HISTORICAL CONTEXT OF TRAIL LAYOUT & DESIGN (TL&D)

OUISCONSING
MSC volunteers at the end of a weekend project.

MOBILE SKILLS CREW
Mobile Skills Crew

OVERVIEW

The Mobile Skills Crew is a crew of dedicated, capable volunteers driven by a passion to help others. In the Mobile Skills Crew, members are not only interested in developing their skills, but also in sharing their knowledge and experiences with others. The crew is dedicated to providing hands-on training in a variety of construction techniques to volunteers who wish to improve their skills in trail building, erosion control, and other related skills.

The Mobile Skills Crew is open to participants of all ages and backgrounds. Whether you are a experienced professional or a beginner, the crew provides an opportunity to learn and share knowledge with others who share a common interest in trail building and outdoor recreation.

MEMBERSHIP

The Mobile Skills Crew is open to anyone interested in participating in trail building and conservation activities. To join the crew, interested individuals must submit an application detailing their background and experience in related fields. The crew will review all applications and make a decision on acceptance based on the information provided.

REQUIREMENTS

To be eligible for membership in the Mobile Skills Crew, applicants must meet the following requirements:

- Be at least 18 years old
- Have completed a basic course in trail building and conservation
- Be willing to commit to a minimum of 10 hours per month of volunteer work
- Be able to follow safety guidelines and protocols

The crew places a strong emphasis on safety and encourages all members to prioritize their own well-being while working on projects.

PROJECTS

The Mobile Skills Crew is involved in a variety of projects, including:

- Building and maintaining trails
- Erosion control
- Vegetation management
- Equipment maintenance

The crew works closely with local and regional organizations to ensure that projects are completed efficiently and effectively.

CONTACT

For more information about the Mobile Skills Crew, or to apply for membership, please contact the crew leader at:

Mobile Skills Crew Leader
123 Main Street
Anytown, USA 12345
Phone: 555-1234
Email: crewleader@mobileskillscrew.org
Website: www.mobileskillscrew.org

South Central Trail District
123 Trail Dr
Anytown, USA 12345
Phone: 555-5678
Email: info@traildistrict.org
Website: www.traildistrict.org
“The real voyage of discovery consists not in seeking new lands, but in seeing with new eyes.”

Marcel Proust
What is a Trail?
A Trail

...is an area of focused impact...
A Trail

...is managed as an outdoor recreational facility...
A Trail

...reacts to, and interprets, the landscape.

A trail is an area of focused impact that is managed as an outdoor recreational facility that reacts to and interprets the landscape.
The Three Disciplines of a Sustainable Trail

- **Physical** - Must adhere to established design elements

- **Environmental** - Do no harm  (*Primum non nocere*)

- **Social** - If you build it (what they want), They will come (and use it)!
Oldest Trails in the World

- The Long Trail, Vermont - Built by the Green Mountain Club between 1910 and 1930, this 272 mile trail is the oldest long-distance hiking trail in the United States.

- Rennsteig Trail, Germany – An historic boundary path in Central Germany, first mentioned in 1536, officially mapped in 1832.

- Via Francigena, Europe - An ancient road & pilgrimage route from Canterbury to Rome. First mentioned in writing as early as 725AD
Art & Science
Why?
The way a trail moves through, reacts to and interprets the landscape... is the art.
The way that a trail sheds water, focuses human impacts and anticipates future conditions... 

*is the science.*
MACRO ANALYSIS

Big picture
Natural & cultural features
Off site
On site
MIRCO ANALYSIS

Determines where, exactly, the trail and trail infrastructure will be located

Shapes the User Experience

From ribbons to pin flags
Macro – off site

Review relevant materials
Macro – off site

Property rights

Permissions

Management objectives
Macro – off and on site

Broad thematic framework.
What makes this place unique?
Macro – on site

Property Boundaries
Macro – on site

Identify control points
Macro – on site

Begin to identify route options

(ribbon flagging)
Micro – off site

Communications

Compliance
Ice Age Trail – Superior Lobe Chapter

Date: June 26, 2018
To: Tim Malzhan
From: Dan Brereton
Copy: Bob Held, Tim McRaith, Dale Cardwell

Subject: Final Approval

Tim, at the Superior Lobe Chapter monthly meeting held on June 19, 2018, the Chapter approved the purchase and construction of the proposed bridge across “No Name Creek”.

Attached are the documents and quote which were approved. I have not obtained the meeting minutes yet, however I can inquire about them and pass them on as well should you require them as evidence the motion has passed.

Up to today, the project timeline and events include:

**February 16, 2018** – DNR opinion the stream is not navigable, no permit required.

**February 28, 2018** – PRF submitted.

**May 24, 2018** - Site visit = location and construction refined.

**May 29, 2018** – Bridge location approval from John Cisek, Barron County Forestry Administrator.

**May 31, 2018** – Finalized bridge diagram and materials list.

**June 5, 2018** – Quote returned from Greeners Lumber, Birchwood.

**June 19, 2018** – Submission and approval from Chapter.

Please let me know if you need anything further to make your decision. If approved, a rough construction timeline approved by the Chapter is below.

