

**EXAMINATION OF NIGHT SERVICE ALTERNATIVES  
FOR VOLUSIA COUNTY DBA VOTRAN**

Technical Memorandum

**Prepared for:**

**Volusia County dba VOTRAN**

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## **An Examination of Night Service Alternatives for Volusia County dba VOTRAN**

In this document, the topic of later evening transit service in Volusia County will be addressed in summary fashion. Background information that highlights the need for such service will be presented, as will a variety of potential alternatives for providing such service. Advantages and disadvantages related to each alternative will be discussed and the alternatives' potential ridership, cost, and revenue figures will be estimated and compared. Finally, a single alternative or combination of alternatives that may best meet Volusia County's needs will be identified based on the information presented herein and be recommended for potential implementation.

### **Background**

The Center for Urban Transportation Research (CUTR) has worked with Volusia County's public transit agency, VOTRAN, on the system's transit development planning process over the last seven years, beginning with its 1996 major Transit Development Plan (TDP) update. The data collection efforts for all three of the major updates that have been undertaken during this period have found that later evening transit bus service has been one of the most desired and needed improvements for VOTRAN, according to system users, workshop participants (both users and non-users), and a number of local officials and agency representatives. It is expected that later evening bus service will allow service workers to get to work and/or get home from work using transit, and will improve transit access to shopping, restaurants, and recreational activities during evening hours. In VOTRAN's most recent major TDP update, one of the on-board survey questions specifically queried riders about whether they would like to have later evening bus service and over 94 percent responded affirmatively. In addition, more than 60 percent of riders indicated that service should operate until at least 11:00 p.m. or midnight. Currently, among VOTRAN's regular bus routes, Route 1A operates the latest, ending service at 7:47 p.m. The system's beach trolley (Route 700) operates until just after 1:00 a.m.; however, it operates only seasonally each year, from January through September, and in a somewhat limited service area.

## **Introduction**

Given the identified increasing desire for VOTRAN to provide later evening transit bus service, more individuals and organizations have intensified their lobbying efforts to help make night bus service a reality. While it is apparent that VOTRAN and its governing board, the Volusia County Council, would like to continue to meet the needs of transit riders and community businesses and organizations, this extension of operating hours certainly will involve a considerable financial impact.

Given that resources for transit service are already constrained, it is in the best interest of VOTRAN and the County Council to examine a variety of alternatives for the provision of night service so that the most suitable and fiscally-responsible option can be identified for potential implementation. As mentioned previously, the purpose of this document is to summarize an examination and comparison of possible night service alternatives, and identify a recommended solution to the limited service hours issue that ultimately can be implemented.

### **Night Service: A Question of Need**

In the Background section presented previously, it was indicated that the clamor for later evening transit service has persisted since at least VOTRAN's 1996 Transit Development Plan, and continues vociferously today. Consider the information presented in Table 1, all of which came from the data collection efforts of VOTRAN's last three TDPs (1996, 1999, and 2002), to gain a better understanding of how the stated desire for night transit service has evolved over time in Volusia County.

**Table 1**  
**Expressed Desire for Night Transit Service in Volusia County, 1996 to the Present**

<b>Data Collection Tool/Forum</b>	<b>1996 TDP</b>	<b>1999 TDP</b>	<b>2002 TDP</b>
<b>On-Board Customer Survey</b>  <ul style="list-style-type: none"> <li>• VOTRAN service aspect customers like least</li> <li>• Avg. customer satisfaction rating for time of day latest buses run on weekdays</li> <li>• Avg. customer satisfaction rating for time of day latest buses run on weekend days</li> <li>• Most important service performance characteristic related to transit usage</li> <li>• <i>Would you like to see VOTRAN provide later evening bus service?</i></li> </ul>	n/a  n/a  n/a  n/a  n/a	1,972 respondents  Limited service hours - #3 rank  3.34 out of 5.00  3.32 out of 5.00  Time of day latest buses run on weekdays - #10 rank  n/a	1,371 respondents  Limited service hours - #1 rank  2.91 out of 5.00  2.93 out of 5.00  Time of day latest buses run on weekdays - #3 rank  Yes - 94.1%, No - 5.9%
<b>VOTRAN Operator Survey</b>  <ul style="list-style-type: none"> <li>• Most frequent passenger complaint(s) heard by operators</li> <li>• Improvement areas for VOTRAN identified by operators</li> <li>• <i>Is night service necessary?</i></li> </ul>	23 respondents  Need later evening service - #2 rank  Extend evening service - #8 rank  Yes - 9, No - 12 No response - 2	21 respondents  Need later evening service - #1 rank  Later evening service - #6 rank  Yes - 15, No - 5 No response - 1	49 respondents  Need later evening service - #1 rank  Later evening service - #6 rank  Yes - 40, No - 8 No response - 1
<b>Discussion Group Meetings</b>	Topic of night service came up in 2 of 3 meetings	Topic of night service came up in 2 of 3 meetings	Topic of night service came up in 3 of 5 meetings
<b>Interviews with Key Local</b>	Topic of night	Topic of night	Topic of night

<b>Officials</b>	service not mentioned in any of the interviews	service came up, but for only those routes with demand for it	service came up, but lack of agreement on level of implementation
<b>TDP Recommendations</b>	#37 of 38 - Initiate later evening service on all routes. (Next 3 to 5 years)	#38 of 51 - Increase span of service on selected core routes. (Next 2 to 3 years)	To be determined.  (Within next year??)

Notes: (1) For the surveys, presented results have been drawn from specific questions on the survey instruments that were utilized for the 1999 and 2002 TDPs. Neither of the survey instruments changed significantly between these two most recent TDPS. Bulleted items that have been italicized represent actual, verbatim questions from the surveys.

(2) An on-board survey was not conducted by CUTR for the 1996 TDP.

(3) On the operator surveys for the three TDPs, the question asking operators to provide a ranking of the improvements that would be most helpful to VOTRAN did not include an option for “extend evening service” or “later evening service.” These responses were actually written in by the operators on the open-ended “other” response that was provided for this question.

It is evident from the information presented in this table that the desire and expressed need for later evening transportation services has grown over time. Customer satisfaction with the current service span has declined since 1999, especially as it relates to how late the bus service operates on weekdays and weekends (the two lowest-rated service performance characteristics of the 21 total characteristics VOTRAN customers were asked to assess in the 2002 on-board survey). Even VOTRAN’s bus operators have acknowledged this particular passenger demand. In 1996, less than 43 percent of drivers responding to an operator survey believed that night service was necessary. In 2002, a similar survey found that more than 83 percent of responding drivers now believe in the need for it. Similar results are evident in the other data collection endeavors from the three TDPs, as well. Given this apparent strong and steadily increasing support for night transit service, it would appear that it is time to give this particular service improvement serious consideration.

But, given the cost of such an endeavor and VOTRAN’s current fiscal constraints, should night service really be a consideration? Is it truly necessary? Is it a wise investment? Or, are transit users in the county just looking for “more” or something to complain about? What about other transit agencies? Are any of them having to deal with this same issue? Well, glad you asked. In fact, like the issue of service frequency, service span historically has been one of the biggest complaints of

transit users, as well as one of the most oft-cited barriers of non-users. If service is not frequent enough or does not operate early/late enough, transit agencies hear about it. Consider the following quote:

“I would like to see the bus service expanded to at least 12:00 - 12:30 a.m. every day of the week including Sundays! The reasons are clear: 1) for those of us who don't drive we need to be able to get around town more easily. 2) The people who work in the nursing homes, hospitals, malls, convenience stores, Gateway, Citibank, etc., to be able to get home on time.”

Sounds like a comment from the recent 2002 VOTRAN on-board survey, right? Well, it is not. It actually is an unedited excerpt from a comment made by a Sioux Falls Transit (North Dakota) rider on the system's 2000 on-board survey that was completed as part of a comprehensive operations analysis.<sup>1</sup> And, there is more.

- In September 2001, Auckland City (New Zealand) saw the start up of a new late night bus service, the Night Rider, implemented to provide young people with an alternative to taxi fares and encourage them to avoid driving after drinking.
- CityLink in Abilene, Texas, received a state grant in December 1999 to operate night bus service for the purpose of providing transportation to and from off-hour jobs for low income people. CityLink's normal service hours previously had ended at 6:00 p.m.
- According to a April 27, 2002, article from the Indo-Asian News Service, India and Bangladesh are considering introducing a night bus service between the cities of Kolkata and Dhaka to keep up with growing demand and meet the requests of frequent travelers.
- In Lafayette, Louisiana, the Lafayette City-Parish Council adopted a compromise regarding an ordinance before the council that would have extended transit service from 6:30 p.m. (the service's current end time) to 11:30 p.m. for a two-year period at a cost of \$500,000 to the city (with a matching \$500,000 federal grant). The compromise established a pilot program that would run for 90 days.
- In Humboldt County, California, a June 2000 Regional Workforce Preparation Mapping and Survey Project found that 42 percent of the county's unemployed indicated that lack of transportation was a significant barrier to getting a job. Further analysis determined that

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<sup>1</sup>*Sioux Falls Comprehensive Operational Analysis, Final Report.* LSC Transportation Consultants, Inc. Appendix D, Comments Section, Page 4. October 26, 2000.

public transportation services were lacking in terms of geographic coverage and hours of operation. For example, in the City of Fortuna, public transit was found to be inadequate “to meet the needs of local citizens who desire evening classes to improve their employment skills, and schedules do not permit use of the public transit system for swing, graveyard, or weekend employment.”

