Universal approaches to traffic applied to cycling

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Outline

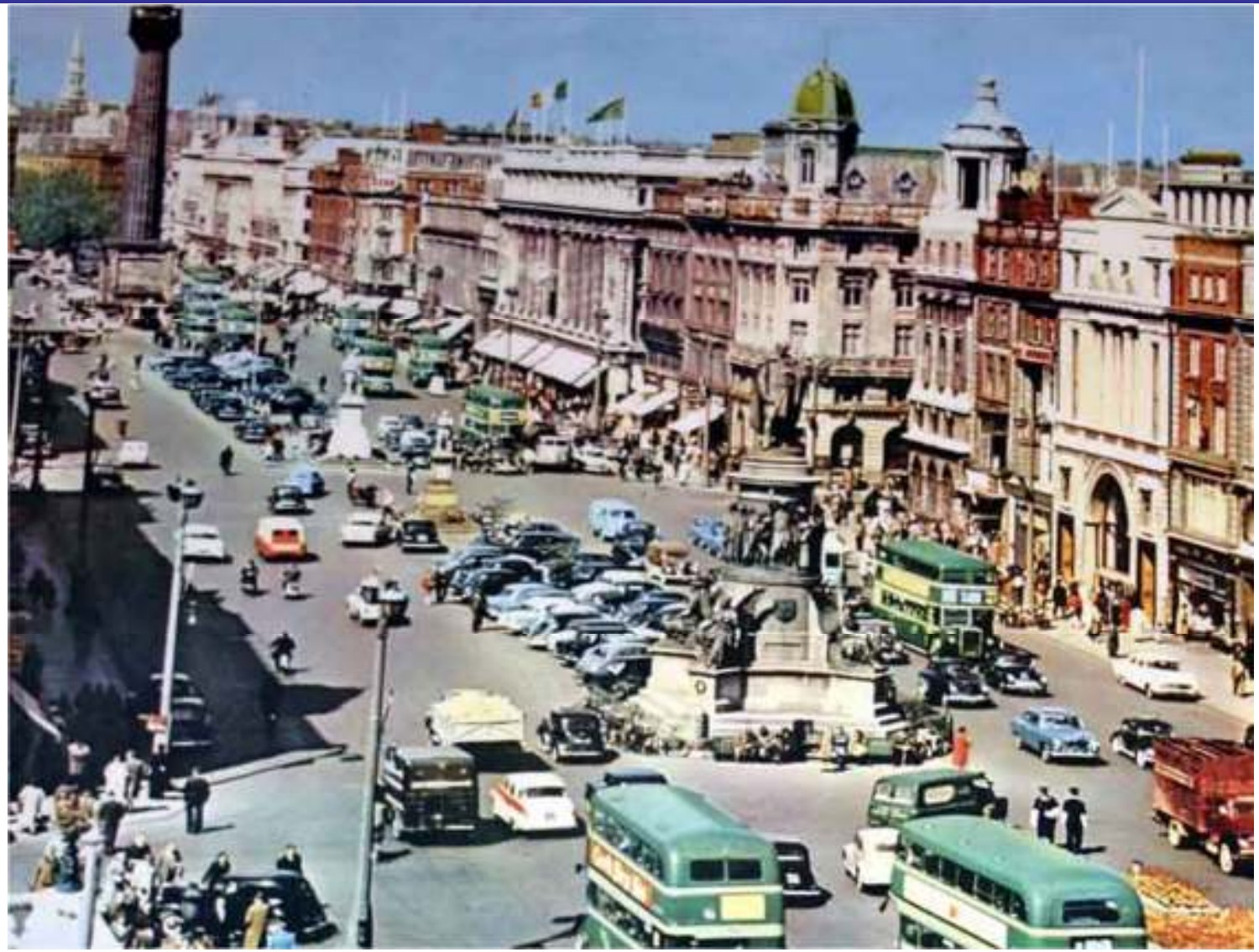
1. The Need for Technical Guidance in Ireland
2. Differences of opinion and approach
3. Principles-led approach
4. Implications for general traffic management
5. The International dimension
6. Expediting Change through Sustainable Safety

THE NEED FOR TECHNICAL GUIDANCE IN IRELAND

The Need for Technical Guidance

1. In 1950s and early 1960's, Dublin (and elsewhere) was primarily a walking, cycling and bus city
2. Car ownership and usage was low
3. Cars contributed to community building (giving lifts to neighbours, "thumbing", etc.)
4. Culturally, Irish society held compliance with the law as a virtue

