Movement Summary Diagram

Reference No.: 77281

Intersection of:
2A & OLDS AIRPORT ACC 32-31-1-500000000

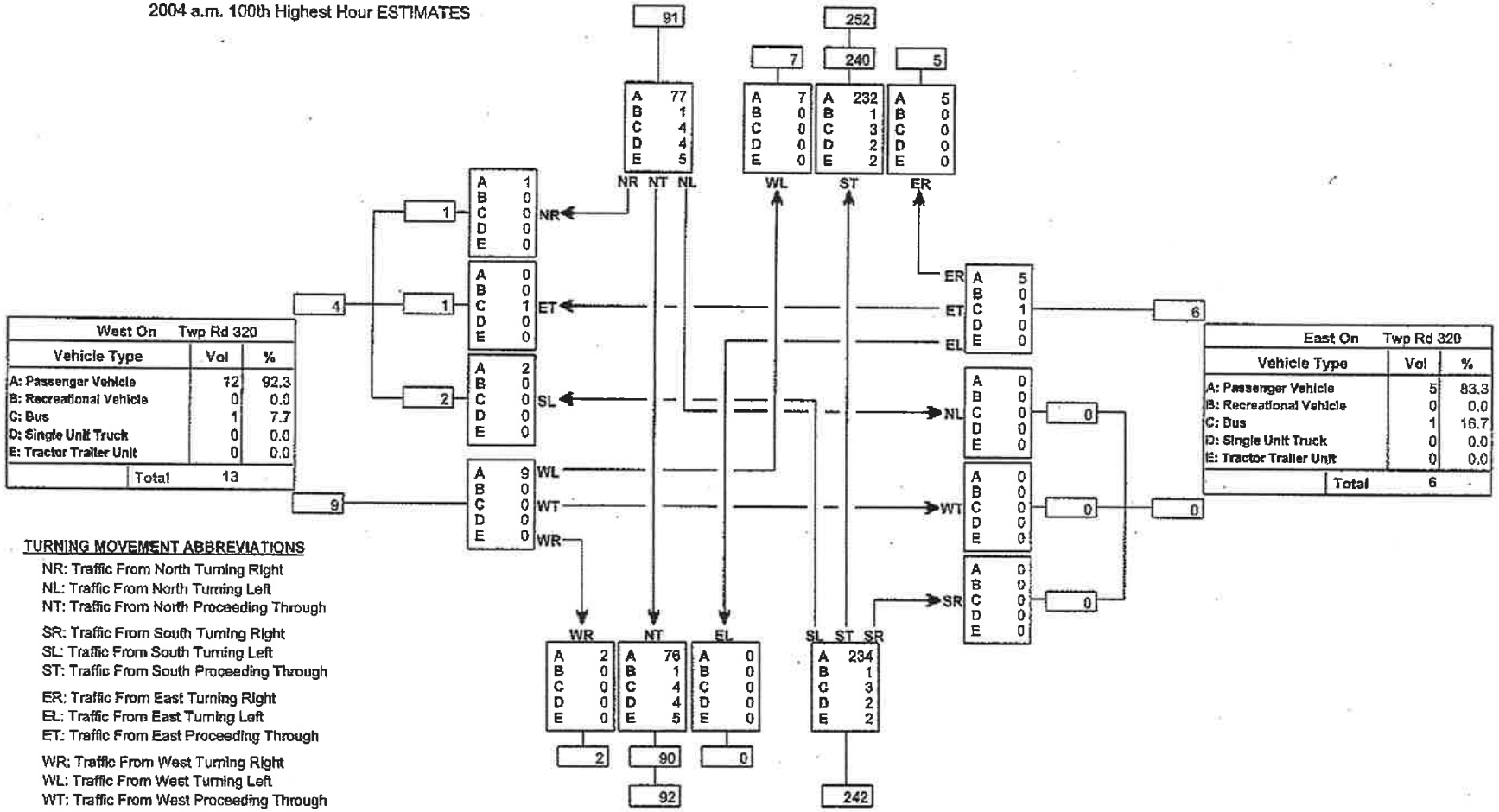
2004 a.m. 100th Highest Hour ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	321	93.6
B: Recreational Vehicle	2	0.6
C: Bus	7	2.0
D: Single Unit Truck	6	1.7
E: Tractor Trailer Unit	7	2.0
Total	343	

West On Twp Rd 320		
Vehicle Type	Vol	%
A: Passenger Vehicle	12	92.3
B: Recreational Vehicle	0	0.0
C: Bus	1	7.7
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
Total	13	

East On Twp Rd 320		
Vehicle Type	Vol	%
A: Passenger Vehicle	5	83.3
B: Recreational Vehicle	0	0.0
C: Bus	1	16.7
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
Total	6	

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	312	93.4
B: Recreational Vehicle	2	0.6
C: Bus	7	2.1
D: Single Unit Truck	6	1.8
E: Tractor Trailer Unit	7	2.1
Total	334	



TURNING MOVEMENT ABBREVIATIONS

NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right
SL: Traffic From South Turning Left
ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right
EL: Traffic From East Turning Left
ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right
WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

Turning Movement Summary Diagram

Reference No.: 77281

Intersection of:
2A & OLDS AIRPORT ACC 32-31-1-500000000

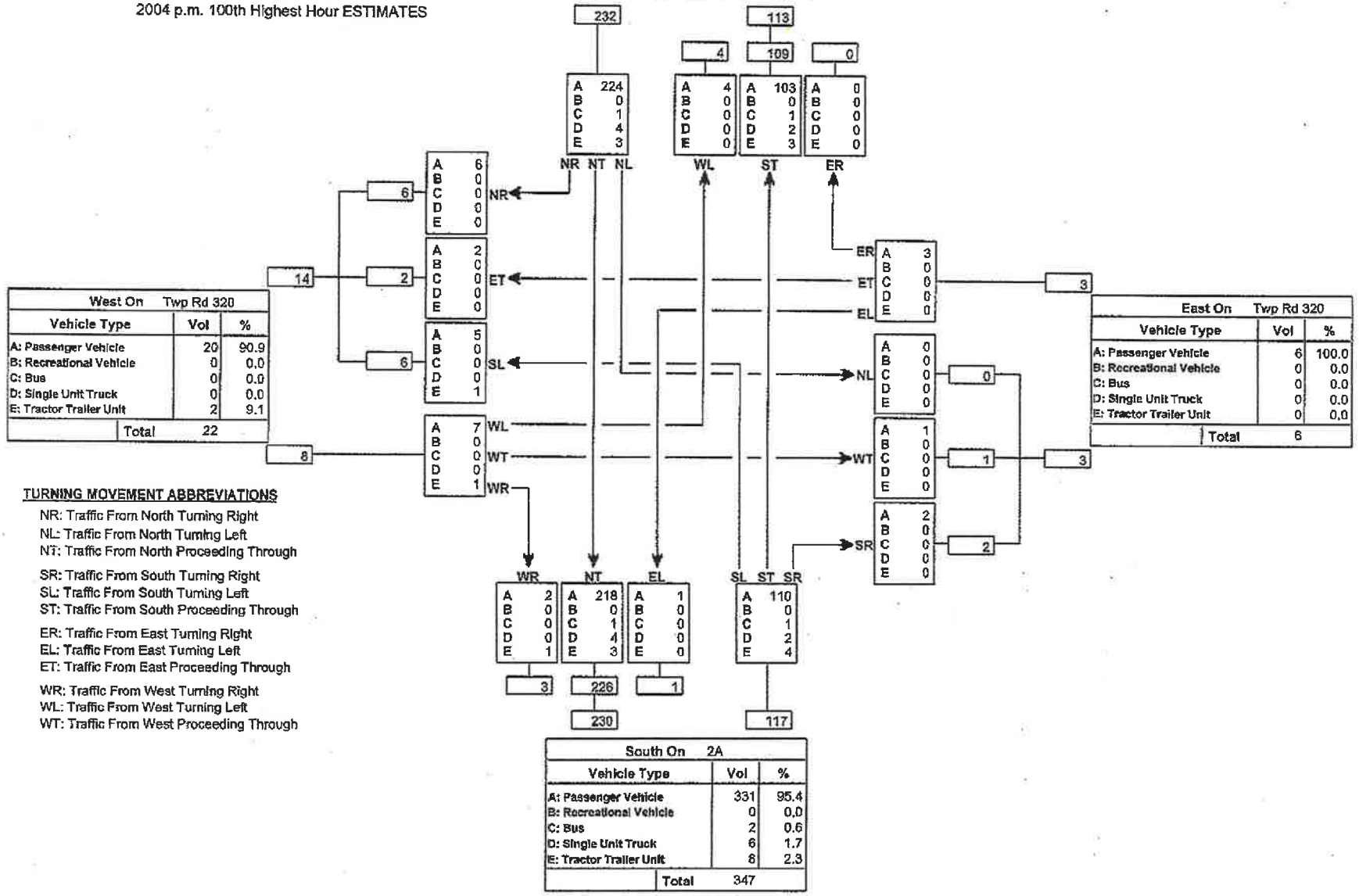
2004 p.m. 100th Highest Hour ESTIMATES

North On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	331	95.9
B: Recreational Vehicle	0	0.0
C: Bus	2	0.6
D: Single Unit Truck	6	1.7
E: Tractor Trailer Unit	6	1.7
Total	345	

West On Twp Rd 320		
Vehicle Type	Vol	%
A: Passenger Vehicle	20	90.9
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	2	9.1
Total	22	

East On Twp Rd 320		
Vehicle Type	Vol	%
A: Passenger Vehicle	6	100.0
B: Recreational Vehicle	0	0.0
C: Bus	0	0.0
D: Single Unit Truck	0	0.0
E: Tractor Trailer Unit	0	0.0
Total	6	

South On 2A		
Vehicle Type	Vol	%
A: Passenger Vehicle	331	95.4
B: Recreational Vehicle	0	0.0
C: Bus	2	0.6
D: Single Unit Truck	6	1.7
E: Tractor Trailer Unit	8	2.3
Total	347	



TURNING MOVEMENT ABBREVIATIONS

NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right
SL: Traffic From South Turning Left
ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right
EL: Traffic From East Turning Left
ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right
WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

APPENDIX D

INTERSECTION TREATMENT AND ANALYSIS

9600230.002

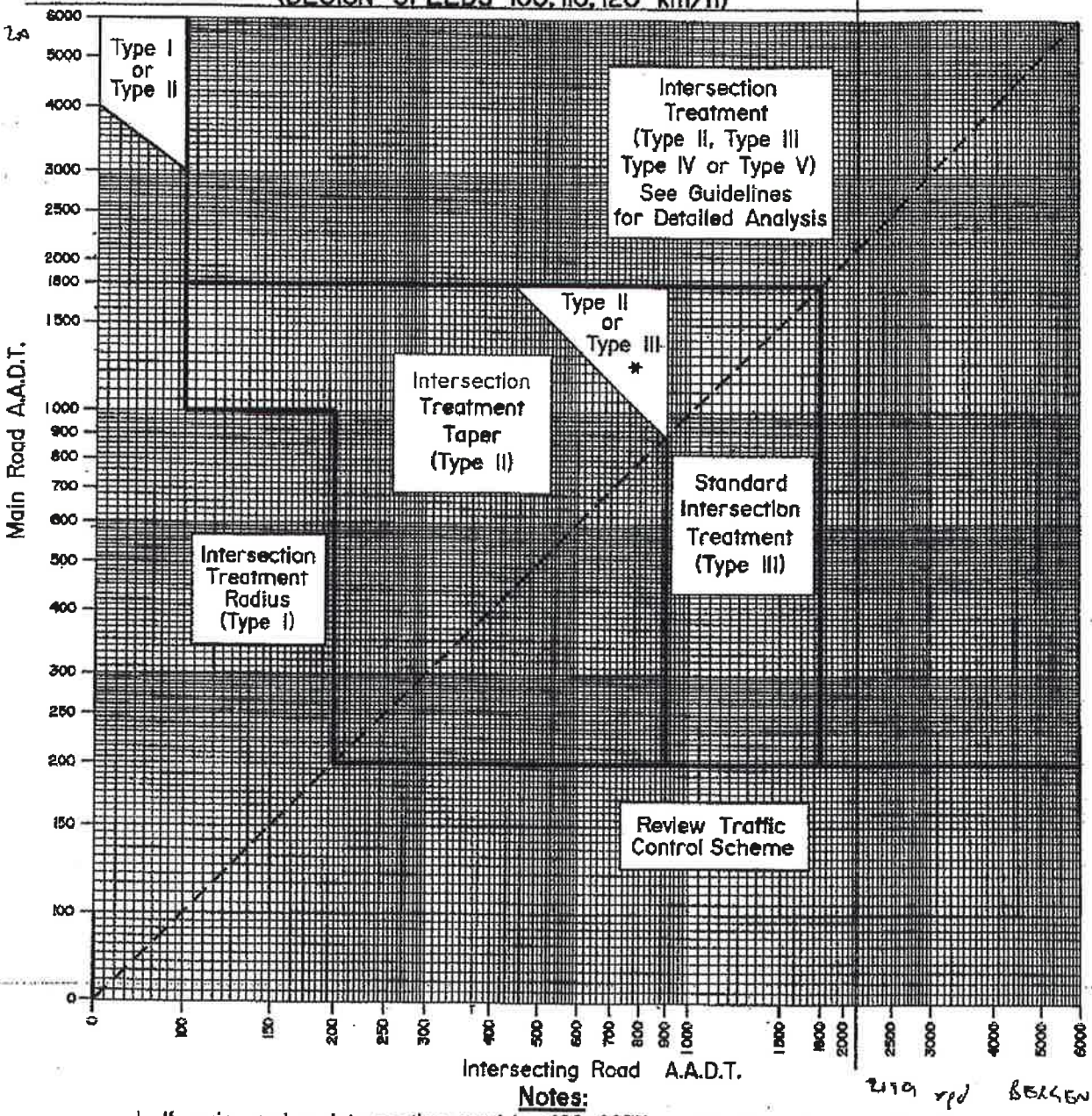
Hwy 2A & Bergen Rd

Tois - Phase 1

FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)

6796 vpd

Hwy 2A



2119 vpd Bergen Rd

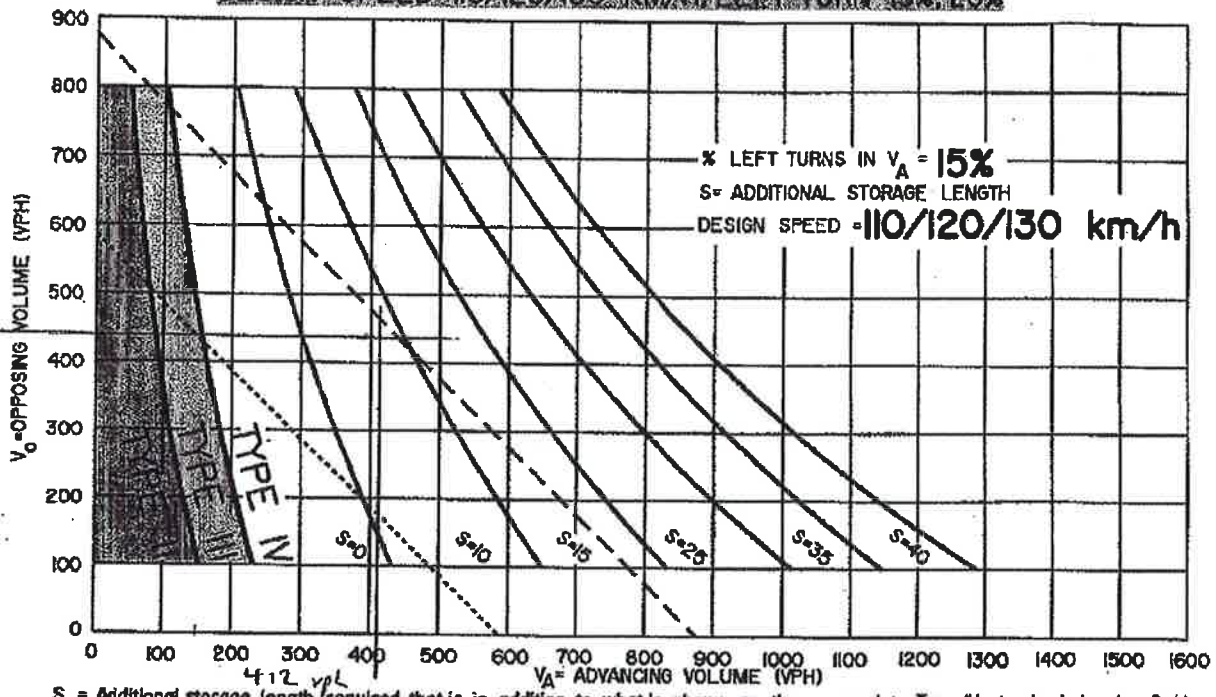
Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

HWY 2A & BERGEN RD

9600230.002

FIGURE D-7.6-7b WARRANTS FOR LEFT TURN LANES AND STORAGE REQUIREMENTS FOR TWO-LANE HIGHWAYS DESIGN SPEED 110/120/130 KM/H LEFT TURN 15%, 20%



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.6a.

---------- Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.

— — — · Traffic signals may be warranted in "free flow" urban areas.

