

INNOVATION INDUSTRIES IN TRANSIT-ORIENTED DEVELOPMENT (TOD) ZONES: OPPORTUNITIES ON STATE LANDS

FINAL REPORT

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Prepared by:

Belt Collins Hawaii LLC

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ABSTRACT

This report documents findings of a study conducted for the Office of Planning (OP) and funded by an award (No. 07-79-07394) from the Economic Development Administration (EDA), United States Department of Commerce. The report is intended to help the State of Hawai'i incorporate emerging and Innovation Industries into the State's planning for State-owned lands near transit stations on the Honolulu Authority for Rapid Transit rail line. The project sought to identify suitable sites and facilities/projects on State owned land near TOD stations to support emerging and Innovation Industries. Potential facilities/projects include incubators, creative media labs, research facilities, and manufacturing hubs.

Belt Collins Hawaii LLC (BCH) conducted interviews and meetings with representatives of State agencies, other landowners along the rail corridor, representatives of organizations encouraging start-ups of emerging technology in Hawai'i, and representatives of Innovation Districts and comparable efforts at selected areas in the United States mainland.

Innovation Districts bring together resources, persons and firms seeking to create new products, venues for collaboration and interaction, as well as capital to support new initiatives. Their champions share a vision for success that draws on local strengths and aspirations. Innovation Districts typically take decades to grow. Other, smaller initiatives – innovation hubs - may foster new economic development as well, but with less chance that such development will continue in spin-offs and ancillary economic growth.

Along the Honolulu rapid transit line now being developed, two sites stand out as likely Innovation Districts, and two others may prosper as innovation hubs. The districts are Kaka'ako and East Kapolei. Potential innovation hubs have been identified at Stadium-Hālawa, where redevelopment can foster economic growth in entertainment and civilian industries supporting the nearby military bases, and in Iwilei-Kapālama, where an emphasis on manufacturing could support new light industry.

Innovation Districts in Saint Louis, Denver, Fremont CA, Chattanooga, and Baltimore are examined in the report. The first three cases and one of the Baltimore cases clearly involve the creation of new high-paying jobs. In East Baltimore and Denver, the scale of development and potential for ancillary development may be limited by control over the districts exercised by private parties. In Saint Louis and Fremont, stakeholders encourage collaboration and new ventures.

Hawai'i stakeholders have asked how much government financial support is needed for developing Innovation Districts. In none of the cases studied have local authorities made the long-term financial commitments for infrastructure development that the Hawai'i Community Development Authority (HCDA) has made in Kaka'ako over decades.

Government and civic leaders have been key participants in planning all the Innovation Districts discussed. They have helped to develop and share a vision for success. They promote redevelopment and facilitate negotiations among stakeholders important to redevelopment.

Innovation Districts succeed over many years, supported by many parties. Collaboration is key, both for new economic ventures and for the stakeholders who want to encourage long-term development.

This study is addressed to State agencies to stimulate discussion, not to set policy. The following points are suggestions for such discussion:

- Consider restating State goals for land use to include providing space for emerging industries. State landowners can provide key resources for new businesses, especially if they can justify risky or low-return investments as supporting their central mission.
- Enter into and continue discussions with private-sector parties who could invest in Hawai'i.
- Help find funding for growth of Innovation Industries.
- Learn what resources are of value to potential investors and innovators.
- Work with all stakeholders to provide infrastructure, including Internet and electrical resources as well as public utilities. Investment in low-impact development may help to attract developers and investors by lowering the cost of their involvement in new projects.
- Anticipate demands for social inclusion.

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Abbreviations and Acronyms

BART	Bay Area Rapid Transit
BCH	Belt Collins Hawaii LLC
CEDS	Comprehensive Economic Development Strategy
Council	Hawai'i Interagency Council for Transit-Oriented Development
CTAHR	College of Tropical Agriculture and Human Resources, University of Hawai'i
City	City and County of Honolulu
DAGS	Hawai'i State Department of Accounting and General Services
DBEDT	Hawai'i State Department of Business, Economic Development and Tourism
DHHL	Hawai'i State Department of Hawaiian Home Lands
DLNR	Hawai'i State Department of Land and Natural Resources
DOE	Hawai'i State Department of Education
EDA	Economic Development Administration, United States Department of Commerce
EPB	Electric Power Board, Chattanooga Tennessee
FTZ	Foreign Trade Zone
HART	Honolulu Authority for Rapid Transit
HCC	Honolulu Community College, University of Hawai'i
HCDA	Hawai'i Community Development Authority
HHFDC	Hawai'i Housing Finance & Development Corporation
HIA	Honolulu International Airport
Horton	D.R. Horton Hawai'i
HPHA	Hawaii Public Housing Authority
HTDC	Hawai'i Technology Development Corporation
JBPHH	Joint Base Pearl Harbor Hickam
LCC	Leeward Community College, University of Hawai'i
LEED™	Leadership in Energy and Environmental Design
LRDP	Long Range Development Plan (for University of Hawai'i campuses)
OCCC	O'ahu Community Correctional Center
OP	Office of Planning, State of Hawai'i
PBR	PBR Hawai'i and Associates, Inc.
TOD	Transit-Oriented Development
UH	University of Hawai'i
UHWO	University of Hawai'i, West O'ahu
U.S.	United States

EXECUTIVE SUMMARY

This report documents findings of a study conducted for the Office of Planning (OP) and funded by an award (No. 07-79-07394) from the Economic Development Administration (EDA), United States Department of Commerce.

The findings of the study are intended to help the State of Hawai'i incorporate emerging and Innovation Industries into the State's planning for State-owned lands near transit stations on the Honolulu Authority for Rapid Transit rail line. The project sought to identify suitable sites and facilities/projects on State owned land near TOD stations to support emerging and Innovation Industries. Examples of potential facilities/projects include incubators, creative media labs, research facilities, and manufacturing hubs.

The entire effort is part of the State's work to advance economic goals of diversification and economic growth in Hawai'i.

In the course of research, Belt Collins Hawaii LLC (BCH) conducted interviews and meetings with representatives of State agencies, other landowners along the rail corridor, representatives of organizations encouraging start-ups of emerging technology in Hawai'i, and representatives of Innovation Districts and comparable efforts at selected areas in the United States mainland.

Innovation Districts bring together resources, persons and firms seeking to create new products, venues for collaboration and interaction, as well as capital to support new initiatives. Their champions share a vision for success that draws on local strengths and aspirations. Innovation Districts typically take decades to grow. Other, smaller initiatives – innovation hubs - may foster new economic development as well, but with less chance that such development will continue in spin-offs and ancillary economic growth.

Along the Honolulu rapid transit line now being developed, two sites stand out as likely Innovation Districts, and two others may prosper as innovation hubs. The districts are Kaka'ako and East Kapolei.¹

- Kaka'ako has key components for an Innovation District – research institutions, incubators, cultural activity, and venues for lively interaction. While the research institutions have a clear focus on medicine, it may be difficult for the district to provide space for related start-ups and firms, in light of the cost of developing Wet Laboratory space.
- In East Kapolei, the University's Creative Media Center will be located at University of Hawai'i (UH) West O'ahu (UHWO). The Creative Media Center will encourage independent student work and collaboration with commercial producers. Both a planned nearby film studio and an innovation center could support new ventures in media and ancillary activities such as set fabrication.

¹ In the rest of this report, TOD zones are discussed from west to east along the transit corridor. In this summary, Kaka'ako, near the eastern terminus, is listed first simply because it is the better known and more developed example of a future Innovation District.

Potential innovation hubs have been identified at Stadium-Hālawā, where redevelopment can foster economic growth in entertainment and civilian industries supporting the nearby military bases, and in Iwilei-Kapālama, where an emphasis on manufacturing (by Kamehameha Schools, Honolulu Community College, and other State landowners) could support new light industry.

Innovation Districts in Saint Louis, Denver, Fremont CA, Chattanooga, and Baltimore are examined in the report. The first three cases and one of the Baltimore cases clearly involve the creation of new high-paying jobs. In East Baltimore and Denver, the scale of development and potential for ancillary development may be limited by control over the districts exercised by private parties. In Saint Louis and Fremont, stakeholders encourage collaboration and new ventures.

Hawai'i government stakeholders have asked how much government financial support is needed for developing Innovation Districts. In the cases of Fremont and Denver, planning, marketing, and willingness to work out arrangements with industry have been effective. Fremont had very limited financial resources. Both Saint Louis and Fremont involve the use of municipal land-use regulatory powers to encourage district development. In none of the cases cited have local authorities made the long-term financial commitments for infrastructure development that the Hawai'i Community Development Authority (HCDA) has made in Kaka'ako over decades.

Government and civic leaders have been key participants in planning all the Innovation Districts discussed. They have helped to develop and share a vision for success. They promote redevelopment and facilitate negotiations among stakeholders important to redevelopment.

Transit has shaped planning for Innovation Districts but is not critical for their development. Plans for a rail station have long been integrated into the urban design for the Cortex district in St. Louis, but the station only opened in 2018, well after the other components of this district took shape. In Fremont, a planned BART stop served as the center for the new district and has helped to reduce the need to devote land for parking. In other cities studied, existing transit systems, whether bus or rail, have supported Innovation District development but have not been central to district growth.

A tension is obvious between long-term planning and implementation and efforts to seize new opportunities as they emerge. Both a long-term vision and agile responses to opportunities can be crucial. However, a long-term vision and incremental realization do not motivate stakeholders over time. Success stories are needed to rally constituents and convince the wider community that innovation serves the common good.

In older cities, social inclusion has been an emergent theme. This issue is currently critical for municipal leaders in cities ranging from Baltimore to San Francisco and Seattle. While much of the Honolulu Authority for Rapid Transit (HART) line runs through greenfield areas, the issue of displacement can be anticipated in Kalihi and perhaps Waipahu. Workforce development initiatives, such as programs for technicians and professionals at

Leeward Community College (LCC) and UHWO, may play a significant role in assuring residents that it is their young people, not just people from outside Hawai'i, who will benefit.

Innovation Districts succeed over many years, supported by many parties. Collaboration is key, both for new economic ventures and for the stakeholders who want to encourage long-term development.

This study is addressed to a wide range of State agencies, with different missions and resources. It is meant to stimulate discussion, not to set policy. The following points are suggestions for such discussion:

- Consider restating State goals for land use to include providing space for emerging industries. State landowners can provide key resources for new businesses, especially if they can justify risky or low-return investments as supporting their central mission.
- Enter into and continue discussions with private-sector parties who could invest in Hawai'i.
- Help find funding for growth of Innovation Industries.
- Learn what resources are of value to potential investors and innovators.
- Work with all stakeholders to provide infrastructure, including Internet and electrical resources as well as public utilities. Investment in low-impact development may help to attract developers and investors by lowering the cost of their involvement in new projects.
- Anticipate demands for social inclusion.

The scope of work for this study included a work task to assess infrastructure needs for innovation projects. However, only a few innovation projects are “firm” and their specific infrastructure needs can be assessed. Therefore, infrastructure needs have been described generally for the TOD zones. The Office of Planning will be working with a master planning consultant on infrastructure and financing for the State-owned lands along the rail corridor with focus on East Kapolei, Stadium-Hālawa, and Iwilei-Kapālama areas.

1 INTRODUCTION

1.1 Purpose of Study

This report documents findings of a study conducted under Contract No. 66675 for the OP, State of Hawai‘i. The work is funded by an award (No. 07-79-07394) from the Economic EDA, United States Department of Commerce. The State sought consultant services to assist in the development of a report to identify and recommend suitable sites and facilities/projects on State land near TOD stations on O‘ahu to support emerging growth industries. This report identifies sites and facilities/projects. The study takes into account access, circulation and other infrastructure needs for development of such facilities, to the extent that these can be assessed on the basis of current plans.

The findings of the study are intended to help the State of Hawai‘i identify economic development related uses of State lands near rail stations. This study also is meant to provide “value-added” information to TOD planning in that it will look beyond the usual housing and retail/commercial uses proposed in TOD planning to specific emerging industry related facilities and development. The entire effort is part of the State’s work to advance economic goals.

In the course of research, BCH conducted interviews and meetings with representatives of State agencies, other landowners along the rail corridor, representatives of organizations encouraging start-ups of emerging growth industries in Hawai‘i, and representatives of Innovation Districts and comparable efforts at selected areas in the United States (U.S.) mainland. Persons interviewed for the project are listed in Appendix A.

1.2 Overall Background

This study supports targeted emerging growth cluster industries (emerging growth industries) identified in the 2016-2020 Hawai‘i Comprehensive Economic Development Strategy (CEDS) and other DBEDT reports by identifying facilities/projects which support these industries that can feasibly be developed on state lands near the rail stations. This project will identify and recommend suitable facilities/projects and sites on state lands near proposed Honolulu Area Rail Transit (HART) rail stations to support emerging growth industries. Emerging growth industries include technology, creative industries, energy, health/medicine/wellness, research and education, defense-related services and others. Facilities/projects will include incubators, tech parks, research center and associated support services.

A major economic goal for Hawaii is the diversification of its economy. Its dominant industry — tourism — is highly vulnerable to external forces. The State of Hawaii supports tourism and also the growth of emerging industries including technology, creative industries (arts, music, digital media, theater, etc.), energy, health and medicine, research, education and defense-related services. These industries may require office space, research facilities, laboratories and, incubator facilities. For example, the State of Hawaii

operates a film studio and is pursuing the development of a digital media facility. The State government in Hawaii also operates a business incubator facility. This study will assist in identifying opportunities for these types of uses on state lands near rail transit stations.

The detailed information provided by the proposed study will help the State of Hawai'i to identify economic development related uses of State lands near rail stations to supplement and enhance the housing and retail uses usually proposed in transit-oriented development.

The CEDS is a strategic blueprint for economic prosperity. It is intended to provide broad overall direction for economic development for the State of Hawai'i including identifying targeted cluster industries and goals, objectives and strategic actions. It is a policy document. This study will help to implement the CEDS by providing baseline information on businesses around the rail stations and identifying potential facilities which could be developed to support emerging growth industries and assessing their feasibility and recommending facilities for development.

1.3 Emerging Growth Industries

Emerging industries are ones expanding in size and tending to create well-paying new jobs. They may be competitive on a national stage.² For the present study, industrial growth, job creation, and the creation of high-wage jobs are taken to be of major importance.

Economic development policy can be directed in many ways. For example, agencies can concentrate on economic development by and for a particular social group, such as Native Hawaiians. Other agencies can focus on the impact of policy initiatives, looking for cascading economic growth, innovation, and/or diversification. The Department of Business, Economic Development and Tourism and local economic development advocates have directed attention to "targeted industry clusters."

Targeted industry clusters for O'ahu were identified by stakeholders³ as:

1. Hospitality and Tourism
2. Health Care
3. Research, Innovation, Technology and Creative Industries
4. National Security
5. Agriculture
6. Construction/Infrastructure
7. Energy

² For a discussion of cluster definitions both in Hawai'i and nationally, see Department of Business, Economic Development and Tourism (DBEDT), *Hawaii's Cluster Economic Performance*, 2016, posted at http://files.hawaii.gov/dbedt/economic/reports/Cluster_June_2016.pdf. See also the recent update, which highlights the career, over ten years, of targeted industries (DBEDT, *Hawaii's Targeted & Emerging Industries: 2017 Update Report*, Posted at http://files.hawaii.gov/dbedt/economic/data_reports/emerging-industries/Hawaii_Targeted_Emerging_Industries_2017_Update_Report.pdf

³ Ibid. p. 21 and Appendix 7

Major initiatives of the State have targeted technology, energy development, agricultural sustainability and medical education. Programs supported by the Hawai'i Technology Development Corporation (HTDC) have generated over \$1.1 billion in annual economic impact.⁴ Health care includes medical research and education providing clinical and technical jobs that are clearly central to O'ahu's emerging growth industries.

The Hawaii Statewide Comprehensive Economic Development Strategy (CEDS) has focused on a cluster-based approach. Research has shown that companies tend to locate near each other as their geographic proximity provides a number of benefits including economies of scale, access to labor and knowledge, improvement in logistics and perhaps most important, greater opportunities to innovate.⁵

A cluster-based strategy seeks to concentrate each emerging industry at an area where it can effectively grow, with major firms, start-ups, resources and suppliers all located near each other. Clustering of established industries, such as tourism and finance, has occurred on O'ahu. Questions to be resolved in the coming years include:

- Which emerging growth industry clusters can be concentrated at sites along the transit route?
- Which sites offer opportunities or support for clustered development, not just location of a single facility or project?
- Where sites are likely to be redeveloped, are there opportunities for Innovation Industries in the redevelopment process?

