



Analyzing social problems.
Advancing enduring solutions.

Senior Transportation in Bermuda

Research and Feasibility Analysis

Prepared by:
Root Cause

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I. EXECUTIVE SUMMARY

Transportation is the vital link between home and community. It connects individuals of all ages to the places where they can fulfill their most basic needs. . . Transportation problems are closely correlated with poor income, self-care problems, isolation and loneliness. Reduced mobility puts an older person at higher risk of poor health, as the ability to obtain the goods and services necessary for good health and welfare is reduced.

—The National Association of Area Agencies on Aging

Introduction

Bermuda's seniors comprise a sizeable and noteworthy segment of the total island society. At an estimated 8,270 individuals representing nearly 13 percent of the total population—and growing—this group represents a significant force in terms of skills, economic assets, and political weight. Because of seniors' ever-growing presence in Bermuda, the level at which their basic needs are met has implications that extend well beyond seniors themselves and greatly affect many stakeholder groups across the island. These stakeholders include caregivers, service providers, government agencies, and private businesses.

Mainstream and senior-focused service providers currently deliver a vast array of services to meet seniors' needs in the critical areas of housing, health care, social and recreational activities, shopping, and transportation. In examining this list, transportation is arguably the central link between seniors and the other service categories. Currently, however, evidence indicates a significant unmet transportation need among Bermuda's seniors. The lack of sufficient transportation has negative social and economic effects on caregivers, service providers, as well as the overall society of the island.

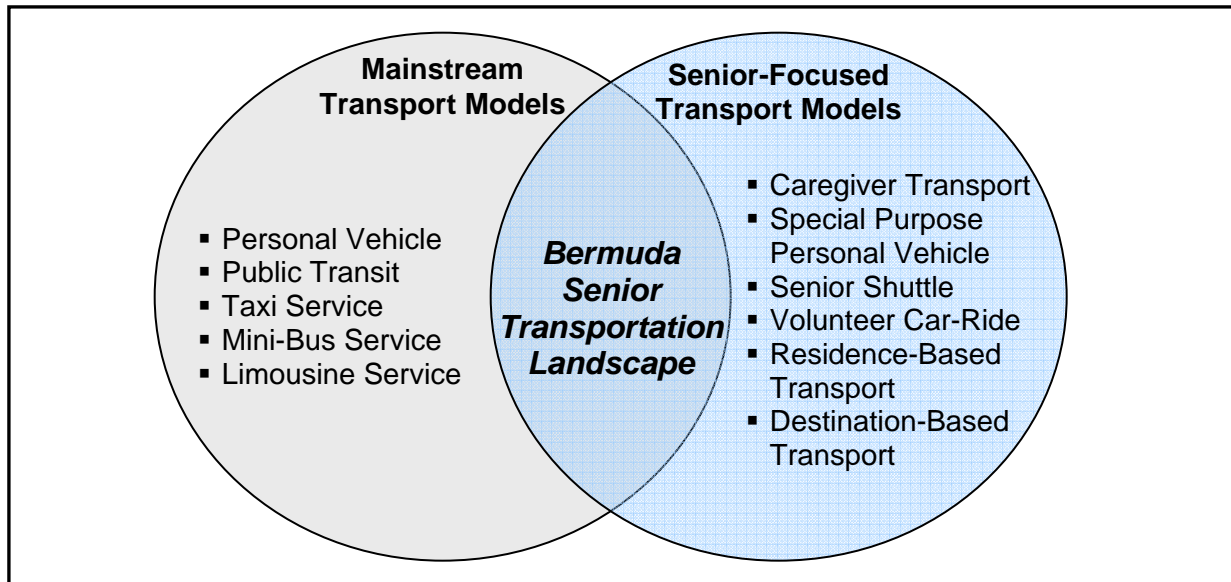
The following research results describe transportation needs among seniors (*Ageing in Bermuda - Meeting the Needs of Seniors*, Fordham University, 2004):

- 21% of older seniors (ages 80+) report needing more transportation services to access a doctor or shopping
- 74% of family caregivers report needing to provide transportation, accounting for major losses in time and productivity
- 43% of service providers cite "travel difficulties" as an obstacle to seniors using existing services

Bermuda's Senior Transportation Landscape

The senior transportation landscape in Bermuda today comprises a wide range of senior transport options operated by service providers in the private, public, and third sectors. These options are based on both *mainstream* transport models, geared towards serving the general population, and *senior-focused* transport models. The intersection of mainstream and senior-focused models forms Bermuda's *Senior Transportation Landscape*, as illustrated in the figure below.

The state of this senior transportation landscape is heavily influenced by four key constraints: constraints on the number and size of vehicles; legal/insurance requirements; volunteer supply limitations; and limited coordination. These constraints emerge as a result of Bermuda's unique characteristics as a physically small island with a small population, a large and highly developed economy, and high population density. These same constraints similarly influence the feasibility of potential solutions.



Mainstream Transport-Disadvantaged Seniors

Mainstream transport options provide the bulk of overall transport capacity on the island. As seniors age, many continue to make use of one or more mainstream models on a regular basis. For example, 6,596 seniors still maintain active driver's licenses and 3,972 own private cars. However, a sizeable contingent of seniors described as *mainstream transport-disadvantaged* are prevented from using mainstream options by any number of barriers including income, disability, location of residence, or other life circumstances. For this group, a range of senior-focused transport options have developed to address the gaps in the mainstream transport space and meet their particular needs.

Bermuda is home to an estimated 1,600 mainstream transport-disadvantaged seniors, representing 20 percent of the total senior population. Based on a conservative individual senior ride profile, this group is estimated to have the following annual needs for rides:

<p style="text-align: center;"> Medical Appointments: 38,400 rides per year Shopping: 76,800 rides per year Social/ Other: 38,400 rides per year Total: 153,600 rides per year </p>
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Senior-Focused Transport

Bermuda's senior-focused transport space comprises numerous public- and third-sector-providers that have a primary focus on meeting the transportation needs of seniors. These providers deliver services that are particularly critical for mainstream transport-disadvantaged seniors. While caregivers and special purpose personal vehicles represent two current approaches to senior-focused transport, they are not considered to be efficient, scalable, or preferable solutions over the long term.

Other major senior-focused models/approaches operated by senior-focused service providers include senior shuttle, volunteer car-ride, residence-based transport, and destination-based transport models. Due to overall capacity limitations, providers that operate these four models cumulatively deliver an estimated *16,000 rides per year, or approximately 10 percent of the 153,600 rides required by mainstream transport-disadvantage seniors.*

These senior-focused rides have the following fundamental characteristics:

- Weighting towards non-emergency medical appointments and shopping
- Operation mainly during weekday, daytime hours
- Concentration within the island's central region

Due to the combination of limited capacity and the characteristics outlined above, the following patterns of gaps in senior-focused transport emerge:

a) Limited Capacity for High-Priority Trips including medical appointments and shopping. Senior-focused transport services that focus on these trip purposes address approximately 7 percent of the estimated 115,200 rides (38,400 medical appointments + 76,800 shopping) required by Bermuda's mainstream transport-disadvantaged seniors.

b) Limited Capacity with Desired Service Attributes including transport for trip purposes *other than* for medical appointments or shopping, after-hours or weekend service, service for pickup or drop-off locations in the East and West regions, and real-time or short notice ride scheduling.

Senior-Focused Transport Benchmark Models

The challenge of providing sufficient senior transportation is by no means unique to Bermuda. Communities throughout the developed world are experiencing similar demographic trends, whereby a rapidly growing senior population is no longer able to make effective use of mainstream transportation options. Nearly 25 examples of senior-focused transport services were benchmarked to survey the global array of senior-focused solutions and to assess their applicability to Bermuda's unique context. These services are based on the following six models/approaches:

Model/ Approach	Description
Senior Shuttle	High-occupancy, accessible vehicles are used to transport seniors and often disabled individuals to and from common destinations along fixed routes. Trips are typically prioritized for non-emergency medical, grocery and other shopping, and recreational purposes.
Volunteer Car-Ride	Volunteers drive their own cars to transport seniors for a range of trip purposes. Volunteers may or may not provide physical assistance.
Taxi Subsidy	Eligible seniors are provided with discount taxi coupons that can be redeemed for rides using standard or wheelchair-accessible taxis for any trip purpose within a designated geographic area.
Centralized Referral	A central call center fields ride requests and provides a referral to the most appropriate transport service operator.
Centralized Brokerage	A central coordinating entity fields ride requests and dispatches requests through a network of existing mainstream and senior-focused transportation service providers.
Hybrid Model - Independent Transportation Network (ITN®)	Hybrid of mainstream taxi, senior shuttle, and volunteer car-ride models. A seamless integration of volunteer and paid drivers use private cars to transport seniors individually or in groups.

Each benchmark model was analyzed using criteria of its operating model, the organizational structure of the provider, and its funding sources. The analysis of each operating model was further divided among its major components including the request handling function, coordination/dispatch function, vehicle and staff capacity, and service attributes such as operating hours, trip purpose restrictions and pricing.

Senior-Focused Transport Recommendations

Based on the cumulative research and analysis, the following recommendations are identified as important to maximizing the reach and effectiveness of any transport solution to be implemented in Bermuda's unique context.

Segmentation of the Senior Population

In order to address senior transport needs at scale and in a cost-effective manner, targeted solutions should be developed for key senior population segments. Bermuda's senior population exhibits remarkable diversity along a number of key attributes, including physical and mental health conditions, geography of residence and proximity to public transit, residence type, level of family caregiving available, income level, and other individual variables. While any of the individual attributes listed above can arguably form a basis for segmenting the senior population, *physical mobility level* represents the most fundamental base criteria to apply, because physical mobility limitations must be addressed by transport capacity before other service requirements become relevant. Three major levels of physical mobility and their corresponding minimum transport requirements are outlined below:

1. *Wheelchair-Bound (~150 seniors)*: Wheelchair-bound residents represent a distinct group of seniors who must make use of either a manual or motorized wheelchair for movement. Seniors in this segment require relatively specialized transportation, consisting at minimum of door-to-door service provided by wheelchair-accessible vehicles.
2. *Ambulatory Disabled (~620 seniors)*: Ambulatory seniors experience varying degrees of walking difficulties and have limited movement due to any number of health issues. Seniors in this segment require a door-to-door transport service that uses easily accessible vehicles and ideally provides additional physical assistance.
3. *Generally Mobile (~7,500 seniors)*: The broadest senior category consists of individuals who are capable of moving a reasonable distance without physical assistance from another individual. Seniors within this segment are physically capable of utilizing the broadest range of transport services.

Overarching Solution Requirements

To ensure maximum chance of long-term success, any transportation solution should:

- Be efficient, scalable, and sustainable.
- Address the distinct transport needs of each senior physical mobility segment.
- Use the most cost-effective model for each segment, with the capacity of most specialized model focused towards addressing specialized transport needs.
- Leverage existing vehicles and infrastructure.
- Use a mix of paid and volunteer drivers.
- Complement existing services, while minimizing duplication, competition, or slowing down of existing systems.
- Capitalize on Bermuda's small geographic size and common destinations to maximize shared rides and fixed routes.
- Include reasonable service fees to enhance sustainability, with higher fees charged for benefits such as short-notice scheduling.

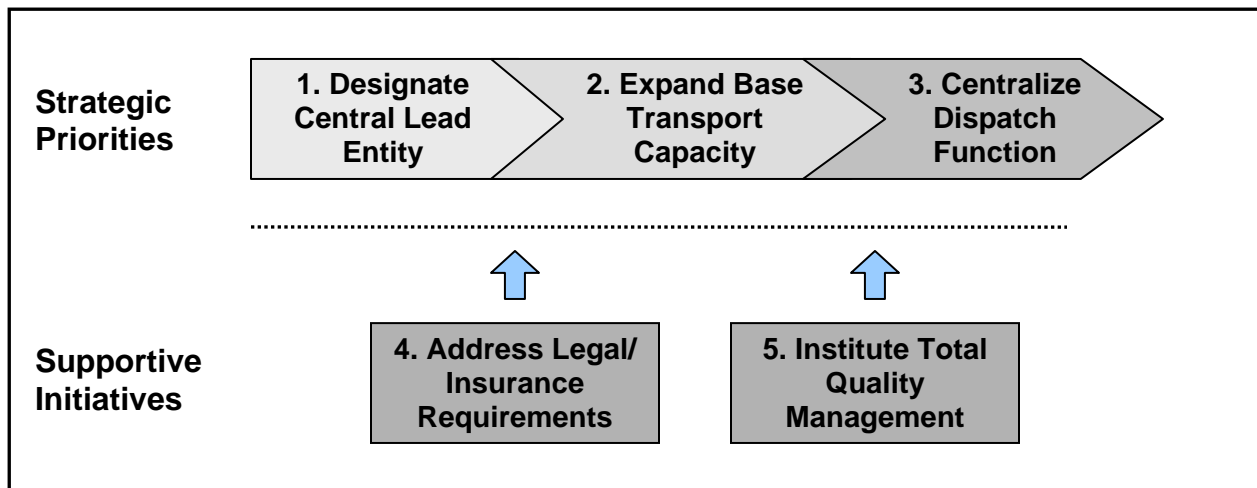
Transportation Service Best Practices

Based on local and international research into senior transportation, the following service-attribute best practices have been identified as critical to the quality of any senior-focused transport service:

- Senior empathy and personal support
- Reliable/ dependable
- Responsive
- Easy to schedule/use
- Affordable
- Allow a range of trip purposes

Recommended Systemic Strategy and Models/Approaches

The development of a comprehensive and effective senior transport solution in Bermuda will require both the integration of multiple models/approaches and their implementation based on a solid systems-level strategy. The following recommended strategy comprises three sequential, strategic priorities that are reinforced by two supportive initiatives, as outlined below:



Strategic Priorities

1. Designate Central Lead Entity

As described earlier, Bermuda’s senior transportation landscape comprises numerous key players across all three sectors. The complexities of this landscape, the diversity of the senior population and its transport needs, and the continued growth of the senior population strongly suggest that no one entity is likely to develop a comprehensive solution on its own. Designating a central lead entity to function as an ongoing champion for senior-focused transportation in Bermuda would address the landscape’s overall lack of coordination. It would also build the sustained momentum required for developing and continuously refining a comprehensive solution to address senior transportation needs at an appreciable scale. Recruiting an existing entity to assume the lead role, versus launching a new organization, would likely reduce the time and costs of organizational ramp-up.

