

Alternative Transportation Programs: A Countermeasure for Reducing Impaired Driving



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Technical Report Documentation Page

1. Report No. DOT HS 811 188		2. Government Accession No.		3. Recipient's Catalog No.	
Title and Subtitle Alternative Transportation Programs: A Countermeasure for Reducing Impaired Driving				5. Report Date September 2009	
				6. Performing Organization Code	
7. Author(s) Lawrence E. Decina, Robert Foss, Ph. D., Mary Ellen Tucker, Arthur Goodwin, Ph. D., and Jamie Sohn				8. Performing Organization Report No.	
9. Performing Organization Name and Address TransAnalytics, LLC 1722 Sumneytown Pike, Box 328 Kulpsville, PA. 19443 Highway Safety Research Center, University of North Carolina 730 Martin Luther King Jr. Blvd., CB 3430 Chapel Hill, NC 27599-3430				10. Work Unit No. (TRAIS)	
				10. Contract or Grant No. DTNH22-05-D-05043 Project 06-01138	
12. Sponsoring Agency Name and Address Impaired Driving Division, W44-212 National Highway Traffic Safety Administration 1200 New Jersey Avenue SE., Washington, DC 20590				13. Type of Report and Period Covered Final Report October 2006-March 2008 Task Order 0005	
				14. Sponsoring Agency Code	
15. Supplementary Notes Contract Officer's Technical Representative: Ruth Esteban-Muir					
<p>This report is a compilation of information on alternative transportation programs that could provide guidance to States and local communities in developing, refining, or expanding programs to address impaired driving.</p> <p>The impaired-driving problem is complex and requires the full range of countermeasures. Alternative Transportation (AT) programs emerged as an approach to reduce drinking and driving episodes. These services transport drinkers home from—and sometimes to and between—drinking establishments using taxis, privately owned vehicles, buses, tow trucks, and law enforcement agents. Some programs provide drivers to drive the drinker's car home along with the drinker. These alternatives to driving a motor vehicle while impaired have been in existence for several decades.</p> <p>Studies on AT programs commissioned by the National Highway Traffic Safety Administration concluded that specific characteristics of various programs show promise. These included accessibility, availability, and ease of integration into activity. The model AT program—one with the greatest likelihood of reducing crashes by impaired drivers—would be continually available, free to users, and would be convenient and easy to use, taking them directly to their homes and minimizing the need to retrieve a vehicle later.</p> <p>The report also provides insight into appropriate experimental design methodology to use when evaluating AT programs.</p>					
17. Key Words alternative transportation Alcohol-impaired driving				18. Distribution Statement	
19. Security Classif. (of this report)		20. Security Classif. (of this page)		21. No. of Pages 54	22. Price

ACKNOWLEDGEMENTS

The authors wish to thank many individuals for their cooperation and assistance during the course of this project, including: Kathy Lococo (TransAnalytics, LLC) and peer reviewers Dr. James Hedlund, Dr. Doug Beirness, and Barbara Alvarez Martin.

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INTRODUCTION

Overview

Alternative transportation describes transportation methods used to avoid driving a vehicle while impaired. Since the late 1980s, the National Highway Traffic Safety Administration (NHTSA) commissioned several studies to compile information on existing alternative transportation programs and evaluate for effectiveness as a strategy used to address impaired driving. A review of those efforts concluded that specific characteristics of various programs show promise. These included accessibility, availability, and ease of integration into activity. NHTSA commissioned TransAnalytics, LLC, to compile information on alternative transportation that could provide guidance to States and local communities in developing, refining, or expanding programs to have greater potential for addressing impaired driving.

This publication describes alternative transportation programs as an approach to reducing impaired driving. Sections include: (1) background on alternative transportation; (2) types of alternative transportation programs; (3) evaluated alternative transportation programs; (4) developing an effective alternative transportation program; and (5) the research methods used for this publication. It is intended for States and local communities that are considering implementation of an alternative transportation program as a strategy to address impaired driving.

The public's increased use of existing transit systems presents an opportunity to implement and further integrate alternative transportation program strategies that

address impaired driving. According to the Federal Transit Administration 2004 data, transit agencies in urban areas operated 120,659 vehicles (5% more than in 2002) of which 92,520 were in areas of more than 1 million people. Rail systems comprised 10,892 miles of track and 2,961 stations. There were 793 bus and rail maintenance facilities and 2,961 stations in urban areas, compared with 769 maintenance facilities and 2,862 stations in 2002. The most recent survey of rural operators in 2000 estimated that 19,185 transit vehicles operated in rural areas. Transit passenger miles traveled (PMT) increased by 1.3 percent between 2002 and 2004, from 45.9 billion to 46.5 billion. In 2004, 41 percent of PMT were on motorbus, 31 percent were on heavy rail, 21 percent were on commuter rail, and 3 percent were on light rail. The remaining modes accounted for 4 percent.¹



¹ Federal Highway Administration & Federal Transit Administration (2006). Status of the Nation's Highways, Bridges, and Transit Conditions & Performance: Report to Congress. Washington, DC: Federal Highway Administration, Federal Transit Administration.

BACKGROUND

Motor vehicle crashes are the leading cause of unintentional death in the United States. According to the 2007 Annual Assessment of Motor Vehicle Traffic Crash Fatalities and People Injured, 41,059 people were killed and 2.49 million were injured in motor vehicle traffic crashes. There were 12,998 people killed in alcohol-impaired-driving crashes. These alcohol-impaired-driving fatalities accounted for 32 percent of the total motor vehicle traffic fatalities in the United States. According to the Department of Justice, nearly 1.4 million drivers were arrested in 2005 for driving under the influence (DUI).² That is less than 1 percent of the 159 million

countermeasures. Alternative transportation (AT) programs are one approach to reducing alcohol-impaired driving crashes. These services transport drinkers home from—and sometimes to and between—drinking establishments using taxis, privately owned vehicles, buses, tow trucks, and law enforcement agents. Some programs provide drivers to drive the drinker's car home along with the drinker. These alternatives to driving a motor vehicle while impaired have been in existence for several decades (Hedlund, 2005). Review of the literature suggests that specific characteristics (accessibility, availability, ease of integration into activity) have the greatest likelihood of encouraging drivers to choose an alternative transportation rather than driving after drinking. The most effective AT programs are likely to be those that provide the greatest coverage of times, geography, individuals, and which involve the fewest practical barriers to their use, consequently achieving maximum ridership among individuals who would otherwise drive while impaired. Besides having a conceptually broad, operationally strong program structure, those that are most extensively and appropriately



self-reported episodes of driving after drinking alcoholic beverages among U.S. adults each year (Quinlan et al., 2005).

The impaired-driving problem is complex and requires the full range of

integrated into a multi-faceted community approach to addressing impaired driving can be expected to have the greatest benefit.

The most frequently used alternatives are those that occur in the social context of drinking such as choosing to use a designated driver, family member, or friend as alternative to driving after drinking. These types of programs encourage people who

² Driving or operating a motor vehicle or common carrier while mentally or physically impaired as a result of consuming an alcoholic beverage or using a drug or narcotic.

are drinking to designate a person who will not drink to provide them with a safe ride home. There are variations on this basic principle. Some programs involve incentives, wherein a bar or restaurant offers free

non-alcoholic drinks and/or food to the designated driver. This publication focuses on programs outside personal social context. Therefore, designated driver programs were not included.

PROGRAM TYPES

AT programs in the United States vary in size, sponsorships and community involvement, funding sources, and how the programs are operated. Characteristics of these programs vary in terms of mode of transportation (e.g., personal vehicle, limousine, bus, taxi, trolley, tow truck, and scooter); type of organization (non-profit, profit); free versus fee-based; type of appointment (reservation in advance; call from location); geographic range of service; and hours of operation. Only a few of these AT programs have been evaluated in terms of public awareness and acceptance or scientific investigation to determine benefits (e.g., crash reduction, reduction in impaired drivers).

AT programs are best described and categorized by mode of transportation. Despite variations in transportation mode, they all have the mission: to save lives and prevent injuries by offering drivers a safe alternative to driving while impaired. Descriptions and examples of AT programs using personal vehicles, limousines, buses, taxis, trolleys, tow trucks, and scooters follow.

A section on college-based AT programs follows the general overview of AT programs. Typically, these programs are designed for student use for transport to and from a campus, for off-campus residents, and various locations in the campus community.

Personal Vehicles

These AT programs involve a client calling a dispatcher (usually a toll-free number), who sends a vehicle to take the client(s) home. These programs typically use pairs of volunteers or paid drivers. Ideally these include both males and females. One member (of the same sex as the client) drives the client and any passengers home in the client's vehicle. The second volunteer follows in the volunteer's vehicle to pick up the program driver. These services are usually free up to a certain distance, but tips are encouraged. Some programs are not free, and some require an advance appointment. These programs range from small operations with a single owner and a few drivers (Shaw, 2006) to large-scale operations (several administrators and dozens of drivers). A couple of large scale operations are described.

The Designated Drivers Association³ (DDA) of San Diego is a non-profit organization that operates a free service (up to 15 miles) and then a \$20 fee is charged. Trips greater than 25 miles incur a charge of \$40. They do not take reservations. Its program covers the city and surrounding areas. The service is offered every Friday and Saturday night from

³ P.O. Box 81362, San Diego, CA 92138, 619-692-0830, <http://ddasd.org/>

10 p.m. to 2 a.m. year round, and on major holidays. The operation uses teams of two (male and female) to drive clients home in the clients' vehicles. The program advertises its service using posters, and distributes wallet-size cards with hours of operation, toll-free number, and sponsor's logo in and around bars, on campuses and military bases, and at driving schools. The primary target is young adults, especially males 21 to 29 years old. The DDA in San Diego has driven more than 4,500 vehicles and 11,000 people home in over 4 years of operation.

An evaluation of the DDA in San Diego was conducted by the California Institute of Transportation Safety at San Diego State University. The researchers interviewed program users in-vehicle at the end of the ride to learn why individuals choose to use the program and to document the (self-reported) drinking and driving behavior of program users. The San Diego survey was conducted with over 500 riders. Participants reported spending an average of 4.8 hours drinking, during which they consumed an average of 7.8 drinks. About half of the riders were college-educated. Males reported consuming significantly more drinks than females. Almost three-quarters of the drivers had more than one passenger. Participants, rather than friends, called the AT service for themselves in almost half the cases. Friends were more likely to have called when the driver was female (Sarkar, Andreas, & De Faria, 2005).

An evaluation of another DDA program in California (Sacramento) was conducted by the same researchers with about 1,500 riders. They found that participants went to an average of 1.5 bars, and the average length of a ride was 11 miles for a freeway drive, and

14 miles for a non-freeway drive. Forty-four percent reported that they would have driven themselves home on the night of the study if the service was not available, and 40 percent said they would have driven back roads to avoid being stopped by law enforcement (Sarkar et al., 2005).

