

MfS v. DMRB

IHE Debate

Stuart Reid | 20 October 2009



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Agenda

- Why was MfS needed?
- What is the applicability of MfS?
- What is different about MfS?
- Visibility?
- MfS v. DMRB?

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Why was MfS needed?

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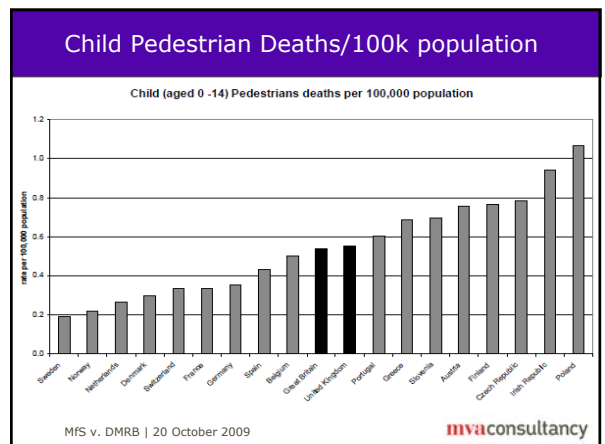
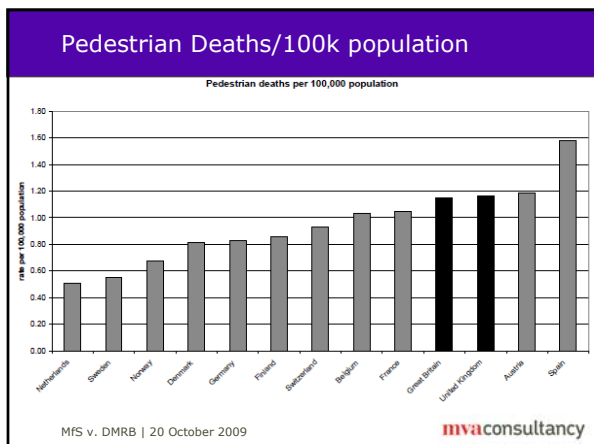
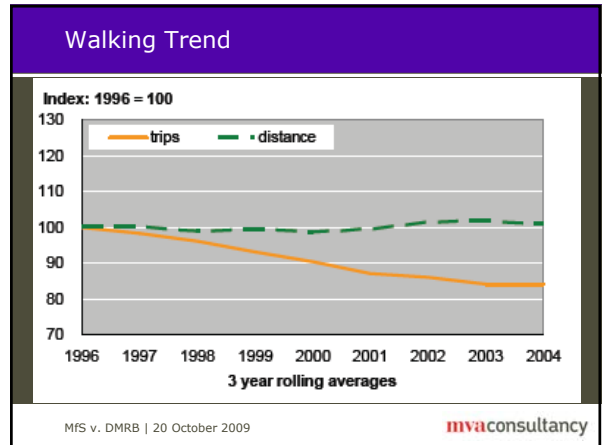
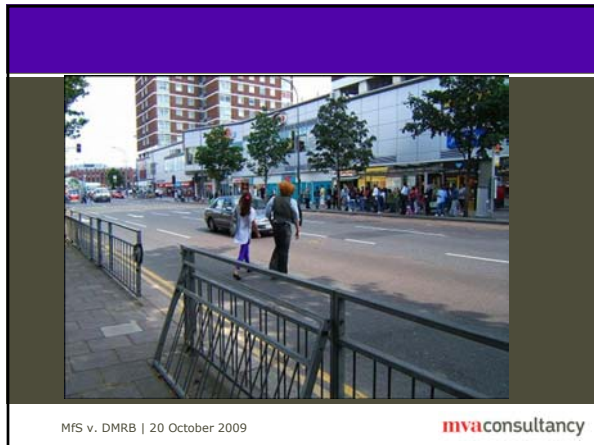
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Social Trends

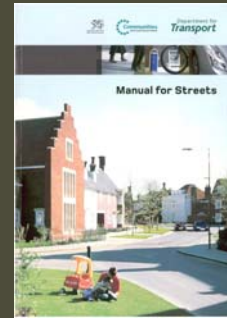
One in four adults
is now obese

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MfS Objectives

- To achieve streets that:
 - help to strengthen communities
 - are pleasant and attractive
 - are cost effective to construct and maintain, and
 - are safe



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What is the applicability of MfS?

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What is a Street?

- Definition of a street:
'A street is defined as a highway that has important functions beyond the movement of traffic.'
- They should also have:
 - '...a sense of place...'
 - '...direct access to buildings...'
- 'Therefore most highways in built up areas can be considered as streets.'

(Reference MfS paragraph 1.1.7)

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Scope

- 'MfS focuses on lightly-trafficked residential streets, but many of its key principles may be applicable to other types of streets.' (ref MfS Status and Application)
- 'MfS does not apply to Trunk Roads.' (ref MfS 1.4.3)
- 'DMRB is not an appropriate design standard for most streets.' (ref MfS 1.4.4)
- 'It is strongly recommended that local authorities review their standards and guidance to embrace the principles of MfS.' (ref MfS 1.4.5)

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MfS Structure

Section A Context and Process: generally applicable

Section B Design Principles: generally applicable

Section C Detailed Design Issues: residential and lightly trafficked

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What is different about MfS?