These questions will be revisited in the recommendations at the end of this report, after reviewing sites and proposed projects.

1.4 Innovation Districts

Areas where new ventures are encouraged have been termed innovation zones, centers or districts. The terminology is far from consistent or clear-cut in most municipal and news reports. However, the components of "Innovation Districts" have been specified by Brookings Institute researchers.⁶ While these components vary greatly from city to city, successful Innovation Districts combine economic, physical, and networking assets with "a supportive, risk-taking culture" to create an ecosystem that promotes both innovative ideas

⁴ Hawai'i Technology Development Corporation, *2017 Annual Impact Report*. Posted at https://www.htdc.org/wp-content/uploads/2018/04/HTDC_2017EconomicImpactSurvey_v09.pdf

⁵ Economic Development Alliance of Hawai'i and Office of Planning, State of Hawai'i. *Hawai'i Statewide Comprehensive Economic Development Strategy: 2016-2020 Strategic Plan*. Prepared for U.S. Economic Development Administration. This paragraph is taken from Appendix 2.

⁶ Bruce Katz and Julie Wagner. "The Rise of Innovation Districts: A New Geography of Innovation in America." (2014) Posted at <https://c24215cec6c97b637db6-9c0895f07c3474f6636f95b6bf3db172.ssl.cf1.rackcdn.com/content/metro-innovation-districts/~media/programs/metro/images/innovation/innovationdistricts1.pd>. and Julie Wagner, Scott Andes, Steve Davies, Nathan Storrington and Jennifer S. Vey., "Twelve Principles Guiding Innovation Districts." (2017). Posted at <https://www.brookings.edu/blog/metropolitan-revolution/2017/09/08/12-principles-guiding-innovation-districts-2/>

and commercial development. This is an ecosystem in which clustered economic development can flourish. The authors identify three broad types:

- **Anchor-plus districts:** These develop in urban areas where a research university and/or medical campus attracts a mix of start-ups, supporting firms, organizations and talent. An exemplary case is Kendall Square in Cambridge, MA, which draws on the Massachusetts Institute of Technology and Mass General Hospital.
- **Re-imagined urban areas.** These are urban redevelopment areas dedicated to innovative growth, fueled by significant but concentrated research investment along with transit access and amenities for a highly skilled and demanding workforce. Examples include Mission Bay in San Francisco and the South Union area in Seattle. A key element for this type is the opportunity to develop a large industrial area from older uses to new ones.
- **Urbanized science parks.** Science parks in the last century were typically suburban. Some of these, including the most successful, the Research Triangle in North Carolina, are pursuing urban development, with housing, retail, amenities for the workforce and transit access to local universities and other centers.

Innovation Districts demand significant investment, propelled by champions in government, research institutions, anchor firms, real estate development, organizations nurturing new firms (incubators, accelerators), and investors. Their impact can be measured most immediately in terms of jobs, but more broadly in terms of sustainability in a changing economy, notably:

- Innovation Districts are oriented to economic growth, whatever form it may take, rather than to existing industries;
- Innovation Districts can empower entrepreneurs;
- Innovation Districts benefit from colocation, encouraging both collaboration and competition; and
- Innovation Districts can create jobs in dense urban areas, i.e., near the neighborhoods where new jobs are most needed.

1.5 Honolulu TOD Zones

The HART route extends from East Kapolei on the 'Ewa Plain to Ala Moana in Honolulu. Some 21 stations are planned. Station sites, and the surrounding TOD zones range from open lands in the west where new communities are being developed to densely populated areas in the urban center. Figure 1 shows the transit route and the stations. TOD zones are areas where people can easily walk to and from the stations. As a rule of thumb, these can be seen as circular, with a radius of a half mile from each station.

As Figure 2 shows, State lands are found in most of the TOD zones; the State is the landowner with the largest holdings along the transit route. Some of the State properties include sites with existing commitments to technical training and emerging industries, as

indicated in Figure 3. Other sites where jobs in emerging industries are already proposed include, from west to east:

- Lands for research and development surrounding UHWO,
- The future rail yard, located just west of LCC, and
- Sites dedicated to entrepreneurial innovation in Kaka’ako, the “Entrepreneurs’ Sandbox” now under construction and the planned adjoining Innovation Hale, along with space at the Foreign Trade Zone (FTZ) at Pier 2 dedicated to creative media.

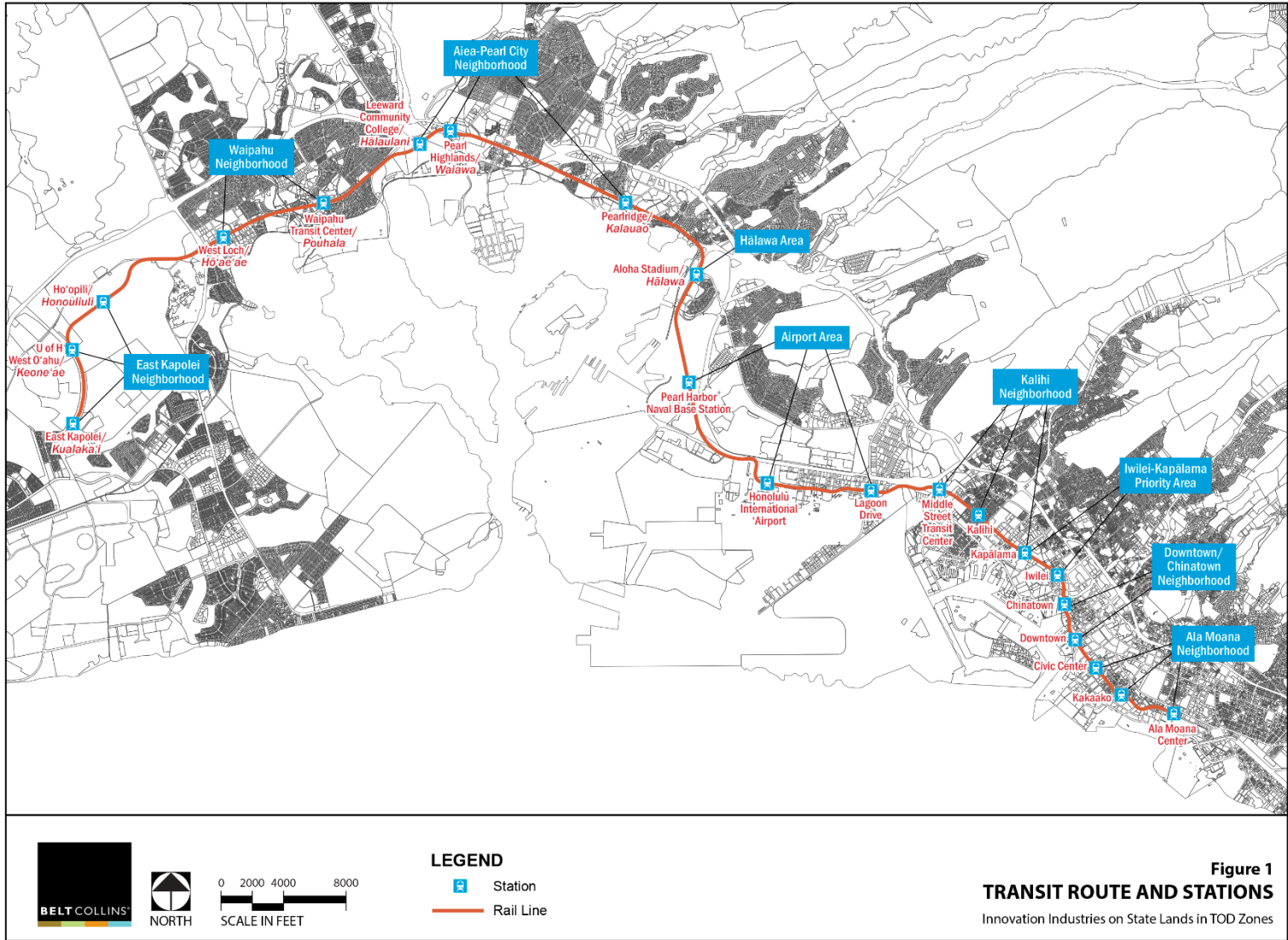
The rail yard is on the former “Drum Site” owned by the Department of Hawaiian Home Lands. It is to be transferred to the City and County of Honolulu (City) in a land exchange.

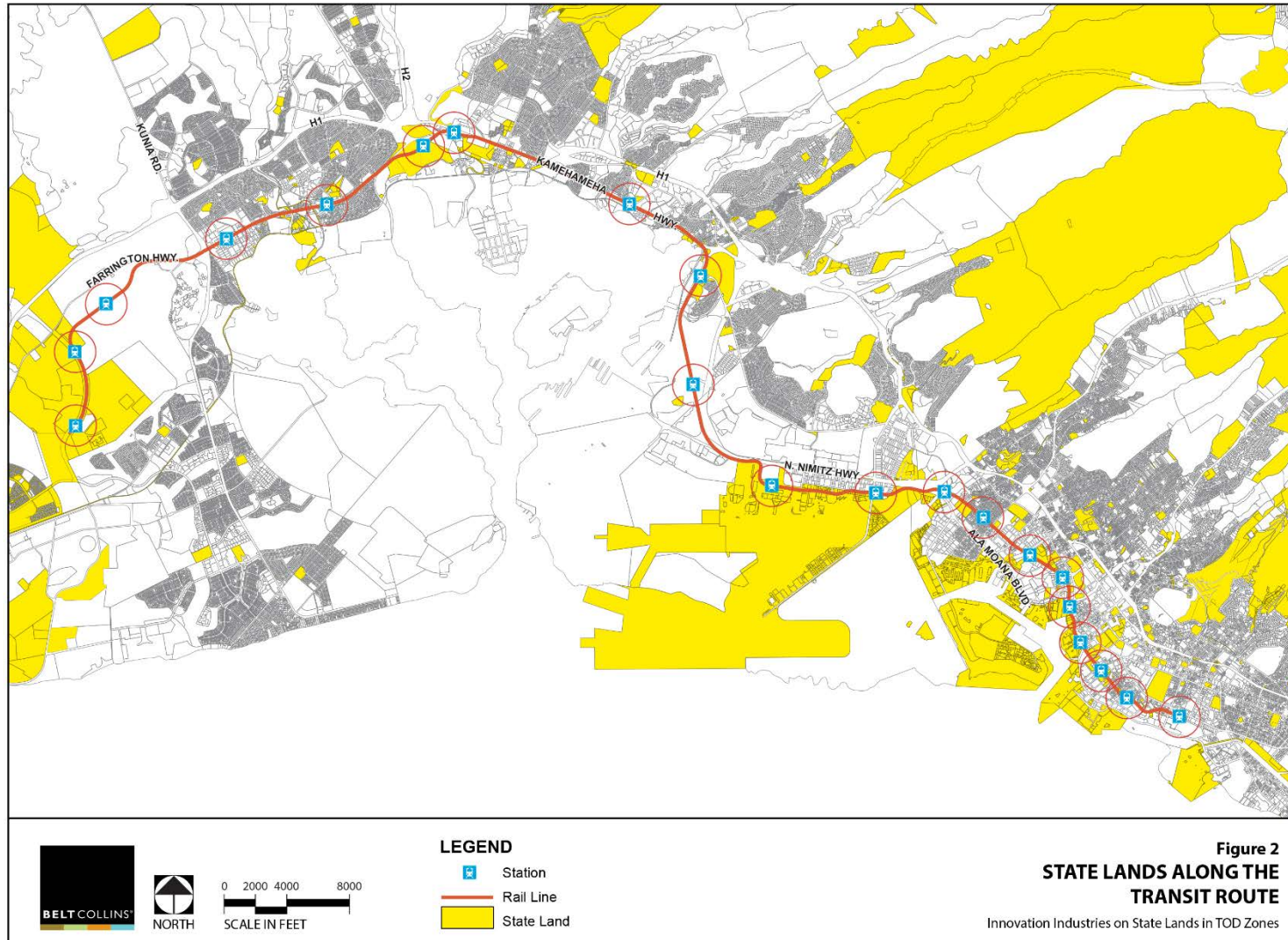
Facilities for co-working and collaboration among entrepreneurs are located in the Kaka’ako and Chinatown districts while accelerators for emerging firms are based in the Downtown area. Managers of collaboration spaces interviewed for this study expressed interest in expanding their operations to other TOD zones, notably Kalihi and East Kapolei.

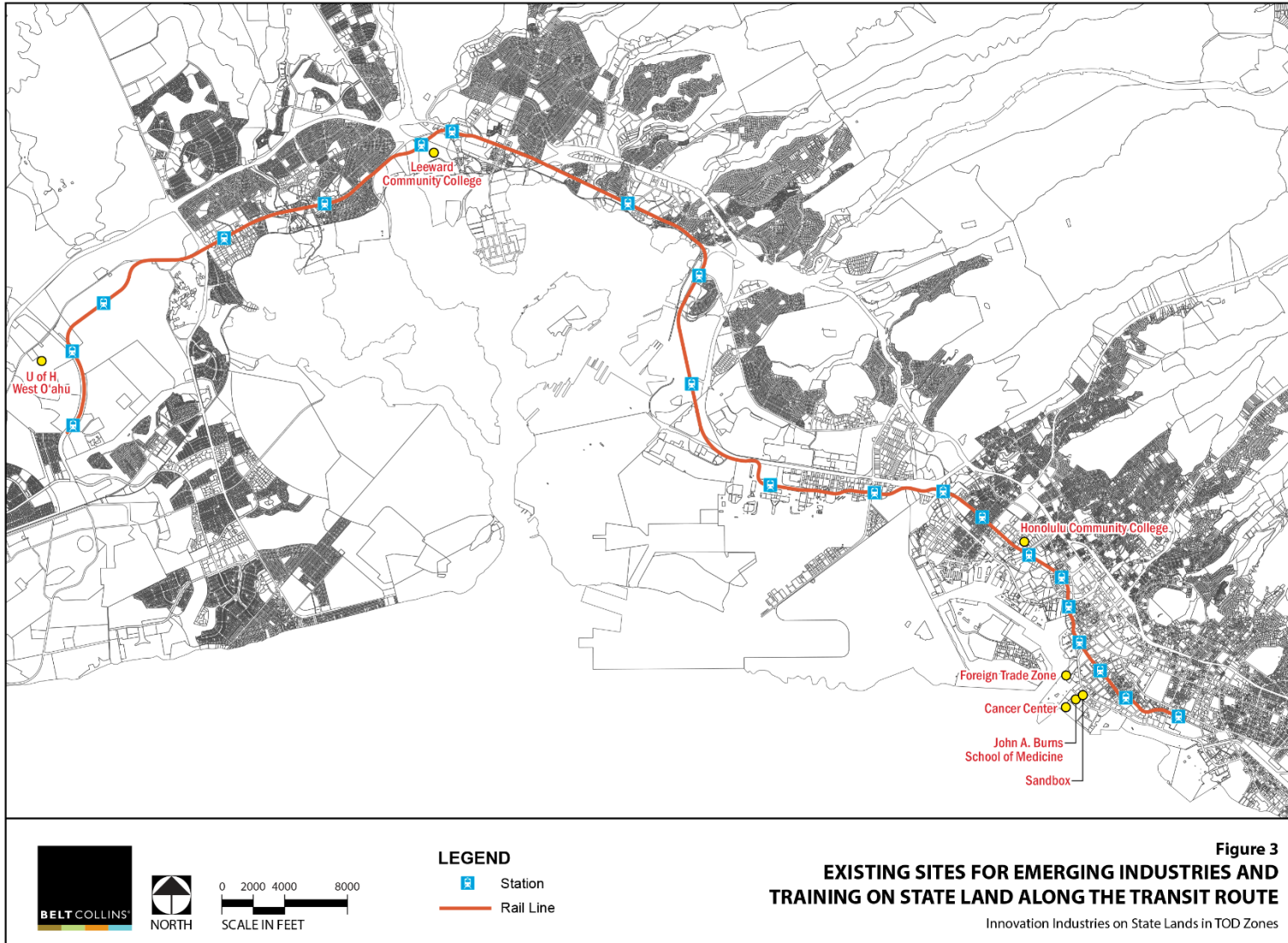
2 THE INTERAGENCY TOD COUNCIL

2.1 Mission

The State administration and legislature conducted inquiries and studies into the State’s role in TOD development, leading to Act 130 of 2016, that formed the Council. Act 130, codified as HRS §226-63, tasks the Council to “Formulate and advise the governor on the implementation of a strategic plan to address transit-oriented development projects, including mixed use and affordable and rental housing projects, on State lands in each county.” The Council is further to “Recommend policy, regulatory, and statutory changes, and identify resource strategies for the successful execution of the strategic plan.” The Council issued a Strategic Plan with its Annual Report to the Legislature in December 2017.







