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Lake Sakakawea Ferry Crossing Feasibility Study

prepared for

Rural Economic Area Partnership Investment Fund, Inc.

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For Stakeholder Review
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United States Department of Agriculture

Rural Development

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EXECUTIVE SUMMARY

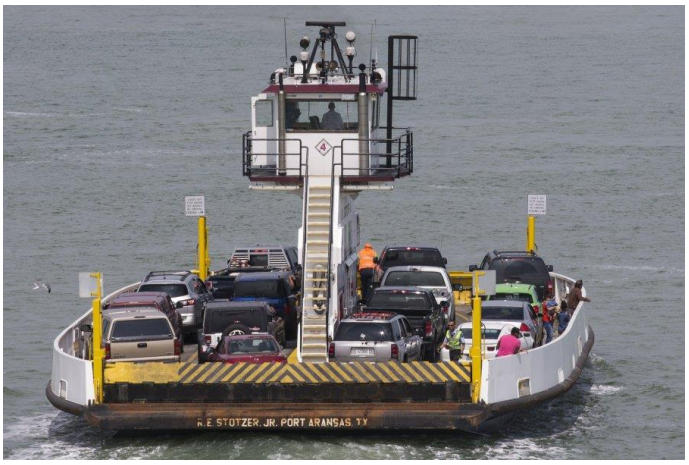


Figure 1. Port Aransas Car Ferry, Texas

Executive Summary

Study Funding Source

The **R**ural **E**conomic **A**rea **P**artnership "REAP" Investment Fund, Inc. received a **R**ural **B**usiness **O**pportunity **G**rant (RBOG) from the **U**nited **S**tates **D**epartment of **A**griculture***** "USDA" Rural Development program to study the feasibility of a car ferry system operating on Lake Sakakawea**.** This study is in conjunction with a comprehensive regional transportation study scheduled to be completed in 2017 by others. The latter study is supported through a **U**nited **S**tates **D**epartment of **T**ransportation "USDOT" **T**ransportation **I**nvestment **G**enerating **E**conomic **R**ecovery "TIGER" Grant.

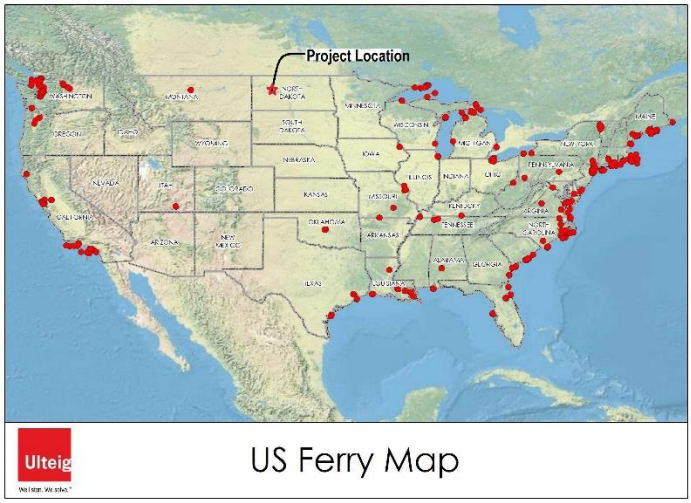
Ferry Description

A car ferry is a ship designed to transport cars and people across a body of water. A ferry that just transports people is sometimes referred to as a "water bus" or "water taxi." Ferries can also transport products and goods. Ferry designs depend on the length of the route, the passenger or vehicle capacity required, speed requirements and the water conditions the craft must deal with. Roll-on/roll-off ferries (RORO) are conventional car ferries named for the ease by which vehicles can board and leave.

History of Ferries that Operated in North Dakota

North Dakota has had a rich history of operating ferries to cross the Missouri and Red Rivers. The ferries were used to transport people, cattle, horses, supplies, agricultural products, cars, trucks and even trains. The review of the historical society records concluded that there were over 30 ferries that operated in North Dakota from the mid-1800s until the mid-1900s. The ferries were typically replaced with bridges.

Existing Ferries Operating in United States



The latest statistics show that there are a total of 231 ferry operators in the United States: 218 across 37 states, 10 in U.S. territories, and 3 between U.S. and non-U.S. locations. Based on data submitted by ferry operators and additional imputations, it is estimated that U.S. ferries carried nearly 103 million passengers and just over 37 million vehicles in calendar year 2009.

Most of the ferries operate along the east and west coasts of the United States and in varying climates. There are several ferries that operate under climatic conditions similar to the proposed car ferry project at Lake Sakakawea.

Figure 2 U.S. Ferry – Map (left)

Example of Existing Operation 1

Examples of U.S Car Ferries- The Keller Ferry

A car ferry located in eastern Washington State crosses the Columbia River at its confluence with the Sanpoil River on Roosevelt Lake.

Construction of the Grand Coulee Dam, about 15 miles downstream from the ferry route, quadrupled the width of the river when the reservoir was filled in 1942. The Roosevelt Lake is 1.25 miles wide at the ferry location. 60,000 vehicles per year use this ferry. Without the ferry traffic would be detoured for 58 miles each way.

The capacity of the vessel is 20 cars with a maximum of 149 passengers and two crew members. The vessel can carry a legally-loaded truck and trailer combination up to 105,500 lbs. The maximum vehicle length is 100 ft. The new vessel entered service on August 14, 2013. The cost of the ferry was $10.4 million.

Figure 3. New Keller Ferry, Washington (above)

Figure 4. Gifford/Inchelium Ferry, Washington (below)

Example of Existing Operation 2

The Colville Indian Reservation is on the north bank and Lincoln County is on the south bank. Twelve tribes make up the Confederated Tribes of the Colville Reservation. The Gifford/Inchelium Ferry is upstream from the confluence of the Columbia and Spokane Rivers.

The Colville Tribe operates a free ferry, the *Columbia Princess*, between Inchelium and Gifford on Roosevelt Lake (Columbia River) on the eastern side of the reservation. The tribe operates the ferry under a Public Law 93-638 contract. The average daily traffic for cars is 227. One round trip on the ferry takes approximately 30 minutes (i.e. 3 miles). The dock is on rails for changes in water elevation.

Figure 5. Fort Berthold Map

Need for a Lake Sakakawea Car Ferry

Similar to Grand Coulee Dam, Garrison Dam was built by the Army Corps of Engineers in 1953, resulting in the flooding of the Missouri River and creating Lake Sakakawea. The Four Bears Bridge at New Town provides the only Missouri River crossing on the reservation.

Lake Sakakawea creates a transportation barrier and divides the Fort Berthold Indian Reservation into five water isolated land segments. The lack of connectivity has created hardships to the businesses, residents, towns, counties, schools, law enforcement, and emergency services.

Prior to the dam being built, North Dakota Highway 8 had a bridge (original four bears bridge) crossing the Missouri River near Twin Buttes. The highway and bridge connected communities in the Southern and Eastern Segments of the reservation. The bridge was removed with the forming of Lake Sakakawea. This resulted in doubling the travel distance from one side of the lake to the other and can now travel to a destination on the opposite side of the lake could be up to 125 miles each way. The excessive distance hinders community connectivity, job opportunities, businesses and economic growth. Emergency responders can take more than two hours if they need to cross the lake. The previously described Kelly Ferry in Washington was deemed necessary when travel of 58 miles each way was considered excessive.

The cost of doing business in the region is higher when travel distances are excessive. It is evident that simple tasks that are taken for granted with a connected transportation system become a hardship when a manmade barrier like Lake Sakakawea makes travel difficult. Travel to the grocery or drug store, to work that is on the opposite side of the lake, fire departments responding to a fire, ambulance service to a hospital, road maintenance crews to repairs, businesses locating in the area, delivery of materials to a job site, kids traveling to school, and delivery of mail have all become difficult.

The residents on both sides of the lake have put up with the limited travel options for over 65 years. Part of the problem may have stemmed from construction easements held by the Corps of Engineers that limited lake side development. A **M**emorandum **o**f **A**greement (MOA), dated May 6, 2015, between the Department of Interior and the **D**epartment of **I**ndian **A**ffairs (DOI); involves the release of construction easements on reservation land adjacent to Lake Sakakawea. The land within the exterior boundaries of the Fort Berthold Reservation acquired by the United States for the construction, maintenance and operation of Garrison Dam and Reservoir Project is no longer needed for such purpose and may be considered administratively transferred to DOI to be held by the United States in trust for the benefit of the **M**andan, **H**idatsa, and **A**rikara (MHA) Nation of the Fort Berthold Reservation, also known as the Three Affiliated Tribes of the Fort Berthold Reservation. The MOA may have an impact in providing approvals for ferry terminals to be built on the reservation and along the shores of Lake Sakakawea.

Car ferries and water taxis are a viable economic alternative to reducing the travel time and creating connectivity to the segmented areas on and off the reservation. The four key factors supporting a car ferry service on Lake Sakakawea include:

- Jobs
- Education
- Health Care
- Community Life Line

Additional benefits supporting the establishment of a car ferry project includes:

- Providing a tourist attraction to the region
- Provide faster access to parks and recreation attractions in the region
- Re-establish transportation connectivity within Fort Berthold Reservation
- Provide for a shorter route for environmental response to environmental spills and cleanup
- Reduction of traffic on the State Highway system
- Provide a faster method to get from one side of the lake to the other
- Improve viability of business locating on either side of the lake
- Reduce the cost of services for residences
- Reduce the cost of materials to the job sites

Figure 6. Lake Sakakawea Crossing Map (above)

Lake Sakakawea creates a transportation barrier for commuters that results in long travel distances to access services on either side of the lake. Commuters have three existing land travel routes to cross from one side of the lake to the other:

1. The eastern crossing is the Garrison **ND 83 Highway** embankment separating Snake Creek (i.e. Lake Audubon) from Lake Sakakawea
2. The central crossing is the New Town **ND 23 Highway** Four Bears Memorial Bridge
3. The western crossing is the Williston **ND 85 Highway** (Lewis and Clark) Bridge

The study and this report's primary focus is on the lake region between Newtown, ND and Garrison, ND.

Figure 7. Four Bears Bridge (above)

Bridge Alternative Cost

An alternative to a ferry operation would be the establishment of a four-mile-long bridge crossing the lake at the proposed location of the car ferry crossing. A bridge at this location would be approximately four miles long and could cost between $400 and $500 million.

The Four Bears Bridge near New Town was constructed in 2005. It is anticipated that the cost of this 4,500 foot bridge in 2017 dollars would be approximately $90,000,000.

Capital Cost of a Car Ferry
Federal Grants require that the proposed ferry be built in the United States and this has an impact on the cost of the ship. The capital costs of a car ferry is based on several factors such as - the capacity i.e. 14 cars and 30 passengers; speed of the ship i.e. 15 miles per hour; and lake conditions i.e. wave height. Based on this descriptions, boat builders indicated that the likely construction costs of this vessel would be $3.8 to $6.8 million.

Increasing the size to accommodate 24 vehicles and 100 passengers; would result in a likely construction costs at approximately $10.4 to $12.8 million per vessel.

Figure 8. Car Ferry – 24 vehicles and 100 passengers (above)

Figure 9. Water Taxi (below)

Water Taxi Ferry Possibilities
Multiple docks could be used by water taxi ferries that would interface a ground public transportation service. Public transportation is being reviewed under a separate study. The water taxi docks could be designed to accommodate the existing tribal yacht that is located in New Town. The feasibility of using the tribal yacht as a tourist attraction is not part of this study.

A separate document titled "Water Taxi Feasibility Study reviews the possibility of creating a water taxi service to accommodate the movement of passengers to various locations around Lake Sakakawea.

A water taxi service could be considered in the public transportation system study. The cost of a water taxis are between $100,000 and $350,000 each. Water taxis are a faster service to commute customers at speeds up to 40 mph. Docks for water taxis are less expensive that those required for car ferries. The estimated cost of a water taxis dock is at approximately $200,000 to $400,000 per dock. Ten docks could be serviced by eight to ten water taxis and pickup and delivery services could be estimated at 15 to 30 minute intervals. Water taxi service would need to interface with a land-based transportation system, i.e. bus or taxi.

Figure 10 Lake Sakakawea State Park Marina Dock (above)

Existing Docks

There are existing dock facilities around Lake Sakakawea that could be considered for the taxi service. The Lake Sakakawea State Park Marina dock is pictured to the left. Additional study would be required to look at the feasibility of using existing docks for a water taxi service.

An existing boat ramp - Skunk Bay Boat Ramp is 14 miles northeast of Mandaree, ND. There is a gravel access road to this site that has a developed along with primitive camping, concession, and lodging. The road appears to be maintained by Three Affiliated Tribes. This could be a possible site for a water taxi service; however, the distance may make the cost prohibitive for a car ferry access point.

The following is a list of existing public fishing docks and public marinas on Lake Sakakawea:

Existing Public Fishing Docks

- American Legion Park
- Beaver Creek
- Charging Eagle
- Fort Stevenson State Park
- Indian Hills
- Little Muddy

Existing Public Marinas

- Beulah Bay
- Fort Stevenson State Park
- Indian Hills
- Lake Sakakawea State Park
- Lake Shore Park
- Lewis and Clark State Park

Cost of Car Ferry Terminal Facilities
The cost of a car ferry terminal facility is based on cost of the components that make up the terminal**.** The facility includes land side improvements as well as water side improvements.

Dock
Lake Sakakawea fluctuates in elevation up to 52 feet during the season that the car ferry is in operation. The docking facility needs to be design to accommodate this fluctuation. The dock also needs to be designed to carry the load of vehicles and pedestrians. A grade level dock allows for the fluctuation of the water surface elevation.

Car Ferries can be designed to have a draft of four to six feet and be capable of landing on shore. This allows for a paved dock that slopes at a 6.6 percent grade (for handicapped accessibility) and parallels the ground surface.

Therefore, a 1,000-foot-long paved dock would accommodate 52 feet of fluctuation of the reservoir and provide a hard surface for loading and unloading vehicles. A floating dock end section on rails would allow for a transition between the ferry and the paved surface. The paved dock and floating section would cost approximately $600,000.

Figure 11. Grade Level Dock (above)

Detailed cost of land side improvements to the terminal are listed in Chapter 7 and represent a total cost for the main terminal and dock at $2,687,000.

Land side improvements include all the facilities necessary to process the cars and pedestrians for loading and unloading the car ferry.

<u>The land side improvement components include (not including $600,000 dock):</u>

Ferry Terminal Road (1000 ft. X 30 ft.) – 8" Asphalt
Holding Lanes (4lanes @ 200 ft. X 15 ft.) – 8" Asphalt
Parking Lot A (20 Stalls) – 8" Asphalt
Bus Parking Lot B (3 Stalls) – 8" Asphalt
Toll Plaza (1 toll both) – Prefabricated
Emergency Generator – (1 – 15KVA)
Pedestrian Paths – (15ft X1500 ft.) – 4" Asphalt
Bus Passenger off area
Bathroom Facilities
Picnic Area (waiting zone)
Supervisors Office
Signage
Security System
Outside Lighting
Fueling System
Dry Docking Facility
Fueling Systems
Total Cost of Landside Improvements (without dock cost) $1,487,000.00

Variable Costs
There are variable costs for each terminal location that cannot be accurately determined at this time. As shown below the variable costs have a significant range. Additional discussions are necessary with the stakeholders in order to more accurately determine the budget for the variable costs.

The list of potential variable costs to the project could include the following:

Land acquisition (10 to 20 acres per site) ……	($50,000 to $250,000)
Road and Utility Right of way ……	($50,000 to $290,000)
Permit costs ……	($10,000 to $100,000)
Environmental Impact Statements, historical and archeological study …	($90,000 to $180,000)
Design cost (include survey and geotechnical work)……	($300,000 to $400,000)
Construction observation and testing ……..	($200,000 to $300,000)
Legal and administrative costs ……	($200,000 to $400,000)
Interest on borrowed money ……	($100,000 to $200,000)
Access roads interconnecting with the State Highway (by others) ….	($500,000 to $1,500,000)
Budget for variable costs (per terminal)……	($1,500,000 to $3,620,000)

Projected Revenue Income
A projection of the income revenue (Chapter 7) is integral with estimating the number of lake crossings and the number of cars and passengers for each crossing. As in other ferry operations in the United States, the majority of the ferry users occur in the morning (going work) and in the evening (coming home). The tables and estimates parallel this same time frame. Base on a conservative estimate as to the average daily usage of the car ferry the follow assumptions were made:

- 90 ferry passengers per day @$10 each (260 days per year)
- 84 automobiles per day @$24 each (260 days per year)

The projected annual revenues generated from the estimated usage and rates identified is …… **$760,000.**

It should be noted that some ferries operating in the United States provide the transportation service for free or a minimal cost like one dollar. The state department of transportation in these cases pay for the operation and maintenance costs of the facilities in lieu of paying for the construction and maintenance of a bridge.

Operational Costs
A projection of the operating costs (Chapter 7) is integral with estimating the number of lake crossings and the number of cars and passengers for each crossing. The estimated operating cost does not include the replacement cost of the car ferry. Based on the usage identified in the projected revenue income portion of the study, the summary of operating costs are shown below:

Labor and Overhead	
Fuel and oil consumption	
Maintenance of boat machinery, hull and outfit	
Maintenance of terminals	
Moorage	
Insurance	
Management and Administration	
Overhead	
Total annual operating costs ……	**$716,000.**

The comparison of the anticipated revenue and the operating costs associated with running a car ferry operation on Lake Sakakawea shows that it is possible to cover the base operating costs with the revenues received.

Car Ferry Total Project Capital Cost

A Car Ferry Crossing Lake Sakakawea at a location near old ND 8 highway appears to be a cost feasible solution at an estimated project cost of **$11.8 to $19.6 million**.

Table of Project Capital Costs – Car Ferry and Two Terminals

Item No.	Description	Low Estimate Cost	High Estimate Cost	Average Estimated Costs
1	14 -Car Ferry Capital Cost	$3,980,000	$8,198,000	$6,089,000
2	Primary South Terminal	$2,687,000	$2,967,000	$2,827,000
3	Primary North Terminal	$2,247,000	$2,547,000	$2,397,000
4	Variable Costs South Terminal	$1,500,000	$3,620,000	$2,560,000
5	Variable Costs North Termnal	$1,500,000	$3,620,000	$2,560,000
	Total Project Capital Costs	$11,914,000	$20,952,000	$16,433,000

The above line item 1 estimate is based on the car ferry designed to a capacity of 14 cars and 30 passengers. If the parameters of the project change and the car ferry capacity increases to 24 cars and 60 passengers, the cost of the car ferry construction could increase by $4,500,000. All other capital costs would remain the same.

This study also reviewed the costs and locations for two additional car ferry terminal sites. If two additional terminals are selected by the stake holders, consideration should be given to the purchase of a second ship. Multiple docking facilities could result in additional crossing alternatives. The estimated cost for each additional terminal would be $4.1 to $4.9 million (includes variable costs). However, if the stake holders decide that it is beneficial to move only people rather than cars at secondary locations; the water taxi / water bus service system could be considered with the lower costs for terminal facilities and ships.

Grants to Support Ferry Service

The proposed project is deemed feasible in this report from and operational view point; however, the capital costs need support from outside sources in the form of grants and stakeholder contributions. There are federal grants for ferry services that are available for the construction of the docking facilities and purchase of the ferry. There are several funding programs identified in this study that could assist in the identified project capital costs. The identified funding programs are part of a transportation set aside for ferry services within the Federal Highway Administration and could provide up to 80% matching funds. These grant programs need to be administered through the North Dakota Department of Transportation as the sponsoring agency.

Three Affiliated Tribes participated in the creation of the USD TIGER grant to fund this report. This grant was awarded for the express purpose of analyzing the feasibility of a car ferry service on Lake Sakakawea. The summary of feasibility is based on information gathered, analysis of capital costs, projecting ridership, determine costs of operation and comparing the proposed project to existing ferry services that are operating under similar parameters.

There are many car ferry services in operation in the United States as well as thought the world. The United States congress and the Federal Highway Administration has recognized the need for ferry services as a viable method of crossing bodies of water and interconnection communities. It is evident that car ferry systems are an economical alternative to building a bridge for crossing the body of water. The amount of funds in the program vary based on congressional allocation to the program. The proposed project is very similar to both the Keller Ferry and the Columbia Princess Ferry in Washington State, which were partially funded by the described matching grant programs.

The information described in this report could be used in conjunction with establishing matching funds and applying for grants.

Conclusion

The car ferry service can operate above a break even scenario. Grants are needed for 80% of the capital improvement costs. The stake holders would need to support the project with 20% matching funds. The following is the breakdown for funding the funding allocation:

1. Grant contribution …….. $ 13,146,400.
2. Stakeholder contribution ……... $ 3,286,600.

   Total cost of capital improvements ……. $ 16,433,000.

Additional study and review with the stake holders is needed to receive stakeholder input and to finalize the cost feasibility of a car ferry service for Lake Sakakawea. A car ferry service should interface with a public transportation system for the passenger component to be successful. Also, additional consideration should be given to reviewing the feasibility of a water taxi / water bus service as a method of providing additional convenience to interfacing with a ground public transportation. A preliminary report has been prepared to identify the differences between a car ferry and a water taxi. The existing Three Affiliated Tribes yacht could be considered as part of the water taxi / bus service. There are many stakeholders identified in the study that can contribute valuable recommendations, comments and suggestions that may incorporated into the report

. The following is a list summarizing conclusions reached in the report:

1. Ferry services operate successfully throughout the United States and the world.
2. Many successful ferry services are supported by federal grants and funds from the state highway department. There are grants available from the Federal Highway Administration.
3. The North Dakota Department of Transportation would need to be a sponsor for grants from the Federal Highway Department of Transportation Administration.
4. A car ferry system infrastructure could cost between $12 and $21 million vs a bridge that could cost between $400 and $500 million.
5. Annual operating costs of the ferry services can be met with user fees.

6. A car ferry project at Lake Sakakawea would need 80% grants for both the land infrastructure and car ferry capital costs in order to operate viably.
7. The ferry operation on Lake Sakakawea would require approval from the federal government through the jurisdictional US Army Corp of Engineers.
8. It is anticipated that environmental impact studies will need to be developed as the project progresses forward.
9. The proposed car ferry should accommodate 14 to 20 cars and up to 30 passengers.
10. A public transit system would be an important component in the successful transfer of non-driving passengers that utilize the car ferry service.
11. Docking facilities can be ramped to accommodate the 52 foot fluctuation of the lake surface.
12. End load ferries provide the best interface with ramped docks.
13. The ferries must meet all the required safety guidelines established by the US Coast Guard.
14. The design of the terminals would need to go through a permitting process.
15. FHWA grants have a stipulation that the ships are built in the USA.
16. Used ferries were investigated to determine the feasibility of purchasing and retrofitting the ship to meet the latest safety standards. This analysis did not review the feasibility of obtaining grants for used car ferries.
17. A test program could be established with the purchase of a used ship and the construction of minimal terminal facilities.
18. A new ship should have a 60 years of service life and meet all the design requirements for the specific locations identified for the terminals.