- The latest TDP update (August 2001) for Palm Tran, the public transit agency in Palm Beach, Florida, indicated that “the need for later night service continues to be expressed to the Palm Beach County Board of County Commissioners and Palm Tran staff by patrons of the system.” Accordingly, the system continues to work toward implementing a recommendation from its last major update that sought later night services on 12 different routes.

This is just a representative sampling of the recent involvement of transit with night service issues; there are significantly more instances that can be cited. However, these brief items are clear indication that the need and/or desire for later evening transit service is not just confined to Volusia County. It is a nationwide topic, as well as a global one. And, as long as restaurants, movie theaters, hospitals, universities, manufacturers, malls, and other places of business and recreation continue to operate well into the evening or even 24-hours per day, the issue will continue to besiege those transit agencies with hours of operation that do not meet the evening/nighttime mobility needs of its community.

So then, what should VOTRAN and Volusia County do? This is a difficult question to answer because, invariably, the issue of funding will play a determining role. Unfortunately, such an issue is well beyond the scope and purpose of this document. Therefore, let us assume for purposes of the discussion and analysis contained in this paper that funding is a foregone conclusion. That is, if the decision to extend VOTRAN’s service hours is made, that the money to implement this service change will be made available to the system. With this assumption, then, the only questions that remain are whether to implement night transit service and, if so, how (i.e., how late, where, which mode option(s), etc.).

The information presented in Table 1 sheds light on the expressed desire of transit users for night service in Volusia County and how it has grown over time. But what impact should/does their need have on the decision to implement night service? Considering VOTRAN’s and Volusia County’s positive track record to date in accommodating the needs of transit patrons, this stated desire undoubtedly will influence the decision-making process to some extent. However, so should

consideration for those persons throughout the VOTRAN service area who are unable to utilize the system because its current service hours do not fit their travel needs. These persons have not had an opportunity to voice their opinions to bus operators or on an on-board survey form. But, based on information from the discussion group meetings and interviews, apparently there are many of these individuals throughout the county, a number of whom are low income and/or in welfare programs and, because of their circumstances, require transportation to access the jobs for which they are qualified (which typically have off-peak and/or irregular hours). Perhaps later evening transit service would help these individuals enter the work force or even find better jobs and, in the process, help them become more frequent transit users.

Even the non-welfare individuals who cannot make use of VOTRAN for work purposes would benefit from later evening service. Hospital workers, emergency personnel, hotel/motel staff, and other “third-shift” workers (those working a late night shift, typically 11 p.m.-7 a.m.) currently cannot use VOTRAN because the system’s hours of operation do not allow them to access their jobs. Even “second-shift” workers (typically 3-11 p.m.) find it difficult to use VOTRAN because, although they can access work, they are unable to take transit back home after the shift ends. Others who would benefit would include mall/retail, restaurant, and bar/club employees; university, college, and technical school students who have night classes; and any other persons who would like to make use of transit to see a movie, go shopping, go out to dinner, or engage in some other nighttime-based social/recreational activity.

And, let us not forget the needs of those persons who choose to visit Volusia County. With its beaches, weather, and numerous attractions, Volusia County is an extremely popular tourist destination. Speed Weeks, the Daytona 500, Spring Break, Bike Week, and other events draw huge crowds to the area each year, generating the only significant congestion issues that the county experiences. Perhaps the availability of later evening transit service can help lessen the tourists’ need for rental vehicles (thereby helping improve the congestion problem) and also provide them with convenient access to all of the area’s attractions, restaurants, clubs, and stores that operate well beyond VOTRAN’s current service end time.

For these reasons, then, it would seem that later evening transit service warrants definite consideration by VOTRAN and the County Council for possible near-term implementation. However, in a time where it is commonplace to examine how others are doing things in order to determine and/or assess one’s own performance, it may be educational to see what other transit

agencies are doing in terms of service end times. To this end, CUTR utilized FY 2000 data from the National Transit Database (NTD) to analyze the reported end times of transit agencies from around the country. Since VOTRAN directly operated 46 motorbus vehicles in peak service during FY 2000, only transit agencies that directly operated less than 100 motorbus vehicles in peak service were included in this analysis. It was determined that a total of 248 agencies met this requirement in FY 2000. These systems were then separated into four peer categories based on total peak buses (2-19 buses, 20-39 buses, 40-59 buses, and 60-99 buses) and a distribution of reported service end times was calculated for each. Table 2 presents the results of this particular analysis.

**Table 2**  
**Distribution of Service End Times for Selected U.S. Transit Agencies by Peak Bus Fleet Size**  
**FY 2000**

Service End Time	2-19 Peak Buses		20-39 Peak Buses		40-59 Peak Buses		60-99 Peak Buses	
	No.	%	No.	%	No.	%	No.	%
<b>5:00-5:59 p.m.</b>	6	5.5	1	1.3	0	0.0	0	0.0
<b>6:00-6:59 p.m.</b>	43	39.1	9	12.0	2	5.1	0	0.0
<b>7:00-7:59 p.m.</b>	20	18.2	10	13.3	6	15.4	1	4.2
<b>8:00-8:59 p.m.</b>	9	8.2	4	5.3	2	5.1	4	16.7
<b>9:00-9:59 p.m.</b>	3	2.7	2	2.7	0	0.0	1	4.2
<b>10:00-10:59 p.m.</b>	12	10.9	11	14.7	7	17.9	2	8.3
<b>11:00-11:59 p.m.</b>	8	7.3	13	17.3	8	20.5	7	29.2
<b>12:00-12:59 a.m.</b>	8	7.3	16	21.3	10	25.6	4	16.7
<b>1:00-1:59 a.m.</b>	1	0.9	5	6.7	3	7.7	3	12.5
<b>2:00-2:59 a.m. or later</b>	0	0.0	4	5.3	1	2.6	2	8.3
<b>Total Transit Agencies</b>	110	100.0	75	100.0	39	100.0	24	100.0

Note: VOTRAN reported its bus service end time as 6 p.m., although the majority of its routes end between 6:30 and 7:30 p.m.

Upon inspection of this table, two interesting results stand out, only one of which was anticipated. First, as one might expect, the larger a transit system is, the more likely it is to operate later evening bus service. In the smallest peer group (2-19 peak buses), almost 63 percent of the systems in this category cease bus service before 8:00 p.m. However, the distribution data indicate that 65.3 percent of the 20-39 peak bus group, 74.3 percent of the 40-59 peak bus group, and 75.0 percent of the 60-

99 peak bus group operate bus service until at least 10:00 p.m. Further, more than half of the agencies in each of these groups operate service until at least 11:00 p.m. The other finding that is readily apparent in this table is that very few systems cease bus operations between 8:00 and 10:00 p.m. Out of the 248 total agencies represented in the table, only 25 end bus service during this time period.

Also evident in this analysis is VOTRAN's service end time performance in comparison to the other peer transit agencies. As noted in the table, in its FY 2000 NTD report, VOTRAN indicated a weekday service end time of 6:00 p.m. for its directly-operated motorbus service, even though the majority of VOTRAN's routes operate until 6:30 to 7:30 p.m. Even if the end time for Route 1A (VOTRAN's latest operating regular route) is used for comparative purposes, 154 of the other 247 transit agencies have later service end times than does VOTRAN, and 89 of these are smaller agencies in terms of peak bus fleet. In its own peer group (40-59 peak buses), 32 of the 38 other agencies have later bus service end times.

From this analysis, it is clear that VOTRAN is not providing a service span that is typical for a system of its size. Based on the distribution of end times for its specific peer group, it would appear that VOTRAN should be providing transit service until at least 10:00 p.m., with an overall service end time falling somewhere in the range of 10:30 p.m. to 12:30 a.m. (21 of its 38 peer systems end service during this span). Such an end time should then appease many of the current riders calling for night service since 46.2 percent of respondents to the 2002 on-board survey indicated a preference for bus service to run until midnight, and another 14.5 percent prefer service to run until 11:00 p.m.

To attempt to collect more information on the process of extending transit service end times, the 248 transit agencies that were included in the previous analysis were reviewed to determine which, if any, had increased their spans of service later into the night within the last five years. This review found that 19 agencies had extended their bus service end times sometime since the 1997 fiscal year. All 19 of these agencies were contacted in order to conduct a brief phone interview concerning this modification. Eleven of the agencies participated in the phone survey, with one of these indicating that the service extension was simply a typographic error in its FY 2000 NTD report. Table 3 presents selected pertinent results from the phone interviews.

