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MEASURING

READINESS & WILLINGNESS TO PAY

OF SURABAYA MASS RAPID TRANSIT (SMART), MONORAIL & TRAM: A SURVEY

SUPERVISOR: PROF. IWAN VANANY, S.T., M.T., Ph.D.
BY: PUTRI NUR IMANI M.

OUTLINES

INTRODUCTION

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Readiness & Willingness To Pay

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- Background
- Problem Identification
- Objectives
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- Scopes

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- Data Analysis
- Conclusion

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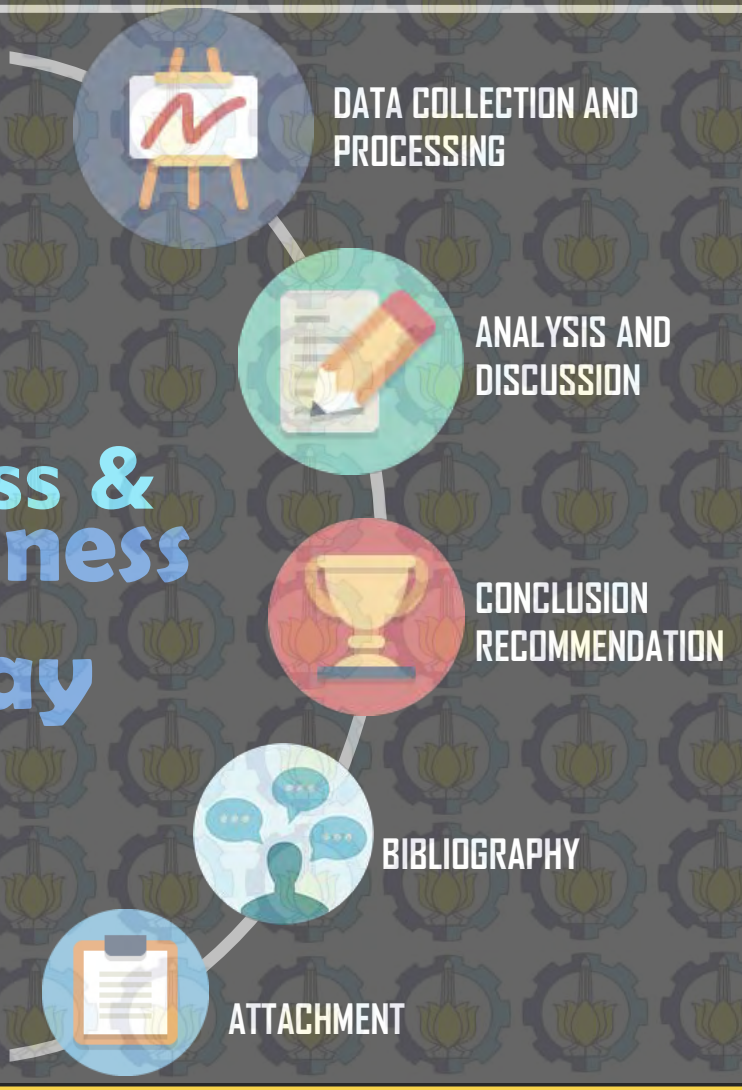
OUTLINES

Readiness & Willingness To Pay



DATA COLLECTION-PROCESSING

- Boyorail and Tram Stations
- Sample Frame
- Validity & Reliability Test
- Sample description
- Readiness to Use Ranking Scale
- Willingness to Shift
- Willingness to Pay

ANALYSIS AND DISCUSSION

- Readiness to Use
- Willingness to Shift
- Willingness to Pay

CONCLUSION-RECOMMENDATION

- Conclusion
- Recommendation

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Introduction

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Background

Existing → **Case**

Lack of public transportation facility

- safe
- fast
- convenient
- integrated

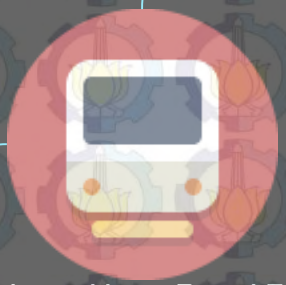
Move to

Congestion/ traffic/pollution

consideration

perception think comment

Feasible or not



Surabaya Mass Rapid Transit (SMART): Monorail & Tram

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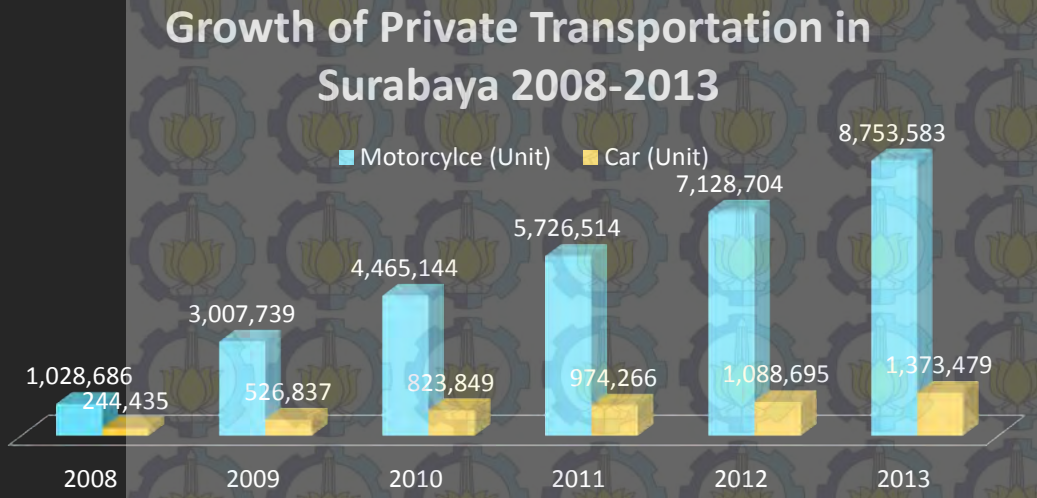
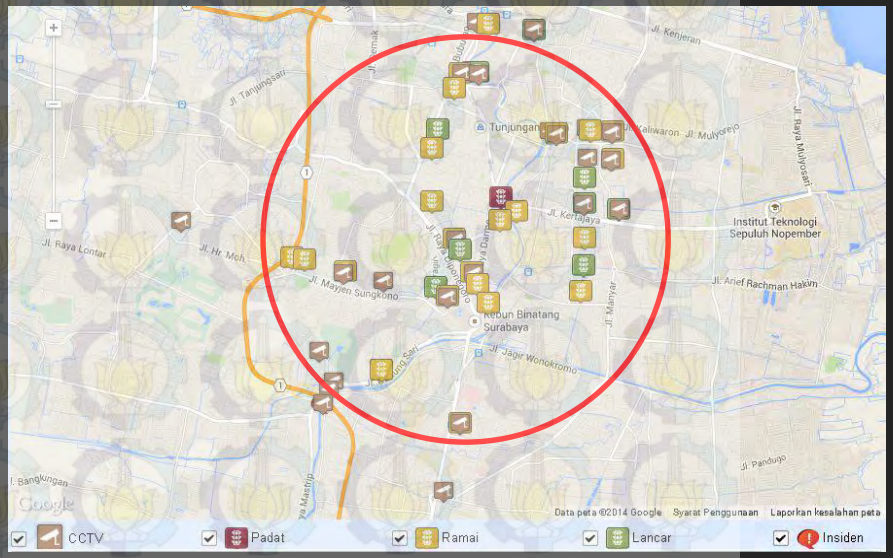
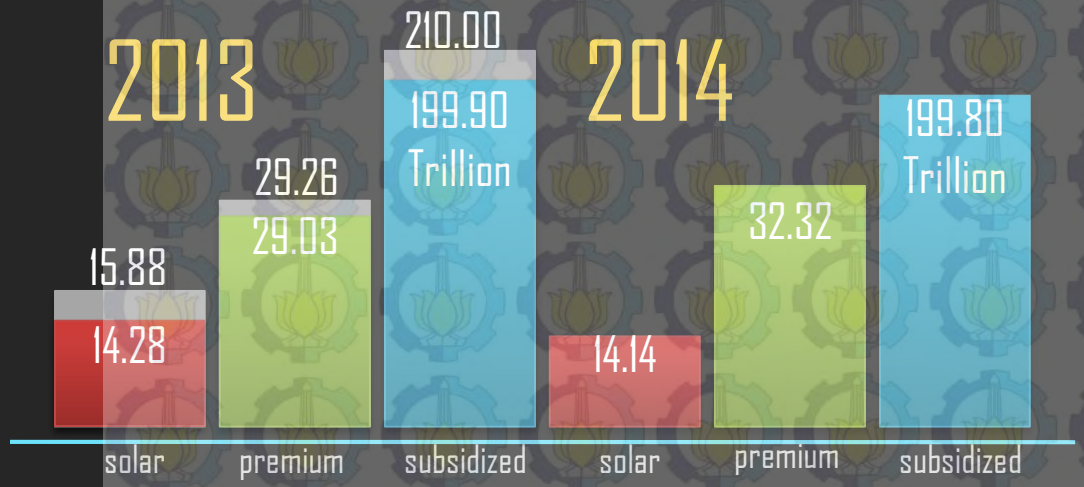
Background







Makes **OVERCAPACITY**

and

HIGH BBM CONSUMPTION

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Problem Identification

Social readiness and willingness of implementing public transportation Monorail and Tram

Surabaya

Study Objectives

Measure readiness to switch and to shift

Analyze WTP attributes for monorail and tram

Propose cost recommendation

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Benefits

Government

To know the feasibility of SMART project Boyorail and Surotram in Surabaya by considering socioeconomic development infrastructure aspect.

Researcher

To know the social willingness for SMART project by considering the appropriate transportation price.

Scopes

Limitations

- Concerns only SMART for monorail and tram
- Targets are employees, PNS, students, and household or who uses private transportation
- Survey location is in Surabaya city

Assumptions

- Route of monorail and tram do not change during the research
- Location of monorail and tram station have fixed
- Result of survey data can represent the existing condition

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Literature Review

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Literature Review

Public transportation

providing people with mobility and access to employment, education, retail, health and recreational facilities which aims to reduce congestion, travel times, air pollution and to improve road system efficiency (Queensland, 2014)

Tram MRT Monorail

Readiness

behavior theory, concerns to environment, value orientation, and relationship to a pro-environmental attitude to leave the private transportation (Garling et al, 1998; Nilsson and Kuller, 2000).

Factor	Author	Sub Factor
1. Switch to monorail and tram	(Hiscock et al., 2002)	1.1 Reduce private transportation
	(Nasrudin, 2013)	1.2 Station distance
2. Travel Motives	(Minderhoud, 2005)	
3. Environment effects	(Istamto et al.,2014)	3.1 Congestion
	(Tarmizi et al., 2014)	3.2 Pollution
	(Anable, 2005)	3.3 Accident

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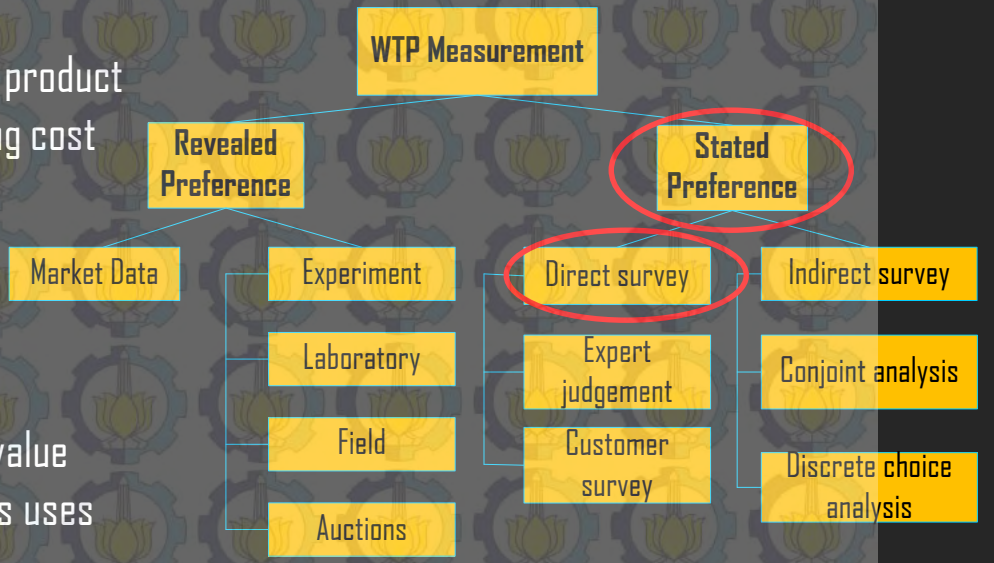
Literature Review

Willingness to shift

consists of attributes becoming as willingness potentials or motives and used to analyze the potential factors influencing to switch. It usually consists of "Yes" or No" questions (Rastogi, 2010)

Willingness to pay

one tool to understand the total users think the product or service will be worth in other side of spending cost (Foreit et al., 2004).



