Chapter 7

SAFETY IMPROVEMENT OF JUNCTIONS

7.1 GENERAL

Relationships between the nature of accidents and the contributory factors of selected junctions have been derived in chapter 6. Based on these equations, reduction of accidents relevant to each nature has been found with respect to particular contributory factors of these junctions.

7.2 ACCIDENT REDUCTION AT SELECTED JUNCTIONS

7.2.1 NATURE OF ACCIDENT: HEAD-ON

The relation between Head-on accidents and contributory factors derived in chapter 6 is shown below.

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations

A(HO)= 0.441+ 0.000267(CM) + 0.035(ALI) + 0.0997(CA*TC)------(01)

Specimen calculation - Yakkala junction

Calculation of a number of head-on accidents before improvement in Yakkala junction is given below.

Impact of contributory factors for existing Yakkala junction.

Impact of center median not available (CM)	-From Table no5.6.2	= 912
Impact of alignment (ALI)	-From Table no5.6.2	= 6
Impact of Traffic controlled conflict area (CA*TC)	-From Table no5.6.2	= 51

From the above equation,

Number of Head-on accidents A(HO) = 5.97 accident per year

A. Provision of Center Median as a safety improvement measures

A center median can be provided for a major road as well as a minor road separately, or both together to reduce head-on accidents in the junction. After the introduction of center median for major and minor roads, the impact of center median becomes zero. The impact of other factors are remain same.

From equation No 01,

Number of Head-On accidents A(HO) after improvement = 5.72 accidents per year

Therefore, the percentage of accident reduction in accidents per year = 4 %

B. Alignment improvement as a safety improvement measures

The head-on accidents may be increased with the absence of good horizontal and vertical alignment. The remedy is to improve the alignment of the junction to a good condition by providing a flatter curve and a straight horizontal alignment. After improvement of horizontal and vertical alignment for major and minor roads, The impact of Alignment for vehicle related accidents can be reduced from 6 to e zero. The impact of other factors for vehicle related accidents remain the same.

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

From equation No 01,

Number of Head-On accidents A(HO) after improvement = 5.75 accident per year

Therefore, the percentage of accident reduction in accident per year = 4 %

C. Adopting of Traffic controlled methods as safety improvement measures

Especially an uncontrolled junction has a large conflict area. The drivers use this conflict area to overtake other vehicles. The result may be the increase of head-on accidents. Yakkala junction is a good example for this situation. This situation can be avoided by adopting traffic controlled measures. After introduction of traffic control to the junction, the impact of traffic controlled conflict area for vehicle related accidents can be reduced from 51 to zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 01,

Number of Head-On accident A(HO)after improvement = 0.9 accident per year

Therefore, the percentage of accidents reduction per year = 85 %

D. Summary of Head-on accidents reduction at junctions

Summary of head-on accident reduction at selected junctions based on the above computation is given in Table7.2.1.

Junction name	No of accident reduction per year after treatment				Percentage of accident reduction after treatment			
	Providing center median	Improving alignment	Traffic controlled	Total no of reduction	Providing center median	Improving alignment	Traffic controlled	Total no of reductio n
Dehiwala	0.17	0.55	0.00	0.73	15%	47%	0%	62%
Yakkala	0.24	0.21	5.07	5.52	4%	4%	85%	93%
Talawatugoda	0.14	0.12	0.13	0.39	17%	15%	15%	47%
Golumadama	0.04	0.00	0.00	0.04	9%	0%	0%	9%
Ganemulla	0.28	0.27	0.72	1.27	16%	16%	42%	74%
Ragama	0.39	0.36	2.11	2.85	12%	11%	64%	87%
Katubedda	0.03	0.00	0.00	0.03	6%	0%	0%	6%
Templers road	0.41	0.00	1.38	1.80	18%	0%	62%	80%
Malabe	0.26	0.26	2.97	3.49	7%	7%	76%	89%
Koswatta	0.32	0.00	1.76	2.08	13%	0%	70%	83%

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

Table 7.2.1 – Summary of number of accident reduction & percentage of accident reduction after treatments for head-on accidents

7.2.2 NATURE OF ACCIDENT: REAR – END

The relation between Rear-end accidents and contributory factors, derived in chapter 6 is shown below.