SafeRide America⁴ is operated by the National Council for the Prevention of Impaired Driving/SafeRide America in the greater Atlanta, Georgia, area. It is a nonprofit organization operating with a three-member staff and a \$750,000 annual budget. It depends on volunteer drivers, donations, membership support (11 Atlanta bars and restaurants have contracts with them), and traditional fundraising to offset costs to the end-user. It is a professional driver-for-hire service. Fees are \$10 to \$20, plus \$2 per mile beyond a certain point. A tax-deductible donation is also requested. It covers the Atlanta area (1,573 square miles in four counties). The program operates on-call from 8 p.m. to 4 a.m. and 24 hours per day by advance reservation. Teams of two drivers take impaired individuals and their vehicles home. The program advertises in bars and restaurants with signs, and waiters and waitresses distribute orange cards to advertise the service. They do not target any specific sex or age group. By 2005, more than 40,000 rides had been provided by the program. An evaluation of program effectiveness has not been conducted to date, but the operation keeps statistics on characteristics of riders (sex, age), distance of ride, and perceived level of inebriation (scale of 1 mildly impaired to 4 heavily impaired).

⁴ 130 W. Wieuca Rd. NE., Suite 205, Sandy Springs, GA 30342, 404-888-0887, <http://saferideamerica.org/>.

Limousines

These AT programs usually involve a large vehicle that can accommodate a larger party that is picked up at a location at the beginning of an evening. Reservations are usually required. An example of a program initiated with NHTSA funds a few years ago is described. In addition, an example of a one-person operation is provided. A benefit to using limousine service is that clients do not need to worry about leaving their own vehicles at the drinking establishments. Their vehicles stay at home.

The Road Crew program was established by the Wisconsin Department of Transportation's Bureau of Traffic Safety through NHTSA funding in 2001. Partners of the program include the University of Wisconsin School of Business, Miller Brewing Company, The Tavern League of Wisconsin, and MasComm Associates. The cost of the service ranges between \$25 and \$50. Reservations can be made in advance using a toll-free number. The program operates in western Wisconsin in several small communities in Barron County, Fox Valley, Southern Grant County, Iowa County, LaCrosse County, and Polk County. The service provides a low-cost ride using pre-owned limousines, from home to a drinking establishment and back home or sometimes even from bar to bar. The program is aimed at 21- to 34-year-old single males, primarily blue collar and farm workers. Advertising geared to this age group is distributed in the target bars and restaurants. Almost 20,000 rides were given to potential drunk drivers in the first year of operation (2002-2003). More information about the program is

provided on the Road Crew Web site.⁵ An evaluation of the reduction in alcohol-related crashes; estimated costs of reduced crashes; and community awareness was conducted by the University of Wisconsin School of Business (Rothschild, Mastin, & Miller, 2006). Details of the evaluation are presented in Evaluated Programs section of this report and in the appendix.

Limo Don is an example of a small grass-roots operation. It is a one-person operation by Don Deviney, whose personal mission is to reduce impaired driving in his community. He offers free rides home to any customer (without a reservation) from three bars in the Denton area of North Texas. He uses his SUV and operates from 10 p.m. to 3 a.m. on Thursday, Friday, and Saturday nights. Efforts to promote the program are currently being developed in conjunction with local radio stations, restaurants, speedways, and beer manufacturers. The service provides an average of 30 rides per night. Anecdotal evidence supporting his program and mission statement can be read at his Web site.⁶

Buses

Some AT programs involve transit agencies. In the Madison, Wisconsin, area the Metro Transit System⁷ (Madison and Dane County teamed up with a beer manufacturer to offer free transit rides to patrons during holidays and city events known as the Miller Free Rides⁸ program. It is a free ride service on

⁵ <http://www.roadcrewonline.org/>.

⁶ www.myspace.com/racinglimosofdallas.

⁷ <http://www.metrocouncil.org>

⁸ Miller Brewing Company, 3939 West Highland Blvd., Milwaukee, WI, 53201-0482, 414-931-2000, <http://www.millerfreerides.com414-931-6519>.

the transit system during the New Year's Holiday from 7 p.m. December 31 to 3:30 a.m. on New Year's Day. The program also operates during other special events such as festivals and parades. During the 2003-04 New Year's period 5,000 free rides were



provided in the Madison area. It was estimated that 1,000 car trips were eliminated that night. The service is advertised through radio and on posters at bus stops.

Special late-night bus service is common on college campuses. These services provide

late-night rides to the student body. Patrons must show a student identification card before entering the bus. Alternative transportation on college campuses is covered in the College-Based Programs section of this report.

Taxis

AT programs have been coordinated with taxicab companies and other sponsors to offer free rides in limited areas during

holiday periods. The SoberRide⁹ program is a non-profit organization operated by the Washington Regional Alcohol Program (WRAP) in the greater Washington, DC, area. The cost varies from free to \$50. There is a toll-free number to call for a reservation. It operates between 8 p.m. and 4 a.m., during the winter holidays, St. Patrick's Day, Independence Day, and Halloween. From 1993 to 2006, 29,500 rides had been provided with this service. In 2005, 602 people used the service over the winter holiday season. Several sponsors work with WRAP, including Anheuser-Busch, Cingular, Enterprise Rent-a-Car, GEICO, Giant Food, Inc., Red Top Cab, Washington Area New Automobile Dealers Association, and at least 10 cab companies. The service is advertised by radio, TV, and bus stop posters throughout the greater Washington, DC, area.

The Sober Cab program in Cambridge, Minnesota, is an example of an innovative AT concept using taxicabs and bar owners. It was developed by Judge James Dehn in Isanti County. He noticed that a large number of people arrested for DUI were coming from bars. Thus, the idea for including bar owners and their staff in the process of getting impaired patrons home safely was born. The program gives local bartenders a phone number to call a cab for anyone they believe is too intoxicated to drive. The cost of the cab ride is covered by the bar owners, the community coalition, and grant funds from Minnesota's Department of Public Safety. In addition, local law enforcement cooperates by not fining drivers (who were driven home in cabs) for leaving their vehicles parked on the streets overnight. The cab company

⁹ 1420 Spring Hill Rd., Suite 250, McLean, Virginia, 703-893-0461, www.wrap.org.

bills the bar owners and the program covers the costs. Over 500 rides were given in the first year of operation (December 2005 - December 2006).

The Get Home Free Card program¹⁰ is a unique operation that mainly targets teenagers and college students. The program founders aim to assist teens and young adults who have car trouble, have been drinking, or whose ride home has fallen through. Cardholders in the program place a call to the Get Home Free hotline, and a car is immediately dispatched to bring them home, with no questions asked. A flat rate, pre-paid fee of \$70 is the cost for the card for one use.

Trolleys

Trolley services in resort towns are another AT program category. The intent of these services is for tourists and locals to leave their vehicle at the hotel or home and to visit attractions, restaurants, and alcohol-serving establishments by using the trolley service that stops at these destinations throughout the town.

Jolly Trolley Program of Rehoboth Beach, Delaware¹¹, uses a trolley car towed by a multipurpose van. It is a seasonal program operating during the summer. The fares are \$2 (\$3

after midnight) one-way. The trolley stops at 10 locations in the Rehoboth and Dewey Beach resort communities of Delaware. Though it is primarily used as a sightseeing ride program, it does operate until 2 a.m. Many seasonal visitors use the trolley late at night to go home from the large number of bars and restaurants in these two towns. Similar programs are offered in other resort towns such as Cape May, New Jersey.

Tow and Ride

Another AT program approach is the use of a towing service. Customers who recognize the need for a ride home after drinking can call the service and their vehicles are towed home as they ride home in the passenger seats of the tow trucks. This eliminates the



¹⁰ Division of Advanced Marketing Team Inc., 5100 Thimsen Avenue, Suite 229, Minnetonka, MN 55345, 952-470-4035, <http://www.gethomefree.com>.

¹¹ P.O. Box 311, Rehoboth Beach, DE 19971, 302-227-1197, 302-227-1197.

need for two people picking up the patron with one person driving the customer's vehicle home as well. However, this service may not be perceived as very discreet. Potential customers might be reluctant to use this service, knowing the tow truck would be dropping off their vehicles late at night at their homes, and possibly waking up the neighbors.

The Tow to Go Program¹² of Florida is a partnership between AAA Auto Club of South Florida and Budweiser. This free-ride service provides party goers and licensed establishments a way to get people home safely during the holiday season (Thanksgiving to New Year's). A number of these programs throughout Florida offer free rides to individuals (and a free tow for their vehicles) who have had too much to drink and are without designated drivers. Adults in need of a ride call a toll-free number, and AAA dispatches a tow truck that takes both the driver and vehicle home, free of charge. This service is available throughout Florida to both AAA members and nonmembers. Similar programs operate in the cities of Savannah and Atlanta, Georgia, and Nashville, Tennessee. AAA Auto Club of South Florida advertises the service on radio. It average about 1,000 tows a year. The busiest night is New Year's Eve. AAA of East Tennessee's program can be contacted through Metropolitan Drug Commission.¹³

Scooters

This type of AT program is similar in operation to the personal vehicle approach.

This service provides a person who arrives at the customer's location on a scooter, folds it into the customer's trunk and drives the customer home. The drawback is the limited area in which the scooters can safely travel. This type of program is probably more practical in areas of mild weather, low traffic volume, and low speed roadways.

Two programs operate out of the greater Los Angeles area. The Home James program¹⁴ operates in Los Angeles. Program hours are 10 a.m. to 3 a.m. Reservations must be booked 24 hours in advance. The scooter service is \$55 for the first 5 miles, and \$5 per mile thereafter. Franchises are offered and the program was featured in a reality television program released in Europe. It also offers to sell the scooters. Another program is the Scooter Patrol.¹⁵ This is a nonprofit organization out of Los Angeles and Orange Counties. It is a free service available anytime for impaired customers. It covers several of the beach resorts in the two counties and operates from 6 p.m. to 2 a.m. seven days a week. The program relies on volunteers and despite the fact that a payment of service is never required, tips are accepted. The program also incorporates an outreach program through bars and restaurants, offering education on the ramification of DUIs, on dangers of impaired driving, and on the ways to avoid impairment. Brochures are handed out at these establishments. The program has safely transported nearly 10,000 people in the last four years.

Another program operates in Suffolk

¹² 800-AAA-HELP.

¹³ P.O. Box 53375, Knoxville, TN 37950-3375, 865-588-5550, <http://www.metrodrug.org>.

¹⁴ 453 S. Spring St., Los Angeles, CA, 213-347-0155, www.homejames.com.

¹⁵ P.O. Box 854, Sunset Beach, CA 90742-0854, 562-577-7365, <http://www.scooterpatrol.org>.

County, New York, primarily serving the South Hampton to East Hampton region of Long Island every day during the summer vacation season and limited service on weekends at other times of the year. Lilybug is a self-sustaining service. The average fare is \$30 within the 5-mile radius of its base operation. Reservations must be made in

advance. There are 12 drivers on call from 9 p.m. to 6 a.m. on weekends. The company is also in the business of selling and renting scooters (\$50 per hour). The operation is currently in the process of obtaining sponsorship from the liquor association board and other community organizations.

