

Preliminary Engineering (PE)

- **Engineering Study**
- Preliminary Design
- Final Design/PS&E
- Bid Phase



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Engineering Study


Prior to Beginning

- Local Project Agreement executed by NHDOT and Sponsor ✓
- Consultant firm approved by NHDOT ✓
- **“Received Authorization to Start”**
Engineering Study ✓

or “RATS” work is ineligible!!

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ES **8 Engineering Study Steps**

- 1) Determine existing conditions and existing environmental resources
- 2) Hold local concerns meeting
- 3) Develop purpose and need statement
- 4) Establish design standards

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ES **8 Steps – Continued**

- 5) Evaluate & vet alternatives
- 6) Select proposed action
- 7) Present results to public
- 8) Submit Engineering Study for NHDOT review and approval

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Step #1 - Existing Conditions

Focus on documenting 5 types of existing features in and near your project area:

- 1) Physical features
- 2) Transportation features
- 3) Right-of-Way features
- 4) Utility features
- 5) Environmental features



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Step #1 - Existing Conditions

Document physical features:

- Ground conditions thru ground survey, aerial images, site visits
- Underground conditions thru test borings and existing plan research
- Physical setting
business, rural, urban
- Water features
natural water features, man-made drainage



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#1

Existing Conditions


Document existing transportation features

- Speed limits
- Traffic volumes
- Roadway geometry
(curves, tangents, grades)
- Lane use and shoulder widths
- Trail and sidewalk layouts



SPEED
 LIMIT
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#1


Existing Conditions

Transportation features continued

- Sight distance
- Crash data
- Roadway network and users
- Access & driveways
- Railroad facilities in the area
- Airport facilities in the area

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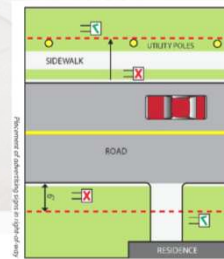
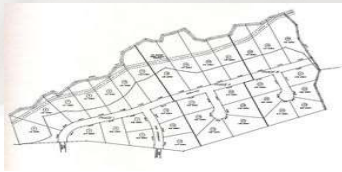
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Existing Conditions

Document existing Right-of-Way features

- Where is the existing ROW?
- Are there any existing easements?
- Who are the owners?



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Existing Conditions

Where do you find the existing ROW?

- Highway plans and files at NHDOT (Both Concord and District Offices)
- Historic layouts (NHDOT, Towns, and Registry of Deeds)
- Physical evidence (bounds, pins)



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Existing Conditions

Where do you find the owners?

- Town tax records
- County Registry of Deeds

Look for both owner of record &
other interested parties:

- Mortgage holders
- Lien holders
- Easement holders
- Lease holders



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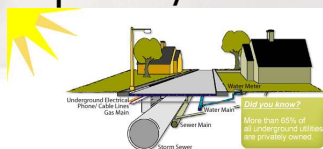
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Existing Conditions

Document existing utility features

- Request existing utility locations and utility rights from utility companies
- Look at both aerial and underground
- Can provide them your plans to mark-up and/or field review



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#1

Existing Conditions


Document existing environmental resources

- Natural Resources
- Cultural Resources
- Contamination
- Others....





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#1

Existing Conditions


Contact affected groups to help identify existing environmental resources

Send letters to:

- Local officials
- State and Federal officials responsible for **documented** resources
- Others as appropriate



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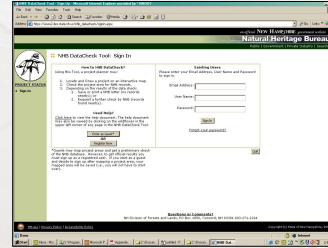
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Existing Conditions

Identify some documented resources thru on-line databases

- GRANIT Database
- NHDES One-Stop Database
- FIRMETTE – Floodway and Floodplain Database
- US Fish & Wildlife Service:
IPAC – Information for Planning and Consultation Database



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Existing Conditions

Some resources require field work to document

Natural Resources

- Wetlands
- Rivers/streams
- Shore lands
- Floodplains
- Invasive species
- Stream crossings
- Etc...



