Walking and bicycle catchment areas of tram stops: factors and insights

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Bicycle-transit combination





Synergies from improved cycling-transit integration (Kager & Harms, 2017)



Bicycle and tram

- Competitors at single trip level
- Complement at total trip level





Research approach

distance		bicycle choice
Literature review	theoretical framework	Literature review
BivariateMultivariate	quantitative	BivariateMultivariate
• Motives	qualitative	• Motives





Theoretical framework Feeder distance







Theoretical framework Feeder mode





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Results: feeder distance (m)

	Ν	min	max	median	mean
Walking	657	10	2470	380	466.18
Cycling	56	80	3170	1025	1159.11
Total	713	10	3170	400	520.60







Results: feeder mode by mode







Results: bivariate Feeder distance







Results: bivariate Feeder mode







Results Multivariate

Feeder distance

Variable	Category	В	Sig.	Exp(B)
Constant		2.575	0.000***	13.136
Feeder mode	<i>Base: walking</i> Cycling	2.438	0.000***	11.453
Frequency at the stop	<i>Base: low</i> Medium High	-0.693 -0.043	0.186 0.930	0.500 0.958
Directness of the line	<i>Base: direct</i> Inbetween Covering	-0.412 0.192	0.213 0.446	0.662 1.212
Amount of tram stops within 400m	Base: 0 stops 1 stop 2 stops 3 stops 4 or more stops	-2.996 -3.533 -3.688 -3.557	0.000*** 0.000*** 0.000*** 0.000***	0.050 0.029 0.025 0.029





Results Multivariate

Feeder mode

Variable	Category	В	Sig.	Exp(B)
Constant		-1.944	0.201	0.143
Feeder distance		0.002	0.000***	1.002
Age		-0.030	0.130	0.970
Transit captivity	Base: other options available No other options available	0.186	0.756	1.204
Frequency of cycling	Base: 4-7 days/week 1-3 days/week 1-3 days per month Less than 11 days/year	-0.924 -2.396 -3.181	0.067 0.035* 0.004**	0.397 0.091 0.042
Trip purpose	Base: working School/internship Leisure/sport Shopping/groceries Visiting family/friends Other	0.218 -0.694 -0.713 -0.453 -3.288	0.727 0.415 0.428 0.562 0.267	1.243 0.499 0.490 0.636 0.040
Home- based/activity -based	Base: home-based Activity-based	-1.299	0.012*	0.273
Bicycle parking at stop	<i>Base: not available</i> Available	-0.153	0.798	0.858
Frequency at the stop	<i>Base: low</i> Medium High	0.949 1.068	0.421 0.318	2.583 2.911
Directnes of the line	Base: direct Inbetween Covering	0.320 0.423	0.676 0.566	1.377 1.527
Amount of tram stops within 400m	Base: 0 stops 1 stop 2 stops 3 or more stops	-2.196 -1.348 -1.389	0.010* 0.061 0.074	0.111 0.260 0.249





Reason for not cycling



*T***UDelft**



1-3 days per month

less than 11 days per year/never

Choosing a further stop

13. Would you have chosen for one **boarding stop** further away if ...

you could avoid a transfer?	Yes	🛛 No	Not applicable
you could park your bike better at that stop?	Yes	🛛 No	Not applicable
there are more trams to your destination at that stop?	Yes	🖵 No	Not applicable





Conclusions

- Median feeder distance: 400m
 - Walking: 380m
 - Cycling: 1025m

Feeder distance

- Feeder mode
- Transit stop density

• Feeder mode

- Feeder distance
- Transit stop density
- Frequency of cycling
- Home-based/activity-based

• 3 barriers for cycling



Cyclists choose stops differently





Recommendations

• Remove barriers for cycling



- Use the data for estimating a choice model
 - Sensitivity
 - Combined choice
- Multi-modal transport models





Questions?

More information/contact



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