

STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE SITE EVALUATION COMMITTEE
DOCKET NO. 2015-06

PRE-FILED DIRECT TESTIMONY OF CARL MARTLAND
ON BEHALF OF
NORTH COUNTRY SCENIC BYWAYS COUNCIL

FILED IN OPPOSITION TO THE APPLICATION OF NORTHERN PASS
TRANSMISSION, LLC AND PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE
D/B/A EVERSOURCE ENERGY
FOR A CERTIFICATE OF SITE AND FACILITY TO CONSTRUCT A NEW HIGH
VOLTAGE TRANSMISSION LINE AND RELATED FACILITIES IN NEW HAMPSHIRE

NOVEMBER 15, 2016

What is your name and what organization do you represent?

My name is Carl Martland and I am speaking on behalf of the North Country Scenic Byways Council.

What is the North Country Scenic Byways Council?

The North Country Scenic Byways Council (NCSBC) is responsible for developing and maintaining management plans for the scenic and cultural byways in northern New Hampshire. Members of the council represent communities served by the byways, state departments concerned with transportation and tourism, regional planning groups, and non-profit organizations that promote the use of the byways to reach the many attractions of the North Country of New Hampshire. NCSBC is a committee of the North Country Council, the regional planning agency for Northern New Hampshire. I am the chair of NCSBC and a member of the North Country Council's Board of Directors.

NCSBC is an intervenor in the SEC's review of the proposed Northern Pass Project, and I am testifying on behalf of NCSBC.

Why is NCSBC participating in this hearing?

The council believes that the proposed Northern Pass (NP) transmission line project will have an unreasonably adverse impact on the aesthetic qualities and cultural integrity of the North Country, which will harm the tourist-based economy and the orderly development of the region.

Do you have any professional experience that is relevant to the SEC's evaluation of the proposed Northern Pass Project?

I have extensive experience in evaluating major infrastructure projects and in teaching subjects related to project evaluation and infrastructure-based systems.

Can you provide some details concerning your professional experience?

I graduated with a BS in Mathematics from MIT in 1968. After serving in the U.S. Army, I returned to graduate school and received an MS in Civil Engineering and the professional Civil Engineer Degree in 1972. I was a member of the research staff in the Department of Civil and Environmental Engineering at MIT from 1972 until 2007, when I retired from my position as a Senior Research Associate and Lecturer. During my time at MIT, I supervised or co-supervised more than a hundred research projects related to the design, construction, rehabilitation, operation or maintenance of railroads, other transportation systems, and other infrastructure-based systems. As a consultant, I have worked on these same topics with all of the major U.S. railroads, many international railroads, and numerous state, local, and federal agencies both in the U.S. and abroad. I have authored or co-authored more than a hundred professional papers related to infrastructure-based systems, including many award-winning papers. In 1997, I was awarded the "Distinguished Transportation Research Award" by the Transportation Research Forum "in recognition of pioneering the planning and costing techniques that are now commonly used by many U.S. railroads."

During my time at MIT, I developed and taught courses at MIT on project evaluation, freight transportation, transportation systems, and engineering systems design. From 2002 to 2005, I co-taught “Sustainable Development of Large-Scale Infrastructure Systems,” a graduate subject within the Department of Civil Engineering at Cambridge University in England. In 2011, Wiley & Sons published my textbook “Toward More Sustainable Infrastructure Systems: Project Evaluation for Planners and Engineers.” In 2016, I published “Project Evaluation: Essays and Case Studies,” which is also based upon the project evaluation class that I developed and taught at MIT for more than ten years.

Have you submitted comments to the SEC or DOE concerning the proposed NP Project?

I submitted comments to the U.S. Department of Energy (DOE) and the New Hampshire Site Evaluation Commission (SEC) concerning the impact of the proposed NP project on property values and on scenic byways.

What is special about New Hampshire’s scenic and cultural byways?

New Hampshire’s scenic and cultural byways all have exceptional scenic and cultural qualities.

How does a road become a scenic and cultural byway?

They must be designated as a scenic and cultural byway by the New Hampshire Scenic and Cultural Byways Council.

What is the purpose of having designated scenic and cultural byways?

The purpose of the NH byways program is stated in RSA 238:19:

The scenic and cultural byways system is established to provide the opportunity for residents and visitors to travel a system of byways which feature the scenic and cultural qualities of the state within the existing highway system, promote retention of rural and urban scenic byways, support the cultural, recreational and historic attributes along these byways and expose the unique elements of the state’s beauty, culture and history.

Can you provide more detail about the criteria for being designated a scenic and cultural byway?

The New Hampshire Scenic and Cultural Byways Council is responsible for designating byways. According to RSA 238:22, all New Hampshire designated byways must satisfy various criteria, including the following:

- *Possesses significant visible natural or cultural features along its border such as agricultural lands, farms, significant architectural attributes, historic sites, town and city centers, museums, cottage industries, panoramic views, vistas of marshes, shorelines or forests, or notable geological or other natural features.*
- *Accessible to natural and cultural features such as cultural facilities, historic sites, town and city centers, trails, lakes, rivers, streams, mountains, the seacoast, bike paths, agricultural land, parks or protected lands that are open to the public, etc.*

- *Is free from intensive commercial development and obstructive signage that would detract from the principal reason for its designation.*

In general, how would the proposed Northern Pass transmission lines and towers affect scenic byways?

If the project were built above ground such that it crossed or was near a scenic byway, then views of towers and overhead transmission lines would qualify as “intensive commercial development and obstructive signage that would detract from the principal reason for its designation.” If the lines pass through the foreground of scenic overlooks, they would definitely detract from the “panoramic views, vistas of marshes, shoreline or forest, or notable geological or other natural features” that together support the designation of the byways as “scenic.”

What about burial? Would there be any long-term impacts if lines were buried under the pavement of a scenic byway?

Burial of the lines under the pavement of a scenic byway would not have any long-term aesthetic impact, although there would be some disruption to traffic and disturbance of the rural character of the byway during construction.

What about burial at the edge of the right-of-way of a scenic byway?

If the lines were buried at the edge of the ROW, then there could be adverse aesthetic impacts for users of the byways, as well as significantly adverse impacts on property values and quality-of-life for abutters.

Please elaborate. Why would burial off the pavement be so much worse than burial under the pavement?

Burial of the lines requires a trench that is only a few feet wide, and such a trench would easily fit under and eventually be covered by the new pavement when the project is completed. If the line is to be buried off the ROW, then it could require removal of trees and shrubs, destruction of stone walls, cuts into embankments or hillsides, and disturbance of wetlands. In many cases, the scenic value of a byway is based upon the rural character of a village or farm lands. Rows of tall trees, carefully sculpted landscapes surrounding old homes, views across stone walls all add to the experience of being on a byway. When the byways wind through portions of the White Mountain National Forest, travelers enjoy views of forests, streams, wetlands, and mountains. If the trees are cut down, if the gardens and shrubs in front of old farm buildings are destroyed, and if the stone walls are eliminated, then there will be a long-lasting adverse visual impact for residents and visitors who travel along the byways.

Could the aesthetic impact of burial be as great as the aesthetic impact of the towers?

