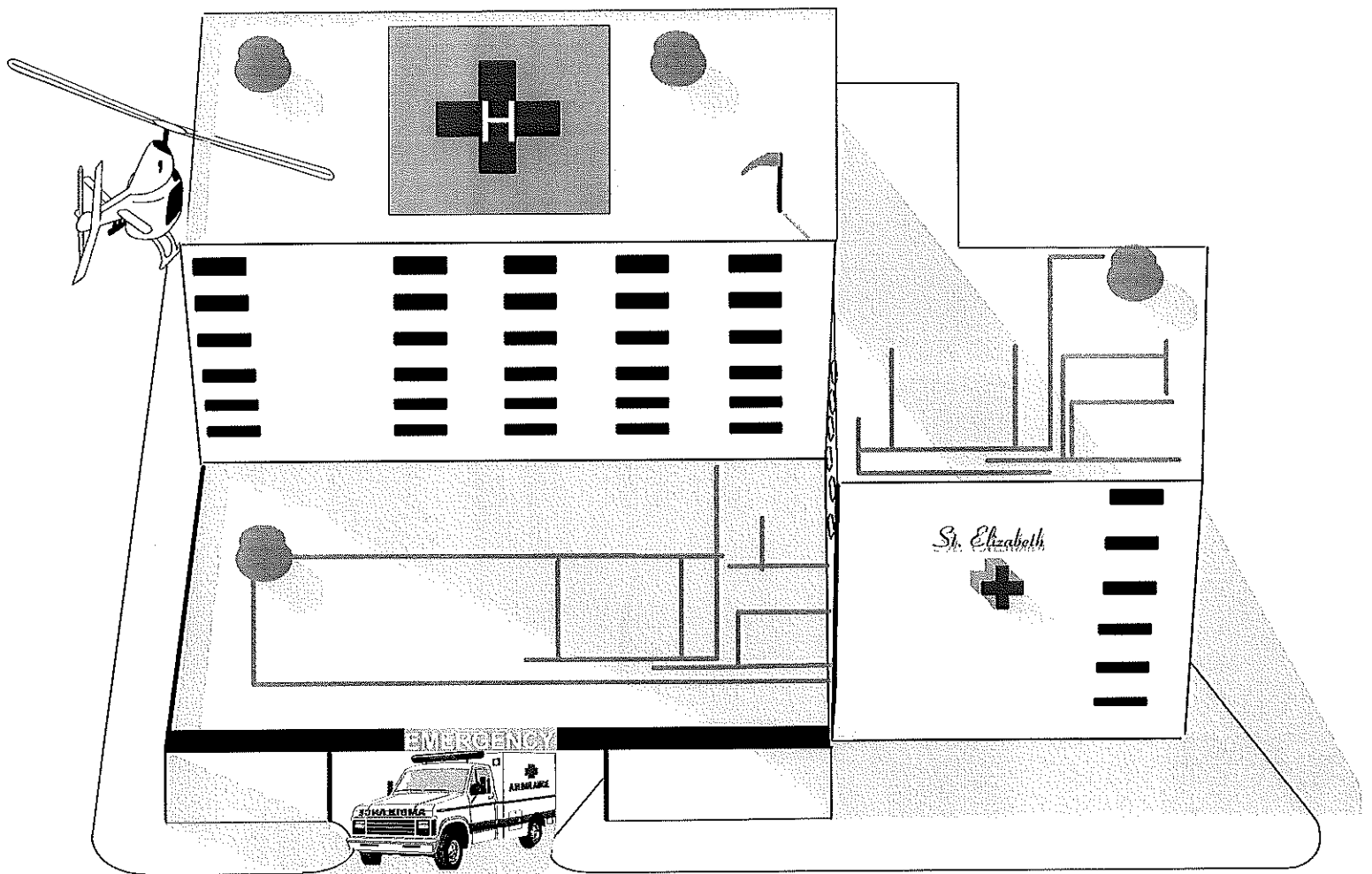


Mediport Implementation Plan

Riaz Aziz

UGPTI Publication No. 112
September 1996



Mediport Implementation Plan

by

Riaz Aziz

Upper Great Plains Transportation Institute

in cooperation with
North Dakota Aeronautics Commission

and

North Dakota Department of Transportation

September 1996
Fargo, North Dakota

The contents of this report reflect the views of the author, who is responsible for the facts and the accuracy of the information presented herein. The suggestions presented are not specific to any mediport. Sponsors interested in establishing a mediport are encouraged to contact the appropriate federal, state, and local agencies for specific requirements, compliance and approval.

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ABSTRACT

North Dakota's aeromedical needs are provided by two Helicopter Emergency Medical Service (HEMS) and 136 ground ambulance or Emergency Medical Service (EMS) providers. Combined, they cover an area in North Dakota approximately 70,655 square miles and serve a population of 638,000. North Dakotans receive health care services from 53 facilities in the state including hospitals, medical centers, public health services, and government hospitals.

EMS and HEMS providers use mediports, public-use airports, and intercepts to transfer people in need of medical care between health care facilities, between accidents sites and health care facilities, or to transport medical personnel to areas where medical care is needed. Rapid access and critical care during transportation can improve the outcome of the patient, reduce the time spent in hospital, and help contain cost. This is especially true in rural areas where residents may live some distance from medical care services and local hospitals may be unable to provide a full range of medical services.

When approaching or departing a landing area, HEMS pilots determine wind directions, obstructions to landing, slope of the ground, debris that may be thrown at people, and dust or snow that may obscure the vision of the pilot from high winds created by the helicopter rotors.

Although, helicopter landing areas (mediports) were established with the knowledge they could help save lives, mediports have been established without a

uniform method of identifying their location or describing their structure.

Establishing a process of identifying and communicating information on mediports will assist those involved in providing health services to respond more efficiently to medical emergencies. Selecting a mediport site should include input from health care providers, EMS and HEMS, law enforcement, regulatory agencies, and community leaders if the mediport is to be designed for optimal use. Latest information on mediport should be made available either on a central computer system or printed in a publication.

ACKNOWLEDGMENTS

The author would like to thank the North Dakota Aeronautics Commission and the North Dakota Department of Transportation for their financial support towards the development of this research project.

Thanks also to the task group for offering their expertise, time, and support, including: the North Dakota Highway Patrol, North Dakota Army National Guard, North Dakota Emergency Medical Association, North Dakota Division of Emergency Management, Federal Aviation Administration, Med/Tran Corporation, North Dakota Department of Health, Omni Flight, and Lifeflight.

A thank you is extended to the Emergency Medical Service providers who took the time to participate in the survey. Finally, thanks to the staff of the Upper Great Plains Transportation Institute and especially Bhaskar Marthi for his help in compiling the maps and database for this report.

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INTRODUCTION

This report was designed to identify existing intercepts and mediports in North Dakota and develop a process by which new intercepts and mediports could be established. Intercepts, mediports, and public-use airports are used by ground ambulance or Emergency Medical Service (EMS) and air ambulance or Helicopter Emergency Medical Service (HEMS) providers to transfer people in need of medical care between hospitals and clinics, between accident sites and the medical care facilities, or to transport medical personnel to areas where medical care is needed. Rapid access combined with critical care during transport to medical centers can often improve the outcome of patients, reduce the length of hospitalization, and contain costs (Lewis et al. 1995).

The North Dakota Aeronautics Commission (NDAC) and the North Dakota Department of Transportation (NDDOT) sponsored a mediport implementation plan study. The study was managed by the Upper Great Plains Transportation Institute (UGPTI) at North Dakota State University in Fargo. A task group (Appendix A) was assembled to provide consultation on the project and included:

- Federal Aviation Administration,
- Med/Trans Corporation,
- Life Flight,
- North Dakota Aeronautics Commission,
- North Dakota Army National Guard,

- North Dakota Emergency Medical Association,
- North Dakota Department of Health,
- North Dakota Department of Transportation,
- North Dakota Division of Emergency Management,
- North Dakota Highway Patrol,
- Omni Flight, and
- Upper Great Plains Transportation Institute.

In addition to identifying existing and future mediport sites, the task group focused on the cost of liability with establishing mediports on private and public land, availability of insurance, limitations of the coverage, and the responsibilities of the insurer.

Objectives of Study

The objectives of the study were to:

- identify existing mediport sites,
- determine if insurance coverage is available for mediports,
- develop requirements for selecting new mediports,
- chart existing mediports, and
- develop a process for sponsoring new mediports.

Background

Medical conditions such as heart attacks, and critical injuries such as those sustained in motor vehicle crashes and occupational accidents, may require EMS response. Though small communities have relatively low volumes of emergency calls and severe trauma may occur infrequently, they may have to deal with multiple victims of an automobile crash (U.S. Office of Technology Assessment 1989).

Strategies designed to improve health services of people in rural areas require choices which interact with community characteristics. Community characteristics include population and demography, geography, physical characteristics, the economy, social structure, institutional and government climate. Success depends on a good match of strategy and community goals. However, since communities vary along many dimensions there are a number of potential strategies and the key is getting the “right fit” or more realistically, a “good fit” (Sears et al. 1995). For example, people in a small community may construct a mediport near a local hospital to improve the aeromedical needs in their community; however, if these people also plant trees close to the mediport as part of an economic development program, the mediport may not be useable.

North Dakota is considered a rural state with much of its 70,655 square miles of land devoted to farming and ranching (Wills 1963). North Dakota’s rural residents may live some distance from medical care services. Doctors and

hospitals located in small cities generally do not provide comprehensive health care services, and rural people must travel long distances for specialized medical care. Part of the medical costs incurred by residents in rural North Dakota include time and distance required to reach health care services (Hamm et al. 1993).

North Dakota's population peaked in 1930 when about 681,000 people lived in the state, mostly in rural areas. Although the state's urban population has been steadily increasing, North Dakota's total population has been decreasing since the 1930s (Bureau of the Census 1990). Communities in rural North Dakota are finding it difficult to attract and keep physicians because of decreasing population and increasing health care costs. Hospitals in rural areas are providing fewer services and some health care facilities are closing altogether (Hamm et al. 1993).

Basis of Problem

Over 180,000 emergency medical flights a year are provided by HEMS in the United States. Even with sophisticated helicopters, experienced flight crews, and trained EMS personnel, there are risks each time a helicopter responds to an emergency (Lewis et al. 1995). However, risks can be minimized if those who use mediports are properly trained, contingencies are planned, and measures are taken to insure safe operations at the site.

When approaching a landing area, HEMS pilots determine wind direction, obstructions, slope of the ground, access to roads to transfer patients, dust, snow, gravel that may be thrown at people or obscure the vision of the pilot from high winds created by the helicopter rotors. Most general helicopter “mishaps” (Figure 1) involve striking an obstruction on the facility (36 percent).

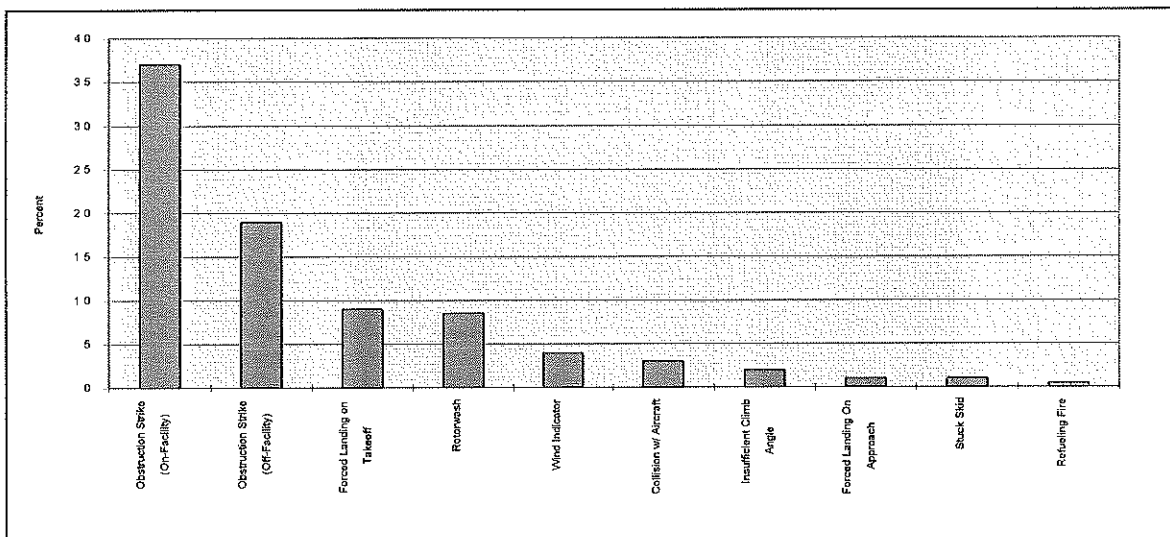


Figure 1 General Helicopter “Mishap” causes

Source: Robert D. Smith. 1995. *Vertical Flight*. Sarde Conference, Bismarck, North Dakota.

Mediports in North Dakota are generally located near health care facilities. Some are located in private or public-owned automobile parking or city lots. Mediports are identified either with a wind sock, brightly colored markings (generally the letter H), heliport identification beacon or a combination of the above. Mediports may be located in open areas; automobile parking lots; near county, state, or interstate roads; or on top of buildings.

