T-14 Strategic Plan

Progress Update

T-14 Meeting
Saratoga Springs, NY
April 2015
Background

- AASHTO SCOBS Strategic Plan update 2013
- Each tech. committee to have Strategic Plan and Work Plan
- Align objectives with eight SCOBS objectives
SCOBS Strategic Plan - Objectives

1. Extend Bridge Service Life
2. Assess Bridge Condition
3. Maintain & Enhance a Knowledgeable Workforce
4. Maintain & Enhance the AASHTO Specifications
5. Accelerate Bridge Delivery and Construction
6. Optimize Structural Systems
7. Model and Manage Information Intelligently
8. Contribute to National Policy
• T-14 working group brainstorming for needed research, code revisions, vision, mission, scope...

• Items presented in Denver August 2014

• Full list sent to T-14 members

• Prioritization based on T-14 member responses

• Top items incorporated into draft plan

• Items identified best suited for Strategies and Action Items

• Objectives developed to envelop the Strategies and Action items

• Action items may be moved to a separate Action Plan or to the Work Plan?
<p>| 1 | Advancement of improved grades of steel (stainless and conventional steels) |
| 2 | Identify effective and reliable corrosion protection systems (paint, metalizing, galvanizing etc.) including guidance on use. |
| 3 | Optimize cross frames – better understand forces (analysis versus reality), determine when analysis is necessary, optimize details for cost and performance |
| 4 | Facilitate technical knowledge transfer from mills and fabricators to designers |
| 5 | Enhance the bridge design specifications for compatibility with Accelerated Bridge Construction (ABC) Methods (stud spacing for precast decks etc.) |
| 6 | Quantify effects of heavier trucks |
| 7 | Development of 3D modeling standards – benchmark problems and stress based design guidance |
| 8 | Develop guidance for universities that are establishing a bridge engineering course or curriculum |
| 9 | Develop Unified LRFD specifications for Non-composite Steel Box Sections (truss members, arch ribs, ties, rigid frame members, columns, bent caps, floorbeams, steel tower legs etc.) |
| 10 | Update guidance on proper use of weathering steel |
| 11 | Damaged steel girder research and evaluation criteria development – how many times they can be repaired, capacity in damaged condition etc. |
| 12 | Reorganization or rewrite of Section 6 of the AASHTO LRFD Bridge Design Specifications |
| 13 | Review the Fracture Control Plan requirements for potential improvement |</p>
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<tr>
<td>14</td>
<td>Develop a continuing education roadmap for bridge engineers</td>
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<td>15</td>
<td>Expand and disseminate information regarding pre-decked girders – provide technical assistance to fabricators, show benefits of eliminating cross frames etc.</td>
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<td>16</td>
<td>Work with FHWA to identify needs for development of NHI training</td>
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<td>17</td>
<td>Bridge Information Modeling (BrIM) standards development - models potentially useful for design, fabrication, construction, inspection and maintenance</td>
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<td>18</td>
<td>Determination of reliable data for use in Life Cycle Cost Analysis</td>
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<td>19</td>
<td>Expand design criteria and material specifications for tubular member bridge design (tube flange girders)</td>
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<td>20</td>
<td>Establish process for and sponsor webinars through AASHTO (content to be determined)</td>
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<td>21</td>
<td>Improvement in education and how we disseminate information to designers and industry</td>
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<td>22</td>
<td>Design guidance for service life</td>
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<td>23</td>
<td>Develop or enhance design criteria, specifications, load rating criteria for steel girders strengthened with non-conventional materials such as FRP</td>
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<td>24</td>
<td>Improve collaboration with the Long Term Bridge Performance Program – for providing input to them and for implementing the research findings</td>
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<td>25</td>
<td>Investigate if/when steel box girders are economical and why</td>
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<td>26</td>
<td>Development of Structural Health Monitoring guidance</td>
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<td>27</td>
<td>Guidance to quantify sustainability of steel bridges – carbon footprint, benefits of recycling</td>
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<td>No.</td>
<td>T-14 Committee Action Items</td>
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Vision
Champion excellence in the planning, design, fabrication, erection, maintenance and rehabilitation of steel bridges.

Mission
To provide safety, reliability and economy in steel bridge planning, design, fabrication, erection, maintenance and rehabilitation. This shall be accomplished through development and maintenance of specifications and technical guidance, advancement of research and outreach.
**Scope**

- Not included in current draft

**SCOPE**

“The T-14 committee is the champion for steel bridges. We are concerned with a variety of topic areas encompassing the initial design, fabrication, erection, and maintenance of steel bridges. One of the primary activities of the committee is the upkeep of Section 6 of the LRFD Bridge Design Specifications, however we also serve as subject matter experts to other technical committees that oversee other AASHTO specifications on topics that involve metals. As part of maintaining accurate and meaningful AASHTO specifications and guidelines, the committee develops and vets research needs statements, and works collaboratively with industry to remain on the cutting edge of technology. The committee is also interested in proper implementation of AASHTO specifications, and fully supports outreach activities to educate practitioners about general steel bridge topics, but also proper use of AASHTO specifications and guidelines.”
Objectives and Strategies

Objective 1: Keep steel bridge related portions of the AASHTO LRFD Bridge Design Specifications and Construction Specifications current with state-of-the-art practices and organized for optimum use.

AASHTO SCOBS Strategic Plan Objective #4: Maintain and Enhance the AASHTO Specification; Objective #5: Accelerate Bridge Delivery and Construction

Strategy 1.1: Develop and review ballot items for updates based on recommendations from completed research and needs identified by the T-14 committee, other committees, industry, academia etc.

