Current situation of road traffic accidents and expectation of utilizing ITS in the Philippines

Ricardo G. Sigua
Professor, Institute of Civil Engineering
College of Engineering
University of the Philippines – Diliman

Research Fellow, UP National Center for Transportation Studies

email: rdsigua@up.edu.ph

Philippines

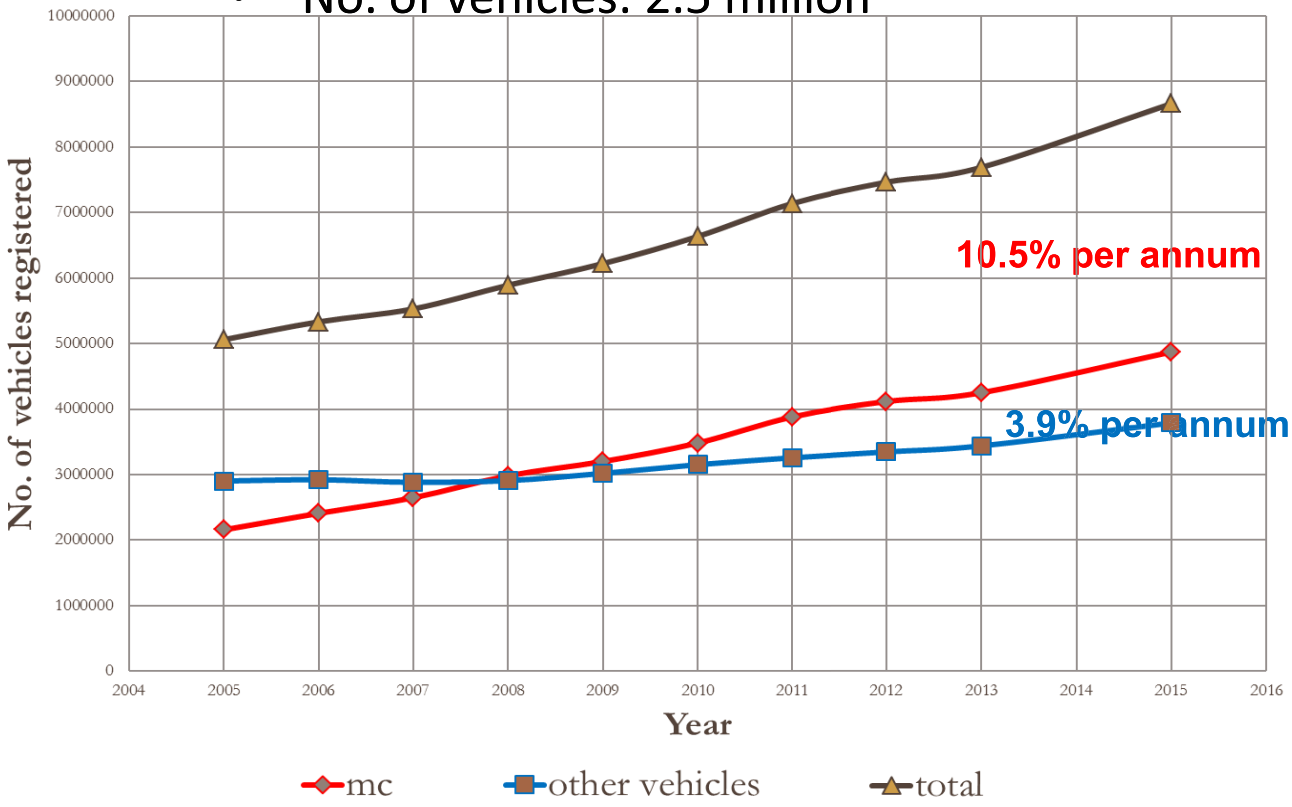
Source: geology.com

Philippines:

- Population: approx. 106million (approx. 1.5% growth rate)
- Area: 342,353 sq. km.
- Vehicle registered 2016: 9.25 million

Metro Manila:

- Population: 12.9million (2015)
- Area: 619.6 sq. km.
- No. of vehicles: 2.5 million