2.2 Membership

The Council brings together 25 representatives from state, county and the public to serve as an advisory body to coordinate and facilitate State agency TOD and facilitate consultation and collaboration between State agency and development communities. It is staffed by the OP and the Hawai'i Housing Finance and Development Corporation (HHFDC).

2.3 Current Directions

The Council issued a *Strategic Plan* and its *Annual Report* to the Hawai'i State Legislature in December 2017.⁷ The Council has formed Permitted Investigation Groups to coordinate and advance project-level and regional-level work in each county to support the implementation of TOD and TRD statewide in the specific areas, including East Kapolei, Hālawā-Stadium, and Iwilei-Kapālama. Additional groups deal with TOD on other islands. Their work goes beyond the limits of the current study.

A separate project involves a contracted team led by PBR Hawai'i and Associates, Inc. (PBR) to produce a State TOD Plan for project implementation and investment on State lands along the rail, particularly for projects that are beyond the scope and resources of any individual State agency to provide. In building off work that has already been done, development of the plan will require extensive coordination and collaboration with State and City agencies, as well as other stakeholders in each priority area.

3. STATE LANDS ALONG THE HONOLULU AREA RAPID TRANSIT LINE

3.1 Approach

OP directed BCH to provide detailed information about future Innovation Industries projects and facilities in the TOD zones.⁸ BCH interviewed State landowners and developers for potential sites. It became clear that a few sites were in the pipeline, while Innovative Industries development of other sites and proposed later phases was at best conceptual. For those concepts, project sizes, footprints, and infrastructure demand could not be specified at this time.

⁷ Posted at https://planning.hawaii.gov/wp-content/uploads/State-TOD-Strategic-Plan_December-2017.pdf and <https://planning.hawaii.gov/wp-content/uploads/2017-TOD-Council-Annual-Report.pdf>

⁸ Contract for PS-05-17-01-OP executed on March 12, 2018. Contract tasks included: CONTRACTOR shall describe, identify and map potential sites and facilities/projects for development which support targeted cluster industry businesses (i.e. incubators, training facilities, offices) on state land near rail stations to support emerging industries. The intent is that these sites and projects will be incorporated into the State TOD Plans which are being developed. Descriptions of the proposed facilities/projects shall, to the extent feasible, include the purpose, users, and benefits of the projects.

Maps or graphics showing the potential sites shall be site maps which show the footprint of the facility, the tax map parcel, roads and other geographic identifying features to facilitate identification of the location of the site and project.

The next sub-sections describe projects that are well under way. Other, conceptual projects are noted in the account of State lands by TOD zone in the rest of this chapter. Infrastructure challenges for those future projects are identified for each zone.

3.1.1 Pipeline Projects in East Kapolei

The University of Hawai'i West O'ahu was located on a larger land base in Kapolei in 2002. The large campus was seen as including space for UHWO (which moved to the site in 2012), expansion areas, and lands for private-sector development that would support the university. Currently, UHWO serves approximately 3,000 students. Figure 4 shows the university lands. The existing campus is on Tax Map Key (TMK) 9-1-016:220. The surrounding parcels are designated for State or private sector development. (The location of future development could change from the sites listed.)

UHWO offers a B.A. in Creative Media. A design-build contract for a new creative media building has been awarded. Figure 5 shows the design. The building is to support student productions as well as teaching; Chancellor Benham emphasized that "The Creative Media Building will be the center of our campus and system efforts to push the boundaries of advanced media/technology production in unprecedented and entrepreneurial ways"⁹ The building is to be designed for 24-hour use, and will include:

- A sound stage;
- A 100-seat screening room;
- Editing suites;
- Sound mixing suites;
- Three computer labs; and
- A café.

⁹ UH press release, June 6, 2018 posted at <http://www.hawaiiensnow.com/story/38367738/uh-west-oahu-awards-33m-contract-for-construction-of-new-creative-media-building>

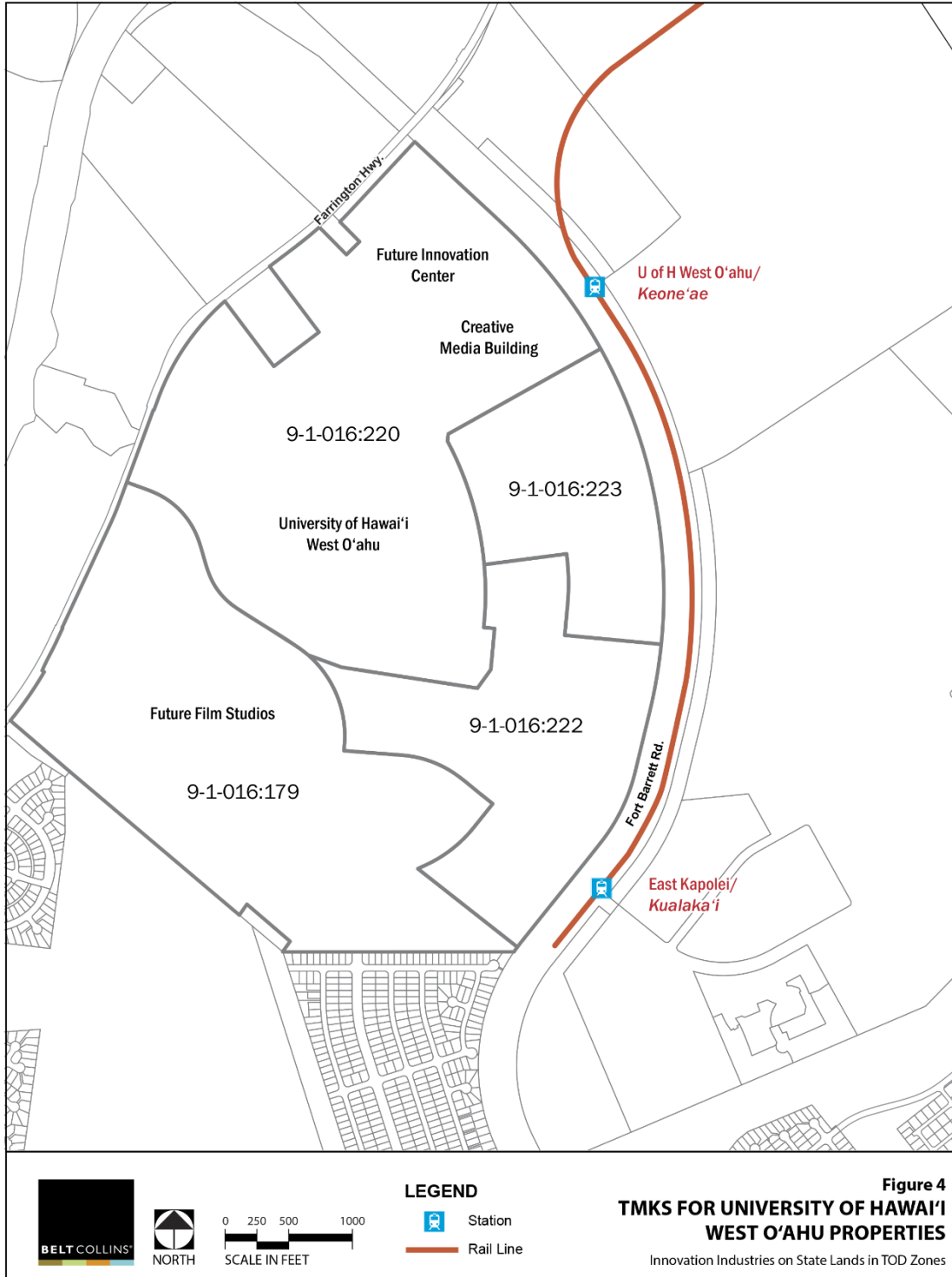


Figure 5: Design for Creative Media Building UHWO



SOURCE: UH press release, June 6, 2018 posted at <http://www.hawaiinewsnow.com/story/38367738/uh-west-oahu-awards-33m-contract-for-construction-of-new-creative-media-building>

The Creative Media building has been included in the UHWO infrastructure plans, and will not need new infrastructure when it opens in 2020. It is easily accessible along with the rest of UHWO, off Farrington Highway. It will be within the TOD zone for the Keone'ae Station.

3.1.2 Pipeline Projects in Kaka'ako

Kaka'ako is home to a pipeline project and an existing site that already supports Innovative Industries. Figure 6 shows the locations of the HTDC's "Entrepreneur's Sandbox" project (TMK 2-1-015:052) and the Homer Maxey Center at Foreign Trade Zone No. 9. (TMK 2-1-015:030).

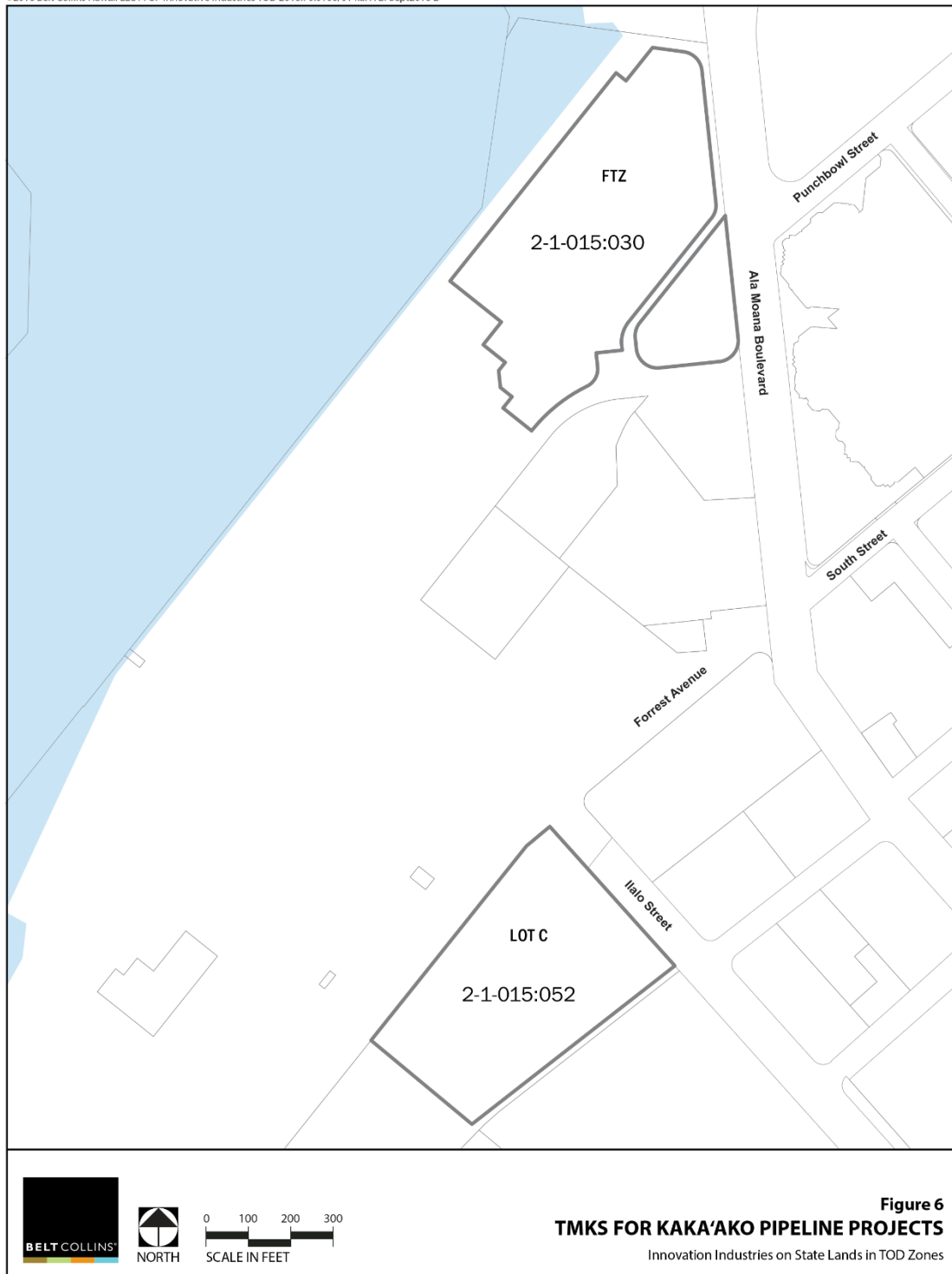


Figure 6
TMKS FOR KAKA'AKO PIPELINE PROJECTS
Innovation Industries on State Lands in TOD Zones

A 13,500 square foot facility, the “Entrepreneur’s Sandbox,” is under construction near the corner of Ilalo and Keawe streets. Infrastructure for the facility has been developed by HCDA. The Sandbox will be open to the public. It will include a Maker Space, a Digital Media and Production Studio, and space that can be used for larger meetings. The Sandbox will also feature a videoconference room and office space for rent. The facility is to open in mid-2019.

The Entrepreneur’s Sandbox has been proposed as the first stage of a multiphase development of a 5.55-acre lot owned by HCDA. Development plans covered a total of more than 300,000 square feet of space plus 600 to 900 parking stalls¹⁰. The project as conceived in 2015 appears to no longer be considered feasible due to construction costs.¹¹ A smaller version could include a mix of offices, commercial and residential space, but its size, components, and time table are all uncertain at this time.

The rest of the TMK has been used for parking, so vehicle access and parking for the Sandbox are sufficient. Parking will be of concern for later phases of the development.

The headquarters of Foreign Trade Zone (FTZ) No. 9 includes both warehouse and office space at Honolulu Harbor’s Pier 2. As a federally-recognized State Agency, the Foreign Trade Zone’s mission includes support for a wide range of international trade activities. It provides office space for maritime commerce, such as shipping agencies. The Homer Maxey International Trade Center expands the office space of the FTZ and includes conference and training space along with facilities for high-volume, secure Internet transmission. It is able to function as the Honolulu center for private-sector creative media ventures.

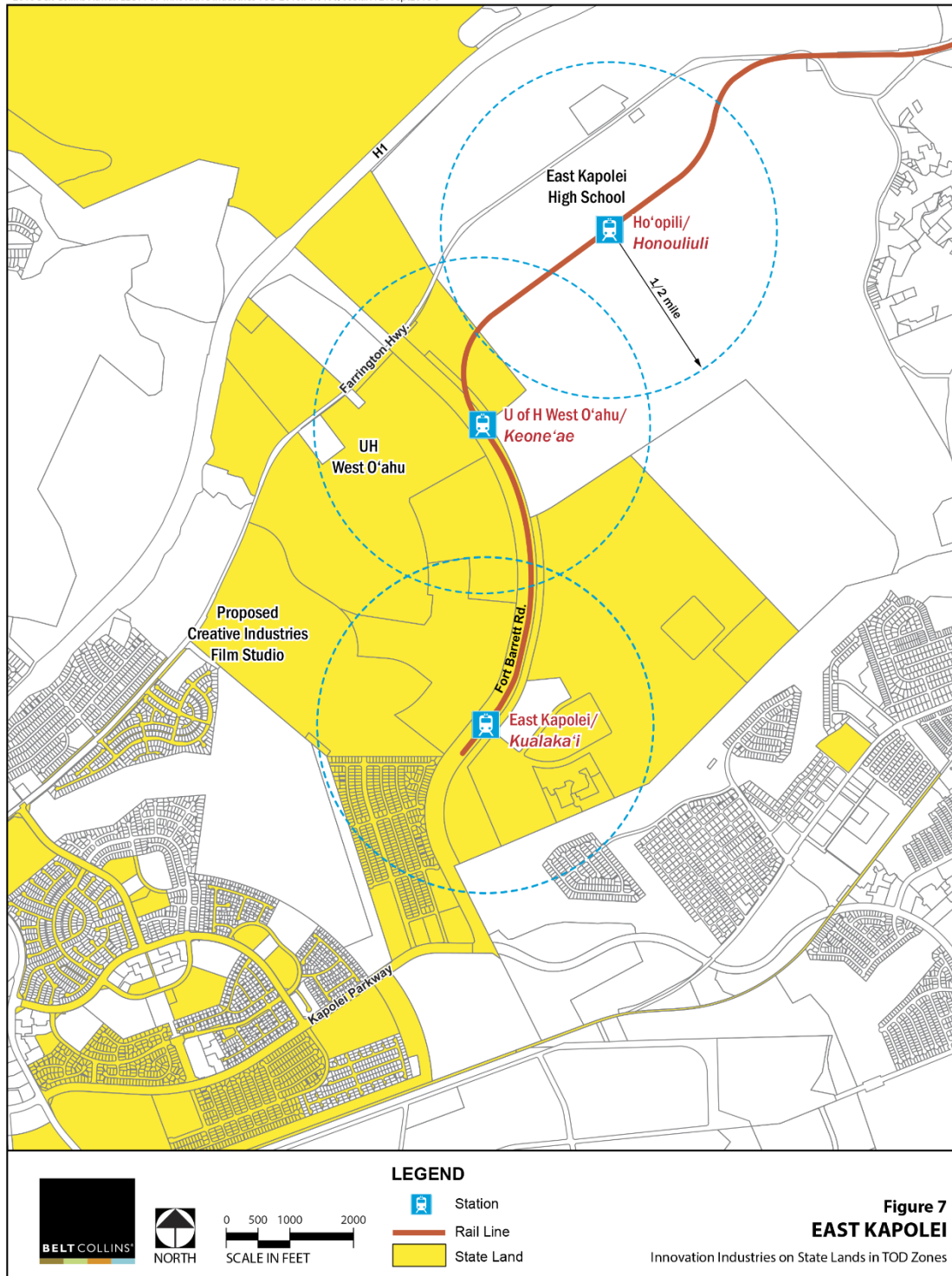
Both of these projects are important steps in the creation of a vibrant Innovation District. The Sandbox is the first phase of what could become a focus for new ventures and a site for collaboration with nearby researchers. The FTZ is providing space for creative media and is seeking ways to support new information technology in Hawai‘i.