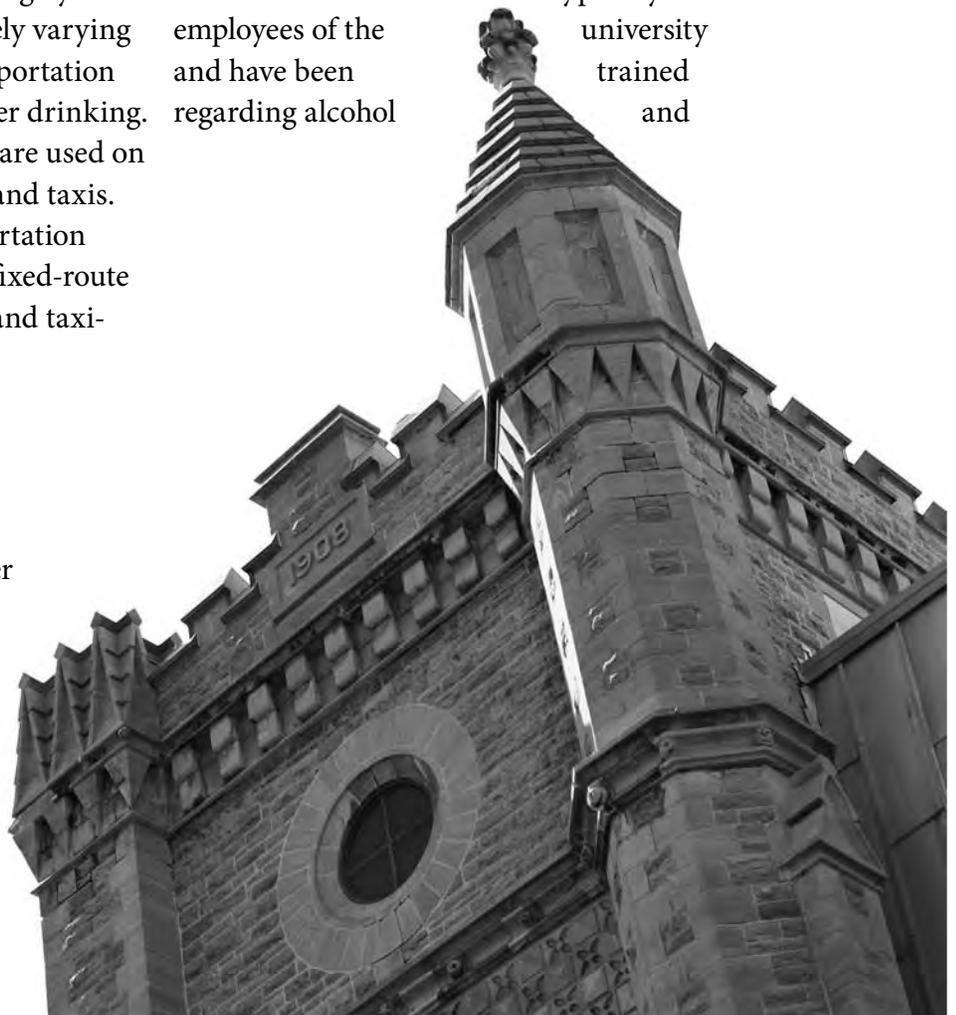
COLLEGE-BASED PROGRAMS

A recent survey revealed that 31.4 percent of 18- to 24-year-old college students report having driven under the influence of alcohol, which is approximately 2.8 million students (Hingson, Heeren, Winter, & Wechsler, 2005). Although educational institutions make efforts to discourage drinking by underage students, there are widely varying approaches used to provide transportation to help students avoid driving after drinking. Various modes of transportation are used on campus, but are primarily buses and taxis. In general, three types of transportation are typically offered to students: fixed-route shuttles, point-to-point shuttles, and taxi-like services.

Fixed-Route Shuttle Programs

Fixed-route shuttle programs offer a bus or other large vehicle that follows a fixed route on campus. Although these may go into town on the route, the purpose is not to be a “downtown shuttle” or service between bars. While these types of campus-based transportation systems may not typically promote services as alternatives

to driving impaired, many include operating hours during times of higher drinking activity. The main purpose of such systems is to transport students between residences and campus locations. Fixed-route shuttles are usually paid for, at least in part, by student fees. Drivers typically are employees of the university and have been trained regarding alcohol and



student safety issues. An example is the P2P Express at the University of North Carolina at Chapel Hill, which offers free, regularly scheduled transportation to all students along a fixed campus route. A point-to-point demand-response van is available for those passengers not on the P2P Express bus route. The Express operates seven days a week during academic semesters from 7 p.m. to 3 a.m.

Point-to-Point Shuttle Programs

Point-to-point shuttle programs use vehicles (cars, vans, buses) dispatched from a point on campus to a location from which a student or group of students request transportation to another specified location, which is often a residence. These shuttles may or may not provide transportation to town locations depending on the program. Some have policies proscribing transportation of nonstudents. For example, Safe Ride at Salisbury University, in Salisbury, Maryland, offers students a “no questions asked – safe ride” from a 3-mile radius of campus back to their on- or off-campus residences. It is operated by the Safe Ride Organization, the student government and university police. It is a free service, but the student must show a college ID card. The program

operates Thursday to Saturday, 10 p.m. to 3 a.m. About 600 students use the service per weekend.

Taxi-Like Service Programs

Taxi-like service programs generally involve the schools contracting with a local taxi company to provide safe rides home for students. These programs vary in what services they provide and how students pay for the service. The one characteristic that unites all of the programs that employ this mode of alternative transportation is the fact that all students can use the taxi service without paying at the time of the ride. Payment methods vary, from having the cost of the ride added to the student’s account, to voucher services provided by the university which absolve the student of any and all financial responsibility for the ride. Some universities that use a voucher system that requires students to sign a pledge that they understand the rules of the program. Any abuse of the taxi service will cause their access to be terminated. For



example, the University of Texas at Austin has the Designated Driver Program that is supported by the Interfraternity Council. Yellow Checker Cab Company provides cab service to any student with a valid ID from anywhere in Austin to the student's home address. Student fees and donations from campus organizations and local businesses primarily fund the program. The program is run by a student board of directors that oversees its operations, volunteer recruitment, and promotion. The cab service operates Thursday to Saturday from 11 p.m. to 3 a.m. during academic semesters.

Similar programs are offered by other colleges and universities, and while they usually employ one modality exclusively, other schools mix and match features from each type of alternative transportation program and tailor the final program to their particular campus and the specific needs of their students. A few universities take extra steps with these programs to make them more enticing to students by offering free service with a valid college ID and providing ways to allow overnight parking on the streets.

In general, larger schools have more programs in place to address the issue of student safety. They often have services that smaller colleges either don't need, due to the size of the student body, or can't afford to implement. The need for AT sources varies substantially depending on the location of a university or college. A residential institution where most students live on campus is less likely to have a program to transport students—unless it is a relatively isolated rural campus, in which case there may be organized transportation to a nearby community. In contrast, a large urban university with many students living off campus in the

community may be more likely to address student transportation needs, for both those who live off and on campus.

Dozens of alternative transportation programs are in operation on college and university campuses across the United States. Their missions are to save lives and prevent injuries by offering students and their companions a safe alternative to driving while impaired.

Program Evaluations of Campus-Based Alternative Ride Service Programs

The literature review identified only two college-based studies that addressed the use of campus-based AT programs. These studies did not evaluate effectiveness in terms of crash or injury/fatality reductions on campus. Instead, the researchers focused on student attitudes towards use of the AT service and drinking behavior.

In 2001, Elam, McKaig, Jacobs, Whitlow, and Louis (2006) evaluated the fixed-route late-night safe ride program called the Midnight Special operated by Midwestern University. This is a campus of 39,000 students. The ride service consisted of three fixed routes: one for the north side of campus where most fraternity and sorority houses are located; one which served the south side of campus, the site of many residence halls; and one serving off-campus apartments. Each route had pick-up sites at designated campus locations. Students were admitted onto the buses by showing student identification cards to the drivers. After boarding the bus, the driver dropped students off at requested spots along the route, including bars and restaurants in the

city. In town, students could flag the driver to stop and pick them up.

Data was collected to determine student use of the AT program. Impressions of its utility and value were obtained from focus groups and interviews with members of student groups and community stakeholders, including campus and city police captains, bus contractors, drivers, and monitors. Campus and city arrest records for operating under the influence (OUI) were also obtained for the study period. However, research design limitations on the use of human subjects affected the ability to directly sample the student ridership. Findings from the focus groups indicated that the AT program may be a recognizable safe ride program by students and community stakeholders. Its value was as an alternative ride service for students who drink and want to travel to and from bars. While most stakeholders perceived the program positively as ensuring safe transportation, some perceived it as encouraging drinking. However, stakeholders agreed that it was one safe and convenient way to combat the fallout from college student drinking. In examining needs for future research in this area, the researchers stated that direct surveys of the ridership would have provided more insight as to who rode the bus, why they chose to use the program, and the perceived effects on drinking behavior (Elam et al., 2006).

Another study in the early 2000s (Mundorf, 2006) evaluated the University of Rhode Island's AT program for college students who travel from the campus location in Kingston to Providence for entertainment and socialization with other college students.

At the time of the study, no public transportation was available from Providence to Kingston after 10 p.m., and taxi fares were prohibitively expensive for student budgets. Consequently, students drove their own vehicles from Kingston to Providence and back at night after visiting bars and consuming alcohol. Starting in 2002 and ending in 2004, an alternative ride service program operating between the campus in Kingston and Providence was established for students. Operating on Thursday night, bus service was established for on-campus students attending a weekly event in Providence known as "College Night." The goal of the bus service was to enable students to reach entertainment venues and return safely. Aims were to eliminate impaired driving by students, and to provide alternatives to counter on-campus student perceptions that there was "nothing to do" on or around campus at night. Media coverage in the newspaper, on local television stations, and the student newspaper created public awareness. Strategies were developed to manage behavior problems on the buses.

AT program ridership increased from 2,250 student riders in the first year of operation in a 30-week period to nearly 5,000 student riders in the second year of operation in a 30-week period. It was estimated that over 1,000 vehicle trips were saved with a considerable number of these trips estimated to be by intoxicated drivers. The results of the needs assessment survey given to students participating in the Thursday night AT bus service showed that two-thirds of the students took the bus to Providence to go drinking. Survey findings also revealed that a majority of students reported going out

two to four nights per week. This indicated a need for alternative transportation and entertainment options on nights other than Thursday. These same students stated that they would use alternate transportation if provided and announced on the campus cable system and other venues. In addition, about half of the respondents reported they used the AT service for convenience. An encouraging finding was 42.2 percent of respondents said they would not have left campus without the bus service. Over 50 percent did report that they would use a car or carpool. Most students reported that they would use the bus service to avoid riding with an intoxicated driver and for safety. Economic considerations were considered secondary (Mundorf, 2006).

Results from the survey showed that the AT program raised awareness among the

student population regarding alcohol use and impaired driving, and provided opportunities that encouraged safe transportation behaviors. The researcher recognized the need to have better knowledge of pertinent assessment tools, involve students in transportation projects, including integration of these topics into the institutional curriculum, and a strategic dissemination plan to reach their target audiences. These would include websites, cable, and local broadcast television channels. Fundamental attitudinal change processes need years to evolve. Due to the 4-year cycle of college life, structures and messages need to be in place to target attitudes and behaviors early on (freshman year), and to reinforce early changes throughout this cycle of college life (Mundorf, 2006).

EVALUATED PROGRAMS

A literature review to compile information on existing programs around the world resulted in very few evaluated programs showing effectiveness or promise for potentially impacting impaired driving. Following is an overview of five studies that have evaluated alternative transportation (AT) programs using safety-related outcome measures as well as other proxy measures of program effectiveness. NHTSA sponsored four of these studies; the fifth was sponsored by the Quebec Automobile Insurance Society. The programs described here are provided for those interested in examples of how or how not to implement an alternative transportation program intended to address impaired driving.