Notes:

1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

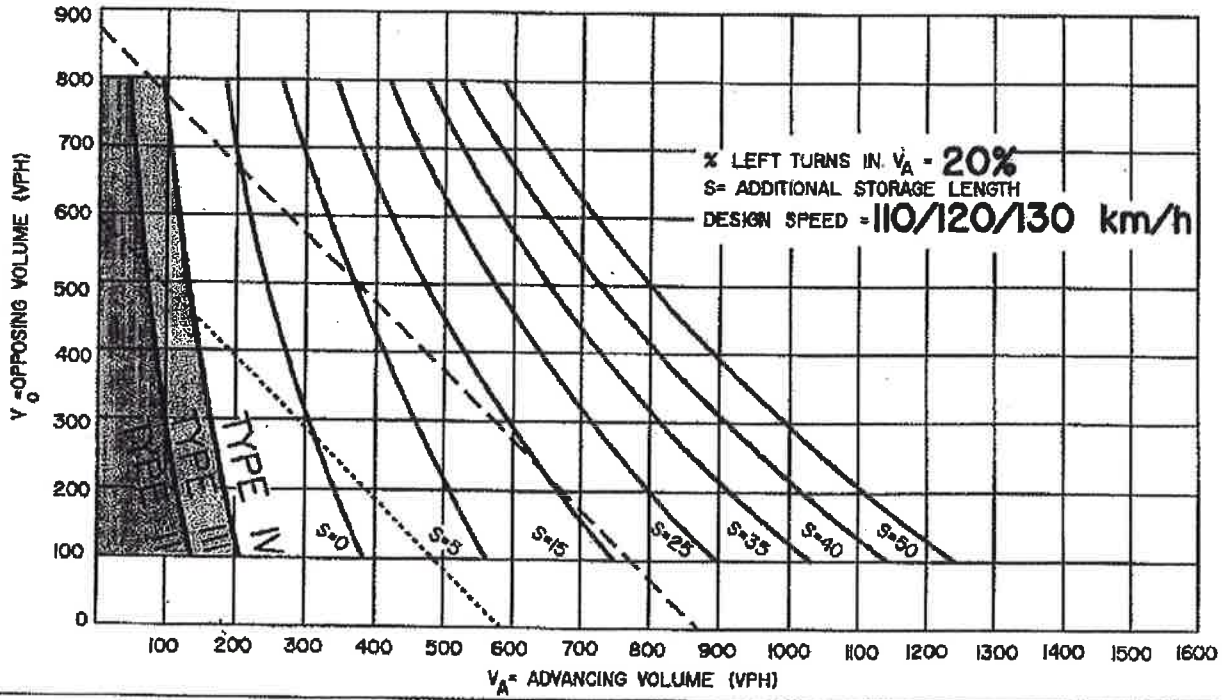
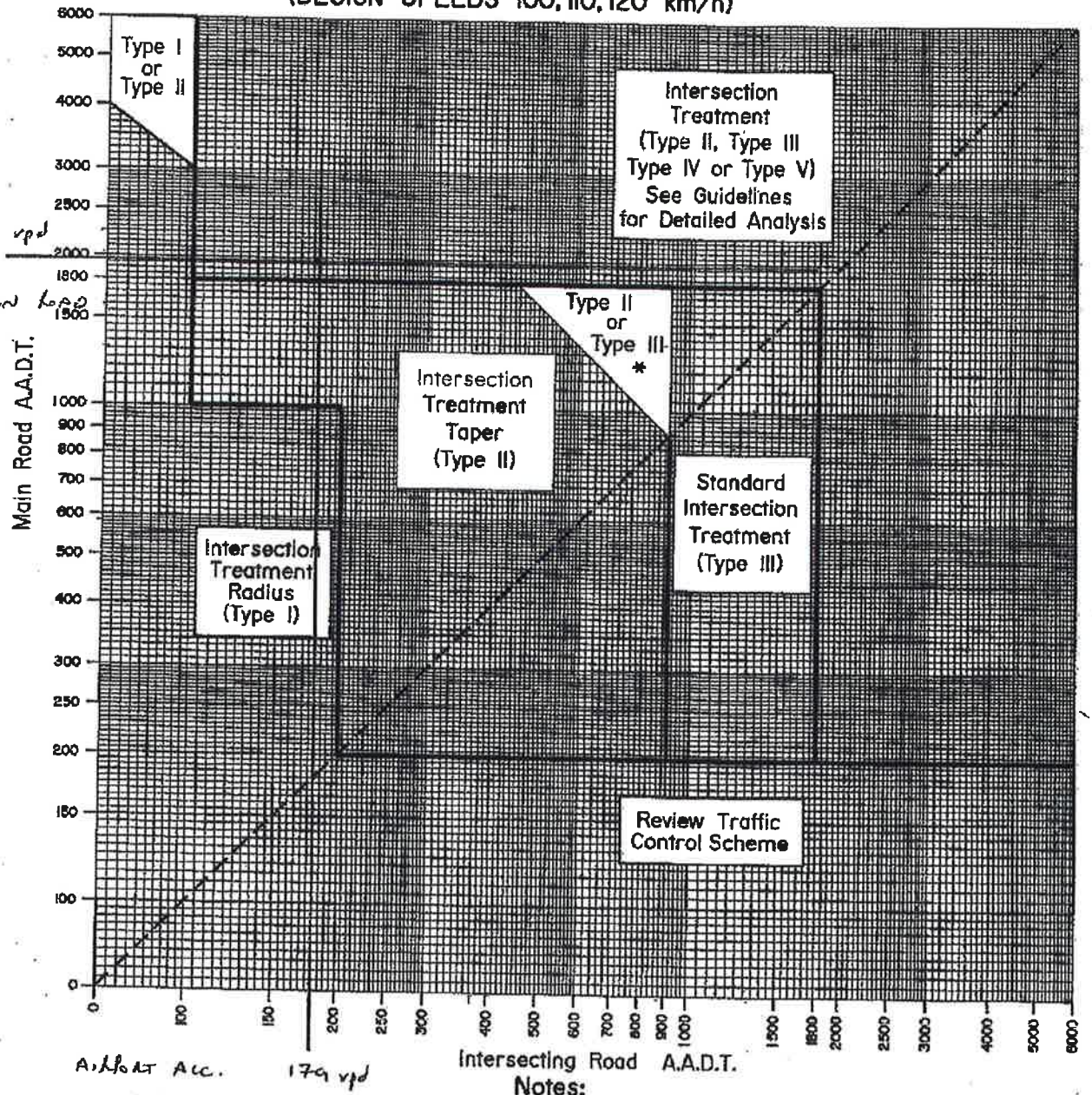


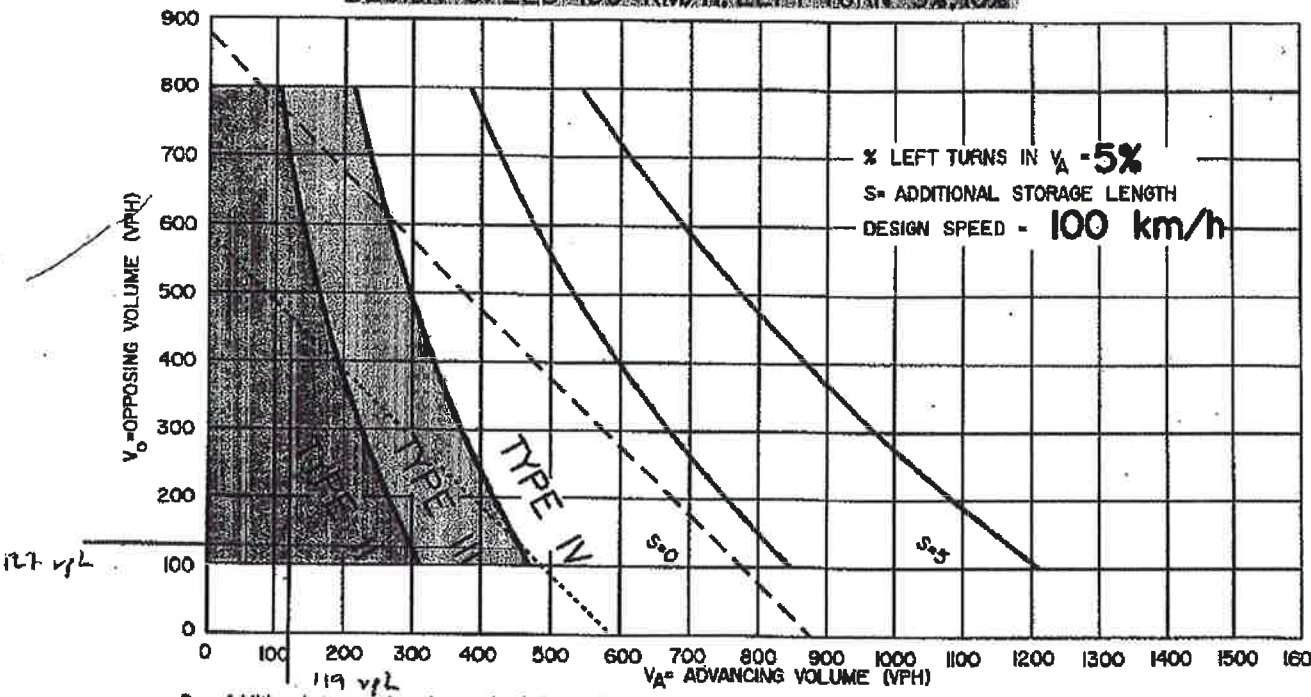
FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)



Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m. radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

FIGURE D-7.6-6a WARRANTS FOR LEFT TURN TREATMENT AND STORAGE REQUIREMENTS FOR TWO-LANE HIGHWAYS DESIGN SPEED 100 KM/H, LEFT TURN 5% 10%



127 vph

119 vph

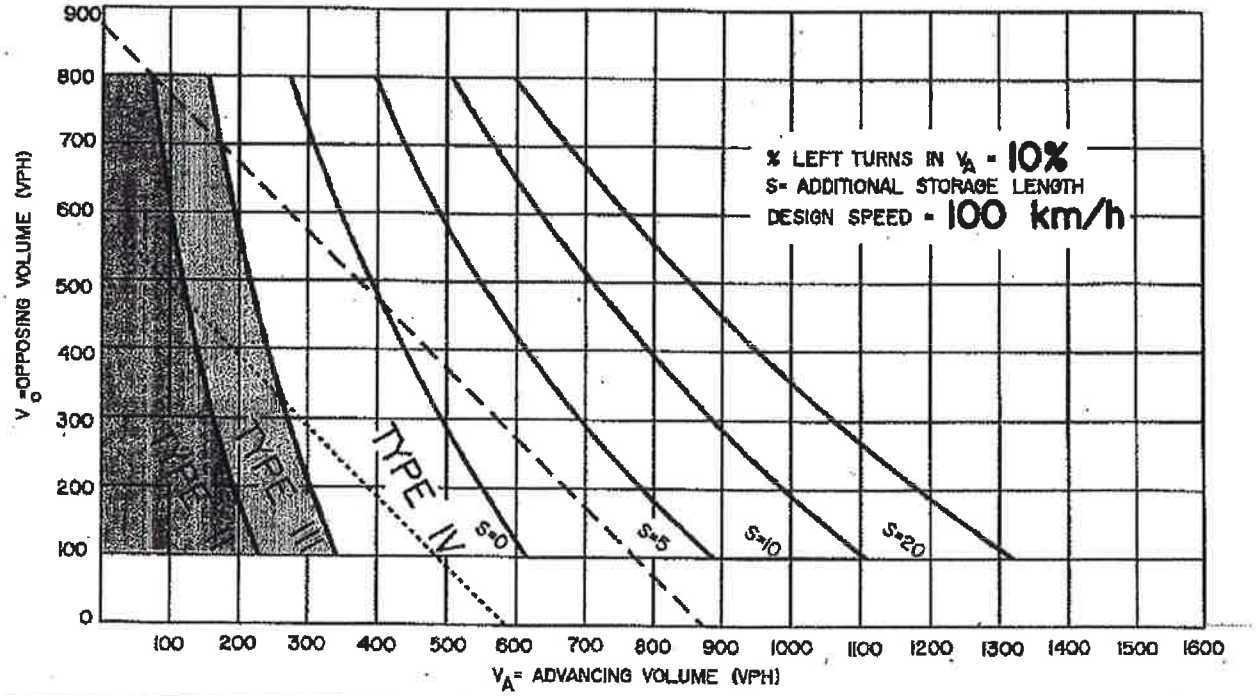
S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.6a.

---------- Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.

— — — Traffic signals may be warranted in "free flow" urban areas.

Notes:

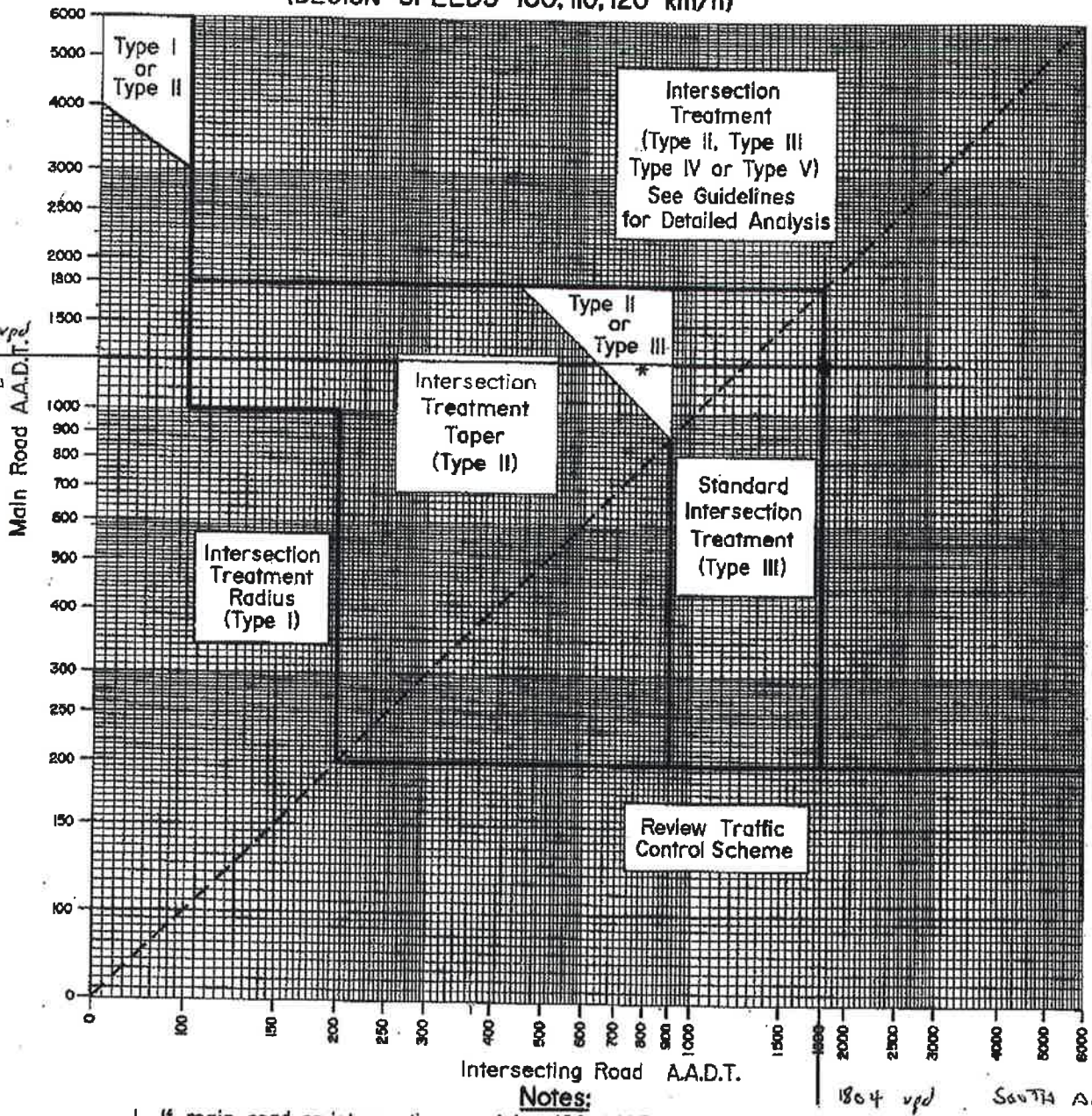
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.



9600230 -002

BERGEN ROAD & SOUTH ACC. TO PARK

FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)



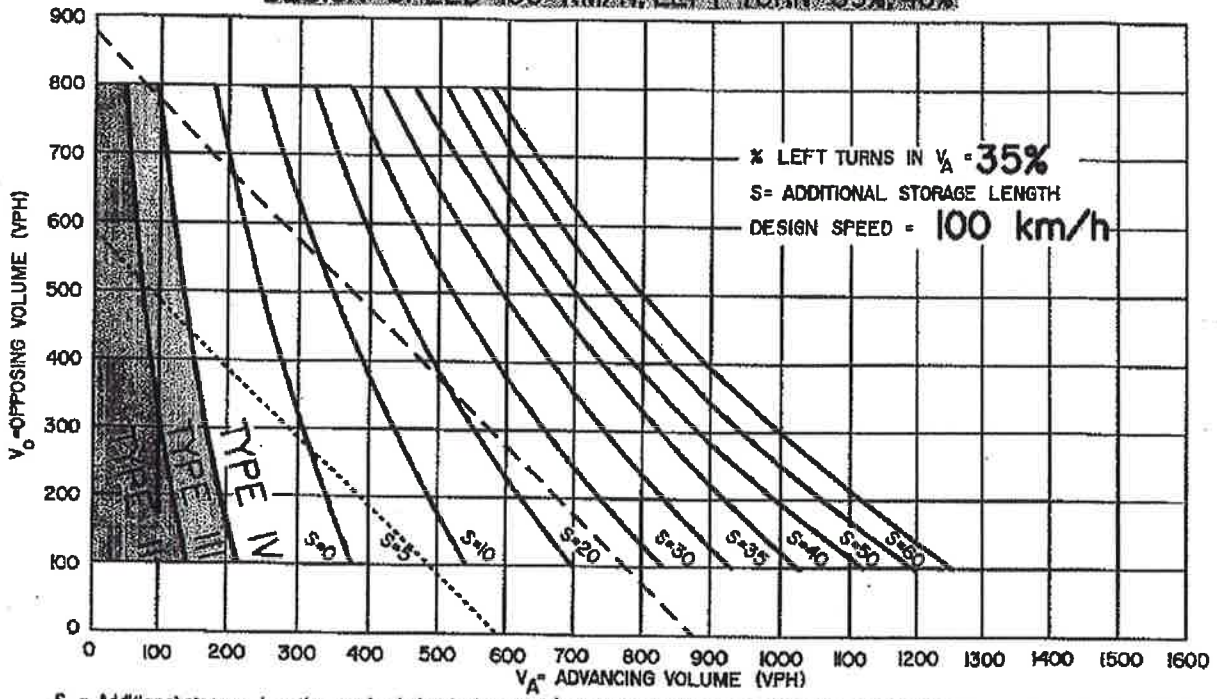
Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

9600236.002

BERGEN RD & SOUTH ACC. TO PARK (2015 - PHASE 1)

FIGURE D-7.6-6d WARRANTS FOR LEFT TURN TREATMENT AND STORAGE REQUIREMENTS FOR TWO LANE HIGHWAYS DESIGN SPEED 100 KM/H, LEFT TURN 35%, 40%



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.5a.