**Table 3**  
**Phone Survey Results of U.S. Transit Agencies with Recently-Extended Hours of Operation**

<b>Transit Agency</b>	<b># Peak Buses</b>	<b># Routes Changed</b>	<b># Total Routes</b>	<b>Reason for Change</b>	<b>Did Cost Increase?</b>	<b>Funding Source(s)</b>
<b>Connecticut Transit - Stamford Division (CT)</b>	32	all	n/a	demand was there	yes	state
<b>Norwalk Transit District (CT)</b>	31	3	18	job access	yes (~8%)	federal, state, local
<b>Olympia Trails Bus Company (NJ)</b>	35			possible typo		
<b>AMTRAN (Altoona, PA)</b>	28	3 (mall)	12	to serve malls & for mall workers	yes	state
<b>Transit Authority Lexington-Fayette (KY)</b>	39	all	9	no longer wanted to contract out night service	yes	local
<b>Pee Dee Regional Transportation Authority (SC)</b>	41	n/a	n/a	wanted to expand service time	n/a	n/a
<b>Belle Urban System - Racine (WI)</b>	26	6	10	welfare issues, for 2nd/3rd shift workers	not much	reallocation
<b>Western Reserve Transit Authority (OH)</b>	36	5	7	for workers, mostly for welfare	n/a	federal, JARC
<b>Kalamazoo Metro Transit System (MI)</b>	30	16/4	16/20	wanted to extend service; contract with Univ of Mich	yes (by \$0.5 mil then by \$1 mil)	local millage; Univ of Mich
<b>Metropolitan Evansville Transit System (IN)</b>	26	7	14	help shopping area employees	yes (by 1/3)	state, local
<b>Rock Island County Metropolitan Mass Transit District (IL)</b>	51	2	57	serve meat packing plant workers	no	agreement w/company

- Notes: (1) Olympia Trails Bus Company staff indicated that service hours were not extended to midnight in FY 2000 as the system's NTD report indicated. They indicated that the reported service end time was probably a "typo."
- (2) No one currently on staff at Pee Dee Regional was with the agency in FY 1998 when the modification was made, so many of the survey questions could not be answered.
- (3) Transit Authority Lexington-Fayette, a department of county government, previously contracted out night service. After agency bought United Transportation, this service's hours of operation were extended, thereby obviating the need for night service contracting.
- (4) Kalamazoo Metro Transit extended service hours twice. In FY 1998, all 16 of the system's routes were extended to 10:15 p.m. Then, in FY 1999, the system added four routes to serve the University of Michigan (under contract with the University) and service was provided on just these four routes until midnight. The second cost increase they reported represents the entire cost of the four new routes, not just the extended hours of service portion.
- (5) JARC stands for Job Access and Reverse Commute, and references a grant that Western Reserve Transit received to help fund its increase in service span.

The information gathered from the ten transit agencies that extended hours of operation into the night in the last few years is interesting. In only three cases did all of a system's routes get extended in terms of service end time. In the remaining cases, only some portion of a system's route structure was modified. For a couple of these systems, the impacted routes were selected for some specific purpose: AMTRAN in Altoona began operating bus service until 10:00 p.m. on three of its routes in FY 1999 to serve a particular mall (the rest of its service ends around 6:30 p.m.), while Rock Island Mass Transit District extended bus service to 1:35 a.m. on two of its routes that serve the IVP meat packing plant (all other service ends by 8:05 p.m.). Also of note are the various reasons that were provided by the agencies for undertaking the span of service increase. Primarily, most of the systems were seeking to provide better job access, whether it be for welfare-to-work purposes, mall employees, or second/third-shift workers.

In addition, in the majority of the cases, the service modifications did result in increased operating costs, and most of the systems relied on federal, state, and local monies (or some combination thereof) for funding purposes. In the two cases where route end times were extended to serve specific entities (Kalamazoo serving the University of Michigan and Rock Island serving a meat packing plant), the entities funded the modifications themselves. A final note of interest concerning this survey is that all of the systems were asked whether they considered any alternative modes to simply operating bus service later. Only one system, Belle Urban System in Racine, Wisconsin, considered an alternative to bus service: shared-ride taxi. However, staff indicated that discussion

of this alternative quickly terminated once it was determined that there was not a “decent” taxicab company in the area and that it was going to be easier to extend already-existing bus service.

Considering all of the information presented in this section, then, it would appear that there is a very good case for VOTRAN to provide some level of later evening transit service. For a system of its size, and taking into consideration the needs of its current riders and potential users of the system (whether they are tourists or residents who cannot make use of the system given its current service span), some configuration of night transit service until 11:00 p.m. or midnight is certainly within the realm of expectation. Based on the experiences of other systems, night service may not be desirable or necessary throughout the entire service area; however, regardless of the level of implementation, this later evening service will result in increased operating costs and will necessitate some form of additional funding from one or more sources. In the following sections, the potential “configuration” of night transit service in Volusia County will be discussed, including different service options and any related service area structure considerations that must be taken into account.

### **Night Service Options**

In this investigation, CUTR examined several potential night service provision options in order to identify a preferred alternative for recommendation to VOTRAN and the Volusia County Council. The investigative process took the form of a relatively cursory alternatives analysis, where the options’ respective service characteristics, advantages and disadvantages, and estimated ridership and financial statistics were used to highlight the option with the best potential for providing effective, efficient, and financially-feasible night service.

The seven service options that were analyzed for possibly having application in Volusia County for the specific purpose of improving nighttime mobility are bulleted below. Most of the options deal with modal variations, although two of the options incorporate the same mode but significantly different service area structures. Note that most of these options should be familiar to VOTRAN staff and members of the County Council since they have been brought up in previous discussions concerning this topic. The considered options are as follows:

- Vanpools
- “Super” Gold Service (i.e., premium door-to-door, demand-response service)
- Shared-ride taxicab service

- Taxicab vouchers
- Fixed-route bus service - Eastside core
- Fixed-route bus service - Eastside core & Westside
- Combination of fixed-route bus service & “super” Gold Service

In the following sections, each service option is presented and analyzed with respect to its inherent capability in successfully providing night transportation services. The analysis of each service option includes a description of the option and its major characteristics, a general discussion of the possible advantages and disadvantages of the option (especially related to the current conditions in the service area), and a rough estimation of the option’s ridership, cost, and revenue potential. It is important to note that only readily available data and information from VOTRAN and the recent data collection process for the system’s Transit Development Plan update was utilized to generate the ridership, cost, and revenue estimates.<sup>2</sup> VOTRAN staff have reviewed the resulting estimates to ensure reasonableness of the methods and results. Finally, it should be recognized that the estimates presented herein are strictly for the purpose of comparing the various options in order to ensure an informed recommendation of the best alternative(s). The estimates are not meant to reflect the actual utilization level, cost, or revenue generation potential of the alternative that is ultimately selected for implementation if and when the need for night service is deemed a service and funding priority.

## ***Vanpools***

### Description

The use of vanpools is one option being considered for the provision of night transportation service in Volusia County. Vanpooling is one form of ridesharing, or the shared use of a vehicle by two or more persons for the purpose of traveling to work, school, or other trip destinations. Typically, the levels of carrying capacity, flexibility, costs, and convenience are in between those of transit and carpools. Vanpools typically consist of 7 to 15 people (primarily commuters) traveling together in

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<sup>2</sup>It also should be recognized that several “default” values were used for various service attributes and/or statistics in the calculations for each of the options to ensure a valid comparison of the results to the maximum extent possible. For example, it was assumed that each option would operate until midnight, Monday through Saturday. Since the common shift times for three-shift workplaces are 7 a.m.-3 p.m., 3 p.m.-11 p.m., and 11 p.m.-7 p.m., this service end time would enable workers for all three shifts to use any of the options to both get to and get back home from work. In addition, a single ridership estimate was generated to be used for each of the modes in order to project truly comparable cost and revenue figures and service requirements (e.g., number of vehicles, etc.). All of the assumed values and VOTRAN service inputs utilized in the estimation calculations contained herein are presented in Appendix A.

a passenger van. Normally, one member of the vanpool serves as the driver, and is often allowed to ride free and have off-hours use of the vehicle. The driver also is usually responsible for the organization and maintenance of the vanpool operation. The formation of a vanpool requires the following:

- identification of at least seven people with similar trip patterns and schedules (in addition to certain personal characteristics);
- support for the cost of acquiring, fueling, and maintaining a vehicle;
- acceptable arrangements for shared responsibility; and
- assumption of the risk and expense of vehicle insurance.

The three major types of vanpool organization are owner-operator vans, employer-sponsored vanpools, and third-party vanpools. Third-party vanpools (i.e., where a third-party organization such as a non-profit corporation, a private vendor, or a transit agency acquires the vans and makes them available to employers or individual users) is the most applicable form for the purpose of night service in Volusia County since VOTRAN would be purchasing and providing the vehicles. However, the other two types could always be encouraged should such a program experience success beyond VOTRAN's funding and/or management capabilities. The vans generally are leased to the users at a rate based on the cost of the vehicle, maintenance, fuel, and insurance. Sometimes, the administration costs incurred by the third party are included in the fares. It is also an option that the third-party organization limit its role to the formation of the vanpool and refer the riders to private leasing companies for the equipment, although this is not being considered for this option at this time.

As it is for all ridesharing options, the success of any vanpool program will be contingent on the availability of a guaranteed/emergency ride home program (GRH). Many people are reluctant to vanpool for fear of being stranded at work without transportation during an emergency. GRH reduces anxiety over vanpooling by guaranteeing participants a convenient and reliable mode of transportation to their home in the event of a personal emergency or in the event an employee must work overtime. The guaranteed ride can be provided by taxi, short-term auto rental, company-owned car, shuttle service, or public transit. Such a program can either be administered by an employer, a regional commuter assistance program, a transportation management organization, or a transit agency.

### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of vanpool service if this option were utilized to provide night transportation service in Volusia County.

First, unlike the other options, the use of vanpools to provide night service will require a capital investment. As noted in Appendix A, it is anticipated that a total of at least 27 vans will be required to accommodate the daily trip-making needs of the persons wanting to utilize night transit service. It should be recognized that this estimate of required program vans is based on the calculation of a night service demand of 377 person trips per day and an assumed trip-making need of only two trips per evening per person. This van estimate will only hold true if the actual persons needing night service remain the same each night and these persons do not require more than two trips per night and the seven persons in each van have relatively homogeneous origins, destinations, and times of travel. If these required qualifications are met, then 27 vans will suffice and, at a cost of \$28,765 per van, the total initial capital outlay required for this option will be \$776,655. Note that, if the qualifications are not met, then it is expected that the van requirement will only increase and, therefore, so will the initial capital cost.