A(RE) =2.57 + 0.824(CA) + 0.113(ALI) + 0.0021((PE(TO)) + 1.04(PAR) +0.07((TV(RT))..... (02)

Specimen calculation - Yakkala junction

Calculation of the number of rear-end accidents before improvement in Yakkala junction is given below.

Impact of contributory factors for existing Yakkala junction.

Impact of right turn traffic volume TV(RT)	-From Table no 5.3.1	= 1.03
Impact of total pedestrian volume PE(TO)	-From Table no 5.4.2	= 80
Impact of parking at junction (PAR)	-From Table no 5.5.2	= 1.24
Impact of conflict Area (CA)	-From Table no 5.6.2	= 8.4
Impact of alignment (ALI)	-From Table no 5.6.2	= 6

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

From the above equation,

Number of Rear-End accident A(RE) = 11.67 accident per year

A. Reduction of Conflict area as a safety improvement measures

The drivers have unnecessary freedom to turn and overtake at a large center area of a junction, if the junction does not have traffic controlling measures. This uncontrolled and irregular traffic movement in the center area may cause rear-end accidents. As a result of the reduction of the center area by 20%, the impact of conflict area for vehicle related accidents of Yakkala junction is reduced from 8.4 to 6.69. The impact of other factors are remain same.

From equation No 02,

Number of Rear - End accidents A(RE) = 10.3 accidents per year

Therefore, the percentage of accident reduction per year = 12 %

B. Alignment improvement as a safety improvement measure

The head-on accidents may be increased with the absence of good horizontal and vertical alignment. The remedy is to improve the alignment of the junction to a good condition by providing a flatter curve and a straight horizontal alignment.

After improvement of horizontal and vertical alignment for major and minor roads, the impact of Alignment become zero. The impact of other factors are remain the same.

From equation No 02,

Number of Rear-End accident A(RE) = 11 accident per year

Therefore, the percentage of accident reduction per year = 6 %

C. Reducing pedestrian volume as a safety improvement measures

Pedestrian volume at junctions in the Western province is comparatively high. This pedestrian volume is rapidly increasing due to urbanization and the increase of activities at the junctions. With the increase of pedestrian volume, the road crossing pedestrian volume also increased. Most of the junctions do not have the required facilities for pedestrians. Because of this, the pedestrians walk along the carriageway and cross the road frequently, wherever they like. It causes a disturbance of the main traffic flow. This situation leads to drivers applying the brake frequently causing rear-end accidents. The reduction of rear-end accidents and its percentage are given below after reduction of pedestrian volume by 30%.

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

After reduction of pedestrian volume by 30% for major and minor roads, The impact of total pedestrian for vehicle related accidents reduced from 80 to 56.. The impact of other factors are remain same.

From equation No 02,

Number of Rear-End accidents A(RE) = 0.05 accident per year

Therefore, the percentage of accident reduction per year = 0.4 %

D. Parking banned at junction as a safety improvement measures

When the vehicle is parked along the road, it lessens the visibility of the junction and increases the side friction of the road. When the vehicle is going to park or the vehicle is taken out from the parking lot, it disturbs the traffic flow at the junction. This situation leads vehicle to sudden the application of brakes of the vehicle. This results in Rear-end accidents. The reduction of rear-end accidents and its percentages are as follows after banning the parking along major and minor roads. After banning of parking, within the junction area, the impact of Parking for vehicle related accidents becomes zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 02,

Number of Rear-End accident A(RE) = 1.29 accidents per year

Therefore, the percentage of accident reduction per year = 11 %

E. Providing a separate lane for right turn as a safety improvement measure

University of Moratuwa, Sri Lanka.
www.lib.mrt.ac.lk

The turning lane helps drivers to turn their vehicles smoothly and it reduces the disturbances to the major traffic flow. The conflict between turning vehicles with through traffic can be eliminated by providing grade separation at the junctions. This treatment is very costly. Where the traffic volume is less, the grade separation is not effective. Anyhow, if it can provide at least, separate lanes for left and right turning, there is a possibility of reducing rear-end accidents, to some extent.