Measuring willingness to pay

1. Random Utility Model with binary discrete value
2. WTP estimation of transportation attributes uses cumulative normal distribution
3. Survey sampling : Cochran formula

Literature Review

Author	Research	Method	Result
(Phanikumar & Maitra, 2007)	*Willingness-to-Pay and Preference Heterogeneity for Rural Bus Attributes*	Multinomial Logits	Shows heterogeneity associated with the mean is investigated, and the travel distance is found to have a statistically significant decomposition effect on the mean of in-vehicle travel time for commuting trips
(Nasrudin et al., 2013)	*Urban Residents' Awareness and Readiness for Sustainable Transportation Case Study: Shah Alam, Malaysia*	Statistics Summary	A significant association exists between the level of willingness to reducecar usage and the age of respondents
(Schwarloze et al., 2014)	*Willingness to pay for public transportation options for improving the quality of life of the rural elderly*	Random Utility Model	Shows the positive willingness to pay of each transportation attributes in each survey area
(Ramayana et al, 2007)	*Quality Expectations of Transport Services and Willingness to Pay: Case of KSRTC*	Multinomial Logits	The preferable and willingness to pay transport service
(Lera-Lopez et al., 2014)	*Evaluating factors of the willingness to pay to mitigate the environmental effects of freight transportation crossing the Pyrenees*	Double Hurdle and Moultan Model	Shows the more aprriciated environmental effect and the socioeconomics factor of willingness
(Eboli & Mazzula, 2008)	*Willingness-to-pay of public transport users for improvement in service quality*	Multinomial Logits	Providing tool to calculate willingness to pay of public transportation by calibrating two models
(Santi, 2011)	*Analisa Willingness-To-Pay Sektor Industri Bagi Penggunaan Air Kali Brantas Menggunakan FUZZY MCDM (Studi Kasus: Daerah Aliran Sungai Brantas, Jawa Timur)*	Fuzzy MCDM	Comparing willingness to pay's price with the real price taken by Jasa Tirta.
(Rastogi, 2010)	*Willingness to Shift to Walking or Bicycling to Access Suburban Rail: Case Study of Mumbai, India*	Statistics Summary	Shows the user behavior factors influenced the result of willingness to shift of transport improvement

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Research Methodology

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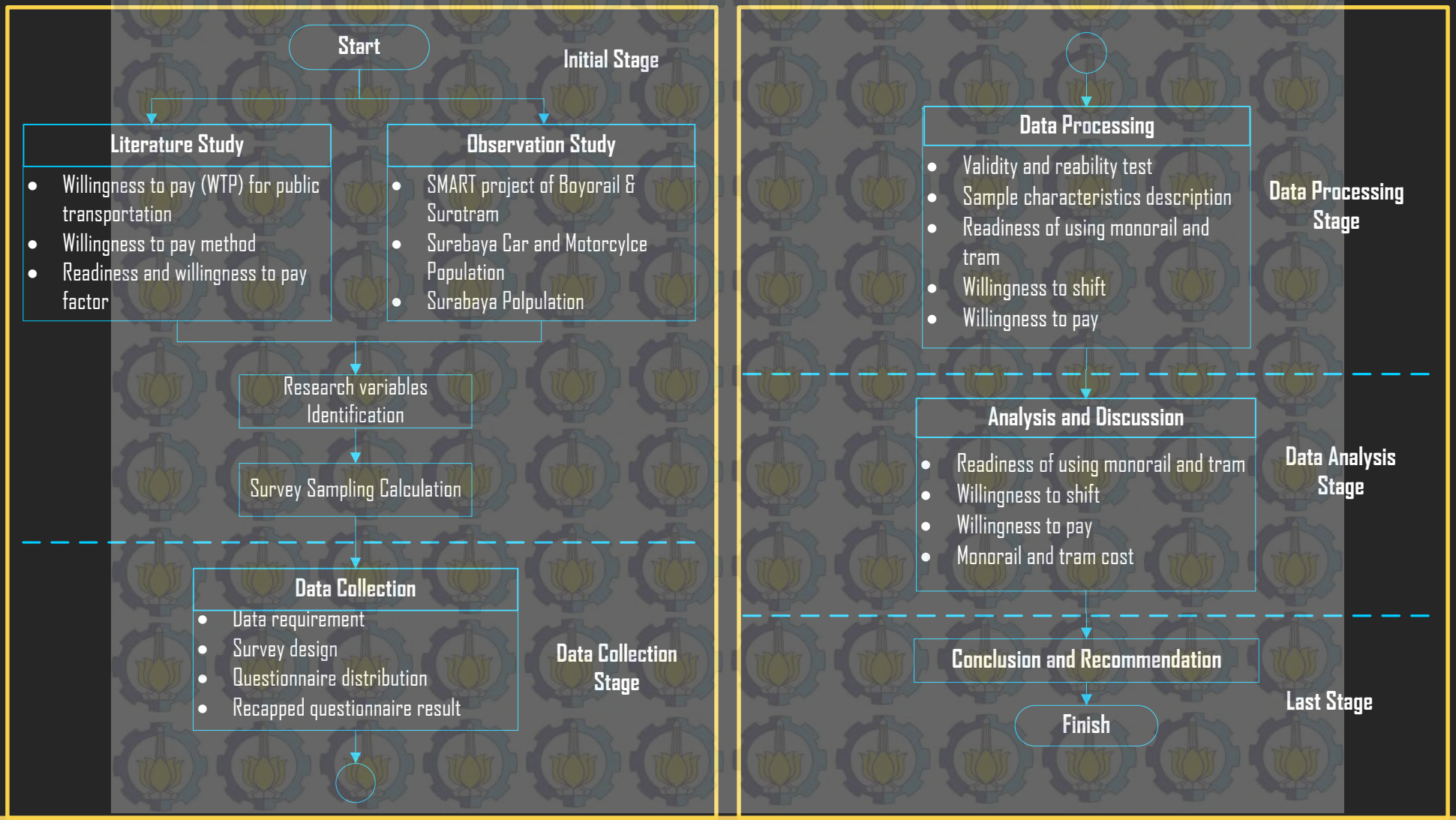
Flowchart

RESEARCH METHODOLOGY



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Initial stage

Observation Study

1. SMART project of Boyorail & Surotram
2. Surabaya car and motorcycle Population
3. Surabaya Polpulation
4. Existing problem of public transportation

Literature Study

1. Willingness to pay (WTP) for public transportation
2. Willingness to pay method
3. Readiness and willingness to pay factor
4. Measuring willingness to pay

Variables Identification

Respondent characteristics

socioeconomic information gender, job, income (Ortuzar, 2001)

Readiness factors

-change to monorail and tram
-travel destination
-environmental impacts

Alternatives of WTP

-transportation attributes
-cost recommendation

Data collection stage

Data Requirement

1. Location Target and survey number
2. Respondent characteristics
3. Readiness and WTP

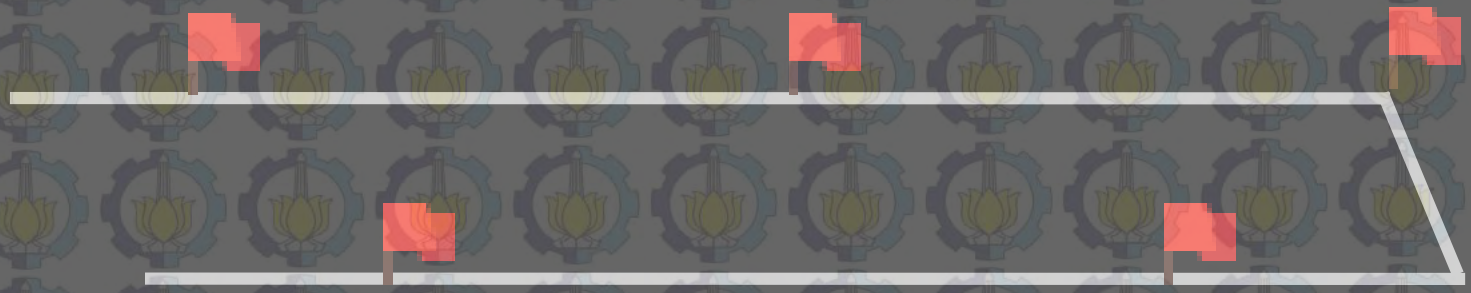
Survey Sampling

Using Cochran formula

95 %	5 %	50 %
CL	SE	P

Survey (Questionnaire) Design

1. Respondent Private Data
2. Readiness to use MRT
3. Willingness to shift MRT
4. Willingness to pay MRT



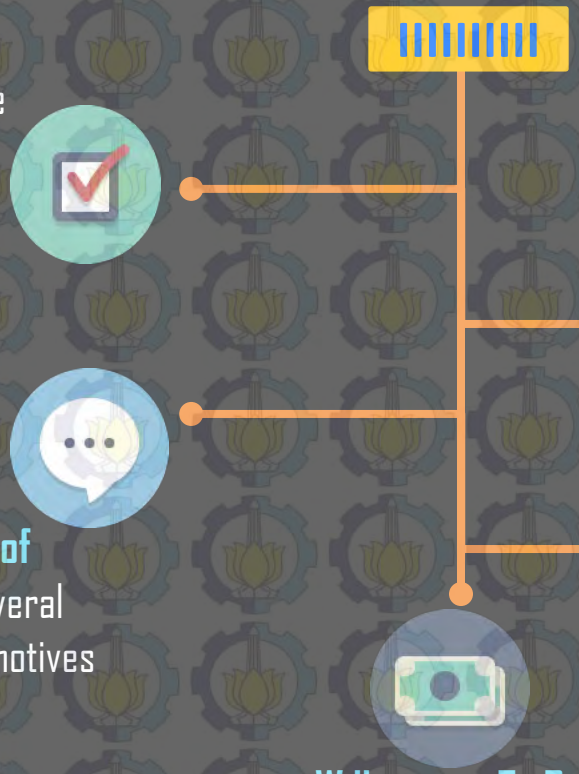
Questionnaire Recapitulation

Recapitulation of all survey (questionnaire) process

Questionnaire Distribution

31 regions in Surabaya with 264 samples
Each region has each sample number based on population proportion

Data processing stage



Validity - Reliability test use SPSS software, to test data validity and consistency level in answering the questionnaire

Sample Characteristics shows social-economic condition of Surabaya population as the social heterogeneity factor

Social readiness level of using MRT based on several proposed reasons and motives

Willingness to shift with YES or NOT comparison of several proposed factors

Willingness To Pay

Option: Random Utility Model/ Regression, evaluating the influences of transportation attributes

Price: determine cost recommendation

Last stage

Data analysis

Readiness ranking scale
the gap of agreeing and refusing new transportation mode (MRT)

WTS statistics summary
Shows the variability demand of willing to shift

WTP option and price with RUM
Evaluate WTP of influenced factors and attributes (transportation option)

Cost recommendation
Decide the cost recommendation of monorail and tram

Conclusion and Recommendation

Concluding four points of analysis result and give recommendation to make the best decision of implementing SMART project

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Data Collection and Processing

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Boyorail and Surotram Routes

DATA COLLECTION AND PROCESSING

No.	From	To	Distance (Km)
TB1	Sentra Bulak	-	0.00
TB2	Sentra Bulak	THP Kenjeran	2.10
TB3	THP Kenjeran	Ken Park	1.61
TB4	Ken Park	Mulyosari Utara	0.60
TB5	Mulyosari Utara	Mulyosari Tengah (CentralPark)	0.71
TB6	Mulyosari Tengah (CentralPark)	Kejawan Putih Tambak	1.15
TB7	Kejawan Putih Tambak	Bundaran ITS	1.19
TB8	Bundaran ITS	Kertajaya Indah (GOR)	0.95
TB9	Kertajaya Indah (GOR)	Manyar Kertoarjo (Samsat)	2.06
TB10	Manyar Kertoarjo (Samsat)	RSUD Dr. Sutomo	1.84
TB11	RSUD Dr. Sutomo	Stasiun Gubeng	0.92
TB12	Stasiun Gubeng	Taman Mukti Mulia	0.67
TB13	Taman Mukti Mulia	Keputran	1.67
TB14	Keputran	Jembatan BAT Ngagel	1.23
TB15	Jembatan BAT Ngagel	Terminal Joyoboyo	1.44
TB16	Terminal Joyoboyo	Mjd. Sungkono (Ciputra World)	2.29
TB17	Mjd. Sungkono (Ciputra World)	Mjd. Sungkono (Bundaran Tol)	1.37
TB18	Mjd. Sungkono (Bundaran Tol)	HR Mohammad (Giants)	1.71
TB19	HR Mohammad (Giants)	HR Mohammad (Patung Kuda)	0.80
TB20	HR Mohammad (Patung Kuda)	Darmo Golf Boulevard	1.30
TB21	Darmo Golf Boulevard	Pakuwon Trade Center	2.60

No.	From	To	Distance (Km)
SU1	Terminal Joyoboyo	-	0.00
SU2	Terminal Joyoboyo	Raya Darmo (Bungkul)	0.81
SU3	Raya Darmo (Bungkul)	Raya Darmo (Santa Maria)	0.79
SU4	Raya Darmo (Santa Maria)	Urip Sumoharjo	1.10
SU5	Urip Sumoharjo	Basuki Rachmad	0.63
SU6	Basuki Rachmad	Embong Malang	1.00
SU7	Embong Malang	Pasar Blauran	0.85
SU8	Pasar Blauran	Bubutan (Halo Surabaya)	0.55
SU9	Bubutan (Halo Surabaya)	Tugu Pahlawan	0.54
SU10	Tugu Pahlawan	Indrapura DPRD Jatim	0.58
SU11	Indrapura DPRD Jatim	Indrapura Parangkusuma	0.65
SU12	Indrapura Parangkusuma	Indrapura (Pertigaan Rajawali)	0.56
SU13	Indrapura (Pertigaan Rajawali)	Perak (Kerapu)	0.68
SU14	Perak (Kerapu)	Perak (Tanjung Sadari)	0.82
SU15	Perak (Tanjung Sadari)	Perak (Teluk Betung)	1.12
SU16	Perak (Teluk Betung)	Rajawali (Kalisosok)	3.04
SU17	Rajawali (Kalisosok)	Rajawali (Taman Jayengrono)	0.37
SU18	Rajawali (Taman Jayengrono)	Veteran (BCA)	0.53
SU19	Veteran (BCA)	Tugu Pahlawan (Gubernur)	0.54
SU20	Tugu Pahlawan (Gubernuran)	Kramat Gantung	0.72
SU21	Kramat Gantung	Tunjungan	0.50
SU22	Tunjungan	Grahadi (Gub. Suryo)	1.12
SU23	Grahadi (Gub. Suryo)	Panglima Sudirman (Bambu Runcing)	0.68

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Validity Test

Socio-demographic data

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.514
Bartlett's Test of Sphericity	Approx. Chi-Square	333.113
	df	21
	Sig.	.000

No.	Predictor Variables	R. Calculation	R. Table	Result
1	Gender	0,533	0,3	Valid
2	Job	0,521	0,3	Valid
3	Income	0,598	0,3	Valid
4	Daily Transporttation	0,509	0,3	Valid
5	BBM Consumption	0,476	0,3	Valid
6	BBM Types	0,480	0,3	Valid
7	Travel Distance	0,596	0,3	Valid

