Hawaii Interagency Council for Transit-Oriented Development

East Kapolei Permitted Interaction Group [June 2018] Summary Report and Recommendations

March 12, 2019

(as amended & adopted April 9, 2019)

This written report supplements the presentation of activities and findings from the East Kapolei Permitted Interaction Group to the Hawaii Interagency Council for Transit-Oriented Development (TOD Council) at its March 12, 2019 meeting. Slides from the presentation can be found in *Attachment A*.

I. Permitted Interaction Group Purpose and Members

The East Kapolei (EK) Permitted Interaction Group (PIG) is one of three PIGs formed by the TOD Council on June 12, 2018, to address TOD implementation issues on State lands in the three TOD priority areas along the Honolulu rail corridor—East Kapolei, Halawa-Stadium, and Iwilei-Kapalama. The PIG was established to provide a forum for input, discussion, and deliberation on infrastructure conditions, improvements required, and financing issues being studied under the State TOD Planning and Implementation Project (State TOD Project), managed by the Office of Planning (OP). (*Refer to Attachment B for more information about the project.*)

TOD Council members selected to serve on the PIG include State landowning agencies in the area, State and county support agencies, and stakeholder group representatives. Additional representatives from PIG member agencies or organizations were invited to participate in the PIG activities, including non-governmental stakeholders with major known projects planned in the area, to ensure that the resulting infrastructure plan represented the cumulative public improvements required to accommodate planned TOD growth in the area over the 30- to 40-year development period. PIG members, designees, and representatives that participated in the PIG activities are listed in *Attachment C*.

Craig Hirai/HHFDC and Carleton Ching/UH and Bonnie Arakawa/UH West Oahu served as co-chairs for the PIG. The PIG was staffed by Rodney Funakoshi and Ruby Edwards, assisted by PBR Hawaii, the prime consultant for the State TOD Project.

TOD Council PIG Members

(1) Office of Planning Director

(2) Hawaii Housing Finance & Development Corporation (HHFDC) Executive Director

(3) University of Hawaii (UH) President

(4) Department of Hawaiian Home Lands Director (DHHL) Director/Chairperson of the Hawaiian Homes Commission

(5) Department of Land & Natural Resources (DLNR) Director/Chairperson of the Board of Land & Natural Resources

(6) Department of Education (DOE) Superintendent

(7) Department of Transportation (DOT) Director

(8) Hawaii Community Development Authority (HCDA) Executive Director

(9) City and County of Honolulu (City) Mayor

II. Tasks Assigned and Activities in Performance of Tasks

The EK PIG was specifically charged with assisting in the following tasks for Phase I of the State TOD Implementation Project:

(1) Develop a preferred master land use plan for State TOD projects in the East Kapolei TOD priority area to identify infrastructure requirements;
(2) Identify infrastructure deficiencies and requirements for the preferred plan;
(3) Identify potential CIP budget requests for TOD Council recommendation to the 2019 Legislature, as needed; and
(4) Identify a public outreach strategy for State TOD implementation, and refine evaluative criteria and develop performance metrics for project implementation.

Since the focus of the State TOD Project is on the infrastructure investments that will be needed to accommodate State TOD project development in the TOD priority areas, the outreach strategy, evaluative criteria, and performance metrics tasks will be tackled later when additional time and resources can be devoted to them.

Context for State TOD Project and PIG Effort. The PIG activities for the State TOD Project aim to flesh out how individual State TOD projects will be developed in the context of the City's Neighborhood TOD Plan for this TOD priority area. The City TOD Plans lay the groundwork for the character and intensity of TOD within their plan areas, based on land use and capacity analyses and community input as to how these communities may evolve over time. The State TOD Project is intended to determine what State infrastructure investments will be needed as State TOD projects build out as part of this community vision.

Phase I of the State TOD Project involves: (1) the compilation of information on State TOD projects in the area, existing infrastructure system conditions, and known infrastructure challenges; and (2) the development of a preferred land use scenario based on agency plans for State lands in the TOD priority area. The preferred land use scenario developed with the PIG will be used in Phase II to determine infrastructure requirements needed to realize State TOD potential in the area, and to inform the development of potential infrastructure financing strategies.

Phase I PIG tasks and activities completed are summarized below.

A. PIG Meeting 1, July 16, 2018—Project kick-off, review of TOD project and plan information compiled to date

The initial PIG meeting was held in July 2018 to orient PIG members to the State TOD Project. PBR Hawaii staff briefed the PIG on information compiled to date for the project from the City's draft East Kapolei Neighborhood TOD Plan (EK TOD Plan), existing studies, and agency project plans. The PIG was asked to identify information gaps and needs for master plan charrettes scheduled for September 2018, as well as concerns and opportunities related to infrastructure and financing for the area that needed to be examined in the study. PIG members were asked to provide any project plans and information to the consultant team to compile for the master plan design workshop (charrette) and the land use model that would be developed to determine regional or local infrastructure needs.

An additional PIG meeting was scheduled in July 2018 to discuss planned widening of Farrington Highway—a City facility—among State and City agencies and other major landowners whose proposed development is impacted by the widening project. At the time, plans were calling for a six-lane arterial that would require multiple turning lanes or a flyover at the intersection with Kualakai Parkway. The scale of the intersection required was of concern to all impacted landowners, in terms of cost and impact on multi-modal transportation options like walking and biking, accessibility to adjoining parcels, and the desired urban design character for lands at this intersection and along Farrington. Concerns were also raised about safe and convenient road crossings by students attending the planned East Kapolei High School. Further discussion between DOT Highways and the City was arranged to discuss a four-lane alternative for the widening project. Subsequently, the City reported that they would proceed with a four-lane facility, but retain a six-lane right-of-way that might be able to accommodate Complete Streets features.

B. PIG Meeting 2, September 21, 2018—Land use workshop/charrette for TOD priority area

The second PIG meeting was a master plan/land use design charrette that was designed to explore existing project plans in relation to the proposed land use pattern, densities, and character of TOD envisioned in the City EK TOD Plan. Within this context, charrette participants discussed proposed land use plans and options with consideration of: existing conditions; proposed land uses and density of individual TOD projects; opportunities to align or coordinate development efforts; public realm and access improvements needed; and the implications of proposed project plans and land uses for public infrastructure systems and infrastructure delivery. PIG members were presented examples of urban design features that could be considered in the development of land use scenarios, as well as sustainable infrastructure design and delivery approaches that could be considered in the development of an infrastructure implementation and financing strategy in Phase II of the project. PIG groups generated different broad land use schemas for the area that were used to formulate alternative land use scenarios for TOD priority area buildout.

PIG agencies were tasked with providing the consultant team with as much information as possible on their current project plans. The alternative land use scenarios developed from information gathered and the charrette discussions were to be reviewed by the PIG to select a preferred land use scenario for the infrastructure assessment to be conducted in Phase II.

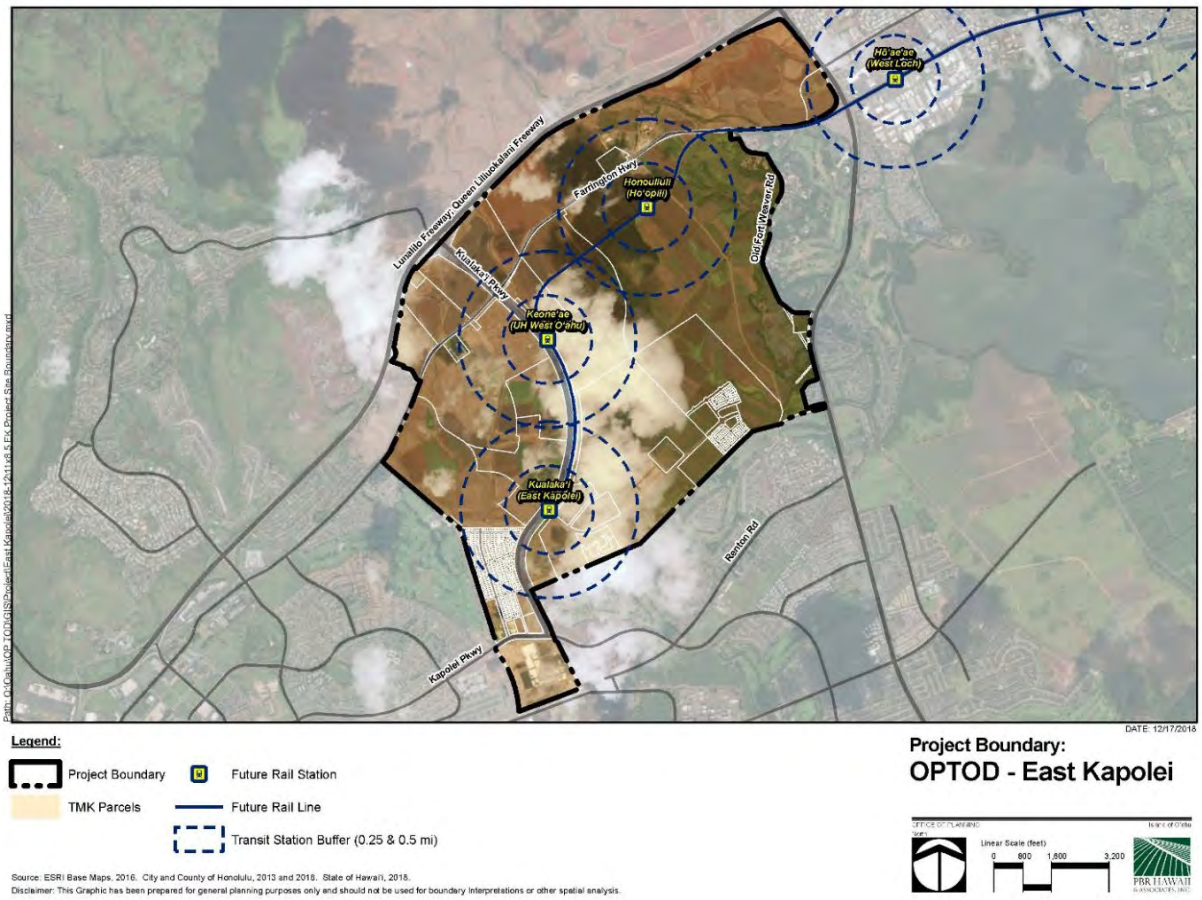
Materials from the charrettes are provided in *Attachment D*; charrette outcomes are summarized in the Oahu PIGs report presentation.

C. PIG Meeting 3, February 26, 2019—Review/selection of preferred land use scenario for infrastructure needs assessment

The third PIG meeting was convened to review the parameters developed for the land use scenarios for the TOD priority area, review maps of existing infrastructure conditions for the area, and to identify a preferred land use scenario for Phase II infrastructure assessment and financing strategy development. The first task for the PIG was affirming a proposed boundary for the priority area that encompassed State sites planned for TOD. The second task was to get agreement on the preferred land use scenario for potential buildout of the

priority area, including existing plans for State facilities and State TOD projects in the priority area.

Project Area Boundary: East Kapolei TOD Priority Area



The boundary for the East Kapolei TOD priority project area was selected in line with the City's draft EK TOD Plan (2010) and planned large property development in the area that will be requiring regional infrastructure improvements. The project area includes three rail stations: Honouliuli (Hoopili), Keoneae (UH West Oahu), and Kualakai (East Kapolei).

