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Video Transit Training for Older Travelers: Case Study of the Rossmoor Senior Adult Community, Walnut Creek, California

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Abstract

This study applied principles of social learning and marketing to develop a transit training video for residents of the Rossmoor Senior Adult Community in California. The video features familiar community members successfully navigating specific concerns and problems related to transit use in accessing key community destinations (shopping, health care, and the nearest San Francisco Bay Area Rapid Transit District station). Residents were recruited to complete questionnaires before and after viewing the video to evaluate its effectiveness. Video messages that were aimed at educating viewers on how to obtain transit, cost, and payment information generated a significant and positive attitudinal change. However, respondents reported that the video did not adequately address the difficulties associated with reading schedules and climbing stairs at transit stations. Survey results also indicate a significant and positive change in respondents' future use of a broader range of Internet-related information sources. The results also reveal a significant and positive change among respondents in using transit services to the specific destinations presented in the video. However, results are mixed on whether participants might take transit to general destinations not explicitly represented in the video.

Introduction

The United States faces the imminent challenge of providing transportation services to a new and vastly larger population of older travelers. There are currently about 34 million senior citizens, and this population is expected to more than double by the year 2030, comprising 20% of the nation's population (1). The next generation of older travelers, baby boomers aged 45 to 64, are most likely to live in the suburbs (52%) and less likely to live in urban (27%) or rural (21%) areas (2). It is well known that activity destinations are less likely to be accessible by transit in suburban areas than urban ones because of differences in intensity and land use. However, in both urban and suburban environments, older people travel most frequently by auto (74% in urban areas and 91% in the suburbs) and much less frequently by transit (8% in urban areas and less than 1% in the suburbs) (3). Cognitive and physical limitations associated with aging can lead to declines in driving performance and safety, particularly after the age of 75. Moreover, driving cessation and reductions in out-of-home activities are significantly related to serious health problems, including heart disease, strokes, fractures, and cognitive impairments (4).

In response to driving difficulties, older travelers might be expected to turn to transit; however, many cannot do so, for the simple reason that transit services are not available in their neighborhoods (5, 6). Nevertheless, there is evidence that a significant number of older travelers would not use transit even if services were improved (5). For many older individuals, using transit is a new or unfamiliar experience that presents numerous physical and cognitive challenges (1). As a result, older adults may require additional instruction and information on how to use transit. Both national and state studies on senior transit use have recommended the development of “mobility planning and training programs” (1) and “education and outreach programs” (7) to address the transit-related information needs of older travelers.

In this study, the principles of social learning and marketing are applied to develop a transit training video for residents of the Rossmoor Senior Adult Community in Walnut Creek, California (east San Francisco Bay Area). This location was selected as the number of senior communities is on the rise in California, and residents in these locations may have distinct travel patterns and needs. Programs based on social learning and marketing theory have been used recently in Australia; Seattle, Washington; and Portland, Oregon, to reduce auto travel and encourage transit, walking, and cycling travel. Preliminary results suggest that these programs have changed travel behavior and are very cost-effective.

This paper begins with a literature review on the demography and mobility of older adults, transit barriers and preferences, and relevant social learning and marketing theory applications. The second and third sections describe the Rossmoor community and review the study methodology. In the fourth section, exploratory focus group findings are presented, capturing residents’ experiences and transit perceptions. The fifth section reviews the survey results and discusses the video’s effectiveness. The final section presents conclusions.

Literature Review

This section reviews three key areas of literature relevant to this study: demography and mobility of older adults, transit barriers and perceptions, and social marketing and learning applications.

Demography and Mobility of Older Adults

Numerous sources document the demographic trends driving the growing challenge of providing transportation services to a new and larger generation of older travelers (3, 8–10). In the United States, there are approximately 34 million senior citizens at present, and this population is expected to more than double by the year 2030, comprising 20% of the nation’s population (1). In California, 3.5 million people are currently over the age of 65; this constitutes 12% of the total state population (8). By the year 2040, the senior population is expected to grow 172% (from 2000), and most of this growth is expected to occur in the next 20 years (8).

Although auto use is lower in urban areas relative to suburban and rural ones, it is still the most commonly used travel mode of seniors. According to an analysis of the 1995 National Personal Transportation Survey, driving a car was the mode of choice for 53% of all trips made

by older people in urban areas, 70% in sub-urban areas, and 66% in rural areas. The second most common mode for seniors was as a passenger in an auto: 21% in urban and suburban environments and 25% in the rural environment (3). In total, older individuals used the car for 74% of all trips in the city and 91% of total trips in the suburbs and countryside. Public transit constituted only 8.2% of all senior trips in urban areas and less than 1% in suburban and rural areas (3).

Until the age of 85, private car travel accounts for nearly 90% of all trips. In the 85 and older cohort, travel by private car decreases by about 10%, and walk and taxi modal shares increase (3). Nevertheless, across successive cohorts, there is an increasing shift from driving a private car to becoming a passenger in an auto (3).

