

benchmark

INTEGRATED PLANNING FOR COST-EFFECTIVE LINEAR PROJECTS

by Morris Perot

In simplest terms, linear projects cross the landscape to connect two or more points. Common examples of linear projects include electric transmission lines, gas and waterpipelines, fiber optic networks, roads, trails, etc., all of which have characteristically long and narrow project footprints. These linear footprints present a variety of challenges for developers because their routes pass through the natural and built environments and intersect with multiple landowners and regulatory jurisdictions. Developers of linear projects, therefore, need to navigate a complex mix of engineering, environmental, and permitting constraints. As discussed throughout this edition of the Benchmark, Kleinschmidt Associates has extensive experience with assisting clients to develop integrated solutions that balance the often competing demands of these constraints.



Kleinschmidt proudly announces the establishment of our newest subsidiary. Water & Willow provides comprehensive, design-build services for mitigation and stormwater management. See Page 5 for more information on how Water & Willow can save you time and money while creating lasting solutions that meet your needs and satisfy regulatory requirements.

Linear projects are expected to be a focal point in the energy industry during the next decade. Edison Electric Institute estimates that investor-owned utilities in the United States will spend nearly \$19 billion a year on linear transmission projects over the next 3 years.¹ Additionally, the Interstate Natural Gas Association of America estimates linear capital expenditures for natural

gas and oil projects in excess of \$10 billion a year through 2035.² The confluence of factors such as aging infrastructure, market demand for the large supply of natural gas being made available through hydraulic fracking, the need to enhance reliability by “hardening” the transmission network against storm damage, and increasing interest in bridging

the geographic disconnection between concentrated energy resources and areas of peak demand is driving these projects. Selecting the route for (often referred to as “siting”), engineering, and permitting linear projects can be daunting tasks because of the challenges inherent in crossing jurisdictional boundaries, avoiding sensitive environmental resources, and complying with state and federal regulations and permit requirements while maintaining engineering efficiency and an acceptable economic return on the investment. Despite the growing sense of urgency to complete new transmission lines and gas pipelines, lack of communication among the routing, engineering, and permitting departments often results in scope creep, increased costs, and delayed schedules.

Integrating routing, engineering, and permitting from the outset of a linear project can improve efficiency and save time and

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¹Edison Electric Institute. 2014. Actual and Planned Transmission Investment By Shareholder-Owned Utilities (2008–2017). http://www.eei.org/issuesandpolicy/transmission/documents/bar_transmission_investment.pdf

²North American Midstream Infrastructure through 2035: Capitalizing on Our Energy Abundance An INGAA Foundation Report, Prepared by ICF International Executive Summary March 18, 2014 <http://www.ingaa.org/file.aspx?id=21498>



by Morris Perot



money by avoiding problem locations during the route selection process, developing engineering plans that minimize effects on those locations during the design process, and preparing mitigation plans to off-set unavoidable effects on protected natural resources during the permitting process. For example, if the routing team understands the full range of environmental and permitting constraints, they can develop

routes that avoid sensitive natural resources, thereby avoiding lengthy permitting review and approval processes as well. An informed engineering team can incorporate measures to minimize potential effects on sensitive resources, such as wetlands and streams, in the project design. For unavoidable effects, mitigation opportunities can be identified, and mitigation plans can be submitted for the regulatory agencies' review during the

permitting process. Effective communication and collaboration among the teams can help to identify insurmountable obstacles to some route alternatives, hidden costs, and favorable conditions for the project. Integrated planning leads to better decision making that is likely to result in a more cost-effective and expedient linear project than is possible using the typical sequential planning approach.

Kleinschmidt's Ecological Services Department is familiar with blending natural science, permitting expertise, and ecological engineering services in integrated approaches to linear projects. Kleinschmidt is able to perform environmental studies and coordinate with agencies, clients, and strategic partners to share information and data for effective integration. Kleinschmidt is able to identify permit needs early and help clients to plan strategically for the permit application process. Identifying these needs and sharing data early and often can avoid or minimize most of the issues that sometimes derail the scope and schedule and increase the cost of a linear project.