Action Items

This report should be considered a living document that will be modified and changed as additional thoughts and ideas are incorporated into the study. The purpose of the report is to put on paper initial ideas and thoughts about the feasible of the car ferry project.

It is recommended that the draft report be reviewed by the sponsoring stakeholders for incorporation of additional comments and ideas prior to reviews being made by all stakeholders. There are several action items and interfaces that need to take place prior to the finalization of a car ferry project:

Initial Action Items

1. This draft report of the car ferry study should be reviewed by the Three Affiliated Tribes' transportation committees, governing members and stake holders for comments and recommendations.
2. The Three Affiliated Tribes governing body should view the report and develop an action plan for a public involvement program that considers the necessity of a car ferry system.
3. A **P**ublic **I**nvolvement **P**lan (PIP) provides the strategic framework for communications and public involvement activities during the **E**nvironmental **I**mpact **S**tatement (EIS) process for the Lake Sakakawea Ferry Project. The PIP develops public involvement communications goals, key messages, public involvement milestones, and stakeholders. The PIP also identifies tools and tactics to engage the public and solicit feedback
4. The NDDOT and Army Corp of Engineers should review and comment on the study in order to develop comments and recommendations associated with the feasibility of the car ferry project. This would also require NDDOT to evaluate the feasibility of sponsoring grant applications.
5. The Three Affiliated Tribes governing body and stakeholders should evaluate the feasibility and action items needed for this project to move forward.
6. The stakeholders need to review and consider the report, make recommendations, add comments and give suggestions.
7. The stakeholders should review the possible sources for the 20% matching funds.
8. This report shall be reviewed and the information incorporated into the overall public transportation project analysis and report. Consideration shall be given to incorporating the bus service, water taxi and car ferry service in the overall transportation system study.

Future Steps for Implementation

9. Grant applications need to be completed, submitted approved by the funding agencies.
10. Environmental impact studies need to be completed for the lake operations and the terminal locations.
11. Land for the terminals need to be purchased.
12. Permitting is needed for the terminal facilities.
13. Ship needs to be designed and built to the standards needed for Lake Sakakawea. The construction process takes two years.
14. The terminals need to be built, this process takes two years.
15. Roads need to be improved to the terminals.

Additional discussions are necessary with the stakeholders to further focus and project needs in order to more accurately determine the project scope. The questions to further clarify the projects scope includes:

1. Will there be a public transit system developed for the region that can interface with the car ferry passenger service needs.
2. If there is a public transit system should consideration be given to including a water taxi / water bus service?
3. Is it possible for land and right of way to be donated for the car ferry project?
4. Will NDDOT contribute to the cost of the connecting ferry terminals to the state highway system?
5. Will the stake holders support a federal grant for the ferry project?
6. Will the State Legislator approve funds for the environmental impact studies for the proposed project?

Example Project Timeline •

The following action items fall outside the scope of this feasibility study; however, they need to be planned for and implemented in order to implement the car ferry system operation:

Fall 2016 – Finalize the project purpose and need statement and create a Public Involvement Plan

December 2016 – Finalize the application for funding environmental studies, legal reviews, and site research.

January 2017 – Begin the Environmental Assessment process (EA) and Public Involvement

April 2017 – Initiate the NEPA/SEPA process

June 2017 – Receive the funding for the environmental studies, legal review and site research.

Fall 2017 – Revise the project purpose and need statement.

Spring 2018 – Complete the NEPA/SEPA EIS Scoping process.

Summer-Fall 2018 – Prepare Draft EIS.

Winter 2018 – Complete the EIS public hearings and comment period.

Spring 2019 – Identify Preferred Alternative.

Summer 2019 to winter 2019 – Prepare Final EIS.

Spring 2020 – Publish Final EIS.

Summer 2020 – Issue Record of Decision (ROD); begin final project design.

Fall 2020 – Issue Design Contract for Ferry.

Spring 2021 – Sign Contract for construction of Ferry and complete final project design.

Summer 2021 – Begin construction

Spring 2023 Start Ferry Operation

Chapter 1 - Introduction

Study Purpose
The purpose of this study is to consider the viability of a car ferry service that addresses the following issues:

- Cost feasibility of establishing a car ferry service on Lake Sakakawea.
- Establish a transportation system that supports cross connectivity for the residents within Fort Berthold Reservation and re-establishes a traffic route that was closed when Garrison Dam was built.
- Provide for a shorter route for emergency services.
- Reduction of traffic on the State Highway system resulting from the oil production impact.
- Provide a faster method to get from one side of the lake to the other to reduce commute times. This would benefit residents that work in energy services by shortening the travel time to work.
- Provide connectivity to parks and recreation attractions in the area.
- Provide an attraction to increase tourism.
- Increase economic development on both sides of Lake Sakakawea.
- Provide a facility that could respond to environmental needs in the area.

Study Scope
At the direction of REAP Investment Fund and Vision West, Ulteig has prepared this study to evaluate the feasibility of providing a car ferry service across Lake Sakakawea. The proposed facility would provide car ferry service from Twin Buttes to Parshall while the Lake is open to boat traffic. The study will evaluate the impact to both local and regional populations, existing infrastructure and the environment. This will include accessibility to the Lake, parking facilities, docks, amenities, operating costs, travel times, operating schedule and boat options. Additionally, Ulteig will review potential docking facilities for four locations around Lake Sakakawea. Appendix D, Attachment A, Figure 37 includes a regional map of the study location.

Stakeholders
During the preliminary discussions with Vision West a list of stakeholders were identified. As part of the study, the stakeholders will be asked to provide input into the study. These stakeholders include:

- REAP
- Army Corp of Engineers
- MHA (Three Affiliated Tribes)
- Interior Department, Bureau of Indian Affairs, Department of Indian Affairs
- Counties: Dunn, McLean, Mercer and Mountrail
- North Dakota Department of Transportation
- Federal Highway Administration
- Environmental Protection Agency
- Town of Twin Buttes
- Town of Parshall
- New Town
- Garrison
- North Dakota Department of Commerce and Tourism
- North Dakota Parks and Recreation
- North Dakota Game and Fish
- Local residents, land owners and farmers
- Bureau of Indian Affairs

Each of the stake holder(s) will be given an electronic copy of the report for their review in order to provide comments, concerns, needs, additional information or requirements of the stake holder. It is anticipated that funding will be required in the form of grants in order to make this project cost feasible.

Study Corridor
The study corridor includes the stretch of Lake Sakakawea from New Town to Garrison ND. This is a nautical distance of approximately 85 miles. The proposed car ferry crossing near the mid-point.

Lake Sakakawea
The lake was created with the completion of the Garrison Dam in 1953. It is located in the Missouri River basin in central North Dakota. Named for the Shoshone-Hidatsa woman Sakakawea, it is the largest man-made lake in North Dakota and the third largest in the United States, after Lake Mead and Lake Powell. The lake lies in parts of six counties in western North Dakota: Dunn, McKenzie, McLean, Mercer, Mountrail, and Williams. A map centered on the Van Hook Arm 47°53'00"N 102°21'14"W of the lake perhaps better shows its westward extent from its origin at the Garrison Dam.

The lake is located about 50 miles from Bismarck; the nautical distance by the Missouri River is 75 miles. The lake averages between two to four miles in width and is 14 miles wide at its widest point (Van Hook Arm). Lake Sakakawea marks the maximum southwest extent of glaciation during the ice age.

Garrison Dam
The Garrison Dam is largest of the six main-stem dams on the Missouri River that have been built and managed by the U.S. Army Corps of Engineers. The dams were built for flood control, hydroelectric power, navigation, recreation and irrigation.

Lake Statistics
Reservoir Regulation of surface elevation:
For the purpose of regulation, the storage capacity at Lake Sakakawea is divided into four zones. Starting at the bottom, there is the 4.9 MAF permanent pool between elevations1775.0 and 1673.0 feet msl. This zone provides minimum power head and sediment storage capacity and assures minimum level for pump diversion of water from the reservoir. Above the permanent pool there is the 13.1 MAF carry-over multiple-use zone between elevations 1837.5 and 1775.0 feet msl. This intermediate zone provides a storage reserve for irrigation, navigation, power production, and other beneficial conservation uses. This zone also provides carry-over storage for maintaining downstream flows through a succession of years in which runoff is below normal. The next zone is the 4.2 MAF annual flood control and multiple use zone between elevations1837.5 and 1850.0 feet msl. This is the desired operating zone. Water stored in this zone is normally evacuated by March 1 of each year to provide adequate storage capacity for the flood season. During the flood period, water is impounded in this space as required. Finally, the upper zone, or exclusive flood control zone, consists of 1.5 MAF of storage between elevations 1850.0 and 1854.0 feet msl. This zone is used only during periods of extreme floods and is evacuated as soon as downstream conditions permit.

Regulating the Missouri River main-stem reservoir system is essentially a repetitive annual cycle. Unless water conservation measures are being implemented, the reservoirs are evacuated to the bottom of the annual flood control and multiple use zone by March 1. Because the major portion of the annual runoff enters the reservoirs between March and July, storage accumulates and usually reaches a peak during early July. During an average year, the Lake Sakakawea elevation crests near 1840 feet msl. However, tables available from the Corp of Engineers indicates that fluctuations of elevation can be from 12 feet to 51 feet. Therefore, a docking facility must be able to handle the fluctuation. A ramp dock facility could allow for surface elevation fluctuations.

The following is a list of basic lake statistics:

- Maximum water storage: 23,800,000 acre feet
- Maximum water depth: 180 feet at the face of the dam
- Normal surface area: 307,000 acres (480 square miles)
- Normal length:178 miles
- Normal shoreline:1,320 miles
- Probable maximum Annual change in water elevation: 52 feet

Fort Berthold Indian Reservation

Created in 1870, the Fort Berthold Indian Reservation is a U.S. Indian reservation in central North Dakota that is home for the federally recognized Mandan, Hidatsa, and Arikara Nations, also known as the Three Affiliated Tribes. The existing reservation is 6.5 percent of the lands originally reserved to the tribes by the Fort Laramie Treaty of 1851, which allocated nearly 12 million acres in North Dakota, South Dakota, Montana and Wyoming. The Fort Berthold reservation is located on the Missouri River in six counties including McLean, Mountrail, Dunn, McKenzie, Mercer and Ward counties.

Presently, the reservation consists of approximately 980,000 square acres, of which 422,830 square acres are owned by Native Americans, either as individual allotments or communally by the tribe. The McLean National Wildlife Refuge lies within its boundaries. The reservation has been originally divided by the Missouri River and later by Lake Sakakawea.

Historical Significance of the Project Location

The construction of Garrison Dam on the Missouri River in 1947-53 resulted in the taking of 152,360 acres of Fort Berthold tribal land. This taking represented over one-fourth of the reservations total land base. Lake Sakakawea was formed as a multi-purpose water reservoir for irrigation, recreation, flood control and hydroelectric power generation. The lake, and the flooding of tribal lands destroyed much of the Three Affiliated Tribes' economy, previously based on farming and ranching in the fertile river bottom.

The Corp of Engineers and the U.S. Legislation determined the compensation settlement for the condemnation of the tribal lands, October 29, 1949. The final piece of settlement legislation denied the tribe, their right to use the reservoir shoreline for grazing, hunting, fishing, or other purposes. It also rejected tribal requests for irrigation development and royalty rights on all subsurface minerals within the reservoir area.

Figure 12 – Four Bears Bridge near New Town ND

Four Bears Bridge

The Four Bears Bridge, which opened in 2005, provides access across the Missouri River on the western end of the reservation near the city of New Town, North Dakota. The Four Bears Bridge is 4,500 feet in length and was built at a cost of $55 million in 2005 (estimated in 2016 equivalent $85 million).

The 2015 Office of Tribal Enrollment showed the individual population on the 1,319 square miles of reservation at 5317[1] with 14,823 registered TAT members. As a means to economic stability and the livelihood of tribes, Congress passed the Indian Gaming Regulatory Act (on October 17, 1988). This legislation authorized Class III casino gaming on Indian Reservations. The Four Bears Casino and Lodge was opened to the public July 16, 1993. Over 90 % of the 322 employees are tribal members.

Past History of Ferries in North Dakota

North Dakota has had a rich history of operating Ferry's to cross the Missouri and Red Rivers. The ferries were used to transport Cattle; Horses, Supplies, Agricultural Products; Cars; Trucks and even trains.

The Sioux Ferry was one of the last ferries used on the Missouri River. The Ferry was built by Oscar Anderson and took its maiden voyage on Memorial Day 1952, and operated until 1962. The Ferry once transported horses, autos and people from bank to bank. For years, the Sioux provided the only means of getting across the wide Missouri. A person could go down to the riverbanks, pay a small fee and ride across. If Anderson was on the other side of the river, one just waved at him to bring the Sioux over. It was closed down in the sixties because of navigation problems. Located at Riverside Park in Washburn along the Missouri River, the Sioux Ferry is on permanent display at the park.[2]

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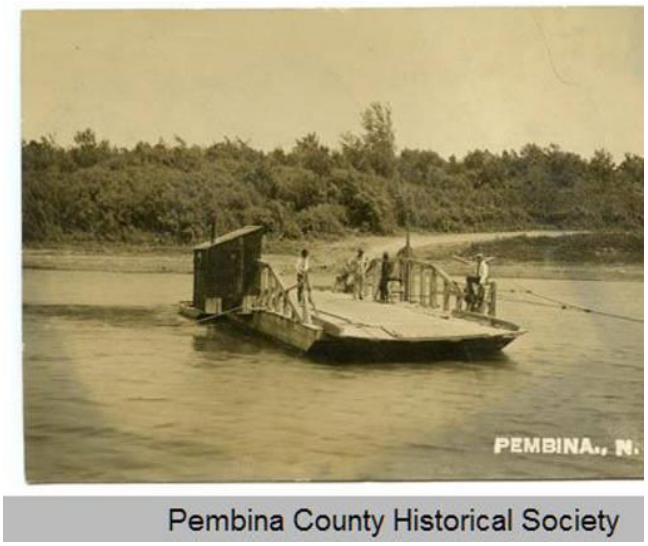
[1] 2015 Enrollment Summary *Office of Tribal Enrollment (OTE)*

[2] City of Washburn North Dakota Web site

[2] Bureau of Indian Affairs

[3] US Department of Transportation, Bureau of Transportation Statistics by Kenneth Steve and Julie Parker



Pembina County Historical Society

Figure 13

William E. (Bill) Shemorry Photograph Collection

Figure 14

State Historical Society of North Dakota

Figure15

Figure 16

Some of the documented ferries to operation across the Missouri River include:

- Fort Abraham Lincoln Ferry
- Fort Pollock Ferry
- Fort Yates Ferry
- Bakers Ferry – McKenzie County
- Carolina Ferry – Emmons County
- Marion Ferry – Western ND
- Menden Hall Ferry – Tioga ND – Figure 14
- Melvin H. Ferry – Spanish ND
- Northern Pacific Railroad Ferry – Bismarck ND – Figure 15
- Stanley ND Ferry
- Pembina County Ferry – Figure 13
- Roams Ferry – Figure 16
- Washburn ND Ferry
- Williston Ferry
- Wolf Ferry – Missouri River

Figures 13, 14, 15, and 16. Historical Ferries in North Dakota from the State Historical Society..

Ferry Types by Use

A breakdown of typical ferry types is provided below:

- **Water Taxis:** small watercraft that typically serve short cross-waterways or waterway circulation routes; by definition, a water taxi provides on-demand service to a variety of destinations. However, the term is commonly applied to small watercraft serving multiple-stop routes.
- **Passenger Ferries:** larger vessels that have higher passenger capacity and speeds than water taxis and typically serve short- to moderate-length routes.
- **Auto Ferries:** also known as roll-on, roll-off ferries, these ferries transport vehicles as well as passengers. They are typically used on longer routes across major bodies of water and on low-volume rural roads crossing rivers.

Because ferries can only take passengers to the water's edge, intermodal transfers are usually required at one and often both ends of the ferry trip. Options for providing this transfer include park-and-ride lots, feeder bus service, roll-on, roll-off bus service (for auto ferries), and terminals located close to rail or bus service. Three Affiliated Tribes is reviewing the feasibility of an intermodal transportation system under a separate study through a USDOT TIGER Grant.

Vessel Type

Vessels can be categorized by their physical and mechanical characteristics. Physical characteristics include the hull type and vessel dimensions and affect the design of both the vessel and passenger facilities. The Society of Naval Architects and Marine Engineers has prepared a summary of a variety of hull types:

- **Monohulls** are commonly used in the United States, especially where speeds greater than 30 knots in high sea conditions are not required. The semiplaning monohull represents a low capital cost, low maintenance option for relatively protected waters.
- **Catamarans** have steadily eclipsed other hull forms as the choice of most ferry operators for all but very high-speed (greater than 40 knots) service. The catamaran offers a more stable platform than the monohull, greater maneuverability (owing to widely spaced propellers), low draft requirements at a given hull displacement, and reasonable economy of operation. Compared with monohulls of similar size, however, capital costs are higher and wider vessel berths are required. At low speeds, operating inefficiency increases, which also increases fuel consumption and fuel costs. Water jet propulsion combines relatively good fuel economy with speed and passenger comfort. Lake Express can carry 46 cars, 12 motorcycles, 20 bicycles and 250 people on each trip at 40 mph.

Figure 17. Catamaran

- **Hydrofoils** feature low-wake profiles, high speed, and low fuel usage. They have deep draft requirements and are susceptible to disablement by submerged or floating flotsam. Debris impacts can lead to costly and time consuming dry-docking.

- **Small Water Plane Area Twin Hull** (SWATH) vessels are designed to reduce vessel motions during rough head seas, while sustaining normal cruising speeds. SWATH ships typically have two submarine-like lower hulls completely submerged below the water surface. Above water, a SWATH resembles a catamaran.
- **Surface Effect Ships** are propelled through the water with 85% of the hull weight lifted out of the water. These ferries operate with low fuel usage and high speeds but have a high capital cost per seat, high maintenance requirements and costs, susceptibility to speed loss in heavy sea conditions, and a less comfortable ride.
- **Hovercraft** travel above water and are propelled through the air. This hull form is attractive for shallow areas (since the vessel travels above the water and not through it) and is faster than other vessels (since it has little contact with, and hence little friction from, the surface water). For short distances, these vessels can also operate across land to sites. Negative considerations include high capital and maintenance costs, bumpy rides, and high levels of exterior noise. As of 2003, with the exception of a single vessel in the St. Petersburg, Florida area, no commercial hovercraft operate in U.S. waters today, although many operate in Europe.
- **Modular Ferry** is a small single hull ferry with double end load ramps for roll on roll off vehicle transportation to cross causeways. These typically have reduced speeds of 9 to 12 mph. An advantage is loading and unloading on ramped docking facilities. This type of ferry is used in military operations to transport vehicles, goods and personnel across lakes and rivers.

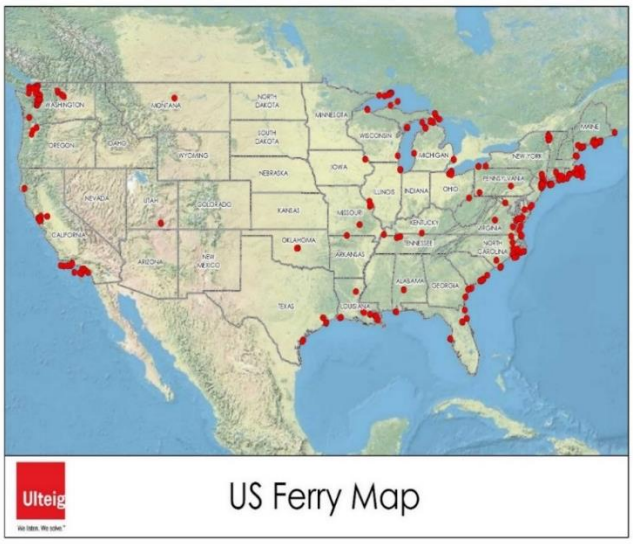
Figure 18. Modular Ferry (double end load referred to as Roll On Roll Off.)

Figure 19. New Wahkiakum County Monohull (23 car, 100 passengers) Ferry – Oscar B Ferry

Estimated cost $10.7m
Service Speed 8.5 knots (drawing & Specs available)
Contractor - Nichols Brothers Boat Builders
Designer - Eliot Bay Design Group

Figure 20. Retired Wahkiakum County Monohull (13 car) Ferry

Ferries are further defined by the location of loading the vessel. Loading can be one end, double end or side loading. Double end loading ferries have the added benefit of loading and unloading in either direction.



High Lights of Ferry Operations in United States
As published in a special report by the United States Department of Transportation, Bureau of Transportation Statistics Sept., 2014. During calendar year 2009, there were a total of 231 ferry operators: 218 across 37 states, 10 in U.S. territories, and 3 between U.S. and non-U.S. locations. Based on data submitted by ferry operators and additional imputations, it is estimated that U.S. ferries carried nearly 103 million passengers and just over 37 million vehicles in calendar year 2009.

Nearly two-thirds of the operations were privately operated (63.7%). About one-third were publicly operated (30.2%), while 6.1% were both publicly and privately operated.