2. Expand Base Transport Capacity

Given current capacity limitations, the expansion of base transport capacity is a high initial priority. Transport capacity should consider the requirements for the three major physical mobility segments (generally mobile, ambulatory disabled, wheelchair-bound) and address high-priority trips plus other service needs.

The expansion of capacity is recommended through a) the implementation of an ITN® model as a key lever, b) the scaling of a core senior shuttle model, c) consolidation of volunteer recruitment and management functions, and d) the introduction of supplementary taxi subsidy coupons.

3. Centralize Dispatch Function

Once a critical mass of transport capacity is in place, Bermuda's senior transport landscape would be in an ideal position to benefit from centralization of the dispatch function. This function could centrally handle dispatching for multiple service providers who are operating ITN®, senior shuttle, volunteer car-ride, residence-based transport, and destination-based transport models.

Supportive Initiatives

4. Address Legal/ Insurance Requirements

The targeting of legal and/or insurance requirements will be an important initiative to support the effectiveness of the strategic priorities above. The lack of clear policies constrains the provision of physical assistance to seniors by paid or volunteer drivers, the leasing of high-occupancy vehicles between organizations, and the straightforward matching between drivers and available vehicles. Potentially, these constraints can be addressed through policy solutions and/or collaborative product development with the local insurance industry.

5. Institute Total Quality Management

In the effort to ensure high quality service across the senior transport landscape, Bermuda's senior transport providers may benefit from a total quality management effort overseen by the central lead entity. One element of quality management will be the training of key driving personnel in passenger assistance techniques, as used in para-transit industries. Quality management will also need to ensure the consistent application of the senior-focused transport best practices as described earlier.

Conclusion

The focus on strengthening transportation for Bermuda's seniors buttresses the increasing emphasis on addressing the needs of this rapidly growing population segment. Recent examples of attention to the problems of Bermuda's seniors include the launch of a partnership between Age Concern and the Bermuda Department of Statistics with a mandate to survey the needs of every senior on the island, the launch of the Bermuda Council on Ageing, and further expansion of the National Office for Seniors and the Physically Challenged.

The launch of these initiatives presents both opportunity and timing to place the critical issue of senior-focused transportation on the national senior agenda. With a robust existing transportation base, a core set of senior-focused organizations, and expanding momentum of community support, a solid foundation is already in place to build on and develop an effective and strategic senior transportation solution. Such a solution would not only benefit seniors themselves, but would also generate positive ripple effects that enhance senior health, economic activity, and caregiver quality of life.

II. THE SENIOR TRANSPORTATION NEED

THE PRIORITY FOR SENIOR TRANSPORTATION

The disproportionate need by Bermuda's seniors for supplementary transportation services arises largely from the reduction of driving ability and/or driving privileges. As individuals age, physical deterioration, especially diminished vision and decreasing reflexes, results in a reduced physical capacity to operate an automobile, moped, or other personal vehicle. Income loss associated with retirement often further diminishes the financial capacity to own, operate, and maintain a vehicle. In addition, these two age-related factors increase the physical and financial challenges associated with using many alternative public and private transport options. Without access to adequate transportation, a senior unwillingly can be limited to his or her place of residence, unable to access medical appointments, shopping, or social and other life sustaining activities. The National Association of Area Agencies on Aging states:

"Transportation is the vital link between home and community. It connects individuals of all ages to the places where they can fulfill their most basic needs...Transportation problems are closely correlated with poor income, self-care problems, isolation and loneliness. Reduced mobility puts an older person at higher risk of poor health, as the ability to obtain the goods and services necessary for good health and welfare is reduced¹."

Seniors facing this scenario of reduced mobility should ideally be able to access supplementary transport services provided by either friends, family, public transit, the third sector, or the private sector. Transport providers in all of these categories currently offer a critical level of quality services to a large number of seniors across the island. However, because of Bermuda's rapidly changing demographic profile, studies show that the majority of Bermuda's seniors still need significant supplemental transportation. The consequences of this unmet need extend well beyond seniors themselves, and greatly affect the entire island including caregivers, service providers, government agencies, and private businesses.

CURRENT UNMET NEED FOR TRANSPORTATION

The need for transportation can best be defined as *the need to move from the door of one's origin to the door of one's desired destination, at the desired time*. The reality that this need goes unmet, in one way or another, for a large portion of Bermuda's seniors is supported by several important indicators.

As part of Age Concern's work as a leading organization working on behalf of Bermuda's seniors, it convened numerous stakeholders within the transportation, human services, and ageing fields around the senior transportation debate. During the February 2007 Transportation Forum, twenty-one participants discussed the state of senior transportation in detail and acknowledged the existence of both a robust transport sector and an important remaining transport gap.

The need for additional senior transportation services is further supported by the report *Ageing in Bermuda - Meeting the Needs of Seniors*, developed in 2004 by Fordham University's Ravazzin Center for Social Work Research in Aging. Based on the results of an island-wide survey of seniors, family caregivers, and service providers, the report states that:

¹ *Home and Community-Based Services for Older Adults: Transportation*, National Association of Area Agencies on Aging, 2007, 1.

- 21% of older seniors (ages 80+) report needing more transportation services to access a doctor or shopping
- 74% of family caregivers report needing to provide transportation, accounting for major losses in time and productivity
- 78% of service providers cite “lack of transportation” as an important senior problem, and additional transportation services as being helpful
- Churches and physicians cite transportation as being one of the most needed senior services
- 43% of service providers cite “travel difficulties” as an obstacle to seniors using existing services

The situations of individual organizations and programs offer specific illustrations of the problems in the senior transport scenario. In one compelling example, the mini-bus of the Continuing Care Division of King Edward VII Memorial Hospital experienced a mechanical failure in February 2006. Immediately following this event, the senior day care program saw its attendance drop from 15 to 3 seniors. After a fact-finding effort, the program’s leaders learned that all of the senior participants who stopped attending did so because they were not able to access suitable alternative transport options².

A WIDENING TRANSPORTATION GAP

Bermuda’s overall ageing trend suggests that if the current situation remains, the current senior transportation gap will continue to widen. According to the 2000 Census of Population & Housing, Bermuda was home to 6,722 individuals aged 65 and older, representing 11 percent of the total population. This figure represents a 25 percent growth since 1991. Particular age groups within the senior population experienced greater growth than others: Between 1991 and 2000, the 70-74 age group grew by 35 percent (1,366 to 1,845); and the 85+ age group grew by 38 percent (404 to 557).

This growth rate continues a long-term ageing trend in Bermuda that began in 1950. Between 1950 and 2000, the number of seniors more than tripled and their percentage share of the total population nearly doubled³. According to the *World Factbook*, *Bermuda’s current senior population as of July 2007 is estimated to be 8,270 individuals*, an additional 23 percent growth since 2000⁴.

The current senior population, while healthier than in 1991, continues to be challenged by numerous health issues. In the 2000 Census, 3,293 seniors self-reported having one or more health conditions, with the leading conditions being high blood pressure, arthritis, diabetes, heart condition, impaired vision, and mobility difficulties; 1,040 seniors self-reported having one or more long-term *disabling* health conditions that affected their daily living activities for more than six months. The leading disabling conditions reported were arthritis, heart condition, high blood pressure, mobility difficulties, diabetes, and impaired vision. This latter senior group represents 15 percent of the total senior population, and 37 percent of all persons in Bermuda who reported having a disabling health condition. Nine out of ten of these disabled seniors reported being restricted in the activities that they were able to perform, including leaving home unaccompanied⁵.

² *Personal Interview*: Capri Smith - Extended Care Director, King Edward VII Memorial Hospital. Interviewed by Anand Dholakia, Root Cause, September 10, 2007.

³ *The Changing Face of Bermuda’s Seniors*, Department of Statistics, 2005.

⁴ *The World Factbook*, Central Intelligence Agency, 2008, <https://www.cia.gov/library/publications/the-world-factbook/geos/bd.html>.

⁵ *2000 Census of Population and Housing*, Department of Statistics.

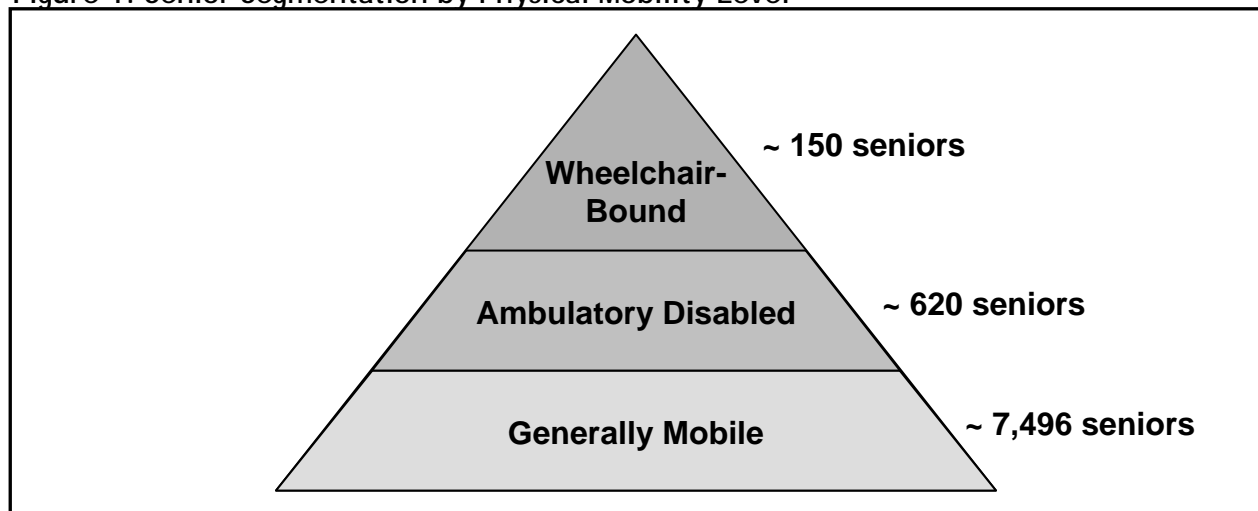
SEGMENTING THE SENIOR POPULATION

In order to form an accurate assessment of the transportation need among Bermuda's seniors, it is critical to recognize the remarkably diverse nature of this population. Although commonly regarded as a single homogeneous group, the senior population represents an age range of approximately 35 years with considerable variation among individual attributes and abilities to access transport services. Key attributes include physical and mental health, geography of residence and proximity to public transit, residence type, availability and level of caregiving assistance, income level, etc. Variation among these attributes directly affects the specific requirements of individual senior transportation needs.

Segmentation by Physical Mobility Level

Any of these individual attributes arguably can form a basis for segmenting the senior population. However, to anchor a senior transportation solution that meets the broadest range of seniors, the initial segmentation should be based on level of physical mobility. This characteristic is primarily shaped according to physical and mental health conditions. The basis for primary categorization is that physical mobility limitations must be addressed before other service requirements can be considered. For example, if a senior is unable to walk more than a short distance or climb steps, door-to-door service and an easily accessible vehicle must be provided before other service attributes such as operating hours and pricing become relevant. Figure 1 below segments seniors according to their physical mobility level and the corresponding specialization level of transport needed, from the most to least specialized.

Figure 1: Senior Segmentation by Physical Mobility Level



The characteristics and minimum transport needs of each segment are described below. Minimum transport needs are described according to the following overall service levels:

Door-to-Door. Transport is provided from the door of the passenger's origin to the door of the destination.

Curb-to-Curb. Transport is provided from the closest curb stopping point on the road adjacent to the origin, to the equivalent point for the destination. Vehicles may enter large parking lots but do not typically negotiate private driveways.

Fixed Route. Transport is provided between fixed stops that are distributed along pre-determined routes.

1. Wheelchair-Bound

Wheelchair-bound residents represent a distinct group of seniors who must make use of either a manual or motorized wheelchair for movement. According to the 2000 Census, 124 wheelchair-bound seniors were reported as residing in Bermuda, comprising 2 percent of the total senior population. Assuming that wheelchair-bound seniors still comprise 2 percent of the estimated 2007 senior population, this figure translates to an estimated 153 wheelchair-bound seniors. Due to the distinct attributes of this group, it is valuable to include non-senior wheelchair-bound individuals within the count. The 2000 Census reported 69 additional non-senior individuals who are confined to a wheelchair⁶. Repeated anecdotal evidence suggests that this number may be far higher in 2007 due to increased moped accidents and other factors. Assuming a non-senior wheelchair-bound population of 100 individuals in 2007, this produces a conservative current figure total of approximately 250 residents who are confined to a wheelchair.

Minimum Transport Requirements: This segment of the population requires the most highly specialized transportation, consisting at minimum of door-to-door service provided by wheelchair-accessible vehicles. The requirement for door-to-door service is supported by volumes of research evidence documenting the transport needs of wheelchair-bound individuals.

2. Ambulatory Disabled

Ambulatory seniors are not confined to a wheelchair but experience varying degrees of walking difficulties or have limited movement due to any number of health issues. Such difficulties cause challenges in covering long and/or uneven distances, negotiating high steps or steep gradients, and possibly using certain types of vehicle seats for extended periods of time. They may employ a personal assistance device such as a cane, walker, or crutches in order to remain mobile, though at a typically slower pace and with frequent rest required.

For the purposes of this report, 8 percent of the total senior population is estimated to be ambulatory disabled, based on the Census 2000 data of 505 seniors who reported being “prevented from leaving home alone” as a result of their disabling health condition. Extrapolated for the 2007 population, this figure translates to 621 ambulatory disabled seniors.

Minimum Transport Requirements: This segment requires at minimum, a door-to-door transport service that uses easily accessible vehicles and ideally provides additional physical assistance. A curb-to-curb service potentially could be adequate if a senior receives physical assistance from a personal care attendant or the service provider.

