# BUS FLEET MANAGEMENT PLAN

**for the**

# HONOLULU HIGH-CAPACITY TRANSIT CORRIDOR PROJECT

## City and County of Honolulu

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## City and County of Honolulu

**REVISIONS**

Modification to this Bus Fleet Management Plan will be made as necessary to conform to evolving project needs. As major revisions occur, the entire manual will be reproduced, bound, and distributed. For minor revisions, only the affected pages will be issued. Upon receipt, previous revisions of the document shall be destroyed.

| Revision No. | Date | Section(s) | Description |
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# Honolulu High-Capacity Transit Corridor Project

# Bus Fleet Management Plan

**April 2008**

City and County of Honolulu
Department of Transportation Services

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# 1 Introduction

Through the Honolulu High-Capacity Transit Corridor Project (HHCTCP), the City and County of Honolulu (City) is embarking on the development of a fixed-guideway system along an approximate 20-mile corridor from East Kapolei to Ala Moana Center. This 20-mile line is anticipated to be completed and open for service by the latter half of 2018 (FY 2019). As the line opens, transit service on O'ahu will change, with the fixed-guideway system taking over some of the load currently accommodated by trunk line bus routes and with other bus routes being restructured to facilitate transfers to fixed-guideway. As the fixed-guideway project is constructed and implemented, it is important to ensure that bus service is not degraded. To that end, this Bus Fleet Management Plan (BFMP) addresses all factors relevant to the City's abilities to maintain its current bus fleet, facilities, and levels of service throughout its service area and to provide the requisite capital and operating funds for that service. Additionally, the BFMP defines measures used for monitoring the quality of bus service. The BFMP describes the City's entire fixed-route bus fleet for a period from three-to-five years prior to construction of the fixed-guideway, over the duration of construction, and for at least one-to-three years after commencement of revenue operations. A separate fleet management plan for the fixed-guideway vehicles will be developed after the technology is selected.

The following sections of the BFMP include descriptions of:

- The existing fixed-route bus system;
- The current passenger demand and expected changes in passenger demand;
- The current fixed-route fleet and the plan for fleet replacement and expansion;
- Service quality and reliability measures; and
- The bus fleet maintenance plan.



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# 2 Transit System

Public transit on the island of Oahu is the responsibility of the City's Department of Transportation Services (DTS). The service is popularly known as *TheBus* for fixed route transit and *TheHandi-Van* for demand-responsive curb-to-curb service for Americans with Disabilities Act of 1990 (ADA) paratransit eligible individuals. Within DTS, the Public Transit Division (PTD) is responsible for managing the City's contract for bus and paratransit operations. By ordinance, the City is required to contract with a private, nonprofit corporation to manage, operate, and maintain the public transportation system on behalf of the City. Oahu Transit Services, Inc. (OTS) is the management firm operating *TheBus* and *TheHandi-Van*. OTS is the employer of record for all operating and maintenance personnel.

The service area for public transit encompasses the entire island of Oahu, which is approximately 600 square miles with approximately 910,000 residents. Most bus service is provided 21 to 22 hours per day with the exception of one bus route (#40/40A), which operates 24-hours per day. Paratransit service is provided during the same hours as the fixed route service. Current transit operating data described in the following sections is based on the tables of information DTS submits to the Federal Transit Administration's National Transit Database (NTD) for report year 2007 and previous years.

## 2.1 *TheBus* Routes

*TheBus* is currently operating 102 fixed routes and three (3) deviation routes (operated by the paratransit division) for a total of 105 routes. Of these, four (4) are limited stop routes (*CityExpress!* A, *CityExpress!* B, *CountryExpress!* C and *CountryExpress! E*) and 32 are peak period, peak direction only express routes. Three (3) of the express routes (Routes 201, 202 and 203 – all bound for Waikīkī) operate seven (7) days of the week. The 105 routes serve about 4,200 bus stops. Passenger amenities include approximately 980 passenger shelters and 2,400 benches. Table 2-1 presents a listing of all bus routes currently operated.

Table 2-1 identifies those routes serving the study area for the HHCTCP (denoted with a "y" for yes, "n" for no and "c" for connects). Many of the routes pass through the HHCTCP study area such as Route 40 and CityExpress! A. A route was identified as serving the HHCTCP corridor if at least 50 percent of its ridership is attributable to person trip origins within the study area. Routes identified with a "c" provide connections into the study area including all Community Circulators operating in Kapolei and Waipahu, Routes 4, 5, 6, 7, 10, 15, 17 and 31 in urban Honolulu, and Routes 71, 73 and 74 in Pearl City and 'Aiea. Express and local routes serving Windward and East Honolulu communities were not identified as operating in the study area even though they travel to downtown Honolulu, as impacts of the proposed fixed-guideway system are assumed to be minimal to their alignments or operating characteristics.



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## *Table 2-1: TheBus Routes*

| ROUTE | DESCRIPTION | WITHIN PROJECT CORRIDOR | ROUTE | DESCRIPTION | WITHIN PROJECT CORRIDOR |
|---|---|---|---|---|---|
| 1 | Kaimukī - Kalihi | y | 85 | Windward Express - Kailua | n |
| 1L | Downtown - Hawai'i Kai Limited | y | 85A | Windward Express - Ha'ikū | n |
| 2 | Waikīkī - School | y | 86 | Windward - Pearl Harbor Express | n |
| 3 | Kaimukī - Salt Lake | y | 86A | Kāne'ohe / Kahalu'u - Pearl Harbor Express | n |
| 4 | Nu'uanu - Punahou | c | 88 | Kahalu'u / 'Āhuimanu Express | n |
| 5 | Ala Moana - Mānoa | c | 88A | North Shore Express | n |
| 6 | Pauoa - Woodlawn | c | 89 | Waimānalo Express | n |
| 7 | Kalihi Valley | c | 90 | Pearl City Express | y |
| 8 | Waikīkī - Ala Moana | y | 91 | 'Ewa Beach Express | y |
| 9 | Pālolo Valley - Pearl Harbor | y | 92 | Makakilo Express | y |
| 10 | Kalihi - 'Ālewa Heights | c | 93 | Wai'anae Coast Express | y |
| 11 | Makalapa - Hālawa - 'Aiea Heights | y | 93A | Wai'anae Coast - Pearl Harbor Express | y |
| 13 | Waikīkī - Liliha | y | 95 | Hawai'i Kai - Pearl Harbor Express | n |
| 14 | St. Louis - Kāhala - Maunalani | y | 96 | Waipi'o Gentry Express | y |
| 15 | Makiki - Pacific Heights | c | 97 | Village Park Express | y |
| 16 | Moanalua Valley | n | 98 | Wahiawā / Mililani Park & Ride Express | n |
| 17 | Makiki - Ala Moana | c | 98A | Kunia / Wahiawā / Mililani - Waikīkī Express | n |
| 18 | University - Ala Moana | y | 101 | 'Ewa Gentry Express | y |
| 19 | Waikīkī - Airport - Hickam | y | 102 | Villages of Kapolei Express | y |
| 20 | Waikīkī - Pearlridge | y | 103 | Paiwa / Waikele Express | y |
| 22 | Beach Bus | n | 201 | 'Ewa Beach / Waipahu - Waikīkī Express | y |
| 23 | Hawai'i Kai - Sea Life Park | n | 202 | Paiwa / Waipahu - Waikīkī Express | y |
| 31 | Tripler - Airport | c | 203 | Kalihi / School Street - Waikīkī Express | y |
| 32 | Kalihi - Pearlridge | y | 231 | Hawai'i Kai - Hahaione Valley | n |
| 40/40A | Honolulu - Mākaha | y | 232 | Hawai'i Kai - Koko Marina | n |
| 41 | Kapolei - 'Ewa Beach | y | 233 | Kāhala Mall - 'Āina Haina | n |
| 42 | 'Ewa Beach - Waikīkī | y | 234 | Kāhala Mall - Wai'alae Nui | n |
| 43 | Waipahu - Honolulu - Ala Moana | y | 235 | Kāhala Mall - Wai'alae Iki | n |
| 44 | Waipahu - 'Ewa Beach | c | 236 | Kāhala Mall - 'Āina Haina - Hawai'i Kai | n |
| 52 | Wahiawā - Circle Island | y | 401 | Wai'anae Valley - Wai'anae Transit Center | n |
| 53 | Honolulu - Pacific Palisades | y | 402 | Lualualei Homestead - Wai'anae Transit Center | n |
| 54 | Honolulu - Pearl City | y | 403 | Nānākuli - Mā'ili - Wai'anae | n |
| 55 | Kāne'ohe - Circle Island | n | 411 | Makakilo Heights - Kapolei Transit Center | c |
| 56 | Honolulu - Kailua - Kāne'ohe | n | 412 | Pānānā Street - Kapolei Transit Center | c |
| 57/57A | Kailua - Waimānalo - Sea Life Park | n | 413 | Campbell Industrial Park - Kapolei Transit Center | c |
| 62 | Honolulu - Wahiawā Heights | y | 414 | Palahi'a Street - Kapolei Transit Center | c |
| 65 | Honolulu - Kāne'ohe - Kahalu'u | n | 415 | Kalaeloa - Kapolei Transit Center | c |
| 70 | Lanikai - Maunawili | n | 432 | East / West Waipahu | c |
| 71 | Pearlridge - Newtown | c | 433 | Waikele - Waipahu Transit Center | c |
| 72 | Wahiawā - Whitmore | n | 434 | Village Park - Waipahu Transit Center | c |
| 73 | Leeward Community College | c | 501* | Mililani Mauka Community Access | n |
| 74 | 'Aiea Heights - Hālawa Heights | c | 503* | Launani Valley / Waipi'o Acres Community Access | n |
| 76 | Waialua - Hale'iwa | n | 504* | Mililani South Community Access | n |
| 77 | Waimānalo - Kāne'ohe | n | A | City Express! - Waipahu - UH Mānoa | y |
| 80 | Hawai'i Kai Park & Ride Express | n | B | City Express! - Kalihi - Waikīkī | y |
| 80A | Hawai'i Kai Park & Ride Express - UH | n | C | Country Express! - Mākaha / Kapolei - Honolulu | y |
| 80B | Upper 'Āina Haina Express | n | E | Country Express! - 'Ewa Beach - Waikīkī | y |
| 81 | Waipahu Express | y | F2 | UH Mānoa - Aloha Tower Ferry Terminal | c |
| 82 | Hawai'i Kai Park & Ride Express / Kalama Valley | n | F3 | Waikīkī - Aloha Tower Ferry Terminal | c |
| 83 | Wahiawā Town Express | n | F11 | Wai'anae - Kalaeloa Ferry Terminal | c |
| 83A | Wahiawā / Mililani - Pearl Harbor Express | n | F12 | Makakilo - Kalaeloa Ferry Terminal | c |
| 84 | Mililani Express | n | F13 | Kapolei - Kalaeloa Ferry Terminal | c |
| 84A | Wahiawā / Mililani Express | n | | | |

*Source: DTS / TheBus; Effective 3/02/08*

Legend:
c – Connects
n – No
y – Yes
* – Deviation Route



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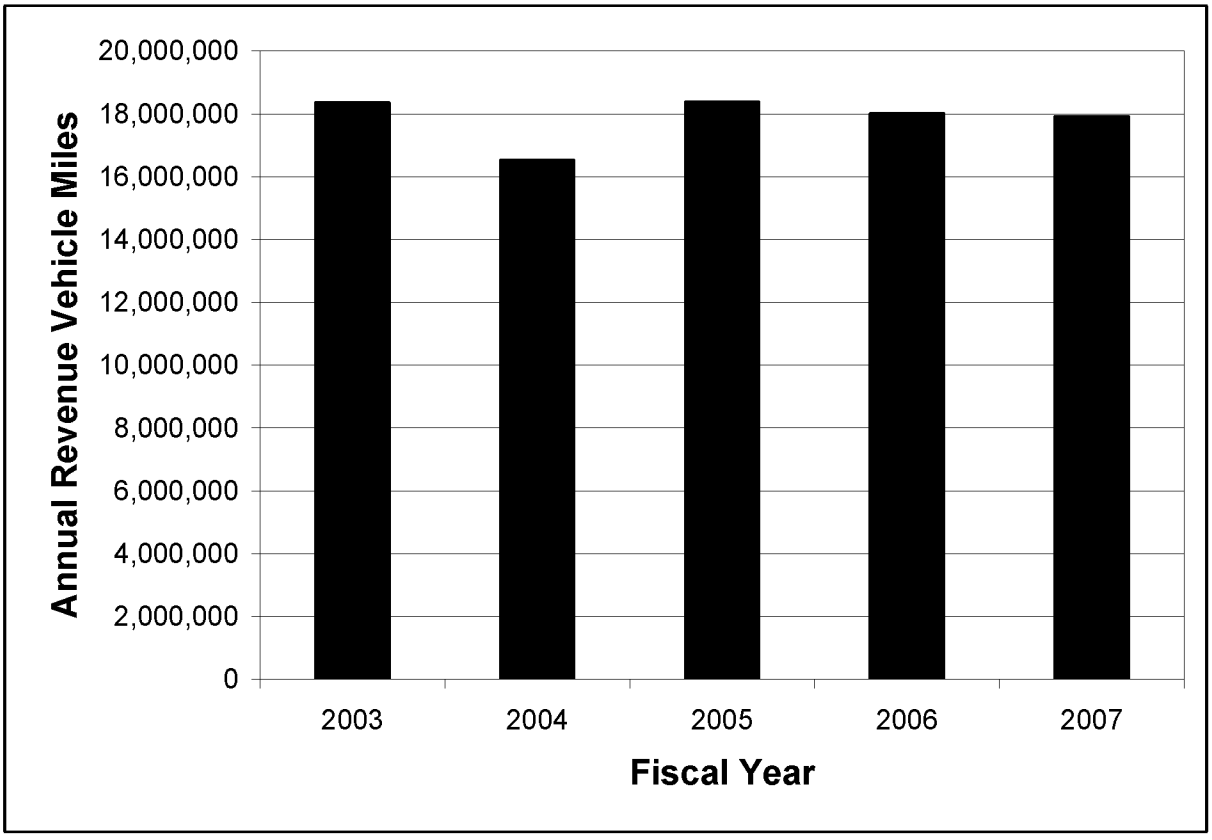
## 2.2 Annual Revenue Vehicle Miles and Hours

The fixed route service had 17,923,724 annual revenue vehicle miles in FY 2007. Figure 2-1 shows that the annual revenue vehicle miles supplied have remained approximately the same over the past five years, except for FY 2004 which was affected by a 34-day strike by *TheBus* operators that ended on September 29, 2003.