Planned Development. The City's EK TOD Plan is founded on principles that would create a dynamic mixed-use urban environment, provide a variety of housing choices, foster gathering places, and increase connections and access throughout the EK TOD Plan area. State and other large development projects that would contribute to realization of the City's EK TOD Plan principles include:

- **Department of Hawaiian Homelands (DHHL):**
  - Residential communities of Kānehili and Kauluokahai, including Kauluokahai Increment IIA TOD project
  - Commercial development at Ka Makana Alii

- **University of Hawaii West Oahu (UHWO) Makai:**
  - University Village District lands—proposed for mixed-use development
  - Campus and campus-related growth and development
  - Department of Business, Economic Development and Tourism—proposed film studio
- **Department of Land and Natural Resources (DLNR):**
  - Four parcels along Kualakai Parkway and Farrington for which conceptual plans are being prepared; initial concepts include mixed-use and light industrial development
- **DR Horton's Hoopili development:**
  - To include sites for new DOE schools: two elementary schools, one middle school, and a high school
- **City Farrington Highway Widening** to support these regional developments

▶Infrastructure Maps: Existing Conditions (Attachment E)

PIG members were updated on information compiled on existing facilities and conditions and known plans for various infrastructure systems in the TOD priority area, as seen in the maps in *Attachment E*. These form the basis for determining where system expansion or redevelopment will be required to support planned TOD in the area.

Land Use Scenarios Considered

- **Land Use Scenario: Existing City TOD Plan Modified by Current Conceptual Plans**

  This scenario represents planned development consistent with the draft City EK TOD Plan and existing plans for State-owned parcels and D.R. Horton's Hoopili master plan. The scenario generally uses the draft EK TOD Plan land use designations and development intensity for estimating parcel buildout—as modified by current individual agency/landowner facility and project plans, which would include increased density on some State parcels. Based on preliminary land use estimates of current agency and major landowner plans, the potential buildout of residential units in 30-40 years could be in the range of 22,000 units, with as much as 11 million square feet of commercial, office, institutional, and other light industrial space being developed over that period.

- **Alternate Land Use Scenario: Charrette-proposed schema for increased connections and commercial activity on Kualakai Parkway**

  The charrette identified opportunities to increase connections between development across Kualakai Parkway both physically and functionally, rather than having Kualakai be the back edge of surrounding development. This alternative would entail improved connectivity and more commercial and mixed-use development along Kualakai Parkway, in addition to Complete Streets improvements for multi-modal access. PIG members discussed the potential for increasing walkability along Kualakai Parkway.

While mixed-use development and its orientation toward activating Kualakai Parkway at intersections and crossings are highly desirable and reasonable, members felt that the functional classification of Kualakai Parkway as a regional arterial with few mauka-makai reliever roads in the area presented challenges to activating the entire length of the Parkway streetscape.

Estimates of potential buildout of residential units and commercial, office, institutional, and light industrial space are subject to change as the land use numbers are finetuned for the preferred land use scenario.

The project area lies outside Sea Level Rise Exposure Areas mapped in conjunction with the *Hawaii Sea Level Rise Vulnerability and Adaptation Report* (Hawaii Climate Change Mitigation and Adaptation Commission, 2017), and at this time, appears to be at lower risk of potential impacts from sea level rise.

III. Results / Outcomes for Consideration: Preferred Land Use Scenario

The PIG supported the defined boundary and **Existing City EK TOD Plan Modified by Current Conceptual Plans Land Use Scenario** for the Phase II infrastructure assessment work. The PIG also supported further refinement of the scenario by the consultant team, as needed, to verify project plan information with individual agencies. This scenario represents the most plausible land use pattern and density for State TOD projects in the area, and provides a reasonable baseline for identifying infrastructure needs and costs for State TOD buildout over time. The preferred land use scenario will be finalized by the consultant team in the coming month.

A preliminary map of the preferred land use scenario is provided on the following page. Assumptions for assessment of infrastructure needs for the preferred land use scenario include:

- Use of current conceptual land use plans for State and major landowner participants;
- No additional intersections along Kualakai Parkway; and
- Improvement of currently planned connections and intersections.

IV. Recommendations

The East Kapolei PIG co-chairs recommend the following for TOD Council action:

(1) At the TOD Council's April 9, 2019 meeting, re-form the East Kapolei Permitted Interaction Group, constituted of the same members, to perform the tasks listed below and report back to the TOD Council at a date to be determined.

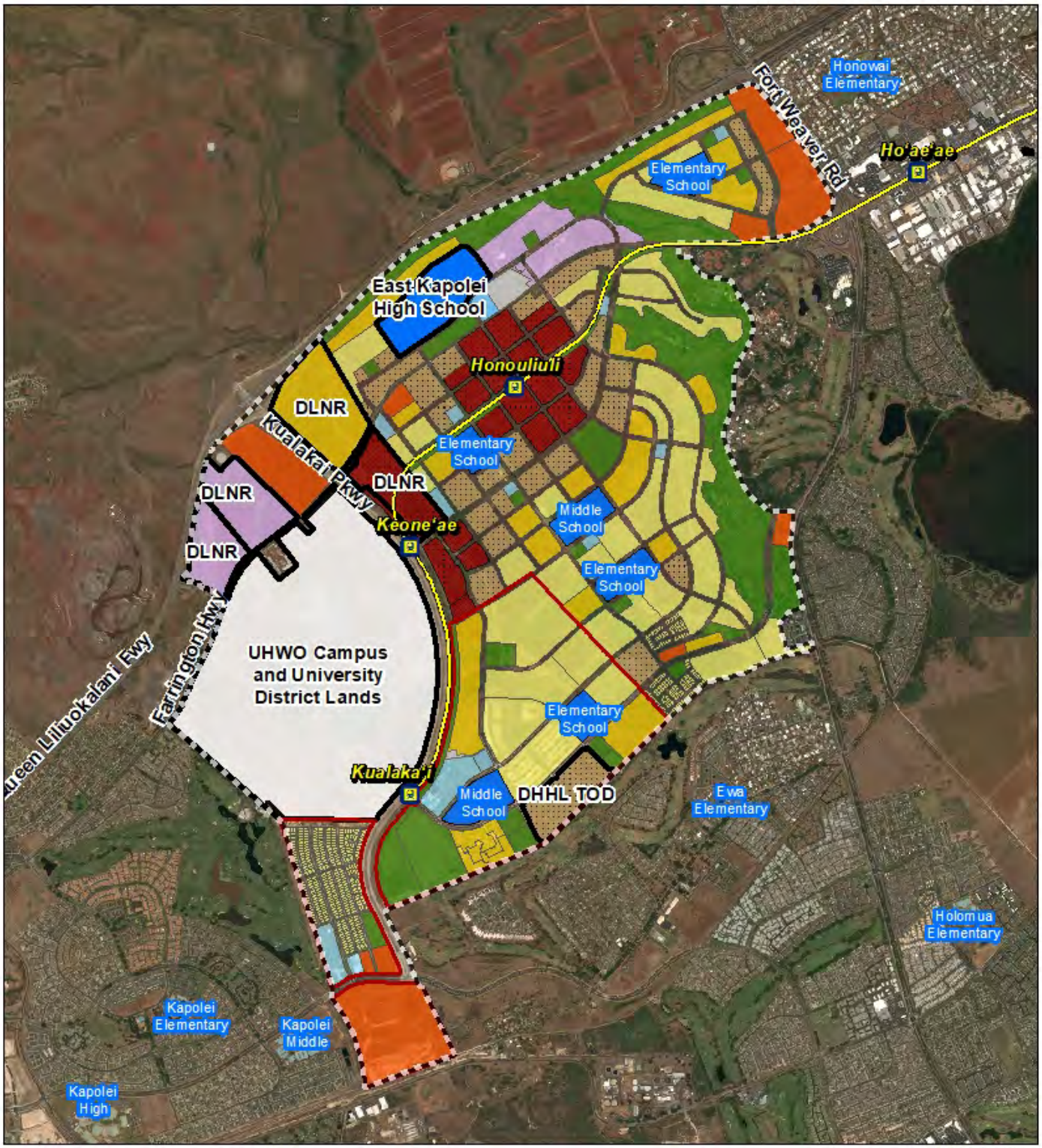
a. Provide input to Phase II of the State TOD Implementation Plan (Oahu) Project for the East Kapolei TOD priority area and assist in:

1. Identifying infrastructure costs, financing options, and phasing for infrastructure improvements required for the preferred TOD land use scenario for the East Kapolei area;
2. Developing a preferred infrastructure implementation plan, phasing, and financing strategy for the TOD priority areas; and
3. Developing recommendations for TOD-related CIP or other budget

requests to [~~implement infrastructure implementation~~] fund infrastructure improvements required for the TOD priority areas, including CIP and budget requests for TOD Council recommendation to the 2020 Legislature, as needed;

b. Identify near-term infrastructure and State TOD project implementation issues to be addressed by the PIG or other entities, develop and implement strategies to address these near-term issues as needed, and ensure that actions taken are integrated with options being considered and recommendations being developed in Phase II of the State TOD Project; and

c. Develop recommendations, as needed, for a public outreach strategy for State TOD implementation for this priority area.



DATE: 4/1/2019

Legend

- Project Boundary
- State Parcels
- State TOD Projects
- UHWO and University District Lands

Anticipated Land Uses

- Apt. Mixed-Use
- Business Mixed-Use
- Commercial
- Community/Public Facilities
- Industrial Mixed-Use
- Res. Low Density
- Res. Single Family
- Utilities

East Kapolei - Anticipated Land Uses

State TOD Planning & Implementation Project, Oahu

OFFICE OF PLANNING — Island of Oahu

North

Linear Scale (feet): 0 — 1,250 — 2,500 — 5,000

FBR HAWAII & ASSOCIATES, INC.

Source: ESRI Base Maps, 2016. City and County of Honolulu, 2013 and 2018. State of Hawai'i, 2018.
Disclaimer: This Graphic has been prepared for general planning purposes only and should not be used for boundary interpretations or other spatial analysis.

Attachment A.
Presentation to TOD Council: Oahu PIGs Report, March 12, 2019

STATE TOD PLANNING & IMPLEMENTATION FOR THE ISLAND OF O'AHU

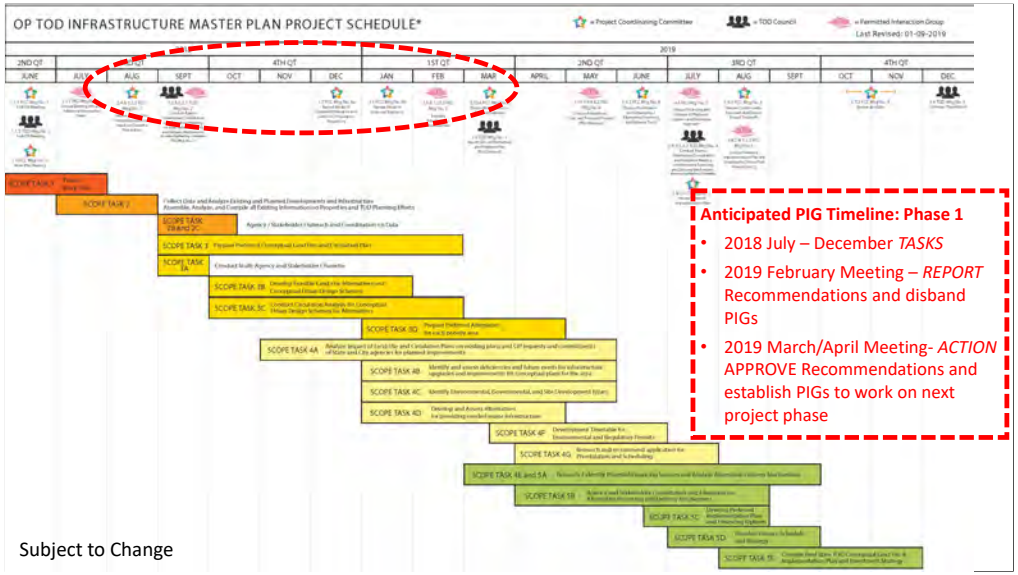
TOD COUNCIL REPORT BACK
Tuesday, March 12, 2019
HCDA Community Room

OFFICE OF PLANNING
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, & TOURISM