3. Generally Mobile

The broadest senior category consists of individuals who are capable of moving a reasonable distance unassisted. Physically they are able to climb standard-height steps onto buses and can board and un-board most typical vehicles found in Bermuda by themselves. The majority of seniors are estimated to be generally mobile. Based on the estimates for wheelchair-bound and ambulatory disabled seniors, approximately 7,496 seniors are generally mobile, or 90 percent of the current total senior population⁷.

⁶ Total 193 individuals reporting being confined to a wheelchair - 124 wheelchair-bound seniors = 69 non-senior individuals who are confined to a wheelchair.

⁷ Total 8,270 - 153 wheelchair-bound - 621 ambulatory disabled = 7,496 generally mobile seniors.

Minimum Transport Requirements: Seniors within this segment are physically capable of utilizing the broadest range of transport services, and can potentially use any transportation with pick-up/ drop-off locations that are within reasonable walking distance from either their origins or final destinations. For those generally mobile seniors who do not live within reasonable distance of fixed stop locations, a curb-to-curb service can be adequate.

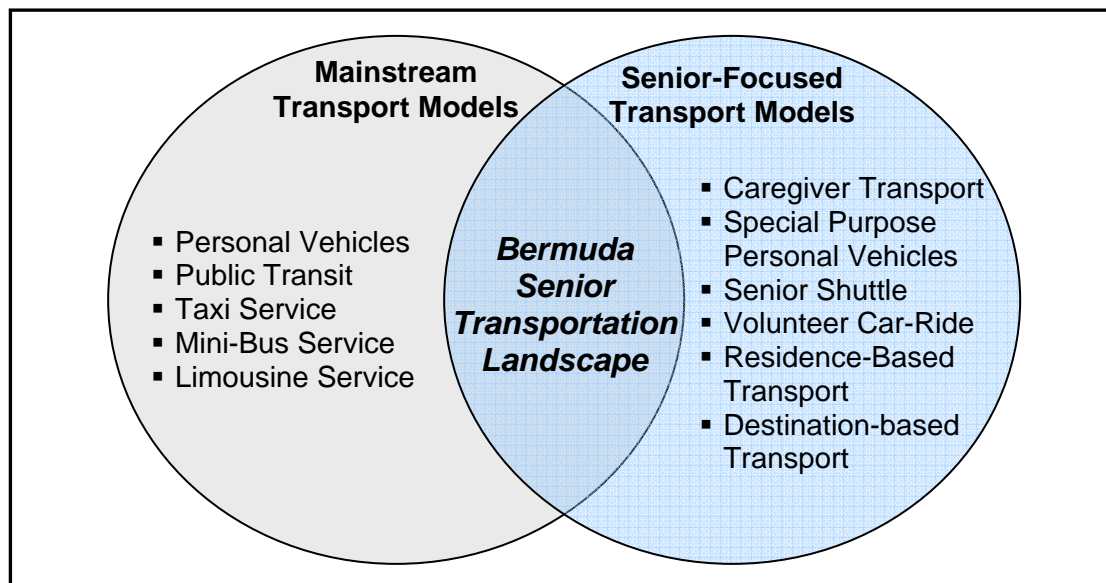
III. BERMUDA'S SENIOR TRANSPORTATION LANDSCAPE

Seniors in Bermuda currently have a range of transportation options available to help them reach their destinations at the desired time. *Mainstream transport* options are mainly geared towards the general population and account for the bulk of transport capacity on the island. Many seniors in Bermuda currently utilize one or more of these options on a regular basis, depending on the specific nature of transportation required.

A sizeable group of seniors, however, is not able to make use of these mainstream options because of income, disability, residence location, or other life circumstances. These seniors can be effectively regarded as *mainstream transport-disadvantaged*. For this group, a range of *senior-focused transport* options offering relatively less transport capacity has developed to address their transport needs. As noted in the previous section, while the current senior transportation landscape contributes significantly to the transport of seniors, an appreciably sized segment of seniors remains unable to access either mainstream or senior-focused transport options. These seniors are arguably within the mainstream transport-disadvantaged group, and are additionally unable to access even senior-focused transport options due to capacity constraints.

Bermuda's existing mainstream and senior-focused transport options are based on a fairly defined number of models or approaches, as shown in Figure 2 below. Each model is currently implemented by one or more service providers within the public, private, or third sectors. The intersection of mainstream and senior-focused models forms Bermuda's *Senior Transportation Landscape*.

Figure 2: Senior Transportation Landscape



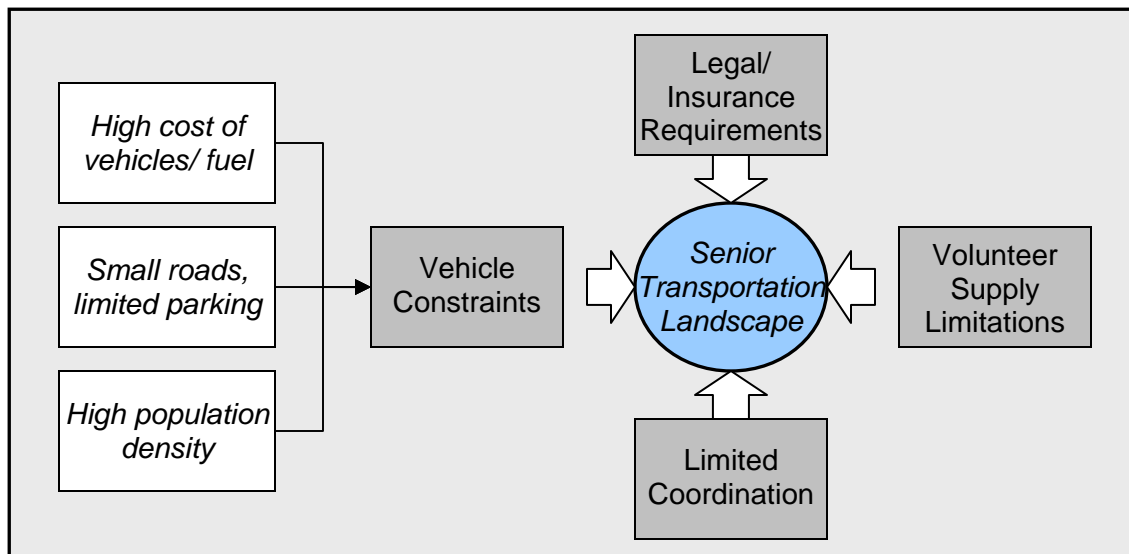
The remainder of this section is organized according to the following outline:

- Key Forces Shaping the Landscape
- Mainstream Transport Models/Approaches
- Mainstream Transport-Disadvantaged Seniors
- Senior-Focused Models/Approaches
- Senior-Focused Transport Assessment

KEY CONSTRAINTS SHAPING THE TRANSPORT LANDSCAPE

While the senior transportation challenge is by no means unique to Bermuda—the United States, Canada, and other developed nations with rapidly ageing populations are facing similar situations—Bermuda’s island-specific context is indeed unique. This context generates several key constraints that shape the current state of Bermuda’s overall senior transport landscape, including both mainstream and senior-focused models. These constraints play an important role in sustaining the previously described *unmet transportation need* of seniors. The conditions result from Bermuda’s unique situation as a physically small island with a small population, a large and highly developed economy, and high population density. The key constraints, shown below, should be carefully considered in both the assessment of the current landscape, and in the evaluation of potential new solutions.

Figure 3: Key Constraints on Senior Transportation Landscape



Vehicle Constraints. Due to a number of interrelated factors, but mostly related to Bermuda’s physical size, the number of new vehicles that can be made available for both mainstream and senior-focused transport models is increasingly limited. The number of vehicles on Bermuda’s roads has multiplied nearly ten times over the past 60 years from 5,000 in 1947 to nearly 48,000 in 2007. This vehicle population has led to well-known traffic congestion and parking issues. Bermuda’s small roads also constrain vehicle size, frequently requiring high occupancy and/or special purpose vehicles to be custom built and thereby also increasing costs.

Legal/Insurance Requirements. The lack of clear legal and/or insurance policies constrains the provision of physical assistance to seniors by paid or volunteer drivers, the leasing of high-occupancy vehicles between organizations, and the straightforward matching between drivers and available vehicles.

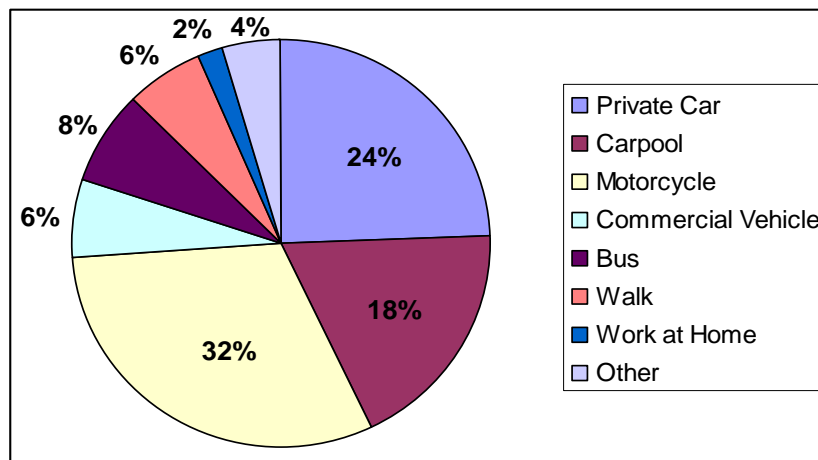
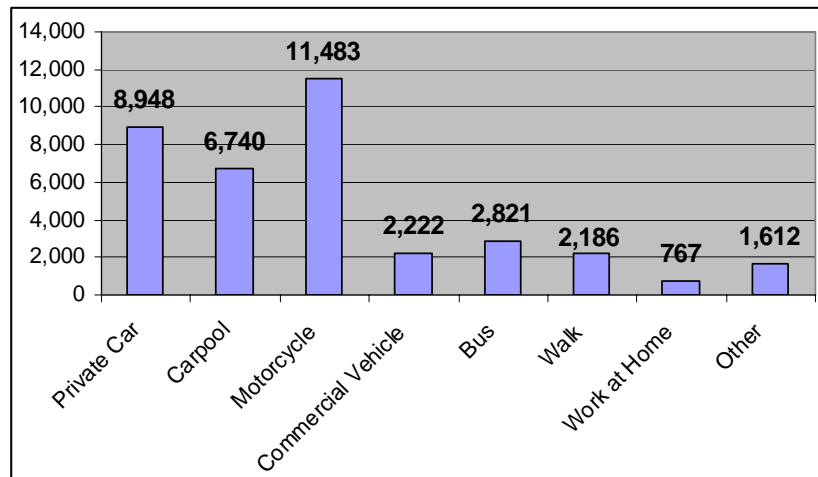
Volunteer Supply Limitations. Service providers who implement senior-focused models are often constrained in the scale, scope, and consistency of services that they can provide owing to ongoing challenges in recruiting, training, and retaining volunteer drivers. Volunteer constraints are particularly heightened because of the licensing, certification, and insurance requirements for driving the high-occupancy vehicles used by several senior transport services.

Limited Coordination. While examples of coordination among transport providers certainly exist, the senior transport landscape is characterized by two levels of divergence: one between the mainstream and senior-focused areas, and the other among senior-focused providers themselves. The divergence between the mainstream and senior-focused areas can be justified by the wide variation among organizational missions. The senior-focused space, however, includes multiple transport providers who exhibit a high degree of mission overlap while operating duplicative functions, such as incoming call handling, ride scheduling, driver recruitment, and dispatch. The effects of this overlap include increased competition for resources, reduced efficiency, and confusion among the senior community.

MAINSTREAM TRANSPORT MODELS/ APPROACHES

Mainstream transport models/approaches in Bermuda include personal vehicles, public transit, taxi service, mini-bus service, and limousine service. These models are mainly operated by the public sector and private companies including individual entrepreneurs.

While not referring specifically to seniors, the modes of transportation that Bermuda’s working population use to travel to work can be used as a proxy of the relative accessibility and usage of mainstream transport models. The charts below illustrate a heavy preference for private cars, carpooling, and motorcycles, which together comprise the work travel modes for nearly 75 percent of the working population⁸.

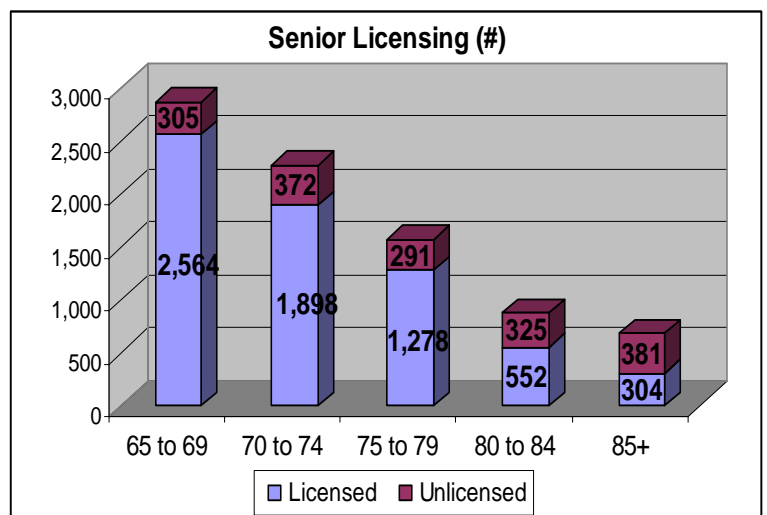
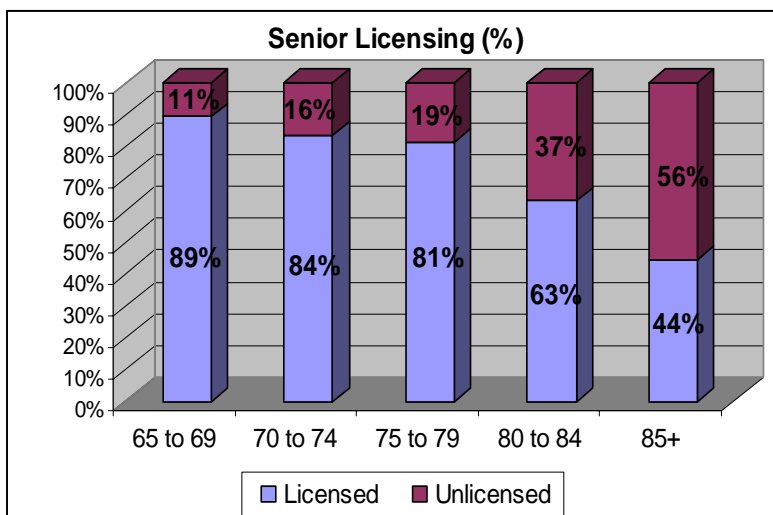


⁸ 2000 Census of Population and Housing, Department of Statistics.

