



LAKE COUNTY/CITY AREA PLANNING COUNCIL

Lisa Davey-Bates, Executive Director
(707) 263-7799 / Fax 463-2212
www.lakeapc.org

367 North State Street, Suite 206
Ukiah, CA 95482

SOCIAL SERVICES TRANSPORTATION ADVISORY COUNCIL (SSTAC) AGENDA

DATE: Wednesday, March 9, 2016
TIME: 10:30 am or directly following the Lake County/City Area Planning Council Board Meeting

PLACE: Lamkin-Sanchez Transit Center Caltrans-District 1
9240 Highway 53 Teleconference
Lower Lake, California 1656 Union Street
Eureka, California

-
1. Call to Order and Introductions
 2. Public Input
 3. Approval of Draft December 8, 2015 SSTAC Meeting Minutes
 4. Roundtable Discussion on Non-Emergency Medical Transportation (NEMT)
 - a. NEMT Background & Findings of Previous Planning Efforts
 - b. Unmet Transit and NEMT Needs
 - c. Medi-Cal Reimbursed Non-Emergency Medical Trips
 - d. Lake Links/Pay Your Pal Program
 - e. NEMT Goals and Implementation Strategies
 - f. Next Steps
 - g. Miscellaneous
 5. Update on Lake Transit Projects and Grants
 6. Update on Human Services Transportation Programs
 7. Discussion of Issues and/or Concerns of SSTAC Members
 8. Date for next meeting: Tuesday, May 10, 2016
 9. Announcements/Good of the Order
 10. Adjourn

PUBLIC EXPRESSION

Any member of the public may speak on any agenda item when recognized by the Chair for a time period, not to exceed 3 minutes per person and not more than 10 minutes per subject, prior to the Public Agency taking action on that agenda item.

AMERICANS WITH DISABILITIES ACT (ADA) REQUESTS

To request disability-related modifications or accommodations for accessible locations or meeting materials in alternative formats (as allowed under Section 12132 of the ADA) please contact the APC office at (707) 263-7799, at least 72 hours before the meeting.

Date posted: 3/3/16

List of Attachments:

Agenda Item #3: December 8, 2015 Draft SSTAC meeting minutes

Agenda Item #4a: Coordinated Plan Strategies and NEMT Plan Recommendations



LAKE COUNTY/CITY AREA PLANNING COUNCIL

Lisa Davey-Bates, Executive Director
www.lakeapc.org

367 North State Street, Ukiah, CA 95482
Administration: Suite 204 ~ 707-234-3314
Planning: Suite 206 ~ 707-263-7799

Social Services Transportation Advisory Council (SSTAC) Minutes

Date Prepared: 12/21/15

Meeting Date: 12/8/15

*Meeting Attendees: Ilene Dumont, Mark Wall, Wanda Gray, Paul Branson, Michelle Dibble
Also present: Karl Parker, Nephele Barrett, Jesse Robertson, and Dave Carstensen (via telephone)*

1. Call to order

Ilene Dumont called the meeting to order at 2:03 PM.

2. Approval of SSTAC meeting minutes

Karl Parker requested a revision to the October 13, 2015 minutes, on the 2nd page, halfway down: "LTA will start recruiting volunteer drivers paid for with emergency funding". Revise to read: "LTA will begin providing reimbursement for volunteer drivers paid for with emergency funding". Dave Carstensen also requested that meeting attendees be limited to SSTAC members and non-members, such as Dave Carstensen, be listed under "also present". Mark Wall made a motion to accept the minutes from the October 13, 2015 SSTAC meeting, with corrections. Paul Branson seconded the motion. The motion passed on a unanimous vote.

3. SSTAC Membership – Election of the SSTAC Co-Chair

Ilene Dumont called for nominations for the SSTAC Co-chair. Mark Wall made a motion to nominate Paul Branson as co-chair. Wanda Gray seconded the motion. Mark Wall sought confirmation that Paul Branson was an official member of the SSTAC. Jesse Robertson confirmed that the Board had confirmed Paul's appointment to the SSTAC. The motion was passed by unanimous vote.

4. Introduction of Unmet Needs Process

Nephele Barrett explained that unmet transit needs process was initiated last year after having not gone through the process for many years. It is a requirement if the region gives TDA money for streets and roads purposes. Lake does not give money for streets and roads but it does fulfil some requirements for public engagement requirements and other duties of the SSTAC and part of the contract that was approved the year prior. It was completed last year, but before that it was last conducted in the 1990s. It is a formal process of gather all of the potential unmet transit needs. The definitions were adopted last year so new definitions are not needed this year. We determine if any of the potential needs qualify as an unmet transit need. The transit agency is supposed to respond with their analysis. The analysis is considered by the SSTAC. The SSTAC makes recommendations and the APC Board takes action on unmet needs to determine if needs are considered reasonable to meet. If, based on the approved definitions, the needs *are* considered reasonable to meet, the needs become part of the budgeting process.

A list of needs were identified from the unmet needs process last year and has been attached to the staff report. A list of transit needs not related to service has also been added, though not required, in order to highlight the needs regardless. Today the SSTAC will be developing a list of potential unmet needs for the 2015/16 fiscal year.

Ilene Dumont stated that the SSTAC has considered and discussed unmet transit needs since the 1990s, just not consistent with the formal TDA process. Paul Branson asked if there is a public hearing announcement process. Nephele stated that the public hearing would be at the February Area Planning Council meeting and that would be noticed as a public hearing. Flyers were also posted on buses last year. Michelle Dibble asked how the list of needs is developed; does the list come from the public hearing? Nephele clarified that a preliminary list will begin development at the SSTAC today. A public hearing will be conducted where the public could submit comments, suggestions and recommendations. The APC can add publicly identified needs onto the preliminary list before taking action. Mark Wall advocated for APC staff to monitor APC Board or Transit Authority minutes throughout the year for public input and add unmet needs onto a running list.

Nephele Barrett recommended reviewing last year's list to determine what remains as an unmet need.

- Dial-a-Ride service from Clearlake Oaks to Clearlake – the finding last year was that this request was determined by LTA to duplicate existing services and not an unmet need. Fixed route service is currently available to connect the two areas and the residents of Eskaton that made the request have an existing stop conveniently located to them. This service is still not considered to be an unmet need.
- The bus stop at the Lakeport Safeway request was identified as an unmet need last year. Wanda Gray confirmed that this need has been met.
- Medical trips from Clearlake to St. Helena and Sutter Lakeside Health: this request would serve individuals in outlying areas by providing non-emergency medical transportation. This was not determined to be an unmet need in the last unmet transit needs process because when this item was under consideration LTA was taking steps to meet the need. At that time, LTA was preparing a contract with Sutter Lakeside to reimburse LTA for providing NEMT trips. The agreement with Sutter Lakeside was never finalized and Mark Wall indicated that he was not able to give a current status update on this project. Communication with Sutter Lakeside has all but ceased since LTA complied with Sutter Lakeside's terms. LTA entered into one agreement and after LTA had complied, the hospital's attorneys demanded a second agreement, which required LTA to get Cyber insurance and also meet HIPA requirements. LTA paid \$10,000 for Cyber Insurance per the terms of the second contract but has not been able to get Sutter Lakeside to execute the contract. Mark Wall recommended developing a policy for the Board to adopt which refuses program transportation or dial-a-ride service on a reservation basis to hospital or clinic patients without reimbursement. LTA provides over 300 trips a month, most of which go to the two hospitals and dialysis clinics for the price of a standard fare. LTA has been providing dial a ride service for a large number of NEMT trips. LTA could continue to provide service to this group but wouldn't able to provide the same level of service to more remote residents. The clinics are already receiving funds from the federal government for transporting clinic patients but that money hasn't been going to LTA,

it appears that the funds are being collected by Sutter Lakeside. Ilene Dumont noted that this service is needed; she receives calls requesting NEMT trips and considers this to remain an unmet need. Mark Wall needs to elevate the issue to the hospital administrator to continue moving forward. Mark suggested that hospital and clinic staff or administrators attend an SSTAC meeting to discuss the issue. The consensus of the SSTAC was to schedule the meeting to take place as part of the February SSTAC meeting. Nephele confirmed that this need would remain on the list.

- Eastbound service to Spring Valley and points east: An LTA connection to Spring Valley was determined to be reasonable to meet, if an interregional route were established to Cache Creek Casino. LTA will apply for funding through 5311 (f) in the next application cycle. This is still a need.
- Establish an NEMT hub for LTA at the Live Oak Senior Center: This request may be reasonable to meet if operating funds can be secured. The Board recommended that LTA conduct a pilot project with the senior center. This has not happened and is still an unmet need. Additional funding would be needed for Live Oak Senior Center in order to expand their existing service. Live Oak would have to become a sub-recipient for 5310 funds for operational costs. The SSTAC was in general agreement that the Live Oak Senior Center currently does not have the administrative capacity to meet 5310 requirements. Some of the hurdles include developing a Title VI plan and a DBE plan, for which Lake APC could provide technical assistance. While it was decided that there is a need for NEMT in Clearlake Oaks area, additional work will be needed to determine how the need could be met. Live Oak Senior Center could provide the service if a funding source could be identified. This need could be combined with other defined unmet needs.
- Non-Emergency Medical Transportation in outlying areas was determined to be an unmet need that was not reasonable to meet at the time. At this time, Mark Wall stated that this need could be funded if medical reimbursements were being paid by Sutter Lakeside and the dialysis clinics. The proposal to meet with the hospital administrator regarding NEMT reimbursements resurfaced. Mark Wall asked Ilene Dumont if she would object to having one or more LTA Board members attend a working meeting of the SSTAC. Ilene consented. Nephele suggested inviting the invitees to a Board meeting. A joint workshop could be publicly noticed to avoid Brown Act violations. Mark wanted a working meeting environment. The possibility of including this as an unmet need is dependent upon the feasibility of receiving medical reimbursements.

Other requests that did not fall under the TDA guidelines for the unmet needs process included:

- A transit shelter at the jail was considered not to be a priority at this time;
- Improved mileage reimbursement rate for volunteer drivers: the low reimbursement rate is considered to be an obstacle to recruiting volunteers. Resolving this issue is one of the tasks for the new Mobility Coordinator and should be resolved during the 2015-16 fiscal year;
- ADA improvements at fixed-route transit stops have been a long-standing need. An update to the Lake County Passenger Facilities Plan is needed to provide better information about the cost, funding, and priority for bus stop development. The solution is to encourage local agencies and Caltrans to include accessibility

improvements, if feasible, when streets/roads projects are adjacent to transit stops. This is still considered an unmet need.

- Senior Centers should take steps to become eligible sub-recipients of FTA grant funds. LTA and the APC should work with the senior centers to determine a plan of action if senior centers are interested in becoming grant applicants for FTA 5310 funds.
- A transit stop is needed at the Kmart in Lakeport. LTA has ordered a new stop, which is expected to be delivered this fiscal year.
- Paul Branson raised a new unmet need: out of County NEMT service. LTA provides service to Ukiah and St Helena. Medical trips to Santa Rosa are the biggest unmet need. Fixed route service to Santa Rosa is provided via MTA twice a day. Assisted service is what is needed.
- Michelle Dibble identified a need for a shelter at the Job Zone Employment Services. The stop should also be moved off of the highway and to a safe location on-site. A location on site may need to be coordinated with potential site improvements.

5. Update on Lake Transit Authority (LTA) Meetings (Wall)

- a. **Lake Transit Authority Meetings** – At the last meeting, the hot topic was the wages and benefits for drivers as a criterion for an immediate increase to the contract with Paratransit Services and for the future contract this coming spring.

6. Update on Lake Transit Projects and Grants (Wall)

a. VFRAP – Valley Fire Ride Assistance Program

The program has received a total of 8 applications and have 2.5 people enrolled. Karl Parker stated that he was underwhelmed by the response. Connecting with people that need the service is believed to be the cause for the low demand. This is a lesson learned for the Pay-Your-Pal Program. The launch date of the Pay-Your-Pal Program is unknown at this time.

- b. **NEMT Pay-Your-Pal:** At last month's meeting, the Authority approved the contract amendment that will allow reimbursements. Additional policies are needed to resolve issues that arose with the VFRAP Program. The SSTAC may be a resource for policy development.

- c. **Energy Use Reduction Plan** – State Grant due in late January and request to move a "big chunk of the fleet" to propane.

7. Update on Human Services Transportation Programs – No updates

8. Update on State and Federal Grant Programs and Projects

a. Lake Transit Hub Relocation Plan (Robertson)

The project is projected relocated the hub across the street from Walmart and Yuba College in Clearlake, but other locations along State Route 53 may also be considered. The kick-off meeting will be held later this month where some revisions will be made to the scope of work. A community design process will be included as part of the project. As the project advances, the SSTAC will be updated.

b. Bus Passenger Facilities Coordinated Plan – Sustainable Communities Transportation Planning Grant (Robertson)

The Caltrans application is due on December 31. APC has been working with LTA to prepare an application that would update the 2006 Bus Passenger Facilities Plan and coordinate capital improvements and maintenance needs with Lake County Public Works, Caltrans, Lakeport and Clearlake. Funds would be available in July of 2016.

9. Discussion of issues and/or concerns

None.

10. Public Input

No comments received.

11. SSTAC Meeting Schedule

- a) The next SSTAC meeting will be on February 9, 2016, at the Umpqua conference room in Lakeport.

12. Announcements

No announcements.

13. Adjourn SSTAC meeting

The meeting adjourned at 3:39 pm.

June 2015

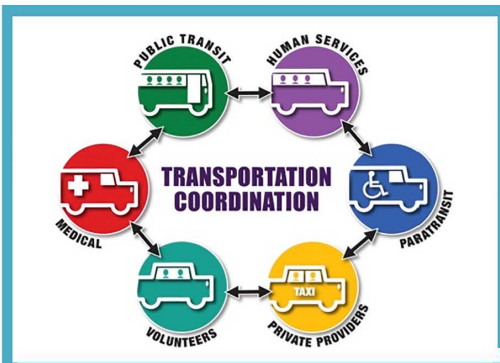
Lake County 2014-2015 Coordinated Public Transit–Human Services Transportation Plan



Prepared for:



Lake County/City Area Planning Council
Ukiah, California



Prepared by:



In Coordination With:

TRANSIT MARKETING, LLC
MOBILITY PLANNERS, LLC

4.3–A Survey of Medical Service Referrals to Out-of-County Destinations

Purpose

Transportation to out-of-county medical facilities has long been a challenge for Lake County residents, given limited specialty care available within the county. As part of this Coordinated Plan update, a survey effort to inform non-emergency medical transportation needs was coordinated with the Lake County Health Services Department and the Lake City/ County Area Planning Council. The jointly conducted survey sought to understand medical referrals to out-of-county health care providers and to identify what common travel patterns to out-of-county health care providers may exist. This can suggest what is and isn't possible in terms of public transit services and where coordinated projects with the health care system may make sense.

Approach

In consultation with the Lake County Health Services Department, a survey was constructed to solicit patient load information as to where and with what frequency medical services personnel are referring patients to out-of-county medical providers. Included as Appendix A, the survey of twelve questions, plus a comment opportunity, was provided as a mail-back paper survey and with an electronic link to a fillable PDF form that participants could electronically transmit.¹ The mailing list developed with assistance from the Health Services Department drawing heavily upon its Directory of Medical Facilities. An initial mailing to 182 addresses was prepared enclosing the paper survey and business reply envelope; a response rate of 16% was achieved after discounting mail returned for poor addresses and incomplete surveys.²

Responding Agencies and Caseload Levels

Although the number of responding surveys was modest, with just 25 useable surveys, it did represent a mix of providers and a significant overall caseload. Table 4-1 lists the specific responding organizations.



¹ The fillable PDF format proved problematic for some respondents because at the end of the survey, it was necessary to press submit in order to save and in order to electronically submit. Several responses were returned blank, presumably because they did not recognize the need to save before submitting.

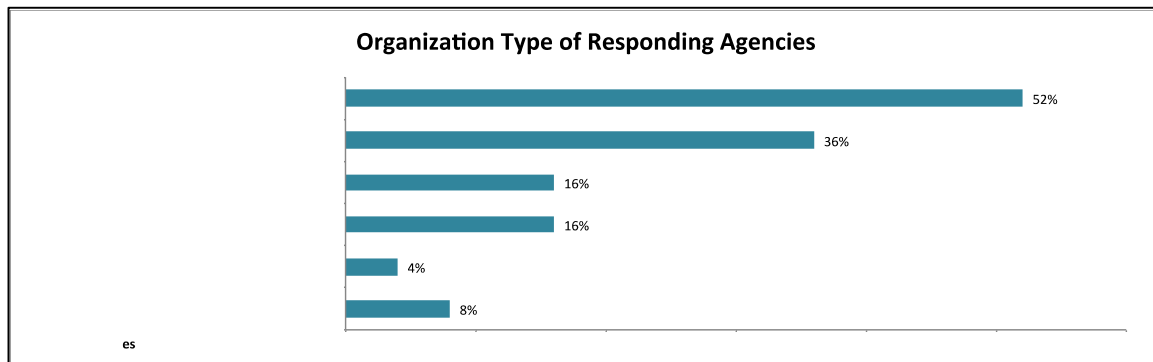
² Almost 30 mailed surveys were returned as “not deliverable as addressed”—16% of the original mailing.