**Figure 2-1: Annual Revenue Vehicle Miles**




Source: National Transit Database



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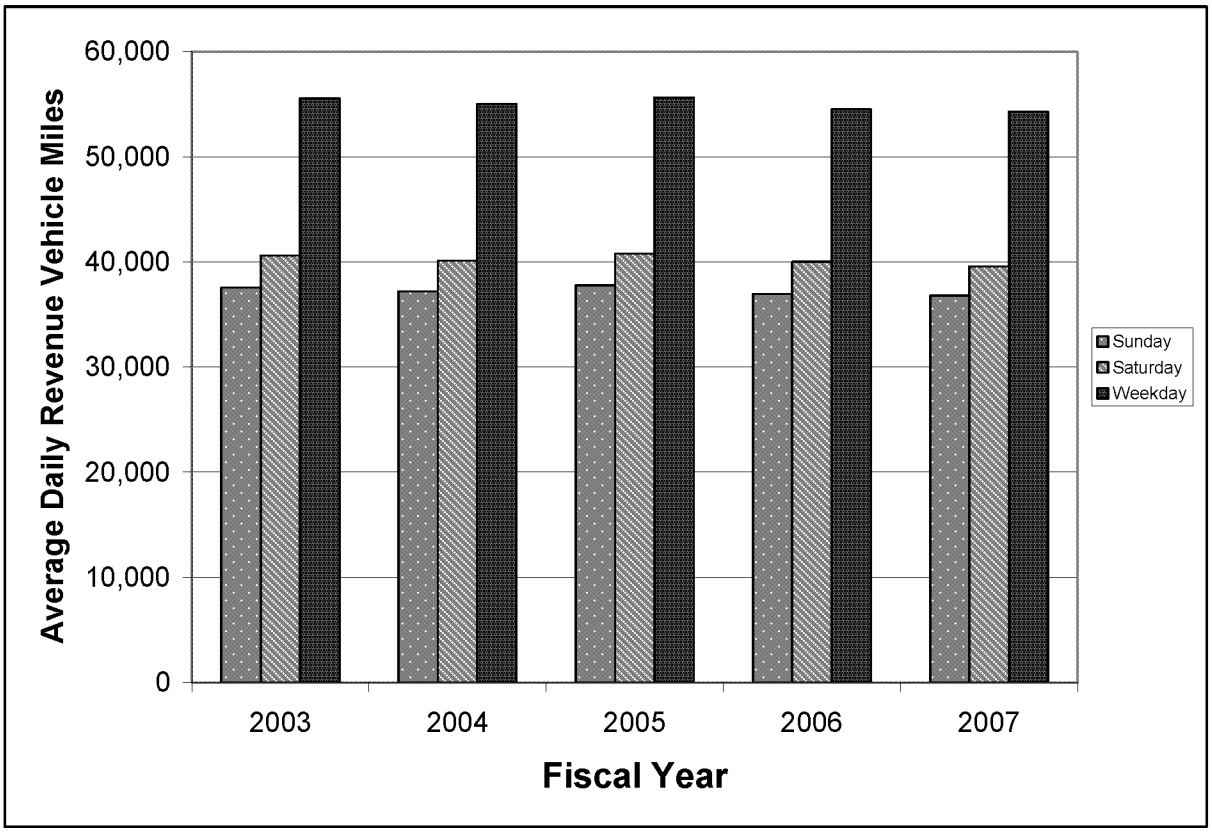
Figure 2-2 shows revenue vehicle miles supplied on an average weekday, average Saturday and average Sunday for the past five years. As can be seen, the service supplied has remained approximately constant over this time period. The average daily values for FY 2004 do not reflect the effect of a 34-day strike by *TheBus* operators that ended on September 29, 2003.

In FY 2007 average weekday revenue vehicle miles totaled 54,250. These miles were divided among route types as follows:

- Rapid Bus 11.2%
- Urban Trunk 24.6%
- Urban Feeder 5.8%
- Suburban Trunk 40.3%
- Suburban Feeder 2.2%
- Community Circulator 5.0%
- Peak Express 10.9%

**Figure 2-2: Average Daily Revenue Vehicle Miles**




Source: National Transit Database



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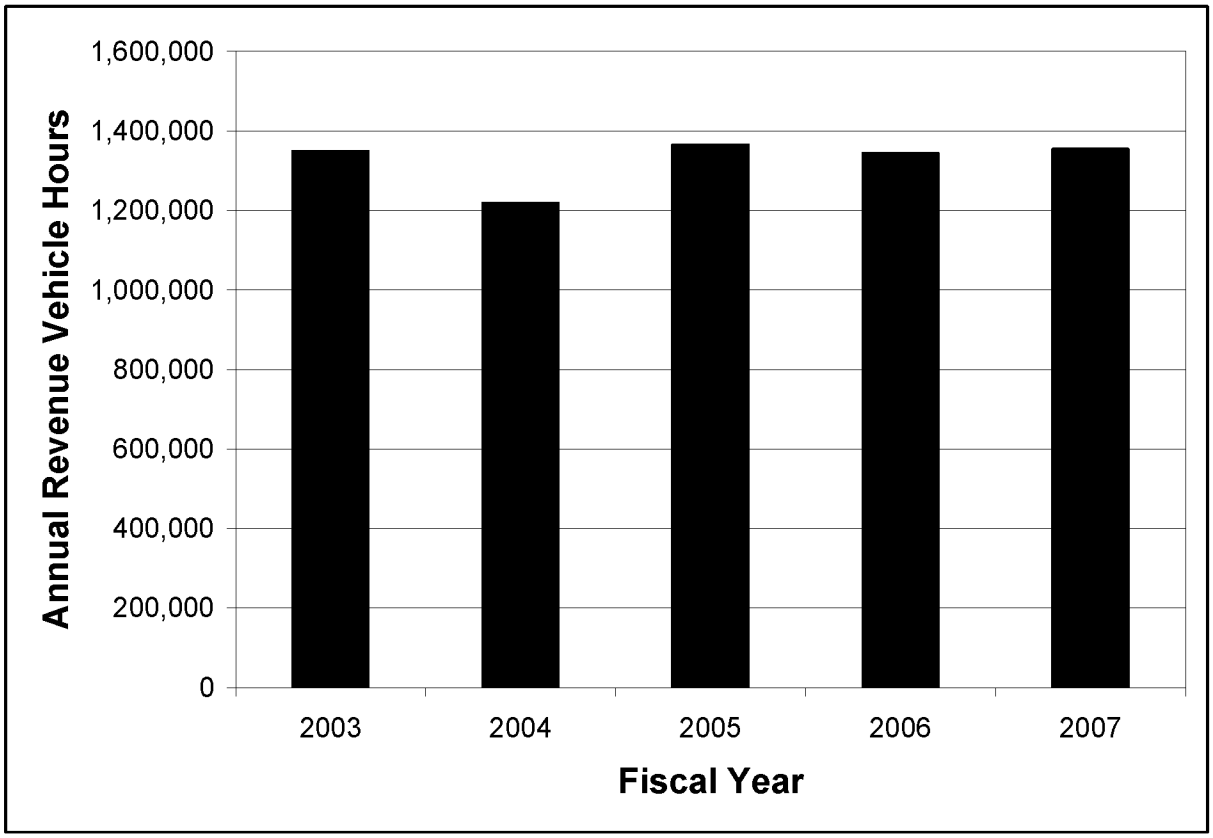
The fixed route service had 1,354,565 annual revenue vehicle hours in FY 2007. Figure 2-3 shows that the annual revenue vehicle hours supplied have remained approximately the same over the past five years, except for FY 2004 which was affected by a 34-day strike by *TheBus* operators that ended on September 29, 2003.

**Figure 2-3: Annual Revenue Vehicle Hours**




Source: National Transit Database



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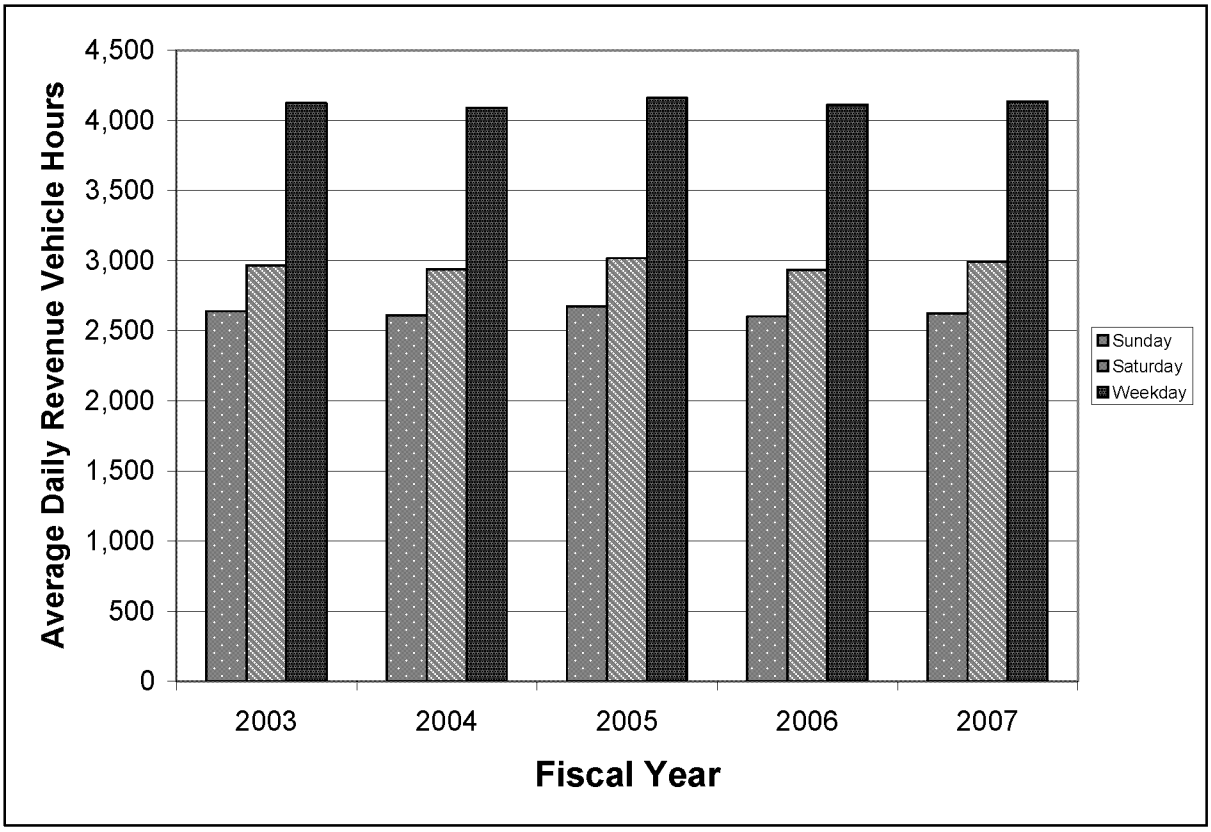
Figure 2-4 shows revenue vehicle hours supplied on an average weekday, average Saturday and average Sunday for the past five years. As can be seen, the service supplied has remained approximately constant over this time period. The average daily values for FY 2004 do not reflect the effect of a 34-day strike by *TheBus* operators that ended on September 29, 2003.

In FY 2007 average weekday revenue vehicle hours totaled 4,135. These hours were divided among route types as follows:

- Rapid Bus 10.6%
- Urban Trunk 35.7%
- Urban Feeder 6.0%
- Suburban Trunk 33.2%
- Suburban Feeder 1.9%
- Community Circulator 5.6%
- Peak Express 7.0%

**Figure 2-4: Average Daily Revenue Vehicle Hours**




Source: National Transit Database



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## 2.3 *TheBus* Fare Structure

Bus fares are set by the Honolulu City Council by ordinance. Current bus fares pursuant to Section 13-2.1 of the Revised Ordinances of Honolulu are shown in Table 2-2 below, along with prior fare structures. The current fare structure went into effect on October 1, 2003.

### *Table 2-2: TheBus Fare Structure*

[As of May 30, 2007. In dollars]

| Effective date | One-way cash fare | | Monthly pass | |
|---|---|---|---|---|
| | Adult[1] | Youth[2] | Adult[1] | Youth[2] |
| March 1, 1971 | 0.25 | 0.15 | (X) | (X) |
| March 2, 1971 | 0.25 | 0.10 | (X) | (X) |
| June 9, 1972[3] | .25, .50 | .10, .25 | (X) | (X) |
| March 15, 1974 | 0.25 | 0.10 | (X) | (X) |
| November 1, 1979 | 0.50 | 0.25 | 15.00 | 7.50 |
| June 18, 1984 | 0.60 | 0.25 | 15.00 | 7.50 |
| October 1, 1993 | 0.85 | 0.25 | 20.00 | 7.50 |
| July 1, 1995 | 1.00 | 0.50 | 25.00 | 12.50 |
| July 1, 2001 | 1.50 | 0.75 | 27.00 | 13.50 |
| July 1, 2003 | 1.75 | 0.75 | 30.00 | 13.50 |
| October 1, 2003[4] | 2.00 | 1.00 | 40.00 | 20.00 |

X Not applicable.

1. "Adult" means any person over the age of 17 who does not qualify as a "youth".
2. "Youth" means a person 6 through 17 years of age, subject to the presentation of a valid identification card establishing the age of the person. The term includes high school students, up to 19 years of age, with a valid high school identification card establishing the age of the student and the student's current enrollment, but excludes college, university and vocational training students if over the age of 17.
3. Zone fares initiated and later eliminated.
4. Other fares. Annual pass, adult: $440.00, youth: $220.00.
   Adult four-day pass: $20.00 for a four consecutive day period.
   Senior citizen, a person 65 years of age or older:
   one-way fare: $1.00 with valid TheBus senior card or valid US Medicare card;
   monthly pass: $10.00 with valid State ID card, driver's license, birth certificate or passport;
   monthly pass sticker: $5.00 with valid TheBus senior card;
   annual pass or renewal sticker: $30.00 with approved application.
   Person with a disability:
   one-way fare: $1.00 with valid disablity bus pass or valid US Medicare card;
   monthly pass: $10.00 with approved application or valid US Medicare card;
   monthly pass sticker: $5.00 with valid disability bus pass;
   annual pass or renewal sticker: $30.00 with approved application or valid US Medicare card.
   FootballExpress. One-way fare: $3.00, roundtrip fare: $6.00.

Source: City and County of Honolulu, Honolulu Public Transit Authority, records; Department of Transportation Services, records; TheBus Oahu Transit Services, Inc.



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By City Council policy (Resolution No. 00-29, CD-1), the farebox recovery ratio is maintained between 27 percent to 33 percent of *TheBus* operations. Based on the NTP Report Year 2006 Closeout information, the farebox recovery ratio for *TheBus* was 30.1%. The fixed-guideway system is planned to operate with a unified fare structure with *TheBus*, with transfers and passes usable on both modes. The *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Report - November 1, 2006 projected the FY 2030 farebox recovery ratio for the 20-mile fixed-guideway alternative to be 28 percent.*

Current transfer policy allows each customer to receive one free transfer upon boarding when paying a cash fare. The transfer is valid for a two hour period and may only be used once for travel in the same direction. Passengers paying cash and requiring a third bus to reach their destination would need to pay another cash fare. This limitation on using a transfer only once is currently under review and may be revised to allow more than one transfer within the time period.

A Four-Day pass, targeted to visitors, offering unlimited use for four (4) consecutive days is available for $20.00. The Four-Day pass is used by approximately 300,000 passengers per year and generates approximately 1.5 percent of *TheBus* revenue, as shown in Table 2-3.

A new University Student Discount Bus Pass (UPASS) program was inaugurated in August 2005 offering college students a semester pass at a discount. The semester pass costs the student $100.00. To date thirteen (13) higher education institutions have joined the UPASS program. The UPASS is used by approximately 1,200,000 passengers per year and generates approximately 3.6 percent of *TheBus* revenue, as shown in Table 2-3.

***Table 2-3: TheBus Annual Fare Revenue***

| Fare Type | Annual Revenue | Percent of Total Fare Revenue |
|---|---|---|
| Adult Bus Pass | $17,807,067 | 42.5% |
| Youth Bus Pass | $2,239,860 | 5.4% |
| Senior Bus Pass | $1,003,378 | 2.4% |
| Disabled Bus Pass | $302,550 | 0.7% |
| UPass | $1,515,580 | 3.6% |
| 4-Day Pass | $628,520 | 1.5% |
| Cash | $18,088,481 | 43.2% |
| Stadium Express | $82,927 | 0.2% |
| Other | $196,156 | 0.5% |
| | | |
| **Total** | $41,864,519 | 100.0% |

Source: Oahu Transit Services,
for the 12 month period March 2007 through February 2008

## 2.4 Service Changes

With implementation of the fixed-guideway line various fixed route bus lines will be restructured. The route restructuring will follow several guiding principles. They are defined as:

1. A route will be realigned and truncated at a fixed-guideway station if the estimated out of direction passenger travel time for local and community circulator routes is impacted by no more than five (5) minutes. The route is not realigned if the impact is eight (8) or more minutes.
2. Local routes will be either discontinued or reclassified as a feeder service where major local routes serve the same alignment as the fixed-guideway. The exception will be for those routes deemed essential to provide local bus stop service along the fixed-guideway alignment.
3. Peak period, peak direction express bus routes in competition with the fixed-guideway system will be discontinued in favor of the fixed-guideway alignment if the estimated passenger travel time is impacted by no more than an additional 15 minutes.
4. Community circulator routes will be reoriented and extended to serve a fixed-guideway station if the mileage impact is no more than an additional two (2) miles. The exception will be for those route changes deemed necessary, especially during the peak periods, to avoid a double transfer to reach a fixed-guideway station. This principle was increased to five (5) miles for the initial segment.
5. Community circulator routes will retain the same span of service and headways as assumed for the future Baseline service unless a route has the same alignment as the fixed-guideway and is eliminated or unless forecast ridership is such that additional service is warranted due to severe overcrowding.
6. The highly urban area routes will not be modified to directly link to a fixed-guideway station if they pass within three (3) blocks of a station and deviating the route has been deemed disruptive to the majority of the passengers.