Older individuals often find certain driving situations exceptionally challenging. After the age of 75, driving performance begins to decline because of increased stimulus-reaction time, declines in visual cognitive performance, and medication effects (11). Car crash statistics indicate that the fatality rate of seniors increases between the ages of 55 and 70, and this increase occurs exponentially after the age of 65 (12). McKnight (11) identifies specific mental processes that are exceptionally difficult for senior citizens while driving: attention sharing, judging gaps in traffic, conducting visual searches, navigation, and motor control. Attention sharing is frequently a required skill for making left-hand turns because the driver must watch multiple events at once (11). A survey of older travelers in San Diego, California, also found that the greatest perceived driving challenges involved making left-hand turns and managing yield situations (5). Motor control deficiencies involve events like misapplications of the accelerator or wide swings around corners (11).

As a result of physical, cognitive, and financial challenges, driving cessation—either forced or voluntary—is inevitable for older travelers who live long enough. Aside from cessation caused by a discrete event such as a crash or an illness, there also appears to be a process of cessation. Focus groups, conducted in Florida, Maine, and Maryland, suggest that older drivers begin the cessation process by restricting trip variety and increasing trip chaining (10). Recreational trips are generally the first trip types to be eliminated, which are also the types of trips that older travelers are likely to value most highly (13, 14). Personal driving is typically replaced by passenger trips that are provided by a family member or friend. Many seniors appear to dislike the feelings of dependence that accompany increases in these trips (6).

Other research that examines the consequences of driver cessation has focused on the health changes that people experience once they stop driving. A core study in this area by Marottoli et al. (4) reviews past research and concludes that after adjusting for sociodemographic and health-related factors, driving cessation is still associated with a further decrease in out-of-home activities. The direct health effects of driver cessation are associated with a more inactive lifestyle, which increases the risk of heart disease, stroke, and fractures. More recently, a decrease in out-of-home activities has been linked to declines in cognitive abilities as well (4).

Transit Barriers and Preferences

A number of studies in recent years have attempted to explore the reasons why older travelers do not take transit, even if it is available to them (1, 5, 6, 15, 16). In general, the study results suggest a number of significant concerns:

- Lack of direct service to local destinations;
- Limited transit service hours during off-peak periods and on weekends;
- Multiple transit connections;
- Transit service that is not prompt or reliable;
- Physical discomfort related to climbing stairs, paying fares, walking to and standing at stops, and standing on buses;
- Fear of crime at park-and-ride lots, riding on the bus after dark, and waiting for the bus after dark; and
- Difficulties understanding how to use transit.

Many of these studies have also recommended strategies to encourage transit use among older individuals. It appears that while all transit users respond favorably to service improvements, seniors may place more value on enhancements to their physical and psychological comfort, safety, and access to local destinations (15). Recommendations have been made to improve information access by making maps and schedules available at bus stops and improving general and real-time telephone information (1, 15). In addition, service limitations may be addressed through shared-ride, demand-responsive services (1). Friendly and patient transit drivers may make the transit experience for older riders more pleasant and comfortable (1, 15). Finally, Burkhardt et al. note that older travelers may be less familiar with transit and may have physical and cognitive challenges that make it more difficult to use. As a result, older travelers may need a higher level of support (e.g., information and assistance) to increase their transit use (1). Burkhardt et al. recommend “developing mobility planning and training programs to help older persons make a transition from driving to public modes of travel” (1, p. 15). A recent report sponsored by the California Department of Transportation on the use of public transit by non-traditional riders also recommended the development of “senior education and outreach programs” (7, p. 6).

Relevant Applications of Social Learning and Marketing Theory

Social learning theory emphasizes a continuous interaction among behavior, personal factors, and environmental determinants and bridges the gap between cognitively oriented rational decision making models and behavioral theory. The relative influence of each factor is different for various settings and behaviors. The environment can influence behavior by making it easier for individuals to act. A distinguishing feature of learning theory is that “symbolic, vicarious and self-regulatory processes assume a prominent role” (17, p. 12). For instance, an individual might observe another person’s behavior, reproduce it, and, in replicating it, reinforce the modeled behavior.

Kotler et al. define social marketing theory as “the use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify, or abandon a behavior for the benefit of individuals, groups, or society as a whole” (18, p. 5). Social marketing builds upon and employs several social learning theory principles. For instance, media (e.g., modeling videos and articles) can be used to stimulate learning by targeted groups, and modeling can help develop an individual’s sense that he or she can perform a new behavior. Similar to social learning theory, social marketing supports a gradual or dynamic approach to behavioral adoption of a new product, concept, or service. Individuals move through definable stages in adopting a new product (19). There are four stages in Andreasen’s social marketing behavioral adoption process: precontemplation, contemplation, action, and maintenance (20).