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#1**


Existing Conditions

Document potential cultural resources



- **Historic**
- **Archaeological
(may require field work too)**

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Existing Conditions

Document Section 4(f) resources:

- Publicly owned public parks and recreation Areas
- Fish & waterfowl/wildlife refuges
- National Register listed/eligible historic properties



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#1


Existing Conditions

Document Other Potential Environmental Resources

Minority Populations


Elderly Populations


Low Income Populations
(Consult Census Data)




Section 6(f) Properties
(Land & Water Conservation Fund)

Consult Dept. of Natural and Cultural Resources
(Formally DRED)







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#1

Existing Conditions

Document any Contamination

- Adjacent sites
- Landfills
- Dry Cleaners
- Manufactured gas plants
- Urban fills
- Railroads
- Asbestos
- Lead Paint



Need Manifests, Proper Handling, Transportation, & Disposal

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#1

Existing Conditions


Identify contamination thru:


On-Line Resources

- DES – UIC, LUST, GMP, AUR,
- Spills/releases (OneStop)


On Site Evidence

- Stained soils
- Stressed vegetation
- Monitoring wells
- People in hazmat suits





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#1


Existing Conditions

Asbestos may be present in:

- Bridges between 1958 and 1978
 - Mastic
 - Pavement
 - Membrane
- Transite pipe
- **Any project in Nashua or Hudson**



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#1**


Existing Conditions

Plan for potential expenses

- Contamination surveys
- Archaeological surveys
- Historic surveys
- Endangered species/habitat surveys
- Air/Noise analyses
- Stream crossing analysis

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#1**


Existing Conditions

Gather all of your existing conditions to:

- Develop a comprehensive summary of existing conditions
- Develop the “purpose and need statement”
- Determine constraints and controls
- Prepare for 1st public meeting



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#2**


Step#2 - Hold Local Concerns Meeting

- Present existing conditions
- Present project area
- Present funding and schedule
- Present basic scope without a solution presented
- Ask for local issues of concern
- Ask for consulting parties- if cultural resources are expected

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PUBLIC MEETING



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#2**

Hold Local Concerns Meeting

Who should be invited?

- Users of the transportation facility
- Those affected by the project
schools, business, hospitals, etc..
- Elected officials in the community
- Direct abutters
- Others interested in the outcome of the project

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#2**

Hold Local Concerns Meeting

Shall be Publicly Noticed

Also notify:

- NHDOT Project Manager
- District Engineer (if State Highway)
- Railroad Owner (if applicable)
- Resource Agencies & Advocacy Groups

**Keep copies of Meeting Notices,
Sign-In Sheets & Meeting Minutes**

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#3**

Step #3 – Develop the Purpose and Need Statement

The Purpose and Need Statement must demonstrate that the project is:

- Justified
- Worth federal expenditures and
- Worth impacts to the environment

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#3**

Purpose and Need Statement

- It's the backbone of the project
- **Has clear description of goals**
- **Does not describe a solution**
- Is used to evaluate alternatives

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#3**


Purpose and Need Statement

The Purpose

The Purpose is NOT the Proposed Action

- The purpose of this project is to **replace the bridge... (WRONG)**
- The purpose of this project is to **correct structural deficiencies** associated with a red list bridge... **(RIGHT)**

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#3**

Purpose and Need Statement

The need is the reason(s) why

- Structural deficiencies in bridge deck
- Limited sight distance
- Weight restrictions
- Substandard guardrail
- Frequent flooding

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#3**

Purpose and Need Statement

Example

- The **purpose** of this project is to remove a structurally deficient bridge from the NHDOT Red List and increase safety of the traveling public
- The **need** for this project is demonstrated by the structurally deteriorated condition of the bridge deck and structural steel, poor sight distance, high frequency of flooding at the bridge and substandard approach guardrail

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Step #4 – Establish Design Standards



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#4

Establish Design Standards

Prior to developing **Alternatives**, the **Design Standards** that will be used to govern the development of potential alternatives shall be stated in the Engineering Study

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Establish Design Standards

Why have standards?

