



## Timber For Transit Program Project Development Guide

The purpose of this document is to provide a guide to projects best suited for the NBRC Timber for Transit Program.

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# Stated Program Purpose and Project Categories:

*The following summary is pulled directly from the NBRC [Timber for Transit Program resources](#). For more detailed program information and resources, visit [www.nbrc.gov/content/t4t](http://www.nbrc.gov/content/t4t).*

The purpose of this funding is to advance the use of wood-based materials and composites (advanced wood materials) through applied research and demonstration projects that showcase the suitability of such materials to [transportation](#) and [transportation adjacent](#) infrastructure.

Highly competitive projects will demonstrate and widely promote the utility of high value forest products (e.g. glued laminated timber, cross laminated timber, composite materials, etc.) in transportation infrastructure and commit to enhancing extreme weather resilience in rural communities. Transportation infrastructure shall mean construction, alteration, or repair, for the purpose of transporting people and goods, including fixed installations and rights of way necessary for transporting from one point to another, including infrastructure that improves economic mobility for individuals, and may include roads, railways, airways, waterways, canals and terminals such as airports, railway stations, bus stations, parking, refueling depots, and seaports.

*(Refer to program investment priorities. As a general guide, competitive projects will have as a central component, the highlighted use of timber products. On the contrary, projects that :1) provide little mention of the type of wood material to be used, or 2) provide little detail as to the purpose of the wood components, or 3) that appear to only mention wood components in order to be eligible under the Timber for Transit program and higher maximum award potential will not be competitive under this program. Additionally, preference will be given to projects that incorporate university and industry education and training (a listed agency investment priority within the [Program User Manual](#))).*

**Feasibility Projects** will be awarded a minimum of \$250,000, and a maximum of \$1,000,000.

1. State or regional inventory assessments of the suitability of wood components to address needed transportation infrastructure improvements and/or new construction.
2. Architectural and engineering designs, cost analyses, and permitting necessary for implementation projects as identified below.

**Implementation Projects** will be awarded a minimum of \$1,000,000 and a maximum of \$5,000,000.

1. Transportation infrastructure projects which utilize commercialized wood products and advanced wood materials to address weather adaptive transportation improvements.
2. Design and construction of pilot and demonstration projects that showcase the capabilities and benefits of utilizing advanced wood materials in transportation infrastructure, including projects that are a hybrid of wood and traditional materials.

## Language from the Omnibus Bill:

- **Federal Highway**, Pilot projects that demonstrate the capabilities of wood-based [transportation] infrastructure projects
  - Criteria should prioritize projects that demonstrate evidence of planning for weather resiliency.
  - No limitation on obligations for Federal-aid highways or highway safety construction programs set forth in any Act making annual appropriations

## Examples of Wood-Based Transportation Infrastructure:

*In developing the Timber for Transit Program, NBRC researched examples of wood-based transportation infrastructure. The below listed examples represent potential applications for wood in transportation infrastructure. Examples come from the study linked below, and not all listed applications are well suited for the Timber for Transit Program.*

- *Russell C. Moody and Michael A. Ritter<sup>1</sup> – Wood in Infrastructure: Analysis of Research Needs and Goals*  
<https://intrans.iastate.edu/app/uploads/2018/08/moody97b.pdf>

**Headers with an \* in the list below have been identified by NBRC as having the highest potential and competitiveness within the Timber for Transit Program.** That said, NBRC also welcomes creative concepts that fit under other categories.

## Highway Structures

### Bridges\*

Under this program, bridge structures should utilize advanced timber components and showcase timber products. Likely the most fitting bridge projects under this program are publicly owned permanent vehicular and pedestrian glue laminated timber bridges. Projects may include covered bridges or other bridge structures that utilize advanced wood materials or composites, in combination with traditional materials.

### Resources (non-exhaustive):

The University of Maine [Advanced Structures and Composites Center](#).

The National Center for Wood Transportation Structures showcases a variety of demonstration projects on their website, linked [here](#) and within the Timber for Transit Program User Manual.

### Research needs for bridge structures<sup>1</sup>:

- Research needed on options for improving load distribution in systems such as plank decks and structural glulam panel decks
- Research needed on additional options for using transverse decks on secondary roads
- Research needed on in-place capacity of composite concrete-wood bridge systems
- Economical methods needed for maintaining and rehabilitating short span timber bridges
- Standard plans have been developed for highway bridges that use Southern Pine for bridge deck systems, hardwood glulam bridges, and crash tested rail systems for longitudinal deck bridges. *What about wood from our region?*

## Sound barriers

### Research needs for sound barriers<sup>1</sup>:

- Serviceability problems. Other non-wood material options are being considered

## Sign and Rail Posts\*

Sign and rail posts will likely be a portion of an NBRC Timber for Transit project, but there is potential for regional wood use. For example, composite trail signs made from Northern Border forests.

### Research needs for sign and rail posts<sup>1</sup>:

- Information needed on performance to improve acceptance criteria
- Techniques for improving the durability of the posts

## Retaining Walls

### Research needs for retaining walls<sup>1</sup>:

- Need for standardized designs for retaining walls.