After banning of right turn, the impact of right turn traffic volume for vehicle related accidents becomes zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 02,

Number of Rear-End accidents A(RE) = 0.07 accidents per year

Therefore, the percentage of accident reduction per year = 01 %

F. Summary of Rear-end accident reduction of junction

Summary of rear-end accidents reduction of selected junctions based on the above computation is given in Table 7.2.2

NAME OF JUNCTIONS	No of accident reduction per year after treatment						Percentage of accident reduction after treatment					
	20% reduction of conflict area	Improving alignment	30% Pedestrian controlled	Banned parking	Right turn banned	Total no of reduction	20% reduction of conflict area	Improving alignment	30% Pedestrian controlled	Banned parking	Right turn banned	Total no of reduction
Dehiwala	5.28	1.79	0.35	1.96	0.11	10.31	16%	5%	1%	6%	0%	30%
Yakkala	1.38	0.69	0.05	1.29	0.07	3.59	12%	6%	0%	11%	1%	31%
Talawatugoda	0.06	0.40	0.01	0.64	0.05	1.18	1%	10%	0%	16%	1%	30%
Golumadama	1.98	0.00	0.08	1.25	0.06	3.57	14%	0%	1%	9%	0%	25%
Ganemulla	0.15	0.88	0.09	1.45	0.07	2.85	3%	15%	1%	24%	1%	47%
Ragama	0.34	1.16	0.13	1.09	0.09	3.10	5%	17%	2%	15%	1%	44%
Katubedda	0.44	0.00	0.06	1.98	0.08	2.70	6%	0%	1%	28%	1%	38%
Templers road	0.21	0.00	0.07	1.52	0.06	2.01	4%	0%	1%	28%	1%	37%
Malabe	0.65	0.85	0.02	1.25	0.10	2.91	8%	11%	0%	15%	1%	36%
Koswatta	0.35	0.00	0.02	1.30	0.14	1.86	6%	0%	0%	22%	2%	32%

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

Table 7.2.2 – Summary of number of accident reduction & percentage of accident reduction after treatments for rear-end accidents

7.2.3 NATURE OF ACCIDENT: ANGLE

The relation between Angle accident and contributory factors derived in chapter 6 is shown below.

A(AN) = 0.704 + 0.0108 (CW) + 0.0307 (VIS) + 0.0538 (CA*TC) + 0.0473(ALI)

.....(03)

Specimen calculation - Yakkala junction

Calculation of the number of angle accidents before improvement in Yakkala junction is given below.

Impact of contributory factors for vehicle related accidents for existing Yakkala junction.

Impact of carriageway width (CW)	-From Table no 5.6.2	= 87
Impact of visibility of junction (VIS)	- From Table no 5.6.2	= 12
Impact of Traffic controlled conflict area (CA*TC)	- From Table no 5.6.2	= 51
Impact of alignment (ALI)	- From Table no 5.6.2	= 6

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

From the above equation,

Number of Angle accidents A(AN) = 4.5 accidents per year

A. Design of carriageway width as a safety improvement measure

Wider carriageway width and the narrow carriageway width create more accidents and lane discipline of drivers at junctions is bad. Therefore, the number of the lanes and the width of lanes are decided according to the speed and the traffic volume of the particular junction.

As an example, Yakkala is a two lane junction with 7.5m lane width, with parking. After redesign, the two lanes were converted into 3.5m wide four lanes with 01m center median for major road. For a minor road, it should be 4.0m wide two lanes with 2.0m center median.

