

A CONVERGENCE OF EVENTS: THE FUTURE

of the

Manual on Uniform Traffic Control Devices

Session 8 B

Joint Western & Midwestern
Districts Meeting

Institute of Transportation
Engineers

Wednesday, July 2nd, 2014



DISCLAIMER

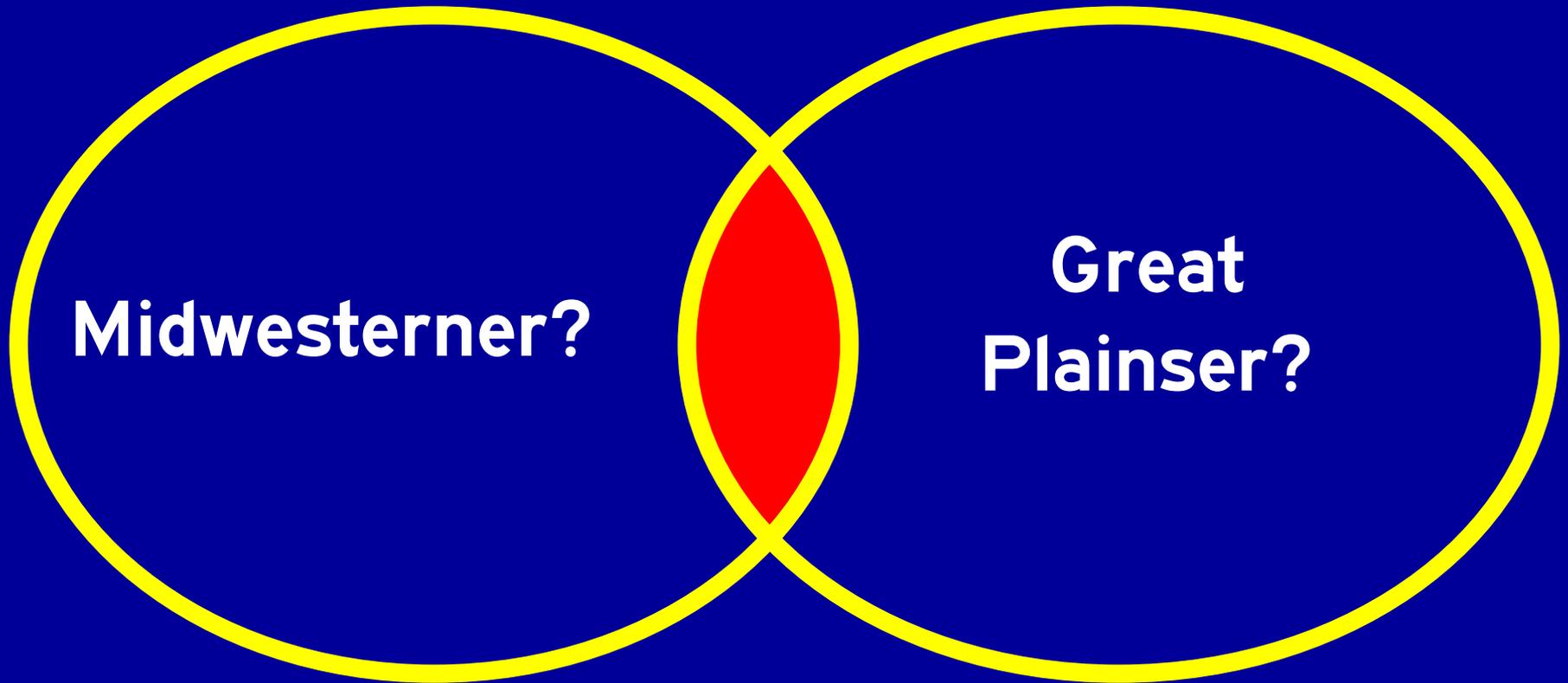
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RELATIONSHIPS



Great Midwesterner!



COMPLEXITY



COMPLEXITY . . .

- SIZE
- ORGANIZATION
- FORMATTING
- RELATIONSHIPS
- SCOPE
- APPLICATION
- SEVERABILITY



COMPLEXITY . . .

DOCUMENT SIZE may appear to have an obvious correlation, yet . . .
it may also be the most manageable.

PERTINENT INFORMATION may be

- **EXCLUDED** in the course of searches
- **EXCLUDED** in the course of updating content
- **EXCLUDED** from both activities by means of poor management of references
- **EXCLUDED** by practitioners with insufficient experience to recognize key content relationships





LARGE, COMPLEX, OR NEITHER?

