



The Highway Capacity Manual:

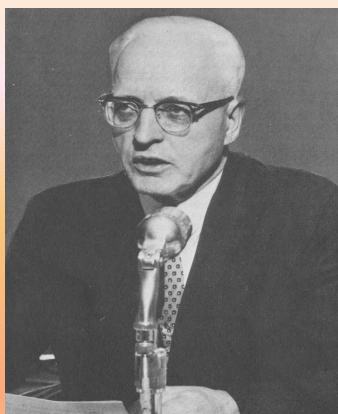
*Past, Present,
and Future*

HCM Chronology

- 1st Ed.:** 1950 BPR/HRB/GPO (147 Pgs)
1957 *Highway Research Board Bulletin 167*
- 2nd Ed:** 1965 TRB Special Report 87 (411 pgs)
1980 *TRB Circular 212* (276 Pgs)
- 3rd Ed:** 1985 TRB Special Report 209 (459 pgs)
1994 *Interim Update*
1997 *Interim Update*
- 4th Ed:** 2000 TRB (1200+ pgs)
- 5th Ed:** 2010 TRB (3000+ pgs)

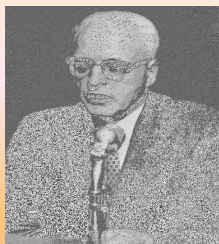
What's next?

Major interim update (or 6th Ed) in 2015.



The HCM has been produced by and overseen by the Highway Capacity and Quality of Flow Committee of TRB since its inception.

The history of the Committee begins with Olav K. (O.K.) Normann



1941: President Franklin D. Roosevelt establishes the National Interregional Highway Committee, chaired by Thomas MacDonald, Commissioner of Public Roads (BPR).

MacDonald assigned several professionals to work full time with the Committee, including a young engineer named O.K. Normann. Normann became the technical leader of the group, and by the time it presented its report in 1944, Normann was a well-known and respected expert on matters related to highway capacity and planning. He developed the first systematic method for observing speeds and spacings of pairs of vehicles, and used it to produce one of the first estimates of the capacity of a lane: 1,800 veh/h/ln.

Development of the Highway Capacity Committee

1927 HRB Committee on Traffic Analysis

1944 HRB Committee on Highway Capacity

O.K. Normann appointed first chairman.

Powell Walker appointed secretary.

Members selected by O.K. Normann.

Committee's Objective: produce the first HCM.

Normann and Walker were permitted to spend most of their professional time on the Committee and its task.

The 1950 Highway Capacity Manual

First appears as a series of articles in *Public Roads*.

Jointly published by BRP and HRB.

Intended to be a basic *design* guide.

Facility Types Covered:

Two-Lane, Two-Way Rural Highways

Three-Lane, Two-Way Rural Highways

Multilane Highways

Signalized Intersections

Weaving Sections

Ramps and Ramp Junctions

Capacity Concepts in the 1950 HCM

Basic Capacity

Maximum possible hourly volume under nearly ideal conditions.

Possible Capacity

Maximum possible hourly volume under prevailing conditions.

Practical Capacity

Maximum possible hourly volume under prevailing conditions while maintaining reasonable traffic operations.

The 1965 Highway Capacity Manual

The Highway Capacity Committee was inactive from 1950 to 1952. It was reactivated in 1953, with OK Normann remaining as chairman, to begin work on a new edition of the manual.

The Committee worked with state and federal highway agencies to collect data on 1600 signalized intersection approaches.

It also published HRB Bulletin 167, with 6 papers on freeway and rural highway capacity in 1957.

In 1960, BPR assigned five full-time staff members to work on the new HCM, under the direction of O.K. Normann.

Key Developments in the 1965 HCM:

***Development of the Level of Service concept.
Great expansion of material specifically related to freeways.
First intended use of methodologies in the operational analysis mode.
First material on pedestrians and transit.***

Facility Types Covered in the 1965 HCM

**Freeways
Multilane Highways
Two-Lane, Two-Way Rural Highways
Three-Lane, Two-Way Rural Highways
Arterials
Downtown Streets
Signalized Intersections
Weaving Sections
Ramps and Ramp Terminals
Bus Transit**

O.K. Normann passed away in 1964, just before publication of the 1965 HCM. With his passing, the operation of the Committee and production of subsequent manuals changed significantly.

The 1985 Highway Capacity Manual

Committee was now a group of volunteers. While FHWA continued to be active on the Committee, there was no full-time support provided by federal agencies.
NCHRP and FHWA supported the development of subsequent HCMs through funded research and production contracts with a variety of research agencies.

Key Issues and Milestones for the 1985 HCM

1980 Circular 212, Interim Materials on Highway Capacity, was published containing new and revised methodologies for signalized intersections, freeways, weaving segments (2 different methods), and ramps.
LOS concept debated (hotly) and retained.
Critical lane approach to signalized intersections adopted.
Greatly expanded material on transit and pedestrians.

Facility Types Covered in the 1985 HCM

Basic Freeway Segments
Weaving Segments
Ramps and Ramp Junctions
Freeway Systems
Multilane Highways
Two-Lane, Two-Way Rural Highways
Signalized Intersections
Unsignalized Intersections
Urban and Suburban Arterials
Transit
Pedestrians
Bicycles

**Changes in the Committee and
the Manual**

**Software (the HCS Package) developed to
implement computations.**

**Subcommittees formed to oversee specific
chapter development, greatly expanding
participation.**

**Last manual that every Committee member had
thoroughly read and understood.**

Significant "updates" issued in 1994 and 1997.

The 2000 Highway Capacity Manual

Explosion of new material, with a new focus on corridor and system level analysis.

New methodologies for:

Freeway Facilities.

Interchange Ramp Terminals.

Multiple Facilities – conceptual.

Corridor Analysis – conceptual.

Area-Wide Analysis (Networks) – conceptual.

The 2010 Highway Capacity Manual

Explosion of material continues.

Part IV of the manual is electronic only, and includes the *HCMAG* and critical source documents.

Key technical revisions:

Multimodal “complete streets” approach to many facility types.

Inclusion of LOS based on predictions of user perception.

Expanded material on roundabouts and STOP-controlled intersections.

Signalized intersections based on actuated control; incorporates incremental queue analysis for delay predictions.

**Forthcoming: The 2015 Update
(or the 2015 HCM)**

Primary need is to include the results of SHRP program research on LOS reliability and Active Demand Management strategies.

Now is the time for input from the profession:

Joint ITE/HCQSC luncheon at Polytechnic Institute of NYU on August 1, 11:45 AM – 1:45 PM.

Register at:

www.poly.edu/registration/highwaycapacity

Some Issues to Think About

What to do with Level of Service:

Can a simple 6-letter scale describe traditional operating parameters, use perceptions, truck LOS and reliability adequately? Safety anyone?

The "Black Box" Syndrome:

Is the software the manual? Can the HCM compete with more user-friendly "black boxes?"

Are levels of analysis fundamentally different?

The HCM now tries to deal with points, segments, sections, facilities, and systems. Is this possible?

Should there be multiple documents covering different areas?

Let us know what you think about these and other issues you are concerned about.

Questions?

Questions for the Audience

How many full editions of the HCM have there been?

When was the concept of Level of Service introduced?

How did the operation of the *Highway Capacity and Quality of Service Committee* change after the publication of the 1985 HCM?