I'm Smart

In the early 1990s, a NHTSA report summarized an evaluation of two types of AT programs. I'm Smart (central New York) was a year-round, for-profit corporate program with paid drivers who provided rides home in the customers' own vehicles. The program offered membership, discounts, publicity and awareness, and server intervention programs. Ridership was 2,500 rides annually. The second program, Sober Cab (Minneapolis and St. Paul Minnesota) operated only during holiday periods and provided rides using a commercial taxicab service. Customers paid for their rides home. The program was operated by a consortium of hospitals, and multiple types of media publicity were used. Ridership was approximately 1,000 rides annually (Molof, Dresser, Ungerleider, Kimball, & Schaefer, 1995).

The I'm Smart program was evaluated using general crash and alcohol-related crash data in intervention and comparison counties; as well as responses from the public on awareness of the program through questionnaires provided at DMVs, surveys at health fairs, and interviews at alcohol-serving establishments. The SoberCab program used DWI data to evaluate treatment versus comparison communities. The researchers also conducted telephone surveys to assess public awareness of the program. For the year-round I'm Smart program, although 50 percent of the individuals interviewed knew of the program, only 5 percent reported they had called for a ride from this service. Efforts to examine the effect of these programs on alcohol-related crashes were hampered by insufficient availability of crash data. The SoberCab program was highly recognized by the public, but the short time period of the program and the limited number of DWI arrests made it difficult to determine any measurable effect on DWI arrests (Molof et al., 1995).

Tipsy Taxi

Another NHTSA-sponsored study in the mid-1990s examined the Tipsy Taxi Service in Pitkin County and Aspen, Colorado. This AT program involving taxicabs was administered through the Sheriff's Office with assistance from local law enforcement and the restaurant association. The year-round service was free, confidential, and even covered parking tickets and towing fees for vehicles left by individuals who used the service. The service was initiated by a bar employee or peace officer who identified patrons who may be in need of help. Bar

patrons were also able to place a request through the bartender. The service was funded by several sources including regular local fund-raising events, and sales tax on alcohol. Publicity events were regularly conducted. Over 20,000 rides were given through the service over the course of the 15-year period between 1984 and 1999 (Lacey, Jones, & Anderson, 2000).

Program effects were examined using interrupted time series analysis of quarterly counts of nighttime crashes and injury crashes. There was a significant 15-percent reduction in injury crashes following implementation of the program. However, a before-and-after analysis of the ratio of the intervention county's fatal crashes to those in two comparison counties showed no significant change after the intervention. Examination using an analysis of variance of fatal crashes as a function of county and period also found no significant difference.

Analysis of fatal crashes was of limited value in view of the small numbers that occurred in these small communities. The decline in injury crashes may suggest that this ride service program may contribute to reducing alcohol-related crashes. The availability of the service 24 hours a day, all year round, was cited as an important factor in its impact (Lacey et al., 2000). Although the results of this study were encouraging, the lack of adequate outcome data to support a thorough evaluation and the atypical nature of the community (tourism for skiing with the population doubling in the winter) argue for caution in interpreting the findings.

CareFare

Another NHTSA-sponsored study in the mid-1990s examined the potential value of a workplace-based AT ride service program using taxis in Dane County, Wisconsin. The CareFare Program was set up in two



types of workplace environments, a “blue collar” manufacturing company and a “white color” banking firm. The development of intervention material and activities was based on focus group discussions with members of a target population of licensed drivers 24 to 49 years old who drink alcohol. The program offered low-cost taxi rides for employees who purchased coupon booklets. In-house promotion (pamphlets and posters in the lobby), ride coupons with half-price fares, and employer communications (e.g., paycheck stuffers or coupon purchases and other program information) were used as interventions. Over 1,450 CareFare coupon booklets were sold between 1995 and 1998; and approximately 2,000 taxi cab rides were registered from coupon receipts (Stewart, Piper, & King, 2001).

The evaluation included employee surveys to measure their drinking and driving behavior. The survey found that there was little awareness of the program among employees of the two participating companies. Program implementation and operation were also examined, including the extent to which employees purchased coupon booklets subsidizing half of a taxi ride home from drinking establishments. The study revealed many managerial, operational, and employee sensitivity issues associated with operating a program like this from a workplace (Stewart et al., 2001). There were no objective measures of crash incidence or any clear measure of program use. The study design was limited due to no random assignment to conditions and no comparison group.

Road Crew

In 2001 the AT program Road Crew featuring limousines and older luxury vehicles

was evaluated. The program was developed from the findings of focus group sessions in bars and taverns with the core target group (males 21 to 34 years old). Focus group discussions were also held with professionals who interact with these patrons as part of their jobs, such as bartenders, EMS personnel, and law enforcement. Central tenets emerging from these discussions were that: (1) young men do not want to leave their vehicles behind; (2) asking them to drink less does not work; (3) using cabs to get home can be humiliating, even if prudent; and (4) effectively encouraging drinkers to take a ride home requires that they go to the bars without their vehicles. The program was designed based on the perception by the target group that a limo ride was socially acceptable and added fun to the evening by providing an environment for socializing with friends while traveling. The program was heavily used during the first year of operation, providing approximately 20,000 rides (Rothschild, Mastin, & Miller, 2006).

An evaluation was conducted by estimating crash reductions as a result of rides provided by the program. Data gathered for the analysis included self-reports of number of drinks and rides taken home using the program vehicles; DWI arrests and alcohol-related crashes in Wisconsin; and arrest data per DWI episode and episodes within 2 hours of any alcohol consumption. In brief, 70 percent of the people in the community were aware of the program and it was calculated that there was a 17-percent reduction in alcohol-related crashes in the area covered by the program. However, the study did not demonstrate that ride service programs had an impact on reducing impaired driving (Rothschild et al., 2006).

Operation Red Nose

Several communities in Canada use a holiday ride service AT program that is offered free of charge by a nonprofit organization called Operation Red Nose. The program was established in Quebec in the mid-1980s. Since that time it has spread to several other provinces. The program uses a team of three volunteers to respond to an alcohol-impaired caller who needs a ride home. Two team members drive the caller home in the caller's vehicle. The third member follows in a separate vehicle to pick up the other team members (Lavoie, Godin, & Valois, 1999).

In the late 1990s, the Public Health Centre of Quebec conducted a study to identify the psychosocial predictors of intention to use the holiday program (or suggest to a friend) in the future. Self-administered questionnaires were mailed to about 1,000 young people 18 to 24 years old who were randomly drawn from a list of licensed young drivers maintained by the Quebec driver license agency. Nearly all of the respondents claimed to know of the program. About one-quarter reported feeling intoxicated while driving during the previous 6 months. Among those who reported having had too much to drink, 17 percent called the holiday service program; 63 percent found another safe way home; and 20 percent drove themselves. This study evaluated provincial citizens' knowledge and reported use of the AT program. Although the study employed a carefully selected, representative sample of young people, self-reports of illegal behaviors (drinking and driving) are inherently limited and can be biased, especially in response to a questionnaire sent to them by the driver licensing agency (Lavoie et al., 1999).

EVALUATION SUMMARY

A high-quality evaluation of an AT program would entail: (1) use of a study design that allows attribution of measured change to the program; and (2) high-quality measurement of appropriate phenomena. Two of the programs included evaluation attempts to identify the extent that alternative transportation (AT) programs reduce the numbers or rates of alcohol-related motor vehicle crashes or DWI violations in the communities where they operate. The other programs collected data primarily on ridership, public awareness, and program operation. Although the reviewed studies identified many features and characteristics of AT programs, other important information was not included. Operational characteristics like type of vehicle used, type of driver, and cost to users were usually provided. Other relevant program features that were often not clearly identified or described in the study reports included nature and amount of publicity for programs, area covered by the service, training of drivers, and client eligibility requirements. Measurement quality ranged from the use of outcome measures that would clearly tap a program effect to those that would be only marginally sensitive to a program's possible effects.

The evaluation of the Aspen Topsy Taxi service included analyzing longitudinal data using sophisticated time-series modeling and including information from comparison communities. Unfortunately, the program studied did not allow clear conclusions because the small community size resulted in an insufficient amount of data on the outcome measure of interest – alcohol-related crashes. Thus, measurement was weak – not

by choice of the researchers but because of what the program context allowed.

The literature search revealed many different modes of transportation (e.g., personal vehicle, taxicabs, limousines, transit vehicles, tow trucks, and even scooters). AT programs are reaching target populations that routinely go to alcohol-serving establishments; and for the most part, it is primarily young adults in their 20s through 40s. Some of the services target the tourist communities.

The selected studies did not examine the amount of drinking prior to arrival at the alcohol-serving establishments. However, some of the current AT programs have been investigated by researchers to study the average number of drinks patrons consumed before they took the ride home. Sarkar et al. (2005) found that participants averaged 7.8

drinks over the course of 4.8 hours drinking before they used the AT service (DDA of San Diego). The SoberCab program in Cambridge, Minnesota, was also researched by Judge James Dehn in Isanti County. He researched drinking behavior of DUI violators relating to where they drink and how much. This data has not been made publicly available to date.

The practicality of AT programs may be discussed in terms of cost, accessibility, and convenience. Costs of many of AT programs are reduced for their users, because the programs are subsidized; lower costs entice the target population to use such services. For nonsubsidized programs, costs are similar to taxicab service costs. The target population is likely to be familiar with transportation costs associated with an evening trip to alcohol-serving businesses. In terms of



accessibility, AT services can be limiting. While these services may be able to meet the client need in a small community, larger population areas may overwhelm an AT service's ability to accommodate all requests for rides. In terms of convenience, it is advantageous to customers when they can leave their vehicles at home, and get round-trip service from the AT program. Leaving a vehicle parked overnight on the street near a drinking establishment or in the bar parking lot is a big concern for many patrons, when they have driven themselves to the bar and then use an AT program to get home.

Reliability of the different AT programs was not described in the research studies, newspaper or magazine articles, or in the information provided by the AT programs themselves. It is likely that the smaller AT operations that use personal vehicles and have a limited number of drivers would have difficulty meeting the demand of customers on a busy weekend or holiday night. Scooter programs are clearly limited, since they do not travel on highways or in inclement weather because of safety issues. Larger AT programs that use taxicab companies or transit buses are likely to be more reliable as their fleet size is based on the community population.

Can AT programs adjust to different community sizes? College and university AT programs provide a good example of adjusting their alternative transportation services by the community size and target population. During semester break, AT services are reduced. However, when school

is in sessions, the services are in full operation. And, in fact, multiple AT services (e.g., fixed route bus, taxicab) are provided on these campuses.

Many of the smaller AT programs that use personal vehicles and volunteer drivers grew out of a single person's desire to "save lives" and reduce the number of impaired drivers on the roads. Their initial services were not based on the size of the community; as public awareness and their success grew, the demands on the services were beyond what they could provide.

Some of the AT programs reviewed promoted their programs for specific age groups (e.g., young males 21 to 34 years old; or employees 21 to 49 years old), and some AT programs are certainly more attractive to certain age groups than others. But in terms of the true mission of these programs, the goal is to reduce impaired driving; and that is an issue to varying degrees in all age groups.