Figure 2-5 shows how bus supply needs are anticipated to change from current conditions to those when the entire fixed-guideway line is in operation (FY 2019). The peak vehicle requirement is based on the Alternatives Analysis assumption that the fixed-guideway line is first opened for service upon completion of the entire 20-mile line. If the fixed-guideway line is opened in phases, then the changes in peak bus requirements would also occur in several increments as each new phase is opened. The peak vehicle requirements reflecting new ridership forecasts based on phased fixed-guideway operations will be developed during Preliminary Engineering (PE).

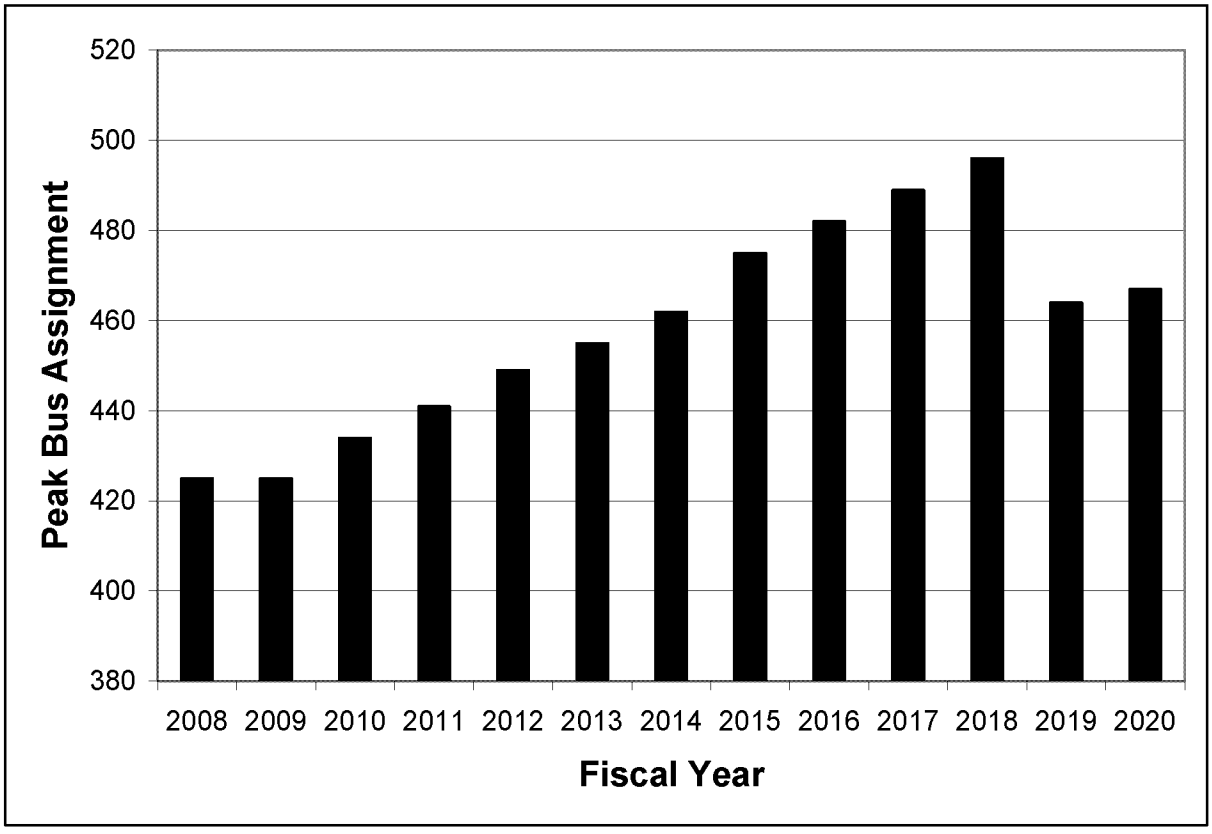


**Figure 2-5: Peak Vehicle Requirements**



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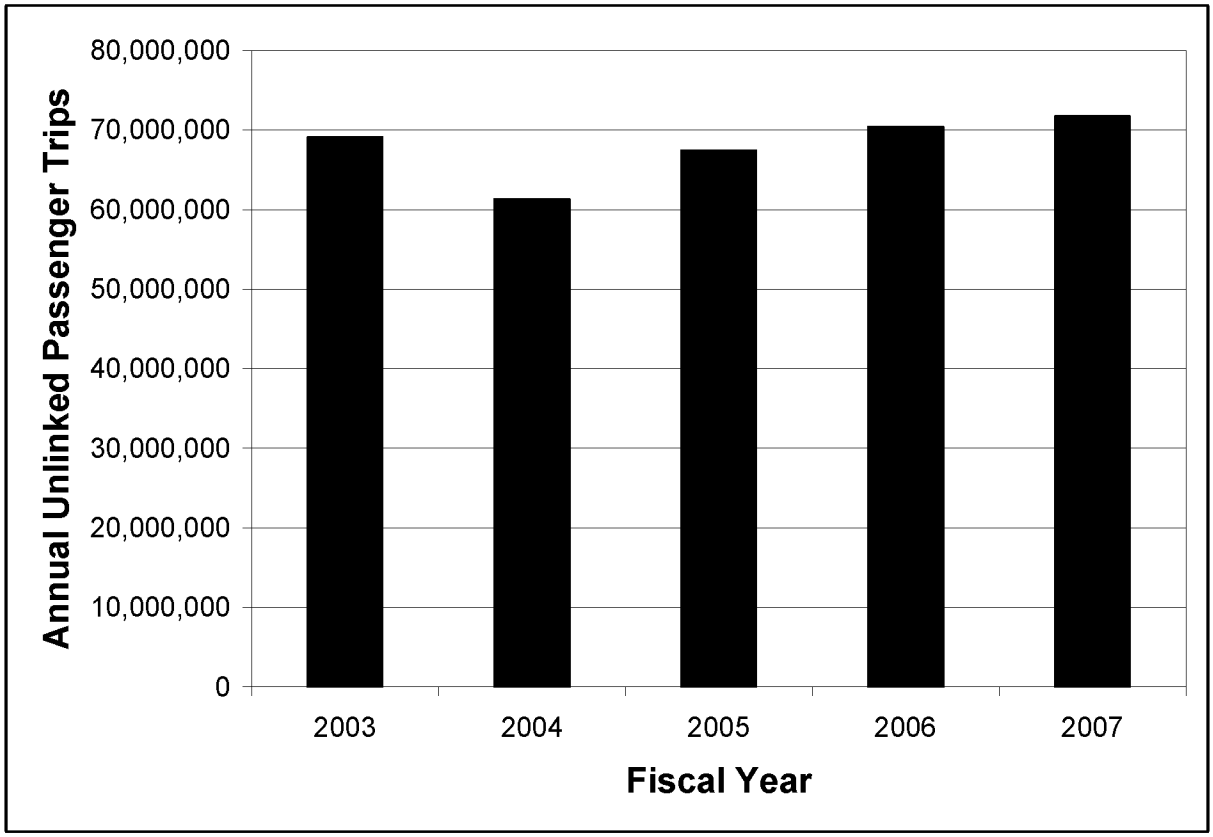
## 3.1 Recent History of Fixed Route Ridership

*TheBus* reported 71,749,456 annual unlinked passenger trips for the fiscal year ending June 30, 2007. This is an increase of 1.9 percent (1,365,000 unlinked passenger trips) over FY 2006 (70,384,355 unlinked passenger trips), and 6.5 percent (4,340,000 unlinked passenger trips) over FY 2005 (67,406,827 unlinked passenger trips). Figure 3-1 presents this data for FY 2003 through FY 2007. FY 2004 was affected by a 34-day strike by *TheBus* operators that ended on September 29, 2003. This was followed by a fare increase that went into effect on October 1, 2003. The fare increase had minimal effect on ridership.

**Figure 3-1: Fixed Route Unlinked Passenger Trips**




Source: National Transit Database



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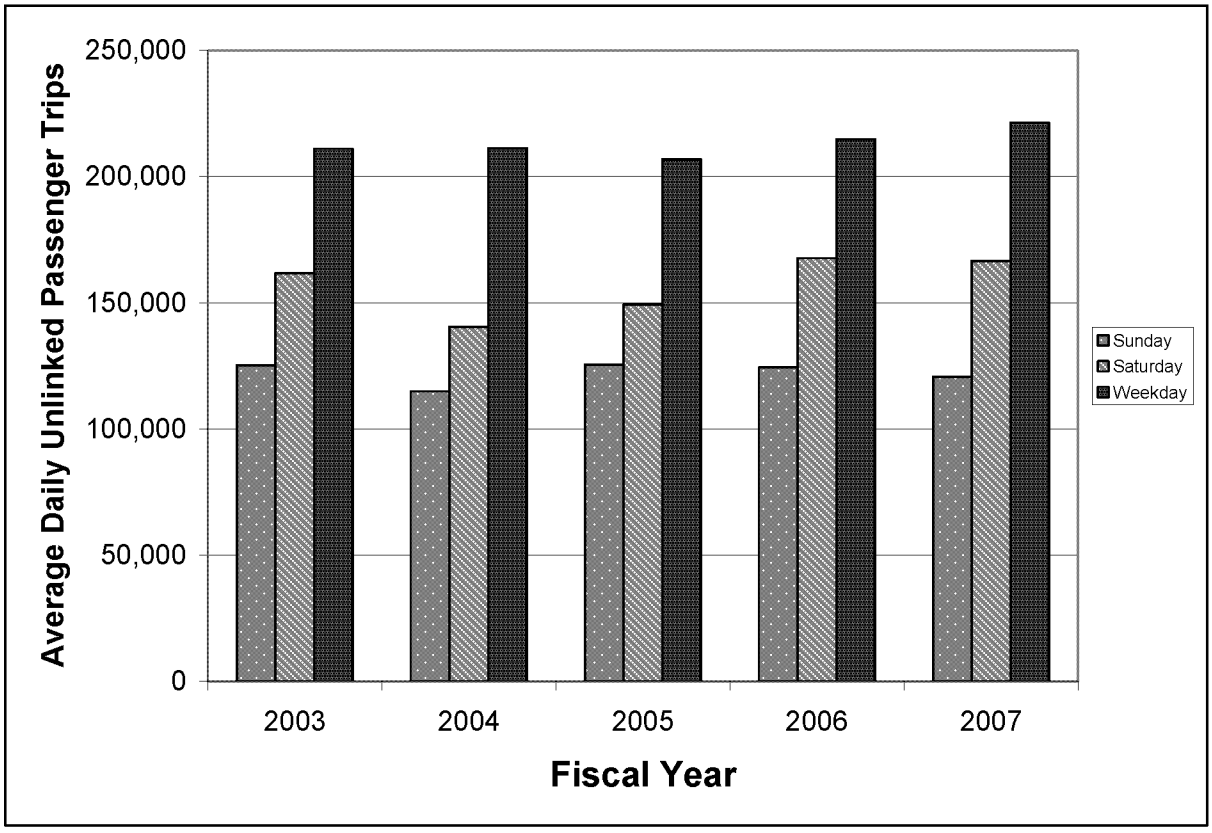
Figure 3-2 shows unlinked passenger trips on an average weekday, average Saturday and average Sunday for the past five years.

**Figure 3-2: Average Daily Unlinked Passenger Trips**




Source: National Transit Database

## 3.2 Ridership Changes

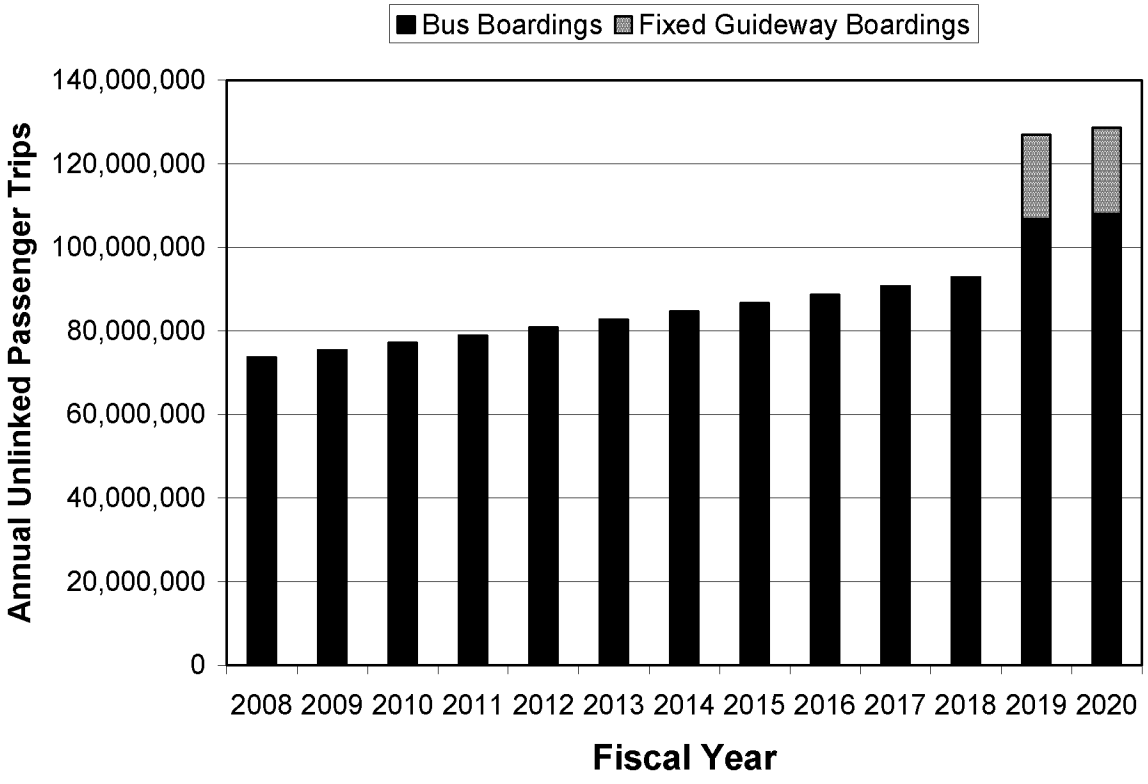
Ridership is expected to increase over time as overall travel demand grows on O'ahu. Future forecasts are prepared using procedures documented in the *Honolulu High-Capacity Transit Corridor Project Travel Forecasting Methodology Report – June 30, 2006*. The forecasts prepared in the Alternatives Analysis are documented in the *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Travel Demand Forecasting Results Report – December 2006*. As shown in Figure 3-3, ridership from FY 2008 through FY 2018 is expected to grow about 2.3 percent per year, somewhat slower than the growth from FY 2005 to FY 2007.

With implementation of the fixed-guideway system new riders are expected to take advantage of this new transit option. The fixed-guideway system will afford existing and new riders with reliable access and connectivity to many social, business, educational and recreational activities. The fixed-guideway system will interface with a modified fixed route bus network providing numerous options for existing and new riders. Assuming that the 20-mile fixed-guideway line is open

for service in FY 2019 upon completion of the entire line, a jump in ridership is forecast by the regional travel forecasting model during the first complete year that the line is open for service. Linked transit trips are expected to be about 8 percent greater with the fixed-guideway line in place than if it is not, reflecting new transit riders attracted by the transit system improvement. Due to increased transfers, a more sizable increase in unlinked trips is expected, as shown in the figure. The forecasts do not include the effect of special events ridership.

If the fixed-guideway line is opened in phases, then the ridership increase associated with the new system will occur in several increments as each new phase is opened. A phasing plan will be developed during PE which will incorporate new forecasts based upon the incremental increases.