Personal Vehicles

A significant group of seniors make regular use of individually owned personal vehicles, including private cars or mopeds, to address their transport needs. The number of seniors with driver's licenses provides a base indicator of the extent to which seniors are able to use personal vehicles. According to the Bermuda Transport Control Department (TCD), 6,596 seniors, ranging from 65 to 98 years of age, are currently registered as having active driver's licenses, comprising 80 percent of Bermuda's total estimated 8,270 seniors⁹.

TCD requires license renewal for seniors at ages 65, 70, 75, and every two years thereafter. Driver's license renewal for seniors requires a road test and medical certification by an independent practitioner. Approximately 1,200 individuals ages 65 and over renew their licenses each year, with approximately 95 percent meeting the renewal requirements¹⁰. The two senior drivers' licensing charts below graphically illustrate the rapid rate at which seniors begin losing driving privileges after age 75¹¹.



While driver's licensing rates are one indicator of personal vehicle use among seniors, the possession of a license far from guarantees access to a personal vehicle, thus necessitating an analysis of vehicle ownership. While mopeds and motorcycles are a preferred mode of transport for many Bermudians (more than 14,000 are registered by TCD), TCD estimates that only a few hundred seniors in Bermuda own and make use of them for regular transportation¹².

A more significant number of seniors are linked to private car use. According to the TCD, as of May 2007, a total of approximately 3,972 private cars were registered to owners of age 65 and older, accounting for 18 percent of the total approximately 22,500 private cars registered in Bermuda¹³. Bermuda's one-car-per-household restriction supports a one-car-to-one-individual assumption, meaning that approximately 3,972 individual seniors directly own private cars (60 percent of licensed seniors, and 48 percent of the total senior population).

⁹ Driver's licensing data, Transport Control Department (TCD), 2007.

¹⁰ *Personal Interview*: Randy Rochester - TCD Director. Interviewed by Anand Dholakia, Root Cause, 9/11/2007.

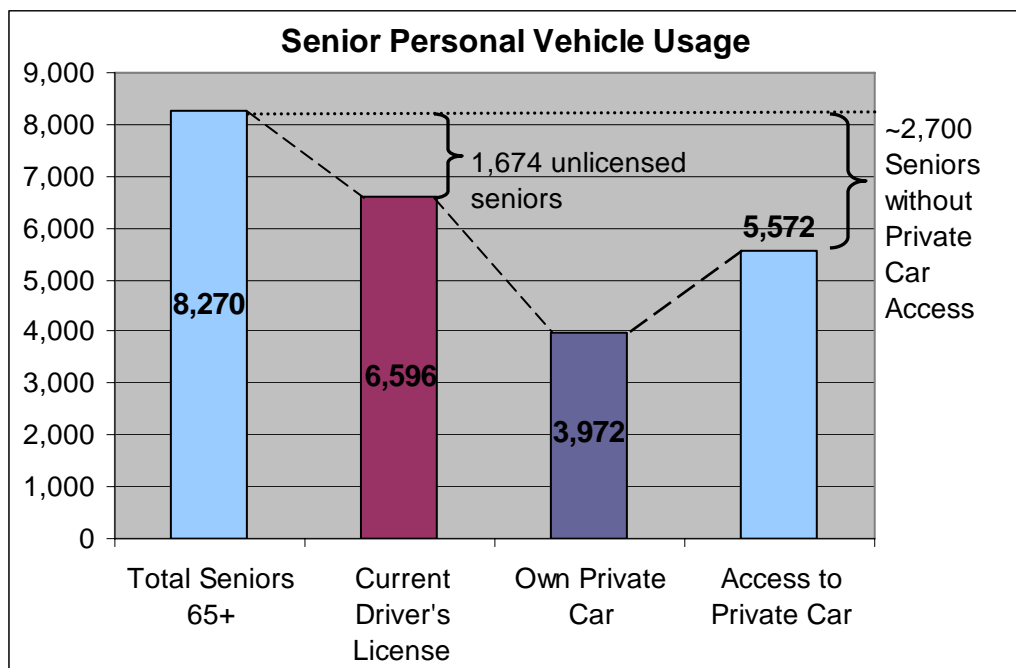
¹¹ Driver's licensing data, TCD, 2007; 2000 Census of Population and Housing, Department of Statistics.

¹² *Personal Interview*: Randy Rochester - TCD Director. Interviewed by Anand Dholakia, Root Cause, 9/11/2007.

¹³ Vehicle registration data, TCD, 2007. Private Cars Classes A-H. 3,672 cars registered to owners ages 66 and over, plus estimated 300 cars registered to owners age 65.

In order to provide a more accurate estimate of private car usage among seniors, a calculation of regular *indirect access* to private automobiles needs to be included with direct ownership. Approximately 75 percent of seniors live in shared households, with 40 percent living with a spouse (may include children), 29 percent living with other relatives only, and 6 percent living with non-relatives (may also include relatives)¹⁴. For the purposes of this revised estimate, it is assumed that only households in which seniors live with a spouse will provide regular indirect private car access to the spouse of the car owner. Thus, an additional 1,600 seniors (40 percent of 3,972) can be estimated to have indirect access to a private car for regular transport¹⁵. This results in an estimated total of 5,572 seniors who can be linked to private car usage, or 67 percent of the total senior population.

Looking at the senior personal vehicle use summary chart below, a cohort of 1,674 seniors do not have driving privileges, and approximately 2,700 seniors remain without private car access.



The highlighted box below outlines the senior benefits of personal vehicles, and those senior segments that are served particularly well.

Senior-Focused Benefits

- TCD will offer free driver's license and vehicle registration for seniors beginning January 2008.

Seniors Segments Served Well

- Generally Mobile seniors who own or have access to a personal vehicle.
- Ambulatory Disabled seniors who own or have access to a personal vehicle.

¹⁴ 2000 Census of Population and Housing, Department of Statistics.

¹⁵ Assume that private car-owning seniors exhibit same household demographics as total senior population

Public Transit

The Bermuda Public Transportation Board (PTB) provides fixed-route bus and ferry service for a significant number of Bermuda's residents, including many seniors. These routes represent the island's backbone of public transit. A fleet of approximately 130 buses carries approximately 15,000 passengers per day along 11 major routes that reach all geographic areas of the island. Based on a hub and spoke layout, vehicles generally operate in 15-minute intervals for 16 to 20 hours per day, from 6:15am to 11:45pm, with exact timing and frequency varying by route and time of day. Buses are also designated to serve cruise ship passengers during tourist season, and can be chartered by schools or community organizations for transporting large groups¹⁶.

In early 2008, PTB officially introduced two new "connector buses" that were integrated within the existing bus system. The 12-seater, wheelchair-accessible mini-buses are intended to increase operational efficiency along specific routes and accommodate disabled passengers.

Senior-Focused Benefits

- Individuals ages 65 and over ride free of charge by showing their Special Person's ID¹⁷.
- Approximately 20 buses out of the PTB fleet (15 percent) have kneeling capability to lower the step height to board.
- New mini-buses will be wheelchair-accessible.

Seniors Segments Served Well

- Generally Mobile seniors who live within reasonable walking distance of a fixed route stop.
- Ambulatory Disabled seniors who live within immediate proximity of a fixed route stop.
- Wheelchair-Bound seniors who live within immediate proximity of a wheelchair-accessible connector bus stop can be accommodated on new mini-buses for trips along connector routes that do not require transfers.

Taxi Service

TCD registers a total of 613 taxis in Bermuda, with 96 percent capable of carrying five to six passengers. Sixty-seven taxis (11 percent) are listed as wheelchair-accessible, and 7 (one percent) are listed as appropriate for ambulatory disabled riders¹⁸. Taxis generally provide door-to-door service 24 hours per day across all areas of the island and accommodate all trip purposes. Taxis can be scheduled in real-time and respond to ride requests in as little as a few minutes. They also can be reserved 24 hours or more in advance. All taxis are metered and tariff fixed by law. Standard passenger fares are \$5.75 for the first mile and \$2 for each additional mile, with 25 percent higher rates between midnight and 6am, and on Sundays and public holidays.

Senior-Focused Benefits

- Wheelchair-accessible and ambulatory disabled senior-friendly taxis can be individually requested through central dispatch.

Senior Segments Served Well

- Generally Mobile, Ambulatory Disabled, and Wheelchair-Bound seniors who can afford taxi fares for regular transport.

¹⁶ *Personal Interviews*: Dan Simmons - PTB Director, October 12, 2007, and Rodney Grimes - PTB Assistant Director, September 8, 2007. Interviewed by Anand Dholakia, Root Cause. In-person interviews.

¹⁷ Because of this senior benefit, senior ridership data is not available.

¹⁸ Vehicle registration data, TCD, 2007.

Mini-Bus Service

TCD registers a total of 18 mini-buses that are operated by five main private sector providers to provide door-to-door or curb-to-curb service¹⁹. Overall, these providers maintain complete geographic coverage of the east, central, and west regions of the island, although individual providers tend to focus on specific regions. The capacity of the vehicles, which ranges between 10 and 28 passengers per vehicle, requires geographic focus in order to maintain a minimum level of capacity utilization and operating efficiency. The services largely operate between 7:30am and 12:30am. Through the delivery of shared rides, mini-buses are generally able to offer flat fares in the range of \$2 to \$4 for trips within an area, or up to \$20 for longer trips such as to the airport. Providers stationed at the east and west ends of the island allocate a major share of capacity to serving cruise ship passengers during tourist season.

While several mini-bus operators have made efforts to serve seniors and have the desire to increase service to this population, financial requirements prevent operators from specifically reaching out to senior passengers at a greater level.

Senior-Focused Benefits

- Offer door-to-door or curb-to-curb service at rates that are relatively more affordable than those offered by taxi services.

Senior Segments Served Well

- Generally Mobile and possibly Ambulatory Disabled seniors whose trip origin and destination fall within the geographic service area of an individual mini-bus provider.

Limousine Service

TCD registers a total of 14 limousines operated by two providers. These services generally focus exclusively on airport to hotel transfers, and are not directly applicable to senior regular transport needs.

MAINSTREAM TRANSPORT-DISADVANTAGED SENIORS

As described above, mainstream transport models in Bermuda provide a significant level of transport capacity for residents and visitors. As they age, seniors continue to make regular use of mainstream options. However, due to specialized needs and/or gaps in the mainstream transport space, a sizeable group of seniors remains unable to utilize this capacity.

These *mainstream transport-disadvantaged* seniors face one or more of the following barriers:

- Do not have direct or indirect access to a personal vehicle
- Do not live within reasonable proximity of public transit fixed stops
- Need to make trips not regularly accommodated by mini-bus services
- Are unable to afford taxi fares for regular transport
- Are ambulatory disabled or wheelchair-bound and require door-to-door or curb-to-curb service, perhaps with additional physical assistance

¹⁹ West End Mini Bus, East End/St. George's Mini Bus, Suburban Transit, Midlands, Bulford's, St. David's.

Estimating the Number of Mainstream Transport-Disadvantaged Seniors

The estimated number of mainstream transport-disadvantaged seniors is calculated via the following two methods:

1. Estimating senior usage rate of mainstream transport options, based on available transportation and census data
2. Estimating senior's difficulty in using mainstream transportation based on research survey data

Estimate One

Estimate One is based on a combination of current available transportation data and the Census 2000 work transport mode data extrapolating for 2007 (as shown earlier in this section). Work transport mode data for the general population is assumed to be a reasonable proxy for calculating the rate at which Bermuda's seniors generally continue to use a range of mainstream transport options, based on the following assumptions:

- Individuals generally choose the most convenient and affordable mainstream transport option available to meet their needs.
- Seniors continue to choose the most convenient and affordable mainstream transport options until they are no longer able to do so.
- The factors that determine choice of work transport modes also determine choice of senior transport modes for both work and non-work purposes. These factors include location of residence, destination, timing, convenience, etc.

This data is then updated as outlined in Table 1 below to reflect changing preferences and ability to use mainstream transport options as individuals age, by incorporating estimates for wheelchair and ambulatory disabled seniors.

Table 1: Mainstream Transport-Disadvantaged Seniors Estimate Calculation

Total Senior Population	2007 estimate (The World Factbook)	8,270
Mainstream Transport Users		
1. Private Cars	3,972 private cars registered to senior owners (TCD, 2007), plus estimated 1,600 seniors with indirect access to private car via a shared household with spouse (2000 Census)	5,572
2. Mopeds	Estimate of a few hundred seniors (TCD, 2007)	200
3. Public Transit	Eight percent of working population uses for travel to work (2000 Census)	662
4. Commercial Vehicle	Six percent of working population uses for travel to work (2000 Census)	496
5. Walk	Six percent of working population uses for travel to work (2000 Census)	<u>496</u>
Subtotal		7,426
Less:		
Wheelchair Users	Seniors confined to a wheelchair (2000 Census)	153
Ambulatory Disabled	Seniors prevented from leaving home alone (2000 Census)	621
Total Mainstream Transport Users		<u>6,653</u>
Mainstream Transport-Disadvantaged	Total Senior Population - Mainstream Transport Users	1,617

Estimate Two

Data gathered by Fordham University during its research to develop *Ageing in Bermuda* provides a secondary basis for estimating the number of mainstream transport-disadvantaged seniors (data provided via email by Dr. Irene Gutheil - Director, Ravazzin Center on Aging).

