

REDUCING CAR USE THROUGH CARPOOL PROGRAM (CASE STUDY PETRA CHRISTIAN UNIVERSITY)

Rudy SETIAWAN¹

ABSTRACT: The use of car by students as a primary mode for commuting to and from campus has profound effects on campus parking requirements and traffic congestion at the peak hour. It is interesting how to reduce the amount of parking provided and also minimize traffic congestion, but still meet transportation demand. One of the alternative solutions was Campus Transportation Management (CTM), that aim was improving transportation efficiency by reducing car dependency by changes to other transport modes. Carpool is one of the most common and cost effective alternative modes, particularly in areas that are not well serve by public transit. This paper aims to recognize the student respond regarding the carpool program and to identify reduction of car use if that program will implement at Petra Christian University. By analyzing 470 questionnaires, the paper presents two major factors that influence the student to join the carpool program, which are cost saving (29%) and attractive facility (26%). If the program will implement, there will be reduction about 796 cars per day (25.3%). Anyway the student which not interested on carpool program, still prefer to use automobile even if they should bear the consequences, such as higher parking charge and limited parking space.

KEYWORDS: carpool, ridesharing, campus transport management

1. BACKGROUND

The use of car by students as a primary mode for commuting to and from campus has profound effects on campus parking requirements and traffic congestion at the peak hour. The explosion in traffic has put significant strains on university dealing with ensuing congestion and limited land for parking expansions. This situation can result in strained relations between the university and the surrounding community, especially if the university is perceive as do-nothing to alleviate the traffic.

Transportation Demand Management (TDM) programs combined with improved alternative transportation facilities are proving to be very successful in offering university commuters option to single occupant driving. TDM programs encompass such as alternative mode incentive programs, car and vanpooling, campus shuttles, and parking management strategies.

Many college and university leaders are finding that these programs are very popular among students and employees who value inexpensive, convenient alternatives to driving alone everyday. Students will be able to experience more transportation options, which may influence their behavior throughout their lives. In short, university TDM or Campus Transportation Management (CTM) programs can be a win-win proposition. [1].

¹ Lecturer, Dept. of Civil Engineering, Petra Christian University, Indonesia

The aim of this study is to recognize the student respond regarding the carpool program and to identify reduction of car use if that program will implement at Petra Christian University.

2. CAMPUS TRANSPORT MANAGEMENT

Conventional planning practices tend to favor automobile-oriented solutions, and undervalue management solutions that can result in a more efficient, and therefore more sustainable, transport systems. Automobile Dependency is the cumulative effect of transportation and land use patterns that result in high levels of automobile use and limited transportation alternatives. An alternative term is automobile oriented transportation and land use patterns. In this case, “automobile” includes cars, vans, light trucks, SUVs, and motorcycles.

The opposite of Automobile Dependency is not a total lack of private vehicles; rather, it is a balanced or multi-modal transport system, meaning that consumers have a variety of Transport Options, and incentives to use each for what it does best. Efforts to create more balanced transport systems can involve a variety of specific actions to improve travel options, create multi-modal land use patterns, correct planning and pricing practices that favor automobile travel, and increase the prestige of alternative modes.

Many factors contribute to automobile dependency. During the last century there has been a self-reinforcing cycle of increased automobile travel, reduced travel options, and more automobile-oriented transportation and land use policies which result in a high level of automobile dependency in most communities. Figure 1 illustrates this cycle [2].

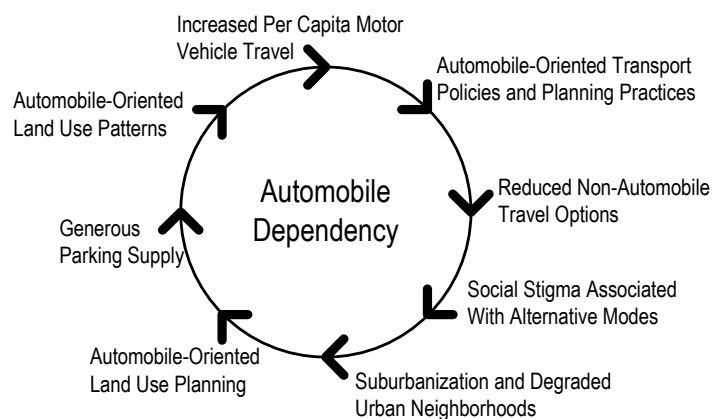


Figure 1. Cycle of Automobile Dependency

Automobile Dependency has many impacts. It increases total mobility, vehicle traffic and associated benefits and costs. It increases the importance of automobile travel and reduces the importance of other modes. In an automobile dependent community, virtually every adult needs a personal automobile (as opposed to a household automobile shared by more than one driver). Non-drivers must be chauffeur whenever they travel, and it becomes difficult to withdraw driving privileges for people who are physically, mentally or emotionally unfit, since there are few viable transportation alternatives. Automobile Dependency reduces the range of solutions that can be used to address problems such as traffic congestion, road and parking facility costs, crashes and pollution.