At any given location, a close-up view of a steel-lattice tower would be much, much worse than what would be caused by clearing a right-of-way for a trench along the roadside. However, the effect of the burial could be something that causes problems at many locations, as the trench would parallel byways for many miles along the portion of the line that NP proposes to bury.

What region is served by the North Country Scenic Byways Council?

The portion of the state that includes and is to the north of Orford, Plymouth, Campton, Waterville Valley, and Conway.

Are there many scenic byways in this region?

Nearly all of the major state highways in the North Country have been designated as NH Scenic & Cultural Byways.

Which roads are designated as scenic byways in the North Country?

The region's byways include the following roads:

1. The Presidential Range Trail includes NH Route 302 from Littleton to Twin Mountain, US Route 3 from Twin Mountain to Lancaster, and NH Route 116 from Whitefield to Jefferson along with routes further south that go through Crawford Notch on NH Route 302 and then head north on NH Route 16 through Pinkham Notch (see Figure A1 in Appendix A).
2. The Woodland Heritage Trail includes US Route 2 from Gorham to Lancaster, US Route 3 from Lancaster to Groveton, NH Routes 110/110A from Groveton to Milan, and NH Route 16 from Milan to Gorham (Figure A2).
3. The Moose Path Trail extends from Gorham to Colebrook to Pittsburg to the Canadian border along NH Routes 16, 26, 145 and US Route 3 (Figure A3).
4. The River Heritage Trail has two loops in a figure eight configuration plus several scenic side trips (Figure A4). The northern loop goes north on US Route 3 from Plymouth to Franconia Notch, then on NH Route 18 to Franconia, NH Route 17 to Bath, and Route 112 back to Plymouth. The southern loop goes south on US Route 3 from Plymouth, then west on NH Route 25 to Haverhill, then north on NH Route 10 to Bath and returns via Route 25 to Plymouth. Other roads designated as NH Scenic & Cultural Byways that are connected to the River Heritage Trail include:
 - a. NH Route 116 from Franconia to Easton, which breaks the northern loop into two shorter loops.
 - b. NH Route 118 from North Woodstock to Wentworth, which breaks the southern loop into two shorter loops.
 - c. US Route 3 from Franconia Notch to Twin Mountain and NH Route 302 from Littleton to Twin Mountain, both of which connect to the Presidential Range Trail
 - d. NH Routes 25A and 25C, which are side trips off Route 25.
 - e. NH Route 49 from Campton to Waterville Valley
5. Prospect Mountain Road, which includes a scenic overlook on Route 3 in Lancaster as well as the road to the summit of Prospect Mountain in Weeks State Park.

Are there maps of the byways?

Yes. Please see Appendix A.

What is the role of the North Country Scenic Byways Council?

Our bylaws state that we are organized for scientific, community development, recreational, and educational purposes to:

1. Promote local businesses located along the byways;
2. Balance the promotion, preservation, enjoyment, and stewardship of the byways;
3. Encourage the public to investigate the resources of the byways;
4. Encourage that the byways be clearly marked, safe and attractive for both visitors and residents;
5. Encourage the many recreational opportunities along the byways;
6. Serve as the central point of contact for the state-designated byways and other scenic byways as adopted by the Council;
7. Serve as the responsible party in the development and implementation of corridor management plans for state-designated and other scenic byways as adopted by the Council.

How does filing this testimony fit in with these roles?

As stated in #4 above, one of our roles is to “encourage that the byways be ... attractive for both visitors and residents.” The proposed Northern Pass project would clearly detract from the attractiveness of the byways for both visitors and residents.

What is a corridor management plan?

According to state law, a corridor management plan must, as a minimum, include the following:

- *Identification and discussion of the intrinsic qualities of the byway.*
- *Current infrastructure conditions and maintenance plans for the corridor.*
- *Current types and volumes of traffic and safety concerns along the corridor.*
- *Identification of visitor amenities, needs and expectations along the corridor.*
- *Byway promotional plans.*

Do the North Country’s byways have Corridor Management Plans (CMPs)?

Yes. The NC SBC worked with NCC in 2014/2015 to develop CMPs for the four Trails. NCC received funds from US Department of Transportation and NH Department of Transportation for this project. The Prospect Mountain Road has a corridor management plan, but it is old and needs to be updated. In 2015, NCSBC assisted the North Country Council in the development of Corridor Management Plans for the four Trails. We will be working with the Town of Lancaster, Weeks State Park, and other state agencies to update the Corridor Management Plan for Prospect Mountain Road.

Have any North Country byways been de-designated by the NH SBC?

No.

Have any North Country byways been listed as possible candidates for de-designation by the NH SBC? If so, why?

Yes, the four major Trails were so listed because they lacked CMPS and they lacked an active corridor management entity. Now that NCC and the NC SBC have created CMPS and taken responsibility for the byways, the four Trails are no longer listed as candidates for de-designation. The Prospect Mountain Road, which was the state's first scenic byway, was listed for lack of an up-to-date CMP and an active committee, but these failings are being addressed.

Is the role of the byways limited to providing a nice route for an afternoon drive?

No, that is only part of their purpose. The state-designated scenic byways highlight routes for a pleasant afternoon drive, but they also provide visitors safe access to historical, cultural and recreational resources throughout the North Country. The byways lead visitors through the historic centers of old mill towns such as Whitefield, Lancaster, and Groveton; they guide visitors to beautiful rural villages such as Stark, Bethlehem and Rumney; and they bring visitors to the remaining 19th century resort hotels in Bretton Woods, Whitefield, and Dixville Notch. They lead hikers to trail heads, fishermen to trout streams, families to state park picnic areas, and tourists to restaurants, campgrounds, motels, and B&Bs. It is impossible to get to the scenic and cultural resources of the North Country without driving along the region's byways.

Are the byways the only scenic roads in the North Country?

Not at all! The byways provide access to local roads and byways that also have extraordinary scenic and cultural value. In fact, some of the local roads that are accessed from the scenic byways are in many cases even more rural, more scenic, and less touched by 20th century industrialization than the designated scenic byways themselves. Prime examples that would be affected by the proposed NP project include, but are not limited to the following:

- Halls Stream Road and Beecher Falls Road in Pittsburgh, which run through the highly scenic and historic area once known as the Indian Stream Republic. I was one of the members of the public who accompanied the SEC when it visited this area on March 7, 2016.
- Bear Rock Road, Harvey Swell Road, and Diamond Pond Road that provide access to Coleman State Park in Stewartstown and offer extraordinary vistas of historic farms, fields, valleys, and mountains. I was one of the members of the public who accompanied the SEC when it visited this area on March 7, 2016.
- The local roads in Stark, including the North Side Road that provides lovely mountain vistas across open farm fields and the access roads to Christine Lake and the Percy Summer Camps.
- North Road, Grange Road and Lost Nation Road between Groveton and Lancaster, which pass through beautiful farmlands and rolling hills.
- Access roads to Forest Lake State Park in Whitefield and Dalton.

It is not only the views and resources from the roadside that merit designation as a scenic and cultural byway, but also the views and resources along these roads and the many other side roads and backroads that connect to the byways.

