

What is Multi-Objective Decision Analysis?

About MODA

Multi-objective decision analysis (MODA) is a process for making decisions when there are very complex issues involving multiple criteria, and there are also multiple parties who may be deeply affected from the consequences of the decisions.

Using MODA allows individual decision-makers to consider and weigh qualitative factors and trade-offs while evaluating each alternative.

The individual decision-makers then discuss the combined group results to help decide on a recommendation.

MODA steps:



Discuss and agree on evaluation criteria



Rank importance of each criterion
Develop weighting of each criterion



Score each alternative against each criterion

Criteria

During the July 18, 2012 meeting, the stakeholder advisory group decided to use the following criteria to analyze the route alternatives as they made their preferred route recommendation.

- *Least proximity to community land use areas* – The location of the transmission line in relation to schools, parks, homes, etc.
- *Least impact to mature vegetation* – The amount of mature vegetation that must be removed or trimmed for construction and operation of the transmission line.
- *Least proximity to critical and designated areas* – The location of the transmission line in relation to critical areas such as wetland, streams, steep slopes, designated view corridors, Native Growth Protection Areas and Transfer of Development Rights, etc.
- *Public support* - Public support for the transmission line route balanced against established comprehensive and functional plans adopted by both cities.
- *Opportunity areas* - The location of the transmission line in relation to the Kirkland railroad corridor, arterial streets (by classification or traffic counts), and existing utility lines/corridors.
- *Least proximity to commercial uses* – The location of the transmission line in relation to places of employment, businesses, stores, etc.

Weighting

Individually each stakeholder advisory group member ranked the importance of each criterion.

Individual ranking (example)

Criteria List	Value of Importance (1 - 6)	Total Value of Importance Score (all stakeholders)	Weighting Percentage (Starting Point)	Final Weighting Value
Least proximity to community land use areas	6	TBD	TBD	TBD
Least impact to mature vegetation	4	TBD	TBD	TBD
Least proximity to critical and designated areas	3	TBD	TBD	TBD
Public support	5	TBD	TBD	TBD
Opportunity areas	1	TBD	TBD	TBD
Least proximity to commercial uses	2	TBD	TBD	TBD
TOTAL				

In the second column (Value of Importance), please rank the criteria from 1 through 6 where 6 is the most important criteria and 1 is the least important criteria. (Please only use each number once). The third column represents the sum total value from all stakeholders, upon which the Prioritized List will be based. The fourth column (Weighting Percentage) is meant to provide a starting point for determining the Weighting Value to assign the criteria in the last column (Final Weighting Value).

The individual results were combined to develop weighting for each criterion.

Combined value of importance *Resulting weighting after discussion*

Criteria List	Value of Importance (1 - 6)	Total Value of Importance Score (all stakeholders)	Weighting Percentage (Starting Point)	Final Weighting Value
Least proximity to community land use areas		70	23.81%	23.81%
Least impact to mature vegetation		39	13.27%	13.27%
Least proximity to critical and designated areas		48	16.33%	16.33%
Public support		56	19.05%	19.05%
Opportunity areas		42	14.29%	14.29%
Least proximity to commercial uses		39	13.27%	13.27%
TOTAL		294	100.00%	100.00%

In the second column (Value of Importance), please rank the criteria from 1 through 6 where 6 is the most important criteria and 1 is the least important criteria. (Please only use each number once). The third column represents the sum total value from all stakeholders, upon which the Prioritized List will be based. The fourth column (Weighting Percentage) is meant to provide a starting point for determining the Weighting Value to assign the criteria in the last column (Final Weighting Value).

Scoring

Stakeholder advisory group members scored each alternative against each criterion. The scoring was based on how the stakeholder advisory group member felt the alternative met each criterion. The better the alternative met the criterion, the higher the points given.

