NCHRP PROJECT 20-07/TASK 423
Planning for a Comprehensive Update and Restructuring of AASHTO’s
A Policy on Geometric Design of Highways and Streets, 8th Edition
or
GB8 Visioning and Road Map

Joint AASHTO/TRB
2018 Mid-year meeting
General Session 3
Franklin Tennessee
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Presentation overview

- Intended Outcomes
- Green Book 7th Edition Overview
- 8th Edition Green Book Visioning Project
- Open Discussion
Intended Outcomes

- Session Overview and Objectives
  - Obtain your view on where GB8 should be heading
  - Hear your initial thoughts on Resource Documents
  - Hear your initial thoughts on Visioning
Presentation overview

- Intended Outcomes
- **Green Book 7th Edition Overview**
- **8\textsuperscript{th} Edition Green Book Visioning Project**
- Open Discussion
7th Edition Green Book Updates

- 7th Edition
  - Publication Status
  - Major Changes
    - Foreword and Chapter 1
      - Separation of design process for new vs existing construction
      - Performance-Based Design
      - New land use context zones
    - Supporting Research
      - NCHRP Reports 785, 839, 855 and 15-50

- 8th Edition
  - Fundamental changes and fresh look
  - Visioning effort
  - Is the publication 8 to 10 years out or sooner?
Presentation overview

- Intended Outcomes
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ADMINISTRATIVE RESOLUTION:
DIRECTION ON FLEXIBILITY IN DESIGN STANDARDS

WHEREAS, The AASHTO A Policy on Geometric Design of Highways and Streets (commonly referred to as the “Green Book”) serves as the preeminent design guidance for streets and roadways in the United States; and

WHEREAS, The Green Book is a research based, peer developed set of design standards, which serves as the basis of design for all roads on the National Highway System, as well as many state and local roads; and

WHEREAS, The next edition of the Green Book is currently under development; and

WHEREAS, Increases in bicycle and pedestrian volumes have been recorded nationwide in large cities, suburbs, and small towns, along with corresponding increases in collisions and fatalities; and

WHEREAS, Funding and right-of-way constraints are a continual challenge for transportation facility owners; and

WHEREAS, Additional, robustly-researched guidance is needed on how best to incorporate other modes of travel when designing safe and efficient roadways that serve all users; and

WHEREAS, The design philosophy that incorporates a multi-faceted approach to street and highway design has been described using various terms, including flexibility in design, context sensitive solutions, practical design, and complete streets; and

WHEREAS, Other publications provide examples for multi-modal street design, but there does not exist research-based, peer-reviewed design guidance that fully address the technical design-related aspects of these issues; and now, therefore, be it

Approved by the Standing Committee on Highways May 25, 2016 in Des Moines, IA
ADMINISTRATIVE RESOLUTION:
DIRECTION ON FLEXIBILITY IN DESIGN STANDARDS

- RESOLVED, AASHTO should provide guidance to state DOTs and other users of the Green Book regarding flexibility in design; and be it further

- RESOLVED, This guidance should follow the AASHTO model of being research-based and peer-reviewed; and be it further

- RESOLVED, The Subcommittee on Design (SCOD) is tasked with developing this guidance, both in the short term (next Green Book edition) and the longer term; and be it further

- RESOLVED, This guidance should assist in educating engineers and designers on the flexibility inherent in the Green Book, as well as new and additional guidance on specific design issues; and be it further

- RESOLVED, This guidance should address designing in and for a multi-modal transportation system; and be it further

- RESOLVED, SCOD should coordinate with and possibly include other AASHTO publications in a future set of flexible design standards; and finally be it

- RESOLVED, SCOD should identify gaps in necessary research and develop a plan to fill those gaps.