ADEQUATE

Readiness data (monorail)

No	Predictor Variables	R. Calculation	R. Table	Result
1	Reduce Private Transportation	0,846	0,3	Valid
2	Station Distance	0,852	0,3	Valid
3	Government Center	0,885	0,3	Valid
4	Education Center	0,868	0,3	Valid
5	Shopping Center	0,751	0,3	Valid
6	Vacation Center	0,816	0,3	Valid
7	Congestion	0,851	0,3	Valid
8	Pollution	0,816	0,3	Valid
9	Accident	0,821	0,3	Valid

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.831
Bartlett's Test of Sphericity	Approx. Chi-Square	979.491
	df	36
	Sig.	.000

Validity Test

Readiness data (tram)

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.828
Bartlett's Test of Sphericity	Approx. Chi-Square	1.169E3
	df	36
	Sig.	.000

ADEQUATE

No	Predictor Variables	R. Calculation	R. Table	Result
1	Reduce Private Transportation	0,900	0,3	Valid
2	Station Distance	0,857	0,3	Valid
3	Government Center	0,854	0,3	Valid
4	Education Center	0,893	0,3	Valid
5	Shopping Center	0,817	0,3	Valid
6	Vacation Center	0,819	0,3	Valid
7	Congestion	0,767	0,3	Valid
8	Pollution	0,762	0,3	Valid
9	Accident	0,890	0,3	Valid

Reliability Test

Socio-demographic data

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.312	.281	7

R-TABLE = 0.279

Readiness data (monorail)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.846	.857	9

No.	Predictor Variables	Corrected Item-Total Correlation
1	Gender	0,490
2	Job	0,479
3	Income	0,542
4	Daily Transporttation	0,277
5	BBM Consumption	0,468
6	BBM Types	0,572
7	Travel Distance	0,354

No.	Predictor Variables	Corrected Item-Total Correlation
1	Reduce Private Transportation	0,540
2	Station Distance	0,472
3	Government Center	0,480
4	Education Center	0,613
5	Shopping Center	0,549
6	Vacation Center	0,575
7	Congestion	0,713
8	Pollution	0,641
9	Accident	0,599

Reliability Test

Readiness data (tram)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.862	.872	9

No.	Predictor Variables	Corrected Item-Total Correlation
1	Reduce Private Transportation	0,580
2	Station Distance	0,470
3	Government Center	0,508
4	Education Center	0,592
5	Shopping Center	0,640
6	Vacation Center	0,631
7	Congestion	0,696
8	Pollution	0,704
9	Accident	0,618

Sample descriptions

Attributes	Center Surabaya		East Surabaya		West Surabaya		North Surabaya		South Surabaya	
	Survey	Proportion	Survey	Proportion	Survey	Proportion	Survey	Proportion	Survey	Proportion
Occupation										
Stated Employees	4	1,5%	8	3,0%	9	3,4%	4	1,5%	7	2,7%
Enterprise	4	1,5%	17	6,4%	15	5,7%	16	6,1%	17	6,4%
Students	10	3,8%	22	8,3%	20	7,6%	24	9,1%	23	8,7%
Household	6	2,3%	20	7,6%	13	4,9%	6	2,3%	19	7,2%
Gender										
Male	11	4,2%	28	10,6%	30	11,4%	29	11,0%	31	11,7%
Female	13	4,9%	39	14,8%	27	10,2%	21	8,0%	35	13,3%
Income										
Low (< 3 millions)	19	7,2%	50	18,9%	31	11,7%	42	15,9%	47	17,8%
Medium (3 - 7.5 millions)	5	1,9%	14	5,3%	19	7,2%	8	3,0%	18	6,8%
High (7.5 - 15 millions)			2	0,8%	6	2,3%				
Very high (> 15 millions)			1	0,4%	1	0,4%			1	0,4%
Owned Car Number										
0	23	8,7%	50	18,9%	41	15,5%	47	17,8%	55	20,8%
1	1	0,4%	14	5,3%	16	6,1%	3	1,1%	10	3,8%
2			2	0,8%						
3			1	0,4%					1	0,4%
Owned Motorcycle Number										
0					11	4,2%	3	1,1%	8	3,0%
1	20	7,6%	52	19,7%	33	12,5%	44	16,7%	48	18,2%
2	4	1,5%	9	3,4%	12	4,5%	2	0,8%	9	3,4%
3			6	2,3%			1	0,4%	1	0,4%
Frequency										
Every day	21	8,0%	55	20,8%	50	18,9%	42	15,9%	56	21,2%
3-4 times/ week	2	0,8%	6	2,3%	6	2,3%	8	3,0%	7	2,7%
Once a week	1	0,4%	4	1,5%	1	0,4%			2	0,8%
< once a week			2	0,8%					1	0,4%
Purpose of trip										
Working	12	4,5%	29	11,0%	28	10,6%	18	6,8%	28	10,6%
Study	9	3,4%	20	7,6%	18	6,8%	23	8,7%	24	9,1%
Shopping	3	1,1%	15	5,7%	11	4,2%	9	3,4%	10	3,8%
Lifestyle/ Vacation			3	1,1%					4	1,5%
Daily Transportation Type										
Car			11	4,2%	10	3,8%	2	0,8%	5	1,9%
Motorcylce	22	8,3%	56	21,2%	44	16,7%	45	17,0%	55	20,8%
Public Transportation	2	0,8%			3	1,1%	3	1,1%		
Bike/walking									6	2,3%
Fuels Consumption										
< 2 liter/week	5	1,9%	12	4,5%	5	1,9%	6	2,3%	3	1,1%
2 liter- 10 liter/week	16	6,1%	40	15,2%	43	16,3%	38	14,4%	52	19,7%
11-25 liter/week	3	1,1%	8	3,0%	7	2,7%	3	1,1%	4	1,5%
> 25 liter/week			6	2,3%					2	0,8%
Type of BBM Consumption										
Premium	20	7,6%	52	19,7%	45	17,0%	38	14,4%	50	18,9%
Pertamax	4	1,5%	11	4,2%	8	3,0%	9	3,4%	11	4,2%
Solar			4	1,5%	4	1,5%				
BBG										
Daily Transporting Distance										
< 10 km	12	4,5%	24	9,1%	10	3,8%	15	5,7%	18	6,8%
10- 29.9 km	11	4,2%	26	9,8%	30	11,4%	26	9,8%	34	12,9%
30 - 60 km	1	0,4%	12	4,5%	17	6,4%	9	3,4%	13	4,9%
> 60 km			3	1,1%						
N	**24**		**67**		**57**		**50**		**66**	**264**

DOMINANT

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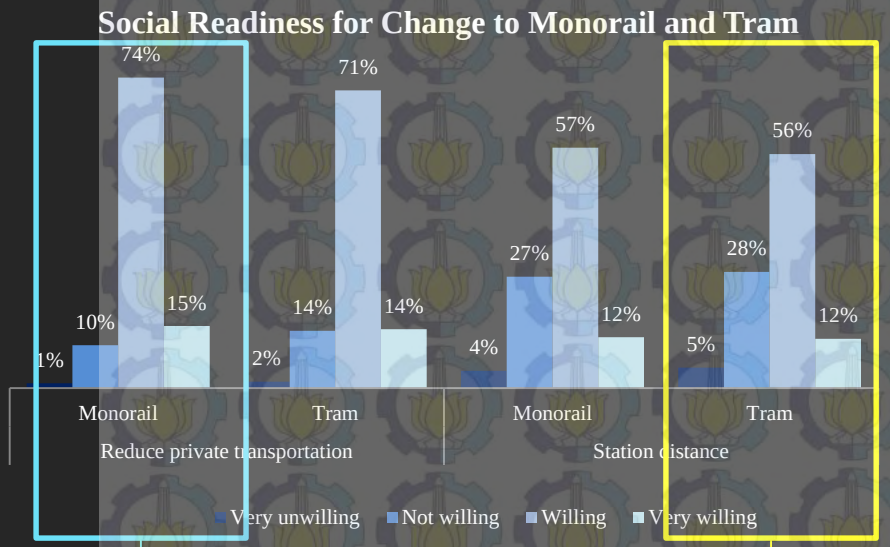
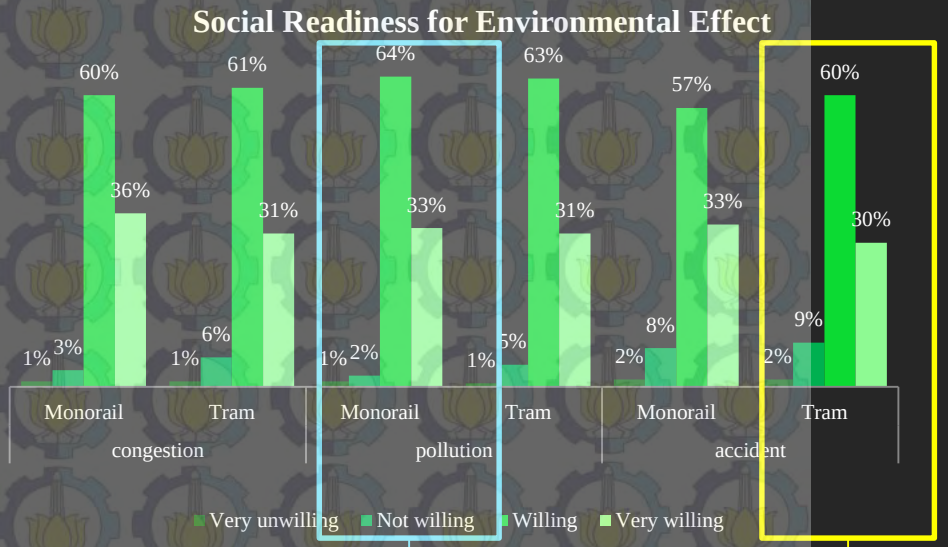
Readiness to Use

DATA COLLECTION AND PROCESSING





THE HIGHEST

THE LOWEST

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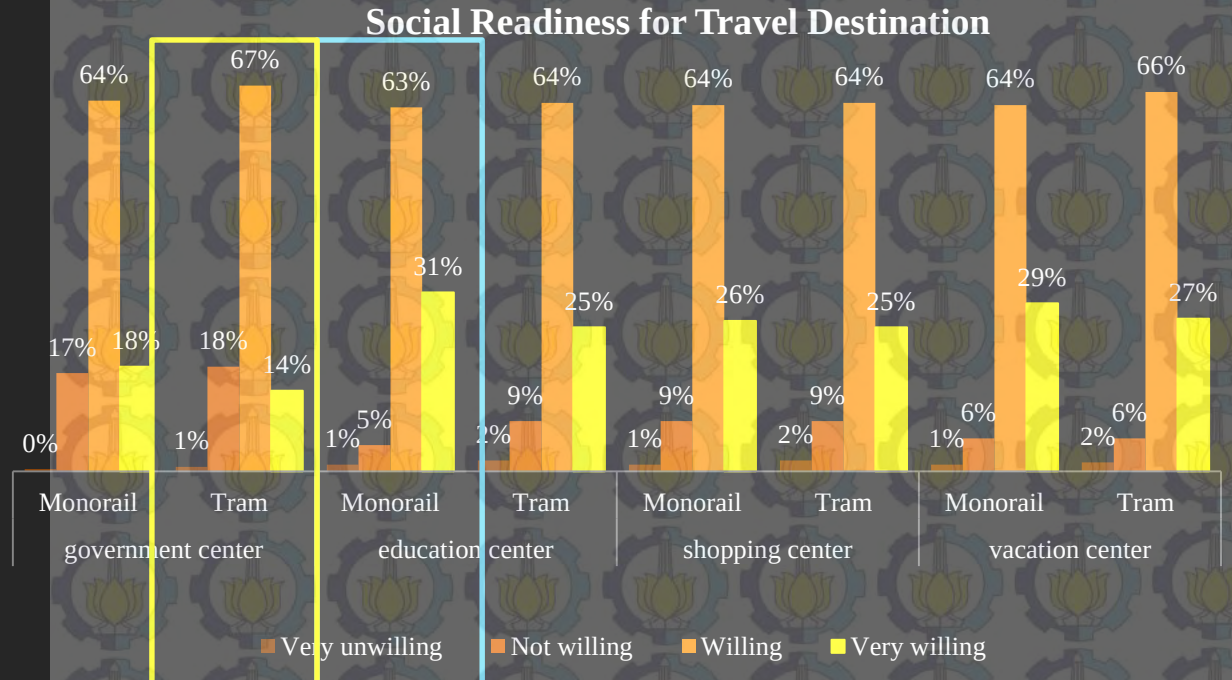
Readiness to Use