---------- Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.

— — — · Traffic signals may be warranted in "free flow" urban areas.

Notes:

1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

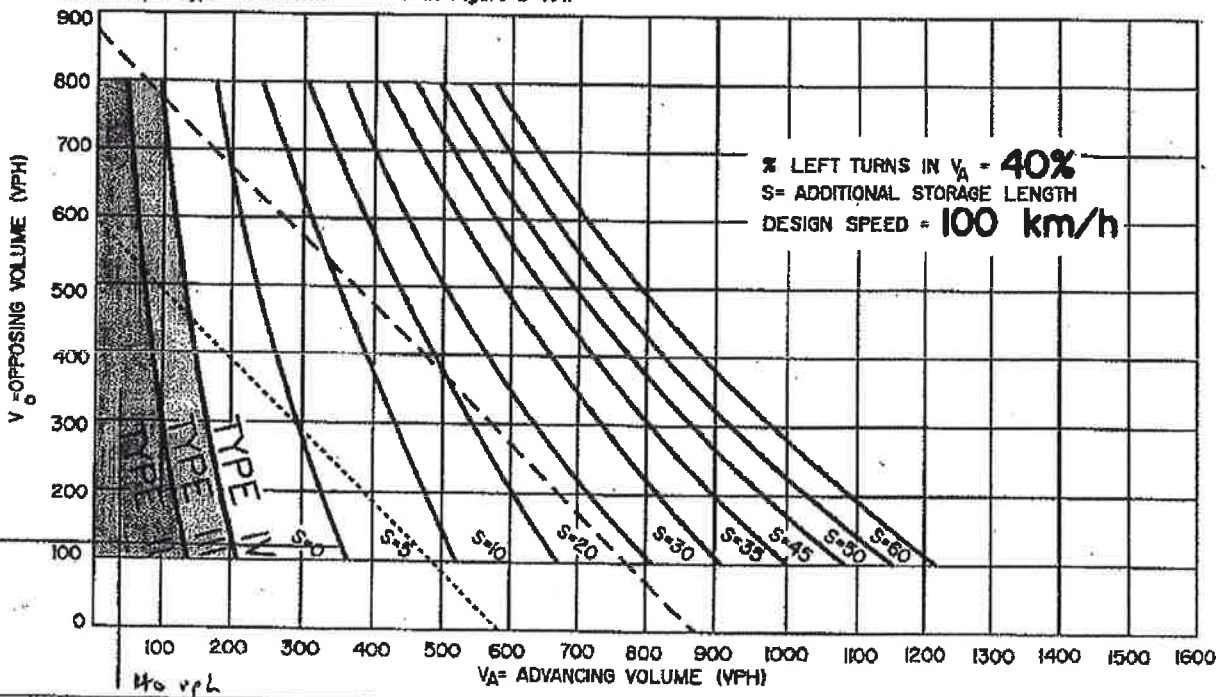
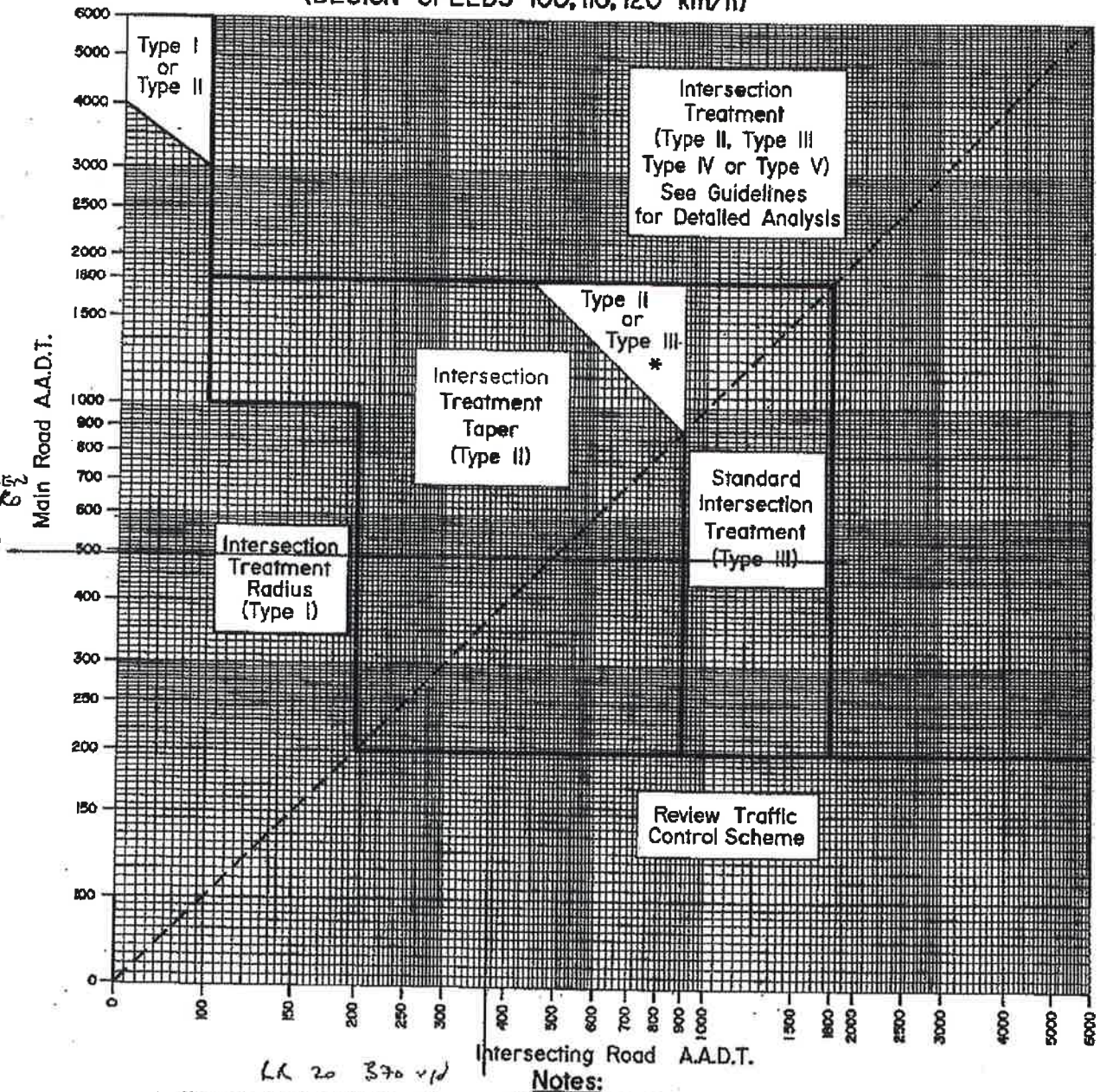


FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)



BERGEN RD 496 vpd

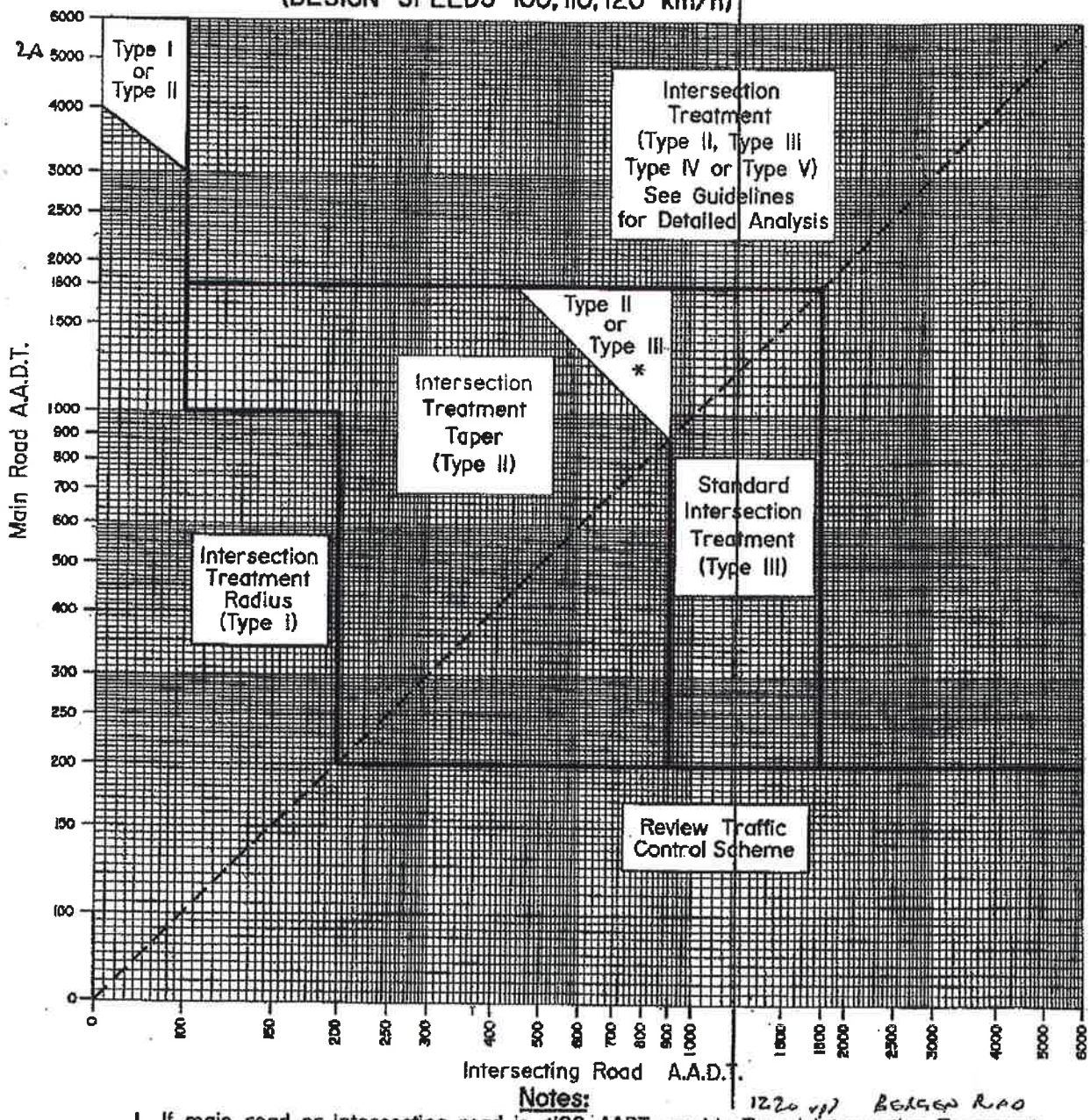
RR 20 370 vpd

Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

9560 vpd

FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)

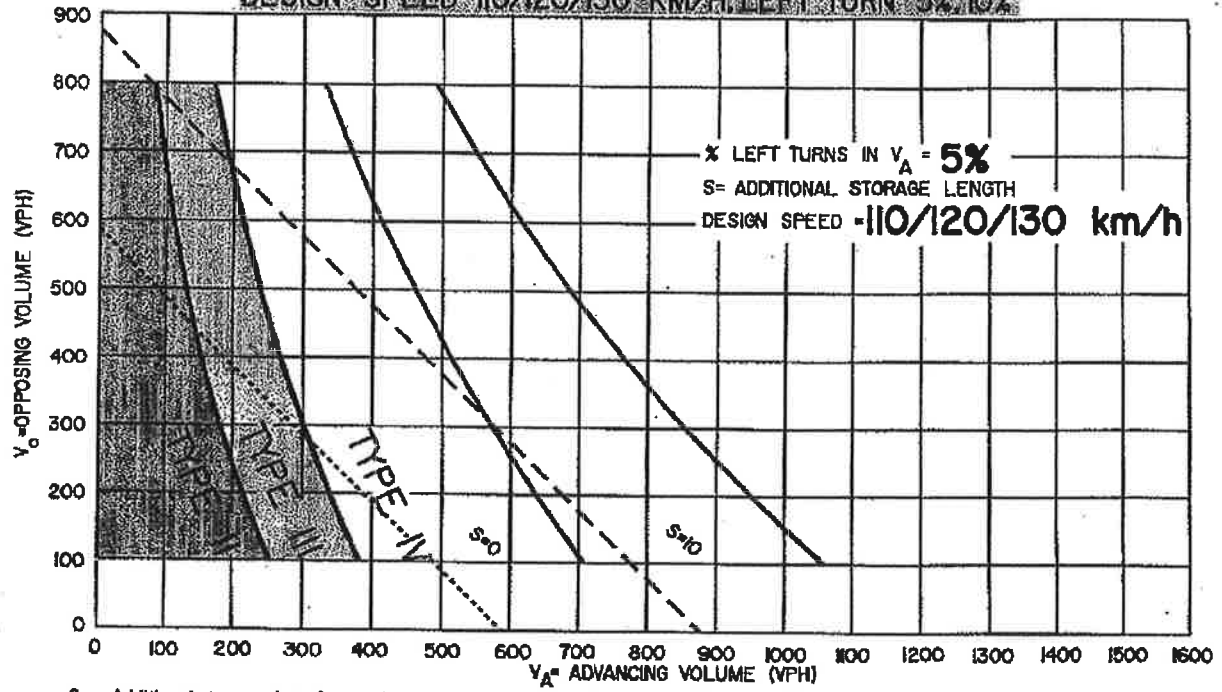


Notes:

1220 vpd BERGEN ROAD

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

FIGURE D-7.6-7a WARRANTS FOR LEFT TURN LANES AND STORAGE REQUIREMENTS FOR TWO-LANE HIGHWAYS
DESIGN SPEED 110/120/130 KM/H, LEFT TURN 5%, 10%



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.6a.

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Notes:

1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

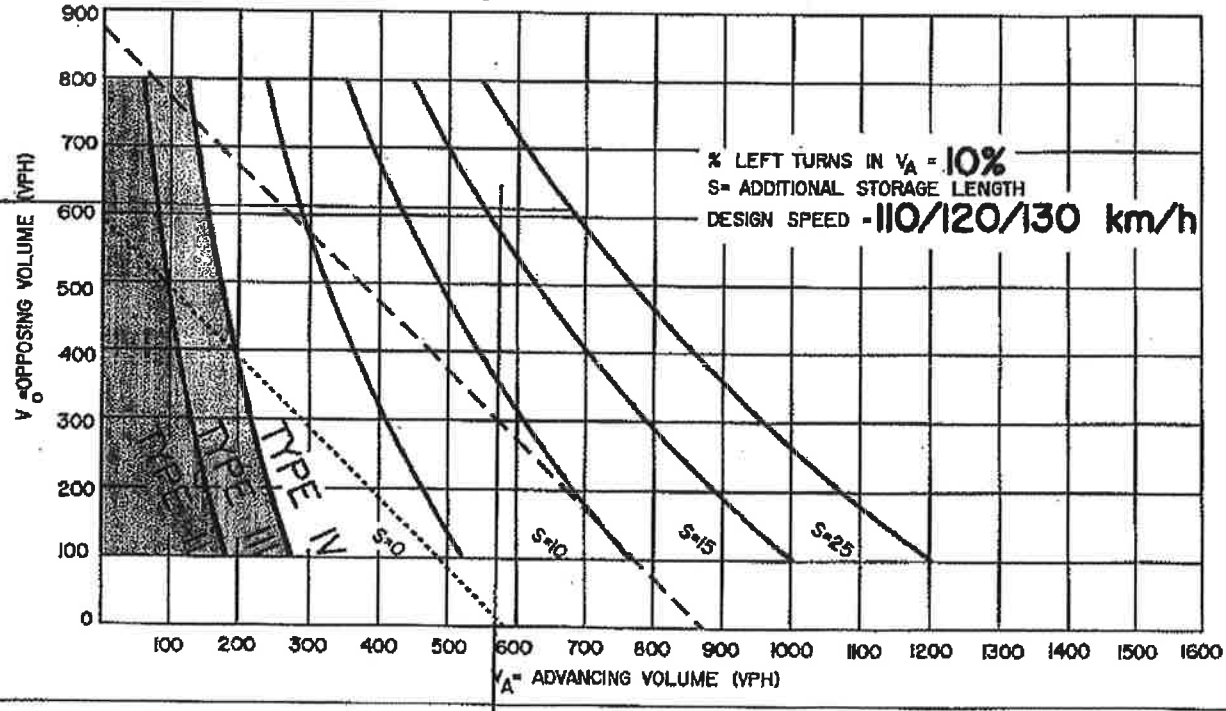
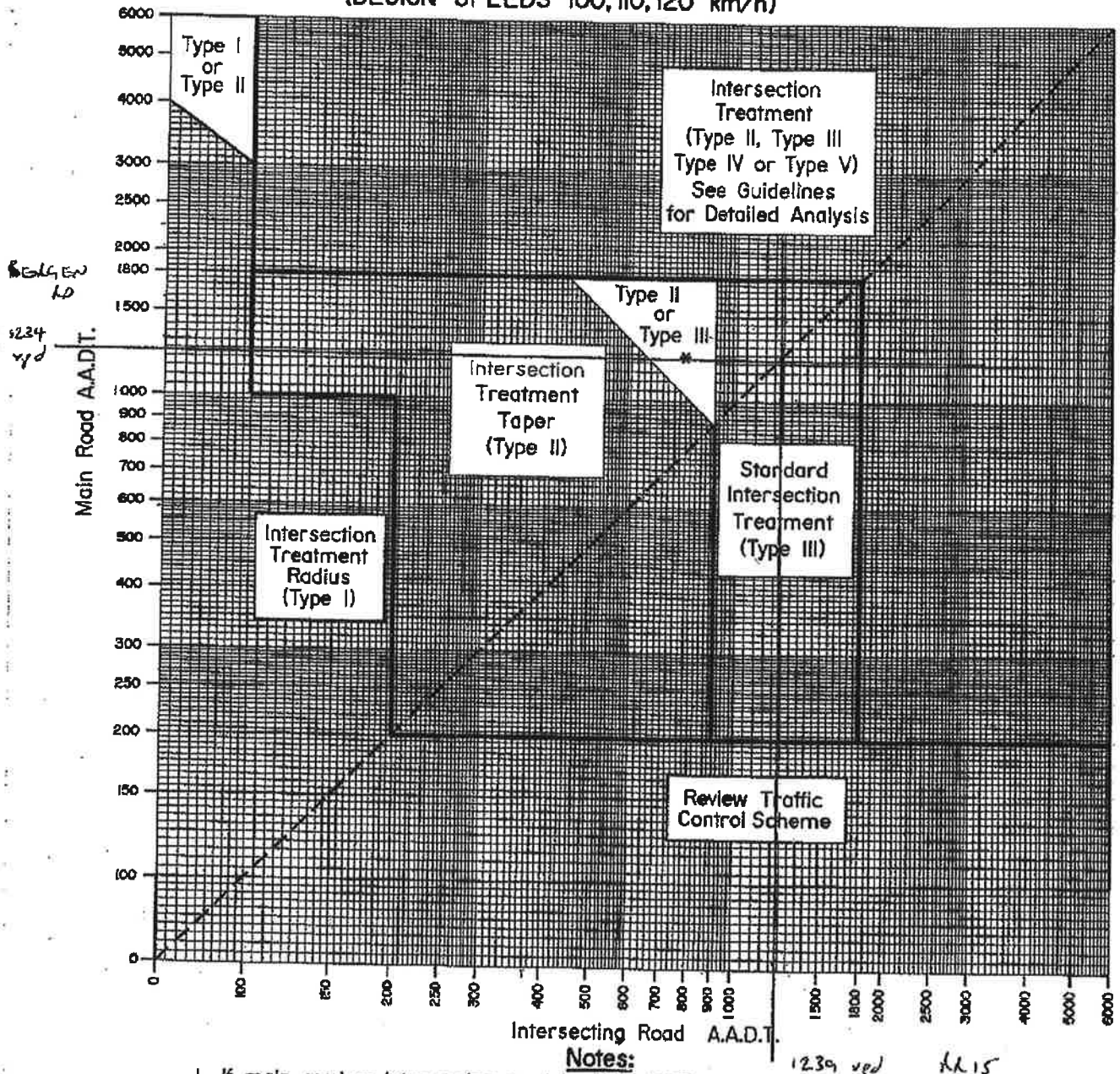


FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)

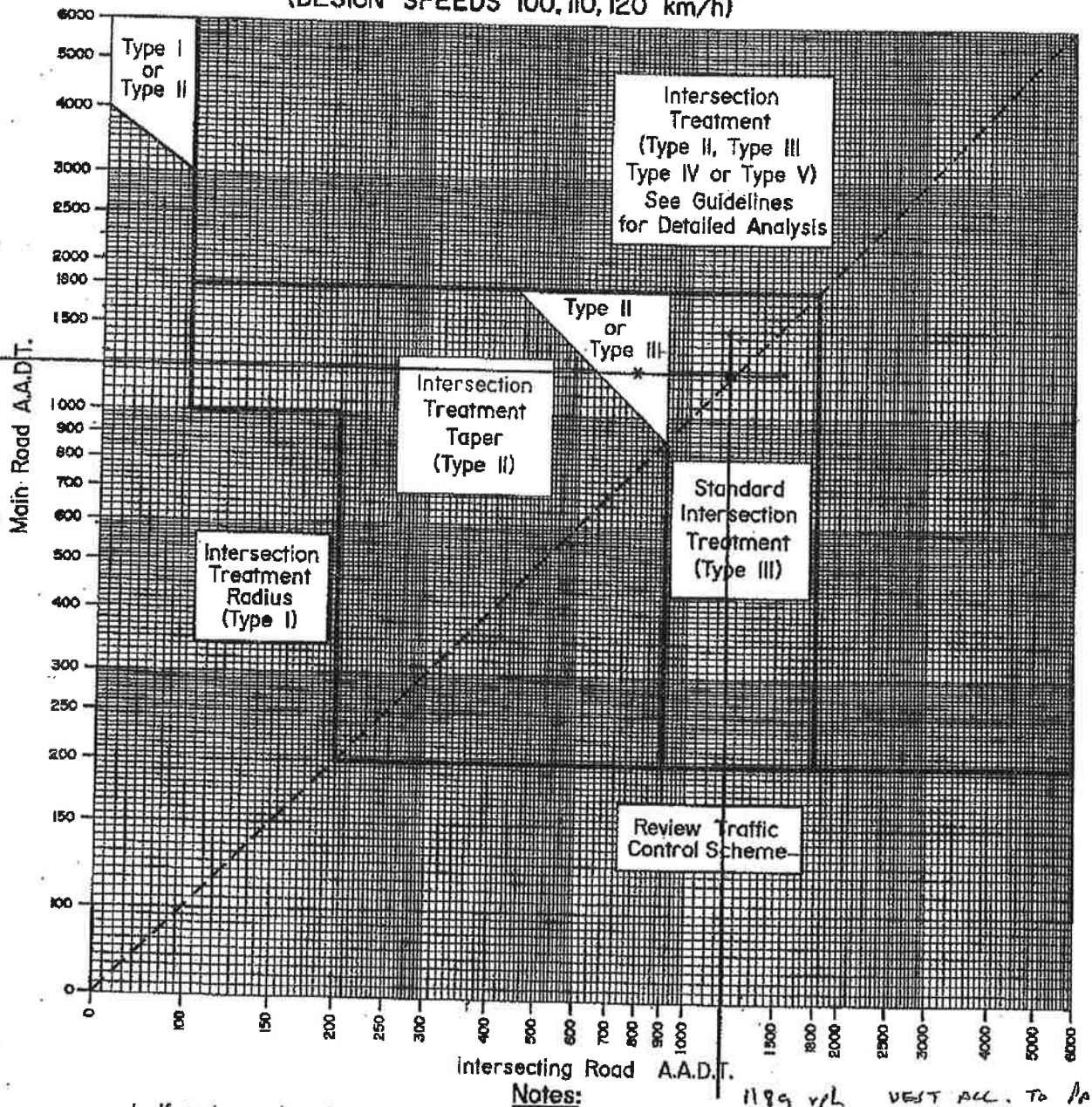


Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

1234 vpd RR 15

FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)

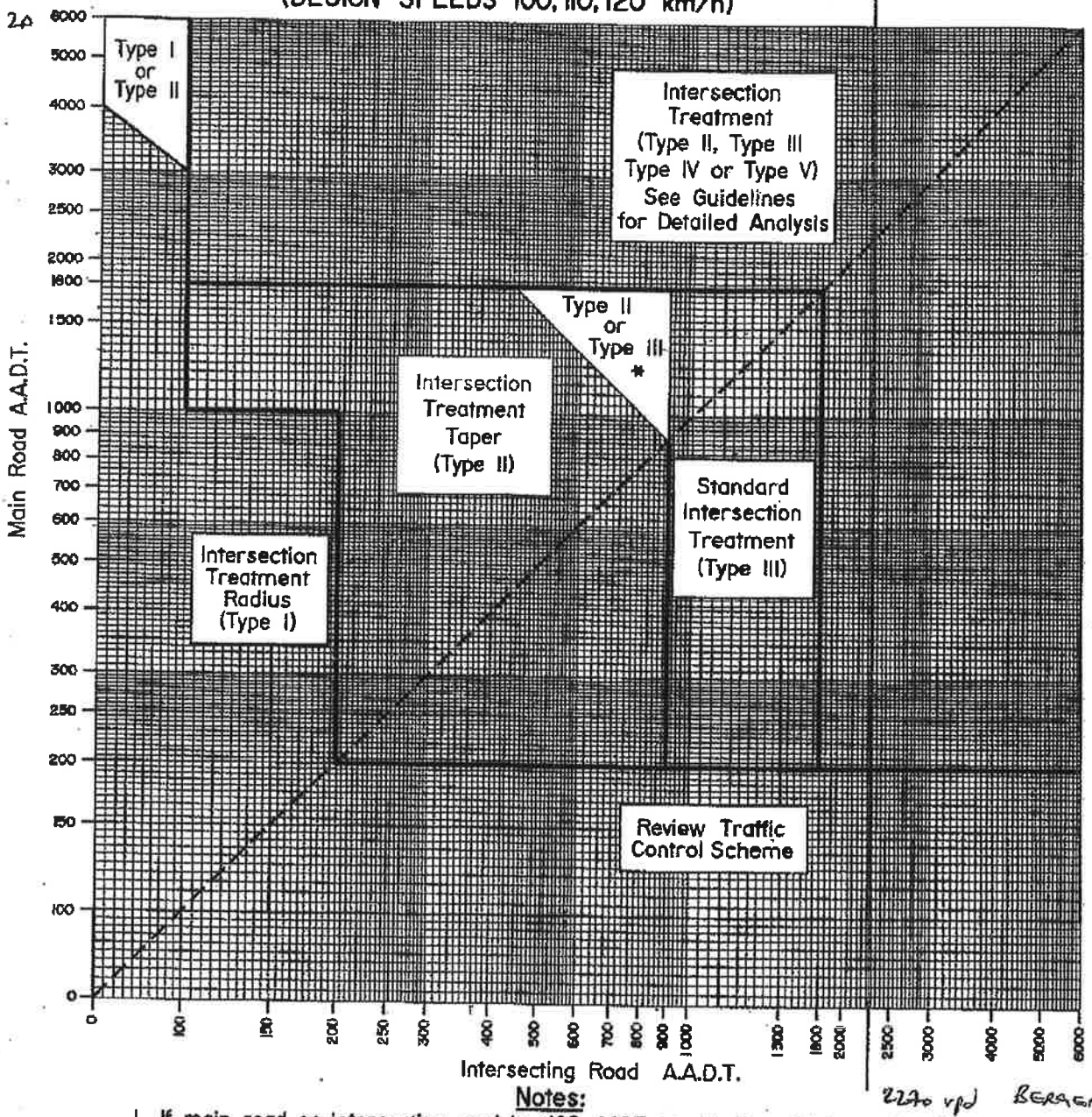


Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

10 430 vpd

FIGURE D-7.4 TRAFFIC VOLUME WARRANT CHART FOR AT-GRADE INTERSECTION TREATMENT ON TWO-LANE RURAL HIGHWAYS (DESIGN SPEEDS 100, 110, 120 km/h)



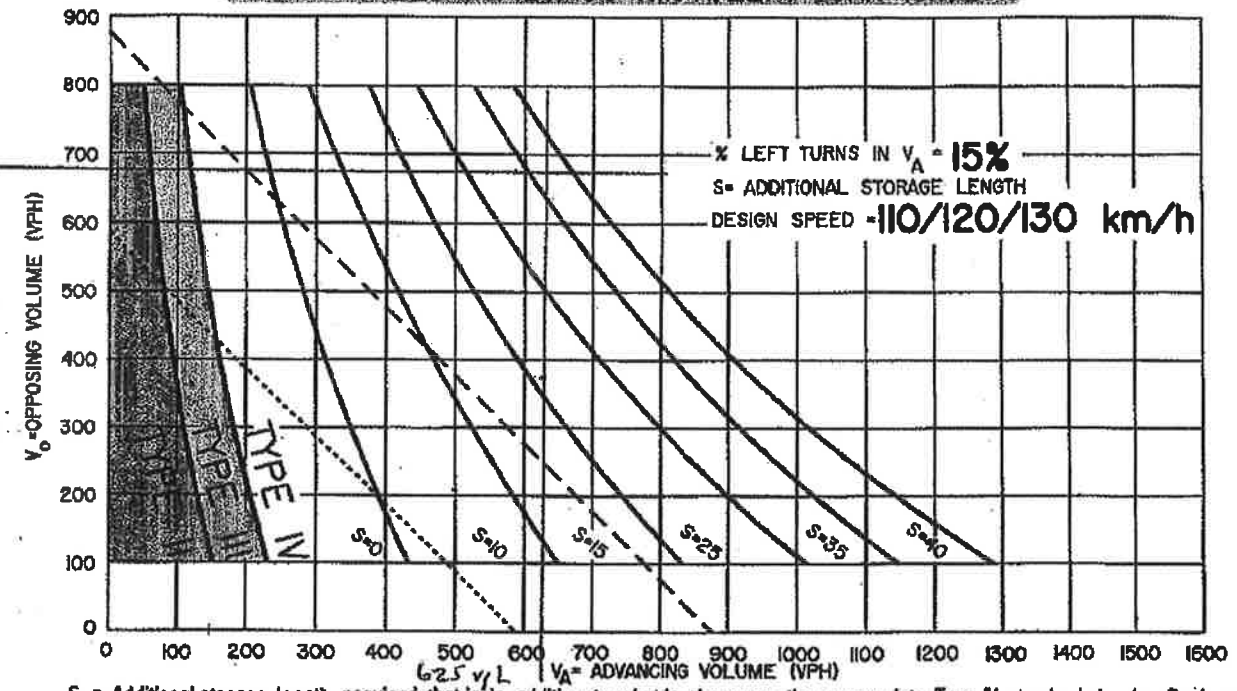
2220 vpd BERGEN RAD

Notes:

1. If main road, or intersecting road, is <100 AADT provide Type I Intersection Treatment (15m radius), except as shown for the higher volume main roads on this chart (Type I or II zone) where engineering judgement may be used to select the appropriate treatment.
2. If main road is >4000 AADT Review Access Management
   — — — If Intersecting Road AADT is > Main Road AADT: Review Traffic Control Scheme
3. Use projected traffic volumes for design
   Sloping line is defined by Main Road AADT x Intersecting Road AADT = 800,000

FIGURE D-7.6-7b WARRANTS FOR LEFT TURN LANES AND STORAGE REQUIREMENTS FOR TWO-LANE HIGHWAYS DESIGN SPEED 110/120/130 KM/H, LEFT TURN 15% 20%

678 vph



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.6a.

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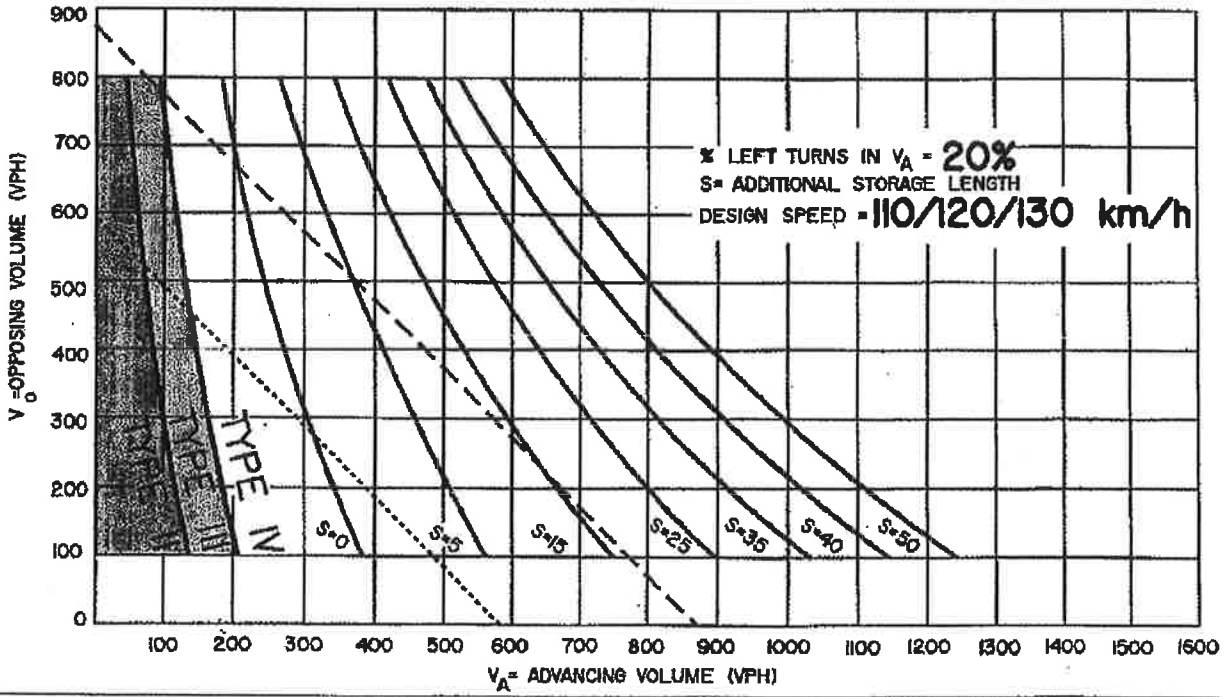
— — — · Traffic signals may be warranted in "free flow" urban areas.

Notes:

1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.