- 304 seniors surveyed
- 7.2 percent reported needing some help to use transport
- 12.2 percent reported being unable to use transport
- A total 19.4 percent reported needing help or being unable to use transport

Based on the current estimate of 8,270 total seniors living in Bermuda, 1,604 seniors (19.4 percent of 8,270) are mainstream transport-disadvantaged.

Based on the two estimation methods above, *approximately 1,600 seniors in Bermuda are estimated to be mainstream transport-disadvantaged, or almost 20 percent of the total senior population.*

Estimated Need for Senior-Focused Transport

A conservative estimate for the total required ride capacity for senior-focused transport in Bermuda can be based on the following average need among mainstream transport-disadvantaged seniors:

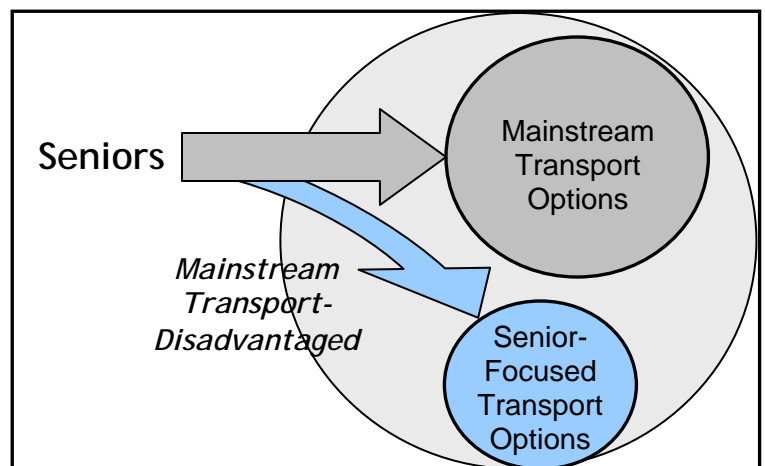
- Non-Emergency Medical Appointments: One round trip per month
- Shopping: Two round trips per month
- Social/ Other : One round trip per month
- **Total: Four round trips per month**

Assuming the above senior ride profile for a population of 1,600 mainstream transport-disadvantaged seniors, the ride capacity for various trip purposes can be calculated as shown in the box below. Detailed calculations are included in Appendix 1.

Medical Appointments: 38,400 rides per year
 Shopping: 76,800 rides per year
 Social/ Other: 38,400
Total: 153,600 rides per year

SENIOR-FOCUSED TRANSPORT MODELS/ APPROACHES

With a primary focus on mainstream transport-disadvantaged seniors, senior-focused transport models/approaches include caregiver transport, special purpose personal vehicles, senior shuttles, volunteer car-ride programs, residence-based transport, and destination-based transport. These models are implemented by a range of service providers in the private, public, and third sectors. Service providers include stand-alone transport organizations, senior residences, government agencies, community groups, and other organizations.



Caregiver Transport

While technically not a tangible “model/ approach,” family and friend caregivers currently play a major role in providing transport for mainstream transport-disadvantaged seniors. In 1991, *A Study of the Needs of Elderly People in Bermuda* reported that approximately 85 percent of seniors were receiving one hour or more of assistance per week from caregivers²⁰. As cited earlier, the Fordham University report *Ageing in Bermuda - Meeting the Needs of Seniors* states that 74 percent of caregivers report the necessity of providing transportation. The report also states that the role of caregiving is a cause of stress and lost time/productivity for caregivers.

Based on this evidence, caregiver transport is recognized as a currently important source of senior-focused transport that should be allowed to decrease over time, especially as senior transport needs are increasingly addressed by other models.

Special Purpose Personal Vehicle

A minimal number of wheelchair-bound seniors own purpose-built, special needs-equipped vans for physically challenged drivers. TCD registers a total of only 34 physically-challenged (PC) vans across the island, owned by both individuals and government. The high cost of purchasing and maintaining these vehicles renders them an unaffordable option for most wheelchair-bound seniors.

Senior Shuttle

One primary service provider, Project Action, currently operates a standalone shuttle model which uses high occupancy vehicles to transport seniors within the general community on a regular schedule. A second provider, St. John’s Ambulance, is in the process of developing a standalone senior shuttle model.

Project Action

Project Action is a third sector organization and the only standalone shuttle operator in Bermuda whose service is primarily senior-focused. The organization operates two custom-built, wheelchair-accessible buses to serve the residents of more than ten senior residential care facilities plus seniors within the general community.

Project Action’s Red Bus (11 seats, 1 wheelchair space) delivers complimentary door-to-door service primarily within the central region for trip purposes that mostly involve non-emergency medical appointments, shopping, or visiting relatives. The bus employs a paid driver to run a regular Monday through Friday schedule from 6 am to 4 pm, plus one or two Saturdays per month depending on volunteer driver availability. Rides must be scheduled 24 hours in advance, though real-time scheduling can be accommodated. Over the first ten and one-half months of 2007, the Red Bus delivered 3,800 passenger trips (approximately 360 passenger trips per month) to a client base of 170 seniors and 20 wheelchair users, utilizing 65 percent of estimated total capacity.

Project Action’s Blue Bus (14 seats, 4 wheelchair spaces) is used to provide individually scheduled senior group trips mainly for social and recreational purposes, running approximately seven group rides across three to four days per week. The operation of this bus is dependent upon the availability of trained volunteer drivers.

²⁰ Chappell, Neena and Victor Marshall, *A Study of the Needs of Elderly People in Bermuda* (Bermuda: 1991).

St. John's Ambulance

St. John's Ambulance is well known for its emergency medical care and transport services at Bermuda's major community events. The organization is also in the process of developing a senior shuttle model based on modified wheelchair-accessible ambulances. The organization has set up its first ambulance and is currently recruiting and training volunteer drivers.

Senior-Focused Benefits

- Seniors ages 60 and over get priority and ride free of charge.
- Senior-friendly service.

Senior Segments Served Well

- Generally Mobile, Ambulatory Disabled, and Wheelchair-Bound seniors who live in a shuttle-accessible location.

Volunteer Car-Ride

The Bermuda senior transportation landscape currently includes two primary providers who operate a volunteer car-ride model, based on volunteer drivers who use their own private cars to provide transportation. These providers are Bermuda Red Cross and P.A.L.S.

Bermuda Red Cross

With a mission to serve the elderly and indigent, the Bermuda Red Cross delivers free transport to non-emergency medical appointments. Twenty-three volunteer drivers located across the island provide service Monday through Friday from morning to 6 pm, depending on appointment timing. Drivers are required to provide curb-to-curb service and may additionally provide door-to-door service. The service currently has the capacity to deliver approximately 100 passenger rides per month, which the Red Cross estimates to be slightly more than half of total demand.

P.A.L.S.

A third sector organization whose mission is to serve cancer patients and families, P.A.L.S. provides free curb-to-curb or door-to-door service for transport to non-emergency medical appointments. Approximately 70 trained volunteers provide comprehensive support, including flexible transportation, for approximately 125 cancer patient beneficiaries who are living in their own homes. At least half of these beneficiaries are seniors.

Senior-Focused Benefits

- Seniors ride free-of-charge
- Senior-friendly service

Senior Segments Served Well

- Generally Mobile and Ambulatory Disabled seniors

Residence-Based Transport

15 to 19 senior residential care facilities are currently operated either privately or by government agencies. These homes combined comprise a total capacity in the range of 280 to 340 residents²¹.

²¹ Estimate based on residential care facility listings (*Changing Face of Bermuda's Seniors, Seniors' Resource Directory* - Bermuda Yellow Pages Online, *Directory of Services for Seniors and Persons With Disabilities* - National Office for Seniors and the Physically Challenged, Bermuda Online) and phone interviews with individual facilities.

While many senior residences partner with standalone senior transportation providers, particularly Project Action, five residences own and operate their own vehicles to provide transportation primarily for their residents²². These five residences together account for approximately 100 residents and 10 day patients. Transport is provided for a wide range of recreational activities, as well as grocery shopping, and non-emergency medical appointments. Their vehicles include six vans ranging in size from four to ten standard seats and one to seven wheelchair placements. The majority of the residences operate transport service for their residents on an activity-based schedule, providing approximately one to two rides per day or less. One residence, Summerhaven, provides shuttle service for physically disabled community members in addition to its own residents whenever possible²³.

Senior-Focused Benefits

- Seniors ride free-of-charge
- Senior-friendly service

Senior Segments Served Well

- Generally Mobile, Ambulatory Disabled, and Wheelchair-Bound seniors who are residents of a facility that owns a vehicle.

Destination-Based Transport

Two organizations offering senior-focused daytime activities operate a destination-based transport model for participants. This model involves an organization using its own vehicle(s) to transport seniors to the organization's central site where activities are held, as well as to off-site activities that are arranged by the organization.

Bermuda Senior Islanders' Centre

The Centre operates one 12-seater van on a daily basis, using mostly paid centre staff in addition to occasional volunteers as drivers. The van is used to transport 10 to 20 seniors per week to a range of activities organized by the Centre. The van is also employed for general office purposes.

King Edward VII Memorial Hospital - Continuing Care Division

Until 2006, the hospital's Continuing Care Division provided complimentary transportation for participants in its senior daycare activities program. A paid hospital driver operated the division's 15-seat bus, making one or two round trips per day to transport seniors from home to the hospital site and back, as well as to off-site appointments and recreational outings. The bus broke down in early 2006, and the Continuing Care Division has partnered with Project Action to provide transportation three days per week for participants. The division is currently planning to obtain a new bus by early 2008.

Senior-Focused Benefits

- Seniors ride free-of-charge
- Senior-friendly service

Senior Segments Served Well

- Generally Mobile and Ambulatory Disabled seniors who are participants in daytime activities run by an organization that is operating a destination-based transport model

²² Summerhaven, Lefroy House, Warwick Parish Lorraine Rest Home, Matilda Smith Williams Nursing Home, Sylvia Richardson Care Facility

²³ Summerhaven is a residence for physically disabled individuals, including seniors

SENIOR-FOCUSED TRANSPORT ASSESSMENT

As described earlier, a wide range of senior-focused models/approaches play an important role in addressing the needs of Bermuda's mainstream transport-disadvantaged seniors. Other than caregivers and special purpose personal vehicles, four senior-focused models/approaches are implemented by providers in the public, private, and third sectors, as summarized in Table 2 below. A detailed break-out of the summary table calculations is included in Appendix 2.

Table 2: Senior-Focused Transport Summary

Model/ Approach	Number of Providers	Vehicles	Estimated Ride Capacity (Rides per Year)
Senior Shuttle	1 current 1 in development	2 mini-buses	~ 4,000
Volunteer Car-Ride	2	93 volunteers use own private cars	~ 3,000
Residence-Based	5	6 vans	~ 7,500
Destination-Based	1 current 1 in development	1 van	~ 1,600

Cumulatively, nine senior-focused transport providers currently deliver approximately *16,000 senior-focused rides per year, addressing approximately 10 percent of the 153,600 estimated required rides*. These rides have the following fundamental characteristics:

- Weighting towards non-emergency medical appointments and shopping
- Operation mainly during weekday, daytime hours
- Concentration within the island's central region

Senior-Focused Transport Providers

For the vast majority of senior-focused service providers, delivering transportation is an integral part of a broader mission. The individual missions of these providers show a high degree of overlap in their focus on meeting the overall needs of Bermuda's seniors.

Gaps in Senior-Focused Capacity

Based on the overview above, the senior-focused transport space exhibits limited capacity in the areas of a) high-priority trips, and b) convenience factors.

a) Limited Capacity for High-Priority Trips

Non-emergency medical appointments and shopping can be regarded as high-priority trip purposes for seniors. This importance is reflected in the corresponding high prioritization of these trip purposes among senior-focused transport services around the world. Approximately 8,300 of Bermuda's senior-focused transport space's 16,000 total rides focus on medical and shopping trip purposes. This capacity addresses 7 percent of the estimated 115,200 rides (38,400 medical appointments + 76,800 shopping) required by Bermuda's mainstream transport-disadvantaged seniors.

b) Limited Capacity with Convenience Factors

The typically limited resources available in most communities for providing senior-focused transport naturally lead to a focus on high-priority trips and on maximizing operational efficiency. This also leads to a situation where senior-focused transport options do not offer service attributes with the level of convenience provided by mainstream options. As in many communities, Bermuda's senior-focused transport space offers limited capacity of services with the following convenience-related service attributes:

- Transport for trip purposes other than medical appointments or shopping
- After-hours or weekend service
- Service for pickup or drop-off locations in the East and West regions
- Real-time or short notice ride scheduling

IV. SENIOR-FOCUSED TRANSPORT BENCHMARK MODELS

The challenge of providing sufficient senior transportation is by no means unique to Bermuda. Communities throughout the developed world are experiencing similar demographic trends, and are faced with similar conditions in which a rapidly growing senior population is no longer able to effectively make use of mainstream transportation options. The unique contexts of each community have prompted the development of a new range of senior-focused solutions that supplement mainstream transport in order to address the unmet transportation needs of the local senior population.