Which of the North Country's byways would be affected by the proposed Northern Pass Project?

All of them. The overhead lines of the proposed Northern Pass Project would be visible from many locations along three of New Hampshire's scenic byways.¹ The overhead lines would cross these byways in eight locations:

1. Presidential Range Trail
 - a. Route 302 in Bethlehem (the overhead portion of the lines would transition to the underground portion of the line at a facility located immediately adjacent to Route 302)
 - b. Route 3 north of Whitefield
 - c. Rt. 116 northeast of Whitefield
 - d. Rt. 116 east of Whitefield at Hazen Road, which provides access to the airport and to Pondicherry Wildlife Refuge
2. Woodland Heritage Trail
 - a. US Route 2 southeast of Lancaster, and the lines be would clearly visible from the scenic overlook on US Route 2
 - b. NH Route 110 between Groveton and Stark
3. Moose Trail
 - a. NH Route 145 between Colebrook and Pittsburg
 - b. NH Route 26 in Millsfield between Dixville and Erol

The overhead lines would be visible from the overlooks on Prospect Mountain Road, the trails on Prospect Mountain, and the tower at the summit of Prospect Mountain. Since the only reason to drive along this short byway is to enjoy the view, the visual impact of the towers would be very important for this byway.

The proposed project would bury transmission lines along various portions of the River Heritage Trail, including NH Routes 18 and 116 in Sugar Hill, Franconia and Easton. Disruption to travelers during construction could be a major concern for this byway. The long-term visual impact would be minor if the lines were buried under the pavement, but there could be adverse impacts if the lines were buried off the pavement, as already discussed.

Are there other impacts of concern to NC SBC?

NCSBC is very concerned about the visual impact of the 40 miles of new right-of-way in Coos County, much of which would create a highly visible swath through a forested area. The lines and towers would be visible for many miles along the region's byways, and they would also have adverse impacts on views from historic town centers, hiking trails, farmlands, lakes, rivers and streams.

In short, the project as currently proposed will have unreasonably adverse aesthetic impacts on the scenic vistas, recreational opportunities and cultural resources that the New Hampshire Scenic and Cultural Byways program is intended to protect.

¹The lines would also be visible from Route 3 and Route 145 along the Connecticut River National Scenic Byway, which is managed by its own scenic byways council with representatives from both New Hampshire and Vermont.

How would the visual impact of the towers affect visitors, residents and potential home buyers?

If the project is constructed as proposed, then visitors to the North Country would suffer unreasonably adverse visual impacts as they drive along the scenic byways and as they visit the attractions and wild areas that can be found along the byways. Visitors would have repeated views of massive industrial structures in what they expected to be a rural or wild region little touched by 20th century industrial development.

For residents, the visual impact could be even worse, because many will see the towers every day as they drive along the byways every day to work or to town. Many of us have chosen to live in this region precisely because of its beauty that we experience every time we drive along the byways.

For those seeking a location for a vacation home or a retirement home, the construction of massive towers will generally make the region less attractive and will specifically destroy the scenic beauty of thousands of potential home-sites on or near the proposed route.

How do you know that the proposed towers will make the region less attractive for a vacation home or a retirement home?

My wife and I can speak from personal experience. We bought a second home in Sugar Hill in 1997 after spending a wonderful vacation in the North Country the previous summer. In 1996, we stayed in B&Bs in Littleton, Bethlehem, and Sugar Hill; we hiked the 4000-footers in Coos County; and we traveled the back roads of Littleton, Sugar Hill, and Bethlehem looking for a dream house – and we found our old farm house in Sugar Hill several hundred yards away from the Eversource lines. We purchased real estate in this general area because of the overall aesthetic qualities of the North Country; we purchased a specific site in Sugar Hill because of its beauty and its views of the Kinsman Range. We did not mind that we were near the power lines, because they were almost entirely invisible behind the tall trees of the forests in the valley below our house. We are among the many people who come to this region who are drawn by the mountains, the views, and the cultural integrity of the landscapes.

Do you have any evidence that construction of transmission lines would actually prevent people like you from buying property or building second homes near the right-of-way?

Yes indeed. When Sugar Hill was threatened by NP with the construction of seven miles of steel lattice towers, I conducted a thorough study of the real estate values along the existing ROW. I found that real estate values were lower near the ROW and I also found that real estate development was severely affected by the power lines.

What do you mean by “severely affected?”

I could not find a single house that was built after 1950 that has a view of the power lines. Only after the trees had grown high enough to block views of the lines did any property close to the lines get developed. The houses in these newly developed areas have all been sited so as to have very little or no view of the existing lines.

This research indicates that transmission lines have affected the orderly development of Sugar Hill. The effect of tall steel lattice towers as proposed for the NP project, would be much worse, because the massive tops of these towers would be visible even over the tops of 70-foot-tall trees.

Why are you using the term “unreasonably adverse” when describing the aesthetic impacts? Is this just your description, or are you using a term that has been defined by professionals who are experts in assessing visual impacts of power lines?

I am using a term defined by experts in visual analysis.

The visual impact of the proposed towers is well-documented in the draft Environmental Impact Statement (EIS) prepared for the federal permit review process. The EIS uses a well-defined methodology to assess the visual impact of the towers and transmission lines. The draft EIS indicates close-up views of the proposed towers would be “considered unreasonably adverse by a casual observer.”

How close is “close-up”?

According to the examples in the draft EIS, any view of a steel lattice tower that is less than 800 feet away would be unreasonably adverse.

Can you describe the methodology used in the draft EIS?

The methodology is based to a large extent on photo simulations of what the proposed towers would look like from 15 “key observation points” (KOPs) along roads, trails, and recreational sites. Experts in evaluating visual impacts quantified the visual impact of the existing and proposed towers by documenting what they termed the “contrast-dominance rating” for each photo. This rating varied from 0 to 45, depending upon the apparent size of the structures and the extent to which the structures contrasted with the surrounding environment. The rating is higher for taller, more massive, closer structures that are located in a less developed, more pristine location. If the contrast-dominance rating is greater than 35, then the visual impact will be severe, which the draft EIS indicates would “likely be considered unreasonably adverse by a casual observer” (Table 1).

Table 1 Visual Contrast-Dominance Rating (draft EIS, Table 3-1)

Contrast-Dominance Rating	Numeric Value Range	Description
Severe	36-45	The visual change is very large, and in sensitive settings is likely considered unreasonably adverse by a casual observer.
Strong	27-35	The visual change is large and is likely to be considered adverse by a casual observer, and depending on the sensitivity of the setting it may be considered unreasonable.
Moderate	18-26	The visual change is clearly noticeable to a casual observer, and is likely to be considered adverse.
Weak	9-17	The visual change is noticeable, but so small as to be considered unimportant.
Negligible	0-8	The visual change is likely to go unnoticed by a casual observer.

Were any of the photo simulations in the draft EIS of special interest for byways?

Yes. The photo simulations cover three situations of special interest to users of the scenic byways:

1. Views of towers at road crossings.
2. Views of a row of towers from a highway.
3. Views of towers from a scenic vantage point.

Can you provide details for a situation where the draft EIS indicated that a views of towers at a road-crossing would have an unreasonably adverse effect?