- Reflect sound engineering
- Draw upon previous experience
- Establish minimum criteria
- Protect the LPA



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Establish Design Standards

Found in reference documents

- The Green Book – A Policy on Geometric Design of Highways and Streets
- NHDOT Highway Design Manual
- NHDOT Bridge Design Manual
- NHDOT Standard Specifications for Road and Bridge Construction
- Roadside Design Guide
- MUTCD – Manual on Uniform Traffic Control Devices



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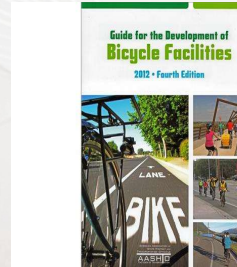
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Establish Design Standards

Reference documents – cont.

- New Hampshire State Trails Plan (NHDOT)
- Guide for the Development of Bicycle Facilities (by AASHTO)
- Guide for the Planning, Design and Operation of Pedestrian Facilities (AASHTO)



➤ **And many more.....**

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Establish Design Standards

Americans with Disabilities Act (ADA) Title II

Presented by Sandt Michener
ADA Title II Coordinator - NHDOT

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The Americans with Disabilities Act

➤ The Americans with Disabilities Act (ADA) is a **civil rights law** that mandates equal opportunity for individuals with disabilities.



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The ADA



- **Title I: Employment**
- **Title II: State and Local Governments**
- **Title III: Places of Public Accommodations**
- **Title IV: Telecommunications**
- **Title V: Miscellaneous**

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Equality in Access

The primary responsibility of public agencies with regard to the ADA is to provide equal access to **PROGRAMS, SERVICES, & ACTIVITIES**



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The Americans with Disabilities Act

- The ADA definition of disability is a legal one: "a person who has a physical or mental impairment that substantially limits one or more major life activity"
- The ADA is NOT a building code subject to local interpretation
- The ADA is an anti-discrimination law

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#4

Consequences of ADA non-compliance

- DOJ can visit you
- Transportation complaints investigated by FHWA or State DOT
- Non-compliance can jeopardize Federal Funding
- Lawyers visit you

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#4

Litigation is very expensive...



THE BEST TIME TO LEARN
ABOUT ADA REQUIREMENTS
IS BEFORE YOU HAVE TO.

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ADA Title II General Requirements for Municipalities

- **Designation of ADA coordinator**
Provide name, office address, and telephone number of the "ADA Coordinator"
- Establish and post a **grievance procedure** and **policy statement**.
- Best practice is to post this information prominently on the town website.

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Alterations

DOJ/DOT Joint Technical Assistance (TA)



U.S. Department of Justice
Civil Rights Division
Disability Rights Section



U.S. Department of Transportation
Federal Highway Administration

Department of Justice/Department of Transportation
Joint Technical Assistance¹ on the Title II of the
Americans with Disabilities Act Requirements to
Provide Curb Ramps when Streets, Roads, or
Highways are Altered through Resurfacing

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Establish Design Standards

- US DOT
 - 2023 Public Right of Way Accessibility Guidelines (PROWAG)
- US DOJ
 - 2010 ADA Accessibility Guidelines (ADAAG)

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Establish Design Standards



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Establish Design Standards



Obstruction clearance 32" allowed for 24" run per ADAAG, but not PROWAG (48" minimum)