**Figure 3-3: Anticipated Future Unlinked Passenger Trips**



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## 4.1 Current Fixed Route Fleet

*TheBus'* current active fixed-route fleet consists of 525 diesel buses. Of these, 72 are articulated 60-foot vehicles (including 10 hybrids); 416 are 40-foot vehicles (including 40 hybrids); 12 are 35-foot vehicles and 25 are 30-foot vehicles, as shown in Table 4-1. All buses are equipped with bicycle racks and are accessible through either lifts (325 buses) or ramps (200 buses). The fixed route service requires 424 vehicles operating in maximum service, which are deployed from two operating bases in Kalihi and Pearl City.

The Kalihi bus facility is located at 811 Middle Street. It was constructed in 1990 on a fifteen acre property. It includes administrative offices, a maintenance shop, fueling and wash areas, and parking for 300 buses. It is currently home base for 295 buses. Adjacent to the Kalihi bus facility is a unit repair shop.

The Pearl City bus facility is located at 1200 Waimano Home Road. It was constructed in 2001 on seventeen acres of a twenty-one acre parcel of land. It includes transportation offices, a fuel and wash area, central training rooms and a maintenance shop. It has capacity for 250 buses; it is currently home base for 230.



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### *Table 4-1: TheBus Active Fleet Inventory*

| Year | Make | Length (feet) | Capacity[1] Seating | Standing | Total | Quantity |
|---|---|---|---|---|---|---|
| 1993 | TMC | 35' | 35 | 28 | 63 | 12 |
| 1993 | TMC | 40' | 43 | 28 | 71 | 31 |
| 1994 / 95 | Gillig | 40' | 45 | 19 | 64 | 98 |
| 1995 | Gillig | 40' | 46 | 19 | 65 | 34 |
| 1996 | Gillig | 40' | 45 | 22 | 67 | 22 |
| 1997 | Gillig | 40' | 45 | 19 | 64 | 47 |
| 1998 | Gillig | 40' | 45 | 19 | 64 | 18 |
| 1998 | Gillig | 40' LF | 40 | 34 | 74 | 3 |
| 1998 | Gillig | 30' | 29 | 20 | 49 | 10 |
| 2000 | New Flyer | 60' LF | 58 | 72 | 130 | 30 |
| 2000 | Gillig | 40' | 45 | 18 | 63 | 34 |
| 2001 / 02 | Gillig | 40' | 45 | 19 | 64 | 19 |
| 2002 | Chance | 30' LF | 23 | 31 | 54 | 10 |
| 2002 | New Flyer | 60' LF | 58 | 72 | 130 | 16 |
| 2002 | Chance | 30' LF | 23 | 31 | 54 | 5 |
| 2003 | Gillig | 40' | 45 | 21 | 66 | 15 |
| 2004 | Gillig | 40' LF | 40 | 20 | 60 | 55 |
| 2004 | New Flyer | 60' LF | 58 | 72 | 130 | 16 |
| 2004 | New Flyer (Artic. Hybrid) | 60' LF | 58 | 72 | 130 | 10 |
| 2006 | New Flyer (Std. Hybrid) | 40' LF | 37 | 37 | 74 | 40 |
| Total Buses in Active Fleet: | | | | | | 525 |

LEGEND: LF-Low Floor

[1] Per manufacturers' data

Source: National Transit Database, 2007

The current fixed route bus fleet provides service on weekdays, Saturdays, and Sundays. Table 4-2 shows the existing daily bus service characteristics.

### *Table 4-2: Existing Average Daily Bus Service Characteristics*

| | Average Weekday | Average Saturday | Average Sunday |
|---|---|---|---|
| Unlinked Passenger Trips | 221,275 | 166,585 | 120,668 |
| Vehicles in Operation | | | |
| AM Peak | 383 | | |
| Midday | 275 | 202 | 176 |
| PM Peak | 414 | | |
| Vehicle Miles | 65,285 | 43,408 | 40,006 |
| Revenue Vehicle Miles | 54,250 | 39,562 | 36,772 |
| Vehicle Hours | 4,585 | 3,128 | 2,751 |
| Revenue Vehicle Hours | 4,135 | 2,991 | 2,625 |
| Boardings per Revenue Mile | 4.08 | 4.21 | 3.28 |

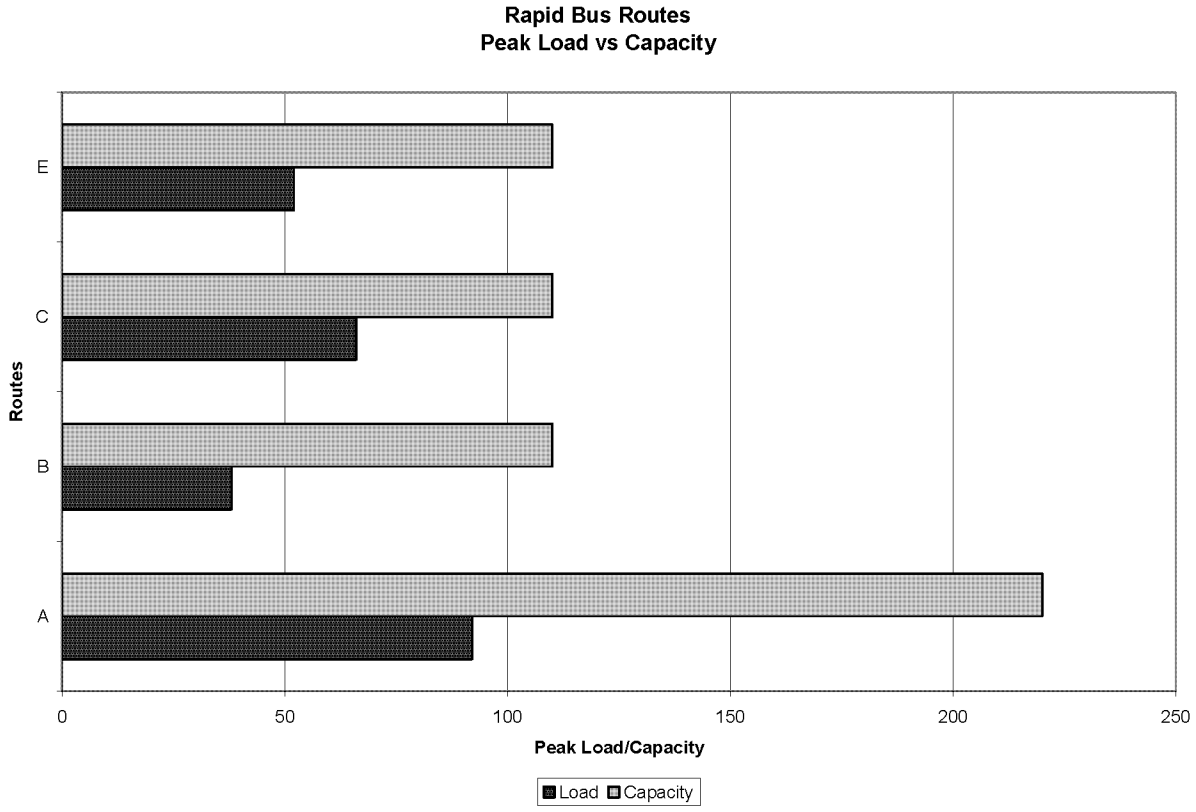
Source: National Transit Database, Report Year 2007 Working Data

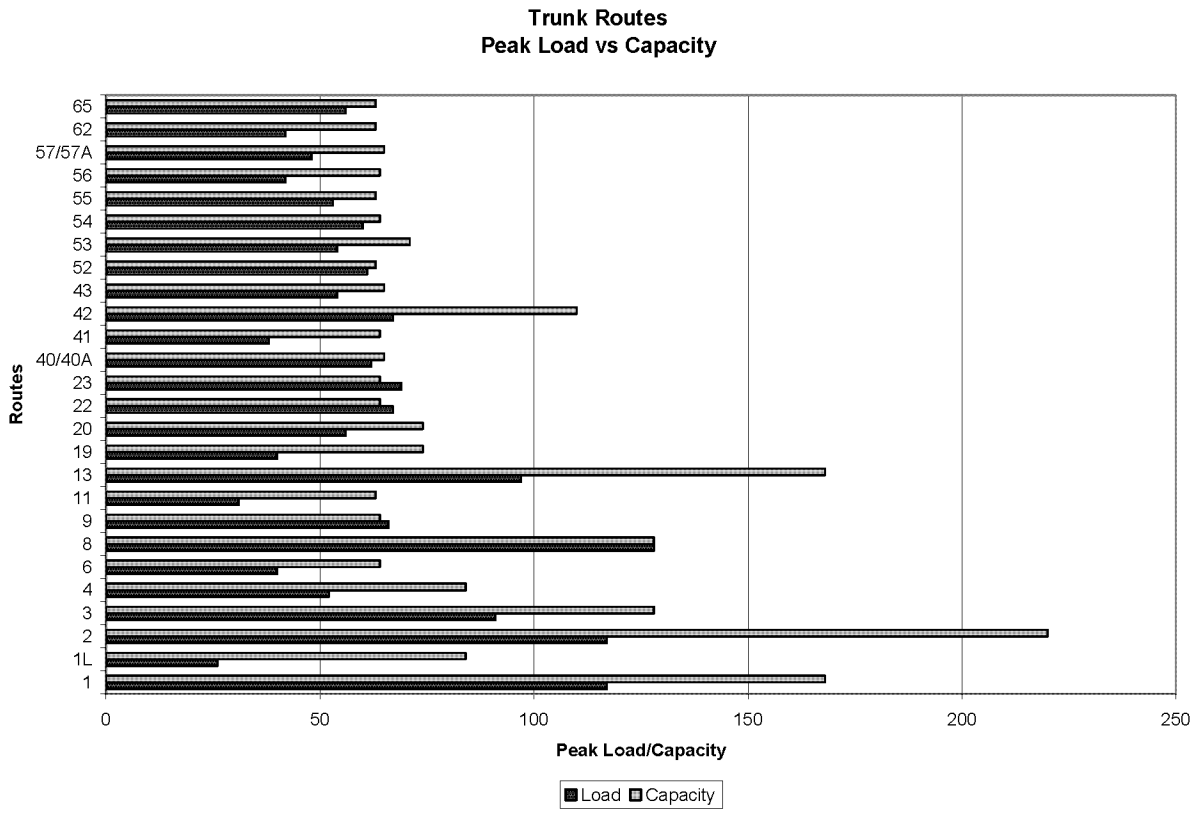
## 4.2 Peak Vehicle Demand

Bus assignments are made to match bus capacity to expected demand. Peak load data by route is obtained from load checks. The peak 15 minute period is selected for each route to define demand. The peak 15 minute period varies by route but is usually within the period from 4:45 to 5:15 p.m. The peak load is compared to the capacity of the vehicles assigned to the specific route. The capacity used is the sum of seated plus standing capacity shown in Table 4-1, except for 60-foot articulated buses. For the 60-foot buses a capacity value of the seated capacity plus 70 percent of the standing capacity is used by OTS when developing the preferred vehicle assignment lists.

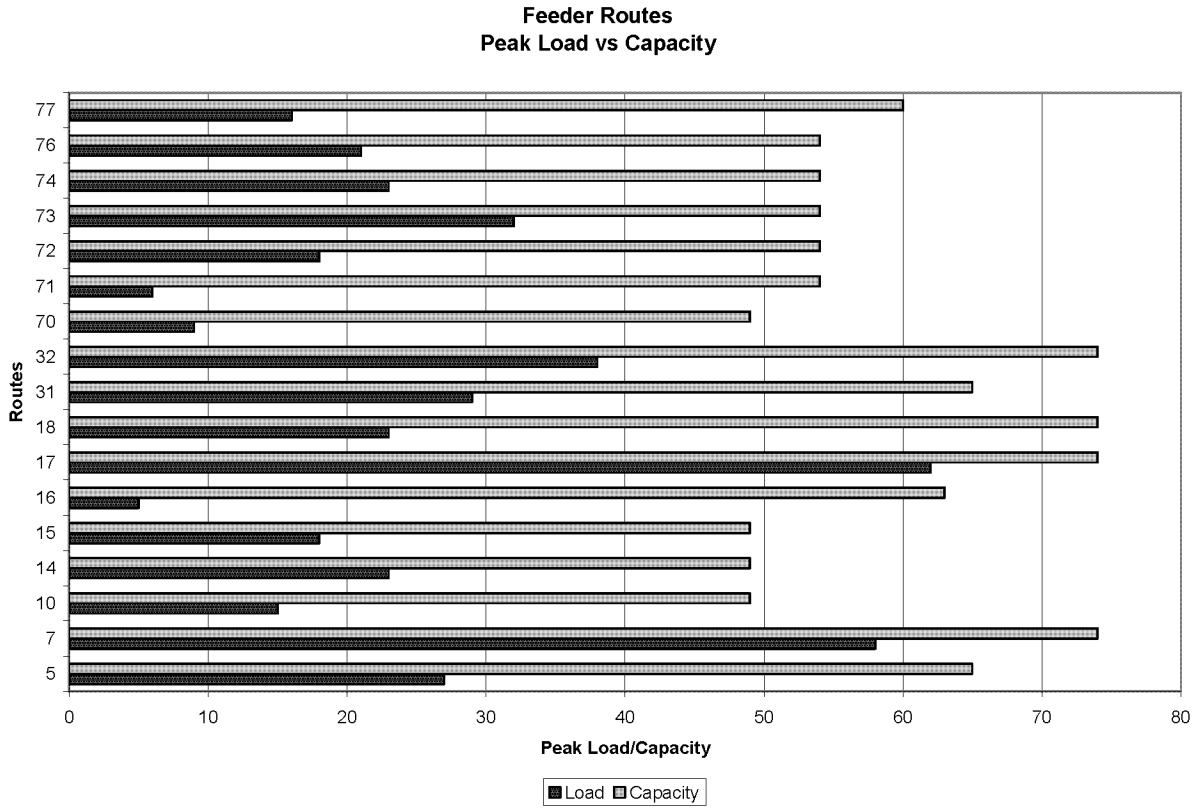
Figure 4-1 shows the comparison of peak load capacity versus demand for all fixed routes at the peak load point during the peak 15 minute period. As can be seen, only three routes operate slightly over capacity, trunk routes 9, 22 and 23. On these routes the peak load demand is approximately five percent over capacity.