Tables published in the referenced report included https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/subject areas/ncfo/highlights:

- Table 1: Passenger and Vehicle Boarding Estimates by Census Region, 2009
  - Indicates that the number of passengers using ferries in the US is 102,822,543
  - Indicates that the total number of vehicles that use ferries is 37,094,351
- Table 2: Ferry Operators by Census Region, 2009
  - Indicates that approximately 232 Ferry Operators in US.
- Table 3: Percentage of Revenue from Funding Source, 2009
  - Indicates that approximately 50% of the revenues from Ticket Sales.
- Table 3: Ferry Vessels by Census Region, 2009
  - Indicates that approximately 622 Vessels in Service.
- Table 5: Ferry Fleet Vessel Characteristics, 2009
  - Indicates that the mean number of vehicles in a ferry is 18
  - Indicates that the median number of vehicles in a ferry is 18.
  - Indicates that the median speed of a Ferry is 12 knots.
- Table 6: Ferry Terminals by Census Region, 2009
  - Indicates that the total number of terminals 485.
- Table 7: Route Segments by Census Region, 2009
  - Indicates that the total number of segments is 461.
- Table 8: Ferry Route Miles by Census Region 2009
  - Indicates that the median number of route miles is 4.0.
- Table 9: Segment Type and National Park Service by Census, 2009
  - Indicates that 388 of the ferries are used for intrastate travel.
  - Indicates that 58 of the ferries are used for interstate travel.
  - Indicates that 15 of the ferries are used for international travel.
  - Indicates that 38 of the ferries are used for park service.
- Appendix A: Passengers, Vehicles and Route Miles by State, 2009
- Appendix B: State Groupings by Census Region, 2009
- Appendix C: Operator, Fleet, and Terminal Characteristics, 2009
- Appendix D: Operators, Vessels, Terminals, Route Segments by State, 2009

Figure 3. Keller Ferry, Eastern Washington (below)

The Keller Ferry operation is similar to the proposed project. The M/V Sanpoil, also known as the Keller Ferry, is 116 feet in length with a 45 foot beam. The capacity of the vessel is 20 cars with a maximum of 149 passengers and two crew members. The Keller Ferry crosses the Columbia River at its confluence with the Sanpoil River from Ferry County and the Colville Indian Reservation on the north bank to Lincoln County on the south. The Columbia River is 1 1/4 miles wide at this point with basalt cliffs and scab land forming both shores. The river wasn't always as wide. Construction of the Grand Coulee Dam about 15 miles downstream from the ferry route quadrupled the width of the river when the reservoir was filled in 1942.

The vessel can carry a legally-loaded truck and trailer combination up to 105,500 lbs. The maximum vehicle length is 100 ft. Approximately 60,000 vehicles travel on the Keller Ferry each year. Walk-on passengers are few as the ferry route is a link in a rural highway, State Route 21. The nearest communities are Wilbur, 14 miles to the south, and Republic, 53 miles north. The free ferry operates seven days a week, 18 hours a day. The tribe contributed $2 million of the $12 million project cost (project cost included terminals).

Figure 4. Gifford/Inchelium Ferry, Washington (below)

The Inchelium-Gifford Ferry -- also called the Gif -- is operated on Lake Roosevelt by the Colville Confederated Tribes on behalf of the Bureau of Indian Affairs. The run connects Inchelium with State Route 25 in Stevens County and has been in operation since 1898.

In 1939 and 1940, water from Lake Roosevelt behind Grand Coulee Dam rose and inundated Inchelium and Gifford. A new Inchelium grew up on higher ground a few miles away and the ferry shifted its landings to the new locations. The Colville Confederated Tribes and the Bureau of Indian Affairs asked Congress for funding for a permanent ferry. The BIA arranged for a tug and barge to move autos across the lake. In 1981, Fisherman's Boat Shop in Everett completed the *Columbian Princess* on a $1.7 million contract with the Bureau of Indian Affairs. In 1994, the tribe took over operation of the ferry from the family that had the BIA contract.

The Colville Tribe operates a free ferry, the *Columbia Princess*, between Inchelium and Gifford on Roosevelt Lake (Columbia River) on the eastern side of the reservation. The tribe operates the ferry under a Public Law 93-638 contract. The average daily traffic for cars is 227. One round trip on the ferry takes approximately 30 minutes (i.e. 3 miles). The dock is on rails to allow for changes in the reservoir water elevation.

North Dakota Towns[3]

Several towns in North Dakota would benefit from a ferry operation on Lake Sakakawea. The benefits would include economic growth to the community, reduced travel time to accesses, increased tourism, and better response time for safety vehicles.

Halliday
- Population: 188 (2010 Census)
- Area: 0.47 square miles
- South of Lake

White Shield
- Population: 336 (2010 Census)
- Area: 3.8 square miles
- K-12 School
- New Construction
- TAT Community (642 OTE)
- North of Lake

Dunn Center
- Population: 146 (2010 Census)
- Area: 0.39 square miles
- South of Lake

Twin Buttes
- TAT Community (353 OTE)
- No 2010 Census Data
- School
- South of Lake

Dodge
- Population: 87 (2010 Census)
- Area: 0.47 square miles
- South of Lake

Golden Valley
- Population: 182 (2010 Census)
- Area: 0.73 square miles
- South of Lake

Zap
- Population: 237 (2010 Census)
- Area: 1.05 square miles
- South of Lake

Beulah
- Population: 3,121 (2010 Census)
- Area: 2.51 square miles
- South of Lake

Cole Harbor
- Population: 70 (2010 Census)
- Area: 0.19 square miles
- South of Lake
-

Garrison
- Population: 1,453 (2010 Census)
- Area: 1.38 square miles
- Airport
- RV Parks
- Elevator
- North of Lake

Makoti
- Population: 154 (2010 Census)
- Area: 0.20 square miles
- North of Lake

Parshall
- Elevator
- School
- TAT Community (704 OTE)
- North of Lake

New Town
- Population: 1,925 (2010 Census)
- Area: 1.28 square miles
- TAT Community (2,922 OTE)
- Fort Berthold Community College
- North of Lake

4 Bears
- Population: 517 (2010 Census)
- Area: 1.0 square miles
- TAT Community
- North of Lake

Mandaree
- Population: 596 (2010 Census)
- Area: 11.2 square miles
- K-12 School
- TAT Community (693 OTE)
- West of Lake

Killdeer
- Population: 751 (2010 Census)
- Area: 0.94 square miles
- K-12 School
- South of Lake

[3] Wikipedia

Hazen

- Population: 2,411 (2010 Census)
- Area: 1.27 square miles
- K-12 School
- South of Lake

Stanton

- Population: 366 (2010 Census)
- Area: 0.47 square miles
- South of Lake

Pick City

- Population: 123 (2010 Census)
- Area: 0.18 square miles
- South of Lake

River Dale

- Population: 205 (2010 Census)
- Area: 1.35 square miles
- Elementary School
- South of Lake

Underwood

- Population: 778 (2010 Census)
- Area: 0.91 square miles
- K-12 School
- South of Lake

Counties

McLean

- Population: 8,962 (2010 Census)
- Area: 2,328 square miles

Dunn

- Population: 3,536 (2010 Census)
- Area: 2082 square miles

Mercer

- Population: 8,424 (2010 Census)
- Area: 1,112 square miles

Mountrail

- Population: 9.517 (2010 Census)
- Area: 1,942 square miles

State Parks and Recreation Areas

Douglas Creek Bay Camp Ground and Recreation Area

- 17 Camp Sites
- Boat Dock
- Corps of Engineers Camp Ground

Fort Stevenson State Park - South of Garrison
Deepwater Recreation Area
Sakakawea State Park
Little Missouri State Park
Indian Hills Recreation Area
Riverdale Wolf Creek
East Totten Trail
Downstream Lake Sakakawea

Sportsmans Centennial Park
Hazen Bay Recreation Area
Beulah Bay Recreation Area
Dakota Waters Resort
Beaver Bay Campground
Indian Hills Resort
Charging Eagle
Skunk Creek Bay
Pouch Point
Brendles Bay

Roadways
The study corridor includes the following state and local highways:

South of Lake Sakakawea

- Four Bears to Mandree on Hwy 22 and Hwy 200, 27.8 miles of two and four land paved road
- Mandree to Killdeer on ND Hwy 22; 31.6 miles of two and four lane road
- Killdeer to Dunn Center on ND 200 Hwy; 6.9 miles of two lane paved road
- Dunn Center to Haliday on ND 200 Hwy; 15.1 miles of two lane paved road
- Haliday to Twin Buttes on ND 8 Hwy; 16.1 miles of two lane paved road
- Twin Buttes to South shore of Lake Sakakawea; 10.7 miles unpaved old ND 8 Hwy
- Twin Buttes to Pick City; 49.2 miles of two lane paved roadway
- Pick City to Riverdale; 5.2 miles of two lane paved roadway
- Riverdale to Cole Harbor on ND 200 Hwy; 9 miles of two lane paved road
- Cole Harbor to Garrison on Hwy 83; 14.7 miles of four lane paved road

Northside of Lake Sakakawea

- Four Bears to New Town on ND 23; 3.7 miles of two lane paved roadway
- New Town to ND 8 Hwy on 23 Hwy; 7.0 miles of two lane paved roadway
- ND 8 Hwy to ND 37 Hwy; 9.9 miles of two lane paved roadway
- ND 23 Hwy on ND 37 Hwy to Parshall; 1.7 miles of two lane paved roadway
- Parshall to Old ND 8 Hwy on ND 1804/23; 24.5 miles of two lane pave roadway
- Old ND 8 Hwy to Lake Sakakawea; 2.8 miles. (Potential dock location)
- Lake Sakakawea on Old ND 8 Hwy along ND 1804 to Garrison; 34.9 miles of two lane paved road

Study Corridor Growth
The placement of ferry ports with the associated infrastructure improvements would enhance the opportunities for new development adjacent to the ports. With a steady schedule of ferry service and routes the opportunity for development would be increased. The economic growth in the corridor would result from additional tourism, hunting, fishing, boating, sales at attractions, concessions, boat storage facilities, housing, employment and supporting industry.

Study Corridor Travel
It is important to consider the following questions when reviewing a proposed ferry operation to cross Lake Sakakawea:

- How many ports are needed to adequately service the residents in the area?
- Would ferry water taxis aide in transporting people in conjunction with bus transportation?

Project Need
The flooding of the Garrison Dam created Lake Sakakawea in the middle of the Fort Berthold Reservation. This caused the removal of the Highway 8 Bridge and isolated Twin Buttes and Mandaree on the south shore from New Town, Four Bears and White Shield on the north shore. Movement between the tribal offices in New Town and the south shore now requires a drive of over 110 miles.

The proposed ferry would meet the following needs:

- Provide transportation options for both residents and tribal members
- Provide transportation options for the general public and tourists
- Increase job accessibility for workings in the energy sector
- It would also provide a shorter seasonal route for emergency service providers
- Reduce regional traffic

- Increase traffic between state parks
- Additional jobs
- In the past five years, energy development increased traffic on all highways serving the Fort Berthold Reservation and northwestern North Dakota. A ferry system would benefit many travelers moving in or out of that general area and reduce traffic on the only two north/south highways serving the area Highway 85 and Highway 22.
- Using the car ferry would reduce the driving time around the lake by 110 miles and may provide a safer alternative
- There has been increased traffic on roads and highways in Northwestern North Dakota to service the energy sector. However, there has not been the addition of connecting north/south routes for transportation
- The marine highway provides a new 5.5 mile water transportation route at a fraction of the price of the price of a bridge with minimal maintenance and repair
- There are currently three state parks in the vicinity of the proposed terminal sites. The marine highway will positively influence those parks and tourism for the lake areas.
- Car Ferry system's often see the creation of amenities at the terminal sites. Ferry systems around the nation have concessions and recreation amenities on or nearby their docks. This would increase access to Lake Sakakawea and therefore increase tourism and recreation opportunities.

Challenges

- Lake Sakakawea and shore line is owned by the federal government and managed by the United State Army Corp of Engineers. Therefore, the Corp must be in agreement with the ferry operation. It is likely shoreline service operations would lease the land from the Corp.
- The Department of Transportation owns and operates the public road system accessing the terminal locations.
- Since it is likely that federal funds will be used in the purchase of the ships and the construction of the terminals, the Department of Transportation would need to be the sponsor for any grants.
- Since some of the terminals may be located on state park land, the Parks and Recreation my want to be involved in the operation of the terminals and docking facilities.

Chapter 2 – Market Potential

The operation of a ferry service in North Dakota is seasonal. Lake Sakakawea freezes for three to four months during the winter months. This would require closing the operation and dry docking the ships. However, the operating period corresponds with the construction season (spring to winter) which would increase job opportunities on both sides of the lake because of shorter travel time.

Tourism

Lake Sakakawea has sites of interest that can generate tourism. The Garrison Dam National Fish Hatchery is the largest walleye and northern pike producing facility in the world and is located at the base of Garrison Dam. Fish production at the hatchery can exceed 15 million fingerling and catchable fish per year. Additional out door tourism opportunities would exist for campers, hikers, bird watchers and scenic tours around the lake.

Earth Lodge Village (right) near New Town provides tourists with a sense of tribal culture and living accommodations during early settlement of the region by the Three Affiliated Tribes. The village is made up of six earth lodges. Visitors have an opportunity to stay overnight and go on horse trails the next day.

Numerous hides bear, deer, etc. are laid out in various areas. War bonnets and other items hang from posts. Many Indian artifacts on put on display for tourists viewing.

Metal sculptures on the buttes overlooking the Village were made by metal sculptor Tony Moran and add to tourism.

The map to the left shows the relationship the Earth Lodge Village to Four Bears Casino, which is another tourist attraction for the region.

Demographics

Based on the 2010 census there is a total population of 30,439 within the four counties (McClean, Dunn, Mercer, and Mountrail) with population density of 4.07 capita per square mile. The study corridor includes an estimated area of 2,100 square miles for an estimated corridor population of 8,000. The corridor is primarily agriculture with some industry located in the larger cities. Each community supports a local school as well as emergency services. There is a regional hospital in Hazen to the southeast of the corridor and a regional hospital located in 30 miles to the east of the corridor area.

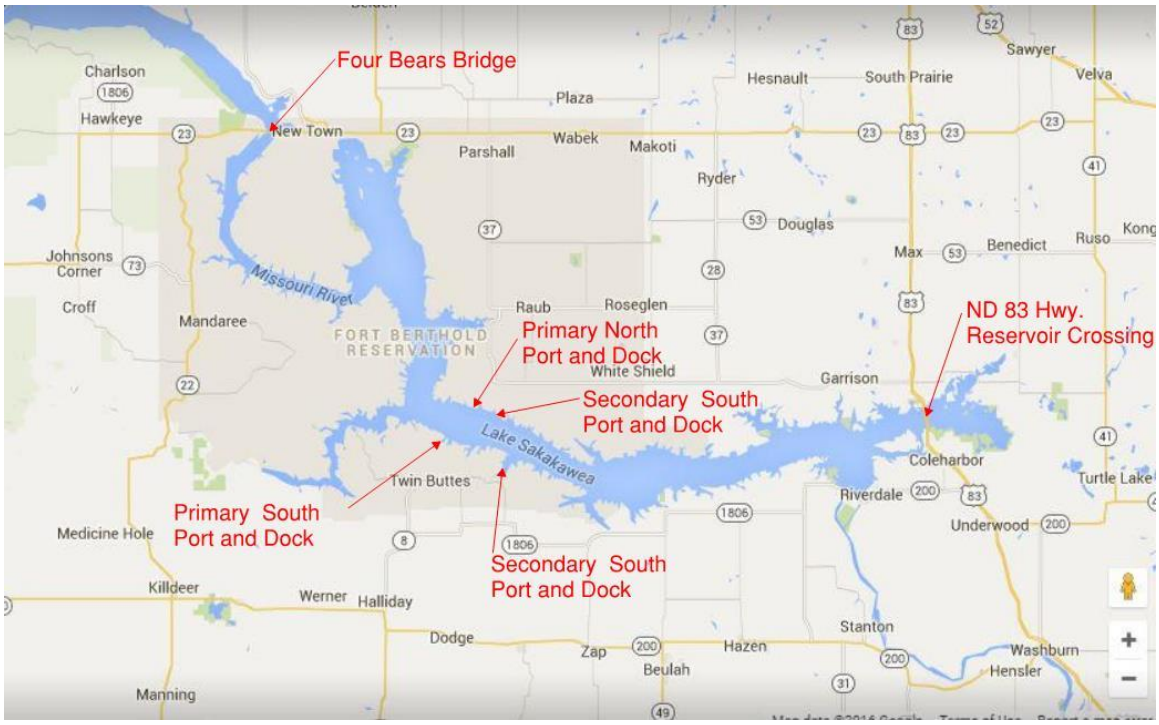
Energy Industry
Oil and Gas exploration has been a major contributor to the economy and has resulted in a large labor force for drilling wells, laying pipelines, building refineries and constructing processing plants. The industry has struggled with hiring enough workers in past years to fill all the positions. Improving transportation and shortening commuter routes would help in providing residents with job opportunities and get workers to jobsites.

Recreation Industry
Hunting, fishing and camping are important life amenities and North Dakota is famous for attracting people from all over the United States to participate in our recreation industry. Providing a better means of transportation to cross Lake Sakakawea will benefit all of the communities surrounding the study corridor and be a destination in itself.

Travel
The study corridor has two major east west routes: ND 200 south of Lake Sakakawea and ND 23 north of Lake Sakakawea. There are two major north south routes outside the study corridor with US 83 to the east and ND 22 to the west. Within the study corridor there are local roads to provide access to the local population. There is a regional casino located near New Town and three state parks as well as lake shore recreation along both the north and south shores.

Summary
A car ferry service would benefit local business, tourism, increased usage of state parks, fishing and hunting sports. There would be benefits to the energy industry and provide additional employment alternatives to residents. There is also a benefit to the improving the cost of maintenance and provide the residents with faster and more cost effective services

Chapter 3 – Preliminary Development of Ferry Service Alternatives



Potential Port and Docking Locations – Figure 23

The study includes consideration for the two primary port locations and two secondary port locations and a docking facility. The primary port locations are:

1. Primary South Port and Docking Facility: North of Twin Butte on old ND 8 Highway. This site is located approximately 4.2 miles northeast of Twin Buttes. See Appendix C Attachment 1, Figure 30a for aerial view of the location.
2. Primary North Port and Docking Facility: The eastern shore of Elbowoods Bay on old ND 8 Highway approximately 3 miles south southwest of the intersection of ND 1804 (ND 8) and ND 1804. See Appendix C Attachment 2, Figure 31 for aerial view of the location.
3. Secondary South Port and Docking Facility: The southern arm of Beaver Creek Bay. This is located 1.2 miles North of ND1806. See Appendix C, Attachment 3, Figure 32 for aerial view of the location.
4. Secondary North Port and Docking Facility: The eastern shore of Good Bear Bay. This is located approximately 4 miles south of ND 1804 Highway. See Appendix C, Attachment 4, Figure 33 aerial view of the location.

All car ferry ports and docking locations except for the water taxi ports and docking facility are located on MHA reservation lands.

Potential Roadway Improvements required on Routes to ports and docking facilities

- Primary South Port and docking facility a distance of 0.9 miles of old ND 8 Highway
- Primary North Port and docking facility a distance of 2.8 miles of old ND 8 Highway
- Secondary South Port and docking facility a distance of 1.2 miles of existing dirt roadway
- Secondary North Port and docking facility a distance of 4.0 miles of existing gravel roadway

Communities that benefit from Terminal Locations

- Primary South Port and dock facility to Primary North Port: This route would attract regional traffic and citizens of Twin Buttes, Werner, Halliday, Dodge, Zap, Beulah and Hazen for access to the north side of the lake.
- Secondary South Port and dock facility to Primary North Port: This route would attract regional traffic and citizens of Twin Buttes, Werner, Halliday, Dodge, Zap, Beulah and Hazen for access to the north side of the lake.
- Primary North Port and docking facility to the primary south port facility. This route would attract regional traffic and citizens of Parshall, Wabek, Makoti, Rider, Douglas, Raub, Roseglen and White Shield for access to the south side of the lake.
- Secondary North Port and docking facility to the secondary south port facility. This route would attract regional traffic and citizens of Parshall, Wabek, Makoti, Rider, Douglas, Raub, Roseglen and White Shield for access to the south side of the lake.

Travel Time

- Primary South Port to Primary North Port: Using a loading and unloading time of 15 minutes each and a crossing time of 30 minutes the minimum travel time would be 46 minutes with the maximum travel time would be two hours 45 minutes. The schedule would have a departure every two hours for a single ferry.
- Secondary South Port to Secondary North Port: Using a loading and unloading time of 15 minutes each and a crossing time of 30 minutes the minimum travel time would be 46 minutes with the maximum travel time would be two hours 45 minutes. The schedule would have a departure every two hours for a single ferry.
- Primary Docking Facility to the Primary or Secondary South Port Docking Facility: Travel time would be dependent on weather conditions as well as the services offered by the ship.
- Primary Docking facility to Garrison Bay Docking Facility: Travel time would be dependent on weather conditions as well as the services offered by the ship.

Capital Costs

- Capital costs can be separated into three groups:
    1. Off shore facilities which includes docks, navigation aides, moorings and dolphins
    2. Ship which includes the car ferry, passenger housing, rest rooms and appurtenances.
    3. Land side amenities which includes access ramp, traffic staging area, parking lots, toll booth, management offices, comfort facilities, fueling stations, maintenance building, area lighting, fences, dry dock, security systems and observation deck
- Dry dock storage and maintenance facilities are needed at the main terminal.
- Optional Docking Facility could be added to the off shore facilities if the terminal is to receive other types of boats such as water taxis or recreational boats.

The capital costs budget for this project is projected to be $16,433,000.
Chapter 7 details off shore and land side development costs for each terminal.

Transportation Demand Potential on the State Highway System
A ferry service would not generate a significant increase in volume of traffic in the area and therefore would not warrant additional traffic infrastructure on the ND State Highway system. Typical two lane state highways will provide adequate capacity for the expected car ferry traffic.

Environmental Considerations
Stormwater Runoff: With the expected paving and site improvements it would be expected that the ports and docking facility would generate additional stormwater runoff that would require isolation from the lake. This could be accomplished with proper grading and detention ponds.

Each ferry will require a home port that provides fueling, sanitary dump, maintenance and dry dock. This will require specific grading and construction to prevent spillage and contamination of the lake. All facilities will require specific grading to contain fuel spills and contaminated runoff from parking areas.

Docking Facilities: The primary docking facility will need to have fueling, sanitary dump and maintenance facilities which will require specific grading considerations.

Chapter 4 - Project Development

Engineering Services
Project engineering services would include the following: Environmental Reviews Site planning, site and facility design for both water and land, building design, dry dock design, ship design, review process overview, bidding and construction management.

Review Process
The review process will require approvals from Three Affiliated Tribe Leadership, Army Corps of Engineers, Environmental Protection Agency, Dunn County, Mercer County, Mclean County, NDDOT, North Dakota Fish and Game, North Dakota Department of Health, North Dakota Department of Parks and Recreation and several others still to be determined.