Our study of the global landscape benchmarked more than 25 examples of senior-focused transport services in order to assess their applicability to Bermuda. While our study examined a wide range of community contexts and services, these services are categorized under six major models/approaches as shown in Table 3 below:

Table 3: Senior-Focused Benchmark Models/ Approaches

Model	Model Overview	Benefits	Challenges
Senior Shuttle	High-occupancy, accessible vehicles are used to transport seniors and often disabled individuals to and from common destinations along fixed routes. Trips are typically prioritized for non-emergency medical, grocery and other shopping, and recreational purposes.	<ul style="list-style-type: none"> ▪ Efficient group transport to common destinations 	<ul style="list-style-type: none"> ▪ High cost vehicles ▪ Limited geographic area and operating hours required to maintain efficiency ▪ Door-to-door service constraints due to vehicle size and multi-passenger transport
Volunteer Car-Ride	Volunteers drive their own cars to transport seniors for a range of trip purposes. Volunteers may or may not provide physical assistance.	<ul style="list-style-type: none"> ▪ Low operating cost ▪ Leverage existing private cars ▪ Economies of scale 	<ul style="list-style-type: none"> ▪ Volunteer recruitment, retention, training, liability
Taxi Subsidy	Eligible seniors are provided with coupons that can be redeemed for fare discounts on rides using standard or wheelchair-accessible taxis for any trip purpose within a designated geographic area.	<ul style="list-style-type: none"> ▪ Leverage existing taxi vehicles ▪ Relatively simple to implement 	<ul style="list-style-type: none"> ▪ High operating cost ▪ Limited economies of scale
Centralized Referral	A central call center fields ride requests and provides a referral to the most appropriate transport service operator.	<ul style="list-style-type: none"> ▪ Increases information access ▪ Relatively simple to implement 	<ul style="list-style-type: none"> ▪ Requires a base transport capacity to which to refer callers ▪ Mainly valuable in an information-challenged environment
Centralized Brokerage	A central coordinating entity fields ride requests and dispatches requests through a network of existing mainstream and senior-focused transportation service providers.	<ul style="list-style-type: none"> ▪ Increases overall efficiency of transport operator network ▪ Individual operators reduce expenses by sharing costs 	<ul style="list-style-type: none"> ▪ Requires a base senior-focused transport capacity to coordinate

Model	Model Overview	Benefits	Challenges
Hybrid Model - Independent Transportation Network (ITN®)	Hybrid of mainstream taxi, senior shuttle, and volunteer car-ride models. Volunteer and paid drivers transport seniors using private cars.	<ul style="list-style-type: none"> ▪ Leverages existing private cars ▪ Allows each car and driver to transport multiple seniors via shared rides ▪ Addresses volunteer supply constraints through attractive volunteer driver position, seamless integration of paid drivers, and volunteer incentive programs 	<ul style="list-style-type: none"> ▪ Lower sustainability due to small population ▪ One-car-per-household restriction may present challenges for volunteers in shared households with multiple drivers

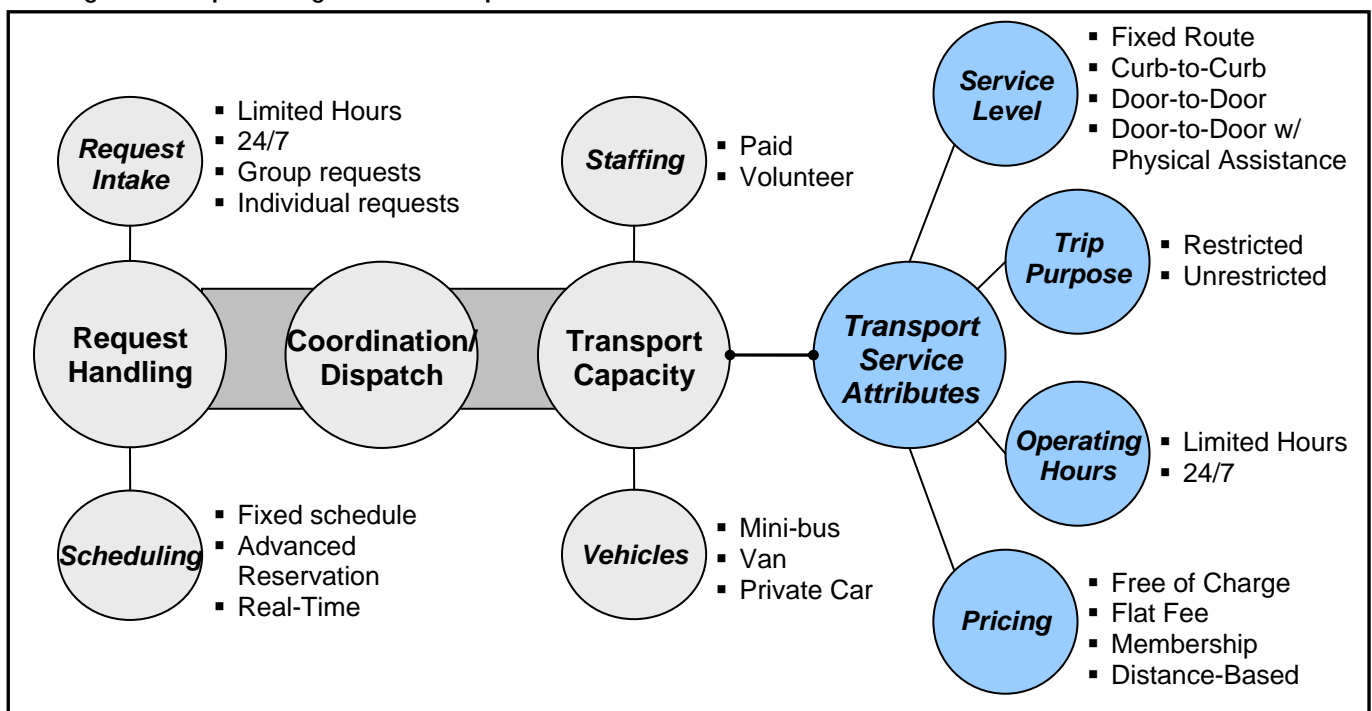
BENCHMARK MODEL/ APPROACH ANALYSIS

Each benchmark model/approach has been analyzed according to the following formula:

$$Model/Approach = Operating Model + Organizational Structure + Funding$$

The operating model specifically encompasses the core of each benchmark model/approach, and is analyzed in terms of an operating model framework with its major components shown in Figure 4 below. While separated for the sake of analytical clarity, in actuality all of an operating model's components are inextricably linked. For example, the nature of a model's transport capacity greatly determines what transport service attributes are possible and what types of request handling and coordination/dispatch are required.

Figure 4: Operating Model Components



Operating Model Components

The following major components are analyzed for the operating model of each benchmark model/approach.

1. Request Handling

Accepts incoming requests for rides from customers and schedules them before they are transferred to the coordination/ dispatch component.

2. Coordination/Dispatch

Allocates transport capacity accordingly to accommodate ride requests.

3. Transport Capacity

The *vehicle* capacity and *staff* capacity that are used to deliver the transport service.

4. Transport Service Attributes

The key attributes of the transport service that characterize it and determine its value to passengers, including service level, trip purpose restrictions, operating hours, and pricing.

SENIOR SHUTTLE MODEL

The senior shuttle is a highly popular model/approach for providing senior transportation, and many communities implement varieties of this model. The model can be considered a mass transit-type solution, but one which is implemented on a limited scale for a smaller targeted population with specialized needs. The following senior shuttle examples were benchmarked:

- Boston Senior Shuttle - *Boston, Massachusetts*
- Senior Services - *King County, Washington*
- Dearborn Senior Services - *Dearborn, Michigan*
- Indianapolis Senior Grocery/ Shopping - *Indianapolis, Indiana*
- Broomfield Easy Ride - *Broomfield, CO*
- Regional Transportation Program (RTP) - *Portland, Maine*
- Cambridge Senior Shuttle - *Cambridge, Massachusetts*
- SCM Transportation - *Somerville, Massachusetts*
- Washington Elderly Handicapped Transportation Service (WEHTS) - *Washington, DC*

Operating Model Components

Request Handling

The request handling component of the senior shuttle model varies in relation to the service level provided (described below in Transport Service Attributes). Shuttles that run a fixed route may not accept any ride requests. Instead they rely upon seniors being present at stop locations at the correct times according to a fixed schedule. If the shuttles do not run a fixed route and schedule, the senior shuttle model requires a central call center to handle ride requests. Those that do group pickups may accept ride requests only from community partners such as senior residences. Such group requests may be processed as advanced reservations or may follow a preset fixed schedule. A small number of shuttles accommodate individual ride requests and will schedule these requests via an advanced reservation system.

Coordination/Dispatch

The coordination and dispatch of transport capacity is handled in accordance with the attributes of the transport service being provided, as described earlier.

A senior shuttle model that accommodates individual ride requests requires the highest level of dispatch resources, followed by those that accommodate group ride requests. A senior shuttle model which runs a fixed route and schedule will require the least level of dedicated dispatch resources.

Transport Capacity

The senior shuttle model is based upon the use of high-occupancy vans or mini-bus vehicles. Many benchmark examples use vehicles that are wheelchair-accessible. Paid drivers are generally required because of vehicle licensing requirements and to support regular daily operating hours (described below). Trained volunteer drivers, however, may be used for one-off scheduled trips.

Transport Service Attributes

To operate efficiently, senior shuttles need to provide shared rides for seniors along fairly standard routes to common destinations. Shuttles typically offer curb-to-curb service due to the constraints of using high-occupancy vehicles. Door-to-door pickups and drop-offs are usually prevented both by the physical size of the vehicles, and by the logistical limits of having to transport multiple passengers. The shared ride arrangement combined with limited capacity means that trip purposes are typically prioritized in the following order: non-emergency medical appointments, followed by grocery shopping, and then social and recreational activities. To maintain efficiency and a minimum level of capacity utilization, the majority of benchmarked models run a regular weekday schedule of six to eight hours per day. Specific origins and destinations may be rotated and service designated for only certain days of the week. Services are generally provided either free of charge or for a nominal flat fee.

Organizational Structure and Funding

Senior shuttles are typically operated and funded by local government departments on ageing or human services; others are operated by private nonprofit organizations that are funded primarily through government contracts.

Key Benefits and Challenges for Bermuda

Benefits

The senior shuttle model is effective for maximizing transport capacity to move large groups of seniors between common departure points and destinations along fairly standard routes, while maintaining a relatively low number of vehicles. This is particularly true in Bermuda where the high priority trip of non-emergency medical appointments is frequently associated with one common destination, King Edward VII Memorial Hospital.

Challenges

The core feature that makes senior shuttles an efficient model for mass transport of seniors—high-occupancy vehicles—is also the main source of challenges to implementing the model in Bermuda. First is the high cost of manufacturing, importing, operating, and maintaining high-occupancy vehicles. Second is the size of the vehicles which places constraints on service attributes including service level, pick-up/drop-off locations, and operating hours.

In order to maintain efficient operations, individual shuttles must typically offer only fixed route or curb-to-curb service and operate within a limited geographic area during weekday daytime hours so that a sufficient number of seats can be filled on each trip while still maintaining reasonable travel times for the majority of passengers. And lastly, Bermuda's small roads offer a particular challenge, making many pickup/drop-off locations inaccessible to shuttle-sized vehicles, thus placing an additional constraint on offering door-to-door service.

VOLUNTEER CAR-RIDE MODEL

Many communities have developed grassroots volunteer car-ride programs to transport seniors, particularly organized by places of worship and civic engagement organizations. While these examples provide a low cost and important service for local communities, relatively few examples were found to have implemented a formalized volunteer car-ride model at scale and with a consistent service level. The following examples of the volunteer car-ride model were benchmarked:

- Ride Connection - *Greater Portland, Oregon*
- Transportation Reimbursement and Information Project (TRIP) - *Riverside County, California*
- Indianapolis Volunteer Medical - *Indianapolis, Indiana*
- Pilgrim Church - *Harwich Port, Massachusetts*

Operating Model Components

Request Handling

Grassroots implementations of the volunteer car-ride model frequently have sign-up forms posted within community locations both for seniors to indicate their ride needs and for volunteers to indicate their availability to provide rides. This model often requires an advance reservation to schedule a ride, because real-time scheduling is difficult to implement without a minimum level of resources to coordinate volunteer drivers. Larger scale examples of the volunteer car-ride model maintain dedicated staff to support call-in numbers and scheduling.

Coordination/Dispatch

The coordination of rides in grassroots benchmark examples consists of seniors being provided with the contact info of available volunteers. The volunteer and senior are responsible for making their own ride arrangements. Larger scale benchmark examples use dedicated staff to centrally manage the dispatch process, making use of technology to allow the matching of ride needs with volunteer availability.

Transport Capacity

Volunteer car-ride transport capacity is based upon individual volunteer drivers who transport seniors using their own private cars.

Transport Service Attributes

Benchmark examples of the volunteer car-ride model offer either a door-to-door or curb-to-curb service level, with the level of additional assistance offered varying by example and by individual driver. Pickup and drop-off locations are generally flexible, though examples with limited capacity prioritize medical and shopping-related trips. The reliance upon volunteer drivers creates challenges in maintaining regular operating hours. Again stemming from the volunteer-based transport capacity, services are typically provided free of charge.

Organizational Structure and Funding

The volunteer car-ride model is generally operated by either local community groups or third sector organizations.

Key Benefits and Challenges for Bermuda

Benefits

The two major benefits of implementing the volunteer car-ride model in Bermuda are that it is relatively low cost to operate and it leverages existing private cars.

Challenges

The challenges of implementing the volunteer car-ride model in Bermuda are common to any volunteer-based model in any community: recruitment, training, retention, and liability. However, Bermuda may face particular challenges due to the volunteer supply constraints described earlier.

TAXI SUBSIDY MODEL

The taxi subsidy model allows seniors to obtain door-to-door taxi transportation at a subsidized portion of the market rate. The model uses established taxi operator networks and supplements them with a user-side subsidy. The subsidy is typically delivered in the form of coupons which are provided to eligible seniors by local government agencies concerned with ageing or human services. The coupons can be redeemed for fare discounts by local taxi operators for any range of trip purposes. Many benchmark examples also include subsidies for travel on public transport such as trains and buses. However, since Bermuda's Public Transportation Board already offers free travel on public transit for seniors, the benchmark research was focused on the following examples that provide subsidies specifically for travel using taxis:

- Cambridge Senior Taxi - *Cambridge, Massachusetts*
- WEHTS/ Call 'n' Ride Program - *Washington, DC*
- Cambridge Accessible Taxi - *Cambridge, Massachusetts*

Operating Model Components

Request Handling

Seniors first obtain coupons from the local government human services agency managing the subsidy program. Agencies offer a limited set of coupons per senior per week, with additional coupons provided only after the allotted ones have already been used. Hours for purchasing coupons coincide with the standard business operating hours for the agency. Once seniors are in possession of the coupons, local taxi operators field ride requests as they do for any customer, typically a call-in number that is available 24/7. Scheduling is handled in a standard manner and allows both real-time requests and advanced reservations.