Mediports in North Dakota have been established over the past 10 years. Some have been developed in cooperation with health care facilities and HEMS providers and others have been developed through a joint effort between private land owners and townships or local municipalities. Mediports were established with the knowledge they could play a role in saving lives; however, this has resulted in the following:

- mediports have been established without a uniform method of identifying their location or describing their structure;
- information on mediports has not been adequately communicated among health care facilities, HEMS and EMS providers, law enforcement, and state and federal aviation officials;
- mediports have been relocated at the discretion of the owner or the sponsoring agent if the area had been designated for other uses; and
- approach and departure paths to mediports have been established at the discretion of HEMS pilots once they have landed at a new mediport.

Pilots hand draw an overview schematic of the town in which the mediport is located and draw the approximate location of the mediport in relation to the town. Also included on the card is information on obstructions, frequency, course, closest navigation aid, and remarks. Coordinates to the mediport is also included. Some coordinates help the helicopter pilots navigate close to the site. For communities which do not have a designated mediport, coordinates for the nearest airport are included.

By establishing a process for identifying, communicating, and accessing information on mediports, communities and health care providers can benefit by:

- providing HEMS pilots the location, structure, obstructions, and safety information on mediports;
- helping EMS personnel better prepare to transfer patients to or from HEMS by providing information on the condition of the pavement used to transport the gurney at mediports;
- improving patient care by saving the time HEMS pilots spend selecting an approach to a landing area;
- communicating proposed changes to the mediports with those who use mediports;
- helping the state health, transportation, and aviation agencies better plan for the future needs of mediports and ground access to the sites;

- accessing a mediport directory that would help ground and helicopter emergency medical personnel to coordinate an intercept location; and
- identifying sponsors that could provide financial assistance for improving or expanding mediports.

NORTH DAKOTA MEDICAL SERVICES

There are 53 health care facilities in North Dakota (Appendix B) including hospitals, medical centers, health centers, public health services, and government hospitals (American Hospital Association Guide 1995). Government hospitals include the U.S. Public Health Service Indian Hospitals in Belcourt and Fort Yates, Veterans Affairs Medical and Regional Office Center in Fargo, and U.S. Airforce Hospitals in Grand Forks and Minot. These facilities offer a variety of medical services, including:

- intensive care,
- orthopedic surgery,
- cardiac rehabilitation,
- organ and tissue transplants,
- neonatal intensive care, and
- alcohol and drug abuse or dependency units.

Most of the services are concentrated in urban areas (Hamm et al. 1993).

In 1995, medical facilities in North Dakota reported having over 5,000 beds, admitting more than 80,400 patients, providing almost 864,700 outpatient services, and incurring \$720,314,000 in expenses (American Hospital Association Guide 1995).

To simplify the information, North Dakota has been divided into six regions along county lines. The regions include Northeast, Southeast, North Central

South Central, Northwest, and Southwest. The largest concentration of health care facilities are located in the northeast and northwest regions (Figure 2).

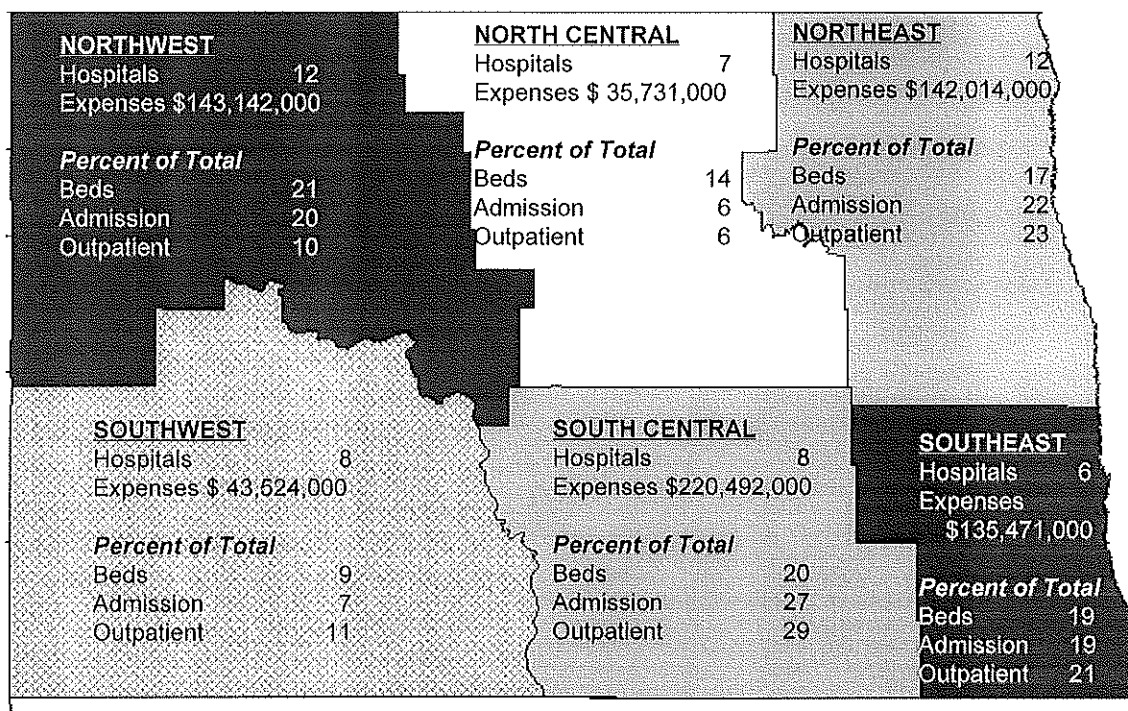


Figure 2 North Dakota Health Care Facilities by Region

Source: American Hospital Association. 1995. *American Hospital Association Guide*. American Hospital Association, Chicago, Illinois.

About a fifth of the hospital beds (21 percent) are in the northwest region and about 9 percent are located in the southwest. The American Hospital Association (1995) reported that 27 percent of admissions and 29 percent of outpatient visits occurred in the south central region of North Dakota. The least number of admissions and outpatient visits (6 percent) were reported in the north central region of the state (American Hospital Association Guide 1995).

Emergency Medical Service (EMS)

North Dakota's EMS personnel responded to almost 23,900 medical calls in 1995. Over half the calls were emergencies, occurring between 8:00 a.m. and 4:00 p.m. About a third of the calls (33 percent) occurred between 4:00 p.m. and midnight and 18 percent occurred between midnight and 8:00 a.m. The highest number of calls (16 percent) occurred on Fridays and the least (12 percent) on Sundays (North Dakota State Department of Health 1996).

North Dakota is served by 136 EMS providers (Appendix C). Except for Slope county, EMS providers are located in 52 of the state's 53 counties (Figure 3).

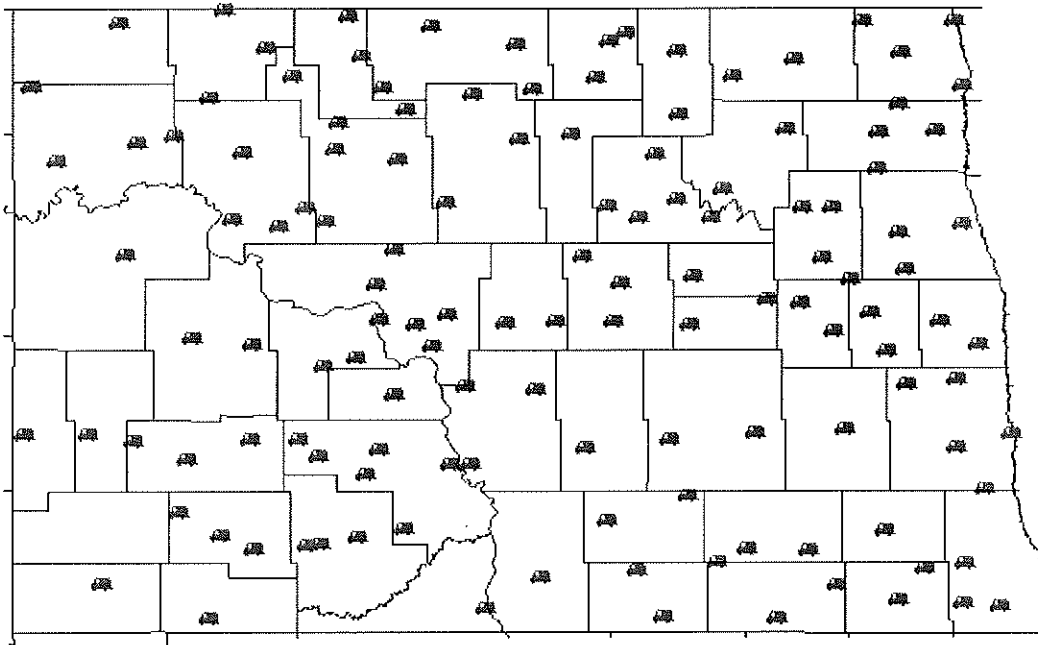


Figure 3 Approximate Location of EMS providers in North Dakota

Source: North Dakota Department of Health. 1996. *EMS Mailing List*. North Dakota Department of Health, Bismarck.

Helicopter Emergency Medical Service (HEMS)

HEMS are used in medical emergencies at the request of the EMS personnel, personnel at health care facilities, or the physician attending to a person in need of medical care. North Dakota is served by two HEMS providers; Med/Tran Corporation located in Bismarck and LifeFlight in Fargo. HEMS pilots must be able to respond to emergency calls within the shortest time and safest means possible. Pilots examine weather reports for the destination and weather forecasts at the point of arrival and departure. When approaching and departing a landing area, the pilot is responsible for determining if the landing area and its surrounding conditions are safe. HEMS pilots land and takeoff at:

- mediports, areas designed for landing and takeoff of helicopters providing emergency medical service;
- airports, areas designed for landing and takeoff of aircraft; or
- intercepts, a location determined by EMS personnel at the time of need, such as a road or a field.

Mediports

There are approximately 51 designated mediports in North Dakota (Appendix D). These helicopter landing areas (Figure 4) are primarily used to move critically ill or injured persons to or from HEMS. Though mediports vary in size and structure, in general, mediports have an approach and departure path, a

touch-down area, and a wind indicator. Large health care facilities build helicopter landing areas on their rooftops. Elevator penthouses, towers, exhaust vents, and other raised features impact rooftop helicopter operations (U.S. Department of Transportation 1994). Smaller hospitals and clinics have mediports in grass covered areas or on paved automobile parking areas near their facility. For those health care facilities that do not have a designated mediport, HEMS pilots select a landing area close to the facility that is clear of obstructions and provides access for EMS.

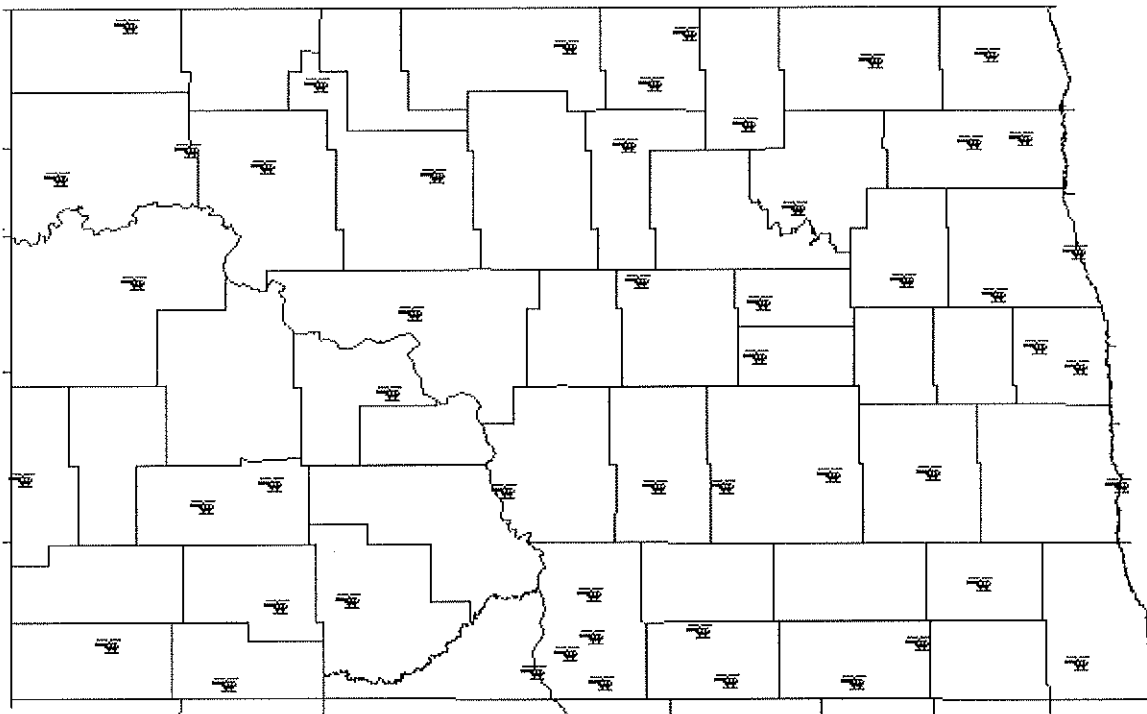


Figure 4 Approximate Location of Mediports in North Dakota

Source: Med/Tran Corporation and Omni Flight. 1995. *Locations Flown in 1995*. Med/Tran Corporation, Bismarck, North Dakota, and Omni Flight, Fargo, North Dakota.