Permitting
Formal building permits may be required the following:

- Dunn, Mclean and Mercer Counties: Building permits, local road construction
- Army Corps of Engineers: 404 Permit, Lake Master Plan Approval, Environmental Assessment, Property Lease, operational plan.
- Environmental Protection Agency: Environmental Impact Statement, Spill Containment plan.
- North Dakota Department of Health: Site plan approvals.
- State Historical Society: Assessment of exiting conditions for impacts to Historical, Archeological and or Biological Impact review of sites.
- Tribal Permits would be required.
- Coast Guard: Certification of boat and operations.
- North Dakota Department of Transportation: Road design within state rights of way, Traffic impact study.

ADA Compliance Standards
Wherever pedestrian facilities are intended to be a part of a transportation facility, 28 CFR Part 35 requires that those pedestrian facilities meet ADA guidelines. Federal regulations require that all new construction, reconstruction, or alteration of existing transportation facilities be designed and constructed to be accessible and useable by those with disabilities and that existing facilities be retrofitted to be accessible. Design pedestrian facilities to accommodate all types of pedestrians, including children, adults, the elderly, and persons with mobility, sensory, or cognitive disabilities.

Physical Barriers to Access from Land to Vessel
Access from shore to vessel involves transit along three path-of-travel elements: stable approach, passenger loading platform, and vessel deck. The access barriers result from the intervening differences in height among those elements, whose descriptions follow:

- Stable approach: The start point of the path of travel, land and/or a fixed pier.
- Passenger loading platform**:** The intermediate component along the path of travel, i.e. a floating dock. This is the most common configuration, but access is sometimes provided directly from the stable approach to the vessel deck.
- Vessel deck**:** The end of the shore facility portion of the path of travel.

Marine Design Requirements for Access Solutions
The following are the unique design constraints imposed by the marine environment for providing access from shore facilities to vessels:

- **Dynamic nature of the marine environment*:*** Shore facilities are exposed to a dynamic marine environment, with the impact of waves, wind, tides, current, and weather. The functional design of access features must account for the resulting loads and motions.
- **Changes in water surface height differences:** Access solutions in the marine environment differ from those on land in that height differences change, over both short and long time frames. Changing height differences drive a unique set of solutions for accessibility.
- **Lift and stability requirements of floating structures*:*** Excluding fixed piers, access structures are floating components subject to the same static and dynamic effects as vessels. The design of access solutions for docks must take into account lift (weight), heel and trim due to shifting of weight, and the dynamic effects of wind and waves.
- **Exposure to harsh weather conditions*:*** While any outdoor system for accessibility must be designed and built to withstand the impacts of weather, marine facilities are especially impacted by their environment, i.e. the effects of water, salt and air on durability and reliability.

Project Management
Project management would include responsibility for establishing project time line, liaison between all stakeholders, consultants and agencies. Applying for and tracking funding applications. Conducting public information meetings and briefing public and Tribal officials.

Projected Costs
Estimated site developments costs are $2.7 million dollars per terminal. This would include Army Corps of Engineering permit fees of $10,000.00.

Design Standards
The project would be designed to the following standards:

- Water Level to vary from 1798 msl. to 1850 msl. = 52 feet
- 10 to 20 Car Ferry
- Dock and unload ferry without onshore electrical power = roll on – roll off

Chapter 5 - Design Year Travel Demand Forecasts

There is difficulty in forecasting - use rates of a ferry operation in central North Dakota when there has not been a new ferry operation located within the four state area. Instead of taking an optimistic attitude from the movie Field of Dreams -"If you build it they will come," we've taken a conservative approach by project needs and demands.

Workers need for a ferry service to get to work. The time of travel to get to a project site on the opposite side of the lake can be 90 minutes each way. The ferry would cut the travel time in half. Instead of leaving for work at 5:30 A.M. they could leave at 6:15 A.M. This is an increase in quality of life and makes it more desirable to work on the opposite side of the lake. This would expand the work force area in the following sectors:

- Oil well operations: 40 to 50 vehicles per day each way
- Pipeline construction: 10 to 15 vehicles per day each way
- Gas Processing Plants: 10 to 15 vehicles per day each way
- Hospital Services: 5 to 10 vehicles per day each way
- Construction Workers: 5 to 15 vehicles per day each way
- Coal Energy operations: 3 to 5 vehicles per day each way
- Maintenance workers: 2 to 5 vehicles per day each way
- Delivery services: 3 to 5 vehicles per day each way
- Hunters and Fisherman: 10 to 15 vehicles per day each way
- Total Vehicles per day: 93 to 135

Anticipated passengers if Water Taxi Service is incorporated with a bus service:

- Commuters in conjunction with bus service: 40 to 60 per day
- Tourists to cross the lake as a park and ride: 10 to 20 per day
- Commuters to the New Town: 100 to 120 per day
- Total Commuters per day: 159 to 200 per day

Study Area testing

Some investigation has been completed as an initial investigation to see if there is a general interest by residents to use a ferry operation. There was a strong response indicating that residents would use the ferry on a regular basis depending on the additional connecting services available i.e. ground transportation.

Additional study may be needed to verify the assumptions made in Chapter 5.

Operation Year: 2025

It would take several years to develop a car ferry operation on Lake Sakakawea because of the several hurtles that must be overcome. This report would be the start of a nine-year plan to implement a ferry system:

- Year 1 and 2 – Review the feasibility study with stakeholders – grant applications for environmental impact study and implementation with stakeholders
- Year 3 – Scope agreements with the stakeholders
- Year 4 – Grant application for design
- Year 5 – Grant application for construction
- Year 5 and 6 – Design and permitting phase for the ship and terminals
- Year 7 thru 9 – Construction of the ship and terminals

Ferry Service
A determination should be made by the stakeholders as to the type and capacity of the ferry services, i.e. should the services be limited to cars, cars and passengers, passengers. Also, a determination should be made by the stakeholders as to the limitation of size of vehicles being transported.

There has been some discussion regarding the purchase of a new or used ship that has been retrofitted to meet all of the latest safety standards required by the United State Coast Guard.

Travel Forecasting Methodology
This report used a fundamental methodology of forecasting the use of the ferry operation. The report is preliminary in nature. A more detailed methodology could be used after receiving feedback from the stakeholders.

Patronage Forecasts for "Reasonable" Scenarios
The energy industry has a significant impact on the forecasts for patronage. The state has been impacted from the reduction of oil prices. However, a reasonable approach to proceeding forward with a ferry service should be somewhat independent of the impact of oil pricing. Therefore, lower patronage numbers were used in the analysis.

Impacts on Highway Travel: There are no anticipated impacts to the existing state or federal highway system.

Summary and Conclusions
The need for the car ferry operation needs to be viewed as a long term solution for commuters needing to cross Lake Sakakawea. The economic impact of the price of oil or the future for the coal industry will have some impact on the number of commuters utilizing the ferry. However, Lake Sakakawea has resulted in a hardship to residents by limiting their mode of transportation to jobs. Even anticipating the lower levels of commuters, the ferry service would have a positive impact to the economic wellbeing of the North Dakota residents in the area.

Chapter 6 - Environmental Impact

Garrison Dam, ND is located 75 miles northwest of Bismarck on the Missouri River. Lake Sakakawea is 178 miles long with 1,340 miles of shoreline and extends from Riverdale to Trenton. This is greater than California's coast line of 840 miles. There are 35 recreation areas around Lake Sakakawea offering outdoor recreation opportunities such as camping, bird watching, hiking, boating, fishing, sailing and hunting. The lake is an important resting stop for whooping cranes and a nesting area for the least tern and piping plover.

This chapter provides an overview of potential environmental impacts and environmental regulatory obligations as they relate to ferry terminal design. This chapter does not provide National Environmental Policy Act (NEPA) or State Environmental Policy Act (SEPA) level analysis, but rather provides a qualitative assessment of the major environmental elements that could pose issues for future ferry terminal development.

The Environmental Review Summary (ERS) provides the first indication of what form the project environmental documentation will take. The ERS is generally developed as part of the Project Summary, which is prepared during the scoping phase of all projects in the construction program. However, the environmental section should be developed prior to the design process to make sure that any rules, regulations, or laws are followed during the x initial scoping and design process.

Based on the environmental considerations identified during preparation of an ERS, NDDOT projects are classified for NEPA/SEPA purposes to determine the type of environmental documentation required. Projects with a federal nexus (using federal funds, involving federal lands, or requiring federal approvals or permits) are subject to NEPA and SEPA.

Projects subject to NEPA are classified as Class I, II, or III as follows:

- Class I projects require preparation of an EIS because the action is likely to have significant adverse environmental impacts.
- Class II projects are Categorical Exclusions (CE) or Documented Categorical Exclusions that meet the definitions contained in 40 CFR 1508.4 and 23 CFR 771.117. These are actions that are not likely to cause significant adverse environmental impacts. Per 40 CFR 1508.4 these projects do not require an environmental assessment or an environmental impact statement. 23 CFR 771.117 defines which actions meet criteria for CEs and the level of NEPA approval required by the Administration.
- Class III projects require an Environmental Assessment (EA) because the significance of the impact on the environment is not clearly established.

SEPA has a similar, but not identical, system. SEPA recognizes projects that are categorically exempt, projects that require an EIS, and projects that do not require an EIS. North Dakota state funded projects that are CEs under NEPA (Class II) might not be categorically exempt under SEPA.

Park and Recreation Lands

Regulations

Park and recreation resources are valued and vital to the health and livability of communities. Section 4(f) of USDOT Act of 1966 requires that transportation projects avoid, minimize or mitigate impacts to public parks and recreation areas as well as historic sites. Compliance with Section 4(f) is ensured in the SEPA/NEPA process of projects.

Potential Effects

Some of the ferry terminals are located in or adjacent to parks and recreation lands, and therefore improvement projects at the terminals could have the potential to impact these areas. Actual impacts to and mitigation for parks recreational lands will be evaluated at the individual project level.

Cultural, Historical, and Archaeological Resources

Regulations
Cultural, historical and archaeological resources are regulated under federal, state and local laws. Section 106 of the National Historic Preservation Act requires any project that has a federal nexus (involves federal funding, federal permits or is on federal lands) to consider the effects of the project on historic or cultural resources.

Visual Quality
Visual perception and experience are important components of environmental quality. It is important to consider the visual resources of the affected environment and the degree of change in those visual resources that would occur as a result of the proposed project.

Traffic / Congestion
Normal operation of auto ferries has an effect on congestion and circulation on local streets, and access to residents and businesses as a result of queuing on road shoulders, vehicle off-loading, parking, pedestrians and traffic safety measures in the communities where the terminals are located.

Hazardous Materials

Regulations
Procedures for reporting, handling, removing, treatment, and/or disposal and transport of contaminated soil, ground water, and marine sediment will follow guidance in NDDOT's *Environmental Documentation Manual, USDOT, US Coast Guard* and all other appropriate regulations. Workers are required to have special training to handle hazardous materials.

The following table is a list of Federal permits and approvals that may be required for the proposed project:

Permits/Approvals with Timelines	Responsible Agency
National Environmental Policy Act (NEPA)	Federal Highway Administration/Federal Transit Administration, WSDOT
Endangered Species Act (ESA): 3 to 9 months	NOAA Fisheries, U.S. Fish and Wildlife Service
National Historic Preservation Act – Section 106	Department of Archaeology and Historic Preservation/State Historic Preservation Officer
Clean Water Act – Section 404: 6 to 12 months	U.S. Army Corps of Engineers
Rivers and Harbors Act - Section 10: 6 to 12 months	Rivers and Harbors Act - Section 10: 6 to 12 months
Section 4(f) of USDOT Act – See NEPA	United States Department of Transportation
Marine Mammal Protection Act (MMPA): 6 to 12 months	NOAA

Topics of Environmental Considerations should include the following:

Land Use

- Existing Land Use
- Changes in Land Use

Air Quality

- Regulation
- Effects on Air Quality
    - Potential Emissions Reductions from Passenger Vehicles
    - Potential Emissions Reductions from the Ferry System

Noise

- Noise Regulation
- Noise Effects

Water Quality

- Water Quality Issues
- Water Quality Regulation
- Water Quality Impacts
- Prop-wash, Vessel Wakes, and Sedimentation

Ecosystems and Protected Species

- Ferry System Ecosystem and Habitat
- Protected Species
    - Endangered Species Act
    - Marine Mammal Protection Act
    - Migratory Bird Treaty Act
- In-Water Work Windows

Earth (Geology and Soils)

- Geologic Hazards
- Geologic Risks and Mitigation

Hazardous Materials

- Regulations
- Potential Effects
- Mitigation

Traffic/Congestion

- Potential Effects

Visual Quality

Tribal Resources and Treaty Rights

- Tribal Treaty Rights and Access to Harvest

Cultural, Historical, and Archaeological Resources

- Regulations
- Potential Effects

Department of Natural Resources Lands

- Operation Effects on Aquatic Land Management

Resource Agency and Tribal Coordination

- Development Process

Chapter 7 – Landside Infrastructure Analysis

Property Acquisition

- Primary South Port and Docking Facility: ND 8 from Twin Buttes north to Lake Sakakawea will need to be reclaimed by the state from the Corps of Engineers with a right of way agreement. In addition an additional 0.9 miles of new right-of-way will be needed to access the proposed port location.
- Primary North Port and Docking Facility: ND 8 from Lake Sakakawea north to ND 1804 will need to be reclaimed by the state from the Corps of Engineers with a lease agreement. In addition an additional 2.8 miles of new right-of-way will be needed to access the proposed port location.
- Secondary South Port and Docking Facility: 1.2 miles of new right-of-way will be needed to access the proposed port location.
- Secondary North Port and Docking Facility: 4.0 miles of new right-of-way will be needed to access the proposed port location.

Approach Highway

- Primary South Port and Docking Facility:
    - Access to the lake would be provided on ND 8 at Twin Buttes. Traffic would travel north on ND 8 a distance of 3.5 miles to a point where ND 8 ends, the old ND 8 has been abandoned. Therefore, the roadway would need to be improve to the lake for a distance of 0.9 miles.
    - The existing ND 8 highway for the 3.5 miles is in good shape and can handle the traffic anticipated for the Car Ferry operation.
    - Reportedly, the Army Corps of Engineers owns the right-of-way for the abandoned section of Hwy 8. Before improvements could be made to the abandoned section of highway an agreement would need to be reached as to the ownership of the facility access road.

- Primary North Port and Docking Facility:
    - Elbowood Bay is 2.8 miles south of ND 1804 Highway. Access to the lake would be provide on old ND 8 Highway. This 2.8 miles of roadway would need to be improved to handle the traffic to the lake.
    - Reportedly, the right of way for this section of ND 8 Highway was reverted to the adjacent land owners. This would need to be verified by title search and discussions with NDDOT.
    - A right of way agreement would need to be reached with the right of way owner.
    - Improvements could be made to the abandoned section of highway after an agreement is reached.

- Secondary South Port and Docking Facility at Beaver Creek Bay:
    - The existing access to the lake is a dirt road. The port and docking facility would be located approximately 1.2 miles north of ND 1806 Highway. The access road would need to be graded and paved to meet highway department standards.
    - A right of way agreement would need to be reached with the right of way owner.

- Secondary North Port and Docking Facility: The eastern shore of Good Bear Bay
    - The existing access to the lake is a gravel road. The distance from ND 1804 Highway to the lake is approximately 4 miles. The access road would need to be graded and paved to meet highway department standards. No new highway would be required.
    - A right of way agreement would need to be reached with the right of way owner.

Site Evaluation Review:

The evaluation of each site was based on the following criteria:

- Offsite Costs: This would include the cost of offsite infrastructure improvements such as roadway improvements and property purchases.
- Onsite Infrastructure: The cost of initial site improvements to provide a standard site for development including mass grading, sanitary treatment infrastructure, electrical power and water supply.
- Existing Conditions: Conflicts with existing public or private activities.
- Tribal Land: Location related to Tribal Lands
- Water Depth: This would include the work needed to provide an adequate water depth for either ferry or docking operations.
- Public Access: The level of effort needed by the public to travel to the site.

Primary South Port

- Offsite Costs
- Onsite Infrastructure
- Existing Conditions
- Tribal Land: Site is located on tribal land
- Water Depth
- Public Access

Primary North

- Offsite Costs
- Onsite Infrastructure
- Existing Conditions
- Tribal Land: Site is located on tribal land
- Water Depth
- Public Access

Secondary South

- Offsite Costs
- Onsite Infrastructure
- Existing Conditions
- Tribal Land: Site is located on tribal land
- Water Depth
- Public Access

Secondary North: The eastern shore of Good Bear Bay

- Offsite Costs
- Onsite Infrastructure
- Existing Conditions
- Tribal Land: Site is located on tribal land
- Water Depth
- Public Access

Access to Public Transportation
The typical use of a car ferry precludes the need for access to public transportation. Public transportation would be a significant asset to a water taxi service. Bus, shuttle or taxi service that is coordinated with the car ferry and water taxi service schedule would encourage use of the facility. A public transit facility is being study under a separate document and not part of this study and report.

Environmental Impacts
The ports, docking facilities and ferry will need to have daily ferry services and maintenance. The environmental portion would include fueling, equipment maintenance, bathroom and solid waste management. Fueling services will require storage tanks with containment berms, pipe in pipe supply lines and spill containment and leak detection equipment. Sanitary liquid and solid waste management would require disposal facilities.

The port facilities will need to maintain controls to prevent pollution of stormwater runoff. It is anticipated that detention ponds will not be required.

Site Specific Environmental Impacts
- Primary south port and docking facility
- Primary north port and docking facility
- Secondary south port and docking facility
- Secondary north port and docking facility

Site Improvements
All facilities will require the same basic improvements including:
- Site Grading: Each site will require basic site grading to allow the construction of parking, support buildings and docks. For each ferry a dry dock will also be needed.
- Potable Water system: A potable water supply will be required for each site. This would be provided either by access to the rural water system, private well or trucked in water.
- Sanitary sewer disposal system: Each site will require a comfort station with bathrooms. Disposal could be on site drain fields, holding tanks or package treatment plants. A lagoon system would not be recommended due to space considerations.
- Electrical Power: Each site will require electrical power for lighting, building services and ferry support.
- Communication: Each site will require phone communications as well as ship to shore radios.
- Security: Each site would have security fencing, video cameras and emergency phone service.
- Each site will have a port authority building with comfort facilities that are ADA compliant. ADA access must be provided during the boarding process as well as for emergency evacuation of the ferry.

Site specific improvements will include:
- Primary South Port and Docking Facility: Security Fence with video cameras that are monitored by an offsite agency
- Primary North Port and Docking Facility: Security Fence with video cameras that are monitored by an offsite agency
- Secondary South Port and Docking Facility: Security Fence with video cameras that are monitored by an offsite agency
- Secondary North Port and Docking Facility: Security Fence with video cameras that are monitored by an offsite agency
- Primary docking facility
- Secondary docking facility
- Optional docking facility

Storage Yard

- Primary South Port
- Primary North
- Secondary South
- Secondary North: The eastern shore of Good Bear Bay

Summary and Conclusions

The scope of the review included analysis of 4 potential terminal sites for the ferry operation. The review of potential sites included driving around the lake and making field observations as to where terminal sites could be located. There are seven feasible sites that could accommodate a car ferry terminal including:

- Primary South Port
- Primary North
- Secondary South
- Secondary North: The eastern shore of Good Bear Bay

The estimated construction costs for each site is similar with two exceptions:

1. The approach road improvements vary in length.
2. The primary south port would include dry dock facilities and fueling facilities.

South Main Terminal Site Costs

Ferry Terminal Road (1000 ft. X 30 ft.) – 8" Asphalt	$400,000.00
Holding Lanes (4lanes @ 200 ft. X 15 ft.) – 8" Asphalt	$140,000.00
Parking Lot A (20 Stalls) – 8" Asphalt	$130,000.00
Bus Parking Lot B (3 Stalls) – 8" Asphalt	$90,000.00
Toll Plaza (1 toll both) – Prefabricated	$60,000.00
Emergency Generator – (1 – 15KVA)	$60,000.00
Pedestrian Paths – (15ft X1500 ft.) – 4" Asphalt	$125,000.00
Bus Passenger off area LS	$40,000.00
Bathroom Facilities	$40,000.00
Picnic Area (waiting zone)	$60,000.00
Ramp to Docking Facility (adjustable with water level)	$400,000.00
Floating docking facility	$200,000.00
Main Slip	$100,000.00
Auxiliary Slip	$100,000.00
Supervisors Office	$50,000.00
Signage	$24,000.00
Security System	$18,000.00
Floating Outer Dolphin with navigational aide	$90,000.00
Floating Intermediate Dolphin	$40,000.00
Floating Interior Dolphin	$30,000.00
Slip and Fenders on Dock	$50,000.00
Outside Lighting	$100,000.00
Fueling System	$100,000.00
Dry Docking Facility	$250,000.00
Total Cost	**2,687,000.00**

Secondary Terminal Site Costs

Ferry Terminal Road (1000 ft. X 30 ft.) – 8" Asphalt	$400,000.00
Holding Lanes (4lanes @ 200 ft. X 15 ft.) – 8" Asphalt	$140,000.00
Parking Lot A (20 Stalls) – 8" Asphalt	$130,000.00
Bus Parking Lot B (3 Stalls) – 8" Asphalt	$90,000.00
Toll Plaza (1 toll both) – Prefabricated	$60,000.00
Emergency Generator – (1 – 15KVA)	$60,000.00
Pedestrian Paths – (15ft X800 ft.) – 4" Asphalt	$75,000.00
Bus Passenger off area LS	$40,000.00
Bathroom Facilities	$40,000.00
Picnic Area (waiting zone)	$60,000.00
Ramp to Docking Facility (adjustable with water level)	$400,000.00
Floating docking facility	$200,000.00
Main Slip	$100,000.00
Auxiliary Docks	$50,000.00
Support Office	$50,000.00
Signage	$24,000.00
Security System	$18,000.00
Floating Outer Dolphin with navigational aide	$90,000.00
Floating Intermediate Dolphin	$40,000.00
Floating Interior Dolphin	$30,000.00
Slip and Fenders on Dock	$50,000.00
Outside Lighting	$100,000.00
Total Cost	**2,247,000.00**

Lopez Fixed Dolphin Figure 24

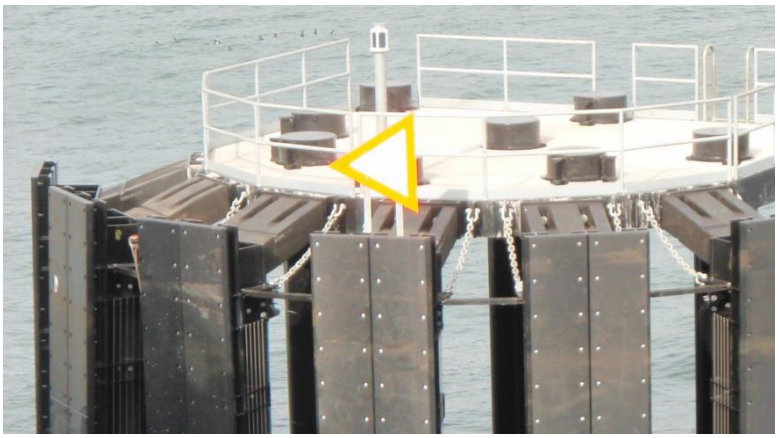


Figure 25 Fixed Dolphin with Navigational Aides

Fixed dolphins serve a number of functions: as protection of adjacent properties (e.g., marinas and breakwaters) or other WSF structures (e.g., wingwalls and overhead loading facilities), as approach and berthing aids, as means to remain stationary during loading and unloading operations, and as mooring points for overnight tie-up.