One of the simulations (KOP BT-1) showed a view of a tower where the proposed NP project crosses Route 302 in Bethlehem, which is part of the Presidential Range Trail. The photos are taken from a point approximately 500 feet away from where the line crosses this scenic byway. In the existing case, the wooden poles are 579 feet away, and the draft EIS rates the visual impact to be “moderate,” which is defined as “the visual change is clearly noticeable to a casual observer, and is likely to be considered adverse.” In the simulated case, a steel tower that is nearly twice as tall is located closer to the edge of the road, and the visual impact is rated as “severe,” which is defined as “the visual change is very large, and in sensitive settings is likely considered unreasonably adverse by a casual observer.”

Isn't this the location where the line would be buried?

Yes.

Doesn't that mean that the views at this particular location would no longer be adverse?

No. The line would be buried on the south side of the road, but there would be tall towers on the north side of the road. Moreover, the revised plan calls for the construction of a massive transition station at this location.

What would the effect be at other road crossings?

The views of steel towers would be similar at the any of the seven other locations where the lines of the proposed Northern Pass Project cross the state's designated scenic byways or any of the dozens of locations where the lines cross local roads that provide access to state parks, hiking trails, and other scenic and cultural resources of the region.

Since the North Country Scenic Byways Council considers any viewpoint along a scenic byway to be a “scenic setting,” we would consider the construction of a steel tower so close to the road to have an unreasonably adverse effect upon anyone driving along any of the byways hoping to enjoy scenic vistas. Moreover, repeated views of such towers would have a cumulative, unreasonably adverse aesthetic impact and create an overall impression of industrial intrusion into a region known for its outstanding natural beauty and its cultural and historical heritage.

Let's move on to the second type of impact of towers on scenic byways. Can you provide some details from the draft EIS that assess the visual impact of viewing a row of towers from a highway?

The draft EIS shows how someone driving up Interstate 93 in Woodstock would view a row of towers climbing over a hillside (KOP WD-3). Today, the wooden poles are mostly hidden below the tree line. The nearest visible structure is 2,666 feet away, and the visual impact is "moderate." In the simulated case, the much taller towers are visible from 1,391 feet away, and the visual impact is "strong", i.e. "the visual change is large and is likely to be considered adverse by a casual observer, and depending on the sensitivity of the setting it may be considered unreasonable" (as defined in the draft EIS; see Table 1 above).

Won't the line be buried in this area now that NP has revised its plan?

Yes.

How is this example still relevant?

The example can be used to document the visual impact of a similar view of a row of towers in any other location. For example, anyone driving along Route 3 from Whitefield toward Pittsburg on the Moose Path Trail would have repeated views of a row of towers running along a nearby hillside. Under these circumstances, the towers will be intrusive, not merely for a couple of fleeting moments, but for a half-minute or longer along each of several stretches of the road. For anyone seeking the beauty, solitude and rural integrity of the North Country landscape, such intrusions will be highly unwelcome.

The cumulative effect of coming across several such vistas when driving along a scenic byway and scenic side roads would be even more adverse and more unreasonable.

Does the draft EIS provide examples showing that views of towers from scenic vantage point would have unreasonably adverse effects?

Yes, there are four examples of Key Observation Points (KOP), which I have summarized in Table 2.

- The first KOP documents the impact of a row of towers crossing a valley, as seen from a vantage point high above the valley. This KOP is from one of two overlooks on the Prospect Mountain Road in Weeks State Park, a road that is itself a NH scenic byway located mostly within a state park that is an attraction for travelers on either the Presidential Range Trail or the Woodland Heritage Trail.² Even from a distance of more than a mile, the visual impact would be moderate (and therefore "likely be considered adverse") when a row of steel towers is added.
- The next KOP shows the impact of adding a transition station and a row of steel towers to an area where there currently are no transmission lines. The visual impact goes from zero to strong ("adverse and possibly unreasonable"). This site, which was visited by the SEC, is near where the proposed project would enter the country from Canada.
- The third KOP shows what a hiker or fisherman would see across Little Dummer Pond. Today, three structures are barely visible, but taller steel towers would clearly make a strong visual impact

² Weeks State Park was donated to the State of New Hampshire by John Wingate Weeks, whose estate was located on the top of Prospect Mountain. Visitors drive up the mountain to visit his home and to enjoy panoramic views of the North Country from the stone tower that he constructed at the summit.

at a distance of a third of a mile across the pond. Similar viewpoints would be seen from hiking trails and logging roads along much of the proposed new right-of-way from Stark to Clarksville.

- The fourth viewpoint shows the severe visual impact of a row of towers across a field from a location at the side of a road. Similar “adverse” or “unreasonably adverse” views would be inflicted upon locations up and down the proposed route, including the town roads in Stark, Northumberland, and Lancaster that provide interesting side trips for those traveling along the Woodland Heritage Trail. For these representative vistas, the average impact of the existing situation is “weak,” whereas the average situation for the proposed situation would be “strong”.

Table 2 Impact of Northern Pass on Views from Scenic Vantage Points

Location	View	Number of Structures Visible: Current & Proposed	Distance to Nearest Structure	Existing Visual Impact	Visual Impact of Steel Towers
Lancaster (LA-2)	View from ledge at Weeks State Park down toward lines crossing generally open area below	15 (34 proposed)	5,985 feet	13 Weak (Unimportant)	23 Moderate (Adverse)
Clarksville (CL-1)	Current view across fields toward forest and distant hills (no existing ROW)	0 (transition station plus 4 towers proposed)	1,450 feet	0 None	29 Strong (adverse, possibly unreasonably adverse)
Dummer (DU-1)	View across Little Dummer Pond toward ROW on side of ridge	3 (6 proposed)	1,756 feet	9 Weak (Unimportant)	29 Strong (adverse, possibly unreasonably adverse)
Deerfield (DE-1)	Lines crossing field and then over a small ridge from Nottingham Road	17 (24 proposed)	301 feet (325 proposed)	28 Strong (adverse, possibly unreasonably adverse)	42 Severe (Unreasonably Adverse)
	Average Impact			13 Weak	31 Strong

Are these four locations the only ones of concern for the Byway Committee?

No, they merely represent the kinds of adverse impacts people will have at numerous locations on and near the byways. The KOPs illustrate the impacts on typical views that can be seen at many different points along and near the scenic byways.

The proposed lines and towers of the Northern Pass Project would not only be visible for many miles along the byways, they would be seen again and again as visitors traveled along local roads to visit nearby attractions, including the historic town centers, hiking trails, farm stands, lakes, rivers and streams, and museums that justify the designation of a road as a NH scenic and cultural byway.

How can the results from the Key Observation Point analysis in the draft EIS be used to document the adverse impact of the proposed towers?

The draft EIS only included simulations for 15 points, but these 15 points represent the entire range of possible conditions, from zero impact if nothing is visible (CL-1, existing conditions) to the severest impact for someone staring at a tall steel lattice tower from less than 40 yards away (LI-4). As illustrated in the above examples, the contrast-dominance ratings for these 15 points could be applied to any similar situations at any point along the proposed route. Complete results of the KOP analysis can be found in Tables B1 and B2 in the Appendix to my pre-filed testimony.

