Rescuing the captive [mode] user:
An alternative approach to transport market segmentation

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INTRODUCTION

The prevailing approach to transport market segmentation has defined two types of users: "captive" and "choice". Despite the widespread use of this paradigm as a means of categorizing and understanding travel behaviour for over thirty years, valid concerns have been raised:

- The lack of a precise and consistent definition for captive and choice users;
- The potential for conflicting interpretations from an economic versus an equity standpoint (i.e., the point of view of a transit agency versus an individual user);
- The focus on public transit and automobile users, meanwhile ignoring active modes.

The purpose of this study was two-fold:

- To examine the implications of the prevailing transport market segmentation paradigm; and
- To propose an alternative framework for defining different types of mode users that reconciles conflicting economic and equity interests, and that can be used to understand travel behaviour for all transportation modes in various geographic contexts.

Using the results of a large-scale travel survey at McGill University in Montreal, this study employs a combination of statistical clustering techniques to uncover different transport market segments. It was hypothesized that the practicality of a particular mode or trip could be the most important factor affecting mode choice for some individuals, while others may value their enjoyment of a certain mode regardless of the level of practicality it offers.

METHODOLOGY

SURVEY DESCRIPTION

A large-scale online travel behaviour survey was conducted in March and April 2011, targeting McGill students, staff, and faculty. The survey captured detailed trip segments, trip satisfaction and trip seasonality.

- A total of 19,693 surveys were distributed;
- A total of 5,016 responses were received;
- After the data cleaning, a total of 3,002 observations were found to be suitable for this analysis.

METHODOLOGY (CONT'D)

MODE-BASED CLUSTER ANALYSIS

A two-step cluster analysis was performed for each of the four modes of transportation examined. The goal of these cluster analyses was to identify distinct groups of individuals within each mode category, using several key variables from the survey results.

FINAL CLUSTER ANALYSIS

A k-means cluster analysis was performed on all twenty-one mode-based clusters resulting from the two-step cluster analysis. This clustering was based on the mean trip utility and trip satisfaction for each initial cluster. Trip utility captures the level of practicality for each trip taken compared to the most realistic alternative for the same trip.

RESULTS

INITIAL MODE-BASED CLUSTERS

A total of twenty-one clusters were defined in the initial mode-based cluster analysis: five each for walkers, cyclists and automobile users, and six for transit users. The percent variation of the mean cluster values for each of these analyses is presented in Figure 1.

FINAL CLUSTERS

The final cluster analysis revealed four groups, as illustrated in Figure 2 in a scatter plot of the trip utility versus the level of satisfaction for each of the initial mode-based clusters. These four final clusters are highlighted by circle outlines in Figure 2.

Figure 1: Percent variation of mean cluster values for walkers, cyclists, transit users, and automobile users

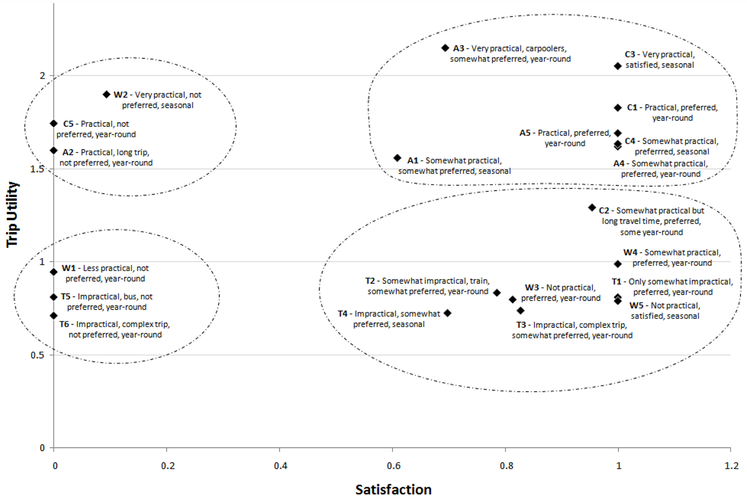

Figure 2: Scatter plot of clusters for satisfaction and trip utility

The four final clusters presented in Figure 2 can be described as follows:

- LOWER-LEFT CLUSTER: Low trip utility (not practical) and a low level of preference for trip, suggesting some level of constraint or captivity (13.6%)
- UPPER-LEFT CLUSTER: Low level of preference, but a high level of practicality in current trip, suggesting a very utilitarian approach to travel decisions (9.0%)
- LOWER-RIGHT CLUSTER: Low trip utility, but high level of trip enjoyment, suggesting a certain level of dedication (55.7%)
- UPPER-RIGHT CLUSTER: Both a high level of trip utility and a high level of preference for trip, suggesting convenience (21.7%)

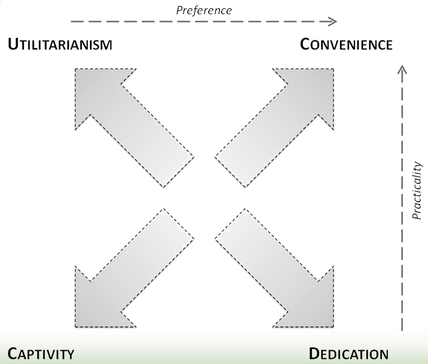

Figure 3: Alternative approach to transport market segmentation

CONCLUSIONS & POLICY IMPLICATIONS

The four final clusters resulting from this analysis inspired the development of an alternative approach to transport market segmentation which has been conceptually presented in Figure 3.

- Four market segments are defined: captivity, utilitarianism, dedication and convenience;
- Main arrows signify a movement toward, rather than a static presence in, a certain market segment;
- Peripheral arrows symbolize varying degrees of preference and practicality within each category;
- Concept of a continuum of travel choice along which individuals move toward various extremes of travel options and preferences.

Some of the key characteristics of this model that set it apart from other segmentation paradigms include:

- It can be applied to any mode and in any regional context;
- It does not presuppose that individuals are static with their respective segment;
- The term captivity is meant to emphasize the need for trip improvements;
- It strives to reconcile conflicting economic and equity perspectives.

Policy goals should strive to move individuals along the continuum illustrated in Figure 3, toward a more preferable and more practical realm of choice ("up" and to the "right" in the conceptual diagram).

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