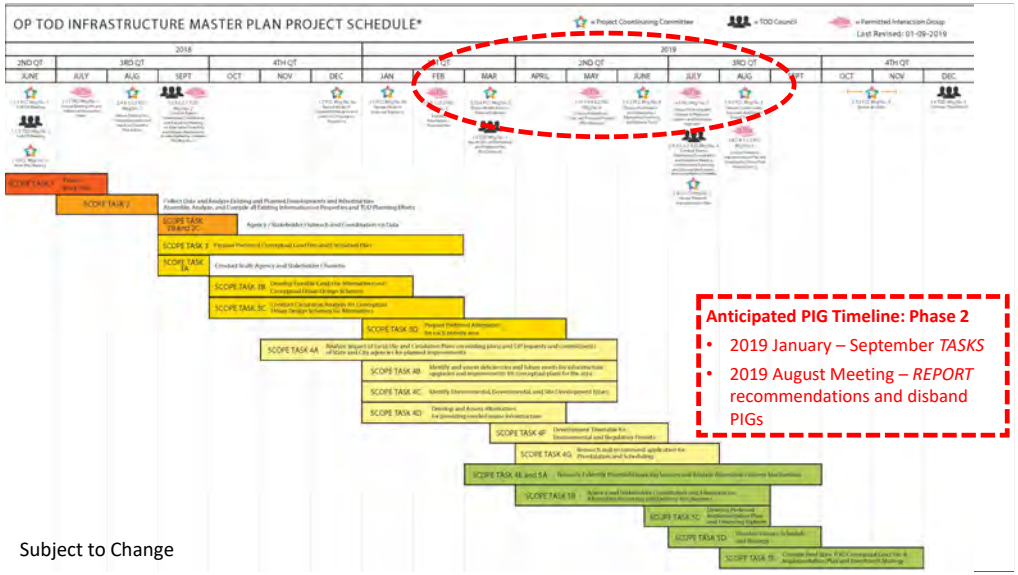
PBR HAWAII & ASSOCIATES INC | DTA DAVID TAUSSIG & ASSOCIATES | CALLISONRTKL | R. M. TOWILL CORPORATION | ARUP

Project Purpose

- Coordinate approach between all stakeholders
- Coordinate regional infrastructure investments
- Identify source(s) of financing and best practices for TOD Implementation
- Consider incentives for landowner participation
- Identify sustainable development practices



Subject to Change



Subject to Change

Phase 1: Process

- Compile existing planning documents
- Finance overview and presentation of information gathered
- Confirm landowner plans and incorporate any updates available
- Charrette
  - Review, refine, and enhance plans
  - Presentations on Urban Design and Sustainability
- Determine preferred conceptual land use scenario to inform infrastructure needs and cost estimates

Phase 1: Meetings Held to Date

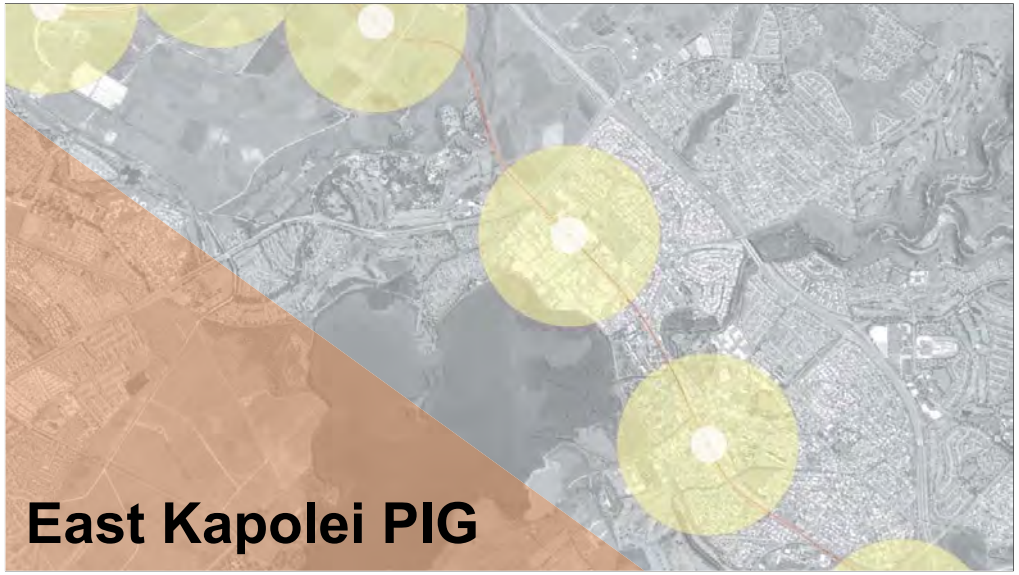
Group	Date(s)	Topics Covered
Project Coordinating Committee (PCC)	• June 1 • June 22 • August 16 • September 21 • November 2 • December 4 and January 23	• Kick-off meeting • Work Plan • Charrette Preparation • Charrette Summary • Project Boundary • Land Use Scenario Review – PIG 3
Permitted Interaction Groups (PIGs)	• July 12 – 20 • July 30 • September 20 & 21 • **February 26**	• Info Compiled to Date • Farrington Widening • Charrettes • **Preferred Conceptual Land Use Scenario**

Conceptual Land Use Scenarios

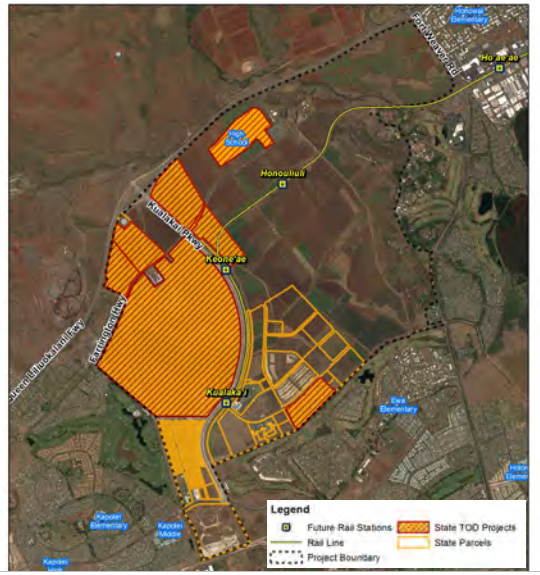
Conceptual Land Use Scenarios: Background Information

- City and County Neighborhood TOD Plans
- Plans and Studies shared by the State, City, and private entities
- Stakeholder input from the:
  - September Charrette
  - Homework and follow-up

Reminder: The project is focused on infrastructure needs and financing. The discussions in this meeting are based on conceptual land use scenarios to identify density and infrastructure needs. We are looking at density, phasing, and impacts of urban design features to inform the needs and costs.



PROJECT AREA BOUNDARY: EAST KAPOLEI STATE LANDS



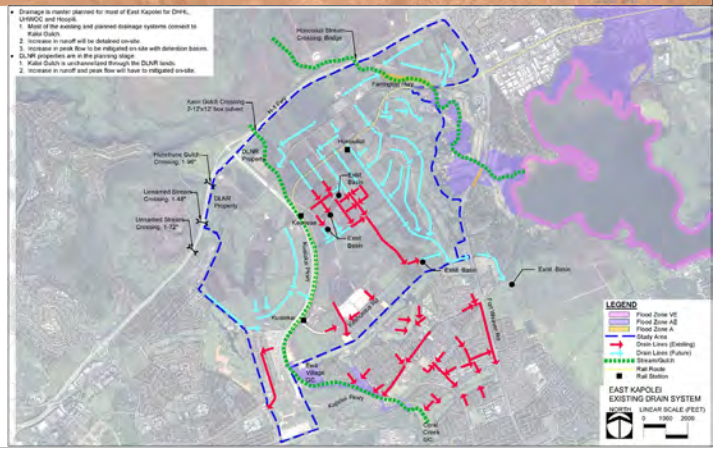
Charrette Input: East Kapolei

Charrette Input: East Kapolei Summary

Frequency	Major Categories	Examples of Comments
17	Infrastructure	Access, no grade separation
12	Connectivity	Distribute traffic, complete streets, ped/bike crossings
10	Development/Planning	Don't turn backs on Kualakai
8	Community Atmosphere	Opportunities to reduce sound so no sound walls
5	Environment	Bridge/Incorporate Gulches – green corridors, cooling interpretive
3	Rail Stations	Commercial Hubs
Tied at 2	Residential	Mixed Use Town/Gown Hub
	Ownership	Common vision for key development zone
	Economy	Create a commercial hub/center of action

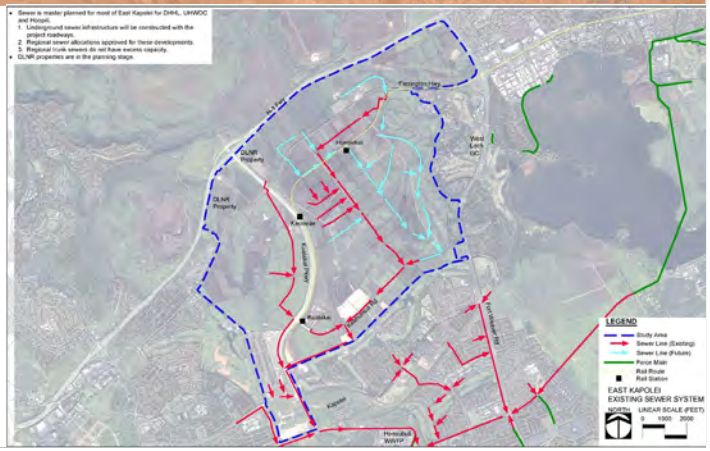
Infrastructure: East Kapolei Drainage

- Master Planned for most of East Kapolei
  - Most of the existing and planned drainage systems connect to Kaloi Gulch
  - Increase in runoff will be detained on-site
  - Increase in peak flow to be mitigated on site with detention basins
- DLNR properties are in the planning stage
  - Kaloi Gulch unchannelized through the DLNR lands
  - Increase in runoff and peak flow will have to be mitigated on-site



Infrastructure: East Kapolei Sewer

- Master Planned for most of East Kapolei
  - Underground sewer infrastructure will be constructed with the project roadways
  - Regional sewer allocation approved for DHHL, UHWO, and Hoopili
  - Regional trunk sewers do not have excess capacity
- DLNR properties are in the planning stage

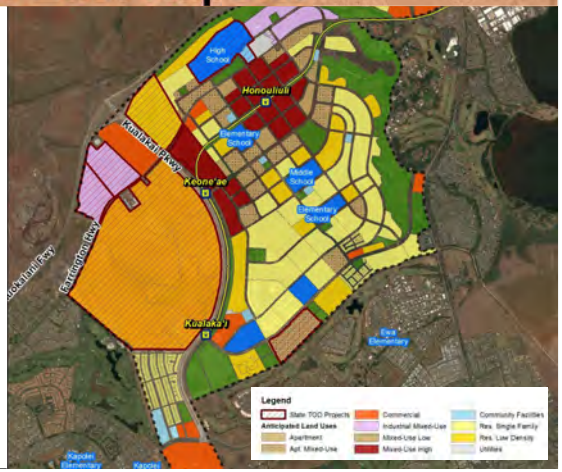


Infrastructure: East Kapolei Water

- Master Planned for most of East Kapolei
  - Underground water infrastructure will be constructed with the project roadways
  - Water reservoirs and booster pump stations will be constructed as development progresses
  - Regional sewer allocation approved for DHHL, UHWO, and Hoopili
  - Water sources are adequate for more new developments but the Ewa Shaft is the next water source required to meet the needs of the Ewa Development Plan
- DLNR properties are in the planning stage