Airports

Helicopters can operate on most airports without interfering with fixed wing traffic. Helicopter landing and takeoff areas may be located anywhere on the airport (U.S. Department of Transportation 1994). There are 95 public-use airports (Appendix E) and over 300 private landing areas in North Dakota. These public airports (Figure 5) maintain over 1,395 aircraft and report annual operations in excess of 900,000.

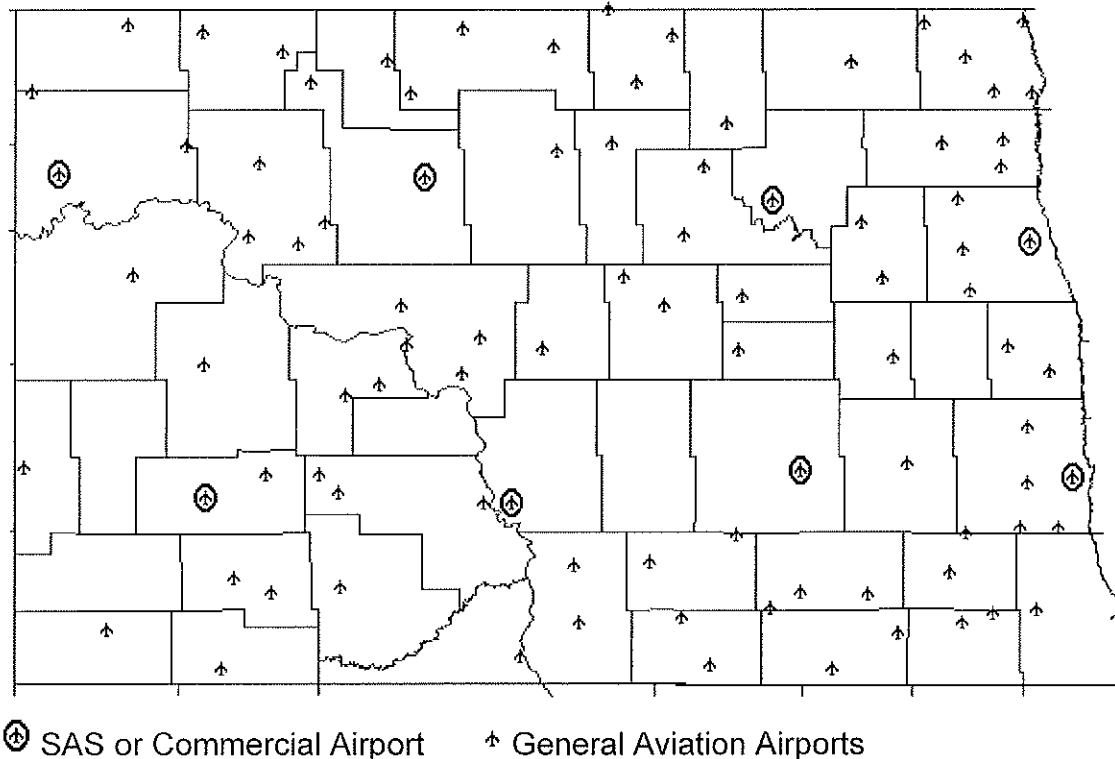


Figure 5 Approximate Location of Public-Use Airports in North Dakota
Public

Source: North Dakota Aeronautics Commission. 1995. *North Dakota Airport Directory*. North Dakota Aeronautics Commission, Bismarck.

Eight airports are designated as Schedule Air Service (SAS) or commercial airports and include the cities of Bismarck, Fargo, Grand Forks, Devils Lake, Minot, Williston, Jamestown, and Dickinson . These airports have regular scheduled air service and air taxi operations. Air taxi operators provide fixed wing air ambulance service between the airport and health care facilities inside and out of North Dakota to facilities such as the Medical Center in Rochester, Minnesota, and the Burn Center in St. Paul, Minnesota.

To simplify information, the approximate location of 136 EMS providers, 51 mediports, and 95 airports are presented on regional maps (Appendix F) by town and county. North Dakota has been divided into six regions including Northeast, Southeast, North Central, South Central, Northwest, and Southwest.

Intercepts

An intercept is established by the EMS or HEMS after both have communicated over a two-way radio and an intercept area is agreed upon. HEMS may land at an intercept after the pilot has determined that the area is safe and can determine the direction of the wind. Law enforcement may assist by diverting or clearing the area of traffic. Considerations for an intercept landing generally include a surface which measures at least 100 feet by 100 feet wide, free of debris and loose material, trees, power lines, towers and other obstacles, and an approach and departure path that allows the helicopter to enter and leave the area into the wind at glide angles not greater than 10 degrees. (Lewis et al. 1995).

When an intercept must be established during periods of darkness, EMS and law enforcement often use the headlights of their vehicles to illuminate the helicopter area.

Trauma Transport Plan

Approximately 100 communities in North Dakota have a Trauma Transport Plan. The plan was developed in cooperation with ambulance services (EMS), health care facilities, and state health agencies to deliver the most optimal emergency medical response. The primary area served by the EMS is divided into zones with instructions on which hospital the EMS is to transport patients and where to intercept with HEMS providers. There are also instructions on advising the hospital of the patient's condition, providing a trauma code, and telephone numbers for requesting an intercept with a HEMS.

MEDIPORT IMPLEMENTATION PLAN

Existing Mediports

North Dakota's mediports vary in:

- size and shape,
- access by air and ground,
- location in relation to medical facility,
- obstruction and clearance, and
- annual use.

The frequency with which mediports are used depends on the location of the mediports to medical care facilities and the number of emergency calls which require HEMS response at mediports. In 1995, North Dakota's two HEMS providers responded to emergency calls in or near 50 cities in the state.

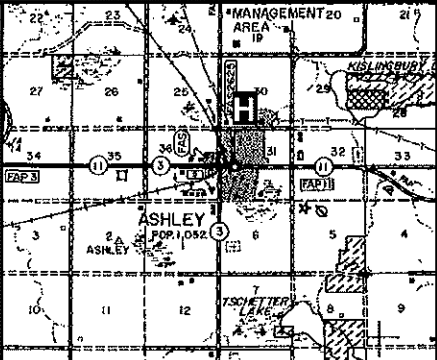
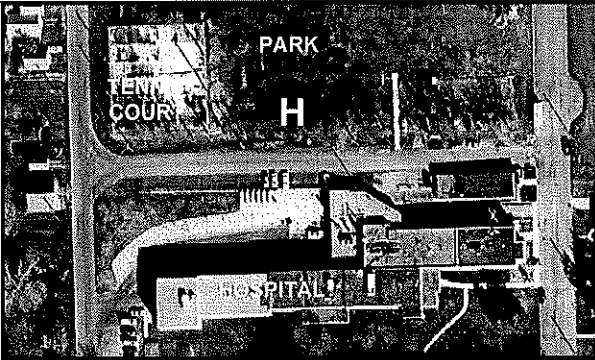
The task group (Appendix A) determined that existing mediports may be adequate to serve the aeromedical needs of North Dakota communities.

However, mediports could be improved for safer operations, including:

- improving the design and size so that helicopters can approach and depart the area safely,
- paving ground access so that EMS personnel can move patients between the ambulance and HEMS with ease,
- removing obstructions that might limit access from the air, and

- developing a mediport directory to assist EMS, HEMS, health care providers, and law enforcement by providing the most current information on the location and condition of mediports.

The directory would serve as a navigation aid for HEMS pilots (Figure 6).

TOWN: Ashley		COUNTY: McIntosh		HOSPITAL: Ashley Medical Center	
					
WPT #1: _____		NAVAID: _____		RADIAL: _____ DIST: _____ ETE: _____	
WPT #2: _____		NAVAID: _____		RADIAL: _____ DIST: _____ ETE: _____	

ENROUTE INFORMATION	
NAVAIDS: 111.0 ASH _____	STATE RADIO TWR: <u>Wishek</u>
LANDMARKS: Ashley is located in the south central region of McIntosh county. _____ Hospital is located north of the town and south of the park. _____	
LANDING INFORMATION	
OBSTRUCTIONS: Trees on south and east of mediport. Tennis court lights, _____ wires, and buildings on west edge of mediports. Contact Ashley Police Department to _____ provide lights for night landing. _____	
DIMENSION: 100' X 100' SITE: Grass _____ MAX. WEIGHT CAPACITY: Unknown _____	
INGRESS / EGRESS: Approach to the east, west, or south. Depart north or east. _____	
MEDIPORT CONTACT: Medical Center _____ MEDIPORT CONTACT: Police _____	
PHONE: 288-1234 _____ PHONE: 288-4321 _____	
FUEL INFORMATION	
NEAREST FUEL POINT: Airport _____ FUEL TYPE: Av. Gas _____ OPS. HRS: 8-5 _____	
DAY PHONE: 288-3675 _____ AFTER HOUR PHONE: 288-3092 _____	
REMARKS: Mediport is not paved and may be wet after rain fall or icy in winter. _____	
LAST REVISION: 9/9/96	

Figure 6 Front and Back Sample Approach Plate to Mediport in Ashley, North Dakota. (Do Not Use for Navigation)

The directory would be similar to the airport directory published by most state aeronautics agencies and would include:

- an overview of the town in relation to the county,
- aerial photograph of the mediport in relation to the town, buildings, and other landmarks,
- latitude and longitude coordinates of the mediport,
- schematic of the proposed approach and departure paths,
- mediport dimensions, construction, and maximum weight capacity;
- frequencies of the closest navigation aids,
- field elevation, name and identification code for each mediport,
- name and phone numbers of persons who can provide information on the condition of the mediports,
- general remarks, and
- last revision date.

Liability

Risk is characterized by a conscious lack of knowledge about the outcome of an event. Risk is the possibility of an unfavorable deviation from the expected resulting in undesirable contingency. It is the probability that something we do not want to occur will happen or something we want to happen will not occur (Athearn 1977).

Accidents resulting from helicopter operations may be covered by insurance policies carried by the two HEMS providers in North Dakota. EMS providers also carry insurance to cover accidents. Mediports located on top of health care facilities, are in most cases, covered by insurance policies for that facility. Mediports on private and public lands may not have insurance policies covering activities when the mediport is used by HEMS and EMS providers to transfer patients or when maintenance is performed on the mediport. Maintenance includes cutting grass, removing snow, inspecting or replacing wind socks, lights, and markers.

Some mediports are not insured because the owners believe the benefits are greater than the risk associated with using the mediports. However, some cities and groups are deterred from establishing mediports without carrying liability insurance.

Fifteen aviation insurance companies from across the country were contacted. Ten of the companies contacted (Appendix G) are licensed to provide

insurance services in North Dakota and showed an interest in writing insurance policies on mediports in the state. The cost and coverage of the policies will depend on:

- risk of using the mediports,
- number of times the mediports are used annually,
- location of mediports,
- level of liability coverage,
- number of mediports covered under a single policy,
- level of deductible, and
- parties responsible for the premium.

Mediports on public land could be covered under the general liability insurance policy for the city in which the mediport is located. Sponsors of mediports are also encouraged to contact insurance companies who specialize in underwriting mediports to determine if the cost is manageable.

Criteria for Selecting Mediport Sites

Before selecting a mediport site, it is important to determine if the site meets the aeromedical needs of the community. Discussions with health care organizations and regulatory agencies would help determine the need for a mediport, and should include:

- health care providers,
- agencies managing the local trauma plans,
- emergency disaster management agencies,
- EMS and HEMS providers,
- state and local law enforcement agencies,
- state and federal aviation agencies, and
- political and business leaders in the community.

Site selection should include the following considerations:

- travel distance to a health care facility,
- paved access for the EMS to drive within a safe distance to the helicopter landing area,
- paved access for EMS to transfer patients between the ambulance and the helicopter,
- safe distance of the mediport from buildings, power cables, towers, and other obstructions;

- clearance for approach and departure paths,
- sponsorship and maintenance responsibility of the mediport, and
- cost of liability.

When a mediport is established, it may not be necessary to have the landing area certified by the Federal Aviation Administration (FAA) provided the conditions under Federal Aviation Regulations Part 157 (Appendix H) are applied. The regulations indicate that it is not necessary to notify the FAA if the intermittent use of a site (as a mediport) is not an established facility and which is:

- intended to be used for less than one year,
- flight operations at the site will be conducted only under Visual Flight Rules (VFR),
- the site will be used no more than three days in a week, and
- there will be no more than ten operations at the site in any one day.

If the mediport is to be certified by the FAA, the North Dakota Aeronautics Commission should be contacted for assistance in completing FAA Form 7480.

The task group determined that mediports may be located in the following areas:

- interstate rest stops,
- near highway off-ramps,
- parks and recreation areas,
- hospitals and clinics,

- near abandoned military missile sites,
- within each trauma transport plan,
- public-use airports, and
- vacant land owned by cities or local municipalities.