Table 4-1, Lake County NEMT Survey of Out-of-County Referrals - Respondents

Clearlake Physical Therapy	Marc Shapin, M.D., Clearlake
E Center WIC Program, Clearlake	Meadowwood Nursing Center
Gary Meas, M.D., Lakeport	North Lake Internal Medicine
John A. Weeks, M.D., Lakeport	Paul Vartabedian DDS, Lakeport
Lake County Health Services Division	People Services, Inc
Lake County Obstetrics and Gynecology	Redwood Coast Regional Center
Lake County Public Health	Redwood Program Oncology Center
Lake Optometry, Clearlake	Specialty Care + Surg Center
Lake Pharmacy, Clearlake	St. Helena Clearlake
Lakeport Medical Group	St. Helena Family Health Center, Clearlake
Lakeport Medical Group	Sun Dental, Lakeport
Lakeport Physical Therapy	Sutter Lakeside Hospital
	Ukiah Valley Rural Health Center, Lakeport

Figure 4-2 following shows that responding organizations reflected a good mix of health care provider types. Just over half of the survey respondents came from doctor’s offices (52%), more than a third were out-patient health care providers (36%), four were dental offices (16%) or in-patient health care providers (36%). The two selecting “Other” were each human service agencies, People Services and the countywide WIC program.

Figure 4-2, Lake County NEMT Survey – Types of Respondents

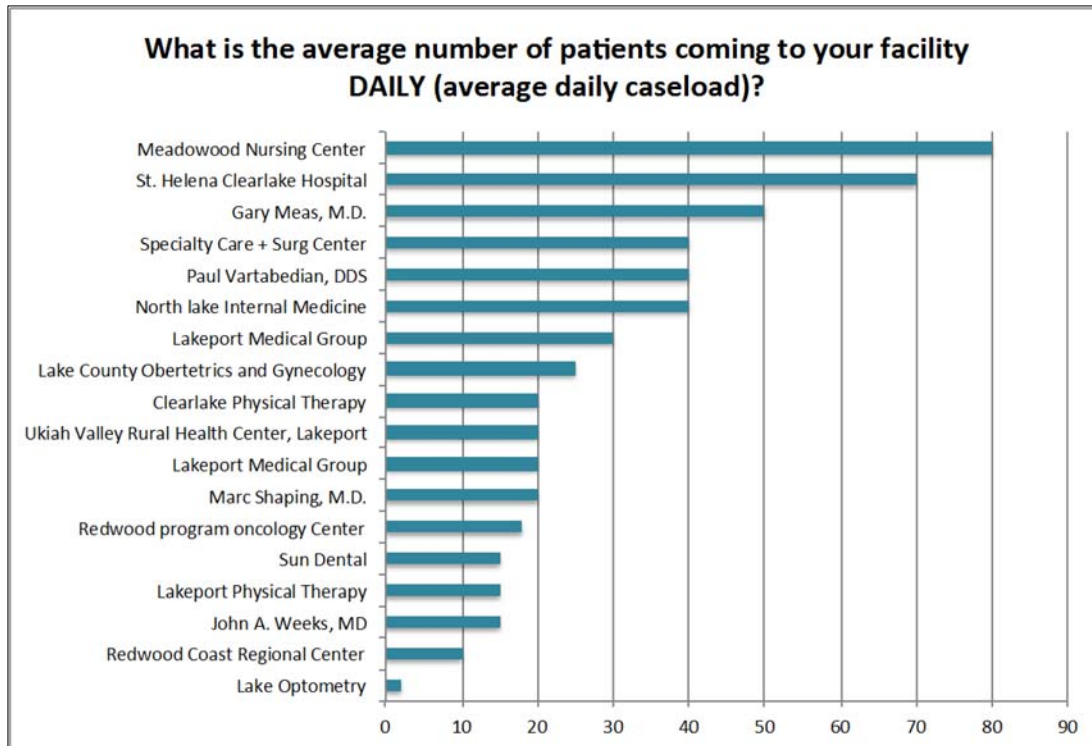


These organizations collectively represented 169,318 persons seen annually, with an average of 6,773 persons seen annually. Although respondents were asked to report their unique number of persons seen annually, it is expected that there is considerable duplication among these patient load figures, as demonstrated by the fact that the county’s total population is just under 60,000. This high number of

persons seen annually suggests that these 25 organizations reflect the patient referral experience of a large proportion of Lake County residents.

Among responding organizations, an average of 50 persons are seen daily, with reported daily visits presented in Figure 4-3. Notably, not all respondents provided this information, including Sutter Lakeside Hospital.

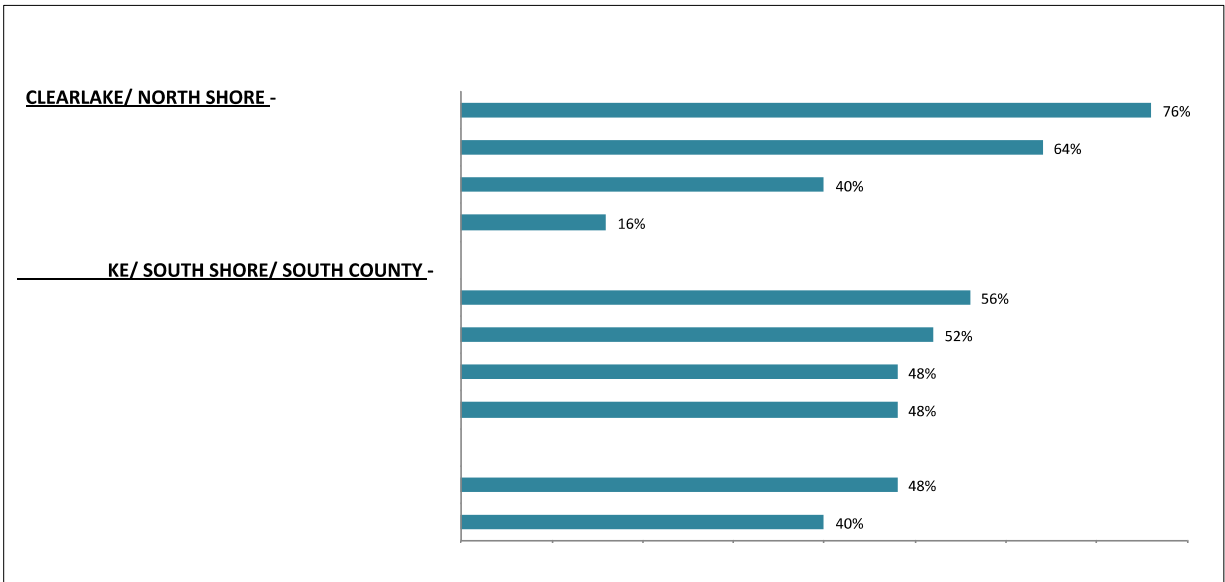
Figure 4-3, Lake County NEMT Survey – Average Daily Caseload



Where Patients Live

In terms of where patients reside, responding organizations served patients who were well distributed around the county. Three out of four responding organizations served Clearlake residents while over half served Lower Lake residents. Figure 4-4 on the following page groups the areas of the county in which respondents have patients by Clearlake and North Shore patients and by Lower Lake, South Shore and South County patients. Almost half the respondents indicated that their patient load came from throughout Lake County (48%), while four in ten respondents had some out-of-county patients on their caseloads. As agencies could select more than one area, these total to more than 100 percent.

Figure 4-4, Lake County NEMT Survey – Where Patients Live

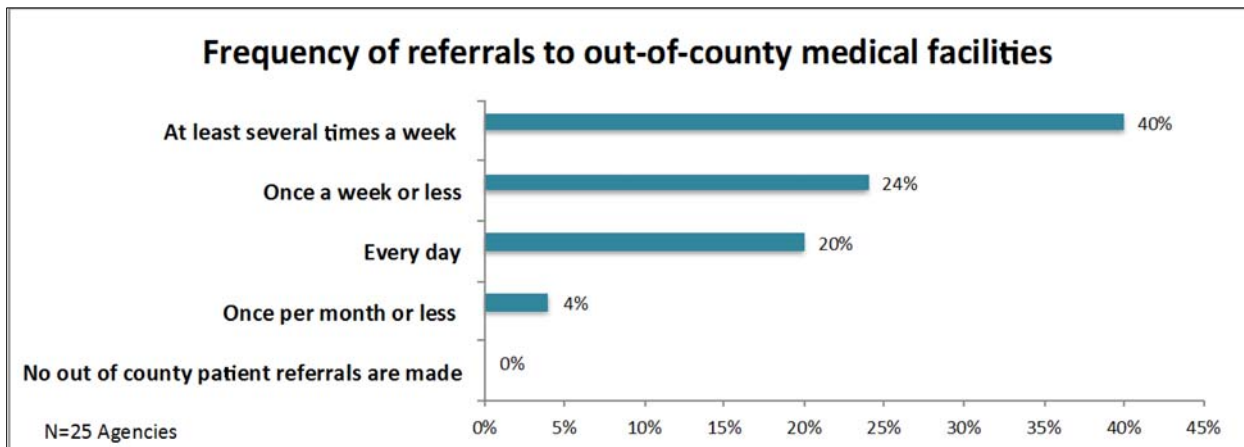


Out-of-County Medical Referrals

Of primary interest and importance to this survey effort was the question of how frequently out-of-county referrals are made.

As shown in Figure 4-5, 40% are making referrals at least several times a week; 24% at least once a week; and 20% every day. In sum, 84% of these 25 organizations are making weekly referrals to out-of-county medical facilities.

Figure 4-5, Lake County NEMT Survey – Frequency of Referrals



Referral Frequency

Figure 4-6 below further details referral information, presenting agency responses to the question “Please indicate the average number of referrals per week, by referral type, creating a sum of all reported weekly referrals”. The sum of 272 average weekly referrals is depicted by provider type and in relation to each agency’s annual caseload size.

Agency reported referral rates presented in Figure 4-6 ranged from 70 and 55 weekly referrals to just a handful of weekly referrals.

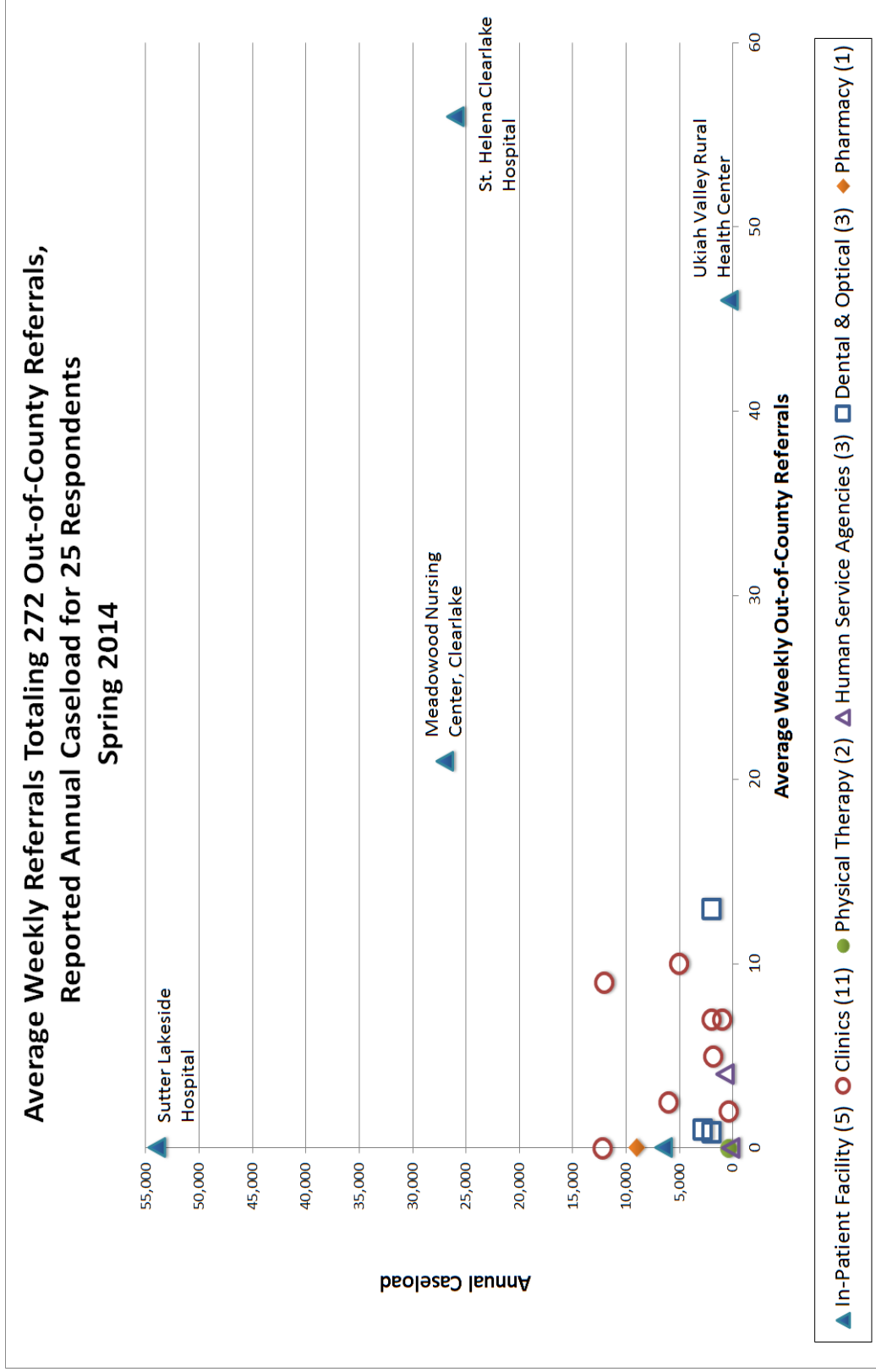
Among the five in-patient stay facilities responding, St. Helena Clear Lake provided the largest number of referrals, with an estimate of 70 referrals per week. Referral rates were collected through a department-by-department inventory by the Continuing Care Director in April 2014. The Ukiah Valley Rural Health Center, with its caseload of 300, reports an average of 46 per week. The Meadowwood Nursing Center, serving the community of Clearlake, estimated 20 weekly out-of-county referrals.

The Sutter Lakeside Hospital, with the largest reported caseload of 54,000 annual patients did not identify an average weekly referral estimate. It is likely that the Sutter Lakeside rate is probably at least equivalent to the 70 weekly referrals of St. Helena Clear Lake, although there may be additional on-site medical services provided by Sutter Lakeside Hospital.

Eleven responding clinics, largely doctors’ offices, reported average weekly out-of-county referrals. Dr. Marc Shapin of Clearlake reported ten weekly out-of-county referrals; Dr. Gary Meas of Lakeport averaged nine. The Redwood Oncology Center and Lakeport Medical Group each reported seven weekly. Dr. John Weeks of Clearlake reported five weekly referrals.

.

Figure 4-6, Lake County NEMT Survey - Out-of-County Referrals



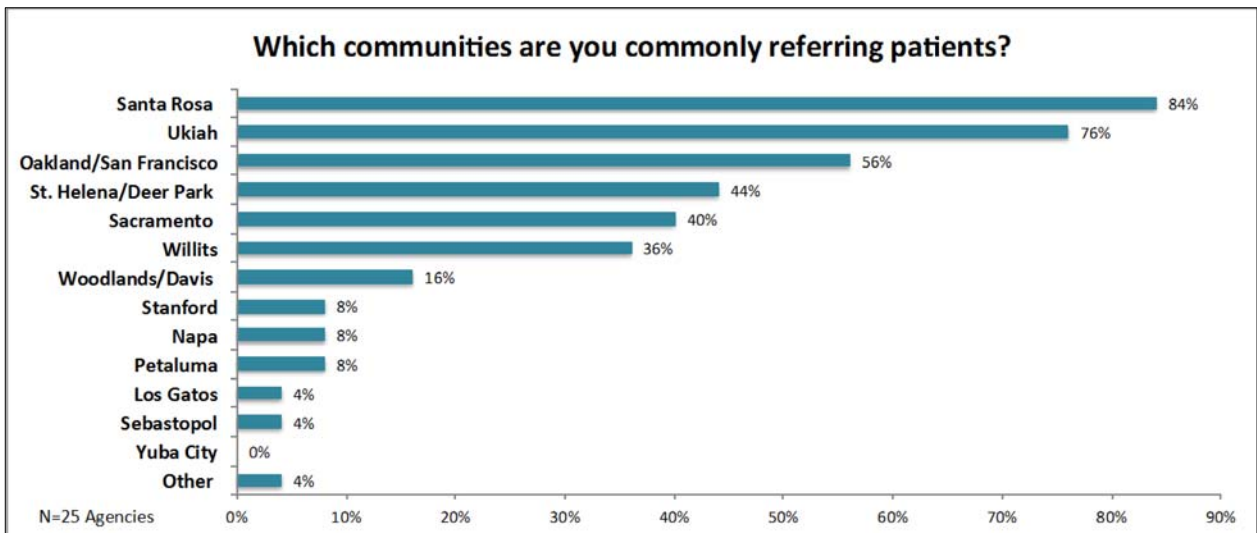
Among other organizations represented, two dental offices responded. Dr. Paul Vartabedian of Lakeport reported an average of 13 weekly referrals, while the other dental office reported a single weekly referral and an optometry office the same. Three responding human service agencies included the Redwood Coast Regional Center, People Services, and the county’s WIC program. The Redwood Coast Regional Center, responsible for approximately 750 Lake County residents with developmental disabilities, indicated they average about four out-of-county medical referrals weekly that may lessen the need for out-of-county referrals.