3.2 East Kapolei Neighborhood

The East Kapolei neighborhood is located on the leeward side of O‘ahu. It extends along Kualaka‘i Parkway. Until the last decade, development in the region has mainly occurred along the Fort Weaver Road corridor and in Kapolei. The TOD neighborhood consists mainly of undeveloped land with large land holdings by the UHWO, the Department of Hawaiian Home Lands (DHHL), the Department of Land and Natural Resources (DLNR), and D.R. Horton Hawai‘i (Horton), shown in Figure 7.

¹⁰ HCDA “Collaborative Project with the Hawai‘i Strategic Development Corporation: Information Briefing May 27, 2015.” Posted at http://dbedt.hawaii.gov/hcda/files/2015/05/BusinessIncubator_052215.pdf

¹¹ Interview with HCDA, D. Neupane and C. Schultz, June 2018.



3.2.1 Stations and State Lands

The Kualaka'i Station (East Kapolei) is the beginning of the transit line. It is near the Kroc Center, a recreational facility for the region, and State lands owned by DHHL and UHWO. The second station is the Keoneae Station; UHWO, DHHL, and, the DLNR own land near this stop. The third station is the Honouliuli Station in Horton's Ho'opili residential development.

3.2.2 Plans

The Kapolei Regional Plan is DHHL's framework for regional strategic planning of this area.¹² DHHL has two development areas, Kānehili East Kapolei I and East Kapolei II, near the Kualaka'i Station. Kānehili East Kapolei I has a mix of land uses, including single-family residences and is almost complete. The Kauluokahai development is situated half a mile from the Kualaka'i Station. It is a master planned community on 404 acres. It is to include approximately 1,000 single family residential lots and 1,000 multi-family residential units which will be developed by DHHL for Hawaiian beneficiaries as well as affordable rentals developed by HHFDC. In anticipation of future student enrollment, the Department of Education (DOE) will build a middle school and an elementary school within this master-planned community.

UHWO owns 500 acres of land abutting the Kualaka'i and Keoneae stations. The State's TOD Strategic Plan shows approximately 180 acres of this land as the University District. The UHWO Long Range Development Plan (LRDP) update outlines the development strategy for the 500-acre property. UHWO designates its University Village to be an area within the designated University District next to the Keoneae Station. The LRDP, "capitalizes on the synergy between the University and the surrounding community by proposing land uses that are aimed at complementing and enhancing the presence of the University."¹³

DLNR has four parcels of land close to the Keoneae Station and wants to use the lands as a long-term source of income for the department. The 36-acre parcel adjacent to the Keoneae Station is identified as having high development potential; 10-acres of this parcel will be a park-and-ride facility.

At the Honouliuli Station is the northern portion of Horton's Ho'opili master-planned community. The total Ho'opili project will provide over 11,500 housing units in approximately 20 years. Current plans are to build a mixed-use community near the rail station. The DOE will build the East Kapolei High School at Ho'opili with an opening date currently estimated as 2023.

¹² November 2010. Posted at <http://dhhl.hawaii.gov/po/regional-plans/oahu-regional-plans/>

¹³ University of Hawai'i West O'ahu Long Range Development Plan 2006 (LRDP); an update process is still ongoing.

3.2.3 Opportunities and Constraints

An opportunity arises for clustered development in East Kapolei since UHWO is designing a new Creative Media Center and will work closely with private sector partners to build an “Innovation Center” on State land nearby. On the other side of Kualaka’i Parkway, DHHL plans to support a business incubator for Native Hawaiians next to the Kualaka’i Station. Depending on the interests of nearby residents, this incubator could be aligned with UHWO efforts in creative media and/or support other small business activities, e.g. with a commercial kitchen. Also, a location for a film studio complex has been identified on UHWO land. While the complex would support jobs of many kinds, as conceived it would be behind fences and accessible only by Farrington Highway, outside the TOD zones.

The State *Strategic Plan for Transit-Oriented Development* acknowledges a lack of sufficient infrastructure as the most commonly cited barrier at TOD locations.¹⁴ Area drainage issues have been addressed in collaborative discussions among the major landowners. UHWO has planned and developed infrastructure for its campus buildings. Water and sewer facilities will be needed for lands slated for private sector development. The Campus Plan shows mixed-use and residential development across from Kualaka’i Station.¹⁵ At the Keoneae Station, the Campus Plan shows a university mixed-use development¹⁶. At this second stop, the UHWO also plans an “innovation center” which could include a student co-working space and a professional development school.¹⁷ The nearby on-campus Creative Media building is also seen as an area for student gathering and co-working.

The DLNR will be working with the OP in preparing a strategic master plan for DLNR land owned within the area of the East Kapolei stations. Noted constraints for development by the DLNR are infrastructure and the natural environment; the Kalo’i Gulch is located within two of its parcels. DLNR is working with HHFDC to build affordable housing on DLNR land.¹⁸ A land exchange with Horton is a possibility on the DLNR parcel abutting the rail at the Keoneae Station; the constraint is the lengthy land exchange process for DLNR.¹⁹

Horton is moving ahead with construction of homes in the Ho’opili development. They expect to build and sell approximately 500 homes a year and will develop phases along Kualaka’i Parkway and near the Ho’opili Station first. For private development, current

¹⁴ Hawai’i Interagency Council for Transit-Oriented Development. *State of Hawai’i Strategic Plan for Transit-Oriented Development*. Prepared by Office of Planning and Hawai’i Housing Finance and Development Corporation. Posted at https://planning.hawaii.gov/wp-content/uploads/State-TOD-Strategic-Plan_December-2017.pdf. December 2017

¹⁵ From the UHWO LRDP 2006

¹⁶ *ibid*

¹⁷ From the 6/20 UHWO interview with K. Ishida and B. Arakawa.

¹⁸ 6/7/2018 DLNR Interview with R. Tsuji and I. Hirokawa.

¹⁹ *ibid*

constraints are the need to develop infrastructure and uncertainty about the details of TOD overlay zoning.²⁰

3.2.4 Next Steps in Developing Innovation Industries

Development of the Center for Creative Media and various programs at UHWO that train technical staff for new industries will be important for Innovation Industries in the region. These programs are currently being planned by UHWO.

UHWO officials were not ready to share details of their updated long-range planning but noted that a recent infrastructure development was master planned to support the campus facilities. Private facilities on State land would need to develop their own connections to the primary water, sewer and electrical systems in the area. The master planning work on East Kapolei for the Council will clarify issues of infrastructure and financing.

Access to the East Kapolei station areas is provided by the H-1 Freeway, Kualaka'i Parkway, and Farrington Highway. The UHWO campus is reached by way of Farrington Highway, and extensive surface parking has been provided.

Next steps include planning for the Center for Creative Media, along with the Council's analysis of infrastructure finance for the East Kapolei area as a whole.

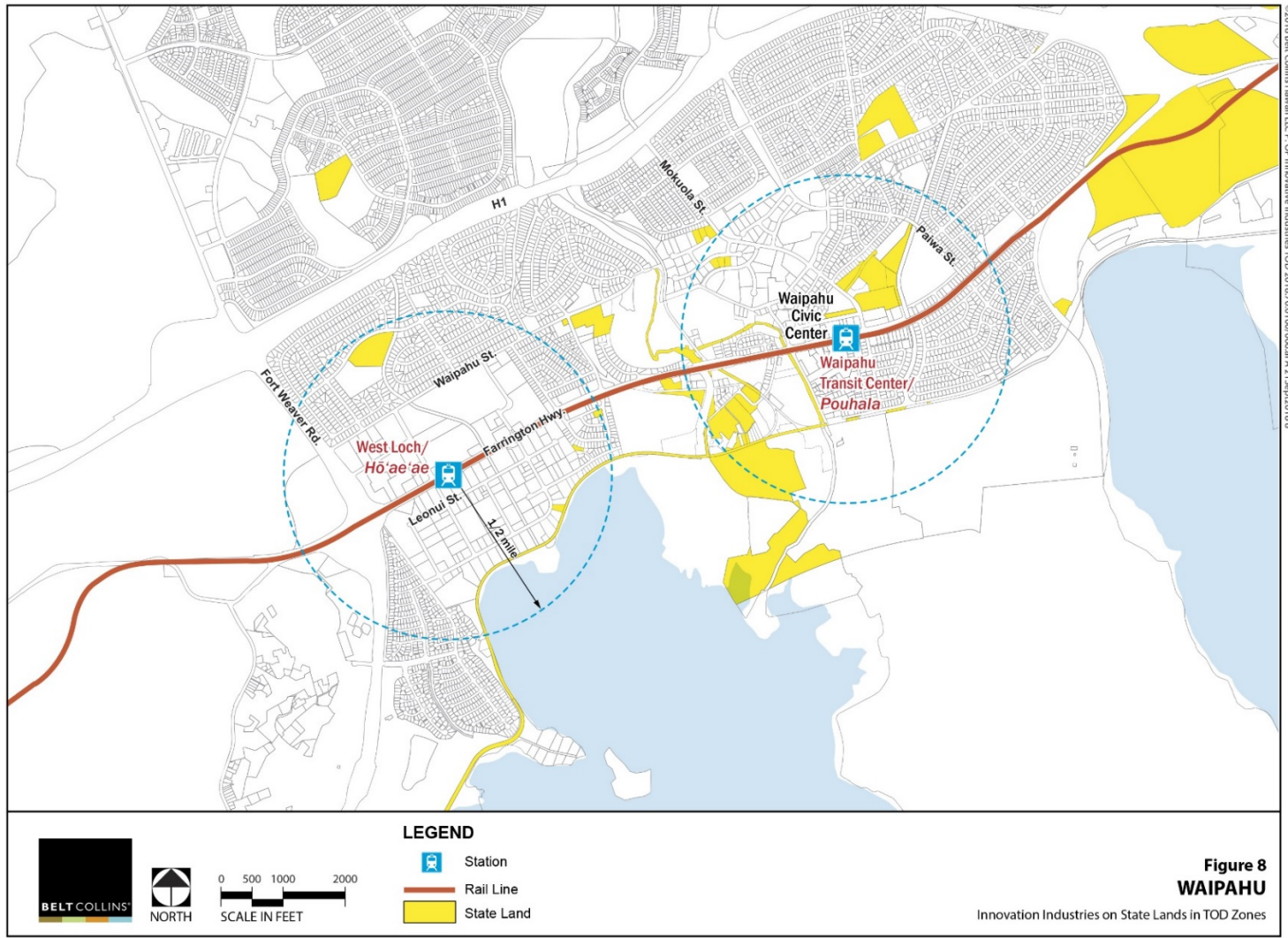
As a greenfield area, the East Kapolei corridor does not yet have the vibrant community and culture of an Innovation District. However, the combination of a growing university with concentrations supporting professionals and technicians in creative and information technology, a proposed innovation center to be developed by private sector partners, the planned film studio, recreational facilities nearby at the Kroc Center, and for food and entertainment offerings at Ka Makana Ali'i, and in Kapolei offer promise that such a district could evolve within the East Kapolei TOD zone in the next decades.

3.3 Waipahu Neighborhood

3.3.1 Stations and State Lands

Waipahu has two stations. However, there is little State land in the TOD zones around the Hō'ae'ae (West Loch) and Pouhala (Waipahu) stations. See Figure 8 **Error! Reference source not found.** At this time, the State-owned sites mauka of the Waipahu Transit Center on Hikimoe Street are dedicated to housing and office use.

²⁰ The City and County of Honolulu has developed design guidelines for TOD districts. For the two Waipahu stations, the proposed design guidelines were incorporated into zoning regulations by the City Council in 2017. Similar special district maps have been proposed for the three Pearl City/'Aiea stations. For the TOD districts in general, the administration has issued TOD Special District Guidelines, posted at <http://www.honolulu.gov/Portals/0/LandUsePermitsDivision/DRAFT%20TOD%20Guidelines%20April%202018.pdf>. Projects which follow those guidelines will presumably be allowed to proceed, subject to standard building permit reviews. Projects that do not follow the guidelines, within reason, may be covered under Special District permits, including Planned Development-Transit Permits. "The PD-T Permit provides opportunities for creative, catalytic redevelopment projects within the TOD Special District that would not be possible under a strict adherence to the development standards of the LUO."



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3.3.2 Plans

No opportunities for new Innovation Industry development on State lands have been identified near the Hō'ae'ae and Pouhala stations.

3.3.3 Opportunities and Constraints

The Rail development will provide opportunities for local business and private landowners in the TOD zones in Waipahu and will link up with bus lines serving all of Leeward O'ahu. Further development of land near the Pouhala Station is constrained by drainage. The area is a designated floodway, and regional drainage issues would need to be addressed before additional State investment occurs near the station.²¹ Land near the Hō'ae'ae station is outside the flood hazard district, and access via Fort Weaver Road and Kunia Road makes this site promising for future development. However, no State land is located in the area.

3.3.4 Next Steps in Developing Innovation Industries

No Innovation Industry development is proposed on State lands in this area.