At best, AT programs should be viewed as an adjunct to other existing transportation programs and ride services. Ridership information gathered from the selected studies and current AT programs revealed that they are not often used. It is unlikely that these ridership levels produce a meaningful effect on overall rates of alcohol-related crashes, deaths, or injuries. But there is hope, and these AT programs can complement other programs and services to offer a range of options for all drinkers in a wide variety of circumstances to enhance the opportunities for a safe ride home.

PROGRAM DEVELOPMENT

The most effective AT programs are likely to be those that provide the greatest coverage of times, geography, individuals, and which involve the fewest practical barriers to their use, consequently achieving maximum ridership among individuals who would otherwise drive while impaired. Besides having a conceptually broad, operationally strong program structure, those that are most extensively and appropriately integrated into a multifaceted community approach to addressing impaired driving can be expected to have the greatest benefit.

With the exception of some atypical communities, even the most well-designed AT programs cannot be expected to produce dramatic reductions in impaired driving or resulting crashes. Alternative transportation services should be viewed as one component of a comprehensive approach to reducing impaired driving. They have the potential both to support and be supported by other elements of a system. For example, in a community with little impaired driving enforcement, the motivation of individuals to overcome the small, but real barriers to use of an AT program will be lower than in a community where there is a substantial amount of highly publicized enforcement. Similarly, the presence of a well-designed, well-publicized, easily accessible AT program could reduce the willingness of some magistrates, prosecutors, or judges to take an overly lenient view of impaired driving.

Although the present review found few evaluations of AT programs, providing little guidance on what sorts of programs are most effective, it is possible to derive some guiding principles for program development

by taking a conceptual look at the issue. In principle, to have the greatest likelihood of contributing to reducing crashes by impaired drivers, an AT program would be continually available, free to users, and would be convenient and easy to use, taking them directly to their homes and minimizing the need to retrieve a vehicle later. The more closely a system approaches this “ideal type,” the greater its benefit is likely to be. Urban mass transit systems approximate many of these elements. University transit systems do so as well, as do commercial taxi services. In addition, though it is a concept more than a program, relying largely on individuals to implement it, the “designated driver” principle approaches this ideal as well. It may be useful to think of AT programs as both a complement to designated driver efforts, and as a supplement to other existing transportation systems, designed to deal with the limitations of the various options available in a particular community.

Mass transit systems are easy to use, but are of limited value in that they are not available in many communities, are available during limited hours in others, do not deliver most riders directly or near to their homes, and they are not free – though they are generally inexpensive. In comparison with standard mass transit, university transit systems are generally free to students, are available during extended hours – at least on weekend nights – and can deliver a large proportion of students on many campuses close to their residences.

Private taxi systems are far more flexible than mass transit systems, but they can be quite costly and they require more individual

initiative and planning since the trip to the drinking locations must be made without using personal vehicles. Otherwise the logistic complications of transporting a vehicle as well as individuals must be dealt with.

Two shortcomings of the designated-driver notion are that: (1) it is not applicable in many drinking situations; and (2) it is often not employed as intended. The designated driver concept assumes that drinking occurs in intact, stable groups that travel together to—and between—drinking locations. Many drinking occasions do not fit that description. Individuals often do not drink in groups that have traveled together, so there can realistically be no advance designation of a group member to drive. In addition, groups are unstable, forming and dissolving—perhaps repeatedly—during the course of an evening. The designated driver approach is surprisingly difficult to apply in practice, requiring plans about drinking location and for assembly of a

group to ensure that individuals do not arrive at drinking locations in multiple vehicles. These do not mesh well with the nature of much drinking behavior in the United States. This may be one of the reasons the principle is often not implemented well, frequently becoming an effort to select the person within a group who is least impaired to serve as the “designated” driver. To function as an effective complement to individuals’ efforts to avoid impaired driving, AT programs need to compensate for the shortcomings of individual drinker’s efforts to avoid impaired driving. Whereas designated driver efforts are person-centered activities, AT programs exist as elements of communities and should be consciously designed with that focus in mind, supplementing whatever alternative options to impaired driving exist in the community. Programs whose service is limited to those rare occasions when the likelihood of drinking is higher than usual (e.g., New Years Eve) make little sense as a community effort. Although they make



some sense from the individual perspective, focusing on what may be the highest-risk occasion for individuals, they address a minuscule part of the aggregate drinking-driving risk in a community. A program that operates every Friday and Saturday night would be approximately 100 times as likely to benefit the community. Roadside surveys indicate that impaired driving is common on weeknights as well as weekend nights, at least in suburban and urbanized communities (Beirness et al., 1997; Foss & Beirness, 1996), suggesting a comparable need for alternative ride options during the week as well.

Another implication of viewing AT ride programs as protection for the community, rather than simply the individual, is that charging individuals for the service, although understandable, may not be desirable. To the extent that doing so discourages use of the service, it is counterproductive, making for less efficient use of the resource that the community has invested some resources in developing, promoting, and perhaps in subsidizing.

EVALUATING FOR EFFECTIVENESS

An important, often overlooked element in conducting a high-quality evaluation of an intervention is the choice of a program to evaluate. This is particularly important in examining alternative transportation programs, in view of their highly varied nature. A poorly designed program has little hope of bringing about a change in the target behavior. Similarly, a poorly implemented program – even if conceptually strong – can do little good (Weiss, 1972). In both instances, even a methodologically sound

evaluation with strong study design and careful measurement would not represent a good evaluation. The methodological rigor would simply provide compelling evidence that a program failed. Yet, a conclusion that the concept, rather than its implementation, failed, would be misleading. Although a program has failed to produce its intended effect, if it is not a strong, well-deployed program, the failure is not in the concept, but rather in the poor implementation. Thus, in addition to using a strong study design and appropriate measurement, a compelling evaluation will also focus on a conceptually sound, well-implemented program.

The distinction between how well an approach might work, as opposed to how well it does work in practice, is often discussed as the distinction between efficacy and effectiveness. The ease with which a concept can be put in place is one of several possible contributors to effectiveness.

To be truly informative an evaluation should examine a program that legitimately embodies the concept or principle, rather than one that only weakly represents the idea. The final evaluation report should include a detailed description of the program so it is clear how well the findings speak to the concept (in this case alternative transportation) or simply to a weak or partial implementation of the concept.

Every trip taken by an impaired person using alternative transportation, rather than by driving, reduces the risk of a crash for the driver and within the community. The ultimate question of interest to traffic safety policy makers considering such programs is whether investing in such an approach to reduce the consequences of impaired driving is an efficient use of limited resources

that might be spent on other approaches, to greater benefit. To adequately answer that question, to greatest degree possible an evaluation needs to examine the utility of the underlying principle – that the availability of alternative transportation for impaired drivers should reduce alcohol-related crashes. An examination of a program that embodies the concept only to a limited degree does not much help to answer the question.

An ideal study design, to provide definitive evidence from a single study of the effectiveness of an alternative ride program in reducing crashes, probably does not exist. Evaluating “real world” programs requires trade-offs in study design and measurement. Creating a program specifically for the purposes of evaluation would allow better design and measurement, but would suffer from artificiality as well as questions about sustainability of the program. Ultimately, a clear determination of the effectiveness of alternative transportation programs is possible only through the accumulation of findings from several independent, high-quality evaluations of generally similar existing programs.

Selecting a solid evaluation study

design for an alternative ride program is not difficult. A good design simply provides for appropriate pre- and post-program measurements, obtained from both the target community/population and a comparable comparison or control population, of phenomena that the program should influence (ultimate or interim “outcomes”). Longitudinal designs, which involve measurements at multiple timepoints are most compelling (Campbell & Stanley, 1963). The challenge comes in locating a program that stands a reasonable chance of producing a measurable benefit, then putting the research plan in place, given the many practical constraints that are inevitably involved in applied research. For example, it is rarely possible to collect pre-program data specific to the issue and the intervention of interest because programs typically pre-date the plan to evaluate them. The inevitable result is that to have comparable pre- and post-program data, it is usually necessary to rely on



existing data that are routinely collected for purposes other than program evaluation.

Crash data are the existing information to which researchers typically turn for measures of program effect. Fortunately, these are precisely what alternative transportation programs are meant to address. There are two main limitations of crash data for purposes of alternative transportation program evaluation. First, the measurement of alcohol-involvement in non-fatal crashes is somewhat subjective, being based on judgment of the investigating officer. Although trained officers are quite good at detecting alcohol involvement, when they have time, the workload involved in managing a crash scene does not always allow the officer to give the attention needed to carefully observe subtle indicators of a driver's drinking. There is substantial variation in officers' training and experience in recognizing the presence of alcohol, and this results in variable quality of judgments about alcohol involvement.

The other, perhaps greater, limitation of crash data is that they are relatively insensitive to program effects. Crashes are rare and fatal crashes are extremely rare events, even for persons driving while impaired. Chance plays a substantial role in whether a crash occurs on any given trip. Consequently, a program that has changed driving after drinking somewhat, may not produce a change in alcohol-related crashes because of the many other factors that affect crashes.

Indirect measures of alcohol involvement (usually called proxy or surrogate measures) have often been used in efforts to side-step the uncertain quality of alcohol reporting for non-fatal crashes. For example, because

single-vehicle, fatal, late-night, weekend crashes often involve a drinking driver, a change in the frequency of this type of crash is sometimes used as a possible indicator of change in alcohol-related crashes more generally. By definition, such measures are somewhat crude, since they include many crashes known not to involve a drinking driver. Consequently, they are likely to detect only fairly large effects.

Other existing data that may be useful in estimating the effect of alternative transportation programs would be records that well-organized programs should have. Every trip taken with the service, rather than driving, essentially removes the risk of a crash for the client and his/her passengers for that trip. If there are other data available on the number of impaired driving trips in a community, it may be possible to estimate the proportion of those trips prevented by the alternative transportation program. Even in the absence of local data it may be possible to develop an "order of magnitude" estimate of the likely effect of an alternative transportation program, if good records are available for the program. Data from roadside surveys can be used to estimate the number of impaired driver trips in a given community, against which the number of rides provided by the alternative transportation program can be compared.

In the absence of existing appropriate pre-program data, it is necessary to obtain some measure of the phenomena of interest prior to the program's implementation. This is difficult unless the program is being developed in conjunction with the evaluation effort. One promising alternative might be to evaluate an existing program that is being re-tooled or substantially expanded. For

example, if a program were to change from charging a fee to providing the service at no cost, or expand its coverage area or target population, an evaluation would be useful.

In cases where a program is started anew, or is altered in ways that theoretically should produce an increment in its effect, several measurement options are available. In addition to examining crash data for the jurisdiction, measures that are more sensitive can be developed. Which of these are most appropriate depends on the context and the program. A substantial program in a modest-size community might be expected to reduce the proportion of all nighttime trips taken in the community by people with illegal blood alcohol concentrations (BAC). The Road Crew program in rural Wisconsin is an example of such a program and setting. Having provided nearly 20,000 rides in a year in communities with relatively small total populations may have materially reduced drinking-driving in the area. Projections of the likely effect of 20,000 fewer trips can be useful. A more definitive evaluation would attempt to measure the effect more directly since it can not be known how many of the trips provided by the alternative transportation program might otherwise have become a drinking driver trip and how many would have resulted in some other form of safe(r) transportation. A roadside survey of representative samples of the nighttime driving population would provide such a measure. This approach has been used successfully to examine the effect of high visibility DWI enforcement programs (Beirness, Foss, & Mercer, 1997; Foss, Beirness, Tolbert, Wells, & Williams, 1997).