The Clearlake Physical Therapy group reported four weekly referrals while the Lakeport Physical Therapy group reported none. Lake Pharmacy also reported no weekly referrals

Location of Out-of-County Referral

Figure 4-7 shows that Santa Rosa is by far the top referral city (84%), followed closely by Ukiah (76%). Somewhat over half (56%) of the respondents reported patient referrals to locations in Oakland or San Francisco. The St. Helena and Deer Park communities and the Sacramento area were 44% and 40% of respondents, followed by Willits at 36%. Four agencies (16%) identified Woodland or Davis and one or two each to a handful of other communities.

Figure 4-7, Lake County NEMT Survey – Which Communities?



Hospital in-patients referrals

In-patient referrals are most commonly made to St. Helena in Deer Park. Following at some distance and all in a similar range are: Sacramento, Santa Rosa, Oakland/San Francisco, and Ukiah.

Referrals to other locations

Respondents in terms of the top three facilities to which they refer presented additional facility referral information. Table 4-2 shows the top-ranked results from a total of 53 referral locations, led by University of California San Francisco Medical Center and California Pacific Medical Center both in San Francisco.

Table 4-2, Lake County NEMT Survey- Referral Destinations

UCSF, including Pediatrics & Obstetrics	13%
California Pacific Medical Center, San Francisco	8%
Dr. Harry Matossian - Ukiah	8%
St. Helena Clearlake	8%
Children's Hospital of Oakland	4%
Dr. Bowen (Lithium) - Willits	4%
Dr. Waterman - Santa Rosa	4%
Medical offices in Santa Rosa/ Head & Neck	4%
St. Helena - Deer Park	4%
UC Davis Medical Center, Sacramento	4%
Ukiah Valley Medical Center	4%
Atwater	2%
Boettger& Tanazl Surgery - Ukiah	2%
Dr. Boettger & Tom	2%
Dr. Chen - Los Gatos	2%
Dr. Coursey - Ukiah	2%
Dr. Hunstock - Santa Rosa	2%
Dr. Jam Joseph - Ukiah	2%
Dr. Massarweh - Ukiah	2%
Dr. Persky - Ukiah	2%
Dr. Simonds & Dr. Uemura - Santa Rosa	2%
Eye Associates - Sebastopol	2%
Hillside Health Center - Ukiah	2%
Lucile Packard Children's Hospital - Palo Alto	2%
Medical offices in Ukiah & St. Helena	2%
Redwood Ortho Pedic	2%
Santa Rosa Memorial	2%
Santa Rosa Oral Surgery	2%
Santa Rosa Radiology	2%
St. Helena Family Health Center	2%
St. Helena Napa Valley	2%
Sutter Medical Center of Santa Rosa	2%

The Oakland Children’s Hospital, UC Davis Medical Center in Sacramento, and the single physician prescribing lithium for mental health system patients in Willets were in the second tier of frequency of noted facilities. Also, there are numerous offices and medical practices in Ukiah and Santa Rosa, as well as the Napa Valley facilities associated with St. Helena Deer Park, that were identified as common destinations.

Who is making the out-of-county patient appointments?

In terms of who makes the referrals appointment, only two respondents indicated that they ALWAYS make the referring appointment. These were Dr. Marc Shapin of Clearlake and the Meadowwood

Nursing Center in Clearlake. About a third each responded to one of three choices: the patient ALWAYS makes the appointment, the office SOMETIMES makes the appointments, or the patient SOMETIMES makes the appointment. Essentially, it varies as to who is making the out-of-county medical referral but the responding medical offices do have some role.

How far in advance are appointments made and when?

How far in advance these appointments are being made seems to vary considerably. Figure 4-8 indicates that most respondents (44%) report, “it varies.” The balance is split equally among the options of advance reservations within a month, within two weeks or within the next week but not sooner than a week out. Similarly, Figure 8 shows that the days of the week on which the referral appointments may happen also vary. Appointments appear least likely to be on Wednesdays, most commonly on Tuesdays (76%), followed by Monday and Thursdays (72%).

Figure 4-8, Lake County NEMT Survey – Appointments How Far In Advance?

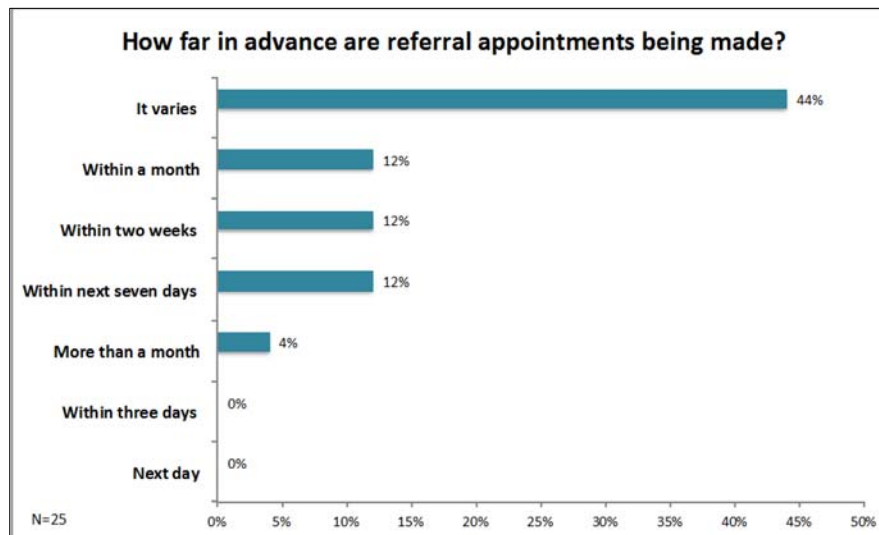
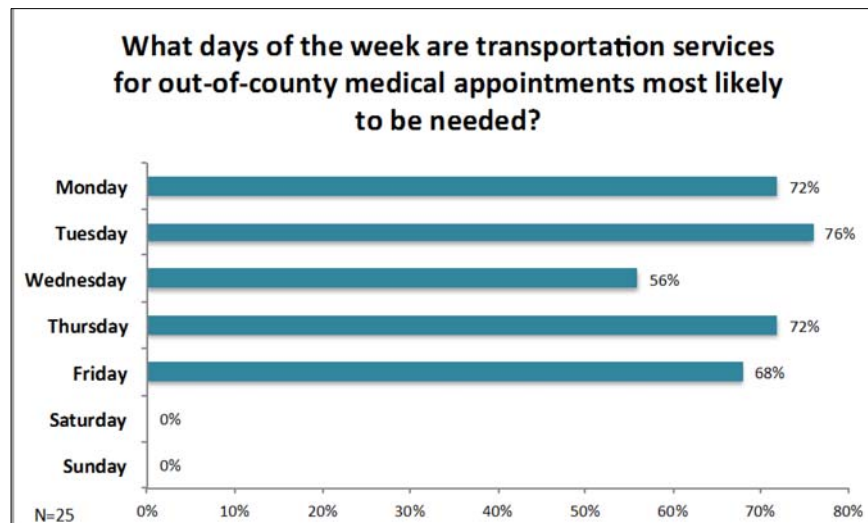


Figure 4-9, Lake County NEMT Survey - Out-of-County Referrals



General Comments on Out-of-County Transportation

Table 4-3 following presents comments provided by ten respondents. Support for out-of-county transportation is indicated on behalf of various sub-groups identified by these commenters and includes low-income mothers, elderly patients, children, persons using mobility devices or who are non-ambulatory, oncology or dental patients.

Table 4-3, Lake County NEMT Survey – Out-of-County Trip Comments Offered

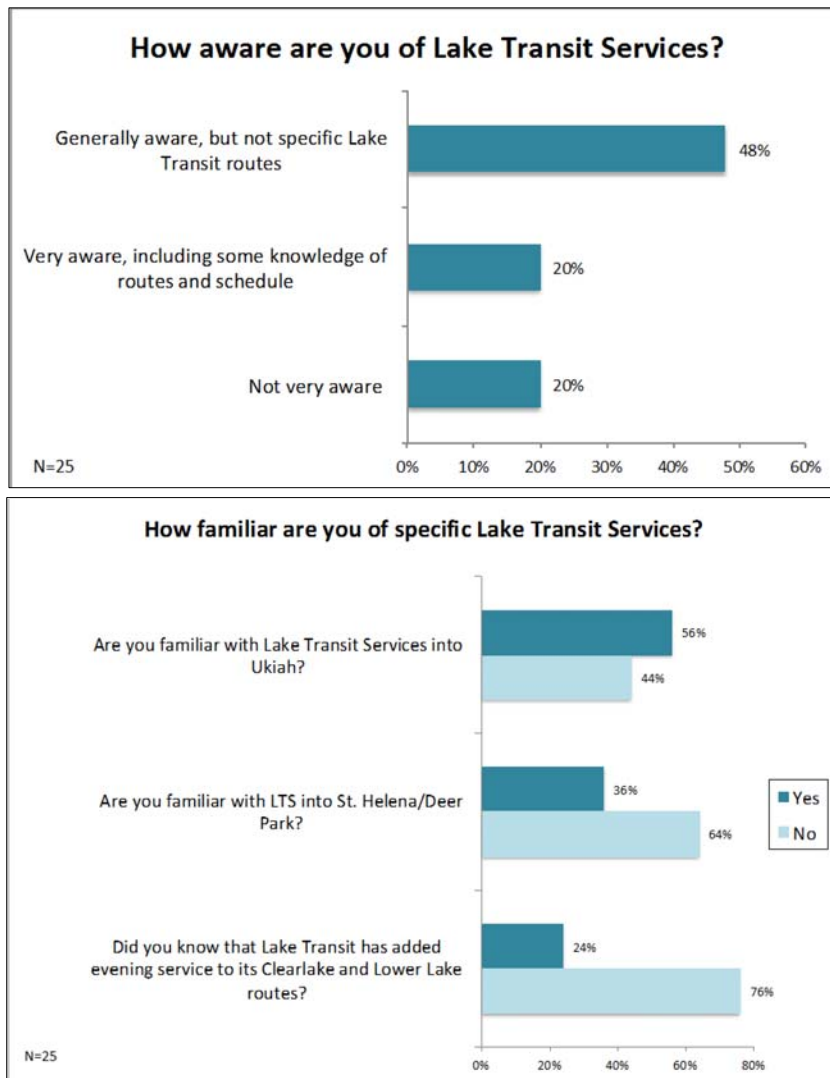
Dr. Marc Shaping	Clearlake	Private officer referral to above, but site could not subsidize. Save if would pay for [public] transit rather than pay for arranged private trasportation if price is competitive and efficient and comfortable
Lake Pharmacy	Clearlake	With limited access to specialty care, [transportation] provides of good value to the community.
St. Helena Clearlake Hospital	Clearlake	Inpatient referrals were measured by transfer logs from the Hospital. Specialist referrals were measured from referral logs at the clearlake family health center, which is located at 15230 Lakeshore Dr. in Clearlake. These are estimates based on experience.
Gary Meas M.D.	Lakeport	Many if our elderly patients needing specialty referrals are reluctant on unwilling to travel/drive themselves out of county due to distance of driving and safety.
Lake County Health Services Division	Lakeport	Transportation to out-of-county medical specialists is a major obstacle to Lake County children's health. There is no public transportation to Bay area that does not involve
Paul Vartabedian DDS	Lakeport	This service would be greatly benefit the residents of the county.
People Services, Inc	Lakeport	We receive calls from non-ambulatory people at large to get to their local doctor appt., although we provided these trips to our own clientele.
Redwood Coast Regional Center	Lakeport	We have a greater need for our clients to utilize transit to get to work from areas that the bus system doesn't currently provide bus stops or even drive to, such as areas in the Riviera, Spring Valley or up in the hills. Out of area medical transportation can be provided by vendored services.
Redwood Program Oncology Center	Lakeport	These trips are a challenge to my patient population.
Ukiah Valley Rural Health Center, Lakeport	Lakeport	There is a HUGE need for medical trasportation in Lake County, especially for our geratric community.

Lake Transit Awareness

In terms of the respondents’ awareness of Lake Transit Services, almost half were generally aware but only two in ten indicated they had significant knowledge of the routes and schedules to be able to help their patients (Figure 4-10). This somewhat limited understanding of Lake Transit services was reflected in the response to specific questions (Figure 4-11).

While over half the respondents (56%) were aware of Lake Transit service into Ukiah, only about a third (36%) were aware of Lake Transit’s Route 3 connection to St. Helena/ Deer Park which is the community receiving significant numbers of referrals. Similarly, only a quarter of the respondents (24%) knew that evening transit service had been added to Clearlake and Lower Lake services in September 2013.

Figure 4-10, Lake County NEMT Survey - Awareness of and Familiarity with Lake Transit



4.4–Discussion of Out-of-County Medical Service Referral Survey

Referral Patterns

Responding organizations reported steady rates of referral to out-of-county health care facilities: 34% of this apparently representative sample of 25 organizations are making weekly referrals; almost half are making such referrals several times a week.

This survey effort did not examine the reasons for out-of-county referrals. A relevant memorandum was sent during this period from the Sutter Pacific Medical Foundation to Sutter Lakeside Division staff. It addressed two themes impacting health care in Lake County: one, the challenges of geographic isolation of Lake County and two, the difficulties of recruitment and retention of needed high-caliber physicians and other clinicians. Chief Operating Officer John Ray of Sutter Pacific Medical Foundation noted the

significant physician turnover in the Lake County office and the importance of developing new approaches to understand and address some of the root causes of physician turnover.

This suggests that referral patterns for Lake County residents to out-of-county locations may well continue. Public transit efforts to continue to understand these patterns and to address them – in conjunction with the health care industry – will certainly have value.

Referral Patterns and Existing Lake Transit Service

The patterns of referral reported are to some extent supported by existing Lake Transit weekday service to out-of-county locations. Route 3 and Route 7 are each anchored by out-of-county medical services.