After redesign of junction, the carriageway width of major road is 15m and 10m for minor road. After adjusting of carriageway width, the impact of carriageway width for vehicle related accidents can be reduced from 87 to 83. The impact of other factors for vehicle related accidents remain the same.

From equation No 03,

Number of Angle accidents A(AN) = 0.04 accidents per year

Therefore, the percentage of accident reduction per year = 01 %

B. Visibility improvement as a safety improvement measure

At most of the junctions, the inner corners are totally encroached by unauthorized structures, parking, vendors and hawkers. As result of this situation, the visibility of junctions is completely obstructed. This inner corner of junction should be clear to prevent accidents. Therefore, the removing of unauthorized structures and keeping the area clean will reduce the angle accidents of junctions.

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

After improving the visibility within the junction area, the impact of visibility for vehicle related accidents can be reduced from 12 to zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 03,

Number of Angle accidents A(AN) = 0.37 accidents per year

Therefore, the percentage of accident reduction per year = 08 %

C. Adopting of Traffic controlled method as a safety improvement measures

Especially an uncontrolled junction has a large conflict area. The drivers use this conflict area to overtake other vehicles. The result may be the increase of angle accidents. Yakkala junction is a good example for this situation. This situation can be avoided by adopting traffic controlled measures. After introduction of traffic control to the junction, the impact of traffic controlled conflict area for vehicle related accidents can be reduced from 51 to zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 03,

Number of Angle accidents A(AN) = 2.19 accidents per year

Therefore, the percentage of accident reduction per year = 49 %

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations

D. Alignment improvement as a safety improvement measure

The head-on accidents may be increased with the absence of good horizontal and vertical alignment. The remedy is to improve the alignment of the junction to a good condition by providing a flatter curve and a straight horizontal alignment. After improvement of horizontal and vertical alignment for major and minor roads, The impact of Alignment for vehicle related accidents can be reduced from 6 to e zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 03,

Number of Head-On accidents A(AN) = 0.29 accidents per year

Therefore, the percentage of accident reduction per year = 6 %

E. Summary of Angle accident reduction of junction

Summary of angle accident reduction of selected junctions based on the above computation is given in table 7.2.3

Junction name	No of accident reduction per year after treatment					Percentage of accident reduction after treatment				
	Redesign of carriageway width	Improving visibility	Traffic controlled	Improving Alignment	Total no of reduction	Redesign of carriageway width	Improving visibility	Traffic controlled	Improving Alignment	Total no of reduction
Dehiwala	0.17	0.00	0.00	0.75	0.92	3%	0%	0%	13%	16%
Yakkala	0.04	0.37	2.19	0.29	2.89	1%	8%	49%	6%	64%
Talawatugoda	0.05	0.22	0.05	0.17	0.50	4%	15%	4%	11%	33%
Golumadama	0.02	0.84	0.00	0.00	0.86	0%	19%	0%	0%	19%
Ganemulla	0.17	0.24	0.31	0.37	1.09	7%	10%	13%	15%	45%
Ragama	0.25	0.32	0.91	0.49	1.96	7%	9%	26%	14%	56%
Katubedda	0.01	0.33	0.00	0.00	0.34	0%	10%	0%	0%	11%
Templers road	0.02	0.00	0.60	0.00	0.62	1%	0%	20%	0%	21%
Malabe	0.04	0.00	1.28	0.36	1.68	1%	0%	43%	12%	56%
Koswatta	0.03	0.00	0.76	0.00	0.79	1%	0%	36%	0%	37%

University of Moratuwa, Sri Lanka
www.lib.mrt.ac.lk

Table 7.2.3 – Summary of the number of accident reduction & percentage of accident reduction after treatments for angle accidents

7.2.4 NATURE OF ACCIDENT: SIDE – SWIPE

The relation between Side-swipe accidents and contributory factors derived in chapter 6 is shown below.

$$A(SS) = 2.3 + 0.092\,(IT) + 0.0071\,(CW) + 0.126\,(ALI) + 0.0557\,((PE(RC)) \quad \text{----------(04)}$$

Specimen calculation - Yakkala junction

Calculation of the number of side-swipe accidents before improvement in Yakkala junction is given below.