In the field of transportation, there have been a number of applications that test aspects of social learning and social marketing theories. One study (21) tested the effect of different types of information, such as storytelling and fact sheets, on knowledge and attitudes related to carpooling. At five employment sites (645 employees), the “story-based intervention was compared to a fact sheet-based intervention and to a control” (21, p. 650). The results indicated that participants who received the information, regardless of its type, “felt more comfortable with their carpool knowledge and felt that they had adequate knowledge to guide them in discussions and problem solving” and “the more interesting text was associated with greater perceived knowledge, greater confidence and comfort with knowledge, and increased willingness to try carpooling” (21, p. 650).

Another study (22) explored the effect of three interventions (information, task assignment and control, and feedback) on the attitudes, social norms, and behavior of mail-van drivers in a Netherlands postal district. The objective of the interventions was to change driving behavior to reduce energy consumption. A field experiment was conducted to test the effectiveness of the interventions. The information intervention included an instructional film and a booklet. The task assignment and control intervention included additional information, commitment, and follow-up with respect to driving behavior and energy consumption. The feedback intervention included weekly information on the change in energy consumption by the drivers. The study indicated that “attitudes, social norms, and reported behavior changed, and energy savings of more than 7% were achieved compared with a control group” (22, p. 417).

Another study employed modeling techniques in a television campaign to promote gasoline conservation behaviors in three New South Wales, Australia, cities (23). The program was implemented in two cities for 4 weeks, and the third city was the control. Before- and-after surveys were administered to about 400 randomly selected respondents in each of the two cities. The campaign used two different themes. The first was saving money to test the effectiveness of economic incentives. The second was good citizenship to test the effect of social norms on behavior. “The results showed that the pro- petrol conservation films, regardless of theme (saving money or good citizenship), had small but statistically significant effects on most measures of attitudes and beliefs, intention to save petrol in the future, and self-reported conservation behavior” (23, p. 444).

Shaheen (24) developed several informational media (a brochure, video, and a trial clinic) to introduce a new carsharing service and found that willingness to use the service was influenced by the amount and type of exposure. Informational media were used to teach targeted groups, and behavioral modeling (i.e., the video and drive clinic) was used to develop participants' confidence in adopting new behaviors. Participants who only read the brochure lost interest over time, while a large majority of those who read the brochure, watched the video, and participated in the clinic stated that they would use the carsharing service.

More recently, programs like TravelSmart in Australia, Seattle, and Portland draw on the social learning concept of self-efficacy by emphasizing personal involvement to change behavior. The hypothesis is that greater participant engagement or interaction produces a stronger motivation to change behavior. For example, children are given decals for bicycles and lunch boxes to encourage awareness of and changes in travel behavior. To encourage transit use, program participants have been offered system experience and motivation (or promised rewards). Preliminary results of these pilot programs suggest that they have changed travel behavior and that the interventions can be cost-effective.

Rossmoor Case Study

The Rossmoor Senior Adult Community was founded in 1963. It is located in Contra Costa County near the city of Walnut Creek, California. As of 2005, the community had a population of 9,233 individuals with 6,700 rental units on 2,200 acres of land. The types of residences included in this community are cooperatives, condominiums, and single-family developments. To be eligible to live in the community at least one household member must be 55 years of age or older. Community facilities include three clubhouses, a medical center, a gymnasium, and pools. The community also supports a newspaper and broadcasting channel. Most residents in the community have access to a personal vehicle. In addition, residents can access the Rossmoor bus (fixed-route and dial-a-bus after-hour services) within Rossmoor and connect to the County Connection bus system that takes travelers to locations outside of Rossmoor, including downtown Walnut Creek and the local Bay Area Rapid Transit (BART) District rail transit station.

Methodological Approach

Researchers began the study with two exploratory focus groups with older individuals from the Rossmoor community in October 2005. The focus groups were conducted to explore participants' use, experience, and perceptions of transit (or self-efficacy). In addition, factors influencing transit-related self-efficacy were explored, such as physical and cognitive challenges, transit familiarity, and peer transit perceptions. Finally, participants were asked to respond to and suggest alternative interventions that might address factors that negatively influence transit-related self-efficacy.

Based on the literature and focus groups, the authors developed an informational transit training video specific to Rossmoor (versus a more general transit video). The video features

older individuals from the community who are relatively well-known and liked. It shows how these residents successfully navigate specific concerns and problems related to traveling by available transit methods to key destinations (downtown Walnut Creek, John Muir Medical Center, and the nearest BART station).

Researchers conducted three video showings during the months of June and July 2006, in which survey instruments were distributed before and after participants watched the video. The surveys assessed respondents' experience, use, and perceptions of transit before and after seeing the video. Participants were recruited from the community by distributing flyers announcing the showing and a gift certificate lottery incentive. A total of 129 surveys were completed.

Focus Group Findings

At the start of the focus groups, researchers administered an intake questionnaire to identify demographic attributes of respondents. Participants in the two focus groups included six men and 16 women. Most are between the ages of 65 and 85, are married, have a college education, and use a mobile phone, the Internet, e-mail, or a combination of the three. The median income of the participants is \$50,000 a year.

