

TABLE 5: ORDERED LOGIT (ALL PARTICIPANTS)

Parameters		Estimate		95% Confidence Interval	
				Lower Odds	Upper Odds
				Ratio	Ratio
Theft influence:	Slight	.667	***	1.499	2.533
	Moderate	1.035	***	2.087	3.800
	Very	1.420	***	2.897	5.905
	Extremely	1.762	***	3.595	9.432
Employment status:	Student	-.356	**	.504	.973
	Retired	-.344		.362	1.386
	Other	.083		.605	1.951
Gender:	Male	.080		.874	1.343
Age:	Age	.018	***	1.007	1.029
Annual household income:	Less than \$20,000	-.629	***	.350	.812
	Between \$20,000 - \$60,000	-.614	***	.409	.715
	Between \$60,000 - \$100,000	-.287	**	.573	.984
Reason:	Culture	-.370	***	.556	.858
Commuting:	Time comfortable	.002	*	1.000	1.004
	Years commuting	-.059	***	.916	.970
Cost of bicycle:	Low (less than \$500)	-.746	***	.382	.589
Cox & Snell R Square = .179				*** 99% significance	
Nagelkerke R Square = .200				** 95% significance	
Total N=1533				* 90% significance	

Similarly to the binary logit model present in Table 4, results of the ordered logit make clear that the variable 'theft' is highly significant. Because these variables are significant at the 99.9% confidence level, they increase individuals' likeliness to be willing to pay a greater amount for parking. Whereas cyclists who are slightly influenced by the risk of theft in their decision to use a bicycle are 50% to 153% more likely to be willing to pay a greater amount than cyclist who are not at all influenced by risk of theft, likeliness to be willing to pay more for secured bicycle parking increases to up to 840% for cyclists who are extremely influenced. Students are willing to pay less, as are cyclists with incomes under \$100,000. The variable 'gender' remains insignificant, but the variable 'time comfortable,' becomes significant at the 90% confidence level. The longer a cyclist is comfortable commuting, the more likely he or she is to be willing to pay a higher amount for secured bicycle parking. This may be because cyclists who are comfortable cycling for longer distances are likely to use their bicycles for commuting, and therefore more likely to require

long-term bicycle parking facilities. Similar results were demonstrated in the analysis of the summary statistics. Similarly to the results present in the binary logit in Table 4, the variables ‘year commuting,’ and ‘culture,’ are also significant in the ordered logit model.

Binary Logit that accounts for ability to pay

Several studies have put forth a concern that WTP often does not account for ability to pay (SafetyNet). Because income is found to be highly significant in both the binary and ordered logit models, a model that includes only cyclists who have an annual income greater than \$60,000 is presented in Table 6. Unexpectedly, the factors effecting WTP for participants who are most likely also able to pay remains similar to those of the total sample. Only the variable ‘student’ becomes insignificant, most likely because this group often has incomes lower than \$60,000.

Similarly to the models that include the full sample, the variable ‘theft’ is also highly significant in the binary logit that accounts for cyclists’ ability to pay. However, within this sample, cyclists whose decision to use a bicycle is extremely influenced by the risk of theft rises to being 1131% more likely to be willing to pay than cyclists whose decision to cycle is not at all influenced by the risk of theft. This makes clear that the likeliness to be willing to pay increases as a cyclist’s decision to use a bicycle becomes more influenced by the risk of theft, as annual household income increases, as well as with age. Because the same variables are significant in all of the models, it is clear that the significant factors influence WTP regardless of ability to pay.