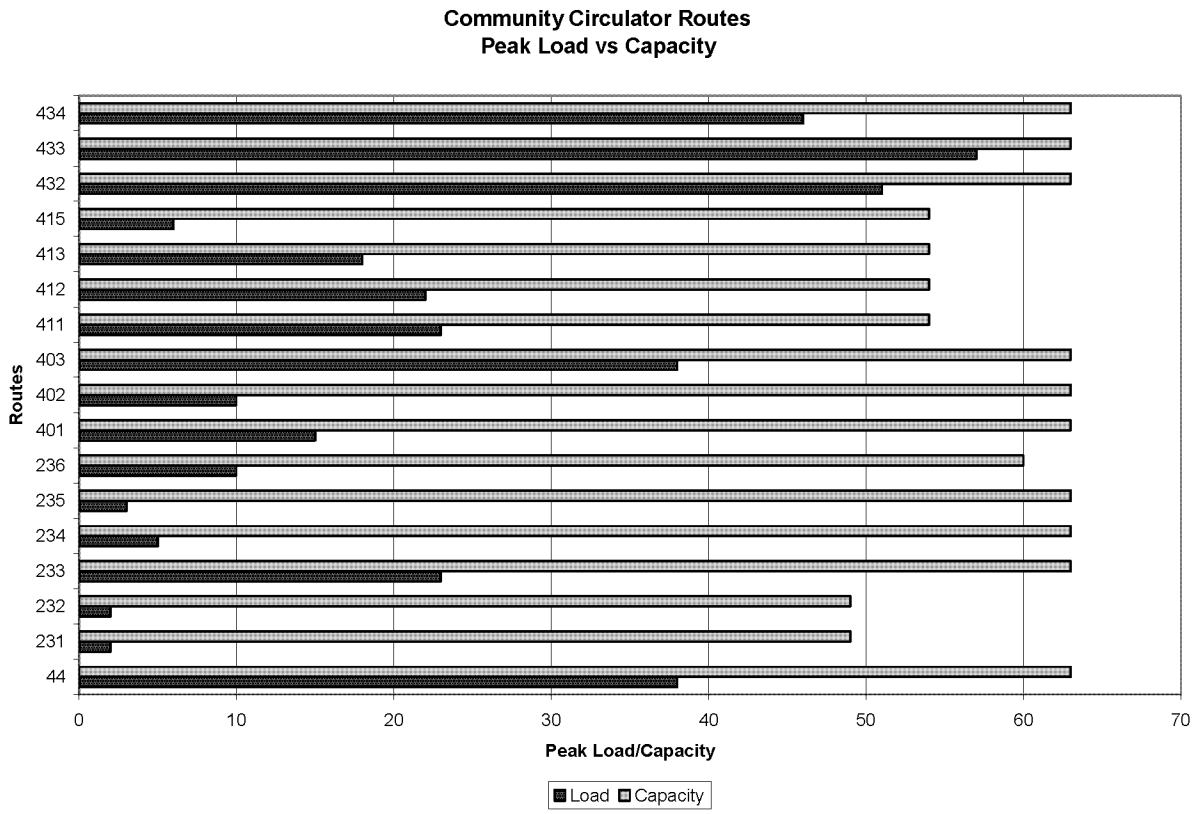
## *Figure 4-1: Passenger Loading at Peak Load Point vs. Vehicle Capacity*



## *Figure 4–1 continued*



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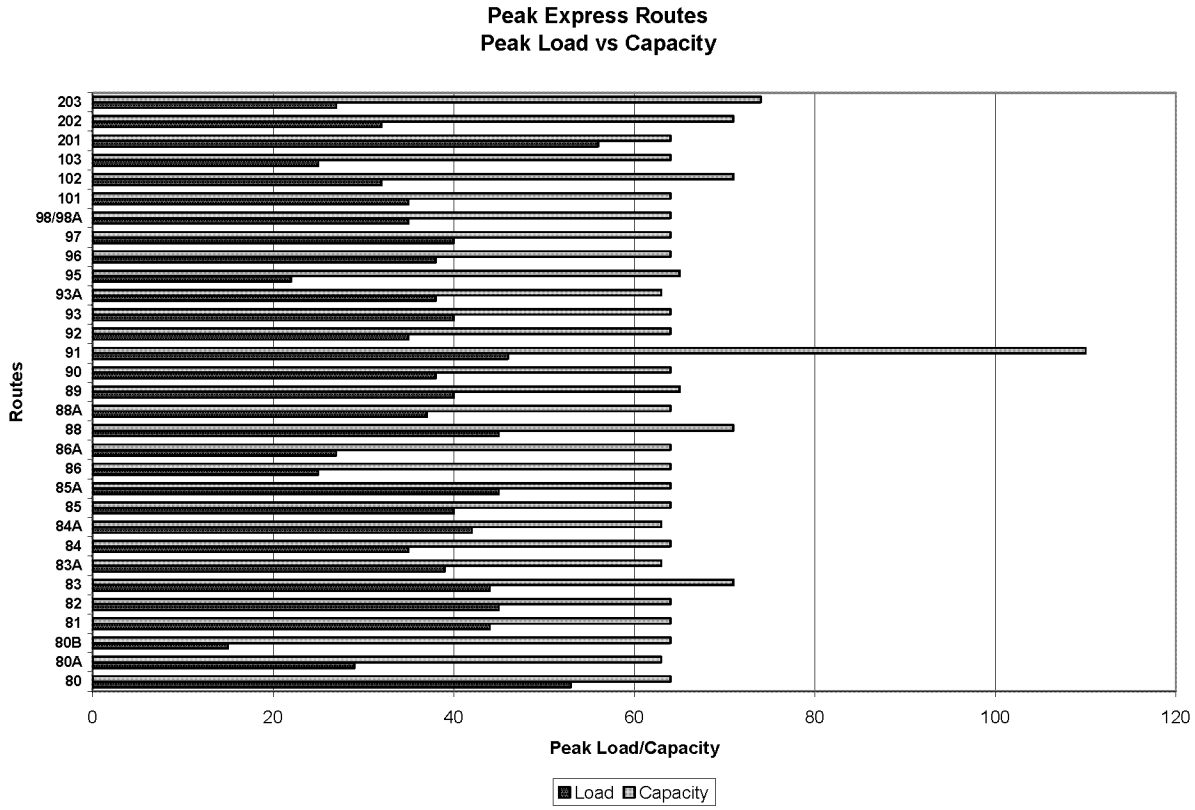
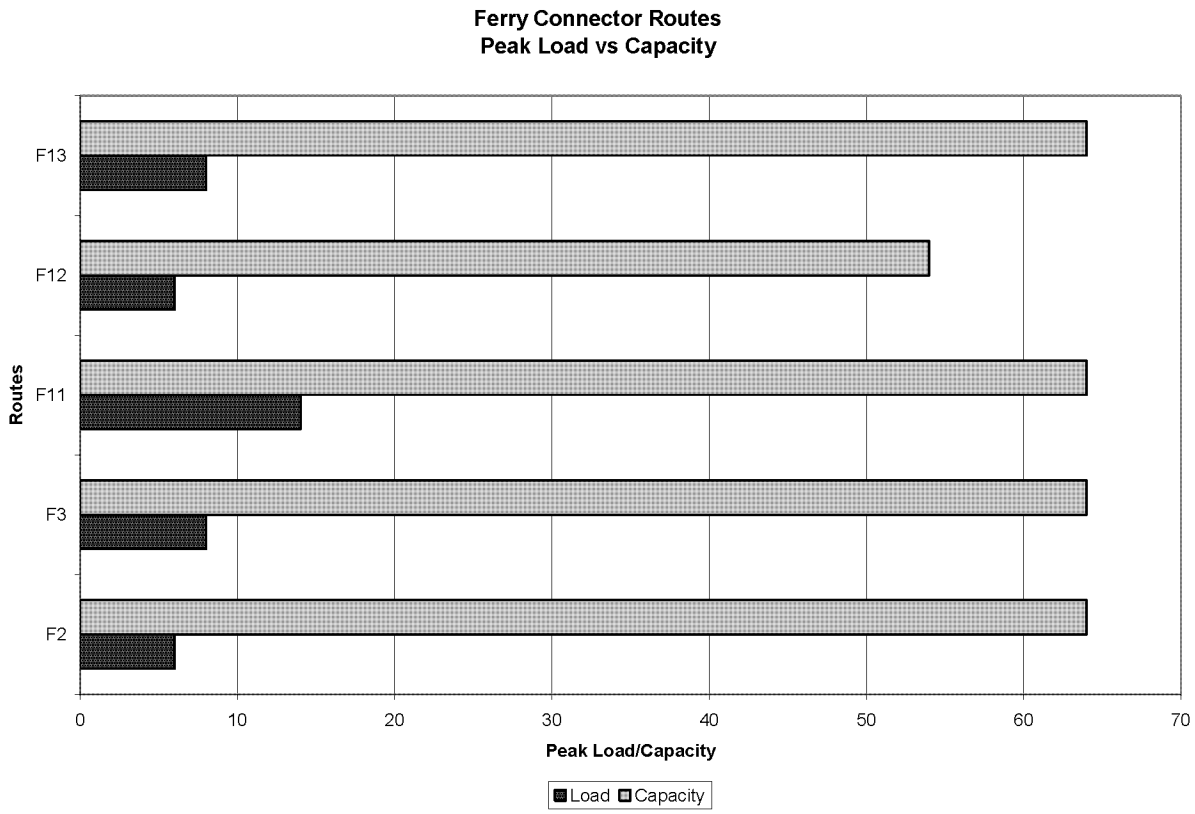
## *Figure 4–1 continued*



## 4.3 Bus Fleet Replacement and Expansion

Table 4-3 shows the plan for replacement and expansion of the fixed route bus fleet from FY 2003 through the beginning of operation of the entire 20-mile fixed-guideway line. As shown in the table (in the "Bus Manufacturer" column), both hybrid electric and standard diesel buses will be added to the fleet.

The *Honolulu High-Capacity Transit Corridor Project Financial Plan – November 2007* describes the capital and operating revenue sources used to fund the replacement and expansion program.

This BFMP and the Financial Plan will be refined during Preliminary Engineering to reflect phased operations of the proposed fixed-guideway system.



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*Table 4-3: Fixed Route Bus Fleet Replacement and Expansion Plan*

| BUDGET FY | DELIVERY FY | BUS MANUFACTURER | SIZE (FT) | AVAILABLE FOR USE IN FISCAL YEAR | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| | 1983 | Gillig | 40' | 50 | 11 | | | | | | | | | | | | | | | | |
| | 1990 | TMC | 40' | 35 | 16 | | | | | | | | | | | | | | | | |
| | 1993 | TMC | 35' | 12 | 12 | 12 | 12 | 12 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1993 | TMC | 40' | 82 | 82 | 71 | 71 | 31 | 22 | 22 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1994/95 | Gillig | 40' | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 63 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1995 | Gillig | 40' | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1996 | Gillig | 40' | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1997 | Gillig | 40' | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 45 | 45 | 22 | 0 | 0 | 0 | 0 | 0 |
| | 1998 | Gillig | 40' | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 11 | 0 | 0 | 0 | 0 |
| | 1998 | Gillig | 40' LF | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 0 | 0 | 0 | 0 |
| | 1998 | Gillig | 30' | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 2000 | New Flyer | 60' LF | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 15 | 0 | 0 | 0 | 0 | 0 |
| | 2000 | Gillig | 40' | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 3 | 0 | 0 | 0 |
| | 2001/02 | Gillig | 40' | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 0 | 0 | 0 |
| | 2002 | Chance | 30' LF | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 2002 | New Flyer | 60' LF | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 0 | 0 | 0 | 0 |
| 2001 | 2002 | Chance | 30' LF | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 2003 | Gillig | 40' | | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 4 | 0 | 0 |
| 2002 | 2004 | Gillig | 40' LF | | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 46 | 36 |
| 2003 | 2004 | New Flyer | 60' LF | | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 0 | 0 |
| 2003 | 2004 | New Flyer (Artic. Hybrid) | 60' LF | | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 0 |
| 2005 | 2006 | New Flyer (Std. Hybrid) | 40' LF | | | | | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| 2006 | 2007 | Artic. Diesel | 60' LF | | | | | | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 0 |
| 2007 | 2008 | Artic. Hybrid Electric | 60' LF | | | | | | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2008 | 2009 | Artic. Hybrid Electric | 60' LF | | | | | | | | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 2008 | 2009 | Standard Diesel | 30' LF | | | | | | | | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| 2009 | 2010 | Hybrid Electric | 40' LF | | | | | | | | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 2010 | 2011 | Hybrid Electric | 40' LF | | | | | | | | | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 2011 | 2012 | Hybrid Electric | 40' LF | | | | | | | | | | | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 2012 | 2013 | Hybrid Electric | 40' LF | | | | | | | | | | | | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| 2013 | 2014 | Standard Diesel | 30' LF | | | | | | | | | | | | | 21 | 21 | 21 | 21 | 21 | 21 |
| 2013 | 2014 | Artic. Hybrid Electric | 60' LF | | | | | | | | | | | | | 42 | 42 | 42 | 42 | 42 | 42 |
| 2014 | 2015 | Artic. Hybrid Electric | 60' LF | | | | | | | | | | | | | | 53 | 53 | 53 | 53 | 53 |
| 2015 | 2016 | Standard Diesel | 30' LF | | | | | | | | | | | | | | | 12 | 12 | 12 | 12 |
| 2015 | 2016 | Hybrid Electric | 40' LF | | | | | | | | | | | | | | | 7 | 7 | 7 | 7 |
| 2015 | 2016 | Artic. Hybrid Electric | 60' LF | | | | | | | | | | | | | | | 50 | 50 | 50 | 50 |
| 2016 | 2017 | Artic. Hybrid Electric | 60' LF | | | | | | | | | | | | | | | | 36 | 36 | 36 |
| 2017 | 2018 | Standard Diesel | 30' LF | | | | | | | | | | | | | | | | | 13 | 13 |
| 2017 | 2018 | Artic. Hybrid Electric | 60' LF | | | | | | | | | | | | | | | | | 18 | 18 |
| 2018 | 2019 | Hybrid Electric | 40' LF | | | | | | | | | | | | | | | | | | 10 |
| 2018 | 2019 | Artic. Hybrid Electric | 60' LF | | | | | | | | | | | | | | | | | | 17 |
| **Total Bus Fleet** | | | | **525** | **553** | **525** | **525** | **525** | **525** | **525** | **534** | **546** | **554** | **562** | **572** | **575** | **583** | **592** | **595** | **595** | **595** |
| Total Active Fleet | | | | 525 | 536 | 496 | 499 | 525 | 501 | 501 | 510 | 522 | 530 | 538 | 548 | 563 | 572 | 580 | 591 | 559 | 559 |
| Peak Vehicle Requirement | | | | 427 | 425 | 416 | 415 | 424 | 425 | 425 | 434 | 441 | 449 | 455 | 462 | 475 | 482 | 489 | 496 | 464 | 467 |
| Spare Vehicles | | | | 98 | 111 | 80 | 84 | 101 | 76 | 76 | 76 | 81 | 81 | 83 | 86 | 88 | 90 | 91 | 95 | 95 | 92 |
| Spare Ratio | | | | 23% | 26% | 19% | 20% | 24% | 18% | 18% | 18% | 18% | 18% | 18% | 19% | 19% | 19% | 19% | 19% | 20% | 20% |
| Active Fleet Average Age | | | | 8.4 | 6.6 | 7.3 | 8.3 | 8.3 | 8.7 | 9.4 | 9.6 | 9.3 | 8.8 | 8.3 | 8.0 | 7.6 | 7.2 | 6.5 | 6.7 | 6.5 | 6.8 |
| Total Fleet Average Age | | | | 8.4 | 7.0 | 7.2 | 8.2 | 8.3 | 9.0 | 9.7 | 9.9 | 9.6 | 9.2 | 8.7 | 8.4 | 7.8 | 7.4 | 6.7 | 6.8 | 7.0 | 7.4 |

Spare Ratio = (Total Active Fleet minus Peak Vehicle Requirement) divided by Peak Vehicle Requirement.



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# 5 Performance Standards and Policies for Bus Operations

The following measures currently are used in examining bus performance:

- On-Time Performance
- Vehicle Assignment
- Vehicle Headway
- Transit Amenities
- Transit Access/Coverage.

## 5.1 On-Time Performance

The overall on-time performance standard for *TheBus* is expressed as *percent of trips that are on-time.* On-time for routes with service headways greater than 15 minutes is considered to be from one minute early to ten minutes late. This definition of on-time has been structured to be in compliance with the Title VI requirements. On-time performance for routes with service headways less than 15 minutes is not as important as the operational headway of all trips on those routes.

The standards are as follows:

| Period | Time | On-Time Performance Standard |
|---|---|---|
| AM (Peak) | 3:42 a.m. to 9:00 a.m. | 70% |
| Base | 9:00 a.m. to 2:00 p.m. | 80% |
| PM (Peak) | 2:00 p.m. to 6:00 p.m. | 70% |
| Night | 6:00 p.m. to end of service | 80% |

## 5.2 Vehicle Assignment

Vehicle assignments are made according to the following criteria:

- Bus assignments are made to match bus capacity to expected demand.
- Articulated buses are assigned to City Express! and other high volume routes.
- Circulator buses (less than 40') are assigned to circulator and feeder routes.



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- Routes that have narrow streets and tight corners may use smaller buses.
- Routes with overhanging trees may require buses with rounded roof edges.

## 5.3 Vehicle Headway

Vehicle headway standards are:

| Route Type | Headway Standard |
|---|---|
| Urban Trunk | 15 minutes |
| Suburban Trunk | 30 minutes |
| Feeder & Circulator | 60 minutes |
| Rapid Bus (Limited Stop) | |
| Urban | 15 minutes |
| Suburban | 30 minutes |
| Peak Period Express | Not Applicable |

## 5.4 Passenger Amenities

Passenger amenities include benches, shelters, trash receptacles, landscaping, static information (such as a route map and schedule), and real-time information available through electronic message sign boards.

Installation of such amenities should not block the accessible landing area or pedestrian pathway around the stop, the immediate area around the transit bus shelter, or the curbside limits of the bus stop zone.