Impact of contributory factors for vehicle related accidents for existing Yakkala junction.

Impact of intersection type (IT)	-From Table no 5.6.2	= 12
Impact of carriageway width (CW)	- From Table no 5.6.2	= 87
Impact of alignment (ALI)	- From Table no 5.6.2	= 6
Impact of road crossing pedestrian PE(RC)	- From Table no 5.4.2	= 24

Electronic Theses & Dissertations
www.lib.mrt.ac.lk

From the above equation,

Number of Side-Swipe accidents A(SS) = 7.67 accidents per year

A. Change intersection type to grade separation as a safety improvement measure

With the increase of the access to the junction, the complexity of the junction increases and increases the conflict area of the junction. Then, the driver has to pay attention to all these legs before he crosses the junction. The grade separation is minimize the no of access connect to the junction and reduce the conflict area. After introduction of grade separation to the junction, the impact of the intersection type for vehicle related accidents can be reduced from 12 to zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 04,

Number of Side-swipe accidents A(SS) = 0.77 accidents per year

Therefore, the percentage of accident reduction per year = 13 %

B. Design of carriageway width as a safety improvement measure

Wider carriageway width and the narrow carriageway width create more accidents and lane discipline of drivers at junctions is bad. Therefore, the number of the lanes and the width of lanes are decided according to the speed and the traffic volume of the particular junction.

As an example, Yakkala is a two lane junction with 7.5m lane width, with parking. After redesign, the two lanes were converted into 3.5m wide four lanes with 01m center median for major road. For a minor road, it should be 4.0m wide two lanes with 2.0m center median.

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

After redesign of junction, the carriageway width of major road is 15m and 10m for minor road. After adjusting of carriageway width, the impact of carriageway width for vehicle related accidents can be reduced from 87 to 83. The impact of other factors for vehicle related accidents remain the same.

From equation No 04,

Number of Side-swipe accidents A(SS) = 0.02 accidents per year

Therefore, the percentage of accident reduction per year = 0.41 %

C. Alignment improvement as a safety improvement measure

The side-swipe accidents may be increased with the absence of good horizontal and vertical alignment. The remedy is to improve the alignment of the junction to a good condition by providing a flatter curve and a straight horizontal alignment. After improvement of horizontal and vertical alignment for major and minor roads, The impact of Alignment for vehicle related accidents can be reduced from 6 to e zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 04,

Number of Side-swipe accidents A(SS) = 0.77 accidents per year

Therefore, the percentage of accident reduction per year = 13 %

D. Providing of an underpass / overpass for pedestrians as a safety improvement measure

University of Moratuwa, Sri Lanka.
www.lib.mrt.ac.lk

Most of the junctions do not have the required facilities for pedestrians. Because of this, the pedestrians walk along the carriageway and cross the road frequently where they like. It causes a disturbance of the main traffic flow. This situation leads to Side-Swipe accidents. Banning of the road crossing pedestrian by providing under or over pass to the junction can reduce the side-swipe accidents. The reduction of side-swipe accidents and its percentage are given below after segregation of pedestrian from traffic. After banning of the road crossing pedestrian for major and minor roads, the impact of road crossing pedestrians for vehicle related accidents can be reduced from 24 to zero. The impact of other factors for vehicle related accidents remain the same.

