



International Road Federation
अंतरराष्ट्रीय सड़क संघ



Focussed Measures on Vulnerable Road Users



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Vulnerable Road Users (VRU's)

- World Health Organisation in 2013 considered VRUs to be **“pedestrians, cyclists, and motorcyclists”**
- European Union's refers to “non-motorised road users, such as pedestrians and cyclists as well as motor-cyclists and persons with disabilities or reduced mobility and orientation”
- United States : road users who are most at risk for serious injury or fatality when they are involved in a motor-vehicle-related collision. These include pedestrians of all ages, types and abilities, particularly older pedestrians and people with disabilities. VRU's also include bicyclists and motorcyclists. Older drivers may also be considered to fit into this same user group

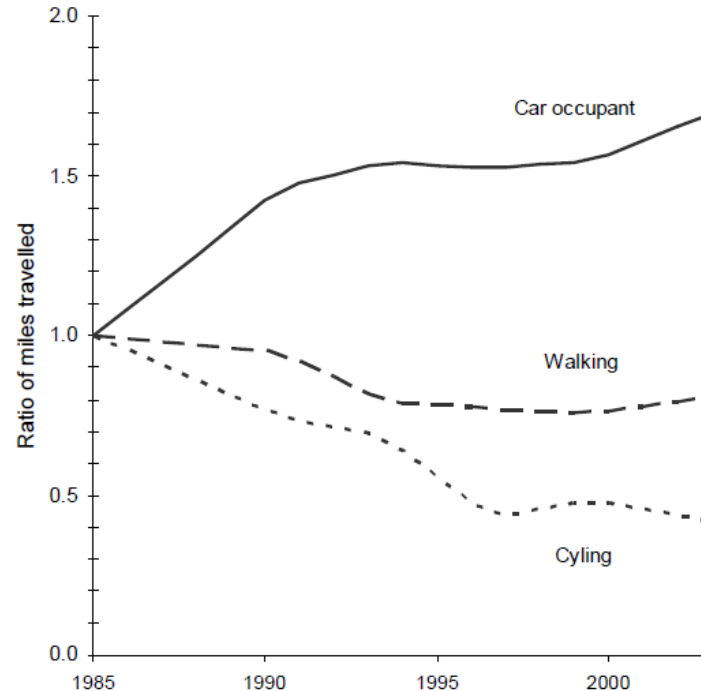


National Road Safety Policy - India

- The design and construction of all road facilities (rural and urban) will take into account the needs of non-motorized transport and the vulnerable and physically challenged in an appropriate manner.

Walking, Cycling & Car Use Trends

1985-2005



Source: Ian Roberts, 2011

Automobile Centric Development

Atlanta : 2000 person/sqkm



Population	Urban area	Transport carbon emissions
5.25 million	4,280 km ²	7.5 tonnes CO ₂ /ha/an (public + private transport)



Population	Urban area	Transport carbon emissions
5.33 million	162 km ²	0.7 tonnes CO ₂ /ha/an (public + private transport)

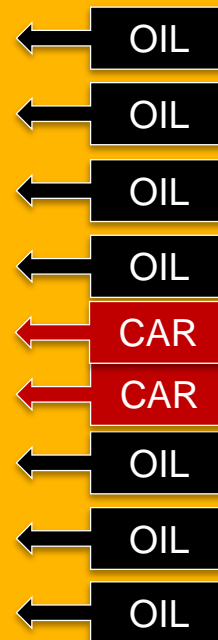
Barcelona : 16000 person/sqkm

SOURCE: *Transit and Density: Atlanta, the United States and Western Europe*, Bertaud and Richardson, 2004



Fortune 500 Companies

RANK	COMPANY	REVENUES (\$M)
1	Walmart	\$500,343
2	State Grid	\$348,903
3	Sinopec Group	\$326,953
4	China National Petroleum	\$326,008
5	Royal Dutch Shell	\$311,870
6	Toyota Motor	\$265,172
7	Volkswagen	\$260,028
8	BP	\$244,582
9	Exxon Mobil	\$244,363
10	Berkshire Hathaway	\$242,137



Road Crashes – VRU's

VRU's Fatalities as Victim in Urban Areas (2018_2020)