Coordination/Dispatch

Local taxi operators use their standard dispatch infrastructure and processes.

Transport Capacity

The taxi subsidy model leverages the existing vehicle and paid driver capacity of local taxi operators.

Transport Service Attributes

The transport service attributes of the taxi subsidy model are equivalent to those of local taxi operators. As such, the service level is typically door-to-door though additional physical assistance is typically not provided. Services are provided 24/7 with no restrictions on trip purpose. The pricing of rides is a function of standard taxi meter rates that are set within each community, less the amount of the discount coupons. The discount amount varies according to local market conditions. As an example, Cambridge Senior Taxi provides coupons which allow a \$2.25 discount off taxi fares of \$2.25 to \$6.50 (discount between 35 and 100 percent), and a maximum \$4.50 discount off taxi fares over \$6.50 (discount of 70 percent and less).

Operating Structure and Funding

The taxi subsidy model as a whole requires the collaboration of two major entities—local taxi operators to provide the transport capacity and a public sector entity to manage coupon distribution and redemption. Taxi operators must be willing to accept coupons in place of cash and then redeem them at the public sector entity for payment. Theoretically, a third sector organization may also manage the coupon distribution and funding through grants and individual donations, but our study found no benchmark examples of this arrangement.

Key Benefits and Challenges for Bermuda

Benefits

One major advantage of the taxi subsidy model is that it leverages existing vehicles and is generally simple to implement, since the request handling, coordination/dispatch and transport capacity components of the model are already in place with the existing taxi operator network.

Challenges

The taxi subsidy model has two primary challenges: a potential high operating cost due to the minimum coupon amount required to provide value to senior passengers; and low potential for economies of scale.

CENTRALIZED REFERRAL MODEL

The centralized referral model supplements an existing senior transport landscape by adding a request handling component that provides individualized transport information. This model is based around a central entity which accepts phone calls from seniors who need rides. The phone call is used to assess a senior's individual travel needs and then directly refer the senior to the most appropriate service. Informal examples of this model likely exist in many communities. However, the following two formalized examples were benchmarked:

- Access Services/ RIDEINFO - *Los Angeles County, California*
- Transportation Reimbursement and Information Project (TRIP) - *Riverside County, California*

Operating Model Components

Request Handling

A typical central call center accepts ride requests during standard business hours. In order to make an informed referral, call center staff who are responsible for request intake ask a series of questions to determine a caller's individual transport needs.

Based on this information, the call center staff refers the caller to the most appropriate transport option out of locally available options. The centralized referral model does not include a scheduling function.

Coordination/Dispatch

The coordination/dispatch function is handled by individual transport service operators.

Transport Capacity

The capacity for transporting passengers is provided by individual transport service operators.

Transport Service Attributes

The attributes of the transport service provided varies by each individual transport service operator.

Operating Structure and Funding

The centralized referral model is generally operated by either the public sector or third sector organizations.

Key Benefits and Challenges for Bermuda

Benefits

The centralized referral model is among the most straightforward models to implement. It delivers the most value in an environment where many transport options exist and seniors either lack full information about options, or are unable to make a decision because they are overwhelmed by too much information. As described in an earlier section, seniors in Bermuda indicate a scarcity of information about the transport options that are available to them, thus implying that a centralized referral model may be of value. Due to the shortage of senior-focused transport capacity in Bermuda, the main benefit would be in directing seniors who are capable of using mainstream transport to those mainstream options already available to them.

Challenges

The primary challenge of implementing the centralized referral model in Bermuda is the constrained capacity of senior-focused transport options. Limited value is gained by providing centralized referrals to transport services which do not have the capacity to accept additional ride requests. Also, given Bermuda's size, it is unlikely that seniors who could use mainstream transport options are currently unaware of those options. Therefore it is also somewhat unlikely that they would benefit from a central referral service.

CENTRALIZED BROKERAGE MODEL

The centralized brokerage model offers a solution for aggregating and coordinating transport capacity across multiple established senior-focused transport operators. Individual transport operators join a larger senior transport network. The model is built upon centralized request handling and coordination/dispatch components that are developed to supplement this existing network. The result is greatly increased efficiency and capacity utilization of the network as a whole, thus increasing the total capacity of the entire network beyond the sum of the capacities of the individual operators.

As an example, Senior Transportation Connection (STC) in Cuyahoga County, Ohio (Cleveland area) leverages a network of nearly 60 municipal and non-profit organizations providing specialized transportation services for older persons. Coordination is achieved through a centralized management structure, and by integrating the scheduling and dispatching functions of local municipal and nonprofit providers into one centralized call center. This call center is built around a state-of-the-art software system²⁴. The following examples of the centralized brokerage model were benchmarked:

- Senior Transportation Connection (STC) - *Cuyahoga County, Ohio*
- Florida Commission for the Transportation Disadvantaged - *Tallahassee, Florida*
- Ride Connection
- RTP/ Rider's Choice program - *Portland, Maine*

Operating Model Components

Request Handling

This model relies upon a central call center that accepts individual ride requests, typically during standard business hours. Requests can be scheduled in real-time or in advance, depending on the individual transport service operator who is assigned to handle the ride request.

Coordination/Dispatch

This represents the core component of the centralized brokerage model. The model requires that the coordination/dispatch function is effectively centralized and that the individual transport service operators become members of the senior transport network. The centralized component then allocates scheduled ride requests among individual operators within the network.

Transport Capacity

The capacity for transportation is provided by individual operators who are members of the larger network and agree to provide capacity as needed to accommodate ride requests that are relayed through the centralized coordination/dispatch component. Operators necessarily provide a senior-focused transport service.

Transport Service Attributes

Because the model relies upon a network of existing providers, service attributes such as service level, operating hours, etc. vary by individual provider. However, the centralized brokerage model often requires network members to meet a common set of standards regarding service quality and safety.

Operating Structure and Funding

Implementation of a centralized brokerage model requires a collaboration of multiple entities. The centralized request handling and coordination/dispatch components are typically operated by a third sector organization or multi-sector collaborative. Individual transport operators are required to provide the transport capacity, and may include the public sector, private sector companies and third sector organizations.

²⁴ Senior Transportation Connection website: <http://cuyahogaseniorsride.com>.

Key Benefits and Challenges for Bermuda

Benefits

Overall, the coordinated brokerage model increases overall efficiency across a network of transport operators, because it assigns the most appropriate operators to address ride requests. Additionally, individual senior-focused transport operators share the costs of maintaining centralized request handling and coordination/dispatch functions, thereby collectively saving resources.

Challenges

Similar to the centralized referral model, the major challenge of implementing the centralized brokerage model in Bermuda is the limited capacity of senior-focused transport options. In communities where the model is implemented successfully, there already exists a wide array of senior-focused transport service operators that is available to be coordinated.

HYBRID MODELS

Hybrid models combine various elements of the pure models described above. The following hybrid models were benchmarked:

- Independent Transportation Network (ITN®) - *Portland, Maine*

1. Independent Transportation Network (ITN®)

ITN® most closely resembles a hybrid of the mainstream taxi and senior-focused shuttle and volunteer car-ride models, incorporating positive elements of all three. Paid and volunteer drivers use private cars to provide door-to-door, individual or shared rides for eligible seniors. All service attributes are equal for rides provided by paid or volunteer drivers.

Operating Model Components

Request Handling

A central call center accepts individual ride requests 24/7. Scheduling may be done on a real-time or advanced reservation basis.

Coordination/Dispatch

A state-of-the-art technology platform, ITNRides™, is used to coordinate transport capacity and meet ride demand. The platform supports the scheduling of either individual or shared rides, so that an individual driver can schedule to drive four, five, or even six seniors at once, rather than just one. ITNRides™ also includes additional functionality to support finance, volunteer management, and fundraising.

Transport Capacity

The ITN® model delivers its rides via private cars that are operated by a network of paid and volunteer drivers. Volunteer drivers use their own cars while paid drivers use cars that are part of the ITN® fleet. By offering shared rides like a senior shuttle model, the capacity of each private car is increased compared to a typical volunteer car-ride model. The ITNRides™ platform supports a seamless integration of paid and volunteer drivers, so that volunteer drivers are scheduled to provide rides when available and paid drivers are used to fill in any volunteer capacity gaps.

An important note is the part-time, hourly structure of the paid driver position, thus rendering paid drivers a variable cost. This structure allows ITN® to efficiently maintain 24/7 transport capacity that is reliable and responsive.

Transport Service Attributes

Through the use of private cars, ITN® is able to provide door-to-door service without physical assistance between any pickup/drop-off locations within its service area. Service can be used therefore for any trip purpose, at any frequency, and is available 24/7. Pricing is a combination of a nominal annual membership fee plus a distance-based ride fee. The distance-based pricing schedule is designed so that seniors typically pay half the true cost of a ride. Substantial discounts are offered for shared rides and for rides that are booked at least one day in advance.

Organizational Structure and Funding

The ITN® network consists of a national third sector organization, ITNAmerica®, which oversees a network of local affiliates. Each local affiliate is an independent third sector organization which operates a local ITN® program under a rigorous set of affiliate requirements. The model is designed so that membership and ride fees cover 50 percent of costs with the remainder of revenue raised from a diverse community funding base of foundations, corporations, local small businesses, and individuals.

Key Benefits and Challenges for Bermuda

Benefits

An ITN® model applied in Bermuda offers multiple potential benefits. First, this model would leverage Bermuda's base of existing personal vehicles, further increasing the capacity of each car and driver by supporting the delivery of shared rides. Also, the well defined and direct service nature of the volunteer driver position offers a strong incentive for volunteer recruitment, a priority in Bermuda's volunteer-constrained environment. The ITN® model additionally offers a range of attractive volunteer incentives that have helped it to maintain a large and dedicated volunteer driver base. The seamless integration of paid drivers further addresses this constraint by filling in any gaps in volunteer capacity, thereby allowing a more consistent level of service than is typically possible with the pure volunteer car-ride model.

Challenges

The ITN® model is currently implemented by affiliates located in United States metropolitan areas with a total population of 200,000 or more. Implementing the model in Bermuda would entail working with a total population that is one-third of the minimum size, resulting in a challenge to deliver enough rides to cover fixed operating costs at a 50 percent sustainable level. An additional potential challenge is Bermuda's one car-per-household restriction, which may present a barrier for volunteers living in shared households with multiple drivers.

V. SENIOR-FOCUSED TRANSPORT RECOMMENDATIONS

Bermuda, like every community aiming to address its seniors' unmet need for transportation, must work within its own unique environment in order to institute an effective solution. As described in earlier sections, the Bermuda context includes a robust existing senior transportation landscape consisting of mainstream and senior-focused transport models. This landscape has been, and continues to be, shaped by a set of key constraints that will further impact any new solution that is implemented. An effective Bermuda solution will necessarily leverage what is already in place while working within those constraints.

The benchmark analysis of the previous section highlights models that can be used to supplement Bermuda's current senior transportation landscape. While demonstrating success, these models all operate within a wide range of unique community contexts. Consequently, it is unlikely that a straight replication of one benchmark model in Bermuda will be as effective as a solution that combines the most effective elements of several models in order to maximize benefits and minimize the challenges.

In order to map out the basis for a series of solid recommendations, this section is organized according to the following outline:

- Key Solution Requirements
- Transportation Service Best Practices
- Recommended Systemic Strategy and Models/Approaches

KEY SOLUTION REQUIREMENTS

Based on the cumulative research and analysis, the following considerations have been identified as important to maximizing the outreach and effectiveness of any transport solution that is implemented in Bermuda. To ensure maximum chance of long-term success, any transportation solution should:

- Be efficient, scalable, and sustainable.
- Address the distinct transport needs of different senior population segments.
- Use the most cost-effective model for each segment, with the capacity of most specialized model focused towards addressing specialized transport needs.
- Leverage existing vehicles and infrastructure.
- Use a mix of paid and volunteer drivers.
- Complement existing services, while minimizing duplication, competition, or slowing down of existing systems.
- Capitalize on Bermuda's small geographic size and common destinations to maximize shared rides and fixed routes.
- Include reasonable service fees along a sliding scale to enhance sustainability, with higher fees for benefits such as short-notice scheduling.

TRANSPORTATION SERVICE BEST PRACTICES

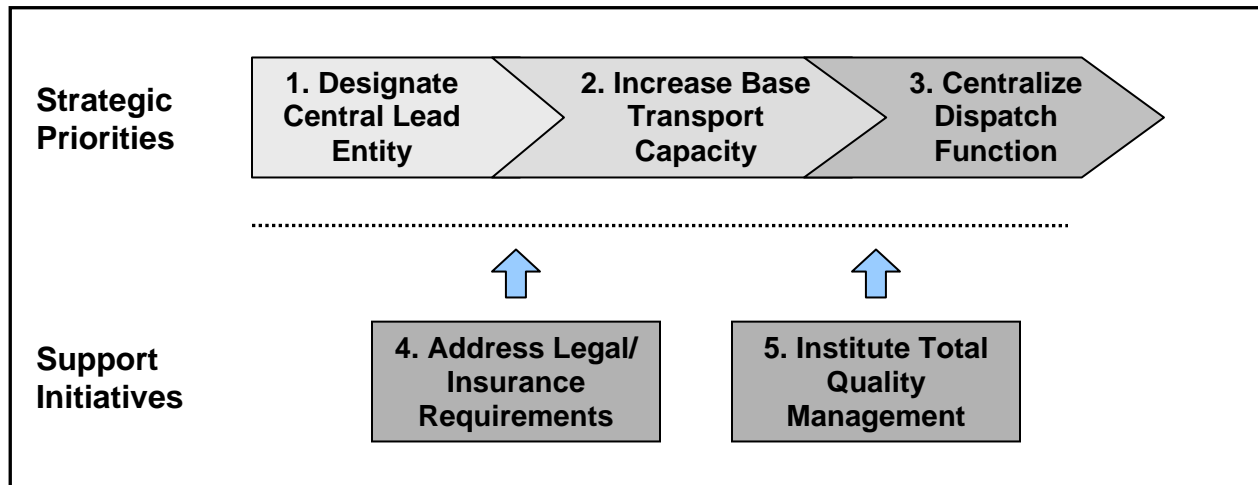
Based on local and international research into senior transportation, the following service-attribute best practices have been identified as critical to the quality level of any senior-focused transport service:

- Senior empathy and personal support
- Reliable/ dependable
- Responsive
- Easy to schedule/ use
- Affordable
- Allow a range of trip purposes

RECOMMENDED SYSTEMIC STRATEGY AND MODELS/ APPROACHES

The development of a comprehensive and effective senior transport solution in Bermuda will require the integration of multiple models/approaches that are implemented based on a solid systems-level strategy. The following strategy comprises three sequential, strategic priorities that are reinforced by two supportive initiatives, as outlined in Figure 5 below.