3.4 'Aiea- Pearl City Neighborhood

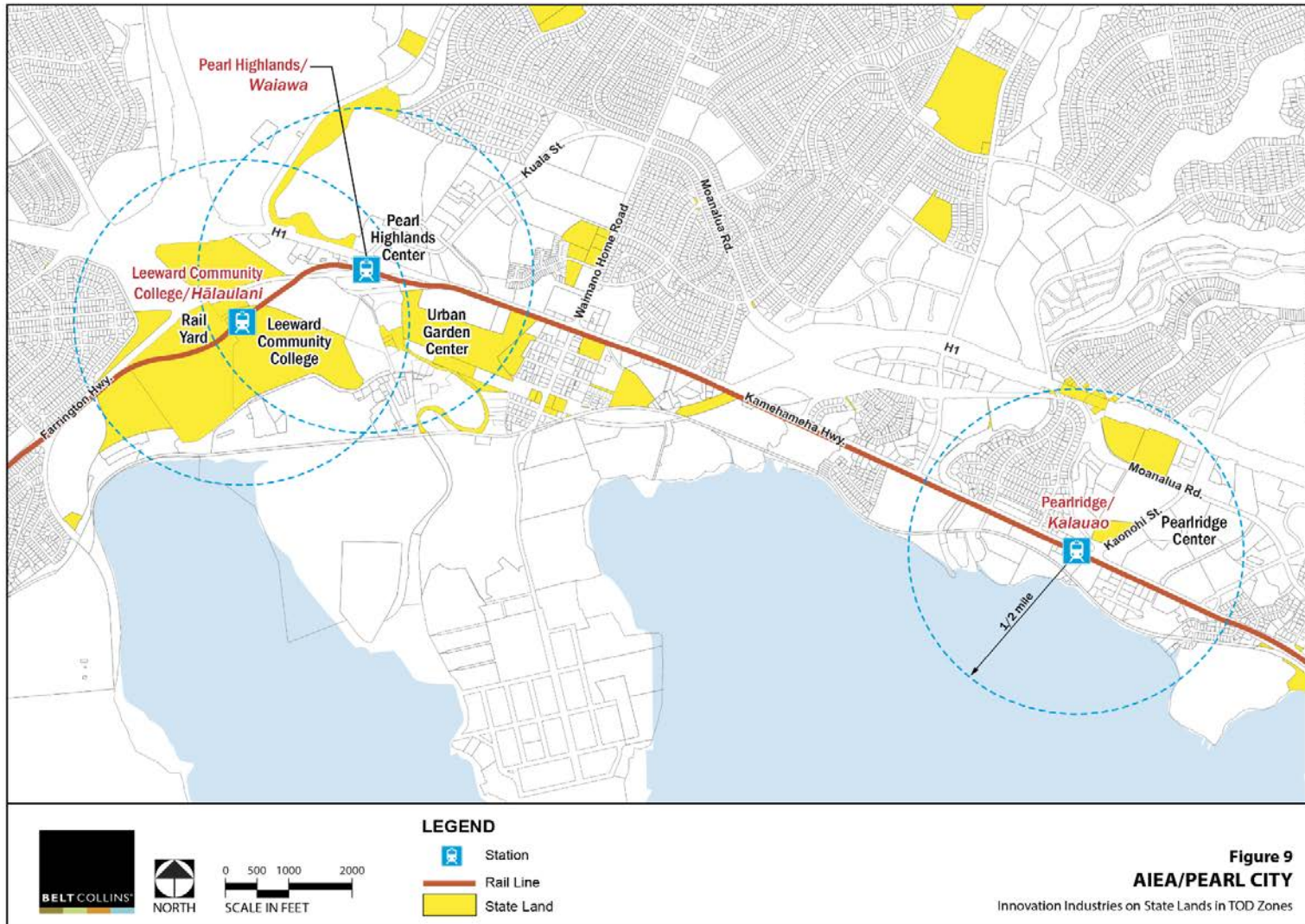
3.4.1 Stations and State Lands

The Hālaulani LCC Station abuts DHHL land that will be dedicated as a rail yard and LCC, which is a State property under the jurisdiction of the UH. The DHHL parcel will in time be exchanged with the City, so the site will no longer be State land. Some LCC facilities in modular buildings have already been relocated to make way for the station.

The Waiawa (Pearl Highlands) Station will be a connection point for public transit riders and will be served by numerous bus routes. A flyover link to the H-2 Freeway is planned. A 1,600-parking space park-and-ride will also be located at this stop. State-owned land at the Waiawa station is owned by the University of Hawai'i as the UH Urban Garden Center. The Urban Garden Center provides examples and instruction in gardening, covering both ornamentals and food crops that could be grown in the urban setting. It serves school groups as well as adult residents.

Kalauao Station (Pearlridge) is next to Pearlridge Center, a major shopping center. Little undeveloped State-owned land is nearby. shows the 'Aiea- Pearl City stations and State lands in the area.

²¹ The City plans to make improvements that would reduce flooding for the area around the Pouhala Station, according to City information in the Council's *Strategic Plan*.



3.4.2 Plans

LCC has developed long-range plans that recognize the rail system as an important adjunct to the campus.²² LCC staff have also developed curricula for training of technicians in manufacturing systems. These programs support skilled workers in technological jobs, including the rail system.

The College of Tropical Agriculture and Human Resources (CTAHR) views the Urban Garden Center as a successful site for its community outreach. CTAHR has no current plans for change at the site.

3.4.3 Opportunities and Constraints

The Hālaulani Station at LCC will serve students attending the community college and a few neighbors. LCC has limited access by Ala 'Ike Street, which must be reached by a bridge over the H-1 Freeway. A second access road to the campus from Waipi'o Point Access Road has long been planned but not funded.

New buildings planned for LCC will need drainage, water and sewer connections. New buildings are not needed for the technician training programs, so there are no infrastructure issues for development of innovation industry training at LCC. Absent any plan for innovative economic development on State land near the Hālaulani and Kalauao stations, no opportunities and constraints arise.

3.4.4 Next Steps in Developing Innovation Industries

The development of the HART Rail Operations Center will support jobs and advanced technical training. Demand for skilled technicians is already strong; it will grow with the development and operation of the rail yard. HART already has facilities built on the site to LEED™ Silver standards; the site is currently in use.²³

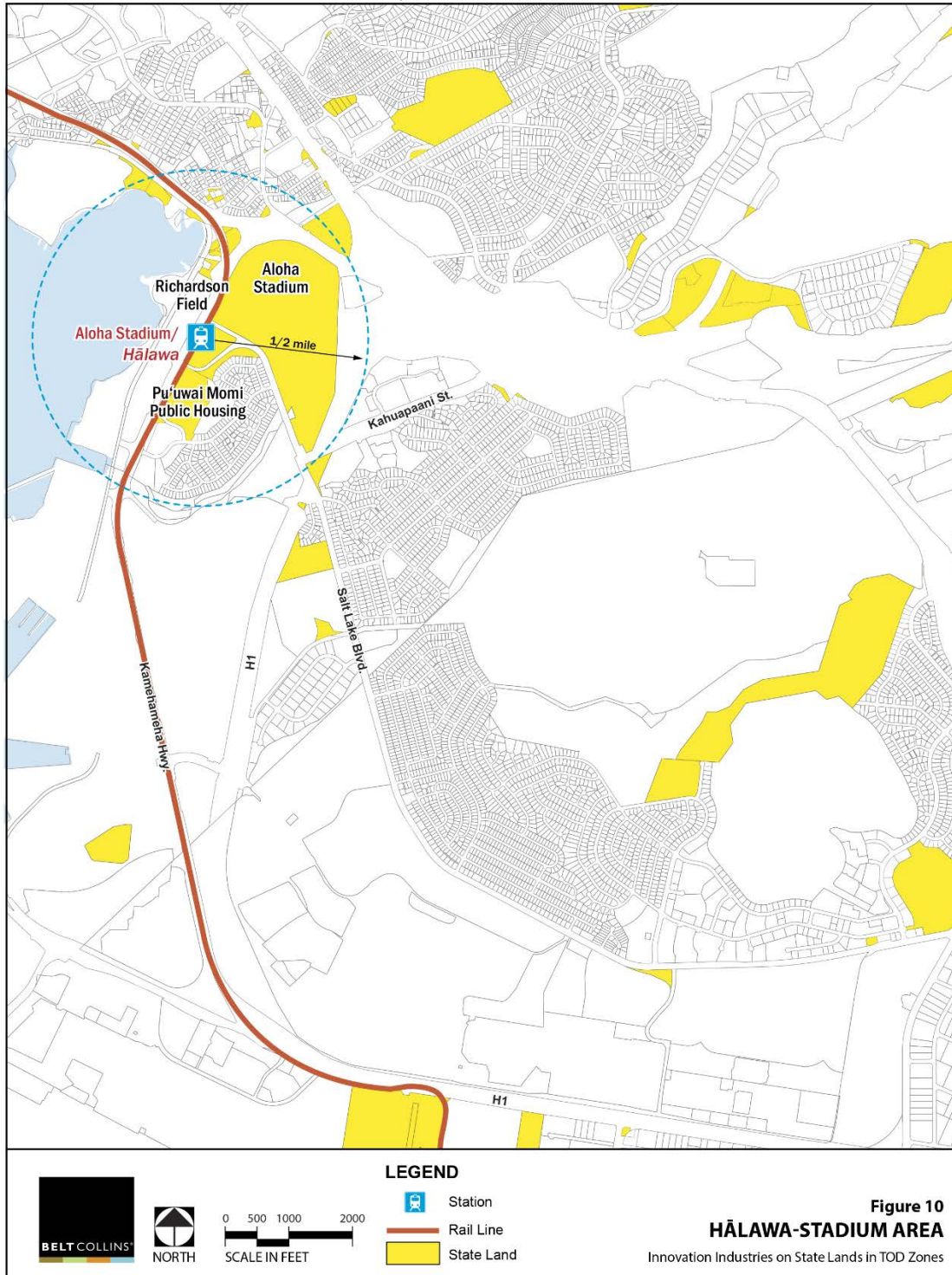
3.5 Hālawā-Stadium Area

3.5.1 Stations and State Lands

The Hālawā Station is the 9th station on the route and sits on State-owned land (See). It is approximately the midway point. Aloha Stadium is currently located 0.25 miles from the Hālawā Station; the 100 acres of surrounding land is owned by the State and operated by the Stadium Authority. Currently, one of the parking lots for the Stadium is adjacent to the rail station site. South of the station, along the guideway, is the Pu'uwai

²² The updated *Long Range Development Plan* for LCC was published in 2016, pending approval by the Board of Regents. It shows a long-term re-arrangement of campus facilities including consolidation of Science, Technology, Health, Engineering and Mathematics instruction. More immediately, a "Education and Innovation Instructional Facility" has been planned. This will address needs for teacher training and the social sciences but does not appear to deal with innovation industries. (See PBR Hawai'i. *Leeward Community College Education and Innovation Instructional Facility Final Environmental Assessment*, 2010, posted at http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2010-08-08-OA-FEA-Leeward-Comm-College.pdf.)

²³ Personal communication, Bill Brennan, Communications Director, Honolulu Authority for Rapid Transit, September 2018.



Momi housing area, owned by the Hawai'i Public Housing Authority (HPHA). Parts of 'Aiea Elementary School are within a half-mile of the Hālawā Station but separated from it by the H-1 Freeway and the Stadium, so it is effectively inaccessible to the station.

3.5.2 Plans

Discussions of the need for redevelopment of Aloha Stadium have led to plans for a smaller stadium, with mixed-use development nearby. *The Hālawā Area Transit-Oriented Plan* outlines plans for the 100-acre stadium site, including 'Aiea Elementary and the Pu'uwai Momi housing complex. Additionally, the master plan includes two privately owned lands, the Ice Palace and the Stadium Mall, near the Department of Accounting and General Services (DAGS)-owned land. A market analysis justified 5.2 million square feet of potential new development consisting of a mixture of residential, commercial, office, sports, medical, sports entertainment, and cultural uses on the 100-acres of land that currently houses Aloha Stadium and parking lot.²⁴ As it stands today, the size and 50,000 seating capacity of Aloha Stadium is too large for its target events. Additionally, it lacks modern stadium amenities such as private suites and premium seating; it also suffers from deferred maintenance. The \$423 million cost to renovate and tend to the deferred maintenance is more than to build a new stadium, at an estimated \$324 million.²⁵ A new stadium will provide all the amenities today's stadiums have as well as operate more efficiently and cost effectively.

Currently, Aloha Stadium hosts about 300 events per year that include UH games, the Sheraton Hawai'i Bowl, and smaller events such as high school football games and graduations.²⁶ The proposed stadium would have a seating capacity between 30,000 to 40,000. Not only will the smaller size better accommodate the events that Aloha Stadium currently hosts, it could also attract larger crowds and attract other events such as Major League Soccer games, international exhibition soccer games, and major outdoor music events.²⁷ The existing stadium will not be demolished until the new stadium is completely constructed.

The Stadium Authority participated in the TOD plan, and seems to support the proposed redevelopment. It plans to issue a request for proposals for design and construction of the new stadium shortly.²⁸

TOD also offers opportunities for the Pu'uwai Momi Public Housing site. HPHA proposes redevelopment of its site with mixed-income and mixed-use amenities. The number of housing units could climb from 260 to 1,000 units.

²⁴ Hālawā Area Transit-Oriented Development (TOD) Plan, Draft Final Plan, July 2017, posted at <http://www.honolulu.gov/tod/neighborhood-tod-plans/dpp-tod-halawa.html>

²⁵ Aloha Stadium Conceptual Redevelopment Report, April 5, 2017

²⁶ Keyser Marston Associates. Market Opportunities Study, Aloha Stadium Station Area. May 2015

²⁷ *ibid*

²⁸ Personal communication, Charles Vitale, Stadium Authority Engineer, June 2018.

3.5.3 Opportunities and Constraints

Transit will make the stadium more convenient and reduce the need for large surface parking areas. Redevelopment of the stadium and new development nearby will demand significant investment in infrastructure and utilities. As of 2016, the cost of new infrastructure was estimated as \$495 million to \$675 million. The actual cost and phasing of infrastructure needs will be examined in more detail by the PBR consultant team working with the Council, and by the developer hired by the Stadium Authority.

The stadium land was acquired by the State from the Navy for use as a stadium. The State and the Navy have reviewed the terms of the acquisition so that mixed-use redevelopment will not be in conflict with the deed.

3.5.4 Next Steps in Developing Innovation Industries

The Stadium Authority will soon issue a Request for Proposals for master-planning and development of the new stadium. Stakeholders note that the mixed-use space near the new stadium could support other entertainment venues or contractors working for the military at the nearby Joint Base Pearl Harbor Hickam (JBPHH). The master planning work on the Hālawā-Stadium area for the Council will clarify issues of infrastructure and financing.

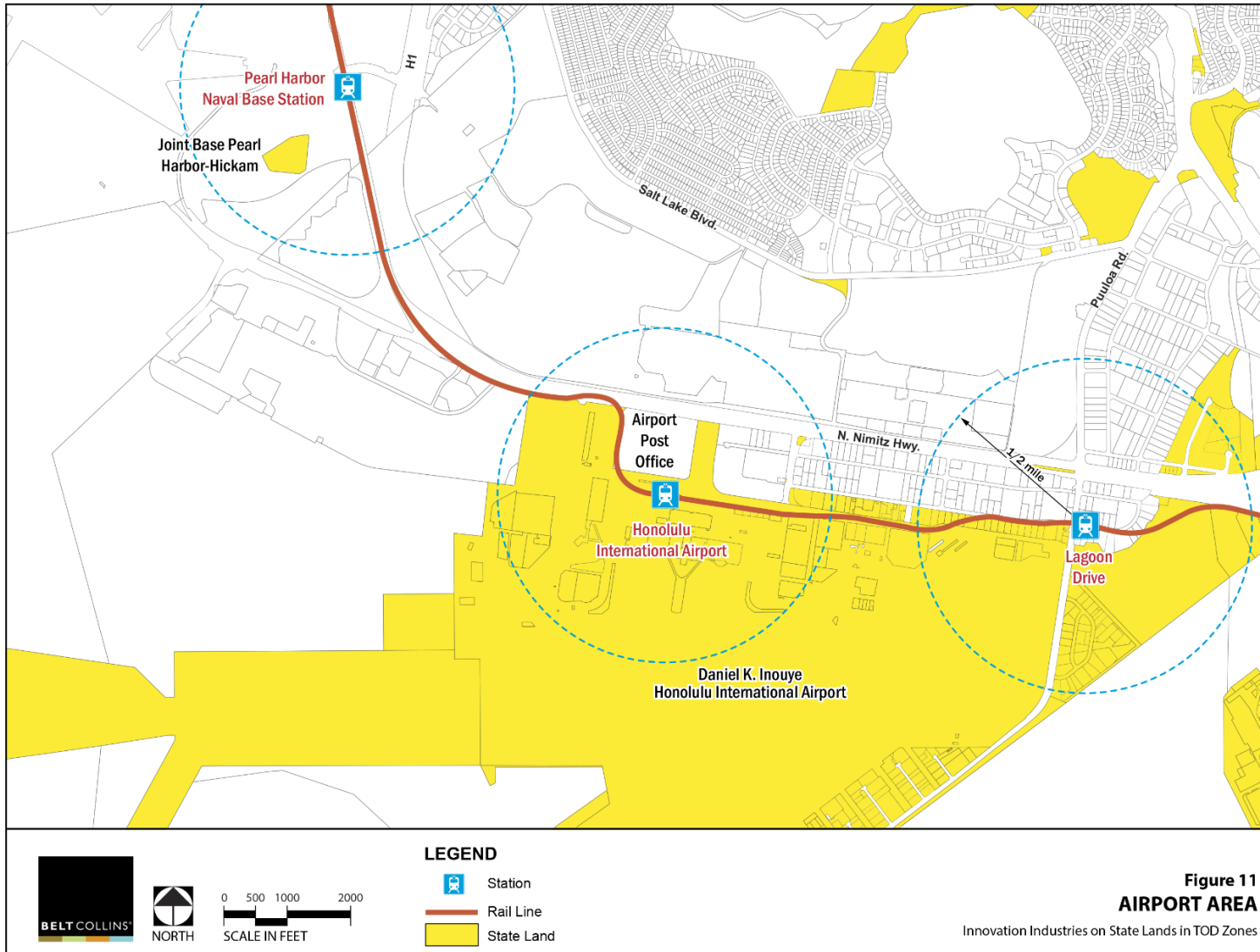
3.6 Airport Area

3.6.1 Stations and State Lands

Three stations are in this area: Pearl Harbor Naval Base Station, the Honolulu International Airport Station, and the Lagoon Drive Station. The first provides a point of access to O'ahu's major site for manufacturing employment, at the shipyard in JBPPH. The Airport Station serves employees working at Daniel K. Inouye International Airport (also known as Honolulu International Airport [HIA]) and makes air travel accessible by rail for residents and visitors along the rail route. Lagoon Drive serves businesses near the airport as well as general aviation within the airport.