What conclusion do you draw from the KOP analysis?

The proposed towers will have an unreasonably adverse aesthetic impact on byway users.

But aren't views already diminished by the existing transmission lines located in the proposed ROW?

The wooden poles are much less a problem than the proposed towers. In general, under existing conditions, the average visual impact is strong only when looking nearly straight down the ROW at a row of wooden structures. Distant views of a row of wooden structures are negligible or weak, while views from less than 1000 feet will have only a weak impact so long as the towers are mostly shielded by trees. The only severe impact cited by experts in the EIS is for a close-up view of an existing wooden structure.

When an additional row of taller towers is added, the average visual impact increases dramatically. All but three of the selected vistas from KOPs in the draft EIS have a strong or severe visual impact. The visual impact is severe in all seven instances where the nearest structure is less than 750 feet away, whether the view is toward a single nearby tower, a row of towers stretching left to right across the field of vision or a row of towers marching out into the distance. The visual impact can be strong ("adverse and possibly unreasonable") even if only a few towers are visible from a distance of nearly 2,000 feet (DU-1) or if several dozen towers are visible from a distance of more than a mile (LI-5).

Would you like to elaborate on your conclusion that the proposed towers will have an unreasonably adverse aesthetic impact on byway users?

Yes. DOE's KOP analysis supports several very important conclusions concerning the visual impact of the proposed Northern Pass Project on people using the North Country Scenic Byways:

- Visual impacts are likely to be "severe" for all locations where towers would be visible up to at least 750 feet from the line. According to DOE's definitions (see Exhibit 1 above), these impacts would be deemed "unreasonably adverse by a casual observer".
- Visual impacts are likely to be "strong" for all locations where towers would be visible from up to at least 1800 feet of the line. Such an impact would be deemed "adverse by a casual observer, and depending upon the sensitivity of the setting it may be considered unreasonable."
- Visual impacts may be moderate or strong even for distances up to two miles from the nearest tower. Even moderate impacts are "likely to be considered adverse" by a casual observer.

In short, the KOP analysis shows that the visual impact of the proposed towers would be "adverse" or "unreasonably adverse" for those people using the scenic byways to explore the North Country of New Hampshire. The strength of the KOP analysis is that it is based upon photographs taken from actual viewpoints that would be of interests to travelers on scenic byways, to hikers or fishermen, or to people considering renting or purchasing property for weekends, vacations, or retirement.

Is the KOP analysis the only study of aesthetic impacts in the draft EIS?

No. The draft EIS used the KOP analysis to document visual impacts at a small number of specific locations. A different methodology was used to estimate the overall visual impact of constructing a new line of towers.

Can you summarize that methodology?

That methodology considered the visual impact from roads as well as the overall visual impact for the region:

- The viewshed for the region was defined to be the area within ten miles of the proposed route where a viewer would be able to see some portion of the lines or towers.
- The viewshed for roads was measured as the miles of road from which a traveler would be able to see some portion of the lines or towers.
- The "visual magnitude" was an estimate of the objective impact of structures on a viewer, taking into account the size of the structures, the number of structures, and the distance to the structures. The visual magnitude was estimated on a scale from 0 (none) to 5 (very high). (p. 8-6 of the draft EIS).
- The "intrinsic visual quality" was an index of "the landscape's inherent potential for attractiveness, stemming from both landform and land cover classification" (p. 8-3). This index ranged from 0 for industrial development on flat land to 5 for such places as a mountain lake or forested mountains.
- The "scenic impact" took into account both the visual magnitude and the intrinsic visual quality, taking into consideration social concerns such as the "level of designation of a scenic resource, the

importance of scenery to the dominant activity, and the potential for visual exposure to area residents.” This was also an index that ranged from 0 to 5 for each point within the viewshed. (p. 8-5)

- The average visual magnitude and the average scenic impact were calculated for the viewshed of each alternative.

How did the draft EIS summarize the visual impact of the proposed NP project?

Table S-2 of the Summary of the draft EIS summarizes the visual impact of the proposed project by showing the net change in average scenic impact:

“The net change in visual resources is measured in comparison with the existing condition, Alternative 1, which includes the existing PSNH transmission line. The existing condition has a visual magnitude of 1.67 (Very Low to Low) and a scenic impact rating of 1.62 (Very Low to Low).” (p. S-18)

According to the Summary of the draft EIS, the visual impact of the project would be minor, as the proposed action would only increase the scenic impact to 1.79, which would still be “Very Low to Low.”

Do you agree with this assessment?

No. By only showing the average scenic impact, the draft EIS failed to show the large increase in the area that would be affected.

Are you saying that the draft EIS greatly underestimated the impact of the proposed towers? If so, why?

Yes. The draft EIS does not present a unified measure that takes into account both the increase in the size of the viewshed and the increase in the average visual magnitude.

How big a problem is this?

When the details of the analysis are examined, it becomes clear that the scenic impact would actually be much greater, as there would be an increase of 63% in the size of the viewshed for the entire project (Table 4-1) and an increase of 165% in the size of the viewshed in the Northern Section (Table 4-68).

How would you interpret the results of the analyses reported in the draft EIS?

The North Country Scenic Byways Council has recommended that DOE create an aggregate measure by multiplying the average visual magnitude by the area of the viewshed or the miles of road that are affected. When aggregate measures are used, the visual impact of the proposed project can clearly be seen to be much greater than what is shown by looking at the minor increases in average impacts.

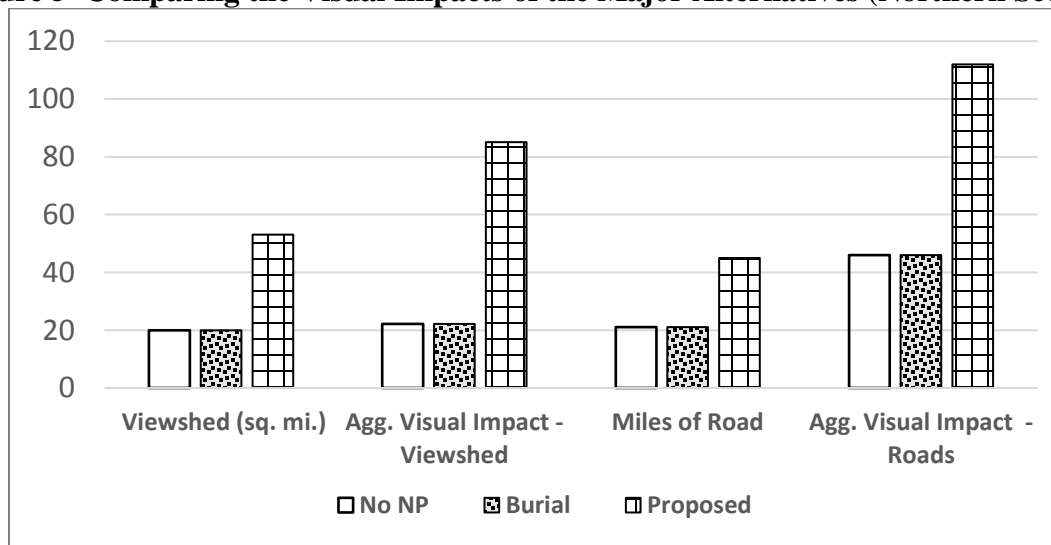
What are your greatest concerns?