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<sup>1</sup> Russell C. Moody and Michael A. Ritter<sup>1</sup> – Wood in Infrastructure: Analysis of Research Needs and Goals

## Other – Portable crossings and pedestrian bridges\*

There is potential for Timber for Transit projects in this category. For example, pedestrian and trail bridges, covered bridges, wildlife crossings, temporary wood skidder bridges fit within this category. Projects must utilize advanced wood materials or composites, in combination with traditional materials. *(Note – one Forest Economy Advisory Board member shared that temporary wood skidder bridges are cheap and in good supply and may not be best fit for the Timber for Transit program).*

### Research needs for portable crossings and pedestrian bridges:

- Need improved and standardized designs for portable crossings
- Need to develop several standardized design approaches

## Railway Structures

### Bridges\*

Depending on the need and wood capabilities, there may be a place for rail bridges under the Timber for Transit program. Projects that represent deferred maintenance will not be considered under this program.

### Research needs for railway bridges:

- Dynamic loading is a concern. New systems being investigated that better load distribution

### Ties

## Utility Structures

### Waterfront Structures\*

Projects that showcase the capabilities of wood in waterfront transportation structures may be well suited to the Timber for Transit Program. For example, is there opportunity/capability for wood in waterfront structures such as wharves, piers, seawalls, etc?

## Examples of Wood in Transportation-Adjacent Infrastructure

NBRC adopted a broad definition for transportation infrastructure under the Timber for Transit Program, to include transportation adjacent projects, for example: Highway rest stops, train depots, airports, trail facilities and outdoor recreation welcome centers. Competitive transportation adjacent structures will most likely utilize advanced wood

materials in construction. Materials such as: mass timber, wood fiber insulation, nanocellulose 3D printed components, etc.

## NBRC Funded Timber for Transit Projects

**Awarded to:** Patrick Leahy Burlington International Airport

**Project:** The North Concourse Replacement Project (Project NexT) includes new concourse replacement, four new aircraft gate replacements, four new passenger boarding bridge replacements, new passenger circulation and hold room space. A standout feature of the building's design is its employment of Mass Timber Framing, Structure and Maple Ceilings, effectively reducing the embodied carbon footprint of the construction.

**Location of Project:** Chittenden County, VT

**Grant Amount:** \$1,778,400.00

**Total Project Amount:** \$3,556,800.00

**Awarded to:** Southwest Region Planning Commission

**Project:** The proposed project will assess the feasibility of meeting a variety of rural transportation infrastructure needs with innovative timber products sourced from regionally available tree species. The project focuses on overcoming challenges and building on opportunities specific to transportation infrastructure in Cheshire County, NH.

**Location of Project:** Cheshire County, NH

**Grant Amount:** \$911,393.00

**Total Project Amount:** \$1,157,972.00

**Awarded to:** Sullivan County

**Project:** The purpose of this project is to replace a deteriorated bridge's old antiquated rough-cut timber beam construction, using wood-based materials and composites and where available advanced wood materials for the improvement of the Town of Neversink's transportation system. Specifically, the bridge superstructure would be replaced with an advanced Glue-Laminated Timber superstructure and the steel bridge railing system would be replaced with a crash tested timber railing system.

**Location of Project:** Sullivan County, NY

**Grant Amount:** \$ 524,800.00

**Total Project Amount:** \$ 656,000.00

**Awarded to:** City of Keene

**Project:** The project provides for designing and constructing an outdoor hybrid timber pavilion structure to support the expansion of flexible Downtown small business uses year-round. Located on Gilbo Avenue in Downtown Keene, this hybrid timber structure

will provide a hub for the Cheshire Rail Trail connection to downtown and serve as an economic catalyst for new business opportunities, new jobs, and private investment.

**Location of Project:** Cheshire County, NH

**Grant Amount:** \$ 1,756,800.00

**Total Project Amount:** \$ 2,196,000.00

## Similar Funding Programs

The US Forest Service previously ran a “Wood in Transportation Program”.

“advancing engineered wood and composites technology through research and demonstration projects to further develop the use of wood for transportation structures.”

How are proposals selected?

### Examples of Funded Projects

Projects range from the design and construction of modern vehicular timber bridges, pedestrian timber bridges, and portable timber bridges, to student design competitions, to market assessments and to non-typical structures such as aqueducts and retaining walls, to the development of technical publications, to monitoring the performance of recently completed structures. Specific examples include the design and construction of two glued-laminated modern timber bridges in White County, GA, three stress-laminated modern vehicular timber bridges in Mat-Su Borough, AK, to a timber suspension bridge along the Appalachian Trail in New Jersey, to a National Timber Bridge Awards competition in Washington.

EXAMPLE - [An evaluation panel is convened on an annual basis to rate proposals received. Proposals are evaluated based on a number of criteria including cost effectiveness, longevity, serviceability, the use of underutilized wood species/new technologies to the extent possible, adherence to design codes, as well as meeting the overall goals of the program.]