DRAFT - PRELIMINARY REPORT

Hospital Substation to Herning Substation Transmission System Route Selection
(Herning Circuit Routing and Easement Study)

ANALYSIS OF FIVE ROUTING OPTIONS AND SELECTION OF PREFERRED ROUTE

MATANUSKA ELECTRIC ASSOCIATION

July, 2012

Dryden & LaRue, Inc.
CONSULTING ENGINEERS

Page

HOSPITAL SUBSTATION TO HERNING SUBSTATION TRANSMISSION SYSTEM ROUTE SELECTION FINAL REPORT

Executive Summary

This route study is for a new 115 kV double circuit transmission line from MEA's Hospital Substation (MHS) near the Mat-Su Regional Medical Center (MSRMC) to the Herning Substation (HES) located on South Denali Street (MSB Assessor No. 17N01W10C011) just east of Knik-Goose Bay Road. MEA has established 100 feet as the easement width to support the new 115 kV double circuit transmission line.

The study reviewed the viability of the following five routing options and is shown on Maps 1 and 2.

- Northern Route Option (Bogard Road)
- Central Route Option (Palmer-Wasilla Highway)
- Southern Route Option
- Alaska Railroad Route Option
- Parks Highway Route Option

The following rating criteria factored into the analysis of routing options:

- Cost
- Ability to strengthen MEA's transmission grid
- Minimize public controversy
- Schedule to energize

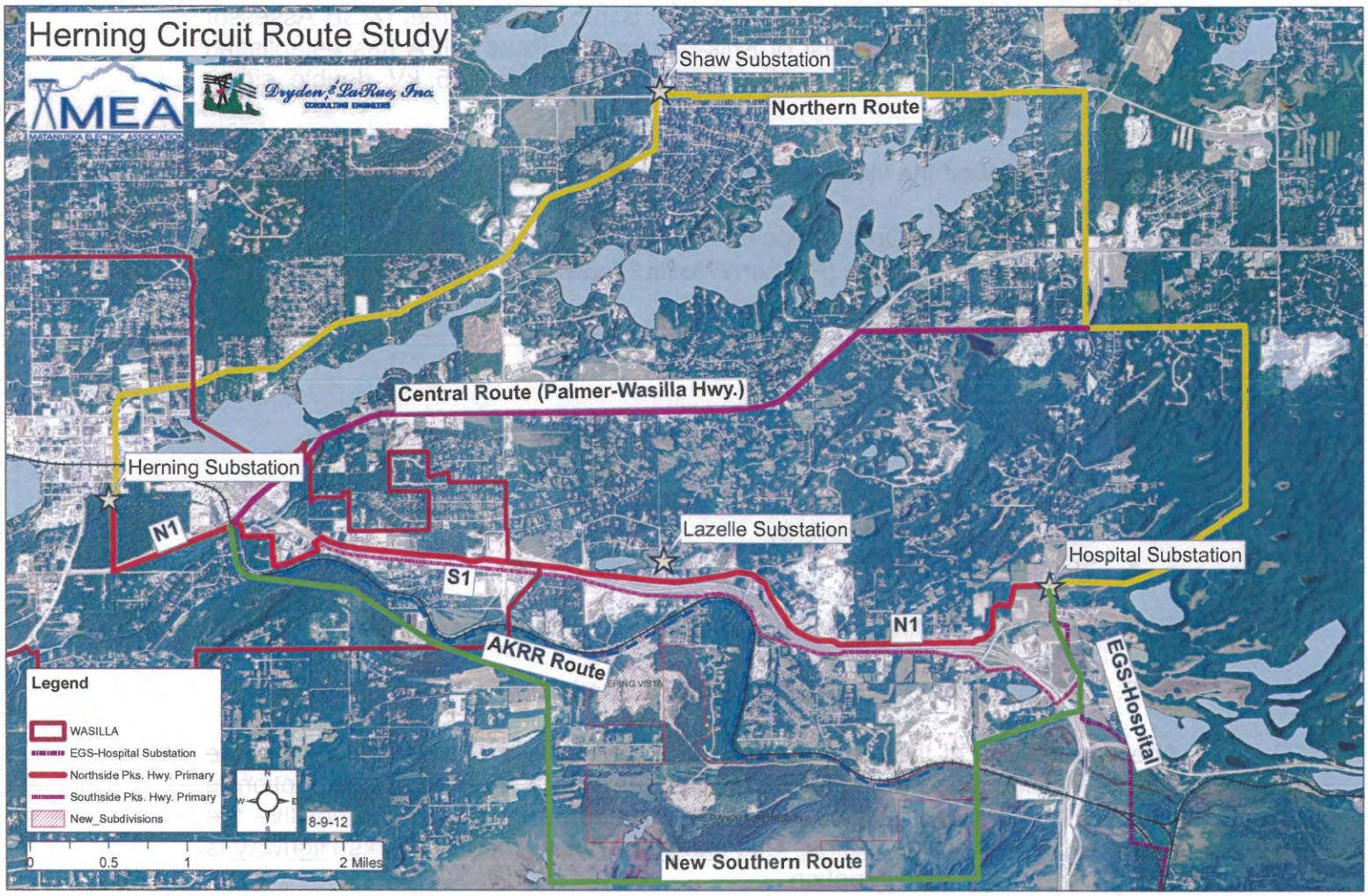
In analyzing each routing option two threshold questions were asked:

1. Is the option physically feasible?
2. Is the option efficient, effective and economic?

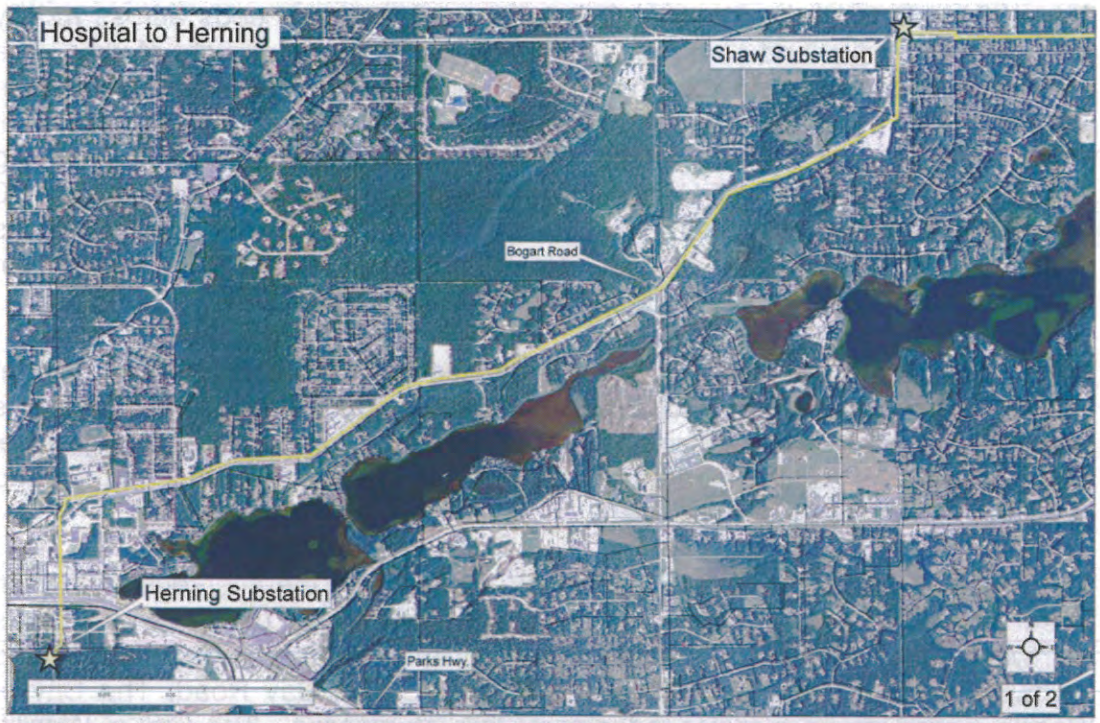
After an analysis of the route options and meetings with DOT/PF, MSB and the City of Wasilla, this study first found that the Parks Highway Route Option is superior to the other options in rating criteria and answers in the positive the above two threshold questions. This study concludes that the Parks Highway is the recommended routing option.

