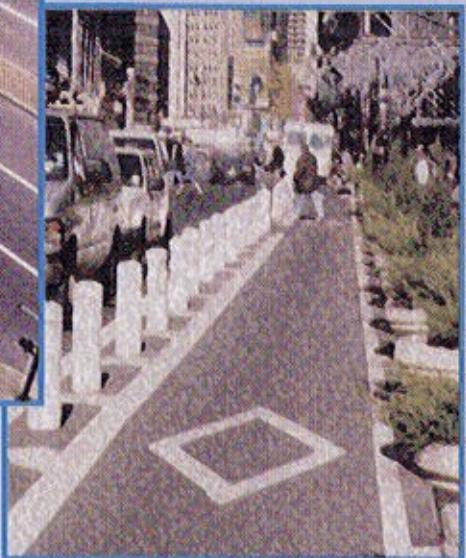
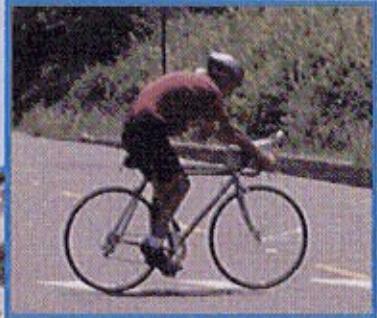


Innovative Bicycle Treatments

An Informational Report



By Jumana Nabti, Matthew Ridgway
and the ITE Pedestrian and Bicycle Council

Table of Contents

<i>List of Figures</i>	v
<i>Executive Summary</i>	ix
<i>Acknowledgments</i>	x
1.0 Introduction	1
1.1 Objectives and Organization of the Report	1
1.2 Identifying Innovative Treatments and Sources of Information	2
2.0 Bicycle Lane and Path Treatments	11
2.1 Contra-flow Bicycle Lane	11
2.2 Contra-flow Bicycle and Bus Lanes with Right-Side Bicycle Lane on One-Way Street	14
2.3 Two-way Bicycle Lane between One-Way Vehicle Traffic and Contra-Flow Bus Lane	15
2.4 Shared Bicycle/Bus Lane	17
2.5 Separated Bicycle and Bus Lane	18
2.6 Left-side Bicycle Lane on One-Way Street	19
2.7 Raised Bicycle Lane	21
2.8 Diagonally Striped Bicycle Lane	22
2.9 Median Bicycle Paths	23
2.10 Cycle Track	25
2.11 Bicycle Boulevard	26
2.12 One-Way Bicycle Path	28
2.13 Colored Bicycle Lanes in High-Conflict Zones	28
2.14 Colored Shoulders	31
2.15 Bicycle Route/Shared Lane Pavement Marking	32
3.0 Treatments for Bicycles at Intersections	35
3.1 Through Bicycle Lane at Dual Right-Turn	35
3.2 Combined Bicycle/Right-Turn Lane	36
3.3 Advance Stop Line (ASL)/Bicycle Box	38
3.4 Toucan Crossing	40
3.5 Elephant Footprint Crossings	41
3.6 Mid-Block Bicycle Crossing #1	42
3.7 Mid-Block Bicycle Crossing #2	43
3.8 Bicycle Signals	44
3.9 Merge Zone at Intersection Approach	46
3.10 On-ramp/Off-Ramp Crossings	47
4.0 Bicycle-Sensitive Detection and Counters	49
4.1 Video Camera Detection	49
4.2 Microwave Radar Detection	50
4.3 Advance Inductive Loop Traffic Signal Detection	52
4.4 Bicycle Push Button/Pad/Bar	53
4.5 Inductive Loop Traffic Signal Detector Stencil	54
4.6 Bicycle-Sensitive Inductive Loop Traffic Counters	55

5.0 Bicycle Signage	57
5.1 Special Signing	57
5.2 SHARE THE ROAD Signage	59
5.3 Construction Zone Detour Signage	60
5.4 Bicycle Route Signage System	61
5.5 BICYCLIST in TUNNEL/on BRIDGE/on ROADWAY Sign with Actuated Flashing Beacon	63
6.0 Traffic Calming Accommodations for Bicycles	65
6.1 Bicycles at Roundabouts	65
6.2 Bicycles at Road Narrowings (Including Chicanes, Choke Points, Median Islands, Extended Curbs, or Curb Blisters)	66
6.3 Bicycle Refuge Island and Bike Access Through Medians	68
6.4 Bicycle Access through Road Closure	69
6.5 Bicycle Access Through Semi-road Closure	70
6.6 Bicycles at Forced Right Turns and Delta Diverters	71
7.0 Bicycle Parking	73
7.1 Bicycle Station/Multi-modal Center	73
7.2 On-street Bicycle Parking	75
7.3 Bicycle Shelters on Sidewalk/Curb Extensions	76
8.0 Other Innovations	77
8.1 Bicycle Racks on Public Transportation Vehicles	77
8.2 Bicycle Bridges	79
8.3 Stairway Ramps and Rails	81
8.4 Continuous Drain	82
8.5 Bicycle Lift/Bicycle Hill Climber	83
8.6 Tactile Ground Surface Indicators	85
8.7 Bicycle Wind Tunnel	86
9.0 Appendices	88
9.1 Bicycle Facilities: A Report to ITE and the Pedestrian/Bicycle Task Force on Future Research Needs, <i>David Noyce</i>	88
9.2 Impact of Bicycle Lanes on Traffic Speeds	99
9.3 "Selecting Roadway Design Treatments to Accommodate Bicycles" (FHWA RD-92-073, Jan. 1994)	104
10.0 Glossary	143
11.0 Abbreviations and Acronyms	146
12.0 Bibliography	147