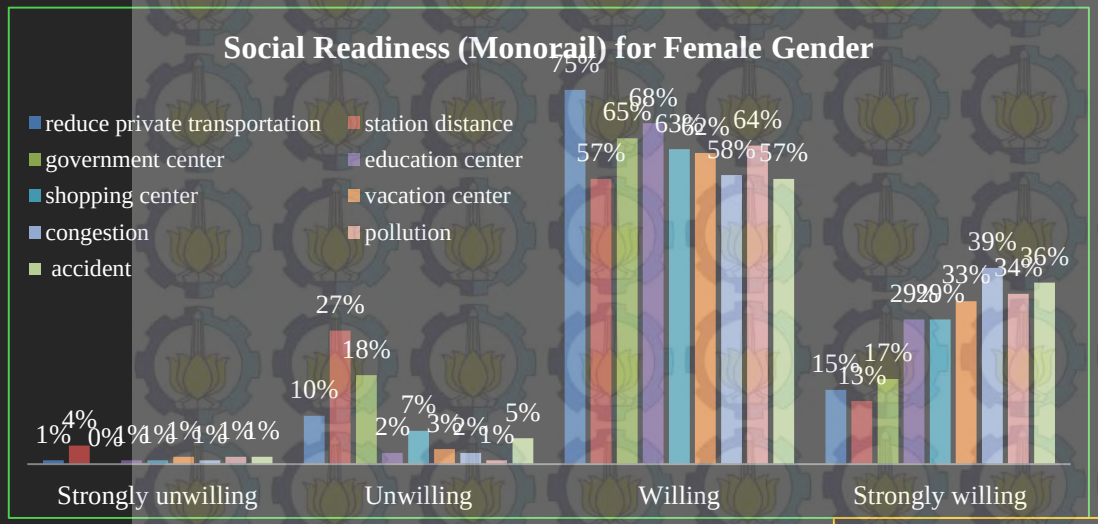


THE HIGHEST

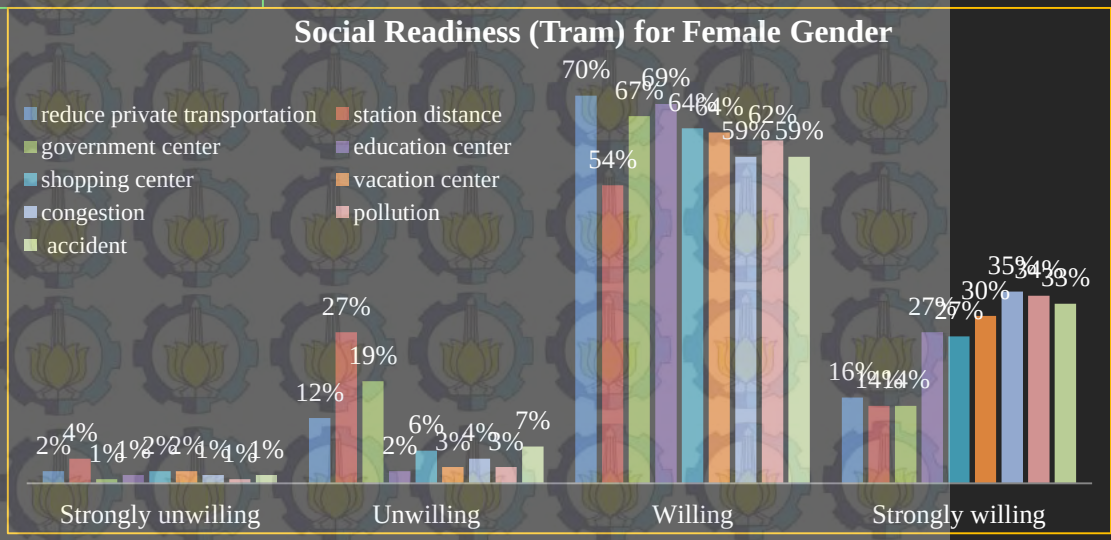
THE LOWEST

Readiness to Use

DATA COLLECTION AND PROCESSING



GENDER (FEMALE)



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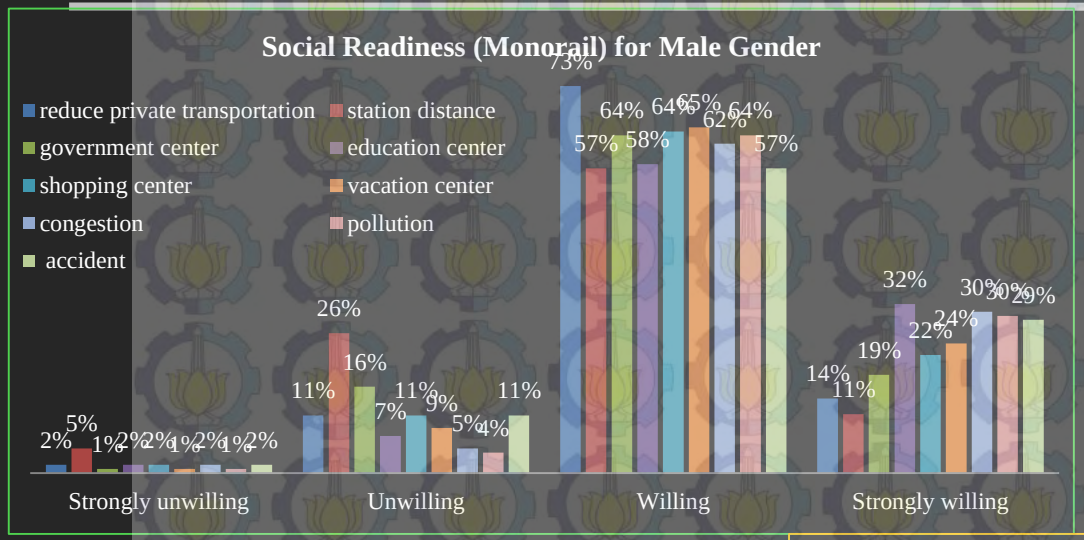
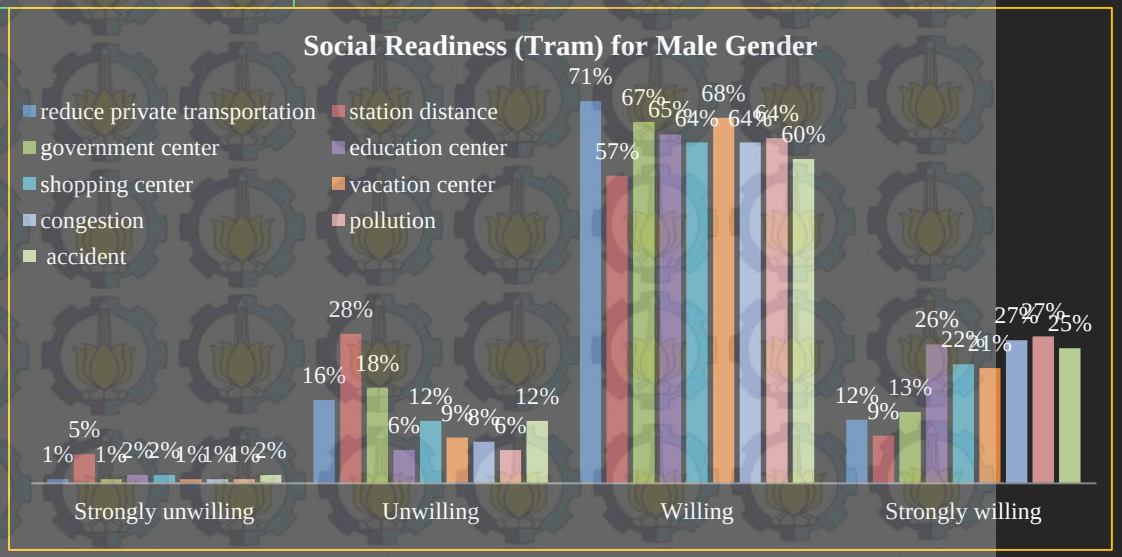
Readiness to Use

DATA COLLECTION AND PROCESSING



GENDER (MALE)



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Readiness to Use

INCOME ASPECT

	Monorail				Tram				
	Strongly unwilling	Unwilling	Willing	Strongly willing	Strongly unwilling	Unwilling	Willing	Strongly willing	Total
Income < 3 millions									
reduce private transportation	1	19	138	31	3	25	130	31	
station distance	7	55	103	24	9	57	97	26	
government center	0	37	117	35	1	37	121	30	
education center	0	9	116	64	2	8	120	59	
shopping center	1	19	115	53	3	19	113	53	189
vacation center	1	11	120	56	2	11	122	53	
congestion	2	5	100	82	2	10	103	74	
pollution	2	3	110	73	1	8	107	73	
accident	3	15	97	74	3	18	100	68	
Income 3 – 7.5 millions									
reduce private transportation	1	8	48	7	1	10	49	4	
station distance	4	15	38	7	4	16	39	5	
government center	1	8	43	12	1	9	47	7	
education center	2	3	45	14	2	3	50	9	
shopping center	2	4	43	15	2	3	46	13	64
vacation center	2	4	41	17	2	4	44	14	
congestion	1	3	51	9	1	4	51	8	
pollution	1	2	52	9	1	3	51	9	
accident	1	5	47	11	1	5	49	9	

Readiness to Use

INCOME ASPECT

	Monorail				Tram				
	Strongly unwilling	Unwilling	Willing	Strongly willing	Strongly unwilling	Unwilling	Willing	Strongly willing	Total
Income 7,500,000-15,000,000 IDR									
reduce private transportation	1	0	7	0	0	1	6	1	
station distance	0	0	7	1	0	0	8	0	
government center	0	0	7	1	0	2	6	0	
education center	1	0	5	2	0	0	6	2	
shopping center	0	0	7	1	0	1	7	0	8
vacation center	0	0	6	2	0	0	7	1	
congestion	0	1	6	1	0	2	5	1	
pollution	0	1	5	2	0	1	6	1	
accident	0	1	5	2	0	1	6	1	
Income >15,000,000 IDR									
reduce private transportation	0	0	2	1	0	0	2	1	
station distance	0	0	3	0	0	0	3	0	
government center	0	0	3	0	0	0	3	0	
education center	0	0	1	2	0	0	1	2	
shopping center	0	0	3	0	0	0	3	0	3
vacation center	0	0	1	2	0	0	1	2	
congestion	0	0	1	2	0	0	3	0	
pollution	0	0	1	2	0	0	3	0	
accident	0	0	2	1	0	0	3	0	

DAILY TRANSPORATION ASPECT

	Monorail				Tram				
	Strongly unwilling	Unwilling	Willing	Strongly willing	Strongly unwilling	Unwilling	Willing	Strongly willing	Total
Car									
reduce private transportation	0	5	17	5	1	6	15	5	27
station distance	1	4	17	5	1	5	16	5	
government center	0	3	17	7	0	3	18	6	
education center	0	1	17	9	0	0	18	9	
shopping center	0	3	16	8	1	1	16	9	
vacation center	0	1	14	12	0	0	16	11	
congestion	0	0	17	10	0	0	19	8	
pollution	0	0	17	10	0	1	18	8	
accident	0	1	16	10	1	1	16	9	
Motorcycle									
reduce private transportation	3	22	166	33	3	30	160	31	224
station distance	10	63	126	25	11	65	124	24	
government center	1	38	144	41	2	40	151	31	
education center	3	10	139	72	4	10	147	63	
shopping center	3	19	143	58	4	21	145	53	
vacation center	3	13	145	62	4	14	149	56	
congestion	3	9	132	80	3	16	134	71	
pollution	3	6	141	73	2	11	141	70	
accident	4	20	126	74	3	23	133	65	

Readiness to Use

DAILY TRANSPORATION ASPECT

	Monorail				Tram				
	Strongly unwilling	Unwilling	Willing	Strongly willing	Strongly unwilling	Unwilling	Willing	Strongly willing	Total
Others (Walking, Bicycling, Public Transportation)									
reduce private transportation	0	0	12	1	0	0	12	1	13
station distance	0	3	8	2	1	3	7	2	
government center	0	4	9	0	0	5	8	0	
education center	0	1	11	1	0	1	12	0	
shopping center	0	1	9	3	0	1	8	4	
vacation center	0	1	9	3	0	1	9	3	
congestion	0	0	9	4	0	0	9	4	
pollution	0	0	10	3	0	0	8	5	
accident	0	0	9	4	0	0	9	4	

Willingness to Shift

DATA COLLECTION AND PROCESSING

Willingness to shift of walking distance motive

	< 0.3 km	0.3- 0.5 km	0.5 -1 km	> 1 km	Total
YES	14	73	106	18	211
NO					53
RESPONDENT					264

Willingness to shift of using bus feeder

	< 5 min	5 -10 min	11-20 min	> 20 min	Total
YES	4	118	61	6	189
NO					75
RESPONDENT					264

Willingness to shift with parking lot cost

Per hour	<1000IDR	1000-1999IDR	2000-5000IDR	>5000IDR	Total
	83	85	65	2	
Per day	<10000IDR	10000-24999IDR	25000-50000IDR	>50000IDR	235
	151	72	9	3	
NO					29
RESPONDENT					264

Willingness to shift with transportation attributes

payment system	Total	operation days	Total	Interarrival time	Total	Operation hours	Total
Manual	127	Monday-Friday	28	> 15 min	20	05.00-18.00	24
Card	137	seven days	236	15 min	104	05.00-22.00	122
				10 min	140	05.00-24.00	118
Total	264		264		264		264

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Willingness to Pay

DATA COLLECTION AND PROCESSING

FROM RUNNING MINITAB

Attributes	Monorail		Tram	
	Coeff.	Std. Error	Coeff.	Std. Error
Fee	0,472255**	0,370037	0,522941**	0,344544
Operation Days				
Monday-Friday	-1,3873898	1,404833717	-1,30103	1,322219295
Seven Days	1,4048337	-1,404833717	1,3222193	-1,322219295
Operation Hours				
05.00 - 18.00	-1,4048337	1,404833717	-1,3222193	1,322219295
05.00 - 22.00	-0,1732434	0,200914843	-0,1962946	0,228882012
05.00 - 24.00	0,1732434	-0,132625565	0,1962946	-0,146128036
Inter-arrival				
> 15 min	0,0409836	-1,387389826	-1,30103	1,322219295
15 min	0,6710526	-0,173243416	-0,1962946	0,228882012
10 min	1,4901961	0,173243416	0,1962946	-0,146128036
Schedule				
Free	-1,3873898	1,404833717	-1,30103	1,322219295
Scheduled	1,4048337	-1,404833717	1,3222193	-1,322219295
Cleaness				
Enough	-1,3873898	1,404833717	-1,30103	1,322219295
Cleaned	1,4048337	-1,404833717	1,3222193	-1,322219295
Information Service				
Schedule	1,4048337	-0,132625565	1,3222193	-0,146128036
Operator	0,1732434	-1,404833717	0,146128	-1,322219295
Socio-demographic 0-1 qualitative				
Choose*Male	1,8027737	2,117271296	1,49485	0,031484794
Choose*Female	1,2007137	1,505149978	1,200714	0,061111111
Choose*Employees	0,1349957	-1,292809665	1,238882	0,078159364
Choose*Students	0,416309	-1,685741739	1,50515	0,030651341
Socio-demographic continuous variables				
Choose*Income_A	1,4149733**	-1,564835083	1,30103**	0,04929972
Choose*Income_B	1,3082086**	-1,30820858	0,148402**	0,047413793
Choose*Income_C	0,0001184*	1,505149978	-1,50515*	1,505149978
Choose*Income_D	4,354E-05*	1,939519253	-1,93952*	1,939519253