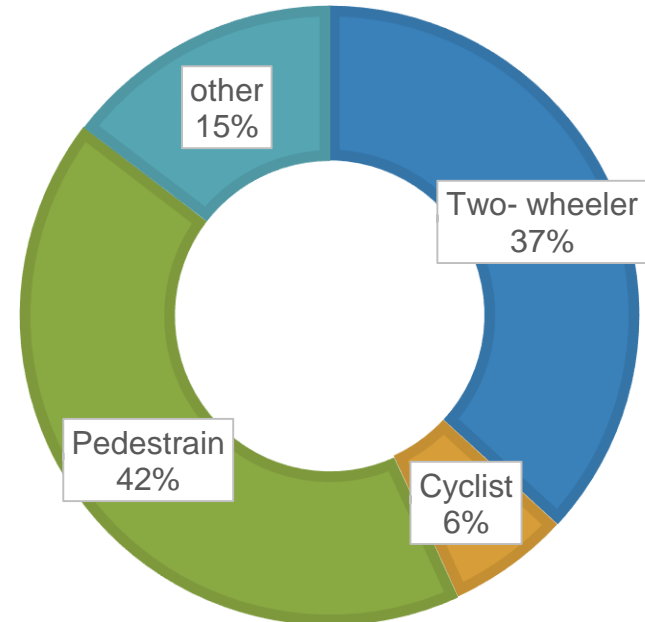
Sr. No.	City	Total Fatality (2018 to 2020)	Total Number of Pedestrian deaths	Total Number of Two Wheeler Deaths	Total Number of Cyclist deaths	Total Fatalities of VRU (2018 to 2020)	Percentage of VRU Fatalities
1	Ludhiana	902	317	403	82	802	89%
2	Jalandhar	290	83	143	26	252	87%
3	Amritsar	228	64	113	23	200	88%
4	Moga	98	30	46	4	80	82%
5	S.A.S Nagar	139	33	76	9	118	85%
6	Patiala	164	28	98	13	139	85%
7	Chandigarh	255	83	110	31	224	88%

NH-44 : Ludhiana Urban Section



■ Two- wheeler ■ Cyclist ■ Pedestrain ■ other

Length (KM)	Total Fatalities	VRU Fatalities	Percentage of VRU	Fatal/KM-year
31.12	315	269	85.4%	3.37



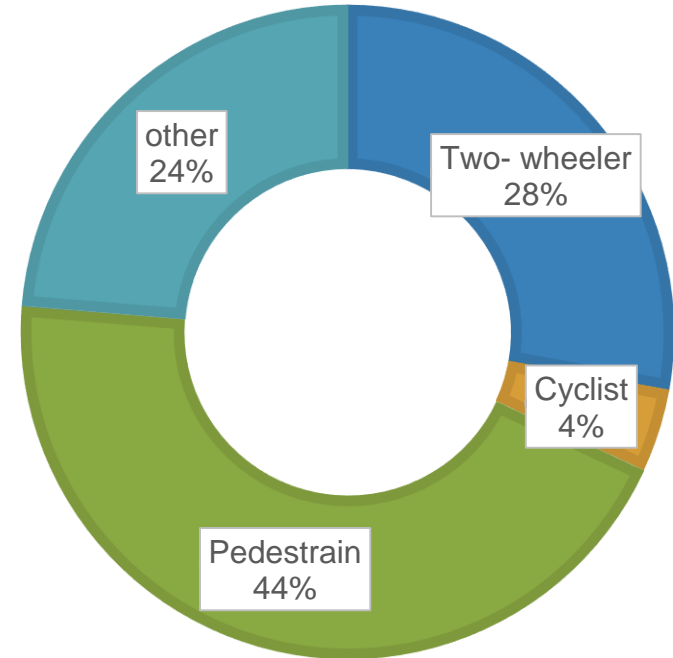
(2019-2021)

NH-44 : Panipat Elevated Urban Section



■ Two- wheeler ■ Cyclist ■ Pedestrain ■ other

Length (KM)	Fatalities	VRU Fatalities	Percentage of VRU	Fatal/KM-year
10	97	74	76.3%	2.4



