MANITOBA-MINNESOTA TRANSMISSION PROJECT

Clean Environment Commission Hearing

Manitoba Hydro

Introduction & Project Description
Engagement
Routing
Construction, Operations & Property
Methods
EMF
Socio-Economic Environment
Biophysical Environment
Environmental Protection Program & Conclusion

Maggie Bratland
James Matthewson
Jesse Glasgow

Application of the routing methodology and review of decisions

2

Scope

- Covered during January 19th routing workshop:
  - Routing methodology
  - How weightings and criteria were determined
  - How feedback from engagement was incorporated into models
- Covered in today's presentation
  - Results and reasons for decisions taken
  - Route comparisons- why one was selected over another

3

Outline

- Background
- Overview and review of approach
- Decisions by round
  - Round 1 Border Crossing selection
  - Round 2 Preferred Route to the Border Crossing
  - Round 3 Final Preferred Route determination
- Final Preferred Route summary
- Conclusions

4

Goals of transmission line routing

Determine a route for a transmission line

Balance multiple perspectives

Limit overall effect

5

Integrated processes

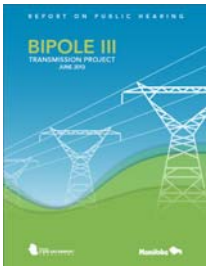
Engagement

Routing

Assessment

6

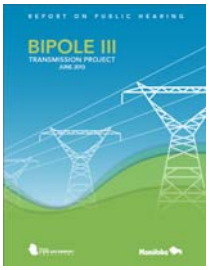
Lessons from past projects and experiences



Non-licensing recommendation 7.1 *Manitoba Hydro develop a more streamlined,* ***open and transparent*** *approach to route selection, making more use of* ***quantitative*** *data.*

7

Lessons from past projects and experiences



Non-licensing recommendation 7.2 : *Manitoba Hydro, in future, invite the potentially affected public and communities, including First Nations and the Manitoba Métis Federation, to* ***participate in the selection of alternative routes*** *and* ***route selection criteria*** *as well as in identifying baseline studies.*

8

EPRI-GTC Siting Methodology

EPRI ELECTRIC POWER RESEARCH INSTITUTE GeorgiaTransmission

- Published in 2006
- Objective, inclusive & transparent
- Refined through hundreds of projects in multiple jurisdictions
- MMTP among most rigorous and transparent implementations

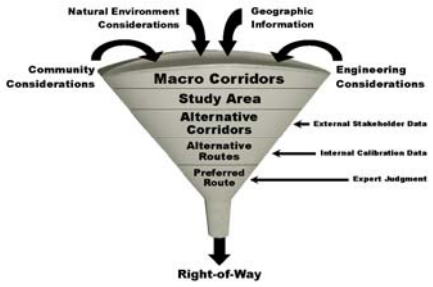
9

EPRI Methodology common themes

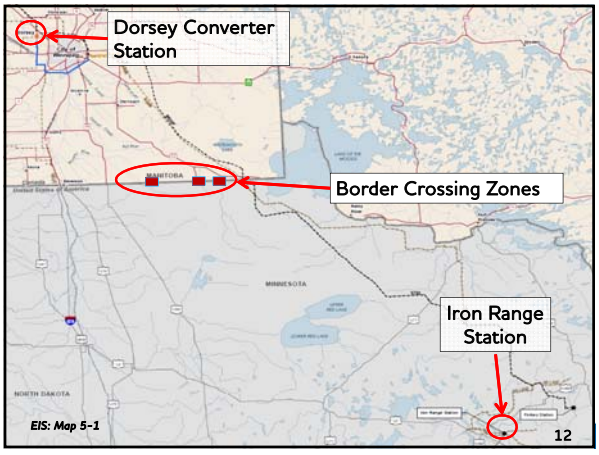
- Using a data driven objective process.
- Calibrate the Alternative Corridor model with external stakeholders
- Routing experts to identify alternative routes using the Alternative Corridors as a guide
- Internal experts calibrate the Alternative Route Evaluation Model
- Using the Alternative Route Evaluation Model to help identify the top routes.
- Leveraging internal expert judgment to calibrate the Preference Determination Model (Expert Judgment Model).