No Need for Traffic Lights



Bikes mixed with Traffic

The Need for Technical Guidance

1. By the 1980s, cars had become more popular, more comfortable, more affordable
2. "Traffic Management" associated with (vehicular) traffic accommodation and efficiency
3. Relative success in this traffic management allowed continued expansion of cities into car-dependent distant suburbs, but commuting time and stress growing
4. Road space was assigned to vehicles - the bicycle was assumed /mixed/ignored

Driver discipline had not improved

Cycling had become dependent on well-behaved Irish drivers, and experienced cyclists taking care of themselves...

	Number of deaths in 2001 (1970 = 100)
Ireland	77
United Kingdom	46
Sweden	45
Netherlands	34

Table 4. *The number of road deaths in 2001 compared with 1970 for Ireland, the United Kingdom, Sweden and the Netherlands (source: IRTAD).*

City Centre within City-Region (2006 Data)

Place of work	1-5 km	6-10 km	11-20km	21-30 km	31-50 km	51km+	Total Trips
Inside Canals	74,609	52,149	39,382	11,096	11,497	6,939	195,672
Inside M50	109,852	68,078	50,871	17,382	15,775	10,501	272,459
Inside Metro Area	56,746	36,899	36,680	14,543	13,919	8,305	167,092
GDA Rural Hinterland	25,253	15,280	16,803	8,312	8,235	4,068	77,951
GDA Large Growth Town	14,483	4,757	6,527	3,262	3,388	1,375	33,792

DIFFERENCES OF OPINION AND APPROACH

How to Provide for the Bike?

1. Major advances in Irish road design (DMRB, TRL traffic analysis suite, computer models etc.) based on UK empirical research for vehicles
2. Lord Mayor's Cycling Report in 1996
3. The First DTO Cycle Manual produced in 1997
4. Technical input from Grontmij - many elements included from "Sign Up for the Bike" Dutch Design Manual
5. Based on the 5 Needs of Cyclists, and advised on when to separate cyclists from general traffic, etc.

Differences

1. While needs of cyclist identified, the needs of traffic / outputs from models were considered first
2. Bus priority programme took any discretionary road space for bus lanes
3. Many traffic designers were UK-based and did not use Irish manual
4. Some Irish designers ignored design manual
5. In response to poorly designed segregation schemes, advocacy group wanted 1950's approach (mixed roads and streets, highly disciplined and slow traffic)

Traffic needs first……

Traffic needs first……

Good and Bad practice...

Or just bad practice...

PRINCIPLES-LED APPROACH

Principles of Sustainable Safety + Cycling

- Contradictory Opinions from designers and users on many issues, with selected technical support.

- Revert to First Principles!

- 1992 *Sustainably Safe Roads*
  - Functionality
  - Homogeneity
  - Legibility
  - Forgivingness
  - Self Awareness

a) Sustainable Safety

Cycling is a vulnerable mode in traffic terms. Safety is at the heart of all good design. The designer should ensure that the Principles of Sustainable Safety have been applied to all schemes

The principles of Sustainable Safety were developed in 1992, and in the following years in the Netherlands. They underpin all road design and the adherence to those principles has contributed to the Netherlands leading record in road safety.

This manual subscribes to the principles of Sustainable Safety and has used them in the determination of content.

There are five principles as follows:

- **Functionality**
- **Homogeneity**
- **Legibility**
- **Forgivingness**
- **Self-awareness**

Principles of Sustainable Safety + Cycling

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Legibility

(i) the road environment must be easy to read, all conflicts should be obvious, and the resolution of those conflicts mutually understood be all users

(ii) Roads and streets should be designed so that traffic conflicts are self-evident, self-explanatory and self-enforcing

Forgivingness

If there is an accident, the outcome will be the best possible

- Slower turning speeds etc.
- Space for evasion, time to stop
- Soft landings, no entrapment

Principles of Sustainable Safety + Cycling

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Functionality

Ensure the road / street is fit for purpose

- List the intended functions
- If there is not enough room…

Homogeneity

don't mix traffic with significant differences in mass, speed or direction

- Advice on when to separate cyclists from traffic

Self Awareness

Be aware of your competence / limitations, and assess your capability to negotiate the road / street environment