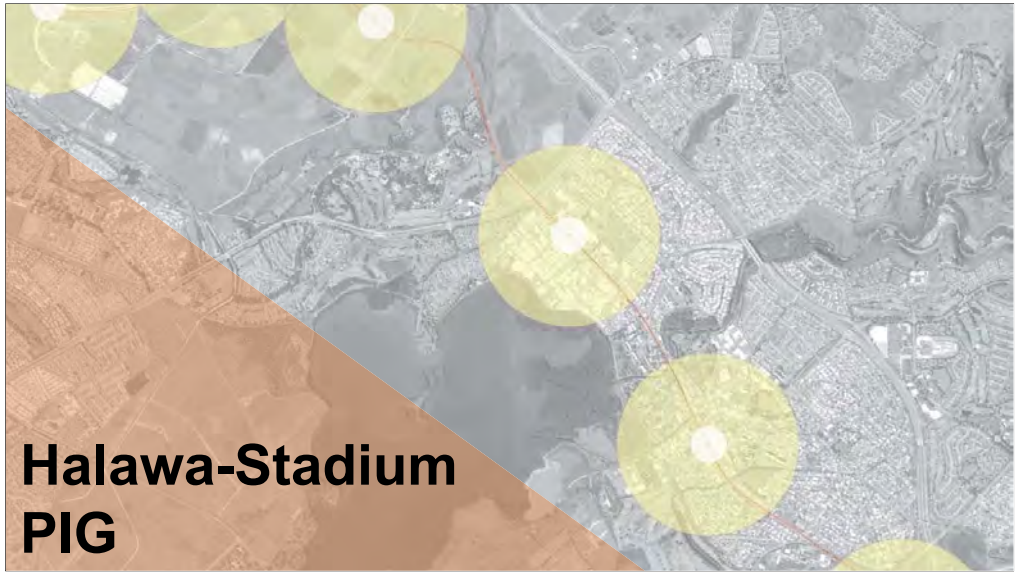
Preferred Land Use Scenario PIG Recommendations: East Kapolei

- ✓ Proceed with current conceptual land use scenarios for each of the various landowners
- ✓ Do not incorporate additional intersections along Kualakai
- ✓ Improve currently planned connections/intersections



Preferred Land Use Scenario Refinement: East Kapolei

- ✓ Update estimated development, conceptual land uses, and estimated phasing for landowners
- ✓ Further coordination with City on TOD Neighborhood Plan



Halawa-Stadium PIG

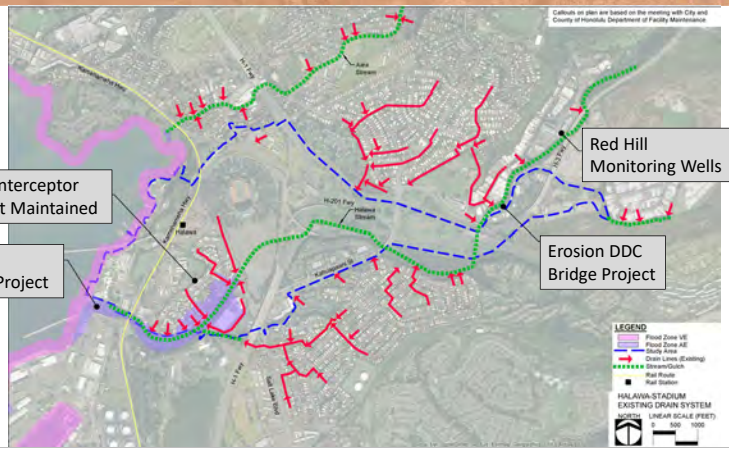
Project Area Boundary: Halawa-Stadium State Lands

Charrette Input: Halawa-Stadium

Charrette Input: Halawa-Stadium Summary

Frequency	Major Categories	Examples of Comments
42	Development/Planning	Dense Core Avoid Bifurcation of Housing types
36	Connectivity	Get across major thoroughfares Bus loops, Trails, multimodal
30	Infrastructure	Central utility systems Schools
14	Community Atmosphere	Community Plaza Adequate Green Space
Tied at 8	Environment	Connect to water
	Residential	Service Local Population
7	Ownership	Work with Federal Landowners
6	Economy	Differentiate Products

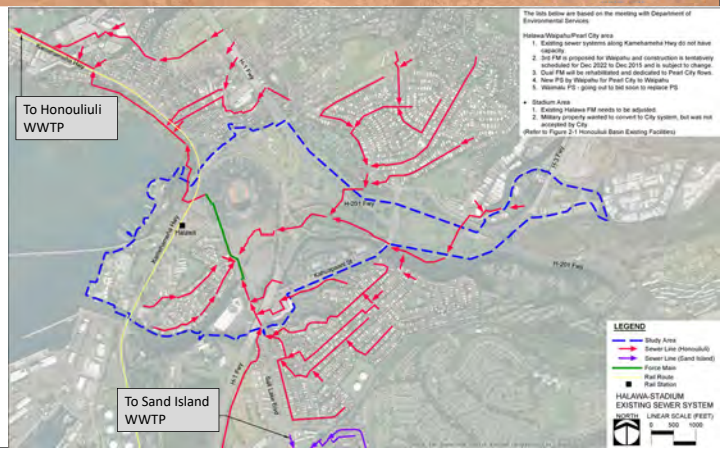
Infrastructure: Halawa-Stadium Drainage



Infrastructure: Halawa-Stadium Sewer

Halawa / Waipahu / Pearl City

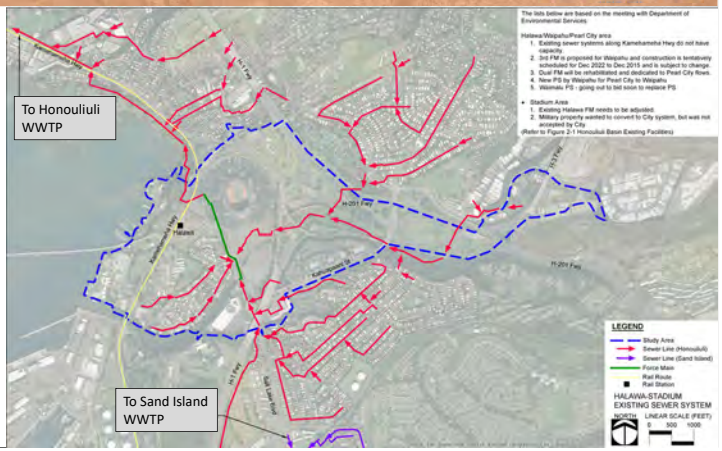
- Existing systems along Kam Hwy do not have capacity
- 3rd FM is proposed for Waipahu; construction tent. scheduled for Dec. 2022 (subject to change)
- Dual FM will be rehabilitated and dedicated to Pearl City flows
- New PS by Waipahu for Pearl City to Waipahu
- Waimalu PS going out to bid soon



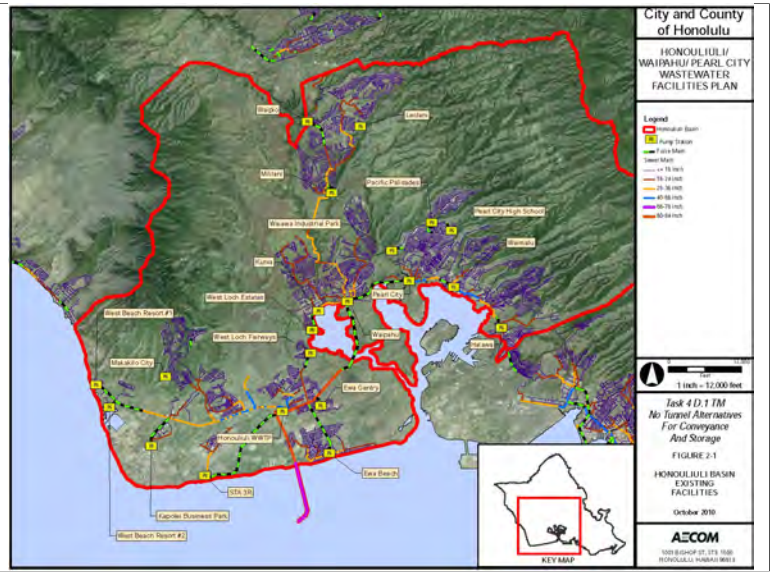
Infrastructure: Halawa-Stadium Sewer (cont.)

Stadium Area

- Existing FM needs to be adjusted
- Military property wanted to convert City system, but was not accepted by City

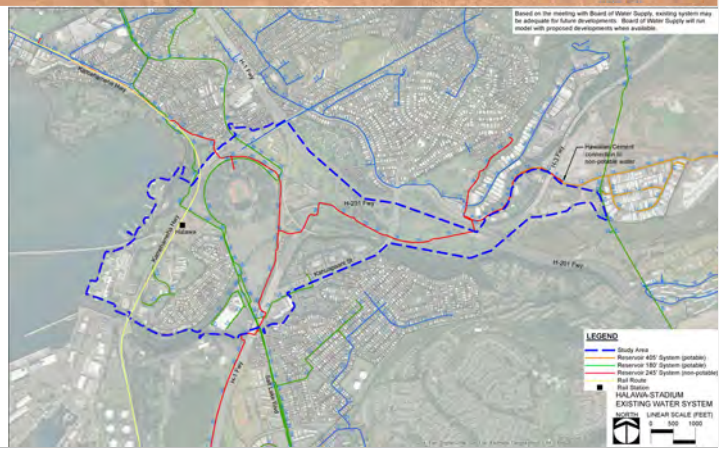


INFRASTRUCTURE: HALAWA-STADIUM WASTEWATER



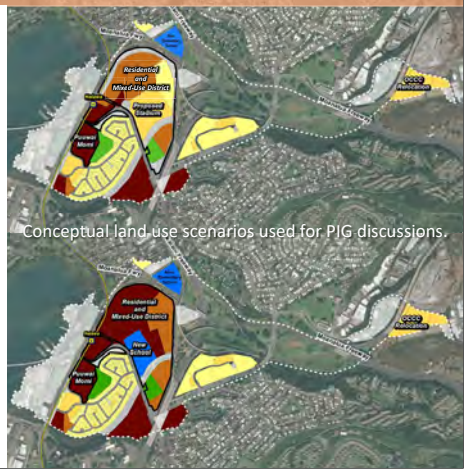
Infrastructure: Halawa-Stadium Water

- Existing system may be adequate for future developments
- BWS will model with proposed developments when development information is available



Preferred Land Use Scenario PIG Recommendations: Halawa-Stadium

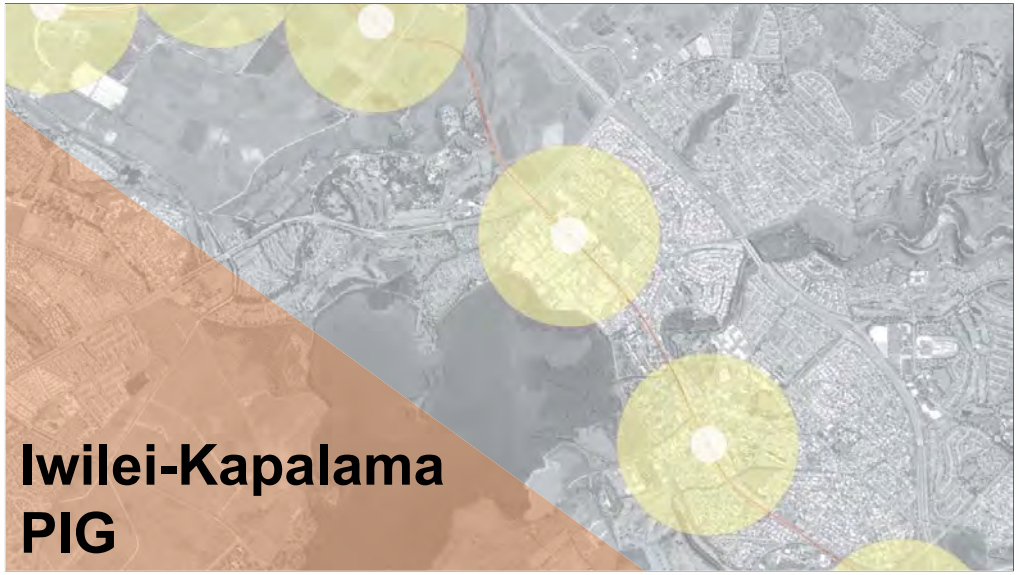
- ✓ Stadium redevelopment on site with additional ancillary mixed-use development
- ✓ Pu‘uwai Momi at maxed out density
- ✓ At least one new DOE School
- ✓ Assume OCCC Relocates to Halawa



Conceptual land use scenarios used for PIG discussions.