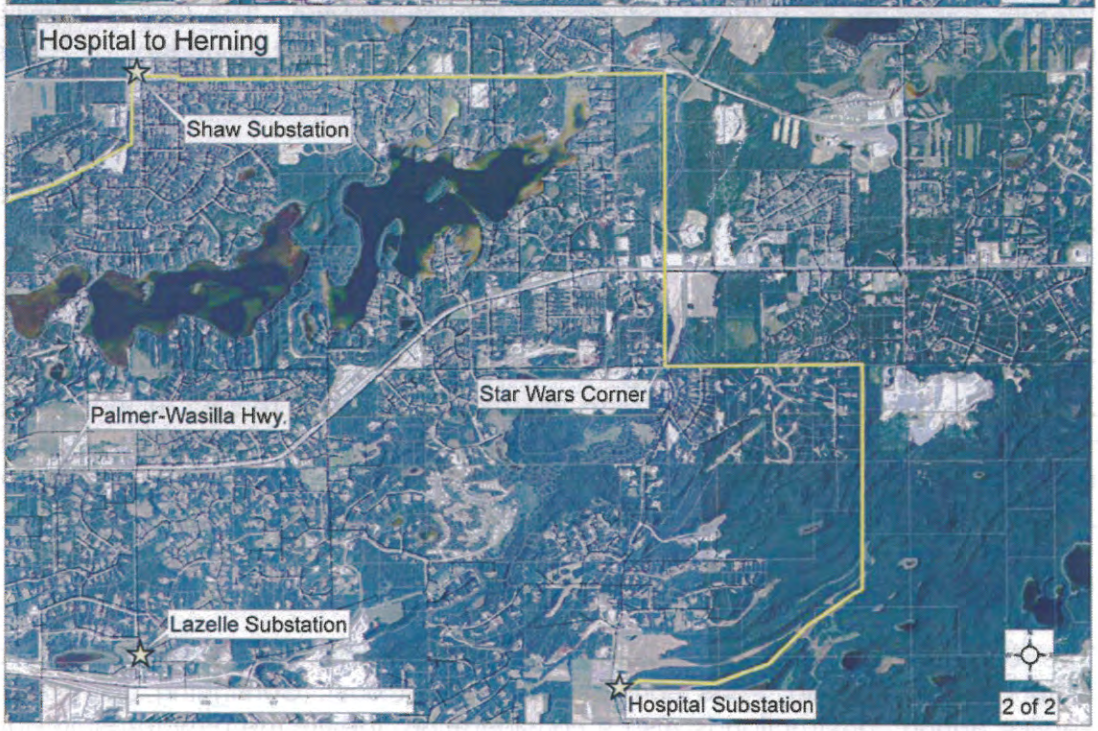
This study is followed by a second study titled An Analysis of the Parks Highway Corridor Option to Determine Optimal Alignment. The study will analyze the north and south sides of the highway along with adjacent alternative routes.

Map 1, Aerial Photo of Map Route Options (Following Page)


Herning Circuit Route Study
MEA
MATANUSKA ELECTRIC ASSOCIATION
Dryden & LaRue, Inc.
CONSULTING ENGINEERS
Shaw Substation
Northern Route
Central Route (Palmer-Wasilla Hwy.)
Herning Substation
N1
Lazelle Substation
S1
Hospital Substation
N1
AKRR Route
EGS-Hospital
New Southern Route
Legend
WASILLA
EGS-Hospital Substation
Northside Pks. Hwy. Primary
Southside Pks. Hwy. Primary
New_Subdivisions
8-9-12
0
0.5
1
2 Miles

Northern Route Option (Bogard Road)





Description of Right of Way

This option starts at the Hospital Substation and then proceeds across mostly University of Alaska land on a newly established 100 foot wide right-of-way. The route then connects to an existing 115 kV transmission line with a distribution underbuild that runs the length of Bogard Road until it turns south on Lane Street where it then crosses the Parks Highway and connects to the Herning Substation. The existing 115 kV transmission line is mostly supported by 50 to 80 foot easements. However, there are several parcels that do not have easements or the easement is less than 40 feet. Most parcels will require the acquisition of additional easements to achieve a 100 foot wide right of way.

When the existing transmission line leaves Bogard Road it enters Lane Street and then crosses the Carrs Shopping Center parking lot. The transmission line is supported by a 100' wide easement through the Carr's property. The large steel poles in the Carrs parking lot are not able to support a second 115 kV circuit and replacing these poles would be costly.

The Parks Highway crossing is a short 2½ blocks from the intersection of Main Street and the Parks Highway, which is a major "choke point" on the Parks Highway. This intersection receives traffic from Bogard Road, the Parks Highway, Wasilla Fish-Hook Road and S. Knik-Goose Bay Road. The City of Wasilla is working on a major redesign of this intersection. The City of Wasilla does not want a new transmission line within the project boundary of Parks Highway/Main Street intersection.

The easements from the south side of the Parks Highway to Herning Substation are older blanket easements. Herning Substation is situated on a two acre unsubdivided parcel.

Department of Transportation and Public Facilities (DOT/PF) Utilities, Design and Planning Departments staff were interviewed regarding the viability of this option. The consensus opinion is that Bogard Road right of way is not recommended for a new transmission line as the road will require a major rebuild in the future. Further, the existing right of way is not sufficient to meet future transportation needs. DOT/PF may state in the Utility Permit that MEA is at risk for paying for the relocation of its facility should DOT/PF require relocation.

Construction and operation considerations

The cost of removing the existing transmission line, that also includes a distribution underbuild, adds considerable upfront cost. Continuing distribution service during construction is also a consideration. Ideally the new transmission line would be constructed prior to the existing line being removed. The existing line has many more years of service life that would be lost if this route option is

chosen. Replacing the existing transmission with a new transmission line would not add to the strength of MEA's transmission grid.

Rough order of magnitude of costs

Length of Project	12.9
Estimated Number of Parcels	150
ROW Acquisition Cost	$990,000
Construction Dollars	$6,115,000
Order of Magnitude Costs	**$7,105,000**

Findings

Positive aspects of this option are:

1) This is a physically possible option based on the existence of an existing transmission line.
2) Most of the alignment has existing easements,
3) Public is already accepts a transmission line in this location.