Manual on Uniform Traffic Control Devices

for Streets and Highways

2009 Edition



U.S. Department of Transportation
Federal Highway Administration



modern traffic consultants

ADDRESSING COMPLEXITY

FHWA EFFORTS

- STUDYING SPLITTING OF THE *MUTCD*
- CHANGES TO ORGANIZATION
- ELECTRONICALLY-ACCESSIBLE DOCUMENTS
- "HOTLINKS" AND SEARCH FUNCTIONS
- DATABASE EFFORTS RELATED TO EXPERIMENTATION AND CLARIFICATION REQUESTS



ADDRESSING COMPLEXITY

NCUTCD EFFORTS

- REFINEMENTS TO LANGUAGE AND FIGURES
- ONGOING EFFORTS TO CULL NEW CONTENT TO ENSURE ...
 - RELEVANCE TO PURPOSE OF *MUTCD*
 - UNIFORMITY OF PRESENTATION
- The *MUTCD 20-Year Vision and Strategic Plan* addresses issues peripherally related to the complexity of the *MUTCD*.
 - LIMITING SIZE OF FUTURE NPAs
 - STRUCTURE and ORGANIZATION
 - GUIDELINES FOR CONTENT



COMPLEXITY IN THIS CONTEXT

COMPLEXITY VARIES ...

- **PURPOSE** for which content is accessed
 - LEVEL OF MANDATE
 - TYPE OF DEVICE
 - PARTICULAR APPLICATION
- **METHOD** of accessing content
- **PRESENTATION** desired for accessed content

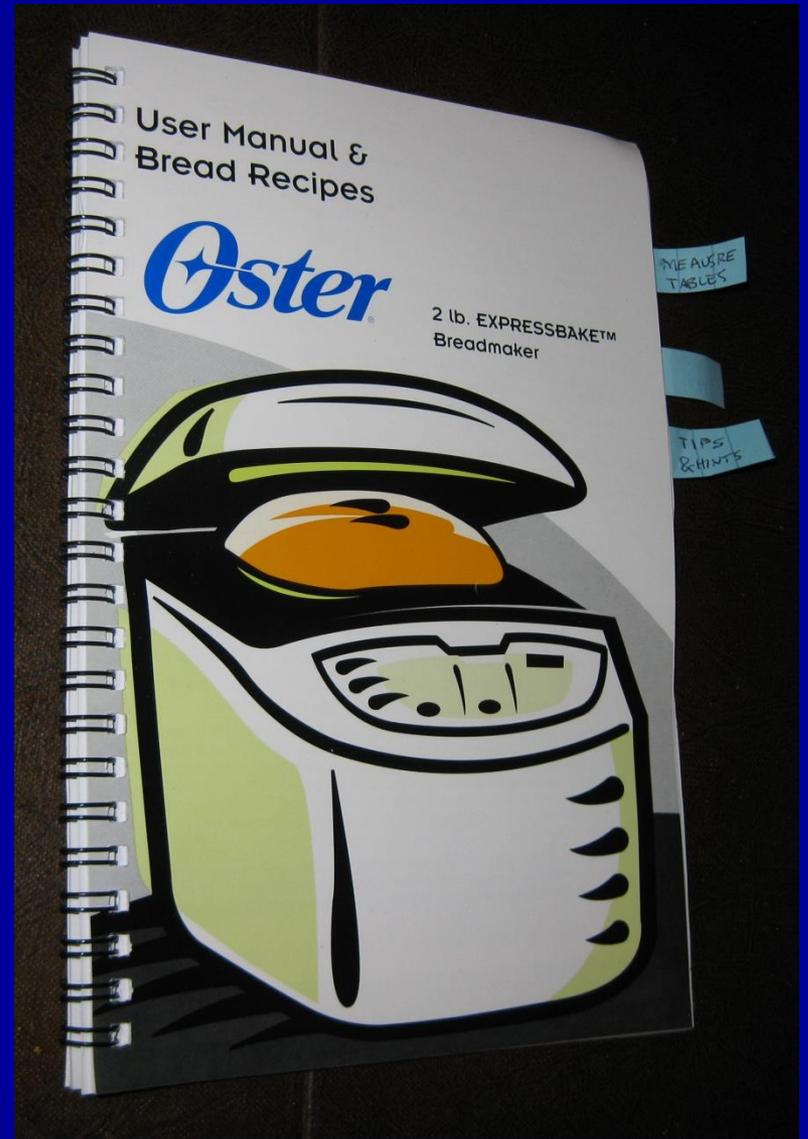
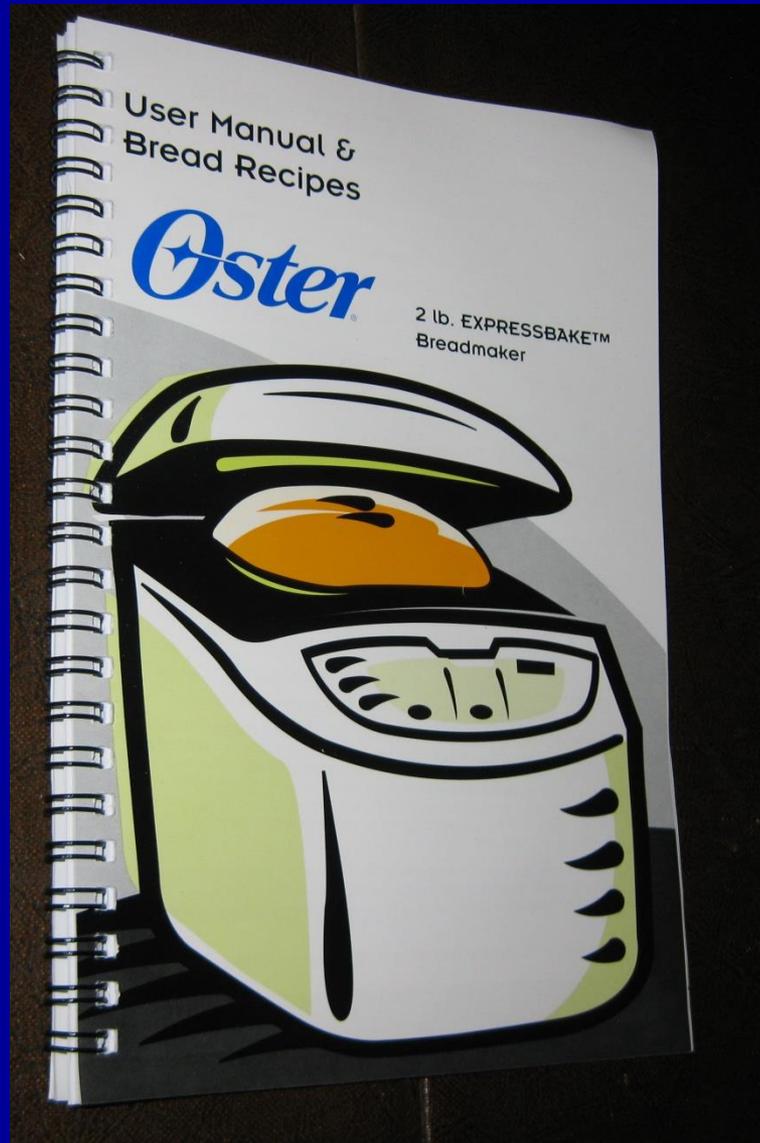