Preferred Land Use Scenario Refinement: Halawa-Stadium

- ✓ Update estimated development, conceptual land uses, and estimated phasing for landowners
- ✓ Combine concepts from TOD Neighborhood Plan
- ✓ Connectivity with region
- ✓ What can currently be accommodated, timing for additional facilities
- ✓ Vertical School vs current BOE standards
- ✓ Pearl Harbor Security



Iwilei-Kapalama PIG

Project Area Boundary: Iwilei-Kapalama State Lands

Charrette Input: Iwilei-Kapalama

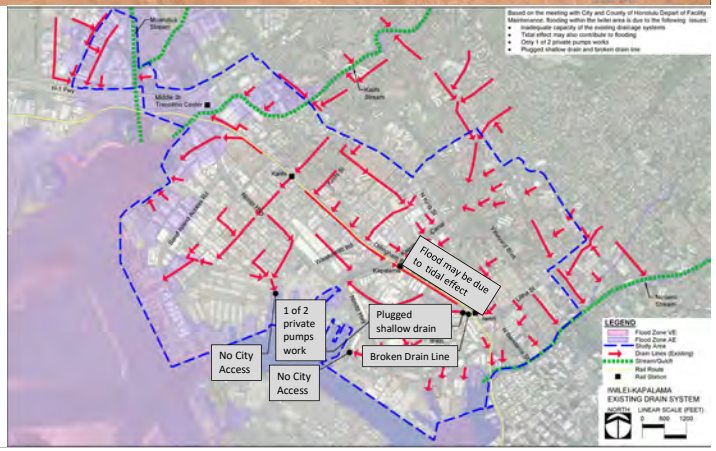
Charrette Input: Iwilei-Kapalama Summary

Frequency	Major Categories	Examples of Comments
53	Development/Planning	Sea level rise strategy applied Green spaces
30	Infrastructure	Control sea level rise Challenge to finance district
24	Connectivity	Hierarchy of streets Improve connections
14	Community Atmosphere	Focal point for community Programmatic connection
10	Economy	Fishing and Artisan villages
8	Residential	Mixed use with housing above other uses
7	Environment	Bioswales; Green corridors for flood retention
3	Ownership	District wide collaboration
2	Natural Hazards	Sea level rise underutilized
1	Rail Station	Retail / amenities at transit stations

Infrastructure: Iwilei-Kapalama Drainage

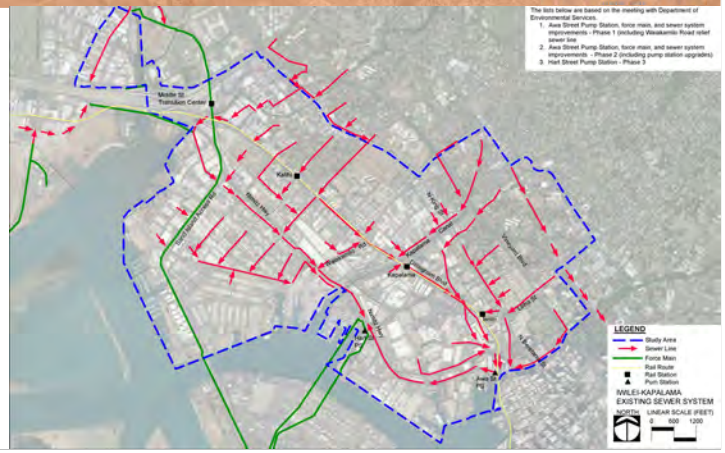
Flooding in the Iwilei area is due to the following issues:

- Inadequate capacity of the existing drainage system
- Tidal effect may also contribute to flooding
- Only 1 of 2 private pumps works
- Plugged shallow drain and broken drain line



Infrastructure: Iwilei-Kapalama Sewer

- Awa Street Pump Station, force main, and sewer system improvements
  - Phase 1 (including Waiakamilo Road relief sewer line)
  - Phase 2 (including pump station upgrades)
- Hart Street Pump Station, Phase 3

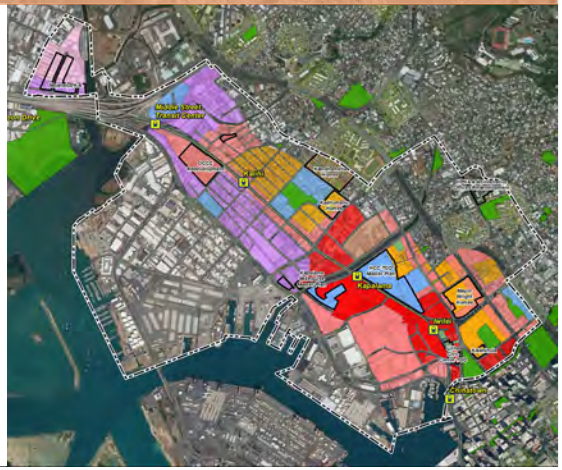


Infrastructure: Iwilei-Kapalama Water

- Existing system capacity may be adequate for future developments
- Frequent main breaks due to its age and condition
- BWS will model with proposed developments when development information is available

Preferred Land Use Scenario PIG Recommendations: Iwilei-Kapalama

- ✓ Baseline = TOD identified zoning without Sea Level Rise
- ✓ Order of magnitude costs for the region, assuming TOD Zoning is not applied to the portion impacted by SLR
- ✓ Two 3-acre DOE sites
- ✓ Assume OCCC Relocates to Halawa and the property is rezoned for TOD



Preferred Land Use Scenario Refinement: Iwilei-Kapalama

- ✓ Update estimated development, conceptual land uses, and estimated phasing for landowners
- ✓ Lifecycles of horizontal infrastructure versus buildings
- ✓ Consequences of not providing infrastructure for areas impacted by SLR
- ✓ How do you prioritize?

Next Steps

NEXT STEPS / SCHEDULE

Next Steps:

- •Land Use Scenario Refinement for Phase 2

Schedule for Phase 2:

- •May 2019, Discuss Preferred Land Use Scenario, Cost, and Timing of Projects (PIGs Regrouped)
- •July 2019, Discuss Financing and delivery of Preferred Land Use Scenario and Determine Approach
- •August 2019, Discuss Preferred Implementation Plan and Schedule for Critical Path Analysis

For requests for materials and project or PIG-related questions, please contact dbedt.op.lud@hawaii.gov or Rodney Funakoshi at: rodney.y.funakoshi@hawaii.gov

If you have additional comments, thoughts, or materials to share, please e-mail Nathalie Razo at: nrazo@pbrhawaii.com

Thank you, any questions?

Attachment B.

State TOD Planning and Implementation Project

Sponsor: Office of Planning, State of Hawai'i

June 12, 2018

East Kapolei | Aloha Stadium / Hālawa | Iwilei-Kapālama

Project Description

The project will produce a State Transit Oriented Development (TOD) Plan for project implementation and investments on State lands along the Honolulu Rail Transit Project corridor, 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.

The process will focus on conceptual area / site planning, infrastructure assessment, and access improvements analysis to determine shared investments, funding, and timeframes for critical infrastructure and other improvements necessary to enable development of State TOD projects. The plan will also serve as a critical tool for the State to assist and track actions needed to facilitate shared infrastructure investments and individual State agency project development along the rail corridor.

Such investments include, for example, wastewater system improvements in the Iwilei-Kapālama area that currently constrain TOD development potential for agencies such as HHFDC, DAGS, UH Honolulu Community College, as well as future phases of HPHA's Mayor Wright Homes redevelopment. While each of the priority areas are likely to have different infrastructure needs and timelines, the project as a whole will identify opportunities for collaboration on infrastructure investments and an overall strategy for infrastructure delivery that will benefit TOD project implementation on State lands and in surrounding neighborhoods.

Project Timeframe

June 2018–December 2019

Phase 1: Jun 2018–Dec 2018	Development of conceptual land use plan for State lands & identification of infrastructure requirements
Phase 2: Jan 2019–Dec 2019	Identification of infrastructure costs/financing & development of an infrastructure implementation plan, phasing & financing strategy

Project Consultant Team

PBR Hawaii (Prime)	Master planning, project management, and stakeholder outreach and engagement
RM Towill	Civil engineering
David Taussig & Associates	Development financing and alternative delivery methods
Fehr & Peers	Transportation engineering and multi-modal system planning
Callison RTKL	TOD master planning and urban design
Ron Ho & Associates	Electrical engineering and communications
ARUP	Green infrastructure and sustainable systems design

Attachment C.
Permitted Interaction Group Meeting Attendees

Mark Ritchie, Department of Business, Economic Development & Tourism
Deepak Neupane, Hawaii Community Development Authority
Carson Schultz, Hawaii Community Development Authority
Craig Hirai, Hawaii Housing Finance & Development Corporation
Leo Asuncion, Office of Planning
Ruby Edwards, Office of Planning
Rodney Funakoshi, Office of Planning
Robyn Loudermilk, Department of Education, Office of School Facilities & Support Services
Brenda Lowrey, Department of Education, Office of School Facilities & Support Services
Kenneth Masden, Department of Education, Office of School Facilities & Support Services
Heidi Meeker, Department of Education, Office of School Facilities & Support Services
Darrell Ing, Department of Hawaiian Home Lands
Allen Yanos, Department of Hawaiian Home Lands
Ian Hirokawa, Department of Land & Natural Resources
Blue Kaanehe, Department of Land & Natural Resources
Russell Tsuji, Department of Land & Natural Resources
Lynette Kawaoka, Department of Transportation, Airports
David Rodriguez, Department of Transportation
Ken Tatsuguchi, Department of Transportation, Highways
Robert Miyasaki, Department of Transportation, Statewide Transportation Planning Office
Carleton Ching, University of Hawaii
Bonnie Arakawa, University of Hawaii West Oahu
Kevin Ishida, University of Hawaii West Oahu
Stan Katsura, City and County of Honolulu, Department of Design & Construction
Mark Yonamine, City and County of Honolulu, Department of Design & Construction
Renee Espiau, City and County of Honolulu, Department of Planning & Permitting
Franz Kraintz, City and County of Honolulu, Department of Planning & Permitting
Harrison Rue, City and County of Honolulu, Department of Planning & Permitting
Kathy Sokugawa, City and County of Honolulu, Department of Planning & Permitting
Jorge Felix, City and County of Honolulu, Honolulu Authority for Rapid Transportation
Craig Arakaki, Engineering Concepts, Inc.
Alan Arakawa, D.R. Horton
Tracy Tonaki, D.R. Horton

Attachment D.
September 2018 Charrette Materials

Hawaii Interagency Council for Transit Oriented Development

East Kapolei Permitted Interaction Group Workshop / Charrette

Friday, September 21, 2018
HCDA, Community Room
8:30 a.m. – 12:00 p.m.