Transit shelters must be accessible to persons in wheelchairs, and provide adequate space for persons in wheelchairs to maneuver into the shelter and remain there fully sheltered.

The minimum standards for applying passenger amenities to any bus stop are as follows:

- All amenities shall continue compliance with Americans with Disabilities Act Accessibility Guidelines (ADAAG).
- Shelters – Transfer points, two or more bus routes that service a stop, and stops on bus routes with headways greater that 40 minutes.
- Benches – Transfer points, two or more bus routes that service a stop, and stops on bus routes with headways greater that 30 minutes.
- Trash receptacle – Transfer points, two or more bus routes that service a stop, and stops on bus routes with headways greater that 15 minutes and/or in the general vicinity of waste receptacle use generator(s).

Restrictions

1. No amenities (i.e.; newspaper/print material vendor stands) should be chained to any pole where a bus stop sign is installed, a separately installed bus stop information display board within 10 feet of any transit bus shelter area, or on the curbside within a bus stop zone.
2. Fixed bicycle stands should not be installed where passengers enter or exit a bus within a bus stop zone.
3. No bicycles, mopeds, or scooters should be chained and left unattended leaning against any pole where a bus stop sign is installed, a separately installed bus stop information display board, or a transit bus shelter.

## 5.5 Transit Access/Coverage

Bus service, including fixed route service and paratransit service, is provided to cover all inhabited parts of O‘ahu. Paratransit service will continue to cover O‘ahu with implementation of the fixed-guideway system.

Standards for transit access are:

- Access distance – Provide a bus stop within ¼ mile (1,320 feet) of 85% of bus riders.
- Major Activity Center Access – Provide a bus stop within 1,000 feet of major activity centers.
- Ease of Use – Make published route maps available to the public.

# 6 Bus Fleet Maintenance Plan

The OTS' Maintenance Department is responsible for the maintenance of the fixed route bus fleet.

OTS's Maintenance Goals and Objectives are listed on the following page.



AR00076254

**MAINTENANCE DEPARTMENT**
**GENERAL OPERATING PROCEDURE**

| | | | |
|---|---|---|---|
| Policy Number: | MTCE 2.400 | Page: | 1 of 1 |
| Title: | MAINTENANCE GOALS AND OBJECTIVES | Effective: | 04/10/07 |
| | | Supersedes: | 06/01/06 |

MISSION STATEMENT

Oahu Transit Services, Inc., under the policy guidance and direction of the City Department of Transportation Services and within the budgetary resources provided, is responsible for providing safe, secure, economical, efficient, effective and dependable public bus service to the community in an environmentally sensitive manner. We will follow a policy of nondiscrimination in employment and in the provision of TheBus service without regard to race, national origin, gender, income level, or disability status. Our business dealings will follow high standards of integrity and ethical business conduct. Our strength and our future growth lie with our employees who we will listen to and support. We value innovation and excellence in the provision of transit services and will seek to perpetuate the Aloha Spirit and the feeling of 'Ohana

Current Goals:

1. Convert the City and County of Honolulu's entire bus and support fleet of tires to Nitrogen vs. Compressed Air.
2. Increase intervals between engine overhauls.
3. Increase brake lining life.
4. Convert the entire revenue fleet to synthetic transmission fluid.
5. Energy conservation efforts.
6. Recycling.
7. 10,000 miles between mechanical road calls.
8. Minimum of 85 percent availability.
9. Overtime less than 5 percent.

Current Challenges:

1. Aging infrastructure at Kalihi-Palama facility.
2. Aging bus fleet.
3. Aging Handi-Van fleet.
4. Handi-Van relocation.
5. Non-revenue fleet replacement.
6. Maintenance equipment in general.
7. Manpower.

Future Goals:

1. Infrastructure improvements at the Kalihi-Palama facility.
2. Infrastructure improvements at the Pearl City facility.



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## 6.1 Scheduled Maintenance Cycles

OTS performs a regular program consisting of several levels of inspection and maintenance of equipment and their components based on accumulated mileage. (Inspection forms are presented in Appendix A.)

As shown on Table 6-1, the oil drops are performed on an eight (8) step inspection schedule which is in 6,000 mile (6K) intervals. Each service interval progressively has added inspections, maintenance and/or repairs. When a vehicle reaches the 48,000 mile threshold (48K inspection), it goes through engine tune-ups and various component change-outs.

***Table 6-1: Bus Maintenance Cycles***

| Inspection | Interval | Labor Hours | Work Description |
|---|---|---|---|
| Eight Step Inspection | 6K Intervals up to 48K | 1–8 | Fluid changes with progressive levels of inspections, maintenance and repair |
| Brake Inspection | Weekly | 0.3 | Complete brake system inspection |
| Heating, Venting, Air Conditioning (HVAC) Inspection | 6K Intervals | 1–8 | System inspection every 6K with an additional specialty shop inspection/ maintenance/repair per mileage requirements. |
| Electrical Inspection | 6K Intervals | 1–8 | System inspection every 6K with an additional specialty shop inspection/ maintenance/repair per mileage requirements. |
| Wheelchair Inspection | 6K Intervals | 1–8 | System inspection every 6K with an additional specialty shop inspection/ maintenance/repair per mileage requirements. |
| Quality Assurance | Daily | 0.5 | Buses are sent to the Quality Assurance Section after repairs are completed in other repair sections before buses are put on the ready line. |
| Service Station/ Interior Cleaning | Daily | 0.3/1 | Buses are sent through for fueling and cleaning daily. |



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In addition to the oil drop inspections, OTS also performs inspections by specialty shops that are mileage driven. The specialty shop inspections include the following:

- HVAC – 6,000 miles
- Electric – 6,000 miles
- Wheelchair Lift – 24,000 miles
- Quality Assurance – Situation Driven

Brake Inspection is performed weekly on all buses and each time a bus is sent for a Quality Assurance inspection.

Approximately 80 percent of the total bus fleet is routed through the Service Station on an average weekday for fueling and cleaning.

## 6.2 Maintenance Facilities and Labor

The daily inspections, fueling and cleaning of the bus fleet is performed by the two maintenance facilities located in Kalihi and Pearl City.

The power train and major component change-outs are completed by the operating divisions; however, the actual power train and major component overhauls are completed by a separate unit repair facility located adjacent to the Kalihi maintenance facility.

Articulated buses are stationed and maintained at both maintenance facilities.

The maintenance staff works on four shifts daily:

1. 0630–1500
2. 1500–2100
3. 1800–0200
4. 2230–0630

The distribution of vehicle and staff by division is shown in Table 6-2

***Table 6-2: Maintenance Division Capacity and Staffing***

| Maintenance Division | Number of Assigned Buses | | | | | Maintenance Personnel | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 30 Ft | 35 Ft | 40 Ft | 60 Ft | Total | Mechanics | Other Staff | Total | Staff per Bus |
| Kalihi | 10 | 12 | 233 | 40 | 295 | 121 | 42 | 163 | 0.5525 |
| Pearl City | 15 | 0 | 183 | 32 | 230 | 121 | 31 | 152 | 0.6609 |
| Unit Repair | | | | | | 32 | 9 | 41 | 0.0781 |



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## 6.3 Scheduled Maintenance Demand

The number of buses pulled-in due to scheduled maintenance on an average weekday is shown in Table 6-3. On an average weekday approximately 137 buses are pulled in due to daily scheduled maintenance, excluding those buses merely undergoing fueling and cleaning.

***Table 6-3: Schedule Maintenance Demand***

| Activity | Number of Buses |
|---|---|
| Lubrication fluid changes | 14 |
| Brake inspections | 105 |
| HVAC inspections | 10 |
| Electrical inspections | 10 |
| Wheelchair lift inspections | 13 |
| Quality Assurance inspections | 10 |
| Service station/Interior cleaning | 424 |

## 6.4 Unscheduled Maintenance

Unscheduled and corrective maintenance demands fall into two categories, equipment failures and miscellaneous reasons. Equipment failures include defects in the axles, body, doors, brakes, lighting system, cooling system, power train, heating system, air conditioning system, wheelchair lifts, steering system and other vehicle components. Miscellaneous reasons include flat tires, broken glass, graffiti removal, vandalism and accidents.

Figure 6-1 shows OTS' recent history of unscheduled maintenance road calls. The annual number of road calls is usually about equally divided between equipment failure and other miscellaneous reasons. The methodology of classifying road calls changed in FY 2007, so the results for that year cannot be compared directly to previous years.

Figure 6-2 shows the history of miles between mechanical road calls from FY 2004 through FY 2007. As noted with Figure 6-1, the methodology of classifying road calls changed in FY 2007 so the results for that year cannot be compared directly to previous years.



AR00076258

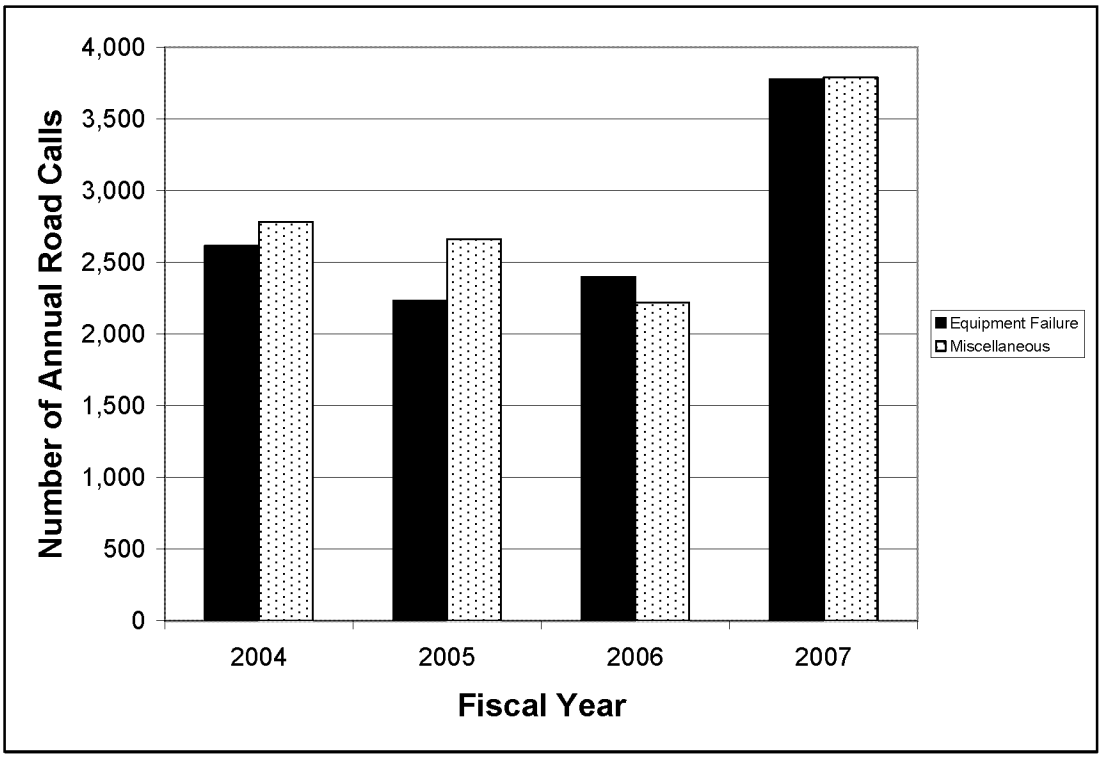


**Figure 6-1: Annual Summary of Road Calls**

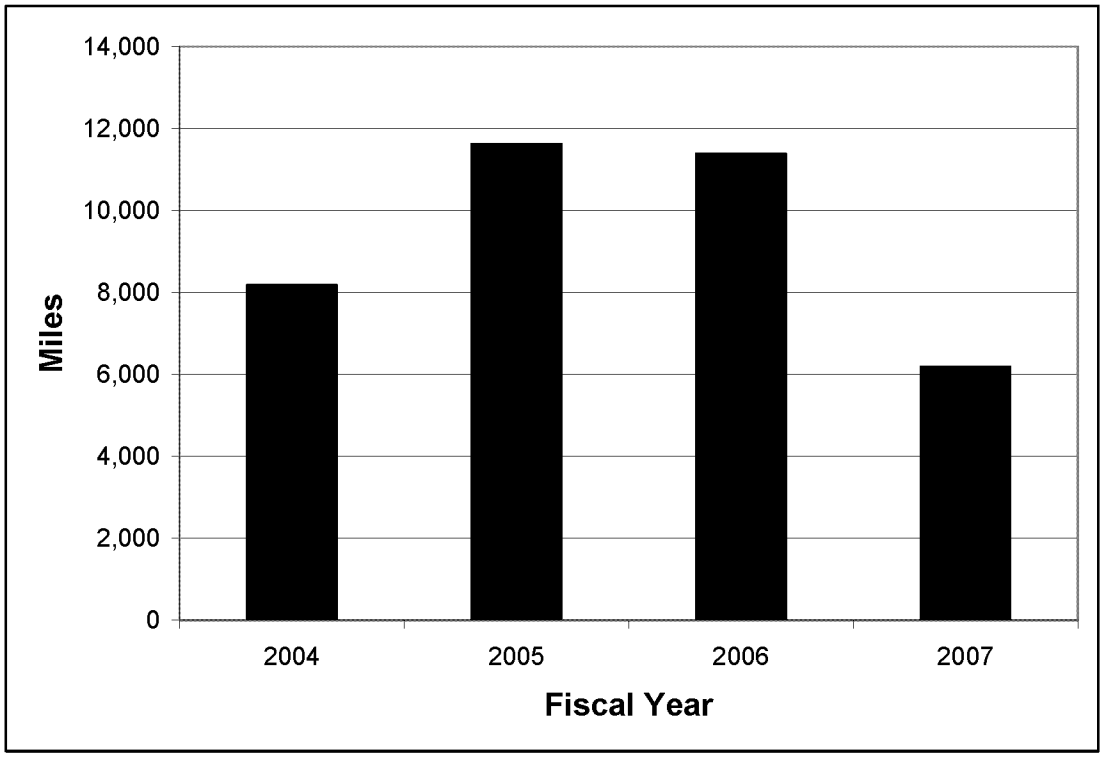


**Figure 6-2: Miles Between Mechanical Road Calls**



AR00076259

## 6.5 Factors Affecting Maintenance Demand

Currently OTS is experiencing approximately 65 percent scheduled maintenance and 35 percent unscheduled maintenance. Ideally, per industry standards, the ratio should be 70 percent scheduled and 30 percent unscheduled. The maintenance department has set a goal to meet the industry standard in FY 2008.

Several factors contribute to elevated levels of unscheduled maintenance, including fleet age (the current fleet age is 8.4 years, with 33 percent of the fleet older than 12 years) and excessive mileage put on specific vehicle types due to scheduling obligations.

Under the current service structure, each bus averages slightly more than 40,000 miles per year. However certain vehicle types average over 60,000 miles per year, as shown in Table 6-4, which increases maintenance demand. The vehicles which average over 60,000 miles per year are assigned to long-distance routes. The 800 series buses serve Routes 52 (Wahiawā – Circle Island), 55 (Kāneʻohe – Circle Island), 62 (Honolulu – Wahiawā Heights), and 65 (Honolulu – Kāneʻohe – Kahaluʻu). The 740 Pearl City series buses serve Route 40/40A (Honolulu – Mākaha). The 100 Pearl City series buses serve Routes CountryExpress! C, 42 (ʻEwa Beach – Waikīkī), and 91 ʻEwa Beach Express. These routes can be seen on the system map presented as Figure 6-3.