Wing Wall Ground Anchors Figure 26

Wing walls serve as the primary structure used to stop and hold the vessel in place for loading, unloading and overnight tie-up. Wing walls serve both operating slips and tie-up slips.

Movable Rail Dock

The above docking system is on rails to allow for a change in elevation of the reservoir. The rails are mounted to a concrete ramp that starts above the high water level and continues to the low water level on a slope of 6.8% to accommodate ADA requirements for passengers.

Operating Costs

Labor
The size of the crew required is dependent on the number of passengers carried and the vessel's configuration. Prior to issuing a Certificate of Inspection, which is required to carry passengers, the local Coast Guard Marine Safety Office must approve the vessel's manning plan. It is strongly recommended that they be consulted early in the process to ensure the proposed plan will be acceptable. The following discussion is based on current operations and is provided as general guidance only.

For vessels with fewer than 50 passengers operating within protected waters, only one operator is generally required with the following stipulations:

- The route is relatively short and protected
- there are two stops
- each with a unique docking facilities
- the system is accessible for people with disabilities

For budgetary purposes, the rate for the operator of this size vessel should be about $26to $32 per hour, exclusive of benefits.

For larger vessels, a master plus at least one mate/deckhand per deck is the usual complement. The licensing requirements for the master on larger vessels are more stringent and a rate of $30 to $42 per Hour should be used for budgeting. Deckhands do not need formal training and should be budgeted at $10–$12 per Hour. If a crew of three is required, the operating budget could include $16 per Hour for a mate/mechanic.

Fuel & Oil
The cost of fuel becomes a more significant factor in the overall operating cost as vessel size and speed increase. For most vessels, doubling the speed will result in quadrupling the fuel consumed, if such speeds are even possible. For pure displacement Hulls, such as the electric and diesel– electric Hybrids discussed above, there is a speed, known as the “Hull speed”, which cannot be exceeded by an appreciable amount regardless of the power applied. As long as the vessel is operated somewhat below Hull speed, the rate of fuel consumption will be relatively low. Marine diesel is budgeted at $3.95 per gallon.

Maintenance

Machinery
For the purposes of this feasibility analysis, the machinery maintenance costs are estimated as a function of the amount of fuel consumed. This cost includes both regular maintenance, such as changing the oil and filters, and annual maintenance, which requires taking the vessel out of SERVICE. While the vessel is out of SERVICE, the annual inspection required by the Coast Guard is also conducted. For a 30 passenger, eight knot vessel, the annual maintenance cost is estimated at $15,000 per year.

Hull & Outfit
Hull and outfit maintenance costs are based on the number of passengers carried and includes daily and weekly maintenance as well as any work done during the annual haul–out, such as cleaning and painting the underside of the Hull. For a 30 passenger vessel operating 3,240 Hours per year, the annual Hull and outfit maintenance budget will be approximately $4,200.

Terminals
To ensure high quality SERVICE, all of the terminals within the system will require periodic cleaning and maintenance. Regular cleaning of the terminals will likely be done by the same personnel who clean the other transit stops within the system and will have a negligible impact on that budget. Annual maintenance of the terminal piers, gangways, and floats will primarily consist of painting and minor maintenance, with an annual budget of $7,350 per terminal per year.

Moorage
The annual operating budget should include the cost of overnight moorage for the vessels. For this study, a budget of $370 per month was assumed for each vessel.

Insurance
The three types of insurance required for vessel operations are hull machinery insurance, liability insurance, and pollution insurance. Hull and machinery insurance is based on the replacement cost of the vessel and generally costs $4.16 per $1,000 of value. For a 20 passenger, diesel mono hull with a replacement cost of $2,280,000; the hull and machinery insurance will cost about $9,500 per year.

Liability insurance is a function of the number of passengers carried annually and is a fixed amount for the initial $l million in coverage, a somewhat smaller amount for each additional $l million in coverage up to $5 million in total coverage, and yet another amount for each $1 million above $5 million. This liability insurance does not cover passengers before they enter the boarding facility or after they depart. For a system carrying approximately 5,000 passengers per year, $2 million in total coverage will cost about $20,000 per year.

Pollution insurance is required to cover the cost of any accidental fuel, oil, or other hazardous material spills. It is not required for electric boats. The amount of pollution insurance required is a function of the size of the vessel and the amount of fuel carried.

Management & Administration
The operation of a waterborne transit system will require some support from personnel on shore. This shore–based staff will be responsible for managing the crews, scheduling maintenance, and ordering supplies. In addition, customer SERVICE and/or marketing support may be required, depending on the relationship between the waterborne SERVICE and the rest of the transit system administration.

For a system comprised of two or fewer vessels, the maintenance planning can be performed by the Chief Master, in which case only a general manager will be required. For a fleet of three vessels or more, a general manager, port captain, and an administrative assistant would be recommended. The annual budget for a General Manager should be $65,000; for Port Captain, $50,000; and for an administrative assistant, $25,000. Benefits will add an additional 25 to 30 percent to these rates.

Overhead
Overhead costs include dock access fees, overnight vessel moorage, rents, utilities, license fees, etc. In addition to the administrative offices, a small workshop for vessel maintenance and parts storage will be required. The total overhead costs can be estimated at 11.75 percent of all other operating costs.

Sample Route Cost Estimates

For Each region of the study area, a sample circular route was developed and the capital and operating costs estimated. The results are shown in the tables below and indicates similarities in operational cost by location.

	Evaluate Route Costs			Overhead
	Option West	Primary Central	Option East	Costs Labor
Operating Days/Week	7	7	7	
SERVICE Hours/Day	12	12	12	
# Vessels on Route	1	1	1	
Size (cars/passengers)	14/20	14/20	14/20	
Minimum Headway	0:58	0:38	0:44	
Annual Operating Hours	3,240	3,240	3,240	
Round Trips/Day/Vessel	9	9	9	
Daily Round Trip Capacity	84/90	84/90	84/90	
Fuel				
Gallons/Hour	12.0	12.0	12.0	
Gallons/Year	38,880	38,880	38,880	
$/Year	$ 155,000	$ 155,000	$ 155,000	
Lube Oil				
Gallons/Year	4,473	4,473	4,473	
$/Year	$ 16,412	$ 16,412	$ 16,412	
Operator				
$/Hour	$ 30.00	$ 30.00	$ 30.00	
$/Year	$ 126,360	$ 126,360	$ 126,360	
Maintenance				
Machinery	$ 15,000	$ 15,000	$ 15,000	
Hull & Outfit	$ 8,000	$ 8,000	$ 8,000	
Terminals	$ 7,350	$ 7,350	$ 7,350	
Insurance				
Hull & Machinery	$ 9,500	$ 9,500	$ 9,500	
Liability & Pollution				$ 20,000
Homeport Moorage	$ 3,350	$ 3,350	$ 4,200	
Office Utilities	$ 1,350	$ 1,350	$ 1,350	$ 8,400
Maintenance Shop Utilities	$ 2,150	$ 2,150	$ 2,100	$ 9,800
Management & Admin				
General Manager				$ 65,000
Port Captain				$ 0
Admin Assistant				$ 37,000
Total Salaries				$ 102,000
Benefits				$ 30,000
Total Shore Personnel				$ 132,000
Direct Costs	**$ 327,945**	**$ 327,945**	**$ 327,945**	
Overhead	**$ 98,055**	**$ 98,055**	**$ 98,055**	
Total Annual Costs	**$ 426,000**	**$ 426,000**	**$ 426,000**	**$ 426,000**
Vessel Maintenance	**$ 154,000**	**$ 154,000**	**$ 154,000**	**$ 154,000**
Total Annual Operating Cost				**$ 712,000**

Table 6 – Example for Estimate of Operating Costs

Chapter 8 - Vessel Analysis

This chapter presents an analysis of operating a medium-speed passenger/car ferry boat service on the waterways associated with the routes under consideration. Issues include vessel performance characteristics, vessel manufacturers, navigational restrictions, jurisdictional requirements, environmental impacts, and physical features. Cost estimates for vessels and other waterside infrastructure improvements are provided in Chapter 6 and Chapter 7.

Medium Speed ferries come in a number of different basic configurations including mono-hull, multi-hull (catamaran style), hydrofoil, and hovercraft. Vessels tend to be constructed of aluminum alloy. The most likely technology for Lake Sakakawea service is some form of a mono-or multi hulled vessel. These proven designs have good operating precedents in inland waterways in the United States. Furthermore, in accordance with the Jones Act (which requires passenger ferries used in the United States to be constructed in the United States), a range of U.S. boat builders could supply such vessels.

Innovations which attempt to combine the best hull features of the basic configurations to achieve greater economies are currently underway. Principal trends include the use of more than two hulls and the use of air cushion effects to raise the hull(s) out of the water. The aim is to reduce both drag and wake. There is also the added advantage of reducing fuel consumption. While taking advantage of the latest technology, care should be exercised to ensure that Lake Sakakawea service is not used as an experimental test bed for novel and unproven designs.

There is, however, increased interest in faster ferry service in a number of locations in the United States. Most high-speed ferries in service in the U.S. are high capacity (in excess of 300 passengers). There appear to be few or low public passenger ferries in the range of 80-100 passengers. Principal cities that include a substantial element of fast ferry operations are New York, Boston, Seattle, and San Francisco. For example, in New York in 1998, ferry passenger traffic on a typical weekday was about 29,000. Of this total, 25,000 were short distance, low speed shuttle services across the Hudson River, and about 4,000 used longer distance and higher speed services. New York, an exceptional example, has very high density communities and a long tradition of ferry operation. However, the experience of fast ferry operators has been mixed with a high turnover of companies and operations.

Vessel passenger capacity demand forecasts indicate potential peak patronage in the range of 6 to 10 single trips each way/each day on the primary route. This is based on a 30-minute service frequency at peak times, approximately $24.40 per one-way trip, and operating speeds of 15 mph for most of the trip. Assuming six departures in the peak period, this equates to an average of between 15 and 30 passengers per vessel and 6 to 15 vehicles. A bunching of demand, rather than a steady demand, over the carrying period is expected. The conversion of mph to knots is based on 0.868976242 knots per mph.

A spread with a distinct peak and shoulder periods, as evidenced in the table below, suggests a vessel with a carrying capacity of over 15 vehicles (to accommodate growth).

Table 8.1 - Vessel Size/Capacity Analysis

- Assumed 90 ferry passengers per day
- Assumed 84 automobiles per day

A larger ferry might be more suitable for tourist and off-peak services or carrying a higher payload. A larger vessel would also be capable of supporting a more flexible internal reconfiguration for conferences, dinner cruises, and similar events. This would be a primary consideration for private operators providing commuter and additional revenue generating services. A capacity of 149 passengers is a threshold beyond which the U.S. Coast Guard vessel equipment and crew requirements increase.

Departure Time AM	Departure Time PM	Assumed Demand Pattern	Passenger Distribution (1)	Automobile Distribution (1)
05:30	04:00	11%	10	9
06:00	04:30	19%	18	16
06:30	05:00	26%	23	22
07:00	05:30	22%	20	18
07:30	06:00	15%	14	13
08:00	06:30	7%	6	6
TOTAL		100%	90	84

Table 8.2 - Typical Vessel Specifications

Ship General Requirements

The project could consist of a new or used vessel; however, care should be taken in being aware of the characteristics, specifications and condition of the vessel. There have been several changes to the code requirements over the years. Many of the code changes were created because of safety concerns, communications and accessibility requirements.

Regulatory Requirements

Vessel to be inspected by the United States Coast Guard as a Subchapter T passenger Vessel with certificate of inspection (COI).

Certifications

Certifications to include Stability Letter, and admeasurement certifications. Passenger Accessibility to meet the requirements of Reference 0.3.

Based on this range of requirements, basic commuter demand needs and off-peak service needs, the likely carrying capacity will accommodate 30 passengers. Typical technical specifications for a medium-speed ferry boat suitable for operation on Lake Sakakawea are included in the table below.

Principal Characteristics		Example
Overall Length	(to be determined)	100'-0"
Length on design load waterline	(to be determined)	98'-1"
Breadth over guard	(to be determined)	47'-6"
Depth amidships at side	(to be determined)	5'-9"
Draft at DLWL	(to be determined)	4'-0"
Number of passengers	(to be determined)	30
Number of vehicles	(to be determined)	14
Capacities (Approximate)		
Fuel Oil		2,900 gallons
Fresh Water		300 gallons
Lube Oil		180 gallons
Waste Oil		180 gallons
Power (Approximate)		
Propulsion power		2X950 BPH
Ships Service Generators		2X23 kW
Other Characteristics		
Regulatory Gross Tonnage		Less than 100
Emergency, Docking and Flood Lighting		Throughout
Radio, Alarm, Navigation and Communication equipment		Latest Standards
Environmental Monitoring Systems		Latest Standards
Life Safety and Emergency Equipment		U.S. Coast Guard
Cruise speed		15 mph
Engine type		Diesel/waterjet
Wake maximum		1ft at 600 ft.
Internal noise level	(normal conversation = 60 dBA)	65 dBA

Based on these descriptions, boat builders indicated that likely construction costs would be approximately $3.8 to $6.8 million per vessel. Increasing the size to accommodate 24 vehicles and 100 passengers; the likely construction costs would be approximately $10.4 to $12.8 million per vessel.

Potential Boat Manufacturing Yards

There are several boat manufacturers in the United States that have experience in medium speed ferry construction. They often call on international partners to gain access to current advances in ferry design and technology. The following provides a sampling of manufacturers and service in the United States. The FHWA grant program requires "Buy American Only".

Table 8.3 - Potential Manufacturers

Manufacturer	Example Experience
Pequot River Shipworks New London, Connecticut	Fox Navigation Fast ferry in New York
Nichols Brothers Freeland, Washington	Cross Sound Ferry Services, Connecticut Catalina Cruise Lines, California
Gladding Hearn Shipbuilding Somerset, Massachusetts	Seastreak America, New York New York Waterways
Derecktor Shipbuilding Mamaroneck, New York	New York Fast Ferries, New York
Air Ride Craft Inc. Miami, Florida	Island Express Boats, Ohio

The manufacturers indicated that the current market for vessels is very active. As a result, there is likely to be a significant lag between order and delivery. The current lead-time to start of construction is approximately six months. Construction of a vessel in the expected size range would take between twelve and twenty-four months. Given the potential for improving construction schedules, a vessel of the same type could possibly be delivered within a 12 to 18 months after design is completed.

Details regarding a typical vessel that is currently in operation has been received from the boat builder's web site. The specifications for this boat was used as a guide to the types of vessels available. Each operating circumstance will require particular modifications to meet local needs. Engine type and size can be varied to meet customer and operating needs. Interior layout and specification is open to a wide range of interpretations and cost variations.

Oversight/Agencies

Several agencies have jurisdiction on Lake Sakakawea. The Army Corp of Engineers and the U.S. Coast Guard represents the federal presence, including coverage of the certification and documentation of "for-hire vessels". The North Dakota Department of Transportation, Environmental Protection Agency and Department of Game and Fish also have jurisdictional authority. The following paragraphs specify the roles of the key agencies.

U.S. Coast Guard

All U.S. vessels carrying passengers for hire are under the jurisdiction of the navigational laws enforced by the U.S. Coast Guard. The Coast Guard has no dedicated assets in the area and does not patrol Lake Sakakawea. Occasionally the Coast Guard may be in the area and may stop to board vessels or to enforce the local speed restrictions.

The Coast Guard would be involved with the start-up and operation of a mid-speed passenger ferry boat service on Lake Sakakawea. Small passenger carrying vessels (under 100 gross tons) that carry seven or more passengers for hire are required to be periodically inspected, operate within the terms contained in a Certificate of Inspection, and be in the charge of a person possessing a license as Master, with gross tonnage restrictions dependent on the type of vessel. The Coast Guard administers the certification of vessels to carry passengers for hire and has the responsibility of inspecting vessels to ensure compliance with federal regulations. Certification can be handled through a regional office. Marine Inspectors witness all tests and conduct necessary examinations for certification. Certificates of Inspection are issued to inspect vessels once they are deemed to be in compliance with applicable regulations. The regulations that apply to small passenger vessels (under 100 gross tons) are contained in 46 Code of Federal Regulations (CFR) Subchapter T (Parts 175-185).

Prior to an initial inspection, plans must be submitted on the following:

- Mid-ship section,
- Outboard profile,
- Inboard profile,
- Arrangement of decks,
- Machinery installation,
- Electrical installation,
- Fuel tanks,
- Piping systems,
- Hull penetrations operation and shell connections,
- Marine sanitation device installation, and
- Steering system diagram.

Federal Law also requires that any vessel that is five net (cubic) tons or more and is used in trade or commercial service must be documented, unless it is used solely within the U.S. Virgin Islands. Vessel documentation is a national form of registration. Vessels of five net tons or more used in coastwise trade, including the transportation of passengers between points in the U.S., must be documented. Documentation requires the demonstration of ownership of the vessel, U.S. citizenship (individual, corporate, or other entity), and evidence that the vessel was built in the United States (to comply with the Jones Act). Documentation is handled by the National Vessel Documentation Center.

There are no known maximum speed restrictions for the main lake area. One of the critical aspects of successful ferry service implementation will be a waiver of the speed restrictions currently enforced on Lake Sakakawea. Without a waiver, a 25-minute one-way trip would take 40 minutes. At that rate, the ferry service could not compete on a travel time basis with other modes.

Most speed restrictions exist to control wave action generated from boat hulls. This wave action causes two main problems, shore erosion and potential damage to docked vessels. Speed restrictions on Lake Sakakawea are primarily established to protect boats that use marinas.

Different hull designs produce different wakes. One of the primary goals in the design of multi-hull medium-speed ferry vessels is to operate at greater speeds while producing little or no wake. The level of wake generated by a medium-speed ferry vessel, the wake's dispersion rate, and performance in varying conditions and speeds can be calculated and measured.

Discussions should be held to determine the process required to achieve a waiver for speed restrictions for a particular vessel. A waiver request should be submitted to the Corp of Engineers office as well as various dock marinas. The Corp of Engineers could contact local marinas and boaters in the affected area. In addition, they would probably request actual testing on the lake at several speeds to measure the wake and other impacts of the vessel(s). From the information collected in this process, the Corp of Engineers could submit a recommendation to the governing bodies.

Navigational Aids

Navigational maps are made available through commercial map distributors. These maps are compiled United States Geologic Survey (USGS) quad maps. The maps and charts generally include the locations of navigational aids and obstructions, including buoys, lights, day-marks, channels, soundings, wrecks, pilings, and horizontal and vertical clearances of bridges.

Chapter 9 – Waterside Operation Analysis

Waterside Operational Issues
One significant unknown is the safety of mid-speed ferry boat operations. The concerns include:

- Conflicts with other boats
- Operations before dawn and after dark
- Debris in the lake (especially following heavy rains upstream)
- Lake-vines and weeds
- Ice
- Fog

Discussions with potential ferry operators, existing commercial vessel operators, marina operators, and boat owners produced the following observations:

- Conflicts – Ferry vessels would be captained by professionals trained to operate safely on congested waterways.
- Operations before dawn and after dark – The ferries would be equipped with appropriate lights and navigational equipment to allow for safe operation in these conditions.
- Debris – Manufacturers and operators state that a medium-speed ferry's aluminum hull can withstand reasonable debris strikes at operating speed without experiencing damage. In addition, a responsible Master will reduce speed in potentially harmful situations.
- Lake Plant Life – Unlike a conventional propeller-driven boat, growth of hydrilla near the surface of the water during warm months should not affect the operation of the medium-speed ferry's waterjet propulsion system.
- Ice – Discussions with operators and manufacturers indicated that modern hulls can break through up to ½ inch of ice.
- Fog – High-speed ferries are equipped with safety-related instrumentation devices, such as sonar and infrared. However, for safety and passenger comfort, the vessel would operate at much lower speeds in fog.

Environmental Impacts of Waterside Operations
Environmental impacts attributed to this project would result from on-land construction of parking lots, road improvements, and pier/dock improvements. The actual ferry vessel does not, at this time, present a problem to the federal agencies contacted. If public funds are used, the project would follow the NEPA/404 process, whereby the federal document and COE permit are coordinated to avoid overlooking any environmental concerns and to facilitate agency cooperation and consensus.

Three areas of concern exist at several of the landing sites. In order of complexity and seriousness of regulatory compliance, these concerns include:

- Use of park lands
- Endangered species, Whooping Cranes, Bald Eagles
- Construction in wetlands

No environmental constraints were identified that would preclude the institution of service. Any construction will require all pertinent environmental documentation and permits.

Oversight Agencies

- Army Corps of Engineers
    - Revisions to the COE Master plan for Lake Sakakawea will be required
    - Environmental Assessment will be required
    - Bonding for site cleanup will be requires
    - 404 Permitting Process
    - Clean Waters Act

- Environmental Protection Agency
    - Environmental Impact Study
- U.S. Coast Guard
- State of North Dakota
- Navigational Aids
- Waterside Operational Issues testing
- Environmental Impacts of Waterside Operations testing
- Summary and Conclusions testing

Coast Guard Regulations for Ferry Boat Operations
The global ferry industry is quite large. Worldwide, ferries transport 2.1 billion passengers every year, 250 million vehicles and 32 million trailers, according to "Inter-Ferry".

Yet despite its vastness, the industry has very safe operations, with less than two associated casualties per year, reports the Passenger Vessel Association. Part of the reason why the industry is so safe is because it's highly regulated by governmental agencies like the U.S. Coast Guard (USCG).

Defining Ferryboats
A ferry is a vessel that has the primary purpose of transportation. Ferries generally operate on a regular schedule on routes lasting less than 48 hours. They usually have a goal of transporting cargo or passengers from Point A to Point B, which is distinguished from other types of vessels such as cruise ships.