- **August/September** - Tree cutting and site prep.
- **September** - 1st partial order from Greeners = initial abutment pieces constructed off site.
- **September** - Work day on site to build and set abutments.
- **September** - 2nd partial order from Greeners = decking and joiners cut to size off site.
- **September/October** - 3rd partial order and delivery of 24’ beams to site by Greeners.
- **September/October** - Work day on site = setting of bridge beams and joiners (decking if time).
- **October** - Work day on site to complete bridge, approach construction, etc.
- **October** - Work day (if needed) to finish any items left.
- **End of October** - Completion/Inspection

Note: Timeline flexible, goal is to get complete by snowfall.
<table>
<thead>
<tr>
<th>PROJECT-Segment</th>
<th>County</th>
<th>PRF STATUS</th>
<th>ARC Phase 1 Needed Y/N?</th>
<th>TL&amp;D COMPLETE BY</th>
<th>SOW MAP Needed by</th>
<th>ARC FIELD DATES</th>
<th>ARC Complete?</th>
<th>NHI status</th>
<th>Water Regs; Clearspan; RT/GP</th>
<th>WisDot</th>
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<tbody>
<tr>
<td>Walla Hi</td>
<td>Manitowoc</td>
<td>submitted</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
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<td></td>
<td>WP-GP-NE-2018-36-X04-17T08-53-16</td>
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<tr>
<td>Cross Plains Conservancy</td>
<td>Dane</td>
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<td>Yes</td>
<td>April</td>
<td>NA</td>
<td>NA</td>
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<td>ERR Log #16-819</td>
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<td>Old RR</td>
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<td>7/18</td>
<td>TBD</td>
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<td>ER Log #18-094 Recommend action submit by 8/1/18</td>
<td>Need</td>
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<td>Dane</td>
<td>in progress</td>
<td>TBD</td>
<td>11/1</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
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<td>Chippewa</td>
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<td>NA</td>
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</table>
Identify the Trail User
# Figure 1: Ice Age Trail Construction Design Standards

<table>
<thead>
<tr>
<th>Standards (desired)</th>
<th>ROS CLASS</th>
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<tbody>
<tr>
<td></td>
<td>Urban</td>
</tr>
<tr>
<td><strong>Tread Width</strong></td>
<td></td>
</tr>
<tr>
<td>Hiking Segments</td>
<td>48&quot;</td>
</tr>
<tr>
<td>Accessible Segments</td>
<td>60&quot;</td>
</tr>
<tr>
<td><strong>Clearing Width</strong></td>
<td>24&quot;</td>
</tr>
<tr>
<td>(each side of tread)</td>
<td></td>
</tr>
<tr>
<td><strong>Clearing Height</strong></td>
<td>10'</td>
</tr>
<tr>
<td>(minimum)</td>
<td></td>
</tr>
<tr>
<td><strong>Slope (max. sustained)</strong></td>
<td>10%</td>
</tr>
<tr>
<td>Hiking Segments</td>
<td>5%</td>
</tr>
<tr>
<td>Accessible Segments</td>
<td></td>
</tr>
<tr>
<td><strong>Slope (max.)</strong></td>
<td>15% for 100'</td>
</tr>
<tr>
<td>Hiking Segments</td>
<td>8% for 100'</td>
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<tr>
<td>Accessible Segments</td>
<td></td>
</tr>
<tr>
<td><strong>Cross Slope (max.)</strong></td>
<td>3%</td>
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<tr>
<td><strong>Accessible Segment Standards</strong></td>
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<tr>
<td>Passing Spot Int.-max.</td>
<td>N/A</td>
</tr>
<tr>
<td>Rest Area Interval-max.</td>
<td>1,200'</td>
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<tr>
<td><strong>Surfaces</strong></td>
<td>Asphalt, concrete, stabilized aggregate, screening (1), wood chip, sod.</td>
</tr>
<tr>
<td><strong>Accessible Surfaces</strong></td>
<td>Asphalt, concrete, stabilized aggregate.</td>
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</tbody>
</table>
Previsualization

Is a conscious process
Anticipates desired end results
Recognizes intermediate steps
Seeks an understanding of craft and sequence
Is the basis of composition
Micro – on site

Rooms

Flow

Tiers
Upper Tier (air and fluids)

Middle Tier (users, natural & mechanical forces)

Lower Tier (gravity, soil, drainage, bedrock)
Micro – on site

Aesthetics
Micro – on site

Human Feelings
Micro – on site

Opinions

Emotions

Motivations
ICE AGE TRAIL ALLIANCE, INC. (IATA)