The focus group moderator asked participants to share their travel experiences. Before moving to Rossmoor, nine participants traveled primarily by auto; eight traveled largely by auto but used transit to commute to work; and three lived in large cities (New York and San Francisco) and almost solely traveled by transit. Since moving to the Rossmoor community, most travel primarily by auto and only use BART to go to San Francisco. Four participants noted that they do not use transit much, but they do "walk a lot." However, most reported that they are "highly confident" taking transit during the day; three conveyed medium confidence, and one indicated a low confidence level. Most stated that they are less comfortable taking transit at night unless traveling in a group.

Many of the transit attributes favored by participants are common to all travelers and not just older adults, including fast travel times, low travel costs, safety, and comfort. More specifically, focus group members identified the following positive attributes of transit relative to the automobile:

- Avoiding congested and busy roadways;
- Faster travel times to certain destinations;
- Saving money on parking, bridge tolls, and gas;
- Avoiding parking in areas where it is difficult or limited;
- Relaxing (i.e., do not have to drive and can read or work);
- Safer at night; and
- Better for the environment (e.g., air quality).

Participants also noted that transit access is very important, particularly when an individual has no car and cannot drive because of a medical condition or revoked license. The merits of transit were discussed largely in the context of challenging driving situations, such as congestion, fast roadway speeds, and impaired night vision.

Focus group members also described transit attributes that they do not like. One category of general dissatisfaction is transit service. Most participants feel that

- Transit frequently does not go when or where they want to go,
- Making transit connections is difficult, and
- Direct service to key destinations is lacking.

Individuals also expressed concerns regarding their physical comfort, safety, and security on transit, including

- Carrying large or many packages on transit,
- Climbing stairs,
- The operational status of station elevators,
- Lack of comfortable seating on transit and at stations and stops (e.g., bikes and passengers who occupy senior seating areas),
- Locked station restrooms, and
- Limited security on transit and at stations and stops, particularly at night.

Focus group participants suggested a number of transit service- related improvements, including:

- Improved transit connections (particularly to BART),
- More frequent service,
- Senior fare discounts, and
- Shorter walking access and egress to transit stops or stations (door-to-door services).

Participants also offered suggested improvements that would address their physical concerns regarding transit use:

- Upcoming stops should be clearly announced by drivers;
- Clear transit signs are needed at stops, stations, and different station levels;
- Drivers should be more helpful and sensitive to older travelers' physical limitations;
- Seats should be comfortable (i.e., not hard or slippery);
- Seats should have seatbelts;
- Equipment is needed for wheelchair access; and
- Steps should be shallow rather than deep.

A number of suggestions were also made to improve older travelers' knowledge and confidence using transit. These included improved transit information and dissemination:

- Better fare and schedule information (e.g., "exact fare so seniors can be prepared," bus schedules at stops, and clearly printed bus schedules),
- Personal communication of information (e.g., staffed information booths at BART and no automated telephone recordings), and
- Information available from a person on the phone or station booth, the Internet (e.g., "Mapquest for transit"), and brochures.

None of the participants had ever heard of 511.org, which is an Internet source for transit services. The focus group results indicate that in-person communication is an important component of effective information access. Participants also had a number of thoughts about how older travelers might be able to practice using transit and begin to feel more confident. These include

- Transit training classes in which a small group is escorted on transit trips by a trainer,
- Taking a transit trip with a friend, and
- An instructional video on the Rossmoor channel that takes viewers through all of the particular details of trips from Rossmoor to specific destinations (in this study, researchers implemented this recommendation).

Survey Results

Researchers analyzed survey data for 129 respondents who watched the transit training video in summer 2006. This section reviews sample demographics, trip-making behavior, auto use, current and prior transit use, perceived response to possible transit barriers and suggested improvements, and video response.

Demographics

Survey respondents are predominantly female (73.6%). Most respondents are between the ages of 75 and 84 (52%), but many are ages 65 to 74 (24.8%) or 85 years of age or older (20.8%). On average, respondents have lived in Rossmoor for 7.5 years and live in a household with 1.4 members. Nearly equal proportions of respondents are either married or widowed, and the rest are single or divorced. There is wide variation in the highest education level completed; the most common degrees are high school (36.5%), college (26.2%), and masters (19.0%). Most participants have a moderate income (pretax in 2005): 36.6% had an income of \$20,000 to \$49,999, 19.5% had an income of \$50,000 to \$79,999, and 19.5% had an income of more than \$110,000 in 2005. More than 50% of respondents use a mobile phone, e-mail, and the Internet, but only 4.1% use a personal digital assistant.

Trip Making and Auto Use

Respondents actively engage in a variety of nonwork trips, including shopping (95.8%), running errands (78.3%), and social engagements (70%). Fewer travel to work (3.3%) or doctors' offices (21.7%) at that frequency. Respondents also reported traveling 2 or more days per week by personal auto (86%), walking (46.3%), and transit (36.3%).