The following articles highlight new consulting practices within Kleinschmidt that offer our clients specialized services to promote cost-effective, expedient, integrated planning for linear projects. Our new

Potential Environmental Impacts of Linear Projects:

- Stream Crossings
- Water quality
- Wetlands
- Threatened or Endangered Species
- Terrestrial Vegetation
- Wildlife

NEPA Services Team applies detailed understanding of the regulations implementing the National Environmental Protection Act (NEPA) to assist clients with the environmental analyses and public outreach required for linear projects that cross federal land, receive federal funding, or require one or more permits from federal regulators. Water & Willow, a wholly owned subsidiary of Kleinschmidt, offers design-build services to help clients mitigate the unavoidable effects of their linear projects. Together with the multidisciplinary staff of the Ecological Services Department, these groups offer the full range of services needed for well integrated planning and execution of linear projects.

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LINEAR PROJECTS AND THE NATIONAL ENVIRONMENTAL POLICY ACT

by Kelly Schaeffer

Linear projects, by their nature, are likely to be subject to the requirements of the National Environmental Policy Act (NEPA), which requires federal agencies to consider the environmental effects of their actions and to balance those effects with the need for, and benefits of, the proposed action. NEPA requires extensive analysis of the effects of the proposed action and reasonable alternatives on natural resources, cultural resources, and the socioeconomic conditions of the affected area. NEPA is triggered when an agency of the federal government contributes funding for a project, when a project crosses federal land, or when a project requires federal approval (permit or license). Transmission lines, gas pipelines, roads, and other linear projects typically are long, spanning from tens to hundreds of miles, increasing the likelihood that their paths will cross federal lands or require one or more federal permits. Moreover, the engineering constraints associated with routing energy-related linear projects sometimes create the need for compensatory mitigation for unavoidable adverse effects on protected natural resources. These mitigation projects also may trigger the NEPA process.

Kleinschmidt has extensive experience in preparing NEPA environmental assessments (EAs)

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Three Examples of Kleinschmidt's NEPA Experience for Linear Projects

Transmission Line Analysis

- TDI-New England seeks a Presidential Permit from the Department of Energy (DOE) to construct a 154-mile transmission line that will cross the Canadian border in northern Vermont. Kleinschmidt is serving as a third-party contractor to DOE to prepare an EIS, coordinate public involvement, facilitate meetings of subject-matter experts, develop reasonable alternatives, address connected actions, and develop the Draft and Final EIS, Record

of Decision, and administrative record for DOE.

Stream Restoration Analysis -

Duke Energy, LLC plans to construct a drought-contingency reservoir associated with the proposed William States Lee III Nuclear Station, and compensatory mitigation for the effects of the reservoir project will be required. Duke is pursuing mitigation credits for restoring streams in Sumter National Forest to meet that requirement. Kleinschmidt is

serving as a third-party contractor to the U.S. Forest Service to complete an EIS analyzing the effects of restoring 100,000 linear feet of stream in four watersheds on federal forest land in South Carolina. While reviewing project data Kleinschmidt and Environmental Planning and Restoration identified an approach for the restoration that would reduce environmental effects and costs, and the Forest Service adopted that approach as its proposed action.

Fiber Optic Broadband

Expansion Analysis - In 2010, the National Telecommunications and Information Administration (NTIA) awarded Maine Fiber Company (MFC) a grant to expand affordable high-speed Internet access to underserved areas in Maine. MFC hired Kleinschmidt to prepare an EA to assess the potential effects of installing more than 1,100 miles of fiber optic infrastructure throughout the state. Kleinschmidt managed consultation with the U.S. Fish and Wildlife Service and Maine Historic Preservation Commission in conjunction with the project. We completed the multidisciplinary analysis on an accelerated schedule, and the NTIA accepted the EA, which resulted in a Finding of No Significant Impact.



Kleinschmidt's NEPA Services

- issue identification and scoping
- purpose and need statement
- comments management and content analysis
- alternatives analysis
- environmental effects analysis
- cumulative effects analysis
- study planning and implementation
- stakeholder outreach
- agency consultation
- mitigation and enhancement identification
- Record of Decision preparation
- administrative record management

and highways and bridges. Kleinschmidt's long, diverse history of NEPA experience — from providing NEPA process training to more than 200 people over the last 10 years, to assisting clients to interpret and manage NEPA requirements across many scientific disciplines — recently inspired us to form a dedicated NEPA Services Team. Kleinschmidt's NEPA Services Team works with clients to assess potential approaches, costs, and environmental effects, and ultimately to identify a preferred alternative or the least environmentally damaging practicable alternative for the client's project. The leaders of the Team have a history of integrating expertise across the range of scientific and engineering disciplines needed to complete NEPA analyses.