As for any operational costs of this option, each van will have a monthly upkeep cost of \$695.75, including the cost for fuel (this translates to an annual operating cost of \$8,349 per van). However, this cost is paid for by the vanpool drivers, who then recoup the expenditures through the daily rider fares that are charged (assumed to be \$4.00 per day per rider). With an average of 25.83 service days per month (310 days , 12 months), 7 riders per van, and \$4.00 per rider per day, total revenue per van should be approximately \$723.33 each month. This means that the vanpool program would more than break even in terms of operating costs and revenues, with VOTRAN netting about \$27.58 per van per month in excess revenue.

However, since the vans will not be ADA-accessible, it will be necessary to provide complementary paratransit in the corresponding service areas to serve those persons who, because of functional limitations or for other ADA-based reasons, cannot utilize the vanpools. The cost of this additional service would include providing service to 6,417 ambulatory patron-based paratransit trips per year at \$16.19 per trip and to 1,953 wheelchair patron-based trips per year at \$24.21 per trip. The total cost for this complementary paratransit service in the first year would be \$151,173. Also, with a fare of \$2.00 per trip, the total paratransit revenue that would be generated would sum \$16,740.

Therefore, for the first year of vanpool night service, total capital costs would be \$776,655; total operating expenses would be \$225,423 for the vans and \$151,173 for the complementary paratransit; total passenger trips would be 116,870 for the vans and 8,370 for the paratransit; and total revenue generated would be \$234,360 for the vans and \$16,740 for paratransit.

The net cost to VOTRAN for the nighttime vanpool service in the first year would total \$902,151, including the initial capital purchase of the vans, to transport a total of 125,240 passenger trips. This option results in a total cost of \$7.20 per trip.

It is important to recognize, however, that these estimates do not consider the implementation of a supportive Guaranteed Ride Home program, which would be necessary to promote the utilization of the vanpool program. For example, if it were assumed that, in the first year, about five percent of the total vanpool trips would generate the need for a GRH trip, a total of 5,844 GRH trips would need to be accommodated. If these trips were provided via taxi voucher, assuming an average trip length of seven miles (i.e., the current average trip length for a paratransit trip on VOTRAN's Gold Service) and based on current taxicab rates, a single trip would cost \$13.30 (not including any waiting fees). The total cost of the 5,844 GRH trips would be estimated at \$77,725. Providing the GRH program in conjunction with the vanpool program, then, would result in a total cost of \$7.48 per trip for the first year.

#### Advantages/Disadvantages

In dispersed, lower-density areas where it is difficult to sustain traditional transit service, vanpooling has some advantages. A van requires fewer passengers than a transit bus to be viable and, from a cost perspective, it can be generally self-supporting. For employers, a major benefit is that vanpooling provides a relatively cost-effective way to access labor in mobility- or economically-restricted areas (such as inner cities or rural areas). Also, it can increase employee morale and reduce absenteeism and tardiness. Conversely, employer concerns typically involve the cost and administrative burden of set-up and operation, worries that adherence to a vanpool travel schedule will compromise professional staff commitments, and that proprietary information may be lost to other companies (if a vanpool has workers from different organizations).

For the individual commuter, vanpooling can result in possibly lower travel costs, increased convenience, more effective use of travel time, and less wear on one's private vehicle. Many vanpoolers enjoy the social aspects of the group travel, as well. Some drawbacks to the individual

in a vanpool are increased travel time, schedule constraints, and cost factors. However, it must be noted that individuals often fail to consider the full costs of driving their private automobiles, which include, beyond the obvious out-of-pocket costs, vehicle ownership, depreciation, maintenance, insurance, taxes and fees, and social/environmental costs.

Transit agencies that administer vanpool programs benefit because the vehicle miles of travel that are accrued by the vanpools actually generate revenue. This is because vanpool programs can earn federal and state formula funding attributed to the number of vanpool vehicle miles traveled. By reporting the vanpool mileage as part of the National Transit Database, a transit system should expect to increase the amount of state and federal revenue apportioned to it as a result of increases in passenger miles, trips, and vehicle revenue miles due to the vanpool program. It is even possible that this revenue can exceed the transit agency's investment in the vanpool program, making the program a revenue generator.

While vanpool programs have been successful in higher-density areas, some of the best vanpooling examples support outlying destinations where employees travel long distances and there is little or no public transit available for the commute. This is a primary reason why the vanpool market is generally limited to long-distance commuters. A common rule of thumb is that a trip length of at least 20 miles is required to sustain a vanpool. Because of the travel time and distance that often is required for picking up/dropping off all participating members of the vanpool, shorter commute trips become so lengthy and unproductive that they are not suitable for this particular mode. This is especially the case as the vanpool members' collective origins and destinations become more dispersed.

In Volusia County, it is anticipated that vanpool night service will encounter several barriers that will severely limit productivity, and may even impact the initial formation of appropriate vanpools. As indicated in the previous discussion of various advantages and disadvantages of vanpooling, the vast majority of programs are developed specifically for longer commute trips. As discussed, the length of the trip has an impact, but so does the fact that most vanpools serve work trips during standard business hours (i.e., 8 to 5). The participants usually are selected based on proximate origins (i.e., home locations) and a common work destination, whether it is the same company or office park. The common work time is also an important factor since travel times for all members of a vanpool will be the same.

Since night service in the county will not just be used for work purposes, it is highly likely that this mode will not serve the needs of everyone requiring nighttime mobility. For example, consider attempting to establish a vanpool of seven persons for shopping purposes. What are the odds that all seven persons (unless they are members of the same family) will want to go shopping at the same places, on the same days, and at the same times? What if on one particular night, three of the vanpool members want to go out for recreational purposes, like a movie or dinner, but the other four have planned a regular shopping trip? Or, what happens to the van if the established driver decides to stay home and only one of the pool members needs to go out on a certain night?

It seems that, in order to even have a chance for a successful vanpool program, trip purposes would have to be limited for each individual vanpool. Is this reasonable? Not really, and it certainly would not endear such a mode to residents. Pool formation also will be made difficult by the increased dispersal of origins and destinations and the wide variety of travel times that the non-work night mobility needs in the county will generate. Because of the difficulty that will arise in matching the travel schedules of a vanpool's members, it is expected that any related Guaranteed Ride Home program that VOTRAN establishes to support the vanpool service will be over-utilized by necessity and will end up generating significant additional operating expenses.

### ***“Super” Gold Service***

#### Description

As mobility coordinator for Volusia County, VOTRAN currently provides door-to-door service for those persons who, due to a mental or physical disability or age, are unable to utilize the system's regular, fixed-route bus service. This paratransit service is known as “Gold Service,” and persons who meet eligibility requirements make advanced reservations (at least one day in advance) to utilize it. The service operates during the same span of hours as the fixed-route motorbus service.

Another potential option for providing night transportation service in the county is extending Gold Service's hours of operation later into the night, and allowing it to be utilized by all residents as a general public dial-a-ride (DAR) service. General public DAR refers to demand-responsive, door-to-door or curb-to-curb service that is provided to the general public without regard for the functional abilities of passengers. In the most basic form of a DAR system, customers request their trips in advance and are then picked up at/near their origin and dropped off at/near their destination. DAR usually takes one of three forms: many-to-one (many origins to one destination), many-to-few (many

origins to a few destinations), and many-to-many (many origins to many destinations). Based on experiences elsewhere throughout the country, general public DAR has been found to be both the most personal alternative to fixed-route transit service, but also the most expensive alternative. Fortunately, when fully-accessible, general public DAR is used, agencies are not required to also provide complementary paratransit as per Americans with Disabilities Act (ADA) guidelines, which helps mitigate costs.

DAR systems also require that agencies have some ability and willingness to take trip requests and schedule trips. Since this service is similar to the Gold Service currently being provided by VOTRAN, it is expected that reservations and scheduling for this “Super” Gold Service already will be able to be handled by staff. However, the actual demand for the service will determine whether the current staff levels and/or reservations/scheduling equipment and processes are adequate.

#### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of “super” Gold Service if this option were utilized to provide night transportation service in Volusia County.

Basically, this option assumes that anyone in the covered service areas needing night transportation service will call and reserve a trip on the dial-a-ride Gold Service. Therefore, since it is also assumed that this service will only be offered in the Eastside core and the Westside service areas, the ridership calculation is identical to that for the vanpool mode. Based on 310 service days, a need for 246 regular (i.e., non-ADA) night service trips per day in the Eastside core, and a need for 131 regular trips per day on the Westside, total regular ridership for the combined service areas will be 116,870 annual trips. Since paratransit vehicles will be used to provide the trips, person with disabilities or other ADA-related issues will be able to use the vehicles, as well. This adds 6,417 ambulatory and 1,953 wheelchair ADA trips to the annual total, for a total annual ridership of 125,240 passenger trips.

To calculate the operating costs for this option, it is assumed that the regular, non-ADA riders will all be ambulatory. Therefore, there would be a total of 123,287 ambulatory dial-a-ride trips per year at \$16.19 per trip and 1,953 wheelchair trips per year at \$24.21 per trip. The total cost for this service in the first year then would be \$2,043,299. Also, with the assumed fare of \$2.00 per trip for all riders (125,240 trips), the total dial-a-ride revenue that would be generated would equal \$250,480.

Therefore, for the first year of dial-a-ride night service, total operating expenses would be \$2,043,299; total passenger trips would equal 125,240; and total revenue generated would be \$250,480.

The net cost to VOTRAN for the nighttime dial-a-ride Gold Service in the first year would total \$1,792,819 to transport a total of 125,240 passenger trips. This option results in a total cost of \$14.32 per trip.