The North Country Scenic Byways Council is naturally most interested in the effects of the proposed lines and rights-of-way on the Northern Section of the route, which includes all of Coos County and northern portions of Grafton County

What is the visual impact in this region?

When interpreted correctly, results from the draft EIS show that the visual impacts of the proposed Northern Pass Project would be very severe. Figure 1 shows that the proposed project would more than double the areas exposed to transmission towers and transmission lines; the viewshed would increase 165% from 20 to 53 square miles and the miles of roads exposed to the towers would increase from 21 to 45. The aggregate measures of visual impact would increase by an even greater amount. On the other hand, if the lines were buried, the visual impact would be negligible.

Figure 5 Comparing the Visual Impacts of the Major Alternatives (Northern Section)



The data you have presented is based upon the draft EIS, but NP has changed its preferred route since then. How should we interpret your results?

Although the route has changed in some locations, the route still follows the existing right-of-way (ROW) from Dummer to Bethlehem, and the impacts would be the same as reported in the draft EIS. For the new ROW further north, the specific locations that would be impacted will naturally change, but wherever you put tall, steel lattice towers in a 200-foot wide ROW you will have major visual impacts. Views of the towers will be found to be unreasonably adverse whenever and wherever anyone comes reasonably close to them. Any study of the visual impact of NP must take into account the larger area affected as well as the greater number of locations where the aesthetic impacts are unreasonably adverse.

How would you summarize your testimony?

I have three main conclusions:

1. The proposed towers will diminish the experience of those who travel along North Country Scenic Byways.
2. The proposed Northern Pass Project will hurt tourism and the orderly development of the North Country.
3. Burying the lines under paved roads or railroads would avoid negative visual impacts.

How will the proposed towers diminish the experience of those who travel along North Country Scenic Byways?

1. The visibility of major transmission lines from our scenic byways increases considerably. The draft EIS estimates that the proposed towers would be visible from 9 miles of scenic byways in the Northern Section of the route, whereas the much shorter wooden towers are now visible only from 3.4 miles of scenic byways.
2. Views will be adversely affected in locations with iconic scenic or cultural significance, e.g. Stark Village, Weeks State Park, and the site of the Indian Stream Republic in Pittsburg.
3. The aesthetic approaches to the historic town centers of Bethlehem, Whitefield, Lancaster, and Groveton will be marred by transmission lines and towers.
4. The lines will adversely affect hikers, fishermen, campers and others who would come across power lines or views of power lines as they move off the byways to places like Lost Nation Road, Forest Lake State Park, Coleman State Park, Little Dummer Pond and the trails to the back country.
5. Hikers who travel beside the back country's lakes and streams and climb to the region's many remote ledges, hillsides, and mountain tops will be exposed to multiple views of industrial towers in a region noted for its natural beauty and remoteness. Locations that would be adversely affected include the iconic vistas from the Percy Peaks and many miles of the Cohos Trail, which goes through the same valleys that would be used for the new right-of-way through Coos County.
6. Repetitive views of industrial towers will diminish the scenic beauty, cultural integrity and historical interest of the entire region.

Why is NCSBC concerned with these adverse aesthetic impacts?

The North Country Scenic Byways Council is concerned that unreasonably adverse aesthetic impacts will diminish the unique scenic and cultural resources of the North Country, which would be contrary to the spirit and mission of New Hampshire's scenic byways. We believe that there would be fewer people using the trails exposed to the towers, that there would be fewer people canoeing and fishing in lakes and waterways exposed to the towers, that there would be fewer visitors to the attractions and towns that will be hemmed in by towers, and that there will be fewer locations suitable for second homes and recreational development. Tourism is a major industry in the North Country precisely because of the rural character of the region, the pristine wildness of its back country, and the miles upon miles of scenic byways that wind throughout the region.

How will the proposed Northern Pass Project hurt tourism and the orderly development of the North Country?

Our byways will be diminished by the proposed project. Our tourist-related economy will be hurt by the project. The scenic beauty and rural integrity of our region will suffer from this project. While it may be difficult to quantify the effects of Northern Pass on tourism, it is clear that Northern Pass as currently proposed will mar a vast portion of the North Country for decades to come. The members of the Site Evaluation Committee must acknowledge the scope of the visual impacts, consider total rather than average visual impacts, and examine how environmental degradation affects recreational opportunities and the tourism industry within an area noted for its natural beauty. Tourism is a major industry in the North Country, and it is the quality of the environment that attracts visitors, bus tours, second-home owners, and retirees from across the US and from overseas.

The SEC cannot ignore the unreasonably adverse impacts of the towers on tourism and the attractiveness of the region for those seeking to purchase or build a vacation home or a retirement home. The KOP analysis indicates that views of the towers from within 1800 feet will be considered to be adverse or unreasonably adverse by the casual observer. Tourists traveling New Hampshire's scenic byways are much more than "casual observers," as they come to northern New Hampshire precisely because there is so much to be seen. Those who consider spending their weekends, vacations or retirement in New Hampshire will be much less willing to rent or purchase property where the views are "adverse or unreasonably adverse."

Would burying the lines avoid negative visual impacts?

The draft EIS indicated that burial of the lines is feasible from both a technological and an economic perspective, and Northern Pass confirmed this conclusion by proposing a different technology that can be buried for long distances. If it is possible to bury the lines in roadways around the White Mountains, then it should also be possible to bury the lines down Route 3 (or other roads or railroads) in the North Country. Burying the lines under paved roads or railroads would make it possible to obtain the economic benefits of the project without sacrificing the natural beauty and rural landscapes that attract people to the North Country via the region's scenic byways.

What happens if the lines are buried, not under the pavement, but at the outer edge of the right-of-way that may extend 25 feet or more from the center of the road?

If the lines are buried beyond the pavement at the edge of the ROW, then the project could diminish the aesthetic quality of the byways. Cutting down old trees, eliminating the natural landscaping by homes and fields, destroying stone walls, clearing sections of forests, and filling in land near wetlands are examples of activities that would diminish the aesthetic qualities of the byways.

What is your final conclusion?

In conclusion, the North Country Byways Council believes that the proposed Northern Pass project would have an unreasonably adverse impact on the scenic and cultural byways of Coos and northern Grafton Counties. Views of the towers where they cross the scenic byways and local roads would all be unreasonably adverse. The cumulative effect of multiple crossings, and extensive views of towers while

driving along the byways, and intensive views of towers from vantage points along and nearby the byways would all detract from the experience of those using these roads to enjoy the scenic and cultural resources of northern New Hampshire. The unreasonably adverse aesthetic impacts would persist for the life of the project, thereby disrupting the tourism economy and the orderly development of the North Country for decades to come.

Is there any evidence that Northern Pass officials would agree with this conclusion?