Before planning a mediport, sponsors should obtain permission from state and local governing agencies which oversee the management of the above areas. In addition, sponsors may be required to obtain construction, zoning, and other permits.

Emergency Medical Service Provider Survey Results

North Dakota's EMS providers were mailed a questionnaire (Appendix I) and asked to indicate if:

- EMS personnel used intercepts, mediports, and airports to transfer patients to or from HEMS;
- the number of times they used these facilities in a year, and
- if they believed there was a need for additional mediports in their primary service area.

Over half (51.4 percent or 70) of the surveys mailed were returned completed. Almost 40 percent of respondents indicated they had used an intercept, airport, or mediport in the past 12 months and about 3 percent indicated they had used all three.

- Fourteen, or 20 percent of responses had used intercepts,
- Fifteen, or 21.4 percent had used airports, and
- Twelve, or 17.1 percent had used mediports.

Respondents were asked to indicate the number of times intercepts, airports and mediports were used during a year. Responses indicated the following:

Intercepts

- Twelve EMS used intercepts 1 to 4 times a year,
- one used them 5 to 8 times, and

- one used them over 20 times.

Airports

- Eleven EMS used airports 1 to 4 times a year,
- one used them 5 to 8 times,
- one used them 9 to 12 times, and
- one used them over 20 times.

Mediports

- Six EMS used mediports 1 to 4 times a year,
- one used them 5 to 8 times,
- one used them 9 to 12 times,
- one used them 13 to 16 times, and
- three used them over 20 times.

EMS providers were asked if they believed additional mediports were needed in their primary service area and to estimate the number of times the new mediports would be used in a year.

- Thirteen respondents or 18.5 percent indicated that one new mediport was needed,
- three or four percent indicated that two additional mediports were needed, and
- one indicated that three new mediports were needed.

Database for Accessing Mediport Information

A computer database was developed at UGPTI to store and retrieve information on mediports, airports, EMS providers, and health care facilities in North Dakota. The data stored included city, county, facility name, and other relevant information. Database applications were combined with geographic application to develop maps of North Dakota to show the approximate location of each facility and provide spatial references.

The databases would provide access to EMS and HEMS providers, health care facilities, law enforcement, and regulatory agencies. By combining the databases with more powerful geographic application, similar to the Geographic Information System (GIS) at the North Dakota Department of Transportation, the location, condition, limitations, and access to mediports would be readily available. Access to the most current information could help reduce the time that EMS, HEMS, law enforcement, emergency management, and other state and federal agencies would need to gather data on mediports and respond to emergencies.

The database could also be used to publish a mediport directory. The publication could be updated annually and copies mailed to the agencies mentioned above. Various health and service organizations in North Dakota could include the publication into their plans to enhance rural health care.

Sponsoring New Mediports

City government, airport authority, health care facilities, EMS, HEMS, clubs, and citizen groups can sponsor a mediport. Most mediports require a minimal amount of expenditure for material and labor. It is estimated that the cost of constructing a mediport on grass (Figure 7) can be less than \$200. The cost of constructing a concrete mediport (Figure 8) with a lighted beacon, fence, gate, and paved sidewalk for transporting patients from the ambulance to the helicopter is estimated to cost \$20,000 (North Dakota Aeronautics Commission 1996).

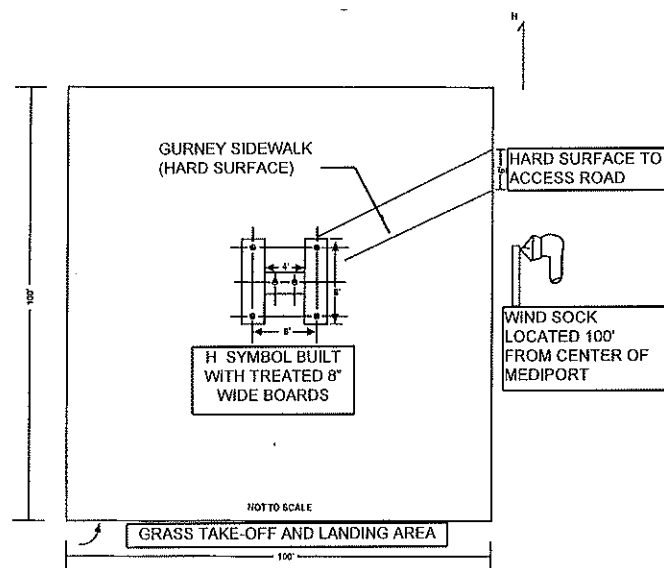


Figure 7 General Schematic of a Grass Mediport

Source: Darrell E. Lewis, Robert Oatfield, and North Dakota Aeronautics Commission. 1995. *Medi-i-port Design Guide*. Executive Air Taxi Corp., Bismarck, North Dakota.

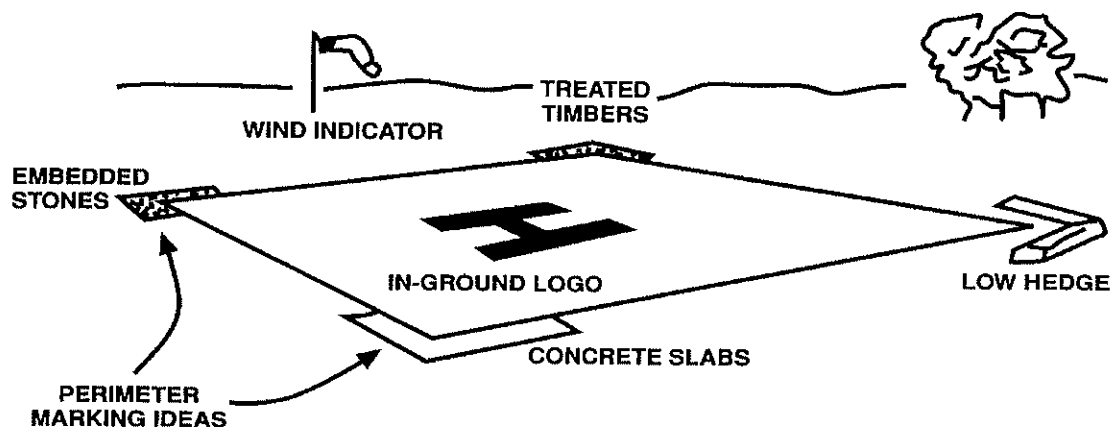


Figure 8 General Schematic of a Concrete Mediport

Source: Darrell E. Lewis, Robert Oatfield, and North Dakota Aeronautics Commission. 1995. *Medi-i-port Design Guide*. Executive Air Taxi Corp., Bismarck, North Dakota.

Labor for building mediports can be requested from the Air National Guard, Army National Guard, and service clubs, such as the Lions and Rotary. Groups such as these often look for weekend community projects (Lewis et al. 1995).

While

mediports can be an important tool in aiding emergency medical care, they can be used most efficiently only if mediports are well maintained. In addition to construction costs, sponsoring agents should consider the cost of liability insurance, and maintenance such as grass mowing, snow removal, and regular inspections of the windsock and landing area.

Those interested in sponsoring, constructing, or having a mediport certified should contact the following agencies for information and assistance:

- North Dakota Department of Transportation at (701) 328-2500, and
- Federal Aviation Administration at (701) 250-4385 in Bismarck or (701) 232-8949 in Fargo.

The following are general guidelines for establishing a mediport:

- secure a copy of the Mediport Design Guide from the NDAC;
- develop a plan for selecting a site and designing the mediport. Include in the plan the annual cost of insurance and maintenance;
- determine the roles of the sponsor, including the responsibility for conducting general maintenance and providing all-weather access to the mediport;
- select a site for the mediport and request a HEMS and an EMS provider to review your site selection;
- contact the appropriate federal, state, and local agencies for specific requirements, compliance, and approval;
- complete FAA form 7480 so that the FAA can inspect the site and make safety recommendations;
- construct the mediport, request a HEMS provider to conduct a flight check and develop an approach plate; and
- notify the following prior to opening the mediport: agency providing insurance coverage on the mediport, local HEMS and EMS providers,

hospital and clinic, law enforcement, emergency management agency,
state and federal aviation agencies.

RECOMMENDATIONS

There are a number of considerations in selecting a mediport site, designing the type of mediport that would best meet the aeromedical needs of the community, and insuring the safe and effective use of mediports. Information on establishing mediports is available from a number of sources presented in the report; in addition, the following recommendations are included:

- Input from all parties involved in the selection, construction, and use of the mediports is important to insure the mediport will be designed and located for the most optimal use.
- Trauma transport plans should be considered as potential sites for mediports.
- Regulatory state and federal aviation and health agencies, and law enforcement should also be consulted to insure that local rules and regulations governing the construction and use of mediports can be properly applied.
- The cost of insuring and maintaining the mediport should be included in the mediport development plan.
- Roles and responsibilities of the mediport sponsoring agent should be clearly defined.
- Sponsors interested in establishing a mediport on public land should obtain permission from state and local governing agencies which

oversee the management of these areas. In addition, sponsors may be required to obtain construction, zoning, and other permits.

- EMS, HEMS, health care facilities, law enforcement, emergency management, and state aviation agencies should consider developing a mediport information directory that provides the most current information on mediports in North Dakota. This information can either be based on a central computer system with access provided to the above or printed in an annual publication.

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APPENDIX A.
MEDIPOINT IMPLEMENTATION TASK GROUP

MEDIPOINT IMPLEMENTATION PLAN - TASK GROUP

Aziz, Riaz - Upper Great Plains Transportation Institute
North Dakota State University - Room 420, IACC Building
PO Box 5074, Fargo, ND 58105
(701) 231-8058 - Fax: (701) 231-1945
EMAIL: aziz@plains.nodak.edu

Bethke, Mark - ND Highway Patrol
600 East Boulevard
Bismarck, ND 58505
(701) 328-4256 - Fax: (701) 328-3000
EMAIL: msmail.hp207@ranch.state.nd.us

Bjerke, Keith - ND Air National Guard
PO Box 5511
Bismarck, ND 58506
(701) 224-5100 - Fax: (701) 224-5180
EMAIL: otag@emh1.tic.bismarck.nd.us

Steward Buckingham - Omni Flight
720 4th Street North
Fargo, ND 58122
(701) 234-6589
EMAIL: None

Haugen, Mark - ND Emergency Medical Association
St. Alexius Medical Center - PO Box 5510
Bismarck, ND 58502
(701) 224-7075 - Fax: (701) 224-7076
EMAIL: None

Holzer, Mark - ND Aeronautics Commission
2301 University Drive, Bldg. 1652-22
Box 5020, Bismarck, ND 58502
(701) 328-2748 - Fax: (701) 328-2780
EMAIL: mholzer@pioneer.state.nd.us

Jacobson, Dennis - ND Department of Transportation
608 East Boulevard Avenue
Bismarck, ND 58505-0700
(701) 328-4403 - Fax: (701) 328-4545
EMAIL: ccmil.djacobso@ranch.state.nd.us

Johnson, Sean - ND Division of Emergency Management
P.O. Box 5511
Bismarck, ND 58502
(701) 328-3300 - Fax: (701) 328-2119
EMAIL: msmail.sean@ranch.state.nd.us

Krantz, Roseann - MeritCare Lifeflight
720 4th Street North
Fargo, ND 58122
(701) 234-6303
EMAIL: None

Lunde, Ann - ND Department of Transportation
608 East Boulevard Avenue
Bismarck, ND 58505-0700
(701) 328-4354 - Fax: (701) 328-2435
EMAIL: ccmal.alunde@ranch.state.nd.us

Ness, Gary - ND Aeronautics Commission
2301 University Drive, Bldg. 1652-22
Box 5020, Bismarck, ND 58502
(701) 328-2748 - Fax: (701) 328-2780
EMAIL: gness@pioneer.state.nd.us

Olson, Jack - ND Department of Transportation
608 East Boulevard Avenue
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(701) 328-4357 - Fax: (701) 328-2435
EMAIL: ccmal.jolson@ranch.state.nd.us

Pfeiffer, Roger - ND Aeronautics Commission
2301 University Drive, Bldg. 1652-22
Box 5020, Bismarck, ND 58502
(701) 328-2748 - Fax: (701) 328-2780
EMAIL: rpfeiffe@pioneer.state.nd.us

Schuck, Brian - Federal Aviation Administration
2000 University Drive
Bismarck, ND 58504
(701) 250-4385 - Fax: (701) 250-4388
EMAIL: brian_p_schuck@mail.hq.faa.gov

Wentz, Brad - ND Department of Transportation
608 East Boulevard Avenue
Bismarck, ND 58505-0700
(701) 328-3736 - Fax: (701) 328-4545
EMAIL: ccmil.bwentz@ranch.state.nd.us

Wickland, Chris - Executive Air Taxi Corp
Box 2273 - Bismarck Airport
Bismarck, ND 58502
(701) 258-5024 - Fax: (701) 258-2693
EMAIL: None

Wiedrich, Timothy - ND Department of Health
600 East Boulevard
Bismarck, ND 58505-0200
(701) 328-2388 - Fax: (701) 328-4727
EMAIL: msmil.timw@ranch.state.nd.us