Although they provide perhaps the most definitive evidence of the amount of drinking-driving in a community, roadside surveys are costly to conduct. In the absence of the ability to conduct a roadside survey, or in communities where the effects of an alternative transportation program would have a small impact on the total amount of impaired driving, a well-designed self-report survey may suffice. To ensure a high-quality evaluation, careful selection of a respondent sample to represent the population the program is meant to influence, rather than interviewing a conveniently available sample (e.g., visitors to a driver license office) is important. Moreover, because impaired driving is relatively uncommon, representing only a very small fraction of all trips and a



small proportion of all drivers, using a general population survey to measure changes resulting from an AT service would be prohibitively expensive. If, however, a target population within which drinking-driving is much more common can be identified and a representative sample selected, interviewing a sufficiently large sample to provide the

necessary statistical power to detect a change might be economically feasible. For example, it might be possible to select a scientifically sound sample of bar patrons in a community then to recruit them for participation in a telephone interview survey.

Table 1 summarizes several types of measures that might be used in an evaluation of an alternative transportation program with respect to their relevance, sensitivity, and ease of use. Relevance refers to the degree to which the measured phenomenon is (or could be) a pertinent consideration in an evaluation. For example, whereas alcohol-related crashes are highly relevant – reducing these is the reason such programs are created

– individuals' beliefs about the program (thinking it is noble, valuable, effective, etc.) are of little relevance for determining a program's effect. Sensitivity refers to the degree to which a measure could detect a true program effect. For alternative transportation programs, most measures are relatively insensitive but some are better than others. Finally, ease of use is an important consideration in selecting measures to include in an evaluation. In general, measures that are relatively easy to obtain (existing, high quality, inexpensive) are preferred over those that must be collected especially for the evaluation, or which are difficult to obtain, difficult to work with, or both.

Table 1. Characteristics of Several Potential Measures of Alternative Transportation Ride Service Programs

Measure	Trait		
	Relevance	Sensitivity	Ease of use
Alcohol-specific measures			
Alcohol-related crashes	High	Moderately low	Moderately easy
Roadside survey BAC data	High	Moderately low	Moderately difficult
DUI/DWI convictions	Low	Low	Moderately Difficult
General crash-injury measures			
Crashes	Moderately high	Lowest	Easy
Proxy measures of alcohol crashes	Moderately high	Low	Easy
Injury crashes	High	Moderately low	Moderately difficult
Self-report measures			
Self-reported program use	Moderately high	Low	Moderately difficult
Self-reported awareness of program	Moderately low	Moderately high	Moderately difficult
Self-reported beliefs about program	Low	Lowest	Moderately difficult
Focus group discussions	Low	Lowest	Moderately easy

RESEARCH METHODS USED FOR COMPILING INFORMATION ON ALTERNATIVE TRANSPORTATION

The following pages discuss the research to collect information on AT programs, including types, design, and effectiveness for the writing of this report.

LITERATURE SEARCH AND REVIEW

Search criteria focused on identifying research studies that conducted scientific evaluations of alternative transportation (AT) program effectiveness. Search criteria were as follows:

- Safety-related outcome measures (e.g., injury and crash data).
- Other proxy measures (e.g., ridership, public awareness, participating establishments).
- Evaluation characteristics (e.g., study period, comparison sites, study design).
- Other non-quantifiable outcome measures.
- Program audit and detailed description of other demonstration characteristics.

Another literature review activity involved identifying current operational AT programs. Search criteria focused on addressing the following questions:

- What modes of transportation are used late at night by AT programs in communities?
- What is the common culture of the target group in terms of transportation?

- How much drinking is going on before patrons reach the alcohol-serving establishments?
- How practical are AT services in terms of cost, accessibility, and convenience? What are the innovative AT programs going on today?
- How reliable are different types of AT services?
- Are there differences in this services provided based on community size?
- Are there program differences by community size?
- What is being done on college campuses?
- Is there a need for different services for different age groups?

Search Methods

Several methods were used to identify relevant resource material. As described below, this included an in-house search, computerized subject databases, use of computerized technical library databases, inquiries to transportation organizations, and inquiries to professional organizations.

In-House Search

The collection of the University of North Carolina Highway Safety Research Center library and TransAnalytics' team members' personal collections provided many relevant documents related to the topic.

Computerized Subject Databases

A computerized search by project staff was conducted in relevant subject databases. The databases included:

- Transportation Research Information Services (TRIS), which covers all of the National transportation science and highway safety research and information produced by the U.S. Department of Transportation and its agencies.
- TRANSPORT CD from Ovid Technologies (or DIALOG's on-line subject database system), which contains the most comprehensive transportation research information from four leading international and national organizations (Organization for Economic Cooperation and Development, European Conference of Ministries of Transport, the Transportation Research Board, and the U.S. DOT).
- SCOPUS, produced by the Elsevier Publishing Company, which covers a large selection of medical and health science journals.
- National Institute on Alcohol Abuse and Alcoholism (NIAAA) database called ETOH, which covers historic alcohol-related research information.
- Dartmouth Medical School's Project Cork database, which contains information on substance abuse for clinicians, health care providers, and policy makers.
- PsychInfo and Sociological Abstracts, which cover a large selection of behavioral sciences, social psychology, and psychological journals.

Search terms were developed from topics that would address the research questions. Topics covered AT interventions to reduce injury and crash rates associated with drinking, and issues relating to the alcohol consumer's intentions and motivations before driving out at night, and the chain of events that occurs at the end of the night. Key terms used in the computerized searches included: alternative transportation; alcohol-impaired driving; injuries; fatalities; crashes; taxis; bus; scooter; train; trolley; incentives; designated driver; safe driver program; drunk driving; alcohol-impaired driver; safe driver service; bar servers; restaurant servers; evaluations; and others.

Use of Computerized Technical Library Databases

A search of Northwestern University Transportation Library's (NWUTL) computerized databases with assistance from NWUTL's reference librarian staff was also conducted. UNC/HSRC's automated database systems were also used. Research librarians at both universities were given a list of the study objectives and a list of key terms. They were given the freedom to identify other key terms for their searches.

Inquiries to Transportation Organizations

Inquiries about AT programs were also made with other associations such as State liquor control boards; service industry associations (National Restaurant Association, and tavern owners groups); and national citizen groups such as Mothers Against Drunk Driving (MADD).

Inquiries to Professional Organizations

Inquiries about AT programs and research studies relating to this topic were also made to professional associations (TRB Committee ANB50 [Alcohol, Other Drugs, and Transportation]); International Council for Alcohol, Drugs, and Traffic Safety; National Association of Governors Highway Safety Representatives (GHSA); National Commission Against Drunk Driving (NCADD); Advocates for Highway and Auto Safety; and State and Territorial Injury Prevention Directors' Association (STIPDA).

Following the review of approximately 100 potentially relevant citations and abstracts, studies and information documents were acquired through vendors, full text-electronic sources, authors, and NHTSA. The acquired reports were sorted into two major groups: studies that evaluated AT programs; and studies that provided program descriptions without an evaluation component. For the AT program evaluations, approximately a dozen studies were identified that were potentially relevant to the goals of the study. These were reviewed, along with another 25 documents identified as "somewhat relevant." For non-evaluated programs, traits of the various programs were described, including costs and source of funding; type of transport (taxis, limos, buses, private vehicles, vans, tow trucks); frequency of service (holiday periods only, weekends, all year/every day); hours of operation (24 x 7, 10 p.m. –3 a.m. weekends); type of passenger (drinker, drinker's passengers, drinker's vehicle); community size; target group (e.g., college-age, 21 to 34, all); voucher system/patron costs; operating staff (volunteers or paid); training of staff; publicity; eligibility

for riders; and shortcomings/problems (e.g., abuse).

IDENTIFICATION OF SELECTED ALTERNATIVE TRANSPORTATION PROGRAMS

Alternative transportation programs were selected that met the evaluation and research methodology criteria developed for this project. Discussed in previous chapter, this included: (1) I'm Smart and SoberCab (Molof, Dresser, Ungerleider, Kimball, & Schaefer, 1995); (2) Topsy Taxi (Lacey, Jones, & Anderson, 2000); (3) CareFare (Stewart, Piper, & King, 2001); (4) Road Crew (Karsten & Rothschild, 2003; Rothschild, Mastin, & Miller, 2006); and (5) Operation Red Nose (Lavoie, Godin, & Valois, 1999).

PEER REVIEW OF DRAFT REPORT

A selection of experts in the impaired-driving field was asked to review a draft final report to ensure the credibility of the findings within the traffic safety community. The Principal Investigator coordinated this activity, providing panel members with necessary materials, and ensured they provided comments in a timely manner for incorporation into the final report. Panelists were selected based on a pre-defined set of criteria, including: working knowledge in this area (i.e., operational knowledge of AT programs, based on either research or administrative experience); and experience in the evaluation of traffic safety programs. Upon review of peer comments, revisions were made to the final report.

REFERENCES

- Apsler, R., Harding, W., & Goldfein, J. (1987). *The Review and Assessment of Designated Driver Programs as an Alcohol Countermeasure Approach*. DOT HS 807 108. Washington, DC: National Highway Traffic Safety Administration.
- Beirness, D. J., Foss, R. D., & Mercer, W. (1997). *Roadside Breathtesting Surveys to Assess the Impact of an Enhanced DWI Enforcement Campaign in British Columbia*. In C. Mercier-Guyon (Ed.) *Proceedings of the 14th International Conference on Alcohol, Drugs and Traffic Safety*, pp 955-961. Annecy, France: Centre d'Etudes et de Recherches en Medecine du Trafic.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and Quasi-Experimental Designs for Research*. Chicago, IL: Rand McNally.
- Ditter, S. M., Elder, R. W., Shults, R. A., Sleet, D. A., Compton, R., and Nichols, J. L. (2005). *Effectiveness of Designated Driver Programs for Reducing Alcohol-Impaired Driving – A Systematic Review*. *American Journal of Preventive Medicine*, 28 (5S), 280-287.
- Elam C., McKaig, R. N., Jacobs, B., Whitlow, M., Gros Louis, K.R.R. (2006). *Examining a Safe Ride Program: An Assessment of the Midnight Special Late Night Bus Service*. *NASPA Journal*, 43(2), 358-376.
- Foss, R. D., & Beirness, D. J. (1996). *Drinking Passengers and their Drivers: Roadside Survey Results*. In 40th Annual Proceedings, Association for the Advancement of Automotive Medicine. DesPlaines, IL.
- Foss, R. D., Beirness, D. J., Tolbert, W. G., Wells, J. K. & Williams, A. F. (1997). *Effect of an Intensive Sobriety Checkpoint Program on Drinking-Driving in North Carolina*. In C. Mercier-Guyon (Ed.) *Proceedings of the 14th International Conference on Alcohol, Drugs and Traffic Safety*, pp 943-948. Annecy, France: Centre d'Etudes et de Recherches en Medecine du Trafic.
- Foss, R. D., Voas, R. B., Beirness, D. J., & Wolfe, A. C. (1990). *Minnesota 1990 Statewide Drinking and Driving Roadside Survey. Final Report (Contract 525493)*. St. Paul: Minnesota Department of Public Safety.
- Harding, W. M., Apsler, R., & Goldfein, J. (1988). *The Assessment of Ride Service Programs as an Alcohol Countermeasure*. DOT HS 807 290. Washington, DC: National Highway Traffic Safety Administration.
- Harding, W. M., Apsler, R., & Goldfein, J. (1987). *A Directory of Ride Service Programs*. DOT HS 807 146. Washington, DC: National Highway Traffic Safety Administration.
- Hedlund, J. H., (2005). *Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices*. Washington, DC: National Highway Traffic Safety Administration.
- Hingson, R., Heeren, T., Zakocs, R. C., Kopstein, A., & Wechsler, H. (2005). *Magnitude of Alcohol-Related Mortality and Morbidity Among U.S. College Students Ages 18-24: Changes from 1998 to 2001*. *Annual Review of Public Health*, 26, 259-79.