During the last decade, the University of Colorado community has been grappling with how to provide access to the campus without destroying the quality of campus as an education community. It has been a difficult and fascinating process, which has led to some fundamental changes in the way we approach transportation, we no longer automatically assume that the only solution to demand is building new parking facilities [1].

By building more parking, the university may inadvertently generate more traffic to the university district. Those who can afford it will purchase parking permits, while others will continue to park for free in the neighborhoods.

If a university generates traffic and overflow parking in surrounding neighborhoods, chances are it is also generating community relation problems. Many times, resident' complaints about, noise, safety, pollution and the inconvenience of finding parking in front of their own houses. If a university responds to traffic complaints by building more parking lots or structures, it may not obtain the desired outcome of alleviating neighborhood traffic [1].

One of the alternative solutions for that problem was Campus Transportation Management (CTM), CTM programs are coordinated efforts to improve transportation options and reduce trips at colleges, universities and other campus facilities. Transport Demand Management (TDM) tends to be particularly effective and appropriate in such settings. It is often more cost effective than other solutions to local traffic and parking problems, and students and employees often value having improved transportation choices [3].

The aim of Campus Transportation Management (CTM) was improving transportation efficiency by reducing car dependency by changes to other transport modes. Ridesharing is one of the most common and cost effective alternative modes, particularly in areas that are not well serve by public transit.

Ridesharing refers to carpooling and vanpooling (the term is sometimes applied to public transit, particularly commuter express bus). Carpooling uses participants' own automobiles. Vanpooling usually uses rented vans (often supplied by employers, non-profit organizations, or government agencies). Most vanpools are self-supporting – operating costs are divided among members. Vanpooling is particularly suitable for longer commutes (10 miles or more each way) [4].

Ridesharing has minimal incremental costs because it makes use of vehicle seats that would otherwise be unoccupied. It tends to have lower costs per vehicle-mile than public transit because it does not require a paid driver and avoids empty backhauls. However, Ridesharing is generally only suitable for trips with predictable schedules such as commuting or attending special events.

Rideshare programs typically provide carpool matching, vanpool sponsorship, marketing programs, and incentives to reduce driving. Rideshare incentives may include HOV Priority (e.g., HOV highway lanes), preferential parking spaces, and awards. Some employers offer Commute Financial Incentives such as a cash payment to employees who carpool, or a voucher that covers vanpool fees, provided as an alternative to a free parking space. Because they have significant economies of scale (the more people who register, the more effective they are at successfully matching riders), it is helpful if one well-publicized ride-matching program serves an entire geographic region.

3. METHODOLOGY

In order to know student response about implementation of carpool program at Petra Christian University (PCU), information about respondent characteristic and response were collected in the campus using a questionnaire. Five hundred copies of the questionnaire were given to the student and among the questionnaires collected, there were 470 effective replies.

They were ask three categories of question, namely: i) general information (years of study, sex, reason for using car as primary mode, etc.), ii) specific question for those who prefer to parking at other parking lot (reason, price per day, etc.), iii) response on offered facilities for SOV and HOV category (include preference to choose other mode for those who not interested to join carpool program).

4. RESULTS

As shown in the Figure 2 percentage of respondent using Single Occupancy Vehicle (SOV) are larger than High Occupancy Vehicle (HOV) for both drivers and non-drivers. That means most of student are driving alone (one person per car) and drive by chauffeur (two persons per car including driver).