COMPLEXITY IN THIS CONTEXT

- SEARCHING FOR INFORMATION
- UPDATING CONTENT
- MANAGING REFERENCES
- ENSURING CONTENT RELATIONSHIPS ARE FLEXIBLE ENOUGH TO MEET THE NEEDS OF ALL USERS



FINDING INFORMATION QUICKLY



RELATIONAL DATABASES



RELATIONAL DATABASES

RELATIONAL DATABASES ARE ...

- DATA STORAGE SYSTEMS
- CONTAINING INFORMATION ORGANIZED IN TABLES
- WITH RELATIONSHIPS DEFINED BETWEEN VARIOUS TABLES
- DEPENDENT ON *OBJECTS* THAT ARE OR CONTAIN INFORMATION
- DESIGNED TO RELATE OBJECTS TO EACH OTHER WITH *METADATA* AND TABLE RELATIONSHIP RULES



RELATIONAL DATABASES

RELATIONAL DATABASES ARE ...

- ACCESSED VIA SYSTEMS OF *QUERYING* AND REPORTS
- CAPABLE OF RELATING INFORMATION IN ONE-WAY AND TWO-WAY RELATIONSHIPS
- CAPABLE OF STORING HISTORICAL VERSIONS OF OBJECTS
- DESIGNED TO PERMIT ACCESS, EDITING, AND MANAGEMENT BY MULTIPLE SIMULTANEOUS USERS



RELATIONAL DATABASES

RELATIONAL DATABASE EXAMPLES

- CAREER AND JOB POSTINGS SEARCH SYSTEMS
- AUTOMOTIVE PARTS CATALOG
- MEDICAL INFORMATION MANAGEMENT
- WIKIPEDIA / WIKI-ANYTHING
- LIBRARY "CARD CATALOG"
- GOOGLE MAIL
- OUTLOOK
- FACEBOOK



