Analysis of Median Use on Beijing Urban Roadways

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Outline

- Introduction
- Background of Median Use in Beijing
- Study Objective
- Data Collection
- Safety and Operational Analysis
- Measures for Improvement
- Conclusion and Further Study

Introduction

- Access Management (AM) is new to China
- Use of fence median can be seen everywhere, but no systematic study on its characteristics
- Trend of changing capacity expansion to management requires introduction of AM

Background of median use in Beijing

- No guidelines for the use of medians
- Lack of coordination among planning, design, and management of urban roadways
- Median types commonly used in Beijing
  - Undivided Median
  - Fence Median (dominant)
  - Raised Median

Study Objective

- Review merits and disadvantages of fence medians
- Start of access management in China
- Increase awareness of impact of access management techniques on safety and operation of roadways

Data collection

- Median type
- Conflicts of pedestrians and U-turns
- Impact of U-turn movements on left turn saturation flow

Distribution of Median Types on Beijing Roadways

Type of roadways	Length in kilometer	Median type		
		undivided	fence	raised
Major arterial	125	25	75	25
Minor arterial	132	57	60	15
Local road	94	82	14	0

Conflicts at Four Signalized Intersections

Name of intersection	Hours to observe	Volume of U-turn plus left turn	Volume of U-turn	Volume of pedestrian	Number of conflicts		
					braking	stopping	Total
Pine Le Yuan	8	605	185	365	25	10	35
Shuang Jing	8	596	202	405	35	5	40
Jin Song Dong Jie	8	864	235	605	58	12	70
Hua Wei Qiao	8	769	283	635	66	8	74

Impact of U-turns on saturation flow rate of left turns

Name of intersection	U-turn volume	Left turn saturation flow rate	Left turn plus U-turn saturation flow rate	Saturation flow rate loss
Pine Le Yuan	185	1700	1515	-11%
Shuang Jing	202	1700	1460	-14%
Jin Song Dong Jie	235	1700	1485	-13%
Hua Wei Qiao	283	1700	1380	-19%

Safety and Operational Analysis

- **Merits of Fence Median**
  - Safer than undivided median
  - Prevention of jaywalking
  - Lower cost and less space
  - Design changed easily

Safety and Operational Analysis

- **Disadvantages of Fence Median**
  - No space for pedestrian to wait
  - Difficult to channelize left turn bays (result in cut-in vehicles)
  - Excessive U-turn movements
  - Sight blocking

Cut-in vehicles

Excessive U-turn

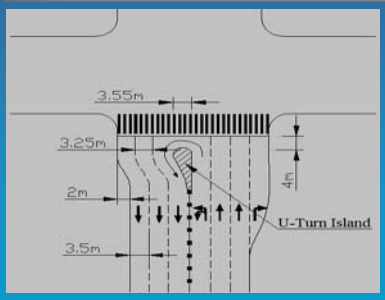
Excessive U-turn

Sight Blocking

Measures for Improvement

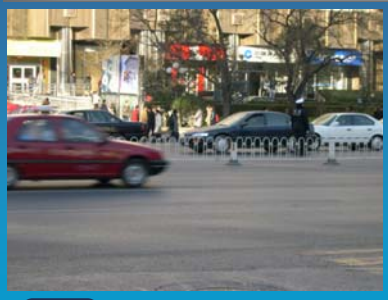
- Replace fence median with raised median
- Mark the U-turn area at intersections
- Lower fence median at opening
- Reduce number of intersections banning left-turn movements

Mark U-turn Area



Mark U-turn Area

Lower fence median



Conclusion and Further Study

- Study is in preliminary stage
- Advantages and disadvantages of fence median are discussed
- Raised median can improve the safety and operation of traffic performance based on American experiences
- More observations are needed
- Median related crash data should be studied

Thank You!