GRAPHICS FILE: d6bd767e.man

960230.002

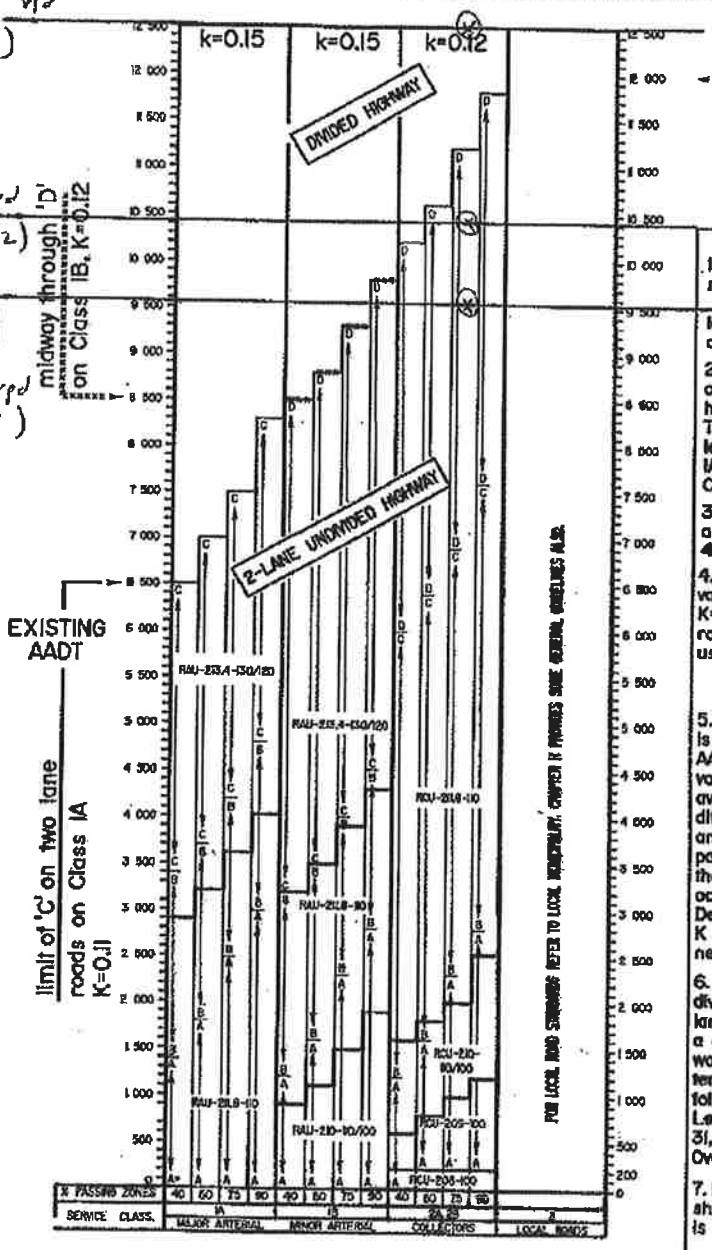
HWY 2A

FIGURE A-9 GUIDELINES FOR TWINNING BASED ON LEVEL OF SERVICE FOR RURAL HIGHWAYS IN ALBERTA (shown in terms of existing AADT)

12520 vpd (2035)

10420 vpd (Phase 2)

9560 vpd (2025)



NOTES

1. The decision to twin a particular section of highway may be made based on system requirements (for continuity, etc.) or due to an unacceptably low level of service on the two-lane roadway. This chart is based on level-of-service requirements.
2. The twinning volume ranges shown here are based on a minimum tolerable level of service in the design hour for two-lane highways on each service classification. The higher classes have a higher minimum tolerable level-of-service. These are C for service classification 1A and midway through D for Class 1B and D for Classes 2A and 2B.
3. The ranges are calculated here for level terrain with assumed percentages of passing zones variable from 40 to 90.
4. To convert from design hour volume to AADT, a K value was used.
   K=0.11 was used for Class 1A and K=0.12 for all other roads except on Classes 2A and 2B where K=0.10 is used for AADT > 8000.
5. The level of service at which a two-lane roadway is operating in the design hour is more relevant than AADT when considered twinning. This chart shows AADT values because these figures are generally more easily available to designers and planners. Where there is a difference between the AADT value showing in the chart and the actual AADT that can be carried on a particular roadway at the designated level of service, the actual AADT should be used. Such differences may occur due to unusual traffic, geometry, or terrain. Designers should always use the actual recorded K value for the highway segment when assessing the need for twinning.
6. A four-lane divided facility is normally used for the divided highway ranges shown on this chart. Additional lanes could be provided when the level-of-service on a divided facility reaches C. The AADT at which this would occur is dependent on many factors including terrain, speed, and traffic type; however the following ranges are suggested:
   Less than 31,000 : 4 lane
   31,000 – 50,000 : 6 lane
   Over 50,000 : 8 or more lanes.
7. For planning and design purposes, projected AADT values should be used to ensure that the designation selected is appropriate for the design life of the facility.
8. The levels of service shown in this chart are based on Level Terrain because it has been found that this assumption yields the most accurate results in Alberta conditions, even on roadways which are in rolling terrain. This is because the factors listed in the Highway Capacity Manual for reduction in service volume at the various levels of service appear to overestimate the effect of rolling terrain on traffic as compared to actual field observations in Canada.

* This letter indicates the level of service expected in the hour with the 100th highest traffic volume in the year being considered.

Volume Capacity Ratio in Level Terrain				
Level of Service	% Passing Zones 40	60	75	90
A	0.07	0.09	0.12	0.15
B	0.19	0.21	0.24	0.27
C	0.34	0.36	0.39	0.43
D	0.58	0.60	0.62	0.64
E	1.00	1.00	1.00	1.00
F	–	–	–	–

Levels of Service Assumptions

The following assumptions were in the Level of Service calculations.

1. Terrain: Level
2. % Trucks: 15
3. % Buses: 0
4. % R.V.: 4
5. Design Speed: 70 mph (112.6km/h)
6. Peak Hour Factor: 1.0
7. Directional Distribution: 60/40
8. Lane Width: 12 feet (3.66m)
9. Shoulder Width: Variable
10. % No Passing Zones: Variable
11. DHV=0.11 AADT on Service Class 1A, DHV=0.12 AADT on all other roads

APPENDIX

APPENDIX C CONCEPTUAL STORMWATER MANAGEMENT PLAN

Mountain View County

CONCEPTUAL STORMWATER MANAGEMENT PLAN
S 1/2 SECTION 5-32-1 W5M
MOUNTAIN VIEW COUNTRY, ALBERTA

9600230-003

August 2005

EBA Engineering Consultants Ltd.
p. 403.203.3355 • f. 403.203.3301
Riverbend Atrium One • 115, 200 Rivercrest Drive SE • Calgary, Alberta T2C 2X5 • CANADA

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1.0 INTRODUCTION

The subject site is located approximately midway between Didsbury, Alberta (to the south), and Olds, Alberta (to the north) as shown on Figure 1. The site is situated at S1/2 5-32-1-W5M and is bounded by Range Road 15 to the west, Township Road 320 to the south, and Highway 2A to the east. The north side of the site is bounded by the mid section mark of *Campground Access Road* and Township Road 320.

The site is currently in use as a municipal airport, with a runway situated diagonally across its length (NW/SE). Hangars and terminal buildings are located centrally on the south side of the site. The Mountain View County Office occupies the northeast corner of the half section, and the remaining site is enclosed by cropland of the surrounding properties.

Expansion of the airport is planned, and a conceptual stormwater management plan (SWMP) is required for this development to accommodate the site drainage.

The purpose of the SWMP is to ensure adequate drainage of stormwater according to existing practices and guidelines.

The objectives of this SWMP are:

- to provide an acceptable level of flood protection for the development;
- to prevent adverse changes to downstream watercourses that may result from increased stormwater flow from land development; and
- to develop design criteria that may be required for development.

A master drainage plan has not been completed for the area and as such, no pre-set release rates or water quality requirements for the area have been established. Mountain View County does not have any stormwater standards or guidelines for development and as such it was requested that provincial stormwater guidelines be used. Specifically it was requested that pre-development flow rates do not exceed post-development flow rates.

Note: This plan is only to address the conceptual stormwater management for the proposed developed and not the existing developed areas.

2.0 DATA COLLECTION

The following information was provided to EBA Engineering Consultants Ltd. (EBA) to complete the conceptual SWMP:

- existing site layout (no topography); and
- proposed site layout including land use (no topography).

The following information was acquired by EBA to complete the conceptual SWMP:

- airphotos (1987, 2000).

No topographic survey has been completed of the site, and therefore EBA conducted a site visit to observe existing drainage patterns. This inspection was guided by a tour and explanation from airport personnel familiar with the land and drainage patterns (June 28, 2005).

This plan is based on visual observations, and not surveyed information. Surveyed information would be required for the development of a more detailed stormwater plan.

3.0 EXISTING CONDITIONS

The majority of the site is comprised of undeveloped agricultural land, and as a whole is relatively flat. Running diagonally across the eastern third of the site is Rosebud Creek, which flows northwest to southeast. With the exception of a small western portion of the site, all stormwater collected eventually exits the site to the southeast via Rosebud Creek. In the NW corner of the site lays the Mountain View County offices and parking lot.

Developed land currently occupying the site includes a small area of hangars and administrative buildings located amongst taxiways and gravel roads in the central south region. Access to this area is gained via Township Road 320. The existing runway divides the site into approximately equal northeast and southwest halves. The existing drainage system consists of swales that run along the runway, all roads, and taxiways. The general stormwater flow patterns of site are shown on Figure 2.

As shown on Figure 2 and Figure 3, the site was divided into four drainage areas. Each area was selected and examined separately based on intended shared collection points of proposed future development. In doing this, existing stormwater peak flows could be estimated and compared to the predicted stormwater peak flows of the future development.

3.1 DRAINAGE AREA 1

Drainage Area 1 is located on the western side of the site and is currently sloughed. Enclosed in this area is a small section of land that slopes gently toward the west, though stormwater collection is also contributed to in this area by the ditch located along Range Road 15. Within this area there exists a small natural pond, located in proximity to a 350 mm culvert that conveys the runoff off site to another sloughed area west of Range Road 15. This area has been described by airport personnel as being relatively dry in recent years.

3.2 DRAINAGE AREA 2

Drainage Area 2 is located southwest of the site and encompasses a quarter section of agricultural land off site where runoff appears to collect and pond off site as shown in Figure 2. Located in this area is a 500 mm culvert that crosses Township Road 322, connecting the runoff to the airport property. On site this water collects in an existing pond that has been created by a dugout of unknown depth and is currently designated as a fire hazard reserve pond. There is no other fire/emergency plan in place.

3.3 DRAINAGE AREA 3

Drainage Area 3 represents the portion of the site located north of the runway. This section of land is comprised of a berm that runs along the northern side of the runway and slopes toward Rosebud

Creek. The flow of Rosebud Creek is directed toward the southeast corner of the site. Runoff further north of the site flows similarly toward Rosebud Creek.

3.4 DRAINAGE AREA 4

Drainage Area 4 is located directly east of where existing development is situated on site. The majority of stormwater collected in this area drains north toward the swales of the runway, though a small portion flows toward and within the swale that runs east along Township Road 320.

4.0 PROPOSED DEVELOPMENT

The proposed development is depicted with land use on Figure 3. The majority of this development is to take place south of the runway, and will consist of hangars, taxiways, and gravel roads. This development will result in a significant increase in the overall impervious area of the site. Since it has been requested to limit post development flow rates to those of existing flow rates, detention areas will be necessary throughout the site to manage the anticipated increase in stormwater runoff.

Existing development is to remain unaffected in terms of stormwater management as a result of proposed development. It is the intention of the conceptual SWMP to maintain existing stormwater flow patterns where possible.

As mentioned in Section 3.0, the site was divided into similar pre-development and post development drainage areas as shown on Figure 2 and Figure 3. With the exception of Drainage Area 1, which has increased significantly in size, all other drainage areas have remained the same.

4.1 DRAINAGE AREA 1

Drainage Area 1 in post development has increased in size by approximately 50%. This area will house approximately 30 larger hangar lots in the western and central areas (ranging in size from 0.2 ha to 1.28 ha), and 35 smaller hangar lots along the eastern borders (ranging in size from 0.1 ha to 0.42 ha). Gravel roads and paved taxiways will be dispersed throughout for access.

This area is to manage a significant volume of water due to the high degree of imperviousness to be incurred after development. In order to manage the expected increase in runoff, the proposed pond (Pond 1) will need to be sized accordingly (see Section 5.1). It is proposed that all flow encapsulated by Drainage Area 1 be directed toward Pond 1. This would likely involve significant re-grading of the area's eastern portion. It is also recommended that this pond be developed as a dry pond so as to avoid attracting birds to the airport. The dry pond would drain to the existing pond in order to maintain natural conditions.

4.2 DRAINAGE AREA 2

Drainage Area 2 is considered in off-site sections and on-site sections. The off-site section consists of a quarter section of agricultural land that is assumed to be remaining undeveloped in the future. The on-site section will again be housing airplane hangars, a gravel road, and taxiway. It is proposed that six hangars, approximately 0.1 ha in size, will occupy this space.

The on-site area currently drains in part toward an existing pond (Pond 2) and north through a culvert that contributes to the bulk of the flow conveyed toward the runway ditching. It has been

requested that this pond remain present, and possibly even be increased in size so as to continue serving its function as a fire reserve. To achieve this, the area should be graded toward Pond 2 during development. The stormwater collected that is not required for fire reserve will have to be directed toward the natural runway swale path by some means.

4.3 DRAINAGE AREA 3

This area is scheduled to be the last development constructed, and is relatively isolated from the remainder of the site. Since isolation exists, there are no concerns with this area regarding significant run-on of adjacent area drainage. The area is not especially large and is to be fairly impervious as well. Approximately 23 hangar lots are proposed for this area, ranging in size from 0.125 ha to 0.30 ha.

It is proposed that the runoff accepted in this area be directed toward the proposed dry pond (Pond 3), which would require construction in a location deemed appropriate at the time of development. This pond would drain to Rosebud Creek.

4.4 DRAINAGE AREA 4

This area is also to house airplane hangars with taxiways and road access throughout. There are currently 18 hangars proposed, ranging in size from 0.05 ha to 0.20 ha. This translates to an area that will be relatively impervious, and therefore runoff will be in need of control.

It is recommended that the stormwater be directed toward the eastern corner of the area, where a small dry pond (Pond 4) is proposed to accept the runoff that it will convey runoff toward the ditching that is currently in place. This ditching leads toward Rosebud Creek. A second option is to have this pond drain toward the runway swales.

5.0 STORMWATER MANAGEMENT PLAN

Development or urbanization of an undeveloped site results in an increase in both the peak flow rate and volume of runoff. In order to guide municipalities and local authorities, Stormwater Management Guidelines for the Province of Alberta were developed (AENV, 1999). The following SWMP follows the provincial guidelines.

There are two levels of drainage networks that serve a development: the major and minor drainage systems. The minor system includes drainage facilities such as gutters, roofleaders, catchbasins, underground pipe systems, manholes, storage facilities, and outfall channels. These facilities are designed for more frequent storms, typically the 10-year event or less. The major system is designed to handle greater flows, such as those up to a 100-year event. Major drainage facilities usually refer to the overland flow system and include gutters, roads, swales, detention ponds, and outfall channels. As there will not be any underground stormsewer systems, the major and minor drainage facilities for this system are considered to be the same. Therefore, the runoff conveyance and control design will consider the 100-year event.

5.1 RUNOFF CONTROL

The objective of runoff control is to limit peak flow rates from the site to existing levels so that downstream watercourses are not impacted. Hydrologic modeling was completed using Visual OTTHYMO to determine peak runoff flow rates for the site under existing and post-development

conditions. The preferred method for attenuating peak flows for this site is through the use of detention storage. Figure 3 illustrates the conceptual SWMP for the development.

As shown on Figure 3, the ponds depicted will collect runoff from their respective drainage areas. A review of Figure 2 and Figure 3 shows little change in the drainage pattern for the site, excluding Drainage Area 1 which now encompasses a greater area. The outlet for the developed site will be the extreme southeast corner of the quarter section, again excluding Drainage Area 1 which exits the site to the west.

Peak flow rate restrictions for each drainage area were calculated as fractions of their respective predevelopment flow rates as follows:

Drainage Area 1 was restricted to a flow rate of 0.561 m^3/s.

Drainage Area 2 was restricted to a flow rate of 0.989 m^3/s.

Drainage Area 3 was restricted to a flow rate of 0.235 m^3/s.

Drainage Area 4 was restricted to a flow rate of 0.094 m^3/s.

Hydrologic Modeling Details and Results are presented in Appendix B. The post-development CN was increased to account for imperviousness created by buildings and roadways.

A reservoir routing function was used in Visual OTTHYMO to predict the active storage volume required for each pond. The routing function requires the outflow-storage relationship of the pond. The pond outflows will ultimately drain to the southeast corner of the site, with the exception of Pond 1, which will drain west.

In the absence of structural outlet details, an orifice outflow relationship may be assumed. Typically, an orifice provides outflow control for the permitted release rate for a dry pond. It is assumed that the orifice outlet is not submerged during discharge. Details of the pond sizing are presented in Appendix B.

The 100-year detention storage hydrologic modeling results for Drainage Area 1 to Area 4 are as follows:

Location	Flow Rate Restriction	Active Storage	Active Depth	Surface Area
Drainage Area 1	0.561 m^3/s	9,000 m^3	1.5 m	1.00 ha
Drainage Area 2	0.989 m^3/s	1,900 m^3	1.5 m	0.30 ha
Drainage Area 3	0.235 m^3/s	1,050 m^3	1.5 m	0.20 ha
Drainage Area 4	0.094 m^3/s	1,300 m^3	1.5 m	0.24 ha

The active storage area for Drainage Area 1, Area 3, and Area 4 will require a dry pond with a minimum volume as indicated by the table above. Drainage Area 2 will require an active storage area of 1,300 m^3 above the desired active storage for the purposes of a fire hazard reserve pond.

Appendix C provides general design criteria for runoff control structures that should be followed for this development.

In addition to the criteria mentioned above and in Appendix C, the recommended design criteria for the stormwater detention ponds should also include:

- sediment traps/forebays at inlet point(s); and
- a riprapped emergency overflow spillway to manage flows in excess of the 100-year 24-hr peak outflow.

Swales should be designed to Alberta Environment (AENV) allowable depth and velocity criteria (Appendix C).

5.2 WATER QUALITY CONTROL

Stormwater runoff from developed areas typically impacts water quality in receiving water bodies. Parameters of concern include:

- suspended solids;
- biological oxygen demand (BOD);
- nutrients;
- pesticides;
- salts; and
- heavy metals and other toxic constituents.