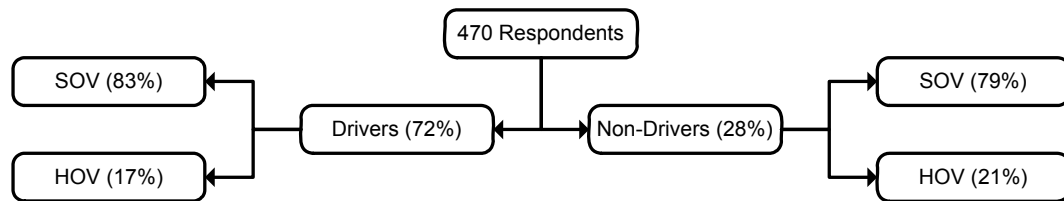


Figure 2. Proportion of SOV and HOV

Most of the students at 2nd and 3rd years of study tend to driving alone for commuting to and from campus (Figure 3).

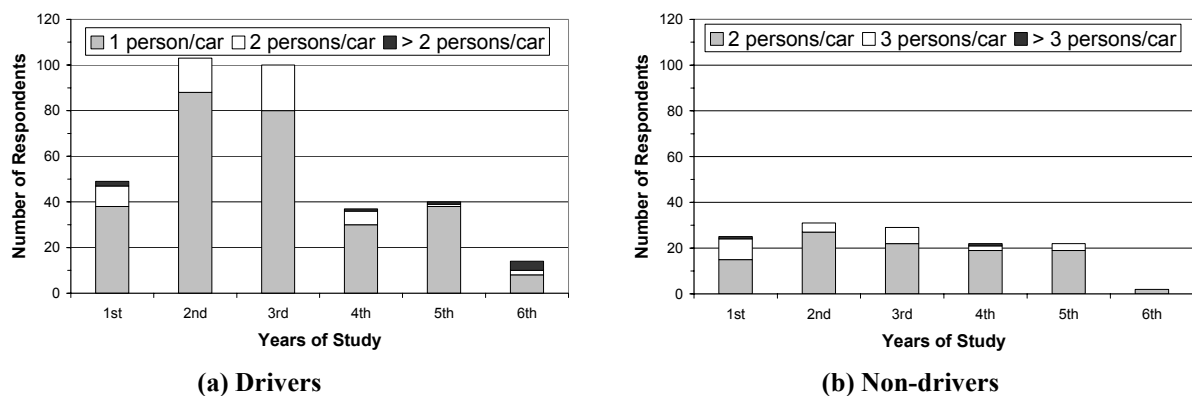


Figure 3. Car occupancy for each years of study

About preference on parking lot, most of the students prefer to parking at PCU and some of them prefer other parking lot because of shorter walking distance and easier to get empty parking space (Figure 4).

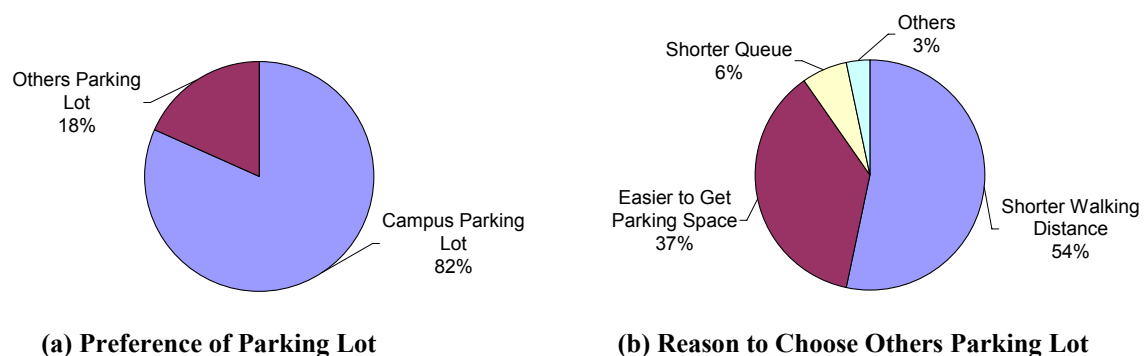


Figure 4. Respond about parking lot

Several facilities were offer to student as an incentive of carpool program as shown in Table 1. Those facilities was selected based on previous study[R] that indicate several major factor that could influence the student preference to choose the car as primary mode, such as availability of empty parking space, walking distance, parking price, and other incentives.