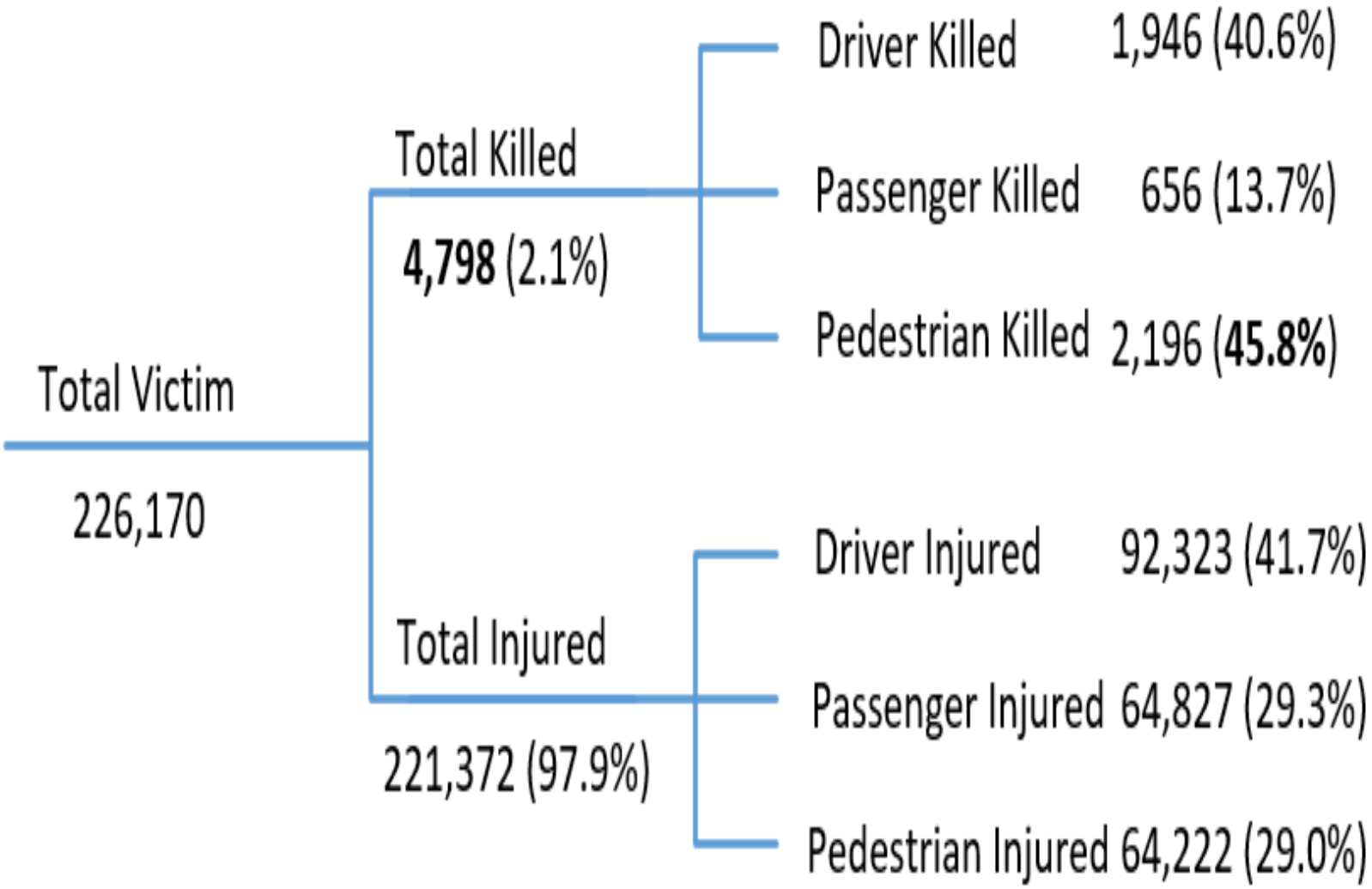
Road crash

- Economic cost: approx. 2.6% of GDP
- No. of fatalities: approx. 10,000 annually
- Identified vulnerable road users: pedestrians and motorcycle riders