#### Advantages/Disadvantages

The advantages of a dial-a-ride system include: door-to-door or curb-to-curb service; larger geographic area of coverage; flexibility; service operated with smaller, more comfortable vehicles; and the fact that the needs of seniors and persons with disabilities are more easily accommodated without the need for complementary paratransit service. Like vanpools, this service's operating statistics also generate revenue from the Federal NTD and state block grant programs. However, there are some disadvantages, as well, such as the shared use of the vehicles, the lack of direct travel between individual origins and destinations, the need for advance notification to make trip requests (extent of this disadvantage is contingent on the level of response time that is established), the need for a high degree of dispatch coordination, the increased operating expenditures per passenger, the higher fares, and the longer travel times.

The benefit of such a service to VOTRAN is that it is already being provided throughout the day during regular service hours as complementary paratransit service. The change to general public dial-a-ride service at night would not necessarily create any additional logistical challenges for the system.

One impact that it might have, however, is the need for increased staffing levels for VOTRAN's reservations and scheduling functions. While any of the options are going to require providing administrative and operations staffing during night service hours, for the dial-a-ride option, VOTRAN will probably need to provide more reservationists during night hours because the service will be available to the general public, thereby increasing demand and the number of reservations that will be made in comparison to what occurs during the day for paratransit service.

Really, the primary drawback to this option is the cost to VOTRAN to provide the service. Dial-a-ride service is significantly more expensive to provide than fixed-route bus service on a per-trip basis because of its more direct, door-to-door nature. Also, depending on the ultimate demand for night

service that occurs, VOTRAN's current capacity on its paratransit fleet may not be able to meet needs. If this happens, it will be necessary for the system to expand its paratransit fleet, costing VOTRAN even more money (although it would be capital funds).

### ***Shared-Ride Taxicab Service***

#### Description

Yet another option that is under consideration for the provision of VOTRAN's potential night service is shared-ride taxicab service. Simply, a shared-ride taxicab service provides taxi transportation in which more than one passenger is in the vehicle at the same time, usually at a reduced rate for each of the passengers. For purposes of efficiency, the riders typically have similar points of origin and destination. At numerous transit agencies around the country, this type of service has been utilized as a way of using taxicabs to provide paratransit service, and it has been found to often increase a transit system's productivity (the number of passenger trips made per vehicle service hour).

For VOTRAN's purposes, this service would need to be contracted out. The system would have to enter into agreements with one or more local area taxi companies for provision of the service. The contract for this service would need to outline any specific service requirements and expectations, such as, the amount of advanced notice required for trip reservations, whether unscheduled stops will be permitted, and the fee schedule for trips (especially if they are to be distance-based), among others. VOTRAN's contract expenditures would involve the cost of offsetting any reduced fare rates outlined in the contract. One major benefit of using these outside agencies to provide the service is that VOTRAN would not be responsible for the reservation and scheduling of trips.

#### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of shared-ride taxi service if this option were utilized to provide night transportation service in Volusia County.

As was the case in the previous options, it is assumed that the shared-ride taxi night service option will be offered only in the Eastside core and the Westside service areas. As a result, the ridership calculation is identical to that for the vanpool mode. Based on 310 service days, a need for 246 regular (i.e., non-ADA) night service trips per day in the Eastside core, and a need for 131 regular trips per day on the Westside, the total non-ADA ridership for the combined service areas will equal

116,870 total annual trips, or 58,435 shared-ride taxi trips, assuming that each shared ride accommodates two trips.

Although some taxi companies are equipped to accommodate a limited level of ADA-accessible trip-making needs, it is not clear whether the capabilities of taxi companies in Volusia County are adequate for the purpose of fulfilling all ADA demand for night service. Therefore, it will be necessary to provide complementary paratransit service in the two service areas to ensure that persons with disabilities or other ADA-related issues will be able to have their nighttime mobility needs met. Again, this adds 6,417 ambulatory and 1,953 wheelchair ADA trips to the annual total, for a total annual ridership of 125,240 passenger trips.

To calculate the operating costs for this option, there would be a total of 58,435 shared-ride taxi trips per year. Assuming an average trip length of seven miles (based on current paratransit trip-making characteristics), and based on current taxicab rates, a one-person trip would cost \$13.30, as long as the person did not accrue any waiting fees. A two-person trip of similar length (with no wait time fees) would cost \$14.30 if the two passengers were picked up together at the same origin and dropped off together at the same destination. Since this situation is not going to happen in every case, it is assumed that, on average, two-person, shared-ride taxi trips will accumulate about 10 miles on the taxi meter. Therefore, a two-person, shared-ride taxi trip would cost \$19.25. The total cost, then, of the 58,435 annual shared-ride taxi trips would be estimated at \$1,124,874. Since two persons would benefit from each trip, this estimated per-trip cost is below the current cost of two ambulatory trips on the system's paratransit mode, \$32.38.

For revenue purposes, it is assumed that each rider will pay \$2.00 towards the fare total of their combined trip. At \$4.00 per trip, 58,435 trips would generate a total of \$233,740 in revenue. However, it should be recognized that this "revenue" is transparent to VOTRAN since it goes directly to the taxi companies as part of the fare. In actuality, the rider fares only lower the total operating cost of subsidizing this service, which would be \$891,134 once the riders' portion of the total cab fares is deducted.

As in the previous options that included complementary paratransit service, the cost of providing this particular service would be \$151,173, or 6,417 ambulatory trips at \$16.19 per trip and 1,953 wheelchair trips per year at \$24.21 per trip. The revenue generated by the paratransit service from fares would be \$16,740.

Therefore, for the first year of shared-ride taxi night service, total operating expenses would be \$1,042,307; total passenger trips would be 125,240; and the total revenue generated would equal \$16,740.

The net cost to VOTRAN for the nighttime shared-ride taxi service in the first year would total \$1,025,567 to transport a total of 125,240 passenger trips. This option results in a total cost of \$8.19 per trip.

#### Advantages/Disadvantages

According to the literature, taxi-based programs typically have a high potential for effectiveness in areas with low demand or low density, or at specific times of the day (late evening service), or on specific days of the week (Sunday service). They are also beneficial in comparison to typical demand-response services (and fixed-route bus services with infrequent route schedules) because response time is about 30 minutes for most taxi services. Like demand-response systems, taxi service also has the advantage of being more convenient in terms of its curb-to-curb transportation capabilities. In addition, like the two previous options, this service's ridership and mileage statistics also generate revenue from the Federal NTD and state block grant programs.

Unfortunately, taxi travel also can be quite expensive. Unless a significantly reduced fare schedule is able to be negotiated for such a service (and it will not be possible to do so unless certain ridership levels can be guaranteed to the satisfaction of the cab companies), the current meter rates will result in significant subsidy costs for VOTRAN, especially if the riders will only be responsible for the first \$2.00 for each trip (as it has been assumed). The costs estimated in the previous section assume constant ridership levels as compared to the other options. However, with speedier response times than demand-response service and more convenience and flexibility than vanpool or bus service, it is possible that demand for such a service would expand beyond current estimates much more quickly than the other options. Residents may be much more willing to make short, non-essential taxi trips for \$2.00 if they have to wait only 30 minutes or less and get picked up at or near their homes. These trips probably would not be made if it were necessary to wait longer, pay more, and/or have to find a way to access a more distant pick-up point.

Another potential barrier to this option is the "shared-ride" requirement. If at least two persons must make use of the taxi for each trip, unless the two persons are actually traveling together, trip mileage is going to accrue rather quickly and add to the total trip cost issue because the taxi is going to have

to pick the persons up at different locations and, potentially, drop them off at discrete destinations. This will not only pose reservation and scheduling issues for the taxi companies (who may not even be able to handle this function for a higher level of demand), but, similar to the case for vanpools, it may end up proving extremely difficult to pair the trips of at least two people with respect to starting location, destination, and time. Ultimately, this particular issue could result in more “shared-ride” trips being able to accommodate only one rider out of necessity, thereby exacerbating this option’s cost issue.

### ***Taxicab Vouchers***

#### Description

This particular option for providing night service in the county is a type of user-side subsidy program. In such a program, a rider needing to make a trip is charged only a portion of the fare associated with that trip and the remainder of the trip’s cost is subsidized by the program’s implementing agency (in Volusia County’s case, this agency would be VOTRAN). Most user-side subsidy programs around the country rely on taxi companies to provide the trips. Typically, in a taxi voucher program, an agreement is established between the implementing agency and one or more taxi companies to outline the details of the program and, if possible, negotiate reduced fare rates. On a schedule set forth in the agreement, the implementing agency reimburses the contracted taxi companies for the difference between the value of each voucher accepted and the actual fares of those trips. The trip vouchers can be provided to the riders directly, or can be distributed via the taxi companies.

Although each program is designed according to each area’s unique mobility needs, some general parameters can be applied to a taxi-based user-side subsidy program. Consider a program where a customer goes to the transit agency to pre-purchase taxi vouchers. First, the customer is sold a specific dollar amount of taxi vouchers at a reduced cost. These vouchers can then be used to pay for an entire cab fare, or a portion thereof, depending on the total fare. The amount of the subsidy passed on to customers can vary, typically from 40 percent to 90 percent. For example, in a program that establishes a 50-percent subsidy, a customer who purchases a \$10.00 taxi voucher would only be charged \$5.00 for the voucher. This customer can then make a trip with a designated taxi company and pay for that trip using the voucher. If the trip ends up costing more than \$10.00, the customer is responsible for that portion of the total fare that exceeds the total value of the voucher. In this example, if the customer’s cab fare totaled \$13.00, the customer would have to pay \$3.00 in

addition to the voucher for the trip. In effect, then, the \$13.00 trip ends up costing this individual \$8.00 (about a 38 percent savings) and the implementing agency \$5.00.