Table 1. Comparison of facilities between HOV and SOV as an incentive for carpool program [5]

Facilities	High Occupancy Vehicle (HOV)	Single Occupancy Vehicle (SOV)
Drop or pick passenger on campus area	Allowable	Prohibited
Parking lot	On campus area	300 meter from campus area
Number of parking spaces	Adequate	Limited
Easement to find empty parking space	Easy (support with parking space code system)	Bothersome
Parking lot condition	Covering with roof	Not available
Parking price per day	Rp. 1.000,-	Rp. 2.000,- s/d Rp. 5.000,-
Guaranteed Ride Home (GRH) ¹	Available	Not available
Parking Pass (PP) ²	Available	Not available

Explanation:

HOV = minimum two passengers per car (include carpool)

SOV = only one passengers per car (two passengers per car for non drivers)

1 Guaranteed Ride Home (GRH) programs provide an occasional subsidized ride to commuters who use alternative modes, for example, if a car pooler must stay at campus later than expected. This addresses a common objection to the use of alternative modes. GRH programs may use taxis, university vehicles or rental cars.

2 =Parking Pass provide an occasional parking permit for SOV driver to use HOV parking space if a car pooler occasionally must driving alone to campus (limited up to five times per semester).

Based on Table 1, respondent were asked about their preference whether they choose to keep driving alone (one passenger per car) or driving by chauffer (two person per car) as a SOV category, or they alter to choose to do ridesharing in this situation was become a carpooler as a HOV category. See figure 5 for their respond about carpool program.

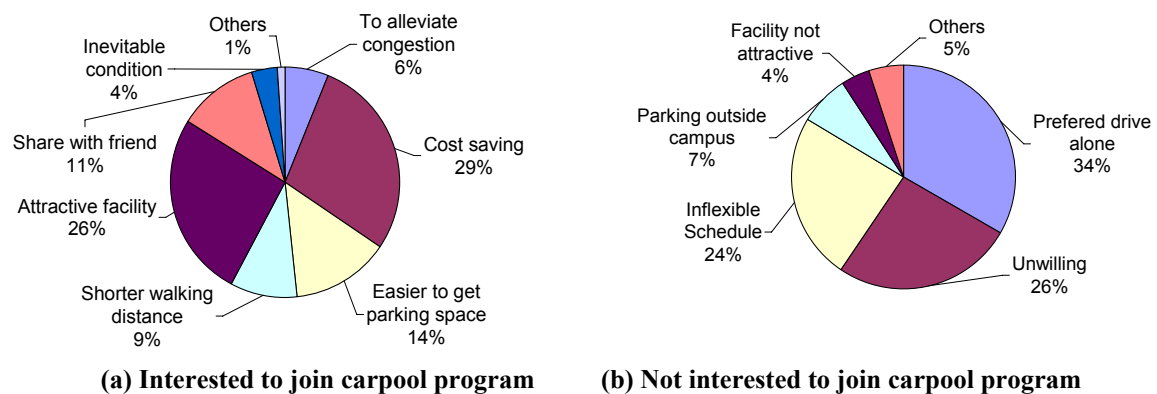


Figure 5. Respond about carpool program

As shown in figure 6, most of the student who interested to join carpool program were living in radii over than 5 kilometers from campus and almost equal for both sex.

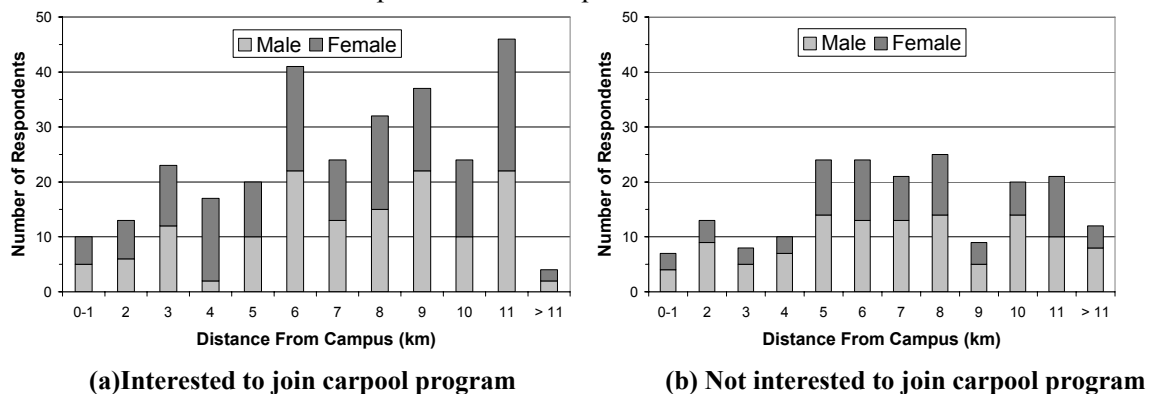


Figure 6. Respond based on distance between house and campus

Figure 7 shown comparison respond about carpool program for both drivers and non-drivers based on years of study.