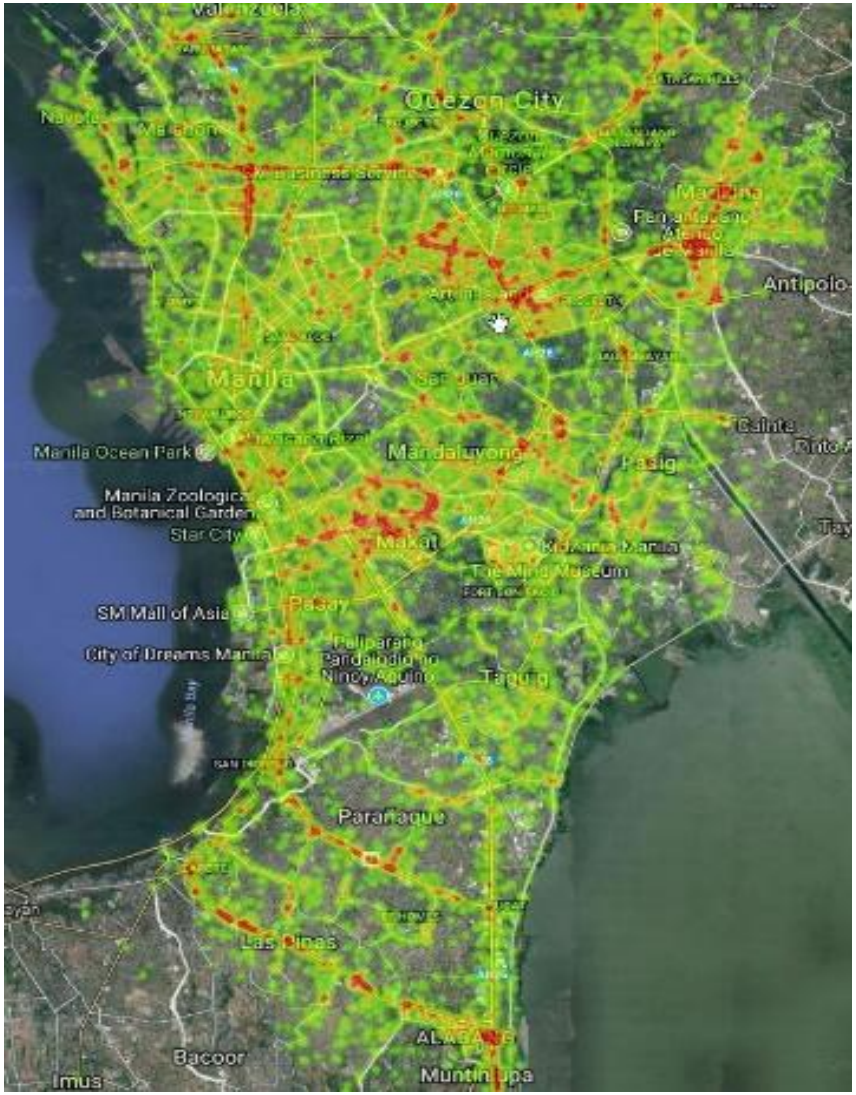
Metro Manila road crash data:

- 12 years (2005 – 2016)
- 957,348 records of accidents from MMDA
- Research Funding from TMF