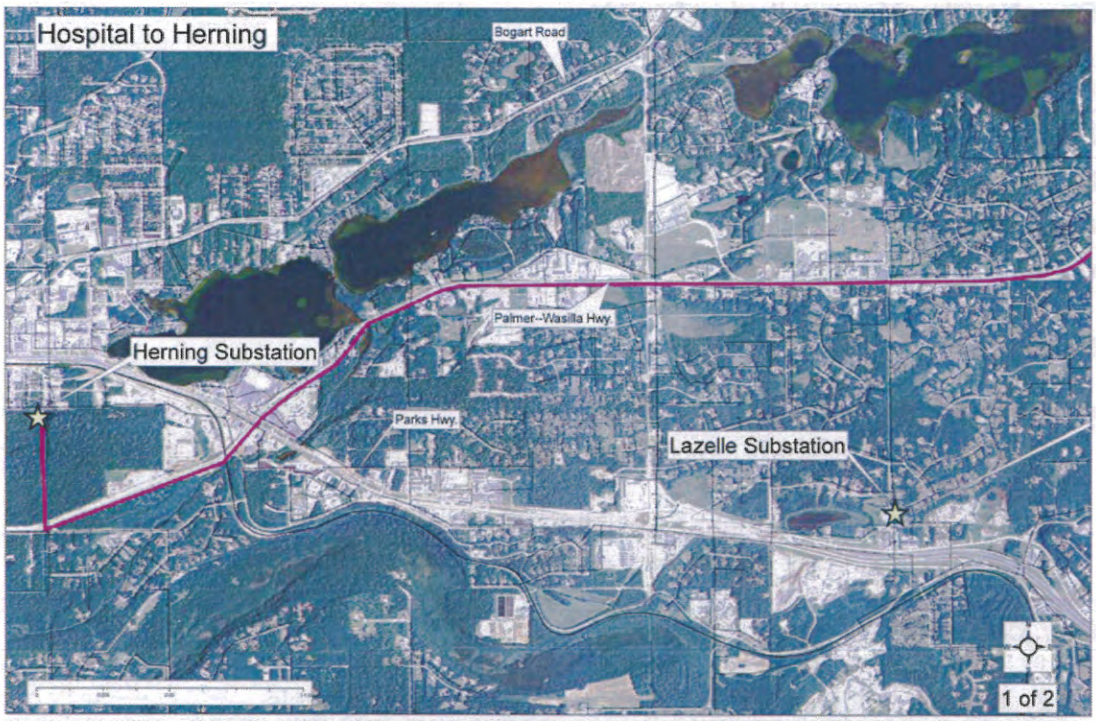
Detractions for this option are:

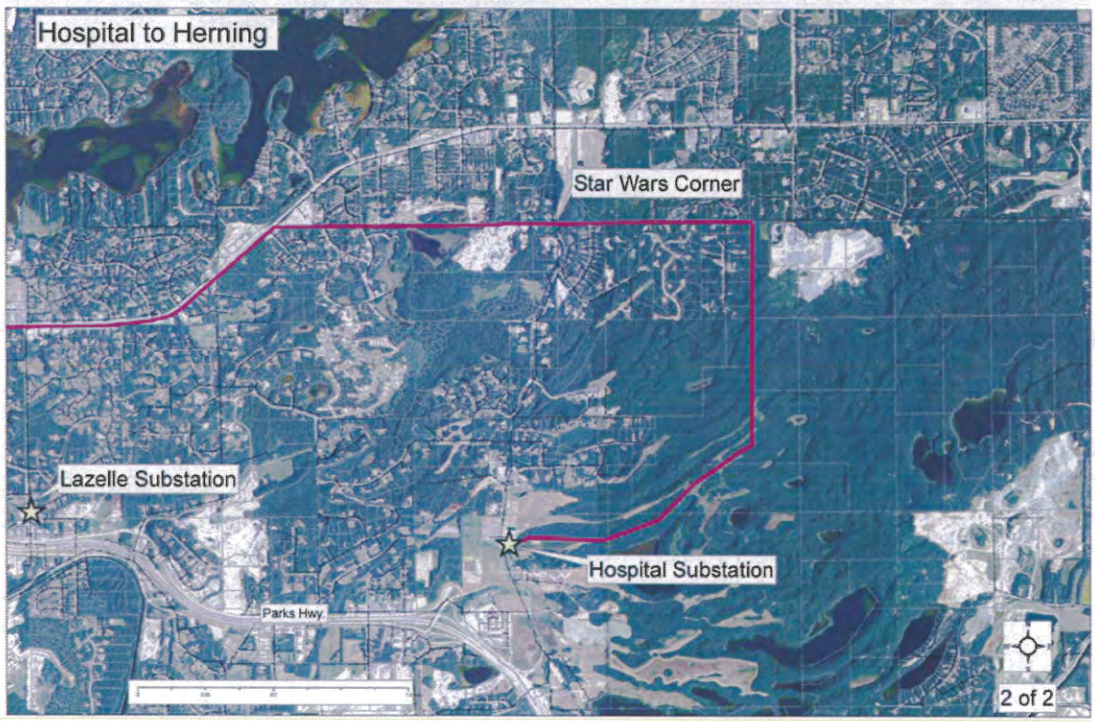
1) Cost to remove existing facility.
2) Need to acquire additional easements on most parcels.
3) Cost from loss of services and outages during construction.
4) Longest route of the four being considered.
5) MEA would lose the residual benefit from the remaining economic life of existing facility.
6) Does not contribute to strengthening MEA's transmission grid.
7) DOT/PF does not support granting a utility permit for a new transmission line for this option. DOT/PF may require MEA to relocate at MEA's cost within five years of construction.

Conclusion

The presence of the existing transmission line demonstrates that this route is constructible but would require the acquisition of additional easements on many parcels to establish a 100 foot wide right of way. The cost to remove the existing facility plus the cost of a new facility makes this option the most expensive to construct. Ultimately, this route is not recommended for a new transmission line because DOT/PF expects to reconstruct Bogard Road in the foreseeable future due to existing traffic counts. DOT/PF may require MEA to relocate at MEA's cost due to the limited availability of highway right-of-way.

Central Route Option (Palmer-Wasilla Highway)





Description of right of way

This option starts at the Hospital Substation and then proceeds across mostly University of Alaska land on a newly established 100 foot wide right-of-way. The route then connects to an existing 115 kV transmission line with a distribution underbuild at the 'Star Wars' intersection where it continues due west until it intersects with the Palmer-Wasilla Highway. The route then follows the Palmer-Wasilla Highway until it crosses the Parks Highway and becomes the Palmer-Wasilla Highway Extension. At Luke Street the existing 115 kV transmission line turns south toward LaZelle Substation. The line then becomes distribution with communication underbuild from Luke Street to the Parks Highway.

The existing MEA easements are for a distribution line and typically do not exceed 40 feet in width with many being only 15 feet wide. A significant number of additional easements will need to be acquired.

DOT/PF staff from the Utilities, Design and Planning Departments was interviewed regarding the viability of this option. The consensus opinion is that DOT/PF strongly opposes this option. DOT/PF is in the design phase to widen the Palmer-Wasilla Highway to three lanes with center two-way left turn only lane. However, traffic counts indicate the need for a four or five lane facility in the near future. The existing right of way is not sufficient to meet current design requirements. DOT/PF would require MEA to waive relocation rights as a condition of issuance of the utility permit.