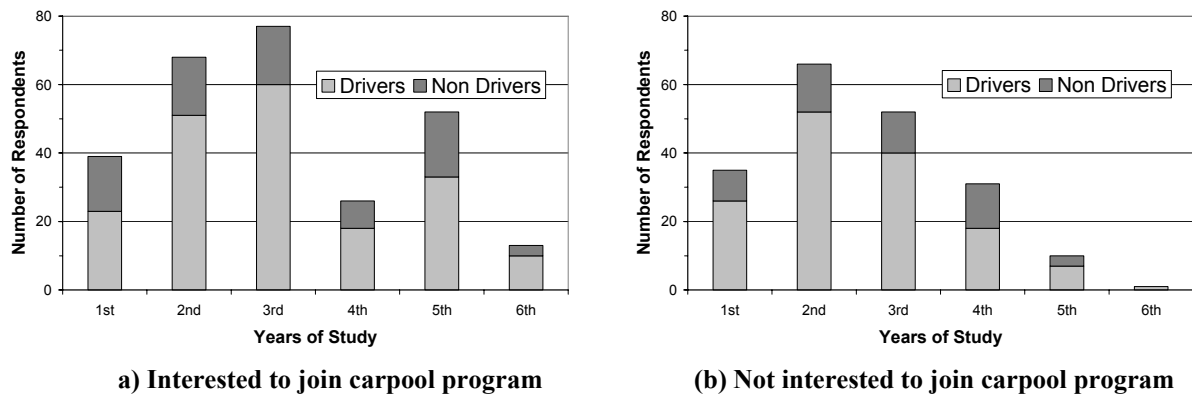


Figure 7. Respond based on years of study

Anyway the student which not interested on carpool program, still prefer to use automobile even if they should bear the consequences, such as higher parking charge and limited parking space (Figure 8).

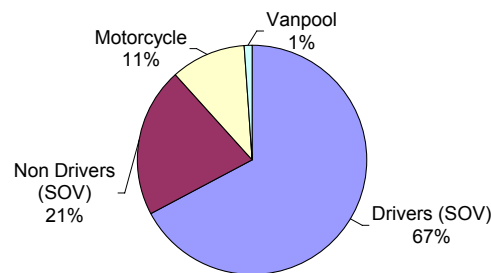


Figure 8. Mode choices for those not interested to join carpool program

Figure 9 present concise questionnaire analysis on respond about implementation of carpool program at PCU. From previous study [6,7] it is known that Petra Christian University (PCU) has about 850 parking space, and an average of daily traffic about 3,150 cars per day (12 hours) that enter parking lot, which make parking turn-over rate become 3.7 (each parking space using about three times per day).

As shown on Figure 9 if carpool program will implement at PCU, about 59% respondent are interested to change their behavior from driving alone (SOV) to become carpooler (HOV) because they get benefit from incentives that offering attractive facilities (Table 1).

By multiply every percentage value on each level of category, we can calculate reduction of car use and reduction of parking space due to implementation of carpool program. For explanation how to determine number of reducing car use if carpool program will implement at PCU, see Figure 10.