Participants are most likely to use an auto as their primary transportation mode (89.6%), drive (88.5%), and have just one driver and auto in their household (58.3 and 74.6%, respectively). For each successively older cohort, respondents are less likely to use autos as their primary mode or have drivers and private vehicles in their households. Overall, the vast majority of respondents have the means to travel by auto. The number of respondents who did not drive is approximately equal to the number of those who use transit as their primary transportation mode. A two-sided chi-square test was conducted to detect whether there was a significant association between using transit as one's primary transportation mode and current driving status; a

significant association was found ($p = .000$). However, the lambda measure for these two variables was .548 ($p = .019$), indicating only a moderate association between using transit as one's primary transportation mode and current driving status.

Prior and Current Transit Use

Before moving to Rossmoor, 59% of respondents stated that they had never lived or worked in a community in which they used transit with some regularity (one or more times a week). However, this probability decreases over the age of 85; approximately two-thirds of respondents aged 65 to 84 and over one-half of those aged 55 to 64 had never lived in a community in which they regularly used transit.

Approximately, 13% stated that transit is their primary travel mode. Moreover, 36.3% use transit two or more times a week. The Rossmoor bus is used most frequently (18.2%), followed by BART (10.7%) and the County Connection bus (7.4%). In this study, it appears that survey respondents use transit far more frequently than the national averages for urban and suburban regions, perhaps because of the higher-quality transit services available in their community.

Potential Transit Barrier Perception and Suggested Improvements

Two sets of survey questions explored participants' response to transit barriers and improvements to promote transit use. Respondents were first asked to indicate which improvement(s) to transit would increase their comfort using transit. As shown in Table 1, the most popular improvements are more frequent schedules (50.5%), better connections (48.6%), more direct routes (44.8%), and easy-to-read schedules (38.1%). Less popular improvements include later schedules (21.9%), better safety measures (15.2%), and more seating (8.6%).

Respondents were also asked to indicate whether they strongly agreed, agreed, were neutral, disagreed, or strongly disagreed (on a scale of +2 to -2) with a number of potential transit barriers. The weighted averages of the scaled responses are also presented in Table 1. Interestingly, the weighted scale is negative (i.e., respondents on average did not agree that the statement reflected a transit barrier) for all but three transit service attributes: travel time, lack of door-to-door service, and transfers. These results suggest that respondents are rather transit savvy and live in a community with a relatively high-quality transit service. Most respondents reported using transit services at least once (approximately 70% use the Rossmoor bus, 60% use the County Connection bus, and 50% use BART). The weighted scores for stairs on buses and trains (-0.26) and stations (-0.60) may reflect knowledge of the Rossmoor bus, the County Connection bus, and BART trains in the area, which do not have steep steps.

Respondents were also asked to indicate which resources they use to obtain information about transit. As described in Table 2, the most commonly used resources are paper schedules, the Rossmoor bus information line, and brochures. Less commonly used resources are family or friends, the Internet, transit training classes, and the 511 information line and website.

TABLE 1 Response to Possible Barriers and Transit Improvements

What Would Increase Your Level of Comfort Taking Transit?	Percent of Respondents ^a
More frequent schedule	50.5
Better connections between different transit options	48.6
More direct routes	44.8
Easy-to-read schedules	38.1
Later schedules	21.9
Better safety measures	15.2
More seating available	8.6
What Prevents You from Using Transit More Frequently?	Weighted Average Score ^b
Takes too long	0.72
No door-to-door service	0.28
Must transfer	0.17
Not easy to get to stops/stations	-0.06
Schedules hard to read	-0.19
Difficult to climb station stairs	-0.26
Do not know how to get information	-0.30
Difficult to pay fare	-0.46
Difficult to step on and off bus/train	-0.60
Unfriendly service	-0.74
Unsafe	-0.76

N = 105.

^aTotal sums to more than 100% because multiple answers were possible.

^bStrongly agree = -2; agree = -1; neutral = 0; disagree = 1; strongly disagree = 2

TABLE 2 Sources Used to Find Transit Information

Transportation Information Resources	Percent of Responses ^a
Paper schedule	52.4
Rossmoor bus transportation info line	43.8
Brochures	36.2
Ask family or friend	19.0
Internet	17.1
Transit training	10.5
511 transit line or website	9.5

N = 105.

^aTotal sums to more than 100% because multiple answers were possible.

Transit Training Video Response

In the transit training video, researchers attempted to address a number of potential barriers to transit use, including finding transit information, reading transit schedules, fare payment, bus and train steps, and transit costs for the three services available to the Rossmoor community (the Rossmoor bus, County Connection, and BART). As indicated in Table 1, on average, the results of the prevideo survey indicate that respondents do not consider these to be significant transit barriers. Thus the video would likely have had little effect on participants who did not perceive those attributes as transit barriers. The distribution of responses indicates that approximately one-half of participants perceive these factors as barriers (strongly disagree or disagree) or were uncertain (neutral).

