Behavioural analysis of Pedestrians while crossing the road at intersection

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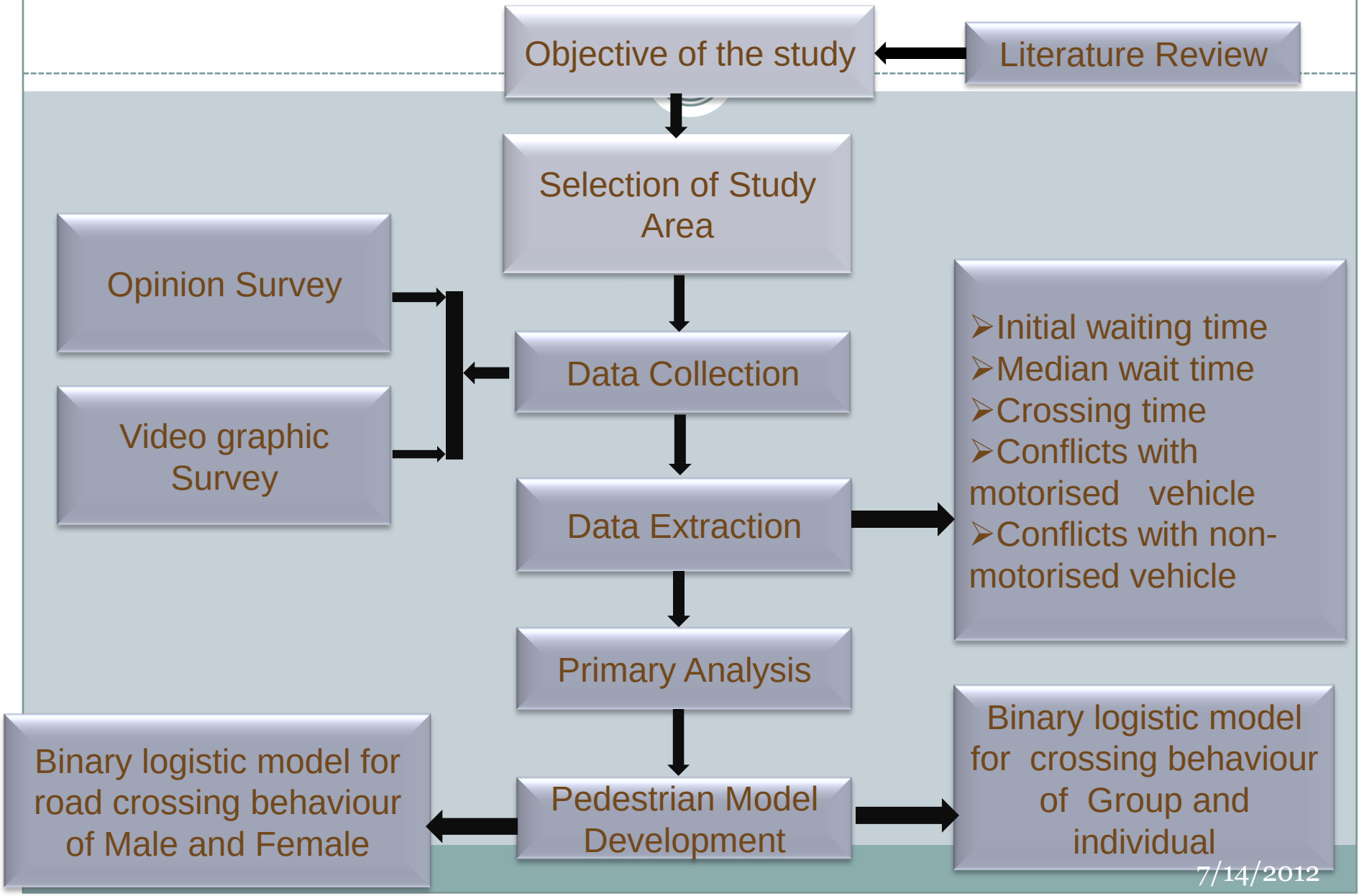
Introduction

- Pedestrians are an inseparable part of transport system
- Most studies on Pedestrians' is limited to facilities on sidewalks with a few studies on pedestrian facility at intersections
- Studies done on intersection facilities are not suitable for Indian traffic scenario of space sharing
- This study has been carried out on an intersection of Delhi i.e. Aali intersection which is on National Highway 2