10

Corridor analysis funnel



11



Sequence of models

Planning	Macro Corridor Model
	Alternative Corridor Model
Evaluation	Alternative Route Evaluation Model (AREM)
	Preference Determination Model (PDM)

13

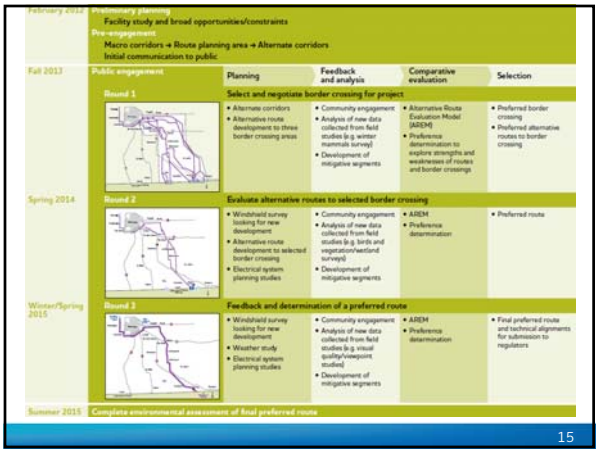
Teams

Management Team

Project Team

Engagement Teams | Discipline Specialists | Routing Consultant | Routing Team

14



15

Each stage of routing

16

Management of potential effects

- *Avoid* – The preference will always be to avoid an effect when possible;
- *Mitigate* –finding ways to limit the degree of potential effects posed when a specific impact cannot be avoided.
- *Compensate* –compensate for the effect or loss caused by a project.

Avoid effects that are difficult to mitigate or compensate.

17

Siting principles

- Avoid or limit effects to residences
- Avoid or limit environmental effects
- Utilize existing transmission facilities
- Parallel or follow existing linear developments
- Avoid or limit effects to recreational areas
- Avoid or limit effects to agricultural operations
- Consider length and cost of proposed facilities

18

Planning begins with corridors

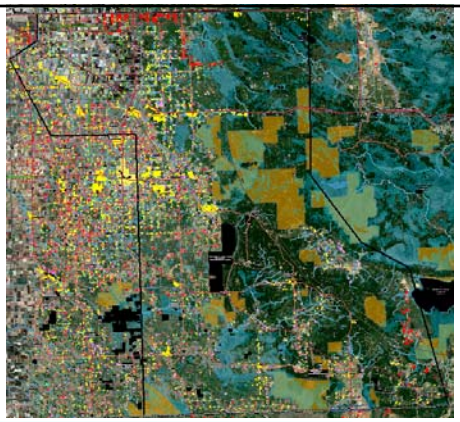
Alternative Corridor Model (ACM)

19

Route segment development

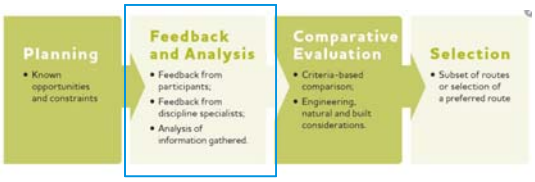
- Team approach with Engineering and Environment (built and natural)
- Planning considerations
  - based on alternate corridor models
  - technical and environmental constraints
- Developed segments not routes
  - To maximize routing possibilities

20



21

Feedback and analysis



22

Feedback and analysis

- Feedback from engagement programs
- Desktop research
- Field surveys
- Develop mitigative segments

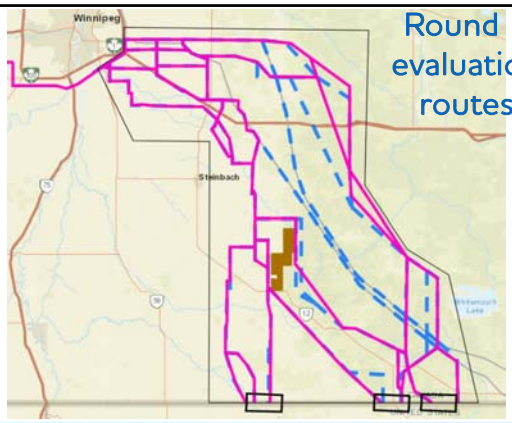
23

Mitigative segments

- Developed
  - In response to feedback / concerns
  - Direct recommendations
- Reviewed by Routing Team for viability
- Included in evaluation routes
- Evaluation Routes = planned routes + mitigative segments

24

Round 1 evaluation routes



25

Comparative evaluation

26

Route evaluation workshop

Alternate Route Evaluation Model (AREM)

- Whole route comparisons
- Metrics and perspectives

Preference Determination Model (PDM)

- Select a preferred option from a subset
- 3-5 routes considered

Decisions by project team

27

Alternative route evaluation

- How the model is used in the workshop
- Perspectives and statistics drive route comparisons
- Normalization allows apples to apples
- Only what is measurable

28

Preference determination

- Used to select a preferred route from a set of finalists
- Focuses on comparing these routes against established criteria
- Project team in workshop environment
- There must be a '1'
- Can be multiple '1's
- Lowest scoring = most preferred

29

Round 1

Determine a border crossing

30

Round 1

Planning

- Alternative segments developed to each border crossing
- Segments are planned across a variety of landscapes and land uses
  - guided by the alternate corridors
  - represent different tradeoffs
  - considered areas of least preference

31

Round 1

Feedback and analysis

- Fall of 2013 to Feb 2014
- PEP and FNMEP processes
- Ongoing discipline specialist research and data gathering
- Weather study
- Mitigative segments developed

32

Round 1

Border crossing determination

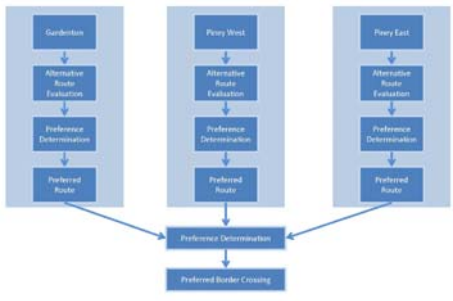


Figure 5-6 Round 1 Alternative Route Evaluation Flow Chart

33

Round 1

Finalists for border crossing selection

Route Finalist	Rationale
TC	Most preferred route to Gardenton
AQS	Most preferred route to Piney West
DKT	2nd most preferred Piney East route
EEL	Most preferred route to Piney East

34

Round 1

Border Crossing Preference Determination

Piney East	Weight	TC GARDENTON	AQS PINEY WEST	DKT PINEY EAST	EEL PINEY EAST
Cost	40 %	1	1.4	1.5	2.2
System Reliability	10 %	1	1	2.5	1
Risk to Schedule	5 %	1	1.5	3	2
Natural	7.5 %	1	1.5	3	1.5
Built	7.5 %	2.75	2.5	1	3
Community	30%	1	1	1	2
Total	100	1.13	1.34	1.60	2.02
Rank		1	2	3	4

35

Round 1

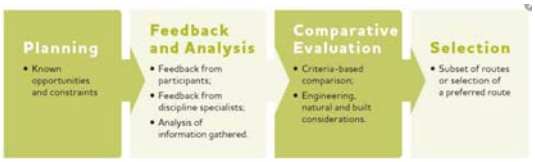
Border crossing determination

- Manitoba Hydro selected Gardenton
- Minnesota Power selected Piney East
- Compromised in selection of Piney West

36

Round 2

Determine a preferred route to the border crossing



37

Round 2

Planning

- Started with route AQS
- Added segments in the RVTC
- Added segments connecting RVTC to AQS
- Added segments to provide different balance of interests for further study and feedback

38

Round 2

Feedback and analysis

- April – August 2014
- Environmental field studies
- Additional windshield surveys
- Weather study finalized
- Mitigative segments developed