The industry is varied, comprising numerous types of ferryboats, such as:
- small ferryboats carrying passengers across a harbor
- large vessels carrying cars and trucks across a lake
- Massive ferries carrying heavy cargo

The USCG Keeps a Watchful Eye on Small Passenger Vessels
The USCG is thorough in its safety enforcement, not only for large ships and barges, but also for small passenger vessels, including ferryboats. To the USCG's credit, the efforts have likely largely contributed to the U.S.-flagged fleet's "excellent safety record."

Commercial passenger vessels are inspected by the USCG at least once a year. Some of the things the inspectors will look at include:

- The vessel's stability
- The condition of the hulls
- Propulsion and other machinery
- Electrical systems
- Lifesaving equipment
- Repair and general operations
- Environmental impact
- Emergency plans
- Fire prevention protocols and firefighting equipment
- Navigation instruments
- First-aid equipment
- Communications systems

Other Ferry Regulations

In addition to the areas above, the USCG also keeps tabs on other important areas in the ferry/small passenger vessel industry:

- Training – each vessel's captain must be licensed by the USCG, which requires rigorous training, exams and experience, and most vessels need to employ a deckhand, too. The crew has to submit to random drug testing and a physical medical examination every five years.
- Construction – each vessel must meet the USCG's construction regulations, which emphasizes stability and safety. Plus, all vessel modifications must be approved in advance.
- Safety Drills – ferryboats should have emergency safety drills at least quarterly. Drills should include those for man overboard, abandon ship, fire and security, among others. It's important to log all the drills accurately and be able to produce the logs to inspectors upon request.
- Security – each vessel must adhere to all USCG-approved security plans, which are far-reaching and thorough.

Keeping Your Records in Order

Ferry operators will want to make sure their vessels are well-organized, meet all the USCG regulations and implement accurate logbooks to keep a paper trail of compliance.

Summary and Conclusions

This chapter described the issues related to the operation of a medium-speed ferry boat service on Lake Sakakawea. In general, the use of the river and interconnecting waterways for medium-speed ferry boat service is inhibited only by speed restrictions that exist along the routes. Vessels will otherwise be able to reach cruising speeds of 20 mph. These speeds are less than many of the recreational vessels already in use on the waterways. Water traffic is light during the weekdays when the ferry commuting service would operate. Navigational aids are in place on the water and mapping is available. Federal requirements must be met in order to operate a for-hire passenger vessel. These include inspection and documentation of vessels and a licensed master and crew.

The speed restrictions are an important aspect involved in the review of waterside operations. Speed restrictions are based upon safety and wake effects. Ferries can operate at 20 mph, but the numerous restricted areas (6-10 mph) represent considerable impediments to a competitive ferry commuter service.

Chapter 10 – Ferry Service Modeling

Service Profiles

- 60 year life cycle
- Annual maintenance requirements
- Dry docking and storage facilities

Patronage Projections

- Landside Capital Needs and Costs: Includes maintenance at $40,000 per year
- Waterside Capital Needs and Costs: Includes maintenance at $130,000 per year
- Fuel Costs Capital Needs and Costs: Includes maintenance at $160,000 per year
- Insurance and miscellaneous cost at $25,000 per year
- Operating Costs and Optimum Fare Structures: Utilities at $30,000 per year
- Employees:
    - Ferry
        - Captain
        - Engineer
        - Deck Hand
    - Port
        - Port Supervisor
        - Clerical / Tickets / Reception
        - Maintenance / Deck hand
    - Regional
        - Operations Manager
        - Ferry mechanic
- Insurance
    - Corps of Engineers may ask for $5.0 million in liability insurance.

We find from other similar ferry services, the business would employ six people on the ferry boat running two shifts daily for approximately nine months each year. There would be an additional four people on two shifts daily on each shore to direct incoming and exiting traffic, provide maintenance and collect fees. There would be at least one full-time year-round administrator/public information officer/bookkeeper.

One Business – Ferry Operations - Jobs Created

<u>Position Wage/Month Number of Months/Year Total Annual Wages</u>

- Administrator (1) $3,500 / (12) $42,000
- Ferry Operators (6) $4,000 / (9) $216,000
- Dock Side Coordination (4) $3,000 / (9) $108,000
- Totals Labor Costs – 11 jobs $366,000 per year
- Total Operating Costs - $385,000 per year
- Total Labor and Operating Costs - $716,000 per year
- Income projects based on user estimates - $760,000 per year ($27 per vehicle and $10 per passenger)

Summary and Conclusions

It is possible to operate a ferry at Lake Sakakawea if grants are secured to purchase the ship and terminal facilities. Based off the utilization rates projected in this report and using the rates of $27 per vehicle and $10 per passenger the operating costs are near breakeven. It should be noted that some ferry operations in the United States are heavily subsidized by the State Highway Department. It appears that these states recognize the cost savings that the ferry operations have against the construction of a bridge. In at least one case the rates for customers utilizing ferries is placed at $1 per vehicle and they generate $380,000 a year in income. This does not meet the operating costs, therefore, the State Highway Department subsidizes the operating costs of the ferry service.

Based on the income projections, there would be funds available for operation and maintenance of the ferry system; however, no funds available for ship replacement costs.

Chapter 11 – Ferry Service Operation Plan

Service Levels

Ferry service will be provided on a seasonal basis - based on ice conditions on the lake.

- Round trip times are estimated at 60 minutes with no weather issues (assuming 15 knots [18 mph] and 10 minutes loading and unloading time).
- For scheduling purposes and for revenue forecasting this study will use 1.25 hours per round trip.
- Ferries would operate on a seven day a week schedule during day light hours from April 1 to December 1.
- Based on a 1.25-hour round trip and 12 hours of day light it is expected to provide nine stops per day on each side of the lake.
- Using a 15-car ferry this would provide an estimated average of 135 cars in each direction per day.
- Patronage Projections: For practical purposes and revenue forecasting this study will use 62% of maximum capacity for 84 cars in each direction per day and 90 passengers.

Financial Projections

Chapter 11 concludes that gross revenues would be approximately $760,000 per year and gross operating costs would be approximately $716,000 per year. The analysis assumes that there will be 30 days a year during the normal operating months when the ferry cannot operate due to weather conditions.

Operating Authority: To be determined.

Summary and Conclusions

Based on the cursory review of the costs of operation and the anticipated revenues, it appears that it is feasible to operate a car ferry with a surplus in revenues of $44,000.

The section is left blank intentionally. Discussions are required with the Three Affiliated Tribes governing body.

Chapter 12 – Public Involvement Plan Activities

Additional review is necessary and should be incorporated into this study. Public input into the need for a ferry to cross Lake Sakakawea is important in the analysis in the feasibility of the operation and usage rates. Key indicators can be determined from the following:

- Study Brochure testing
- Regional Market Survey testing
- Technical Information Meeting testing
- Meetings with Private Sector, Agency and Government Representatives testing
- Press Advisories testing
- Newspaper Advertisement testing
- Citizen Information Meeting testing

Chapter 13 – Federal Funding

Congressional approval of a $1.1 trillion appropriations bill for federal programs for 2016 includes $500 million for the popular TIGER grant program. State and local ferries will get a boost in funding from the FAST-Act approved by Congress late last year due to an overall increase, and a new formula. The Federal Highway Administration ferry formula program gets $80 million per year in the FAST-Act, an increase of $13 million from prior years.

The Federal Highway Administration (FHWA) oversees the Federal-aid highway program. Under this program, Federal-aid highway funds are available, through the State transportation agencies, for designing and constructing ferry boats and for designing, acquiring right-of-way, and constructing ferry terminal facilities. Ferry boats and terminal facilities that serve vehicular travel as links on public highways (other than Interstate highways), as well as ferry boats and terminals only serving passengers as a fixed route transit facility, may be eligible for certain types of Federal-aid highway funding. The following discussion covers:

- The basic eligibility criteria that must be satisfied if Federal-aid highway funding is to be used for improvements to ferry boats and ferry terminal facilities.
- The various types of Federal-aid highway funding sources available for improvements to ferry boats and ferry terminal facilities.
- The general procedures that are followed to advance ferry improvement projects funded under the Federal-aid highway program.

Eligibility

The basic criteria that must be satisfied for a ferry boat or ferry terminal to be considered eligible for Federal-aid highway funds are established in Federal law and set forth in Section 129 of title 23, United States Code (U.S.C).

These eligibility criteria are:

- Location
- Vehicular ferries must serve a public road, but cannot be on the Interstate System.
- Passenger only ferries must be a fixed route transit ferry eligible under 49 U.S.C. Chapter 53 that serves as an alternative to an eligible highway route.
- The ferry facility must not operate in foreign or international waters except for ferry service in Hawaii, Puerto Rico, a U.S. territory, and Alaska and for ferry service between any State and Canada or between Alaska and Washington.
- It must not be feasible to build a bridge, tunnel or other highway structure in lieu of the ferry.

Operation and Fares

The operating authority for the ferry must be under the control of the State or another public entity [23 U.S.C. 129(c)(4)]. This requirement applies to the entire ferry route and is not dependent upon where the improvement is to occur, either the terminal or vessel. A route operated by a private entity would have a contract, permit, or other agreement with a public entity which demonstrates that control to provide service on the public route.

The fares charged for passage must also be under the control of the State or another public entity [23 U.S.C. 129(c)(4)]. All revenues derived from the ferry operation must be applied to actual and necessary costs of operation, maintenance and repair, debt service, negotiated management fees, and in the case of a privately operated toll ferry, for a reasonable rate of return. Fares, tolls, or any other fees, if charged, must be reviewed and approved regularly by the public entity.

Ownership

The ferry boat or ferry terminal to be improved must be [23 U.S.C. 129(c)(3)]:

- Publicly owned, where the title for the boat or terminal is vested in a Federal, State, county, town or township, Indian tribe, municipal or other government instrumentality, or
- Publicly operated, where a public entity operates the boat or terminal, either with public employees or by paying others to do so, even though the boat or terminal may be privately owned, or
- Majority publicly owned, where more than 50% of the ownership is vested in a public entity and where substantial public benefits of the ferry operation are documented.
- The ownership test is applied to the specific facility being improved. For example, if a ferry system has privately owned and operated boats but the terminal is publicly owned, Federal-aid highway funds could be used for improvements to the ferry terminal but could not be used for improvements to the ferry boats. The operation of the ferry and fares must be under the control of a public entity as previously discussed.

Allowable Costs

Federal-aid highway funds are available for capital improvements to existing ferry facilities as well as construction of new ferry facilities. Cost-effective preventive maintenance activities that extend the useful life of the ferry facility are also an eligible activity under 23 U.S.C. 116(e). However, operational costs of a ferry, such as costs of ferry service administration, crews, general maintenance and fuel, are not eligible for direct Federal-aid highway funding.

Federal-aid highway funds may only be used for the allocable portion of the facility or vessel receiving funding. In accordance with 2 C.F.R. 225 Appendix A, paragraph C, costs must be reasonable, necessary and allocable to the eligible purpose for which the funds are being used. It is necessary to determine the portion of the project cost that serves the eligible purpose to determine the Federal share of funding.

The ineligible portions of the cost of the facility or vessel cannot be considered part of the non-Federal share of the eligible project costs.

The term “ferry boat” includes other types of water transportation vessels that meet the location, ownership and operation criteria, including hovercrafts. Boats and facilities constructed for the purpose of dinner cruises, sightseeing, or entertainment excursions, for example, are not eligible for participation.

If Federal-aid highway funds have been used to purchase a new ferry boat or facility or improve an existing one and the grantee or sub-grantee desires to later sell, lease or otherwise dispose of the ferry, this action requires approval from the FHWA.

Federal-Aid Highway Funding Sources

- National Highway Performance Program (NHPP) Funds
- Surface Transportation Program (STP) Funds
- Congestion Mitigation and Air Quality Improvement (CMAQ) Program Funds
- Construction of Ferry Boat and Ferry Terminal Facilities Program (FBP) Funds
- Ferry Boat Discretionary Funds

Federal Share

Federal-aid highway funding sources available for ferry improvements, NHPP, STP, CMAQ, FBP and ferry boat discretionary funds, have a basic Federal share of 80%. The non-Federal share must be provided by the State or local entity and may include private contributions. For projects that have multiple purposes, the Federal share is applied only to the portion of the project cost that is determined to reasonable, necessary and allocable to the eligible ferry purpose.

Access to Federal Funds

The access to federal funds is through the state department of transportation.

Formula Funds

NHPP, STP, and CMAQ funds are only available through State transportation agencies. States, in cooperation with local officials, select the projects that will be federally funded. Project selection is accomplished through a transportation planning process conducted cooperatively by the States, Metropolitan Planning Organizations (MPOs), and transit operators with all governmental levels, public and private organizations, and the general public participating in the planning process. To gain access to formula Federal-aid highway funds, the key contact points are State transportation agencies and the MPO if a proposed project lies within an urbanized area with an MPO.

Formula

The amounts allocated pursuant to subsection (c) of the funding guidelines:

- 20% shall be allocated among eligible entities in the proportion that:
    - The number of ferry passengers carried by each ferry system in the most recent fiscal year; bears to
    - The number of ferry passengers carried by all ferry systems in the most recent fiscal year;
- 45% shall be allocated among eligible entities in the proportion that:
    - The number of vehicles carried by each ferry system in the most recent fiscal year; bears to
    - The number of vehicles carried by all ferry systems in the most recent fiscal year; and
- 35% shall be allocated among eligible entities in the proportion that:
    - The total route miles serviced by each ferry system; bears to
    - The total route miles serviced by all ferry systems.

Authorization of Appropriations

There is authorized to be appropriated out of the Highway Trust Fund (other than the Mass Transit Account) to carry out this section $67,000,000 for each of fiscal years.

Period of Availability

Notwithstanding section 118(b), funds made available to carry out this section shall remain available until expended.

Applicability

All provisions of this chapter that are applicable to the National Highway System, other than provisions relating to apportionment formula and Federal share, shall apply to funds made available to carry out this section, except as determined by the Secretary to be inconsistent with this section.

FBP funds are allocated to the State transportation agencies but are only available to the specified ferry operations based on the formula criteria. The specified ferry operations need to work with the State transportation agencies and local government entities to develop eligible projects.

Guidelines for Developing Federally Funded Ferry Projects

Once a ferry boat or ferry terminal facility project is selected to receive Federal-aid highway funding, the project must be developed in accordance with Federal requirements and procedures that apply to Federal-aid highway projects.

Environmental Review

A project must comply with the National Environmental Policy Act.

Right-of-Way Acquisition

Acquisition of needed right-of-way for a project must comply with the requirements of the Uniform Relocation Acquisition and Real Property Acquisition Policies Act of 1970 (as amended by title VI of the Surface Transportation and Uniform Relocation Assistance Act of 1987).

Competitive Bidding

The physical construction of a project is to be done by a contract awarded by competitive bidding unless some other method, such as force account, is approved by the FHWA as more cost effective.

Davis-Bacon Wage Rates

The Davis-Bacon Act requires the payment of predetermined minimum wage rates on certain federally funded contracts.

Buy America

The Buy America provisions require the use of domestic steel and iron in Federal aid highway construction projects. However, waivers can be granted by the FHWA.

Disadvantaged Business Enterprise (DBE)

T
he main objective of the DBE program is to ensure that DBE firms have an opportunity to participate in Federal-aid funded contracts.

Design-Build

The design-build method of contracting is an alternative to the traditional design bid-build contracting method.

Maintenance

Federal highway law requires that all federally assisted projects be properly maintained. Maintenance and operation of ferry services is not eligible for Federal-aid funding.

Other laws

Other laws may also apply to the construction of ferry boats and facilities. For instance, the Jones Act, administered by MARAD, requires that vessels be constructed in the U.S. A waiver process is available for small passenger vessels. In addition to the Jones Act, the Passenger Vessel Services Act prohibits a foreign vessel from transporting passengers between ports of places in the US.

Ferry Design Standards – 23 US Code 127

Construction of Ferry Boats and Ferry Terminals.

Chapter 14 – Conclusions and Recommendations

Benefits

This proposed project will improve the economic activity in the service area through higher wages, improved benefits, greater career potential, and/or the use of higher level skills than are currently typical. The wages paid should be competitive with other jobs in the area *not* including some oil or coal based jobs.

Study Conclusions

There is a need for improving the amount of time it takes to access locations that are presently impaired by the impasse of Lake Sakakawea. The lake has resulted in impairment of economic growth in the area and limitation of residents to job opportunities. The annual equivalent cost to span Lake Sakakawea with a bridge ($480 million) is $8,000,000 per year plus maintenance over the 60 year life of the ship and facilities. However, a ferry service is an economically viable alternative at a total system cost of ($16,643,000) is a comparative $277,283 per year for 60 years (with revenues to pay for operation and maintenance costs).

The consideration of reviewing the cost of a ferry system vs. a bridge is to show that the cost savings to the tax payers is the equivalent of $7.722 million per year for 60 years.

Recommendations

The evidence presented in this study indicates that a ferry operation can be cost feasible with grants received from the Federal Highway Administration. However, further discussions are necessary with the stakeholders in order to receive public input as to the type size and location of the facilities.

Appendix A - Regional Map

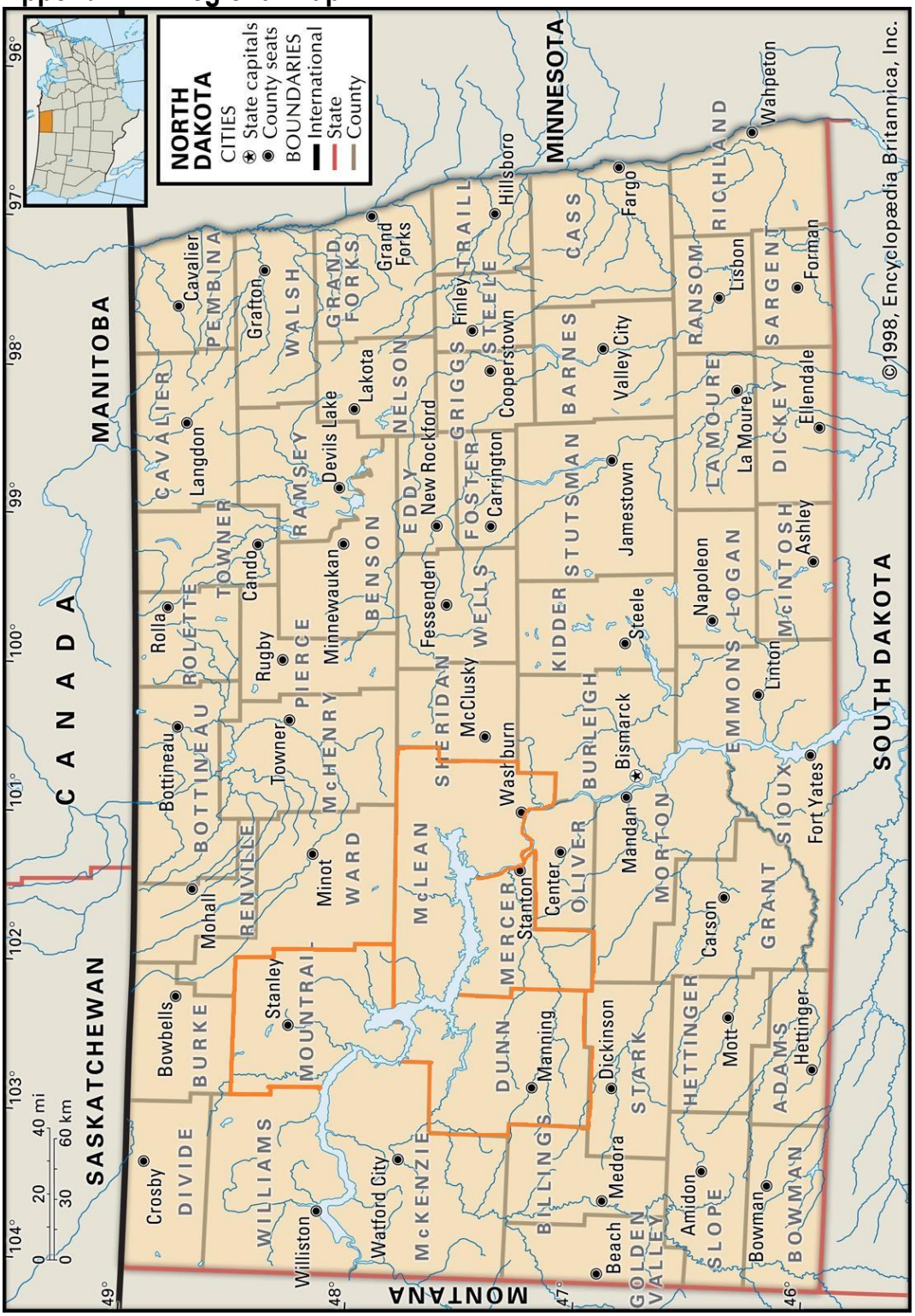
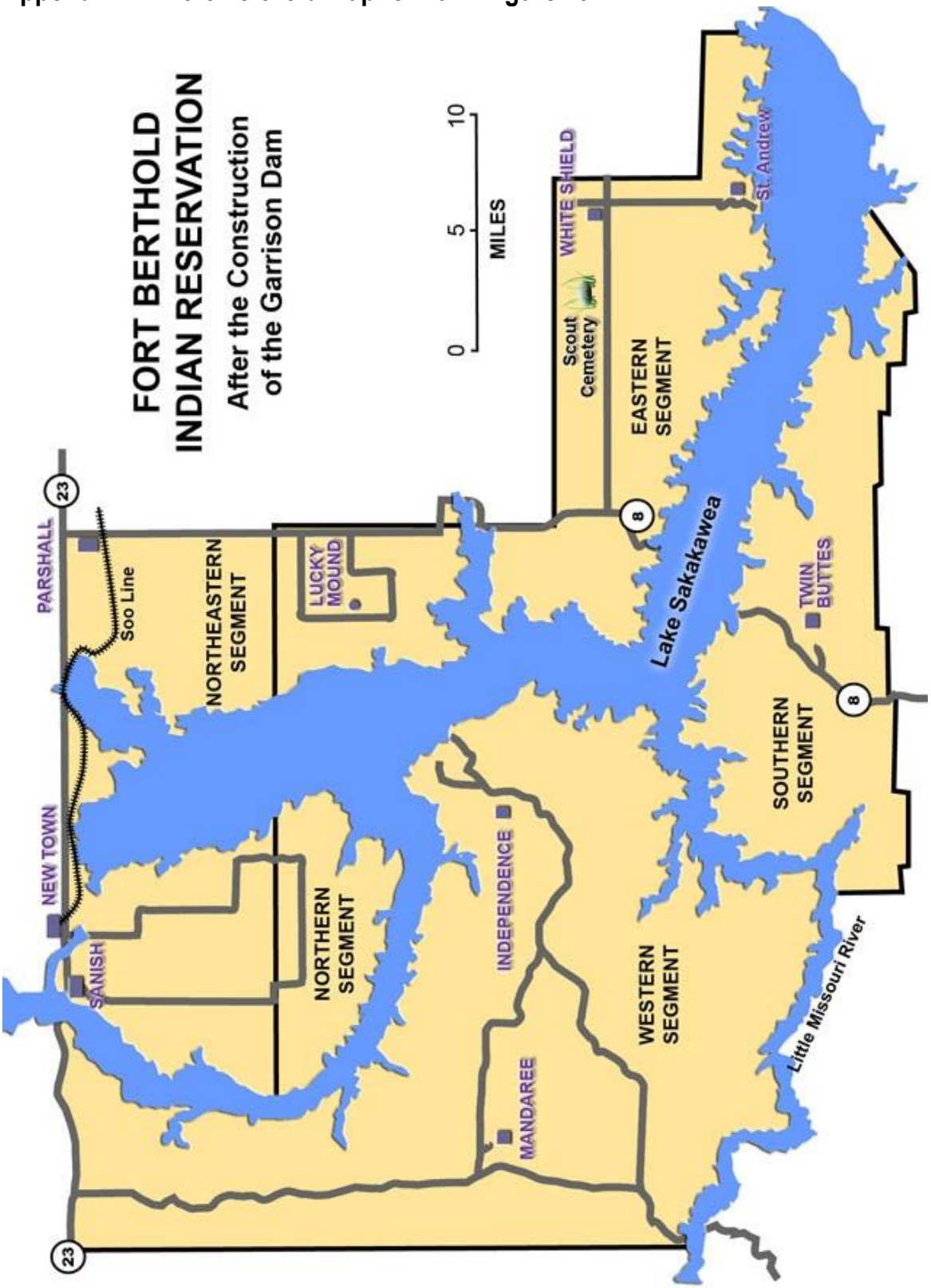