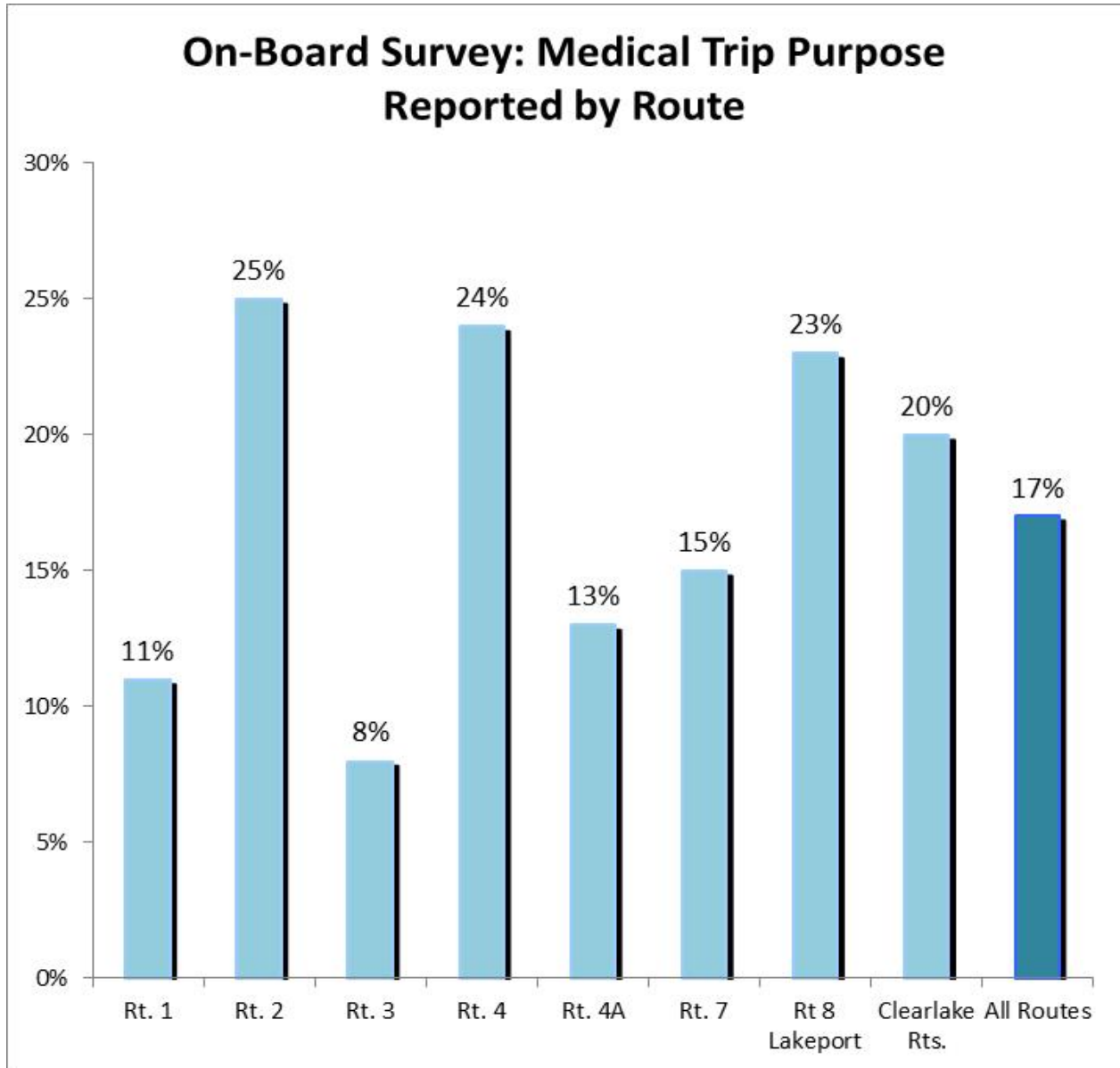
- To St. Helena in Deer Park – Route 3. St. Helena Hospital in Deer Park was most frequently identified as the in-patient hospital to which patients are referred, presumably often from the St. Helena Clearlake medical facility.
- Lake Transit’s Route 3 travels twice daily between St. Helena Hospital Deer Park and Clearlake at Ray’s and Wal-Mart to Deer Park, arriving there at 9:20 am and 2:10 pm, leaving St. Helena Hospital at 9:30 am and 2:20 pm.
- To Ukiah – Route 7 travels four times daily to the second-highest referral community, Ukiah, traveling from downtown Lakeport and through the Robinson’s Rancheria to five stops within Ukiah that include the Veteran’s Clinic.
- Route 7 arrives at the VA Clinic at 9:25 am, 1:20 pm, and 4:10 pm, with the last run of the day not stopping at this clinic but arriving at the airport at 6:25 p.m. Route 7 has westbound stops at the VA Clinic at 9:25 am and 4:15 pm, as well as a 2:00 pm run and a 6:35 pm run, which both leave from the airport where Greyhound connections are possible.

Almost eight in ten responding agencies (76%) are referring weekly to the Ukiah area, served currently by four daily Lake Transit round trips on Route 7. And more than four in ten (44%) of respondents are referring to medical facilities in Ukiah where Lake Transit is making five daily round trips on Route 7. It is important to note that responding organizations report only modest understanding of Lake Transit services and when it comes to the specifics, very limited awareness. This points to value of expanding existing information strategies. Potentially, destination way-finding strategies can help riders connect with their medical destinations when using Lake Transit services.

Lake Transit Medical Trip Purpose Information from the On-Board Survey

To further inform the findings of this out-of-county referral survey, it is important to see how people are using Lake Transit for medical purposes. The fall 2013 on-board passenger survey brought back some additional information about medical trip purposes. Figure 4-12 shows the proportion of passengers’ responses indicating that their trip that day was for medical purposes.

Figure 4-12, Lake Transit On-Board Survey, Medical Trip Purposes by Route



Overall, 17% of the 263 riders surveyed reported that their Lake Transit trip that day was for medically related reasons. The largest proportions are all on routes within Lake County. Route 2 has the highest number of medical trip purposes reported at 25%, followed closely by Route 4 at 24% and Route 8 at 23%. Route 2 along Highway 175 to Clearlake may reflect trips into Clearlake to doctor and clinic appointments. Route 4 which travels along the South Shore to Kelseyville and Lakeport may serve trips to medically related destinations in Lakeport. Route 8 serves Lakeport and connects to Sutter Lakeside Hospital.

The *Clearlake Routes*, with 20% reporting medical trip purposes, include Routes 5, 10, 11, and 12 reported together. Routes 5, 10, and 11 all serve St. Helena Hospital and it is possible to connect from Route 12 at Ray's to get to St. Helena.

The *out-of-county Route 7 to Ukiah* had a 15% reported medical trip purposes. And *Route 3* had only an 8% medical trip purpose rate, although it makes a direction connection to St. Helena Hospital, Deer Park. For these two routes it isn't possible to know from these responses whether medical destinations within Lake County or to destinations in Ukiah or Deer Park, or elsewhere.

Transfer information responses provide a little more insight into transit use for medical purposes. Two individuals responding to the on-board survey indicated they would transfer to a Greyhound bus to complete their trip, traveling on Routes 4 and 8 when they were surveyed. An individual on Route 12 indicated he or she would transfer to Mendocino Transit. Single riders on Route 3 and Route 7 each marked that they would transfer but did not indicate to what service. So some level of out-of-county transit connections are being made, about 13% of trips, a modest at 5 in 64 trips.

Lake County Connections to Other Transit Services

Important connections exist which make it possible for Lake Transit residents to reach other counties and travel to more distant locations.

Table 4-4 following presents the options for long-distance travel into Santa Rosa, San Francisco, and Oakland, with a meaningful connection possible from Route 7 to Mendocino Transit's CC Rider and Golden Gate Transit. At present, there is not a meaningful connection from Route 3 to Napa's VINE Transit.

Table 4-4, Existing Out-of-County Transit Connections, Fall 2014

Start point	Connect	End point	Start point	Connect	End point	Quality of Connection
Lake County, CA <i>Earliest Lakeport Departure: 8:00 AM</i>	Lake Transit Route 7 - Lakeport to Ukiah	Ukiah, CA <i>Arrival: 9:10 AM</i>	Ukiah, CA <i>Departure: 9:20 AM</i>	MTA-Route 65 CC Rider - Fort Bragg to Santa Rosa	Santa Rosa, CA <i>Arrival: 10:30 AM</i>	Meaningful connection
Santa Rosa, CA <i>Departure: 10:43 AM</i>	Golden Gate Transit Route 101 (Basic Route)- Santa Rosa to San Francisco	San Francisco, CA <i>Arrival: 1:06 PM</i>				
Lake County, CA <i>Earliest Clearlake Departure: 7:55 AM</i>	Lake Transit Route 3-- Highway 29 Clearlake to Deerpark	St. Helena, CA <i>Arrival: 9:20 AM</i>	St. Helena, CA <i>Departure: 9:18 AM</i>	Vine Transit Route 29 - Express to BART Station at El Cerrito Del Norte	Richmond, CA	No meaningful connection - The potential connection at St. Helena is to Route 29 but the only run that travels to BART leaves at 5:38 a.m. Not all Route 29 runs have the BART express service.
Richmond, CA	Bay Area Rapid Transit- Richmond to Daly City/Milbrae	San Francisco, CA				
Lake County, CA <i>Earliest Clearlake Departure: 7:55 AM</i>	Lake Transit Route 3 - Highway 29 Clearlake to Deerpark	St. Helena, CA <i>Arrival: 9:20 AM</i>	St. Helena, CA <i>Departure: 9:42 AM</i>	Vine Transit Route 10 - Calistoga to Napa Valley College	Napa, CA <i>Arrival: 10:50 AM</i>	No meaningful connection - involves 4 different transit agencies requiring 5 different connections.
Napa, CA <i>Departure: 11:04 AM</i>	Vine Transit Route 11 - N. Vallejo (Vallejo Transit Center) to Redwood Park N Ride	Vallejo, CA <i>Arrival: 11:56 AM</i>	Vallejo, CA <i>Departure: 12:00 PM</i>	Sol Trans Route 80 -(Vallejo Transit Center) to BART Station at El Cerrito Del Norte	Richmond, CA <i>Arrival: 12:27 PM</i>	
Richmond, CA <i>Departure: 12:42 PM</i>	BART- Richmond to Daly City/Milbrae	San Francisco, CA <i>Arrival: 1:42 PM</i>				

Considering Responses to These Findings

This survey's sample of twenty-five organizations appears to be representative of the range of Lake County health care organizations that are likely to have out-of-county medical referrals. It includes Lake County's two acute care hospitals, although only one provided estimates of weekly out-of-county health care referrals. It includes oncology and obstetrics clinics as well as general medical doctor practices. It also includes dental and optometry offices. Finally, it includes the Public Health Department and two of the larger human service programs in Lake County.

Referral Patterns that Suggest Transit Solutions

From among this sample, 272 patient referrals are estimated weekly, more likely on Monday, Tuesday, Thursday or Friday and least likely on Wednesdays. Importantly, 84% of these 25 organizations are making at least once weekly referrals to out-of-county medical facilities. And 40% of the responding organizations are making out-of-county referrals at several times a week and more.

It is difficult from the data available to know how many of these almost 300 persons might present for medically-related transportation assistance – or are already using Lake Transit for some out-of-county trips. With 17% of the on-board survey riders using Lake Transit for medical trip purposes, that could likely be greater with more information about transit connections possible.

Health Care Professionals Needing Medical-Trip Specific Transit Information

Clearly the health care professionals are only minimally aware of their patients' use of Lake Transit, which may or may not reflect actual patient use of public transportation.

The four top-ranked communities include two to which Lake Transit is already providing daily public transit – twice daily round trips to St. Helena Hospital in Deer Park (Lake Transit Route 3) and four times daily round trips to Ukiah, including to the VA Clinic (Lake Transit Route 7). As noted, the highest ranked community was Santa Rosa while the third ranked region was the Oakland and San Francisco region, clearly a large geographic area with a high number of medical facilities.

There is also likely need to bring the medical community directly into the information-exchange process. Communication strategies can specifically convey Lake Transit's existing service to common medical destinations, for example: "You CAN get there from here!"

Enhancing and Promoting Connections for Distant Travel

Other top out-of-county referrals included trips to Santa Rosa, the most frequently identified referring area at 84%, to San Francisco and Oakland, identified by over half of the responding organizations (56%). Connections to Santa Rosa are possible through Mendocino Transit's CC Rider and through Greyhound service, stopping in Ukiah and from there via Golden Gate Transit into San Francisco and beyond. Furthermore, the VA and Tribal Clinic transportation services provide some additional transportation connection.

6. Implementation Approach for Addressing Lake County Mobility Gaps

Transportation Coordination Institutional Issues

Extending Lake APC and Lake Transit Leadership

Leadership is critical to achieving the suggested coordinated projects that could meet the transportation needs of populations addressed in this Plan. Such leadership has already been effectively led by Lake Transit’s manager and working coordinated projects between the senior centers and the public transit program. The planned hiring of the new Mobility Manager will bring attention to Coordinated Plan actions. The Social Services Transportation Advisory Committee (SSTAC) can be informed of and support coordination progress as it develops. Further components of that leadership are suggested here, to marshal and extend the county’s scarce resources to address sometimes hard-to-serve needs of Lake County residents who are frail, isolated, or have very limited means.

Building a Mobility Management Capability

Formalizing the home for Lake County Mobility Management will facilitate a leadership role by which to implement this Coordinated Plan. Some effort to explore the appropriate CTSA organizational model and affiliation is indicated and may further shape Lake County Mobility Management. From a general perspective, Mobility Management in Lake County can pursue the following characteristics and advantages:

- As an **organizing strategy** for initiating coordinated projects to address mobility gaps of the target groups, providing leadership around these projects;
- As a **focal point for getting the right partners to the table** to secure additional funds or overcome institutional barriers or promote new services; and
- To **help to secure funding**, including new and continued funding, by which to implement new mobility projects and to assist local partners in complying with funding rules and regulation.

Most importantly, working from within the appropriate organizational home, the Mobility manager can undertake the leg work necessary to create more non-emergency medical transportation options.

Developing Interested, Willing, and Able Partners

Given the project responses identified, and in light of always limited funding it will be critical to continue to identify additional partners and resources to move this Coordinated Plan forward. Specifically, the priorities presented here must be championed by **“interested, willing and able”** partners, with Lake Transit leadership.

Stakeholders who are “*interested*” in addressing the transportation concerns of their clientele, of a given constituency or of the general public, can be considered key partners. A number of these agency representatives have been identified through this Coordinated Plan process and include existing members of the SSTAC and others. They are “*willing*” in that they are individuals with sufficient authority or their organizational mission will allow them to participate in crafting project solutions. And they are “*able*” stakeholders in that they have the organizational capacity and resources to move projects from concept through to implementation.

Building such local capacity and partnerships must be ongoing and requires ongoing leadership. Thus, it will necessitate securing additional funding.

Priority Strategies and Projects List

Several priority categories and the actions suggested within each by this planning effort follow. For each this Coordinated Plan’s three goals, strategies are discussed as either “critical” or “high” priority.

Lake Transit’s Short Range Transit Plan (SRTP) will drive the various recommended strategies and projects that fall within its purview and facilitate **Goal #1 – Support, Maintain and Enhance Lake County Public Transportation Services**. Of critical priority is to enhance and improve public awareness of Lake Transit (Strategy 1.1) and to secure new and continued funding (Strategy 1.2). Both of these will support and enable implementation of further service improvements, identified as high priority.

Goal #2 – Build Capacity for Specialized Transportation Alternatives, Including Formalizing a Sustainable CTSA is key to developing projects and strategies that will extend what public transportation can do. This Coordinated Plan has identified various transportation needs that go beyond public transit, including the type of trip or the geographic reach of the trip. Of critical priority and as an immediate first step is to integrate the Mobility Programs Coordinator position, the new mobility management function, to align that position work plan with the priorities of this Coordinated Plan (Strategy 2.3).

Subsequent activities, of high importance, but not as critical, will be to define the CTSA model appropriate for Lake County (Strategy 2.1) and to seek new partnerships among potentially interested, willing, and able human service agencies (Strategy 2.2) for purposes of growing capacity to meet these hard-to-meet trip needs.

Finally, but by no means of least importance, **Goal #3 - Develop Sustainable Non-Emergency Medical Transportation Solutions**. With health care reform, the possibilities for developing new non-emergency medical transportation options are increasing and their pursuit is very timely. This activity can be among the critical priorities that the new Mobility Manager pursues. Goal 3 describes a mix of critical strategies that include new institutional relationships with Lake County’s managed health care system as well as the development of a breadth of other strategies (Strategy 3.1). Goal 3 includes as a high priority the development of information tools that are geared specifically to health care professionals, to help them connect with the transportation resources that do exist.

Table 6-1, Lake County Coordinated Plan Priority Strategies List

GOALS	STRATEGIES	PRIORITIZATION
<p>Goal #1 - Support, Maintain, and Enhance Lake County Public Transportation Services</p>	<p>1.1 Enhance and improve public awareness of and access to Lake County public transportation services through a comprehensive public information and bus stop improvement program.</p>	<p>Critical Priority</p>
	<p>1.2 Implement SRTP-recommended service improvements as funding allows and where minimum performance standards can be met.</p>	<p>High Priority</p>
	<p>1.3 Pursue and secure funding to support, maintain, improve safety and enhance the Lake County public transportation network.</p>	<p>Critical Priority</p>
<p>Goal #2 - Build Capacity for Specialized Transportation Alternatives, Including Formalizing a Sustainable Consolidated Transportation Services Agency (CTSA) Appropriate for Lake County.</p>	<p>2.1 Integrate the Mobility Programs Coordinator position so that it can be a focal point for implementing the Coordinated Plan goals and strategies.</p>	<p>Critical Priority</p>
	<p>2.2 Define the CTSA model that is appropriate and sustainable for Lake County.</p>	<p>High Priority</p>
	<p>2.2 Seek new partnerships with interested, willing, and able agencies and organizations that can promote awareness of public transit participate in projects addressing transportation needs and gaps.</p>	<p>High Priority</p>
<p>Goal #3 - Develop Sustainable Non-Emergency Medical Transportation Solutions</p>	<p>3.1 Develop near and long-term non-emergency medical transportation (NEMT) alternatives that will address NEMT trip needs both within Lake County and to out-of-county destinations, including enhanced transit connections, special shuttle or life-line services, brokered trip provision across multiple providers, use of targeted mileage reimbursement and other such initiatives.</p>	<p>Critical Priority</p>
	<p>3.2 Develop way finding and safety-focused, trip specific improvements or information tools to support travel to key NEMT destinations within and beyond Lake County.</p>	<p>High Priority</p>



NON-EMERGENCY MEDICAL TRANSPORTATION PLAN FOR LAKE COUNTY, CALIFORNIA

Final Report

Prepared for:



LAKE COUNTY/ CITY AREA PLANNING COUNCIL

Prepared by:



In Collaboration With:



DORA BARILLA, DRPH, MPH, CHES
LOMA LINDA UNIVERSITY,
SCHOOL OF PUBLIC HEALTH
LOMA LINDA, CA

ROY GLAUTHIER
TRANSPORTATION
PLANNING AND POLICY
COSTA MESA, CA.