Action: Reorganize and simplify Section 6 of the AASHTO LRFD Bridge Design Specifications.
Action: Develop unified LRFD specifications for non-composite steel box sections – truss members, arch ribs, ties, rigid frame members, columns, bent caps, floorbeams, steel tower legs, etc.
Action: Develop and implement new fracture toughness requirements

Strategy 1.2: Develop and update AASHTO specifications and guide documents for steel bridges for compatibility with Accelerated Bridge Construction (ABC) methods.

Action: Revise the shear stud provisions of the AASHTO LRFD Bridge Design Specifications for optimum compatibility with precast concrete decks.
Action: Expand and disseminate information regarding pre-decked girders.

Strategy 1.3: Coordinate with other SCOBS technical committees on ballot items as appropriate.
**Objective 2:** Identify and facilitate the advancement of state-of-the-practice through research.

**AASHTO SCOBS Strategic Plan:** Objective #1: Extend Bridge Service Life; Objective #2: Assess Bridge Condition; Objective #4: Maintain and Enhance the AASHTO Specifications; Objective #5: Accelerate Bridge Delivery and Construction; Objective #6: Optimize Structural Systems; Objective #7: Model and Manage Information Intelligently

**Strategy 2.1:** Identify needed research.

**Strategy 2.2:** Develop or recommend the development of research needs statements for identified research needs in conjunction with FHWA, TRB structural technical committees etc.

**Strategy 2.3:** Advise and actively participate on research panels.
Objective 3: Promote development and use of design methods and materials that will extend the service life of steel bridges.

AASHTO SCOBS Strategic Plan Objective #1: Extend Bridge Service Life

**Strategy 3.1:** Develop research problem statements and support research for the advancement of improved grades of steel (stainless and conventional steels).

**Strategy 3.2:** Identify effective and reliable corrosion protection systems (paint, metalizing, galvanizing etc.) and develop guidance on their use. Coordinate with T-9.

**Strategy 3.3:** Update guidance on the use of weathering steel.

**Strategy 3.4:** Establish design guidance for extended service life.
Objective 4: Keep AASHTO/Industry guide documents current with state-of-the-art design and detailing for cost efficiency and optimum performance of steel bridges.

AASTHO SCOBS Strategic Plan Objective #6: Optimize Structural Systems

Strategy 4.1: Develop guidance clarifying when analysis of cross frames is necessary.

Strategy 4.2: Partner with industry to develop optimized structural steel details.
   Action: Develop cross frame details optimized for cost and performance.

Strategy 4.3: Prepare guidelines for reliable fit-up of steel I-girder bridges

Strategy 4.4: Support research of longitudinally stiffened girders
**Objective 5:** Promote advancement of intelligent steel bridge design, construction and management modeling.

*AASHTO SCOBS Strategic Plan Objective #7: Model and Manage Information Intelligently.*

**Strategy 5.1:** Support development of 3D modeling criteria and tools.

**Action:** Develop stress based design criteria for use with 3D modeling.

**Action:** Develop benchmark problems for 3D modeling.
Objective 6: Contribute to national policy regarding steel bridge performance and safety.

AASHTO SCOBS Strategic Plan Objective #8: Contribute to National Policy

Strategy 6.1: Review the Fracture Control Plan requirements for potential improvement.
Objective 7: Identify training needs related to steel bridges and support development of training.

AASHTO SCOBS Strategic Plan Objective #3: Maintain and Enhance a Knowledgeable Workforce.

Strategy 7.1: Partner with FHWA to identify needs for development of NHI training.
2015 Work Plan
Subcommittee on Bridges and Structures Technical Committee 2015 Work Plan

Technical Committee #14
Technical Committee Name: Structural Steel Design

Chair: Norm McDonald
Vice-Chair: Keith Fulton

Important Activities/Research Underway

1. Extend Bridge Service Life
   a. Develop and support research for the advancement of improved grades of steel.
   b. Identify effective corrosion protection systems and develop guidance on their use.
   c. Update guidance on the use of weathering steel.
   d. Design guidance for service life.

2. Assess Bridge Condition
   a. ...

3. Maintain and Enhance a Knowledgeable Workforce
   a. Partner with FHWA to identify needs for development of NHI training.
   b. ...

4. Maintain and Enhance the AASHTO Specifications
   a. Develop unified LRFD specifications for non-composite steel box sections.
   b. Reorganize and simplify Section 6 of the AASHTO LRFD Bridge Design Specifications.
5. Accelerate Bridge Delivery and Construction
   a. Revise the shear stud provisions of Section 6 of the AASHTO LRFD Bridge Design Specifications for optimum compatibility with precast concrete decks.
   b. Develop guidance and promote the use of pre-decked steel girders for ABC construction.

6. Optimize Structural Systems
   b. Longitudinally stiffened girder research.
   c. Curved tubular flange girder research.
   d. Orthotropic deck research.

7. Model and Manage Information Intelligently
   a. Develop stress based design criteria for use with 3D modeling.
   b. Develop benchmark problems for 3D modeling.
   c.

8. Contribute to National Policy
   a. Review the fracture control plan requirements for potential improvement.
   b.
   c.
Upcoming New or Updated Publications
- Steel Bridge Erection Guide Specification
- Guidelines for Steel Girder Bridge Analysis

Needs/Concerns

Goals for Next Year
- Develop and implement new fracture toughness requirements.
- Review 2015 Aluminum Design Manual for revisions to Section 7 of the LRFD BDS

Goals for Next 5 Years
- Guide specification for full and hybrid use of stainless steel bridge girders.
- Develop guidance for analysis of cross frames.
- Unified LRFD specifications for non-composite steel box sections.
- Develop specialized coatings for steel bridge girders.

Future Meetings

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