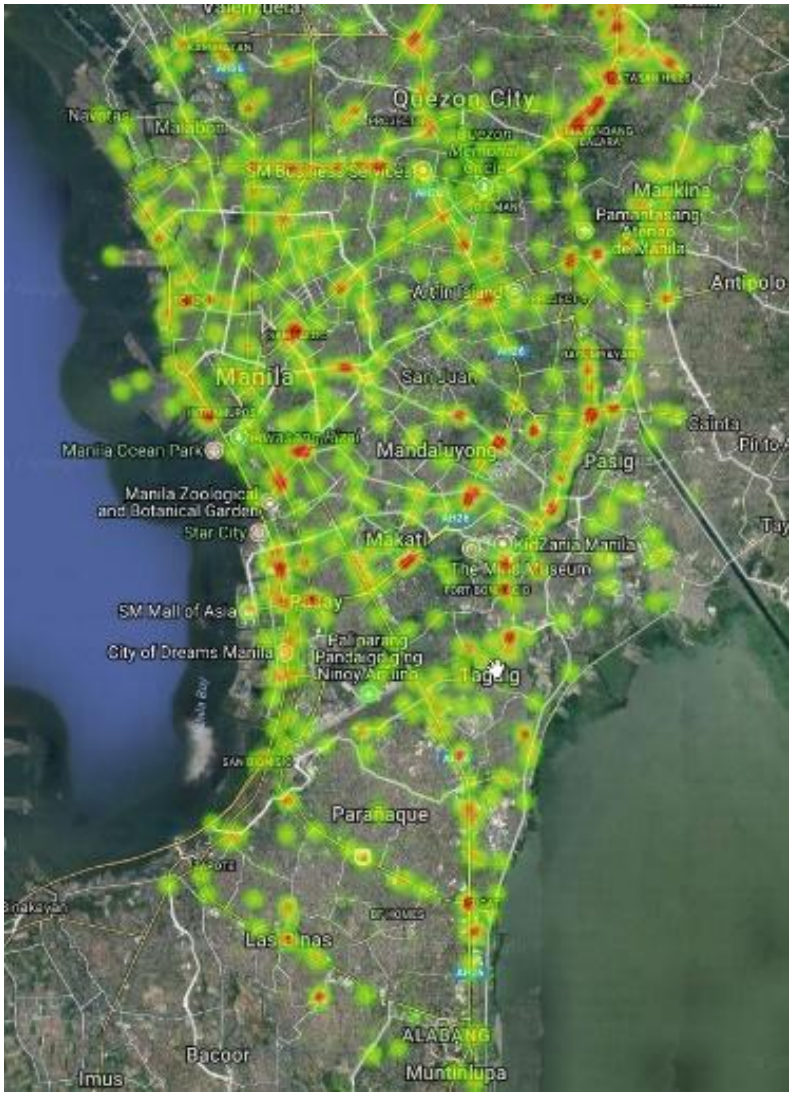
Breakdown of road crash victims, Metro Manila



Road crash heat map



All road crashes



Road crashes with fatalities

Road crash location

	Number of Accident	Number of Death	Number of Injured
Mid-Block	269,003 (28%)	1,682 (35%)	71,137 (32%)
Junction	95,883 (10%)	367 (8%)	16,696 (8%)
Total (sample)	364,886 (38%)	2,049 (43%)	87,833 (40%)

Rank	Junction Type	Number of Accident			Number of Death			Number of Injured		
1	Cross roads	47092	(	39%)	171	(	36%)	10077	(	45%)
2	T Junction	34292	(	28%)	120	(	25%)	6714	(	30%)
3	Other									6%)
4	Other (Bridge/Flyover									2%)
5	U turn slot									7%)
6	Rotunda									5%)
7	Y Junction									2%)
8	Other (Bridge/Flyover									1%)
9	Other (Tunnel/Underpass)	1373	(	1%)	5	(	1%)	154	(	1%)
10	T Junction (Closed Intersection)	1398	(	1%)	3	(	1%)	136	(	1%)
11	Other (Parking Area)	3434	(	3%)	1	(	0%)	86	(	0%)
12	K Junction	48	(	0%)	0	(	0%)	10	(	0%)
13	Skew Junction	22	(	0%)	0	(	0%)	2	(	0%)

- **Lack of pedestrian facilities**
- **Uncontrolled lane splitting behavior of motorcycles**

Junction control type

Rank	Junction Control	Number of Accident	Number of Fatality	Number of Injured
1	Traffic Lights	43,599	130	7,094
2	Other	5,722	64	1,576
3	Give Way sign or marking	5,270	26	1,520
4				
5				
6				
7	Other (entrance/exit of an establishment)	46	0	9
8	Other (Tunnel/Underpass Marking)	95	0	4

- **Low compliance (beating red lights; ignoring signals)**
- **Inefficient signal control**

Road crash by time of day

Day or Night	Number of Accident	Number of Fatality	Number of Injured
Night	352,560	2,902	97,619
Day (5AM to 6PM)	604,788	1,896	123,753

Road crash by weather type

Weather	Number of Accident	Number of Fatality	Number of Injured
Dry	944,752	4,730	217,976
Wet	12,522	67	3,372