***Table 6-4: Mileage Summary FY 2007***

| Number Series | Year of Manufacture | Make | Miles | Vehicles | Average Miles per Bus |
|---|---|---|---|---|---|
| 020 | 2002 | Optima 30' LF | 321,381 | 15 | 21,425 |
| 040 | 1998 | Gillig 30' | 456,082 | 10 | 45,608 |
| 050 | 1993 | TMC 35' | 208,608 | 12 | 17,384 |
| 070 | 2000 | New Flyer 60' LF | 685,542 | 30 | 22,851 |
| 100 Kalihi | 2004 | New Flyer 60' LF Hybrid | 347,330 | 10 | 34,733 |
| 100 Pearl City | 2002 | New Flyer 60' LF | 2,079,198 | 32 | 64,975 |
| 200 | 1993 | TMC 40' | 630,806 | 31 | 20,349 |
| 300 | 1997 | Gillig 40' | 2,405,037 | 68 | 35,368 |
| 500 | 2004 | Gillig 40' LF | 2,041,568 | 55 | 37,119 |
| 600 Kalihi | 1995 | Gillig 40' | 993,454 | 45 | 22,077 |
| 600 Pearl City | 1994 | Gillig 40' | 2,159,001 | 53 | 40,736 |
| 740 Kalihi | 1995 | Gillig 40' | 881,013 | 25 | 35,241 |
| 740 Pearl City | 1995 | Gillig 40' | 1,876,193 | 31 | 60,522 |
| 800 | 2000 | Gillig 40' | 4,674,076 | 68 | 68,736 |
| 900 | 2006 | New Flyer 40' LF Hybrid | 1,401,877 | 40 | 35,047 |
| **TOTAL** | | | **21,161,166** | **525** | **40,307** |



AR00076260

*Figure 6-3: TheBus System Map*

# *Appendix A*
# *Maintenance Plan – Recurring Inspections*



AR00076262

# MAINTENANCE DEPARTMENT
# GENERAL OPERATING PROCEDURE

| | | | |
|---|---|---|---|
| Policy Number: | MTCE 2.200 | Page: | 1 of 2 |
| Title: | MAINTENANCE PLAN – RECURRING INSPECTIONS | Effective: | 06/01/06 |
| | | Supersedes: | 07/01/03 |

## POLICY

An active preventative maintenance plan is critical in order to ensure that the bus fleet is maintained in optimum operating condition. In this regard, the maintenance divisions must utilize the following:

1. Manufacturer-specific maintenance plans as promulgated through maintenance manuals, both printed and CD-ROM based. Each time a new bus fleet is delivered, ample quantities of maintenance manuals are procured and distributed to the various shops as well as to division administrative offices.

2. "K" inspection checklists for inspections occurring at 3,000 miles; 6,000 miles; 12,000 miles; 24,000 miles; 36,000 miles; 48,000 miles and 72,000 miles. Copies of the most current fixed route checklists (Rev. 4/02) and paratransit checklists (Rev. 4/99) are attached. As changes occur, checklists will be revised and reissued.

   *Note:* a) On new buses, oil is dropped at 3,000 miles; then the 6,000-mile schedule is followed.
   b) On new buses, synthetic transmission fluid is dropped at 3,000 miles; then the appropriate K- mile schedule is followed in compliance with factory-recommended filter changes.
   c) On new Hybrid buses, synthetic transmission fluid is dropped at 5,000 miles; then the 72,000-mile schedule is followed in compliance with recommended filter change intervals.

3. Wheelchair lift inspection checklist. A copy of the most current checklist (Rev. 4/02) is attached. As changes occur, this checklist will be revised and reissued.

4. Voith transmission inspection checklist. A copy of the most current checklist (Rev. 4/02) is attached. As changes occur, this checklist will be revised and reissued.

5. Transynd inspection checklist. A copy of the most current checklist (Rev. 4/02) is attached. As changes occur, this checklist will be revised and reissued.

6. Articulated joint inspection checklist. A copy of the most current checklist (7/03) is attached. As changes occur, this checklist will be revised and reissued.

7. Tune-up inspection checklist. A copy of the most current checklist (Rev. 4/02) is attached. As changes occur, this checklist will be revised and reissued.

8. As with any program, monitoring and follow-up are critical elements to the effectiveness of the preventative maintenance program. In this regard, we use the Vehicle Condition Report (VCR) card. The VCR card is filled out by drivers, collected at the end of the day and then distributed to the appropriate shops to take corrective action. A copy of the most current VCR is attached.

OAHU TRANSIT SERVICES, INC. MAINTENANCE DEPARTMENT

# 3,000 / 6,000 Miles Inspection

BUS #_____ ODOMETER READING_____ DATE_____

VRO #_____ TOTAL TIME_____ MECHANIC'S NAME_____

(3) = If OK (2) = Adjusted/Repaired/Replaced (1) = Repairs Needed (N/A) = Not Applicable

**BOTTOM INSPECTIONS:**

_____ Driver Seat Operation and Lube
_____ Horn and Alarm
_____ All Mirrors, Chimes and Visors
_____ All Sign and Annunciator Operations
_____ Windshield Wiper, Washer and Delay
_____ Dash Control Switches, Knobs
_____ Dash Warning, Indicator Lights
_____ Door Control and Door Operation
_____ Microphone Operation
_____ Driver Light and Fan
_____ A/C and Defroster Operation
_____ Air Pressure Gauge
_____ Volt Gauge (Charging System)
_____ Wheelchair Lift and Safety Operation
_____ Kneeling Operation
_____ All Interior Lights
_____ All Exterior Lights and Reflectors
_____ Proper Height of Coach
_____ Body Damage
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Outrigger Bolts and Mounts
_____ Engine, Trans and Differential Oil Leaks
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator/Air Compressor Leaks
_____ Electrical Cables and Wiring
_____ All Engine/Trans Bolts and Nuts
_____ Grease Coach, Jack Up Front End
_____ Wheel Bearings/Seals and Oil Hubs
_____ King Pin and Front Axle
_____ Tie Rod Ends
_____ Drag Link and Pitman Arm
_____ Steering Box and U-Joints
_____ All Bellows, Height Controls and Links
_____ Stabilizer Bar and Links
_____ Radius Rod and Bushings
_____ Radius Rod Bolts and Nuts
_____ Lateral Rod and Bushings
_____ Lateral Rod Bolts and Nuts
_____ Engine and Trans Mounts
_____ Frame Structure and Trunnion
_____ Shock Absorbers
_____ Tire Condition
_____ Wheel Splash Guard
_____ Oil Sample Engine
_____ Drain Engine Oil / R&R Engine Oil Filter
_____ Drain Air Tanks Completely
_____ Air Dryer
_____ All Brake Adj/Lining/Cam Height
_____ Driveline, U-Joints and Bolts
_____ Air System Leaks (Lines, Valves & Chambers)

**TOP INSPECTIONS:**

_____ All Door Props
_____ Lube All Door Rollers/Tracks/Linkages
_____ Rear Door Sensitive Edge and Bars
_____ Lube Accel/Brake Pedal Pivots
_____ Test Emergency Engine Shutdown
_____ Wheelchair Lift and Safety Operation
_____ Tilt Steering and Lube
_____ Fire Extinguisher / Triangle Kit and Chalk
_____ Stanchions and Subway Straps
_____ All Interior Decals
_____ Seats/Frame/Arm Rest
_____ Wheelchair Folding Seats
_____ Wheelchair Belts
_____ Buzzer Cord and Touch Tape Strips
_____ A/C Filter
_____ Escape Latches and Roof Hatch
_____ Glass and Window Operation
_____ Floor Covering
_____ Interior Body Damage
_____ Car Cards and Lock Strips
_____ Interior Bolts, Screws and Rivets
_____ Battery Cable Connections
_____ Bike Rack
_____ All Compartment Door Latches
_____ Exterior Body Screws, Bolts and Rivets
_____ Body Damage
_____ Wheelchair Oil Level
_____ Alternator Belt
_____ A/C Belt
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Muffler Mounts
_____ Outrigger Bolts and Mounts
_____ Oil Pressure and Gauge
_____ Water Temperature Gauge
_____ Engine and Trans Oil Leaks
_____ Engine Water Leaks
_____ Engine and Trans Mounts
_____ Frame Structure
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator and Air Compressor Leaks
_____ All Engine/Trans Bolts and Nuts
_____ Air Cleaner Indicator
_____ Engine Compartment Lights
_____ Throttle Springs and Linkages
_____ A/C Compressor
_____ Accumulator Charge 50psi (TMC)
_____ Fill Engine Oil
_____ Test Engine Coolant
Glycol_____ / Nitrite_____
_____ Qts. Engine Oil
_____ Qts. Trans Oil
_____ Pts. Power Steering Oil
_____ Pts. Wheelchair Oil

**Mech. Signature:**_____ **Mech. Signature:**_____

*MTCE 2.200* *Rev. 4/02*

**OAHU TRANSIT SERVICES, INC.** **MAINTENANCE DEPARTMENT**

# 12,000 / 36,000 Miles Inspection

**BUS #**_____ **ODOMETER READING**_____ **DATE**_____

**VRO #**_____ **TOTAL TIME**_____ **MECHANIC'S NAME**_____

**(3) = If OK** **(2) = Adjusted/Repaired/Replaced** **(1) = Repairs Needed** **(N/A) = Not Applicable**

**BOTTOM INSPECTIONS:**

_____ Driver Seat Operation and Lube
_____ Horn and Alarm
_____ All Mirrors, Chimes and Visors
_____ All Sign and Annunciator Operations
_____ Windshield Wiper, Washer and Delay
_____ Dash Control Switches, Knobs
_____ Dash Warning, Indicator Lights
_____ Door Control and Door Operation
_____ A/C and Defroster Operation
_____ Air Pressure Gauge
_____ Volt Gauge (Charging System)
_____ Wheelchair Lift and Safety Operation
_____ Lube Wheelchair Ramp Pins
_____ Kneeling Operation
_____ Microphone Operation
_____ Driver Light and Fan
_____ All Interior Lights
_____ All Exterior Lights and Reflectors
_____ Proper Height of Coach
_____ Body Damage
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Outrigger Bolts and Mounts
_____ Engine, Trans and Differential Oil Leaks
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator/Air Compressor Leaks
_____ Electrical Cables and Wiring
_____ All Engine/Trans Bolts and Nuts
_____ Oil Sample Engine and Trans
_____ Drain Engine and Trans Oil
_____ R&R Engine and Trans Oil Filters
_____ Flush Steering System
_____ Grease Coach, Jack Up Front End
_____ Wheel Bearings/Seals and Oil Hubs
_____ King Pin and Front Axle
_____ Tie Rod Ends
_____ Drag Link and Pitman Arm
_____ Steering Box and U-Joints
_____ All Bellows, Height Controls and Links
_____ Air System Leaks (Lines, Valves & Chambers)
_____ Stabilizer Bar and Links
_____ Radius Rod and Bushings
_____ Radius Rod Bolts and Nuts
_____ Lateral Rod and Bushings
_____ Lateral Rod Bolts and Nuts
_____ Engine and Trans Mounts
_____ Frame Structure and Trunnion
_____ Shock Absorbers
_____ Tire Condition
_____ Wheel Splash Guard
_____ Drain Air Tanks Completely
_____ Air Dryer
_____ All Brake Adj/Lining/Cam Height
_____ Driveline, U-Joints and Bolts

**Mech. Signature:**_____

**TOP INSPECTIONS:**

_____ All Door Props
_____ Lube All Door Rollers/Tracks/Linkages
_____ Rear Door Sensitive Edge and Bars
_____ Lube Accel/Brake Pedal Pivots
_____ Test Emergency Engine Shutdown
_____ Wheelchair Lift and Safety Operation
_____ Tilt Steering and Lube
_____ Fire Extinguisher / Triangle Kit and Chalk
_____ Stanchions and Subway Straps
_____ All Interior Decals
_____ Seats/Frame/Arm Rest
_____ Wheelchair Folding Seats
_____ Wheelchair Belts
_____ Buzzer Cord and Touch Tape Strips
_____ A/C Filter
_____ Escape Latches and Roof Hatch
_____ Glass and Window Operation
_____ Floor Covering
_____ Interior Body Damage
_____ Car Cards and Lock Strips
_____ Interior Bolts, Screws and Rivets
_____ Battery Cable Connections
_____ Bike Rack
_____ All Compartment Door Latches
_____ All Access Door Hinges and Lube
_____ Body Screws, Bolts and Rivets
_____ Body Damage
_____ Power Steering Filter
_____ Wheelchair Pump Filter
_____ Wheelchair Oil Level
_____ Alternator Belt
_____ A/C Belt
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Muffler Mounts
_____ Outrigger Bolts and Mounts
_____ Oil Pressure and Gauge
_____ Water Temperature Gauge
_____ Engine and Trans Oil Leaks
_____ Engine Water Leaks
_____ Engine and Trans Mounts
_____ Frame Structure
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator and Air Compressor Leaks
_____ All Engine/Trans Bolts and Nuts
_____ Air Cleaner Indicator
_____ Engine Compartment Lights
_____ Throttle Springs and Linkages
_____ A/C Compressor
_____ Fill Engine and Trans Oil
_____ Trans Filter
_____ Engine Spinner
_____ Flush Steering System
_____ R&R Power Steering Filter
_____ Accumulator Charge 50psi (TMC)
_____ Qts. Engine Oil
_____ Qts. Trans Oil
_____ Pts. Power Steering Oil
_____ Pts. Wheelchair Oil

**Mech. Signature:**_____

OAHU TRANSIT SERVICES, INC. MAINTENANCE DEPARTMENT

# VOITH TRANSMISSION - 36,000 Miles Inspection

**BUS #**_____ **ODOMETER READING**_____ **DATE**_____

**VRO #**_____ **TOTAL TIME**_____ **MECHANIC'S NAME**_____

**(3) = If OK** **(2) = Adjusted/Repaired/Replaced** **(1) = Repairs Needed** **(N/A) = Not Applicable**

**BOTTOM INSPECTIONS:**

_____ Driver Seat Operation and Lube
_____ Horn and Alarm
_____ All Mirrors, Chimes and Visors
_____ All Sign and Annunciator Operations
_____ Windshield Wiper, Washer and Delay
_____ Dash Control Switches, Knobs
_____ Dash Warning, Indicator Lights
_____ Door Control and Door Operation
_____ A/C and Defroster Operation
_____ Air Pressure Gauge
_____ Volt Gauge (Charging System)
_____ Wheelchair Lift and Safety Operation
_____ Lube Wheelchair Ramp Pins
_____ Kneeling Operation
_____ Microphone Operation
_____ Driver Light and Fan
_____ All Interior Lights
_____ All Exterior Lights and Reflectors
_____ Proper Height of Coach
_____ Body Damage
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Outrigger Bolts and Mounts
_____ Engine, Trans and Differential Oil Leaks
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator/Air Compressor Leaks
_____ Electrical Cables and Wiring
_____ All Engine/Trans Bolts and Nuts
_____ Oil Sample Engine and Trans
_____ Drain Engine and Trans Oil
_____ R&R Engine and Trans Oil Filters
_____ Flush Steering System
_____ Grease Coach, Jack Up Front End
_____ Wheel Bearings/Seals and Oil Hubs
_____ King Pin and Front Axle
_____ Tie Rod Ends
_____ Drag Link and Pitman Arm
_____ Steering Box and U-Joints
_____ All Bellows, Height Controls and Links
_____ Air System Leaks (Lines, Valves & Chambers)
_____ Stabilizer Bar and Links
_____ Radius Rod and Bushings
_____ Radius Rod Bolts and Nuts
_____ Lateral Rod and Bushings
_____ Lateral Rod Bolts and Nuts
_____ Engine and Trans Mounts
_____ Frame Structure and Trunnion
_____ Shock Absorbers
_____ Tire Condition
_____ Wheel Splash Guard
_____ Drain Air Tanks Completely
_____ Air Dryer
_____ All Brake Adj/Lining/Cam Height
_____ Driveline, U-Joints and Bolts