APPENDIX B.
HEALTH CARE FACILITIES IN NORTH DAKOTA

HEALTH CARE FACILITIES IN NORTH DAKOTA

City	Facility Name	County
Ashley	Ashley Medical Center	McIntosh
Belcourt	U.S Public Health Service Indian Hospital	Rolette
Bismarck	Medcenter one	Burleigh
Bismarck	St Alexius Medical Center	Burleigh
Bottineau	St Andrew's Health Center	Bottineau
Bowman	St Lukes Tri State Hospital	Bowman
Cando	Towner County Memorial Hospital	Towner
Carrington	Carrington Health Center	Foster
Cavalier	Pembina County Memorial Hospital	Pembina
Cooperstown	Griggs County Hospital and Nursing Home	Griggs
Crosby	St Luke's Hospital	Divide
Devils Lake	Mercy Hospital	Ramsey
Dickinson	St Joseph Hospital And Health Center	Stark
Elgin	Jacobson Memorial Hospital Care Center	Grant
Fargo	Dakota Hospital	Cass
Fargo	Heartland Medical Center	Cass
Fargo	Meritacare Medical Center	Cass
Fargo	Veterans Affira Medical And Regional Center	Cass
Fort Yates	U.S Public Health Service Indian Hospital	Sioux
Garrison	Garrison Memorial Hospital	McLean
Grafton	Unity Medical Center	Walsh
Grand Forks	Medical Center Rehabilitation Hospital	Grand Forks
Grand Forks	United Health Services	Grand Forks
Grand Forks	U.S. Air Force Hospital	Grand Forks
Harvey	St Aloisius Medical Center	Wells
Hazen	Sakakawea Medical Center	Mercer
Hettinger	West River Regional Medical Center	Adams
Hillsboro	Hilsborro Community Hospital	Traill
Jamestown	Jamestown Hospital	Stutsman
Jamestown	North Dakota State Hospital	Stutsman
Kenmare	Kenmare Community Hospital	Ward
Langdon	Cavalier County Memorial Hospital	Cavalier
Linton	Linton Hospital	Emmons
Lisbon	Community Memorial Hospital	Ransom
Mandan	Medcenter One Mandan	Morton
Mayville	Union Hospital	Traill
McVile	Community Hospital In Nelson County	Nelson
Minot	Trinity Medical Center	Ward
Minot	U.S Airforce Regional Hospital	Ward
Minot	Unimed Medical Center	Ward

Northwood	Northwood Deaconess Health Center	Grand Forks
Oakes	Oakes Community Hospital	Dickey
Park River	St Ansgar's Hospital	Walsh
Richardton	Richardton Health Center	Stark
Rolla	Presentation Medical Center	Rolette
Rugby	Heart Of America Medical center	Pierce
Stanley	Stanley Community Hospital	Mountrail
Tioga	Tioga Medical Center	Williams
Turtle Lake	Community Memorial Hospital	McLean
Valley City	Mercy hospital	Barnes
Watford City	McKenzie County Memorial Hospitla	McKenzie
Williston	Mercy Medical Center	Williams
Wishek	Wishek Community Hospital	McIntosh

APPENDIX C.
EMERGENCY MEDICAL SERVICE (EMS) PROVIDERS OF NORTH DAKOTA

EMERGENCY MEDICAL SERVICE PROVIDERS IN NORTH DAKOTA

City	Name Of The Service	County
Almont	Almont Ambulance Services	Morton
Aneta	Aneta Ambulance Services	Nelson
Ashley	Ashley Ambulance Services	McIntosh
Beach	Community Ambulance Service	Golden Valley
Belcourt	Belcourt Ambulance Service	Rollette
Belfield	Belfield Ambulance Service	Stark
Berthold	Berthold Ambulance Service	Ward
Beulah	Mercer County Ambulance Service	Mercer
Beulah	Coteau Properties Co Ambulance Services	Mercer
Beulah	Dakota Gassifications Co Ambulance Services	Mercer
Beulah	MDU Coyote Station Ambulance	Mercer
Binford	Binford Ambulance Service	Griggs
Bismarck	Metro Area Ambulance Service	Burleigh
Bottineau	Bottineau Ambulance Service	Bottineau
Bowbells	Bowbells Ambulance Services	Burke
Bowdon	Bowdon Ambulance Services	Wells
Bowman	Bowman Ambulance Squad Inc.	Bowman
Cando	Towner County Ambulance Service Inc.	Towner
Carpio	Carpio Ambulance Service	Ward
Carrington	Carrington Health Center Ambulance	Foster
Carson	George Francis Memorial Ambulance Service	Grant
Casselton	Casselton Ambulance Service	Cass
Cavalier	Cavalier Ambulance Service Inc.	Pembina
Center	Oliver County Ambulance Service	Oliver
Cooperstown	Cooperstown Ambulance Service	Griggs
Crosby	Divide County Ambulance Service	Divide
Devils Lake	Lake Region Ambulance Service	Ramsey
Dickinson	Dickinson Area Ambulance Service Inc.	Stark
Drayton	Drayton Volunteer Ambulance Service	Pembina
Edgeley	Edgeley Ambulance Service	La Moure
Edmore	Edmore Volunteer Ambulance Service	Ramsey
Elgin	New Leipzig Ambulance Service	Grant
Ellendale	Ellendale Community Ambulance Service Inc.	Dickey
Esmond	Esmond Community Ambulance Service	Benson
Fargo	F-M Ambulance Service Inc.	Cass
Fessenden	Fessenden Ambulance Service	Wells
Finley	Finley Ambulance Service	Steele
Flasher	Flasher Ambulance Service	Morton
Fordville	Fordville Ambulance Service	Walsh
Forman	Sergent County Ambulance Service	Sargent

Fort Totten	Dakotah Sioux Ambulance	Benson
Fort Yates	Standing Rock Health Systems Inc.	Sioux
Gackle	Gackle Ambulance Service	Logan
Garrison	Garrison Ambulance District	McLean
Glen Ullin	Glenn Ullin Area Ambulance Service	Morton
Glenburn	Glenburn Area Ambulance Service Inc.	Renville
Goodrich	Goodrich Ambulance Service	Sheridan
Grafton	Valley Ambulance & Rescue Service Inc.	Walsh
Grand Forks	United Hospital Ambulance Service	Grand Forks
Grenora	Grenora Ambulance Service	Williams
Halliday	Halliday Ambulance Service	Dunn
Hankinson	Hankinson Volunteer Ambulance Service	Richland
Harvey	Harvey Ambulance Service Inc.	Wells
Hazen	Mercer County Ambulance Service Inc.	Mercer
Hebron	Hebron Ambulance Service	Morton
Hettinger	West River Ambulance Service	Adams
Hillsboro	Hillsboro Ambulance Service	Traill
Hoople	Hoople Volunteer Ambulance Service Inc.	Walsh
Hope	Hope Ambulance Service	Steele
Hunter	Hunter Ambulance Service	Cass
Jamestown	Jamestown Ambulance Inc.	Stutsman
Kenmare	Kenmare Ambulance Service Inc.	Ward
Killdeer	Killdeer Area Ambulance Service Inc.	Dunn
Kindred	Kindred Area Ambulance Service Inc.	Cass
Kulm	Kulm Ambulance Corps Inc.	La Moure
Lakota	Lakota Ambulance Service	Nelson
Lamoure	Community Volunteer Ambulance Service	La Moure
Langdon	Langdon Ambulance Service	Cavalier
Lansford	Lansford Ambulance Service	Bottineau
Larimore	Larimore Ambulance Service	Grand Forks
Leeds	Leeds Ambulance Service	Benson
Lidgerwood	Lidgerwood Community Ambulance Service	Richland
Linton	Emmons County Ambulance Service	Emmons
Lisbon	First Medic Ambulance Of Ransom County Inc.	Ransom
Maddock	Maddock Ambulance Service	Benson
Makoti	Ryder-Makoti Ambulance Service	Ward
Mandan	Metro-Area Ambulance Service Inc.	Morton
Max	Garrison Ambulance District-Max Unit	McLean
Mayville	West Traill Ambulance Service	Traill
McClusky	Mc Clusky Rural Ambulance Service	Sheridan
McHenry	Mchenry Ambulance Service	Foster
McVile	Mcville Community Ambulance Service	Nelson
Medina	Medina Ambulance Service	Stutsman

Medora	Billings County Ambulance Service	Billings
Michigan	Michigan Area Ambulance Service	Nelson
Milnor	Sargent County Ambulance Service	Sargent
Minnewaukan	Minnewaukan Ambulance Service	Benson
Minot	Community Ambulance Service Inc.	Ward
Mohall	Mohall Ambulance Service	Renville
Mott	Mott Ambulance Service	Hettinger
Munich	Munich Rural Ambulance	Cavalier
Napoleon	Napoleon Ambulance Service	Logan
New England	New England Ambulance Service	Hettinger
New Leipzig	New Leipzig Ambulance Service	Grant
New	Community Ambulance	Eddy
Rockford		
New Salem	New Salem Ambulance Service	Morton
New Town	New Town Ambulance Service District	Mountrail
Northwood	Northwood Ambulance Service	Grand Forks
Oakes	Oakes Volunteer Ambulance Service	Dickey
Page	Page Ambulance Service	Cass
Park River	Park River Volunteer Ambulance Service	Walsh
Parshall	Rural Parshall Ambulance Service Inc.	Mountrail
Pembina	Pembina Ambulance Service	Pembina
Plaza	Plaza Ambulance Service	Mountrail
Portal	Portal Ambulance Service	Burke
Powers Lake	Powers Lake Ambulance Association	Burke
Ray	Ray Community Ambulance District	Williams
Regent	Regent Ambulance Service	Hettinger
Richardton	Richardton-Taylor Ambulance Service	Stark
Riverdale	Riverdale Ambulance & Fire Dept.	McLean
Rock Lake	Rock Lake Ambulance Service	Towner
Rolette	Rolette Ambulance Service Inc.	Rolette
Rolla	Community Ambulance Service Of Rolla	Rolette
Rugby	Rugby Emergency Ambulance Service	Pierce
Sherwood	Sherwood Ambulance Service	Renville
Stanley	Stanley Ambulance Service	Mountrail
Steele	Kidder County Ambulance Service	Kidder
Tioga	Tioga Ambulance Service	Williams
Towner	Towner Fire & Ambulance Service	McHenry
Turtle Lake	Turtle Lake Ambulance Service	McLean
Underwood	Underwood Ambulance Service	McLean
Underwood	Coal Creek Station Ambulance Service, CPA	McLean
Underwood	Falkirk Mining Company Ambulance Service	McLean
Upham	Upham Rfpd Ambulance Service	McHenry
Valley City	Barnes County/City Ambulance	Barnes

Velva	Velva Ambulance Service	McHenry
Walhalla	Walhalla Ambulance Service	Pembina
Washburn	Washburn Volunteer Ambulance Service	McLean
Watford City	Mckenzie County Ambulance Service	McKenzie
Westhope	Westhope Ambulance Service	Bottineau
Williston	Williston Ambulance Service	Williams
Willow City	Willowcity Ambulance Service	Bottineau
Wilton	Wilton Rural Ambulance Service	Burleigh
Wing	Wing Rural Ambulance	Burleigh
Wishek	Wishek Ambulance Service	McIntosh
Wyndmere	Wyndmere-Barney Rural Ambulance District	Richland

APPENDIX D.
MEDIPOINTS IN NORTH DAKOTA

MEDIPOINTS IN NORTH DAKOTA

Town	Mediport Location	County
Ashley	N of the street of the Ashley Medical Center and E of the Tennis Courts	McIntosh
Beach	S of the Clinic In the N end of the parking lot	Golden Valley
Bismarck	St. Alexius Hosital	Burleigh
Bismarck	Medcenter One	Burleigh
Bottineau	SE side of the St Andrews Hospital	Bottineau
Bowman	E corner of the parking lot or SE corner of the St Lukes Hospital	Bowman
Cando	On a grass area N of the football field and S of Towner County Memorial	Towner
Carrington	Parking lot E of the Carrington Health Center, NE corner of the town	Foster
Cavalier	Airport apron on S edge	Pembina
Crosby	Street NW of St Lukes Hospital and NE of the parking lot	Divide
Dawson	Asphalt road, S of the I-94 and NW of the power lines	Kidder
Devils Lake	N of the Mercy Hospital and NE corner of the town	Ramsey
Dickinson	NE of the Rodeo Island and a block S of High School	Stark
Dickinson	E of the Happy Joes Pizza and S of the tower	Stark
Elgin	S of the parking lot and E of the Jacobson Memorial	Grant
Ellendale	Airport	Dickey
Fargo		Cass
Ft Yates	Located on the NE side of the Hospital and on the N side of the parking lot	Sioux
Garrison	Airport	McLean
Grafton	E of the Unity Hospital and S of the facility building	Walsh
Grand Forks	Parking lot	Grand Forks
Hankinson	Airport	Richland
Harvey	S of he St Alioius Hospital and NE of the Highway	Wells
Hazen	Located N of the parking lot and NW side of the Sakawea Medical Center	Mercer
Hillsboro	Between Elementary school and football field SE of the hillsboro community hospital	Traill
Hettinger	Located on the E of the Community Hospital and N of Highway 12.	Adams
Jamestown	Airport	Stutsman
Kenmare	Community Hospital - Airport	Ward
Langdon	E edge of town, N of main intersection, open lot N of Cavalier County Memorial	Cavalier
Lisbon	Fairgrounds, W edge of town, W of Street, S of buildings, E of racetrack	Ransom