The intersection of the Parks Highway and Palmer-Wasilla Highway is a major choke point. It is already heavily developed with commercial improvements. Right-of-way costs through this area would be significant. This intersection receives traffic from the Parks Highway, S. Knik-Goose Bay Road, Palmer-Wasilla Highway Extension and Palmer-Wasilla Highway. This intersection is scheduled for a major redesign and DOT/PF does not want a new transmission line within the project boundary of this intersection.

Construction and operation considerations

The cost of removing the existing distribution line adds considerable upfront cost. Ideally the new transmission line would be constructed prior to the existing distribution line being removed. Inadequate right of way will make design difficult. It will be time consuming and expensive to acquire the needed additional easements for a new transmission line. DOT/PF's scheduled reconstruction of the P-W Highway makes this option unworkable.

Rough order of magnitude of costs

Length of Project	11.3
Estimated Number of Parcels	75
ROW Acquisition Cost	$1,475,000
Construction Dollars	$3,858,000
Order of Magnitude Costs	**$5,333,000**

Findings

Positive aspects of this option are:

1) Public already accepts distribution and transmission lines in this location.

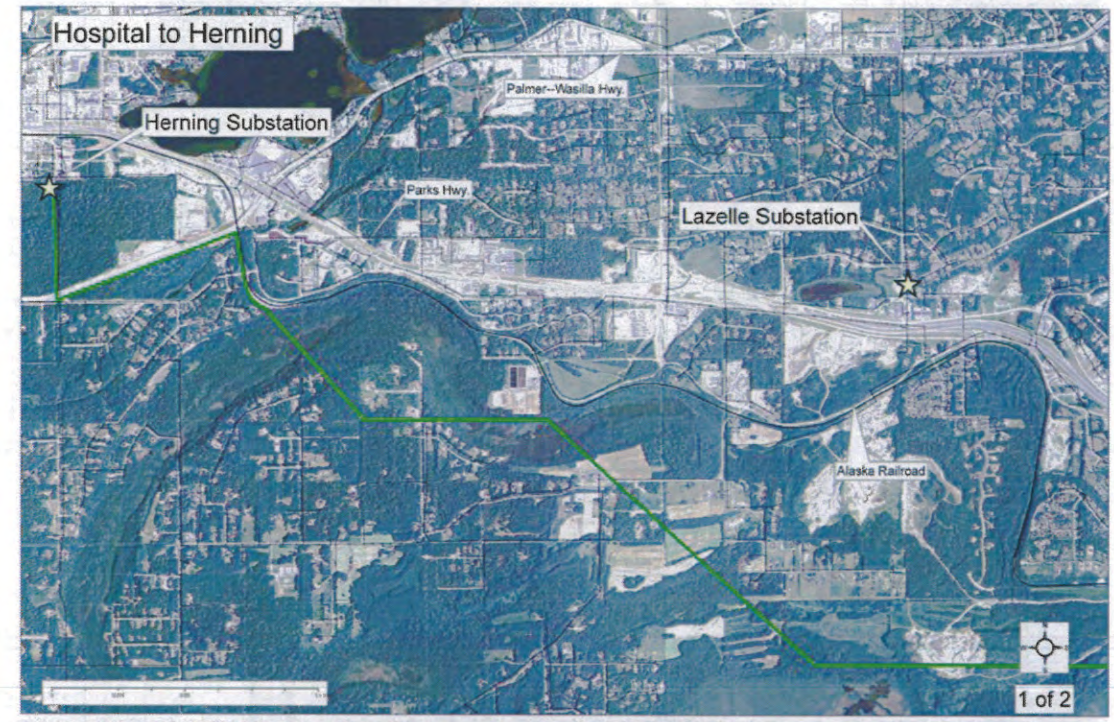
Detractions for this option are:

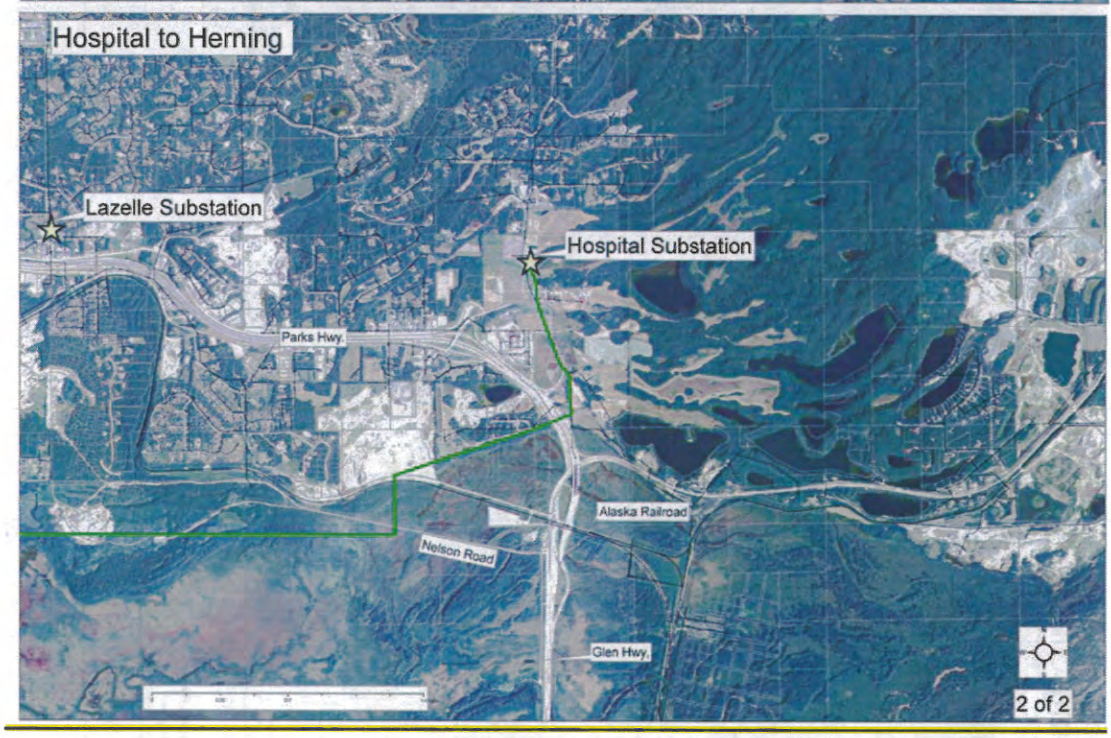
1) DOT/PF opposes granting a utility permit for this option due to near term reconstruction of the P-W Highway and its need to acquire easements for the reconstruction of the P-W Highway.
2) DOT/PF will require MEA to relocate at MEA's cost.
3) Cost from loss of services and outages during construction.
4) Existing MEA easements are not sufficient for a transmission line. MEA would have to acquire numerous expensive new easements.