Figure 28

Appendix B – Fort Berthold Map for 2014 Figure 29



Appendix C –
Attachment 1 - Primary South Port and Car Ferry Docking Facilities

ND 8 Highway Bay

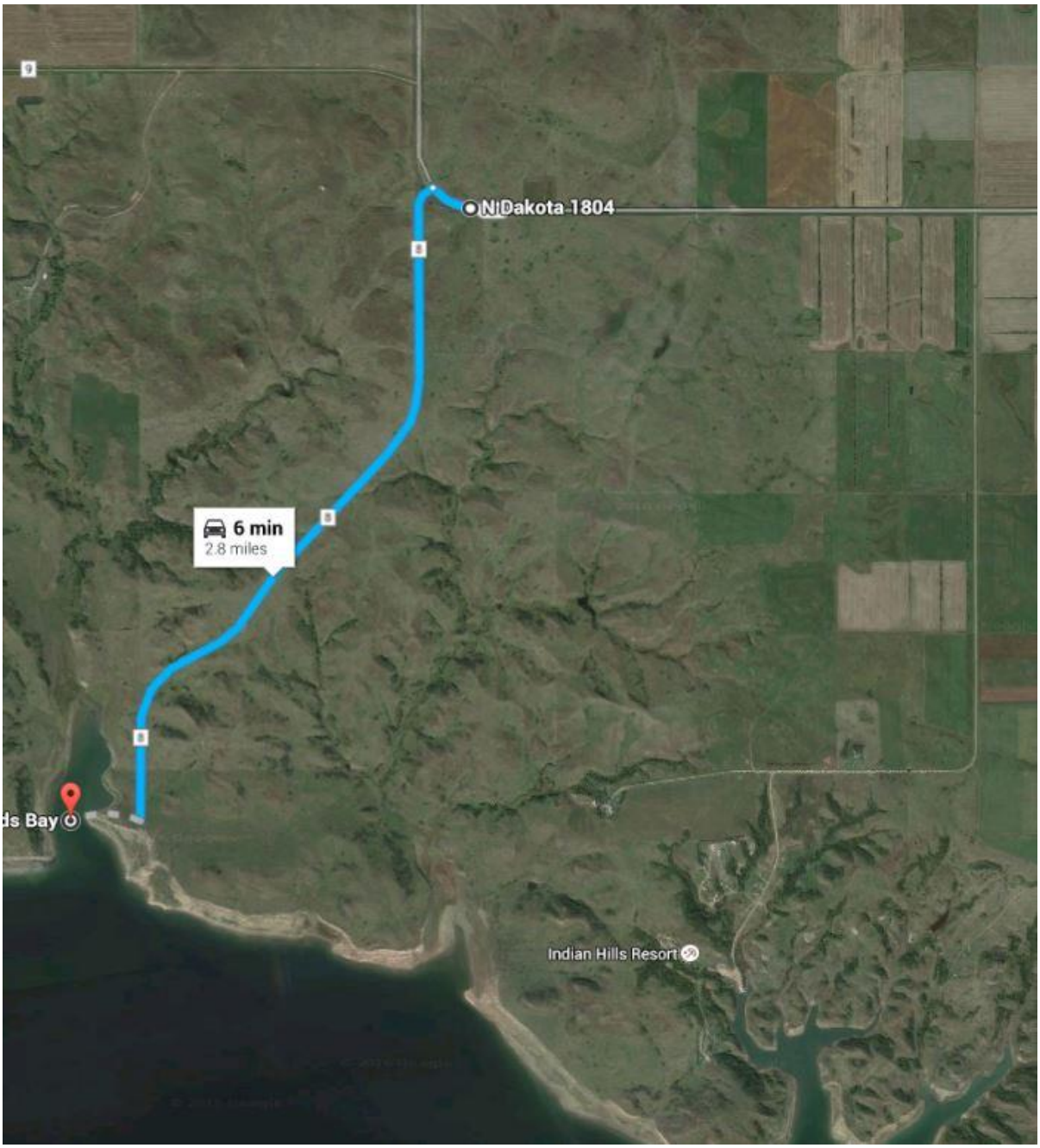
Figure 30a

Attachment 1 – Secondary South Port and Car Ferry Docking Facilities

Medicine Stone Bay

Figure 30b

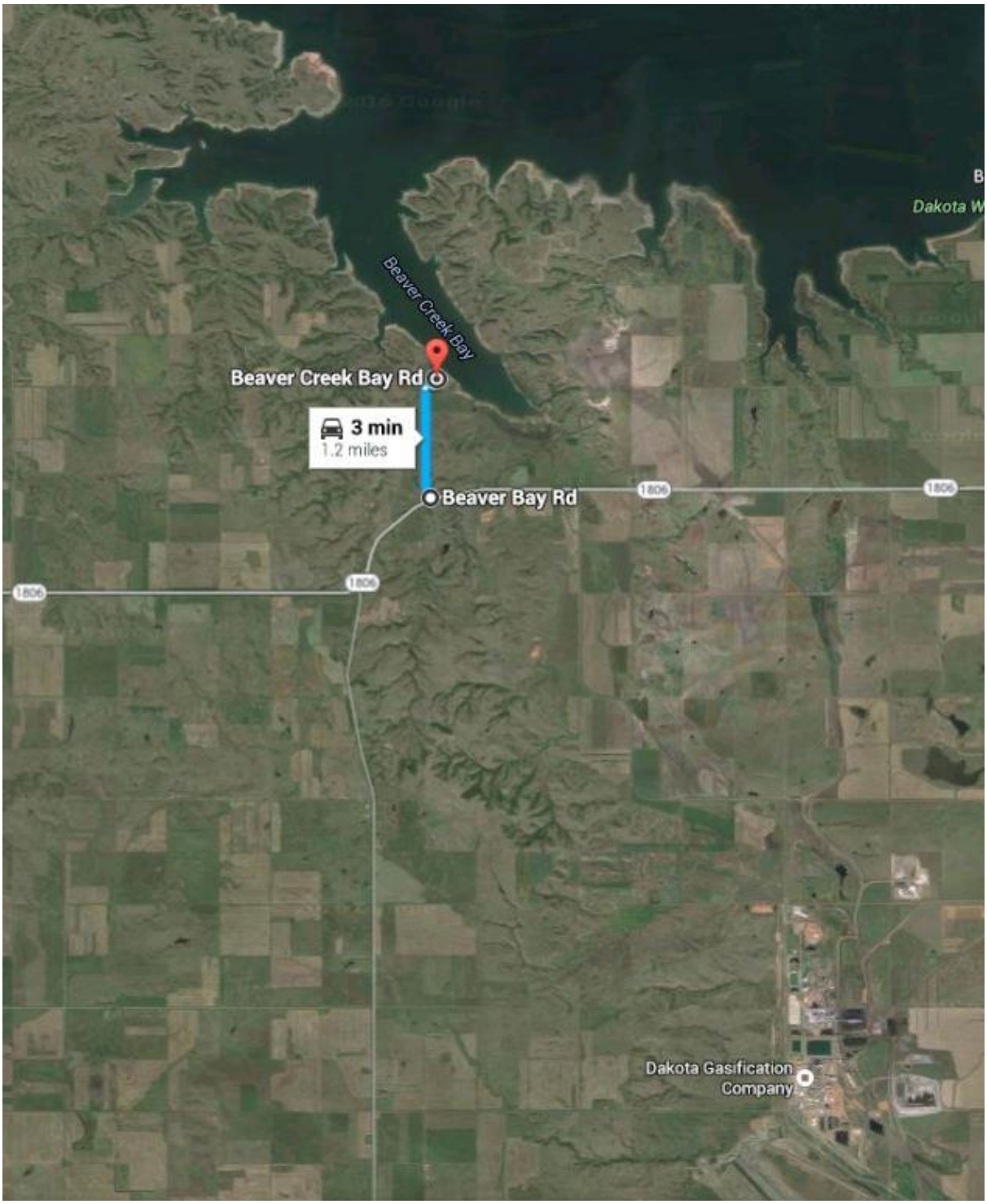
Attachment 2 – Primary North Port and Docking Facilities



Elbowood Bay

Figure 31

Attachment 3 – Secondary South Port and Docking Facilities



Beaver Creek Bay

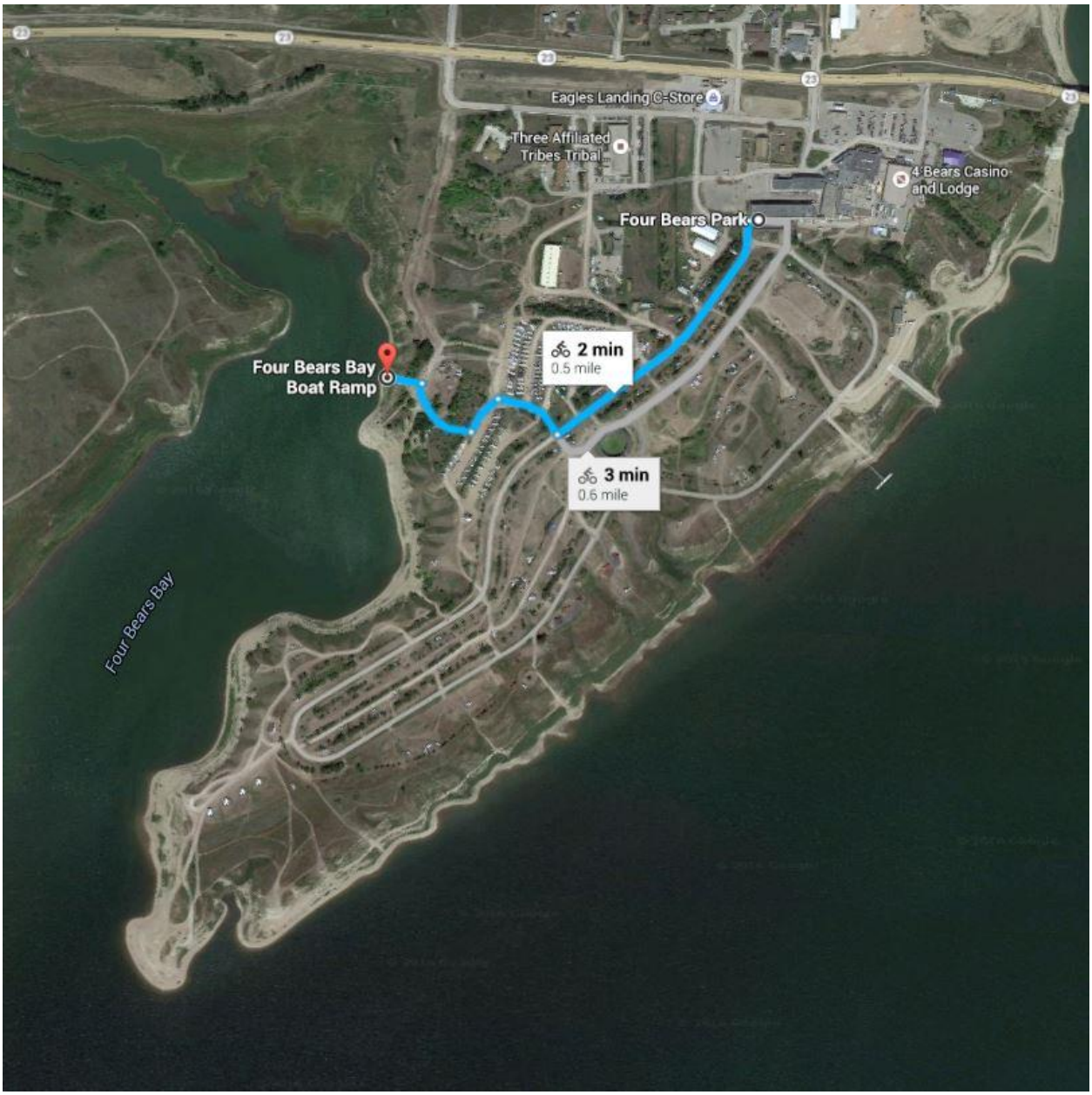
Figure 32

Attachment 4 – Secondary North Port and Docking Facilities

Good Bear Bay

Figure 33

Attachment 5 – Secondary North Port and Docking Facilities



Four Bears Bay – Water Taxi Service

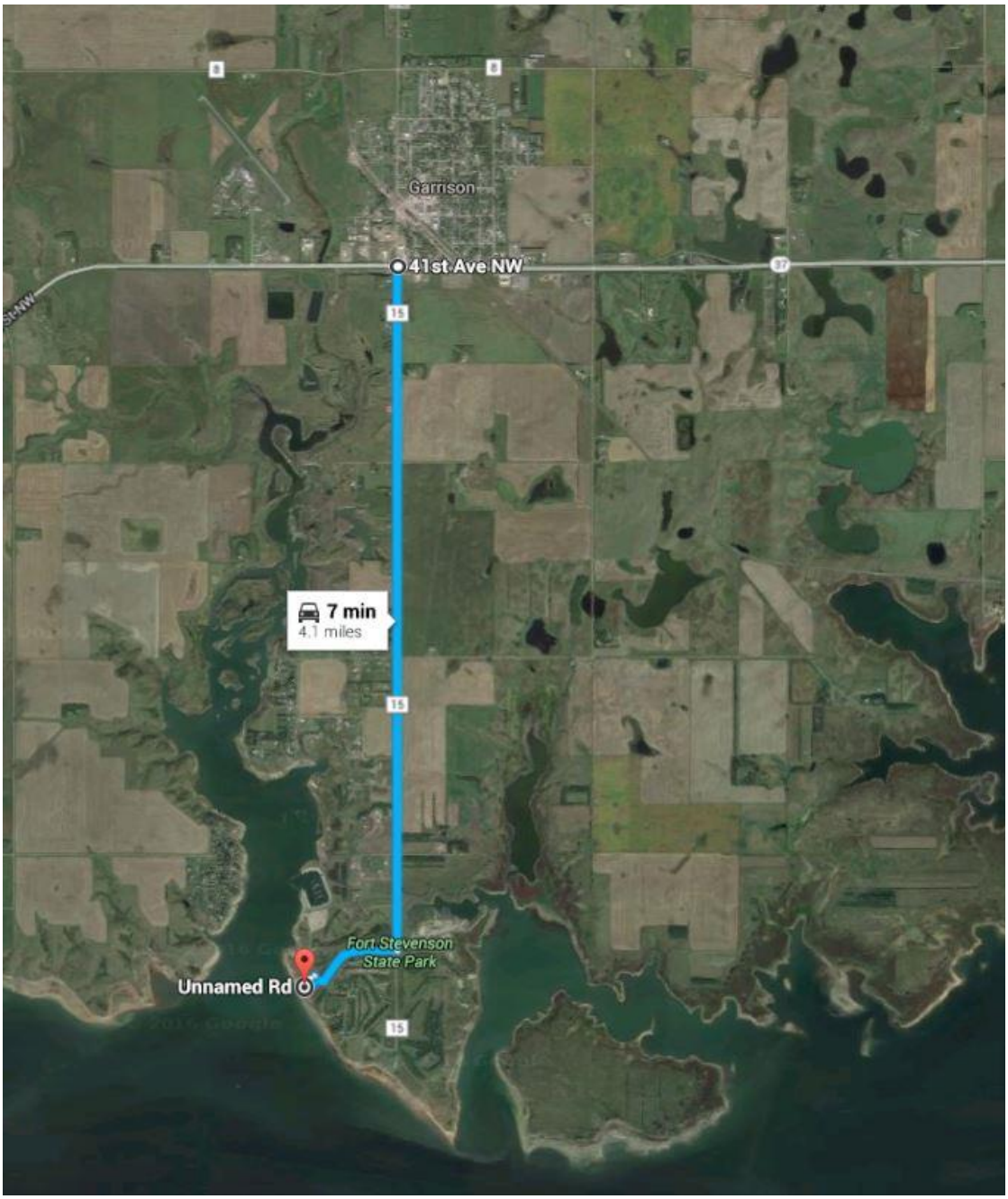
Figure 34

Attachment 6 – Secondary Docking Facilities

Four Bears Bay near Earth Lodge Village – Water Taxi Service

Figure 35

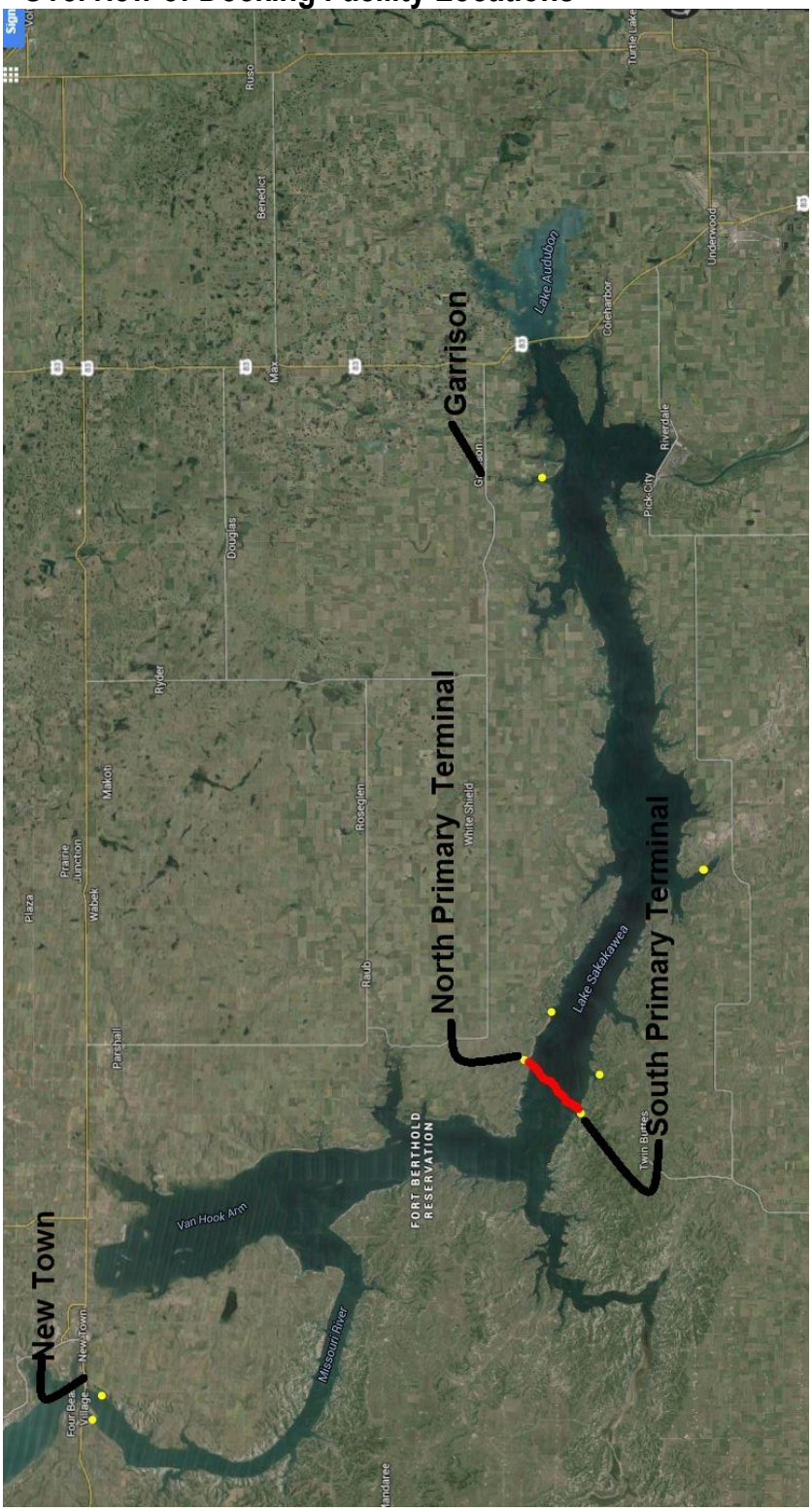
Attachment 7 – Optional North Docking Facilities