Approved by the Standing Committee on Highways May 25, 2016 in Des Moines, IA
8th Edition Green Book Visioning Project

NCHRP PROJECT 20-07/TASK 423
Planning for a Comprehensive Update and Restructuring of AASHTO’s A Policy on Geometric Design of Highways and Streets

- Ray Derr, Senior Program Officer
- Ms. Joyce Taylor, P.E., Technical Panel Chair
- Multi-Modal Panel formed and reviewed proposals
- Selected Kittelson & Associates
Objective:
– “...detailed roadmap to develop and implement the 8th Edition of the Green Book that supports a data driven, performance-based design process as described in NCHRP Report 839...”

Budget: $100,000

Schedule: 1 Year, May 2018 to May 2019
Foundational Research Documents

- NCHRP Report 785: Performance-Based Analysis of Geometric Design of Highways and Streets
- NCHRP Report 839: A Performance-Based Highway Geometric Design Process
Foundational Research Documents

- NCHRP Report 785: Performance-Based Analysis of Geometric Design of Highways and Streets
  - Outcomes-based framework
  - Each project development stage

- NCHRP Report 839: A Performance-Based Highway Geometric Design Process
  - New or reconstruct threshold
  - GB Outline: 4 Parts 29 Chapters
8th Edition Green Book Visioning Project

- Review Documents
- Stakeholder Meetings
- Summarize GB8 Framework

DEVELOP A FOUNDATION

GATHER AND SHARE

ASSESS AND VALIDATE

FINAL ROADMAP & IMPLEMENTATION

GB8 VISION

Moving Toward a Validated GB8 Vision
8th Edition Green Book Visioning Project

- Task 1: Panel Meetings
  - On-going check-ins and conference calls

- Task 2: Literature Review and Evaluation
  - NCHRP Report 785: Performance-Based Analysis of Geometric Design of Highways and Streets
  - NCHRP Report 839: A Performance-Based Highway Geometric Design Process
  - Others: AASHTO, TRB/NCHRP, FHWA, NACTO, ITE, AMPO, CNU and more.

- Task 3: Draft Roadmap and Proposed Recommended Approach
  - Supports outreach meeting discussion
  - Develops draft visioning and roadmap products

...based on actual contract NTP
We have focused on Task 4...
8th Edition Green Book Visioning Project

- **Task 4: In-Person Meetings**
  - AASHTO Spring Meeting
    - Franklin, TN May 2018
  - AASHTO and TRB Committee on Design Annual Meeting
    - Franklin, TN, June 2018
  - AASHTO Council on Active Transportation
    - Spokane, WA July 2018
  - NACTO, Designing Cities Conference
    - Los Angeles, CA, October 2018
  - TRB Annual Meeting
    - Washington, D.C., January 2019
8th Edition Green Book Visioning Project

- Task 5: Final Roadmap and Implementation Plan
  - Draft & Final GB8 Vision
  - Roadmap for Implementation
  - PowerPoint Presentations
  - Research Summary

...Complete by March, 2019....
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Literature Review Discussion
The purpose of the literature review is to:

- Compile a list of documents that may influence GB8
- Identify a list of key themes from these documents that may help guide the visioning for GB8
Literature Review Discussion

- We’ve compiled an initial list of documents and would like your feedback.

- Questions for the group discussion:
  - Are there any other documents that we should consider including in this list?
  - What are the priority documents that you think may have the most influence on GB8?
  - In your current experience with the documents, what are some of the key themes that will help direct or influence GB8?
Considerations for Prioritizing Sources

- Project development and performance metrics
- Support planning decisions and design needs
- Adapt to each stage of the design process
- Integrate quality of service for each user
- Incorporate livability, economic vitality, and community heritage interests
- Public health as a performance metric
- Others?
AASHTO Sources

- A Policy on Geometric Design of Highways and Streets, 7th Edition
- A Guide for the Development of Bicycle Facilities
- Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤400)
- Others?
TRB/NCHRP Sources