RELATIONAL DATABASES

BMW ElektronikTeileKatalog (ETK)

ETK

Parts search Part Use Additional Information Extras View Diagram Back Administration Help Print

Display of Diagrams filtered
6' E63 COUPE 645Ci ECE N: 33_1174 REAR AXLE CARRIER

Yes	No	??	Code	Description
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	S229A	DYNAMIC DRIVE

To Parts List 1 <<D >>D

	Nr	Description	Supplement	Me	Von	Bis	Kat	Ge	Le	Part Number	AE	R	ZI
i	08	HEX BOLT WITH WASHER	M14X1,5X138	4						33 32 1 096 101			
i	09	HEX BOLT WITH WASHER	M10X35-10.9	4						31 10 1 095 140			
i	10	RUBBER MOUNTING FRONT		2						33 17 6 767 525		1	
i	11	HEX BOLT WITH WASHER	M12X1,5X108	1						33 17 6 756 510			
i	12	HEX BOLT WITH WASHER	M12X1,5X108	1						33 17 6 756 510			
i	13	RUBBER MOUNTING REAR		1						33 17 6 767 526			
i	14	HEX BOLT WITH WASHER	M14X1,5X110	1						33 17 1 093 098			
i	15	SELF-LOCKING COLLAR NUT	M14X1,5	1						33 32 1 092 384			



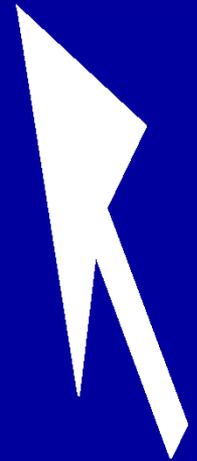
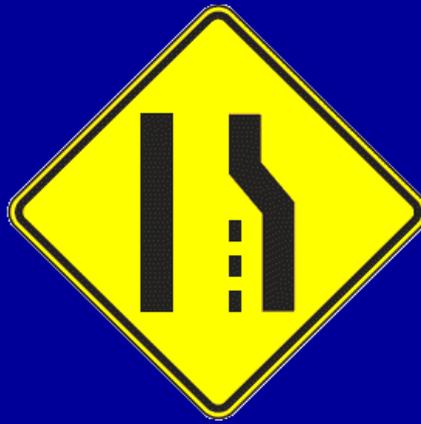
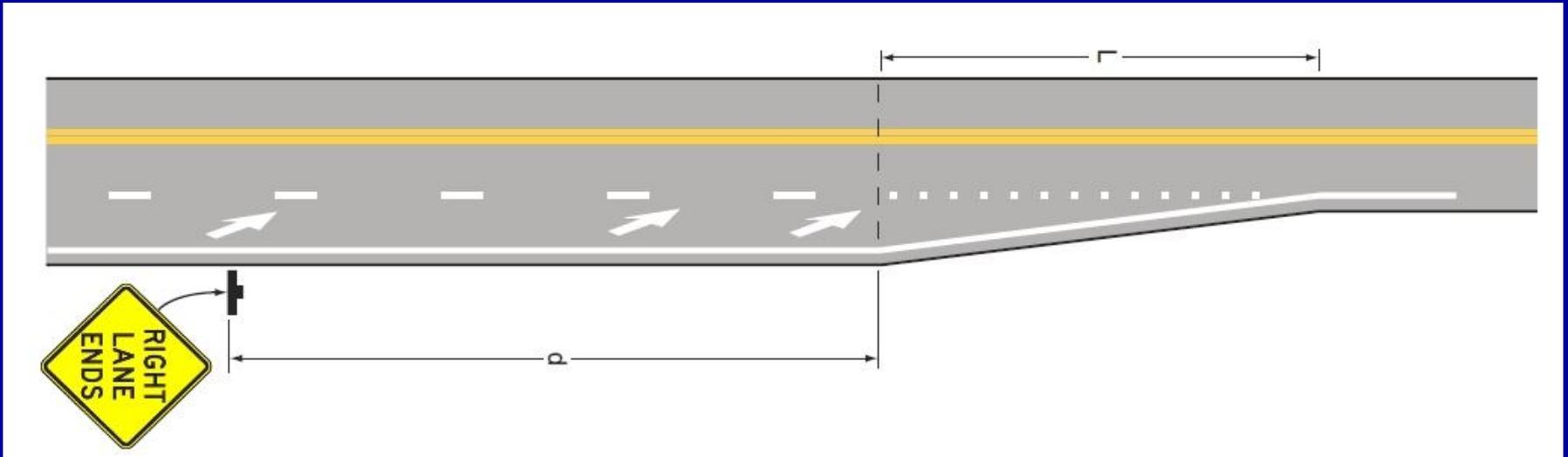
METADATA?