Conclusion

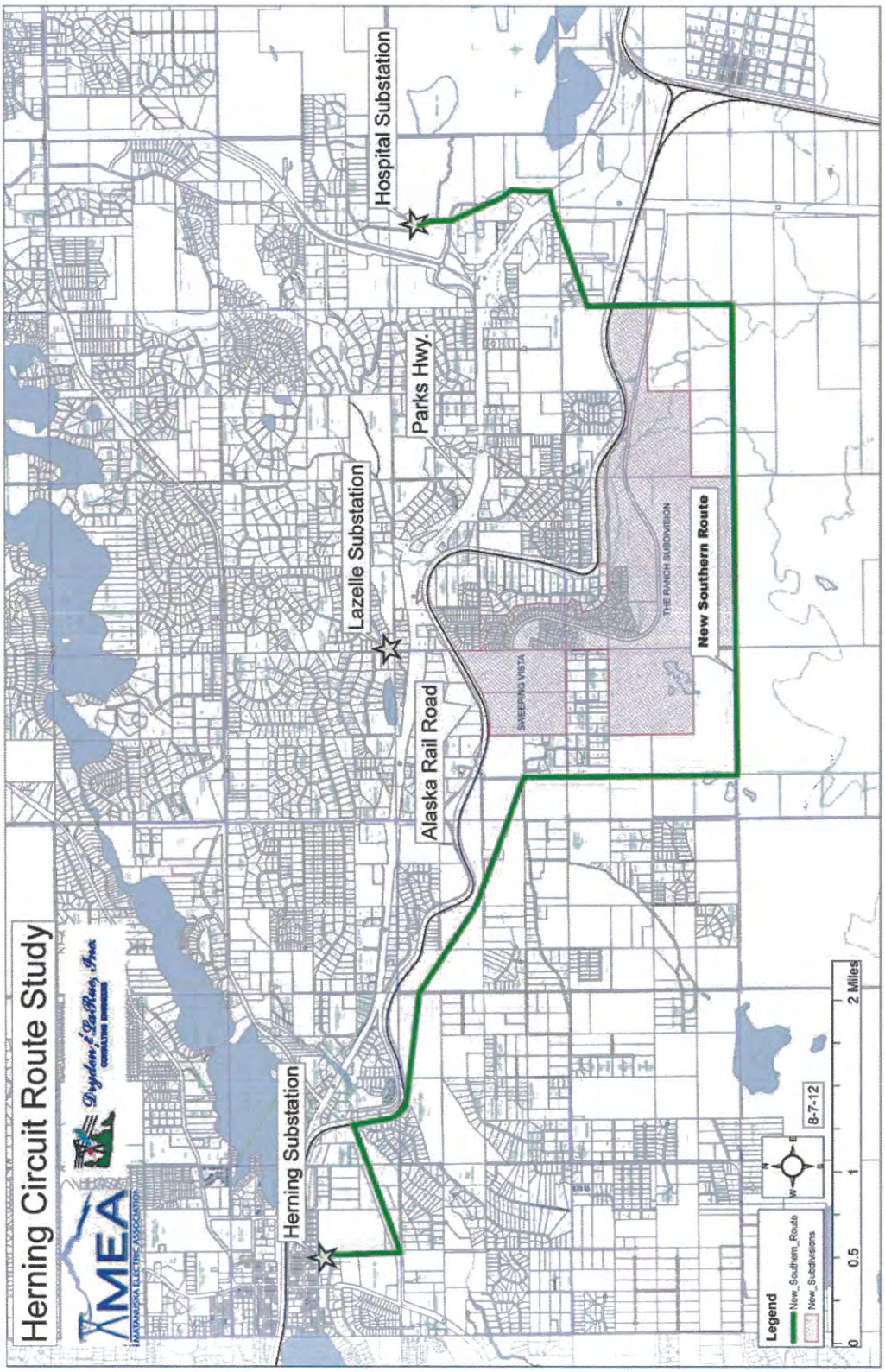
Palmer-Wasilla Highway has inadequate right of way to support DOT/PF's planned reconstruction project. As such, DOT/PF opposes this option for a new transmission line. DOT/PF would condition issuance of the Utility Permit on MEA waiving its right to relocation at DOT/PF's expense. This option poses a high risk of additional relocation costs to MEA in the near future.

Southern Route Option





Southern Route Option (Alternative)



Description of right of way

This option starts at the Hospital Substation and would then cross the Parks Highway on the southeasterly side of the Trunk Road. It will proceed southwesterly until it crosses Nelson Road and then proceeds westerly to the City of Wasilla sewer treatment plant, then west and northwest to the south side of the Alaska Railroad. It then follows the south side of the Alaska Railroad until it reaches the P-W Highway Extension where it stays on the south side until it intersects with the transmission line and connects to the Herning Substation.

The objective would be to accomplish the routing shown on the above aerial photo for this option. There are significant obstacles that make the proposed routing difficult to accomplish.

- The route would need authorization to cross the Palmer Hay Flats State Game Refuge in Section 22, T17N, R1E, S.M.
- This route would cross existing and proposed new subdivisions. The master plan for the 'The Ranch Subdivision' has been approved by the MSB Platting Board but is not yet recorded. The outline of this proposed subdivision is shown on the map above. There does not appear to be a functional route for a new transmission line requiring a 100 foot right-of-way through this subdivision.
- Acquisition of easements across lots within the approved master plan will affect numerous lots and may damage remaining lots and infrastructure and may possibly require revised platting, which will be difficult to accomplish in the next eighteen months.
- Of the five routes analyzed, this route has the greatest impact on residential properties. Residential properties along the ARR route will also be affected; but the existing railroad use and topographic features along the railroad will not result in the same level of impact as the southern route. The other three routes affect commercial or residential properties transitioning to commercial or higher density use.
- The construction component of this option is not cost effective assuming the need to acquire expensive easements through developed subdivision properties, especially with the numerous angle points that would require additional guy easements and more costly structures. Going around 'The Ranch Subdivision' will add a considerable distance to the line and place the line in wetlands on the south side of Nelson Road that would also increase the cost of construction.
- Existing and planned higher value residential development will take advantage of the views afforded by the undeveloped Palmer Hay flats State Game Refuge. View shed issues will impact negotiations for easements.
- Outside of the proposed subdivision areas, there are significant wetland areas that would require soil analysis and permitting by the Corps of Engineers. Construction through these wetland areas would be restricted

to the winter. Construction through these wetland areas may also be controversial. Portions of these areas will require flood plain permits.

Construction and operation considerations

Two construction objectives would be to minimize angle structures that require guying anchors and to avoid wetland areas that require special foundations significantly increasing construction costs and restrict access for maintenance. As shown on the above maps, in order to avoid existing or future subdivisions and follow road rights of way, maintaining long linear alignments will be difficult. Additionally, long segments of the alignment would need to be routed through wetland and flood plain areas. Foundations in wetlands and poor soil areas will be driven pipe piles, with the structure shaft either direct embedded inside with imported granular fill, or welded to the pipe pile. These areas will require winter construction unless existing roads are available for accessing the structure sites. In elevated areas where decent soils exist, the structures can be direct embedded into the ground without driven piles.

Rough order of magnitude of costs

Length of Project	8.4
Estimated Number of Parcels	44
R.O.W. Acquisition Cost*	$2,140,000
Construction Dollars	$3,566,000
Order of Magnitude Costs	**$5,706,000**

*R.O.W. cost avoiding the ranch subdivision. Crossing the subdivision would significantly raise the R.O.W. costs.

Findings

Positive aspects of this option are:

1) New circuit south of the Parks Highway would add strength to existing transmission grid.