Most of the land near these stations is either federal or State property. (See Figure 2.) HIA has been extensively developed to serve current and anticipated aviation needs. Hickam Air Field within JBPPH adjoins HIA and shares use of some of its facilities.

The business district next to the airport includes a mix of light industrial uses including data centers. Part of the area is now used for large automobile dealership lots, so eventual redevelopment for denser commercial or industrial uses is possible.



At JBPHH, HTDC has been involved in developing renewable energy microgrids that will test energy storage systems. Energy independence is a major objective for the armed services, so renewed investment and employment in energy projects can be anticipated on and near major military bases in the years to come.

3.6.2 Plans

The State of Hawai'i Department of Transportation developed its Airports Modernization Plan in 2008. Current work at HIA under the plan includes construction of a new concourse and a five-story consolidated rental car facility. It also allocates space for the construction of the Airport Transit Station.²⁹

These plans do not explicitly point to TOD-related development of State lands beyond allowing access to the Airport station to and from the airport concourses.

3.6.3 Opportunities and Constraints

JBPHH and HIA are major employment sites. U.S. Navy planning has taken TOD into account by anticipating need for bus and bicycle routes on base for workers and sailors traveling by rail.

3.6.4 Next Steps in Developing Innovation Industries on State Lands

Innovation Industries will likely continue to increase on private land near the airport and on federal sites, depending on market and military demand. One HTDC project, involving energy generation and storage, has been planned for Hickam Air Field; it could be expanded on site, given the military's support for sustainable energy projects, and be replicated elsewhere.

3.7 Kalihi Neighborhood and Iwilei-Kapālama Priority Area

3.7.1 Stations and State Lands

The Kalihi-Pālama area has long been a working-class district with a mix of commercial and industrial establishments towards the harbor. Four stations are in this area: Middle Street Transit Center, Kalihi, Kapālama, and Iwilei. (See Figure 12.)

State lands located near these stations include parts of Honolulu Harbor, Ke'ehi Lagoon Park, and Honolulu Community College (HCC). The O'ahu Community Correctional Center (OCCC), which is planned to be relocated to the Animal Quarantine Station site in Hālawā, is between the Middle Street and Kalihi Stations. The Iwilei station will serve residents of the Mayor Wright Housing redevelopment area as well as the existing homes in the area.

²⁹ On the Airports Modernization Plan, see <http://www.hawaiiairportsmodernization.com/3/what-were-doing-now>. For TOD planning, see the public review draft developed for the City and County in 2017, AECOM Technical Services, Inc. http://www.honolulu.gov/rep/site/dpptom/airport_docs/Airport_TOD_Plan_Public_Review_Draft_3-17.pdf.



3.7.2 Plans

The State Department of Transportation Harbors Division is working on a 2050 Master Plan, which could result in new projects as soon as 2023.³⁰ The major harbor project currently being designed is the Kapālama Container Terminal. This terminal will provide modern facilities and the additional container handling capacity needed to meet demand for the next decades.

Governor Ige recently announced that the State Department of Public Safety will be moving the aged, crowded facility at OCCC to a 25-acre site in Hālawā valley.³¹ Following facility relocation, the currently occupied OCCC land will become a prime site for commercial redevelopment.

Ke‘ehi Lagoon Park is in active use and is at a low elevation relative to mean sea level. No plans for Innovation Industries development are being considered for these State lands.

HCC is reviewing its plans in light of TOD. Its long-range plan was finalized in 2011.³² Its programs train a variety of skilled workers, many of whom could support the expansion of innovation industries. Near the Kapālama station, Kamehameha Schools is considering redevelopment of some of its lands for multi-story industrial uses. These industries could be served by training programs at HCC.

3.7.3 Opportunities and Constraints

State lands in the area are largely occupied by aging facilities supported by aging infrastructure. At Kapālama Harbor, development of the new terminal has only been possible with relocation of other users. Limited sewer capacity will affect development in the area until problems of capacity and an aging system are solved. Whether these challenges will limit, or delay redevelopment of State lands will need to be assessed relative to specific projects.

3.7.4 Next Steps in Developing Innovation Industries

The City has recently completed a detailed infrastructure study for the Iwilei-Kapālama district. The master planning work on Iwilei/Kapālama for the Council will further clarify issues of infrastructure and financing. HCC and other State agencies did not identify near-term projects for Innovation Industries, but may do so as planning continues.

³⁰ Current plans are were discussed in recent presentations, posted at https://static1.squarespace.com/static/5a6f9300b1ffb62cf1932433/t/5b736ee0cd83660fe34e5c97/1534291680623/APPENDIX+11_MEETINGSIFT+REPORT.pdf

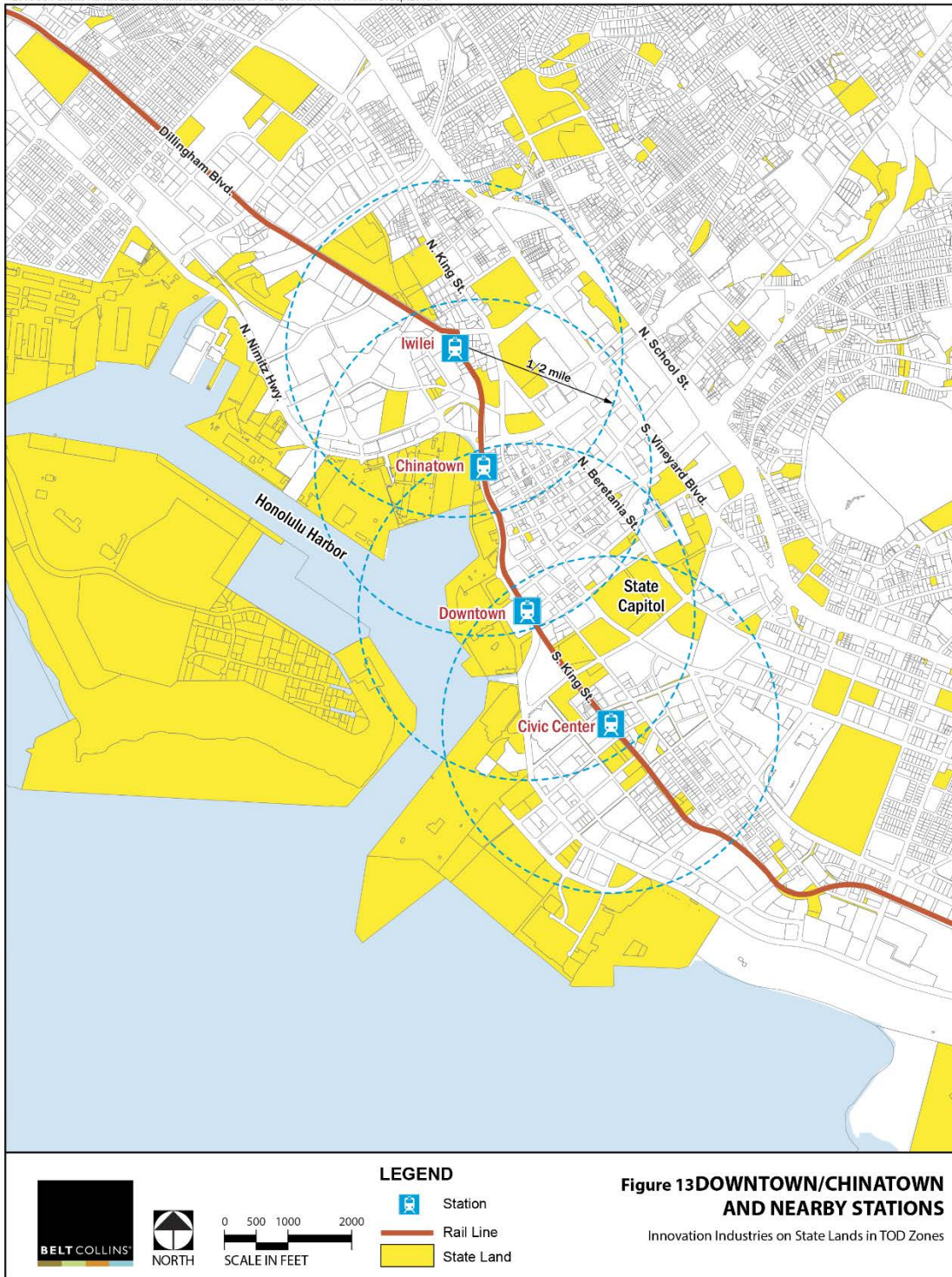
³¹ <http://www.hawaiinewsnow.com/story/38980938/its-official-state-plans-to-relocated-crowded-occc-to-halawa>

³² Helber Hastert & Fee, Planners, *Long Range Development Plan Update, Honolulu Community College*. 2011. Posted at <https://www.honolulu.hawaii.edu/sites/www2.honolulu.hawaii.edu/files/lrdp-2011-03.pdf>

3.8 Downtown/Chinatown Neighborhood

3.8.1 Stations and State Lands

The Chinatown and Downtown stations serve dense areas with high volumes of traffic by bus and automobile. State lands include harbor land dedicated to maritime activities and the Aloha Tower complex, which was redeveloped as a retail and entertainment area but is now also part of the Hawai'i Pacific University urban campus with student housing and classrooms. The State Capitol and other State offices are within reach of the Downtown station as well as the Civic Center station (shown in Figure 13).



Downtown Honolulu is the financial and commercial center of Hawai'i, and is home to accelerators and other agencies supporting innovation industries. Chinatown is one of the sites where incubators have been developed, since office space there is less expensive than in Downtown Honolulu.

3.8.2 Plans

No plans for Innovation Industries on State lands in this neighborhood have emerged.

3.8.3 Opportunities and Constraints

The density of existing development in this area and the limited availability of State land for new purposes constrain innovation industries in this area.

3.8.4 Next Steps in Developing Innovation Industries

None are anticipated.

3.9 Civic Center and Kaka'ako

3.9.1 Stations and State Lands

Stations are located near State land in the Civic Center and Kaka'ako areas, as shown in . Major State facilities already developed include the UH John A. Burns School of Medicine and Cancer Center. The FTZ has developed offices and training space for innovation industries as part of its mission of supporting import/export activity. HTDC has begun construction on the "Entrepreneurs' Sandbox," a facility planned to encourage and support innovators. Inland, Blaisdell Center is the City's major entertainment venue.

3.9.2 Plans

Kaka'ako has been identified as a major redevelopment area, with the HCDA responsible for planning, design criteria and management. HCDA has developed infrastructure for the Kaka'ako District. HCDA supports and regulates redevelopment initiatives by private developers in the district and has long focused on development of a pedestrian-oriented community.

The Sandbox is part of a long-planned effort to bring new industries to Hawai'i. A second phase of this project would provide space for HTDC and start-ups. Earlier plans proposed developing a biotech hub, with facilities on land owned by various State agencies and Kamehameha Schools and close collaboration with the Medical School. Those plans have not proved feasible.

On Kamehameha Schools land, new development has included residential projects priced for the local market and SALT, a commercial area with a variety of eating and drinking establishments. Support for local arts by Kamehameha Schools and HCDA has also contributed to the area's vibrant atmosphere.



3.9.3 Opportunities and Constraints

The steps taken to date make Kaka‘ako Honolulu’s center for innovation and cultural activity, but challenges remain. Regional infrastructure in the eastern portion of the Kaka‘ako Mauka is old, and roadways, water, drainage and sewer infrastructure are constrained by age and high demand. The City has been making sewer and water system improvements, while HCDA has been negotiating with private land owners on cost-sharing for other improvements.

Kaka‘ako Makai, where the Cancer Center, medical school and Sandbox are located, is on fill land; further inland, the Kaka‘ako area is still low-lying, and is more likely than the seaward area to be affected by sea level rise.³³

Innovation Districts on the U.S. Mainland (discussed in Section 4) tend to identify key anchor resources, leading to focused innovation activities in particular areas. Focused activities occur, for example, when biological and medical research stimulates related new product development. In Kaka‘ako, Hawai‘i’s leading medical research institutions have relocated, and these provide services to “the medical community.” Thus far, this focused activity has not led to commercial research facilities nearby, which could be because of the high cost of building Wet Laboratories, especially in Hawai‘i.

3.9.4 Next Steps in Developing Innovation Industries

Kaka‘ako has many of the elements of a successful Innovation District: research institutions, cultural activity, new affordable housing, and a vibrant mixed use center at the Kamehameha Schools’ SALT area. HCDA has encouraged these components and has demanded that additional industrial space be part of the development of the Howard Hughes Corporation area east of Ward Avenue.

Development and use of the Sandbox facility by start-ups will be important in creating a successful Innovation District. The DOE plans to develop a “vertical school” – a multistory elementary school – in Kaka‘ako to serve the population in new residential projects. This project could stimulate new design for the school system in other urban areas of the State.

In addition to these near-term projects, it will be important to expand development at the State’s site around the Entrepreneur’s Sandbox and to encourage collaboration between the State’s facilities and tenants of private sector co-working spaces nearby. Successful development of start-ups will create new demands for space, both in the State projects and in the surrounding area.

³³ Much of Kaka‘ako, from Ilalo Street to Halekauwila Street, could be flooded if sea level rise of four feet or more occurs. See viewers such as the National Oceanic and Atmospheric Administration’s: <https://coast.noaa.gov/digitalcoast/tools/slr> for illustration. `

3.10 Ala Moana Neighborhood

3.10.1 Stations and State Lands

This last station on the line is not on State land. It is in reach of important civic facilities: Ala Moana Regional Park and the Hawai'i Convention Center. The station and the immediate area are on privately owned property which is already developed for commercial uses.

3.10.2 Plans

A master planning effort for Ala Moana Regional Park is in progress.³⁴ With transit in place, Park visitors will likely increase in number. No new initiatives for innovation industries are planned for the Park.

3.10.3 Opportunities and Constraints

The density of existing development in this area and the limited availability of State land for new purposes constrain innovation industries in this area.

3.10.4 Next Steps in Developing Innovation Industries

None are anticipated.

4. OPPORTUNITIES FOR INNOVATION NEAR TRANSIT STATIONS: LESSONS FROM THE U.S. MAINLAND

4.1 Introduction

Technological innovation occurs in many settings. The first Apple computers were designed and built in a garage. Lockheed Martin's Skunk Works has been a model for innovation within a corporate setting since World War II. A skunk works is typically a small team dedicated to a project with a clear objective, and little interference from management, other personnel, and other obligations.³⁵ These examples suggest that isolation may be a key to innovation.

In the mid-twentieth century, planners and developers championed suburban research parks and office parks. The Research Triangle in North Carolina is the major success story for research parks, as an area where academic and corporate research could thrive with support from local and federal agencies.

In recent years, many civic leaders and planners hoping to encourage economic development in their cities have sought to develop "Innovation Districts" where new ideas, ventures, collaboration and products can flourish, transforming the energy of young

³⁴ The Master Plan is described and assessed in the Draft Environmental Impact Statement published in 2018, posted at http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2018-07-08-OA-DEIS-Ala-Moana-Regional-Park-Improvements.pdf

³⁵ See for a summary Matthew E May, "The Rules of Successful Skunk Works Projects." *Fast Company*, October 9, 2012, posted at <https://www.fastcompany.com/3001702/rules-successful-skunk-works-projects>.

innovators into firms that will support technical and professional jobs. “Innovation Districts” vary greatly, depending on the urban environment, locally available resources, and the ambitions of their proponents.