Overall, approximately 30% to 65% of respondents who perceived the specified factors as transit barriers indicated some positive change in perception after viewing the video. The messages that educated viewers on how to obtain information on transit schedules, costs, and payment appeared to generate the most positive change, but those that addressed difficulties in reading schedules and climbing stairs did not. A one-sided binomial test also indicated a statistically significant ($\alpha = .05$) difference between respondents who had negative perceptions before and after the video and those who had negative or neutral perceptions before and positive perceptions after viewing the video message on obtaining information on transit schedules ($p = .014$), costs ($p = .014$), and payment ($p = .029$). The difference is insignificant for difficulty in reading schedules ($p = .421$) and climbing stairs ($p = .421$). This last result may be explained by the video intervention's quality or the respondents' physical abilities (i.e., vision or walking), which are necessary conditions to read schedules and climb stairs. The video did portray transit accommodations for certain disabilities, but the level of these adjustments would not have met the needs of all respondents across transit services.

The transit training video takes viewers through specific transit steps for three services (Rossmoor bus, County Connection, and BART) to make trips from Rossmoor to downtown Walnut Creek, the John Muir Medical Center, and a nearby BART station. Before viewing the video, participants were asked if they had previously used any of these transit services to go to the destinations presented in the video or other locations. After viewing the video, respondents were asked if they would use these transit services to go to specific destinations more frequently and if they would use transit instead of driving to frequent destinations. The results are presented in Figure 1.

The positive change in stated use is greater than a continued negative response to transit use for the destinations specified in the video and frequent destinations (with the exception of BART). In general, predicted transit travel to video destinations reveals a somewhat greater improvement than travel to frequent destinations.

In addition, for each transit service and destination pair described in Figure 1, a one-tailed binomial test was conducted between the proportion of respondents who did not use a service and destination before and after viewing the video and respondents who did not use a service and destination before but indicated that they might after viewing the video. The results show a

statistically significant ($\alpha = .05$) difference for the Rossmoor bus ($p = .034$) to frequent destinations; the County Connection bus to frequent destinations ($p < .001$), down- town Walnut Creek ($p < .001$), and the John Muir Medical Center ($p < .001$); and BART to a nearby station in the video ($p = .004$), but not BART to other frequent destinations ($p = .381$).

Before watching the video, participants were also asked what sources they used to obtain transit information (Table 2). After watching the video, they were asked what sources of information were best suited for their personal transit use. The change in transit resources used (and to be employed in the future) before and after viewing the video is presented in Figure 2. The results indicate a positive change across all categories; however, the greatest changes are for the Internet and 511.org (both are featured in the video). The greatest negative changes in resources used before but not after the video are asking a friend or family member, paper schedules, and the Rossmoor bus information line.

In addition, a one-tailed binomial test was conducted for each information source described in Figure 2 to determine if there is a significant difference between the proportion of respondents who selected an information source only after viewing the video and the remaining respondents. Statistically significant ($\alpha = .05$) differences are revealed for paper schedules ($p = .001$), the Rossmoor bus information line ($p = .003$), the Internet ($p = .042$), a transit training class ($p = .017$), and the 511 phone line or website ($p = .002$). No statistically significant differences appear for brochures ($p = .136$) and friends or family ($p = .119$).

Conclusion

In this study, the authors applied principles of social learning and marketing to develop a transit training video for residents in the Rossmoor retirement community in Walnut Creek, California. The video features familiar community members successfully navigating specific concerns and problems, as identified in the literature review and focus groups, related to available transit use to key community destinations. Residents were recruited to complete surveys before and after viewing the video. Survey results provide some insight into respondents' travel-related experiences, preferences, and constraints:

- Approximately 90% use autos as their primary travel mode, are able to drive, and have a vehicle available for their household's use; however, these proportions tend to decline with respondents' age.
- About 60% had lived in a community before moving to Rossmoor where they used transit with some regularity; this proportion tends to increase with respondents' age.
- Approximately 13% use transit as their primary travel mode, and 36% use it two or more times a week.
- Most participants indicated that transit travel time, lack of door- to-door service, and transfers are significant barriers to transit use; as a result, the most popular improvements are frequent schedules, better connections, and direct routes.