Linton	Located SE of the Hospital and W of the main street	Emmons
Mayville	NE corner town - street between nursing home and vacant lot with water tower	Trall
McVille	Street	Nelson
Medina	Located N of the Main Street and S of the clinic.	Stutsman
Minot	Land on top of the Hospital (for Trinity Hospital)	Ward
Mott	Airport	Hettinger
New	Airport (Just N of the town for City Hospital)	Eddy
Rockford		
Northwood	NW of Northwood Deaconess hospital and SW of parking lot	Grand Forks
Oakes	N of the gravel rd, SE of the Oakes Community Hospital	Dickey
Park River	St Ansgar's - Baseball field NE corner town, S of ball field	Walsh
Richardton	N Of the Community Hospital And S of the Wind Sock	Stark
Rolla	Land At the airport For Community Hospital	Rolette
Rollette	Community Hospital - Airport	Rolette
Rugby	E of the Good Samaritan S of the Parking lot and N of Highway 2	Pierce
Stanley	Community Hospital Airport	Mountrail
Tioga	E of the parking lot and SE of the Community Hospital and N of Highway	Williams
Tioga	E of the parking lot and SE of the Community Hospital and N of Highway	Williams
Valley City	SE of the Mercy Hospital, E of the parking lot and S of the Facility building	Barnes
Watford City	McKenzie County Hospital - Airport	McKenzie
Willinston	W of the N parking lot and on the street.	Williams
Wishek	NE of Community Hospital and N of the clinic house	McIntosh

APPENDIX E.
NORTH DAKOTA PUBLIC-USE AIRPORTS

NORTH DAKOTA PUBLIC-USE AIRPORTS

City	Airport	County
Arthur	Arthur Municipal	Cass
Ashley	Ashley Municipal	McIntosh
Beach	Beach	Golden Valley
Beulah	Beulah Municipal	Mercer
Bismarck	Bismarck Municipal	Burleigh
Bottineau	Bottineau Municipal	Bottineau
Bowbells	Bowbells Municipal	Burke
Bowman	Bowman Municipal	Bowman
Cando	Cando Municipal	Towner
Carrington	Carrington Municipal	Foster
Casselton	Casselton Regional	Cass
Cavalier	Cavalier Municipal	Pembina
Columbus	Columbus Municipal	Burke
Cooperstown	Cooperstown Municipal	Griggs
Crosby	Crosby Municipal	Divide
Devils Lake	Devils Lake Municipal	Ramsey
Dickinson	Dickinson Municipal	Stark
Drayton	Drayton Municipal	Pembina
Dunseith	Intl. Peace Garden	Rolette
Edgeley	Edgeley Municipal	La Moure
Elgin	Elgin Municipal	Grant
Ellendale	Ellendale Municipal	Dickey
Enderlin	Enderlin Municipal	Cass
Fargo	Fargo Municipal	Cass
Fessenden	Fessenden Municipal	Wells
Fort Yates	Standing Rock	Sioux
Gackle	Gackle Municipal	Logan
Garrison	Garrison Municipal	McLean
Glen Ullin	Glen Ullin Municipal	Morton
Grafton	Grafton Municipal	Walsh
Grand Forks	Grand Forks International	Grand Forks
Grenora	Grenora Centennial	Williams
Gwinner	Gwinner Municipal	Sargent
Harvey	Harvey Municipal	Wells
Hazelon	Hazelon Municipal	Emmons
Hazen	Mercer County Regional	Mercer
Hebron	Hebron Municipal	Morton
Hettinger	Hettinger Municipal	Adams
Hillsboro	Hillsboro Municipal	Traill
Inkster	Inkster	Grand Forks

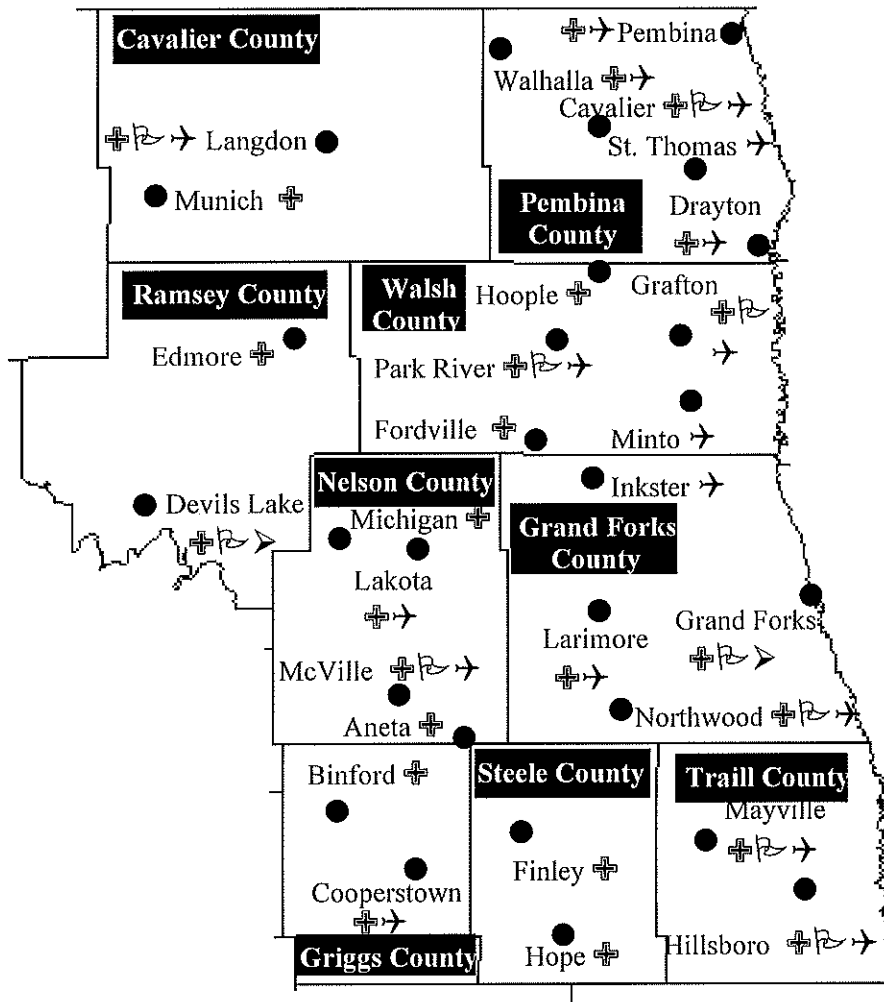
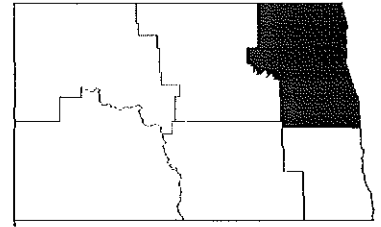
Jamestown	Jamestown Municipal	Stutsman
Kenmare	Kenmare Municipal	Ward
Killdeer	Weydahl Field	Dunn
Kindred	Hamry Field	Cass
Kulm	Kulm Municipal	La Moure
Lakota	Lakota Municipal	Nelson
La Moure	La Moure Municipal	La Moure
Langdon	Langdon Municipal	Cavalier
Lansford	Lansford Municipal	Bottineau
Larimore	Larimore Municipal	Grand Forks
Leeds	Leeds Municipal	Benson
Leonard	Leonard Municipal	Cass
Lidgerwood	Lidgerwood Municipal	Richland
Linton	Linton Municipal	Emmons
Lisbon	Lisbon Municipal	Ransom
Maddock	Maddock Municipal	Benson
Mandan	Mandan Municipal	Morton
Mayville	Mayville Municipal	Traill
McClusky	McClusky Municipal	Sheridan
McVille	McVille Municipal	Nelson
Milnor	Milnor Municipal	Sargent
Minot	Minot International	Ward
Minto	Minto Municipal	Ward
Mohall	Mohall Municipal	Renville
Mott	Mott Municipal	Hettinger
Napoleon	Napoleon Municipal	Logan
New Rockford	Tomlinson Field	Eddy
New Town	New Town Municipal	Mountrail
Northwood	Vince	Grand Forks
Oakes	Oakes Municipal	Dickey
Page	Page Regional	Cass
Park River	Park River Municipal	Walsh
Parshall	Parshall-Hankins	Mountrail
Pembina	Pembina Municipal	Pembina
Plaza	Plaza Municipal	Mountrail
Regent	Regent Municipal	Hettinger
Richardton	Richardton	Stark
Riverdale	Garrison Dam Recreational	McLean
Rolette	Rolette	Rolette
Rolla	Rolla Municipal	Rolette
Rugby	Rugby	Pierce
St. Thomas	St. Thomas Municipal	Pembina
Stanley	Stanley Municipal	Mountrail

Tioga
Towner
Turtle Lake
Valley City
Wahpeton
Walhalla
Washburn
Watford City
West Fargo
Westhope
Williston
Wishek

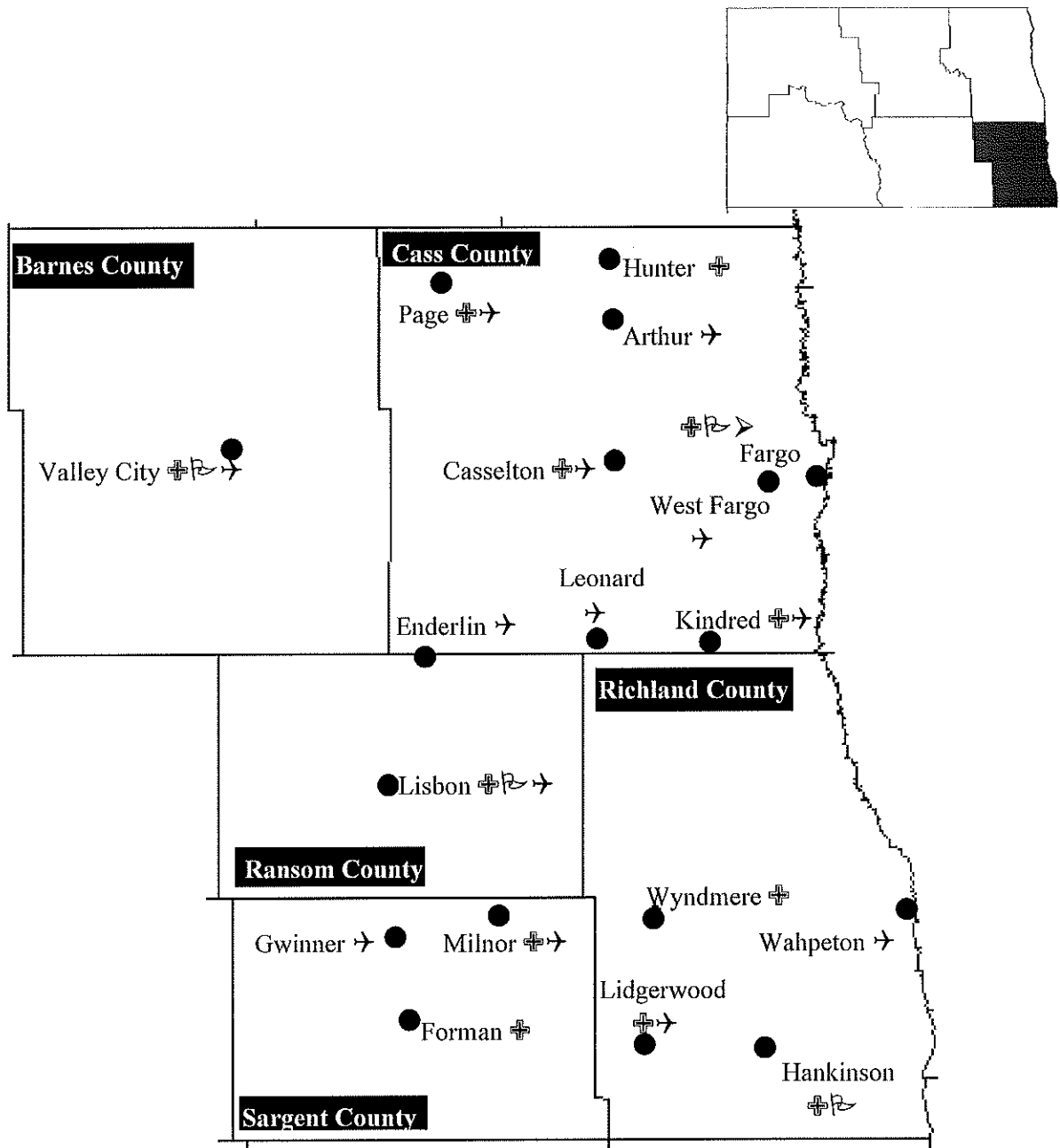
Tioga Municipal
Towner Municipal
Turtle Lake Municipal
Barnes County Municipal
Harry stern
Walhalla Municipal
Washburn Municipal
Watford City Municipal
West Fargo Utility
Westhope Municipal
Sloulin Field International
Wishek Municipal