IMPLICATIONS OF PRINCIPLES FOR GENERAL TRAFFIC MANAGEMENT

Key implications for traffic management

- Mixed traffic streets are not "automatically" sustainably safe, but must be designed and managed to be so.
- Side swipe tolerated on motorways - sideswipe is unacceptable if (motor)cyclists are mixed up between weaving vehicles
- Where the (cycle) vehicle position is not obvious, situations can be unpredictable / illegible
- On that basis, the following are inherently not advised for Irish multi-modal city streets:
  - Multi-lane one way systems
  - Left hand slip lanes
  - Dual-entry, dual circulating roundabouts
  - Merges, demerges

Legible?

Functional? Legible? Homogenous?

Functional? Legible? Homogenous?

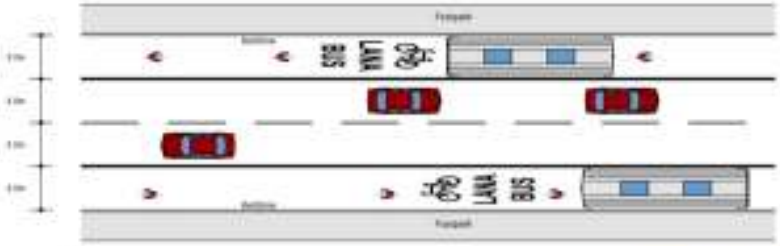
Implications for Bikes and Buses

- Sufficient Width – either shared (fore-and-aft) or bike lane beside bus lane
- QBC services – bus headway 90 seconds, plus taxis can mean highly trafficked lanes
- Management of bus lane speeds and operational hours
- Set back of bus lanes approaching junctions?
- Road construction and Surface maintenance
- Bus stops – delays and conflicts between buses / bikes / pedestrians / passengers

Surface Quality and Room

Surface Quality and Room

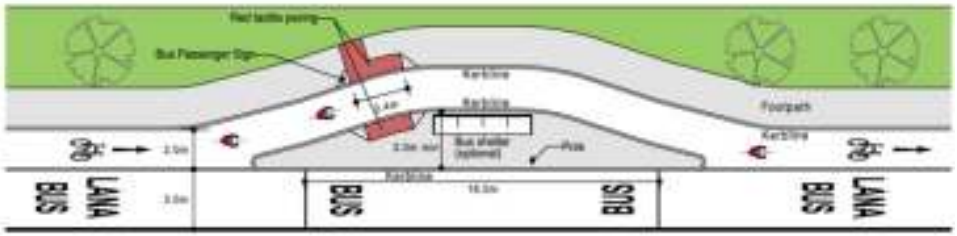
Option 1 –Shared Bike / Bus Lane (circa 3m)



Option 2 – Bus Lane Beside Bike Lane

Handling Intermediate Widths

Bus stops – total of 9 options



THE INTERNATIONAL DIMENSION

Not-so-universal Principles?