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What Are Streets For?

DMRB TD9/93: "single 2 lane carriageways up to 10m wide shall be designed with safety and the objective of un-congested flow in mind"

MfS (2.3.1): "Streets have five principal functions:

- Place;
- Movement;
- Access;
- Parking; and
- Drainage, utilities and street lighting"

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Streets Are More Complex Than Roads

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Risk and Liability

- Drivers are first and foremost responsible for their own safety
- The highway authority's duty to maintain does not extend to road signs or markings
- Most claims against a highway authority are for maintenance defects – claims against design defects are relatively rare.
- A strong defence against claims comes from well-documented and rational decision processes –
- A Quality Audit

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Process

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Quality Auditing

- Grouping of technical assessments
- Aid to balanced decision making
- Content depends on the nature of the scheme
- How well have the objectives been met? E.g.
 - Visual quality audit
 - Road safety audit
 - Access audit
 - Cycle audit

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Visibility?

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Evidence

- MfS research:
 - Sub-standard visibility not associated with casualties
- Previous TRL research for Highways Agency at c.800 junctions – only one (positive) correlation between visibility and casualties:
 - Greater Y distance associated with more rear shunts

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Driver Behaviour and Environment

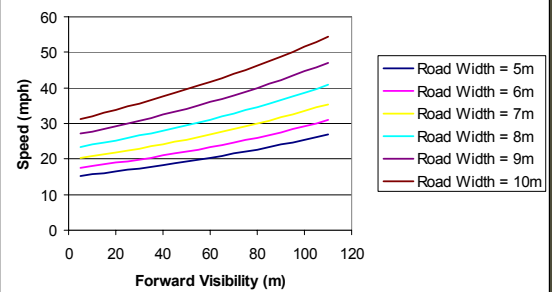
- MfS Research
 - Visibility
 - Width
 - Parking
 - Surface
- Consistent with other research on driver behaviour:
 - Human activity
 - Side friction

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Driver Behaviour Change

(85th percentile speeds)



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What went before

DB32 guidance:

- Perception-reaction Time 2 seconds
- Deceleration 0.25g
- No supporting evidence
- No transparency of assumptions
- Take it or leave it

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MfS Goes Back to First Principles

$$\text{SSD} = vt + v^2/2d$$

Evidence:

- Emergency PR in 0.67 seconds
- Average PR (all incidents) in range 1-1.3 seconds
- Review of 27 PR studies concluded 85%ile (all incidents) is 1.5 seconds
- Deceleration tests, average capability of 30 cars = 0.9-1g

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Stopping Sight Distances

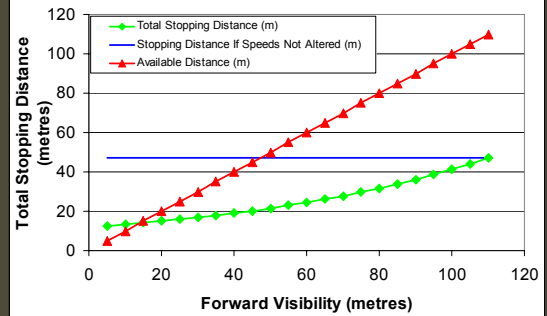
- MfS gives a worked example based on transparent assumptions:
 - PR 1.5 seconds
 - Deceleration .45g
- Margin of safety in worst case
- Results in values in 7.1. To be treated as guidance – equations provided

Design Speed	Kilometres per hour	16	24	32	40	48	60
	Miles per hour	10	15	20	25	30	37
SSD (M)	Zero gradient	9	15	22	31	40	56

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Safety Margins



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Assumptions Can Be Varied

MPH	v (m/s)	t	d (m/s ²)	SSD
20	8.9408	1.5	4.5	22.29319
30	13.4112	1.5	4.5	40.10128
40	17.8816	1.5	4.5	62.35036
20	8.9408	2	4.5	26.76359
30	13.4112	2	4.5	46.80688
40	17.8816	2	4.5	71.29116

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What Assumptions are Appropriate?



“the nature and use of the street had changed completely...at the time of the audit pedestrians had claimed the street”
 RSA Stage 3,
 New Road
 Brighton

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MfS v. DMRB?

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What's so bad about DMRB?

- HD 42/05 Non-motorised User Audit
 - Mandatory on all schemes
 - Requirement to understand NMU context
 - Set objectives for NMU provision and report on them throughout design process
- Clear process for relaxations
 - Recognises that standards are not always achievable
 - Sets out steps of relaxation permitted

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Some more pertinent questions?

- Highway engineers as professionals v. enforcers of rigid standards?
- Uniformity v. placemaking?
- Traffic v. communities?
- Do engineers have the confidence, skills and experience to use their own judgment?

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Conclusions

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Conclusions

- The status quo is not acceptable
- Most urban streets are more complex than DMRB allows for
- MfS recognises that streets are also public spaces
- Highway engineers are encouraged by MfS to widen objectives
- MfS makes transparent assumptions and gives tools and responsibility to engineers for the first time
- The gap roads issue has always existed – don't blame the MfS
- MfS and DMRB are advisory: burn your books and use your knowledge and experience

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