Scoring Worksheets East of Interstate 405

Individual scoring (example)

Name:			
Sammamish-Juanita 115 kV Project	Route Alternative 1	Route Alternative 2	Route Alternative 3
Criteria List	Scoring	Scoring	Scoring
Least proximity to community land use areas	5		
Least impact to mature vegetation	4		
Least proximity to critical and designated areas	5		
Public support	5		
Opportunity areas	1		
Least proximity to commercial uses	3		
Total (Max of 30 points per alternative)	23		
<p><i>Please score each of the above concepts for each of the criteria based on the following scoring table:</i></p> <p>Scoring Key</p> <p>5 points = Exceeds the criterion</p> <p>4 points = Meets the criterion completely</p> <p>3 points = Mostly meets the criterion</p> <p>2 points = Mostly doesn't meet the criterion</p> <p>1 point = Completely fails to meet the criterion</p>			

West of Interstate 405

Name:		
Sammamish-Juanita 115 kV Project	Route Alternative 1	Route Alternatives 2 and 3
Criteria List	Scoring	Scoring
Least proximity to community land use areas		
Least impact to mature vegetation		
Least proximity to critical and designated areas		
Public support		
Opportunity areas		
Least proximity to commercial uses		
Total (Max of 30 points per alternative)		
<p><i>Please score each of the above concepts for each of the criteria based on the following scoring table:</i></p> <p>Scoring Key</p> <p>5 points = Exceeds the criterion</p> <p>4 points = Meets the criterion completely</p> <p>3 points = Mostly meets the criterion</p> <p>2 points = Mostly doesn't meet the criterion</p> <p>1 point = Completely fails to meet the criterion</p>		

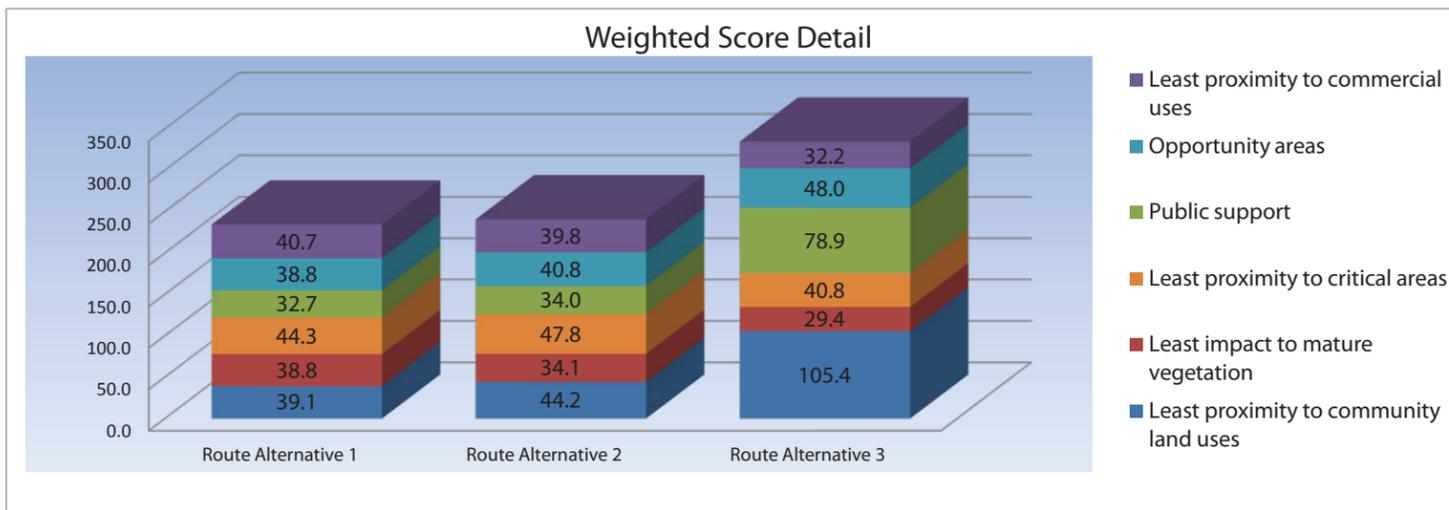
Scoring Results

The individual results were combined and weighted to develop the final scores.