Detractions for this option are:

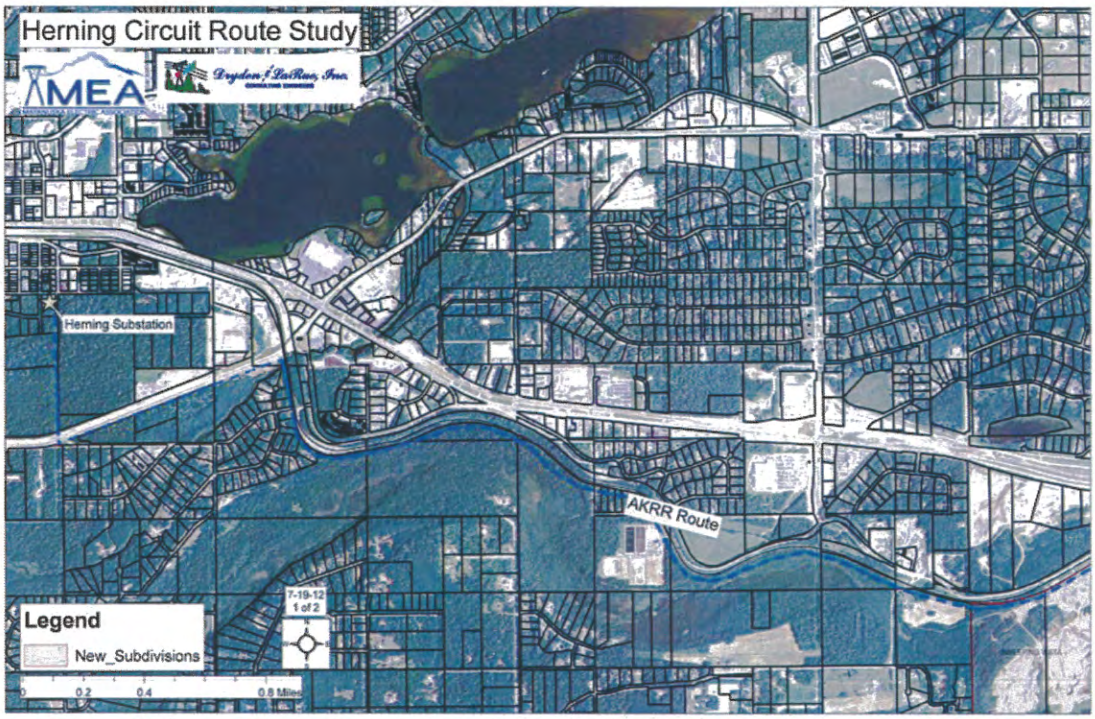
1) Need to route line past existing and new development. 'The Ranch Subdivision' noted above that has an approved master plan will quite possibly require the line to be routed past it adding significantly to construction costs. The wetland areas in Sections 20 and 29, T17N, R1E, S.M. where the line may need to be routed will also add to cost of construction.
2) All new easements and permits will be required.

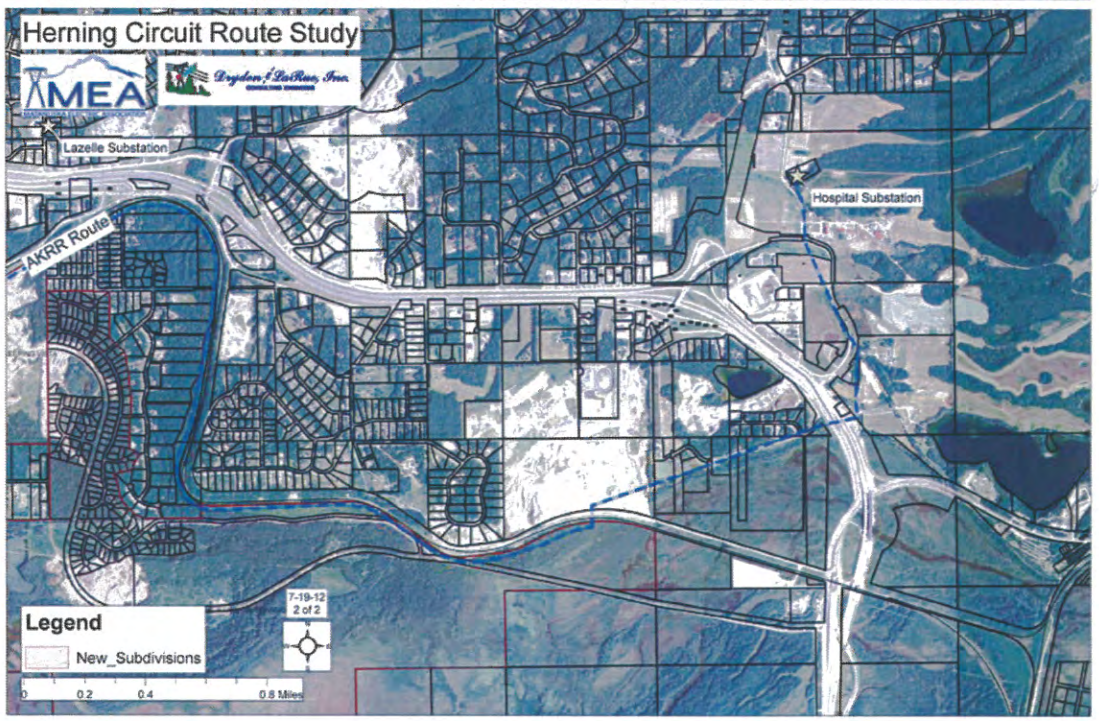
3) Length of time and cost to acquire new easements
4) Need for expensive angle structures if curvilinear segments are needed to route the line past subdivisions and stay within road right of way.
5) Placement of structures within wetland areas.
6) Impacts on viewshed.

Conclusion

This line segment needs to be constructed in time to transmit power from the Hospital Substation to the Herning Substation when the Eklutna power plant starts generating power in 2014. The issues involved with the acquisition of easements across The Ranch Subdivision may delay completion of the line in the required time frame. Routing the line around The Ranch Subdivision will add a considerable distance and would place the line in wetlands. The lead time for design, right of way acquisition, permitting, viewshed issues and increased construction cost eliminates this route from primary consideration.

ALASKA RAILROAD (ARR) ROUTE OPTION





Description of right of way

The ARR has a 200 foot right-of-way to support its track and appurtenant facilities. The Alaska Railroad Corporation (ARRC) policy is for utilities to be located in the outer 10 feet of its right-of-way. Dryden and LaRue, Inc. staff met with ARRC engineering and real estate staff to discuss placing the line inside the ARR right-of-way. During this meeting it was additionally clarified that only poles would be allowed inside the ARR right-of-way. Crossings of the ARR need to be a clear span and no guy wires would be authorized inside the right-of-way. Marker balls are required at all crossings. An annual lease rate would also be charged by the ARRC, which will be substantial for the distance needed for a new transmission line. A typical lease rate formulate would be: (distance) (value of adjacent property) (10%). The ARRC adjusts its lease rates every five years.

ARR staff also confirmed that it desires to straighten parts of its alignment within this route option. The master plan of 'The Ranch Subdivision' shows a possible realignment of a section of the ARR. Funding for this work is not available at this time and there is not a projection on when the funding would be available for a realignment of the track. The future realignment of the ARR may also require MEA to relocate its transmission line at MEA's expense.

It is important to note that the ARR has many curves for the duration of the southern route. Transmission lines need to be guyed at angle points and there will be many such angle points along each curve. Guying significantly impacts construction and operation costs. The level of engineering design also increases. Easements to support the guy wires will need to be acquired from adjacent private property. The curvilinear route of the existing ARR alignment would also add a considerable distance to the transmission line for a southern route.