- Karsten, C., and Rothschild, M. L. (2003). *The Road Crew Final Report*. DTNH22-01-H-07010. Washington, DC: National Highway Traffic Safety Administration.
- Lacey, J. H., Jones, R. K., & Anderson, E. W. (2000). *Evaluation of a Full-Time Ride Service Program: Aspen, Colorado's Tipsy Taxi Service*. DOT HS 809 155. Washington, DC: National Highway Traffic Safety Administration.
- Lavoie, M., Godin, G., and Valois, P. (1999). Understanding the Use of a Community-Based Drive-Home Service After Alcohol Consumption Among Young Adults. *Journal of Community Health, 24* (93). 171-186.
- Molof, M. J., Dresser, J., Ungerleider, S., Kimball, C., & Schaefer, J. (1995). *Assessment of Year Round and Holiday Ride Service Programs*. DOT HS 808 203. Washington, DC: National Highway Traffic Safety Administration.
- Mundorf, N. (2006). *Change strategies for safe transportation behaviors-- creating safe transportation options for college students*. University of Rhode Island Transportation Center Project No. 536162. Kingston, RI: Dept. of Communication Studies, University of Rhode Island.
- NHTSA. (2006). *Traffic Safety Facts 2005: Alcohol*. Washington, DC: National Highway Traffic Safety Administration.
- Quinlan, K. P., Brewer, R. D., Siegel, P., Sleet, D. A., Mokdad, A. H., & Shults, R. A. (2005). Alcohol-impaired Driving Among U.S. Adults, 1993-2002. *American Journal of Preventive Medicine, 28* (4). 345-350.
- Rothschild, M. L., Mastin, B., & Miller, T. W. (2006). Reducing Alcohol-Impaired Driving Crashes Through the Use of Social Marketing. *Accident Analysis and Prevention, 31* (2), 305-325.
- Sarkar, S., Andreas, M., & DeFaria, F. (2005). Who Uses Safe Ride Programs: An Examination of the Dynamics of Individuals Who Use A Safe Ride Program Instead of Driving Home While Drunk. *American Journal of Drug and Alcohol Abuse, 31* (2), 305-325.
- Shaw, R. (2006). For drinkers who think (ahead) with his designated driver service, a young entrepreneur (Brian Peters) solves a perpetual problem: getting the vehicles home safely. TwinCities.com Pioneer Press. (<http://www.twincities.com/mld/twincities/15768230.htm>)
- Stewart, K., Piper, D., & King, M. (2001). *Exploring an Alternative Program to Reduce Impaired Driving*. DOT HS 809 364. Washington, DC: National Highway Traffic Safety Administration.
- Weiss, C. (1972). *Evaluation Research*. Englewood Cliffs, NJ: Prentice-Hall.

APPENDIX A - PROGRAM LIST & CONTACT INFORMATION

Personal Vehicle

Designated Drivers Association –

San Diego, CA
P.O. Box 81362
San Diego, CA 92138
619-692-0830
<http://ddasd.org/>

Safe Ride America – Greater Atlanta, GA

130 W. Wieuca Rd. NE., Suite 205
Sandy Springs, GA 30342
404-888-0887
<http://saferideamerica.org/>

Limousine

Road Crew – Western Wisconsin
<http://www.roadcrewonline.org>

Limo Don – Denton, Texas
www.myspace.com/racinglimosofdallas

Bus

Miller Free Rides – Madison and Dane Counties, Wisconsin
Miller Brewing Company
3939 West Highland Blvd
Milwaukee, WI 53201-0482
414-931-2000
414-931-6519
<http://www.millerfreerides.com>

Taxi

Sober Ride – Washington, DC
1420 Spring Hill Rd., Suite 250
McLean, VA
703-893-0461
www.wrap.org

Get Home Free Card – Minnesota
Division of Advanced Marketing Team, Inc.
5100 Thimsen Avenue, Suite 229
Minnetonka, MN 55345
952-470-4035
<http://www.gethomefree.com>

Trolley

Jolly Trolley Program – Rehoboth Beach, Delaware
P.O. Box 311
Rehoboth Beach, DE 19971
302-227-1197

Tow and Ride

Tow to Go Program – Florida, Georgia, and Tennessee
800-AAA-HELP

Scooter

Home James – Los Angeles, California
453 S. Spring St.
Los Angeles, CA 90013
213-347-0155
www.homejames.com

Scooter Patrol – Los Angeles and Orange County, California
P.O. Box 854
Sunset Beach, CA 90742-0854
562-577-7365
<http://www.scooterpatrol.org>

Lilybug – Suffolk County, New York
866-678-LILY (5459)
<http://www.lilybugscooters.com>

APPENDIX B - SUMMARY OF SELECTED STUDIES

Study 1: I'm Smart; SoberCab	
References	Molof, M. J., Dresser, J., Ungerleider, S., Kimball, C., & Schaefer, J. (1995). Assessment of Year Round and Holiday Ride Service Programs. DOT HS 808 203. Washington, DC: National Highway Traffic Safety Administration.
Location	I'm Smart (central New York) SoberCab (Minneapolis-St. Paul, Minnesota)
Target Population	General public
Program Traits	<p>I'm Smart</p> <ul style="list-style-type: none"> • Year-round, for-profit corporation provides safe rides to intoxicated clients from bars and parties. • Transportation to home in their own vehicles —staff drives client vehicle and other staff (opposite sex) follow in another vehicle. • Dispatchers monitor system, driving teams scattered around the city during evening hours, larger number on weekends. • Drivers need chauffer category license. • Drivers paid for being on call and per ride. • Corporate memberships available and offer awareness sessions, free ride coupons, and monthly newsletter. • Drinking establishment's memberships offer server intervention training, complimentary ride passes, and reduced rates for patrons (198 organizations in 1992). • Funding: 342 organizations representing private, public, and non-profit organizations, and commercial alcohol-serving establishments (144 commercial alcohol-serving establishments in 1992). • Ridership: 2,500 rides annually.

Study 1: I'm Smart; SoberCab	
Program Traits	<p>SoberCab</p> <ul style="list-style-type: none"> • Transportation from public drinking establishments to private residences only. • Taxicab service and costs. • Eight- to ten-day holiday service only. • Volunteer dispatchers from hospitals. • Consortium of 24 hospital corporations operate program. • Publicity strategy: press conference, TV spots, newspaper feature articles, radio and posters/flyers. • Ridership: 700 – 1,200 rides annually.
Study Objectives	To increase the knowledge base about ride service programs and to evaluate two existing models: a year-round service (I'm Smart) and a winter holiday program (SoberCab, December 25 – January 1), both of which were established programs.
Study Period	October 1991 to October 1993
Study Design	<p>I'm Smart</p> <ul style="list-style-type: none"> • Questionnaires from DMV to identify name recognition and knowledge of program. • Surveys administered at RID booth at State Fair. • Interviews at alcohol-serving establishments. <p>SoberCab</p> <ul style="list-style-type: none"> • Telephone survey to identify name recognition.

Study 1: I'm Smart; SoberCab

<p>Outcome Measures/ Results</p>	<p>I'm Smart</p> <p>Self-Reported Awareness of Program:</p> <ul style="list-style-type: none"> • 50% of general public knew about program. • 25% of general public knew about program in comparison county. • 75% of bar patrons heard of program, only 15% had ever used it. <p>Alcohol-Related Crashes:</p> <ul style="list-style-type: none"> • Crash data analysis provided no evidence a program effect on alcohol-related crashes in the program county. • Alcohol-related crashes declined similarly in two comparison counties. <p>SoberCab</p> <p>Self-Reported Awareness of Program:</p> <ul style="list-style-type: none"> • Name recognition was very high (88%) among the sampled population and customers of alcohol serving establishments. <p>Note: Unlike the I'm Smart program, pre-intervention crash data were never collected to conduct an evaluation of differences of alcohol-related crashes from program effects.</p>
<p>Program Evaluation</p>	<p>Despite a high level of name recognition for both programs, the services were not often used.</p> <p>I'm Smart</p> <ul style="list-style-type: none"> • The organization has had a long-standing relationship with a multitude of private, public, and non-profit organizations, as well as alcohol-serving establishments. By 1992, which is the 10th year of operation, a total of 342 organizations had paid to belong to the program. This included 198 private, public, and non-profit organizations, and 144 commercial alcohol-serving establishments and private clubs. • There were program issues relating to inconvenience (shorter waiting times), transporting the user's vehicle, confidentiality, and lack of adequate funding. <p>SoberCab</p> <ul style="list-style-type: none"> • Program needed more public awareness in drinking establishments and better service features (less waiting time).

Study 1: I'm Smart; SoberCab	
Strengths of Study	<p>I'm Smart</p> <ul style="list-style-type: none"> Attempted to measure the effects of these programs on crashes. Analyses of alcohol-involved crashes were conducted to determine if there was any statistically reliable evidence that the year round program uniquely contributed to a decrease in number of alcohol-related crashes in the county. <p>SoberCab</p> <ul style="list-style-type: none"> Trends in number of crashes using alcohol-involved crashes as a percent of total crashes as the criterion variable in holiday periods were collected for program communities (counties) and the comparison area (Statewide).
Weaknesses of Study	<p>For both programs, limited data were examined to measure effectiveness of the programs.</p> <p>SoberCab</p> <ul style="list-style-type: none"> For example, DWI statistics were used in the evaluation to compare treatment versus comparison communities. Although this is one of the ultimate outcomes that programs are meant to affect, the number of arrests was not large enough to detect changes brought about by the program. Arrest data for a one week period during which the holiday program operated could not be expected to show a measurable change. No crash data were available for a period prior to the initiation of SoberCab to conduct a before-and-after analysis. More generally, arrest data are a poor measure of programs meant to affect drinking driving because arrests reflect many things besides the prevalence of the problem. In particular, enforcement priorities, variations in deployment of enforcement resources and financial resources can easily obscure actual changes in the prevalence of impaired driving in a population.

Study 2: Tipsy Taxi

References	Lacey, J. H., Jones, R. K., and Anderson, E. W. (2000). Evaluation of a Full-Time Ride Service Program: Aspen, Colorado's Tipsy Taxi Service. DOT HS 809 155. Washington, DC: National Highway Traffic Safety Administration.
Location	Pitken County and Aspen, Colorado.
Target Population	General public (community residents and tourists).
Program Traits	<ul style="list-style-type: none"> • Administered through county sheriff office as a crime prevention program with assistance from other city law enforcement agencies and the local restaurant association. • A year-round taxicab service. • Completely free and confidential. • Also covered parking tickets and tow fees. • Publicity and fundraising events were regularly conducted. • Funds came from fundraising events, mailed solicitations, grants, alcohol license fees, and DUI offender fees.
Study Objectives	To examine a well-established, continuous service that used a partnership between law enforcement and the community.
Study Period	1976-1998
Study Design	Program effects were examined using interrupted time series analysis of quarterly counts of two surrogate measures for alcohol-involved crashes (nighttime crashes and injury crashes).