**Mech. Signature:**_____

**TOP INSPECTIONS:**

_____ All Door Props
_____ Lube All Door Rollers/Tracks/Linkages
_____ Rear Door Sensitive Edge and Bars
_____ Lube Accel/Brake Pedal Pivots
_____ Test Emergency Engine Shutdown
_____ Wheelchair Lift and Safety Operation
_____ Tilt Steering and Lube
_____ Fire Extinguisher / Triangle Kit and Chalk
_____ Stanchions and Subway Straps
_____ All Interior Decals
_____ Seats/Frame/Arm Rest
_____ Wheelchair Folding Seats
_____ Wheelchair Belts
_____ Buzzer Cord and Touch Tape Strips
_____ A/C Filter
_____ Escape Latches and Roof Hatch
_____ Glass and Window Operation
_____ Floor Covering
_____ Interior Body Damage
_____ Car Cards and Lock Strips
_____ Interior Bolts, Screws and Rivets
_____ Battery Cable Connections
_____ Bike Rack
_____ All Compartment Door Latches
_____ All Access Door Hinges and Lube
_____ Body Screws, Bolts and Rivets
_____ Body Damage
_____ Power Steering Filter
_____ Wheelchair Pump Filter
_____ Wheelchair Oil Level
_____ Alternator Belt
_____ A/C Belt
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Muffler Mounts
_____ Outrigger Bolts and Mounts
_____ Oil Pressure and Gauge
_____ Water Temperature Gauge
_____ Engine and Trans Oil Leaks
_____ Engine Water Leaks
_____ Engine and Trans Mounts
_____ Frame Structure
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator and Air Compressor Leaks
_____ All Engine/Trans Bolts and Nuts
_____ Air Cleaner Indicator
_____ Engine Compartment Lights
_____ Throttle Springs and Linkages
_____ A/C Compressor
_____ Fill Engine and Trans Oil
_____ Trans Filter
_____ Engine Spinner
_____ Flush Steering System
_____ R&R Power Steering Filter
_____ Accumulator Charge 50psi (TMC)
_____ Qts. Engine Oil
_____ Qts. Trans Oil
_____ Pts. Power Steering Oil
_____ Pts. Wheelchair Oil

**Mech. Signature:**_____

OAHU TRANSIT SERVICES, INC. MAINTENANCE DEPARTMENT

# 24,000 / 48,000 Miles Inspection

BUS #_____ ODOMETER READING_____ DATE_____

VRO #_____ TOTAL TIME_____ MECHANIC'S NAME_____

(3) = If OK (2) = Adjusted/Repaired/Replaced (1) = Repairs Needed (N/A) = Not Applicable

**BOTTOM INSPECTIONS:**

_____ Driver Seat Operation and Lube
_____ Horn and Alarm
_____ All Mirrors, Chimes and Visors
_____ All Sign and Annunciator Operations
_____ Windshield Wiper, Washer and Delay
_____ Dash Control Switches, Knobs
_____ Dash Warning, Indicator Lights
_____ Door Control and Door Operation
_____ A/C and Defroster Operation
_____ Air Pressure Gauge
_____ Volt Gauge (Charging System)
_____ Wheelchair Lift and Safety Operation
_____ Lube Wheelchair Ramp Pins
_____ Kneeling Operation
_____ Microphone Operation
_____ Driver Light and Fan
_____ All Interior Lights
_____ All Exterior Lights and Reflectors
_____ Proper Height of Coach
_____ Body Damage
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Outrigger Bolts and Mounts
_____ Engine, Trans and Differential Oil Leaks
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator/Air Compressor Leaks
_____ Electrical Cables and Wiring
_____ All Engine/Trans Bolts and Nuts
_____ Oil Sample Engine and Trans
_____ Drain Engine and Trans Oil
_____ R&R Engine and Trans Oil Filters
_____ Drain and Fill Differential Oil
_____ Flush Steering System
_____ Grease Coach, Jack Up Front End
_____ Wheel Bearings/Seals and Oil Hubs
_____ King Pin and Front Axle
_____ Tie Rod Ends
_____ Drag Link and Pitman Arm
_____ Steering Box and U-Joints
_____ All Bellows, Height Controls and Links
_____ Air System Leaks (Lines, Valves & Chambers)
_____ Stabilizer Bar and Links
_____ Radius Rod and Bushings
_____ Radius Rod Bolts and Nuts
_____ Lateral Rod and Bushings
_____ Lateral Rod Bolts and Nuts
_____ Engine and Trans Mounts
_____ Frame Structure and Trunnion
_____ Shock Absorbers
_____ Tire Condition
_____ Wheel Splash Guard
_____ Drain Air Tanks Completely
_____ Air Dryer
_____ All Brake Adj/Lining/Cam Height
_____ Driveline, U-Joints and Bolts

**Mech. Signature:**_____

**TOP INSPECTIONS:**

_____ All Door Props
_____ Lube All Door Rollers/Tracks/Linkages
_____ Rear Door Sensitive Edge and Bars
_____ Lube Accel/Brake Pedal Pivots
_____ Test Emergency Engine Shutdown
_____ Wheelchair Lift and Safety Operation
_____ Tilt Steering and Lube
_____ Fire Extinguisher / Triangle Kit and Chalk
_____ Stanchions and Subway Straps
_____ All Interior Decals
_____ Seats/Frame/Arm Rest
_____ Wheelchair Folding Seats
_____ Wheelchair Belts
_____ Buzzer Cord and Touch Tape Strips
_____ A/C Filter
_____ Escape Latches and Roof Hatch
_____ Glass and Window Operation
_____ Floor Covering
_____ Interior Body Damage
_____ Car Cards and Lock Strips
_____ Interior Bolts, Screws and Rivets
_____ Battery Cable Connections
_____ Bike Rack
_____ All Compartment Door Latches
_____ All Access Door Hinges and Lube
_____ Body Screws, Bolts and Rivets
_____ Body Damage
_____ Power Steering Filter
_____ Wheelchair Pump Filter
_____ Wheelchair Oil Level
_____ Alternator Belt
_____ A/C Belt
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Muffler Mounts
_____ Outrigger Bolts and Mounts
_____ Oil Pressure and Gauge
_____ Water Temperature Gauge
_____ Engine and Trans Oil Leaks
_____ Engine Water Leaks
_____ Engine and Trans Mounts
_____ Frame Structure and Trunnion
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator and Air Compressor Leaks
_____ All Engine/Trans Bolts and Nuts
_____ Air Cleaner Indicator
_____ Engine Compartment Lights
_____ Throttle Springs and Linkages
_____ A/C Compressor
_____ Fill Engine and Trans Oil
_____ Trans Filter
_____ Engine Spinner
_____ Flush Steering System
_____ R&R Power Steering Filter
_____ Accumulator Charge 50psi (TMC)
_____ Qts. Engine Oil
_____ Qts. Trans Oil
_____ Pts. Power Steering Oil
_____ Pts. Wheelchair Oil
_____ Pts. Differential Oil

**Mech. Signature:**_____

OAHU TRANSIT SERVICES, INC. MAINTENANCE DEPARTMENT

# TRANSYND - 72,000 Miles Inspection

BUS #_____ ODOMETER READING_____ DATE_____

VRO #_____ TOTAL TIME_____ MECHANIC'S NAME_____

(3) = If OK (2) = Adjusted/Repaired/Replaced (1) = Repairs Needed (N/A) = Not Applicable

**BOTTOM INSPECTIONS:**

_____ Driver Seat Operation and Lube
_____ Horn and Alarm
_____ All Mirrors, Chimes and Visors
_____ All Sign and Annunciator Operations
_____ Windshield Wiper, Washer and Delay
_____ Dash Control Switches, Knobs
_____ Dash Warning, Indicator Lights
_____ Door Control and Door Operation
_____ A/C and Defroster Operation
_____ Air Pressure Gauge
_____ Volt Gauge (Charging System)
_____ Wheelchair Lift and Safety Operation
_____ Lube Wheelchair Ramp Pins
_____ Kneeling Operation
_____ Microphone Operation
_____ Driver Light and Fan
_____ All Interior Lights
_____ All Exterior Lights and Reflectors
_____ Proper Height of Coach
_____ Body Damage
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Outrigger Bolts and Mounts
_____ Engine, Trans and Differential Oil Leaks
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator/Air Compressor Leaks
_____ Electrical Cables and Wiring
_____ All Engine/Trans Bolts and Nuts
_____ Oil Sample Engine and Trans
_____ Drain Engine and Trans Oil
_____ R&R Engine and Trans Oil Filters
_____ Flush Steering System
_____ Grease Coach, Jack Up Front End
_____ Wheel Bearings/Seals and Oil Hubs
_____ King Pin and Front Axle
_____ Tie Rod Ends
_____ Drag Link and Pitman Arm
_____ Steering Box and U-Joints
_____ All Bellows, Height Controls and Links
_____ Air System Leaks (Lines, Valves & Chambers)
_____ Stabilizer Bar and Links
_____ Radius Rod and Bushings
_____ Radius Rod Bolts and Nuts
_____ Lateral Rod and Bushings
_____ Lateral Rod Bolts and Nuts
_____ Engine and Trans Mounts
_____ Frame Structure and Trunnion
_____ Shock Absorbers
_____ Tire Condition
_____ Wheel Splash Guard
_____ Drain Air Tanks Completely
_____ Air Dryer
_____ All Brake Adj/Lining/Cam Height
_____ Driveline, U-Joints and Bolts

**Mech. Signature:**_____

**TOP INSPECTIONS:**

_____ All Door Props
_____ Lube All Door Rollers/Tracks/Linkages
_____ Rear Door Sensitive Edge and Bars
_____ Lube Accel/Brake Pedal Pivots
_____ Test Emergency Engine Shutdown
_____ Wheelchair Lift and Safety Operation
_____ Tilt Steering and Lube
_____ Fire Extinguisher / Triangle Kit and Chalk
_____ Stanchions and Subway Straps
_____ All Interior Decals
_____ Seats/Frame/Arm Rest
_____ Wheelchair Folding Seats
_____ Wheelchair Belts
_____ Buzzer Cord and Touch Tape Strips
_____ A/C Filter
_____ Escape Latches and Roof Hatch
_____ Glass and Window Operation
_____ Floor Covering
_____ Interior Body Damage
_____ Car Cards and Lock Strips
_____ Interior Bolts, Screws and Rivets
_____ Battery Cable Connections
_____ Bike Rack
_____ All Compartment Door Latches
_____ All Access Door Hinges and Lube
_____ Body Screws, Bolts and Rivets
_____ Body Damage
_____ Power Steering Filter
_____ Wheelchair Pump Filter
_____ Wheelchair Oil Level
_____ Alternator Belt
_____ A/C Belt
_____ All Hoses and Clamps
_____ Exhaust Pipes and Clamps
_____ Muffler Mounts
_____ Outrigger Bolts and Mounts
_____ Oil Pressure and Gauge
_____ Water Temperature Gauge
_____ Engine and Trans Oil Leaks
_____ Engine Water Leaks
_____ Engine and Trans Mounts
_____ Frame Structure
_____ Hydraulic Hoses and Leaks
_____ Water Pump, Radiator and Water Leaks
_____ Fan Blades, Hubs and Drive
_____ All Fuel Lines and Connections
_____ Alternator and Air Compressor Leaks
_____ All Engine/Trans Bolts and Nuts
_____ Air Cleaner Indicator
_____ Engine Compartment Lights
_____ Throttle Springs and Linkages
_____ A/C Compressor
_____ Fill Engine and Trans Oil
_____ Trans Filter
_____ Engine Spinner
_____ Flush Steering System
_____ R&R Power Steering Filter
_____ Accumulator Charge 50psi (TMC)
_____ Qts. Engine Oil
_____ Qts. Trans Oil
_____ Pts. Power Steering Oil
_____ Pts. Wheelchair Oil

**Mech. Signature:**_____

# 24,000 Miles Wheelchair Inspection

**BUS #_____ ODOMETER READING_____ DATE_____**

**TOTAL TIME_____ MECHANIC'S NAME_____**

**(3) = If OK (2) = Adjusted/Repaired (1) = Repairs Needed (4) = Send to Other Department**

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1. _____ Clean all chains, sprockets and rails
2. _____ Power on pushbutton "ON" only with front doors fully open
3. _____ Handrails secure and tight
4. _____ Clearance between handrails and front door panels
5. _____ Clearance between blue plastic bundle and lift during in-and-out travel of lift platform
6. _____ Stow latch for adjustment, wear and operation
7. _____ Sensitive edge/switch mat operation and override functions
8. _____ Lift travel, uneven movement or binding while cycling 3x
9. _____ Ramp/barrier locked when in raised position
10. _____ Ramp/barrier switch and linkage for wear or damage
11. _____ Bridge/barrier switch and linkage for wear or damage
12. _____ Slave chains for correct tension, wear or damage
13. _____ Master chains for wear or damage
14. _____ Master chain limit switch for damage
15. _____ Master chain limit switch activating arm position correct
16. _____ Stow/floor level switch and cams for wear or damage
17. _____ Hydraulic lines and fittings for wear or leaks
18. _____ Lift cylinders for leaks
19. _____ Stow/deploy motor chain for wear or damage
20. _____ Stow/deploy motor drive gears for slipping wear or damage
21. _____ Stow/deploy chains for correct tension, wear or damage
22. _____ Stow/deploy channel sprockets for alignment
23. _____ Stow/deploy switch, arm and elec. cable for wear or damage
24. _____ Stow cam for secure mounting, wear or damage
25. _____ Deploy cam for secure mountings
26. _____ Lift tray components for wear, damage, leaks, etc.
27. _____ Lube master, drive, slave and stow/deploy chains
28. _____ Torque shaft crutch
29. _____ Lube ramp/bridge barrier actuating cams and pins
30. _____ Lube ramp/barrier support pivot (hinge)
31. _____ Lube bridge/barrier pivot points, bolts and linkage
32. _____ Lube stow latch pivot
33. _____ Lube main lift cylinder anchor pins

Nos. **28** and **30** .....CHAIN LUBE
No. **31** .....MARINE GREASE
Nos. **32**, **33** and **34** .....ANTI-SEIZE (MOLYBDENUM DISULFIDE)

**Mechanic Signature:_____**

**Mechanic Signature:_____**

24,000 / 48,000 Miles Inspection

# TUNE-UP

BUS #_____ ODOMETER READING_____ DATE_____

VRO #_____ TOTAL TIME_____ MECHANIC'S NAME_____

(3) = If OK (2) = Adjusted/Repaired (1) = Repairs Needed (N/A) = Not Applicable

_____ Injector Condition
_____ Injector Timing
_____ Injector Wiring and Harness
_____ Valve Clearance
_____ Valve Springs
_____ Valve Bridges
_____ Injector Rack Bridges
_____ Control Tubes
_____ Fuel Rods
_____ Rocker Arms
_____ Rocker Arm Shafts
_____ Rocker Arm Buttons
_____ Rocker Arm Adjusting Screw
_____ Push Rods
_____ Camshaft and Rollers
_____ Cam Followers
_____ Governor Cover
_____ Governor Weights
_____ Throttle Linkage
_____ Throttle Return Spring
_____ Fast Idle Cylinder
_____ Engine Stop Cylinder
_____ Throttle Pedal Assembly
_____ Front Throttle Valve
_____ Rear Throttle Slave Cylinder
_____ Intake Hoses and Clamps
_____ Exhaust Piping and Clamps
_____ RPM Idle and Max No Load
_____ Road Test
_____ Steam Clean Engine Assembly
_____ Rear Seat Hinges
_____ Rear Seat Safety Prop
_____ Engine Access Panel
_____ Engine Access Opening
_____ Engine Safety Guard and Brackets

Comments: _____

Mechanic Signature:_____

## 6,000 / 60,000 Miles Inspection

# ARTICULATED JOINT

**BUS #**_____ **ODOMETER READING**_____ **DATE**_____

**VRO #**_____ **TOTAL TIME**_____ **MECHANIC'S NAME**_____

**(3) = If OK** **(2) = Adjusted/Repaired** **(1) = Repairs Needed** **(N/A) = Not Applicable**

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**6,000 Miles:**

_____ Check all fastener torques
_____ Check rear fastening screws (515 ft-lbs.)
_____ Check front fastening screws (370 ft-lbs.)
_____ Check cover M10 screws (22 ft-lbs.) +/- 5%
_____ Check support plate securing screws (check for fastener security only)
_____ Check folding bellows for firm seating

**60,000 Miles:**

_____ Perform 6,000 mile torque check
_____ Perform 6 month cleaning procedure
_____ Insert 200 g. approved lubricant into the grease distributor
_____ Perform "Backlash Adjustment"
_____ Perform "Hydraulic Control Unit Maintenance"

**6-Month Articulated Joint Area Cleaning:**

1. Open folding bellows insert floor
2. Clean interior of all dirt
3. Open platform service plate and remove all dirt from hydraulic area
4. Close all access doors

**Mechanic Signature:**_____