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Establish Design Standards



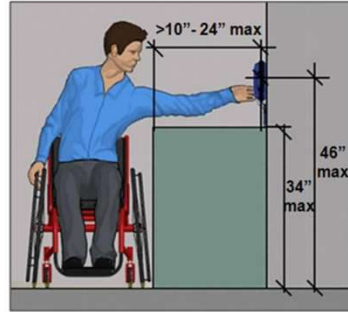
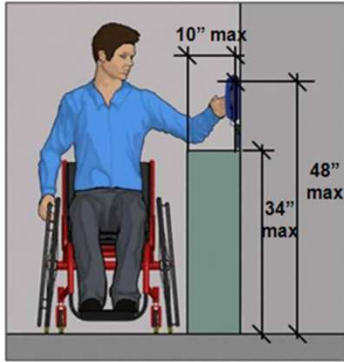
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ADAAG reach ranges within buildings

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PROWAG 10" maximum reach

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Establish Design Standards



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Accessible Pedestrian Signals

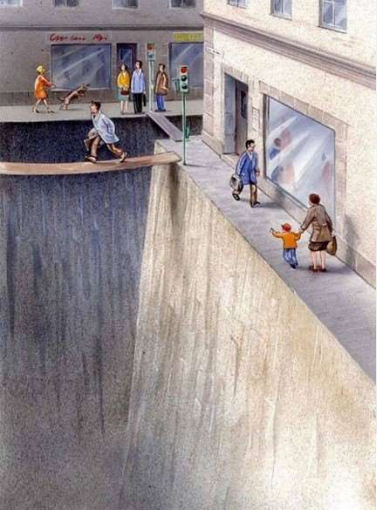
Audible AND vibro-tactile pushbuttons now required per PROWAG



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#4

Establish Design Standards



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#4

Maximum Extent Feasible


Lesser Evils Principle

- ROW
- Vegetation
- Utilities
- Terrain



- Traffic flow
- Drainage
- Weather
- Buildings

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Maximum Extent Feasible Lesser Evils Principle

- ROW
- Vegetation
- Utilities
- Terrain
- Buildings
- Traffic flow
- Drainage
- Weather



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Maximum Extent Feasible



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Maximum Extent Feasible



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Maximum Extent Feasible



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Maximum Extent Feasible





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Maximum Extent Feasible



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Maximum Extent Feasible



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Maximum Extent Feasible



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Maximum Extent Feasible



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Maximum 10" reach range



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Maximum Extent Feasible



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Maximum Extent Feasible



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Maximum Extent Feasible



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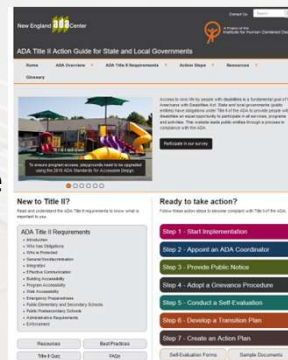


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ADA Compliance Resources

- Your local Regional Planning Commission
- Governor’s Commission on Disabilities 603.271.2772
- ADA Title II Action Guide for State and Local Governments: adaactionguide.org



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 NHDOT ADA Title II Coordinator
 Telephone: 603.271.3736
 Email:
sandt.d.michener@dot.nh.gov

Now Back to Tom

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#5**


Step #5 – Evaluate & Vet Alternatives

Alternatives should always:

- Include No Build
- Relate back to Purpose and Need Statement



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**ES
#5**

Evaluate & Vet Alternatives


Environmental Vetting

- Process to examine alternatives with resource agencies and others responsible for protecting resources
- NHDOT has forums to facilitate the process



Um...who vetted that guy?

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#5**

Evaluate & Vet Alternatives


Monthly Natural Resource Meetings

- 3rd Wednesday of each month
- Video conference currently
- Submit Agenda Item Request (AIR) form
- **Sample AIR form in handout**



May not be necessary if natural resource impacts are not anticipated

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#5**


Evaluate & Vet Alternatives

Monthly Cultural Resource Meetings

- 2nd Thursday of each month
- Video conference currently
- Submit Project Review (RPR) form approximately one month ahead
- **State Historic Preservation Office (SHPO) attends meeting**

Sample RPR form in handout

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**ES
#5**


Evaluate & Vet Alternatives

Avoid, then Minimize, then Mitigate

- 1st** Avoid impacts if possible
- 2nd** Minimize impacts by varying alternative
- 3rd** Mitigate by doing additional actions to offset unavoidable impacts

Applies to environmental impacts, abutter impacts, utility impacts, etc.....