Yes. After Northern Pass reviewed the draft Environmental Impact Statement, the company decided to bury the transmission lines along 52.3 miles of state roads between Bethlehem and Bridgewater. All but three miles of this new buried portion were examined as part of possible alternative routes in the draft EIS. Mr. James Muntz, at that time the president of Northern Pass Transmission LLC, explained why they decided to bury the route in his letter dated April 19, 2015 to Mr. Brian Mills in the Office of Electricity Delivery and Energy Reliability in the U.S. Department of Energy. Mr. Muntz indicated that NP supported burial along these alternate routes because the overhead portion of the project would thereby:

“avoid some of the least developed portions of New Hampshire, where concerns about the visibility of the Project, particularly in and around the White Mountain National Forest, have been the greatest.

The additional three-mile segment, which was not part of any of the routes examined in the draft EIS, would:

“take the place of an overhead segment that ... would pass over one site listed in the National Registry of Historic Places (the Rocks Estate) and would be visible from another site that is eligible for listing (Baker Cabins). This additional three-mile segment is proposed to avoid potential impacts on these sites.”

In other words, Mr. Muntz and NP agreed that it would be better to bury lines through the least developed portions of New Hampshire, particularly near the White Mountain National Forest and sites of historical interest.

The overhead portions of the proposed Northern Pass Project pass through a region that is also extraordinarily scenic and even less developed than the region between Bethlehem and Sugar Hill. The proposed route is also close to the White Mountain Forest and other wild areas, and it is close to many sites and regions of historical and cultural importance. The same logic that Northern Pass cited in its decision to bury a long portion of the lines below Bethlehem should also apply to burial of the lines north from Bethlehem to the Canadian Border.

Appendix A – Maps of North Country Scenic & Cultural Byway

These maps are from the Corridor Management Plans approved in 2015. The Trails are highlighted in blue; other roads designated as scenic & cultural byways are shown in blue. Roads crossed out of the Moose Path Trail remain parts of other state or federal scenic and cultural byways.

Figure A1 Presidential Range Trail

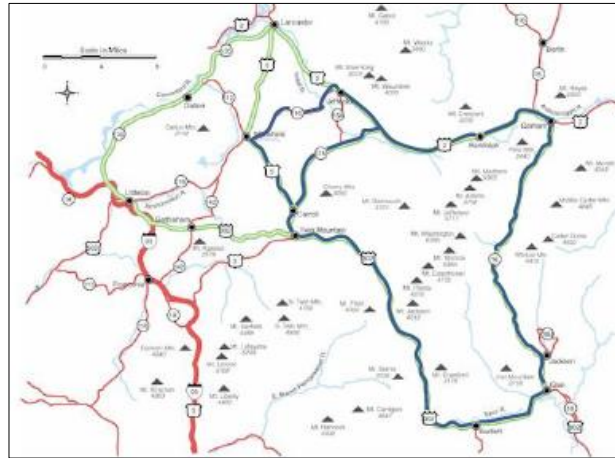


Figure A2 Woodland Heritage Trail

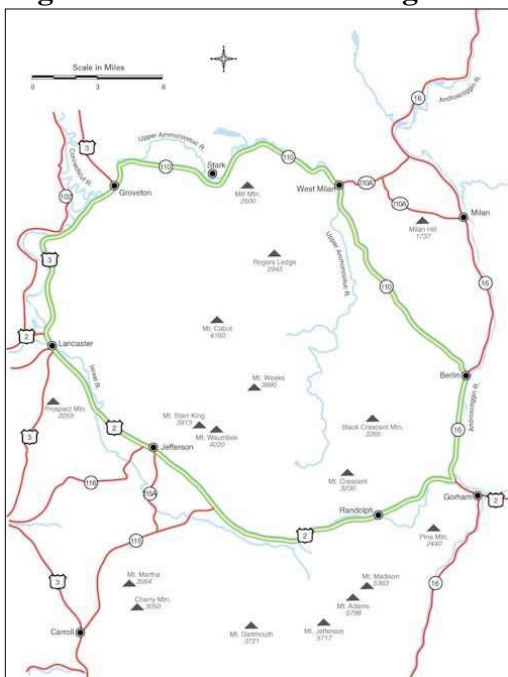
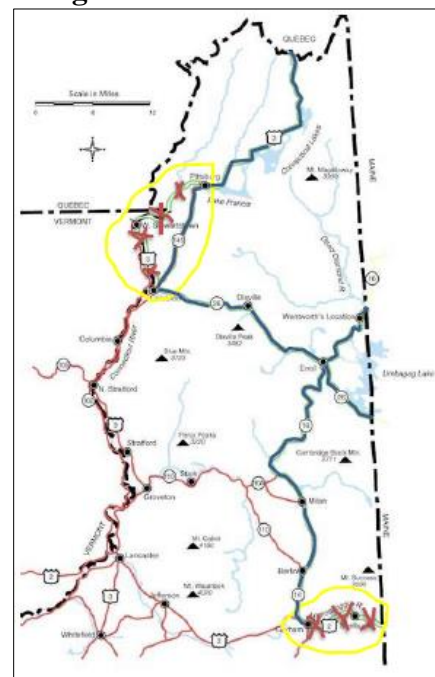


Figure 3 Moose Path Trail



A detailed map of Vermont showing its major road network, towns, and mountain peaks. The map is oriented with North at the top. Major roads are color-coded: red for primary routes (e.g., US-2, US-93, VT-100), green for secondary routes, and blue for tertiary routes. Towns are marked with black dots and labeled. Mountain peaks are indicated by black triangles with their names and elevations. The map includes a scale bar in miles (0 to 8) and a compass rose. The state's borders with New Hampshire to the east and Massachusetts to the south are shown. The map also depicts several rivers and lakes, including Lake Champlain to the west and Lake Umbagog to the east.

Appendix B
Consolidation of the Results of the Draft EIS's Analysis
of the Impact of Transmission Lines on Key Observation Points¹

Table B1 summarizes the visual impact of the existing transmission lines at 15 key observation points (KOPs). The average visual impact was found to be between weak and moderate. Table B2 summarizes the visual impact of the proposed transmission lines at these same 15 observation points. Because of the addition of much taller steel lattice towers, the average visual impact would be strong. By comparing the view from any point to a KOP with similar characteristics, it is possible to estimate the visual impact of existing or proposed lines using the methodology that was developed by experts in visual analysis for the US Department of Transportation.

¹ Source of data: details of KOP from Volume 2 of the draft EIS; contrast dominance ratings and qualitative interpretations from Sections 4.2.1, 4.3.1 and 4.4.1 of the draft IES.