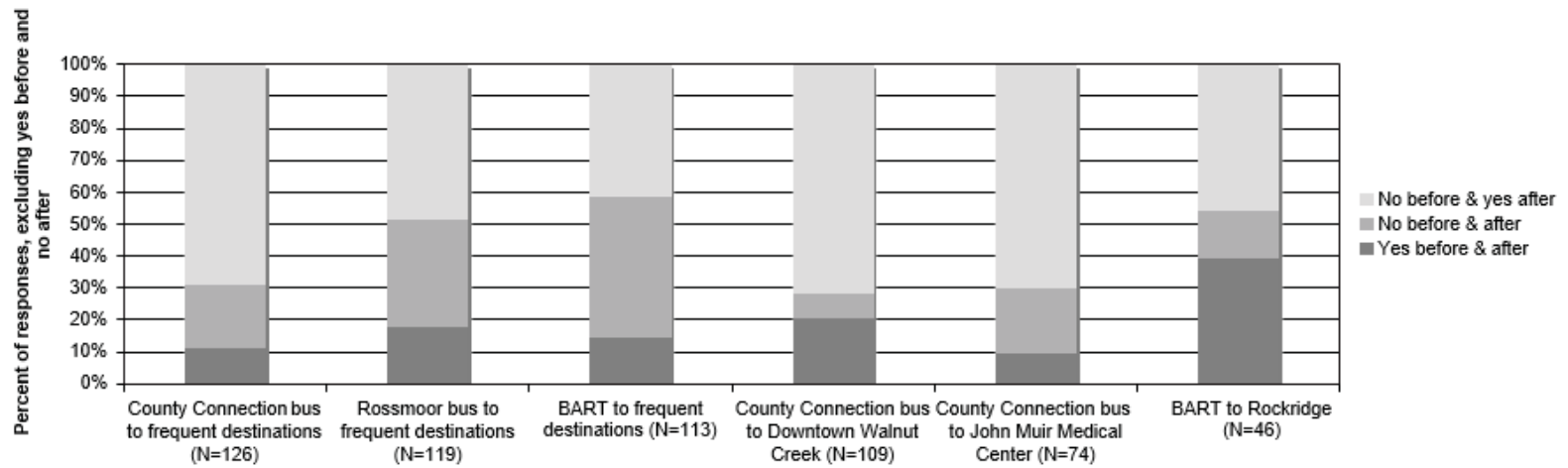


FIGURE 1 Change in respondents' stated use before and after viewing video.

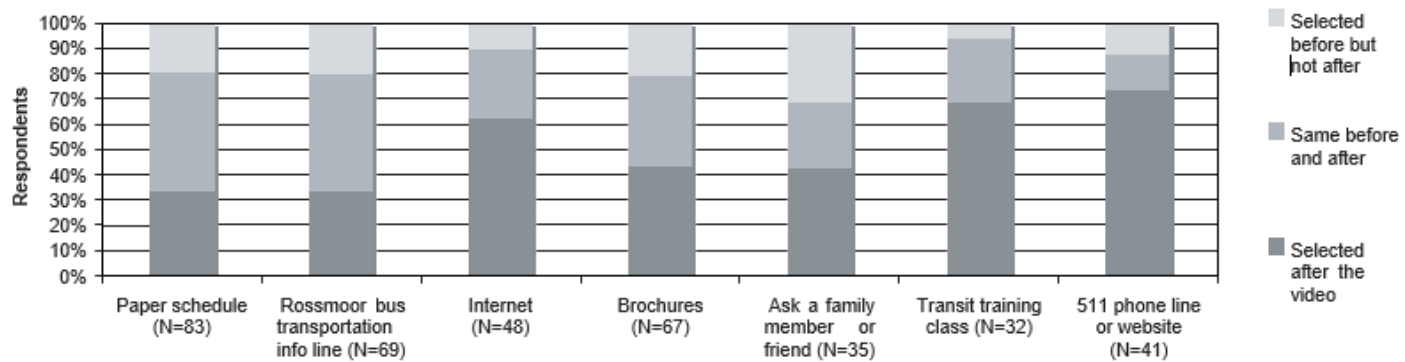


FIGURE 2 Change in sources of information used for transit use before and best suited after viewing video.

In addition, survey results were also evaluated to explore the video intervention's effectiveness for promoting transit use among older travelers:

- The video messages that educated viewers about how to obtain information on transit schedules, costs, and payment generated a significant and positive attitudinal change; however, those that address difficulties reading schedules and climbing stairs did not, perhaps because these tasks require a level of physical ability that cannot be fully addressed by the video.
- After viewing the video, respondents indicated a significant and positive change in transit use to the specific destinations portrayed in the video; however, results are mixed for transit travel to more general destinations that are not explicitly portrayed in the video.
- The video also educated viewers about a broader range of information sources, such as the Internet and 511.org. After viewing the video, respondents indicated a significant and positive change in their future stated use of these information sources.