Study 2: Tippy Taxi	
Outcome Measures/ Results	<p>Injury Crashes, Nighttime Crashes, Fatal Crashes:</p> <ul style="list-style-type: none"> • There were too few fatal crashes in the county and the comparison counties for formal statistical analysis of this type of crash. • There was a small non significant reduction in nighttime crashes of about 4 percent after the program began. • An examination of injury crashes (as a proxy of alcohol-related crashes) revealed a significant reduction (15%) associated with implementation of the program. • A before- and after- analysis of the ratio of the intervention county's fatal crashes to the comparison counties' fatal crashes showed no significant change in the ratio after the intervention. An analysis of variance examination of fatal crashes as a function of county and period did not find any significant difference either. The significant decline in injury crashes suggests that this ride service program may have helped reduce alcohol-related crashes.
Program Evaluation	<p>Success of the program is attributed to accessibility of the service (available 24 hours, all year round), and being able to operate without tax dollars and without losing money. Funding came from regular fund-raising events, mailed solicitations, grants, alcohol license fees, and fees for DUI offenders.</p>
Strengths of Study	<p>A careful effort was made to measure program effects of crashes using a solid study design (time-series with comparison group).</p>

Study 2: Tippy Taxi

Weaknesses of Study

- The study community is highly atypical, which begs the question of whether this program could be replicated elsewhere and whether its effect (if there is any) would be expected in a typical, non-resort community.
- The small population and resulting small number of crashes forced the researchers to turn to unusually crude (insensitive) measures of alcohol-involved crashes.
- The study design was unable to control for coincident changes in the community during the study period that may have affected the outcome measures (injury crashes). Dramatic increases in housing costs may have driven out much of the lower income population who are more prone to drinking and driving. The use of comparison communities helped to address this, but they were not comparable in important ways.
- Availability of a late night bus service may have also contributed to the impact on the program ridership and the number of impaired drivers on the road.

Study 3: CareFare	
References	Stewart, K., Piper, D., & King, M. (2001). Exploring an Alternative Program to Reduce Impaired Driving. DOT HS 809 364. Washington, DC: National Highway Traffic Safety Administration.
Location	Dane County, Wisconsin.
Target Population	<ul style="list-style-type: none"> • Drivers age 24 to 49. • Bank firm (white collar). • Tool and dye manufacturer (blue collar).
Program Traits	<ul style="list-style-type: none"> • Taxicab service. • Low-cost taxi rides. • Coupon booklets sold at convenience stores. • Promotional activities at employment sites.
Study Objectives	To assess the impact of alternative ride service program at two workplace environments (bank and manufacturer) targeting employees 25 to 49 years old.
Study Period	1995-1998
Study Design	<ul style="list-style-type: none"> • Focus groups were initially conducted to examine perceptions, opinions, attitudes, and beliefs about impaired driving and to explore attitudes about the importance of family, jobs, and friendships in making decisions about driving after drinking and staying in control. • Pre- and post-intervention survey of employees to understand their ideas about drinking and driving. • Focus group sessions with CareFare (coupon) purchasers. • Focus group sessions with site participants (employees). • Interviews with taxi drivers. • Interviews with major employers.

Study 3: CareFare	
Outcome Measures/ Results	<ul style="list-style-type: none"> • Self-Reported Awareness of Program, Focus Groups, Ridership: • Sales and use of coupons. • Ridership. • Survey responses regarding program awareness, attitudes, and drinking and driving behavior.
Program Evaluation	<ul style="list-style-type: none"> • Study revealed managerial, operational, and employee sensitivity associated with operating a program from the workplace. Employers expressed concerns about mixed messages about drinking. Employees expressed concerns about confidentiality and did not really perceive employers had strong norms or expectations about avoiding drinking and driving. • This type of program based on the use of taxis and programs based in the workplace, appeals to those who plan to drink and possibly become impaired, but who are responsible enough to plan ahead to avoid drinking. It was suspected that some of the most frequent users of the program are heavy drinkers who are aware of their need to make other transportation arrangements. • Surveys conducted after the program found that there was very little awareness of the program among employees of the two participating companies. • Use of such a program might be increased by more vigorous promotion and improved convenience for employees. The inclusion of a mechanism to ensure employee confidentiality appears to be a critical component if workplace programs of this type are to be embraced by employees.
Strengths of Study	Examined the potential value of alternative transportation programs based in the workplace
Weaknesses of Study	<ul style="list-style-type: none"> • There were no objective measures of crash incident, nor even any clear measures of program use. • This study is essentially a case study design with two treatment groups and no comparison (control) group.

Study 4: Road Crew	
References	<p>Karsten. C., & Rothschild, M. L. (2003). The Road Crew Final Report. DTNH22-01-H-07010. Washington, DC: National Highway Traffic Safety Administration.</p> <p>Rothschild, M. L., Mastin, B., & Miller, T. W. (2006). Reducing Alcohol-Impaired Driving Crashes Through the Use of Social Marketing. <i>Accident Analysis and Prevention</i>, 31 (2), 305-325.</p>
Location	Four communities in rural Wisconsin: Dodgeville-Mineral Point; Tomah; Manitowoc County; and Polk County.
Target Population	Interventions developed to appeal to young male drivers 21 to 34, but all ages were eligible to use the program.
Program Traits	<ul style="list-style-type: none"> • The program featured limousines and older luxury vehicles with a logo and slogan on the side. • A limo ride was seen as a socially acceptable thing to do by the target group and added fun to the evening by providing an environment for socializing with friends and keeping the party going for a group of friends out for the evening.
Study Objectives	<ul style="list-style-type: none"> • Development of a ride service program through focus group research. • Evaluated the effectiveness of the program by estimating crash reductions as a result of rides provided by the program. Data gathered for the analysis included self-reports of number of drinks and rides taken home from the program; DWI arrests and alcohol-related crashes in Wisconsin; and arrest data per DWI episode and episodes within 2 hours of any alcohol consumption.
Study Period	2002-2003
Study Design	<ul style="list-style-type: none"> • Data collected at baseline, during test year, and post-test year. • Pre-, post- with control group design (3 intervention communities and 5 control/comparison communities) • Ridership count conducted by dispatcher. • Self-report of drinking and driving behavior was obtained in the treatment and control communities. • Post-intervention telephone survey in the treatment communities.

Study 4: Road Crew

Outcome Measures/ Results	<p>Ridership, Self-Reported Awareness of Program, Self-Reported Use of Program, Self-Reported Beliefs About Program:</p> <ul style="list-style-type: none"> • Ridership - 19,757 rides during the test year (10,097 rides were taken by 21-to-34-year-olds). • Awareness – 70% of respondents aware of program; 80% of those who were aware of it had positive feelings about the program. • Self-reported drinking and driving behavior. • Alcohol-Related Crash Data, DWI Arrests: • 17% reduction of alcohol-related crashes on area roads.
Program Evaluation	<p>Identified program messages and activities through qualitative research (focus groups with target age groups). Used qualitative measures to collect drinking and driving behavior of target group at bars. Used telephone surveys during post-treatment period to gain insight into program exposure among members of the target group, general population, and bar owners and servers.</p>
Strengths of Study	<ul style="list-style-type: none"> • Estimated crash reductions as a result of ridership. • Data gathered from self reports of number of drinks and rides taken home from the program; DWI arrests and alcohol-related crashes in Wisconsin; and arrest data per DWI episodes and episodes driving within 2 hours of any alcohol consumption. • These data were used to estimate the number of alcohol-related crashes avoided as a result of the program.
Weaknesses of Study	<ul style="list-style-type: none"> • Inaccuracies with self-reporting of drinks consumed during the surveys at the bars. • Not known how well impaired patrons attend to, remember, and report their alcohol consumption. • The definition of impairment on the basis of estimated number of drinks (5 or more by males; 4 or more by females), without taking into account the period of time during which they were consumed, is a serious flaw in the study. • Similar studies measuring alcohol use have used portable breath testers rather than relying on self-reported consumption and crude estimates of impairment.

Study 5: Operation Red Nose	
References	Lavoie, M., Godin, G., & Valois, P. (1999). Understanding the Use of a Community-Based Drive-Home Service After Alcohol Consumption Among Young Adults. <i>Journal of Community Health</i> , 24 (3), 171-186.
Location	Quebec, Canada
Target Population	Public, age 18 to 24
Program Traits	<ul style="list-style-type: none"> • Holiday ride service program. • Nonprofit. • Free of charge. • Two members of the program team drive the caller; and one member follows to pick them up.
Study Objectives	To identify the psychosocial predictors of intention to use, or suggest that a friend use, the ride service program in the future.
Study Period	1993-1999
Study Design	<ul style="list-style-type: none"> • Focused on 18-to 24-year-old French-speaking residents in the 581 municipalities where the program was offered. • Self-administered questionnaires measured participants' understanding of the ride service program and their intent to use it during the holiday period (Christmas to New Years). • Sample of 896 individuals stratified according to age categories (18-21 and 22-24 years old) was drawn at random from a list of 290,400 eligible young adults. • Sampled individuals were mailed the questionnaire with a request to complete and return it in a pre-stamped envelope to the researchers. The questionnaire was accompanied by a \$2 incentive and a letter assuring confidentiality of responses.

Study 5: Operation Red Nose

<p>Outcome Measures/ Results</p>	<p>Results Self-Reported Awareness of Program, Self-Reported Program Use:</p> <ul style="list-style-type: none"> • Survey responses to questions about driving and drinking behavior. • About one quarter of the respondents reported having driven while impaired during the previous 6 months. • 99% of the respondents had a good knowledge of the program. <p>Among those who used the service as drivers:</p> <ul style="list-style-type: none"> • 17% phoned the service; 46% asked friends/family pick them up; 5% called a taxi; 12% adopted some other strategy; and 20% drove while impaired. <p>Among those who used the service as passengers (i.e., passengers who called for their friend who had driven them to a party, because in their opinion, they, as well as their driving friend were intoxicated by alcohol):</p> <ul style="list-style-type: none"> • 36% phoned the service; 36% asked a friend or parent to pick them up; 8% called a taxi; 15% adopted some other strategy; and 5% rode with the impaired driver.
<p>Program Evaluation</p>	<p>The services offered by the Red Nose organization were well known to the young people in Quebec.</p>
<p>Strengths of Study</p>	<p>The study employed a carefully selected, representative sample of young people throughout an entire jurisdiction (province) to examine awareness of, opinion about and self-reported use of a program. Many studies of ride service programs fail to follow this standard research procedure (appropriate sampling).</p>
<p>Weaknesses of Study</p>	<p>Self-reports of illegal behaviors (drinking and driving) are inherently limited and can be biased, especially in response to a questionnaire sent by the driver licensing agency.</p>

DOT HS 811 188
September 2009



U.S. Department of Transportation
**National Highway Traffic Safety
Administration**