** Significant at the 5% level

* Significant at the 1% level

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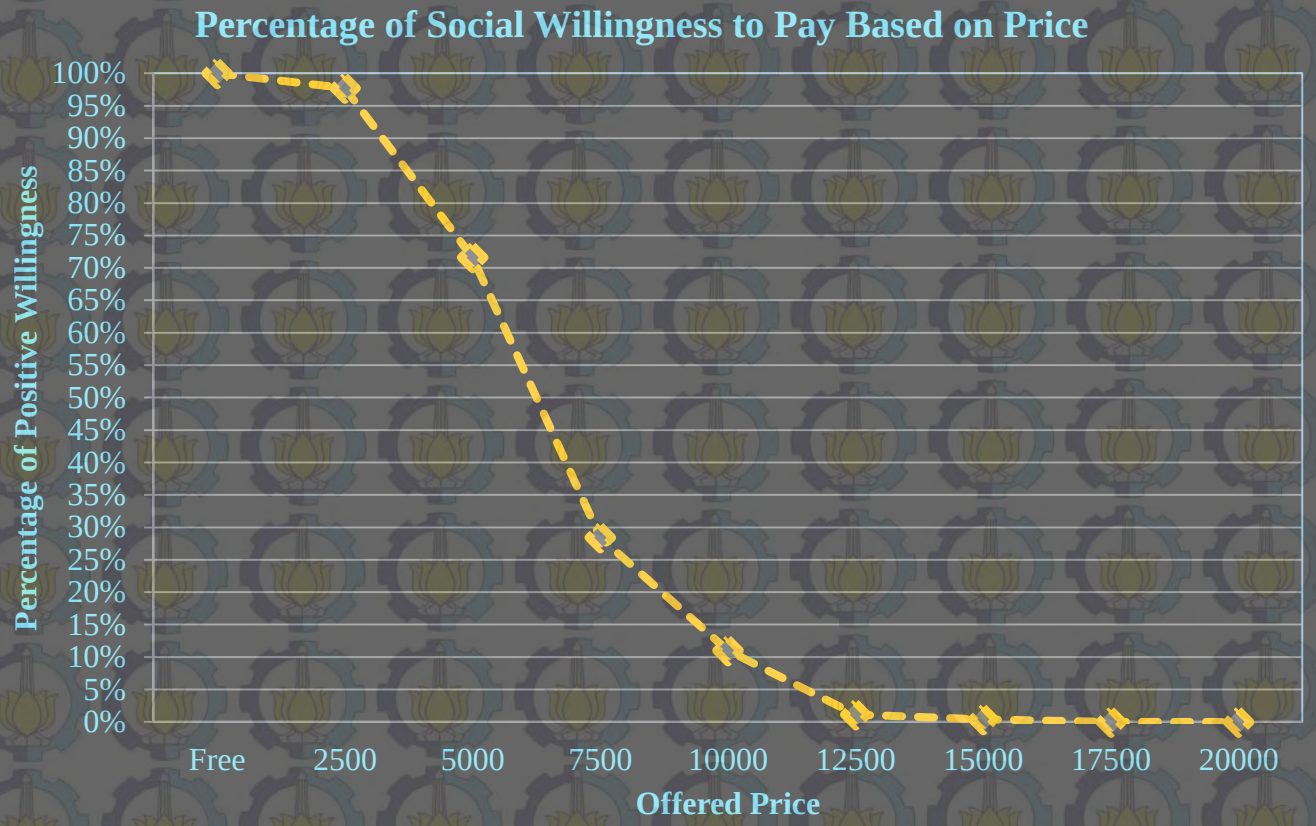
Willingness to Pay



Price	Free	2500	5000	7500	10000	12500	15000	17500	20000
Percent	100%	98%	72%	28%	11%	1%	0%	0%	0%

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2511 100 0 41

Analysis and Discussion

SUPERVISOR: PROF. IWAN VANANY, S.T., M.T., Ph.D.
BY: PUTRI NUR IMANI M.

Readiness to Use

78%

Change to monorail and tram factor

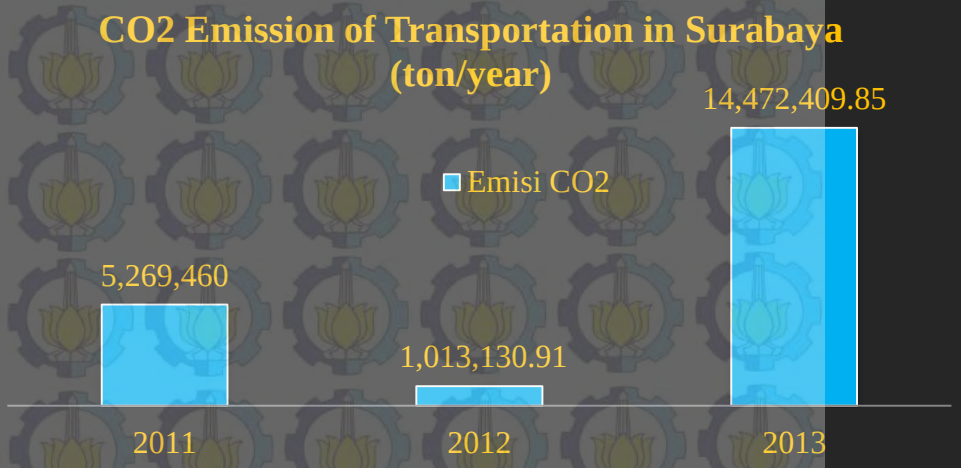
89%

Travel destination factor

93%

Environmental Effect

1. policy maker as Surabaya government should offer high environmental benefits of using monorail and tram to society
2. Government should propose the policy to limit the number of owned private transportation to reduce the booming of road capacity



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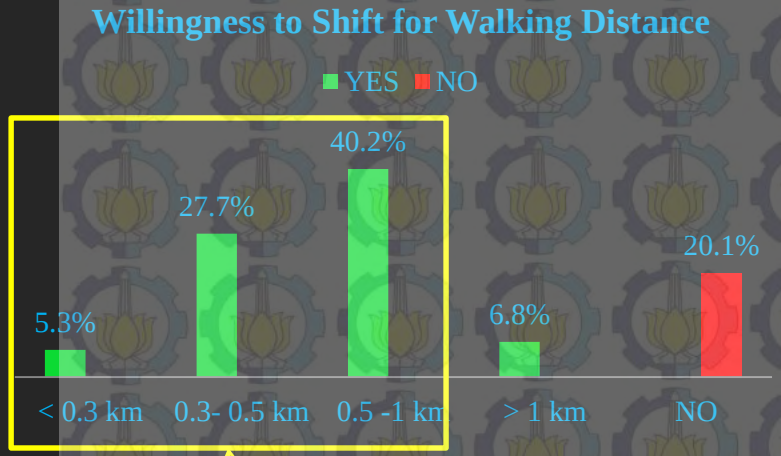
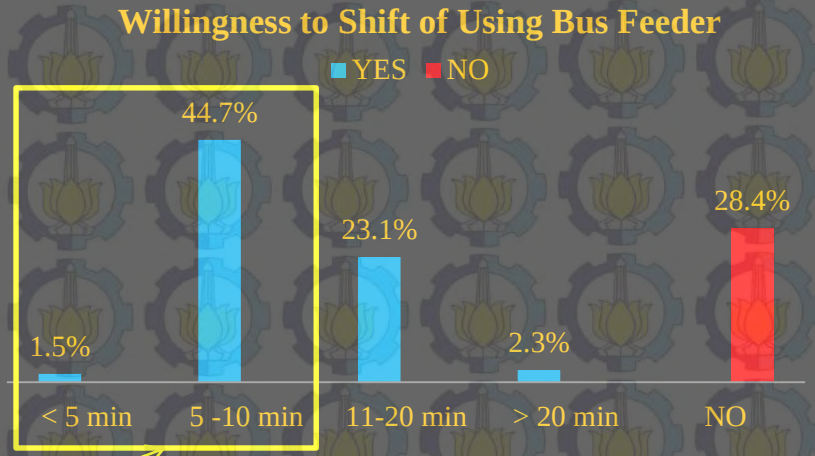
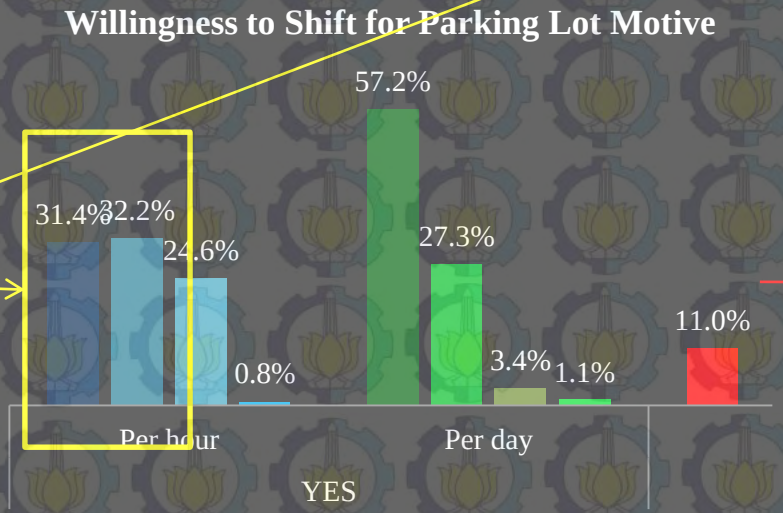
Willingness to Shift

ANALYSIS AND DISCUSSION







Policy maker considerations

Cost of parking lot	
Per hour	Per day
<1000IDR	<10000IDR
1000-1999IDR	10000-24999IDR
2000-5000IDR	25000-50000IDR
>5000IDR	>50000IDR

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Willingness to Pay (Option)

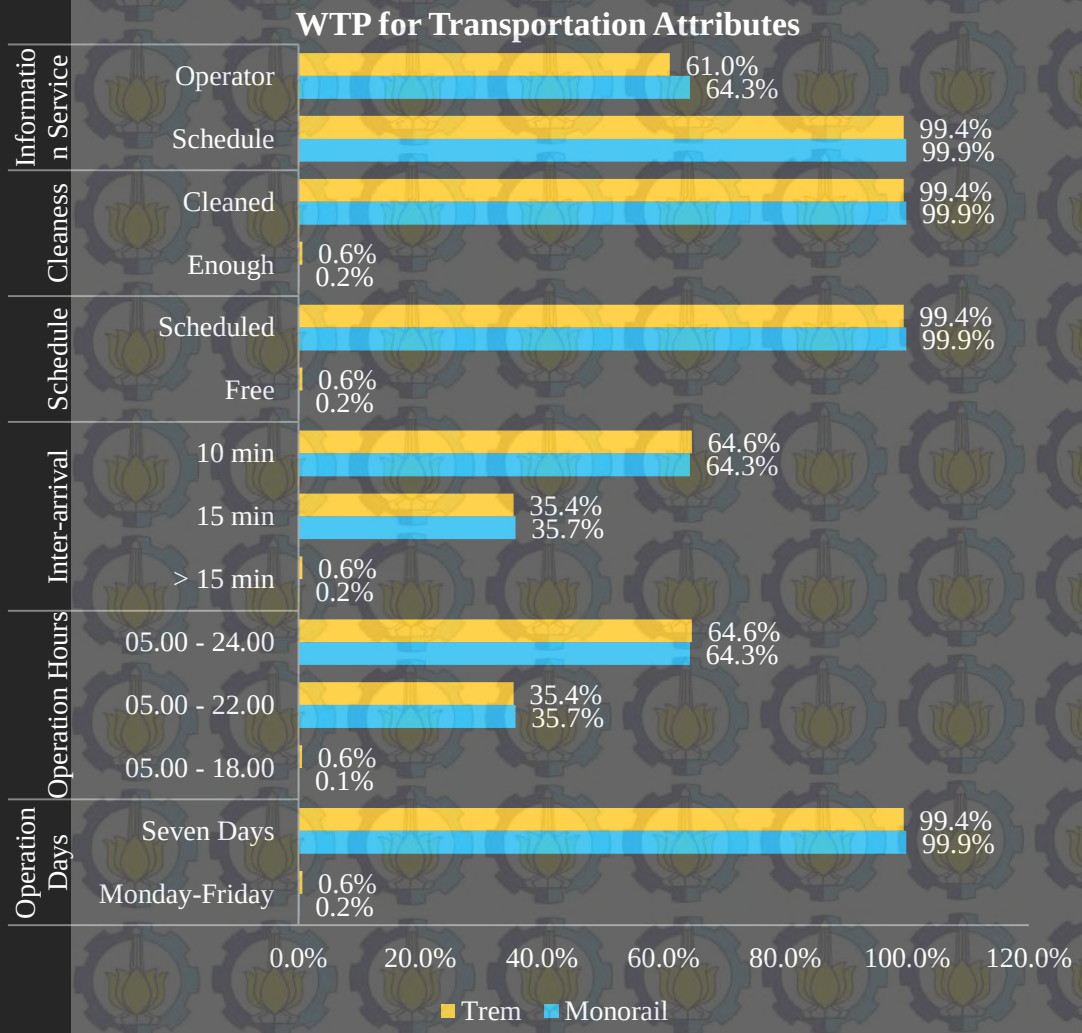
Null Hypothesis		X2	P>|X2|
	Monorail		
Two options			
	Bm-f=Bsevendays	4,48019	0,034
	Benough-Bcleaned	11,3199	0,001
	Bfree=Bscheduled	7,41915	0,006
	Bschedule=Boperator	6,06061	0,014
Three options			
	B>15min=B15min	5,66793	0,017
	B>15min=B10min	9,81818	0,002
Inter-arrival	B15min=B10min	1,72841	**0,189***
	B5 AM – 6 PM=B5 AM – 10 PM	2,22893	**0,135***
	B5 AM – 6 PM=B5 AM – 12 AM	3,8029	**0,051***
Operation hours	B5 AM – 10PM=B5 AM – 12 AM	9,84252	0,002
	Tram		
Two options			
	Bm-f=Bsevendays	11,5227	0,001
	Benough-Bcleaned	6,6000	0,010
	Bfree=Bscheduled	6,23743	0,013
	Bschedule=Boperator	7,33333	0,007
Three options			
	B>15min=B15min	1,76534	**0,184***
	B>15min=B10min	3,28996	0,07
Inter-arrival	B15min=B10min	1,87315	**0,171***
	B5 AM – 6 PM=B5 AM – 10 PM	1,60655	**0,205***
	B5 AM – 6 PM=B5 AM – 12 AM	5,51357	0,019
Operation hours	B5 AM – 10PM=B5 AM – 12 AM	4,55983	0,033

*Higher than 5% P-value, meaning to reject Null Hypothesis

the effects of the socio-demography variable

significant hypothesis should be considered by policy maker in determining whether which one the preferable transportation attributes

Willingness to Pay (Option)



HAVE NO BIG PRIORITY IN ONE TRANSPORTATION MODE

respondent will use whether monorail or tram based on the nearest station from living place and destination place.