TOD Council Permitted Interaction Groups

Purpose

- **"more in-depth and targeted discussions of regional and project implementation issues among directly affected agencies needed to advance project development"**

8 Permitted Interaction Groups

East Kapolei	Kauai	Neighbor Islands
Halawa-Stadium	Maui	
Iwilei-Kapalama	West Hawaii	
	East Hawaii	

TOD Council Permitted Interaction Groups: Addressing Challenges and Needs for State TOD

Challenges/needs identified by TOD Council

- Need for unified, coordinated approach that melds State, County, private sector & community interests and provides strategic direction on investments & project specific coordination
- Coordination/sharing of regional infrastructure investments
- Committed source(s) of funding
- Incorporating best practices for TOD & financing
- Incentives for TOD to allow private & smaller land owner participation
- Incorporating sustainable development practices to address climate change

PIGs: means to address challenges/needs in particular region

STATE TOD PLANNING & IMPLEMENTATION FOR THE ISLAND OF O'AHU

East Kapolei Permitted Interaction Group –Workshop / Charrette
Friday, September 21, 2018
HCDA, Community Room
8:30 a.m. – 12:00 p.m.

OFFICE OF PLANNING
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT, & TOURISM

PBR HAWAII & ASSOCIATES, INC. · DAVID TAUSSIG & ASSOCIATES · CALLISONRTKL · R. M. TOWILL CORPORATION · ARUP

Agenda

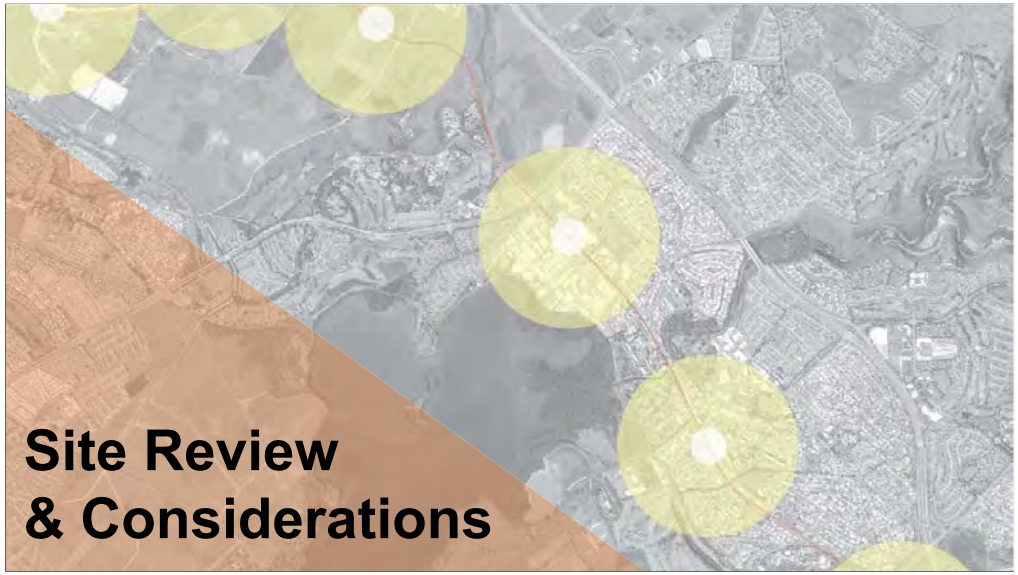
1. Introductions
2. Meeting Agenda, Objectives, and Ground Rules
3. Site Review and Considerations
4. Urban Design
5. Exercise 1: Teams Review Regional Plan
6. Infrastructure and Environmental Considerations
7. Exercise 2: Teams Enhance Design Concepts
8. Teams Report Back
9. Finance Considerations
10. Wrap-Up / Questions / Next steps

Objectives

- Consider regional synergies and conflicts and how they relate to the City's Neighborhood TOD Plans
- Advance regional plans acknowledging infrastructure
- Introduce potential financing tools relevant to projects and/or landowners

Ground Rules

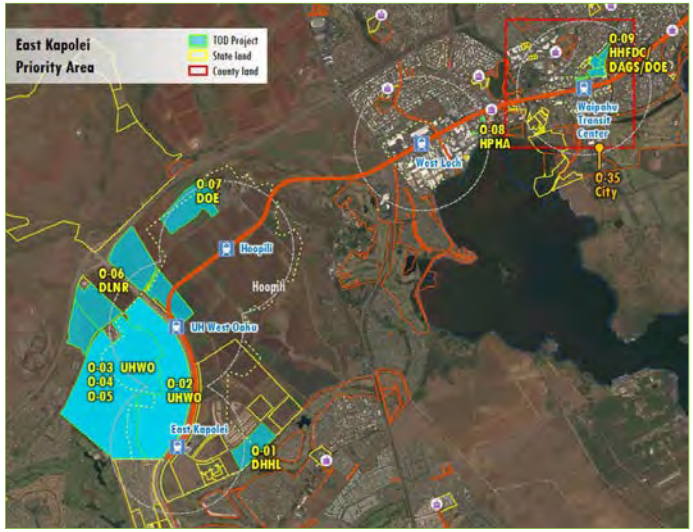
1. Work together
2. Look at the long term
3. Be honest about self interests
4. Be open to "showing your cards"
5. We're here to brainstorm
6. Idea is to get good ideas on the table



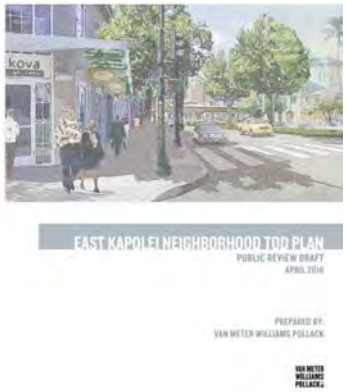
Site Review & Considerations

Project

TOD STATION ANALYSIS: EAST KAPOLEI



East Kapolei Neighborhood TOD Plan Vision:



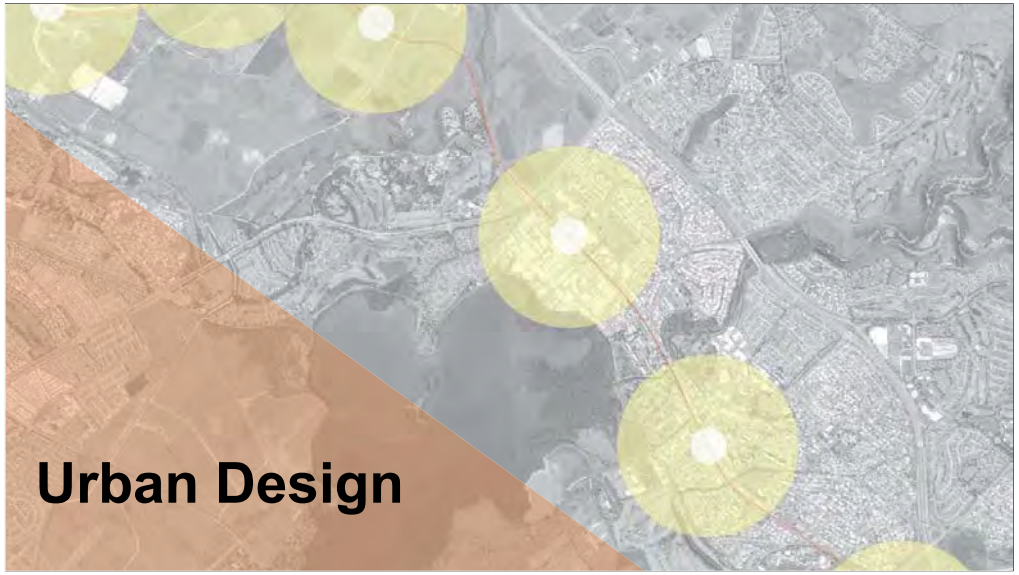
- *Sustainable, responsible, and integrated community*
- *Transit oriented development sites that provide a series of transportation options for residents, workers, and visitors alike*
- *Compact, pedestrian friendly environments that provide numerous housing, employment, and recreational opportunities*

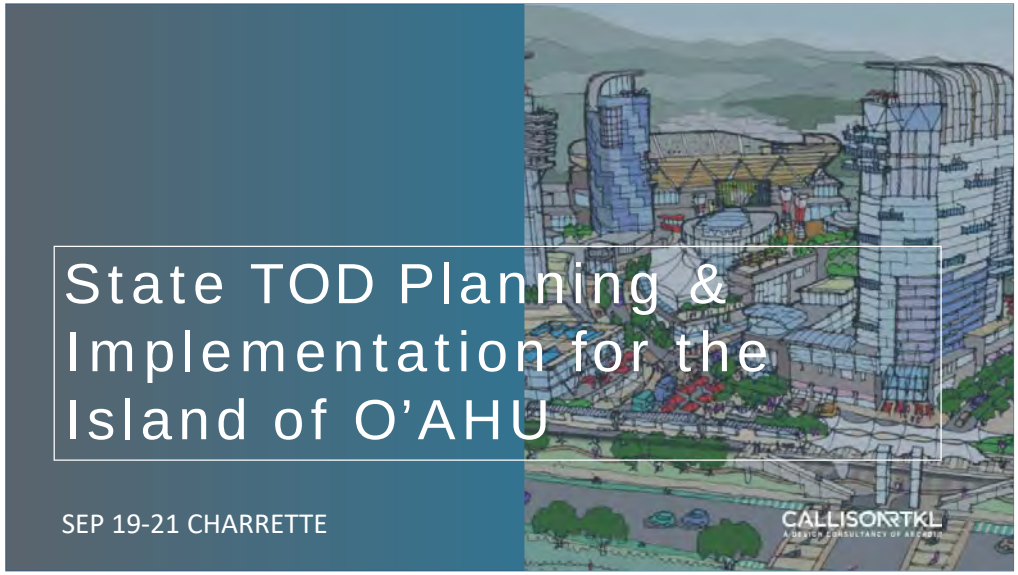
WHAT WE'VE HEARD TO DATE

- School facilities
- Connectivity
- Infrastructure

GROUP INPUT

Anything we've missed?



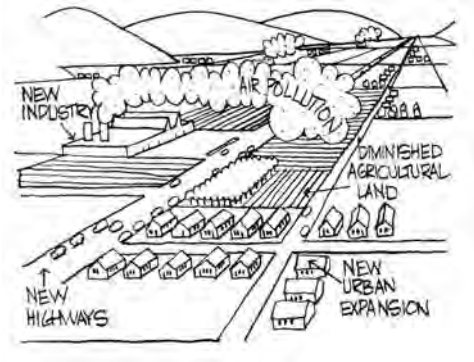


SMART GROWTH + TRANSIT ORIENTED DEVELOPMENT

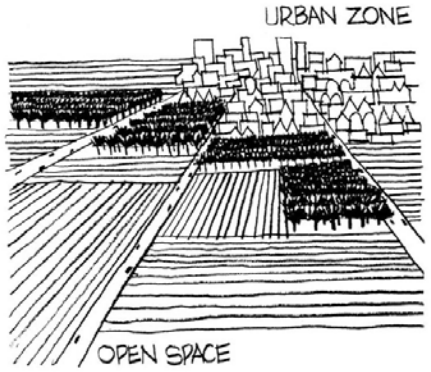
CALLISONRTKL

AVOIDING SPRAWL

SPRAWL



COMPACT URBAN DEVELOPMENT



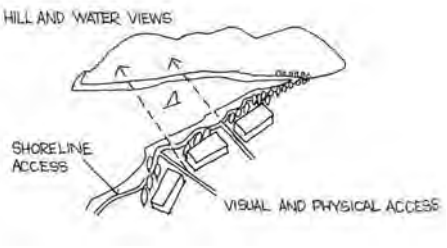
CALLISONRTKL

Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

CONNECTION TO NATURE

PRESERVE NATURAL BEAUTY, OPEN SPACE, AND CRITICAL ENVIRONMENTAL AREAS

IMPROVED ACCESS / INCREASE APPRECIATION

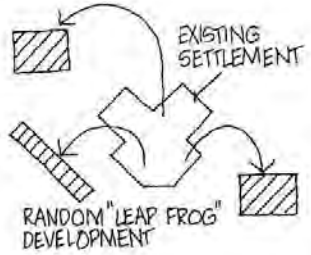


CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

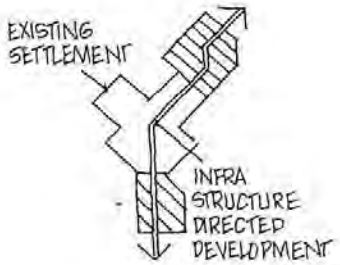
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