FEBRUARY 4, 2011



NON-EMERGENCY MEDICAL TRANSPORTATION PLAN FOR LAKE COUNTY, CALIFORNIA

Final Report

Introduction

Although transportation is not traditionally discussed in health policy circles, transportation is a key determinant of health outcomes. Communities that lack good transportation systems face many barriers to good health. Low income and rural communities are disproportionately harmed when transportation systems are underfunded, don't operate effectively or can't address pockets of need. This contributes, in part, to health disparities.

More than one in five Americans ages 65 and older do not drive because of poor health or eyesight, limited physical or mental abilities, concerns about safety, or because they have no car. More than half of non-drivers, or 3.6 million Americans, stay home on any given day—and more than half of that group, or 1.9 million, have disabilities.¹ For those over the age of 65, this equates to roughly 22% fewer trips per year than non-senior individuals² or, 15 percent fewer trips to the doctor; 59 percent fewer trips to shops and restaurants; and 65 percent fewer trips for family, social, and religious activities.³ Isolation is especially acute in both rural communities and sprawling suburbs, particularly among the elderly and persons with disabilities for whom walking to a distant bus stop can be problematic.

Often individuals in communities with limited access to transportation can resort to dialing “911” for non-emergency medical transportation, placing an undue burden on city and county emergency response systems. Non-emergency medical transportation is the preferred form of medical transportation in non-emergency situations for transport from one location to another and where family members or others are unavailable or cannot assist. The cost for non-emergency medical transportation tends to be significantly lower than that for emergency transportation and is a more appropriate utilization of scarce services.

¹ Bureau of Transportation Statistics, Issue Brief #30, “Transportation Difficulties Keep over Half a Million Disabled at Home,” 2003.

http://www.bts.gov/publications/issue_briefs/number_03/html/transportation_difficulties_keep_over_half_a_million_disabled_at_home.html.

² Rosenbloom, Sandra, “The Mobility Needs of Older Americans: Implications for Transportation Reauthorization,” Center on Urban and Metropolitan Policy, 2003.

http://www.brookings.edu/es/urban/publications/20030807_Rosenbloom.pdf.

³ L. Bailey, “Aging Americans: Stranded Without Options,” Surface Transportation Policy Project, 2004.

http://www.apta.com/research/info/online/documents/aging_stranded.pdf



About this Study's Process In response to these issues and with an awareness of the specifics of Lake County, the Lake County/ City Area Planning Council sought and secured a competitive grant from Caltrans to develop a plan by which to address non-emergency medical transportation (NEMT) needs. The grant identified numerous elements for examination and required as an end product a plan to provide direction to key stakeholders for meeting unmet non-emergency medical transportation needs of Lake County residents.

This document compiles and analyzes information from the study's outreach and data gathering efforts. To identify non-emergency medical transportation needs and resources, a mix of quantitative and qualitative tools were utilized. A countywide household survey was undertaken with its findings reported here, reaching out to over 33,000 households. An agency survey to almost 200 human services and other Lake County organizations brought back additional information. Public meetings in several settings, with intercept surveys at a senior center and the Tribal Health Consortium, all contributed to an understanding of the issues. Interviews with additional key stakeholders extend and enrich a growing appreciation of the scale and characteristics of non-emergency medical transportation needs within Lake County and to medical services in neighboring counties. An estimated 1,315 individuals directly contributed to survey findings. Gaps in service for non-emergency medical transportation needs are examined, drawn from these extensive public input processes.

Technical Advisory Group Building upon the numerous letters of support provided to Lake City/County APC for the original Caltrans NEMT proposal for this study, an interdisciplinary technical advisory group (TAG) was convened to provide input and guidance through the study process. The TAG's invitees and participants are identified in Appendix A. The group met, in varying configurations, four times.

Many of the themes identified by TAG members at its first meeting in June 2010 helped guide this study process. Several described responses to the non-emergency medical transportation challenge that have either unraveled or not yet been realized, including:

- ***Sutter Lakeside Hospital's*** van used by the Healthy Families program discontinued service earlier this year due to operating costs with a vehicle that broke down repeatedly and had rising maintenance costs.
- ***Catholic Charities*** had a ten-year program of interfaith volunteer drivers receiving mileage reimbursement to transport individuals to out-of-county medical facilities including Santa Rosa and St. Helena. This was discontinued in 2002 when funding shrunk and the all volunteer-driver-board aged and was not easily replaced.
- ***Redwood Coast Regional Center's vendor, People Services Inc.*** has an extensive passenger vehicle fleet, many of them aging vehicles, but does have a capability of providing some trips to persons who are not its consumers but no ready way to connect with such potential riders.
- ***County Public Health Department*** is concerned about closing medical facilities, including a south shore facility providing taxi vouchers to help bring patients to its facilities. Similarly, emergency services personnel are concerned about inappropriate use of the ambulance resources within the county or for out-of-county trips, committing vehicles and personnel.



- **St. Helena Hospital, Clearlake** Its Healthy Start collaboration, funded partly by First Five Lake provides some, but not enough, kid-medical-transport. Integrated chronic care appointments are often missed when individuals say they can't get there due to transportation difficulties.

About the Plan's Direction to Lake County The outreach process findings are summarized in seven categories of *institutionally-related needs* with almost 30 possible projects and in five categories of *consumer-oriented needs*, along with 15 possible projects. Three organizing principles for an NEMT plan are identified related to sustainability, to demonstrating costs and benefits, and to the critical role of coordination. Various service alternatives are discussed to explore NEMT responses. Selected institutional barriers are also discussed, to be addressed in some manner in order to ensure increased non-emergency medical transportation capacity of Lake County residents. Most critical among these is the dilemma of leadership, that no clear leader of an NEMT service was identified.

Making a "strong" case for the cost savings capability and for the cost-effectiveness of expanded non-emergency medical transportation, a national research effort on NEMT cost and benefits is discussed in some detail.⁴ Important to Lake County are two guiding recommendations that develop from the overall study process and form a foundation for a Lake NEMT plan:

- **a program of projects approach** appears the most responsive design where individual pilot initiatives can be developed and tested, based upon interests, willingness and abilities of sponsoring agencies;
- **a brokerage-type infrastructure** is indicated to extend individual agency initiatives and to provide leadership in weaving these into a countywide program responsive to a broader needs-base and with increased capacity to seek continuing funding and achieve some economy of scale.

To support a potential Lake County NEMT effort, twelve funding sources or opportunities are discussed. Funding that is both short-term, as in pilot funding, or possible longer-term continuing funding is considered. To implement the guiding recommendations, eight action steps are enumerated, identifying the responsible parties and general timeframes for each. A preliminary budget is presented that address three cost areas: one, detailing costs for five direct service projects; secondly, costs for the mobility management / brokerage; thirdly, costs for enhancements to Lake Transit to serve NEMT purposes. Annual costs for each year of a three-year pilot period are presented. Projected numbers of one-way passenger trips and of unique persons to be served for the direct service cost components are estimated.

Importantly, an evaluation framework is presented to provide Lake County stakeholders with the tools necessary to evaluate the effectiveness and viability of its NEMT program. This evaluation process will enable decision-makers to determine the program's ability to move out of a pilot, test-period and into a sustainable Lake County non-emergency medical capability.

⁴ "Cost Benefit Analysis of Providing Non-Emergency Medical Transportation-Project B-27", P. Hughes-Cromwick, R. Wallace, H. Mull, J. Bologna, C. Kangas, J. Lee, S Khasnabis; Altarum Institute, Ann Arbor, Michigan. Transportation Research Board, Transit Cooperative Research Program [TCRP] of the National Academies of Science, Washington DC, October 2005.



Selected Service Alternatives

This subsection examines characteristics of selected service alternatives that are responsive to NEMT needs. These service alternatives or “projects” are drawn from the preceding Tables 14 and 15, but by no means inclusive of all the project ideas that may be possible for Lake County. Outlined below are seven project areas that seem most readily implementable and responsive:

- Selected Lake Transit service improvements
- mileage reimbursement volunteer projects
- taxi user-side subsidies / trips of last resort projects
- human service agency transportation trip-by-trip purchasing
- travel training workshops
- mobility management including one-stop information / brokerage capabilities
- one number/ information service

Such alternatives are discussed generally below in terms of their basic characteristics.

1. Lake Transit Service Improvements

Purpose: To expand Lake Transit service in ways that will facilitate use of Lake Transit by patrons to travel to medical appointments and destinations

- Lake Transit personnel and Lake APC should pursue all grant opportunities that will enable expansion of the service footprint, the days of operation or the length of the operating day. Increasing service into the early evening hours could facilitate participation in preventative health and specialty clinics operated by the two hospitals, the VA Clinic or the Tribal Health Consortium.
- Prioritizing the expansion of service is likely to depend upon the potential funding opportunity: expanded evening hours could support clinics; expanded weekend and holiday service could potentially reduce the emergency services calls.
- Lake Transit should develop regular contacts with key individuals at these facilities to identify changes in programming or specialty services that could have a public transit implication.
- Lake Transit should continue to coordinate its schedules with out-of-county transit providers to help promote convenient transfer to other services traveling to medical facilities in adjacent counties.
- Lake Transit should promote and work with the County and the local jurisdictions to develop bus stops, bus shelters, amenities and improved paths-of-access that promote transit use.

2. TRIP-Type Mileage Reimbursement Project

Purpose: To establish a low-cost, volunteer based program that potentially can provide individuals with door-through-door transportation assistance. Program can be self-limiting and eligibility for participation determined in a variety of ways.



- A sponsor agency can provide volunteer drivers or the individual consumer can locate a neighbor or near-by friend who is able and willing to provide the trip. The volunteer serves as both driver and escort at the destination and end of trip, thus providing door-to-door or door-through-door assistance.
- Driver agrees to basic set of parameters, including current insurance.
- The individual consumer reports the trips monthly and requests the mileage reimbursement on behalf of the driver.
- Mileage may be capped at 200 to 300 miles per month or several times the expected round-trip distance between the individual's home and key medical destinations. Family members may be excluded as volunteer drivers, on the assumption that these individuals should be responsible already for transportation assistance without recompense. Volunteer eligibility can be managed at agency level.

This program is directly responsive to a range of needs identified and potentially easy to implement where partner agencies can be found, where some level of funding can be identified and where there is a likely pool of volunteers. The model of Riverside County's TRIP does not provide the volunteers but supports individual consumers in determining how to develop their own volunteer driver, how to ask neighbors or friends for assistance with transportation.

3. Taxi User-Side Subsidy/ Trips of Last Resort Project

Purpose: This utilizes existing private transportation resources and can enable passengers to get immediate assistance, particularly important for those trips that cannot be planned ahead of time. It can be used as a rationed resource for eligible participants or only on a "last resort" basis when no other transportation option is immediately apparent.

- Taxi cooperatives agree to participate and *door-to-door* assistance may potentially be negotiated by drivers, recognizing that these are independent contractors who will provide trips to riders. Taxis can be utilized for *portal-to-portal* transportation, bringing passengers directly from one location to their destination without requiring the transfer sometimes necessary on public fixed-route transit.
- Eligibility would be managed by the agency where the contract with the taxi co-op resides.
- Agency must think through who is eligible, the limits on eligibility and the limits on the taxi scrip available and make such limitations clear in all public information as these programs can quickly become oversubscribed.
- A \$20 cab fare subsidy would provide for varying trip lengths dependent upon meter rates in different areas. Taxi subsidy programs are potentially very popular and must be carefully



structured so as not to run out of funding and to limit opportunities for fraud and abuse. Monitoring is also important to ensure that individual taxi drivers are adhering to the rules established by the program, such as basic acceptance of the vouchers and the distances covered, and provision of the service needed by riders including portal-to-portal transportation.

This program is highly desirable by consumers as it gives them a high degree of choice and may provide the portal-to-portal service that enhances riders' convenience and safety. It is however, more expensive than a volunteer-based program and there are mixed reports from consumers about taxi drivers' limited willingness to provide *door-to-door* assistance that may be needed by the most frail individuals in need of a non-emergency medical trip.

4. Purchase-of-Service on Existing Human Service Agency Transportation Project

Purpose: This option draws upon the existing transportation capabilities that reside within human service agencies and organizations within Lake County, developing mechanisms for them to serve trips to non-agency personnel who need to travel to the same locations as agency clients.

Non-traditional transit services can involve obtaining trips on human service transportation that is already traveling to key destinations for other consumers. Linking non-affiliated riders with agency transportation services is potentially complicated but works on the presumption that since the vehicle is making the trip anyway, it is conceivable that other riders could be transported for a fee that covers the marginal cost of these additional riders.

- Infrastructure has to be developed to link human service agency transportation services with individuals who need trips. Agencies can conceivably “sell” trips but a variety of issues need to be worked through, not only the cost of the trip, but liability issues, trip scheduling expectations, return trip expectations, and basic agency safety practices related to vehicle maintenance and driver training.
- Developing the capacity of such programs involves defining potential partners and the limits of what the transportation-providing agency might provide. There needs to be an individual or an organization with authority to develop these arrangements, including agreements that might underwrite the transfer of dollars.

5. Travel Training Workshops

Purpose: Recurring Lake Transit travel training workshops, geared to a variety of audiences and held at different locations around the county will serve to introduce individuals to Lake Transit services in the moment when they are open to what it might offer them. Specific focus on NEMT destinations can help prospective users consider how they might use Lake Transit to meet selected medical transportation needs.

- Simple, rider-oriented travel training curricula can be developed for presentation by the Mobility Manager.



- Sessions can be scheduled and held quarterly at a variety of locations around the county, including senior centers, community centers, regular hospital clinics serving chronic health conditions, certain Wellness clinics such as St. Helena’s program, and other such settings. Envision two upper county and two lower county workshops annually.
- Ideally one workshop annually, or biennially, could schedule with simultaneous Spanish translation and a few handouts printed in Spanish. This could, for example, be targeted to Spanish-speaking seniors who can be brought current with changes in Lake Transit services that could serve NEMT trips.
- Some workshops can be geared specifically to the transit users; while others can be oriented to agency personnel to help them assist their own consumer base in understanding Lake Transit services, discussing some specific health care destinations and the routing to get to those locations.
- Workshops participants – both general public and agency personnel – could potentially be provide with two to four free trip tickets on Lake Transit, to encourage them to use Lake Transit services.
- A follow-up letter to participants, within thirty days after each workshop, could include a postcard response inviting participants to report on any use of Lake Transit post the workshop and provide feedback on the travel training itself, supporting its improvement over time.

Travel training activities, even of modest duration and emphasis, will have value if they are locally based and focused upon the kinds of trips people in that community or that neighborhood might want. An NEMT dimension can be developed with input from health care professionals, to identify particular clinic times and hours, potentially offering the workshop at the clinics themselves or at times when target individuals might be present. Creative methods can be developed to “introduce” people to public transit, revealing to them a service that has been there all along but may otherwise be invisible.

6. Mobility Management/ Brokerage Capabilities

Purpose: Some additional infrastructure is necessary to knit together the various disparate opportunities, needs and potential resources that exist in Lake County by which to address NEMT. Mobility management and brokerage functions are discussed here as means for coordinating and growing countywide NEMT response.

Two concepts are presented here somewhat synonymously, namely that of **mobility management** which has been funded through the Federal Transit Administration JARC and New Freedom programs and involves promotion and education around transportation services and **brokerage**, an



older concept involving linking riders and with available trips. These are discussed together here because of their overlapping elements.

- The mobility management function is a local or regional transportation expert that helps to connect individuals with available transportation through education and information. A mobility manager is a person – full-time or part-time – whose expert knowledge of transportation increases access to services for the individuals with whom they work. For this NEMT focus, it will be critical that this individual is also, and possibly primarily, a health care expert as well. That knowledge base allows access to and participation in health care decision-making as it may relate to transportation services.
- Outreach responsibilities are a key mobility management activity, with outreach oriented both to consumers for education purposes and to agencies for resource development and staff education about available resources.
- Mobility management must involve program design/ program development of services, potentially including building volunteer-based programs, taxi or scrip-based door assistance resources, and encouraging local providers to consider providing NEMT trips on a space-available, cost-reimbursement basis.
- One-number resource capabilities can be championed by the mobility manager; given that Lake County has neither 211, the human services resource phone number nor 511, the transportation resource number. It may be feasible to piggy-back on the Bay Area’s MTC 511.org resource.
- The brokerage function, as distinct from mobility management’ program development orientation, is more focused linking consumers needing trips with the most appropriate transportation service. The brokerage function can support the mechanics of linking consumers with trips, helping to ensure that these services are safe, charging appropriately and that necessary reporting is happening.
- The mobility manger/ broker can be mandated with responsibility to negotiate with funding partners and with service providing partners, working through issues or regulation, funding requirements, reporting and auditing concerns.
- The mobility manager/ broker should have lead, but not exclusive responsibility, for seeking new or expanded funding alternatives to support NEMT. For example, this entity might work through the Medi-Cal reimbursement processes with key stakeholders and develop grants to respond to appropriate funding sources. Efforts to secure a continuing funding base are a critical activity of the mobility manager/ broker.