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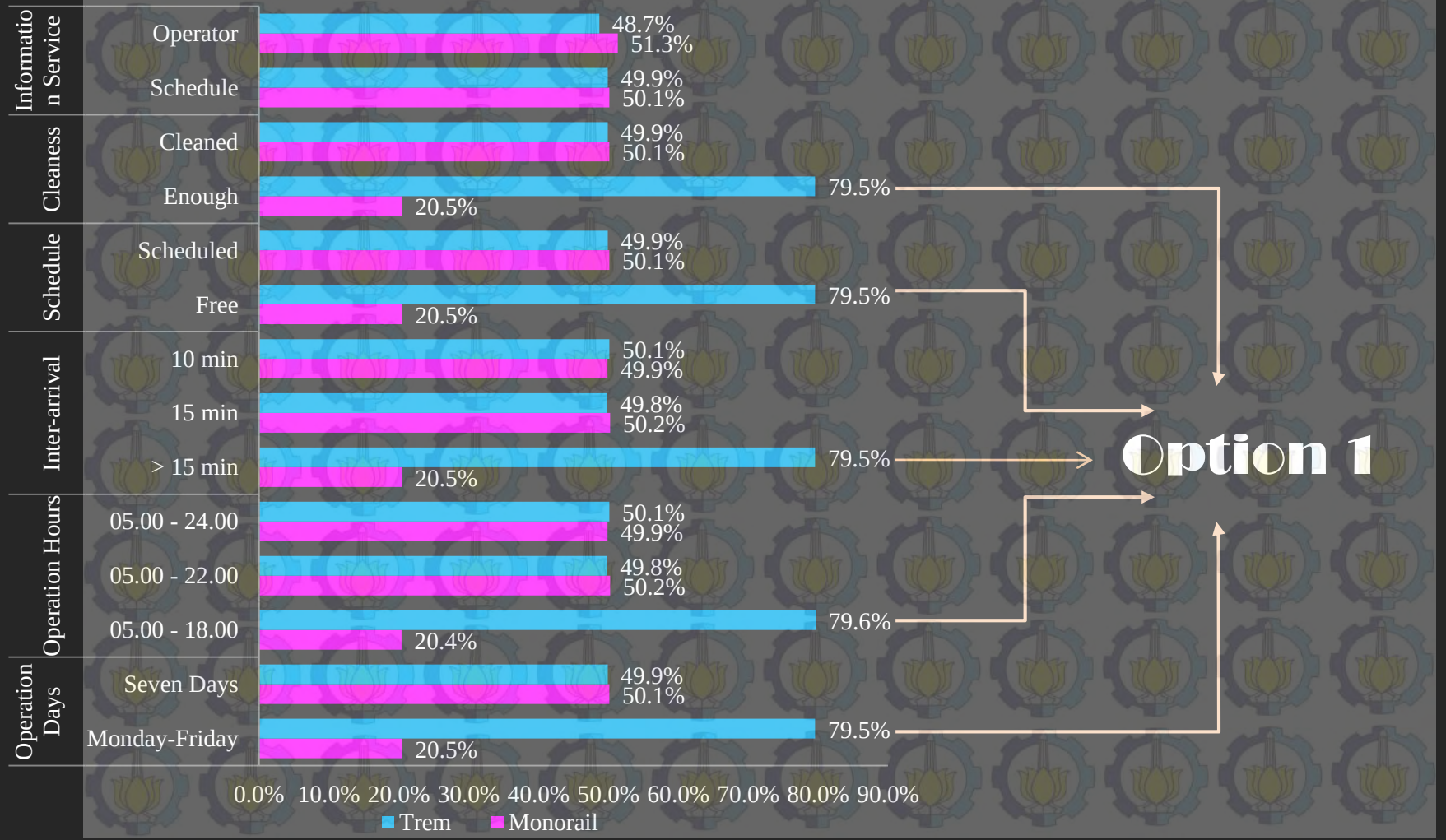
Willingness to Pay (Option)

ANALYSIS AND DISCUSSION



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Willingness to Pay (Price)

COST RECOMMENDATION CALCULATION			
MRT SPECIFICATION	**MONORAIL**	**TRAM**	**Surabaya Population**
NEED FOR FLEET (UNIT)	**18**	**22**	**3.022.481**
CAPACITY (PSG/TRAIN)	**400**	**200**	
STATION	**25**	**36**	
Capacity/ Route	7.200	4.400	
Capacity/ day	172.800	154.000	
DEMAND/YEAR	**53.942.104**	**40.737.896**	
Demand/ day	149.839	113.161	
Demand/ Capacity	86,71%	73,48%	
Percentage of WTP	5,72%	5,10%	
Range	10000-12500 IDR	10000-12500 IDR	
WTP of MRT Tariff	**11.337**	**11.495**	

Assumption:
People will use MRT to go the second stop from their initial station

Capacity/ Route = need for fleet x capacity
Capacity/ Day = capacity/route x (station-1)
Percentage of WTP = capacity/ day : population

2511 100 0 41

Conclusion and Recommendation

SUPERVISOR: PROF. IWAN VANANY, S.T., M.T., Ph.D.
BY: PUTRI NUR IMANI M.

Conclusion

CONCLUSION-RECOMMENDATION

Readiness to use & Willingness to shift

majority
- gender
- income
- daily transportation

READY

- Change to monorail and tram
- Travel destination
- **Environmental effect**

Willingness Motives

Manual Payment System

Less than **10** minutes of bus feedeer time

Less than **1 km** of walking distance

LOW PARKING LOT COST

Cost Recommendation

6250 IDR

50 % willingness

11337 IDR
Boyorail

11495 IDR
Surotram

Willingness to pay

Most of people **have no different priority** in one mode depended on the **station location** from **living** and **destination place**

Service Quality

Option 1 **Option 2-3**

Surotram → Monorail

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Recommendation

For practical aspect

to help the policy maker as Surabaya government in determining MRT (monorail and tram) tariff by considering the service quality, benefits, and customer willingness. Especially, the indirect benefit is the tourism aspect to increase the foreign exchange.

For future research

(a) the study should conduct with more preferable and applicable method, such as combining WTP option and WTP price, (b) This study can be used to do other research scopes, such as measuring subsidized BBM and reducing private transportation.

Bibliography

Anable, J., (2005). "Complacent car addicts" or "aspiring environmentalist"? Identifying travel behaviour segments using attitude theory'. *Transport Policy* 12, vol. (1), pp. 65 78.

Anonymous. (2013). '*Energi : Pengelolaan Bahan Bakar Minyak Bumi*', Indonesia, Picked up from Government Financial Report 2013.

Austengineer. (2012). '*Mass Rapid Transit*', Indonesia, accessed 2 October 2014, <http://austengineer.wordpress.com/2012/12/24/mass-rapid-transit-2/>.

BPH Migas, Pertamina, (2014). '*Perkembangan Pemakaian BBM Bersubsidi*'. Indonesia, Picked up from Tabloid Kontan 14-20 April 2014.

Ben-Akiva, M.E. and Lerman, S.R. (1985) Dicrete Choice Analysis: Theory and Application to Travel Demand, The MIT Press, Cambridge, Mass.

Breidert, C., Hahsler, M., & Reutterer, T. (2006). 'A review of methods for measuring willingness-to-pay'. *Innovative Marketing, 2* vol. (4), pp. 8-32.

Chowdhury, M. S. & Chien, S. I.-J. (2001). 'Optimization Of Transfer Coordination For Intermodal Transit Network. *Transportation Research Board*, no. 01-0205.

Dinas Perhubungan Kota Surabaya (2012), '*Rancangan rute Surabaya monorel dan trem*', Indonesia, East Java, accessed 1 October 2014, <www.dishubsurabaya.org/>.

Dinas Perhubungan Kota Surabaya (2013), '*Tingkat kepadatan transportasi kota Surabaya*', Indonesia, East Java, accessed 1 October 2014, <www.dishubsurabaya.org/>.

Dinas Perhubungan Kota Surabaya (2014), Indonesia, East Java, accessed 17 September 2014, <www.dishubsurabaya.org/>.

Eboli, L. Mazzulla, G. (2008). ' Willingness-to-pay of public transport users for improvement in service quality'. *European Transport,* vol.38, pp.107-118.

Foreit, J. R. Foreit, K. G. F. (2014). 'Willingness to Pay Surveys for Setting Prices for Reproductive Health Products and Services: A User's Manual', The Population Council. USA.

Bibliography

Fox, N. Hunn, A. Mathers, N. (2009). 'The NIHR Research Design Service for Yorkshire & the Humber: Sampling and Sample Size Calculation', National Institute for Health Research, vol. 1, United Kingdom.

Garling, E. et al. (1998). 'Reintroducing attitude theory in travel behavior research'. *Transportation, vol.* 25, pp. 129-146.

Greene, W.H., Hensher, D.A. and Rose, J. (2006) "Accounting for heterogeneity in the variance of unobserved effects in mixed logit models." *Transportation Research Part B*, vol. 40, pp.75-92.

Hiscock, R., Macintyre, S., Kearns, A., Ellaway, A., (2002). 'Means of transport and Ontological security: do cars provide psychosocial benefits to their users?', *Transportation Research Part D: Transport and Environment,* vol. 7(2), pp. 119 135.

Istamto, T. Houthuijs, D. Lebret, E. (2014). 'Multi-country willingness to pay study on road-traffic environmental health effects: are people willing and able to provide a number?', *Environmental Health*, vol. 1, pp. 1-13.

ITSnet. (2013). '*ITS Persembahkan Surotram dan Boyorail untuk Kota Surabaya*', Surabaya, accessed 13 October 2014, < http://itsnet.web.id>.

Khairani, S.I. (2014). '*Optimasi Rute dan Jumlah Feederuntuk Surabaya Mass Rapid Transit Boyorail'.* Bachelor Thesis, Institut Teknologi Sepuluh Nopember, Surabaya.

Larson, P. D. Viafara, J. Parsons, R. V. Elias, A. (2014). 'Consumer attitudes about electric cars: Pricing analysis and policy implications', *Transportation Research Part A*, vol. 69, pp. 299-314.

Lera-Lopez, F. Faulin, J. Sanzhez, M. Andrian, S. (2014). 'Evaluating factors of the willingness to pay to mitigate the environmental effects of freight transportation crossing the Pyrenees', *Transportation Research*, vol. 3, pp. 423-432.

Martadipura, B.A.P. (2010). '*Populasi dan Sampel'*, Statistics Knowledge, Indonesia, ppt.

Minderhoud, M. M. Zuylen, H. J. (2015). 'Willingness-to-pay for Private Rapid Transit in the City of Almelo', *Automated People Movers*, Delft University of Technology.

Bibliography

Nasrudin, N. Md Nor, A. R., Noor, H. M., Abdullah, Y. A. (2013). 'Urban Residents' Awareness and Readiness for Sustainable Transportation Case Study: Shah Alam, Malaysia', *Social and Behavioral Sciences,* vol. 105, pp. 632-643.

Nilsson, M., Kuller, R., (2000). 'Travel behavior and environmental concern'. *Transportation Research Part D,* vol.5, pp. 211 234.

Ortúzar, J. de. (2001). 'Modelling Transport 3rd edition', *John Wiley & Sons*, New York.

Phanikumar, C. V. Maitra, B. (2007). 'Willingness-to-Pay and Preference Heterogeneity for Rural Bus Attributes', *Journey Transportation Engineering*, vol. 133, pp. 62-69.

Queensland. 2014. 'The role of public transport'. *Queensland Government Brochure.*

Ramayana, V. and Nagadevara, S.R. (2007). "Quality Expectations of Transport Services and Willingness to Pay: Case of KSRTC." *AIMS International Part 1,* vol. (1), pp. 39-52.

Rastogi, R. (2010). 'Willingness to Shift to Walking or Bicycling to Access Suburban Rail: Case Study of Mumbai, India', *Journey Urban Planning*, vol. 136, pp. 3-10.

Schwarzlose, A.A. I. Mjelde, J. W. Dudensing, R. M. Jin, Y. Cherrington, L. K. Chen, J. (2014). 'Willingness to pay for public transportation options for improving the quality of life of the rural elderly', *Transportation Research Part A*, vol. 61, pp. 1-14.

Shono, A. Kondo, M. Ohmae, H. Okubo, I. (2014). 'Willingness to pay for public health services in rural Central Java, Indonesia: Methodological considerations when using the contingent valuation method', *Social Science & Medicine,* vol. 110, pp. 31-40.

SMART Surabaya (2013), 'Private Transportation Growths in Surabaya', Surabaya, accessed 1 October 2014, <smart.surabaya.go.id>.

SMART Surabaya (2013), 'Design of Boyorail and Surotram Transportation', Surabaya, accessed 1 October 2014, <smart.surabaya.go.id>.

Sun, C. Zhu, X. (2014). 'Evaluating the public perceptions of nuclear power in China: Evidence from a contingent valuation survey', *Energy Policy*, vol. 60, pp. 397-405.

Bibliography

Surabaya Kita Editorial Staff, (2013). *'Tambah Tahun Surabaya Tambah Macet'*. Indonesia, accessed 2 October 2014, <http://www.surabayakita.com/index. php?option=comcontent&view=article&id=5679:tambah-tahun-surabaya-tambah-macet&catid=25&Ite-mid=0>.