TABLE 6: BINARY LOGIT (PARTICIPANTS WITH ANNUAL INCOME GREATER THAN \$60,000 ONLY)

Parameters:		Coefficient		t-stat	Odds Ratio
Theft influence low:	Slight	.555	***	2.941	1.741
	Moderate	1.004	***	4.403	2.730
	Very	1.649	***	5.786	5.201
	Extremely	2.510	***	4.456	12.307
Employment status:	Student	-.245		-.815	.783
	Retired	-.208		-.404	.812
	Other	.596		.963	1.815
Gender:	Male	-.058		-.340	.944
Age:	Age	.016	**	1.970	1.017
Annual household income:	Between \$60,000 - \$100,000	-.375	**	-2.366	.687
Reason:	Culture	-.403	**	-2.397	.669
Commuting:	Time comfortable	.002		1.073	1.002
	Years commuting	-.083	***	-3.701	.921
Cost of bicycle:	Low (less than \$500)	-.834	***	-5.146	.434
Constant:		.095		.216	1.100
Cox & Snell R Square = .168				*** 99% significance	
Nagelkerke R Square = .224				** 95% significance	
n=793				* 90% significance	

CONCLUSION AND DISCUSSION

As various cities around the world plan to increase their bicycle mode share, the problem of bicycle theft will continue to remain significant unless countermeasures are taken. Cyclists are highly likely to become victims of theft or bicycle related crime over the course of their lifetimes. Given the costs associated with losing cyclists and thereby decreasing the share of the preferred mode, policy makers and planners should take a multi-faceted approach to consider strategies to promote the use of the bicycle. Secured bicycle parking facilities that decrease the chance of theft are likely to encourage individuals to increase their bicycle usage.

In addition to implementing municipal and provincial theft prevention strategies, policy makers and planners should understand that many individual citizens are willing to pay for bicycle security. Although this study provides information about a sample of Montreal cyclists' willingness to pay for secured bicycle parking facilities, the findings are also relevant for transportation planners in other regions and future study of this new area of research is worthy of further scholarly attention.

A limitation identified with this study is that the survey did not ask cyclists who would be willing to pay for secured parking how often they are expected to use this service. Future studies should ask participants how often they would use secured parking in addition to how much they would be willing to pay. Future studies would also benefit from comparing cost estimates to the expected effectiveness of secured bicycle parking. Another question for further research that should be addressed is the role of bicycle sharing programs and their relationships with infrastructure investments and cyclists' willingness to pay. Further research should also include questions such as whether cyclists would rather use a shared bicycle and not worry about theft, as well as whether public resources would be better spent on bicycle sharing programs instead of secured parking.

Other considerations that city planners and transportation professionals should take into account are the reasons that cyclists would not pay for parking. The responses from the open-ended questions from the Montreal Bicycle Theft Survey confirm that many cyclists are not willing to pay for secured bicycle parking because they use a bicycle to save money. The statement that "*[l]e but du vélo est, entre autres, d'économiser en coût de transport*" ("the goal of using a bicycle, among others, is to save money on transportation costs") is representative of the opinions of many survey participants. This finding is also reflected in the summary statistics which demonstrate that of the people who stated that the low cost of cycling was very or extremely important in their decision to cycle, 61% were not willing to pay for secured parking. The results of the binary logit that includes the total sample also confirm that participants with annual household incomes lower than \$60,000 are much less likely to be WTP than participants who have household incomes higher than \$100,000. Other reasons that cyclists are not willing to pay for secured parking include the concern that secured parking would not be located in the places where cyclists would want to go, and that their current bicycle lock was sufficiently secure. One participant stated that "[i]t would take a very long time, if ever, for such services to be located conveniently enough throughout the city. I want to lock my bike close to where I am going."

Yet, even though many cyclists are not willing to pay for secured parking, there are a substantial number who would be interested in increasing the security of their parked bicycle for a price. Based on the findings of this study, cities will benefit from improving their cycling infrastructure by installing more secured bicycle parking facilities. Cyclists who state that risk of theft influences their decision to cycle are more likely to pay for secured parking. As risk of theft becomes more influential in a cyclist's decision to use a bicycle, his or her willingness to pay for secured parking increases. Therefore, if cities provide more bicycle parking then bicycle mode share is likely to increase. Although the installation of paid secure bicycle parking is highly recommended, city planners and transportation officials should ensure that the pricing of these facilities remains low to ensure that the security provided by paid bicycle parking always remain an incentive to use a bicycle.