

Evaluation of Effectiveness of Temporary Video Detection Systems (VIDS) in Construction Zone

For Rehabilitation, Restoration, and Reconstruction Projects (3R projects)

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PURPOSE OF STUDY

- The intent of the study was to develop a document that provides guidelines for installing temporary VIDS at signalized intersections during construction projects
- It was also the intent of the study to identify the benefit/cost to implement the temporary VIDS concept

LITERATURE REVIEW

- Some maintaining agencies and State Department of Transportations have set standards and policies for temporary VIDS in construction zones
- Cost Benefit ratios were not identified for temporary VIDS
- Neither Broward County Traffic Engineering Division (BCTED) nor Palm Beach County Traffic Engineering Division (PBCTED) have established standards or policies to address the concept of implementing temporary VIDS

ANALYSIS OF BENEFIT COST FOR VIDS IN 3Rs

- A B/C analysis was conducted with twelve (Broward County & Palm Beach County) signalized intersections and three different lane configurations

APPROACH TO B/C ANALYSIS

- Traffic count data and signal timings were obtained for the 12 signalized intersections
- The intersections analyzed consisted of the following lane configurations (6X6), (6X4), and (4X4)
- A Synchro 7 operational analyses was performed with resultant delay output used to estimate the delay savings and develop the B/C ratios for the installation of temporary VIDS by lane configuration type

APPROACH TO B/C ANALYSIS

- In order to limit the variables in the analysis it was assumed that the signal without detection would go into pre-timed operation rather than using minimum green time
- The analysis compared delays at the signalized intersections with no working detectors versus delays at signalized intersections under normal operations with detectors functioning

COST OF TEMPORARY VIDS

- Average cost for installation of temporary VIDS is \$31,000
- This equates to \$90 per day assuming annual cost of inflation is 7 percent and the temporary use is one year
- The cost for installation of temporary VIDS was cited from Palm Beach County Traffic Division information

POTENTIAL DELAY SAVINGS

- Based on the operational analysis performed the potential delay savings for the three lane configurations of the twelve intersections are as follows:
 - 6X6 = \$870
 - 6X4 = \$3,200
 - 4X4 = \$1,300
- The B/C analysis results ranged from 7.0 to 53.4 based on the various intersection lane configurations indicating a high return on potential investment

VIDS IMPLEMENTATION GUIDELINES

- Implementation guidelines for corridors with five, ten, and fifteen signalized intersections were developed based on the B/C analysis
- The following table presents the when and for how long a 3R project must be under construction for the temporary VIDS to be cost beneficial

MINIMUM NUMBER OF CONSTRUCTION DAYS FOR CONSIDERING TEMPORARY VIDS

	AADT	Number of Signalized Intersections		
		15	10	5
Six-Lane Roadway	35,000	242	151	90
	40,000	275	172	103
	45,000	300	187	112
	50,000	322	201	120
	55,000	337	201	120
Four-Lane Roadway	10,000	220	138	82
	15,000	265	170	107
	20,000	269	168	101
	25,000	288	183	113
	30,000	389	243	146
	35,000	288	180	108
	40,000	302	189	113
	45,000	294	183	110
	50,000	304	190	114
	55,000	313	195	117

CONCLUSION

- The utilization of temporary VIDS will improve motorist benefits
- Benefits in reduced delay are dependent upon traffic and turning movement demand, AADT, and the signal cycle length and splits as well as duration of construction