Swait, J. (2001). 'A Non Compensatory Choice Model Incorporating Attribute Cutoffs', *Transportation Research Part B*, vol. 35, 2001, pp. 903-928.

Tambor, M. Pavlova, M. Rechel, B. Golinowska, S. Sowada, C. Groot, W. (2014). 'Willingness to pay for publicly financed health care services in Central and Eastern Europe: Evidence from six countries based on a contingent valuation method', *Social Science & Medicine*, vol. 116, pp. 193-201.

Tarmizi, H. A. Kamarulzaman, N. H. Latifi, I. A. Rahman, A.A. (2014). 'Factors influencing readiness towards *hala*/logistics among foodbased logistics players in Malaysia', *UMK Procedia 1*, no. 10.1016, pp 42-49.

Tejada, J.J. Punzalan, J.R.B. (2012). 'On the Misuse of Slovin's Formula', *The Philippine Statistician*, vol. 1, pp. 129-136.

VALID International Ltd. (2006). 'Notes on required sample sizes for CSAS and similar coverage surveys', SampleCSAS.pdf.

Vanany, I. Ciptomulyono, U. Khoiri, M. Hartanto, D. (2014). '*Kajian Kesediaan dan Kesiapan Masyarakat Kota dan Penentuan Infrastruktur Pendukungnya untuk Proyek Surabaya Mass Rapid Transit (SMART)*'. LPPM Project, Institut Teknologi Sepuluh Nopember, Surabaya.

Wahyuni, A.W. Wicaksono, A. (2011). '*Kajian ability to pay, willingness to pay dan willingness to use, calon penumpang kereta commuter Malang Raya'*, *ISBN*, no. 978-979-18342-0-9, pp. 49-57.

Western Brisbane (2008). 'Transport Network Investigation'. *Queensland Government Brochure.*

No. Kuesioner

Nama Surveyor :.....

Part 1. Data Diri Responden

1. Nama :.....
2. Alamat :.....

Berikut ini pilih jawaban yang sesuai

3. Jenis Kelamin

   ☐ Laki-Laki ☐ Perempuan

4. Pekerjaan

   ☐ PNS ☐ Pegawai swasta

   ☐ Mahasiswa/Pelajar ☐ Ibu Rumah Tangga

   ☐ Wiraswasta ☐ Lain-lain:.....

5. Jumlah Pendapatan

   Berapa nilai nominal pendapatan/uang saku (untuk mahasiswa) Anda: Rp .....

   ☐ <3 juta ☐ 3 -7,5 juta ☐ 7,5 -15 juta ☐ > 15 juta

6. Kendaraan yang dimiliki:

   ☐ Mobil ke-(1, 2,3, n) cc: (1).....(2).....(3).....

   Tahun keluar : (1).....(2) ....., (3) .....

   ☐ Sepeda motor ke (1,2,3,n) cc: (1).....(2).....(3).....

   Tahun keluar : (1).....(2) ....., (3) .....

7. Penggunaaan kendaraan

   ☐ setiap hari ☐ 3-4 kali seminggu

   ☐ 1 kali seminggu ☐ kurang dari 1 kali seminggu

8. Tujuan penggunaan kendaraan:

   ☐ Bekerja ☐ Berbelanja ☐ Wisata/Lifestyle

   ☐ Belajar/Sekolah ☐ Lainnya:.....

9. Daerah yang dituju?.....

10. Tipe BBM apakah yang sering Anda gunakan setiap harinya

    ☐ Premium ☐ Pertamax ☐ Solar ☐ BBG

11. Volume BBM yg dikonsumsi kendaraan anda:

    Rata-Rata : Rp (liter)...../minggu

    ☐ < 2 liter/minggu ☐ 2- 10 liter/minggu

    ☐ 11-25 liter/minggu ☐ > 25 liter/minggu

12. Beraparata-rata jarak tempuh kendaraan Anda seharinya:.....km
13. Pada pendapatan berapakah (per bulan) Anda akan membeli mobil?

    Rp.....

14. Sudah berapa kali Anda berganti mobil?.....kali

    Selang berapa lama Anda berganti mobil?.....tahun

15. **Apakah Anda mengetahui tentang monorel atau trem (Surabaya *Mass Rapid Transit*)?**

    ☐ Ya ☐ Tidak

Attachment

Part 2. Kesiapan Untuk Berpindah (*Readiness*)

1. Kendaraan apa yang sering Anda gunakan sehari-hari? (*centang salah satu*)

   ☐ Mobil ☐ Sepeda Motor ☐ Angkutan Umum ☐ lain-lain: .....

2. Centanglah pilihan Anda! (*diprioritaskan tidak memilih nomor 3*)

   Skala 1: Sangat Tidak Bersedia 2: Tidak Bersedia 4: Bersedia 5 : Sangat Bersedia

Faktor	Sub Faktor	Pertanyaan	Monorel					Trem				
			1	2	3	4	5	1	2	3	4	5
1. Berpindah ke Monorel dan Trem	1.1 Pengurangan kendaraan pribadi	Apakah Anda bersedia untuk beralih untuk menggunakan Monorel dan Trem?										
	1.2 Jarak Stasiun	Apakah Anda bersedia jika stasiun pemberhentian berjarak maksimum 1km meter dari tempat tinggal?										
2. Tujuan Perjalanan		2.1 Apakah Anda bersedia jika stasiun pemberhentian berada di dekat pusat pemerintahan?										
		2.2 Apakah Anda bersedia jika stasiun pemberhentian berada di dekat fasilitas pendidikan (sekolah/universitas)?										
		2.3 Apakah Anda bersedia jika stasiun pemberhentian berada di dekat tempat wisata?										
		2.4 Apakah Anda bersedia jika stasiun pemberhentian berada di dekat pusat perbelanjaan?										
3. Dampak Lingkungan	3.1 Kemacetan	Apakah Anda bersedia beralih menggunakan Monorel dan Trem untuk mengurangi kemacetan?										
	3.2 Polusi	Apakah Anda bersedia beralih menggunakan Monorel dan Trem untuk mengurangi polusi?										
	3.3 Kecelakaan	Apakah Anda bersedia beralih menggunakan Monorel dan Trem untuk mengurangi terjadinya kecelakaan?										

Attachment

Part 3. Kesediaan Untuk Berubah (*Willingness to Shift*)

Centanglah pilihan Anda!

1. Apakah Anda bersedia untuk berjalan kaki menuju stasiun Monorail atau Trem terdekat?

   ☐ Ya ☐ Tidak

   Berapa jarak maksimum berjalan kaki yang Anda toleransi: .....Km

2. Apakah Anda bersedia menggunakan bus feeder/angkutan menuju stasiun Monorail atau Trem terdekat?

   ☐ Ya ☐ Tidak

   Berapa waktu maksimum sampai ke stasion monorail ataru trem yang Anda toleransi: .....menit

3. Apakah Anda memerlukan fasilitas area parkir kendaraan di dekat stasiun Monorail atau Trem?

   ☐ Ya ☐ Tidak

   Bila iya, berapa tiket parkir yang diinginkan:

   (1) perjam : Rp.....

   (2) perharinya (inap) : Rp .....

4. Sistem pembayaran yang Anda pilih

   ☐ Manual

   ☐ Kartu/Electronic

5. Hari operasi yang Anda pilih?

   ☐ senin-jumat

   ☐ setiap hari

6. Waktu antar kedatangan yang Anda pilih?

   ☐ >15 menit ☐ tiap 15 menit

   ☐ tiap 10 menit

7. Jam operasi yang Anda pilih?

   ☐ 5 pagi - 6 petang ☐ 5 pagi - 10 malam

   ☐ 5 pagi - 12 malam

Part 4. Kesediaan Untuk Membayar (*Willingness to Pay*)

4.1 Kesediaan Untuk Membayar Tanpa Berdasarkan Harga

Centanglah salah satu pilihan Anda!

4.1.1 Monorel

Atribut	Opsi 1	Opsi 2	Opsi 3
Hari operasi	Senin-Jumat	Tujuh hari	Tujuh hari
Waktu antar kedatangan	> 15 menit	setiap 15 menit	setiap 10 menit
Jadwal	Bebas	terjadwal	Terjadwal
Jam operasi	5 pagi- 6 petang	5 pagi- 10 malam	5 pagi- 12 malam
Fasiltas Monorel			
Kebersihan	Cukup	Terjaga Kebersihannya	Terjaga Kebersihannya
Layanan informasi	Map perjalanan, tanpa jadwal, pengumuman keterlambatan	Map perjalanan, jadwal, pengumuman keterlambatan	Map perjalanan, jadwal, pengumuman keterlambatan, penjaga
Kotak centang	☐	☐	☐

4.1.2 Tram

Atribut	Opsi 1	Opsi 2	Opsi 3
Hari operasi	Senin-Jumat	Tujuh hari	Tujuh hari
Waktu antar kedatangan	> 15 menit	setiap 15 menit	setiap 10 menit
Jadwal	Bebas	terjadwal	Terjadwal
Jam operasi	5 pagi- 6 petang	5 pagi- 10 malam	5 pagi- 12 malam
Fasiltas Monorel			
Kebersihan	Cukup	Terjaga Kebersihannya	Terjaga Kebersihannya
Layanan informasi	Map perjalanan, tanpa jadwal, pengumuman keterlambatan	Map perjalanan, jadwal, pengumuman keterlambatan	Map perjalanan, jadwal, pengumuman keterlambatan, penjaga
Kotak centang	☐	☐	☐

4.2 Kesediaan Untuk Membayar Berdasarkan Harga

Centanglah pilihan Anda!

No	Pertanyaan	Jawaban
1	Apakah Anda bersedia apabila harga tiket Monorail dan Trem gratis?	☐Ya ☐Tidak
2	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 2.500,-?	☐Ya ☐Tidak
3	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 5.000,-?	☐Ya ☐Tidak
4	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 7.500,-?	☐ Ya ☐Tidak
5	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 10.000,-?	☐Ya ☐Tidak
6	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 12.500,-?	☐Ya ☐Tidak
7	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 15.000,-?	☐Ya ☐ Tidak
8	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 17.500,-?	☐ Ya ☐ Tidak
9	Apakah Anda bersedia apabila harga tiket Monorail dan Trem Rp 20.000,-?	☐ Ya ☐Tidak

Terima kasih atas isiannya, tanpa partisipasi anda, penelitian kami tidak akan terlaksanan dengan baik.

Validated by BAPPEKO, 2015

Attachment

QUESTIONNAIRE DISTRIBUTION

NO	District	Population	Sample per Region	
			Proportion	Sample
1	Suko manunggal	101617	0,034	12
2	Tandes	95458	0,032	12
3	Asem Rowo	42580	0,014	6
4	Benowo	50388	0,017	7
5	Pakal	44811	0,015	6
6	Lakarsantri	53466	0,018	7
7	Sambikerep	57452	0,019	8
8	Genteng	67659	0,022	9
9	Tegalsari	113772	0,038	14
10	Bubutan	113181	0,037	14
11	Simokerto	104836	0,035	13
12	Pabean Cantikan	91148	0,030	12
13	Semampir	199011	0,066	25
14	Krembangan	125800	0,042	15
17	Etc.			

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2511 100 0 41

THANK YOU~

SUPERVISOR: PROF. IWAN VANANY, S.T., M.T., Ph.D.
BY: PUTRI NUR IMANI M.

Attachment

POSITIVE WTP CALCULATION

Here is the example calculation of positive WTP estimation for Monday-Friday of monorail.

$$WTP_k = -\frac{\beta_k}{\beta_s} = -\left(\frac{-1.387398}{0.472225}\right) = 2.937798$$

$$percent = \left(1 - \varphi\left(-\frac{\beta_k}{\beta_s}\right)\right).100 = \left(1 - \varphi(2.937798)\right).100 = 0.2\%$$

Here is the example calculation of PERCENTAGE OF WTP MONORAIL AND TRAM.

Seven days (monorail)= seven days (monorail)/sevendays(monorail+tram)
Seven days (monorail)= 0.2% /(0.2+0.6)%= 20.5 %

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Attachment

POSITIVE WTP CALCULATION

Attributes	Mean WTP		Normal Cumulative Distribution		Percent		Comparison	
	Monorail	Tram	Monorail	Tram	Monorail	Tram	monorail	tram
Operation Days								
Monday-Friday	2,937798067	2,487909718	0,998347239	0,993575183	0,2%	0,6%	20,5%	79,5%
Seven Days	-2,974735506	-2,5284292	0,001466206	0,00572871	99,9%	99,4%	50,1%	49,9%
Operation Hours								
05.00 - 18.00	2,974735506	2,528429201	0,998533794	0,99427129	0,1%	0,6%	20,4%	79,6%
05.00 - 22.00	0,366842948	0,375366715	0,643131915	0,646306122	35,7%	35,4%	50,2%	49,8%
05.00 - 24.00	-0,366842948	-0,37536671	0,356868085	0,353693878	64,3%	64,6%	49,9%	50,1%
Inter-arrival								
> 15 min	2,937798067	2,487909718	0,998347239	0,993575183	0,2%	0,6%	20,5%	79,5%
15 min	0,366842948	0,375366715	0,643131915	0,646306122	35,7%	35,4%	50,2%	49,8%
10 min	-0,366842948	-0,37536671	0,356868085	0,353693878	64,3%	64,6%	49,9%	50,1%
Schedule								
Free	2,937798067	2,487909718	0,998347239	0,993575183	0,2%	0,6%	20,5%	79,5%
Scheduled	-2,974735506	-2,5284292	0,001466206	0,00572871	99,9%	99,4%	50,1%	49,9%
Cleaness								
Enough	2,937798067	2,487909718	0,998347239	0,993575183	0,2%	0,6%	20,5%	79,5%
Cleaned	-2,974735506	-2,5284292	0,001466206	0,00572871	99,9%	99,4%	50,1%	49,9%
Information Service								
Schedule	-2,974735506	-2,5284292	0,001466206	0,00572871	99,9%	99,4%	50,1%	49,9%
Operator	-0,366842948	-0,27943503	0,356868085	0,389955494	64,3%	61,0%	51,3%	48,7%