From equation No 04,

Number of Side-swipe accidents A(SS) = 1.31 accidents per year

Therefore, the percentage of accident reduction per year = 23 %

E. Summary of Angle accident relation of junction

Summary of side-swipe accidents reduction of selected junctions based on the above computation is given in Table 7.2.4

NAME OF JUNCTIONS	No of accident reduction per year after treatment					Percentage of accident reduction after treatment				
	Provide grade separation	Design carriageway width	Improving alignment	Provide under/over pass for pedestrian	Total no of reduction	Provide grade separation	Design carriageway width	Improving alignment	Provide under/over pass for pedestrian	Total no of reduction
Dehiwala	2.95	0.11	1.99	8.58	13.64	16%	1%	11%	46%	73%
Yakkala	0.77	0.02	0.77	1.31	2.87	13%	0%	13%	23%	50%
Talawatugoda	0.03	0.03	0.45	0.37	0.89	1%	1%	13%	11%	26%
Golumadama	1.11	0.01	0.00	1.92	3.04	15%	0%	0%	26%	42%
Ganemulla	0.09	0.11	0.98	1.54	2.72	2%	2%	18%	28%	50%
Ragama	0.19	0.17	1.30	1.57	3.22	3%	3%	21%	26%	53%
Katubedda	0.25	0.00	0.00	0.74	0.99	5%	0%	0%	16%	21%
Templers road	0.12	0.02	0.00	1.13	1.26	3%	0%	0%	24%	27%
Malabe	0.36	0.03	0.95	0.37	1.71	8%	1%	21%	8%	39%
Koswatta	0.19	0.02	0.00	0.69	0.90	5%	1%	0%	19%	25%

Table 7.2.4 – Summary of number of accidents reduction & percentage of accident reduction after treatments for side-swipe accidents

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

7.2.5 NATURE OF ACCIDENT: PEDESTRIAN

The relation between Side-swipe accidents and contributory factors derived in chapter 6 is shown below.

$$A(PE) = 1.35 + 0.0171\ (IT) + 0.0515\ (VIS) + 0.00113\ (CA*TC) \quad \text{----------(05)}$$

Specimen calculation - Yakkala junction

Calculation of number of pedestrian accidents before improvement in Yakkala junction is given below.

Impact of contributory factors for existing Yakkala junction.

Impact of intersection type (IT)	-From Table no 5.6.3	= 47
Impact of visibility of junction (VIS)	-From Table no 5.6.3	= 47
Impact of traffic controlled conflict area (CA*TC)	-From Table no 5.6.3	= 750

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

From the above equation,

Number of Pedestrian related accidents A(PE) = 5.4 accidents per year

A. Change intersection type to grade separation as a safety improvement measure

With the increase of the access to the junction, the complexity of the junction increases and increases the conflict area of the junction. Then, the driver has to pay attention to all these legs before he crosses the junction. The grade separation is minimize the no of access connect to the junction and reduce the conflict area. After introduction of grade separation to the junction, the impact of the intersection type for pedestrian related accidents can be reduced from 47 to zero. The impact of other factors for pedestrian related accidents remain the same.

From equation No 05,

Number of Pedestrian accidents A(PE) = 4.6 accidents per year

Therefore, the percentage of accidents reduction per year = 15 %

B. Visibility improvement as a safety improvement measures

At most of the junctions, the inner corners are totally encroached by unauthorized structures, parking, vendors and hawkers. This situation leads to completely obstruction of the visibility of pedestrians as well as drivers. This inner corner of junctions should be clean and clear to prevent the pedestrian accidents. Therefore, the removing of unauthorized structures and keeping clean the area will reduce the pedestrian accidents at junctions. After improving the visibility within the junction area, the impact of visibility for pedestrian related accidents can be reduced from 47 to zero. The impacts of other factors for pedestrian related accidents remain the same.

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

From equation No 05,

Number of Pedestrian accident A(PE) = 3.0 accident per year

Therefore, the percentage of accident reduction per year = 45 %

C. Adopting of Traffic controlled method as a safety improvement measure

Signal adopting as a traffic controlled method to the junction is automatically linked with pelican crossing for pedestrian. Pelican crossings are more appropriate than zebra crossings where pedestrian flow is heavy and a pelican will prevent pedestrian establishing a continuous flow on the crossing. Yakkala junction is one of the good examples for this situation. This situation can be eliminated by adopting a traffic controlled method to the junction.