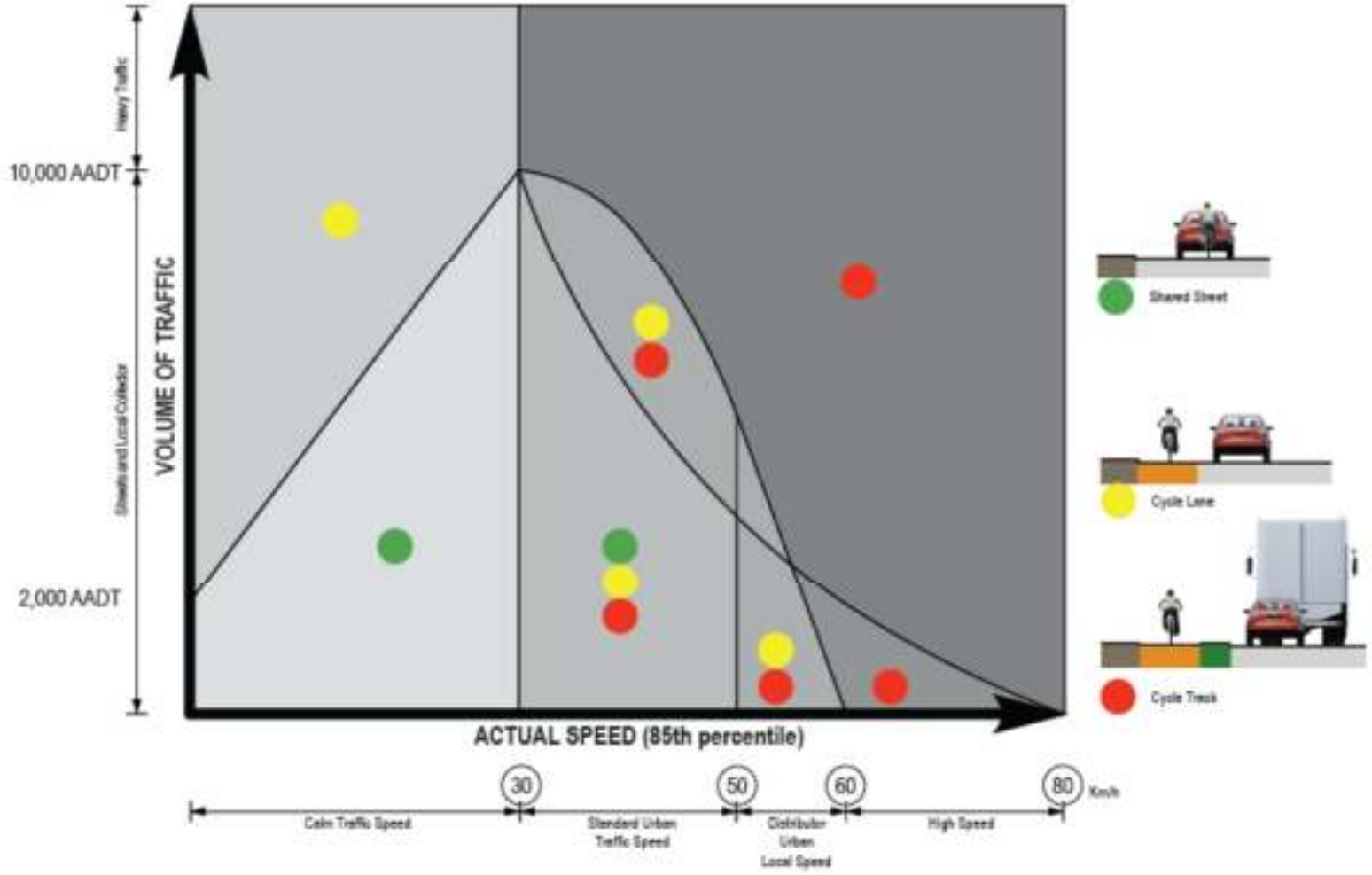
Not-so-universal Principles?

Not-so-universal Principles?

International Community

1. International experts from 5 countries
2. Agree Principles, present design challenges
3. Rapid conclusions on most issues
4. Sustainably safe principles necessitate the orderly management of vehicles
5. Many solutions will require capacity reductions for private car
6. CROW advice on segregating bicycles retained

Best Practice – Integration Zones



Universal Manual?

- First genuine on-line manual?

- International contributions
- Contributions from consultants, authorities, user groups, etc.

- Format allows for
  - Fly-throughs / Movie files (e.g. cyclists' perspective)
  - Tutorials

- Web 2.0 approach enables
  - Feedback
  - Comments
  - Surveys of registered users
  - Users forum?

International

- High quality scaled graphics is a good selling tool, to convince stakeholders to change

- Consideration to generate "reversed" designs
- Universal traffic signage in designs?

- Web = ongoing process, with (i) updates (ii) suite of other designs to follow

- Registration will allow better communication, update notification and analysis of general interest etc.

- Available to *Presto* initiative

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EXPEDITING CHANGE THROUGH SUSTAINABLE SAFETY

Two Approaches?

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Top Down Sustainability Policy

1. De-couple economic growth from vehicular dependency
2. Promote mass transit, technology, new fuels, regional strategies and local plans, public consultation processes etc.

Bottom Up Sustainable Safety Design

1. Present the Hazard / Risk / Accident Profile
2. Present the Options
3. Deliver the solution

OPTIMAL APPROACH TO DELIVERING CHANGE?

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1. Within policy and strategies, include Sustainable Safety as design bedrock

2. Develop top-down objectives, networks, and key actions / measures as before

3. Demonstrable action at ground level, expedited through "safety" policy, designed according to Sustainably Safe Principles

4. With greater local understanding of policy effects, greater acceleration of overall change?