The type of water quality analysis required for stormwater management projects is determined by the following two criteria (AENV, 1999):

- If a municipal water supply, recreational area or sensitive biological resource will be affected or there is a potential to increase an existing water quality problem.
- Stormwater which does not, when assessed by themselves, represent a significant receiving stream impact but whose cumulative effects may be of concern.

The first category requires a detailed water quality study to establish the proper controls. The second category does not require a detailed water quality study and detention ponds are advocated by AENV as an acceptable control measure. It is assumed that this project falls under the second category, though it is recommended that AENV be contacted with regards to the area of Rosebud Creek located north and east of the site.

Design Criteria for Stormwater Quality Control from AENV Guidelines are:

- In the absence of detailed studies in Alberta, it is considered that providing a minimum pond storage volume equivalent to 25 mm of rainfall on the contributing area is appropriate for stormwater quality control.
- A detention time of at least 24 hours should be used for detention facilities.

Recent Alberta guidelines (AENV, 2001) called for a minimum of 85% removal of sediments of particle size 75 µm or greater for new stormwater facilities.

The use of grassed ditches and culverts for drainage conveyance will assist with filtering and settling out sediment in runoff. Where specific users could be handling hazardous materials, specific spill management plans will need to be developed.

In addition to the drainage ditches, the stormwater pond will act as a sediment basin for runoff. Sediment accumulation in the ponds should be checked annually and sediment removed periodically to maintain the necessary storage for runoff control.

While AENV guidelines specify detention for infrequent storms, provisions should be made for the early stages of a storm runoff event which deliver the highest proportion of contaminants and is known as the "First Flush" (Shammaa Y., 2002). A multi-level pond outlet can ensure sufficient detention for both 100-year design storm and the First Flush. The multi-level outlet varies the outflow discharge to provide the required detention time. These outlets are typically a combination of orifices, perforated risers or weirs. The outlet design should be completed in the detailed design phase.

5.3 EROSION AND SEDIMENT CONTROL

The most critical time for sediment migration from the site will be during construction. This includes both the grading work to complete the development and the construction of buildings. During these times, a series of sediment controls should be implemented including:

- sediment fencing around the perimeter of construction areas;
- rock check dams in ditches for sediment retention;
- use of storm pond sites for sediment basins;
- watering for dust control; and
- stabilization of exposed areas with erosion matting, seed, and sod.

6.0 RECOMMENDATIONS

This conceptual SWMP was based purely on visual observations and proposed land use development maps. A detailed topographic survey will be required to confirm that the ponds will work in terms of both geometry and grade. Both geotechnical and hydrogeologic information should also be acquired, as the proposed pond depths may be affected (particularly concerning the depth of the groundwater table).

The following are further recommendations regarding the stormwater management requirements for the site.

1) Construct Pond 1, Pond 3, and Pond 4 as dry ponds in order to limit the attraction of birds to the airport.

2) Construct grass swales, grade roads and install culverts to collect runoff and convey it to the proposed ponds as shown on Figure 3.

3) Design swales to AENV depth and velocity criteria.

4) Regrade land as necessary to convey runoff to detention ponds.

5) Construct the ponds to the sizes recommended in Section 5.1 and in such a manner that the inlets and outlets are located as far apart as possible to prevent flow short-circuiting.

6) Design a sediment forebay(s) for the proposed ponds.

7) Ensure the hydraulics and size of the ponds during the detailed design phase. The outlet should be designed for quality and quantity control.

8) Design erosion and sediment control measures and implement during construction.

9) Develop a maintenance plan for sediment build-up within the system.

10) Contact AENV about specifications regarding water quality and the potential implications of fish habitat upstream of the dam located on Rosebud Creek.

11) Follow the guidelines presented in Appendix C when completing the detailed design of the stormwater management plan.

7.0 LIMITATIONS OF LIABILITY

Recommendations presented herein are based on surface water assessment as described in Section 1.0. This report has been prepared for the exclusive use of Mountain View County for the specific application described in Section 1.0 of this report. It has been prepared in accordance with generally accepted geo-environmental engineering practices. No other warrantee is made, either expressed or implied. Engineering judgement has been applied in developing the recommendations of the report.

For further limitations, reference should be made to the General Conditions in Appendix A.

8.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please do not hesitate to contact the undersigned at your convenience.

Respectfully submitted,
EBA Engineering Consultants Ltd.

Shane Mulligan, E.I.T.
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PERMIT TO PRACTICE
EBA ENGINEERING
CONSULTANTS LTD.

Signature _____

Date _____

PERMIT NUMBER: P245

The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

Brian C. Adeney, P.Eng.
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/cb

9.0 REFERENCES

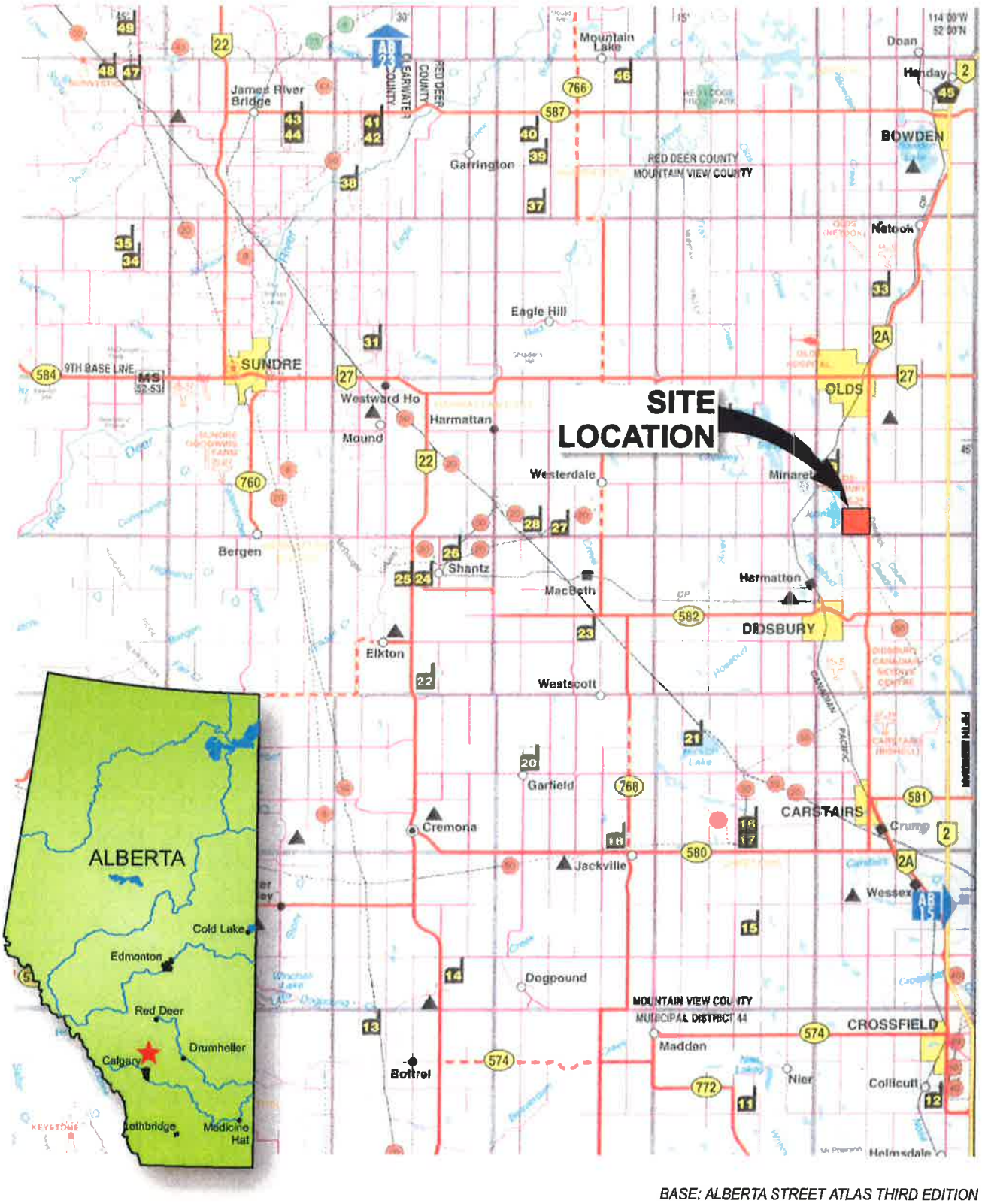
Alberta Environment Protection (AENV), 1999, Stormwater Management Guidelines for the Province of Alberta, January 1999.

Alberta Environment Protection, 2001, Municipal Policies and Procedures Manual, April 2001.

Alberta Transportation, 2003, Design Bulletin #16/2003 – Drainage Guidelines for Highways Under Provincial Jurisdiction in Urban Areas, September 2, 2003.

Shammaa Y. *et. al*, 2002, Effectiveness of dry ponds for stormwater total suspended solids removal, Can. J. Civ. Eng. 29: 316-324.

FIGURES



BASE: ALBERTA STREET ATLAS THIRD EDITION

CLIENT/PROJECT DESCRIPTION
MOUNTAIN VIEW COUNTY
OLDS DIDSBURY AIRPORT
OLDS/ DIDSBURY, ALBERTA

EBA Engineering Consultants Ltd.

SCALE/EBA PROJECT NO.	DATE/DRAWN BY:	TITLE/EBA DRAWING NO.
NTS 9600230-003	05/07/26 CDK/SM	**SITE LOCATION PLAN** FIGURE 1

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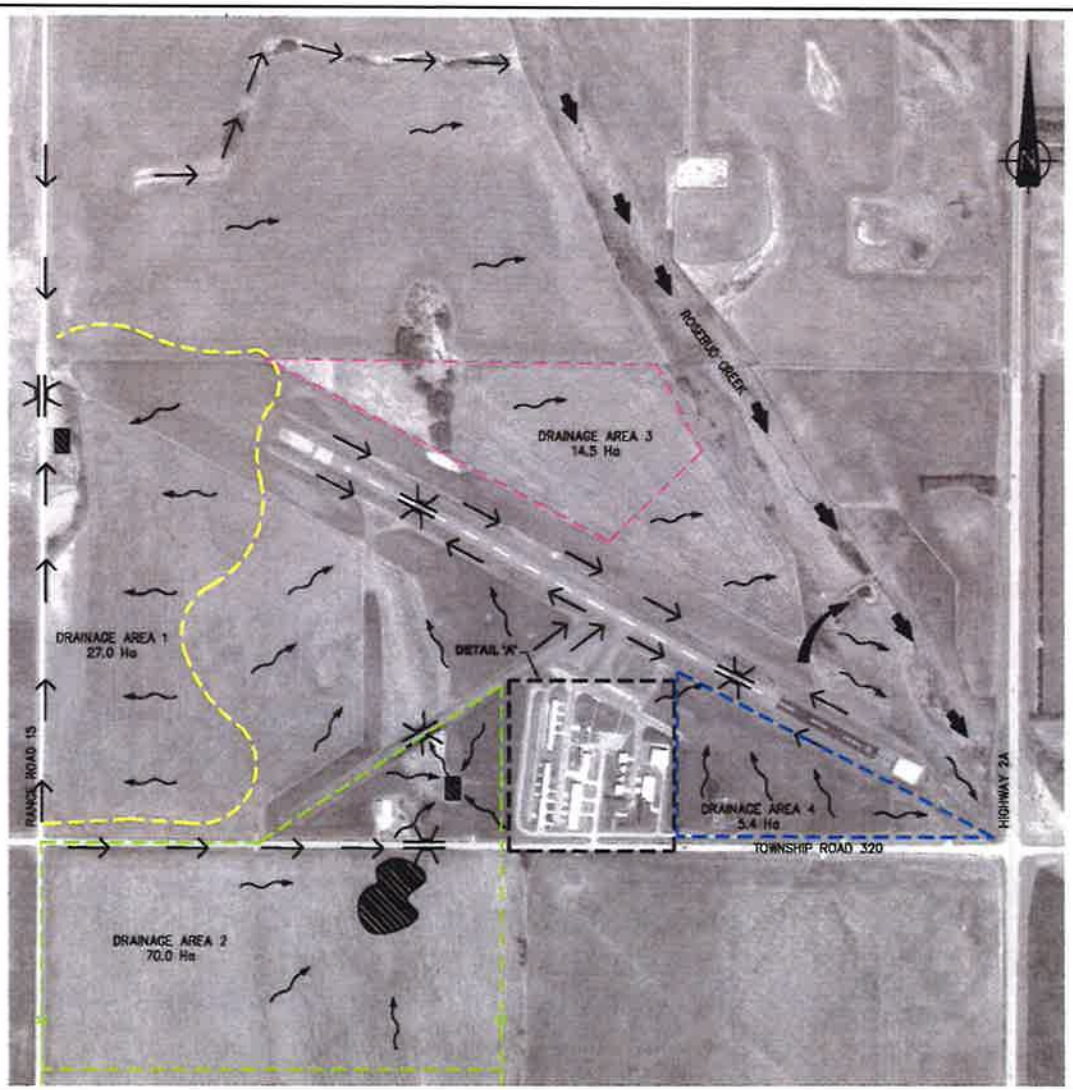
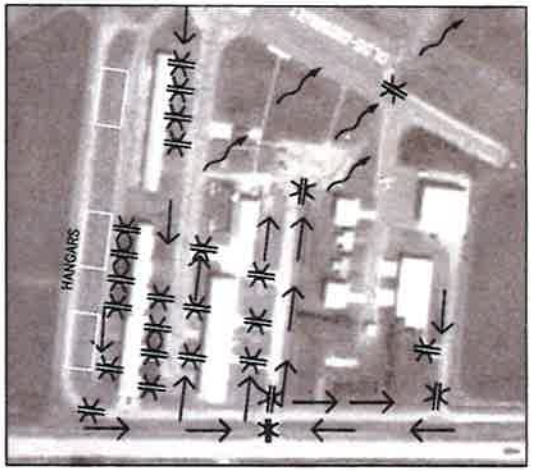




DETAIL 'A'
1:3000

AIR PHOTO YEAR 2000
ORIGINAL PRODUCED IN COLOR

SHEET TITLE
MOUNTAIN VIEW COUNTY
OLDS DIDSBURY AIRPORT
OLDS / DIDSBURY, ALBERTA
SEC. 5, TWP. 32, RGE 1, W5M

LEGEND
- POND
- DRAINAGE AREA 1 (27.0 Ha)
- DRAINAGE AREA 2 (70.0 Ha)
- DRAINAGE AREA 3 (14.5 Ha)
- DRAINAGE AREA 4 (5.4 Ha)
- OVERLAND RUNOFF
- DITCH/SWALE FLOW
- CULVERT
- CREEK FLOW

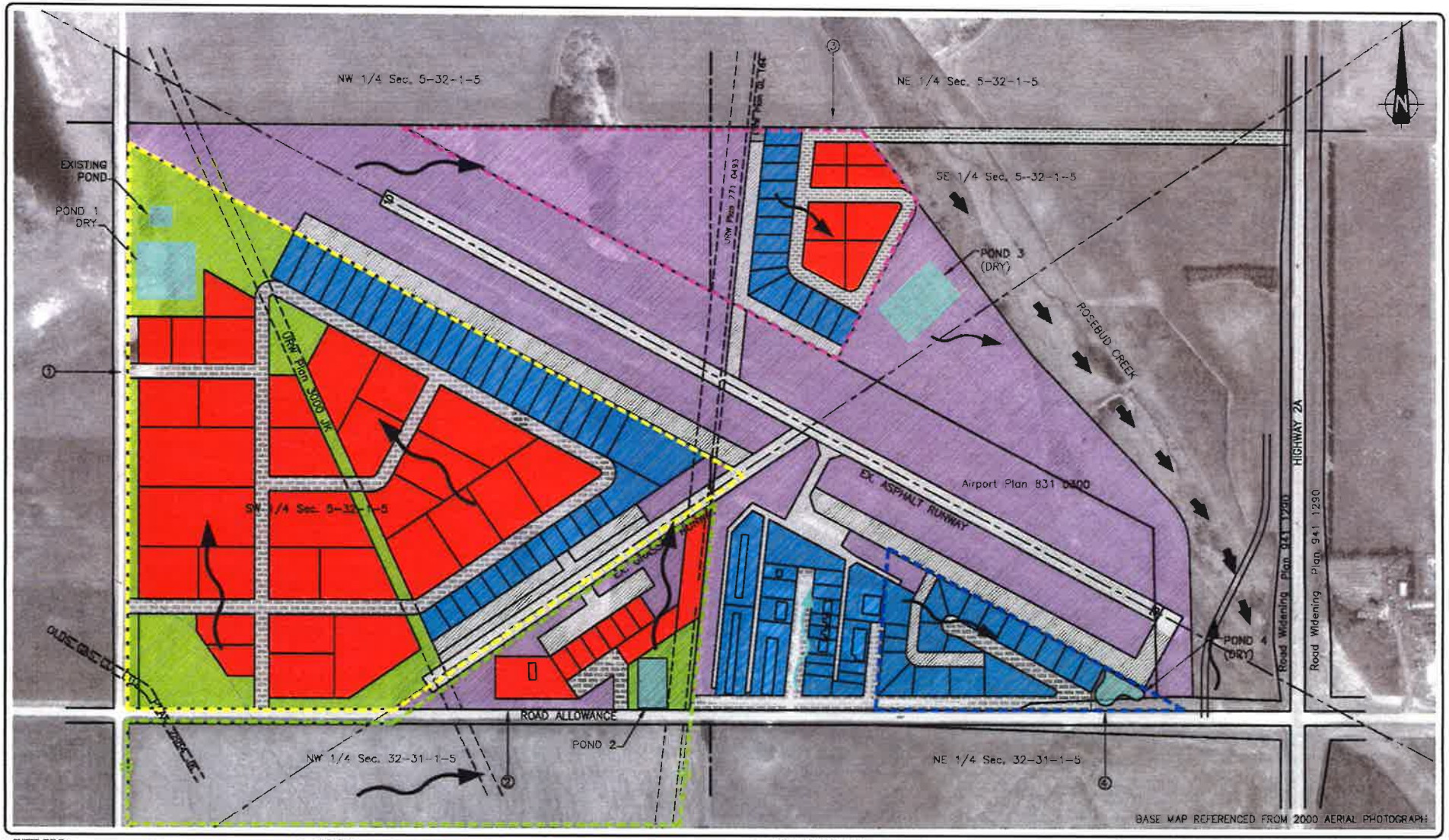
DRAWN/CHECKED BY: CDK/SM

DATE/EBA PROJECT NO.: 05/06/30 9600230

EBA Engineering Consultants Ltd.