POLICY: TRAIL LAYOUT AND DESIGN

APPROVED: BOARD OF DIRECTORS

EFFECTIVE DATE: JANUARY 22, 2011

RELATED DOCUMENTS AND POLICIES: IATA BY-LAWS ARTICLE II, SECTION 17 (B); THE NATIONAL TRAILS SYSTEM ACT; THE NATIONAL ENVIRONMENTAL POLICY ACT; THE ICE AGE NATIONAL AND STATE SCENIC TRAIL VISION STATEMENT AND ATTRIBUTES; ICE AGE NATIONAL SCENIC TRAIL: A HANDBOOK FOR TRAIL DESIGN, CONSTRUCTION AND MAINTENANCE; THE TRIAD MEMORANDUM OF UNDERSTANDING; THE NPS/IATA TRAIL PROJECT TIMELINE; THE ICE AGE TRAIL PROJECT REVIEW FORM, AND THE IATA MOBILE SKILLS CREW PROJECT TEAM DESCRIPTION.

TABLE OF CONTENTS

BACKGROUND

PURPOSE

AUTHORITY FOR THIS POLICY

TRAIL LAYOUT AND DESIGN PROCESS

STAKEHOLDERS

TRAIL PROJECT TIMELINE

APPEAL PROCESS
“IF YOU WANT TO BUILD A SHIP…

Don’t drum up the men to gather wood, divide the work & give orders.

INSTEAD…

TEACH THEM TO YEARN FOR THE VAST AND ENDLESS SEA.

ANTOINE DE SAINT-EXUPÉRY
Micro – on site

Accommodating

Erosion
Micro – on site

Water > Wind > Gravity

Ice > Snow > Use
Volume + Velocity = Damage

Hydrologically Invisible

Befriend the one over three rule
Generally, the shape of the trail alignment influences trail outcomes more than any other factor.
Micro – on site

Anticipate future conditions
The form that a Trail takes... becomes an expression of cultural priorities.
Resistant
Durable
Trails
Resistant Alignments
Trail Alignment Angle to the Prevailing Slope

Low alignment angle

High alignment angle
| 0-22 degrees | Bad – very difficult to drain water, will erode except on low trail grades |
| 23-45 degrees | Poor – requires tread manipulation/structures to drain water, will erode on steep trail grades |
| 46-67 degrees | Good – easy to create positive drainage points while still gaining elevation |
| 68-90 degrees | Excellent - easy to drain water, but trail doesn’t gain elevation very fast |
SOILS: from least to most durable
Sand, Silt, Loam, Clay, Gravel, Shale, Rock
WATER WINS...
Following the Contour of the Land Facilitates Sheet Drainage
Sheet Drainage (Laminar Flow)
Rise ÷ Run = 

**Trail Grade**

*Example:*

1000’ Elevation Change ÷ 10,000 Ft. Linear Run = 10% Average Grade
<table>
<thead>
<tr>
<th>Trail Slope Alignment</th>
<th>Study Area</th>
<th>Trail Grade</th>
<th>Totals</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>0-2%</td>
<td>3-10%</td>
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<tr>
<td>0-30°</td>
<td>BSF</td>
<td>2.3</td>
<td>10.1</td>
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<tr>
<td></td>
<td>HNF</td>
<td>8.9</td>
<td>7.5</td>
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<td>ANP</td>
<td>6.9</td>
<td>22.9</td>
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<td>HNF</td>
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<td>61-90°</td>
<td>BSF</td>
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<td></td>
<td>HNF</td>
<td>42.6</td>
<td>17.9</td>
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<tr>
<td></td>
<td>ANP</td>
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<td>17.3</td>
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**Totals**

<table>
<thead>
<tr>
<th>Study Area</th>
<th>BSF</th>
<th>HNF</th>
<th>ANP</th>
</tr>
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<tbody>
<tr>
<td>BSF</td>
<td>22.4</td>
<td>56.0</td>
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<td>33.6</td>
<td>9.4</td>
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<tr>
<td>ANP</td>
<td>22.1</td>
<td>48.9</td>
<td>27.4</td>
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</table>

**Trail Sustainability Ratings**

<table>
<thead>
<tr>
<th>Good</th>
<th>Neutral</th>
<th>Poor</th>
<th>Very Poor</th>
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</thead>
<tbody>
<tr>
<td>BSF</td>
<td>45.9</td>
<td>22.5</td>
<td>24.7</td>
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<tr>
<td>HNF</td>
<td>26.1</td>
<td>56.9</td>
<td>13.3</td>
</tr>
<tr>
<td>ANP</td>
<td>26.0</td>
<td>22.1</td>
<td>33.6</td>
</tr>
</tbody>
</table>
TOOLS

Clinometer, Compass, topographic & aerial maps

Weather-resistant notebook, pens, fine point sharpies

Ribbon and wire-stake (pin) flagging

STHL folding saw; 100’ measuring tape, camera

Appropriate / layered clothing for the terrain

Sturdy footwear – boots are preferred

Water, food, cell phone

First aid supplies
RECAP

Identify the user types and know the design standard for the setting

Factor 100 hours per mile for design time

Obtain permissions & communicate up

Allow at least 4 seasons field time
THANK YOU!!