After adopting of traffic controlled method to the junction, the impact of traffic controlled conflict area for pedestrian related accidents can be reduced from 750 to zero. The impact of other factors remain the same.

From equation No 05,

Number of Pedestrian accident A(PE) = 4.6 accident per year

Therefore, the percentage of accident reduction per year = 16 %

D. Summary of Pedestrian accident relation of junction

Summary of pedestrian accidents reduction of selected junctions based on the above computation is given in Table 7.2.5

NAME OF JUNCTIONS	No of accident reduction per year after treatment				Percentage of accident reduction after treatment			
	Provide grade separation	Improving visibility	Provide traffic controlled to junction	Total no of reduction	Provide grade separation	Improving visibility	Provide traffic controlled to junction	Total no of reduction
Dehiwala	2.33	0.00	0.00	2.33	63%	0%	0%	63%
Yakkala	0.80	2.41	0.85	4.05	15%	45%	16%	75%
Talawatugoda	0.24	0.71	0.01	0.95	10%	31%	0%	41%
Golumadama	0.49	1.48	0.00	1.98	15%	45%	0%	59%
Ganemulla	0.48	1.44	0.11	2.02	14%	43%	3%	60%
Ragama	0.50	1.50	0.19	2.18	14%	42%	5%	62%
Katubedda	0.26	0.78	0.00	1.04	11%	33%	0%	44%
Templers road	0.27	0.00	0.03	0.31	16%	0%	2%	18%
Malabe	0.12	0.00	0.03	0.15	8%	0%	2%	10%
Koswatta	0.10	0.00	0.01	0.10	7%	0%	1%	7%

Table 7.2.5 – Summary of number of accidents reduction & percentage of accident reduction after treatments for pedestrian accidents

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

7.3 SUMMARY OF SAFETY IMPROVEMENT OF JUNCTIONS

Under the Chapter 7.2, accident reductions relevant to all nature of accident of selected junctions have been analysed by introducing safety improvement measures. The summary of reduction in accidents with respect to each nature of accident ; head-on, rear-end, angle, side-swipe and pedestrian are given in Table7.2.1, Table 7.2.2, Table 7.2.3, Table 7.2.4 and Table 7.2.5 respectively.

The summary of comprehensive analysis of all selected junctions is given in Table 7.3 which shows the reduction in all nature of accidents as a percentage after introducing safety improvement measures.

JUNCTION NAME	JUNCTION TREATMENTS										
	Provision of Center Median	Alignment Improvement	Adopting of traffic Controlled Method	Reduction of Conflict Area	Reducing Pedestrian Volume	Parking Banned at junction	Providing Separate Right Turn Lane	Design Of Carriageway Width	Visibility Improvement at junction	Change Intersection Type	Total accident reduction
Dehiwala	0%	8%	0%	8%	14%	3%	0%	0%	0%	8%	43%
Yakkala	1%	6%	25%	4%	4%	4%	0%	0%	8%	6%	58%
Talawatugoda	1%	10%	1%	0%	3%	5%	0%	1%	7%	7%	36%
Golumadama	0%	0%	0%	6%	7%	4%	0%	0%	7%	10%	34%
Ganemulla	1%	13%	6%	1%	8%	7%	0%	1%	9%	6%	53%
Ragama	2%	13%	14%	1%	7%	4%	0%	2%	7%	6%	57%
Katubedda	0%	0%	0%	2%	4%	11%	0%	0%	6%	7%	31%
Templers road	2%	0%	12%	1%	7%	8%	0%	0%	0%	7%	38%
Malabe	1%	12%	21%	3%	2%	6%	0%	0%	0%	4%	49%
Koswatta	2%	0%	17%	2%	4%	8%	1%	0%	0%	5%	40%

Table 7.3 - Summary of accident reduction percentage after treatments

University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk