# TRANSIT AND TRANSIT ORIENTED DEVELOPMENT

## An Issue Paper of the American Planning Association

## Hawaii Chapter


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Photo Credit: The cover photo of the Main Street Station in Vancouver, B.C. was taken by Tony Ching of the City Department of Planning & Permitting

# TRANSIT AND TRANSIT ORIENTED DEVELOPMENT

## An Issue Paper by the American Planning Association Hawaii Chapter

# Introduction

In December 2006, the Honolulu City Council voted to select a fixed guideway project as the Locally Preferred Alternative (LPA). This was a historic decision. The APA Hawaii Chapter (APAHI) supported the LPA and the fixed guideway transit system not only because it serves to move people and improve mobility, but because it will be key to shaping the development in the transit corridor as well as many high-density areas within the transit influence zone. These are important planning issues that will re-shape the urban form of Honolulu, will shape the emerging form of the Ewa/Kapolei district, and will determine the connection between these two important urban centers.

The Council and the community-at-large understood that this was not just a decision about transportation, as important as that is to the economy and to people's lives. The decision represented an opportunity to re-order land use with transit as an organizing element. It was a chance to create spaces that achieved community and building objectives. It would provide grounding in making location decisions and setting priorities for public and private investment in infrastructure, public facilities, and affordable housing.

### Why Do We Need Planning Now?

Upcoming decisions for alignment, station location, access, amenities, and nearby land use all involve trade-offs. Identifying alternatives, understanding costs and benefits, and finding criteria for decisions are all basic steps in the planning process. Choices made for development, both public and private, will determine the success of the transportation system, its ridership, its usefulness, and its ability to interact between destinations. Having land use and transportation work together is often called "Making the Connection."

Honolulu, like other cities, wants to become more sustainable, to use renewable resources to create a valued quality of life that does not rob from future generations. Sustainability and making the connection of land use and transportation are future oriented. It is the purpose of planning today to make sense of all of this and to create the policies, documents, and regulations which both represent the community values and are consistent and effective in achieving them.

No city sits still. The choice to start planning now means that more and more decisions about land use and transportation can be made in an inter-connected way. Fewer choices will be made which eliminate or pre-empt other decisions that could support the connection of land use and transit. This is community building through smart development.

A review of the record surrounding the Council's discussions in December 2006 indicates that the Council intended the City to look into both a rapid transit program and the associated land use and benefits from transit oriented development (TOD). The environmental impact statement (EIS) scoping process was completed in the spring of 2007. A draft EIS is expected in mid-2008 and a final EIS in 2009. Developing and implementing a community based planning program is

expected to take nearly two years. Based on the experience in other cities which have successful TOD programs, discussion and development of the TOD process needs to run in parallel to the transit decision making processes. That means that planning for TOD should start now.

**What Kind of Planning is Needed?**

There are different kinds of planning. For most of the planning-related issues discussed in this paper, the appropriate method is by using a community-based process. However, other appropriate forms of getting input will include technical advisory committees, peer review panels, "learning from others" scan tours, and facilitation/mediation/negotiation. The decisions ahead that will benefit from community-based planning include:

Alignment Issues:

- Salt Lake alignment and the airport
- Segment phasing
- Phasing of the MOS (Minimum Operable Segment—see Glossary)
- Relationship of technology to alignment

Station Issues:

- Location
- Access by other modes
- Pedestrian and bicycle access
- Parking
- Place-making and amenities

Transit Oriented Development Issues:

- Who is part of the project negotiation process?

Where Does Infrastructure Go?

- What is the institutional context?
- What is the role of the community?
- What is the role of the Council?

**About this Issue Paper**

Many planners will find themselves in the position of advising a client – a developer, public agency, or a community group – on how transit could impact them and/or how to take advantage of the opportunity presented by transit.

This issue paper, written by the APAHI Ad Hoc Transit Committee, is intended to be a contextual piece for use by APAHI and its members. It creates a foundation for understanding many of the planning issues along the Honolulu high capacity corridor from Kapolei to the University of Hawaii at Manoa. It identifies areas in planning for transit and transit oriented development which would be of greatest interest to APAHI and its members.

While meant for APAHI members' use, the paper is available to others free of charge. When using the paper, we request proper attribution. Comments may be sent to the Committee through the Chapter web page: www.hawaiiapa.org.

The issue paper will be an ongoing work of the Ad Hoc Transit Committee. APAHI advocacy positions are bulleted and highlighted. This first edition, dated July 2007, covers the following major topics:

**Section 1**: Land Use Planning and Transit Planning

- Neighborhood
- Station
- Street Design
- Parking
- Transit First
- Public Education and Community Outreach

**Section 2:** Transit Oriented Development

- Definition
- TOD Typologies
- What Can be Learned from Other Cities
- Place Making and TOD Area Plans
- Small Landowners
- Infrastructure to Support TOD

**Section 3**: Future Transit Decisions

- Alignment
- Technology

**Section 4:** Other Related Issues

- Outside the Corridor
- Affordable Housing
- Governance - Transit Authority
- Procurement

## ACRONYMS USED IN THE PAPER

| | |
|---|---|
| APA | American Planning Association |
| APAHI | American Planning Association Hawaii Chapter |
| AGT | Automated Guideway Transit |
| BRT | Bus Rapid Transit |
| BWS | Board of Water Supply |
| CSD | Context Sensitive Design |
| D-B | Design Build method of contracting |
| DBOM | Design, Build, Operate and Maintenance means of contracting |
| DOT | US Department of Transportation |
| DPP | City & County Department of Planning & Permitting |
| DTS | City & County Department of Transportation Services |
| EIS | Environmental Impact Statement |
| EPA | US Environmental Protection Agency |
| FTA | US Federal Transit Agency |
| GET | State of Hawaii General Excise and Use Tax |
| HCDA | Hawaii Community Development Authority |
| HDOT | State of Hawaii Department of Transportation |
| HECO | Hawaiian Electric Company |
| HOV | High Occupancy Vehicle |
| LPA | Locally Preferred Alternative |
| LRT | Light Rail Transit |
| LUO | Land Use Ordinance of the City & County of Honolulu |
| MOS | Minimum Operable Segment |
| NEPA | National Environmental Policy Act of 1969 |
| OMPO | Oahu Metropolitan Planning Organization |
| ROW | Right of way |
| RRT | Rail Rapid Transit |
| SEPA | State Environmental Policy Act |
| SRB | Semi Rapid Bus |
| TOD | Transit Oriented Development |
| ULI | Urban Land Institute |

# 1. Land Use Planning and Transit Planning

## *1.1 Neighborhood Planning*

The APAHI comments submitted as part of the environmental impact statement (EIS) scoping process emphasize the need for community based neighborhood planning in order to make transit a success. Making the connection between land use and transportation is an APA policy, and this is embedded in federal transportation policy and legislation as well.

Impacts, opportunities, and outcomes are felt most acutely at the neighborhood level. Therefore, the residents and community must be involved in creating the future vision and in choosing the street level design of each station and its surrounding area. Today there is great concern in Honolulu for improved pedestrian safety. APAHI is a partner in One Voice for Livable Islands, a coalition for change to promote pedestrian and bicycle friendly neighborhoods.

Neighborhood planning and space making are part of the same issue as pedestrian safety. If multi-modal access is to be achieved, then community planning is needed for walking, and bicycling, as well as bus and ferry modes. Other cities' experience show that parking policy will need community input before determining the size/scale, pricing, and spillover effects of parking for transit.

Consistent with the APA Policy Guide and good planning practice, APAHI advocates the following:

- The transit project should consist of a context sensitive design (CSD) process based on principles of community based planning. This is different from a community information process. The purpose of the CSD community process is to identify connectivity issues and to integrate transit with other community spaces. Every station area should have a community level plan developed by the affected community. This should be completed well before construction is started, especially if the project moves forward as design-build. This community process should be funded adequately to produce the plans in a timely manner.
- The neighborhood plans should be tied in to the Development Plan/Sustainability Plan process called for in the City Charter.
- The framework and ground rules for the CSD community process should be crafted by an independent task force of experts from the fields of facilitation and community participation. This independence is critical so that a climate of mutual trust can predominate, clearing the path for wise decision-making and the resolution of differences. The ground rules developed by the task force should ensure that the community process is timely and is not used by opponents to obstruct or delay the implementation of transit.
- Adequate staffing and consultant funding should be appropriated over multiple years to do TOD correctly. In Vancouver, the up-front community based planning took 18 months; in Denver it took two years. Therefore, APAHI supports the filling of 12 staff positions in the Department of Planning and Permitting (DPP), plus the allocation of consultant funds to conduct a TOD process.

## 1.2 Station Planning

Station plans address connectivity in the community, including access for pedestrians, bicyclists, and bus rider transfers, as well as the need for park-and-ride facilities (as appropriate). The plans would also address parking policies within the communities affected by transit.

- APAHI advocates for station planning that includes community connectivity and accessibility beyond just the station footprint.

Literature on transit oriented development classifies TOD into categories or typologies (ULI, TRB). Creating TOD typologies is meant to show that differences occur among places depending on their location and character, for example, between urban and suburban or between commercial and residential. Another differentiator is the amount of transit service provided, through buses, rail, or other modes, and whether the transit service is peak predominant or lasts throughout the day.

In Honolulu, typologies for TOD will have to relate to the Land Use Ordinance (LUO). To start this process, each station area needs to be defined according to a TOD typology which defines the functional characteristics of density, land use mix, level of transit service and street connectivity. Each TOD station must also be defined according to its location efficiency, mix of choices, place making, and potential for value capture. Such a definition of TOD is performance-based as to how well it helps with place making, how well it creates a mix of choices, and how much it adds to location efficiency or value capture.

## 1.3 Street Design Related to Transit

Sidewalks need to be wider and crosswalks safer and more convenient within transit influence zones. At present, City standards require only a five-foot sidewalk width in residential zones and six-foot sidewalk in commercial zones, which includes space for street fixtures. Certain of these fixtures – e.g., bus shelters, traffic control boxes, light and utility poles, newspaper stands, traffic signs and parking meters – can impede pedestrian traffic. Street trees, including intrusive root systems, can also be an impediment, although shade from these trees also provides a pedestrian amenity.

The sidewalk width must take into consideration the need to accommodate transit stops. Transit stations can possibly be integrated within buildings on redevelopment sites, but there are few potential locations where this could occur, and the timing and coordination would have to be extraordinarily favorable. At present, the sidewalk widths at proposed transit station sites, especially those in urban Honolulu, are very narrow. Necessary elevators, stairs, or escalators to access an overhead station will be difficult to fit. At intersections, it may be necessary to have four points of access to an overhead station.

- APAHI advocates that sidewalks have a minimum five-foot pedestrian clear zone in transit station areas. At urban stations, the width of the pedestrian clear zone should be at least eight feet. In many instances, especially in urban Honolulu, this would require either additional right-of-way acquisition (which would be difficult and expensive), travel lane narrowing, parking lane removal, or a combination of these.

In recent years, the City's adoption of the standard for broadly-striped crosswalks is a big improvement, but many busy crosswalks still lack this treatment.

- APAHI advocates that the City consider additional improvements for crosswalks near transit stations, such as Barnes Walk operations, restricted vehicular movement, special paving, and signage.

Off-street parking requirements need to be reduced within the transit influence zone and within urban Honolulu in general. We need to develop shared parking facilities (see Section 1.4) in urban Honolulu's neighborhood business (and possibly apartment) districts, where there is a preponderance of small lots that have difficulty accommodating off-street parking. This would, in effect, reduce the number of driveways, which would improve sidewalk conditions and better organize traffic patterns.

## *1.4 Planning for Parking*

Experience with the development of transit systems throughout the US and around the world shows that successful transit-oriented development hinges on providing neither too little nor too much parking. Where too much parking is provided, opportunities to create a vibrant pedestrian-friendly environment are considerably reduced; where too little parking is provided, the surrounding area businesses and neighborhoods could become negatively impacted by transit users' parking in spaces meant for customers and residents (ULI; Dittmar & Ohland).

ULI suggests four "principal tools" as part of providing flexible parking standards:

*Move it* – place parking within a five- and seven-minute walk from the station platform to encourage development of the land between the parking structure and the platform.

*Share it* – design parking lots and garages to serve multiple users based on time-of-day and time-of-week use, such that commuter patrons use the parking facilities during the weekdays and recreational patrons use them during the weekends.

*Deck it* – provide multiple floor parking structures rather than surface parking lots. Because of the high-cost per parking space for these types of parking structures, a fee should be charged.

*Wrap it* – "wrap" retail, residential, and other land uses around the station to make it into a destination.

Many of the existing parking regulations provide minimum parking spaces based on floor area ratio or number of dwelling units. To move toward providing neither too little nor too much parking, parking requirements must be re-evaluated.

- APAHI advocates the need for a total revamp of the City LUO parking regulations all along the high capacity corridor.

## *1.5 Transit First Planning*

Many cities have adopted a "Transit First" policy whose objective is to create a city where it is possible to live without an automobile. San Francisco's Transit First Policy was enacted into law several years ago. The works of Robert Cervero attempt to measure the results in San Francisco, including the creation of housing as a result of stations nearby.

WMATA in Washington, D.C. is considering eliminating all parking requirements near station areas except for shared parking and short term parking. Seattle's Neighborhood Business District Strategy looks at how transit can assist business. Miami planners talk about how to redesign public spaces, buildings, and their way of life to live around transit instead of the automobile.

APAHI is a member of One Voice, a coalition of organizations dedicated to making Honolulu a pedestrian and bicycle friendly city, in accordance with Charter Amendment 8, and focusing on improving safety in the pedestrian environment. One Voice shares many of the objectives found in cities that have a Transit First Policy, and this may be a next logical extension for the local One Voice Coalition.

- APAHI advocates that the City study the potential for converting some one-way streets to two-way traffic in order to provide more options for travel routes and to calm vehicular traffic and create safer conditions for pedestrians and bicyclists. Streets that serve as major bus routes may need to be modified to optimize bus ridership; e.g., by providing semi-exclusive bus lanes and larger bus shelters with more conveniences
- APAHI advocates that the City make a concerted effort to implement the recommendations of the Honolulu Bicycle Master Plan, potentially adding revisions to this plan to enhance bicycle connections to the planned transit stations.

## *1.6 Public Education and Community Outreach for Planning*

Not everyone will want to participate at the Neighborhood Plan level. Public education and information is essential in all phases of the transit project. Some of the topics recommended by the Urban Land Institute (ULI) that help lead to successful development projects around transit and lend themselves to workshops and conferences are:

- Power of partnerships
- Getting parking right
- Creating retail space that is market driven, not transit driven
- Making buses work both as connectors and in areas not served by rail
- Engaging corporate attention

- APAHI advocates for and is willing to cosponsor conferences and workshops on important topics related to the planning and implementation of transit.

# 2. Transit Oriented Development

## *2.1 Definition of Transit Oriented Development*

Transit oriented development (TOD) is a form of development that encourages mobility such as walking, biking, bus, and light rail. Typical TOD sizes range from five to ten acres within a quarter mile of a transit station. Typically, TOD will:

- Provide new development with a mixture of land uses, including residential and commercial uses, parks, and public facilities that can be reached without driving.
- Establish minimum densities for both commercial and residential development
- Site new residential development within a half mile of transit stops on the assumption that commuters prefer to walk to station stops
- Build housing that varies in density, building type, price, and ownership pattern.
- Locate commercial buildings adjacent to transit rather than surround the stops with large parking lots.
- Provide a street network that offers multiple routes for walking and biking between commercial areas and surrounding neighborhoods.
- Locate off-street parking in surface lots at the rear of buildings, underground, or in parking structures.

The housing component of a TOD typically increases the density of the community, containing between 1,000 and 2,000 dwelling units, offered mostly as apartments, condominiums and townhouses. The employment center may have 750,000 square feet of office space and 60,000 square feet of shopping facilities. Seven typologies are frequently discussed in the TOD literature. These should be expanded upon by preparing Area Guideline Plans for each station area.

## *2.2 TOD Typologies*

The following table describes TOD typologies that should be considered in Honolulu.

**TRANSIT ORIENTED DEVELOPMENT TYPOLOGIES**

| Typology | Characteristics |
|---|---|
| Urban-Downtown | Civic and cultural centers<br>Multiple transit lines and transfer points |
| Urban Neighborhood | Moderate to high density (>30 du per acre)<br>Extension of downtown street system<br>Shopping along a central street<br>Key crossroads<br>Usually more affordable housing<br>High pedestrian activity<br>Sometimes historic districts adjacent to downtown |

| Typology | Characteristics |
|---|---|
| Regional Town Center | Shopping center, with ample auto access<br>Will require careful connectivity<br>Land use changes will likely be needed<br>Infill opportunities to make the area 24 hour |
| Suburban Neighborhood | Opportunity for higher density and redesign<br>More commuter focused<br>Some retail and commercial in existence, but limited |
| Neighborhood Transit Zone | Mostly residential<br>Some shopping with limited retail or office space |
| Commuter Town | Freestanding, with commuter service to downtown<br>Station area may be a "main street" with retail, offices, residential<br>Supports peak hour service but needs parking |
| University Center | Pedestrian and bike environment<br>Needs sidewalk and shuttle bus connectivity to student activity centers, sports complex and libraries |

(This table is modified from Dittmar & Ohland, *New Transit Towns*, Table 2-1.)

## *2.3 What Can be Learned from Other Cities*

The Ad Hoc Transit Committee has been educating itself by reading current papers and studying TOD. Many members have visited cities with good TOD projects such as those in Vancouver, Portland, San Francisco, Washington DC, and Boston.

Some of these cities have first-generation TOD projects which did not achieve many of their objectives. The projects were more transit adjacent than transit oriented. Lessons learned from these examples have created a more recent set of second generation TOD projects. The preliminary list of important features that need to be understood in each TOD project are:

- Place making: creating public and civic spaces
- Building intensity and scale (overlay districts)
- Integration with transit
- Land assembly
- Interface of the transit agency with other agencies
- Financing TOD
- Joint development

For Honolulu to take full advantage of the opportunities presented by TOD will require the following:

- APAHI advocates that new policy and regulatory features be put into the Development Plans, Sustainable Community Plans, Special Area Plans, and the LUO. APAHI advocates that the discussions leading to those changes start immediately, and that input from the local planning and design community be part of the ordinance writing process.

- APAHI advocates that design issues should not be totally in the hands of architects based outside of Hawai‘i or with those who are unfamiliar with elements that create a Hawaiian sense of place.

## 2.4 Place Making and TOD Area Plans

Transit oriented development is all about creating new urban places. Opportunities will vary by location. From the experiences in other transit cities, we know that TOD does not occur by accident, but by well formulated articulation of community objectives, criteria for evaluation, policies, and regulations.

- APAHI advocates that the specific processes for encouraging and then processing TOD be discussed with the community at large in the same timeframe as the transit EIS is being prepared and reviewed.

A TOD area plan would do the following:

- Present a conceptual land use diagram and program.
- Identify key opportunity sites.
- Incorporate services such as day care, and elderly facilities.
- Present design guidelines and a streetscape plan.
- Designate investment priorities for infrastructure and place making amenities.
- Present an action plan and financing strategy. Discuss how the value would be captured and how it would be spent.
- Create guidelines for parking design and vehicular circulation to avoid automobile and pedestrian conflicts.
- Set high design standards, ensure careful design review, and enforce standards.

## 2.5 Small Landowners

The East Kapolei end of the line has a small number of landowners, many of these institutional. Landowners are moving forward with development within the context of the adopted Ewa Development Plan. TOD is a natural complement to these projects, but for much of the balance of the alignment, starting with Waipahu, there is extensive pre-existing development and a large number of small landowners.

A look at the proposed station locations shows dozens, even hundreds, of separately owned parcels within a quarter mile. The existing neighborhoods in the vicinity already have their own particular sets of dynamics: people, uses, structures, streets, utilities, problems, potentials, and needs. Some neighborhoods will have opportunities for adding a mixture of choices, place making, resolving node and place tensions and value capture. In other areas, planning may need to focus more on mitigating adverse impacts. For most areas, it will be a combination.

- The TOD area planning processes need to reach out to small landowners. APAHI advocates that TOD planning be done station by station, community by community, encompassing all interested parties.

## *2.6 Prioritizing Infrastructure Upgrades to Support TOD*

The availability of adequate infrastructure to support TOD is a primary concern within existing developed areas such as urban Honolulu, where infrastructure is old, undersized, and in need of upgrading. Infrastructure capacity in recently developed or developing areas such as Ewa and Kapolei is of minor concern, since the supporting infrastructure is relatively new and sized for future growth.

Issues related to the key infrastructure systems that influence the potential for TOD in urban Honolulu are summarized below:

### 2.6.1 Sewage System Capacity

The city is under consent decrees and administrative orders to make expensive and time-consuming improvements to sewage systems and to parts of those systems throughout the island, including local collection lines, regional force mains and pump stations, and treatment plants. The lack of adequate system capacity constrains the full development potential of many urban Honolulu properties even under present zoning regulations. If the City wishes to facilitate higher-density TOD in urban Honolulu that is concurrent with or shortly follows transit station development, improvements to sewer capacity must be a priority. This leads to several questions:

- Given the mandates of the consent decrees and administrative orders, is the city able to develop a plan of action that would give priority to sewage infrastructure improvements that serve properties along the transit line?
- Can the city attract a sufficient supply of qualified contractors to undertake the massive number of improvements that are needed?
- What is the cost and time frame for such improvements? Can these improvements be coordinated with the development of the transit system?
- Are state or federal sources of financing available for these improvements?

### 2.6.2 Streets

Over the years, the city has sought to optimize the vehicular capacity of urban Honolulu's street system by modifying them in design and operation to improve traffic flow and accommodate increasing volumes of vehicles. One of the major operational changes was the adoption of a one-way street plan in the 1970s. Design modifications have included fully or partially converting parking lanes to travel lanes, re-striping and/or narrowing travel or parking lanes to create turn lanes, and creating a wider curb radius at certain intersections.

Some of these measures have resulted in the width reduction of already narrow sidewalks. The City has rarely initiated sidewalk widening or improvement projects, other than to meet federally-mandated accessibility standards or to revitalize specific streets in Waikïkï or Chinatown. Some streets have been modified to improve bus transit service, particularly at bus stops. However, there are very few exclusive or semi-exclusive bus lanes. Bus shelters have been added as a convenience to riders, but often at the sacrifice of the sidewalk area. There are very few dedicated or posted bicycle routes or bike lanes in Honolulu.

In short, the street system in urban Honolulu tends to favor private vehicles over other modes of travel. To develop a true TOD in Honolulu, streets need to be modified to provide better support for pedestrian, bicycle, and bus travel, not just within the immediate vicinity of the stations but throughout the urban street system.

Other infrastructure systems may constrain TOD in localized areas, but not to the degree that the sewer and street systems do. These systems are described in the following sections in relative order of significance:

### 2.6.3 Storm Drainage

Many of the current storm drainage systems within the primary urban core are old. Maintenance of these systems, not their capacity, is the main concern. However, localized areas, such as central Kaka‘ako, are within potential TOD zones that presently lack adequate drainage. Storm drainage improvements will be needed before such areas are redeveloped. On the other hand, these areas tend to have relatively small lots, which is another type of constraint on TOD, as discussed in Section 5.6.

### 2.6.4 Electrical Power

Hawaiian Electric Company (HECO) will be improving the reliability of its transmission system with a new 138kv line that follows an underground route through urban Honolulu. The phased project will reconfigure and connect existing 46kv circuits from Pukele Substation at the northern end of the transmission corridor with the existing and new 46kv circuits at Archer and Kamoku substations in the southern 138kv corridor. Underground 46kv lines would be installed in the Ala Moana, McCully, Mo‘ili‘ili, Kapahulu, Makiki, McCully, and Kaka‘ako areas. HECO has not yet started this construction, but it will be needed to support TOD in urban Honolulu.

### 2.6.5 Potable Water

The Honolulu Board of Water supply has indicated that water availability is sufficient to meet current and presently anticipated densities. Should significantly higher densities be projected, coordination with BWS will be needed to assure sufficient pressure.

### 2.6.6 Solid Waste Disposal

While the city is currently developing an overall solid waste management plan for Oahu, solid waste disposal is not a particular limiting factor to TOD.

# 3. Future Transit Decisions that will Impact Land Use

## *3.1 Alignment*

### 3.1.1 MOS Ends of Line

The beginning and end points of the Minimum Operable Segment (MOS) are doubly critical for their end of line issues (access, park and ride) as well being the starting point for future extensions. The alternative development process must allow for and produce alternate designs which enhance and draw out the urban form possibilities surrounding the MOS end points.

### 3.1.2 Eastern End: Ala Moana Station

Preliminary indications for the design of the Ala Moana station are that it would be 80 feet above ground level. Such a height contradicts good urban space planning in that location and would create logistical problems for both modal transfer and future extensions. The scope of the EIS needs to be broad enough to evaluate horizontal and vertical variations and identify solutions and mitigations that as much as possible establish a more human scale for this and other stations. The City should not shy away from takings when necessary to achieve the right form and to enhance ridership.

### 3.1.3 Western End: East Kapolei Station

The preliminary indications for transit in East Kapolei are that it may not have a UH West Oahu Campus station. In APAHI comments during the EIS scoping process, we advocated for the review of an option integrated within the campus.

### 3.1.4 Alignment Section I: Ewa Plain

All stations in the Ewa Plain area must be integrated fully with the overall urban form following principles of connection. Stations should not be relegated to the periphery of master planned sub-communities. The Ewa communities have a strong record of being involved in planning and facility design (e.g., schools, parks, transit hub, Kalaeloa). They should be empowered partners in design decisions.

### 3.1.5 Alignment Section V: At-grade vs. Elevated Transit Line in Urban Honolulu

This section is taken from prior APAHI scoping comments. An elevated guideway is much more difficult to accommodate in Section V (urban Honolulu) than in outlying areas for the following reasons:

- It is desirable to have more frequent stops in the dense urban core than in the outlying areas, where the system will function more as a commuter line.
- Direct and convenient pedestrian access to stations is more important in the urban core than in outlying areas, where commuters are more likely to drive to the stations.
- The construction cost per mile for an overhead viaduct in the urban core is much higher than in outlying areas.

- An overhead viaduct running along the downtown waterfront and through the older, narrower streets of urban Honolulu will have a significant adverse impact on adjacent land uses. It will discourage improvement of adjacent properties and diminish the quality of the streetscape in the very locations where we most need to stimulate pedestrian activity and transit oriented development. Since it is very difficult to retrofit an overhead viaduct into a densely built urban core, engineers must resort to awkward solutions: for example, the flyover above the H-1 viaduct near the University of Hawai‘i at Mānoa, or the station placed at 80 feet above grade at Ala Moana Center. But alternate designs must be sought through peer review and design competitions.
- Of the five cities that City and County of Honolulu officials visited in late 2006 to look at transit oriented development, none built overhead rail viaducts within the urban core. Seattle has a short monorail viaduct, but this was not designed as a major transit line, and it is a comparatively light structure. Otherwise, Seattle, Vancouver, and San Francisco have overhead viaducts in outlying areas but bring the rail line underground or at-grade when it enters the urban core. San Diego and Portland rely on at-grade transit systems when in town.
- One way to mitigate the extreme grade issues in the Kaka‘ako and Ala Moana sections is to alter the vertical alignment by using alternate streets (e.g., Kapiolani versus Kona). Elimination of extreme grade at the freeway/University needs constructability and peer review.

## *3.2 Selecting an Appropriate Technology and Transit System*

The City and County of Honolulu presently is considering several types of transit technologies, including light rail, heavy rapid rail, rubber-tired guided vehicles, magnetic levitation, and monorail systems. The City administration will choose the technology if the City Council decides not to make this decision. According to news reports, Mayor Mufi Hannemann strongly prefers a rail transit system that runs on an exclusive guideway, while some City Council members want to consider buses and other modes that use rubber tires. (Brannon, 2007) The City’s chief transit engineer prefers an elevated guideway, even in downtown Honolulu, because variable soil conditions make the cost of digging a tunnel for a subway very expensive (Hamayasu, 2007). Architects, planners and others who oppose a superstructure in the urban core cite potential negative impacts on important view planes and the difficulties and challenges of integrating stations with surrounding neighborhoods.

Given the importance of all of these issues, planners need to understand the performance characteristics and costs of various transit systems and modes, and how each one matches local needs and conditions. Transit systems have three basic characteristics:

- type or category of right-of-way (ROW),
- technology (vehicles that use roads or rails), and
- type of operation (local, express, special).

These characteristics are interrelated to some extent. Because the choice of ROW affects both the investment cost and the performance of the transit system, it is important to review three basic types of ROW, which are more fully described elsewhere (Vuchic 1981).

### 3.2.1 Categories of Right-of-Way

**Category A.** This category is fully grade separated from other traffic. It requires a very high level of capital investment to support construction of aerial structures, tunnels, transit stations, automatic signal control systems, and other infrastructure. Justifying this level of investment typically requires selection of rail technology that has higher capacity, reliability, and safety compared to manually driven transit systems that operate on streets or highways. These rail technologies include heavy rail transit (HRT), rail rapid transit (RRT), or automated guideway transit (AGT) systems. Because of their higher performance, these systems compete more effectively with automobiles and are more likely than bus systems to support transit-oriented development (TOD) at transit stations.

**Category B.** This category is partially separated from mixed traffic. The separation is achieved either by dedicating streets as transit malls in central business districts or by constructing curbs, street medians, or aerial structures beyond the CBD. These physical separations or barriers enable higher transit speeds. This category is suitable for semirapid bus (SRB) and light rail transit (LRT) systems that use manually driven vehicles. Because of manual operation, these transit systems can stop for cross traffic at signalized intersections, which lowers average transit speeds but facilitates pedestrian access of the transit system in areas with high levels of pedestrian activity. The overall performance, cost, and potential for TOD of these systems is typically less than that of systems with exclusive ROW over the entire alignment. However, at-grade transit systems usually have fewer visual impacts, especially if higher performing systems must rely on aerial structures rather than more costly tunnels.

**Category C.** This category includes surface roads and streets with mixed traffic. Category C primarily serves the transit-captive market, rather than commuters who have access to automobiles, because this type of right-of-way cannot compete effectively with the superior speed and reliability of automobiles. Except for express bus service, this category presently describes most other bus service in Honolulu that operates on surface streets. In sum, both ROW categories A and B are better than C in achieving a transit system that can compete with private automobiles.

### 3.2.2 Transit Technologies

Transit technology refers to specific modes: mini, regular, and articulated buses; semi-rapid bus (SRB) or bus rapid transit (BRT); light-rail transit (LRT); automated guideway transit (AGT); rail rapid transit (RRT); and others. The choice of transit technology, which is largely a technical consequence of the ROW decision, should be based on expected performance requirements: needed capacity, comfort, speed, safety, and operating cost. Mini, regular, and articulated buses are the most cost-effective mode on ROW category C in providing service for low to moderate passenger volumes on urban surface streets. Transit systems with higher capacity and speed, such as SRB, BRT, and LRT on ROW category B, or AGT and RRT on ROW category A, are necessary as passenger volumes increase and service is extended to distant suburban areas.

See Appendix A for a briefing paper with more detailed comparison of fixed guideway transit technologies. The briefing paper was prepared by member Peter Flachsbart.

# 4. Other Issues

The issues touched upon in this section require further discussion by the Ad Hoc Committee. No positions have been taken on any of them.

## *4.1 What Happens with Transit Outside the High Capacity Corridor?*

Many corridors with important surface transit routes stand alone and/or link into rail transit. It may be worthwhile developing TOD standards for these corridors as well.

## *4.2 Transit Oriented Affordable Housing*

A major challenge for Honolulu will be to create attractive housing choices to accommodate an estimated 85,000 new homes expected to be developed in the City's Ewa and Primary Urban Center Development Plan Areas over the next 25 years (DPP projection 2006). Market forces will provide the lion's share of these homes and much of the housing growth on the Ewa Plain will be subject to the City's standard 30 percent affordable housing requirement implemented through unilateral zoning conditions. Urban infill housing adjacent to proposed transit stations will not likely produce affordable housing unless it is either required as a condition of rezoning or as part of a transit oriented development (TOD) overlay zone.

Affordable for sale and rental units are needed to ensure a wide range of housing choices and are "crucial to building a region that is both equitable and efficient" (Dittmar & Ohland 2004). Affordable housing, including workforce housing, is acutely needed on Oahu where median single family home prices are about double what the "median" family can afford. The City's proposed transit project provides an important planning tool to focus on and encourage mixed use development including a full range of housing choices. Since transit ridership is also dependant on resident demand, housing and transit have an important mutual relationship.

See Appendix B for a briefing paper on affordable housing prepared by member Tom Fee.

## *4.3 Governance: Purpose and Form of a Transit Authority*

It is common for public owners who undertake a new large billion dollar project to create a special entity, often a construction authority, to oversee building the project. The transit construction agency needs adequate powers to negotiate and address the risks inherent in a large project. Later, the same authority may be responsible for operations and maintenance, but this is not automatic; it could be transferred to a different authority or agency. The decisions regarding whether to have a transit construction authority, and if so, its form, size, and the extent of its responsibilities, have not been made, nor has this issue been widely addressed outside of City Hall.

How Honolulu brings together transit, land use, and development is still another level of governance. Should the same authority responsible for the transit project oversee TOD or should it be separate (but coordinated)? Is a new separate authority needed for this? Do new responsibilities need to be given to existing agencies?

The literature suggests that when a transit authority is involved with development projects, its goals are to: (1) maximize monetary return on the land, (2) maximize ridership, and (3) value capture over the long term. Three examples are offered here:

1. Washington Metropolitan Area Transit Agency in Washington DC (WMATA) has been active in promoting TOD by getting involved in real estate development. WMATA proactively purchased the land around new transit stations and worked with local land use authorities to ensure TOD-supportive zoning which promoted mixed uses and density.
2. The Chicago Regional Transit Authority (CTA) promotes station area planning through funding and technical assistance to local communities.
3. Triangle Transit Authority (TTA) in Raleigh-Durham North Carolina created TOD guidelines for station area development, published a Livable Communities brochure and reviews potential development in station areas.

Common barriers for transit agency involvement in TOD are that they see themselves as providers of transportation services. They have limited funds and skills for development. Thus, their participation is often focused on sites suitable for joint development with a private developer partner on a site owned by the transit agency. Commonly this involves a leasing of ground space or air rights. Sometimes operational costs are shared (utilities, parking facilities).

See Appendix C for a briefing paper on transit authority roles in TOD in other areas of the county. The briefing paper was prepared by member Dennis Silva.

## *4.4 Procurement*

Modern transit systems often involve proprietary designs that are available only as complete packages from specific vendors who offer several major transit technologies:

1. steel wheel on steel rail systems with steerable trucks;
2. vehicles with rubber tires on concrete pads;
3. straddle-beam monorail systems; and
4. magnetic levitation (maglev) vehicles.

Major subsystems of proprietary designs cannot be purchased under separate procurements.

The Federal Transit Administration (FTA) prefers that cities not select a vendor and technology prior to preparation of the environmental impact statement (EIS). FTA does not want cities to tie their hands to one vendor and technology before the environmental impacts of that technology have been fully explored in an EIS. The risks of first selecting a vendor and technology are: (a) some of the environmental impacts of that technology may not be publicly disclosed during the planning stage; and (b) it may not be possible to mitigate the adverse impacts of that technology.

The City will most likely use a competitive, negotiated procurement process. Under this process, the City's request for proposals (RFP) will call for one contractor to design, build, operate, and maintain (DBOM) the fixed-guideway transit system. It is not likely that the City will use conventional procurement, because it would take too long to procure the transit system. DBOM imposes certain responsibilities on the public and private sectors. The public sector's obligation is to define the project well, obtain public support, streamline the procurement process to avoid delays, set a realistic schedule, and share risk of failure with the private sector. To expedite the procurement process, APAHI recommends that the City provide the right-of-way for the guideway, stations, power substations, and sites for a central control facility and a maintenance

and storage facility. Other elements, such as fare-collection equipment, can be obtained through City-let contracts. Such contracts may also be used to procure various transit stations. Stations should be designed to satisfy the specifications of the chosen technology as well as neighborhood preferences obtained through a community-based planning process. This process should begin as soon as possible.

In reality, one contractor represents a consortium of separate large and small contractors, who together must design, build, furnish, operate, and maintain the system. The contractor will most likely be responsible for final engineering and design, construction, equipment supply, start-up operation, and maintenance for a five-year period. This period could be extended if the City decides not to take over operation of the system. Since a transit system can spur real estate development within the rapid transit corridor, the City may grant development rights and zoning concessions to the contractor in exchange for private sector financing of the project. Real estate development near transit stations could provide the contractor with lease rents, which could offset a portion of the transit system's operating cost.

APAHI advocates that any development rights and zoning concessions that are extended to the contractor should conform to the City's expectations for transit oriented development.

## About the Committee

Formation of the Ad Hoc Transit Committee was approved by Chapter President Gene Yong on January 5, 2007. The objective was for the American Planning Association Hawaii Chapter (APAHI) to be a positive force for good planning practice and to be an effective participant in deliberations about Honolulu's transit and TOD planning. All Chapter members are invited to attend and minutes are kept.

The goals of the Task Force are to:

- Become better educated about transit, land use, and transit oriented development.
- Couple and apply this expertise with committee members' training, knowledge, and experience in planning, community benefits, and public participation.
- Develop APAHI chapter positions on important transit-related issues, using a structured process of research and deliberation.
- Present testimony where appropriate.
- Prepare and sponsor issue papers which identify important planning issues associated with the Honolulu transit project that would be of interest to the Chapter and its members.
- Identify important resources for planners wishing to be more knowledgeable about TOD practice in the United States and, in particular, how it interfaces with transit planning.
- Agree upon a common vocabulary for land use, transit, and TOD.
- Interface with other organizations and committees that form around transit, land use, and planning issues.
- Ensure that any actions or positions taken by APAHI are consistent with the APA Policy Guide on Surface Transportation ratified by the APA Board of Governors in April 1997.

**Roster of Members as of June 2007**

John Whalen and Cheryl Soon, Co-Chairs

Tom Fee, Peter Flachsbart, Cami Kloster, Shevaun Low, Deepak Neupane, Gary Okino, Ralph Portmore, Sue Sakai, Dennis Silva, Kathy Sokugawa, Bruce Tsuchida, John Valera, and Charles Willson

## List of APAHI Testimonies and Comments

The Ad Hoc Transit Committee presented testimony and comments on behalf of APAHI with regard to the City's proposed transit project. Copies of the positions taken are presented in Appendix F.

| | |
|---|---|
| February 12, 2007 | Testimony to Honolulu City Council Transportation and Budget Committees supporting the Minimum Operable Segment from East Kapolei to Ala Moana Center.<br><br>*Outcome: referred to City Council* |
| February 21, 2007 | Testimony to Honolulu City Council supporting the Minimum Operable Segment from East Kapolei to Ala Moana Center.<br><br>*Outcome: adopted as Resolution 07-039* |
| April 2, 2007 | Eight comments to DTS on scoping for the EIS and Preliminary Engineering.<br><br>*Outcome: awaiting response to comments* |
| April 25, 2007 | Comments to City Council on Bill 30 CD1 Executive Operating Budget, supporting a request for 12 staff positions and consultant funding for TOD.<br><br>*Outcome: positions reinserted by Council into the Budget* |
| May 3, 2007 | Comments to OMPO supporting inclusion of the MOS in the ORTP.<br><br>*Outcome: MOS Adopted by OMPO* |
| May 23, 2007 | Testimony to Honolulu City Council Budget Committee supporting request for 12 staff positions and consultant funding for TOD.<br><br>*Outcome:* approved by City Council. |

## Recommended Reading

APA CD ROMs on *Transportation* and Land Use Connection and on TOD Regulations

APA *Policy Guidelines on Surface Transportation*

Belmont, Steve. 2002. *Cities in Full*. APA Press, Washington DC.

Belzer. "Transit Oriented Development: Moving from Rhetoric to Reality." June 2002 in CD on Smart Growth.

Cervero, Robert, Peter Hall and John Landis. 2002. *Transit Joint Development in the United States, Monograph 32*. Institute of Urban and Regional Development, University of California, Berkeley.

Dittmar, Hank and Gloria Ohland. 2004. *The New Transit Town: Best Practices in Transit Oriented Design.* Island Press, Washington DC

Dunphy, Robert T. 2005. *Developing Around Tranist.* Washington, D.C.: ULI Press.

Hanson, Susan and Genevieve Giuliano, ed. *Geography of Urban Transportation*, Third Edition. 2004. Guilford Press, New York. See Chapter 8 by John Pucher: Public Transportation.

Moore, Terry and Paul Thorsnes with Bruce Applegate. 2007. *The Transportation/Land Use Connection*. Second Edition. APA Planning Advisory Service (PAS).

Shoup, Donald. *The High Cost of Free Parking.* APA Planners Press, Chicago.

Smart Growth America. 2005. CD ROM on *Smart Growth Software*.

Transportation Cooperative Research Program Report No. 102 *Transit Oriented Development in the United States: Experiences, Challenges and Prospect*.

Urban Land Institute (ULI), *Ten Principles for Successful Development Around Transit*.

# Glossary

**AA – Alternatives Analysis**

An analysis of the engineering and financial feasibility of alternatives under consideration for a rail project or other major transit construction project, required before monies can be allocated to a project, resulting in sufficient information to support selection by state and local officials of a locally preferred alternative.

**ADA – Americans with Disabilities Act**

Federal civil rights legislation for disable persons passed in 1990, which calls on public transit systems to make their services more fully accessible as well as to underwrite a parallel network of paratransit service.

**Arterial Street**

A major thoroughfare used primarily for through traffic rather than for access to adjacent land; characterized by high vehicular capacity and continuity of movement.

**AFC – Automatic Fare Collection System**

A system that controls equipment that automatically admits passengers on insertion of the correct fare in coins, tokens, tickets, or farecards. It may include special equipment for transporting and counting revenues.

**CBD – Central Business District**

The downtown retail trade and commercial area of a city of an area of very high land valuation, traffic flow, and concentration of retail businesses, offices, theaters, hotels, and services.

**CDV – Credit/Debit Vendor**

Machines that will accept credit cards or automated teller machine (ATM) cards in payment for high value transit tickets.

**EIS – Environmental Impact Statement**

An analysis of the environmental impacts of proposed land development and transportation projects. For federally funded or approved projects, the EIS is prepared in accordance with the National Environmental Policy Act (NEPA). In Hawaii, Chapter 243 HRS requires similar environmental documentation for projects involving state or county funds, use of state or county land, or certain permit approvals. A Draft EIS is circulated for comment to the public and agencies with approval authority. Later, a Final EIS is circulated which contains responses to

public comment and ways to mitigate adverse impacts. The NEPA EIS process ends with the issuance of a Record of Decision (ROD) by the sponsoring federal agency.

**Fixed Guideway System**

A system of vehicles that can operate on its own guideway constructed for that purpose. Federal interpretation includes rapid rail, light rail, exclusive right of way buses, trolley coaches, and ferryboats.

**Fixed Route**

Service provided on a repetitive, fixed-schedule basis along a specific route with vehicles stopping to pick up and deliver passengers to specific locations. Each fixed route serves the same origins and destinations, unlike demand-responsive services and taxicabs.

**FY –Fiscal Year**

The annual period defined by government for budgetary/funding purposes. For the federal government, the fiscal year begins on October 1st. The City fiscal year begins on July 1st.

**GO – General Obligation Bonds**

These are municipals bonds backed by the taxing power of the government and may be repaid with taxes and/or project revenues.

**HOV – High Occupancy Vehicle**

A vehicle carrying two or more passengers.

**Intermodal**

Activities which involve or affect more than one mode of transportation, such as automobile, transit, ship, bicycle, and walking. This term includes connections, choices, cooperation, and coordination. Also called “multi-modal.”

**ISTEA, TEA 21, SAFETEA-LU**

ISTEA was landmark federal legislation passed in 1991 which called for broad changes in the way transportation decisions are made. ISTEA emphasized diversity and balance of modes, as well as the preservation of existing systems before construction of new facilities. TEA 21 and SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act for Land Use) were later reauthorizations of ISTEA passed in 1997 and 2005, respectively.

**LOS – Level of Service**

A qualitative assessment of a road operating conditions or an indicator of the extent to which service is provided by a facility based on its operational characteristics. LOS is a grading system used in transportation planning that assigns a grade to a roadway usually based on the V/C ratio. The V/C ratio is represented by the letters A through F, with LOS A representing the best conditions and LOS F representing the worst.

**LPA – Locally Preferred Alternative**

The LPA results from the selection of the Alternatives Analysis and is selected by local officials. For Oahu, the selection of the Honolulu fixed guideway system was by the Honolulu City Council.

**LRT – Light Rail Transit**

Fixed guideway transportation mode that typically operates on city streets and draws its electric power from overhead wires. This also includes streetcars, trolley cars, and tramways. It differs from heavy rail, which has a separate right-of-way and source of power. Has more closely spaced stops and carries fewer passengers than heavy rail.

**MOS – Minimum Operable Segment**

That portion of the Honolulu High Capacity Corridor Project's LPA for which funding was projected to be available: from East Kapolei to Ala Moana. The MOS meets the following criteria:

- It can be implemented with anticipated funding;
- It includes system-wide facilities, such as a vehicle maintenance and storage site, required for operation;
- It has independent utility and logical termini, meaning that it is able to provide substantial transportation benefit independent of any potential future extensions, and
- Its transportation benefits meet Federal Transit Administration (FTA) requirements for federal New Starts funding.

**O&M – Operations and Maintenance**

Terminology used to refer to the costs associated with operating and maintaining a system which can include, but are not limited to, labor costs, administrative costs, costs associated with utilities, rent, etc. versus capital costs.

**OMPO – Oahu Metropolitan Planning Organization**

A joint city state transportation planning agency with a Policy Committee, Technical Advisory Committee, and Citizen Advisory Committee. OMPO is responsible for five-year updates to the Oahu Regional Transportation plan (ORTP) and for prioritizing federal funding of ground transportation projects.

**ORTP – Oahu Regional Transportation Plan**

This plan is prepared and adopted by OMPO. It must be updated at least every five years.

**OTS – Oahu Transit Services**

Contracted operators of TheBus and Handivan.

**PE – Preliminary Engineering**

The initial design phase of a project during which cost estimates and analysis of benefits and impacts are identified with a greater degree of confidence than in earlier stages.

**PUC – Primary Urban Center**

The island of Oahu is divided into eight community planning areas. The PUC extends from Pearl City to Kahala.

**Ridership**

The number of rides taken by people using public transportation in a given time period. Used primarily to describe transit, ridership can be measured by boardings (the number of people who embark upon a transit vehicle) or by trips (which would include transfers and consecutive boardings as part of a single trip).

**Shuttle**

A vehicle that travels back and forth over a particular route, especially a shorter route or one that provides connections between transportation systems, employment centers, etc.

**STP – Surface Transportation Program**

One of the key funding programs in ISTEA. STP monies are “flexible—meaning they can be spent on mass transit, pedestrian, and bicycle facilities as well as on roads and highways.

**V/C – Volume to Capacity Ratio**

V/C represents the percent of a roadway’s capacity that is being utilized. It is determined using volume of traffic on a roadway divided by the physical capacity of the roadway, measured in vehicles per hour. V/C is often used in conjunction with LOS. For example, a roadway with a V/C ratio of 0.5 indicates that the roadway is operating at 50% of its capacity, which translates into LOS A, or free-flow conditions.

**VHD – Vehicle Hours of Delay**

VHD is the difference between vehicle hours of travel under congested conditions and vehicle hours of travel that would otherwise be expected under free-flow conditions.

**VMT – Vehicle Miles Traveled**

VMT is the number of total miles traveled by all vehicles for a specified geographic area.

# *APPENDIX A: BRIEFING PAPER ON TRANSIT TECHNOLOGIES*


## *Prepared by Peter Flachsbart, Ph.D., AICP, University of Hawaii*


## *Selecting an Appropriate Technology and Transit System*

The City and County of Honolulu presently is considering several types of transit technologies including light rail, rapid rail, rubber-tired guided vehicles, magnetic levitation and monorail systems. The city administration will choose the technology if the city council decides not to make this decision. Mayor Mufi Hannemann strongly prefers a rail transit system that runs on an exclusive guideway, while some city council members want to consider buses and other modes that use rubber tires. (Brannon, 2007) The city's chief transit engineer prefers an elevated guideway, even in downtown Honolulu, because variable soil conditions make the cost of digging a tunnel for a subway very expensive (Hamayasu, 2007). Architects, planners and others who oppose a superstructure in the urban core cite potential negative impacts on important view planes and the difficulties and challenges of integrating stations with surrounding neighborhoods.

Given the importance of all of these issues, planners need to understand the performance characteristics and costs of various transit systems and modes, and select one that best matches local needs and conditions. Transit systems have three basic characteristics:

(1) type or category of right-of-way (ROW);
(2) technology (vehicles that use roads or rails); and
(3) type of operation (local, express, special).

These characteristics are interrelated to some extent. Because the choice of ROW affects both the investment cost and the performance of the transit system, it is important to review three basic types of ROW, which are more fully described elsewhere (Vuchic 1981).

## *Categories of Right-of-Way*

Category A. This category is fully grade separated from other traffic. It requires a very high level of capital investment to support construction of aerial structures, tunnels, transit stations, automatic signal control systems, and other infrastructure. To justify this level of investment typically requires selection of rail technology that has higher capacity, reliability, and safety compared to manually driven transit systems that operate on streets or highways. These rail technologies include heavy rail transit (HRT) or automated guideway transit (AGT) systems. Because of their higher performance, these systems compete more effectively with automobiles and are more likely than bus systems to support transit-oriented development (TOD) at transit stations.

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## *Transit Technologies*

Transit technology refers to specific modes: mini, regular and articulated buses; semmirapid bus (SRB) or bus rapid transit (BRT); light-rail transit (LRT); automated guideway transit (AGT); rail rapid transit (RRT); and others. The choice of transit technology, which is largely a technical consequence of the ROW decision, should be based on expected performance requirements: needed capacity, comfort, speed, safety, and operating cost. Mini, regular and articulated buses are the most cost-effective mode on ROW category C in providing service for low to moderate passenger volumes on urban surface streets. Transit systems with higher capacity and speed, such as SRB, BRT and LRT on ROW category B or AGT on ROW category A, are necessary as passenger volumes increase and service is extended to distant suburban areas.

### Light Rail Transit

In the United States, San Diego opened the first modern light rail transit (LRT) line in July 1981. Since then LRT systems have become the nation's most popular form of new rail transit (Pucher, 2004). These systems are modern versions of the electric streetcar. Most of the vehicles are not much different from the old PCC cars that were in operation in many U.S. cities prior to 1970. In the early 1970s, the federal Urban Mass Transportation Administration (UMTA) [now FTA] financed the design of a new Standard Light Rail Vehicle. Conventional LRT systems have the following characteristics:

1. LRT uses predominantly reserved lanes, but not necessarily grade-separated right-of-way.
2. Electrically propelled rail vehicles operate singly or hitched together in trains.
3. LRT can use all types of right-of-way on the same route and yet have the advantages of guided technology: high capacity, high labor productivity, comfortable ride, etc.

Black (1995) claims that LRT has the following advantages over heavy rail (HR) or rail rapid transit (RRT) systems:

1. LRT is safer than heavy rail, because the electricity comes from an overhead wire instead of a third rail. There is no need to fence the track, and it can operate in the street if it is wide enough.
2. LRT offers more flexibility of location than heavy rail. Where land is expensive (as in downtown areas), LRT tracks can be laid in a street and passengers can board and alight from the sidewalk. Right-of-way acquisition and construction can be much cheaper than for heavy rail.
3. LRT is viable in situations with lower levels of demand than that needed to justify costly heavy rail projects. This advantage is important to medium-size cities such as Honolulu, where the only other alternative is bus service.
4. If most of a route is on separate right-of-way, average speeds are higher than for buses in mixed traffic. Hence, light rail often attracts more passengers than buses.
5. The technology of LRT is well known and has been proven by experience. Consequently, there is less risk of encountering mechanical problems or big cost overruns.

In 1986, the City of Vancouver, Canada, began service on an automated guideway transit (AGT) system known as Skytrain. AGT systems represent advanced LRT systems, because they have protected right-of-ways similar to heavy rail systems, but the speeds and line capacities of AGT systems are either comparable to or exceed that of conventional LRT systems. AGT systems usually consist of two or four cars in married pairs to form a train that cruises at 50 mph. Trains operate under tight headways to boost capacity, which is essential because each car has only 40 seats and 35 standees. The system uses a steerable bogey technology that allows for tighter turns and increased maneuverability, which translates into less land acquisition and lower capital costs.

Skytrain uses linear induction motors, which draw power from plates embedded between the tracks. Hence, the guideway must be protected because each plate carries 600 volts and trains have no operators on-board. This technology also enables trains to climb steeper slopes.

Transit stations have automated fare collection systems to further reduce labor costs; but the central control facility has a substantial number of computer control operators, which increases labor costs. Although Vancouver uses the noisier steel-wheel-on-steel-rail technology, other cities (e.g., Lille, France) use rubber tires on concrete guideways to reduce noise.

**Bus Rapid Transit (BRT)**

In recent years, the FTA has promoted bus rapid transit (BRT) as a cheaper alternative to LRT and other rail transit systems with a demonstration program in ten U.S. cities. While there are several variations of BRT, all of them involve some kind of express bus service. The three main categories of BRT are: (1) busways with completely separate roadways for buses only; (2) high-occupancy vehicle (HOV) lanes shared with carpools and vanpools on limited-access highways; and (3) bus lanes on arterial streets within cities. Within these three categories, high quality BRT systems have several features that improve performance and quality of service: (1) traffic signal

priority; (2) prepaid or electronic fare passes; (3) low-floor vehicles or platform-level boarding with multidoor entry and exit; (4) increased distance between stops; (5) improved stations and shelters; (6) cleaner, quieter, and more attractive vehicles; and (7) Intelligent Transportation System (ITS) technology to optimize bus scheduling and provide passengers with real-time information. The well-known BRT systems of Curitiba, Brazil, and Ottawa, Canada, have most of these features in addition to exclusive busways. (Pucher, 2004)

In the United States, some cities have what Vuchic (1981) calls a semirapid bus (SRB), which is an express bus line running on shared HOV lanes with little if any signal priority, special station design, advanced ticketing, ITS features, or modern, attractive vehicles. An SRB transit system has the following characteristics:

1. A large number of bus routes converge on the CBD during commuting hours from suburban areas. There may be no service during off-peak hours.
2. Buses travel on dedicated lanes of a freeway with few or no stops until they reach surface streets in the CBD.
3. Bus routes are purely radial and may have coordinated transfers with other bus routes providing local or feeder service.
4. During afternoon peak hours, SRB service operates in reverse.

An example of SRB service is the Shirley Express, which is an 11-mile busway on the Shirley Memorial Highway (I-395) in the Washington Metropolitan area. Opened in 1969, this busway connects the nation's capitol with the suburbs of Northern Virginia. Another example is El Monte Express, which is an 11-mile busway that opened on the San Bernardino Freeway in the Los Angeles area in 1973. Originally, both of these busways were restricted to buses; they are now open to vanpools and carpools, too. In each urban area, two freeway lanes are dedicated for HOV use, and flyover ramps at various locations enable buses, vanpools and carpools to get on and off the freeway without stopping.

Some SRBs use dual-mode technology. These are buses that travel on a guideway at high speeds (e.g., a constant 60 mph) during the automated, line-haul portion of the trip to offset the extra time spent collecting a load of passengers in residential areas. With this technology, standard buses use guide rollers while traveling on an exclusive busway. These dual-mode bus technologies reduce the need for mode transfers at park-and-ride facilities, which LRT and AGT systems require in low-density suburban areas. The bus driver resumes manual control when the bus reaches destinations in downtown business districts or other activity centers such as university campuses. The potential for door-to-door service reduces time spent waiting at transfer points for people who live and/or work in low-density areas. In 1986, Adelaide, Australia, became the first city to adopt this technology. The 7.5-mile line cost only $70 million. The guideway was originally intended to be a freeway serving a suburban area. Compared to SRB, a LRT system has several advantages and disadvantages.

The advantages of LRT are:

1. easier to secure right-of-way (less pressure to mix with other traffic);

2. a stronger image and identity that appeals to developers of TOD;
3. more-spacious and comfortable vehicles that appeal to middle-class patrons;
4. ability to attract more passengers as a result of the previous two factors;
5. no diesel exhaust emissions;
6. better vehicle performance due to electric traction;
7. higher system performance (capacity, productivity, reliability, etc.);
8. ability to operate in tunnels; and
9. ability to upgrade to a higher capacity transit system if demand increases.

The disadvantages of LRT relative to SRB are:

1. lower service frequency for a given demand due to larger vehicles;
2. higher investment for the same alignment;
3. for new applications, a need to introduce new service facilities for a different technology;
4. lower ability to branch out, requiring more transfers; and
5. a longer implementation period.

**Discussion**

Dedicated busways and at-grade LRT systems can satisfy passenger demands of between 6,000 and 10,000 passengers per hour in the peak direction (pphpd). For busways, platoons of three buses running at 60-second headways on a single lane could increase this figure to 14,000 pphpd. This level of line-haul capacity could be further increased with the use of articulated buses, but these buses would be limited in their feeder service functions due to their large size and lack of maneuverability. Multiple stopping bays could significantly increase capacities, but such a configuration is relatively complex to manage and control. The best option for increasing capacities beyond 14,000 pphpd is to provide a passing lane at stations or even a second lane throughout the full corridor. A passing lane at stations enables buses to easily overtake other buses and provides flexibility for future ridership growth. To fit a passing lane in some of Honolulu's tight corridors, it would be necessary to stagger and elongate the stations in the median of the right-of-way. Other options include reducing the number of mixed traffic lanes and buying adjacent property to widen the right-of-way. (Wright, 2004)

In the early 1990s, planners for then mayor Frank Fasi's rail transit project projected that a grade-separated, fixed guideway system would need to satisfy a minimum of 7,500 passengers per hour in the peak direction when revenue service commenced in 2005. Beyond that year, they estimated that the transit system would ultimately need to serve between 17,500 and 22,500 passengers per hour in the peak direction. The higher figure of that range took into account higher density land use development around rail stations. Thus, Fasi's transit planners estimated that dedicated busways and at-grade LRT systems could satisfy initial ridership demand, but would not be able to handle long-term demand.

Dedicated busways on the U.S. Mainland have been successful where sufficient space exists in freeway median strips to build new lanes for express buses that travel long distances from suburban locations. Among the earliest and best examples of dedicated busways are the Shirley

Highway Busway in Washington, D.C. and the El Monte Busway in Los Angeles, California, as described above. However, it is not likely that these Mainland successes could be repeated in Honolulu, because our core freeways and arterials do not have wide, landscaped medial strips that could be converted to busways. Hence, an elevated structure would have to be built. Dedicating one or more existing lanes for busways on our freeways would decrease existing capacity for automobiles and would greatly aggravate traffic congestion for vehicles in remaining unrestricted lanes. The policy of the State Department of Transportation is that no lanes from existing state highways should be removed from service.

In 1991, the Committee on Sensible Transit (COST) proposed a two-lane 'highway in the sky' for express buses and other high-occupancy vehicles (HOVs) from Leeward Community College to downtown Honolulu. Since then there has been an ongoing debate over whether to build an elevated guideway for express buses, and if so, whether it should be built over H-1 or Nimitz Highway west of downtown. Busways (sometimes called transitways) exist in several North American cities (e.g., Pittsburgh, Ottawa, Houston, and Seattle) and elsewhere (e.g., Adelaide, Australia and Runcorn, England).

Recently, UH professor emeritus of urban and regional planning Tom Dinell proposed that Honolulu should reexamine the 'high-speed bus' alternative (Dinell, 2007). He correctly noted that this alternative was not considered in the city's alternatives analysis for a high-capacity transit corridor (Department of Transportation Services, 2006). It should be noted that the city's Department of Transportation Services (DTS) asked an engineering consultant (Lea + Elliott) to review the merits of a guideway for high-speed buses in the late 1980s.

Lea + Elliott's Report on Bus on Busways convinced DTS that busways were inferior to conventional LRT and AGT systems at that time (Department of Transportation Services, 1989). The drawbacks and limitations of buses on busway were summarized in a letter (dated May 18, 1990) from Mr. Charles P. Elms, P.E., Senior Principal of Lea + Elliott to Mr. Joseph M. Magaldi, Jr., Deputy Director of DTS. This letter makes the following points:

1. Building a separate guideway running next to the H-1 freeway would require large-scale condemnation and land acquisition. The social and economic costs would be great, because a large portion of this land would be residential.

2. Bus stations cannot easily be built into the existing freeway fabric. Off-line stations would require large tracts of land, as well as exit and entry points to the freeways. On-line stations would prevent pass-bys by other buses unless there were additional lanes. Entering the busway randomly could cause queuing at stations and uneven service.

3. High performance diesel engines on buses are less reliable than electric motors on trains. A disabled bus would cause other buses to stack up behind it, because an exclusive busway has no provision to allow buses to pass disabled vehicles. This would discourage ridership.

4. Diesel engines on buses emit more toxic air pollutants than electrically powered trains in a fixed-guideway microenvironment.

5. If the busway has no access or exit ramps for its entire length, except at terminal points, it would not serve the general urban population. The principal beneficiaries of an exclusive busway would be communities in Central and Leeward Oahu. Compared to this exclusive busway, a rail transit system would improve the general mobility of many more people at all times of the day throughout the travel corridor. An exclusive busway would not serve tourist destinations either.

6. When coupled as a married pair, the proposed rail vehicles have four doors on each side. Buses have just two doors, which increase dwell times at stations to load and unload passengers. This increases required headways between buses and reduces their line-haul capacities below rail systems.

7. Unlike rail systems, conventional buses do not readily accommodate the handicapped. Use of lifts increases dwell times at stations and decreases average bus speeds.

8. Compared to rail systems, a busway is likely to generate less private capital investment around stations, because the volume of pedestrian traffic is lower for buses.

9. A dedicated busway attempts to mimic the door-to-door service of an automobile. It thus supports continued suburbanization and low-density development. On the other hand, a rail system supports more compact development especially around stations. This type of development will be necessary in the future given that Oahu's developable land resources are limited.

10. Busway operating and maintenance costs per passenger-mile are higher than for an AGT system, because more labor is needed to operate and maintain buses.

11. A busway requires a larger superstructure than does a light rail system and bus stations would be larger than those for a rail transit system. If the busway has “flyover ramps” to cross over the H-1 freeway, the entire dedicated busway would have greater visual impacts than a comparable rail system.

12. The consultants estimated that a busway would eliminate transfers for only 40 percent of total riders, because one-third of the busway routes were low volume, and hence would provide only feeder service to the busway. Sixty percent of bus riders would have to transfer to a bus that entered the busway, thus diminishing the busway’s main advantage.

13. Unlike an AGT system, a busway has less flexibility to respond to sudden surges in travel demand that occur spontaneously around events at certain stations (e.g., Aloha Stadium). These surges in demand can be monitored by close-circuit TV in a central control facility of an automated system. Trains can quickly be put into service to handle this type of demand.

Still, it would be wise for local transit engineers and planners to give BRT more attention, given improvements in BRT technology, the FTA's demonstration program in ten U.S. cities, and the interest in rubber-tired transit systems among some members of City Council.

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## *Appendix B: Briefing Paper on Affordable Housing*

### *By Tom Fee, Principal, Helber, Hastert & Fee*

A major challenge for Honolulu will be to create attractive housing choices to accommodate an estimated 85,000 new homes expected to be developed in the City's Ewa and Primary Urban Center Development Plan Areas over the next 25 years (DPP projection 2006). Market forces will provide the lion share of these homes and much of the housing growth on the Ewa Plain will be subject to the City's standard 30% affordable housing requirement implemented through unilateral zoning conditions. Urban infill housing adjacent to proposed transit stations will not likely produce affordable housing unless it is either required as a condition of rezoning or as part of a transit-oriented development (TOD) overlay zone.

Affordable for sale and rental units are needed to ensure a wide range of housing choices and are "crucial to building a region that is both equitable and efficient" (Dittmar *et al* 2004). Affordable housing, including workforce housing, is acutely needed on Oahu where median single family home prices are about double what the "median" family can afford. The City's proposed transit project provides an important planning tool to focus and encourage mixed use development including a full range of housing choices. Since transit ridership is also dependant on resident demand, housing and transit have an important mutual relationship.

1. **Transit-oriented development can enhance quality of life, and create an attractive, higher density alternative to suburban living.**

People choose where they want to live for a number of reasons including price, access to good schools, proximity to work, convenience, etc. (i.e., price is just one of several factors). An argument needs to made -- and TOD zoning needs to ensure -- that urban TODs stimulate quality development of higher density mixed housing by making a wider range of "mobility and shopping choices available than in conventional suburban development" (Dittmar and Ohland, 2004). The City's TOD regulatory strategy needs to incorporate appropriate mechanisms and strategies to promote this mix of uses and mobility options.

From a regional planning perspective, affordable housing – particularly workforce housing -- needs to be located close to Honolulu's job centers. Long commutes "lower the quality of life for [working] families and fray the social fabric as public employees such as teachers and police officers live far from the communities they serve…and can have an economic impact in the form of lower workplace productivity" (Myerson 2003).

Jurisdictions across the Nation are formulating their own approaches to addressing this need. For example, the City of Austin, Texas implemented its SMART (Safe Mixed income, Accessible, Reasonably priced, Transit-oriented) housing initiative which offered developers benefits and incentives for eligible projects (e.g., expedited permitting, reduced parking requirements, and advocacy) (Myerson 2003). In three years (2000-2003), a total of 1,756 units were constructed under the initiative and 12,609 units were certified as eligible.

Housing, including affordable housing, may only be suitable at a subset of the 21 stations identified along Honolulu's "minimum operable segment" due to lack of available land, site character, etc. (e.g., lower density suburban mall locations versus higher density urban sites). It's understood that some of the siting conditions are dynamic, and in the long term, most stations would support at least some level of transit-oriented housing. Clearly, some station locations will have immediate/short term desirability while other locations will have more long term potential. A careful analysis of each station area is needed to identify and scale potential for affordable housing opportunities.

**2. Transit can make housing more affordable by reducing household automobile costs.**

The average household spends 32 cents of each after tax dollar on housing and *19 cents* on transportation (Calthorpe in Dittmar and Ohland, 2004). A family of four earning the median income in Honolulu in 2006 ($71,300) can afford to spend about $325,000 for a home (5% down, 6.5%, 30-year rate). By comparison, median single and multi family home prices in Honolulu are currently $615,000 and $320,000, respectively (February 2007 as reported in PBN March 5, 2007). Only about half of Oahu's households can afford to purchase a condo and only a small percentage can afford to purchase a single family home. The availability of affordable housing is therefore an extremely important public policy issue.

Avoiding one car in the household would allow the family to purchase 16% to 36% more home with their income,[1] or spend less of their income on housing. Household cost savings associated with transit is recognized in the "Location Efficient Mortgage" product now available to homebuyers near transit lines in the metropolitan areas of Chicago, Los Angeles County, San Francisco Bay, and the city of Seattle. "LEMs" enable homebuyers to qualify for a higher loan-to earning ratio (purchase more home with the same amount of income) in transit-accessible, urban-style communities (Southern California Association of Governments n.d.).

In "Lessons Learned" from the Atlanta Case Study, Dittmar and Ohland, (2004) notes that "TOD planning should include measures to preserve existing affordable housing and incentives to build new affordable housing, because significant new investments in neighborhoods will drive up property values and price low income tenants out." Although transit "can be an important catalyst for residential renewal" (ibid), the process needs to be managed carefully to minimize this unintended consequence. Once new affordable housing is built, it's important that it stays affordable over time. Forest City Enterprises, developer of the 4,700-acre Stapleton project in Denver, maintains long term affordability of owner-occupied homes through 30-year deed restrictions, allowing owners to realize some appreciation but keeping prices below market value (Myerson 2003).

Also, based on the narrow reasoning discussed above, investment in transit could be reconceived as an affordable housing subsidy. If the sole objective were to develop affordable housing, there

[1] The average cost of automobile use is estimated at between $8,000 to $18,000/year depending on the car (Runzheimer International 2006) --not including the cost of parking which can add an additional $2,400/year for downtown Honolulu workers (@ $20-35K/stall to build). The reduction of one car per household due to the proximity of transit could provide a household with between $52,000 to $118,000 of a 30-year mortgage at 6.5% interest.

may well be a more efficient way to subsidize it. It's important to keep in mind that transit provides far more benefits than just affordable housing (Dittmar and Ohland 2004).

## 3. Implementation mechanisms

The City has a number of tools at its disposal to encourage development of transit-oriented affordable housing.

### *3.1 Rezoning*

Properties requiring rezoning for residential use would need to satisfy the City's standard 30% affordable housing requirement issued as part its unilateral conditions.

### *3.2 TOD Overlay*

DPP is in the process of drafting a TOD "regulatory strategy" that presumably will consider affordable housing incentives mentioned in the Mayor's Affordable Housing Advisory Committee issue paper (April 2006) and the Urban Land Institute's "Hard at Work for Workforce Housing" article (Myerson 2003) that would be available to projects not requiring a rezoning action. These incentives include: expanded range of permitted uses, reduced parking ratios, density and height bonuses, property tax credits, expedited processing, reduced/waived sewer and water development charges, and exemptions from park dedication ordinance requirements.

The City also has the ability to increase the "attractiveness" of developing affordable housing via a variety of funding mechanisms also mentioned in the Affordable Housing Advisory Committee issue paper (April 2006), including: tax exempt multi family revenue bonds, real property tax exemptions, community facilities district and/or tax increment financing, targeted use of Community Development Block Grant and HOME[2] funds, etc.). Application of these various tools and incentives would need to be negotiated on a project-by-project basis given the variety of conditions and circumstances across the City.

Land cost is a critical component in the development *pro forma*. The City should take a more direct role in stimulating development of transit-oriented affordable housing projects by donating or purchasing/writing down strategically located lands in the vicinity of transit stations.

## 4. Follow-on actions

A partial list of actions based on a cursory study is provided below.

### *4.1 Short Term*

1. Coordinate with advocacy groups such as the City's Affordable Housing Advisory Committee, Housing Hawaii and ULI Hawaii's Affordable and Workforce Housing Committee

[2] Federal block grant to State and local governments designed exclusively to create affordable housing for low-income households

2. Review housing study prepared by Bill Lee/ERA for the 1992 Honolulu rail project (suggested by D. Davidson)
3. Complete interviews with affordable housing proponents (e.g., K. Carney, S. Murata, C. Wathen, etc.)

### *4.2 Long Term*

1. Compile land use inventories within one mile of each transit station to identify City-owned land and opportunities for leveraging affordable housing (e.g., short, mid and long term potential, etc.)
2. Update the City's development and special area plans to include TOD definitions and planning guidelines related to TOD-related affordable housing
3. Prepare an affordable housing element of the pending TOD regulatory strategy that identifies goals, objectives and implementing strategies.

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## *Appendix C: Briefing Paper on Transit Authority Roles in TOD*

## *By Dennis Silva, AICP*

### Outreach & Education

Public outreach and education have constituted a lion's share of TOD activities among U.S. transit agencies. Most outreach by transit agencies involves technical assistance on TOD planning matters. The most common approach to general-public outreach on TOD matters has been design charrettes, that is, neighborhood meetings where residents and business-owners participate in the design of a master plan for a station area under the assistance of trained professionals (TCRP Report 102, p. 43). Outreach is significant in helping to initiate projects.

### Federal Roles & Involvement

The primary role of the federal government has been to encourage the growth of TOD is one of funding. National policies and programs that have promoted TOD and joint development include:

*New Joint Development Policy:* Permits transit agencies to sell land holdings financed by federal grants without having to return proceeds as long as funds are used to "help shape the community that is being served by the transit system."

*New Starts Criteria:* This policy mandates that applicants for federal New Starts funds carefully address land-use matters as part of their capital investments. The key to successful applications for highly competitive New Starts funding are "transit supportive existing land-use policies and future patterns," "supportive zoning regulations near transit stations," "tools to implement land-use policies," and "the performance of land-use policies." Several recent studies have concluded that this policy has spurred U.S. transit properties to take land-use matters and transit-supportive planning far more seriously than in the past (TCRP Report 102, pp. 48-49).

### Case Examples of TOD Powers in Transit Authorities

The following is a summary of the types of powers exercised in six different Transit Authorities. This summary illustrates how Transit Authorities implemented TOD in various political and economic climates.

Metropolitan Washington, D.C. is considered a major success story in part because of the degree to which is succeeded in shaping land use as a goal of the original transit investment. Signature TOD abound in the District of Columbia, surrounding cities, and increasingly in outlying suburbs, a result of rebounding markets for in-town housing and commercial space, unfettered market forces, and interventionist public actions. Metrorail's ambitious joint development program adds riders to trains and revenues to public reserves, serving as a model for the nation (TCRP Report 102, p. 463).

Boston is an urban TOD success in large part because central-city real estate is hot. Outside the city proper, however, TOD has failed to materialize, partly a consequence of inadequate attention to NIMBY opposition.

Three areas where TODs have sprouted in suburban settings are northeast New Jersey, metropolitan Chicago, and the Dallas metroplex. Northeast New Jersey's TOD market is booming thanks to major rail improvements that have dramatically reduced the amount of time it takes to rail commute into Manhattan. Its experiences remind us that the quality of transit services is often of paramount importance. Swift and direct rail connections to major urban centers that provide travel-time savings over the automobile are guaranteed ways to generating TODs.

Metropolitan Chicago's suburban TOD successes owe much to local political leadership and careful station-area planning. In greater Dallas, TOD leadership has come mainly from the private sector, spawning compact, mixed-use development near light-rail stops in places like Plano and Richardson, development that only a decade or so ago would have been unimaginable. Metropolitan Denver has similarly witnessed suburban TOD because of community activism and an urban renaissance in and around major transit corridors (TCRP Report 102, p. 463).

Portland is the most extreme case of pushing the TOD envelope in the United States, courtesy of regional visioning and planning, extensive interagency agreements, regulatory controls, and incentives that encourage densities that exceed those that would be achieved through normal market forces. Portland is the best example of TOD planning and implementation at a regional scale in the United States, and like Boston and Denver, it has entered a new phase that focuses on constructing central-city infill projects close to rail corridors (TCRP Report 102, pp. 463-464).

Despite a consolidated government structure that has centralized planning and transit functions, Miami-Dade County has struggled in its pursuit of TOD. In the absence of proactive public policies, the market has failed to spawn TOD, not only in prime real-estate locations, but also in communities that are most in need of development.

**Fiscal Considerations and Partnerships**

How do Transit Authorities obtain revenue to do all of the planning and development associated with TOD?

TODs benefit from recapturing some of the value conferred by transit investments to generate revenues needed for ancillary improvements. Entrepreneurial transit agencies, like Washington D.C.'s WMATA, have over the years recaptured value through aggressive joint development activities, including land leases and station interface programs. WMATA pegs lease revenues to the values of surrounding properties, thus ensuring that it benefits from land appreciation after a lease with a developer has been invoked.

Creative financing is essential to spreading the risks, expanding the base of knowledge and experience, and tapping into the fiscal advantages of certain partners, such as local governments'

superior bond ratings and guarantees, to make projects pencil out. Local governments are often in a position to offer revenue bonds at favorable rates, use tax-exempt fiscal instruments, and secure loan guarantees backed by the federal government.

A transit agency may be in a position to contribute critical parcels through land swaps or the provision of easements. In built-up settings with smaller lots under multiple owners, no one party can create TOD on its own. Experiences with risky mixed-use investments in marginal urban districts like Barrio Logan in San Diego, Overtown in Miami, and El Cerrito del Norte in the San Francisco Bay Area underscore the importance of creative multilateral financing (TCRP Report 102, p. 460).

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# APPENDIX D

# What Can Honolulu Learn from Other Cities about Transit-Oriented Development?

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## Introduction

The two salient features of the American way of life since the end of World War II have been low-density living and high personal mobility. Public opinion surveys and market behavior would indicate that the vast majority of Americans prefer automobiles and suburban lifestyles. Federal policies and programs (i.e., those affecting freeway construction and home mortgages) have encouraged low residential densities in many U.S. cities including Honolulu. (Altshuler, 1979)

In recent years, questions have been raised as to whether market forces and consumer preferences should be the sole determinants of urban form and mobility on the Island of O'ahu, given the state's dependence on foreign oil and new threats from global climate change. Hawai'i relies on a volatile global energy market for its oil supplies and it often leads the nation in having the highest retail price of gasoline. Many social commentators have said that urban sprawl is not sustainable, because sprawl entails excessive energy, environmental, economic, and social costs that will negatively affect future generations (Newman and Kenworthy, 1999; Kunstler, 2005). These costs are more severe on an island such as O'ahu, where planners must accommodate population growth with limited land and public funds for highway improvements and infrastructure extensions for new subdivisions. Moreover, housing prices have escalated rapidly on O'ahu since 2000. As a result, single-family homes are out of reach for many first-time homebuyers, even those who consider themselves middle class.

To address these and other planning issues, the Legislature of the State of Hawai'i formed a task force in 2005 to develop a "Sustainability Plan" for the year 2050. The plan intends to promote more sustainable and livable communities in Hawai'i. (The Auditor, 2005) There is growing evidence that transit-oriented development (TOD), if carefully planned, can play a role in achieving these goals in cities that have invested in bus and rail transit improvements (Belzer and Autler, 2002; Dittmar and Ohland, 2004).

This paper addresses the following question: What can planners in Honolulu learn about TOD from other cities that have invested in bus or rail fixed-guideway systems? Although this paper does not provide a comprehensive answer to this question, it attempts to provide enough information to show that local planners face a steep learning curve on this subject.

**What is TOD?**

In *The Next American Metropolis*, architect Peter Calthorpe describes TOD as "a mixed-use community within an average 2,000-foot walking distance of a transit stop and core commercial area. TODs mix residential, retail, office, open space, and public uses in a walkable environment, making it convenient for residents and employees to travel by transit, bicycle, foot, or car." (Calthorpe, 1993, p. 56) According to Calthorpe (1993), urban TODs should be located directly on rail transit lines and neighborhood TODs should be located along local bus lines that feed directly into rail transit lines. He describes urban TODs as denser and more focused on employment opportunities than are neighborhood TODs, which tend to emphasize housing.

Calthorpe (1993) said that the minimum residential density for TODs with a housing component should average 15 units per acre. This figure is close to the density of streetcar suburbs of the early 20th century (Warner, 1962), and significantly higher than today's typical suburban developments, which are closer to 4 or 5 dwelling units per acre (Audirac, 1999). Similarly, Bernick and Cervero (1997) prescribed 15 housing units per acre for TODs with mixtures of small-lot single-family homes and duplexes or triplexes. These density recommendations come from the pioneering work on public transportation and land use policy by Pushkarev and Zupan (1977)

Besides higher than average densities, TOD typically will have a mixture of land uses (residential, office and retail), a defined center, and buildings whose design and orientation facilitate transit use and pedestrian activity. Together, these land use and design features enable TODs to reduce (in theory) the use of single-occupant motor vehicles and enhance transit investments by bringing potential riders closer to transit facilities.

**What is transit joint development?**

Transit joint development (TJD) is another term found in the literature on TOD. TJD refers to development at, above, below, or adjacent to a transit facility on property that is controlled by the transit agency. In contrast, TOD refers to any development that occurs—on land owned by the transit agency or others—in the general vicinity of a station. Cervero et al. (1992) said that TJD is based on a *quid pro quo*. In TJD, private development benefits from higher occupancy rates and sales volumes due to its location at or directly adjacent to a station, and transit agencies benefit from increased ridership and a stream of lease income.

**What are transit villages?**

Unlike other forms of development, planners believe that a TOD should function as both a transit node or station within the larger regional or metropolitan system and as a good place to live, work, shop, play, etc. (Dittmar and Ohland, 2004) Some planners use the term "transit village" to describe this type of TOD (Bernick and Cervero, 1997). Transit villages are quite similar to TODs, and sometimes the two terms are used interchangeably.

Transit villages borrow from the visions of early city planners such as Ebenezer Howard. In the late 19th century, Howard advanced the idea of building garden cities that would orbit London. Garden cities were separated by protected greenbelts and connected by inter-municipal railways (Howard, 1898). In the United States, examples of early streetcar neighborhoods include the Back Bay area of Boston, Riverside near Chicago, Roland Park in Baltimore, and central Pasadena in the Los Angeles area. These neighborhoods, some of which were designed by Andrew Jackson Downing and Frederick Law Olmstead, depended on pedestrian access to transit to reach downtown jobs and neighborhood centers, since they were built prior to the invention of the automobile. Europe offers the best modern-day examples of transit village development. In Europe, dozens of compact, mixed-use satellite communities are interconnected by regional rail systems in metropolises such as Stockholm and Copenhagen. (Cervero, 1994)

Transit villages are generally more *ad hoc* in nature and almost all of them are located on rail rather than bus lines. Gillham (2002) says that transit villages may lack the detailed physical design guidelines of some TODs, such as those designed by architect Peter Calthorpe, and may be higher in density (e.g., 12 to 60 dwelling units per acre). The Fruitvale project on the Bay Area Rapid Transit (BART) line in Oakland, California, is an example of a transit village in a struggling inner-city area (Bernick, 1996). Fruitvale was planned to contain 500 housing units (mostly above ground-floor retail), an open-air market, a museum and library, open space, and a public plaza. When built, Fruitvale was the most extensive transit village in an inner-city location in the United States.

**A variety of TODs**

While planners may agree on some basic definition of TOD, there is in reality a wide variety of transit-oriented development in the United States. Based on a survey of transit agencies and a literature review in late 2002, Cervero et al. (2004) identified 117 TODs in the

United States. Although the majority of them are located in large cities with rail service, many are located in newer and older suburbs outside of central cities. Most of the TODs are served by some type of rail transit, as shown below:

| | |
|---|---|
| Heavy rail | 37.4% |
| Light rail | 31.3% |
| Commuter rail | 21.8% |
| Bus | 7.8% |
| Ferry | 1.7% |
| | 100.0% |

Cervero et al. (2004) also found different definitions of TOD among 10 transit agencies, as shown in Table 1. While most definitions of TOD focus on design characteristics of transit-supportive environments, some definitions are based on smart-growth and sustainability principles.

TODs consist of different land use types in both urban and suburban locations – office, market rate and affordable housing, social services, high technology, destination and local-serving retail, and mixed-use projects. TODs are often constructed at a variety of locations, ranging from new 'greenfield' sites, to 'greyfield' or 'brownfield' sites, large and small-scale urban infill projects, and the conversion of surface transit parking lots into TODs. The planning of TODs may engage a variety of participants such as private developers, transit agencies, non-profit groups, redevelopment agencies, local governments, and public-private partnerships. Also, the financing of TODs may use various types and amounts of public subsidies, or funds that are privately financed. In most cases, constructing a TOD requires effective public/private partnerships.

It is very difficult to make generalizations about the shape and appearance of TOD projects, because each TOD creates a mix of housing, retail, office, and other uses that appears to be appropriate to the surrounding community, the transit system, and the metropolitan region. Most TOD research focuses on suburban and 'greenfield' sites of fast-growing regions in the western and southern United States. TODs exist in older cities, but they are not well publicized and largely ignored by the literature. In older cities, development along transit corridors is rarely

**Table 1. Transit Agency Definitions of TOD.**

| Transit Agcncy | Definitions |
|---|---|
| ATLANTA: Metropolitan Atlanta Rapid Transit Authority (MARTA) | Broad concept that includes any development that benefits from its proximity to a transit facility and that generates significant transit ridership. |
| ASPEN: Roaring Fork Transportation Authority Colorado | Land development pattern that provides a high level of mobility and accessibility by supporting travel by walking, bicycling, and public transit. |
| BALTIMORE: Maryland Transit Administration | A relatively high-density place with a mixture of residential, employment, shopping, and civic uses located within an easy walk of a bus or a rail transit center. The development design gives preference to the pedestrian and bicyclist. |
| CHARLOTTE: Charlotte Area Transit System | High-quality urban environments that are carefully planned and designated to attract and retain ridership. Typically, TODs provide for a pedestrian-friendly environment. |
| NEW JERSEY: New Jersey Transit Corporation (NJ TRANSIT) | An environment around a transit stop or station that supports pedestrian and transit use, created by providing a mix of land uses in a safe, clean, vibrant, and active place. |
| CHICAGO: Regional Transportation Authority of Northeast Illinois (RTA) | Development influenced by and oriented to transit service that takes advantage of the market created by transit patrons. |
| ORLANDO: Central Florida Regional Transportation Authority (LYNX) | A sustainable, economically viable, livable community with a balanced transportation system where walking, biking, and transit are as valued as the automobile. |
| SALT LAKE CITY: Utah Transit Authority (UTA) | Projects that enhance transit use, improve the quality of service provided to Authority riders, or generate revenue for the purpose of supporting public transit. |
| SAN FRANCISCO: Bay Area Rapid Transit Authority (BART) | Moderate- to higher-density development, located within an easy walk of a major transit stop, generally with a mix of residential, employment, and shopping opportunities designed for pedestrians without excluding automobiles. TOD can be new construction or redevelopment of one or more buildings whose design and orientation facilitate transit use. |
| WASHINGTON, D.C.: Washington Metropolitan Area Transit Authority (WMATA) | Projects near transit stops which incorporate the following smart-growth principles: reduce automobile dependence; encourage high shares of pedestrian and bicycle access trips in transit; help to foster safe station environments; enhance physical connections to transit stations from surrounding areas; and provide a vibrant mix of land-use activities. |

Source: Cervero et al., 2004.

called TOD; it is simply "regular development". Studies of inner-city TOD focus on the lack of it, or any type of development, especially in economically depressed areas. In each case, obstacles and opportunities that are peculiar to unique urban environments affect the shape and appearance of TODs. (Hess and Lombardi, 2004)

Inner-city TODs would appear to have greater potential for success than suburban or greenfield TODs, because inner cities have higher concentrations of homes, jobs, and amenities (Bernick and Cervero, 1997; Bae, 2002). However, some inner-city sites lack these ingredients, according to Loukaitou-Sideris and Banerjee (1996), who studied the Blue Line through South Central Los Angeles. The literature shows that TOD is least likely to succeed in places that have few amenities to offer as locational advantages (Bernick and Cervero, 1997; Loukaitou-Sideris, 2000; Bae, 2002). In comparing cities and suburbs, Hess and Lombardi (2004) argue that cities are the best sites for TOD, because they already have higher densities and mixed land uses.

**What are the benefits of TOD?**

Newman and Kenworthy (1999) claim that TOD has great potential for reducing automobile use, increasing transit ridership, and fostering a sense of community in neighborhoods. In theory, TODs should be able to reduce personal transportation costs, motor vehicle emissions, and dependency on fossil fuels. They should also be able to promote access to local services and amenities through walking and biking activities. In suburban areas, TODs have the potential to increase transit ridership, reduce commute distances, and decrease the cost of infrastructure extensions. Arrington and Parker (2001) claim that TOD provides even more benefits, as shown in Table 2.

Despite these claims, empirical studies of light rail transit (LRT) systems constructed in the 1980s and early 1990s revealed that LRT projects had little or no effect on land-use patterns in station areas in some cities. In some cases, there was a simple explanation. Planners know that successful mass transit systems connect activity centers at high-density locations. However, it is very difficult and expensive to build rail transit in these locations, because of the high cost of land assembly and construction, not to mention the disruption to business caused by long periods of construction in these areas. To reduce these costs, some cities route transit lines through abandoned industrial belts once served by freight trains. While this practice often reduces the cost of acquiring right-of-way, it may also lower ridership, if it prevents transit from connecting

**Table 2. The Benefits of TOD.**

A recent study, *Factors for Success in California's Transit-Oriented Development*, commissioned by the California Department of Transportation, identified the following 10 potential benefits of TOD. The study cites research showing that TOD can:

1. **Provide mobility choices**. By creating "activity nodes" linked by transit, TOD provides important mobility options, very much needed in congested metropolitan areas. This also allows young people, the elderly, people who prefer not to drive, and those who don't own cars the ability to get around.

2. **Increase public safety**. By creating active places that are busy through the day and evening and providing "eyes on the street," TOD helps increase safety for pedestrians, transit users, and many others.

3. **Increase transit ridership**. TOD improves the efficiency and effectiveness of transit service investments by increasing the use of transit near stations by 20 to 40 percent, and up to five percent overall at the regional level.

4. **Reduce rates of vehicle miles traveled (VMT).** Vehicle travel in California has increased faster than the state's population for years. TOD can lower annual household rates of driving 20-40 percent for those living, working, and/or shopping within transit stations areas.

5. **Increase households' disposable income**. Housing and transportation are the first and second largest household expenses, respectively. TOD can free-up disposable income by reducing the need for more than one car and reducing driving costs, saving $3000-$4000 per year.

6. **Reduce air pollution and energy consumption rates**. By providing safe and easy pedestrian access to transit, TOD allows households to lower rates of air pollution and energy consumption. Also, TODs can help households reduce rates of greenhouse gas emissions by 2.5 to 3.7 tons per year.

7. **Conserve resource lands and open space**. Because TOD consumes less land than low-density, auto-oriented growth, it reduces the need to convert farmland and open spaces to development.

8. **Play a role in economic development**. TOD is increasingly used as a tool to revitalize aging downtowns and declining urban neighborhoods, and to enhance tax revenues for local jurisdictions.

9. **Contribute to more affordable housing**. TOD can aid to the supply of affordable housing. It was recently estimated that housing costs for land and structures can be significantly reduced through more compact growth patterns.

10. **Decrease local infrastructure costs**. TOD can reduce costs for water, sewage, and roads to local governments and property owners by up to 25 percent.

Source: Arrington and Parker, 2001.

key activity centers. The Blue Line in Los Angeles and MetroLink in St. Louis are two examples of light rail transit that run through economically distressed areas of the city.

Based on a review of early LRT projects, Vessali (1996) concluded that the only substantial impacts of transit on land use occurred in cities that had a high degree of planning and involved a sizeable investment of public resources and coordination. Planners often cite Portland, Oregon, as an example of a city where land use and rail transit planning have succeeded (Adler and Dill, 2004). Still, the first generation of TODs in many cities, even those with strong planning efforts, often fell short of the ideal TOD (Dittmar and Ohland, 2004). Some TODs are in reality transit-adjacent developments (TADs), such as the Lindbergh City Center in Atlanta, Georgia. A TAD is the "evil twin" of a true TOD, because a TAD breaks the rules that make TOD work (Halbur, 2007). In a case study in Portland, Bae (2002) concluded that much of the development at the Orenco Station on the MAX light rail line was too distant from transit facilities to make them convenient for users. Although the Orenco Station appears to be a TAD in Bae's opinion, it is still cited as a good example of TOD by planners. In a recent newsletter, Honolulu's transit planners made the following claim: "Orenco Station in Hillsboro, Oregon changed an industrial zoned site to a 'town center' calling for higher density mixed-use. Financed by the private sector, this 1,834-unit residential, retail and office project took full advantage of the light rail station within it." (Department of Transportation Services, 2006, p. 3)

**Have federal mandates changed?**

In the 1970s, the federal government advocated TOD as a means to help pay for the construction of new rail systems – the term then was 'value capture'. For a variety of reasons the theory and practice of 'value capture' never seemed to materialize. The challenge of trying to put together complex multi-party funding packages was often a greater hurdle than simply seeking more federal funding for a new rail project. In the past several years, transit agencies have been using the concept of 'joint development', which involves the use of property acquired as part of a transit project. (Parker et al., 2002)

Several years ago there was a reduction in the federal percentage share (from 80/20 to 50/50) for new rail projects. This change significantly increased competition among cities seeking federal funding for new rail projects. As a result, the motivation to consider value capture has started to change. Thirty-five years after the federal government first started to

promote the concept of value capture, there are finally some examples where TOD is playing a major role in the financing of new transit facilities. In Portland, for example, Bechtel Enterprises is contributing $28.3 million toward the $125 million cost of the airport light rail extension, which is built around TOD. In return, Bechtel and its real estate partner, Trammell Crow, will develop a 120-acre TOD that includes office, retail, and hotel uses called Cascade Station at the entrance to the airport. (Parker et al., 2002)

In 1997, the Federal Transit Administration (FTA) introduced a new criterion—'transit-supportive land use' for proposed major transit investments – as a significant factor in determining which proposed rail projects would receive federal transit funding. This new factor stimulated cities to revise old and adopt new land use plans and controls designed to encourage transit ridership to make their proposals for federal funding more cost-effective and competitive.

This policy change acknowledges that rail investments alone cannot induce transit-oriented development. For example, over $14 billion was invested in mass transit in the State of California between 1990 and 2000. During the past 30 years, California built more new rail systems, more miles of track, and more transit stations than any other state in America. It has also produced a record number of new TODs in California's major cities. Even so, the dominant land use around the majority of the major bus and rail stations in California is still conventional, car-oriented development (e.g., a park-and-ride lot) that does not take full advantage of proximity to high-quality transit service or provide good pedestrian access to transit stations. Hence, while interest in TOD is significant and growing, the reality is that true TODs are the 'exception and not the rule' at most major transit stations in California. (Parker et al., 2002)

**What are useful sources of information on TOD?**

As indicated above, the Federal Transit Administration (FTA) considers transit-supportive land use an important criterion for making capital investment funding decisions on 'new starts' public transit projects. In fact, FTA's Office of Planning released a set of guidelines and standards on this subject (Office of Planning, 2004). As a result, cities that are planning high-capacity transit systems are now taking a serious look at TOD to improve their chances to secure federal funds. For example, both Denver and Seattle compiled case studies of TOD, which are posted on city Web sites, to inform the planning process for their transit projects.

To assist cities, the Transportation Research Board published two major studies of TOD in recent years (Cervero et al., 2002; Cervero et al., 2004). The California Department of Transportation (Caltrans) did a statewide study of TOD, given all of the rail and bus transit investments that have occurred in Los Angeles, Sacramento, San Diego and the San Francisco Bay Area over the last 35 years (Parker et al., 2002). The latter report has a very useful list of TOD Internet sites, which is reproduced here in Appendix A. The Center on Transit Oriented Development in Oakland, California has a Web site (www.reconnectingamerica.org) that has information on a variety of subjects related to TOD for both citizens and planners. Lastly, the Urban Land Institute (ULI) published its "Ten Principles for Successful Development Around Transit" for developers of TOD (Dunphy et al., 2003).

**Is there an emerging market for TOD?**

The literature suggests that TOD can be viewed either as a set of policies affecting urban form near transit stations or as a type of development, as suggested by the ULI report mentioned above. However, while the number of TODs is growing, there are few development companies that specialize in TOD construction as a market niche. This has been attributed to transit's inability to attract a sufficient volume of patrons to support TOD, according to a comprehensive report by the California Department of Transportation (Parker et al., 2002). However, the same report claims that there are a variety of factors still driving demand for TOD in the real estate market:

1. Escalating traffic congestion is increasing the attractiveness of inner city sites and suburban locations that are close to rail transit.
2. Rising land values in many communities are creating the economic conditions necessary to help make mixed-use compact development feasible.
3. The increased trend of Americans moving back into the core areas of cities makes them more attractive places for real estate investment.
4. Demographic changes underpin an expanding market for moderate and higher-density mixed-use communities.

5. Nationwide, support for ‘smart growth’ is at record levels. In a September 2000 poll, nearly 80% of Americans indicated that they support smart growth and the strategies necessary to implement it.
6. There have been recent significant changes in Federal Transit Administration (FTA) policies for ‘joint development’, and an emphasis on transit-supportive land use in federal funding for new rail starts.
7. More transit agencies are starting to realize they are in the ‘community-building’ business as well as the ‘people-moving’ business.

In the early 1990s, surveys of 28 large-scale housing projects near California rail stations showed that residents tended to be young professionals, singles, and ‘empty-nesters’, with typically just one car per household. They also tended to work in downtown and other locations well serviced by transit. (Cervero, 1994) More recent surveys show that this demographic group is growing larger. People who prefer to live in housing near transit, which includes people living in downtown locations, are more likely to be singles, childless married couples or have smaller families. Increasingly, they also include same-sex couples and the “creative” class who are interested in accessing urban amenities (Florida, 2003). Developers of TOD now target this demographic group in their advertising campaigns, which claim that TODs provide home buyers with good access to centrally located jobs, retail stores, walkable neighborhoods, museums, concert halls, theaters, and nightlife.

More recently, Lund (2006) surveyed 605 people who moved into a TOD within walking distance of a light, heavy, or commuter rail station in the San Francisco Bay Area, Los Angeles, or San Diego. Each person had moved into a TOD less than five years before the survey. The purpose of the study was to determine: (1) who is locating in TODs and how do they differ from the general population; (2) what factors lead them to locate in TODs; and (3) what are the implications for transit use? Lund found that TOD residents had a higher household income and were less likely to be Hispanic. She found they were no less likely to have private cars, which suggested that limiting parking availability at TODs might not be a good idea. She also reported that individuals chose to live in TODs for a wide range of reasons. About a third of the respondents said that access to transit was one of the top three reasons for choosing to live in a TOD. However, people were equally or more likely to choose to live in a TOD because of lower

housing cost or the quality of the neighborhood. She did not determine whether or not respondents brought their interest in transit with them, when they moved into TODs, or developed their interest in transit afterwards. Even so, Lund (2006) found that people who chose TOD were 13 to 40 times more likely to use transit than those who did not.

Based on surveys, Cervero (1994) reported that residents living within a quarter mile of a California rail station are three times as likely to commute by rail compared to the average worker living in the same city. The two most important factors determining rail transit usage were whether the trip destination was within walking distance of a rail stop and whether parking at the job site was free. Among those living near BART stations and heading to San Francisco job sites with no free parking, nearly nine out of ten work trips were by BART. For trips to secondary urban centers such as Oakland and Berkeley, half of the commutes were by BART. For all other destinations (where workers often park free), only 6 percent of commute trips by station-area residents were by rail. (Cervero, 1994)

Given these findings, some planners argue that TOD overlay zoning standards should allow just one parking space per housing unit located near rail stations. This policy would help drive down the construction costs of TOD. Some lenders now offer 'location-efficient' mortgage loans to those buying homes in TODs. A 'location-efficient' loan recognizes that housing near transit can lower household transportation costs. The bank subtracts these savings from the monthly payment of principal, interest, taxes, and insurance when calculating mortgage qualifications. (Cervero, 1994)

**Why is TOD difficult to achieve?**

In a statewide review in California, Parker et al. (2002) discussed five barriers facing TOD:

1. Tension exists between place and node. Transit stations often have poor pedestrian access and are not well integrated with the surrounding local community. Broad expanses of surface-level parking often separate stations from the surrounding community, and stations and transit corridors are often located in areas with little or no development potential, which significantly reduces transit's ability to link activity centers.

2. Local communities have concerns. Despite good design and appropriate density, communities often resist TOD projects, because they increase density and often lead to displacement and gentrification of a neighborhood.
3. Local zoning is not transit-friendly. Local development codes around major transit stations often tend to favor low-density, auto-oriented uses.
4. TOD developers face higher risks and costs. Mixed-use and/or higher-density projects (such as TOD) present a higher level of risk for developers and financiers. Such projects require more high-quality planning, design and construction. This makes TOD more expensive than conventional low-density, single-family homes.
5. Financing is difficult to obtain. Many lenders have concerns about or lack experience with financing mixed-use projects or those with lower parking ratios. Both features are typical of TOD. Public financing for TOD is also limited and difficult to obtain even though it often is available within redevelopment agencies.

**What are the prerequisites for TOD?**

In an early study of the effects of light rail transit (LRT) on urban development, Cervero (1984) concluded that TOD requires a strong regional economy, supportive land use policies, and a hospitable station environment. A strong regional economy is important, because TOD largely does not exist in slow-growth cities (like Buffalo and St. Louis) that built new LRT systems. Even in Chicago, which has a diversified and growing economy, TOD is occurring in the city's affluent and gentrifying neighborhoods. TOD has largely been absent (along with development in general) in Chicago's poor districts (Ohland, 2001).

Supportive-land use policies and hospitable station environments are also important. Merely clustering housing around rail stops will do little good if job growth occurs mainly along suburban freeway corridors, as occurred during much of the 1980s in cities on the U.S. Mainland. Both ends of work trips—housing and job sites—must be within reasonable proximity of transit stations if clustered growth is to pay any accessibility and environmental dividends. Cervero (1994) as well as Newman and Kenworthy (1999) both argue that more mixed-use transit village development is needed to achieve these dividends.

In an extensive review of TOD in the United States, Cervero et al. (2002) noted that transit investments are more likely to redistribute rather than generate growth. The City of San Diego was among the first cities in California to recognize this effect. San Diego's City Council adopted a formal policy in 1992 "to direct growth into compact neighborhood patterns of development, where living and working environments are within walkable distances of transit systems." (San Diego City Council Policy 600-39, August, 1992, p. 1.) The master-planned community of Otay Ranch exemplifies this policy. Adjacent to the cities of San Diego and Chula Vista, Otay Ranch features five village clusters at blended densities of 18 dwelling units per acre. This community is directly served by an extension of the San Diego Trolley.

In other cities, there is frequently a large gap between a city's desire for TOD and the reality of what is allowed and built in local plans. Many cities that have existing or planned rail systems do not have 'transit-friendly' zoning or development plans in place around stations. Some cities assume that TOD is just another type of development and demand impact fees of developers of TOD. The literature suggests that TOD is a fragile real estate product that faces major barriers to successful implementation. Supportive land-use policies, such as overlay zoning—a planning ordinance that stipulates the density and type of future development permitted in stations areas—is essential for transit-oriented development to occur properly. Supportive land-use policies, which are all about place-making, are just as important as decisions on transportation engineering in shaping urban form.

Adopting supportive-land use policies can be very difficult, because there are considerable opportunities for conflict over this issue. Transit agencies, land use planners, and policy makers often have very different goals, priorities, and constraints. Transit agencies favor stations in locations that will maximize ridership and fare-box revenues, and minimize construction cost. In contrast, city planners want to build communities around the stations, while city council members often resist the land use zoning changes that are necessary for TOD, especially if their constituents oppose higher densities and mixed use. Zoning changes that favor TOD often lead to displacement of existing residents and businesses around stations. Hence, early community involvement in the planning process is essential for the success of TOD.

**What lessons can Honolulu planners learn from other cities about TOD?**

Honolulu's linear land use pattern and strong urban core make it rather unique among U.S. cities. Still, local planners can learn a variety of lessons about TOD from other cities that may be applicable to Honolulu. Hank Dittmar and Gloria Ohland (2004) discuss many of these lessons in their book titled, *The New Transit Town: Best Practices in Transit-Oriented Development*. This book actually covers a variety of topics on TOD, as listed in Appendix B. Many of these topics are complex and beyond the scope of this short paper. Instead, this paper identifies six lessons from other cities that may be applicable to Honolulu.

*Lesson #1: Early action is essential for successful TOD.*

Over the past 25 years, there has been a pronounced shift in the planning for and implementation of TOD in America. Planning for TOD was not a strong focus of many new rail starts in the 1970s and 1980s. During that period, Atlanta, Miami, Portland and Washington, D.C., prepared station area plans as part of the development of their transit systems. However, except for Portland and a few stations in Washington, D.C., the plans generally were not used to guide or shape development around stations.

However, transit operators are starting to learn from their initial experience that TOD planning is something that needs to be done earlier in the project development process. Denver, Dallas, St. Louis, Salt Lake City, Portland, San Diego, San Jose, and Sacramento, are all examples of transit systems with new rail extensions that increased their TOD efforts well after their first line was already in place. Those early efforts appear to be paying off in each of those cities. (Parker et al., 2002)

*Lesson #2: Compared to bus improvements, rail is more likely to shape growth.*

In the United States, rail has consistently shown more ability than bus improvements to shape growth, attract new riders, and increase property values when the new rail system is implemented in a growing market with supportive policies in place. In cities on the U.S. Mainland, people who ride rail and those who take buses often come from different demographic groups. Rail systems have been more effective in attracting new 'choice' riders to transit, and these new riders tend to have higher income than existing bus riders. This difference results because rail and bus systems often provide service to different geographic and travel markets.

Compared to bus routes, rail transit systems are relatively fixed. A fixed guideway increases the ability of developers and bankers to invest in transit-supportive development near rail stations. Rail systems have a proven TOD track record, while bus TODs are more rare. Making bus TODs work can be achieved, but it requires a focused approach and an extra level of leadership and intervention than a comparable TOD built around a rail station. There are a few examples of bus rapid transit (BRT) systems in the U.S. (e.g., two lines in Los Angeles) that are beginning to resemble good BRT systems in other countries (e.g., Ottawa, Canada and Curitiba, Brazil) in terms of performance. High-quality BRT systems are similar to rail systems in attracting 'choice' riders. Such systems show promise as a 'smart growth' strategy to focus development, reduce dependence on the automobile and help revitalize cities. (Parker et al., 2002)

*Lesson #3: Decide on whether to use TOD typologies or station area plans.*

Dittmar and Ohland (2004) claim that a standard definition of TOD leads to a "one-size-fits-all set of solutions onto the different types of sites served by transit and the different types of transit that serve communities." (p. 33) To avoid this mistake, cities have adopted TOD typologies and station area plans. For example, Denver adopted a typology of TOD for different locations (i.e., downtown, major urban center, urban center, urban neighborhood, commuter town center, main street, and campus/special events station), as shown in Table 3. For each location, the typology defined the desired land-use mix, housing types, commercial and/or employment types, scale and transit system function. (Community Planning and Development, 2006)

In contrast, Seattle launched a Station Area Planning (SAP) program that involved a community-based planning effort between 1998 and 2001. The program focused on areas within a quarter mile of proposed transit stations, built on existing neighborhood vision statements, and involved Station Area Advisory Committees (SACS) in the planning and design process. In July 2001, the City Council established Station Area Overlay Districts (SAOD) and rezoned areas around eight future light rail stations. A market analysis indicated which station locations had the strongest potential for new housing and commercial development. The SAOD provided flexibility for existing businesses, new development and prohibited certain auto-oriented land uses near stations. (Seattle Department of Transportation, 2007)

**Table 3. Denver's TOD Typology.**

| TOD Typology | Desired Land Use Mix | Desired Housing Types | Commercial/ Employment Types | Proposed Scale | Transit System Function |
|---|---|---|---|---|---|
| Downtown | Office, retail, residential, entertainment, and civic uses. | Multi-family and loft. | Prime office and shopping location. | 5 stories and above. | Intermodal facility/transit hub. Major regional destination with high quality feeder bus/streetcar connections. |
| Major Urban Center | Office, retail, residential, entertainment. | Multi-family and townhome. | Employment emphasis, with more than 250,000 office and 50,000 square feet retail. | 5 stories and above. | Sub-regional destination. Some park-n-ride. Linked with district circulator transit and express feeder bus. |
| Urban Center | Office, retail residential. | Multi-family and townhome. | Limited office. Less than 25,000 square feet office. More than 50,000 square feet retail. | 3 stories and above. | Sub-regional destination. Some park-n-ride. Linked with district circulator transit and express feeder bus. |
| Urban Neighborhood | Residential, neighborhood retail. | Multi-family townhome, small lot single-family. | Local-serving retail. No more than 50,000 square feet. | 2-7 stories. | Neighborhood walk-up station. Very small park-n-ride, if any. Local bus connections. |
| Commuter Town Center | Office, retail, residential. | Multi-family townhome, small lot single-family. | Local and commuter-serving. No more than 25,000 square feet. | 2-7 stories. | Capture station for in-bound commuters. Large park-n-ride with local and express bus connections. |
| Main Street | Residential, neighborhood retail. | Multi-family. | Main street retail infill. | 2-7 stories. | Bus or streetcar corridors. District circulator or feeder transit service. Walk-up stops. No transit parking. |
| Campus/ Special Events Station | University campus, and sports facilities. | Limited multi-family. | Limited office/retail. | Varies. | Large commuter destination. Large parking reservoirs but not necessarily for transit. |

Source: Community Planning and Development, 2006.

*Lesson #4: Adopt lower parking standards for TODs.*

In Dallas, Texas, there has been a lot of development next to DART stations. However, it is largely transit-adjacent development (TAD) not transit-oriented development (TOD). Development has not been shaped by transit, partially because TOD is technically 'illegal' in Dallas. In other words, the zoning and development code in the City of Dallas does not allow development to occur in a different manner because of its proximity to transit. Even when the market wants to respond to transit in Dallas, it is not allowed to in some cases. For example, the developer of DART's Mockingbird Station built $6 million worth of additional structured parking, because the city refused to reduce the parking requirements for the project. (Parker et al., 2002)

In contrast, the City of Vancouver, British Columbia, reduced its parking standard from 1.35 stalls to 1.04 stalls per dwelling unit, because a parking study showed that TODs in Vancouver generally required only 0.6 to 0.7 stalls per dwelling unit. This reduction enabled the developer of a 27.3-acre TOD (i.e., Collingwood Village) at SkyTrain's Joyce Station to save hundreds of thousands of dollars, which the developer (Concert Properties) spent on station area streetscape and security improvements for the community. (Nieweler, 2004)

*Lesson #5: Carefully decide where to provide transit system parking and where to build TOD.*

When the Bay Area Rapid Transit (BART) system began service in 1972, planners provided park-and-ride lots in suburban locations as a way of encouraging automobile commuters to switch to transit. The planners hoped that developers would one day convert these lots to mini-communities (i.e., TODs). Planners thought developers would be attracted to these sites, because parking lots would eliminate the risks of negotiating land purchases among multiple property owners. (Cervero, 1994)

The BART experience with park-and-ride lots shows that planners face a unique challenge when they try to develop TODs in suburban areas. The challenge is simple: Is the land around transit stations in suburban areas best used for commuter parking or building communities? There is often conflict between the long-term goal of building TOD communities in suburbs and the short-term goal of providing park-and-ride lots for motorists who live in low-density subdivisions and want to ride the transit system. Once these suburban locations are used for commuter parking, it is difficult to convert them later to high-quality TODs, because park-

and-ride commuters often view the parking lots as a vested right. The collective voice of existing park-and-ride patrons is always louder than the voice of future TOD residents. The Ohlone-Chynoweth Station in San Jose, California, is a more recent example of a TOD created from a park-and-ride lot. Typically, TODs built on parking lots in the suburbs must generate enough revenue to replace surface parking with structured parking for transit commuters (usually on a 1:1 basis). The expense of structured parking often can be a significant barrier to building TOD in a commuter suburb. (Parker et al., 2002)

*Lesson #6: Make TODs livable.*

TODs make more intensive use of developable sites around transit stations in urban areas. How can this be achieved without giving some people a sense of crowding? Answering this question is essential to making TODs more livable. Lund's (2006) study in California indicates that some housing consumers prefer TODs because they provide better living environments. What made these TODs desirable? How can the site planning and design of TODs be improved to make them appear less dense than they really are? What design factors influence consumer perceptions of and satisfactions with residential densities? Fortunately, research in the field of architectural and environmental psychology is providing answers to some of these questions (Norcross, 1973; Rapoport, 1975; Flachsbart, 1979; Bookout and Wentling, 1988; Bergdoll and Williams, 1990; Cervero and Bosselman, 1998). The lessons of these studies need to be reviewed and shared with the planning and design professions in Hawai'i.

A community-based planning process can assist with this challenge. For example, the Collingwood Village project in Vancouver, B.C., appears to be a good model of this process (Nieweler, 2004; Berelowitz, 2005). This TOD was designed for 5000 people living in 2800 housing units on a 27.3-acre site, which is about 100 dwelling units per acre. Over a two-year period, the developer (Concert Properties) presented the community with a number of visual options and achieved consensus on the final plan and a package of community benefits. Stakeholders representing the city, community, and developer agreed to increased densities in exchange for a package of community benefits. Landscaping and other design features give the project a human scale despite many tall structures. New housing is buffered from the elevated SkyTrain, which runs along the northern edge of the site, by means of landscaping, modest setbacks and acoustic treatment of north-facing units.

## Final Remarks

This brief review has shown that TOD has a variety of definitions and locations in urban areas. TOD has many potential social and environmental benefits, but they largely depend on whether transit systems can attract enough patrons who typically have access to other modes of travel. Some patrons expect TOD to provide them with more affordable and livable housing environments than currently exist. For TOD to occur and succeed, it needs several factors: a strong regional economy; supportive land use policies; hospitable walking environments; and a collaborative planning effort among various actors representing transit and governmental agencies, land use planners, developers, lenders and members of the community. Because these factors appear to be essential, true TODs are often hard to find. Many first-generation TODs are viewed as transit-adjacent developments (TADs). They fell short of expectations, because of significant barriers to TOD implementation. Some of these barriers can be surmounted by enlightened public policies on infrastructure provision, land use planning, parking policy, and zoning. Toward that end, this paper identifies several TOD issues and questions that may help to inform the debate on public policy (Appendix B). This paper has also derived several lessons that Honolulu planners can learn from other cities that have seen TOD in response to new rail starts or extensions.

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## Appendix A
## TOD Internet Sites

http://www.calthorpe.com Brief descriptions of several TOD projects by Calthorpe Associates.

http://www.cnu.org Profiles and images of TODs from the Congress of New Urbanism.

http://www.charlotte.com/observer/0217train.htm TOD activity in Charlotte, North Carolina.

http://www.ci.gresham.or.us/departments/cdd/com_districts/lightrail.htm TOD and light rail in the City of Gresham, Oregon.

http://www.ci.hillsboro.or.us/Planning_Department/Ordinance2793-4-77/Section15.pdf TOD Zoning Ordinance for the City of Hillsboro, Oregon.

http://www.ci.seattle.wa.us/council/whatsnew.htm Information about station area planning in Seattle, Washington.

http://www.ci.seattle.wa.us/planning/todstudy/cs00sum.htm TOD page in Seattle, Washington.

http://www.co.contra-costa.ca.us/depart/cd/charrette/ Pleasant Hill *BART Specific Plan*, BART Fact Sheet.

http://www.globaltelematics.com/tod.htm Research papers on TOD concept.

http://www.linearcity.org/ Regional scale TOD featuring a linear city concept.

http://www.orencostation.com Images and information on the Orenco station TOD in Hillsboro, Oregon.

http://www.metrokc.gov/kcdot/alts/tod/todindex.htm TOD in King County, Washington.

http://www.newurbannews.com Articles on TOD in the New Urban News.

http://www.sacbee.com/news/newss/local01_19991213.htmli TOD in Sacramento, California.

http://www.sacrt.com/TLC/TLCMainPage.htm Sacramento Transit for Livable Communities.

http://www.sfgate.com/cgi-bin/article.cgi?file=/examiner/archive/1999/07/11/METRO12270.dtl Update on Fruitvale TOD project in Oakland, California.

http://www.stationfoundation.org/tod.htm Information on TOD by the Great American Station Foundation.

http://www.todcommunities.org/ Transit-Oriented Communities by the Puget Sound Regional Council in the Seattle, Washington area.

http://transaact.org Information on a variety of alternative transportation and land use studies at the Surface Transportation Policy Project site.

http://www.tri-met.org/reports/dreams98.htm Transit-Oriented Development Case Study in Portland by G. B. Arrington for Tri-Met.

http://www.tri-met.org/communitybuilding.htm Tri-Met Transit-Oriented Development Community Sourcebook of TOD in Portland, Oregon.

http://www.unitycouncil.org/html/ftvinitiative.html Fruitvale BART Station in Oakland, California.

Source: Parker et al., 2002.

## Appendix B
## TOD Issues and Questions

This appendix summarizes several issues and questions raised by transit-oriented development. These issues are raised and discussed in a book titled, *The New Transit Town: Best Practices in Transit-Oriented Development*, edited by Hank Dittmar and Gloria Ohland, and published by Island Press, Washington, D.C., in 2004.

*Land Assembly*. A TOD serves as both a transit station node and a place in its own right. Some TODs may require more than a single parcel. In such locations, property ownership may be fragmented and assembly of multiple parcels may be difficult. High land costs and fragmented land ownership patterns may be an impediment to infill development. To what extent should the City & County of Honolulu (hereafter "the C&C") help assemble parcels of land at station locations?

*Financing*. How will increased property values be captured and spent at identified TOD locations? In what locations and under what circumstances should Honolulu finance infrastructure and public improvements to demonstrate its commitment to TOD? Should the C&C make funding for key infrastructure contingent on transit-supportive design and/or provision of affordable housing?

*Public Education*. What should be the role of the C&C in educating the public about TOD? Should the C&C facilitate structured community input for TOD projects as occurred in the Rosslyn-Ballston Corridor of Arlington County, Virginia, for the Washington Metro?

*Building Intensity and Scale*. Should the C&C have overlay districts for TODs that set minimum floor area ratios (FARs), minimum lot area per unit and minimum heights and/or massing? Should the C&C set minimum or average densities for TOD projects to encourage transit ridership? Should density bonuses be available to promote affordable housing? What densities exceed acceptable levels of livability in Honolulu? Should buildings be oriented to the street with small or zero setbacks?

*Pedestrian Orientation*: To what extent should the C&C encourage pedestrian activity at TODs by using zoning and building codes to address the design of buildings, sites and streets as well as the mix of land uses?

*Land Use Mix*. What is an appropriate land use mix in Honolulu for different types of TODs? Should it include both a horizontal and vertical land use mix (i.e., residential over retail)? Should land uses that encourage pedestrian activity be permitted as of right with no or minimal discretionary review? Should mixed-use zoning districts provide incentives for affordable housing by allowing projects by-right if they have a certain percentage of floor area devoted to residential uses? A "by-right" approach may reduce the planning approval time for mixed-use projects.

*Transit Integration.* How will land uses in Honolulu interface with the transit system? Customized projects elsewhere integrate transit facilities and land uses on site. They involve

detailed and lengthy planning that is shared among many private entities and public agencies. Smaller and midsize TOD projects may have walking access to transit stations, but do not incorporate transit stations. In either case, Honolulu's zoning ordinance will need to address how tracks and stations integrate with surrounding land uses.

*Parking Policy*. TODs typically ban surface parking lots between buildings. To what extent should the C&C relax parking standards for TODs?

*Role of Transit Agency*. Federal rules now make it possible for transit agencies to support TOD on property that has been purchased for right-of-way with federal funding. How and to what extent should this occur in Honolulu?

*Context-Sensitive Design*. To what extent should Honolulu's zoning ordinance and urban design guidelines preserve historic buildings and encourage context-sensitive designs?

*Civic and Open Space*. What will be the requirements for civic and open space in Honolulu?

## *Appendix E: Milestones in Transit Planning in Honolulu, 1967 – 2007*

### *By Peter Flachsbart, PhD, AICP*

The following timeline provides a record of notable events in transit planning in Honolulu between 1967 and 2007.

**1967:** The O'ahu Transportation Study (OTS) recommended the construction of a 26-mile, fixed-rail rapid transit system running from Pearl City to Hawai'i Kai by 1985.

**1972:** After considering several alternatives, including bus-on-busway and waterborne systems, the Preliminary Engineering and Evaluation Program (PEEP) - Phase I study concluded that a fixed-guideway rapid transit system running from Pearl City to Hawai'i Kai would best meet the long-range transportation needs of O'ahu.

**1973:** The Evaluation of Alternative Transportation System Study looked at additional alternatives but upheld the conclusions of the PEEP - Phase I study.