Many states have NEPA-like legislation governing the actions of state agencies that has triggers analogous to those of NEPA, such as the California Environmental Quality Act. Kleinschmidt's NEPA experience can be especially useful in supporting clients to comply with those state-specific regulations.

Kleinschmidt's NEPA Services Team is particularly adept at managing and facilitating the public engagement component of the NEPA process. We believe that being proactive to educate stakeholders about the scope and

A robust and meaningful public engagement process that begins with scoping and continues through the comment period on the draft and final NEPA documents can make the difference between ardent resistance - which can be costly, time consuming, and frustrating to address - and public acceptance.

benefits of the proposed action and how it will be funded and to explore their perceptions and concerns thoroughly can smooth the course of this vital part of the NEPA process. A robust and meaningful public engagement process that begins with scoping and continues through the comment period on the draft and final NEPA documents can make the difference between ardent resistance — which can be costly, time consuming, and frustrating to address — and public acceptance. Our NEPA Services Team includes trained facilitators who specialize in translating technical material for general audiences, listening effectively, and managing the conversation to

promote a constructive exchange of relevant ideas.

About the Author: *Kelly Schaeffer leads Kleinschmidt's NEPA Services Team. Kelly has nearly 25 years of experience with implementing the NEPA process from two perspectives — formerly as a regulator for the Federal Energy Regulatory Commission, and now as an environmental consultant. Kelly's multiple perspectives bring a uniquely broad and sophisticated understanding of the NEPA process to the work of Kleinschmidt's NEPA Services Team.*

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and environmental impact statements (EISs) for lead federal and cooperating agencies and for private clients as a third-party contractor. Our NEPA project experience covers a wide range of projects including stream restoration, energy, transmission, fiber optic cable,

MITIGATION FOR LINEAR PROJECTS: WATER & WILLOW LLC

by Scott Ault

Important constraints that determine appropriate siting and design of linear projects, particularly public safety, sometimes make avoiding protected environmental resources impossible. In such cases, regulatory agencies require plans for acceptable compensatory mitigation for the affected resources before they will issue the permits required to proceed with the linear project. Some resources that commonly require mitigation for unavoidable effects include wetlands, streams, and unique habitats for rare, threatened, or endangered species. Mitigation for these resources can include preservation, enhancement, restoration, or creation either within the project area, or elsewhere.

As a project advances from siting to preliminary design, the permitting team needs to document measures planned to reduce or mitigate the effects of the project on protected resources. Neglecting to plan for mitigation early is a common mistake during the development of linear projects. Many applicants believe that proposing a mitigation project risks committing to spend money on a project that the agencies may not require for the permit. This “wait and see” strategy often results in project delays because a permit application is rejected for not proposing adequate



mitigation for the project's effects. The permitting team can identify the potentially affected resources and their significant features but may not understand the relative cost implications of measures to minimize effects on those resources or the alternative, compensatory mitigation for the effects. Many applicants believe that mitigation projects can be found easily through mitigation banks, or that a mitigation plan can be developed quickly, but this often is not the case. Frequently no mitigation bank exists within reasonable proximity of the affected area, and identifying an appropriate location for developing a permittee-responsible mitigation project, where the landowner is willing to

cooperate, takes time. Including a design-build contractor with expertise in mitigation project design and construction on the planning team for a linear project can help to make the best financial and practical decisions about measures to minimize or mitigate the unavoidable effects of the project.

Kleinschmidt Water & Willow LLC is a wholly owned subsidiary of Kleinschmidt that works with a variety of regional experts in ecological restoration to provide design-build services for ecological mitigation projects. Water & Willow exercises Kleinschmidt's substantial expertise in the regulatory requirements surrounding

jurisdictional wetlands and water bodies as well as the planning, design, and implementation of associated mitigation efforts to develop mitigation designs that succeed and meet the agencies' and the clients' expectations. We work with multiple state and federal agencies on projects involving stream protection measures such as fish habitat protection and best management practices (BMPs) for crossing streams. We have facilitated hundreds of public meetings and technical stakeholder meetings for permitting, relicensing, watershed planning, and engineering designs.