Table B1 Visual Impact of Existing Situation

Location	View	Number of Structures Visible	Distance to Nearest Structure (feet)	Visual Impact
CL-1	View across fields toward forest and distant hills (no existing ROW)	0	-	0
Franconia (FR-2)	View from summit of Mt. Lafayette	6	34,443	7 Negligible
Dummer (DU-1)	View across Little Dummer Pond toward ROW on side of ridge	3	1,756	9 Weak
Lincoln (LI-2)	Driving north along Interstate 93 where it enters Franconia Notch State Park	5	10,491	10 Weak
Lancaster (LA-2)	View from ledge at Weeks State Park down toward lines crossing generally open area below	15	5,985	13 Weak
Campton (CA-1)	View to north at Exit 28, where existing ROW climbs Sunset Hill	4	758	16 Weak
Woodstock (WD-3)	Driving north along Interstate 93 just north of Exit 31 where towers climb across a ridge almost directly in front of viewer	6	2,665	21 Moderate
Concord (CO-1)	View of three rows of lines next to a shopping center	6	737	22 Moderate
Bethlehem (BT-1)	View across small pond where existing ROW crosses Route 302	2	579	24 Moderate
Concord (CO-4)	View from boat ramp across Turtletown Pond toward lines extending along shore	10	1,058	25 Moderate
Lincoln (LI-5)	View from Appalachian Trail near summit of S. Kinsman toward Bog Pond	25	9,320	25 Moderate
Deerfield (DE-1)	Lines crossing field and then over a small ridge from Nottingham Road	17	301	28 Strong
Woodstock (WD-4)	View along ROW where it crosses the Gordon Pond Trail	5	507	28 Strong
Easton (EA-3)	View from where ROW crosses Route 116 looking east toward Kinsman Ridge	7	129	32 Strong
Lincoln (LI-4)	Where the ROW crosses the Appalachian Trail at its intersection with the Reel Brook Trail, looking at the nearest tower	1	105	36 Severe
Average				18 Weak/ Moderate

Table B2 Visual Impact of Proposed Situation

Location	View	Number of Structures Visible	Distance to Nearest Structure (feet)	Visual Impact
Franconia (FR-2)	View from summit of Mt. Lafayette	16	35,412	11 Weak
Lincoln (LI-2)	Driving north along Interstate 93 where it enters Franconia Notch State Park	8	10,155	17 Weak
Lancaster (LA-2)	View from ledge at Weeks State Park down toward lines crossing generally open area below	34	5,981	23 Moderate
Lincoln (LI-5)	View from Appalachian Trail near summit of S. Kinsman toward Bog Pond	38	9,411	27 Strong
Dummer (DU-1)	View across Little Dummer Pond toward ROW on side of ridge	6	1,756	29 Strong
CL-1	View of new transition station at transition between towers and burial, across fields toward forest and distant hills	5	1,450	29 Strong
Woodstock (WD-3)	Driving north along Interstate 93 just north of Exit 31 where towers climb across a ridge almost directly in front of viewer	11	1,391	32 Strong
Concord (CO-4)	View from boat ramp across Turtletown Pond toward lines extending along shore	13	1,058	33 Strong
Concord (CO-1)	View of three rows of lines next to a shopping center	7	749	36 Severe
Campton (CA-1)	View to north at Exit 28, where existing ROW climbs Sunset Hill	12	649	37 Severe
Bethlehem (BT-1)	View across small pond where existing ROW crosses Route 302	3	509	40 Severe
Deerfield (DE-1)	Lines crossing field and then over a small ridge from Nottingham Road	24	325	42 Severe
Woodstock (WD-4)	View along ROW where it crosses the Gordon Pond Trail	10	502	41 Severe
Easton (EA-3)	View from where ROW crosses Route 116 looking east toward Kinsman Ridge	25	126	43 Severe
Lincoln (LI-4)	Where the ROW crosses the Appalachian Trail at its intersection with the Reel Brook Trail, looking at the nearest tower	1	117	44 Severe
Average				32 Strong

Appendix C

Visual Impact of the NP Project as Documented in the draft EIS

Various measures of the visual impacts for the Northern Region are presented in Table C1 for the region's viewshed and Table C2 for the region's roads. All of these measures come directly from the draft EIS.

Table C1 Landscape Assessment Impacts (from Draft EIS Table 4-68 and pp. 4-93 to 4-96)

	Alternative 1 No Northern Pass	Alternative 2 Proposed Project	Alternative 3 Burial in Proposed Right-of-Way	Alternative 4a Burial Along Route 3
Land Area in Viewshed (sq. miles)	20 sq. mi.	53 sq. mi.	20 sq. mi.	20 sq. mi.
Additional Land Area with High or Very High Visual Magnitude	-	6 sq. mi.	0	0
Average Visual Magnitude within Viewshed	1.25 (very low to low)	1.61 (very low to low)	1.25 (very low to low)	1.25 (very low to low)
Land Area with High or Very High Scenic Impact	0.7 sq. mi.	2 sq. mi.		
Overall Scenic Impact	1.11 (very low to low)	1.32 (very low to low)	1.11 (very low to low)	1.11 (very low to low)

Table C2 Roads-Based Analysis (from Draft EIS Table 4-69, pp. 4-94 to 4-96, and p. 4-117)

	Alternative 1 No Northern Pass	Alternative 2 Proposed Project	Alternative 3 Burial in Proposed Right-of-Way	Alternative 4a Burial Along Route 3
Miles of Roads within Viewshed	21	45	21	21
Miles of Designated Scenic Roads within Viewshed	3.4	9	3.4	3.4
Average Visual Magnitude within viewshed	2.18 (low)	2.49 (low to moderate)	2.18 (low)	2.18 (low)
Additional Overhead Road Crossings	N.A.	41	0	0

Table C3 shows how the aggregate measures of visual impacts can be calculated using data from Tables C1 and C2. The aggregate visual magnitude for the region (Table C3, row 3) is obtained by multiplying

the land area of the viewshed (row 1) by the average visual magnitude (row 2). For the existing situation (Alternative 1), the average visual magnitude is 1.11 and the aggregate is $1.11 \times 20 = 22.2$. For the proposed project, the average visual magnitude is 1.61 and the aggregate is 85.3. While the average measure increased only 45% from 1.11 to 1.61, the aggregate measure increased by 284% from 22.2 to 85.3. The right-hand column of Table C1 shows the incremental changes, which are obtained by subtracting the measure for Alternative 1 from the measure for Alternative 2. The incremental change offers another way of looking at the impact of the proposed Northern Pass Project on the North Country: in addition to the existing 20 square miles where the average visual impact today is 1.11, there would be a much larger area where the average visual impact would be 1.91, or nearly twice as bad. Rows 4 to 6 of the table show a similar analysis for the visual impact on roads. The length of roadways with views of transmission lines would more than double, from 21 to 45, and the aggregate visual impact would rise from 46 to 112, an increase of 143%.

Table C3 Aggregate and Incremental Visual Impacts on Viewsheds and Roadways

		Alternative 1 No Northern Pass	Alternative 2 Proposed Project	Increment
	Viewshed Measures			
1	Land area of Viewshed	20 sq. mi.	53 sq. mi.	33 sq. mi.
2	Average Visual Magnitude	1.11 (very low to low)	1.61 (very low to low)	1.91 (low)
3	Aggregate Visual Magnitude (Sq. mi. of viewshed x average visual magnitude)	$20 * 1.11 = 22.2$	$53 * 1.61 = 85.3$	$85.33 - 22.2 = 63.1$
	Road Measures			
4	Miles of Roads	21	45	24
5	Aggregate Visual Magnitude	$21 * 2.18 = 46$	$45 * 2.49 = 112$	66
6	Average Visual Magnitude	2.18 (low)	2.49 (low to moderate)	2.75 (moderate)