Williams
McHenry
McLean
Barnes
Richland
Pembina
McLean
McKenzie
Cass
Bottineau
Williams
McIntosh

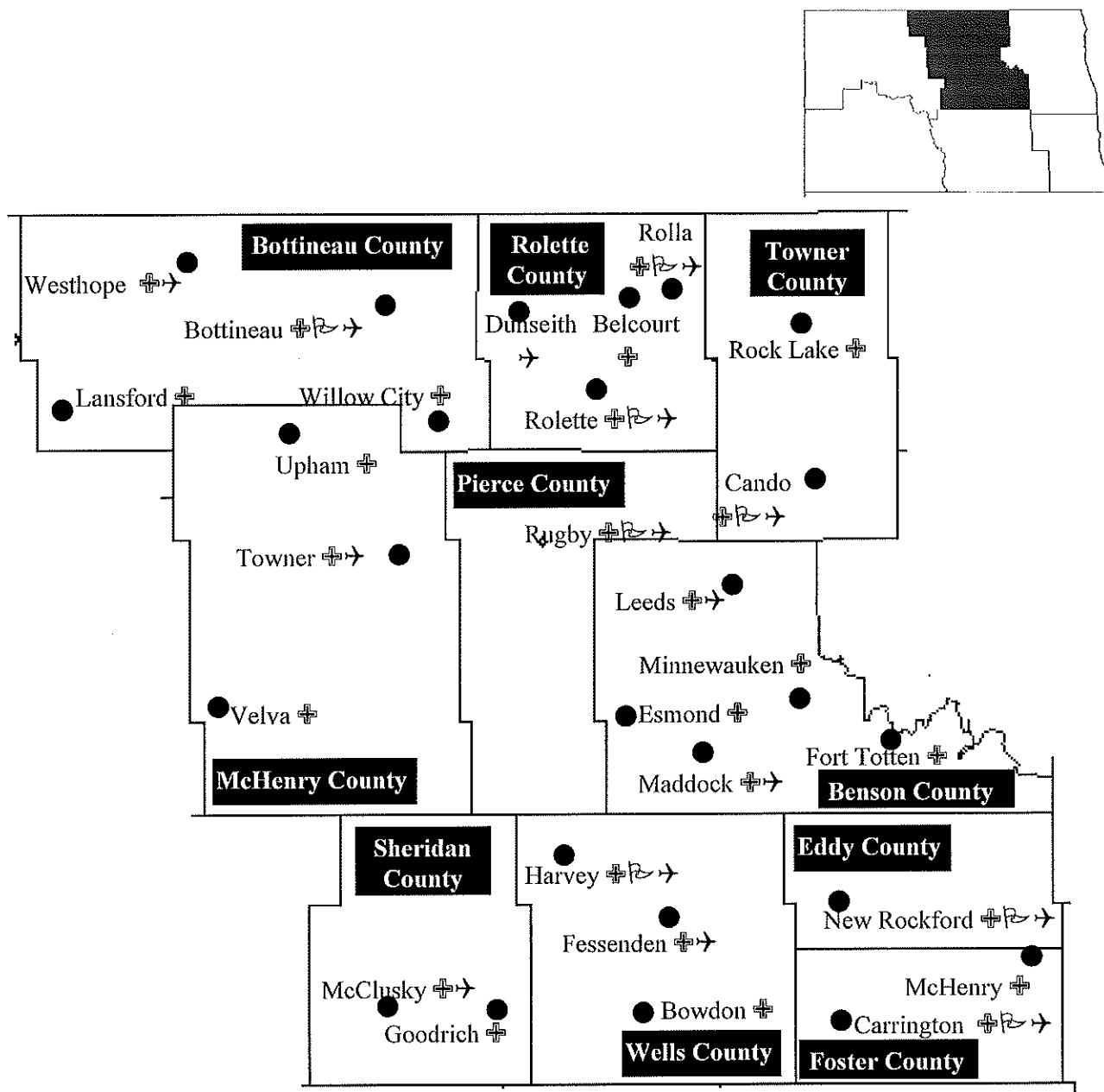
APPENDIX F.
APPROXIMATE LOCATION OF EMS, MEDIPORTS, AND AIRPORTS IN NORTH
DAKOTA BY REGION



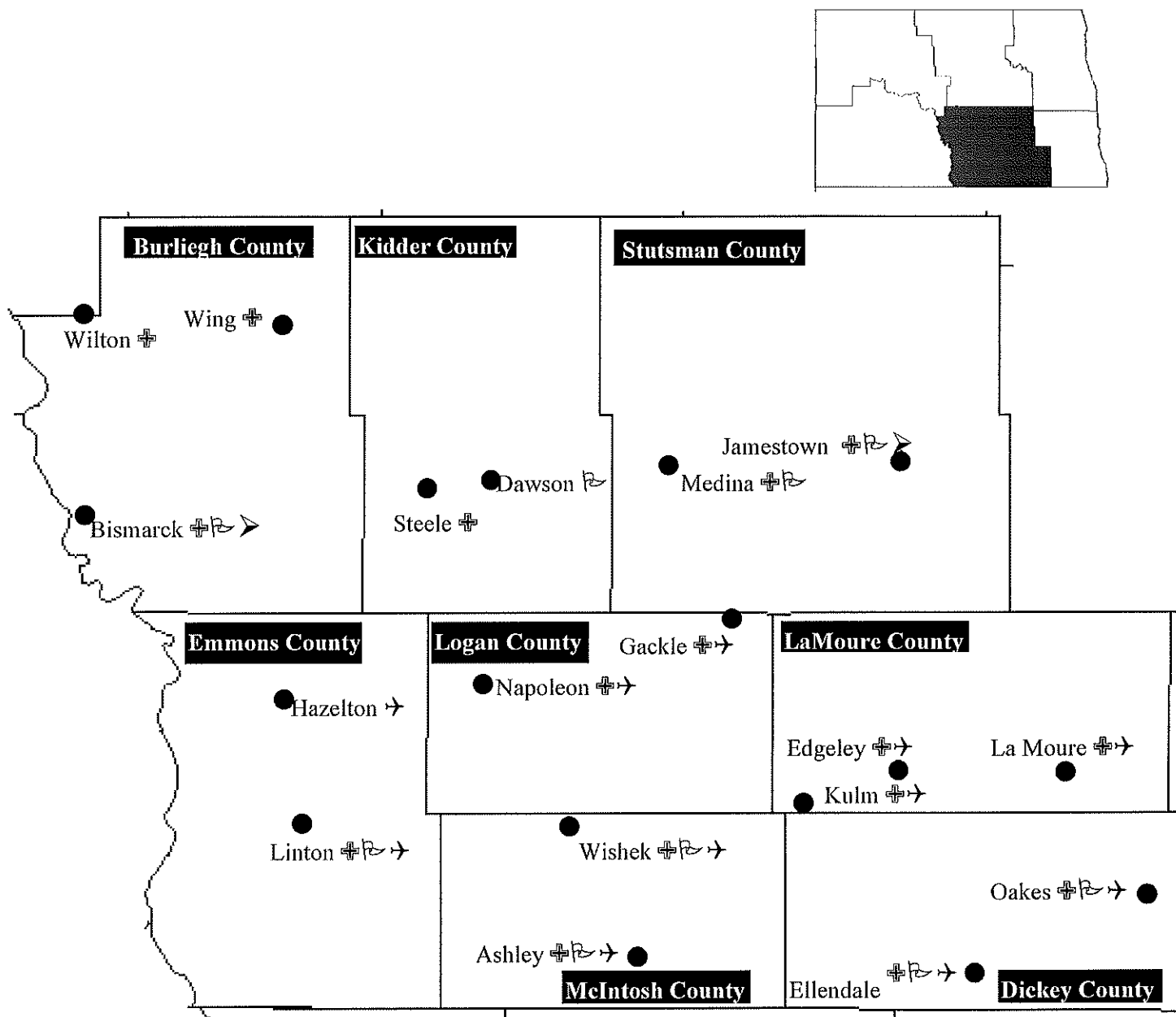
Counties in the Northeast Region of North Dakota with Approximate Location of Towns (●), EMS Providers (⊕), Mediports (⌘), General Aviation Airports (✈), and Commercial Airports (✈)



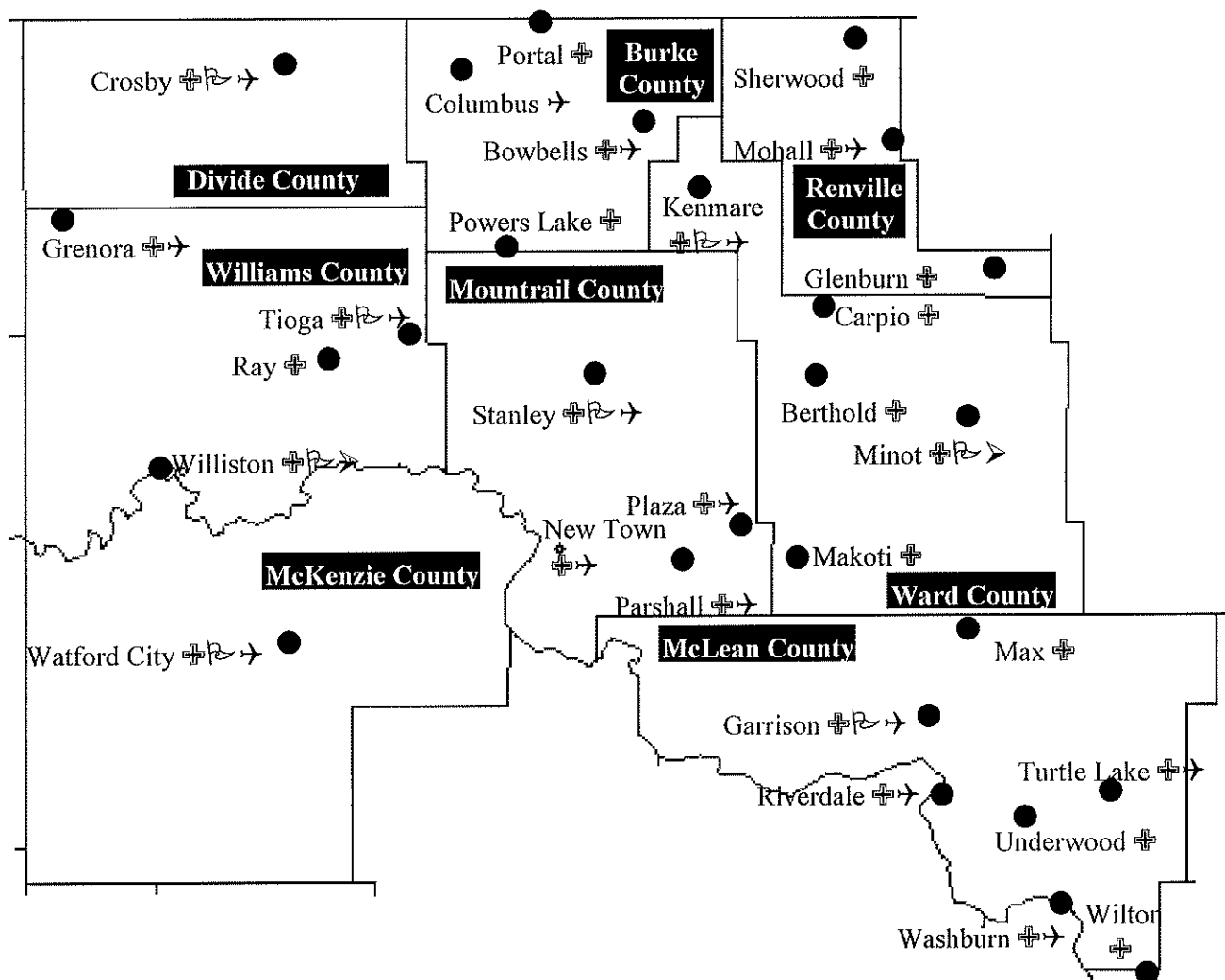
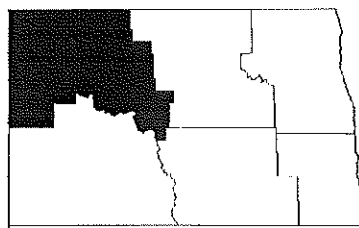
Counties in the Southeast Region of North Dakota with Approximate Location of Towns (●), EMS Providers (⛑), Mediports (ℹ), General Aviation Airports (✈), and Commercial Airports (✈)