In most taxi voucher programs, limitations are established for maximum trip length and/or the maximum voucher amount that can be applied to the cab fare for any one trip. In some instances, the implementing agency will use its fully-allocated cost for providing a paratransit trip (or some related figure) to establish the maximum meter amount allowed for a taxi trip, and will set the customer's portion of the fare equal to the standard paratransit trip fare.

### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of a taxi voucher program if this option were utilized to provide night transportation service in Volusia County.

Again, for this option it is assumed that the taxi voucher program option will be offered only in the Eastside core and Westside service areas. As a result, the ridership calculation is identical to that for the vanpool mode. Based on 310 service days, a need for 246 regular (i.e., non-ADA) night service trips per day in the Eastside core, and a need for 131 regular trips per day on the Westside, the total non-ADA ridership for the combined service areas will equal 116,870 total annual trips. As indicated in Appendix A, it is assumed that all taxi voucher rides will be one-person trips (i.e., no multi-loading).

As discussed in the estimation section for the shared-ride taxi service option, it is not clear whether the Volusia County taxi companies are capable of adequately fulfilling all ADA demand for night service. Therefore, it will be necessary to provide complementary paratransit service in the two service areas to ensure that persons with disabilities or other ADA-related issues will be able to utilize night transportation service, as well. Again, this adds 6,417 ambulatory and 1,953 wheelchair ADA trips to the annual total, for a total annual ridership of 125,240 passenger trips.

To calculate the operating costs for this option, it is helpful to assume an average trip length. Seven miles will be utilized for this purpose since it is the current average trip length for a paratransit trip on VOTRAN's Gold Service. Based on current taxicab rates, a one-person trip of this distance would cost \$13.30, as long as the person did not accrue any waiting fees. The total cost, then, of the 116,870 annual taxi voucher trips would be estimated at \$1,554,371. This estimated per-trip cost is

below the current cost of an ambulatory trip on the system's paratransit mode, \$16.19. In addition, it is expected that the design, printing, and distribution of the actual vouchers will result in some cost to VOTRAN; however, this expense should be comparatively negligible so it has not been estimated for purposes of this analysis.

For revenue purposes, it is assumed a rider will pay \$2.00 towards the fare total of the voucher trip. This would generate a total of \$233,740 in revenue. Like the case for shared-ride taxi service, though, this "revenue" would be transparent to VOTRAN since it goes directly to the taxi companies as part of the fare. In actuality, the rider fares only lower the total operating cost of subsidizing this service, which would be \$1,320,631 once the riders' portion of the total cab fares is deducted.

As in the previous options that included complementary paratransit service, the cost of providing this particular service would be \$151,173, or 6,417 ambulatory trips at \$16.19 per trip and 1,953 wheelchair trips per year at \$24.21 per trip. The revenue generated by the paratransit service from fares would be \$16,740.

Therefore, for the first year of a nighttime taxi voucher program, total operating expenses would be \$1,471,804; total passenger trips would be 125,240; and the total revenue generated would equal \$16,740.

The net cost to VOTRAN for the nighttime taxi vouchers in the first year would total \$1,455,064 to transport a total of 125,240 passenger trips. This option results in a total cost of \$11.62 per trip. However, should VOTRAN elect to limit the meter rate of voucher trips to the per-trip paratransit cost of \$16.19, the maximum annual cost of the voucher program (deducting the riders' fares and excluding paratransit service costs and revenue) would be \$1,658,385. In net terms with paratransit service accounted for, VOTRAN would pay a maximum of \$1,792,818 to accommodate 125,240 total trips in the first year of the voucher program – an average total cost of \$14.32 per trip.

#### Advantages/Disadvantages

The issues for this option are similar to those for the shared-ride taxi option. However, the cost impacts are even more problematic since this option provides for greater subsidy (and less discounting) of the taxi meter rates. Trip lengths, again, will determine the ultimate operating costs of a taxi voucher program (as well as a shared-ride taxi service). As a result, in both of these cases, it is strongly urged that specific caps be established either for maximum trip lengths and/or for the

portion of cab fare that will be subsidized. Unfortunately, these limitations are not expected to have significant impact on demand, so it will still be the case that utilization of the service will drive its total cost. Only limiting trip-making frequency or purpose, then, will be able to lessen demand, and neither of these policies are recommended, especially since none of the other options would be implemented with such limitations.

### ***Fixed-Route Bus Service - Eastside Core***

#### Description

The last two night service options are identical in mode (i.e., regular bus service) and only differ in the extent of service area that will have longer hours of service. As most know, traditional fixed-route bus service is provided along specified routes with scheduled arrival/departure times at predetermined bus stops. The majority of the transit service that VOTRAN currently provides is of the fixed-route bus variety. For this particular option, fixed-route bus service would be extended later into the night on VOTRAN's core routes within the Eastside service area. The routing structure for this night service would be very similar to the modified structure operating on Sundays, with some adjustments to ensure that most major nighttime destinations (e.g., shopping centers, malls, hospitals, universities/colleges, etc.) are served. The routes that would be affected include Routes 1 and 17 along the A-1-A corridor, Routes 3 and 4 along the U.S. 1 corridor, and Routes 10 and 15, which serve the core of the Daytona Beach area to the west of U.S. 1 and along International Speedway Boulevard.

Although limited geographically compared to VOTRAN's actual service area, this initial night bus service would be able to serve as a gauge for interest in and utilization of the service. Future expansion of this service could eventually take place as the level of utilization warrants it and funding is available. It is important to recognize that, in order to meet the requirements of the ADA, this option would require the provision of complementary paratransit service within the night service core for the same time span.

#### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of fixed-route bus service in the Eastside core service area if this option were utilized to provide night transportation service in Volusia County.

Since this option would only provide nighttime service in the Eastside core service area, total ridership for the fixed-route buses would be based on 310 service days and a need for 246 regular (i.e., non-ADA) night service trips per day. This results in a total non-ADA ridership estimate for the Eastside core service area of 76,260 annual trips.

To accommodate persons with disabilities and/or other ADA-related issues, it will be necessary to provide complementary paratransit service in the Eastside core to ensure that these persons have access to night transportation service, too. The addition of this service would add 4,185 ambulatory and 1,395 wheelchair ADA trips to the annual total, for a total annual ridership of 81,840 passenger trips in the Eastside core service area.

The cost of the fixed-route portion of this option is based on the additional service hours that the increase in span of service will produce. As noted in Appendix A, within the Eastside core, an additional 7,230 annual service hours will be required to provide night bus service until midnight. At a cost of \$42.25 per service hour, the total operating cost of this additional bus service would be \$305,468. Further, with a current average fare per trip on VOTRAN's fixed-route bus service of \$0.56, it is expected that an annual total of \$42,706 in passenger fare revenue will be generated.

The cost of the complementary paratransit service would be based on providing 4,185 annual ambulatory trips at \$16.19 per trip and 1,395 annual wheelchair trips at \$24.21 per trip. The total cost for the first year of this service would be \$101,528. Also, with a fare of \$2.00 per trip, the total paratransit revenue that would be generated would equal \$11,160.

Therefore, for the first year of fixed-route nighttime bus service in the Eastside core, total operating expenses would be \$406,996; total passenger trips would be 81,840; and total revenue generated would be \$53,866.

The net cost to VOTRAN for the Eastside core nighttime bus service in the first year would total \$353,130 to transport a total of 81,840 passenger trips. This option results in a total cost of \$4.31 per trip.

#### Advantages/Disadvantages

The literature indicates that fixed-route systems are generally effective in meeting travel demand for intra-urban and suburban-urban trips, but tend to fall short in generating suburban-suburban and rural

trips, as well as trips for the elderly and persons with disabilities. The basic advantages of fixed-route transit are: no reservations are required to access the service, little or no passenger screening or registration is needed (except when offering discounted fares to certain population segments), and large numbers of people can be transported at one time in a single vehicle. Fixed-route transit also has its disadvantages, as well, such as system access is limited due to predetermined stops and schedules, access is difficult or impossible for many seniors and patrons with disabilities, and large transit buses are often perceived to be aesthetically displeasing, especially in smaller cities and suburbs.

Despite the pros and cons of this particular mode, it is an option, like the dial-a-ride alternative, with which VOTRAN has direct experience and could implement quite easily. Equipment and staffing are available, routing is in place, and the mode is one that is familiar to county residents. Certainly, not as much marketing or training of the system's users would be necessary as compared to that which would be required for other unfamiliar alternatives. In addition, probably the most important benefit of this particular option is that the service would be started on a smaller scale than any of the other alternatives. This would allow VOTRAN and the County Council to have an opportunity to gauge the initial level of demand for night transit service, as well as the success of this particular mode in meeting the nighttime mobility needs of residents, while still having a comparatively low initial investment that would not go to waste should the decision ever be made to cease night transportation service in the county.

### ***Fixed-Route Bus Service - Eastside Core & Westside***

#### Description

As discussed in the description of the previous night service option, this particular option is identical to that one in terms of using fixed-route bus service to provide later transportation service. However, this option seeks to extend bus hours of operation on more of VOTRAN's fixed-route system, thereby increasing the proportion of county residents that would be able to enjoy the benefits of nighttime mobility. To accomplish this, the routing structure for this night service would include the Eastside's core routes (as set forth in the previous option) and two of the Westside routes (Routes 20 and 22). A supplementary review of major nighttime destinations in these areas may also prove to be prudent to ensure that appropriate coverage is provided to them. Additionally, for ADA purposes, the service hours for complementary paratransit service in the Eastside core and Westside service areas would need to be extended, as well.

### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of fixed-route bus service in the Eastside core and Westside service areas if this option were utilized to provide night transportation service in Volusia County.