Road crash cause

Rank	Accident Cause	Number of Accident	Number of Fatality	Number of Injured
1	Human Error	116,886	1,029	47,963
2	Vehicle Defect	670	33	1,103
3	Infrastructure Problem	197	5	197

Rank	Accident Cause	Detail Cause	Number of Accident	Number of Fatality	Number of Injured
1	Human error	Inattentive	19,974	459	18,058
2	Human error	Too fast	46,020	364	16,225
3	Human error	Driver Error	14,197	47	5,230
4	Human error	Lost Control	597	45	612
5	Human error	Alcohol suspected	585	32	469
6	Human error	Too close	5092	24	2563
7	Vehicle Defect	Mechanical	403	24	746
8	Human error	Bad overtaking	16517	17	1682
9	Human error	Disobey sign or traffic lights	5519	13	1187
10	Human error	Bad turning	6523	10	1219

Collision Type

Rank	Collision Type	Number of Accident	Number of Fatality	Number of Injured
1	Hit Pedestrian	59,172	2,097	62,171
2	Hit Vehicle	283,127	573	50,861
3	Self-Accident	12,378	307	6,621
4	Hit Object	19,104	230	4,266
5	Multiple Collision	11,859	191	7,415

Collision Direction

Rank	Collision Direction	Number of Accident	Number of Fatality	Number of Injured
1	Side Swipe	147,380	217	23,454
2	Rear-End	89,572	146	12,713
3	Angle Impact	40,735	135	12,631
4	Head-On	3,299	69	2,205
5	Backing Collision	500	0	6

Pedestrian casualties

Year	Pedestrian Killed		Total Fatality
2005	177	50.9%	348
2006	190	51.2%	371
2007	184	53.0%	347
2008	127	46.0%	276
2009	140	47.3%	296
2010	175	41.8%	419
2011	181	45.7%	396
2012	177	43.0%	412
2013	187	43.8%	427
2014	196	44.1%	444
2015	239	43.9%	544
2016	195	43.7%	446
Average	180.7	46.2%	393.8

Mode Involvement

Mode Involvement	Death Victims			Injured Victims		
	Driver	Passenger	Pedestrian	Driver	Passenger	Pedestrian
Motorcycle	1,405	302	259	71,437	21,764	23,035
Car	455	214	513	39,820	26,300	17,053
Truck	454	181	453	6,556	6,828	2,779
Bike	223	20	11	8,935	1,414	636
Jeepney	185	116	258	9,754	17,942	7,491
Van	169	45	213	6,923	6,510	3,792
Bus	102	64	189	2,621	8,382	1,929
Tricycle	93	64	54	7,533	10,603	4,131
Fx/Taxi	68	36	83	8,094	7,159	3,370
Pedestrian	42	14	2,184	1,171	1,022	64,014
Train	3	4	84	13	49	60

Number of Accidents and Victims by Mode Involvement

Mode Involvement	Number of Accident	Injured Victims	Death Victims
Pedestrian	61,952	66,207	2,240
Motorcycle	187,870	116,236	1,966
Car	678,562	83,173	1,182
Truck	126,340	16,163	1,088
Jeepney	130,434	35,187	559
Van	137,822	17,225	427
Bus	70,182	12,932	355
Bike	15,056	10,985	254
Tricycle	39,888	22,267	211
Fx/Taxi	99,833	18,623	187
Train	240	122	91

Mode Interaction

Rank	Mode Interaction	Number of Accident	Number of Fatality	Number of Injured
1	Ped-Car	16,199	525	17,434
2	Ped-Truck	2,836	459	2,890
3	Motorcycle-Truck	8,188	363	5,165
4	Motorcycle-Car	82,762	298	35,377
5	Ped-Motorcycle	21,789	279	24,411
12	Motorcycle-Motorcycle	12,368	90	11,504
13	Car-Truck	74,257	88	3,347
20	Car-Car	203,673	50	6,481

Pedestrians and MC riders continue to be the most vulnerable road users in Metro Manila

ITS Applications

- Adaptive Traffic signal systems with red light cameras
- Exclusive motorcycle lane; motorcycle crash avoidance system (V2M)
- Pedestrian collision avoidance as part of intelligent vehicle systems (V2P)