39

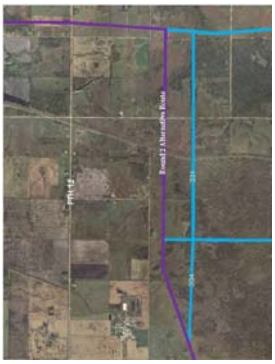
Round 2

- Proposed by landowners

40

Round 2

- Landowner constructing two homes



41

Round 2

- Developed by Routing Team
- In response to landowner and RM concerns

42

Round 2

- Developed by Routing Team
- In response to landowner concerns

43

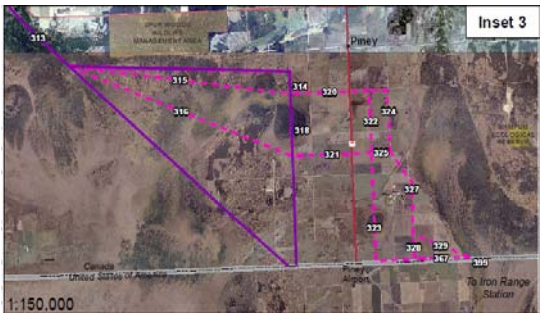
Round 2

- Developed by Routing Team
- In response to concerns from Manitoba Conservation

44

Round 2

- Border crossing adjustment

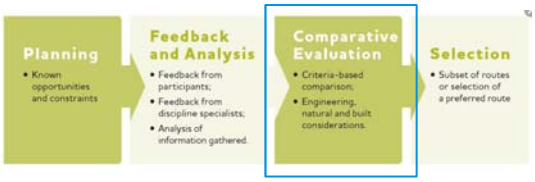


45

Round 2

Comparative evaluation

- Routing workshop



46

Round 2

Route finalists

Route Finalist	Rationale
URV	Top engineering route
URQ	Top natural route
SIL	Top scoring (simple average); included use of RVTC, parallel 230kV and travels west of WMA
AY	Top built route
SGZ	Top simple average route

47

Round 2

Preference determination

Criteria	Weight	URV West	URQ West	SIL West	AY East	SGZ East
Cost	40 %	1.02	1.04	1.04	1.06	1
System Reliability	10 %	1	1	1.5	1.5	1.5
Risk to Schedule	5 %	1	1	1	2	2
Natural	7.5 %	1.2	1	2.2	3	2.7
Built	7.5 %	3	3	2.7	1	2
Community	30%	2	3	1	2	3
Total	100	1.47	1.77	1.28	1.57	1.90
Rank		2	4	1	3	5

48

Interests and concerns

- **East** (AY/SGZ)
  - Less private and agricultural lands
  - More Crown lands with identified resource use and cultural value
- **West** (SIL/URV/URQ)
  - More private and agricultural lands
  - Less Crown lands

49

Balance of interests

- Community perspective scores reflect feedback
- Perspectives shared often conflicting
- Private in contrast to Crown lands

50

Round 3

Round 3

Determine a final preferred route

51

Round 3

Planning

- Adjusted offsets: property lines, existing t-lines, roads
- Updated data on building locations
- Address concerns of landowners
- Increase separation from homes

52

Round 3

Feedback and analysis

- January 2015 to April 2015
- Further data gathering
- PEP and FNMEP
  - Residential proximity
  - Fireguard 13
  - livestock operations (interference with operations and biosecurity)
  - private recreational users
  - Cultural and traditional land use