- Its an urban intersection located near Mohan co-operative industrial estate on one side and on other side the Aali village
- The site selected is occupied by a considerable number of pedestrians during the day
- It’s T- junction with 7 traffic movements

METHODOLOGY



Objective of the study

- To understand the behaviour of pedestrians while crossing on selected intersection.
- Includes:
  - a) gender based crossing behaviour
  - b) individual and group crossing behaviour

Surveys conducted

- Opinion survey
  - To know their preferences and rating for road crossing facilities
- Video graphic survey
  - Pedestrians behaviour (initial wait time before crossing, number of attempts made, crossing time, median break if any, number & type of conflicts happened while crossing the road)

Primary Analysis

- Sample size for present study from opinion survey is 349 and 245 during peak and off-peak hours respectively
- Pedestrians were asked to rate the intersection according to their perspective towards the crossing facility existing at the intersection.
- Ratings were given between 0 to 10; where 0 means most difficult to cross and 10 means very easy to cross

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- 18% and 20% pedestrians during off-peak and peak hours respectively have given ‘0’ rating to the crossing facilities
- When they have been asked about group or individual crossing preference 38% of pedestrians said that they prefer individual crossing rather than group crossing while 60% of pedestrians preferred group crossing and remaining 2 % did not respond clearly

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- Hypothesis testing done on initial wait time shows that there is no significant difference in initial wait time of pedestrians during peak/off peak hours of working/non-working day.
- On non working signal condition (i.e. unsignalised intersection) initial wait time as well as total crossing time for females is higher compared to the males

Contd….

- Individual crossing and group crossings (group size between 2 to 5 persons and more than 6 persons) have been analysed separately.
- Results shows that there is a significant difference in behaviour of individual and group of size more than 6 in terms of initial as well as total crossing time

Binary logit models for pedestrians road crossing behaviour

1. Gender based Binary logit model

Variables	B	S.E.	Wald	Significance	Exp(B)
Conflicts_nonmotorised	.082	.032	6.714	.010	1.086
Conflicts_motorised	-.089	.040	5.011	.025	.915
Median_wait_time	.004	.002	4.232	.040	1.004
Constant	-.879	.093	88.598	.000	.415

- significant variables ($p<0.05$) are number of conflicts seen with motorised and non-motorised vehicles and the time spend as wait time at median of the road

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- median wait time is higher for females compared to males
- conflicts with motorised vehicles while crossing the road is higher for male pedestrians though conflicts with non-motorised vehicles are higher for females

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- At present site as conflicts with motorised vehicles have been considered more dangerous than non-motorised vehicles which are a kind of slow moving vehicles i.e. bicycles and cycle rickshaws

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2. Binary logit model for individual and group crossing behaviour

Variables	B	S.E.	Wald	Sig.	Exp(B)
C_ped	.163	.052	10.012	.002	1.177
C_rick	.400	.183	4.762	.029	1.491
Initial_wait	.013	.002	59.704	.000	1.013
Median_wait	-.007	.002	12.534	.000	.993
Gender(1)	.245	.126	3.773	.050	.782
Constant	-.290	.135	4.660	.031	.748

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- significant difference in number of conflicts made with pedestrians, cycle rickshaws if a pedestrian is crossing the road as an individual or in a group
- In group crossings - less number of conflicts with motorised vehicles has been observed however; conflicts with non-motorised modes (i.e. other pedestrians, cycles and cycle-rickshaws) are more for group crossings

Results & Discussions

- Gender based crossing behaviour analysis shows male pedestrians are more risk takers compared to female pedestrians as number of conflicts with motorised vehicles are significantly higher for male pedestrians.
- Wait time at median is higher for female pedestrians which indicate that female pedestrians are spending more time for road crossing compared to the male pedestrians.

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- Binary logistic model for group and individual crossing provides information that as initial wait time increases, probability of crossing the road in a group increases. Further, stated preference of pedestrians show that most of the pedestrians (60%) feel safer if they cross the road in a group compared to an individual crossing.
- Binary logit model for group or individual crossing provides an important information that group crossing behaviour of pedestrians increases the safety

Limitation

- Limitation of the present study is - analysis is dependent on single location study. For more generic behavioural analysis more location data is required to be analysed.


Thank you