- A brokerage function may negotiate with the destination-end of the trip, engaging medical offices or treatment facilities in grouping individuals' appointments such that they can be cost-effectively brought together from a distant area. For example, certain clinic services for given chronic health conditions could be served on the same day, grouping appointments of individuals who might otherwise be seen at various times. Similarly, if a community knows that there is a particular travel day to a given out-of-county medical facility, individuals might be empowered to make their own medical appointments within that travel window.
- The broker may rely upon some level of technology, such as paratransit providers' trip scheduling software [e.g. Route Match or Trapeze] or the more open-architecture rideshare capabilities such as the San Francisco Bay Area's 511.org or www.rideamigos.com
- With a locally-defined orientation to mobility management/brokerage, the mobility manager or broker could be housed in a partner human services agency, public agency or potentially, even a private taxi operation. Aside from hiring for the outgoing attributes of a communicator and educator, a critical external factor is the access to a pool of riders or potential riders. Also important is some knowledge of health care service delivery systems.

Mobility management and brokerage capabilities require both individual and organizational commitment and leadership to bring about effective service responses. The mobility management function can relate to consumer education and information, as well as helping to grow available transportation resources for individuals. The brokerage function can represent the infrastructure for connecting individuals with services, on a trip-by-trip basis and ensuring that appropriate rules, law and reporting are addressed.

7. One-Number/ One Call Information Services

Purpose: Lake County officials should explore the potential to fold in an information-component, possibly by web, by telephone or otherwise, to bring together the array of information sources related to transportation.

- Development activities for 511 [transit] and 211[social service information] should be monitored and an appropriate role sought for Lake County, to ensure that the general public has access to consolidated information services and can readily find its way through the current multiplicity of information sources available.
- The information function can, and possibly should, be rolled into the Mobility Management function but should be separately identified and monitored as a function critical to helping individuals connect with available services to make non-emergency medical trips.



Recommended Action Plan – Lake County Pilot NEMT Program

The following eight action steps are proposed for a Lake County Pilot NEMT Program, providing direction to begin addressing needs and realizing the opportunities set forth in this document. A sample implementing budget follows, showing various line-item costs in three parts: a start-up package of projects; a mobility manager/ brokerage function and Lake Transit service enhancements. Additionally projected are transit-related outcomes of passenger trips and unique persons served by this initially proposed budget.

Table 17, Action Steps to Implement a Lake County Pilot NEMT Program

Action Step	Responsible Parties	Timeframe
1. Determine the interest, willingness and ability of Lake County agency partners to participate in a program-of-projects approach to meeting NEMT needs.	Lake APC and TAG members, other interested parties	Immediate
2.. Identify and develop the near term and longer-term grant applications and solicit letters-of-interest necessary to go forward with initial funding requests. Potential funding opportunities include Caltrans MAP-PAC, JARC and New Freedom Call for Projects and Veterans’ Administration national pilot project opportunities.	Lake APC lead with support from prospective partner agencies	Immediate
3. Develop the “suite of projects” to be undertaken during an initial pilot project phase. The project list will be directed, in part, by the ability of partner agencies to identify current or future levels of financial participation, at even modest amounts, including in-kind contributions.	Lake APC with partner and prospective partner agencies	Immediate, but possibly concurrent with development of grant applications
4. Determine the optimal organizational structure of the Lake County NEMT Pilot Brokerage (e.g. a CTSA-entity, an adjunct to an existing hospital-based initiative, or some new stand-alone, non-profit structure.) Develop necessary agreements, memorandum of understanding or other arrangements to go forward. Define the on-going oversight role of partner agencies, with the new structure.	Lake APC with partner and prospective partner agencies	Near term Start-up phase
5. Undertake the hiring of Mobility Manager/ Broker and task him/ her with development of first-year operating plan based upon the initial, provisional suite of projects and committed partner agencies. Expect completion of operating plan within sixty-days after hire.	Oversight by Lake APC and possibly Lake Transit of new Pilot Project Mobility Manager	Start-up
6. Determine cost reimbursement pricing for human service agency purchased trips and price structure for other trips potentially purchased by the broker.	Pilot Project Mobility Manager	Start-up phase



<p>7. Undertake local research and potential negotiations for Medi-Cal reimbursement to the brokerage for eligible trips that may be provided through a mix of private sector, taxi-based services, LTA’s public transportation vehicle resources and human service agency resources.</p>	<p>Lake APC, Lake Transit, TAG members and Pilot Project Mobility Manager</p>	<p>Ongoing,, upon decision to go forward</p>
<p>8. Undertake first year and second year formal evaluations, assessing program implementation against guiding principles and other important measures. Conducted by an outside third-party, the completion of these evaluations prior to the end of each fiscal year will inform decision-making about the future of the pilot. Must ensure that critical data for each project is reliably collected and compiled.</p>	<p>Third-party contractor</p>	<p>Initially during start-up regarding data to track; quarterly summaries and year-end report</p>

Preliminary Pilot Program Costs

The following Tables 18-A, 18-B, 18-C introduce an estimation of probable costs associated with three years of operation of the proposed NEMT direct services projects, of a mobility management / brokerage pilot program and for selected Lake Transit enhancements. The individual projects can be enacted in whole or in part. These tables are calculated using general assumptions to create an overall cost basis for the program. Additionally, for individual direct service projects, estimates of potential numbers of passenger trips provided and unique persons served; in addition to project costs will be useful to seeking potential funding.

Operating components for five direct service projects are presented on Table 18-A. These include a mileage reimbursement program allowing for long distance or out of county trips; a taxi subsidy program to provide trips of last resort; a transportation voucher program for use on existing human service transportation programs; and a travel training function designed to introduce, and educate potential riders on utilizing available transportation options.

The mobility management/ brokerage sample budget, presented on Table 18-B consists of a full time professional to implement the operating plan, manage available projects, and coordinate available transportation resources. This project also includes an initial part-time administrative assistant providing internal project support, and moves to a full-time position in the second project year. Infrastructure costs for rent, utilities, supplies, equipment and marketing; and an annual stipend for third party analysis and program evaluation are also presented.

All costs presented are estimates and will require a full cost analysis prior to implementation of any proposed project component. As presented, the first year proposed budget of \$331,435 is comprised of \$208,570 in direct service projects and \$122,865 in mobility management/ brokerage expense. An estimated minimum of 38,000 one-way passenger trips and at least 420 unique persons are anticipated



to be served in the first program year. Second and third year expense increases modestly with small increases in labor; more if a technology component is added. Comparable, if not higher, numbers of trips provided and persons served can be expected with subsequent full-year operations as the program moves beyond its start-up phase. The spreadsheets for building these budgets will be provided to Lake City/ County APC, enabling them to readily put in actual costs for various line items, as they work with these in an implementation phase.

Table 18-C presents the costs for various Lake Transit enhancements which could be implemented individually or collectively. With additional detail provided in Appendix J, these estimates represent the increased number of revenue hours to add service to selective routes and on selective days. These include:

- The JARC/ NEMT Evening Hours Service Project for South County is presented as responsive to a petition by a number of CalWorks participants requesting evening bus service to Yuba College. It would also address evening hour needs for NEMT preventative care and evening doctors' appointment needs, discussed in this document.
- The Extended Clearlake/ Lower Lake Service to 10:30 p.m. would add runs to Routes 5 and 6 to provide for continuous operation of these routes from 6:00 a.m. to 10:30 p.m. and would supplement the Yuba College runs identified in that service module. IT would allow for travel throughout the evening to and from hospital or health clinics in the Clearlake/ Lower Lake area, while also increasing support for more service sector jobs.
- Holidays, Sundays and Evenings Countywide Expanded Service is estimated based upon a Saturday service schedule and as well as costing a modest demand responsive NEMT paratransit program that could operate countywide.

These estimates also assume a three percent annual increase in service cost and a farebox recovery ratio of 20 percent.

Cost–Benefit Analysis of Rural and Small Urban Transit in the United States

Ranjit Prasad Godavarthy, Jeremy Mattson, and Elvis Ndembe

The true value of transit systems in rural and small urban areas in the United States has been largely unmeasured, and there are often effects that go unidentified. Many studies have documented the benefits of urban transit systems with benefit–cost analysis. However, not many have looked into the benefits of transit in rural and small urban areas, where there is a great need for public transit, especially for transportation-disadvantaged individuals. This study focused on evaluating the qualitative and quantitative benefits of rural and small urban public transit systems and analyzed the benefit–cost ratio for rural and small urban transit areas for fixed-route and demand-response services in the United States. Data for rural and small urban transit systems from the national transit database (NTD) and rural NTD were used for calibrating the transit benefits and costs. Results were presented at a national level to show the effects of transit investments in rural and small urban areas nationally. Transit benefits in the United States for 2011 were found to be \$1.6 billion for rural transit and \$3.7 billion for small urban transit, not including the economic effects. Results showed a benefit–cost ratio of 2.16 for small urban transit and 1.20 for rural transit in the United States. Sensitivity analysis showed that increasing the percentage of forgone trips to 50%, increasing the cost of forgone medical and work trips by 25%, and increasing the percentage of medical trips to 30% substantially increased the total transit benefits by 88%, 20%, and 158%, respectively.

Transit systems in rural and small urban areas are often viewed as valuable community assets because of the increased mobility they provide to those without other means of travel. The value of those services, however, has been largely unmeasured, and there are often effects that go unidentified. As transit systems compete for funding at local, state, and federal levels, it is important to identify and quantify, where possible, the effects that the services have in local communities, as well as throughout the state or country. The benefits accruing to transit services, especially those in rural areas, have rarely been quantified, often because of a lack of data or the cost of collecting those data.

Benefits to the public transit user include lower-cost trips, new trips that are made, and relocation avoidance. The alternative means of travel for transit users, which may involve purchasing an automobile or paying for a taxi ride, are often more expensive. As transit provides access to work, health care, education, shopping, and so

forth, additional trips will be made for those purposes, resulting in increased earnings, improved health, involvement in social activities, and additional spending in the local community. Furthermore, the service reduces the likelihood of transportation-disadvantaged individuals experiencing isolation and depression. The existence of transit operations also creates economic activity in the community. This activity includes jobs created directly by the transit system, income generated by industries that supply inputs to the transit system, and induced economic activity.

Decision makers need objective and credible information on the costs and the benefits of transit operations to support their decisions on investment in public transportation. Some of these benefits lend themselves easily to quantification, while others do not. A full representation of the benefits, including quantitative and qualitative benefits, is necessary for local and state governments to make informed choices. The objectives of this study are to develop a method and estimate the economic costs and benefits of rural and small urban transit at the national level.

LITERATURE REVIEW

The major findings of previously conducted studies show that publicly operated transit provides significant benefits to the community compared with the costs contributed by the community. Burkhardt conducted national and local analyses of rural systems and concluded that returns on investment of greater than 3 to 1 can be achieved by allowing residents to live independently, increasing the level of business activity in the community, allowing residents to live more healthy lives, and making more productive use of scarce local resources (1). Analysis by Southworth et al. in Tennessee yielded benefit–cost ratios greater than 1.0, with most of the benefits coming from increased accessibility (2). In its research in Wisconsin, HLB Decision Economics, Inc., concluded that every dollar invested in public transportation provided \$6 in economic returns (3). HDR Decision Economics estimated that every dollar spent on public transit in South Dakota generates \$1.90 in economic activity, on average, and the social benefits equal \$9.11 per trip in urban areas and \$2.42 per trip in rural areas (4). Skolnik and Schreiner calculated a benefit–cost ratio of 9.7 to 1 for a small urban system in Connecticut (5). Peng and Nelson analyzed the economic benefits of elderly riders, work trip riders, and school trip riders in rural Georgia and also found benefits to exceed costs (6).

Burkhardt (1) and Southworth et al. (2) both showed that the benefits of rural transit systems vary significantly, depending on the characteristics of the service provided and the percentage of transit-dependent riders that they serve. Burkhardt found that two types of rural transit services generated the greatest economic benefits: employment transportation for riders and services that enabled people to live independently (1). Southworth et al. showed that transit

Small Urban and Rural Transit Center, Upper Great Plains Transportation Institute, North Dakota State University, 1320 Albrecht Boulevard, Room 448, Quentin Burdick Building, Fargo, ND 58102. Corresponding author: R. P. Godavarthy, ranjitprasad.godavar@ndsu.edu.

Transportation Research Record: Journal of the Transportation Research Board, No. 2533, Transportation Research Board, Washington, D.C., 2015, pp. 141–148. DOI: 10.3141/2533-16

services that provide rides to those who otherwise would not make the trip, and therefore place additional burden on state resources or suffer a significant loss of mobility, are very cost-effective (2). Cronin et al. found the highest return on investment for nutrition and medical trips (1,252% and 1,108%, respectively) although return on investment for education, employment, and life-sustaining and other trips for transportation-disadvantaged individuals was also very high (585%, 571%, and 462%, respectively) (7).

Burkhardt's research was based on 22 case studies of rural transit systems, including eight in-depth case studies showing cost-benefit ratios ranging from a low of 1.67 to 1 to a high of 4.22 to 1 (1). Burkhardt noted, however, that the study focused on the primary types of benefits and did not attempt to exhaustively quantify all benefits, so the estimates might slightly underestimate the actual benefits. HDR Decision Economics also noted that its results are conservative and do not account for some benefits that are too difficult to quantify (4).

CATEGORIZATION OF TRANSIT BENEFITS

The transit benefits in rural and small urban communities are categorized primarily as transportation cost-saving benefits, low-cost mobility benefits, and economic impact benefits. If transit is not provided in a community, then transit riders would have to either use a different mode or forgo the trip. Transportation cost savings are the savings that result when individuals are able to use transit in place of another mode, and affordable mobility benefits are the benefits that result when trips are made that would otherwise be forgone (trip that would not have been made) in the absence of transit. Transportation cost-saving benefits included vehicle ownership and operating expenses, chauffeuring cost savings, taxi trip cost savings, travel time cost savings, crash cost savings, and emission cost savings. Low-cost mobility benefits include cost savings by avoiding forgone medical, work, and other trips. Economic benefits result from the economic activity generated by transit operations. Economic benefits were not analyzed in this study because of the lack of data for calculating those benefits nationwide.

There are additional benefits that can be included among transportation cost savings or other benefits, such as parking cost savings and land use impacts. These benefits were not monetized for this analysis because they are not significant in small urban and rural communities.

METHOD FOR ESTIMATING BENEFITS

This study focuses on transit systems operating in rural and small urban areas across the United States. Rural transit systems are defined as those receiving Section 5311 Non-Urbanized Area Formula Funding and who report to the rural national transit database (rural NTD). Small urban transit agencies are defined as those receiving Section 5307 Urbanized Area Formula Funding and serve areas with a population of 200,000 or less.

Unlike previous research that included cost-benefit analyses of specific transit systems or specific states or regions, this study makes a broad analysis of rural and small urban transit across the country. Data for small urban transit systems for 2011 were obtained from the NTD, and 2011 data for rural transit systems were obtained from the rural NTD. A total of 1,392 rural transit agencies and 351 small urban transit agencies were identified and included in the analysis. Cost data and operational data for each of these agencies were obtained through the NTD and rural NTD. Small urban and rural transit benefits, transit

costs, and benefit-cost ratios were calculated at the national level. The analysis was restricted to modes defined as fixed-route bus or demand-response service although that included most of the transit service in those areas.

Travel Behavior in the Absence of Transit: Use of Alternative Modes and Forgone Trips

Estimating the benefits of public transit first requires an estimate of how transit riders would respond if transit service were not available. This study uses results from previously conducted surveys of the Transit Performance Monitoring System (TPMS) study prepared for the American Public Transportation Association to predict the behavior of transit users in the absence of transit (8). According to the TPMS study survey results, 21.5% of transit riders would not make a trip in the absence of transit, which can be called a forgone trip. The TPMS results also show that in the absence of transit, 12.8% of transit riders drive a car, 22.8% ride with someone, 11.7% take a taxi, 26.7% walk, and 4.5% ride a bicycle to make the trip.

It was determined by the authors that the TPMS results may be appropriate for fixed-route riders, but demand-response riders may face different alternatives. Mattson et al. conducted a series of surveys of demand-response riders at different sites across the country in urban and rural areas, collecting information on how riders would make the trip if the service were not available (9). Preliminary results from that study showed that 31% of demand-response riders would not make the trip in the absence of transit, 51% would ride with someone else, 7% would use a taxi, 5% would walk, and just 5% would drive themselves. The results were used to estimate travel behavior in the absence of transit for demand-response riders in rural and small urban areas for this study.