Fort Stevenson State Park – Water Taxi Service

Figure 36

Appendix D
Attachment 8 – Overview of Docking Facility Locations



Car Ferry Primary Route Figure 37
Lake Sakakawea

Appendix D – State Parks and Recreation Areas

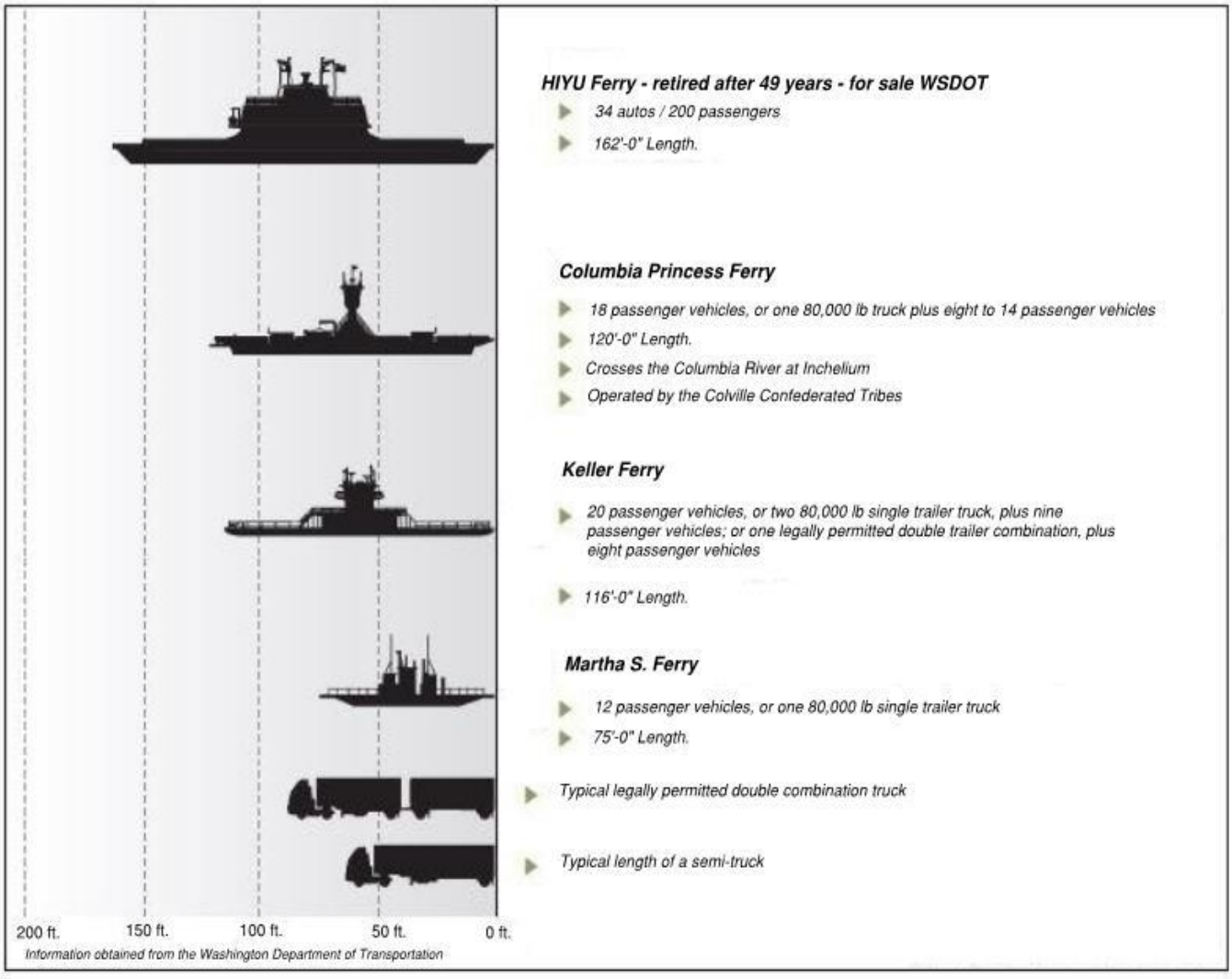
Medicine Stone Bay Public Use Area Figure 38

Appendix E – Typical Road Section

This drawing will be included after the initial reviews of the draft report.

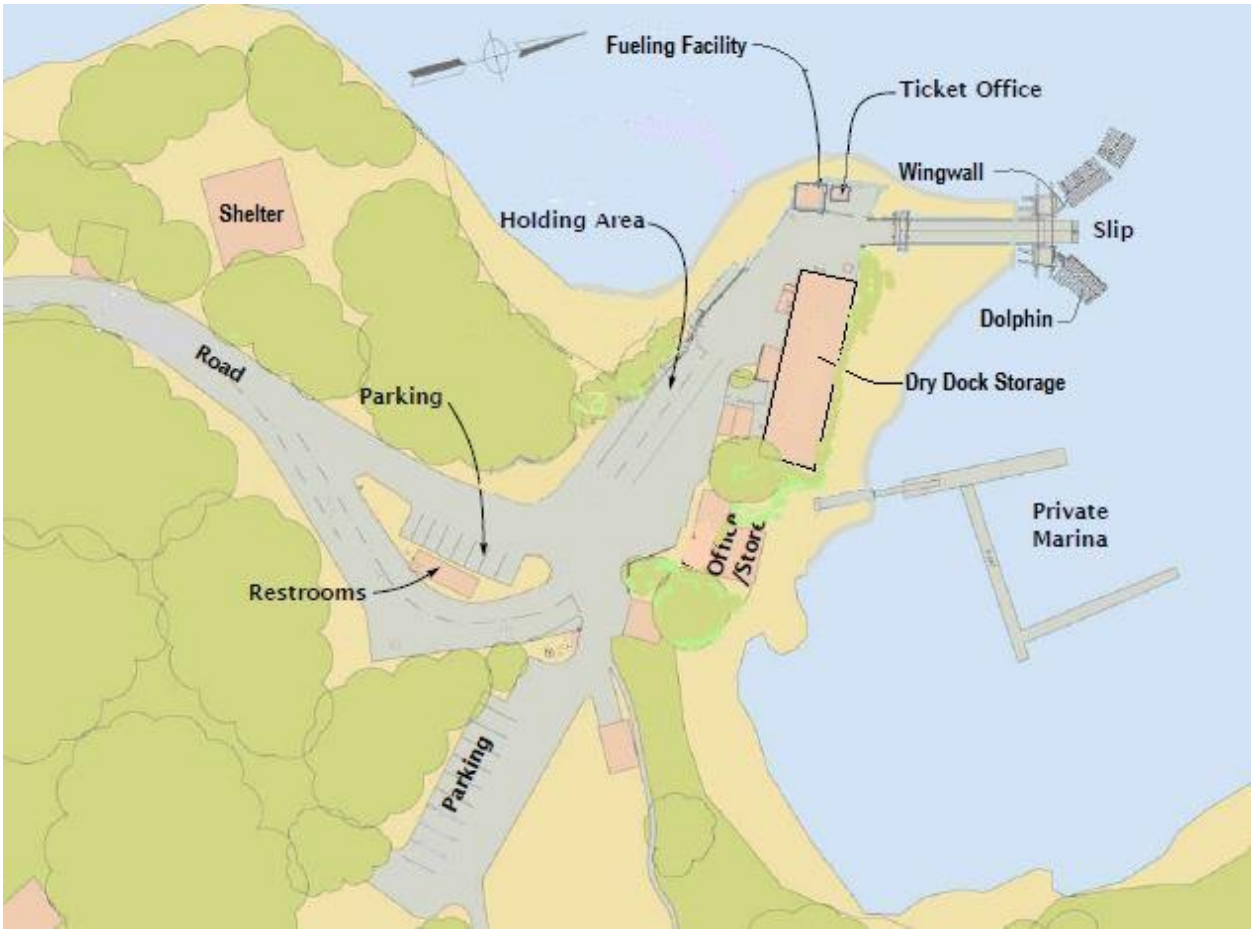
Appendix F – Ship size comparison Chart

This chart was published by the Washington Department of Transportation. Estimated cost of Keller Ferry - $10.8 million



Appendix G – Port Facility Site Plan with Dry Dock

The site plan is for general review purposes and not to be considered construction drawings.



Appendix H – Port Facility Site Plan without Dry Dock

This schematic shows a transition dock on a trestle; however, the proposed project would have a paved surface sloping at a 6.6% grade to an extended location equal to low water.

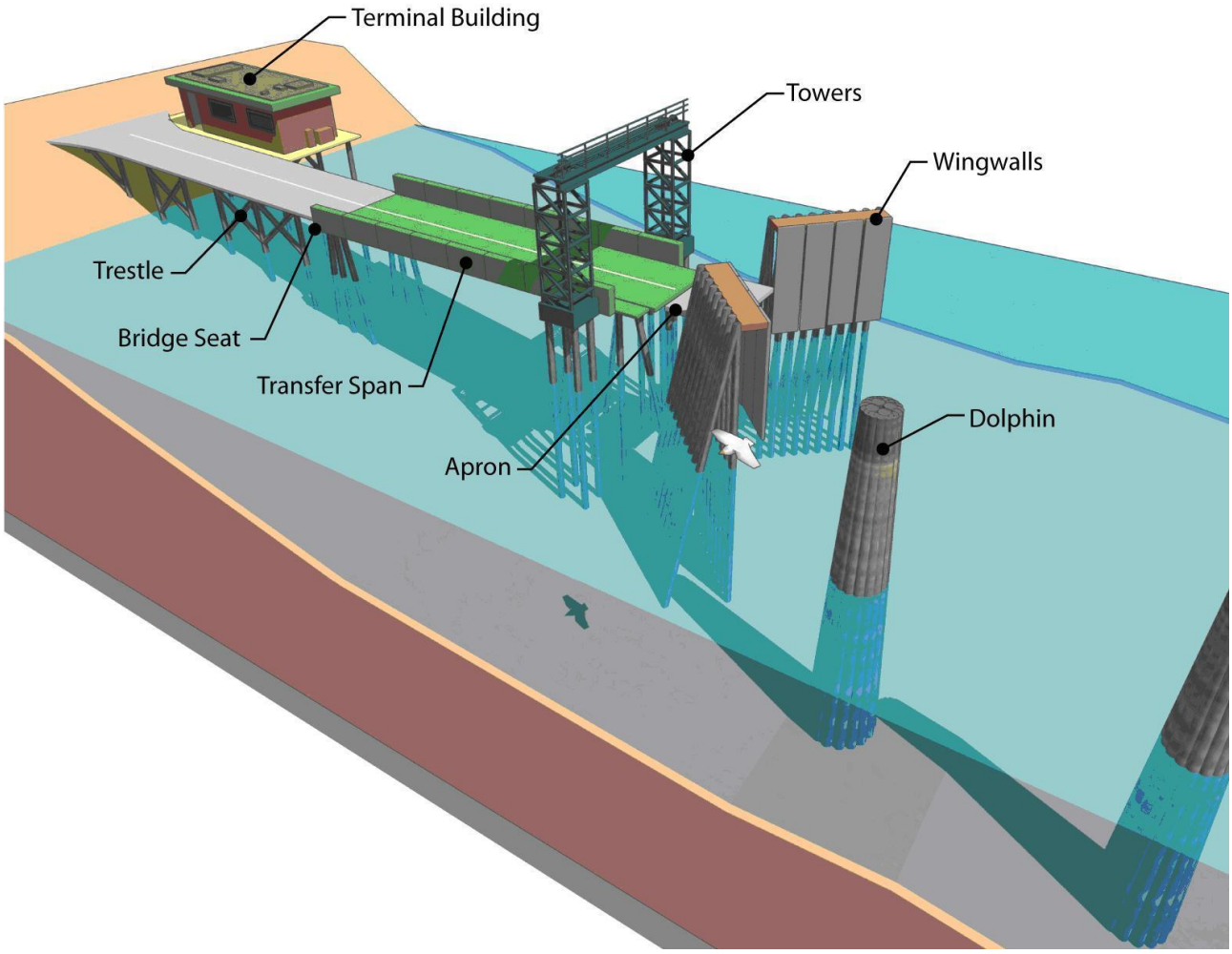


Figure 39 – Schematic of a Typical Port Facility

Appendix I – Highlights of Ferry Operations in the United States

Operational Requirements:

Hours and schedule of operation: A plan must be presented to address the months of proposed operation that takes into consideration the lake ice conditions. If the Ferry is to be operated at night or during poor weather conditions such as rain and high winds, safe operating parameters must be addressed.

High and Low Water Operations: The design parameters of the docking system must address the fluctuation of the water levels in the reservoir. The ferry operation cannot effect the USACE management of the reservoir.

Sewerage and Waste Disposal: The ferry operations must address the proper handling of sewerage and waste disposal in an environmentally friendly manor.

Master Planning all ancillary accessories to the Ferry Operation: The master plan should address any proposed ancillary uses to the docking site, including, parking, camping, entertainment, parks and recreation, etc. The USACE has a non-recreational out grant policy that needs to be addressed as part of the application.

Owners Liability Insurance Requirements: USACE requires minimum liability insurance to be carried by the Owner/Operator of the commercial project. The range of limits would be between $2 million and $5 million.

Operating Utilities including phone, cable, electricity and gas: The owner will need to address the plans for bring power to the shore facilities and will need to be responsible for the costs of bringing the utilities to the shore area.

Dredging in the Lake to accommodate ferry hull depth: Special permits and design considerations are required if the proposed project anticipates dredging in the lake.

ADA and ABA requirements: The design of the facility must take into account accessibility requirements.

Storage and Security Issues: The operational guidelines are to include the storage of the Ferry during the winter and the security of the site when the ferry is not in operation.

Appendix J – Environmental Considerations Exhibits- 1-4

The USACE identified environmental consideration that need to be reviewed for the Ferry Project:

Environmental Assessment: The owner is responsible for the cost and time of a consultant to develop the environmental assessment for the project.

State Health Department: The owner is responsible for the cost and time to develop a contingency plan for contaminates entering into the Lake, including fuel spills and cleanup. There is a response team in New Town that the oil companies use for spill containment. They've used oil skimmers in response to previous spills. Staging and fueling plans need to be address, along with fuel spill prevention.

Land Lease Requirements: The USACE leases shore line real estate at fair market value. However, if the owner can demonstrate public benefit there is a provision for the USACE to waive this requirement. The length of lease could be for up to 25 years.

Annual Inspections by USACE: The Corps maintains authority over the facility to conduct annual inspection of the land facilities and Ferry to assure that maintenance is being conducted and actions taken to avoid spills and lake contamination.

Safety to protect other boating operations: The USACE may require lighting of the ferry and dock to prevent other water vehicles from running into it during the night.

Administrative cost to process the Permits: USACE will require a permit fee to process the permit for the Ferry Project. The cost of the permit would range in cost from $5,000 to $8,000.

Type of Haul: The owner must address the type of vehicles being proposed for the ferry operation i.e small vehicles, pickups, boats trailers, etc. The concern is that there are no contaminants entering into the lake.

Appendix K

List of Hospitals and Care Centers in North Dakota

The residents around Lake Sakakawea have a long travel distance to get to a Hospital. It is anticipated that a Ferry Service can help reduce the travel time to the hospital. The following list is an indication of the limited number of hospital and care facilities in North Dakota and specifically the limited number of facilities in and around Lake Sakakawea which are highlighted in red:

- 5th Medical Group - Minot Air Force Base, North Dakota
- 319th Medical Group - Grand Forks Air Force Base, North Dakota
- Altru Health System - Grand Forks, Grand Forks County, North Dakota
- Anne Carlsen Center for Children - Jamestown, Stutsman County, North Dakota
- Ashley Medical Center - Ashley, McIntosh County, North Dakota
- Bismarck Cancer Center - Bismarck, Burleigh County, North Dakota
- Carrington Health Center - Carrington, Foster County, North Dakota
- Cavlier County Memorial Hospital & Clinics - Langdon, Cavalier County, North Dakota
- Central Dakota Village - Jamestown, Stutsman County, North Dakota
- Community Memorial Hospital - Turtle Lake, McLean County, North Dakota
- Cooperstown Medical Center - Cooperstown, Griggs County, North Dakota
- Dakota Clinic - Fargo, Cass County, North Dakota
- First Care Health Center - Park River, Walsh County, North Dakota
- Garrison Memorial Hospital - Garrison, McLean County, North Dakota
- Heart of America Medical Center - Rugby, Pierce County, North Dakota
- Hillsboro Medical Center - Hillsboro, Traill County, North Dakota
- Innovis Health - Fargo, Cass County, North Dakota
- Jacobson Memorial Hospital - Elgin, Grant County, North Dakota
- Jamestown Hospital - Jamestown, Stutsman County, North Dakota
- Kenmare Community Hospital - Kenmare, Ward County, North Dakota
- Linton Hospital - Linton, Emmons County, North Dakota
- Lisbon Area Health Services - Lisbon, Ransom County, North Dakota
- McKenzie County Memorial Hospital - Watford City, McKenzie County, North Dakota
- Medcenter One Health Systems - Bismarck, Burleigh County, North Dakota
- Mercy Hospital - Devils Lake, Ramsey County, North Dakota
- Mercy Hospital - Valley City, Barnes County, North Dakota
- Mercy Medical Center - Williston, Williams County, North Dakota
- MeritCare Health System - Fargo, Cass County, North Dakota
  - MeritCare Children's Hospital - Fargo, Cass County, North Dakota
  - MeritCare Hospital - Fargo, Cass County, North Dakota
  - MeritCare South University - Fargo, Cass County, North Dakota
- MeritCare Hospital - Fargo, Cass County, North Dakota
- MeritCare South University - Fargo, Cass County, North Dakota
- Mountrail County Medical Center - Stanley, Mountrail County, North Dakota
- Nelson County Health System - McVille, Nelson County, North Dakota
- North Dakota State Hospital - Jamestown, Stutsman County, North Dakota
- Northwood Deaconess Health Center - Northwood, Grand Forks County, North Dakota
- Pembina County Memorial Hospital - Cavalier, Pembina County, North Dakota
- Prairie Saint John's Psychiatric Center - Fargo, Cass County, North Dakota
- Presentation Medical Center - Rolla, Rolette County, North Dakota
- Quentin N. Burdick Memorial Health - Belcourt, , North Dakota
- Rosewood on Broadway - Fargo, Cass County, North Dakota

- Saint Alexius Medical Center - Bismarck, Burleigh County, North Dakota
- Saint Aloisius Medical Center - Harvey, Wells County, North Dakota
- Saint Andrew's Health Center - Bottineau, Bottineau County, North Dakota
- Saint Joseph's Hospital and Health Center - Dickinson, Stark County, North Dakota
- Saint Luke's Hospital - Crosby, Divide County, North Dakota
- Sakakawea Medical Center - Hazen, Mercer County, North Dakota
- Sheyenne Care Center - Valley City, Barnes County, North Dakota
- Sisters of Mary of the Presentation Health System - Fargo, Cass County, North Dakota
  - Central Dakota Village - Jamestown, Stutsman County, North Dakota
  - Presentation Medical Center - Rolla, Rolette County, North Dakota
  - Rosewood on Broadway - Fargo, Cass County, North Dakota
  - Saint Aloisius Medical Center - Harvey, Wells County, North Dakota
  - Saint Andrew's Health Center - Bottineau, Bottineau County, North Dakota
  - Sheyenne Care Center - Valley City, Barnes County, North Dakota
- Southwest Healthcare Services - Bowman, Bowman County, North Dakota
- Stadter Center, The - Grand Forks, Grand Forks County, North Dakota
- Tioga Medical Center - Tioga, Williams County, North Dakota
- Towner County Medical Center - Cando, Towner County, North Dakota
- Trinity Health - Minot, Ward County, North Dakota
  - Trinity Kenmare Community Hospital - Kenmare, Ward County, North Dakota
  - Trinity Medical Center - Minot, Ward County, North Dakota
- Trinity Kenmare Community Hospital - Kenmare, Ward County, North Dakota
- Trinity Medical Center - Minot, Ward County, North Dakota
- Triumph Healthcare
  - Triumph Hospital Central Dakotas - Mandan, Morton County, North Dakota
  - Triumph Hospital Fargo - Fargo, Cass County, North Dakota
- Triumph Hospital Central Dakotas - Mandan, Morton County, North Dakota
- Triumph Hospital Fargo - Fargo, Cass County, North Dakota
- Union Hospital - Mayville, Trail County, North Dakota
- Unity Medical Center - Grafton, Walsh County, North Dakota
- VA Medical Center Fargo - Fargo, Cass County, North Dakota
- West River Health Services - Hettinger, Adams County, North Dakota
- Wishek Community Hospital & Clinics - Wishek, McIntosh County, North Dakota

Location of nearby hospitals and care centers in North Dakota, as published by the Community HealthCare Association of the Dakotas

Figure 40

This drawing will be replaced after the initial reviews of the draft report.

Appendix L

Public Involvement Goals and Objectives

The project needs to be committed to providing an open public involvement process with ample opportunities to inform and involve the public in the Lake Sakakawea Project. Stakeholders will have opportunities to interact with and receive responses from project team members on issues of interest or concern throughout each phase of the project.

The following goals and objectives will help guide the public involvement and communications strategy. These goals were developed as general guidelines for the communications plan and should be reviewed, updated and modified as the project progresses forward.

Goal A: Promote an understanding of the purpose and need for the project and the process leading to the final decisions.

Objective – Ensure that comprehensive information about the project and the decision process is available to the public and the media.

Objective – Explain the cultural significance and concurrent tribal decision-process in a clear and sensitive manner.

Objective – Deliver honest and consistent messaging to the public.

Goal B: Involve the community and other stakeholders early in and throughout the process

Objective – Involve new and existing stakeholders by providing a range of public input opportunities early and often.

Objective – Provide continued communication and feedback to the public throughout the process.

Objective – Engage typically underserved populations (low-income, minority, and limited-English proficient) early in the public involvement process by providing involvement opportunities designed to meet the unique needs of these groups.

Objective – Meet all NEPA Environmental Justice (EJ) and Title VI limited-English proficiency (LEP) requirements.

Objective – Publicize programs and activities through multiple and diverse communications vehicles and hold meetings in ADA- and transit-accessible facilities.

Objective – Notify affected communities of public involvement opportunities early and through a variety of advertising mediums and formats.

Objective – Facilitate constructive dialogue between NDDOT, FTA, and key stakeholders.

Goal C: Ensure that public input is incorporated into the decision-making process.

Objective – Provide involvement opportunities in conjunction with key project milestones and prior to decision-making.

Objective – Solicit meaningful input from affected communities on the range of alternatives and potential impacts.

Objective – Identify and resolve challenges in a timely manner.

Objective – Respond to public comments in a timely and thorough manner.

Objective – Report back to the community on how their feedback has been considered and incorporated into the decision-making process.

Index

Figure 40 Hospital Locations retrieved from http://history.nd.gov/archives/index.html Community HealthCare Association of the Dakotas. (ND) Find a Community Health Center in the Dakotas. (CHAD). Retrieved from http://www.communityhealthcare.net/find-a-chc-site.