SCALE: 1:8000 (0, 80, 200, 400m)

TITLE/EBA DRAWING NO.
EXISTING SITE DRAINAGE
FIGURE 2



SHEET TITLE

MOUNTAIN VIEW COUNTY
OLDS DIDSBURY AIRPORT CONCEPT PLAN
OLDS/DIDSBURY – MOUNTAIN VIEW COUNTY
5-32-1 W5M

LEGEND

- TAXIWAY
- RUNWAY
- ROADS
- AIRPORT OPERATIONAL RESERVE
- AIR SIDE
- MUNICIPAL RESERVE
- GROUND SIDE
- DRAINAGE AREA 1(40.7h
- DRAINAGE AREA 2(70ha)
- DRAINAGE AREA 3(9.9ha)
- DRAINAGE AREA 4(5.4ha)
- OVERLAND DRAINAGE

DRAWN/CHECKED BY: ANS/CDK/DCH/SM

DATE/EBA PROJECT NO.: 05/06/20 9600230-003

EBA Engineering Consultants Ltd.

SCALE: 1:5000 (0 50 100 150 200 250m)

TITLE/EBA DRAWING NO.: PROPOSED CONCEPTUAL SITE DRAINAGE PLAN FIGURE 3

APPENDIX

APPENDIX A ENVIRONMENTAL REPORT – GENERAL CONDITIONS

EBA Engineering Consultants Ltd. (EBA)
ENVIRONMENTAL REPORT – GENERAL CONDITIONS

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 LIMITATIONS OF REPORT

This report is based solely on the conditions which existed on site at the time of EBA's investigation. The client, and any other parties using this report with the express written consent of the client and EBA, acknowledge that conditions affecting the environmental assessment of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

The client, and any other party using this report with the express written consent of the client and EBA, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that EBA is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

2.1 Information Provided to EBA by Others

During the performance of the work and the preparation of this report, EBA may have relied on information provided by persons other than the client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

3.0 LIMITATION OF LIABILITY

The client recognizes that property containing contaminants and hazardous wastes creates a high risk of claims brought by third parties arising out of the presence of those materials. In consideration of these risks, and in consideration of EBA providing the services requested, the client agrees that EBA's liability to the client, with respect to any issues relating to contaminants or other hazardous wastes located on the subject site shall be limited as follows:

(1) With respect to any claims brought against EBA by the client arising out of the provision or failure to provide services hereunder shall be limited to the amount of fees paid by the client to EBA under this Agreement, whether the action is based on breach of contract or tort;

(2) With respect to claims brought by third parties arising out of the presence of contaminants or hazardous wastes on the subject site, the client agrees to indemnify, defend and hold harmless EBA from and against any and all claim or claims, action or actions, demands, damages, penalties, fines, losses, costs and expenses of every nature and kind whatsoever, including solicitor-client costs, arising or alleged to arise either in whole or part out of services provided by EBA, whether the claim be brought against EBA for breach of contract or tort.

4.0 JOB SITE SAFETY

EBA is only responsible for the activities of its employees on the job site and is not responsible for the supervision of any other persons whatsoever. The presence of EBA personnel on site shall not be construed in any way to relieve the client or any other persons on site from their responsibility for job site safety.

5.0 DISCLOSURE OF INFORMATION BY CLIENT

The client agrees to fully cooperate with EBA with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The client acknowledges that in order for EBA to properly provide the service, EBA is relying upon the full disclosure and accuracy of any such information.

6.0 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

7.0 EMERGENCY PROCEDURES

The client undertakes to inform EBA of all hazardous conditions, or possible hazardous conditions which are known to it. The client recognizes that the activities of EBA may uncover previously unknown hazardous materials or conditions and that such discovery may result in the necessity to undertake emergency procedures to protect EBA employees, other persons and the environment. These procedures may involve additional costs outside of any budgets previously agreed upon. The client agrees to pay EBA for any expenses incurred as a result of such discoveries and to compensate EBA through payment of additional fees and expenses for time spent by EBA to deal with the consequences of such discoveries.

8.0 NOTIFICATION OF AUTHORITIES

The client acknowledges that in certain instances the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

9.0 OWNERSHIP OF INSTRUMENTS OF SERVICE

The client acknowledges that all reports, plans, and data generated by EBA during the performance of the work and other documents prepared by EBA are considered its professional work product and shall remain the copyright property of EBA.

10.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

APPENDIX

APPENDIX B HYDROLOGIC MODELING

HYDROLOGIC MODELING

1.0 DESCRIPTION OF VISUAL OTTHYMO MODEL

All hydrologic modeling was performed with Visual OTTHYMO Version 1.0. Visual OTTHYMO is a Windows-based upgrade of the widely used OTTHYMO 1989 hydrologic simulation program.

Visual OTTHYMO is an operational hydrologic model for simulating storm flows from rural, urbanized and urbanizing watersheds, particularly in the framework of master drainage plans and watershed plans. Meteorological input data can be either design storm data or historical events. Various types of output hydrographs can be used to simulate runoff depending on land cover.

2.0 DESIGN STORM

A design storm can be a historic storm, which has been recorded and is considered a critical event for a specific region or it can be a statistically synthesized storm using local intensity-duration-frequency data (IDF). Most regions of Alberta do not have a historical design storm that has been selected by authorities for design. Atmospheric Environment Service (AES) has a Type 1 and Type 2 storm for the Prairie Provinces. The AES Type 1 30th percentile distribution is most representative for use in simulation modeling (AENV, 1999). In addition to the AES storms, the Chicago distribution is commonly used in Alberta. Alberta Infrastructure and Transportation (AIT) recommends the use of the Chicago distribution with 4-hour storm duration for conveyance systems and 24-hour storm duration for detention facilities (Alberta Transportation, 2003) when local authorities do not specify a storm.

IDF data was acquired from the AES for the Red Deer Airport (Station 3025480) for the purpose of preparing this SWMP. The Chicago Storm was used with the hydrogeologic model.

The rainfall intensities for the Chicago distribution are derived from an IDF relationship as follows:

$$I = a/(b+t)^c$$

where I is the intensity (mm/hr), t is time in minutes and a,b and c are constants.

The time of the storm peak is derived from:

$$t_p = r \times t_d$$

where t_p is the time to peak, t_d is the storm duration and r is the ratio of time to peak to storm duration. The IDF parameters were computed using least squares analysis.

3.0 DURATION

Peak runoff is generally taken to occur over a storm duration greater or equal to the time of concentration of the basin. The time of concentration (T_c) is the time when the entire basin is contributing runoff to flow at the outlet. In general, the time of concentration is determined through emprical relationships that consider basin characteristics such as slope, length and roughness. To determine the peak pre-development flow rates for small urban areas, a storm duration of one-hour is considered suitable (AENV, 1999).

A 24-hour Chicago storm was selected to determine peak flows prior to development. AENV Guidelines (AENV, 1999) state "for Rural areas, experiences with runoff models indicate that with the Chicago

hyetograph, the peak flow rate increases as the storm duration increases". This effect is diminished by the time the storm duration reaches 24 hours. As a result, in rural areas, the storm duration simulation period should be 24 hours.

For detention structure sizing, longer duration precipitation events are necessary to determine critical volumes. A 24-hour Chicago storm was used to simulate routing through the detention storage facilities.

4.0 MODELING UNDEVELOPED ("NATURAL") HYDROLOGIC CONDITIONS

The Nash Instantaneous Unit Hydrograph was selected to model undeveloped runoff. This hydrograph utilizes a cascading scheme of 3 linear reservoirs and is typically used for rural areas. It can also be applied in urban watersheds when density of development is low. Rainfall losses were computed using the Modified SCS Curve Number (CN) appropriate for the soils and vegetation cover of the region.

5.0 MODELING POST-DEVELOPMENT CONDITIONS

The Nash Instantaneous Unit Hydrograph was selected to model the post-development areas. Rainfall losses were computed using the Modified SCS Curve Number (CN) appropriate for the development conditions expected.

6.0 POND SIZING

A reservoir routing function was used in Visual OTTHYMO to predict the active storage volume required for each pond. The routing function requires the Outflow-Storage relationship of the pond.

In the absence of structural outlet details, an orifice outflow relationship may be assumed. Typically, an orifice provides outflow control for the permitted release rate for a dry pond. The orifice is usually located in a weir wall that provides a source of overflow in the event of an orifice blockage and emergency overflow capacity for storms greater than the 100-year design event. The orifice equation is:

$$Q = C_0 A_0 (2gH_0)^{0.5}$$

where: Q = orifice flow rate, m^3/s
C_0 = discharge coefficient
A_0 = area of orifice, m^2
H_0 = effective head on the orifice measured from the centroid of the opening, m
g = acceleration due to gravity (9.81 m/s^2)

The required orifice size was estimated from the orifice equation for the allowable release rate. H_0 is based on the assumed orifice diameter by assuming the maximum active depth of the pond to be 1.5 m. The orifice discharge coefficient is taken to be 0.6.

Using the approximated orifice area, discharge for several pond depths was calculated to provide a stage-discharge curve.

```
V     V   I     SSSSS  U   U    A    L
V     V   I     SS     U   U   A A   L
 V   V    I      SS    U   U  AAAAA  L
 V   V    I       SS   U   U  A   A  L
  VV      I     SSSSS  UUUUU  A   A  LLLLL

 OOO    TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM, Version 1.0
O   O     T      T    H   H   Y Y   MM MM  O   O
O   O     T      T    HHHHH    Y    M M M  O   O   Licensed To:
O   O     T      T    H   H    Y    M   M  O   O   Test
 OOO      T      T    H   H    Y    M   M   OOO    VO101MH0024
```

Distributed by Greenland Engineering Group. Trademark (TM), Paul Wisner & Assoc., 1996.

***** D E T A I L E D O U T P U T *****

Input filename: C:\Visual OTTHYMO v1.01\Olds Didsbury\Post Development Option 2.ott
Output filename: C:\Visual OTTHYMO v1.01\Olds Didsbury\Post Development Option 2-1detail.txt
Summary filename: C:\Visual OTTHYMO v1.01\Olds Didsbury\Post Development Option 2-1summary.txt

DATE: 7/26/05 TIME: 8:30:15 AM

USER: Shane

<=== comment ===>A second option for stormwater drainage

****
** SIMULATION NUMBER: 1 **
****

| CHICAGO STORM |
| Ptotal= 95.41 mm |

IDF curve parameters: A= 680.271
B= 1.500
C= .707
used in: INTENSITY = A / (t + B)^C

Duration of storm = 24.00 hrs
Storm time step = 5.00 min
Time to peak ratio = .33

The CORRELATION coefficient is = .9949

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	206.40	181.11
10.	127.80	121.00
15.	99.00	93.74
30.	58.40	59.34
60.	30.80	36.98
120.	18.40	22.85
360.	9.60	10.57
720.	7.10	6.48
1440.	4.70	3.98

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	1.18	6.08	3.24	12.08	3.08	18.08	1.62
.17	1.19	6.17	3.34	12.17	3.03	18.17	1.61
.25	1.20	6.25	3.46	12.25	2.99	18.25	1.60
.33	1.20	6.33	3.58	12.33	2.95	18.33	1.59
.42	1.21	6.42	3.72	12.42	2.91	18.42	1.58
.50	1.22	6.50	3.87	12.50	2.87	18.50	1.57
.58	1.23	6.58	4.03	12.58	2.83	18.58	1.56
.67	1.24	6.67	4.21	12.67	2.80	18.67	1.56
.75	1.25	6.75	4.41	12.75	2.76	18.75	1.55
.83	1.26	6.83	4.64	12.83	2.73	18.83	1.54
.92	1.27	6.92	4.90	12.92	2.70	18.92	1.53
1.00	1.28	7.00	5.19	13.00	2.66	19.00	1.52
1.08	1.30	7.08	5.53	13.08	2.63	19.08	1.51
1.17	1.31	7.17	5.94	13.17	2.60	19.17	1.51
1.25	1.32	7.25	6.42	13.25	2.57	19.25	1.50
1.33	1.33	7.33	7.00	13.33	2.54	19.33	1.49
1.42	1.34	7.42	7.74	13.42	2.52	19.42	1.48
1.50	1.35	7.50	8.69	13.50	2.49	19.50	1.48
1.58	1.37	7.58	9.99	13.58	2.46	19.58	1.47
1.67	1.38	7.67	11.88	13.67	2.44	19.67	1.46
1.75	1.39	7.75	14.96	13.75	2.41	19.75	1.45
1.83	1.41	7.83	21.10	13.83	2.39	19.83	1.45
1.92	1.42	7.92	43.27	13.92	2.36	19.92	1.44
2.00	1.43	8.00	181.11	14.00	2.34	20.00	1.43
2.08	1.45	8.08	54.74	14.08	2.32	20.08	1.42
2.17	1.46	8.17	31.84	14.17	2.29	20.17	1.42
2.25	1.48	8.25	23.39	14.25	2.27	20.25	1.41
2.33	1.49	8.33	18.86	14.33	2.25	20.33	1.40
2.42	1.51	8.42	15.98	14.42	2.23	20.42	1.40
2.50	1.52	8.50	13.96	14.50	2.21	20.50	1.39
2.58	1.54	8.58	12.47	14.58	2.19	20.58	1.38
2.67	1.56	8.67	11.31	14.67	2.17	20.67	1.38
2.75	1.58	8.75	10.38	14.75	2.15	20.75	1.37
2.83	1.59	8.83	9.62	14.83	2.13	20.83	1.36
2.92	1.61	8.92	8.97	14.92	2.12	20.92	1.36
3.00	1.63	9.00	8.43	15.00	2.10	21.00	1.35
3.08	1.65	9.08	7.95	15.08	2.08	21.08	1.35
3.17	1.67	9.17	7.54	15.17	2.06	21.17	1.34
3.25	1.69	9.25	7.17	15.25	2.05	21.25	1.33
3.33	1.71	9.33	6.85	15.33	2.03	21.33	1.33
3.42	1.74	9.42	6.55	15.42	2.01	21.42	1.32
3.50	1.76	9.50	6.29	15.50	2.00	21.50	1.32
3.58	1.78	9.58	6.05	15.58	1.98	21.58	1.31
3.67	1.81	9.67	5.83	15.67	1.97	21.67	1.31
3.75	1.83	9.75	5.63	15.75	1.95	21.75	1.30
3.83	1.86	9.83	5.45	15.83	1.94	21.83	1.29
3.92	1.89	9.92	5.28	15.92	1.92	21.92	1.29
4.00	1.91	10.00	5.12	16.00	1.91	22.00	1.28
4.08	1.94	10.08	4.97	16.08	1.89	22.08	1.28
4.17	1.97	10.17	4.83	16.17	1.88	22.17	1.27
4.25	2.00	10.25	4.70	16.25	1.87	22.25	1.27
4.33	2.04	10.33	4.58	16.33	1.85	22.33	1.26
4.42	2.07	10.42	4.47	16.42	1.84	22.42	1.26
4.50	2.10	10.50	4.36	16.50	1.83	22.50	1.25
4.58	2.14	10.58	4.26	16.58	1.82	22.58	1.25
4.67	2.18	10.67	4.17	16.67	1.80	22.67	1.24
4.75	2.22	10.75	4.08	16.75	1.79	22.75	1.24
4.83	2.26	10.83	3.99	16.83	1.78	22.83	1.23
4.92	2.30	10.92	3.91	16.92	1.77	22.92	1.23
5.00	2.35	11.00	3.83	17.00	1.76	23.00	1.22
5.08	2.40	11.08	3.76	17.08	1.74	23.08	1.22
5.17	2.45	11.17	3.69	17.17	1.73	23.17	1.21
5.25	2.50	11.25	3.62	17.25	1.72	23.25	1.21

```
 5.33    2.56 | 11.33    3.55 | 17.33    1.71 | 23.33    1.20
 5.42    2.61 | 11.42    3.49 | 17.42    1.70 | 23.42    1.20
 5.50    2.68 | 11.50    3.43 | 17.50    1.69 | 23.50    1.19
 5.58    2.74 | 11.58    3.38 | 17.58    1.68 | 23.58    1.19
 5.67    2.81 | 11.67    3.32 | 17.67    1.67 | 23.67    1.19
 5.75    2.89 | 11.75    3.27 | 17.75    1.66 | 23.75    1.18
 5.83    2.97 | 11.83    3.22 | 17.83    1.65 | 23.83    1.18
 5.92    3.05 | 11.92    3.17 | 17.92    1.64 | 23.92    1.17
 6.00    3.14 | 12.00    3.12 | 18.00    1.63 | 24.00    1.17
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0005) |   Area     (ha)=  61.60   Curve Number    (CN)= 69.0
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.70   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .81

     Unit Hyd Qpeak  (cms)=   2.887

     PEAK FLOW       (cms)=   1.617 (i)
     TIME TO PEAK    (hrs)=   9.000
     RUNOFF VOLUME    (mm)=  39.486
     TOTAL RAINFALL   (mm)=  95.414
     RUNOFF COEFFICIENT   =    .414

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0001) |   Area     (ha)=  40.66   Curve Number    (CN)= 82.5
|ID= 1 DT= 5.0 min |   Ia       (mm)=   3.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .78

     Unit Hyd Qpeak  (cms)=   1.991

     PEAK FLOW       (cms)=   1.784 (i)
     TIME TO PEAK    (hrs)=   8.917
     RUNOFF VOLUME    (mm)=  58.378
     TOTAL RAINFALL   (mm)=  95.414
     RUNOFF COEFFICIENT   =    .612

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0006) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW     STORAGE    |   OUTFLOW     STORAGE
--------------------      (cms)       (ha.m.)   |    (cms)      (ha.m.)
                           .000        .000     |     .435        .555
                           .253        .259     |     .561        .893

                                  AREA      QPEAK      TPEAK       R.V.
                                  (ha)      (cms)      (hrs)       (mm)
     INFLOW : ID= 2 (0001)       40.66       1.78       8.92      58.38
     OUTFLOW: ID= 1 (0006)       40.66        .56      11.00      58.37

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 31.12
                TIME SHIFT OF PEAK FLOW         (min)=125.00
                MAXIMUM  STORAGE   USED        (ha.m.)=   .88

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0002) |   Area     (ha)=  70.00   Curve Number    (CN)= 61.5
```

```
|ID= 1 DT= 5.0 min |    Ia       (mm)=   7.20    # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=   1.15

     Unit Hyd Qpeak  (cms)=   2.325

     PEAK FLOW       (cms)=   1.109 (i)
     TIME TO PEAK    (hrs)=   9.500
     RUNOFF VOLUME    (mm)=  31.476
     TOTAL RAINFALL   (mm)=  95.414
     RUNOFF COEFFICIENT   =    .330

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0007) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW     STORAGE    |  OUTFLOW     STORAGE
--------------------       (cms)      (ha.m.)    |   (cms)      (ha.m.)
                            .000        .000     |     .748        .103
                            .376        .043     |     .989        .185

                                    AREA      QPEAK     TPEAK       R.V.
                                    (ha)      (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0002)         70.00      1.11      9.50       31.48
     OUTFLOW: ID= 1 (0007)         70.00       .96     10.25       31.48

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 86.56
                    TIME SHIFT OF PEAK FLOW         (min)= 45.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=   .18

--------------------------------------------------------------------------------
--------------------
| CALIB              |
| NASHYD    (0003)   |    Area     (ha)=   9.90   Curve Number    (CN)= 75.0
|ID= 1 DT= 5.0 min   |    Ia       (mm)=   4.60   # of Linear Res.(N)= 3.00
--------------------    U.H. Tp(hrs)=    .50

     Unit Hyd Qpeak  (cms)=    .756

     PEAK FLOW       (cms)=    .448 (i)
     TIME TO PEAK    (hrs)=   8.583
     RUNOFF VOLUME    (mm)=  46.995
     TOTAL RAINFALL   (mm)=  95.414
     RUNOFF COEFFICIENT   =    .493

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0008) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |      OUTFLOW     STORAGE    |  OUTFLOW     STORAGE
--------------------       (cms)      (ha.m.)    |   (cms)      (ha.m.)
                            .000        .000     |     .186        .056
                            .119        .022     |     .235        .104

                                    AREA      QPEAK     TPEAK       R.V.
                                    (ha)      (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0003)          9.90       .45      8.58       46.99
     OUTFLOW: ID= 1 (0008)          9.90       .22      9.42       46.99

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 49.93
                    TIME SHIFT OF PEAK FLOW         (min)= 50.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=   .09

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```