- Report 600: Human Factors Guidelines for Road Systems
- Report 616: Multimodal Level of Service Analysis for Urban Streets
- Report 642: Quantifying the Benefits of Context Sensitive Solutions
- Report 687: Guidelines for Ramp and Interchange Spacing
- Report 785: Performance-Based Analysis of Geometric Design of Highways and Streets
- Report 839: A Performance-Based Highway Geometric Design Process
- Report 855: An Expanded Functional Classification System for Highways and Streets
- Report 880: Guidelines for Designing Low- and Intermediate-Speed Roadways that Serve All Users
FHWA Sources

- Performance-Based Practical Design (PBPD)
  - Main Website: [https://www.fhwa.dot.gov/design/pbpd](https://www.fhwa.dot.gov/design/pbpd)

- Separated Bike Lane Planning and Design Guide

- Small Town and Rural Multimodal Networks

- Rural and Small Town Bicycle and Pedestrian Facilities

- Guide for Achieving Multimodal Networks: Applying Design Flexibility and Reducing Conflicts

- Guidebook for Developing Pedestrian and Bicycle Performance Measures

- Others?
NACTO Sources

- Urban Street Design Guide
- Global Street Design Guide
- Urban Bikeway Design Guide
- Transit Street Design Guide
- Blueprint for Autonomous Urbanism
- Urban Street Stormwater Guide
- Others?
ITE Sources

- Urban Street Geometric Design Handbook
- Designing Walkable Urban Thoroughfares: A Context Sensitive Approach
- Recommended Design Guidelines to Accommodate Pedestrians and Bicycles at Interchanges: A Recommended Practice
- Others?
AMPO Sources

- [http://www.ampo.org/resources-publications/publications](http://www.ampo.org/resources-publications/publications)
- Publications, such as “Summary Reports”
CNU Sources

- https://www.cnu.org/resources/tools
- Concepts such as “transect zones” and “form-based code”
- Others?
State Highway Agencies

- Complete Intersections: Caltrans
- Complete Streets Context Classification System: FDOT
- Complete Streets Handbook: FDOT
Other Topics/Groups to Integrate

- Project for Public Spaces
- National Association of County Engineers
- Americans with Disabilities Act
- Public Rights-of-Way Accessibility Guideline
- Visually Impaired and Special User needs
- Freight Mobility and Goods Movement
- Others?
Visioning Discussion
Visioning Discussion

- **Visioning Goals**
  - Assess performance-based evaluation approaches
  - Identify and gather input on concepts and ideas for a GB8 Vision
  - Develop a roadmap for implementation

- **The visioning will discuss key questions:**
  - What is your vision for the GB8? What does it look like?
  - What are the considerations that will allow us to develop the plan to achieve that vision? How do we get there?
Visioning Discussion

- We’ve developed a list of topics/categories and would like your feedback.

Questions for the group discussion:
- Are there additional categories or topics we should include?
- What are your initial thoughts on each topic?
  - What are your priorities?
  - What are some of the key considerations?
- Functionally, how do we achieve the desired outcome for GB8?
  - What are the challenges that you see of achieving the vision?
  - What partnerships need to be developed to achieve the vision?
Key Topics

- Complete Project Development Process
- Guiding Principles Focused
- User Centered
- Role of Dimensional Design Criteria
- Highlights & References
- Electronic/Digital Format
- Modular in Nature
- Research-Based Leadership
- Collaboratively Assessed & Refined
- Expected Development Timeline
- Rome was Not Built in a Day
- Structure
- Other Considerations
Complete Project Development Process

- **Tie to the project development process**
  - Design doesn’t just begin in “Design”

- **Emphasize early participation and contributions from interdisciplinary team members**
  - Create context-sensitive solutions

- **Establish GB8 as a resource for:**
  - Applying roadway design fundamentals at each development stage
  - Smooth transitions as projects move from planning and programming to eventual design and construction
Guiding Principles Focused

- **Design GB8 to define guiding principles**
  - Understanding principles allows users to adapt to virtually any project needs and context

- **Principles focused for flexible design**
  - GB text has sometimes been more valuable than a chart

- **Integrate principles of multi-modal users**
  - How does roadway design affect them?
  - How do they influence roadway design?