The ARRC policy to only allow poles in the outer ten feet of its right-of-way means that a double circuit facility will require easements on all adjacent private property. The cost of these easements would be $1,813,000.

Construction and operation considerations

Transmission lines need long straight lines to minimize the number of costly angle structures and guy wires. This option will require numerous angle structures and guy wires. Guy wires must be maintained on a regular basis adding to the cost of maintenance. Access to the ARR right-of-way is restricted. A long length of poles in the ARR right-of-way will require constant coordination with the ARRC for maintenance and operations.

Rough order of magnitude of costs

Length of Project	6.38
ROW Acquisition Cost	$1,813,000
Construction Dollars	$7,227,000
Order of Magnitude Costs	**$9,040,000**

Findings

Positive aspects of this option are:

1) New circuit would add strength to existing transmission grid.

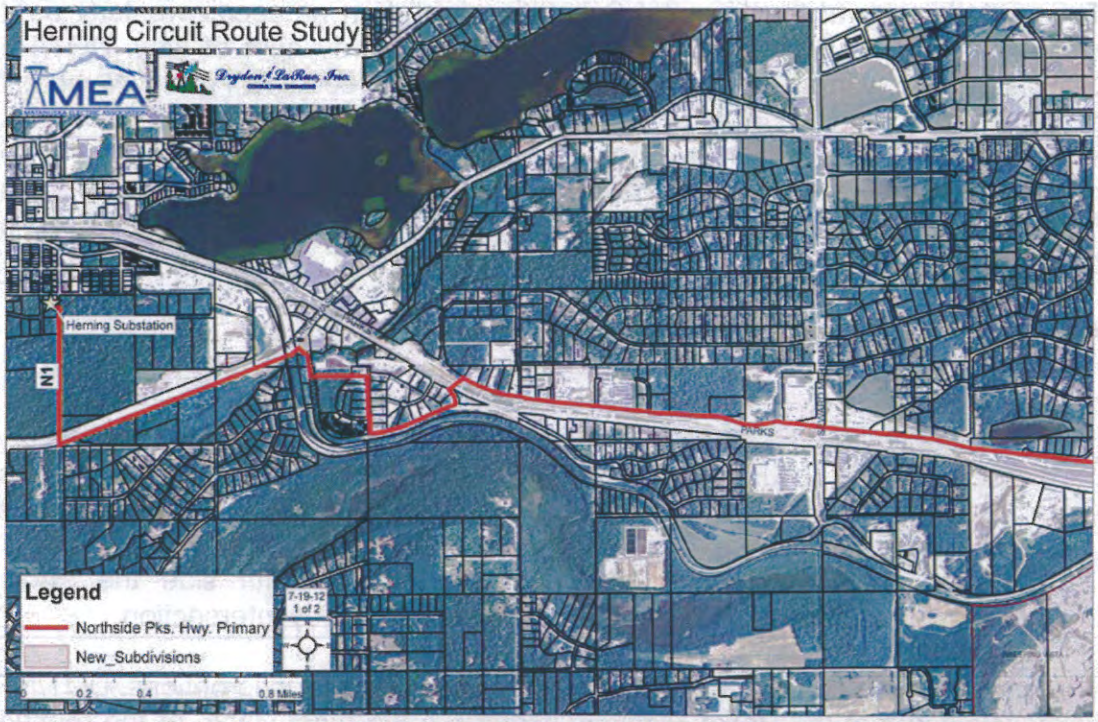
Detractions for this option are:

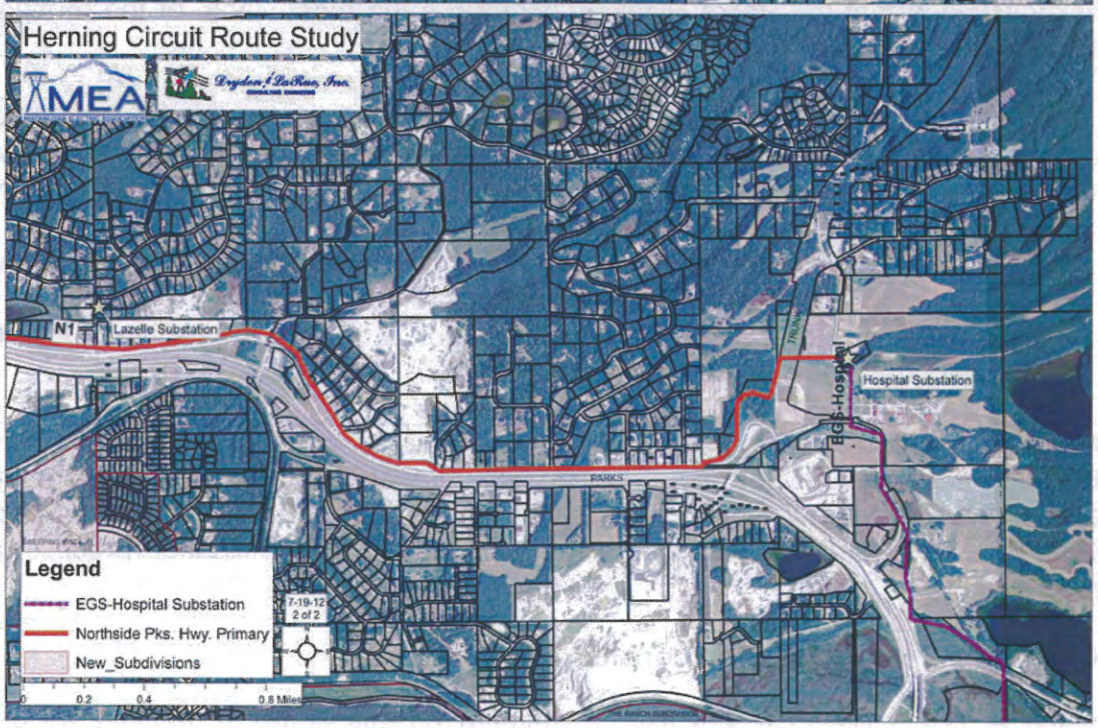
1) Longer distance resulting from curvilinear alignment of ARR.
2) Possible future alignment.
3) Annual ARR lease payment.
4) Cost of acquiring an easement for each guy wire
5) Cost of acquiring additional 50 foot wide easement adjacent to the ARR.
6) Increased construction and maintenance cost due to the many angle. points resulting from the curvilinear alignment of the ARR.

Conclusion

The initial high cost of construction plus the long-term maintenance and operations cost along with the annual ARR lease payment makes this option uneconomic. The added uncertainty of a future realignment of the ARR through 'The Ranch Subdivision' does not make this a viable option.

Parks Highway Route Option





Description of right of way

This option starts at the Hospital Substation and then proceeds westerly as it crosses the Trunk Road and enters the Parks Highway right of way. DOT/PF Utilities Section wants utilities located in the outer five feet of its right of way but if circumstances warrant will allow installation in the outer ten feet. Considerations for routing will be to minimize removal of existing distribution lines and to minimize radius that will require guying poles. As such, both sides of the Parks Highway will need to be reviewed to identify the optimal location of a transmission line.

Addressing the following obstacles may require special design:

1. Crossing the Hyer Road and Seward-Meridian intersections.
2. Accounting for the planned Parks Highway Alternative Corridor.
3. DOT/PF has requested that the line not extend into the Palmer-Wasilla Highway intersection area because of a planned redesign of this intersection.
4. Identifying an alignment after crossing to the south side the Parks Highway to connect with the Palmer-Wasilla Highway intersection.

