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Lake Sakakawea Ferry Crossing Feasibility Study

prepared for

Rural Economic Area Partnership (REAP)

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United States Department of Agriculture

Rural Development

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EXECUTIVE SUMMARY

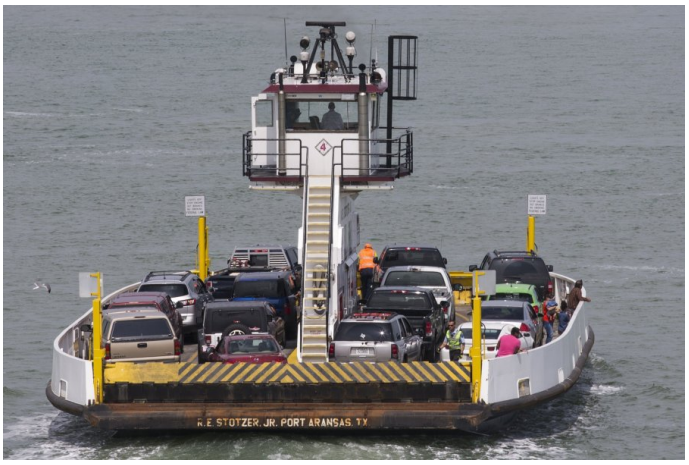


Figure 1. Port Aransas Car Ferry, Texas

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.

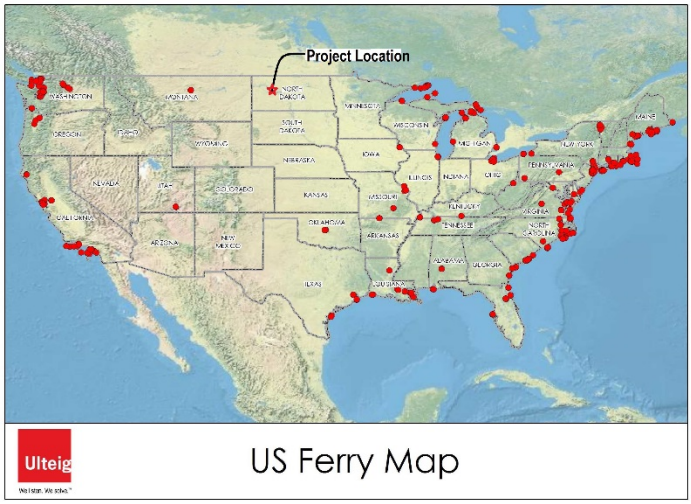
Ferry Description

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 (left)

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 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 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** 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. 12 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)

Water Taxi Ferry Possibilities:

Figure 9. Water Taxi (below)

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.

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.

Figure 10 Lake Sakakawea State Park Marina Dock (above)

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 (left)

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.
The land side improvement components include:

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/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 A includes a regional map of the study location.

Stakeholders

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

- REAP
- Army Corp of Engineers
- MHA (Three Affiliated Tribes)
- Dunn County
- McLean County
- 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 Fort Berthold Reservation and Lake Sakakawea east of the reservation.

Lake Sakakawea
The Lake was created with the completion of the Garrison Dam in 1956. 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.

It is located about 50 miles from Bismarck; the distance by the river is about 75 miles. The lake averages between two and three 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 was completed in 1956 and is the second and 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 for flood control, hydroelectric power, navigation and irrigation.

Lake Statistics
Reservoir Regulation:
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: 51 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 a small part 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.

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.