Using a combination of inhouse expertise and specialty contractors, Water & Willow provides all of the skills and services required to complete

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a wetland or stream mitigation or stormwater management designbuild project in one package. Water & Willow offers Kleinschmidt's expertise in wetland delineation and functional analysis, fisheries ecology, and civil engineering. We procure and manage regional specialty contractors for excavation, planting, and invasive species control. We have the knowledge and experience to identify specialty contractors who appreciate the unique considerations involved in ensuring successful mitigation projects, such as the relationship between precise excavation of a planting area and the very specific habitat requirements of many native wetland plants. We develop and maintain regional

Water & Willow's Work on a Linear Project: Constitution Pipeline

Constitution Pipeline Company is developing a new, 124-mile-long natural gas pipeline that will span two states and three U.S. Army Corps of Engineers districts. Mitigation is required to address unavoidable effects on regulated wetlands along the pipeline corridor.

Water & Willow LLC is providing comprehensive support to

engage and inform the public and design, permit, build, and monitor wetland mitigation in a fast-paced environment, with the understanding that the regulatory agencies may not prescribe the final mitigation requirements until several months prior to construction. Water & Willow is identifying properties for restoration, negotiating easements, developing mitigation

plans and construction plans, and completing local permits and erosion and sediment permits. Under a design-build contract, Water & Willow is taking full responsibility for construction of the wetland mitigation sites, the implementation of the design, and monitoring and maintenance of the completed sites up to agency approval, which may take as many as 10 years.

Water & Willow is managing multiple teams of specialists to simplify a complex project, increase efficiency, reduce procurement costs, and improve communications for Constitution. As a result of our efficient design-build business model, Water & Willow has identified, procured, and designed five mitigation sites in less than 2 years and will begin construction during 2015.



Water & Willow's Services

- mitigation planning, design, and implementation
- mitigation monitoring and maintenance
- project management services
- risk assumption
- agency liaison
- environmental permitting and permit management