Three meetings have been held with DOT/PF to discuss routing options. DOT/PF acknowledges that the Parks Highway corridor is the most viable of the routing options and it supports this option.

- The transmission line would be located in a newly constructed segment of the Parks Highway, as such; DOT/PF can issue a utility permit for a new transmission line and not be concerned about the need to relocate the line because of a change to the design of the highway.
- A preliminary review of the highway corridor indicates that there is room for a transmission line with minimal impact on other utilities.
- DOT/PF acknowledges that this segment of the Parks Highway is an appropriate location for a transmission line.

Meetings were also held with City of Wasilla staff and Matanuska Susitna Borough (MSB) staff. Both sets of local government staff supported this option after being briefed on the project alternatives. MEA will need to comply with MSB Chapter 17.05 Essential Service Utilities and the public participation process it requires.

Construction and operation considerations

Much of Parks Highway that will be affected by this option is designated as limited access highway. This means that MEA would not be able to access portions of the transmission line from the main road corridor for maintenance.

However, this concern is alleviated when the poles are adjacent to a frontage road.

Rough order of magnitude of costs

Length of Project	7.4
Estimated Number of Parcels	22
ROW Acquisition Cost	$795,000
Construction Dollars	$3,021,000
Order of Magnitude Costs	**$3,816,000**

Findings

Positive aspects of this option are:

1) DOT/PF supports this option and will work cooperatively with MEA to permit this option.
2) Most direct route.
3) Minimal private easement acquisitions
4) Most cost effective option.
5) Ability to construct in a short time period.

Detractions for this option are:

1) New utility permit from DOT/PF.
2) Some new private easements.
3) May require some expensive large steel poles in a limited number of locations.

Conclusion

The Parks Highway option presents a cost effective and do-able route that can be constructed in the time frame established by MEA to connect the Hospital Substation to the Herning Substation. The support of DOT/PF, City of Wasilla and the MSB for this option is an additional compelling reason to recommend this option as the preferred alternative.

Recommendation of Preferred Route Option for Right of Way Analysis and Design

Pursuant to D&L's February 7, 2012 proposal D&L presented its preliminary findings at an April 16, 2012 meeting with MEA.

	Northern Option Bogard Road	Central Option P-W Highway	Southern Option	Parks Hwy Option	ARR
Length of Project	12.9	11.3	8.4	7.4	6.38
Estimated Number of Parcels	150	75	44	22	138
ROW Acquisition Cost	$990,000	$1,475,000	$2,140,000	$795,000	$1,813,000
Construction Dollars	$6,115,000	$3,858,000	$3,566,000	$3,021,000	$7,227,000
Order of Magnitude Costs	**$7,105,000**	**$5,333,000**	**$5,706,000**	**$3,816,000**	**$9,040,000**

The Parks Highway is the recommended route option. The remainder of the project will focus on:

Task 2 - Comprehensive Routing Plan Drawings and Narrative: A plan describing how the circuit can be run along each section of the recommended option from the MHS to the Herning Substation will be developed. This plan will be of sufficient level of detail to illustrate pole placement, guy anchor placement and property boundaries on "E" sized engineering scale drawings.

Task 3 - Identify Easements/Rights of Way: Identify the necessary easements and rights of way on behalf of MEA for the above described Herning circuit and all required guy anchors.

Task 4 - Identify Land Use and Environmental Permits: Identify all land use and environmental permits needed for the recommended routing option, including, but not limited to DOTPF, ARRC, MSB, ADF&G, ADEC, COE, EPA, NPDES and SWPPP plans or permits.

MSB Chapter 17.05: Essential Service Utilities – Public Involvement Process

CHAPTER 17.05 ESSENTIAL SERVICE UTILITIES
17.05.040 TYPE II ESSENTIAL SERVICE UTILITY.

(A) All proposed Type II essential service utilities shall require a public involvement program in accordance with a public participation plan as submitted by the utility in all areas of the borough excluding the cities of Houston, Palmer, and Wasilla.

(B) Within 20 calendar days of receipt of the proposed public participation plan, the director shall provide the applicant with written acknowledgement of receipt of the plan, along with any recommendations concerning the proposed process. The public involvement program, at a minimum, must contain the following:

(1) Minimum requirements.

(a) the utility's public involvement program must comply with established state and federal guidelines governing the utility including adequate public notice, public process, public meetings, or public hearings;

(b) if no established state or federal guidelines apply to the proposed action, the utility shall follow its own utility board adopted guidelines for public notification and involvement;

(c) if there are no established state, federal or utility board adopted guidelines, the public involvement program will consist of the minimum requirements outlined in subsection (B)(2) of this section, Public Involvement; and

(d) if a state, federal or utility board adopted public involvement program is used, they must at least meet or exceed the minimum guidelines in subsection (B)(2) of this section, Public Involvement.

(2) Public involvement

(a) a minimum of one public meeting will be held by the utility and shall be held in an area central to the area impacted by proposed action;

(b) a minimum of one formal public hearing will be held by the utility later in the process to allow for formal public testimony. The public hearing will be held in an area central to the area impacted by proposed action; and

(c) notice of the public meeting and public hearing to occur a minimum of 15 days in advance of the public meeting or public hearing. The public notice will include:

(i) three notices in a newspaper of general circulation within the borough;

(ii) public postings in local areas such as libraries, public buildings, schools, stores, laundromats, lodges, on the

utility's website, and on the Matanuska-Susitna Borough's website, etc.;

(iii) public service announcements on local radio stations starting 15 days before the public meeting; and

(iv) mailings, as appropriate, including notification of all affected community councils.

(C) Implementation of the public involvement program shall commence within 120 days from the issuance date of written acknowledgement.

(D) Upon completion of the public involvement program elements, the applicant shall create and submit to the director a decisional document that describes how the public involvement program was implemented, the nature of public comment, the chosen course of action, timeline for construction, and the public's appeal process. Copies of all written public comments and an audio record, if available, shall be included in the decisional document.

(Ord. 07-076, § 2 (part), 2007)

17.05.050 DEFINITIONS.

"Type I essential service utility" means any above or below ground structures or facilities used for utility distribution including:

(1) "Electricity distribution" means medium voltage (less than 50KV) power lines, low voltage electrical substations and pole-mounted transformers; and low voltage (less than 1,000V) distribution wiring to provide service to individual customers; and

(2) "Service pipeline" means a distribution line that transports gas, oil, water, or sewage from a common source of supply to the meter set assembly or distribution endpoint to provide service to individual customers.

"Type II essential service utility" means any aboveground or below ground structures or facilities used for utility transmission including:

(1) "Electricity transmission" means high-voltage (50KV or higher) power lines, high-voltage electrical substations and pole-mounted transformers, and high-voltage distribution or transmission wiring; and

(2) "Transmission pipeline" means pipelines installed for the purpose of transmitting gas, oil, water, or sewage from a source or sources of supply to one or more distribution centers, to one or more large volume customers, or a pipeline installed to interconnect sources of supply. In typical cases, transmission lines differ from distribution lines in that they operate at higher pressures, are longer, and the distance between connections is greater.

PAGE

INTENTIONALLY

LEFT

BLANK