- **Support GB8 Users**
  - Infographics to support applications and concepts
  - Schematics, graphics, and photos
User Centered

- Design GB8 to consider the user and environment first, and then defining roadway forms that meet those needs
  - Land use context in which the roadway is integrated
  - Fiscal awareness
  - Context sensitive, Practical design

- Consider whom the facility or design element is intended to serve to inform design decisions
  - What are we trying to achieve?
    - Operations, safety, reliability, land uses, economic development, community values, history and heritage
  - Consider “design users”
    - Pedestrians, bicyclists, transit, goods movement
Role of Dimensional Design Criteria

- Using dimensional design criteria supported by research-based documentation.

- Integrating previous traditional design criteria.
  - How much research has been completed for this?

- Considering vehicle and infrastructure technology
  - Connected/Automated Vehicles
  - When will we designers give up “sight distance?”
Highlights & References

- Include highlights from select references and resources at the end of each section
  - Support guiding documents that meet each user type from NCHRP Reports, FHWA, ITE, NACTO

- Being clear on what we:
  - Know
  - Think
  - Don’t know
Electronic/Digital Format

- The industry is going digital and GB8 must too
- Create hot links and references to other key documents
- Allowing searching on key words
- Paper versions have their role and value, too
Modular in Nature

- Make GB8 a much more dynamic resource
- Modular portions can be updated more frequently
  - Helps address various facility types and design users
- This will be useful with the incremental integration of connected/automated vehicles and smart roadway systems
- Considerations for how a modular format may impact the local, state and federal adoption process.
Research-Based Leadership

- AASHTO is a leader in:
  - prioritizing research needs
  - funding applied research
  - publishing results

- The GB8 efforts could better define and refine guidance by non-AASHTO groups
  - Especially for topics to be integrated into the first GB8 document
  - Prioritized research to support AMPO, NACE, NACTO, ITE concepts

- Expand TRB and AASHTO relationships to each mode
Collaboratively Assessed & Refined

- The AASHTO Technical Committee on Geometric Design historically produced new editions of the Green Book

- How will the GB8 be developed?
  - AASHTO Technical Committees? If so, which ones?
  - Should the work be outsourced?

- What are the external partnerships?
  - NACTO, ITE, CNU, NACE, AMPO, TRB/NCHRP, FHWA
Expected Development Timeline

- The expected development timeline may impact the scope of the document.

- When is GB8 expected to be published next?
  - 3 to 4 years?
  - 4 to 6 years?
  - 8 to 10 years?
Rome was Not Built in a Day

- GB8 is the cornerstone of a new way to approach transportation planning and design

- It’s a paradigm shift from previous editions
  - It may not get it all done…
  - Future editions should continue to build and expand the precedent set by GB8
  - Example: AASHTO’s *Highway Safety Manual, 1st Edition*
Structure—Organizing GB8

- How should the GB8 be organized?
- A future GB8 might be written and published in separate parts
  - By Work Type (Resurfacing, New Construction, Reconstruction)
  - By Land Use Context (Urban, Urban Core, Suburban, Rural, Rural Town).
  - By modal focus (Multi-modal, Inter-modal)
  - Other
Option 1 Four Part (29 Chapter) Publication (as presently proposed by NCHRP Report 839)
  - Part 1 (Chapters 1-8) Fundamentals of Geometric Design
  - Part 3 (Chapters 19-28) Geometric Design Process for Reconstructed Roads
  - Part 4 (Chapter 29) Existing Roads Requiring Resurfacing, Restoration or Rehabilitation

Option 2 a Two Part (multi-chapter) Publication split by Urban or Rural Land Use as follows:
  - Part 1 Geometric Design Criteria for Urban Areas (which would include Urban, Urban Core and Suburban) and then
  - Part 2 Geometric Design Publication that would provide criteria for the Rural and Rural Town land use contexts.

Or .... Etc.
Other Considerations?
Follow up?

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…I welcome your input and suggestions…