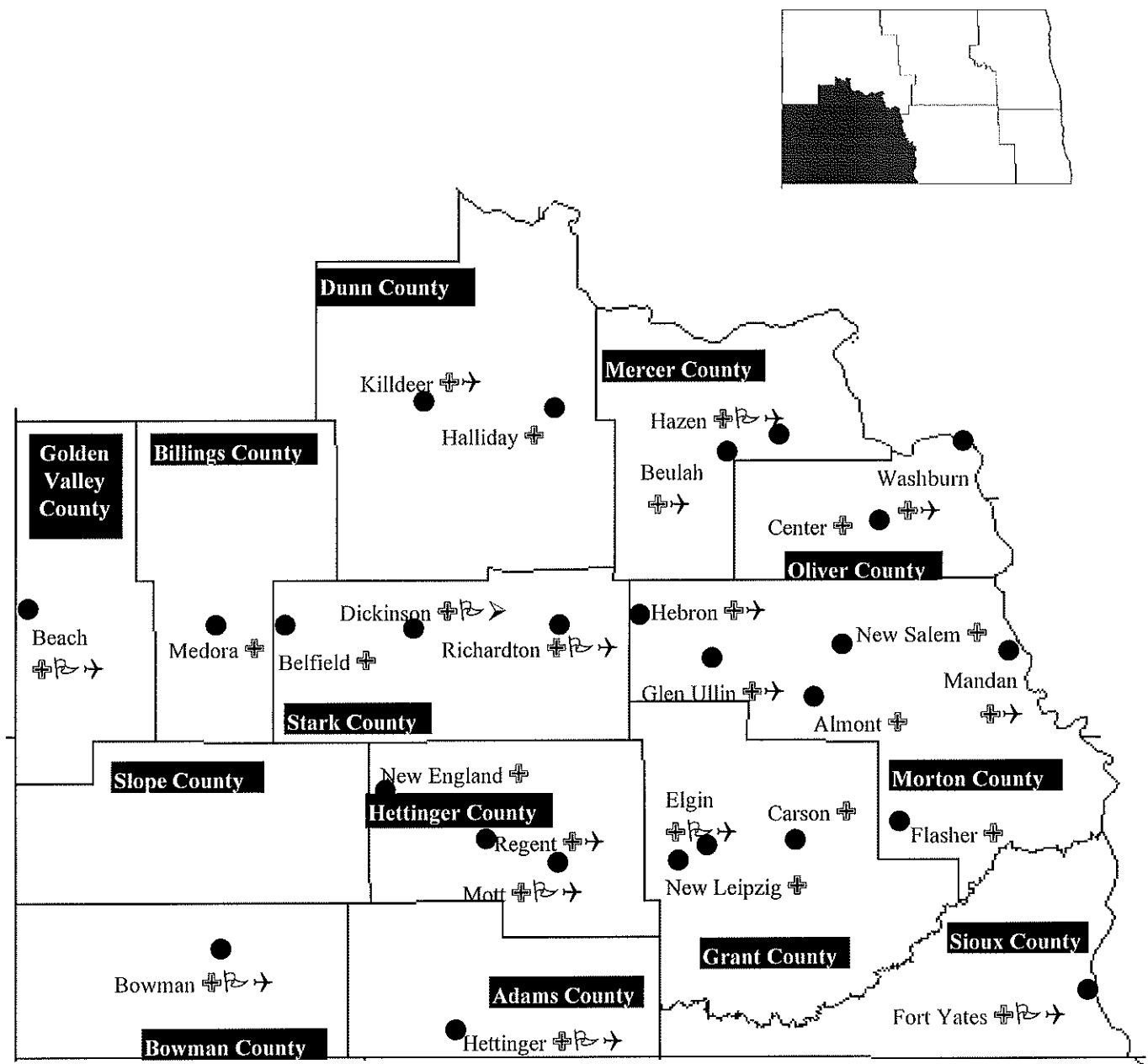
Counties in the North Central Region of North Dakota with Approximate Location of Towns (●), EMS Providers (⛑), Mediports (ℹ), and General Aviation Airports (✈).



Counties in the South Central Region of North Dakota with Approximate Location of Towns (●), EMS Providers (⛑), Mediports (⌘), General Aviation Airports (✈), and Commercial Airports (➤)



Counties in the Northeast Region of North Dakota with Approximate Location of Towns (●), EMS Providers (⊕), Mediports (⊕), General Aviation Airports (→), and Commercial Airports (➤)



Counties in the Southwest Region of North Dakota with Approximate Location of Towns (●), EMS Providers (+), Mediports (⌋), General Aviation Airports (→), and Commercial Airports (→)

APPENDIX G.
INSURANCE PROVIDERS

Companies Offering Insurance Coverage for Mediports

- 1. Alexander and Alexander Inc.**
1185 Ave of Americas, New York, ND 10036-2684
Phil Elson Ph: 212-238-1784 Fax: 212-238-1065
- 2. Frank Crystal & CO Inc.**
40 Broad Street, New York, NY 10004
Brian Glod Ph: 1-800-221-5830 Fax: 212-509-1292/952-1095
- 3. Air - Sur Inc.**
Suite A 141, Sage Brush Trail Rd, Ormond Beach, FL 32174
Philip Scarcalla Ph: 1-800-342-3896 Fax: 904-677-2690
- 4. Daniel & Henry CO**
Suite 400, 2350, Market, St Louis, MO 63103
Rosie Stout Ph: 314-444-1988 Fax: 314-444-1525
- 5. Halton Hall & Associates Inc.**
P.O Box 6275, Ft Worth, TX 76115
Tom Bradshaw Ph: 817-293-3530 Fax: 817-568-2996
- 6. Rollins Hudig Hall, Chicago**
123 N Wacker Dr, Chicago, IL 60606
Wayne Wigans Ph: 312-701-4201 Fax: 312-701-4199
- 7. H P Golding and CO**
P.O Box: 16444, John Wayne Airport, Irvine, CA 92713
H Paul Golding Ph: 714-362-3290 Fax: 714-831-2014
- 8. Avsurance Corp**
47, West Ellsworth, Ann Arbor, MI 48108
Joel Hirst Ph: 1-800-472-7090 Fax: 313-663-8296
- 9. Aviation Insurance Agency Inc.**
PO Box: 2260, 901, SW Martin Downs Blvd, Palm City FL 34990
Keith Davi Ph: 1-800-422-2868 Fax: 407-286-1108/800-572-0893
- 10. Dale L Bonette & Associates**
Poydras Center, Suite 2715
650 Poydras St, New Orleans, LA 70130-6101
Chris Bonnette Ph: 1-800-628-6038/504-525-3862 Fax: 504-525-4592

APPENDIX H.
FEDERAL AVIATION REGULATIONS PART 157

Part 157—Notice of Construction, Alteration, Activation, and Deactivation of Airports

Source: Docket No. 25708, 56 FR 33996, 7/24/91, unless otherwise noted.

§ 157.1 Applicability.

This part applies to persons proposing to construct, alter, activate, or deactivate a civil or joint-use (civil/military) airport or to alter the status or use of such an airport. Requirements for persons to notify the Administrator concerning certain airport activities are prescribed in this part. This part does not apply to projects involving:

(a) An airport subject to conditions of a Federal agreement that requires an approved current airport layout plan to be on file with the Federal Aviation Administration; or

(b) An airport at which flight operations will be conducted under visual flight rules (VFR) and which is used or intended to be used for a period of less than 30 consecutive days with no more than 10 operations per day.

(c) The intermittent use of a site that is not an established airport, which is used or intended to be used for less than one year and at which flight operations will be conducted only under VFR. For the purposes of this part, "intermittent use of a site" means: (1) the site is used or is intended to be used for no more than 3 days in any one week; and (2) no more than 10 operations will be conducted in any one day at that site.

(Amdt. 157-2, Eff. 6/27/70); (Amdt. 157-3, Eff. 3/23/72); (Amdt. 157-4, Eff. 2/27/91); (Amdt. 157-6, Eff. 8/30/91)

§ 157.2 Definition of terms.

For the purpose of this part:

"Airport" means any airport, heliport, helistop, vertiport, gliderport, seaplane base, ultralight flightpark, manned balloon launching facility, or other aircraft landing or take-off area.

"Heliport" means any landing or takeoff area intended for use by helicopters or other rotary wing type aircraft capable of vertical takeoff and landing profiles.

"Private use" means available for use by the owner only or by the owner and other persons authorized by the owner.

"Private use of public lands" means that the landing and takeoff area of the proposed airport is publicly owned and the proponent is a non-government entity, regardless of whether that landing and take-off area is on land or on water and whether the controlling entity be local, State, or Federal Government.

"Public use" means available for use by the general public without a requirement for prior approval of the owner or operator.

"Traffic pattern" means the traffic flow that is prescribed for aircraft landing or taking off from an airport, including departure and arrival procedures utilized within a 5-mile radius of the airport for ingress, egress, and noise abatement.

(Amdt. 157-4, Eff. 2/27/91); (Amdt. 157-6, Eff. 8/30/91)

157.3 Projects requiring notice.

Each person who intends to do any of the following shall notify the Administrator in the manner prescribed in § 157.5:

(a) Construct or otherwise establish a new airport or activate an airport.

(b) Construct, realign, alter, or activate any runway or other aircraft landing or takeoff area of an airport.

(c) Deactivate, discontinue using, or abandon an airport or any landing or takeoff area of an airport for a period of one year or more.

(d) Construct, realign, alter, activate, deactivate, abandon, or discontinue using a taxiway associated with a landing or takeoff area on a public-use airport.

(e) Change the status of an airport from private use to public use or from public use to another status.

(f) Change any traffic pattern or traffic pattern altitude or direction.

APPENDIX I.
EMERGENCY MEDICAL SERVICE PROVIDERS SURVEY

Emergency Medical Service Providers

Survey

May 1996

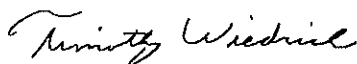
Dear Emergency Medical Service Provider:

The volunteers and paid EMS providers play a pivoting role in saving lives. However, life saving minutes can be lost when ground and air EMS providers are challenged to find intercept areas to transfer patients. A study is underway to evaluate intercept and mediports in North Dakota, in cooperation with the ND Department of Health, ND Department of Transportation, ND Aeronautics Commission, ND Highway Patrol, and providers of ground and air EMS. The study is managed by the Upper Great Plains Transportation Institute at North Dakota State University in Fargo.

This survey will help us to gain a better understanding of the needs of ground EMS providers. Please help us by completing and returning the survey on the reverse side by June 17, 1996. Thank you for your time and effort

Sincerely,

Sincerely,



Timothy Wiedrich, Director
Division of Emergency Health Services
North Dakota Department of Health



Gary R. Ness, Director
North Dakota Aeronautics Commission

INSTRUCTIONS

1. Please read and answer all questions carefully.
2. Select the response that best represents your feelings.
3. There are no right or wrong answers.
4. To ensure anonymity, your name will not appear in the published results.
5. When you have completed the survey, return it in the stamped, self-addressed business-reply envelope.
6. Please return the survey by June 17, 1996
7. If you have questions, please contact:
Riaz Aziz, North Dakota State University, Upper Great Plains Transportation Institute, PO Box 5074, Fargo, ND 58105
(701) 231-8053 Fax: (701) 231-1945 EMAIL: aziz@plains.nodak.edu

DEFINITION

Intercept:	A location used to transfer a patient from a ground EMS provider to a helicopter EMS provider as determined by the ground EMS personnel <u>at the time of need</u> .
Airport:	An area intended to be used for the landing and takeoff of aircraft, including its buildings and facilities, if any.
Mediport:	An area intended to be used for the landing and takeoff of helicopters providing emergency medical service, including its buildings and facilities, if any.
HEMS:	Helicopter Emergency Medical Service.

SURVEY

1. In the past 12 months, how many times has your ambulance service used the following locations to transfer patients to or from an HEMS provider? (Circle your response)

Intercept:	None	1-4	5-8	9-12	13-16	17-20	>20
Airport:	None	1-4	5-8	9-12	13-16	17-20	>20
Mediport:	None	1-4	5-8	9-12	13-16	17-20	>20

2. If your ambulance service has used an airport in the past 12 months to transfer patients to or from an HEMS provider, list the location of the two most frequently used airports and estimate the number of times the airport was used during the same period.

Airport: _____ Annual Use: _____ Airport: _____ Annual Use: _____

3. If your ambulance service has used a Mediport in the past 12 months to transfer patients to or from an HEMS provider, list the location of the two most frequently used mediports and estimate the number of times the mediport was used during the same period.

Mediport: _____ Annual Use: _____ Mediport: _____ Annual Use: _____

4. If you believe there is a need for additional mediports in your primary service area, indicate where the additional mediports should be located and circle the estimated annual use for each mediport.

Location of mediport 1: _____

Estimated annual use of mediport 1: 1-4 5-8 9-12 13-16 >16

Location of mediport 2: _____

Estimated annual use of mediport 2: 1-4 5-8 9-12 13-16 >16

Location of mediport 3: _____

Estimated annual use of mediport 3: 1-4 5-8 9-12 13-16 >16

5. Indicate the percentage of time your ambulance service has experienced problems communicating over Channel 2 with HEMS providers in the past 12 months? (Circle your response)

None 1-10% 11-25% 26-50% 51-75% >75%

6. Results of the survey will be mailed to you at the completion of the study in early Fall. Please complete the following:

Your Name: _____ Your Company: _____

Company's Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Fax: _____ EMAIL: _____

7. Use this space for additional comments about EMS and Helicopter transfers.

THANK YOU. YOUR RESPONSE IS GREATLY APPRECIATED