“The RIGHT LANE ENDS sign shall be the first sign in a sequence of warning signs placed in advance of a lane reduction taper.”

“Merge arrows”



METADATA?



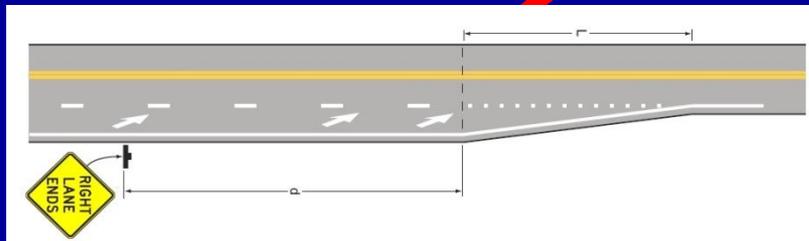
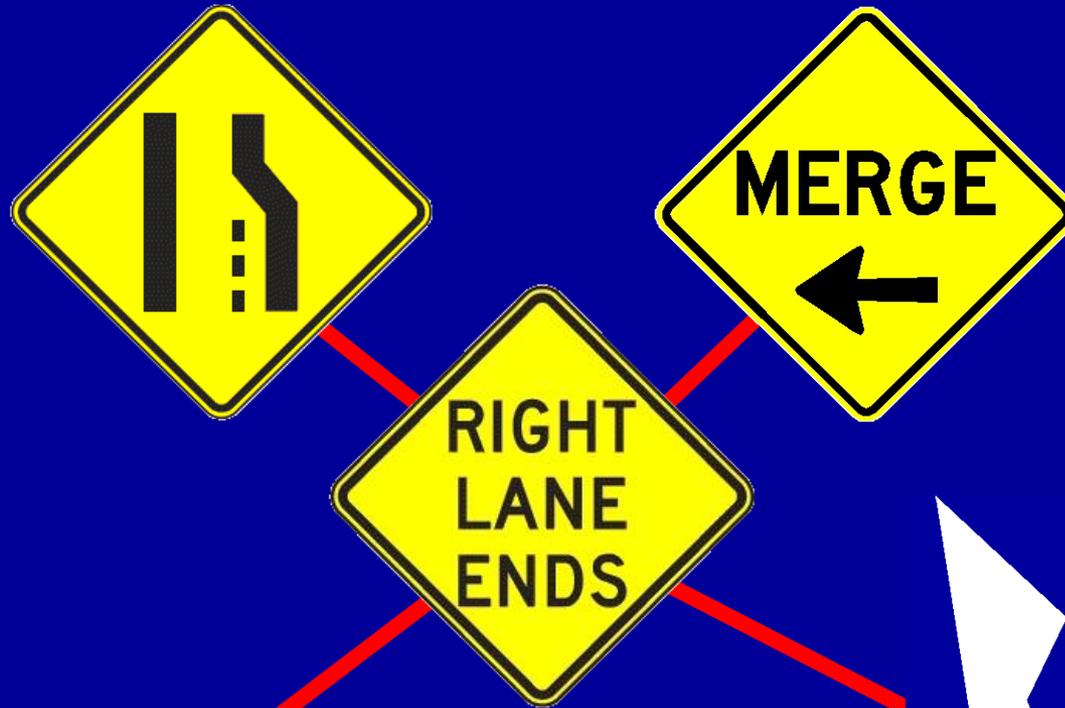
METADATA

“The RIGHT LANE ENDS sign shall be the first sign in a sequence of warning signs placed in advance of a lane reduction taper.”