Information on trip purpose is also necessary for estimating the cost of forgone trips. Trip purpose data from the TPMS for small transit systems were used for small urban areas in this study. For rural areas, trip purpose data were obtained from the *2012 Rural Transit Fact Book* (10), which was derived from the 2009 National Household Travel Survey.

Transportation Cost Savings

A potential benefit of transit services is a reduction in transportation costs to those who use transit in place of another mode of travel. If the rider already owns and can operate an automobile, the cost of traveling by another mode includes fuel and other operating costs. Some who do not own a car may have to purchase one, incurring the costs of automobile ownership. If the rider were to get a ride from someone else, the cost would again include the operating costs plus the time and inconvenience required for someone to provide the ride. A trip by taxi, if available, would cost the taxi fare. The costs of walking and bicycling would also be considered. Most of these alternatives will cost more to the user than the cost of transit.

In addition to out-of-pocket costs, there are other costs associated with travel, including the cost of time, safety costs resulting from crashes, and environmental costs resulting from emissions. Switching from transit to other modes would also affect each of these costs, so they need to be included in the analysis. In many cases, transit can reduce these costs, but sometimes the costs can be higher.

Transportation cost savings benefits include primarily vehicle ownership and operation cost savings, chauffeuring cost savings,

taxi fare cost savings, travel time cost savings, crash cost savings, and environmental cost savings.

Transit riders using personal automobiles for their trips would incur vehicle ownership and operating expenses, which can be considered savings if the rider instead used transit. The savings were calculated on the basis of the savings per vehicle mile of the personal vehicle traveled. The vehicle ownership and operation cost for an average U.S. driver is estimated as \$0.65 per mile, which is the average of values for all vehicle types from the American Automobile Association data for 2013 (11).

While some will drive themselves in the absence of transit, many cannot drive or do not have access to an automobile and will get a ride from someone else, such as a family member or friend. Chauffeur trips are additional automobile trips made specifically for a passenger (12). Litman's estimate of \$1.05 per chauffeured vehicle mile was considered appropriate for this study to determine the cost of the chauffeured trips (12). This estimate will be multiplied with the average trip length derived from the NTD database to determine the cost of a chauffeured trip.

Taxi trips can be very expensive. According to Litman's study, average taxi fare of \$2.25 per mile was used to calculate the cost savings from taxi trips for rural and small urban areas (12). This study also takes into consideration differences in travel times between modes and the associated costs. Travel costs suggested by Litman (13) were used in this study, with adjustments made according to median wages for 2011 (Bureau of Labor Statistics) (14). With Litman's estimate for urban off-peak and rural transit travel, the travel time of transit passengers is assumed to be 25% of wages (\$4.14), and the travel time of automobile driver and passenger is valued as 25% of the average wages times $\frac{2}{3}$ (\$2.76) (13). Time devoted to walking and bicycling is charged at \$3.75 per hour. The difference between travel time costs of alternative travel modes and travel time costs of transit gives the travel time cost savings values.

Crash costs were calculated for all alternative modes by multiplying total miles of travel by cost per mile. A crash cost of 10¢ per vehicle mile was used for automobiles (13). For small urban transit, Litman's estimate of 28.9¢ per bus mile, considering an average of 5.2 passengers, was considered appropriate (13). Crash costs for rural transit were calculated by multiplying the types of crashes (fatality or injury) by the respective cost values. On the basis of the crash cost values in the National Highway Traffic Safety Administration's *National Pedestrian Crash Report* for 2008, pedestrian and bicycle crash costs were estimated in this study as 10¢ per walking mile and 10¢ per bicycle mile, respectively (15). The crash cost difference between the alternative modes and the transit modes determines whether any crash cost savings are attributable to using transit.

Finally, emission costs of \$0.15 and \$0.06 per vehicle mile were used for transit and alternative travel modes (driving a personal car or riding with someone), respectively, following Litman (13).

Low-Cost Mobility Benefits

Low-cost mobility benefits result when trips are made that would otherwise be forgone in the absence of public transit. For many, there may be no feasible alternative modes, or the costs are prohibitively expensive, so they will forgo trips. The costs of those forgone trips can be substantial. A missed work trip, for example, means lost income. A missed health care trip means a person's health might not be properly managed and could result in a need for in-home care or a future emergency care trip via an ambulance. Lost educational trips could

reduce a person's future earnings potential, and lost shopping trips mean less money is spent in the community. Providing trips that would otherwise not be made results in other intangible benefits, such as providing enjoyment and fulfillment and preventing social and physical isolation. To estimate low-cost mobility benefits, the costs of trips that would be forgone in the absence of transit, such as missed health care trips or missed work trips, were estimated. Forgone trips were categorized as medical trips, work trips, and other trips, and different methods were used for each.

Medical Trips

The benefit from providing a trip for medical purposes is the difference between well-managed and poorly managed care, which can include a reduction in more costly care and improved quality of life. Calculations from a spreadsheet tool developed by Hughes-Cromwick et al. were used to estimate this benefit (16). This study made assumptions about the percentage of adult users of nonemergency medical transportation services who have different chronic conditions or require preventive care as well as the number of office visits required for each (16). These estimates are national norms identified by Hughes-Cromwick et al. (16). The benefits of nonemergency medical transportation trips are calculated as the cost difference between well-managed and poorly managed care, plus improvements in quality of life, minus costs of additional medical treatment incurred, divided by the number of trips required. The tool developed by Hughes-Cromwick et al. shows a net benefit of \$713 per round-trip, or \$357 per one-way trip (16). Therefore, that is assumed to be the cost of forgone medical trips. The total number of forgone medical trips was multiplied by \$357 to determine the total cost of forgone medical trips.

Work Trips

Building on previous research (HLB Decision Economics 2003 and HDR Decision Economics 2011), this study estimates the benefit of providing work trips by the effect it has on reducing public assistance spending (3, 4). If a person cannot go to work because of a lack of transportation, he or she may be eligible for assistance from the government through the Temporary Assistance for Needy Families (TANF) program or the Supplemental Nutrition Assistance Program (SNAP).

TANF, commonly referred to as welfare, provides cash assistance to needy families with dependent children. In FY 2011, \$30.6 billion was spent on the program, including federal and state expenditures, for 1.8 million families receiving assistance (17). The amount of SNAP benefits a household can receive is dependent on net income and household size. The maximum monthly allotment for a four-person household in 2013 was \$668 (18).

A four-person household receiving TANF and SNAP assistance, therefore, could result in \$24,400 in state and federal expenditures. These are costs that could potentially be avoided by providing transit services to transportation-disadvantaged individuals. Providing transit to work for one individual for a year would require approximately 500 trips, or two trips per day (one trip to work and a return trip home) for 250 working days per year. If providing these 500 trips allows the person to keep a job and not require government assistance, government payments could be reduced by an average of \$49 per trip. On the basis of these calculations, the cost of a forgone work trip is estimated to be \$49 although it is recognized that there is significant variation in this number.

Other Forgone Trips

The cost of forgone trips for other trip purposes is calculated by using the concept of consumer surplus. HDR Decision Economics (4) and HLB Decision Economics (3) also used that approach. Consumer surplus is the difference between the maximum price a consumer is willing to pay and the price the consumer actually does pay. Providing transit service increases consumer surplus by decreasing the amount users must pay for a trip.

RESULTS

Transit Cost Data

The 1,393 rural transit agencies reporting to the 2011 rural NTD had total operating expenses of \$1.3 billion. Operating expenses averaged \$10.78 per trip and \$2.49 per mile for those rural systems. For agencies operating only demand-response service, average cost per trip was \$17.31, while average cost per trip for fixed-route agencies was \$6.96.

Total operating expenses for the 351 small urban transit agencies was about \$1.6 billion. The average cost per trip was \$4.49, and the average cost per vehicle mile of service was \$5.25. Cost per trip was \$21.39 for demand response and \$3.63 for fixed route.

Estimated Transportation Cost Savings and Low-Cost Mobility Benefits

Transportation cost savings and low-cost mobility benefits were calculated for all agencies. The rural and small urban area transit benefits were further categorized according to the two primary types of service in these areas: demand-response service and fixed-route bus service.

Rural Transit Results

The transit benefits for transit agencies operating in rural areas are summarized in Table 1. It is observed that there are no travel time cost

savings and emission cost savings for either the fixed-route mode or the demand-response mode, and no crash cost savings for demand-response service. The negative travel time savings may be attributed to the lack of congestion for regular traffic when compared with transit, which can be a completely different scenario in urban areas. No emission cost savings are observed in rural areas because of lower vehicle occupancy rates. Results also show that demand-response service has larger negative values when compared with fixed-route bus, most likely because of lower vehicle occupancy rates. However, the essence of demand-response service is to provide mobility for people who are in need.

Overall, transportation cost saving benefits in rural areas totaled \$196 million for fixed-route bus and \$34 million for demand-response service. Forgone trip benefits were observed to be \$738 million for fixed-route transit and \$639 million for demand-response service. Overall, transportation benefits of \$934 million were observed in fixed-route transit and \$673 million were observed in demand-response service. Among the total transit benefits, the share of low-cost mobility benefits were observed to be substantially high for fixed-route bus service (79%) and demand-response service (95%), proving that low-cost mobility benefits are very important transit benefits in rural areas.

Small Urban Transit Results

Transportation cost benefits and low-cost mobility benefits for small urban transit agencies operating in the United States are summarized in Table 2. Travel time cost savings were negative for fixed-route bus and demand-response, proving that there are no travel time benefits to transit in small urban areas. Because fewer people ride demand-response transit in small urban areas, the crash cost savings and emission cost savings associated with transit cannot be seen unless the transit vehicle ridership nears its capacity. Apart from travel time benefits, the remaining categories for fixed-route bus were positive, indicating the existence of transit benefits. However, for demand-response service, the travel time cost savings, crash cost savings, and emission cost savings were negative.

TABLE 1 Rural Transit Benefits Categorization

Transit Benefit Category	Fixed-Route		Demand-Response		Total	
	Benefit [\$(%)]	Benefit per Trip (\$)	Benefit [\$(%)]	Benefit per Trip (\$)	Benefit [\$(%)]	Benefit per Trip (\$)
Transportation Cost Savings						
Vehicle ownership and operation costs	34,548,296	0.50	7,866,150	0.19	42,414,445	0.38
Chauffeuring costs	49,704,699	0.72	84,279,527	2.05	133,984,227	1.21
Taxi cost savings	109,312,967	1.58	38,342,849	0.93	147,655,816	1.34
Travel time cost savings	-19,560,594	-0.28	-36,213,133	-0.88	-55,773,727	-0.51
Crash cost savings	29,212,649	0.42	-13,170,826	-0.32	16,041,823	0.15
Emission cost savings	-7,079,055	-0.10	-47,129,195	-1.14	-54,208,250	-0.49
Total transportation cost savings	196,138,962 (21)	2.83	33,975,372 (5)	0.83	230,114,334 (14)	2.08
Low-Cost Mobility Benefits						
Forgone medical trip benefits	393,088,598	5.68	340,365,706	8.27	733,454,304	6.65
Forgone work trip benefits	296,014,254	4.28	256,311,430	6.23	552,325,684	5.00
Other forgone trip benefits	49,078,193	0.71	42,495,595	1.03	91,573,788	0.83
Total low-cost mobility benefits	738,181,045 (79)	10.67	639,172,731 (95)	15.53	1,377,353,776 (86)	12.48
Total transit benefits	934,320,007 (100)	13.50	673,148,102 (100)	16.35	1,607,468,110 (100)	14.56

TABLE 2 Small Urban Transit Benefits Categorization

Transit Benefit Category	Fixed-Route Bus		Demand-Response		Total	
	Benefit [\$(%)]	Benefit per Trip (\$)	Benefit [\$(%)]	Benefit per Trip (\$)	Benefit [\$(%)]	Benefit per Trip (\$)
Transportation Cost Savings						
Vehicle ownership and operation costs	109,504,604	0.33	3,736,711	0.22	113,241,314	0.32
Chauffeuring costs	157,544,484	0.47	40,035,876	2.35	197,580,360	0.56
Taxi cost savings	346,479,411	1.03	18,214,264	1.07	364,693,675	1.04
Travel time cost savings	-148,062,294	-0.44	-17,202,571	-1.01	-165,264,865	-0.47
Crash cost savings	41,930,026	0.13	-17,631,822	-1.03	24,298,205	0.07
Emission cost savings	5,504,437	0.02	-8,914,173	-0.52	-3,409,736	-0.01
Total transportation cost savings	512,900,668 (15)	1.53	18,238,285 (7.5)	1.07	531,138,953 (14.5)	1.51
Low-Cost Mobility Benefits						
Forgone medical trip benefits	1,362,173,952	4.07	100,952,297	5.92	1,463,126,250	4.16
Forgone work trip benefits	1,389,891,143	4.15	103,006,451	6.04	1,492,897,594	4.24
Other forgone trip benefits	160,459,212	0.48	21,690,446	1.27	182,149,657	0.52
Total low-cost mobility benefits	2,912,524,307 (85)	8.70	225,649,194 (92.5)	13.24	3,138,173,501 (85.5)	8.92
Total transit benefits	3,425,424,975 (100)	10.23	243,887,479 (100)	14.31	3,669,312,454 (100)	10.43

In summary, transportation cost saving benefits existed in small urban areas, with benefits being \$513 million for fixed-route bus and \$18 million for demand-response service. Forgone trip benefits were \$2.9 billion for fixed-route transit and \$225 million for demand-response service. Overall, transportation benefits of \$3.5 billion were observed in fixed-route transit and \$244 million were observed in demand-response service. Of the total transit benefits, the share of low-cost mobility benefits was high for fixed-route bus service (85%) and demand-response service (92.5%), proving that low-cost mobility benefits are very important transit benefits in small urban transit.

The average transit benefits per trip for fixed-route service are observed to be \$10.23. Similarly, the average transit benefits per trip for demand-response service are observed to be \$14.31. On average, the transit benefits per trip for transit in small urban areas are found to be \$10.43. The transit benefits per trip are comparatively higher for demand-response service because of the increased proportion of forgone trips.

Benefit–Cost Analysis

Transit in small urban areas yielded a benefit–cost ratio of 2.16, which means every dollar invested in transit in small urban areas resulted in \$2.16 in benefits (Table 3 and Table 4). Transit in rural areas resulted in a benefit–cost ratio of 1.20, which means every dollar invested in transit in rural areas results in \$1.20 in benefits. In small urban areas, because of data availability, results were differentiated between fixed-route and demand-response service, with the analysis showing a benefit–cost ratio of 2.60 for fixed-route and 0.64 for demand-response. Though demand-response service is not found to have a high benefit–cost ratio, these services are considered to be critical to the community to meet the mobility needs of the transportation disadvantaged. The benefit–cost ratios were calculated in this study assuming transportation cost savings and low-cost mobility benefits as total transit benefits and not including the economic effects of transit. Therefore the benefit–cost ratios are likely conservative estimates that do not include all potential benefits.

TABLE 3 Estimated Transit Benefits

Benefit Category	Small Urban Areas		Rural Areas	
	Transit Benefit (\$)	Benefit per Trip (\$)	Transit Benefit (\$)	Benefit per Trip (\$)
Vehicle ownership and operation cost savings	113,241,314	0.32	42,414,445	0.38
Chauffeuring cost savings	197,580,360	0.56	133,984,226	1.21
Taxi cost savings	364,693,674	1.04	147,655,815	1.34
Travel time cost savings	-165,264,864	-0.47	-64,230,510	-0.58
Crash cost savings	24,298,205	0.07	16,041,822	0.15
Emission cost savings	-3,409,736	-0.01	-54,208,250	-0.49
Cost of forgone medical trips	1,463,126,250	4.16	733,454,303	6.65
Cost of forgone work trips	1,492,897,594	4.24	552,325,683	5.00
Cost of other forgone trips	182,149,657	0.52	91,573,788	0.83
Total transit benefits	3,669,312,454	10.43	1,599,011,322	14.49

TABLE 4 Estimated Transit Costs

Cost Category	Small Urban Areas		Rural Areas	
	Transit Cost (\$)	Cost per Trip (\$)	Transit Cost (\$)	Cost per Trip (\$)
Operational expenses	1,581,017,438	4.49	1,322,556,555	10.78
Capital expenses	117,565,000	0.33	113,346,800	1.03
Total transit costs	1,698,582,438	4.83	1,435,903,355	11.81

Sensitivity Analysis

The travel behavior and unit costs used in this study for monetizing the transit benefits were based on many assumptions made from previous studies. To account for the uncertainty and variation of the values used that might occur, a series of sensitivity analyses were conducted to understand how results change when some of the key variables change. Sensitivity analysis was conducted for the study by considering eight different scenarios. In each scenario listed below, changes were made to one of the travel behavior or unit cost variables, while the other variables maintained the values from the base case:

Scenario 1. Fifty percent of passenger trips were assumed to be forgone in the absence of transit, as opposed to 22% for fixed route and 31% for demand response in the base case, and the rest of the trips were distributed according to their proportion from the base case. This scenario examines how results would change for transit systems that serve a higher percentage of transit-dependent riders and how results are sensitive to the percentage of forgone trips.