Since this option would provide nighttime bus service in the Eastside core and the Westside service areas, like the case for the vanpool option, the ridership calculation is based on 310 service days, a need for 246 regular (i.e., non-ADA) night service trips per day in the Eastside core, and a need for 131 regular trips per day on the Westside. These figures produce a total non-ADA bus ridership estimate for the combined service areas of 116,870 annual trips.

As in the previous fixed-route bus option, persons with disabilities and/or other ADA-related issues will need to be served, as well. As a result, it will be necessary to provide complementary paratransit service in both service areas included in this option. The addition of this service would add 6,417 ambulatory and 1,953 wheelchair ADA trips to the annual total, for a total annual ridership of 125,240 passenger trips in the two service areas.

The cost of the fixed-route portion of this option is also based on the additional service hours that the increase in span of service will produce. As noted in Appendix A, an additional 7,230 and 8,370 annual service hours will be required to provide night bus service until midnight within the Eastside core and Westside service areas, respectively. At a cost of \$42.25 per service hour, the total operating cost of this night bus service would be \$659,100. In addition, based on VOTRAN's current average fare per trip for bus service of \$0.56, an annual total of \$65,447 in passenger fare revenue will be generated.

The cost of the complementary paratransit service would be based on providing 6,417 annual ambulatory trips at \$16.19 per trip and 1,953 annual wheelchair trips at \$24.21 per trip. The total cost for the first year of this service would be \$151,173. And, with a fare of \$2.00 per trip, total paratransit revenue would equal \$16,740.

Therefore, for the first year of fixed-route nighttime bus service in the Eastside core and Westside service areas, total operating expenses would be \$810,273; total passenger trips would be 125,240; and total revenue generated would be \$82,187.

The net cost to VOTRAN for the Eastside core and Westside nighttime bus service in the first year would total \$728,086 to transport a total of 125,240 passenger trips. This option results in a total cost of \$5.81 per trip.

#### Advantages/Disadvantages

The advantages and disadvantages of this option are identical to those indicated for the previous option (Option #5, Fixed-Route Bus Service - Eastside Core), which also deals with using fixed-route bus service to meet the nighttime mobility needs of Volusia County residents.

The only comparative differences that exist between the two options are the service area coverage differences and the ultimate costs of operating the respective services. This particular option, which proposes operating the late night bus service in both the Eastside core and the Westside service areas, has the advantage of being able to provide nighttime service to a greater proportion of county residents. Conversely, because of this greater coverage, it also is disadvantaged in the comparison of total annual operating costs.

However, the greatest disadvantage that is evident for this option is that it does not address the connectivity issue between the two service areas. As this option is outlined, Route 60 (the East-West Connector) will not operate later into the evening. This may ultimately prove to be a disservice to the potential success of this option since, similar to what is experienced for typical daytime travel, it is anticipated that many county residents will want to travel between the two service areas at night, as well, whether it be for work, shopping, educational, and/or recreational purposes.

#### ***Combination of Fixed-Route Bus Service & “Super” Gold Service***

##### Description

This option is the only hybrid of the options being considered for the implementation of night transportation service in Volusia County. Basically, it is a variant combination of Option #6 (Fixed-Route Bus Service - Eastside Core & Westside) and Option #2 (“Super” Gold Service). The intent of this option would be to provide night transit service on the Eastside core routes using fixed-route bus service, and in the Westside service area using dial-a-ride transit service. This combination of services would still allow for an increased proportion of county residents to have access to night transportation service, but it would also enable a more cost-efficient alternative to fixed-route bus

service to be utilized on the Westside, where demand for transit service is comparatively lower than the Eastside. Once again, complementary paratransit service would have to be provided for a similar span of service hours in the Eastside core to meet ADA requirements. This requirement would not be necessary in the Westside service area as long as the dial-a-ride service is fully accessible.

#### Selected Service Statistics Estimates

Based on the assumptions that are presented in Appendix A, the following costs, ridership, and revenue are estimated for the first year of a hybrid service that would provide fixed-route bus service in the Eastside core service area and dial-a-ride service on the Westside if this option were utilized to provide night transportation service in Volusia County.

Estimates for operating the Eastside core nighttime fixed-route bus portion of this hybrid alternative are identical to that for Option #5 (Fixed-Route Bus Service - Eastside Core). The fixed-route bus service would provide a total of 76,260 annual non-ADA trips, have a total annual operating cost of \$305,468, and generate an annual total of \$42,706 in passenger fare revenue. Also, complementary paratransit service would need to be provided in the Eastside core, as well, for ADA-accessibility purposes. This service would add 4,185 ambulatory and 1,395 wheelchair ADA trips, would cost \$101,528 for the first year of operation, and would generate fare revenue in the amount of \$11,160. In total, then, the first year of the Eastside core portion of this hybrid alternative would cost \$406,996 and would generate 81,840 passenger trips and \$53,866 in revenue.

The estimates for operating dial-a-ride Gold Service in the Westside service area would be calculated utilizing a process similar to that used in Option #2 (“Super” Gold Service). First, based on 310 service days and a need for 131 non-ADA trips per day on the Westside, total non-ADA ridership for the Westside would be 40,610 annual trips. Since paratransit vehicles would be providing the trips, person with disabilities or other ADA-related issues would be able to use the vehicles, as well. This adds 2,232 ambulatory and 558 wheelchair ADA trips to the annual total, for a total annual ridership of 43,400 passenger trips on the Westside.

For operating cost estimation, it is assumed that all of the Westside’s non-ADA riders will be ambulatory. Therefore, total operating cost for the first year of the Westside dial-a-ride portion of this hybrid alternative would be based on 42,842 ambulatory trips at \$16.19 per trip and 558 wheelchair trips at \$24.21 per trip, or a total cost of \$707,121. In addition, with the assumed fare

of \$2.00 per trip for all riders, the total dial-a-ride revenue that would be generated would equal \$86,800.

In total, then, the first year of the hybrid fixed-route bus/dial-a-ride night service would cost \$1,114,117, would carry 125,240 passenger trips, and would generate \$140,666 in revenue. The net cost to VOTRAN for the first year would total \$973,451 to transport the 125,240 trips, resulting in a total cost of \$7.77 per trip.

Advantages/Disadvantages

Since this is a hybrid alternative that combines Option #6 (Fixed-Route Bus Service - Eastside Core & Westside) with Option #2 (“Super” Gold Service), all of the potential advantages and disadvantages of this option have already been discussed. Unfortunately, it is not clear whether one of the intentions of this particular option is to provide some sort of connectivity between the Eastside and Westside service areas. If it is intended to do so, then this would be one major advantage that this alternative would have over Option #6. Otherwise, there is nothing else that is comparatively advantageous over Option #6, especially since this alternative would be more expensive to operate on a per-trip basis because of the higher costs associated with dial-a-ride services.

**Summary**

Table 4 presents the total cost, revenue, and ridership estimates for the first year of operation for each of the seven night service options presented in this document. For each option, all the service modes necessary for the successful implementation of that option (e.g., complementary paratransit service) are included in the summary statistics. The average cost per trip provided is also shown for each of the alternatives.

**Table 4  
Night Service Options: Initial Year Summary Cost, Revenue & Ridership Estimates**

<b>Night Service Option</b>	<b>Operating Cost</b>	<b>Revenue</b>	<b>Trips Served</b>	<b>Net Cost/Trip</b>
Vanpools	\$1,153,251	\$251,100	125,240	\$7.20
“Super” Gold Service	\$2,043,299	\$250,480	125,240	\$14.32
Shared-Ride Taxicab Service	\$1,042,307	\$16,740	125,240	\$8.19

Taxicab Vouchers	\$1,471,804	\$16,740	125,240	\$11.62
Fixed-Route Bus Service - Eastside Core	\$406,996	\$53,866	81,840	\$4.31
Fixed-Route Bus Service - Eastside Core & Westside	\$810,273	\$82,187	125,240	\$5.81
Fixed-Route Bus Service - Eastside Core & “Super” Gold Service - Westside	\$1,114,117	\$140,666	125,240	\$7.77

- Notes: (1) The net cost-per-trip ratio calculation is based on each option’s net operating cost, or the cost minus the generated revenue.
- (2) The vanpool operating cost includes the capital dollars necessary to purchase 27 vans for the initial service start-up. It does not include, however, any costs related to a Guaranteed Ride Home program.
- (3) Only the “super” Gold Service alternative does not require some level of complementary paratransit service.
- (4) The operating cost of the taxicab voucher option would increase if VOTRAN elected to use its current paratransit ambulatory trip cost of \$16.19 to serve as a cap for the taxi meter rate for each voucher trip. In this case, the total cost would be \$1,809,558 and the net cost per trip would be \$14.32.

These figures represent the best estimates that can be made using current data and similar assumptions across the alternatives. In each of the cases, various support activities related to the implementation of a particular option have not been included. For example, as discussed in the section concerning taxi vouchers, the cost of designing, printing, and distributing the vouchers to the public or to the taxi companies has not been estimated or included. It is also important to recognize that additional costs for marketing the chosen alternative will be necessary. Additionally, if the selected option is new modal type for the county (e.g., shared-ride taxi, vanpool, taxi vouchers, dial-a-ride), some level of rider instruction or training also may be necessary to help interested persons understand how to utilize that mode for their night mobility purposes.

In summary, it is apparent from the data in Table 4 that the options relying wholly or partially on fixed-route bus service are among the least expensive on a per-trip basis. This is especially the case for the fixed-route bus alternative that would serve only the Eastside core service area, which is estimated to cost \$4.31 per trip. Of course, this alternative’s total costs are aided by the fact that it will provide night service to the smallest service area among the options. However, the other fixed-

route bus option that would serve both the Eastside core and the Westside, also has a comparatively low cost per trip at \$5.81.