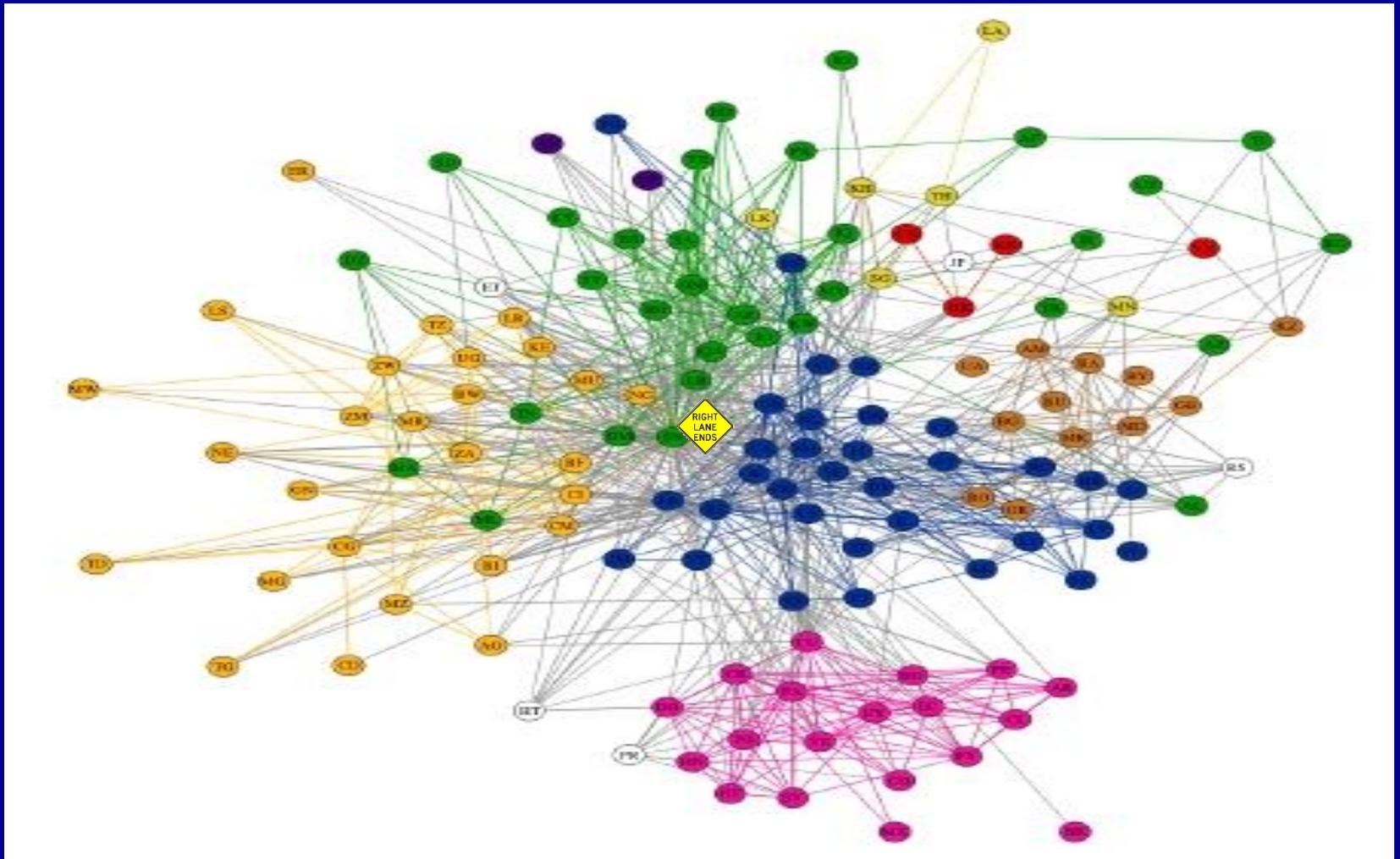
*W9-1R W9-1L MERGE ARROW W4-2 W9-2 R3-7
AASHTO CHAPTER 30 LANE REDUCTION MARKINGS*



RELATIONSHIPS



RELATIONSHIPS



REFERENCES

INTERNAL REFERENCES

- FIGURES
- TYPICAL APPLICATIONS
- RELATED CONTENT
- SIMILAR DEVICES IN OTHER APPLICATIONS



REFERENCES

- EXTERNAL REFERENCES
 - TRAFFIC ENGINEERING PRACTICES
 - ITE *Traffic Control Devices Handbook*
 - ITE *Traffic Engineering Handbook*
 - AASHTO *Guide to the Geometric Design of Highways and Streets*
 - AGENCY POLICY STATEMENTS
 - EXAMPLES OF INSTALLATIONS



REFERENCES

HOTLINKS OR HYPERLINKS ...

- NECESSITATE A SOURCE DOCUMENT
- MUST BE APPLIED AD-HOC TO INDIVIDUAL ELEMENTS
- ARE ONE-WAY
- FACILITATE 1-TO-1 RELATIONSHIPS IN SINGLE-SOURCE CONTEXTS
- REQUIRE SOURCE DOCUMENT UPDATES WHEN THE TARGET RESOURCE ADDRESS IS UPDATED
- CANNOT ACCEPT RELATIONSHIPS TO MULTIPLE RESOURCES
- EVEN IF "SMART", CANNOT RECOGNIZE METADATA-SOURCED CONTENT RELATIONSHIPS