Scenario 2. The percentage of trips made by walking or bicycling in the absence of fixed-route transit was reduced by half (from 27% to 13% for walking and from 5% to 3% for bicycling). This scenario was run because the survey results used for the base case provided walk and bicycle shares that may be too high. The rest of the trips were distributed according to the proportions observed in the base case.

Scenario 3. The average automobile cost was increased from \$0.65 per mile to \$0.84 per mile (which is the American Automobile Association estimate when the average mileage is 10,000 mi).

Scenario 4. The costs of forgone medical and work trips were increased by 25% from the base case.

Scenario 5. The costs of forgone medical and work trips were decreased by 25% from the base case.

Scenario 6. The value of travel time for automobile was adjusted to be the same value as that for transit. A value of travel time of \$4.14 per hour was used for transit and automobile travel.

Scenario 7. Travel time, crash cost, and emission cost savings were excluded from the analysis. These are among the most difficult to quantify of the costs considered in this study, and therefore there is a higher degree of uncertainty concerning their results. For demand-response service, negative values were found for each of these, resulting in lower benefit–cost ratios. Negative values were also found for travel time savings for fixed-route service in urban and rural areas and emissions savings for fixed-route service in rural areas. However, users of transit services may have a lower value of travel time than that used in the analysis, and the costs associated with crashes and emissions are more difficult to quantify. Therefore, the purpose of this scenario is to show how results would differ if these three costs were excluded.

Scenario 8. The proportion of medical trips was increased to 30%, as opposed to 5.3% for small urban transit and 7.4% for rural transit in the base case, and the remaining trips were distributed according to the proportion of trip purposes from the base case. This scenario examines how results would change for transit systems that serve a higher percentage of medical trips and how results are sensitive to the trip type.

Table 5 presents the individual transit benefits, total transit benefits, and benefit–cost ratio for the base case and for each scenario. The percentage increase and decrease of all transit benefits when compared with the base case in each scenario are also provided in parentheses.

In Scenario 1, modifying the percentage of forgone trips to 50% for fixed-route and demand-response service resulted in an overall 88% increase in total transit benefits, with the benefit–cost ratio being 3.17. Under this scenario, the benefit–cost ratios increase from 2.16 to 4.22 in small urban areas and from 1.20 to 1.93 in rural areas. Further, for small urban transit, the benefit–cost ratio for demand-response service increased from 0.64 to 0.93 and the benefit–cost ratio for fixed-route service increased from 2.60 to 5.17.

Figure 1 shows how the benefit–cost ratio of public transit varies with the percentage of forgone trips in the absence of public transit. The benefit–cost ratio varies from 0.98 to 5.92 when the percentage of forgone trips ranges from 10% to 100%. This finding shows that results are highly sensitive to the percentage of trips that would be forgone in the absence of transit and that transit systems serving a greater percentage of transit-dependent riders produce more benefits. Further, Figure 1 shows the benefit–cost ratio of rural and small urban transit for various forgone trip percentages when 30% of the trips are dedicated for medical trip purposes (as explained in Scenario 8). This situation substantially increases the benefit–cost ratio of rural and small urban transit ranging from 2.17 to 17.83 when the percentage of forgone trips ranges from 10% to 100%.

Scenarios 4 and 5 also show that the results are sensitive to the values assigned to forgone trips. Increasing the cost of forgone medical trips and work trips by 25% in Scenario 4 increased the total transit benefits by 20%. Similarly, decreasing the cost of forgone medical trips and work trips by 25% in Scenario 5 decreased the total transit benefits by 20%.

Results from Scenarios 2, 3, and 6 produced minimal difference from the base case, showing that the results were not as sensitive to walk and bicycle percentages, automobile costs, and value of travel time. Scenario 7 shows that excluding travel time, crash, and emissions costs from the analysis increases the benefit–cost ratio from 1.68 to 1.76. Scenario 8 shows that results are highly sensitive to trip type and the percentage of trips that are for medical purposes. Increasing the proportion of medical trips to 30% increases the total transit benefits by 160% and the benefit–cost ratio from 1.68 to 4.38. Under this scenario, the benefit–cost ratios increase from 2.16 to 5.92 in small urban areas and from 1.20 to 2.57 in rural areas.

TABLE 5 Sensitivity Analysis Results for Eight Scenarios

Benefit Categorization	Transit Benefits									
	Benefits, by Scenario									
	Base Case	1	2	3	4	5	6	7	8	
Vehicle ownership and operation cost savings [\$ millions (%)]	156	100 (-36)	203 (30)	201 (29)	156 (0)	156 (0)	156 (0)	156 (0)	156 (0)	156 (0)
Chauffeur cost savings [\$ millions (%)]	332	227 (-32)	397 (20)	332 (0)	332 (0)	332 (0)	332 (0)	332 (0)	332 (0)	332 (0)
Taxi cost savings [\$ millions (%)]	512	314 (-39)	680 (33)	512 (0)	512 (0)	512 (0)	512 (0)	512 (0)	512 (0)	512 (0)
Travel time cost savings [\$ millions (%)]	-221	-482 (-118)	-507 (-129)	-221 (0)	-221 (0)	-221 (0)	-171 (23)	0 (100)	-221 (0)	-221 (0)
Crash cost savings [\$ millions (%)]	40	-15 (-138)	39 (-2)	40 (0)	40 (0)	40 (0)	40 (0)	0 (-100)	40 (0)	40 (0)
Emission cost savings [\$ millions (%)]	-58	-79 (-38)	-41 (28)	-58 (0)	-58 (0)	-58 (0)	-58 (0)	0 (100)	-58 (0)	-58 (0)
Cost of forgone medical trips [\$ millions (%)]	2,197	4,787 (118)	2,197 (0)	2,197 (0)	2,746 (25)	1,647 (-25)	2,197 (0)	2,197 (0)	11,255 (412)	11,255 (412)
Cost of forgone work trips [\$ millions (%)]	2,045	4,495 (120)	2,045 (0)	2,045 (0)	2,557 (25)	1,534 (-25)	2,045 (0)	2,045 (0)	1,521 (-26)	1,521 (-26)
Cost of other forgone trips [\$ millions (%)]	274	590 (115)	274 (0)	274 (0)	274 (0)	274 (0)	274 (0)	274 (0)	204 (-25)	204 (-25)
Total transit benefits [\$ millions (%)]	5,277	9,935 (88)	5,287 (0)	5,322 (1)	6,337 (20)	4,216 (-20)	5,327 (1)	5,515 (4.5)	13,742 (160)	13,742 (160)
Benefit-cost ratio	1.68	3.17	1.69	1.70	2.02	1.35	1.70	1.76	4.38	4.38

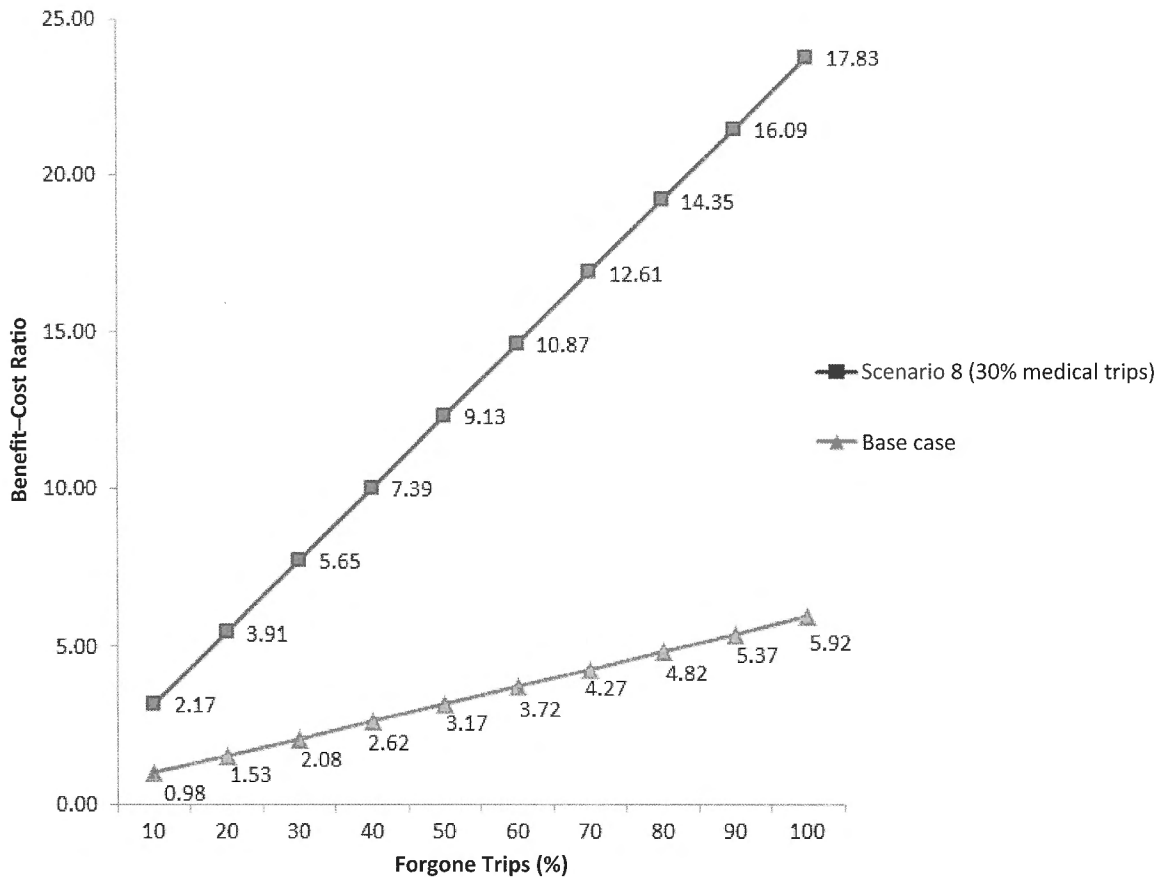


FIGURE 1 Benefit-cost ratio of small urban and rural transit for various percentages of forgone trips.

CONCLUSIONS

Implications

With benefit–cost ratios greater than 1, the results show that the benefits provided by transit services in rural and small urban areas are greater than the costs of providing those services. Results show that benefit–cost ratios are higher in small urban areas than in rural areas, but benefits were found to exceed costs for rural and small urban transit. Results also showed that fixed-route service has higher benefit–cost ratios than demand response. Demand–response service provides significant benefits per trip, but the cost of providing this service is also significantly higher.

While there are a number of different types of benefits from transit service, the study shows that most of the benefits of urban and rural transit services are generated by creating trips for individuals who would not be able to make the trip if the service were not available. In particular, the creation of medical and work trips accounted for the largest share of transit benefits.

The study also showed that the results are highly sensitive to the percentage of trips that would be forgone in the absence of transit, the cost values assigned to those forgone trips, and the percentage of trips that are for medical purposes. Benefit–cost ratios increase to more than 3 to 1 if it is assumed that half of the trips would not be made in the absence of transit and to more than 4 to 1 if 30% of trips are for medical purposes.

The implication from these results is that transit services that serve a higher percentage of transit-dependent riders and those that provide a greater percentage of medical or work trips will provide more benefits per trip. The benefit of providing a medical trip to someone who otherwise would not be able to travel is especially high.

Limitations

This study attempts to estimate overall benefits and benefit–cost ratios at the national level, but it is recognized that these values can vary significantly between individual transit systems according to the types of services they provide and the individuals they serve.

The results can also be considered to be conservative because some benefits are difficult to quantify. While the study showed significant value for providing medical and work trips, the value of providing other types of trips may have been underestimated because of the difficulty in quantifying the benefits of those trips. In many cases, the benefits of providing those trips are more qualitative in nature. Social trips, for example, can have significant quality-of-life benefits that are difficult to quantify. Providing a person with the ability to travel where and when the person wants, regardless of trip purpose, improves quality of life in a way that may have been underestimated in this study.

Further, there are other potential benefits not included in this study because they are generally less relevant to rural and small urban areas or because of the difficulties in quantifying them. For example, parking cost savings, congestion mitigation, and land use impacts are significant effects of transit in urban areas but were not included in this research because they are less relevant for the areas being studied. However, in some small urban areas, these may be significant benefits that need to be considered. There are also a number of less tangible benefits not included in this study that could be considered, such as community cohesion, relocation cost savings, and provision of transportation service during emergencies. Relocation cost savings, in particular, could be significant in rural areas, to the individual and to the community.

ACKNOWLEDGMENTS

The funds for this study were provided by the U.S. Department of Transportation through the National Center for Transit Research in the Center for Urban Transportation Research at the University of South Florida.

REFERENCES

- Burkhardt, J.E. Economic Impact of Rural Transit Services. In *Transportation Research Record: Journal of the Transportation Research Board*, No. 1666, TRB, National Research Council, Washington, D.C., 1999, pp. 55–64.
- Southworth, F., D.P. Vogt, and R. Curlee. Rural Transit Systems Benefits in Tennessee: Methodology and an Empirical Study. *Environment and Planning A*, Vol. 37, 2005, pp. 861–875.
- HLB Decision Economics, Inc. The Socio-Economic Benefits of Transit in Wisconsin. Final Report No. 0092-03-07. Development and Technology Transfer, Wisconsin Department of Transportation Research, 2003.
- HDR Decision Economics. Costs and Benefits of Public Transit in South Dakota. South Dakota Department of Transportation, Pierre, 2011.
- Skolnik, J., and R. Schreiner. Benefits of Transit in Small Urban Areas: A Case Study. In *Transportation Research Record 1623*, TRB, National Research Council, Washington, D.C., 1998, pp. 47–56.
- Peng, Z.-R., and A. C. Nelson. Rural Transit Services: A Local Economic and Fiscal Impact Analysis. In *Transportation Research Record 1623*, TRB, National Research Council, Washington, D.C., 1998, pp. 57–62.
- Cronin, J.J., J. Hagerich, J. Horton, and J. Hotaling. Florida Transportation Disadvantaged Programs Return on Investment Study. Marketing Institute, Florida State University College of Business, 2008.
- McCullom Management Consulting. Transit Performance Monitoring System (TPMS) Results: Summary Report Phases I and II. Prepared for American Public Transit Association in cooperation with and funded by FTA in association with M. Davis and Company, NuStats International, and P. Furth, 2002.
- Mattson, J., J. Miller, J. Hough, J. Goodwill, and P.S. Sriraj. Evaluating the State of Mobility Management and Human Service Transportation Coordination. National Center for Transit Research, 2014.
- Small Urban and Rural Transit Center. *2012 Rural Transit Fact Book*. Upper Great Plains Transportation Institute, North Dakota State University, 2012.
- American Automobile Association. Your Driving Costs: How Much Are You Really Paying to Drive? 2013. Available at <http://newsroom.aaa.com/wp-content/uploads/2013/04/YourDrivingCosts2013.pdf>. Accessed 2013.
- Litman, T. *Evaluating Public Transit Benefits and Costs: Best Practices Guidebook*. Victoria Transport Policy Institute, Victoria, BC, Canada, 2012.
- Litman, T. *Transportation Cost and Benefit Analysis: Techniques, Estimates and Implications*, 2nd ed. Victoria Transport Policy Institute, Victoria, BC, Canada, 2011.
- Bureau of Labor Statistics. Earnings and Unemployment Rates by Educational Attainment. Dec. 2013. Available at http://www.bls.gov/emp/ep_chart_001.htm. Accessed Jan. 2014.
- National Pedestrian Crash Report. Report No.: DOT HS 810 968. National Highway Traffic Safety Administration, U.S. Department of Transportation, 2008.
- Hughes-Cromwick, P., R. Wallace, H. Mull, J. Bologna, C. Kangas, J. Lee, and S. Khasnabis. *Cost-Benefit Analysis of Providing Non-Emergency Medical Transportation*. TCRP Web-Only Document 29 (Project B-27). Contractor's final report. Transportation Research Board of the National Academies, Washington, D.C., 2005.
- Administration for Children and Families, U.S. Department of Health and Human Services. Fiscal Year 2011 TANF Financial Data. Available at http://archive.acf.hhs.gov/programs/ofa/data/2011fin/tanf_2011_index.html. Accessed Nov. 2013.
- Food and Nutrition Service, U.S. Department of Agriculture. Supplemental Nutrition Assistance Program (SNAP): How Much Could I Receive? Available at <http://www.fns.usda.gov/snap/how-much-could-i-receive>. Accessed Nov. 2013.

The Standing Committee on Rural Public and Intercity Bus Transportation peer-reviewed this paper.