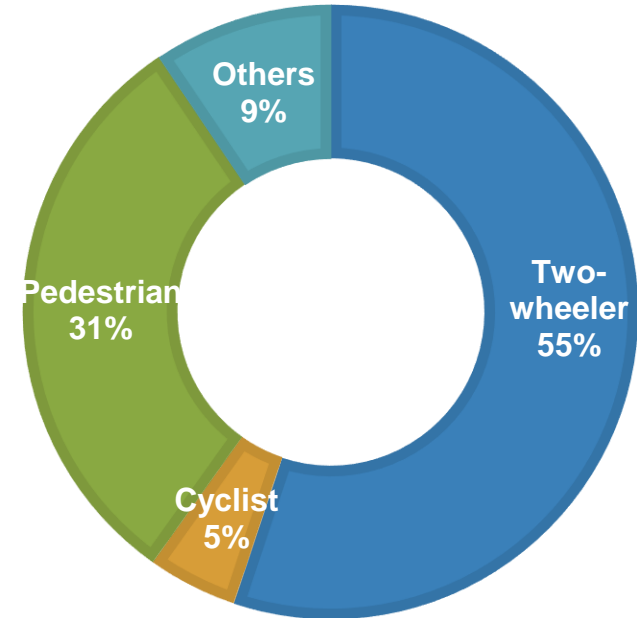
(2018-2021)

NH-5 : Ludhiana Urban Section



■ Two- wheeler ■ Cyclist ■ Pedestrian ■ Others

Length (KM)	Fatalities	VRU Fatalities	Percentage of VRU	Fatal/KM-year
36.82	127	115	90.5%	1.15



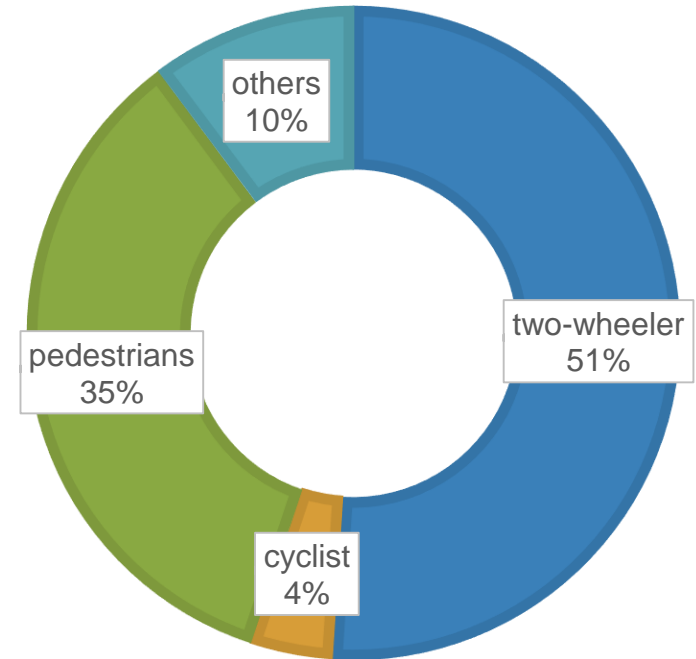
(2019-2021)

Old GT Road : Amritsar BRTS Corridor

Length (KM)	Fatalities	VRU Fatalities	Percentage of VRU	Fatal/KM-year
16	49	44	89.8	1.02

(2017-2019)

■ two-wheeler ■ cyclist ■ pedestrians ■ others





Issues

Villages and Settlement Along Highways



Gurudwara
Sahib Kamal Ke
ਗੁਰੂਦੁਆਰਾ
ਸਾਹਿਬ ਕਮਲ ਕੇ

Government Senior
Secondary School
ਸਰਕਾਰੀ ਸੀਨੀਅਰ
ਸੈਕੰਡਰੀ ਸਕੂਲ







Median Railing Design



Design : Open Drain



Fixed Hazards in Clear Zone



Other Issues

- Social Impact and Road Safety
- Inter-Departmental Coordination
- Provision for Para-Transit Modes of Transport and Multimodal Integration with Highway Design
- Street Light and Conspicuity

Case Studies



Sector 43 : CHANDIGARH



Sector 17 Underpass : CHANDIGARH



Cycle Tracks : CHANDIGARH





Thank You

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