Investment in research or leading-edge industries can attract similar firms, skilled personnel, and more capital. On a more modest scale, collaboration, enthusiasm and serendipity can lead to new products and have significant impact on the local economy.³⁶

4.2 Case Studies

Examples of urban Innovation Districts help to underline the potential of an urban form to support growth and the complex factors that, in different ways in different places, contribute to their success or stagnation. The Brookings Institute researchers have looked carefully at sites throughout the U.S. Mainland and have found critical success factors. However, the period in which urban Innovation Districts have been nurtured is short, and growth has been constrained by national and local economic trends after 2008.

The ideal case for comparison with Honolulu would be a large city developing new transit systems, with a commitment to innovation industries. Three clear cases emerged. Other cases discussed in this report provide indications of how planning for Innovation Districts can succeed or fail, and of the extent to which such districts must depend on transit.

Case studies discussed in this section are from Saint Louis, Denver, Fremont CA, Baltimore and Chattanooga. In the cases of Denver and Fremont, planning for transit and Innovation District development has occurred in tandem. In Saint Louis, the transit link supporting an Innovation District was long planned but slow to materialize. The other cases discussed, in Baltimore and Chattanooga illustrate the variety of approaches to planning for Innovation Districts.

All the cases deal with cities that have regional importance but have depended on industries that are stable or declining, and hence not a basis for long-term economic growth. Local stakeholders have championed Innovation Districts and seen transit as part of the resource base for new economic development. Table 1 shows some of the contrasts and similarities of these cases.

³⁶ See, for example, Lidia Gryszkiewicz & Nicolas Friederici. “How to Create an Innovation Hub.” Posted by J. Sweeney at <http://www.id8nation.com/how-to-create-an-innovation-hub/#sthash.VNOK4MNY.dpbs> and Mary Jo Watts, “Guidelines for Building an Innovation Hub.”(2013) Posted at www.fora.org/Reports/Colloq/Panel_2_MaryJoWaits_121213.pdf.



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Table 1: Characteristics of Selected Innovation Districts

	ST LOUIS	DENVER	FREMONT	BALTIMORE	CHATTANOOGA
Population	311,000	693,000	233,000	615,000	178,000
Socio-Economic Condition of City	Older regional center	Regional center	Indust town in Silicon Valley	Older city with decaying neighborhoods, industrial base	Smaller metro, has lost its industrial base
Major Assets	Universities, Hospitals	Smart City contracts	Industrial Space	Universities, Hospitals	"Gig" economy
Transit	Light rail, bus	Light rail, bus	BART, bus	Interurban rail, light and commuter rail, bus	Bus system and EV car-share and charging
District Size	200 ac.	382 ac.	879 ac.	East: 88 ac. ; West: 1,300 ac.	140 ac.
Founded	2002		2010	East: 2002; West: 2016	2015
City initiatives:					
TOD Plans		x			
Innov. District Plans	x		x		x
Infrastructure		x			x
Zoning			x		
Design Standards			x		
Other	Eminent domain, tax abatement powers to District	Extensive search for private sector partners	Marketing, search for corporate partners offering high wage jobs		City utility offers high-speed, high capacity Internet
Champions	Universities	City, airport, Panasonic	City	E: Johns Hopkins; W: City	Mayor
Targeted groups/industries:	Biomed	intelligent transportation systems	manufacturing, biomed devices	E: biomed; W: none yet	Users of fast internet
Challenge faced in redevelopment	Develop commercial value of research institutions	Opportunity for demonstration site for new technologies	Job loss	Poverty, inclusion	Competitive position, redevelopment
Success story	Jobs	Demonstration center	Tesla, new housing and industry	Redevelopment, housing, jobs	TBA

Champions point to data suggesting that Innovation Districts studied are generating economic development that is much greater than the investment needed to create these Districts. These claims seem valid but cannot be reduced to a single row in Table 1, since each case involves different types of investment, different indicators are cited from case to case, and the period involved ranges from five to twenty years.

Several cases were considered but set aside as difficult to compare directly with Hawai'i's challenges and opportunities. Philadelphia is often discussed in studies of Innovation Districts, but largely criticized because the city does not provide an integrative framework for linking and supporting initiatives by universities and private-sector developers.³⁷

San Francisco and Seattle are important sources for ideas about transit projects and TOD. These have involved successful redevelopment initiatives. Both Mission Bay in San Francisco and Seattle's South Lake Union area are examples of redevelopment of waterfront areas as research and technology centers. Honolulu lacks sites and venture capital comparable to the funding for these initiatives.

On a smaller scale, research was conducted on a proposed Innovation District in Riverside CA. This turned out to be in initial planning stages, and too young to provide lessons to Honolulu.

4.2.1 Saint Louis, MO

Saint Louis has long been a major regional center. It is served by highway, rail and air transportation. Its manufacturing base declined during the second half of the twentieth century, much as in other urban centers in the East and Midwest United States.

The Cortex district was established in 2002 to be a center for biotechnology and technology development.³⁸ Civic leaders saw their city as supporting research and start-ups, but as losing them to West and East Coast locations with capital, tech workers, leading universities and other technology firms.³⁹ Steps undertaken included development of incubators and accelerators, redevelopment and construction of new laboratory and office space, and encouraging local venture capital.

Cortex resident companies can gain access to specialized research facilities at Washington University in St. Louis, Saint Louis University, the University of Missouri-St. Louis and the Donald Danforth Plant Science Center. These facilities provide startups and growing companies with access to the equipment and expertise critically important to scaling high-growth information technology and bioscience ventures.⁴⁰

³⁷ Vey, J., S. Andres, J. Hachadorian and B. Katz, "Connect to Compete: Philadelphia's University City-Center City Innovation District." Brookings Institute, 2017. Posted at <https://www.brookings.edu/research/connect-to-compete-philadelphia/>

³⁸ See the District website, <https://cortexstl.com/> and sites for the Center for Emerging Technologies (<https://cetstl.com/>) and the St. Louis branch of Cambridge Innovation Centers (<https://cic.com/stlouis>).

³⁹ Dr. William H. Danforth, President Emeritus of Washington University, in *Smart People, Cool Places*, documentary on the development of the Cortex District, posted at <http://www.ninenet.org/cortex/>.

⁴⁰ "Available cores" listed by Cortex include mass spectrometry, NMR, flow cytometry, comparative medicine, genomics, protein purification, high throughput screening, human immunology and immunotherapy, X-ray diffraction, cellular imaging, microscopy, cell/monoclonal antibody and hybridoma development, plant tissue culture and transformation GMP production, proteomic and plant growth facilities. See <https://cetstl.com/core-research-development-facilities/>. Cortex also provides standard templates for use and lease of research facilities.

Municipal authorities granted the Cortex district both the power to exercise eminent domain and to negotiate tax abatements for its tenants, so the district's managers can implement plans for redevelopment with the powers of a government authority.⁴¹

In new buildings, Cortex identifies both new firms and ones relocating from the suburbs. Ongoing development includes a recently opened Metrolink station and a hotel now under construction. As of 2016, Cortex identified 3,800 tech-related jobs and \$500 million in investment generated over 14 years.⁴² The Cortex District now includes both technology initiatives linked to its focus on biomedicine and other development attracted by the area's character and growth, notably a regional headquarters for Microsoft.

⁴¹ J. Wagner, "In St. Louis, a gateway to innovation and inclusion." *Metropolitan Revolution*. 2016. Posted at <https://www.brookings.edu/blog/metropolitan-revolution/2016/05/05/in-st-louis-a-gateway-to-innovation-and-inclusion/>.

⁴² Ibid.



Cortex Innovation Community <https://cortexstl.com>

Figure 16: Cortex District, Saint Louis

4.2.2 Denver, CO

Government and commercial leaders sought to develop new industrial resources in Denver through planning and marketing. A notable result: Denver has developed a significant partnership with Panasonic Enterprise Solutions. Panasonic is designing information and electronic systems for Denver International Airport (DIA) and the transportation links between the airport and the city center. Panasonic will extend this effort along the I-70 interstate highway. Panasonic executives point towards development of safe self-driving automobile technology as the result of these efforts. At the same time, Panasonic's CityNOW project is planning "smart city" development of a neighborhood and transit station near DIA. Pena Station NEXT will include a microgrid based on renewable energy. All projects are to be LEED™ Silver or higher.

So far, Panasonic has built its Denver headquarters and is demonstrating vehicles and household appliance systems.

In Denver, the "innovation zone" is a network of schools, not a district of the city.⁴³



FasTracks http://www.rtd-fastracks.com/ec_1

Figure 17: Location of Pena Station (Panasonic) on the Denver Airport Rail Line

4.2.3 Fremont, CA

Fremont is located north of San Jose. It has a population over 220,000. It has for decades been an industrial town in a region known for technological development. The Warm Springs area was home to the only major automobile plant in the Western United States – but the plant closed in 2010, and 4,000 workers lost their jobs there. The Union Pacific Railroad planned to use part of the available space as a rail yard, a use that would not

⁴³ See <http://portfolio.dpsk12.org/our-schools/innovation-schools/> for description of types of "innovation zone" established under Colorado law and Denver Public Schools oversight.

restore or add jobs. Fremont city officials worked to plan and develop a more vibrant economy grounded in an Innovation District.⁴⁴

Steps toward development of an Innovation District included planning with an Urban Land Institute team of specialists, creation of a plan that emphasized jobs, housing and connectivity, and an agreement with Union Pacific to hold off the rail yard project if a more productive solution could be found. The City found a range of tax incentives and pledged to streamline permitting. The City and partner organizations continue to encourage startups.

Next, Tesla announced plans to occupy the automobile plant. Finally, the Bay Area Rapid Transit (BART) station in the Warm Springs area opened in 2017. With connectivity, new jobs and municipal support for housing growth, the Innovation District was clearly successful by 2017.⁴⁵

Fremont's municipal government developed a narrative, an account of the city's strengths and the opportunities for prosperity based on innovation and manufacturing, which they shared with all stakeholders. The local government continues to share and refresh this account enthusiastically.⁴⁶

Fremont has responded effectively to a crisis. The Warm Springs District is growing rapidly. Factors contributing to its prosperity include a pro-active government seeking to attract business in key clusters, to ease development through tax incentives and permitting, and to provide a balance of housing and jobs. The Silicon Valley economy, the regional housing shortage and high housing prices, and the longstanding plans of the BART system to extend a line to Fremont and San Jose provide an exceptionally strong basis for fast-growing TOD-related development.

⁴⁴ This account follows presentations in Honolulu by Kelly Kline, Economic Development Director for the City of Fremont, along with information posted by the City of Fremont (<https://fremont.gov/1093/Warm-SpringsSouth-Fremont>) and its economic development team (<https://www.thinksiliconvalley.com/>).

⁴⁵ An additional stimulus is the high demand for housing in the Silicon Valley area. New townhomes in the Warm Springs area are being sold for \$1 million by major developers (Lennar and Toll Brothers).

⁴⁶ See www.thinksiliconvalley.com for their narrative.

**Warm Springs/South Fremont
 Community Plan Area Major Projects**

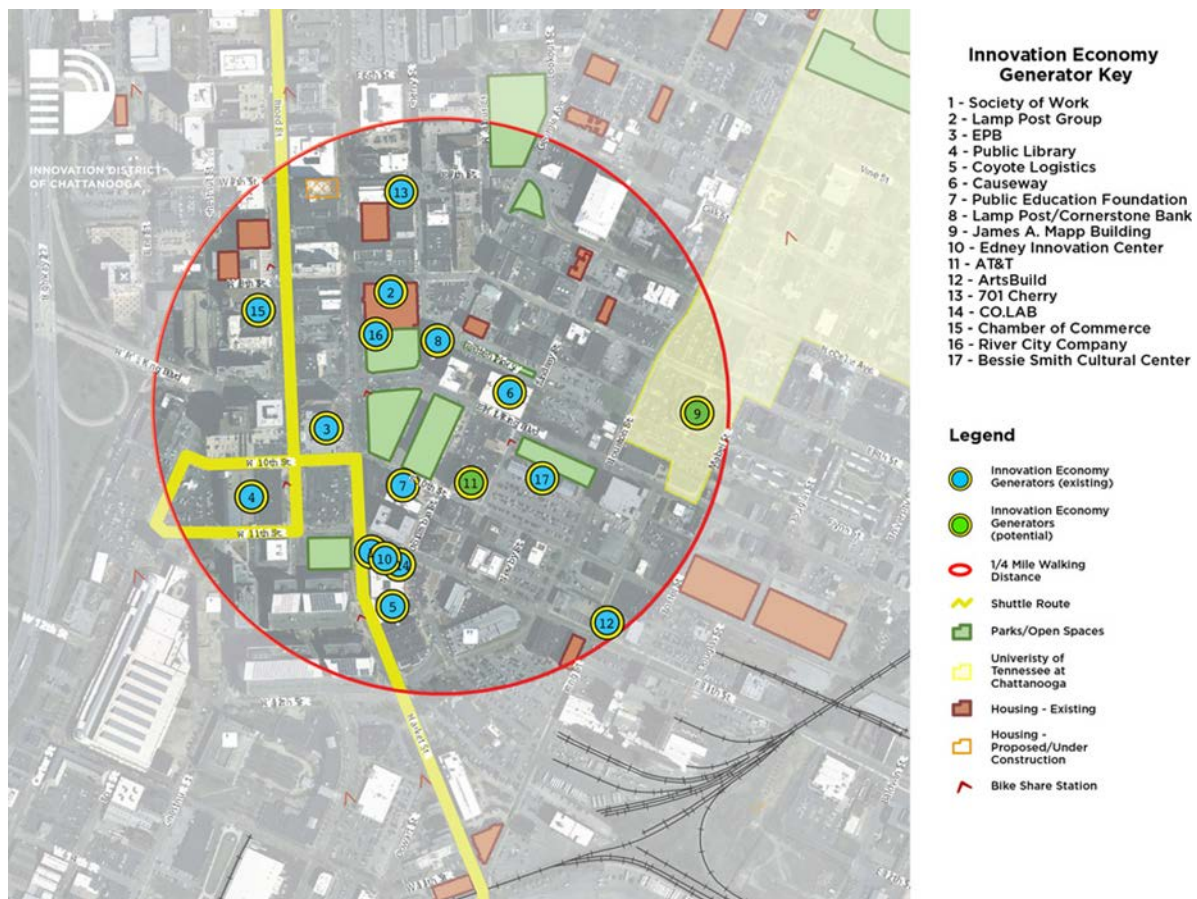


Figure 18: Warm Springs Innovation District, Fremont

4.2.4 Chattanooga, TN

The Innovation District overlaps with Chattanooga’s central business district and civic institutions (Chattanooga Public Library, part of University of Tennessee – Chattanooga). Plans have recently been announced for the District, and both civic and technical resources are in place to encourage new projects.⁴⁷ Chattanooga runs a free electric shuttle service through the Innovation District, linking it to other downtown resources.

Chattanooga is proud of its Electric Power Board (EPB), a public utility with smart-grid and high-speed internet services provided regionally. The city expects its technological strengths will translate into new economic development opportunities.



Chattanooga Innovation Framework <https://framework.chainnovate.com/background/>

Figure 19: Chattanooga Innovation District

⁴⁷ The Framework for the Innovation District and listings of resources and collaborators are found at the District website, <https://www.chainnovate.com/>

4.2.5 Baltimore, MD

Baltimore has at least three major Innovation areas.⁴⁸ In East Baltimore, Johns Hopkins is developing a Science and Technology Park with over a million square feet of space for new industries. Next, the University of Maryland created a Research Park in 2003, focused on the life sciences. It covers only 12 acres but has grown to include a mix of research and office facilities. It is credited with creating 1,000 jobs to date.⁴⁹ In West Baltimore, the City and local Community Development Corporations along with local universities (Maryland Institute College of Art and Coppin State University) are planning an Innovation District, in part to address the area's poverty and social unrest. While the initiative has wide community support, some local leaders feel their community was not involved and that the district would simply lead to gentrification.⁵⁰ Since the Innovation Village initiative was announced, a smaller 1,300-acre project has been planned, bringing together resident organizers and real estate developers.⁵¹

The university-based research parks have seen incremental growth. Their leaders recognize a need for involvement with the surrounding neighborhoods but are clearly focused on developing space for new technology. In contrast, the City's West Baltimore initiative responds to major social issues but has not yet identified a basis for sustained economic development. The educational institutions associated with the initiative do not appear to be research universities. Funding is being sought for redevelopment of housing, but no innovation industry projects have been formulated.