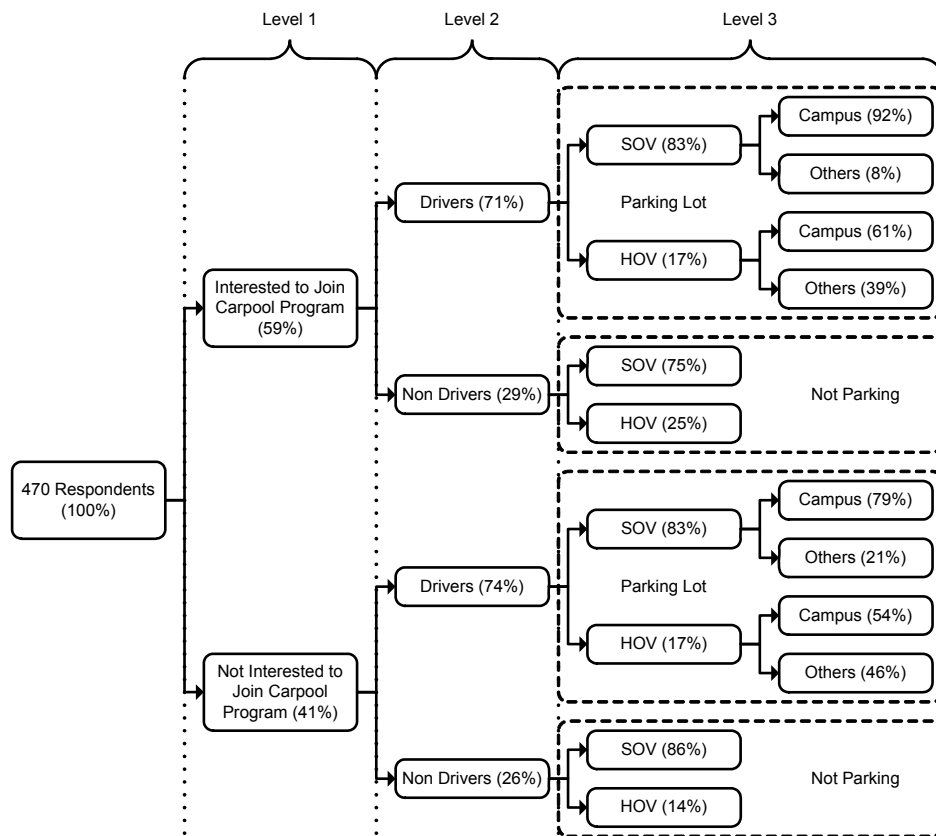


Figure 9. Summary of analysis

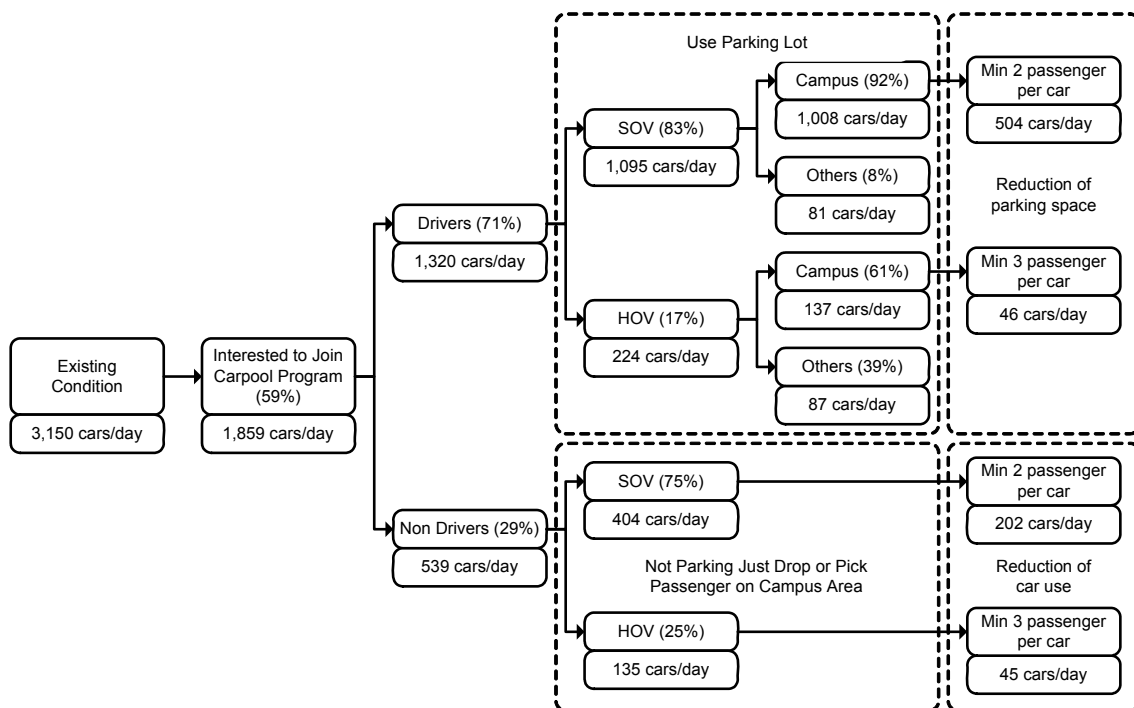


Figure 10. Number of car reducing due to implementation of carpool program

5. CONCLUSIONS

Based on the analysis, the implementation of carpool program can reducing car use about 796 cars/day (504+46+202+45) or 25.3% reduction from existing condition 3,150 cars/day and also reduce amount of car using PCU parking lot about 549 cars/day (546+46). Further study is needed to do feasibility study on implementation of carpool program at PCU.

6. REFERENCES

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