53

Round 3

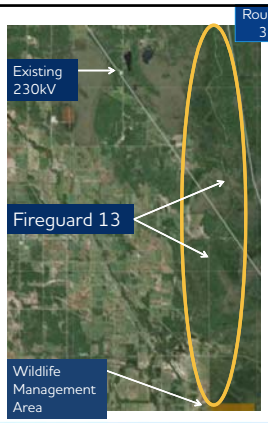
Mitigative segments

- Community concern
- Increase separation from homes

54

Round 3

- Fireguard 13 to avoid development near La Broquerie



55

Round 3

Mitigative segments

- Livestock operations
- Private recreational land use
- Forest fragmentation

56

Round 3

Mitigative segments

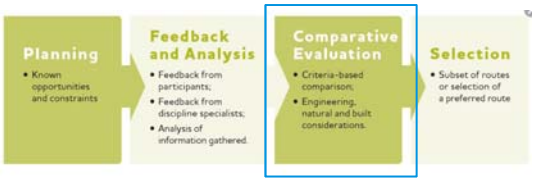
Figure 5-31 Segment 475 (blue line) was Created to Address Concerns Raised Regarding First Nations Traditional and Cultural Land Use on Privately Held Property

57

Round 3

Comparative evaluation

- Routing workshop



58

Round 3

Route finalists

Addresses concerns of:	BMX	BXP	BWZ	BMY	BOB
Town of LaBroquerie		✔	✔		
Village of Marchand	✔			✔	✔
Private Recreational Use	✔		✔	✔	✔
Livestock Concerns (biosecurity)	✔		✔	✔	✔
Landowner D				✔	
Forest and Habitat Fragmentation	✔			✔	✔
Important Species Habitat				✔	✔
Length, Reliability	✔			✔	✔

59

Round 3

Preference determination

	Weight	BMX	BXP	BWZ	BMY	BOB
Cost	**40 %**	1	1.02	1.02	1	1
System Reliability	**10 %**	1	1.5	1.5	1	1
Risk to Schedule	**5 %**	1	3	2.5	1	1.5
Natural	**7.5 %**	1.5	3	2.8	1	1.2
Built	**7.5 %**	2.9	1.1	1	3	3
Community	**30%**	2.5	2.5	2	1	2
Total	**100**	1.66	1.77	1.57	1.15	1.49
Rank		4	5	3	1	2

60

FPR selected

- Landowner D
- Livestock operations
- Private recreational land
- Crown land fragmentation
- Town of La Broquerie / Village of Marchand

61

Final Preferred Route

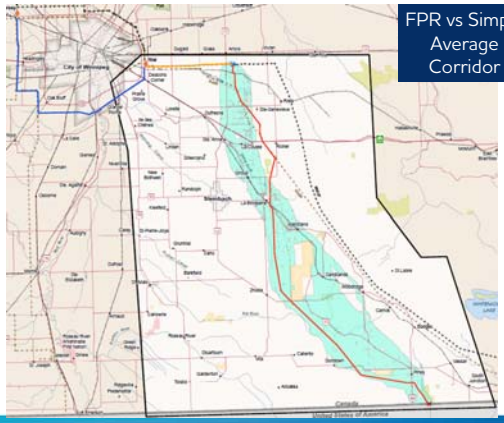
- 213km total length
- 92 km in existing ROW
- 121 km of new ROW
- Of the new ROW:
  - ~30% Crown owned
  - ~70% private owned
  - 500 hectares of clearing required
  - 126 private landowners

62

Final Preferred Route – review of siting principles

- Avoided or limit effects to residences
- Avoided and limited effects on intactness and wetlands
- Utilize SLTC and RVTC corridors
- Parallels existing 230kv Transmission Lines
- Avoided or limited diagonals on cropland, follows property lines
- Avoided or limited effects on recreational and traditional use areas
- Efforts to understand site specific land uses and mitigate concerns
- Planned with technical and local knowledge

63



64

Summary

- Stakeholder, public, FNMEP input early and often
- Criteria informed by feedback
- Data collection at every stage
- More quantitative information
- Team based evaluation and decisions
- Streamlined

65

CEC BPIII recommendations revisited

Recommendation	Result
Open	Opportunities for participation at multiple stages
Quantitative	Quantified input that can be difficult to measure
Transparent	Weightings and judgments shared
Streamlined	Consistent steps and process with whole route comparisons
Participation in selection of criteria	Routing workshops (ACM, AREM)
Participate in route selection	Mitigative Segments and Evaluation Criteria

66

Objectives reviewed

Determine a route for a transmission line

Balance multiple perspectives

Limit overall effect

67