



Scope & Key Points

Scope

 Handbook is intended for use by engineers and technicians working with law enforcement to address safety problems related to red-lightrunning.

Key Points

- Solution to RLR is 3-E process that <u>starts</u> with engineering
- Focus is on <u>crashes</u>, not violations
- Find and treat truly problem locations
- Goal is to drop crashes to reasonable levels
- If engineering treatments unsuccessful, try enforcement & public awareness campaign



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Violations and Crashes					
Time into Red of Red-Light Violation	Less than 4 seconds	4 or more seconds			
Percent of RLR Violations	95 %	5 %			
Percent of RLR Crashes	15 %	85 %			
Typical RLR Crash Type	Left-turn opposed	Right-angle			
RED LIGHT	101 22 y-31				
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Engineering Countermeasures

Many Available

- Handbook lists 23 countermeasures
- Examples...
 - Reduce delay by retiming signal
 - Remove unneeded signals
 - Add capacity using additional traffic lanes
 - Add advance warning signs
 - Add advance detection
 - Improve signal coordination & increase cycle length
 - Protected-only left-turn phasing
- Different violation causes = different countermeasures



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		Cause of Violation in Typical Crash ¹			
Category Countermeasure		Inattentive (A)	Unneces- sary Delay (B)	Congest- ion, Dense Traffic (C)	Incapable of Stop (D)
Traffic Char.	Reduce approach speed	>			~
Signal Operation	Increase signal cycle length if v/c ratio < 0.60		>		
	Increase yellow interval duration (not to exceed 5.5 s)				~
	Provide green extension (advance detection) ²				~
	Add protected-only left-turn phasing				~
Motorist Information	Improve signal visibility via better signal head location	~			Ś
	Improve signal visibility via additional signal head	~			I
	Improve signal visibility by clearing sight lines to signal	>			I
	Improve signal conspicuity by upgrading to 12" lenses ³	~			~
	Improve signal conspicuity by using yellow LED's				~
	Improve signal conspicuity by using red LED's	>			
	Improve signal conspicuity by using back plates	>			~
	Improve signal conspicuity by using dual red indications	~			
	Add advance warning signs (no flashers)	>			
	Add advance warning signs with active flashers ⁴	>			
Traffic Operation	Reduce delay through re-timing if v/c ratio > 0.70			~	
	Reduce unnecessary delay through signal re-timing		>		
	Improve signal coordination ⁵			~	
Geometry	Remove unneeded signals	~	~		
	Add capacity with additional lanes or turn bays			~	
Education	Implement public awareness campaign		~	~	
Enforcement	Increase officer enforcement		Ś	~	
	Implement camera enforcement		~	~	