```
---------------------
| CALIB             |
| NASHYD    (0004)  |   Area     (ha)=   5.40   Curve Number    (CN)= 86.6
|ID= 1 DT= 5.0 min  |   Ia       (mm)=   2.25   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .25

     Unit Hyd Qpeak  (cms)=    .825

     PEAK FLOW       (cms)=    .589 (i)
     TIME TO PEAK    (hrs)=   8.250
     RUNOFF VOLUME    (mm)=  65.470
     TOTAL RAINFALL   (mm)=  95.414
     RUNOFF COEFFICIENT   =    .686

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

---------------------------------------------------------------------------
---------------------
| RESERVOIR (0009)  |
| IN= 2---> OUT= 1  |
| DT=  5.0 min      |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
---------------------      (cms)     (ha.m.)   |    (cms)     (ha.m.)
                           .000        .000    |     .075        .069
                           .050        .027    |     .094        .130
     **** WARNING : STORAGE-DISCHARGE TABLE WAS EXCEEDED.

                              AREA      QPEAK      TPEAK       R.V.
                              (ha)      (cms)      (hrs)       (mm)
     INFLOW : ID= 2 (0004)    5.40        .59       8.25      65.47
     OUTFLOW: ID= 1 (0009)    5.40        .09       9.50      65.45

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.08
                  TIME SHIFT OF PEAK FLOW          (min)= 75.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=   .13

---------------------------------------------------------------------------

 FINISH
===========================================================================
==========================
```

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================================================================================
========================

      V    V   I    SSSSS  U   U    A    L
      V    V   I    SS     U   U   A A   L
       V  V    I     SS    U   U  AAAAA  L
       V  V    I      SS   U   U  A   A  L
        VV     I    SSSSS  UUUUU  A   A  LLLLL

       OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM, Version 1.0
      O   O    T      T    H   H   Y Y   MM MM  O   O
      O   O    T      T    HHHHH    Y    M M M  O   O   Licensed To:
      O   O    T      T    H   H    Y    M   M  O   O   Test
       OOO     T      T    H   H    Y    M   M   OOO    VO101MH0024

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1996.

                    *****  D E T A I L E D   O U T P U T  *****

  Input    filename: C:\Visual OTTHYMO v1.01\Olds Didsbury\100 Year Flood Level.ott
  Output   filename: C:\Visual OTTHYMO v1.01\Olds Didsbury\100 Year Flood Level-
ldetail.txt
  Summary filename: C:\Visual OTTHYMO v1.01\Olds Didsbury\100 Year Flood Level-
1summary.txt

DATE: 7/26/05                              TIME: 8:05:26 AM

USER: Shane


 <=== comment ===>The 100 year flood level for the Olds Didsbury airport storm

--------------------------------------------------------------------------------
-----------------------
  ***************************
  ** SIMULATION NUMBER:   1 **
  ***************************

---------------------
| CHICAGO STORM     |     IDF curve parameters: A= 680.271
| Ptotal= 95.41 mm  |                           B=   1.500
---------------------                           C=    .707
                          used in:    INTENSITY =  A / (t + B)^C

                          Duration of storm   = 24.00 hrs
                          Storm time step     =  5.00 min
                          Time to peak ratio  =   .30

                     The CORRELATION coefficient is =  .9949

                      TIME        INPUT INT.          TAB. INT.
                     (min)         (mm/hr)             (mm/hr)
                        5.          206.40              181.11
                       10.          127.80              121.00
                       15.           99.00               93.74
                       30.           58.40               59.34
                       60.           30.80               36.98
                      120.           18.40               22.85
                      360.            9.60               10.57
                      720.            7.10                6.48
                     1440.            4.70                3.98
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.08	1.18	6.08	4.55	12.08	2.79	18.08	1.58
.17	1.19	6.17	4.83	12.17	2.76	18.17	1.58
.25	1.20	6.25	5.14	12.25	2.72	18.25	1.57
.33	1.21	6.33	5.52	12.33	2.69	18.33	1.56
.42	1.22	6.42	5.96	12.42	2.66	18.42	1.55
.50	1.24	6.50	6.51	12.50	2.63	18.50	1.54
.58	1.25	6.58	7.20	12.58	2.60	18.58	1.53
.67	1.26	6.67	8.08	12.67	2.58	18.67	1.53
.75	1.27	6.75	9.30	12.75	2.55	18.75	1.52
.83	1.28	6.83	11.06	12.83	2.52	18.83	1.51
.92	1.29	6.92	13.95	12.92	2.50	18.92	1.50
1.00	1.31	7.00	19.75	13.00	2.47	19.00	1.50
1.08	1.32	7.08	41.53	13.08	2.45	19.08	1.49
1.17	1.33	7.17	181.11	13.17	2.42	19.17	1.48
1.25	1.34	7.25	55.51	13.25	2.40	19.25	1.47
1.33	1.36	7.33	32.69	13.33	2.37	19.33	1.47
1.42	1.37	7.42	24.10	13.42	2.35	19.42	1.46
1.50	1.39	7.50	19.45	13.50	2.33	19.50	1.45
1.58	1.40	7.58	16.49	13.58	2.31	19.58	1.45
1.67	1.42	7.67	14.42	13.67	2.29	19.67	1.44
1.75	1.43	7.75	12.89	13.75	2.27	19.75	1.43
1.83	1.45	7.83	11.69	13.83	2.25	19.83	1.43
1.92	1.46	7.92	10.73	13.92	2.23	19.92	1.42
2.00	1.48	8.00	9.94	14.00	2.21	20.00	1.41
2.08	1.50	8.08	9.28	14.08	2.19	20.08	1.41
2.17	1.52	8.17	8.71	14.17	2.17	20.17	1.40
2.25	1.53	8.25	8.22	14.25	2.15	20.25	1.39
2.33	1.55	8.33	7.79	14.33	2.13	20.33	1.39
2.42	1.57	8.42	7.42	14.42	2.12	20.42	1.38
2.50	1.59	8.50	7.08	14.50	2.10	20.50	1.37
2.58	1.61	8.58	6.78	14.58	2.08	20.58	1.37
2.67	1.63	8.67	6.51	14.67	2.07	20.67	1.36
2.75	1.66	8.75	6.26	14.75	2.05	20.75	1.36
2.83	1.68	8.83	6.03	14.83	2.03	20.83	1.35
2.92	1.70	8.92	5.83	14.92	2.02	20.92	1.34
3.00	1.73	9.00	5.63	15.00	2.00	21.00	1.34
3.08	1.75	9.08	5.46	15.08	1.99	21.08	1.33
3.17	1.78	9.17	5.29	15.17	1.97	21.17	1.33
3.25	1.80	9.25	5.14	15.25	1.96	21.25	1.32
3.33	1.83	9.33	5.00	15.33	1.95	21.33	1.32
3.42	1.86	9.42	4.87	15.42	1.93	21.42	1.31
3.50	1.89	9.50	4.74	15.50	1.92	21.50	1.31
3.58	1.92	9.58	4.62	15.58	1.90	21.58	1.30
3.67	1.95	9.67	4.51	15.67	1.89	21.67	1.30
3.75	1.99	9.75	4.41	15.75	1.88	21.75	1.29
3.83	2.02	9.83	4.31	15.83	1.87	21.83	1.28
3.92	2.06	9.92	4.22	15.92	1.85	21.92	1.28
4.00	2.10	10.00	4.13	16.00	1.84	22.00	1.27
4.08	2.14	10.08	4.04	16.08	1.83	22.08	1.27
4.17	2.18	10.17	3.96	16.17	1.82	22.17	1.26
4.25	2.23	10.25	3.89	16.25	1.80	22.25	1.26
4.33	2.27	10.33	3.81	16.33	1.79	22.33	1.25
4.42	2.32	10.42	3.74	16.42	1.78	22.42	1.25
4.50	2.37	10.50	3.68	16.50	1.77	22.50	1.24
4.58	2.43	10.58	3.61	16.58	1.76	22.58	1.24
4.67	2.49	10.67	3.55	16.67	1.75	22.67	1.24
4.75	2.55	10.75	3.49	16.75	1.74	22.75	1.23
4.83	2.61	10.83	3.44	16.83	1.73	22.83	1.23
4.92	2.68	10.92	3.38	16.92	1.72	22.92	1.22
5.00	2.76	11.00	3.33	17.00	1.71	23.00	1.22
5.08	2.83	11.08	3.28	17.08	1.70	23.08	1.21
5.17	2.92	11.17	3.23	17.17	1.69	23.17	1.21
5.25	3.01	11.25	3.18	17.25	1.68	23.25	1.20
5.33	3.11	11.33	3.14	17.33	1.67	23.33	1.20

5.42	3.21	11.42	3.09	17.42	1.66	23.42	1.19
5.50	3.33	11.50	3.05	17.50	1.65	23.50	1.19
5.58	3.45	11.58	3.01	17.58	1.64	23.58	1.19
5.67	3.59	11.67	2.97	17.67	1.63	23.67	1.18
5.75	3.74	11.75	2.93	17.75	1.62	23.75	1.18
5.83	3.91	11.83	2.89	17.83	1.61	23.83	1.17
5.92	4.10	11.92	2.86	17.92	1.60	23.92	1.17
6.00	4.31	12.00	2.82	18.00	1.59	24.00	1.17

CALIB					
NASHYD (0001)	Area (ha)=	26.97	Curve Number (CN)=	60.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.50	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.63		

Unit Hyd Qpeak (cms)= 1.622

PEAK FLOW (cms)= .561 (i)
TIME TO PEAK (hrs)= 7.917
RUNOFF VOLUME (mm)= 30.043
TOTAL RAINFALL (mm)= 95.413
RUNOFF COEFFICIENT = .315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0002)	Area (ha)=	70.00	Curve Number (CN)=	60.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.50	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	1.15		

Unit Hyd Qpeak (cms)= 2.325

PEAK FLOW (cms)= .989 (i)
TIME TO PEAK (hrs)= 8.667
RUNOFF VOLUME (mm)= 30.044
TOTAL RAINFALL (mm)= 95.413
RUNOFF COEFFICIENT = .315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0003)	Area (ha)=	14.54	Curve Number (CN)=	60.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.50	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.94		

Unit Hyd Qpeak (cms)= .592

PEAK FLOW (cms)= .235 (i)
TIME TO PEAK (hrs)= 8.417
RUNOFF VOLUME (mm)= 30.044
TOTAL RAINFALL (mm)= 95.413
RUNOFF COEFFICIENT = .315

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB					
NASHYD (0004)	Area (ha)=	5.40	Curve Number (CN)=	60.0
ID= 1 DT= 5.0 min	Ia (mm)=	7.50	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	.84		

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      Unit Hyd Qpeak  (cms)=    .246

      PEAK FLOW       (cms)=    .094 (i)
      TIME TO PEAK    (hrs)=   8.250
      RUNOFF VOLUME    (mm)=  30.044
      TOTAL RAINFALL   (mm)=  95.413
      RUNOFF COEFFICIENT   =    .315

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB             |
| NASHYD     (0005) |   Area     (ha)=  70.74   Curve Number    (CN)= 67.2
|ID= 1 DT= 5.0 min  |   Ia       (mm)=   6.00   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .84

      Unit Hyd Qpeak  (cms)=   3.217

      PEAK FLOW       (cms)=   1.610 (i)
      TIME TO PEAK    (hrs)=   8.250
      RUNOFF VOLUME    (mm)=  37.465
      TOTAL RAINFALL   (mm)=  95.413
      RUNOFF COEFFICIENT   =    .393

      (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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APPENDIX

APPENDIX C STORMWATER MANAGEMENT DESIGN CRITERIA

STORMWATER MANAGEMENT DESIGN CRITERIA

The following design objectives and design criteria for major system drainage facilities were taken from the provincial stormwater management guidelines report (AENV, 1999). These objectives and criteria were used to develop the Stormwater Management Plan (SWMP) and should be used to assist in the detailed design of the major drainage facilities.

Design Objective for Stormwater Quantity:

- Reproduce pre-development hydrologic conditions.

Design Criteria for Stormwater Quality Control:

- In the absence of detailed studies in Alberta, it is considered that providing a minimum pond storage volume equivalent to 25 mm of rainfall on the contributing area is appropriate for stormwater quality control.
- A detention time of at least 24 hours should be used for detention facilities.

Design Criteria for Wet Ponds:

- Design capacity suitable for the 100-year event.
- Maximum sideslopes above active storage zone of 4:1.
- Maximum interior sideslopes in active storage zone of 5:1.
- Maximum exterior sideslopes of 3:1.
- Minimum ratio of effective length to effective width of 2:1.
- Minimum length to width ratio of 4:1.
- Minimum permanent pool depth of 2 m.
- Maximum permanent pool depth of 3 m.
- Maximum active detention storage depth of 2 m.
- Post-development peak outflows should not exceed pre-development levels.

Design Guidelines for Dry Ponds:

- Storage capacity for up to the 100-year storm.
- Detention time of 24 hours.
- Maximum active storage depth of 1.0 m to 1.5 m. The maximum water level should be below adjacent house basement footings (Ponds were selected to be 1.5m in depth for the purposes of this SWMP in order to limit area).
- Maximum interior sideslopes of 4:1 to 5:1.
- Maximum exterior sideslopes of 3:1.

- Minimum freeboard of 0.6 m.
- Minimum ratio of effective length to effective width of 4:1 to 5:1.
- Minimum slope in the bottom of the pond of 1 percent (2 percent is preferred).

Design Guidelines for Grassed Swales:

- Minimum longitudinal slope of 1%.
- Maximum side slopes no greater than 2.5:1.
- Minimum bottom width of 0.75 m.
- Minimum depth of 0.5 m.
- Maximum flow velocity of 0.5 m/s.
- Vegetation should be of local species or standard turf grass.
- Vegetation should be allowed to grow higher than 75 mm in order to filter suspended solid.

Permissible Velocities For Depths of Flow – Swales And Gutters (AENV, 1999)

Water Velocity (m/s)	Permissible Depth (m)
0.5	0.80
1.0	0.32
2.0	0.21
3.0	0.09

APPENDIX

APPENDIX D LEED CRITERIA

LEED Certification

LEED was created to:

- define "green building" by establishing a common standard of measurement
- promote integrated, whole-building design practices
- recognize environmental leadership in the building industry
- stimulate green competition
- raise consumer awareness of green building benefits
- transform the building market

LEED provides a complete framework for assessing building performance and meeting sustainability goals. Based on well-founded scientific standards, LEED emphasizes state of the art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED recognizes achievements and promotes expertise in green building through a comprehensive system offering project certification, professional accreditation, training and practical resources.

The following is the checklist developed by the US Green Building Council to guide the development of sustainable buildings and communities that provide improved health and wellness opportunities as well as generate less waste and conserve our valuable resources. The checklist provides a point system earned by special design and energy considerations. A certain number of points must be achieved to attain LEED certification. There is certification at several levels from silver to platinum.

Many municipalities are requiring LEED certification in all public buildings and often provide incentives for LEED certification in private developments. For example, the City of Calgary requires a minimum of silver certification level for all city structures and has developed a development bonusing system for development based on meeting LEED criteria.