⁴⁸ The City administration welcomes the various efforts described here as "Innovation Districts." See Mayor Catherine E. Pugh's page, posted at <https://mayor.baltimorecity.gov/news/blog/2016-02-10-innovation-districts>. The University of Maryland's BioPark is described here as a separate entity, but it is sometimes treated as part of a greater Southwest Partnership for community redevelopment.

⁴⁹ See <http://www.umbiopark.com/>.

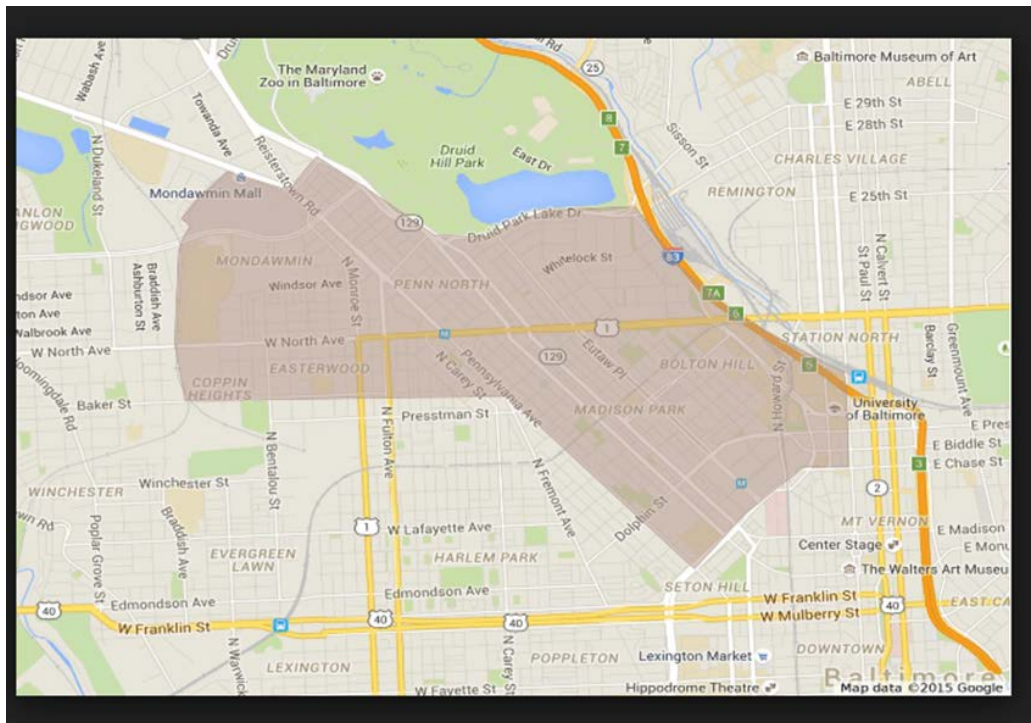
⁵⁰ Stephen Babcock, "Meet the Group of Neighbors Spearheading West Baltimore's Innovation District." *Technical.ly Baltimore*, January 18, 2016; Michael Dressner. "Partnership Aims to Revitalize Central West Baltimore." *Baltimore Sun*, January 18, 2016. Posted at <http://www.baltimoresun.com/news/opinion/editorial/bs-md-ci-baltimore-innovation-village-20160118-story.html>.

⁵¹ Andrew Zaleski, "the Great 'Innovation' Rebrand of West Baltimore." *Next City*, March 20, 2017. Posted at <https://nextcity.org/features/view/west-baltimore-innovation-district-rebrand-tech-economy>.



East Baltimore Development, Inc. <http://www.ebdi.org/home>

Figure 20: East Baltimore Innovation District



Babcock (2016)

Figure 21: West Baltimore Innovation District

4.3 Innovation Hubs and Other TOD- based Development with Economic Growth Impacts

While Innovation Districts can foster economic growth and new industries, smaller-scale efforts can result in economic impacts. Also, districts grow over time, and depend on the efforts of individual developers, entrepreneurs, and civic leaders to start and maintain their specific projects.

Key elements for Innovation Districts – incubators, accelerators, and maker spaces – are likely to be developed long before an Innovation District takes shape. In Honolulu, co-working spaces and incubators have been started in Kaka‘ako and Chinatown, while accelerators are located in Downtown Honolulu. The Mānoa Innovation Center has housed start-ups for years and could continue to do so. However, UH is taking over management of the space from HTDC. UH could prioritize University tenants rather than start-ups if space is limited.

Operators of incubators cite the cost of real estate as a major hurdle to their growth. Incubators thrive in areas where redevelopment is pending, rather than ones in which redevelopment has brought higher rents. Consequently, incubators may not be limited to Innovation Districts unless district authorities offer them preferential rents.

Stadiums clearly benefit from TOD. New stadiums also involve Innovation Industries, notably in their use of wireless resources.⁵² If a stadium must supply internet connections for many thousands of spectators’ smart phones, it will also support connectivity for nearby facilities. The concept of Hālawa as a preferred site for military contractors could be realized due to such connectivity, not just its location.

4.4 Lessons Learned from U.S. Mainland Cases

The case studies include initiatives to build Innovation Districts from:

- Reimagined urban areas (Fremont, West Baltimore);
- Anchor-plus development based on research institutions (Saint Louis, East Baltimore); and
- Anchor-plus development based on utility infrastructure (Denver, Chattanooga).

The last category was not part of the Brookings model discussed above in section 1.3. However, it demonstrates results comparable to those of districts with research anchors, but those results are slow to be achieved and may only emerge in a decade or more.

These districts vary greatly in the extent or type of government support. Saint Louis and Fremont benefit from continuing government support. In Denver, the Pena station development followed from government and business planning, but it is likely to be

⁵² Slowery, K. “Top trends in sports stadium design: The 'battle for the fan' is on.” Posted at <https://www.constructiondive.com/news/top-trends-in-sports-stadium-design-the-battle-for-the-fan-is-on/423381/>.

controlled by the corporate sponsor. In Chattanooga, the local government has provided a key resource, but does not seem to be actively involved in developing the Innovation District. Finally, the West Baltimore Innovation District was announced by city authorities but has not found the financial backing and direction needed for innovation zone development.

Hawai'i government stakeholders have asked how much government financial support is needed for developing Innovation Districts. In the cases of Fremont and Denver, planning, marketing and willingness to work out arrangements with industry have been effective. Fremont had very limited financial resources. Both Saint Louis and Fremont involve the use of municipal land-use regulatory powers to encourage district development. In none of the cases cited have local authorities made the long-term financial commitments for infrastructure development that HCDA has made in Kaka'ako.

In two of the cases discussed, district development remains largely in the hands of the private-sector sponsors (Pena station in Denver, and the East Baltimore district controlled by Johns Hopkins). Such control could limit potential spill-over impacts for these districts in future years.

Government and civic leaders have been key participants in planning all the Innovation Districts discussed. They have helped to develop and share a vision for success. They can promote redevelopment and facilitate negotiations among stakeholders important to redevelopment.

Transit has shaped planning for Innovation Districts but may not be critical for their development. Plans for a rail station have long been integrated into the urban design for the Cortex district – but the station only opened in 2018, well after the other components of this district took shape. In Fremont, a planned BART stop served as the center for the new district and has helped to reduce the need to devote land for parking. In other cities studied, existing transit systems, whether bus or rail, have supported Innovation District development but not been central to district growth.

A tension is obvious in the cases cited between long-term planning and implementation and efforts to seize new opportunities as these emerge. Both a long-term vision and agile responses to opportunities can be crucial. Also, a long-term vision and incremental realization do not motivate stakeholders over time. As one district leader noted, clear improvement in run-down sites, replacing boarded-up housing with a new community center, for example, is much more promising than steady progress. Success stories are needed to rally constituents and convince the wider community that innovation serves the common good.

In older cities, social inclusion has been an emergent theme. If an innovation sector profits corporations and the tech workers they import, but not other residents, it will be viewed as displacing, not improving, the urban fabric. This issue is currently critical for municipal leaders in cities ranging from Baltimore to San Francisco and Seattle. While much of the

HART line runs through greenfield areas, the issue of displacement can be anticipated in Kalihi and perhaps Waipahu. Workforce development initiatives, such as programs for technicians and professionals at LCC and UHWO, may play a significant role in assuring residents that it is their young people, not just people from outside Hawai'i, who will benefit.

Innovation Districts succeed over many years, supported by many parties. Collaboration is key, both for new economic ventures and for the stakeholders who want to encourage long-term development.

5. RECOMMENDATIONS

This study is addressed to a wide range of State agencies, with different missions and resources. It is meant to stimulate discussion, not to set policy. The following points are suggestions for such discussion:

- Consider restating State goals for land use to include providing space for emerging industries. In interviews, State landowners tended to speak of parts of proposed development that would be central to their agency missions – housing above all – and mixed-use development that they viewed as a future source of revenue. DHHL planners discussed a possible incubator in East Kapolei to support their beneficiaries' economic ventures. Incubators and start-ups often need reduced rents or land costs to survive, State landowners can provide key resources for new businesses, especially if they can justify risky or low-return investments as supporting their central mission.
- Enter into and continue discussions with private-sector parties who could invest in Hawai'i. State landowners have entered into partnerships with developers, and these relationships will be important for new projects. In order to promote continuing prosperity for Hawai'i, future land users, not just developers, will be key partners for the State. (Panasonic in Denver is one example; the several industrial firms relocating to Fremont are another.)
- Help find funding for growth of innovation industries. HTDC is committed to the search for federal funds. It will remain a major stakeholder in this regard. Other agencies can collaborate by working with private-sector entities. The Opportunity Zone program could also bring private-sector funding to Hawai'i, so long as investors learn that State land offers reliable opportunities for economic development.⁵³
- Learn what resources are of value to potential investors and innovators. In Fremont, an empty automobile plant was an obvious resource. In Denver, the resources attractive to Panasonic may not have been so obvious since these take on value in light of the corporation's long-term planning.

⁵³ Mark Ritchie of DBEDT is the key source of information in Hawai'i for this program. Rules for Opportunity Fund investment are to be promulgated by the U.S. Treasury in 2019.

- Both Hawai'i stakeholders and U.S. mainland interviewees agree that broadband capacity with low latency will be increasingly important. The City supports provision of a fiber network along the rail guideway, with access points for users at the transit stations.
- Energy usage can be expected to grow, so provision of renewable energy resources will be part of redevelopment solutions. Similarly, adherence to "green" building standards such as LEED™ Silver will be valuable to attract and support innovation industries.⁵⁴
- Anticipate demands for social inclusion. Much of the State's efforts along the rail corridor will go to create new affordable housing. If economic development is not integrated with this socially valued initiative, then Innovation Industries may be seen as displacing local residents, rather than supporting their continuing prosperity.

Early in this report, three questions about emerging growth industry clusters were formulated as to be resolved in the coming years. The answers at this time are provisional:

- Sites in East Kapolei offer opportunities for clustered development (Creative Media);
- In Kaka'ako, many components of an Innovation District are present, but the only site with an industry-specific focus is the creative media complex at the FTZ. No other specific linkage between research institutions and an industry cluster appears to be actively pursued.
- As noted in the account of the TOD zones, significant opportunities for Innovation Industries arise in the course of redevelopment in the Iwilei-Kapālama and Hālawā-Stadium areas.

⁵⁴ Harrison Rue (City and County of Honolulu TOD Coordinator) points to development of a central plaza and low-impact development infrastructure at Cortex as reducing the cost of new development for a new hotel and other private-sector investments.

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APPENDIX A: PERSONS INTERVIEWED FOR THIS REPORT

NAME AND TITLE	ORGANIZATION OR AGENCY
Bonnie Arakawa, Director of Planning and Development	University of Hawai'i at West O'ahu
Milton Arakawa, Senior Planner	HHF Planners
Giorgio Caldarone, Senior Director, Planning & Development Commerical Real Estate Division	Kamehameha Schools
Catherine Camp, Director, Planning & Development Commerical Real Estate Division	Kamehameha Schools
Carleton Ching, Director of Land Development, Office of the Vice President for Administration	University of Hawai'i System
Nicholas Comerford, Dean, College of Tropical Agriculture and Human Resources	Univesity of Hawai'i at Mānoa
Louis Concato	Carbon Lighthouse
Ann Coulter, Strategic Planning Manager	The Enterprise Center, Chattanooga TN
Jay Fidell	Think Tech Hawai'i
Forest Frizzell, CEO	Shifted Energy, start-up
Rechung Fujihara, CEO and Co-Founder	Box Jelly
Leonard Higashi, Senior Economic Development Manager	HI Technology Development Corporation, DBEDT
Ian Hirokawa, Special Projects Coordinator, Land Division	Hawai'i State Department of Land and Natural Resources
Darrell Ing, Real Estate Development Specialist;	Department of Hawaiian Homelands, Land Development Division
Kevin Ishida, Vice Chancellor for Administration	University of Hawai'i at West O'ahu
Kelly Kline, Director of Economic Development	City of Fremont, CA
James Kurata, P.E., Director of Planning and Project Development, Office of Capitol Improvements	University of Hawai'i System
William Labby, Workforce Development Coordinator	Leeward Community College, University of Hawai'i
Mark Lane, Vice Chancellor for Administrative Services	Leeward Community College, University of Hawai'i
Margaret Larson, Transportation Energy Specialist	Hawai'i State Energy Office, DBEDT
Chris Lee, Founder and Director	Academy for Creative Media UH
Jordan Little, Portfolio Manager	Elemetal Excelerator

	NAME AND TITLE	ORGANIZATION OR AGENCY	
	Ryan Little	Real Estate Market Consultant	
	Burt Lum, Strategy Officer-Broadband	DBEDT	
	Aki Marceau, Director of Policy and Community Development	Elemental Excelsior	
	Ken Masden, Planning Chief, Facilities	Hawai'i State Department of Education	
	Steve Massa, Innovation Economy Project Manager	City of Riverside, CA	
	Robbie Melton, Executive Director and CEO	Hawai'i Technology Development Corporation	
	Ross Mukai, Founder and Managing Member	O'ahu Makerspace	
	Scott Murakami, Director of Workforce Development	UH-Community Colleges	
	Deepak Neupane	HCDA	
	Nick Nichols, Facilities Planner	Hawai'i State Department of Education	
	Miles Nishijima, Land and Property Director	Office of Hawaiian Affairs	
	Stan Osserman, Director, Hawai'i Center for Advanced Transportation Technologies	Hawai'i Technology Development Corporation	
	Millie Perreira-Gilmore	DR Fortress	
	Mark J. Ritchie, Business Development and Support Division	DBEDT	
	Veronica Rocha, Energy Program Manager	Hawai'i State Energy Office, DBEDT	
	Fred Rodi, President	DR Fortress	
	Harrison B. Rue, TOD Coordinator	City and County of Honolulu Department of Planning and Permitting	
	Merissa Sakuda, Clean Energy Solutions Program Manager	Hawai'i State Energy Office, DBEDT	
	Carilyn O. Shon, Energy Program Administrator	Hawai'i State Energy Office, DBEDT	
	Georja Skinner, Chief Officer, Creative Industries Hawai'i, Hawai'i Film Office,	Creative Industries Development Branch, DBEDT	
	Norman Sakamoto, Acting Administrator	Department of Hawaiian Homelands, Land Development Division	

NAME AND TITLE	ORGANIZATION OR AGENCY	
Carter Schultz	HCDA	
Pono Shim	O'ahu Economic Development Board	
David Sikkink, Zone Administrator	Hawai'i Foreign-Trade Zone No.9	
Candace Tagawa	DR Fortress	
Walter Thoemmes III, Managing Director, Commerical Real Estate Division	Kamehameha Schools	
Deb Tillett, President and Executive Director	ETC Baltimore	
Tracy Tonaki, Senior Vice President	D.R. Horton - Schuler Homes, LLC	
Russell Tsuji, Land Division Administrator	Hawai'i State Department of Land and Natural Resources	
Charles Vitale, Engineer	Stadium Authority	
Nam Vu, Co-Founder	Impact Hub Honolulu LLC	
Allen G. Yanos, Property Development Agent	Department of Hawaiian Homelands, Land Development Division	
Sterling Yee, Director of Strategic Planning	Oceanit	