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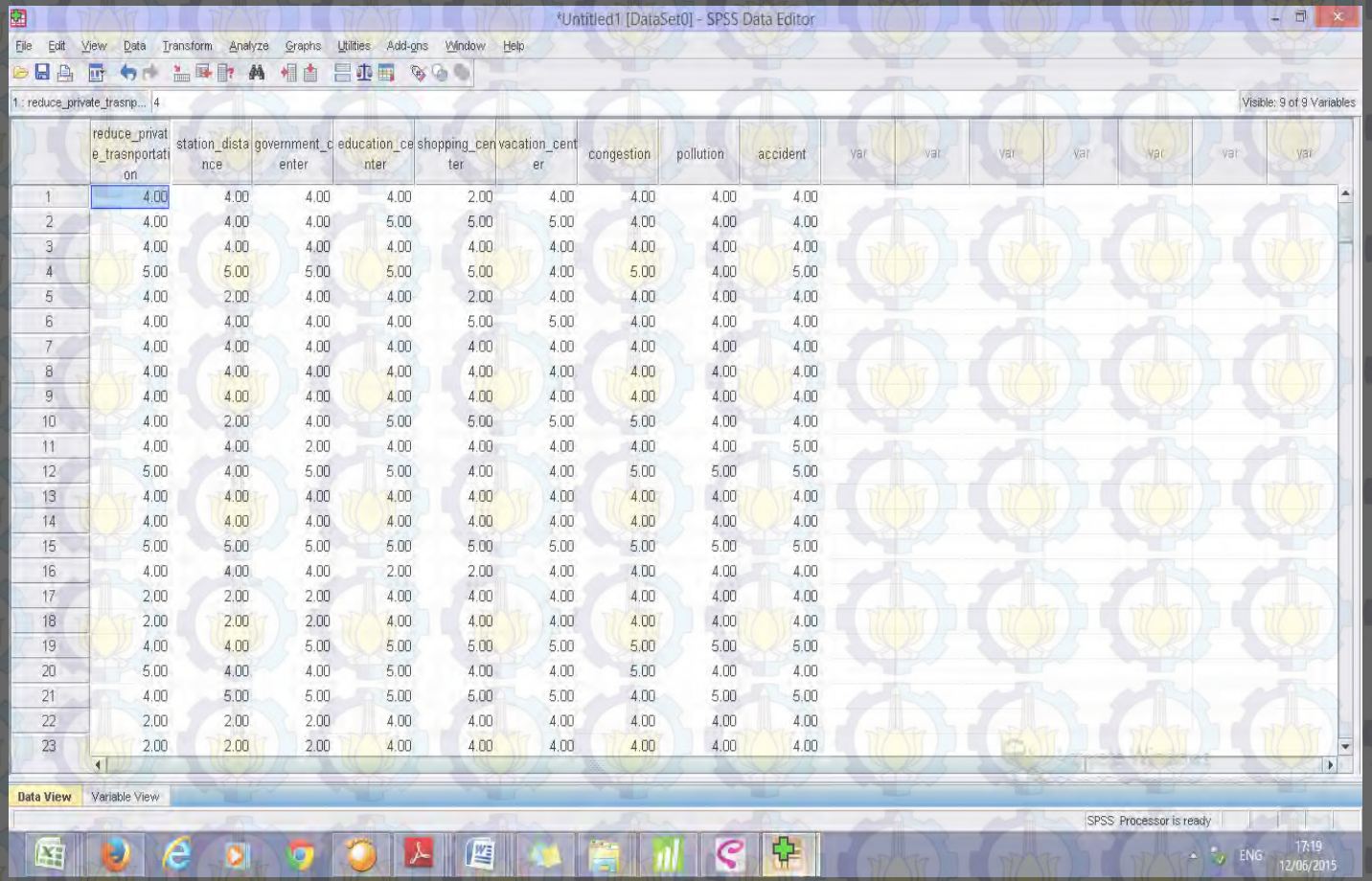
Attachment

POSITIVE WTP CALCULATION



	reduce_private_trasnportation	station_distance	government_center	education_center	shopping_center	vacation_center	congestion	pollution	accident	var	var	var	var	var	var	var
1	4.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00							
2	4.00	4.00	4.00	5.00	5.00	5.00	4.00	4.00	4.00							
3	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00							
4	5.00	5.00	5.00	5.00	5.00	4.00	5.00	4.00	5.00							
5	4.00	2.00	4.00	4.00	2.00	4.00	4.00	4.00	4.00							
6	4.00	4.00	4.00	4.00	5.00	5.00	4.00	4.00	4.00							
7	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00							
8	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00							
9	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00							
10	4.00	2.00	4.00	5.00	5.00	5.00	5.00	4.00	4.00							
11	4.00	4.00	2.00	4.00	4.00	4.00	4.00	4.00	5.00							
12	5.00	4.00	5.00	5.00	4.00	4.00	5.00	5.00	5.00							
13	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00							
14	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00							
15	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00							
16	4.00	4.00	4.00	2.00	2.00	4.00	4.00	4.00	4.00							
17	2.00	2.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00							
18	2.00	2.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00							
19	4.00	4.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00							
20	5.00	4.00	4.00	5.00	4.00	4.00	5.00	4.00	4.00							
21	4.00	5.00	5.00	5.00	5.00	5.00	4.00	5.00	5.00							
22	2.00	2.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00							
23	2.00	2.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00							

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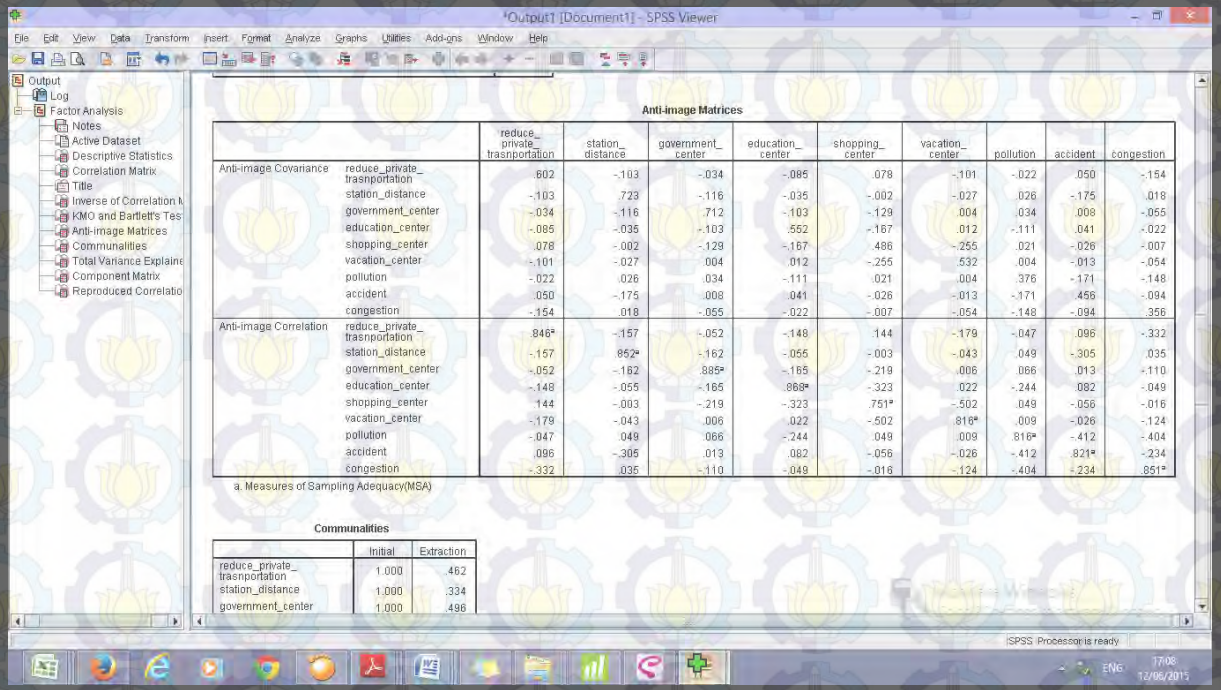
Attachment

POSITIVE WTP CALCULATION



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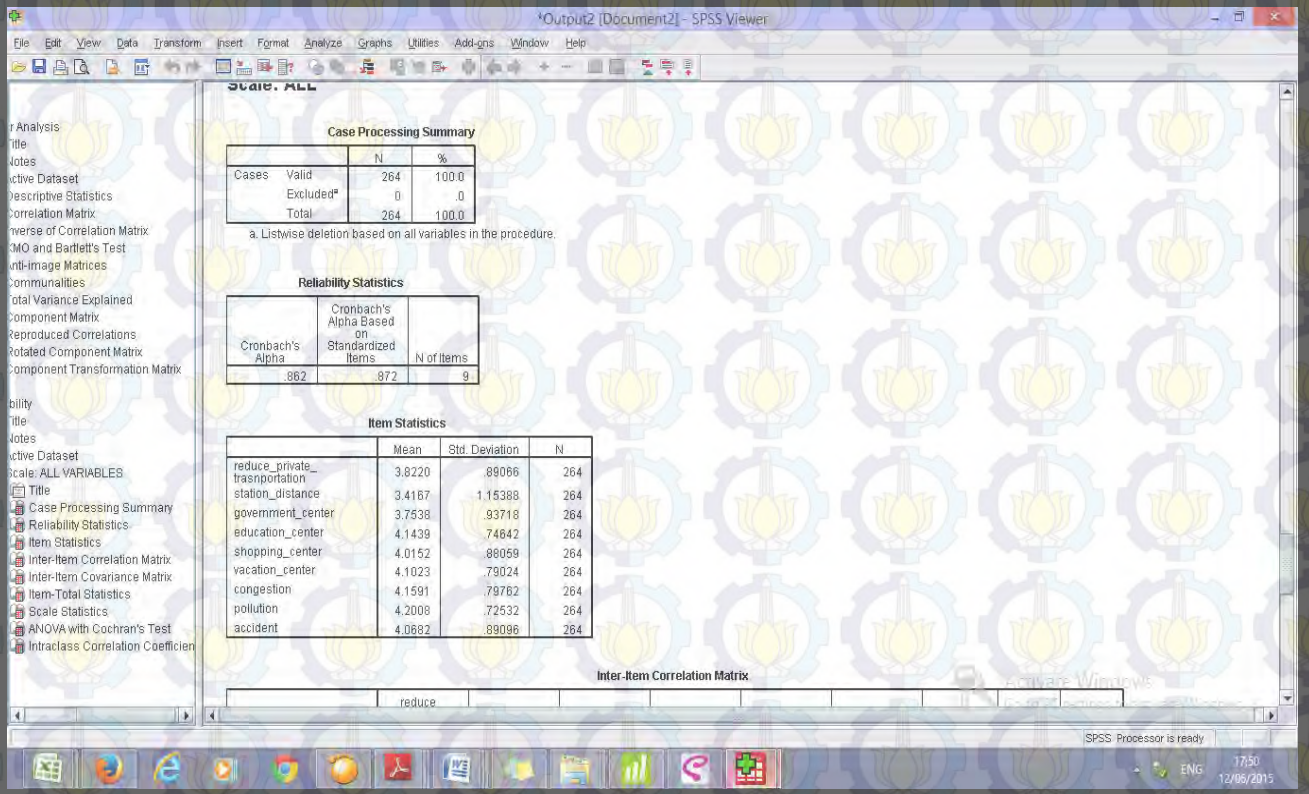
POSITIVE WTP CALCULATION



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Attachment

CHI-SQUARED TEST (MONORAIL)

Chi-Square Goodness-of-Fit Test for Categorical Variable: cleaness

Category	Observed	Historical Counts	Test Proportion	Expected	Contribution to Chi-Sq
Cleaned	10	10	0,1	26,4	10,1879
Enough	254	90	0,9	237,6	1,1320

N	N*	DF	Chi-Sq	P-Value
264	0	1	11,3199	0,001

Chi-Square Goodness-of-Fit Test for Categorical Variable: information service

Category	Observed	Test Proportion	Expected	Contribution to Chi-Sq
operator	152	0,5	132	3,03030
schedule	112	0,5	132	3,03030

N	N*	DF	Chi-Sq	P-Value
264	0	1	6,06061	0,014

Attachment

CHI-SQUARED TEST (TRAM)

Chi-Square Goodness-of-Fit Test for Categorical Variable: information service_1

Category	Observed	Test Proportion	Expected	Contribution to Chi-Sq
operator	154	0,5	132	3,66667
schedule	110	0,5	132	3,66667

N	N*	DF	Chi-Sq	P-Value
264	0	1	7,33333	0,007

Chi-Square Goodness-of-Fit Test for Categorical Variable: schedule

Category	Observed	Historical Counts	Test Proportion	Expected	Contribution to Chi-Sq
free	10	12	0,084507	22,310	6,79218
scheduled	254	130	0,915493	241,690	0,62697

N	N*	DF	Chi-Sq	P-Value
264	0	1	7,41915	0,006

Attachment

POSITIVE WTP CALCULATION

LOGISTIC REGRESSION (TRAM)

Binary Logistic Regression: choose versus PRICETAG

Link Function: Logit

Response Information

Variable	Value	Count	
choose	1	252	(Event)
	0	12	
	Total	264	

Logistic Regression Table

Predictor	Coef	SE Coef	Z	P	Odds Ratio	95% CI Lower	95% CI Upper
Constant	1,53727	0,971665	1,58	0,114			
PRICETAG	0,522941	0,344544	1,52	0,129	1,69	0,86	3,31

Log-Likelihood = -47,524
Test that all slopes are zero: G = 2,582, DF = 1, P-Value = 0,108

OPTION REGRESSION (TRAM)

Regression Analysis: option versus Monday-Friday

The regression equation is
option = 2,60 - 1,60 Monday-Friday

Predictor	Coef	SE Coef	T	P
Constant	2,59843	0,03029	85,80	0,000
Monday-Friday	-1,5984	0,1556	-10,27	0,000

S = 0,482675 R-Sq = 28,7% R-Sq(adj) = 28,4%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	24,582	24,582	105,51	0,000
Residual Error	262	61,039	0,233		
Total	263	85,621			

BY: PUTRI NUR IMANI M.