DEVELOPMENT LINKED TO INFRASTRUCTURE INVESTMENT

"LEAP FROG" DEVELOPMENT



DIRECT DEVELOPMENT TOWARDS EXISTING COMMUNITIES



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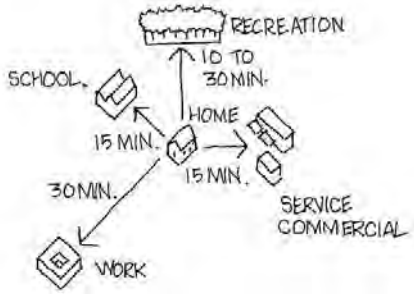
A DESIGN CONSULTANCY OF ARCADIS

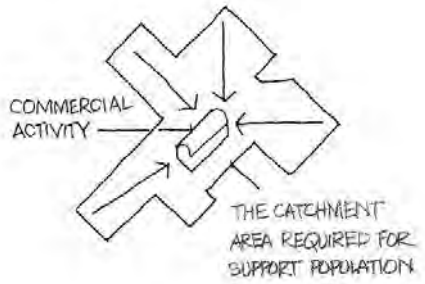
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

MORE CONVENIENCE

ADJACENT AMENITIES + SERVICES



CRITICAL MASS OF LOCAL POPULATION



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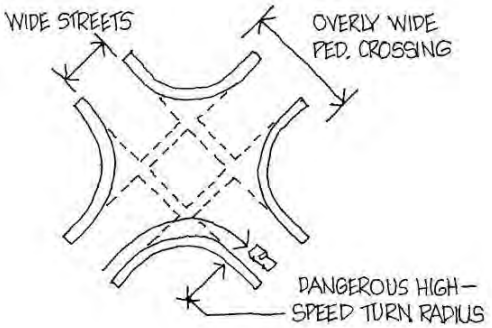
A DESIGN CONSULTANCY OF ARCADIS

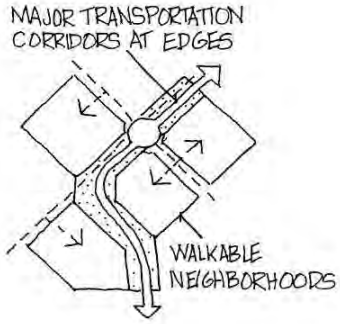
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

FOCUS ON PEDESTRIAN

CAR DOMINANT



WALKABLE NEIGHBORHOOD

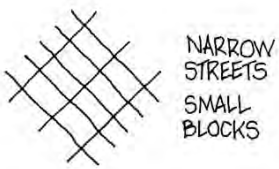


CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

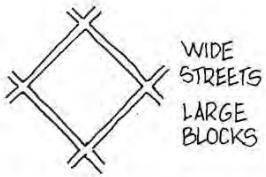
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

COMPACT BLOCK STRUCTURE

SMALL BLOCKS WITH DIVERSITY AND HIGHER EFFICIENCY



GIANT BLOCK WITH LOWER EFFICIENCY

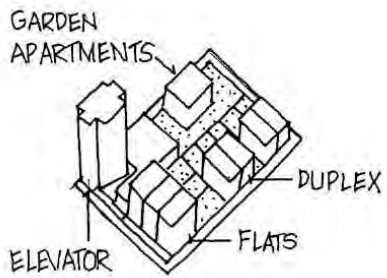


CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

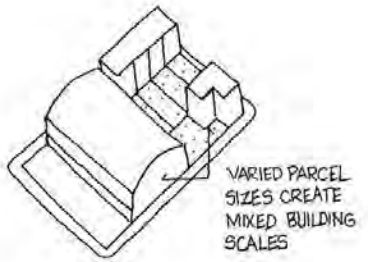
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

DIVERSITY OF LAND USE AND HOUSING

MIXE OF HOUSING TYPES



VARIOUS PARCEL SIZES AND BUILDING SCALES



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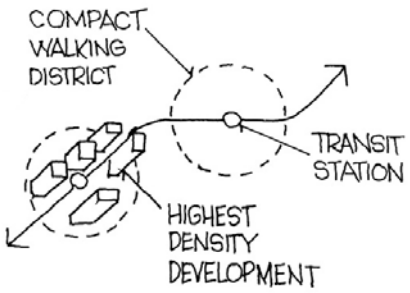
A DESIGN CONSULTANCY OF ARCADIS

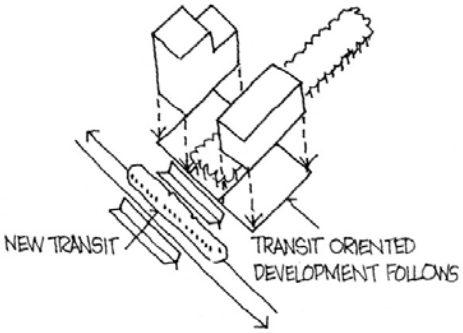
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

HIGHEST DENSITY AT STATIONS

HIGH DENSITY WITHIN WALKING DISTANCE OF STATION



HIGHEST DENSITY AT STATION AREA

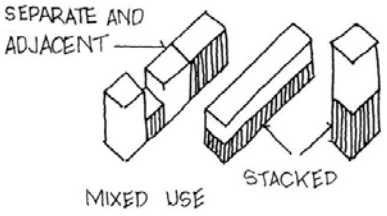


CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

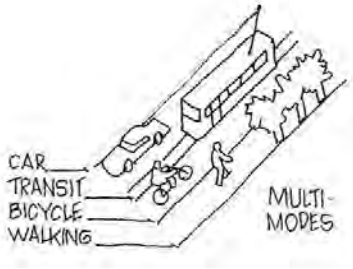
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

INCREASED CHOICE IN MOBILITY AND LAND USE

ADJACENT AND VERTICALLY INTEGRATED MIXED USES



MULTIPLE TRANSPORTATION CHOICES



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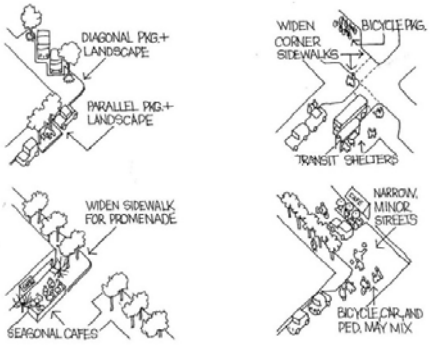
A DESIGN CONSULTANCY OF ARCADIS

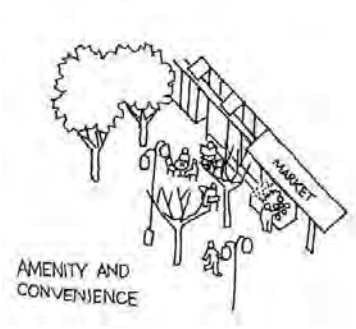
Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

APPEALING STREETSCAPE AND INTIMATE SPACES

STREETS FOR PEOPLE



PROVIDE 'ASSETS' OF LIVABILITY



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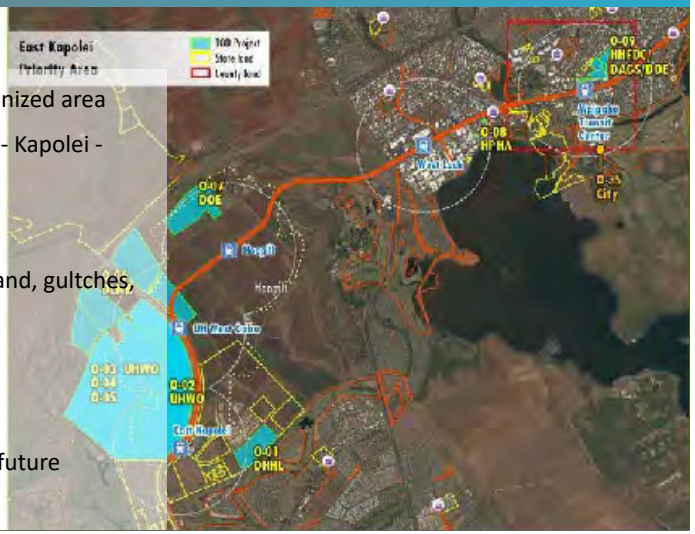
A DESIGN CONSULTANCY OF ARCADIS

Source: John Lund Kriken. City Building – Nine Planning Principles for the Twenty-first Century.

EAST KAPOLEI

AREA CHARACTERS

- At the outskirt of the urbanized area
- Near planned community - Kapolei - "second city" of Oahu"
- Regional shopping center
- Natural resources – farmland, gultches, mountains, etc.
- H1 freeway access
- Future campus growth
- Competition w/ Kapolei's future development



TOD PRINCIPLES

- ✓ Town/Gown relationship – UC Berkeley
- ✓ Innovation cluster– Novus, Tech Square
- ✓ Student/Faculty/Entrepreneur-centric– USC Village
- ✓ Streets for people – My Fig
- ✓ Green network – Celebration FL
- ✓ Flexibility for growth – UC Merced

1 TOWN/GOWN RELATIONSHIP

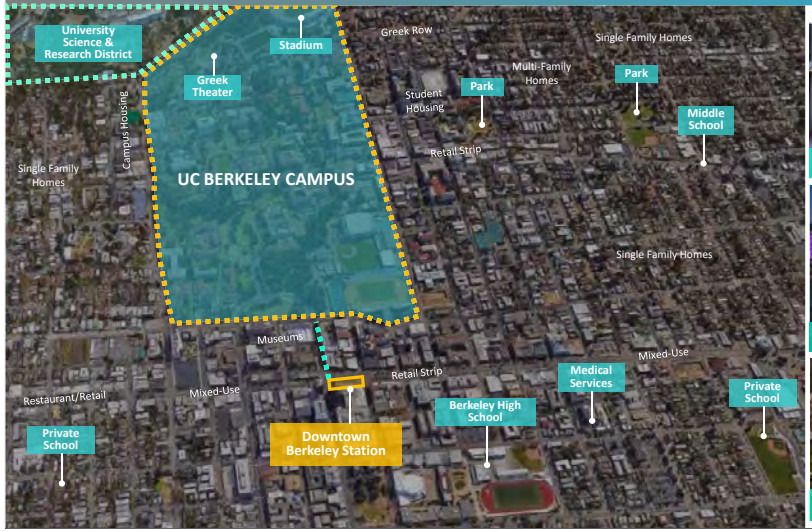
CALLISONRTKL
A DESIGN CONSULTANCY OF ARCADIS

Downtown Berkeley Station Hub

A modernized dinning, arts, and education hub facilitating connectivity to adjacent university and downtown.