FIGURE 2E-11

29 SECTIONS IN CHAPTER 2E

FIGURE 2E-22

62 OTHER SECTIONS

TABLE 2E-4

TABLE 2E-5

LEFT

EXIT 301

FIGURE 2E-22

FIGURE 2D-3



NORTH

TABLE 2E-2

SECTION 2D.15

SECTION 2E.05

Westport

TABLE 2E-1

SECTION 2G.24

STD HWY SIGNS



ONLY



STD HWY SIGNS

TABLE 2E-3

SECTION 2G.24



RULEMAKING PROCESS

Code of Federal Regulations

codification of the administrative rules of federal agencies;
agencies are granted authority to enact and enforce regulations

“ ... the policies and procedures of the Federal Highway Administration (FHWA) to obtain basic uniformity of traffic control devices shall be as described in 23 CFR 655, Subpart F.”

- PUBLIC PROCESS
- NOTICE OF PROPOSED AMENDMENT
- PUBLIC COMMENT PERIOD
- FINAL RULE



NEW APPROACH TO RULEMAKING?

- IMPROVED MANAGEMENT OF RELATED CONTENT
- IMPROVED ABILITY TO TRACK, ANALYZE, AND UNDERSTAND DEVELOPMENT OF CONTENT
- SIMULTANEOUS UPDATES WITH DIFFERENT HORIZONS
- ABILITY TO MANAGE ERRATA
- ABILITY TO IMMEDIATELY VIEW ALL VERSIONS AND RELATED CONTENT SIDE-BY-SIDE



RULEMAKING PROCESS

SCENARIO	BINDING LANGUAGE	NON-BINDING LANGUAGE	OWNER OF NON-BINDING LANGUAGE	RESPONSIBLE FOR RELEASE OF DOCUMENT
PRESENT	RULEMAKING	NONE	N/A	FHWA
1	RULEMAKING	RULEMAKING	FHWA	FHWA
2	RULEMAKING	NON-RULEMAKING	FHWA	FHWA
3	RULEMAKING	NON-RULEMAKING	FHWA	COMMUNITY
4	RULEMAKING	NON-RULEMAKING	COMMUNITY	COMMUNITY



INFORMATION DELIVERY

DELIVERY SYSTEM

- ONLINE OR OFFLINE
- OFFLINE WITH DATA DELIVERY
- OFFLINE STATIC WITH OMNIBUS UPDATES

DELIVERY PRESENTATION

- DIRECT VIEWING OF CONTENT
- GENERATION OF RELEVANT REPORTS
- ACCESS TO DEPRECATED RESOURCES
- ACCESS TO RELATED RESEARCH



W9-2 Lane Ends Hybrid Symbol Signs



W9-2L



Information

The Lane Ends hybrid symbol sign, whether for a single lane or multiple lanes, either through the use of the hybrid symbol sign or the Lane Reduction symbol sign, is intended to be used in advance of the beginning of the lane reduction taper by a distance equal to no more than a multiple of 1.5 times the posted speed limit. Uniform placement between multiple locations in similar facility types is desirable.

The Lane Ends hybrid symbol sign is intended to be used in advance of the beginning of the lane reduction taper by a distance equal to no more than a multiple of 1.5 times the posted speed limit. Uniform placement between multiple locations in similar facility types is desirable.

Policy

Standard The Lane Ends hybrid symbol sign shall not be used in advance of any other lane reduction advance warning sign.

The Lane Ends hybrid symbol sign is intended for placement just prior to the beginning of the lane reduction taper. Generally, the placement will be at the beginning of the lane reduction taper or in advance of the beginning of the lane reduction taper by a distance equal to no more than a multiple of 1.5 times the posted speed limit. Uniform placement between multiple locations in similar facility types is desirable.

Policy

Standard The Lane Ends hybrid symbol sign shall not be used in advance of any other lane reduction advance warning sign.

Guidance

Use of the Lane Ends hybrid symbol sign should be standardized between locations of similar geometric and operational conditions.

Option

The Lane Ends hybrid symbol sign may be installed in advance of the beginning of lane reduction tapers to warn motorists that the subject lane is ending and that a taper will begin at the location of or closely following the sign.

History

The Lane Ends Hybrid Symbol sign was developed for use in work zones by the Minnesota Department of Transportation. Use of the sign in permanent installations was tested in 2009 and its use expanded to several other states. This sign was first included in the 2016 Edition of the MUTCD.

Succession

This sign replaces the LANE ENDS MERGE LEFT (RIGHT) sign, which last appeared in the 2009 edition of the MUTCD.