Preferred Route East of Interstate 405

Weighted Score Results		Route Alternative 1		Route Alternative 2		Route Alternative 3	
Criteria List	Weight	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Least proximity to community land uses	23.81	1.6	39.1	1.9	44.2	4.4	105.4
Least impact to mature vegetation	13.27	2.9	38.8	2.6	34.1	2.2	29.4
Least proximity to critical areas	16.33	2.7	44.3	2.9	47.8	2.5	40.8
Public support	19.05	1.7	32.7	1.8	34.0	4.1	78.9
Opportunity areas	14.29	2.7	38.8	2.9	40.8	3.4	48.0
Least proximity to commercial uses	13.27	3.1	40.7	3.0	39.8	2.4	32.2
Total	100	14.8	234.5	15.0	240.8	19.1	334.7

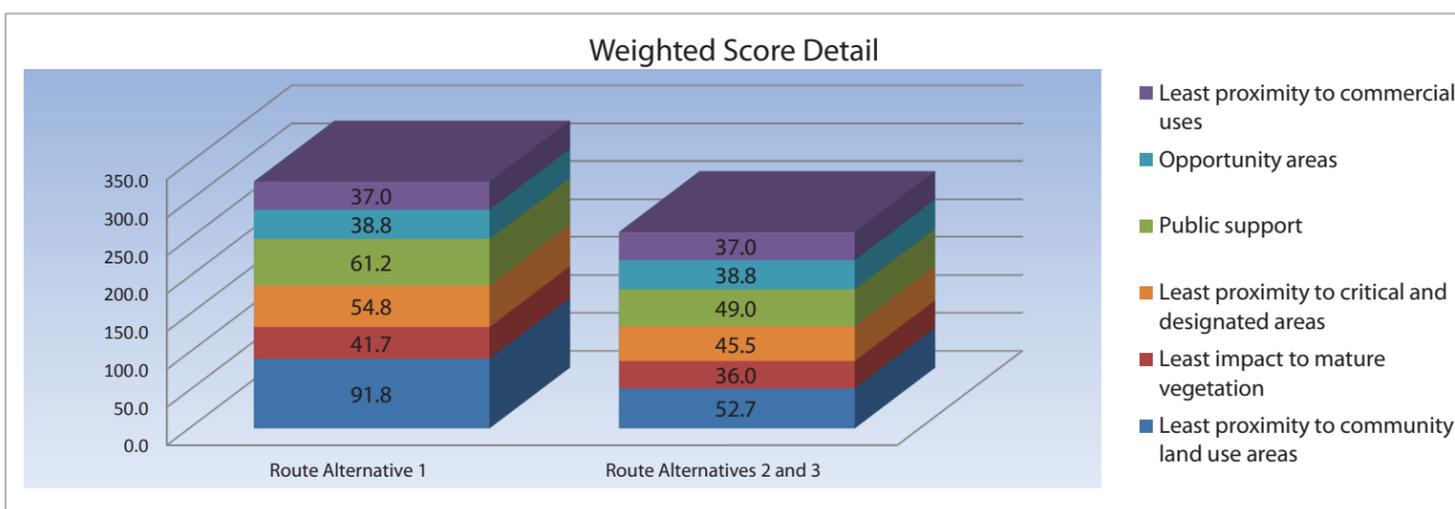
Final weighted scores



Preferred Route West of Interstate 405

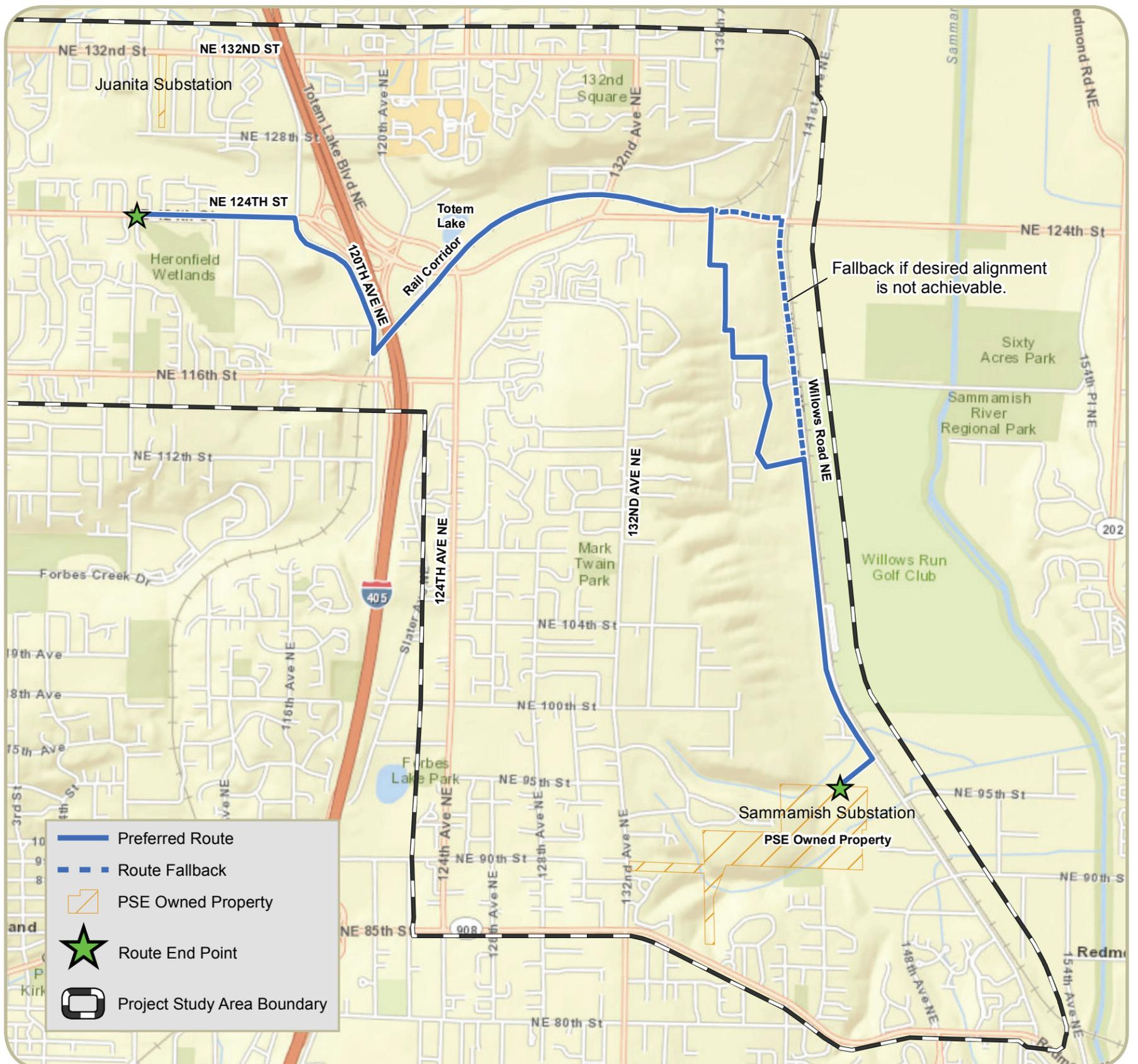
Weighted Score Results		Route Alternative 1		Route Alternatives 2 and 3	
Criteria List	Weight	Score	Weighted Score	Score	Weighted Score
Least proximity to community land use areas	23.81	3.9	91.8	2.2	52.7
Least impact to mature vegetation	13.27	3.1	41.7	2.7	36.0
Least proximity to critical and designated areas	16.33	3.4	54.8	2.8	45.5
Public support	19.05	3.2	61.2	2.6	49.0
Opportunity areas	14.29	2.7	38.8	2.7	38.8
Least proximity to commercial uses	13.27	2.8	37.0	2.8	37.0
Total	100	19.1	325.3	15.8	258.9

Final weighted scores



Stakeholder Advisory Group Recommendation

The stakeholder advisory group discussed the results and recommended the preferred route.



Note: A final alignment will be selected after public review, micrositing with property owners and further studies are completed.