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References

1. Burkhardt, J. E., A. T. McGavock, C. A. Nelson, and C. Mitchell. *TCRP Report 82: Improving Public Transit Options for Older Persons*, Vol. 2. Transportation Research Board of the National Academies, Washington, D.C., 2002.
2. *Profile of General Demographic Characteristics: 2000*. Bureau of the Census, U.S. Department of Commerce, 2000, Table DP-1.
3. Rosenbloom, S. Mobility of the Elderly: Good News and Bad News. In *Conference Proceedings 27: Transportation in an Aging Society: A Decade of Experience*. Transportation Research Board of the National Academies, Washington, D.C., 2004, pp. 3–21.
4. Marottoli, R. A., C. F. Mende de Leon, T. A. Glass, C. S. Williams, L. M. Cooney, and L. F. Berkman. Consequences of Driving Cessation: Decreased Out-of-Home Activity Levels. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, Vol. 55, 2000, pp. 334–340.
5. Holmes, M., S. Sarkar, M. Emami, and D. Shaules. *Travel Patterns and Concerns of Suburban Elderly in San Diego County* (CD-ROM). Transportation Research Board of the National Academies, Washington, D.C., 2002.
6. Stowell-Ritter, A., A. Straight, and E. Evans. *Understanding Senior Transportation Report and Analysis of a Survey of Consumers Age 50+*. AARP Public Policy Institute, Washington, D.C., 2002.
7. *An Analysis of Public Transportation to Attract Non-Traditional Transit Riders in California*. Business, Transportation and Housing Agency, California Department of Transportation, Sacramento, April 2003. www.dot.ca.gov/hq/MassTrans/Non-Traditional_Ridership.htm. Accessed July 28, 2006.
8. Scharlach, A., F. Torres-Gil, and B. Kaskie. *Strategic Planning Framework for an Aging Population*. California Policy Research Center Report: Strategic Planning on Aging Series, Berkeley, 2001.
9. Lee, R., T. Miller, and R. D. Edwards. *The Growth and Aging of California's Population: Demographic and Fiscal Projections, Characteristics and Service Needs*. California Policy Research Center, Berkeley, Special Report, Technical Assistance Program, 2003.
10. Burkhardt, J. E. Mobility Changes: Their Nature, Effects, and Meaning for Elders Who Reduce or Cease Driving. In *Transportation Research*

- Record: Journal of the Transportation Research Board, No. 1671, TRB, National Research Council, Washington, D.C., 1999, pp. 11–18.
11. McKnight, A. J. The Freedom of the Open Road: Driving and Older Adults. *Journal of the American Society on Aging*, Summer 2003. www.asaging.org/generations/gen27-2/article.cfm. Accessed July 28, 2006.
 12. Cerrelli, E. Crash Data and Rates for Age–Sex Groups of Drivers. National Highway Traffic Safety Administration Research Note, Jan. 2003.
 13. Douma, F., and C. Duncan. Using ITS to Better Serve Diverse Population. Final Report. Minnesota DOT Guidestar 2002 Research Project, St. Paul, Minn., Aug. 2004.
 14. Collià D. V., J. Sharp, and L. Giesbrecht. The 2001 National Household Survey: A Look into the Travel Patterns of Older Americans. *Journal of Safety Research*, Vol. 34, 2003, pp. 461–470.
 15. Koffman, D., and R. Salstrom. How Best to Serve Seniors on Existing Transit Services. Report FHWA/CA/OR-2001-23. Mineta Transportation Institute, San Jose, Calif., 2001.
 16. Suen, S. L., and L. Sen. Mobility Options for Seniors. In *Conference Proceedings 27: Transportation in an Aging Society: A Decade of Experience*. Transportation Research Board of the National Academies, Washington, D.C., 2004, pp. 97–113.
 17. Bandura, A. *Social Learning Theory*. Prentice Hall, Englewood Cliffs, N.J., 1977.
 18. Kotler, P., N. Roberto, and N. Lee. *Social Marketing. Improving the Quality of Life*. 2nd ed. Sage Publications Inc., Thousand Oaks, Calif., 2003.
 19. Maibach, E. W., and D. Cotton. Moving People to Behavior Change: A Staged Social Cognitive Approach to Message Design. In *Designing Health Messages* (E. W. Maibach and R. L. Parrott, eds.), Sage Publications Inc., Newbury Park, Calif., 1995.
 20. Andreasen, A. R. *Marketing Social Change: Changing Behavior to Promote Health, Social Development, and the Environment*. Jossey-Bass Publishers, San Francisco, Calif., 1995.
 21. Kearney, A. R., and R. De Young. A Knowledge-Based Intervention for Promoting Carpooling. *Environment and Behavior*, Vol. 27, No. 5, 1995, pp. 650–678.
 22. Siero, S., M. Boon, G. Kok, and F. Siero. Modification of Driving Behavior in a Large Transportation Organization: A Field Experiment. *Journal of Applied Psychology*, Vol. 7, No. 3, 1989, pp. 417–423.
 23. Syme, G. J., C. Seligman, S. J. Kantola, and D. K. MacPherson. Evaluating a Television Campaign to Promote Petrol Conservation. *Environment and Behavior*, Vol. 19, No. 4, 1987, pp. 444–461.
 24. Shaheen, S. Dynamics in Behavioral Adaptation to a Transportation Innovation: A Case Study of CarLink—A Smart Carsharing System. PhD dissertation. UCD-ITS-RR-99-16. University of California, Davis, Oct. 1999.