References

- W4-2 Lane Ends symbol sign (Section 2C.42)
- W9-1 RIGHT (LEFT) LANE ENDS sign (Section 2C.42)
- Pavement Markings for Transition Areas (Section 3B.08)
- Typical Applications for Lane Reductions (Figure 2C-9)

WHAT DOES THIS MEAN?

- THE PRESENTATION AND EVEN MANAGEMENT OF THE *MUTCD* COULD TRANSITION TO COMMUNITY-BASED AND COLLABORATIVE CLOUD-HOSTED SYSTEM THAT IS MANAGED BY THE FHWA
- THE *MUTCD* COULD BE UPDATED IN PIECES, AS NEW TECHNOLOGIES, DEVICES, AND APPROACHES ARE DEVELOPED AND RESEARCHED
- INDIVIDUAL STATES WOULD NEED TO ADJUST THEIR LAWS AND PROCEDURES WITH REGARD TO ADOPTING THE *MUTCD*
- THE INVOLVEMENT OF THE COMMUNITY WOULD NEED TO BE MODERATED, DIRECTED, AND MONITORED TO ENSURE CONSISTENT DEVELOPMENT OF NEW LANGUAGE



FUTURE RESEARCH NEEDS

- DETERMINING USER PREFERENCES, PARTICULARLY WITH REGARD TO ACCESSIBILITY AND PRESENTATION OF CONTENT
- FEEDBACK AND COMMUNICATIONS FORUMS, PARTICULARLY THE RESPONSIBILITY FOR HOSTING AND MANAGING
- CURRENT CHANNELS OF COMMUNICATION WITH FHWA, NCUTCD, AND AMONG USER GROUPS (ITE, ASCE, AASHTO, ATSSA)
- VALIDITY AND USEFULNESS OF USER-COMMUNITY-MANAGED LINKS TO EXTERNAL RESOURCES
- INVESTMENT NEEDS FOR HARDWARE, SOFTWARE, AND MANAGEMENT



FUTURE RESEARCH NEEDS

“Compiling and distributing a document containing federal regulations by means of a database system must be evaluated in light of international experience, similar projects at state and local levels, and the experience of other agencies within the national government “



FUTURE RESEARCH NEEDS

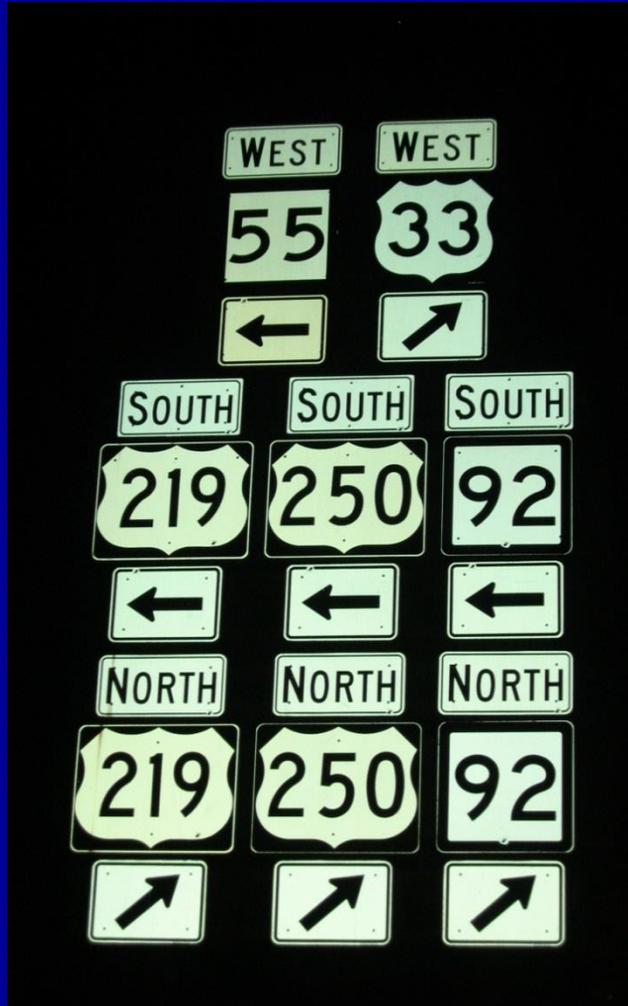
SUCH A PROPOSAL WILL FACILITATE,
AT A MINIMUM, A

- COMMUNITY-BASED
- COLLABORATIVE
- WEB-BASED (“CLOUD”)

INFORMATION SYSTEM ...
WHICH HAS NEVER BEFORE BEEN
CREATED IN THIS CONTEXT.



DESPITE SIMPLIFICATION OF THE REGULATIONS . . .



THANK YOU

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