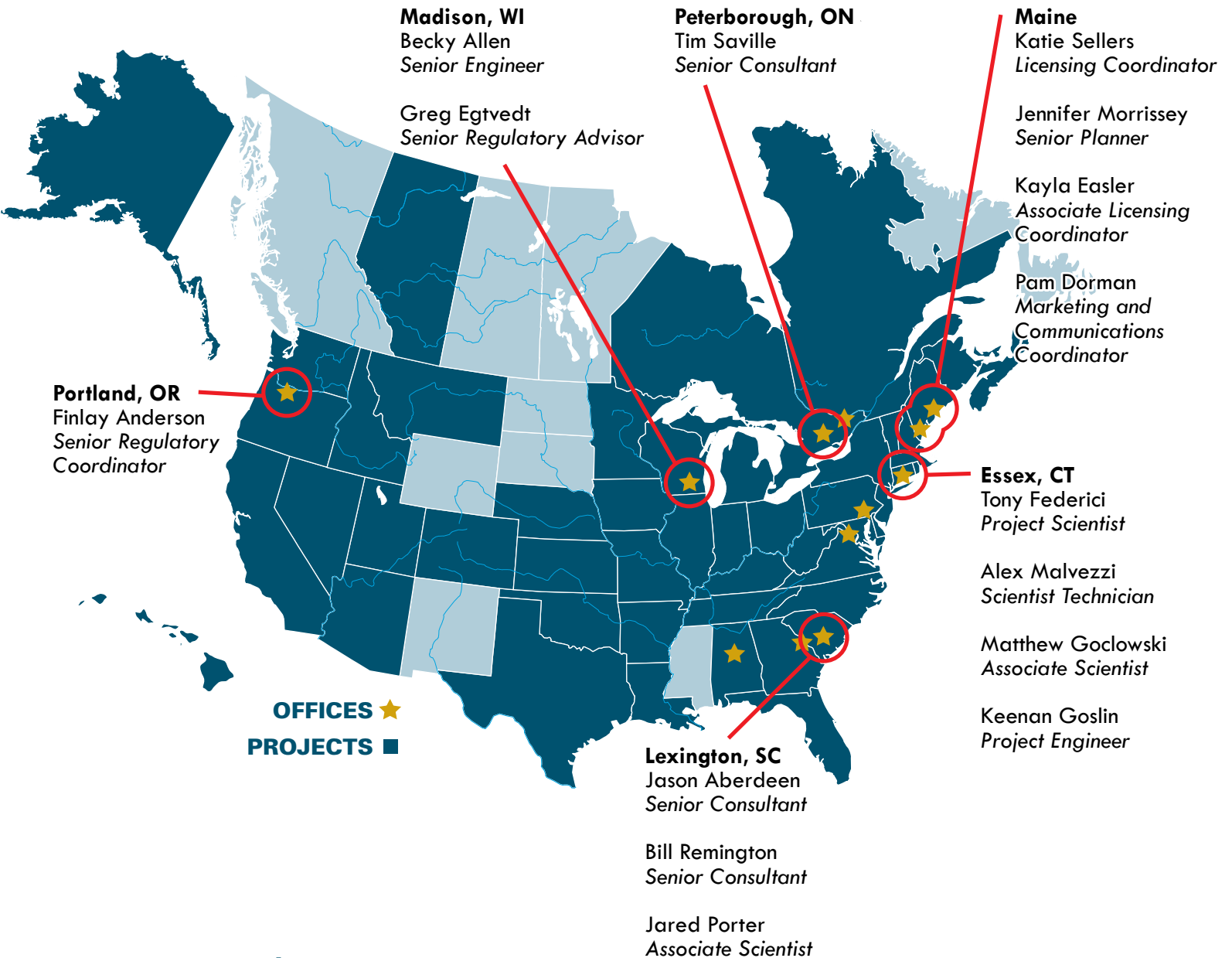
teams that work together efficiently and effectively. Water & Willow handles all aspects of a mitigation project from design through long-term monitoring, thereby increasing efficiency and reducing overall cost and internal administrative costs that the client otherwise would have to bear.

Perhaps most importantly, Water & Willow assumes the risk that would otherwise be the client's obligation after individual design and construction contractors have completed their jobs. This entails purchasing mitigation property, monitoring the success of the mitigation project, managing and maintaining it adaptively

as necessary to achieve the agencies' criteria, managing permit conditions, and serving as a liaison with federal agencies and the public on behalf of our clients.

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Represents full-time or senior hires over the past 9 months





CLIMATE CHANGE RESILIENCY

The effects of more frequent episodes of extreme weather, changes in water resource availability, and climate variability on infrastructure, municipalities, ecosystems, wildlife, fisheries and human well-being have become apparent, particularly over the past decade. We can no longer focus solely on the effects of projects on the environment—whether the project is construction of an energy production facility or development of a habitat restoration enhancement— but also must consider the effects of a changing environment on developments, cities, structures, watersheds, and terrestrial and aquatic habitats.

Our scientists, engineers and planners can help you assess risks and potential vulnerabilities in your project in the context of climate change, identify and evaluate alternatives, and design sustainable solutions to maintain

the efficiency and longevity of your project. We have the experience to develop adaptive plans and strategies to minimize risk in response to new challenges that arise as the environment around us continues to change. Our multidisciplinary staff is educated and experienced in:

- ecology
- terrestrial and aquatic (freshwater and marine) biology
- earth and atmospheric science
- hydraulics and hydrology
- state, federal, and municipal permitting/licensing
- civil, structural, mechanical, and electrical engineering
- spatial and GIS analysis

For more information on our Climate Change services, contact Scott Ault at Scott.Ault@KleinschmidtGroup.com.

Our Services:

Hydropower Consulting

Regulatory & Permitting

Fish Passage

Marine Renewables

Onshore Wind

Fisheries & Aquatic Sciences

Terrestrial & Wetland Sciences

Water Resource Engineering

Valuations

Dam Safety

Our Mission:

“Do good work and make a living at it. Enjoy what you are doing, and the rest will take care of itself.”