It is clear from these data that the most cost-efficient options among the alternatives are those for which VOTRAN already has infrastructure in place, i.e., the fixed-route bus service. It is also evident that the costs go up as the services become more flexible and convenient in terms of door-to-door or curb-to-curb capabilities. This is why the dial-a-ride service is the highest-cost alternative despite VOTRAN already having infrastructure in place to operate this type of service.

### **Recommended Alternative**

Based on consideration of the advantages and disadvantages of each of the night service alternatives, as well as their cost-per-trip estimates, it is recommended that VOTRAN and the County Council pursue the implementation of nighttime fixed-route bus service in the Eastside core. This is the recommendation that will be included in VOTRAN's major TDP update for budgeting purposes.

As discussed in the section on advantages and disadvantages of this particular option, this fixed-route bus alternative should be easier to implement than most of the other recommendations as it will allow VOTRAN to utilize existing equipment, personnel, and routing for its provision. Also noted in that section is the fact that the smaller scale of this alternative will provide VOTRAN and county officials with the opportunity to gauge the initial level of demand for night transit service, as well as the success of this alternative in meeting that demand. This "demonstration" aspect of the recommended option will help keep the initial investment comparatively low. And, depending on the level of success of the night bus service, the nighttime service area can eventually be expanded as funding and demand will allow, or it can be contracted or eliminated completely should utilization not meet minimum expectations.

## Appendix A

### Assumed Values and VOTRAN Service Inputs Utilized in Service Statistics Estimation

#### VOTRAN Fixed-Route Service Inputs and Assumptions

In this analysis, it is assumed that night transportation service will operate until 12:00 a.m. Since the majority of the VOTRAN's Eastside core routes that will be extended cease service around 7:00 p.m., an overall average service end time of 7:00 p.m. was used to calculate the additional hours of service that would be required to provide the night service until midnight in the Eastside core (i.e., five additional hours of service span per day). Similarly, this process was used for the Westside service; however, that service ends slightly earlier so an additional 5.4 hours of service span per day was assumed for this service area.

It is also assumed that night service will be provided Monday through Saturday, resulting in a total of 310 days (258 weekdays + 52 Saturdays) each year that service will operate until midnight.

As a result, the annual additional hours of service that will be required for fixed-route bus can be calculated as follows:

- For the Westside, the two routes that will provide night service require a total of five buses. Operating 5 buses for an additional 5.4 hours per day for a total of 310 days results in an annual total of an additional 8,370 service hours that will be required.
- For the Eastside core, there are six routes that will provide night bus service; however, the presence of the beach trolleys affects total bus requirements, so two different calculations based on the time of year must be made (i.e., one for January to August when they are in operation, and one for September to December when they are not). When the trolleys are out of service (September to December, or a total of 103 days), a total of six buses will be needed to provide night service on the six core routes. Operating 6 buses for an additional 5 hours per day for 103 days results in an annual total of 3,090 service hours. When the trolleys are in service (January to August, or 207 days), only four buses will be needed to provide Eastside core night service. Operating 4 buses for an additional 5 hours per day for 207 days results in an annual total of

4,140 service hours. Therefore, the Eastside core night service will generate an annual total of an extra 7,230 service hours.

In this analysis, all costs for fixed-route bus service are calculated on a per-hour basis, so VOTRAN's estimated expenditures for the options including this mode will be based on total hours of service. The current cost per service hour for VOTRAN fixed-route bus service is \$42.25. In addition, the average fare per trip on fixed-route bus service is approximately \$0.56, given the current utilization of regular and discounted fare options.

The calculation of passenger utilization (i.e., ridership) of the night service for fixed-route bus service is based on current daily and hourly ridership levels on VOTRAN's existing bus service. Accordingly, it is assumed that a total of 246 unlinked passenger trips per day will be made on the Eastside during the 4.95 additional hours of night service in the core, and a total of 131 unlinked passenger trips per day will be made on the Westside during the 5.35 additional hours of night service in that area. This results in a total annual fixed-route ridership of 76,260 (246 trips per day for 310 days) on the Eastside and 40,610 (131 trips per day for 310 days) on the Westside.

### **VOTRAN Paratransit/Demand-Response Service Inputs and Assumptions**

Unlike the fixed-route bus mode, all costs for paratransit/demand-response service are calculated on a per-trip basis, so VOTRAN's estimated expenditures for the options including this mode will be based on total passenger trips. There are two different per-trip costs for VOTRAN paratransit service that are dependent on whether the passenger is ambulatory or in a wheelchair. The current cost per trip for ambulatory passengers is \$16.19, while the current cost per trip for wheelchair passengers is \$24.21. In addition, the current fare per paratransit trip is \$2.00.

In the estimation of costs for the options that involve taxi service, it will be necessary to use the average paratransit trip length to calculate expected and/or maximum meter rates. Currently, the average trip length for a paratransit trip is about seven miles.

The calculation of passenger utilization (i.e., ridership) of complementary paratransit night service is based on current ridership usage levels that VOTRAN is experiencing, including the distribution between ambulatory and wheelchair riders. Accordingly, on the Eastside it is expected that approximately 5,580 (4,185 ambulatory + 1,395 wheelchair) trips will be made annually on this mode

during the extended night hours. For the Westside complementary paratransit service, about 2,790 (2,232 ambulatory + 558 wheelchair) annual trips will be taken.

For the general public dial-a-ride option (i.e., “super” Gold Service), these same ridership figures are utilized to represent the regular paratransit patrons that will make use of that particular mode at night. However, the fixed-route night ridership figures are also included to represent the rest of the general public that will utilize that night service. For dial-a-ride, it is assumed that the base fare will be \$2.00 per trip for all persons using the service, including those persons who are certified as eligible to use VOTRAN’s Gold Service.

At this point, it is useful to point out that, for the dial-a-ride and taxi-based options, VOTRAN and the County can elect to charge a premium fare for night service. Typically, up to twice the regular fare can be charged for a particular service if it is considered to be a “premium” service (e.g., nighttime door-to-door or curb-to-curb transportation). In all of the non-fixed-route alternatives considered in this document, the maximum per-trip fare is assumed to be \$2.00 (the same fare as that for current VOTRAN Gold Service) in order to minimize the cost impact to VOTRAN’s ADA-eligible riders. If it is decided that the maximization of revenue is a necessity, then a per-trip fare of up to \$4.00 can be considered.

### **Vanpool Service Inputs and Assumptions**

For vanpool service, it is expected that VOTRAN will utilize vans similar to the 12-passenger vans the system is using for its current vanpool program. The cost of one of these vans is \$28,765.

For reasons of comfort and efficiency, it is assumed that the maximum capacity for nighttime vanpool service will be seven persons per van.

It is also assumed that the vanpool service will be offered in both the Eastside core and Westside service areas. This results in a total of 377 daily trips that will need to be served during the extended evening hours. If it is assumed that this service’s users will make an average of two trips per day, then a total of 189 persons will need to be accommodated in vanpools each night. With a seven-person capacity per vehicle, this means that at least a total of 27 vans will need to be operated (this number is also contingent on the dispersal of origins and destinations of the persons who will be using the service).

Based on cost figures from VOTRAN's existing vanpool service, the following per-van monthly cost estimates are assumed:

- Fuel - \$237.75
- Maintenance - \$105.00
- Insurance - \$328.00
- Cleaning - \$25.00

The driver that is established for each vanpool will be responsible for paying VOTRAN for all van upkeep costs (as itemized previously) minus fuel expenses that will be paid out of pocket. In return, the driver gets use of the van during non-program hours. The driver also will be responsible for scheduling pick-up/drop-off times and locations for all riders, as well as collecting daily fare charges from each the riders. For VOTRAN's current vanpool program, this fare has been set at \$4.00 per day per rider (based on the assumed average trip-making of two trips per day and a fare of \$2.00 per trip).

Additionally, it is assumed that complementary paratransit service will need to be provided in the night service areas because the vans (nor their drivers) will be able to handle the transportation needs of wheelchair patrons or other persons with functional limitations or other special needs. This service will impact the total operating costs of this option.

### **VOTRAN Taxi-Based Service Inputs and Assumptions**

The taxi-based options are assumed to be offered in both the Eastside core and Westside service areas, as well. Again, this results in a total of 377 daily trips that will need to be served during the extended evening hours. Due to the multi-loading aspect of the shared-ride taxi option, it is assumed that an average of two persons will be able to be accommodated per taxi ride. Conversely, it is assumed that all trips for the taxi voucher program will be one-person trips. Also, because it is likely that taxis may not be able to handle the transportation of wheelchair patrons and other persons with special needs, it is assumed that some level of complementary paratransit will need to be provided in the nighttime service areas.

As mentioned in the assumptions for the paratransit-related service options, the estimation of costs for the taxi-based options will need to use the average paratransit trip length to calculate expected

and/or maximum meter rates. Currently, the average trip length for a paratransit trip is about seven miles.

For a taxi voucher program, it is assumed that VOTRAN will set the meter ceiling for any one trip at \$16.19 – the current cost of an ambulatory trip on the system’s paratransit mode. In addition, a rider will be responsible for the first \$2.00 of the fare (again, to match current paratransit fare rates). Current typical taxicab rates in Volusia County are as follows:

- \$1.90 initial drop charge for first 1/11-mile (i.e., boarding fee)
- \$0.15 for each additional 1/11-mile for trips up to one mile
- \$3.40 for first mile and \$0.15 for each additional 1/11-mile for trips over one mile
- \$0.30 per minute waiting fee
- \$1.00 per extra passenger

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