**1976:** The Preliminary Engineering and Evaluation Program (PEEP) - Phase II study concluded that a 14-mile fixed-guideway system had the advantage over an all-bus system and less capital intensive, light rail transit (LRT) alternatives running at grade level.

**1979:** Mayor Frank Fasi proposed an 8.4-mile, 11-station, conventional heavy rail transit system from the Honolulu International Airport to the University of Hawai'i at Manoa. Known as the Honolulu Area Rapid Transit (HART) project, the system was to be electrically powered with trains up to ten cars in length operating at average speeds of 30 mph with top speeds of 55 mph. Approximately 2 miles of the proposed fixed-guideway system would travel in a subway under Honolulu's downtown and civic center with the remaining portion on aerial structures.

**1981:** Following the defeat of incumbent Frank Fasi, newly elected Mayor Eileen Anderson expressed concern about local bus ridership and U.S. budget cuts. She decided to end more than five years and $6 million in planning for the billion-dollar HART project and returned its planning and engineering funds to the federal Urban Mass Transportation Administration (UMTA).

**1984:** The O'ahu Metropolitan Planning Organization (OMPO) published the HALI 2000 Study, which evaluated six alternatives to accommodate projected growth in travel demand by 2000. Of these alternatives, the study showed that a fully grade-separated rapid transit line would provide improved service quality and attract the largest increase in patronage, but would require significantly increased capital funding.

**1985:** Reelected in 1984, Mayor Frank Fasi asked John Hirten to reexamine fixed-guideway alignments that could take advantage of automated light rail technologies, such as SkyTrain in Vancouver, Canada, and the VAL system in Lille, France.

**October 1991:** The Fasi administration selected the team of AEG Westinghouse Transportation Systems, Inc. and Morrison Knudsen Corp. to design, build, furnish and operate a fully automated, customized transit system, based on vehicle and guideway subsystems that had not yet been proven together as an integrated system in revenue service elsewhere in the world.

**November 14, 1991:** The City Council voted 5 to 4 to allow Mayor Frank Fasi to sign a development agreement with Governor John Waihee to build a 15.6-mile rapid transit system in Honolulu by 1997. The City assumed that the federal government would pay 30 percent of the $2 billion system. The remaining funds would come from an increase of 4.0 to 4.5 percent in the state's general excise tax, which would be collected by the state over a ten-year period.

**September 22, 1992:** The City Council's Policy Committee voted 5 to 4 not to authorize a 0.5 percent increase in the state's general excise tax on O'ahu, causing more than $708 million in federal money earmarked for Honolulu to lapse.

**March 1999:** Based on the O'ahu Trans 2K visioning process in eleven communities, which began in fall 1998, Mayor Jeremy Harris released the Islandwide Mobility Concept Plan. It explored the use of more buses on exclusive freeway lanes, and the potential of at-grade bus rapid transit (BRT) and light rail transit (LRT) alternatives between various activity centers.

**October 27, 2003:** State and city officials announced plans to build a $2.6 billion light-rail transit system for O'ahu. The new rail line was expected to run for 22 miles from Kapolei to Iwilei.

**February 7, 2005:** Members of the state House and Senate transportation committees approved similar bills that would give counties the option to add a surcharge of up to 1 percent on top of the existing 4 percent general excise tax to pay for a mass-transit system on O'ahu.

**April 12, 2005:** The state Senate voted to give Honolulu and Neighbor Island counties the option of adding a surcharge of 0.5 percent onto the state's 4 percent general excise tax to pay for mass transit.

**April 29, 2005:** State House and Senate negotiators agreed to give counties the option of adding a 0.5-percentage-point surcharge to the state's 4 percent general excise tax. Planners estimated that the surcharge could raise as much as $150 million per year to pay for mass transit.

**May 2005:** Under Mayor Mufi Hannemann, the City awarded a $9.7 million contract to analyze alternative alignments and environmental impacts of high-capacity, fixed-guideway transit systems to Parsons Brinckerhoff Quade & Douglas. The company

worked on similar studies for Honolulu's last major attempt at transit, which ended in 1992.

**May 11, 2005:** On first reading, the City Council approved a bill that would increase the general excise tax from 4 percent to 4.5 percent to pay for mass transit on O'ahu.

**July 11, 2005:** Governor Linda Lingle agreed not to veto the Legislature's bill giving counties the option to raise the general excise tax after state lawmakers agreed to try to change the law when they met in regular session the following year. Lingle had said she would veto a county tax option for mass transit if the state, instead of the counties, were to collect the new tax revenue.

**August 10, 2005:** The City Council gave final approval to a tax increase to pay for a Honolulu mass-transit system. As a result of the 7 to 2 vote, the general excise tax on O'ahu rose on January 1, 2007 from 4 percent to 4.5 percent — a 12.5 percent increase.

**December 2005:** City consultants identified three likely technologies — light rail, monorail and magnetic levitation — and four routes that could be used for a new mass-transit system between Kapolei and the University of Hawai'i at Manoa. An elevated roadway, known as the "managed lanes alternative" for buses, carpools and toll-paying vehicles, was also under consideration.

**December 13, 2005:** Planners held the first of two public "scoping" meetings as part of a federally required process for all mass-transit projects that hope to receive federal funding.

**March 23, 2006:** City released details of possible mass-transit stations, including 64 tentative stations along four alternate routes, with 25 to 30 stations on each route intended to serve the main residential areas from Kapolei to the University of Hawai'i at Manoa.

**June 22, 2006:** City planners released new cost and ridership estimates for mass transit, with a cost of $3 billion and between 120,000 and 150,000 riders a day by the year 2030. The new cost estimate was at least $200 million more than previous estimates.

**December 7, 2006:** City Council approved on second reading a bill to commit to some form of a fixed-guideway system as the locally preferred alternative (LPA) for a mass-transit project that the City estimated could cost between $3.8 billion and $4.6 billion.

**December 14, 2006:** The City Council's Transportation Committee recommended some sort of fixed-guideway system, which could include rail or buses. It also recommended a route that did not directly serve areas in Kalaeloa and the 'Ewa Plains.

**December 22, 2006:** The City Council voted 7 to 2 to approve Mayor Mufi Hannemann's proposed $4.6 billion fixed-guideway system using either buses or rail from Kapolei to the University of Hawai'i at Manoa. Source: http://the.honoluluadvertiser.com/article/2006/Dec/23/ln/FP612230340.html

**February 27, 2007:** The City Council voted 5 to 4 to approve the first phase of the transit route known as the "minimum operable segment" (or MOS) from North-South Road in East Kapolei to the Ala Moana Center. The City estimated that the system would initially provide service to about 70,000 residents who live along Salt Lake Boulevard, and that extensions would be made eventually to the Honolulu International Airport, to the Manoa campus of the University of Hawai'i, and to Waikiki.

**May 4, 2007:** The Policy Committee of the O'ahu Metropolitan Planning Organization (OMPO) voted 11 to 1 to include the MOS in the O'ahu Regional Transportation Plan. The vote cleared the way for federally supported engineering and environmental studies of the project.

**June 6, 2007:** The City Council approved an annual budget that supported Mayor Hannemann's request for 12 staff positions and consultant funding for the implementation of transit-oriented development (TOD). The positions are assigned to the Department of Planning and Permitting.

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"Vote clears way for initial transit work," *The Honolulu Advertiser*, February 28, 2007, pp. A1, A2.

# *APPENDIX F*

# *APAHI Testimonies and Comments*

hawai'i chapter
of the
american planning
association
p.o. box 557
honolulu
hawai'i
96809
www.hawaiiapa.org

February 12, 2007

The Honorable Nestor Garcia, Transportation Committee Chair
The Honorable Todd Apo, Budget Committee Chair
Honolulu City Council
560 South King Street
Honolulu, Hawai'i 96813

Dear Chairmen Garcia and Apo, and Members of the City Council Transportation and Budget Committees:

**Honolulu High-Capacity Transit Corridor Project**
**Minimum Operable Segment**
**Resolution No. 07-039**

The Hawai'i Chapter of the American Planning Association supports the Minimum Operable Segment (MOS) of the Locally Preferred Alternative for the Honolulu High Capacity Transit Corridor Project as proposed in Resolution 07-039.

The APA Hawai'i Chapter has approximately 300 members. Our membership is composed of individuals from the private and public planning sectors, interest groups, and landowners, including decision-makers, administrators, lawyers, architects, developers, university professors, students, and other interested individuals.

The APA Hawai'i Chapter supports the MOS as identified in Resolution No. 07-039 as providing a critical transportation alternative between East Kapolei and the Ala Moana Center. Designing and developing the high-capacity transit system with these endpoints has several advantages. The western alignment, with a terminus at North-South Road:

- Addresses the problem needing the most immediate attention, i.e., commuter travel in the congested leeward corridor;
- Has the greatest potential for shaping transit-oriented development on a significant scale;
- Costs less per mile to construct;
- Will have transit stations that are spaced farther apart; and
- Includes the best location options for a rail yard.

The eastern alignment, with a terminus at Ala Moana Center:

- Supports existing, high-density residential and employment districts where transit ridership will be high;
- Will promote infill in urban Honolulu with new, transit-oriented development; and
- Can effectively integrate with existing bus transit that already serves the University of Hawai'i at Manoa and Waikiki.

*founded in 1962, the hawai'i chapter has over 300 members, including planning officials, public and private sector planners, and community advocates, on the major islands across the state*

***e mālama pono i ka 'āina; nānā mai ke ola***
*take good care of the land; it grants you life*

During preliminary engineering and in the EIS, vertical and horizontal alternatives for Section V of the alignment (i.e., urban Honolulu) should be explored because of the complex design and land use issues in this segment.

APA supports a fixed guideway transit system not only because it serves to move people, but because it will be key in shaping the development of the transit corridor as well as many high-density areas within the transit influence zone. The APA Hawai'i Chapter will continue its commitment to this important project as it moves forward, with a particular interest in transit-oriented development, context-sensitive design and community integration.

Very truly yours,

Gene Yong
*APA Hawaii Chapter President*

John Whalen
*APA Transit Committee*

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of the
american planning
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p.o. box 557
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hawai'i
96809
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February 21, 2007

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and Members of the Honolulu City Council
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Honolulu, Hawai'i 96813

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*and Members of the City Council*
*February 21, 2007*

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Very truly yours,

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*APA Hawaii Chapter President*

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*APA Transit Committee*

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April 2, 2007

Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Attn: Honolulu High-Capacity Transit Corridor Project

Re: **Hawaii Chapter Comments on Scoping for the Environmental Impact Statement (EIS) and Preliminary Engineering**

Gentlemen/Ladies:

The importance of this project cannot be overstated in terms of the way it will shape new urban spaces for fifty or more years, as well as re-shape the urban form of Honolulu that has evolved in the past hundred years. Given this historic importance:

- The project should structure a context sensitive design (CSD) process based on principles of community based planning. This is different from a community information process. The purpose of the CSD community process is to identify connectivity issues and to integrate transit with other community spaces. Every station area should have a community level plan developed by the affected community. This should be completed well before construction is started, especially if the project moves forward as design-build. The community process should be funded adequately to produce the plans in a timely manner.
- The framework and ground rules for the CSD community process should be crafted by an independent Task Force of experts from the fields of facilitation and community participation. This independence is critical so that a climate of mutual trust can predominate, clearing the path for wise decision-making and the resolution of differences. The ground rules developed by the Task Force should ensure that the community process is timely and is not used by opponents to obstruct or delay the implementation of transit.
- The station plans should address connectivity, including access for pedestrians, bicyclists, bus rider transfers, and park-and-ride facilities (as appropriate) within the community. The plans should also address other parking policies within the communities affected by transit.
- Transit-oriented development (TOD) must be about creating new urban places. Opportunities will vary by location. From the experiences in other transit cities, TOD does not occur by accident, but by well formulated articulation of community objectives, criteria for evaluation, policies and regulations. The specific processes for encouraging and then processing TOD should be described in the EIS.
- There needs to be input from the local design and physical planning community starting now in the EIS process and carrying through preliminary engineering, procurement and on to construction. Design cannot take a second seat to cost, expediency or be left to private consultation between the city and individual landowners. Further, design

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issues should not be totally in the hands of architects based outside of Hawaii and who may be unfamiliar with elements that create a Hawaiian sense of place.

The next three scoping comments are specific to the beginning and end points of the MOS. This makes them doubly critical for their end of line issues as well as for future extensions. The alternative development process must allow for and produce alternate designs which enhance and draw out the urban form possibilities surrounding the MOS end points.

- The preliminary indications for the design of the Ala Moana station are that it would be at an eighty foot elevation. Such a height contradicts good urban space planning in that location and would create logistical problems for both modal transfer and future extensions. The scope of the EIS needs to be broad enough to test horizontal and vertical variations to find those that best reduce the height of this and any other stations to a more human scale. The City should not shy away from takings when necessary to achieve the right form and to enhance ridership.
- The preliminary indications for transit in Kapolei are that it may not be within the West Oahu Campus. Scoping should include review of an option integrated within the campus.
- All stations in the Ewa Plain must be integrated fully with the overall urban form following principles of connection, and not be relegated to the periphery of master planned sub-communities.

Thank you for the opportunity to comment on the scope of the EIS. APA Hawaii Chapter remains committed to working with the City towards the successful rebuilding of Honolulu through transit.

Sincerely,

Gene Yong, AICP
*APA Hawaii Chapter President*

John P. Whalen, FAICP
*APA Transit Committee*

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April 25, 2007

The Honorable Barbara Marshall, Chair
and Members of the Honolulu City Council
560 South King Street
Honolulu, Hawai'i 96813

Dear Chair Marshall and Members of the City Council:

**Bill 30, CD1**
**Executive Operating Budget**

The Hawai'i Chapter of the American Planning Association supports the Administration's request for twelve staff positions and consultant funding for the implementation of transit-oriented development. These requests will provide the Department of Planning and Permitting with the necessary planning, financial, legal and community outreach skills to undertake an effective transit-oriented development program.

The City and County of Honolulu's investment in transit is about much more than transporting people from one location to another. To make wise use of this investment, it is very important to recognize that transit has a significant role in shaping O'ahu's communities and pattern of urban life.

One of the lessons we have learned from other cities that have developed transit systems is that successful transit-oriented development requires extensive, long-term public outreach. These are not merely informational meetings, but intensive programs to get communities actively involved in planning the future of neighborhoods in the transit-influence zones. In Vancouver, for example, they conducted 18-month public participation programs for each transit station area, with working groups helping to develop policies and projects for housing, shopping and public facilities. They had outreach workers who spoke the languages of immigrant groups to ensure that participation was broad.

It would be a terrible missed opportunity to short-change the transit-oriented development program, because this is where we can make best use of the long-term investment in transit. We urge you to restore the twelve positions and funds for related consultant assistance that was requested by the Department of Planning and Permitting.

Thank you for this opportunity to comment.

Very truly yours,

Gene Yong
*APA Hawai'i Chapter President*

John Whalen
*APA Transit Committee*

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May 3, 2007

Chair Nestor Garcia, Vice-Chair Willie Espero and Members of the OMPO Executive Committee
O'ahu Metropolitan Planning Organization
707 Richards Street, Suite 200
Honolulu, HI 96816

Re: **Inclusion of the MOS in the ORTP**

The Hawai'i Chapter of the American Planning Association (APA) supports the inclusion of the Minimum Operable Segment (MOS) in the O'ahu Regional Transportation Plan (ORTP). This would be the latest in a series of necessary steps towards improving the land use and transportation connection for this community.

The City and State investment in transit is about much more than transporting people from one location to another. To make wise use of this investment, it is very important to recognize that transit has a significant role in shaping O'ahu's communities and patterns of living.

Good long term planning is essential if Oahu is to realize the full benefits possible through transit. APA Hawai'i Chapter is committed to working alongside others to make create a transit system combined with transit oriented development and creation of pedestrian spaces that will serve current and future generations. Thank you for moving us along that path through your vote today.

Thank you for this opportunity to comment.

Very truly yours,

Gene Yong
*APA Hawai'i Chapter President*

John Whalen
*APA Transit Committee*

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May 23, 2007

The Honorable Todd K. Apo, Chair
and Members of the Honolulu City Council Committee on Budget
560 South King Street
Honolulu, Hawai'i 96813

Dear Chair Apo and Budget Committee Members:

**Bill 30, CD1**
**Executive Operating Budget**

The Hawai'i Chapter of the American Planning Association supports the Administration's request for twelve staff positions and consultant funding for the implementation of transit-oriented development. These requests will provide the Department of Planning and Permitting with the necessary planning, financial, legal and community outreach skills to undertake an effective transit-oriented development program.

The City and County of Honolulu's investment in transit is about much more than transporting people from one location to another. To make wise use of this investment, it is very important to recognize that transit has a significant role in shaping O'ahu's communities and pattern of urban life.

One of the lessons we have learned from other cities that have developed transit systems is that successful transit-oriented development requires extensive, long-term public outreach. These are not merely informational meetings, but intensive programs to get communities actively involved in planning the future of neighborhoods in the transit-influence zones. In Vancouver, for example, they conducted 18-month public participation programs for each transit station area, with working groups helping to develop policies and projects for housing, shopping and public facilities. They had outreach workers who spoke the languages of immigrant groups to ensure that participation was broad.

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Thank you for this opportunity to comment.

Very truly yours,

Gene Yong
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