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#5**


Evaluate & Vet Alternatives

Design exceptions

In the process of avoiding and or minimizing impacts to abutters and/or the environment, the transportation **design standards** may need to be modified by obtaining a **design exception**

Covered in Preliminary Design

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#5**

Evaluate & Vet Alternatives

Costs:

- Shall be developed for each alternative
- Can include contingencies at Engineering Study level
- Shall include NHDOT Major items
- Shall include Non-Participating items

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**ES
#6**

Step #6 - Select Proposed Action

- A **detailed analysis and narrative** of **each alternative** should be provided and logically lead to the identification of the **Proposed Action**
- Narratives shall include discussions on costs, proposed features, impacts to environmental resources, utilities and private property, as well as, traffic and construction impacts

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Select Proposed Action

Proposed Action should be the alternative that:

- Most meets the **Purpose and Need Statement**
- Represents the **Least Environmentally Damaging Practicable Alternative (LEDPA)**



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Step#7 – Public Presentation of Proposed Action

- Present Pros and Cons of each Alternative. Can be held remotely (Notice #2020-06)
- Present detailed narrative of why **Proposed Action** best meets the **Purpose and Need Statement**
- Similar format invite list as Local Concerns Meeting (Step #2)



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Public Presentation of Proposed Action

Present Abutter Impacts

- You must illustrate the impacts outside of the existing right-of-way to the public and abutters
- Include temporary impacts for equipment, access, driveway matches, etc....



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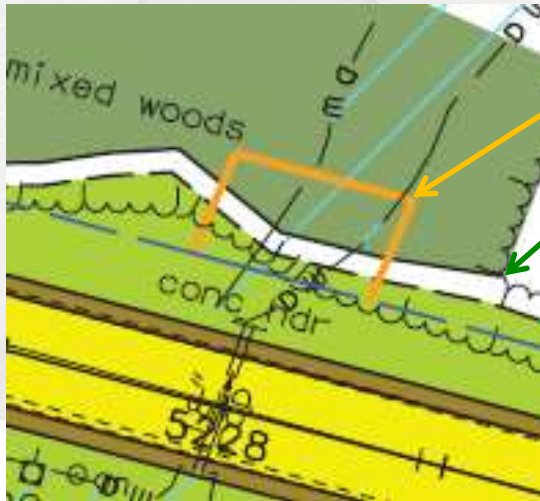


Public Presentation of Proposed Action

Example

- Drainage Easement
- Clearing Easement
- Slope Easement

Existing ROW



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**ES
#8**

Step #8 – Submit Engineering Study for NHDOT Review and Approval

Submission requirements

- Sponsor Letterhead
- Electronic submission
- Back up material, calculations, etc..
- Verify format with NHDOT Project Manager

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8 Engineering Study Steps

Re-Cap:

- 1) Determine Existing Conditions and Existing Environmental Resources
- 2) Hold Local Concerns Meeting
- 3) Develop Purpose and Need Statement
- 4) Establish Design Standards

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8 Steps – Continued

Re-Cap:

- 5) Evaluate & Vet Alternatives
- 6) Select Proposed Action
- 7) Present Results to Public
- 8) Submit Engineering Study for NHDOT review and approval

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End of Engineering Study

Project Status

- Project Agreement ✓
- Consultant Selection (QBS) ✓
- Scope and Fee ✓
- Engineering Study ✓
- Received letter from NHDOT to Proceed to Preliminary Design ✓




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Engineering Study

Questions ?



**Next Up:
Preliminary Design**



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