Figure 5: Systems-Level Strategy for Senior Transport



Strategic Priorities

1. Designate Central Lead Entity

As described earlier, Bermuda's senior transportation landscape comprises numerous key players across all three sectors. No one entity is likely to maintain a full solution on its own because of the complexities of this landscape, the diversity of the senior population, its transport needs, and the continued growth of the senior population.

Designating a central lead entity to function as an ongoing champion for senior-focused transportation in Bermuda would address the landscape's overall lack of coordination. It would also build the sustained momentum required for developing and continuously improving a comprehensive solution to address senior transportation needs at appreciable scale. Recruiting an existing entity to assume the lead role, versus launching a new organization, would reduce the time and costs of organizational ramp-up.

In this scenario, a central lead entity would be charged with the following core functions:

- Set a long-term vision for senior-focused transportation across the island
- Build a unified brand representing high quality transportation for Bermuda's existing and future seniors
- Build and organize critical financial and other support and partnerships among key stakeholders
- Support the development, testing, and continual refinement of solutions
- Manage centralized functions such as request handling, volunteer recruitment/management, etc.

2. Expand Base Transport Capacity

Transport capacity is essentially comprised of vehicles, paid drivers, and volunteer drivers. The expansion of transport capacity is the most essential element in meeting the needs of mainstream transport-disadvantaged seniors. This expanded transport capacity should account for the three major senior segments (generally mobile, ambulatory disabled, wheelchair-bound) and address both high-priority trips and other service needs.

2a. Implement an ITN® Model

As part of a systemic strategy, an ITN® model could function in two ways as a key lever to increase the effectiveness of the entire senior transport landscape. First, the model would ideally address the transport needs of those generally mobile and slightly ambulatory disabled seniors who live across the island, who can physically ride in private cars, and who can afford to pay reasonable fares in exchange for the increased flexibility and responsiveness of service. Addressing this area of need would thereby free up the capacity of other senior-focused transport operators who offer more specialized and/or lower-price services to service seniors with more specialized needs or lower income. Second, the model's core technology platform would provide a scalable foundation for centrally coordinating the dispatch functions for other senior-focused models.

Several core features of the model suggest its feasibility for success within the four constraints that shape Bermuda's senior transportation landscape. First, the model addresses vehicle constraints by leveraging an extensive supply of private cars, and allowing them to be used for shared rides. Second, the model addresses volunteer supply constraints by providing a flexible and low-barrier volunteer opportunity, seamlessly integrating paid drivers to fill any volunteer gaps, and offering several highly-valued volunteer incentives, e.g. Transportation Social Security™ allows volunteer drivers to build up transportation credits that can be donated to family members or saved for their own use later in life.

A number of additional contextual factors suggest the ITN® model's potential to address Bermuda's volunteer supply limitations: a steadily increasing population of young retirees (ITN® has seen that this population represents its most active volunteers), an overall high level of driver licensing, and the fact that transport providers who operate volunteer car-ride models in Bermuda currently maintain a cumulative base of nearly 100 volunteer drivers. This existing, but fragmented, volunteer base has high potential to be coordinated via the ITN® model's central dispatch function.

From an infrastructure and operations perspective, the ITN® model is highly scaleable and can be operated in a sustainable manner via its sliding fee structure. In order to significantly lower the barriers to implementation, Bermuda's central lead entity should strongly consider working with ITN® in some way to adopt its core technology platform.

2b. Scale Senior Shuttles

Scaling existing senior shuttle operators will help to address the capacity requirements for high priority trips along fixed routes to common destinations. Senior shuttles also offer one of the more efficient means of serving ambulatory disabled and wheelchair-bound seniors, and the approximately 400 seniors who live in senior residences. The shuttle model allows for additional physical assistance to be provided to senior passengers via the training and liability coverage of relatively few paid shuttle drivers.

The scaling of the senior shuttle model would require expanding the available pools of both vehicles and paid drivers. While the expansion of the supply of paid drivers would require a straightforward financial investment, the expansion of the high-occupancy vehicle pool must work within Bermuda's vehicle constraints. This constraint could be addressed through a partnership structure in which the idle capacity of the approximately 80 existing high-occupancy community service vehicles are borrowed or leased per time and/or distance used. A lease arrangement would generate a mutually beneficial relationship where senior shuttle operators gain access to additional high occupancy vehicles at a fraction of the cost by paying only for the usage, and vehicle-owning organizations convert their idle capacity into earned income. Vehicle-owning organizations with high potential for benefiting from such an arrangement include senior residential care facilities, churches, and day care centers.

In acquiring new vehicles that may be necessary, a key consideration will be the introduction of smaller para-transit type vehicles as were introduced by the PTB. The smaller size of these vehicles would allow physical access to a greater number of senior residences, and would help maintain adequate capacity utilization along less traveled routes.

2c. Consolidate Volunteer Driver Functions

As described earlier in the senior-focused transport assessment, senior-focused transport operators in Bermuda exhibit a degree of mission overlap in their intent to meet seniors' needs. This is particularly true of organizations that currently operate *senior shuttle* and *volunteer car-ride* models. A symptom of these overlapping missions is the duplication of core volunteer driver recruitment and volunteer management functions. The duplication of these functions leads to competition among transport operators for volunteer drivers and inefficient use of resources within the senior-focused space.

Consolidating these core functions within a central lead entity would allow participating providers to streamline operations and share resources, thereby reducing operating costs and increasing the ability to recruit and retain volunteer drivers. A centralized volunteer recruitment campaign could foster a community movement, offering volunteers options for driving either their own private cars or high-occupancy vehicles.

2d. Taxi Subsidy Coupons

The targeted implementation of taxi subsidy coupons can provide important supplementary transport capacity while leveraging Bermuda's existing taxi network. The model would provide seniors with an affordable option for one-off trips that are not covered by other services. Examples of possible focus areas include trips to designated destinations for short-notice medical appointments, and wheelchair-bound seniors who require use of a wheelchair-accessible taxi. Besides government and foundations, potential funding sources include local businesses who value the patronage of senior customers.

3. Centralize Dispatch Function

Once a critical mass of transport capacity is in place, Bermuda's senior transport landscape will be in an ideal position to benefit from centralization of the dispatch function. As described in the benchmark analysis section, all successful examples of centralized dispatch models operate in environment where there is a large pool of providers with senior-focus. This function could handle central dispatching for multiple service providers who are operating any number of transport models including an ITN® model, senior shuttles, volunteer car-rides, residence-based transport, and destination-based transport.

A centralized dispatch function could build off of a technology platform similar to the one developed for an ITN® model. Similar to the consolidation of volunteer driver functions, centralizing the dispatch function would allow participating transport operators to share resources and thereby reduce operating costs associated with request intake, scheduling, and actual dispatch itself.

Supportive Initiatives

4. Address Legal/ Insurance Requirements

The clarification or targeting of legal and/or insurance requirements will be an important supportive initiative for maximizing the effectiveness of the strategic priorities above. Efforts in this area should seek to lower or eliminate barriers to the provision of physical assistance to seniors by paid or volunteer drivers, the leasing of high-occupancy vehicles between organizations, and the straightforward matching between drivers and available vehicles. Potentially, such requirements may be addressed through policy solutions and/or collaborative product development with the local insurance industry. Several related options in this area have the potential to benefit seniors and generate ripple benefits for the private sector and overall community, e.g. formalized health insurance coverage of transportation that is used by seniors to access preventative medical care.

5. Institute Total Quality Management

In the effort to ensure high quality service across the senior transport landscape, Bermuda's senior transport providers would benefit from a total quality management effort that is overseen by the central lead entity. One element of quality management would be training of key driving personnel in passenger assistance techniques, as is used in para-transit industries. Quality management would also need to ensure the consistent application of the senior-focused transport best practices as described earlier.

VI. BUSINESS PLAN SCOPE OF WORK

The following scope of work outline describes the content of a consulting engagement in which Root Cause would work with key stakeholders on the planning of a Bermuda-based senior transportation solution. The engagement would be organized around two major phases. Phase I would involve working with a multi-stakeholder working group to review the results of this report, conduct high-level planning and designate a central lead entity. Phase II would involve Root Cause working closely with the designated central lead entity on the development of a full business plan.

Phase I. Form Multi-Stakeholder Working Group

- Include comprehensive mix of working group members
 - Transportation
 - Ageing/ Human Services
 - Senior Community
- Review research report/ feasibility analysis
- Prioritize senior segments to be targeted
- Select overall models/approaches to be developed based on recommended systemic strategy
- Designate existing or new central lead entity

Phase II. Develop Business Plan with Central Lead Entity

- Develop Social Impact Model
 - Define mission, vision, social change strategies
 - Define operating model(s)
 - Service delivery model (vehicle type, number of vehicles, staffing, routes if applicable, operating hours, scheduling procedures, etc.)
 - Define technology requirements
 - Select key indicators and develop management dashboard
- Define organization structure
 - Develop cost comparison of organizational structure options
 - Develop org chart, key job descriptions, governance structure
- Develop Financial Sustainability Plan
 - Identify short- and long-term funding sources
- Develop Implementation Plan
- Develop Action Plans

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Bermuda Housing Trust. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Bermuda Physically Handicapped Association. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Bermuda Red Cross. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Bermuda Senior Islanders' Centre. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Project Action. Interviewed by Anand Dholakia, Root Cause. Phone Interview.

Easter Lily Residential Home. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Elder Care Rest Home/ Elder Home Care. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Herb Gardens. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Lefroy House. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Lorraine Rest Home. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Matilda Smith Williams Nursing Home. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

P.A.L.S. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Mon Reve. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Orange Valley Centre, Department of Health. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Pleasantville Palms Nursing Home. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Summerhaven. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Sunny Vale. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Sunset View. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Sylvia Richardson Care Facility. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

Westmeath Rest and Nursing Home. Interviewed by Jessica Bloom, Root Cause. Phone Interview.

VIII. APPENDICES

Appendix 1: Estimated Need for Senior-Focused Transport

Appendix 2: Senior-Focused Transport Assessment

Appendix 1

Estimated Need for Senior-Focused Transport

The total required ride capacity for senior-focused transport in Bermuda can be conservatively estimated based on the modest assumptions in the following average mainstream transport-disadvantaged senior rider profile:

- Non-Emergency Medical Appointments: One round trip per month
- Shopping: Two round trips per month
- Social/ Other : One round trip per month
- *Total: Four round trips per month*

Assuming the above senior ride profile for a population of *1,600 mainstream transport-disadvantaged seniors*, the ride capacity for various trip purposes can be calculated as shown in the table below:

Trip Purpose	Individual Senior				1,600 Seniors
	Round Trips per <i>Month</i>	Round Trips per <i>Year</i>	Rides per Round Trip	Rides per Year	Rides per Year
Medical Appointments	1	12	2	24	38,400
Shopping	2	24	2	48	76,800
Social/ Other	<u>1</u>	<u>12</u>	2	<u>24</u>	<u>38,400</u>
Total	4	48	na	96	153,600

Appendix 2

Senior-Focused Transport Assessment

The following table summarizes the estimated ride capacity of senior-focused models/approaches currently being operated in Bermuda by all known providers, less transportation provided by caregivers and special purpose personal vehicles.

Model/Approach	Vehicles	Senior Ride Activity (Stated by Provider)	Estimated Annual Ride Capacity
Senior Shuttle			
Project Action	Mini-Bus 1: 4 w/c, 13 seats Mini-Bus 2: 2 w/c, 15 seats	3,800 rides per year	3,800
St. John's Ambulance	In development	na	na
Total	2 mini-buses		~ 4,000 rides
Volunteer Car-Ride			
Bermuda Red Cross	23 volunteers using private cars	100 rides per month	1,200
P.A.L.S.	70 volunteers using private cars	Rides vary. 125 total passengers, at least 50 percent are seniors.	1,826 ²⁵
Total	93 volunteers using private cars		~ 3,000 rides
Residence-Based			
Lefroy House	Van 1: 1 w/c, 4 seats Van 2: 4 w/c, 10 seats	4 outings per week. Many daily trips to appointments	3,494
Matilda Smith Nursing Home	Van: 2 w/c, 6 seats	Activity-based, 1 to 2 times per week	936
Summerhaven	Van: 7 w/c	10 rides per week (for seniors)	520
Sylvia Richardson	Van: 1 w/c, 6 seats	20 rides per week	1,040
Warwick Parish 'Lorraine' Rest Home	Van: 8 seats	One to two rides per day, 5 to 7 riders per week. Van used 10 hrs per week.	1,560
Total	6 vans		~ 7,500 rides
Destination-Based			
Senior Islanders' Centre	Van: 12 seats	10 to 20 people per week, van operated every day.	1,560
Bermuda Hospitals Board - Continuing Care Programme	In process of purchasing new vehicle	na	na
Total	1 van		~ 1,600 rides
GRAND TOTAL			~ 16,000 rides per year

²⁵ Conservative estimate, using Bermuda Red Cross as a benchmark. Assumes 70 volunteers deliver approximately 3,650 total rides (1,200 x 70/23 = 3,650), 1,800 of which are for senior patients (3,650 x 50%). This translates to an estimated 2 rides per senior per month.