UC BERKELEY
Berkeley, California

STATION HUB SERVES BOTH CAMPUS & NEIGHBORHOOD




Station Entry


Greek Theater


Stadium

STATION SUPPORTIVE DEVELOPMENT

- **LOCATION**: On Shattuck Avenue between Allston Way & Addison St. Within a 0.25 mile radii of campus
- **SURROUNDING DEVELOPMENT:**
  - Over 1,400 residential units
  - 90,000 sq ft of retail space
- **MULTI MODAL CONNECTIONS:**
  - AC Bus Transit
  - Bicycle Facilities & Network
  - Walkable Pedestrian Network
  - Zipcar


Projected Development


Station Supportive Development

STATION AS A WORLD-CLASS GATEWAY

- **LESSONS LEARNED**
  - Community based functionality
  - Establish Station as a world-class gateway to the city and UC Berkeley Campus
  - Enhance access between station and Downtown Berkeley neighborhoods
  - Improve the station's function, safety, capacity and appearance
  - Incorporate art and community identity into the stations placemaking efforts
  - Reflect BART systems sustainability goals
  - Add station amenities to improve commuter experience


Modernized Entry


Active Frontages


Placemaking


Multi-modality

Bike Valet


Station Plaza

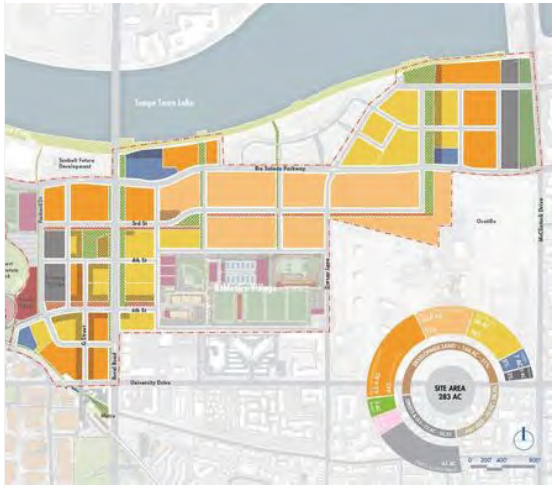
A TECH ORIENTED COMMUNITY NEAR CAMPUS

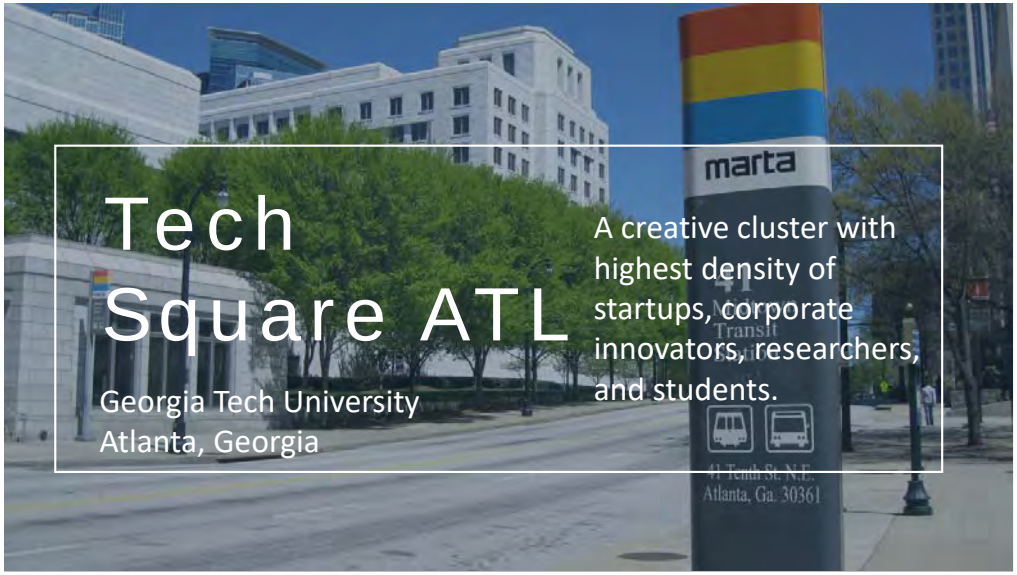
LOCATION: Downtown Tempe adjacent ASU campus

PROJECT SIZE: 8 million GSF +/ (Phase 1: 1 million GSF+/-, 20 AC SITE AREA)

LESSONS LEARNED:
- Flexibility of master plan
- Mix of Class A office, residential, hotel, retail, and entertainment
- 5 neighborhoods with distinctive character that complement one another
- Apply innovation products & ideas to overall community improvement
- Leverage adjacent world-class sports and entertainment destination
- Employ sustainability & smart city technologies in campus design
- ASU-driven smart partnerships of 500+ global companies
- Brings in approximately 20,000 jobs and 5,000 residents

A FLEXIBLE MASTER PLAN FOR ACCOMODATING FUTURE GROWTH





Tech Square ATL

Georgia Tech University
Atlanta, Georgia

A creative cluster with highest density of startups, corporate innovators, researchers, and students.

INNOVATION DISTRICT ADJACENT CAMPUS

MIX OF HOUSING, CREATIVE OFFICES, START UPS, HOSPITALITY

- **LOCATION**: Adjacent to Georgia Tech University Campus. Within 1/2-1/4 mile radii of Midtown Station
- **DISTIRCT SIZE:**
  - **1.4 million-square-foot** bike-friendly, urban **mixed-use development**
  - 1.2 Square Mile Midtown Improvement District
- **MULTI MODAL CONNECTIONS:**
  - MARTA Rail
  - Bus Transit
  - Bicycle Network & Relay Bikes
  - Tech Trolley
  - Zipcar
  - Walkable Campus Network
- **LESSONS LEARNED**
  - Attract creative class workers
  - Create more destinations around MARTA
  - Reduce congestion
  - Support high rise housing
  - Density and rich mi of land uses
  - Creating more of a "24/7" environment

Midtown Improvement District

Neighborhood Uses

Introduction of Highrise Housing

ACCESIBLE AMENITEIS + MULPLE TRANSPORTATION CHOICES

Tech Trolley


Bike Share


Nightlife


Super Market

Georgia Tech


Arts & Culture

BRANDING AND WAYFINDING STRENGTHENS THE ENTRY OF THE AREA

3 STUDENT/FACULTY/ ENTREPRENEUR-CENTRIC AMENITIES & SERVICES

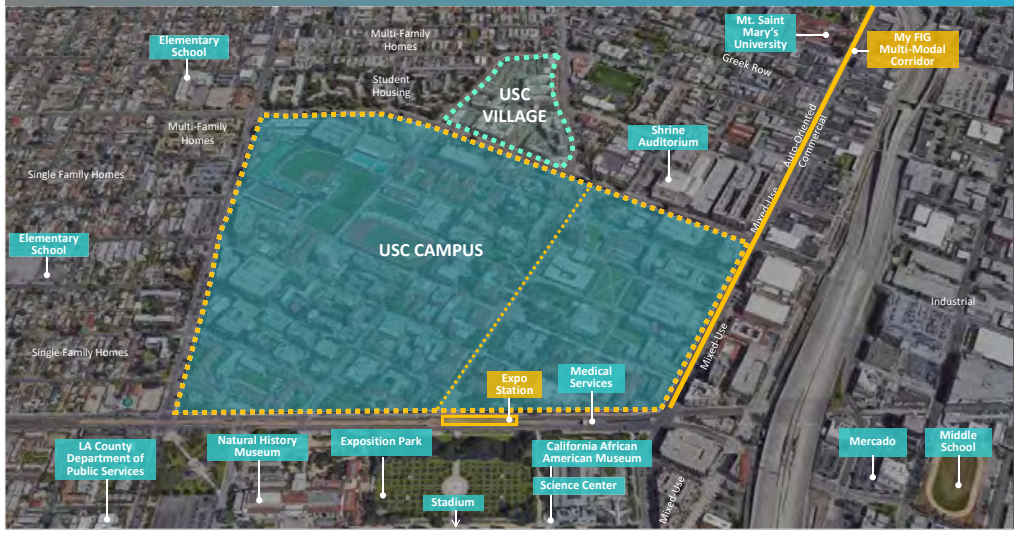
CALLISONRTKL

USC Village

University of Southern California
Los Angeles, California

A transit accessible living and learning environment fostering a built-in community open to USC's community and neighbors.

ACCESSIBLE AMENITIES & SERVICES FOR STUDENTS AND NEIGHBORHOODS



KEY CHARACTER & LESSONS LEARNED

- **LOCATION**: Adjacent to USC Campus. Within a 0.30 mile radii of Expo Station
- **VILLAGE SIZE:**
  - 15 AC campus extension
  - 148,000 ground floor retail
  - 663 student housing units
- **MULTI MODAL CONNECTIONS:**
  - Metro Rail
  - Metro Bus Transit
  - Bicycle Network
  - Walkable Campus Network
- **LESSONS LEARNED**
  - Increase student housing to reinforce USC as a residential campus
  - Enhance the pedestrian experience of the campus.
  - Use flexible planning frameworks to allow for uncertainties of future campus development needs and opportunities.
  - Use open space and circulation as the organizing framework.
  - Identify opportunities to make mutually beneficial connections, provide continuity and enhance the physical form, enjoyment and use of the campus and its surrounding residential community.
  - Use traffic moderation strategies and encourage multimodal transportation.

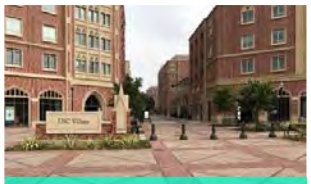
Compact Configuration

Neighborhood Uses

Pedestrian Focused Connections

MULTIPLE TRANSPORTATION CHOICES + DIVERSE PROGRAMS

My Fig Project – Complete St



Traditional Architectural Style

Bike Share

Entertainment Venue

Neighborhood Third Place

Student Housing w/ Active Ground Floor Uses

MyFig Project

LOS ANGELES, CA

A complete street project transforms the corridor into a multimodal street that better serves the needs of pedestrians, bicyclists, transit riders, and drivers alike.

CREATE A STREET FOR PEOPLE

11th and Hope

Project Area

Figueroa and 11th

MLK and Hoover

LOCATION: Along Figueroa Street from 7th Street to Martin Luther King Jr. Blvd.

LESSONS LEARNED:

- Complete street corridor
- Remake Figueroa Street for people
- Better signalization and signage, high-visibility crosswalks, transit platforms, more street trees, and public art
- A 3-mile protected bike lane expand city's bike network
- Funded by a Proposition 1C grant. Proposition 1C funding improves infrastructure for new development in urban areas, with the goal of making streets, sidewalks and transit more accessible for residents of affordable housing

Bell Street Park

SEATTLE, WA

A park-like transportation corridor through the belltown shared by pedestrians, cyclists, and automobiles.

SHARED BY ALL MODES

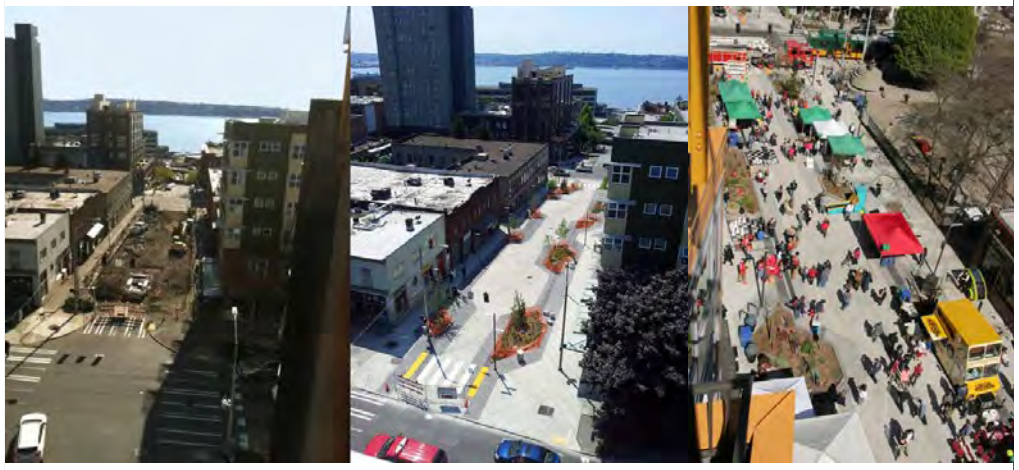
LOCATION: Bell street from 1ST – 5th Ave

PROJECT SIZE: 56,000 square-foot

LESSONS LEARNED:

- A raised, shared street space
- A single travel lane for pedestrians, buses, bicyclists, and autos
- Improved landscaping, better lighting, and more open space
- Strong city/community collaboration
- Programming and community events
- Promote the growth of Belltown as a compact, mixed-use, multi-modal neighborhood

A STREET PARK



SUBURBAN PLANNED COMMUNITY

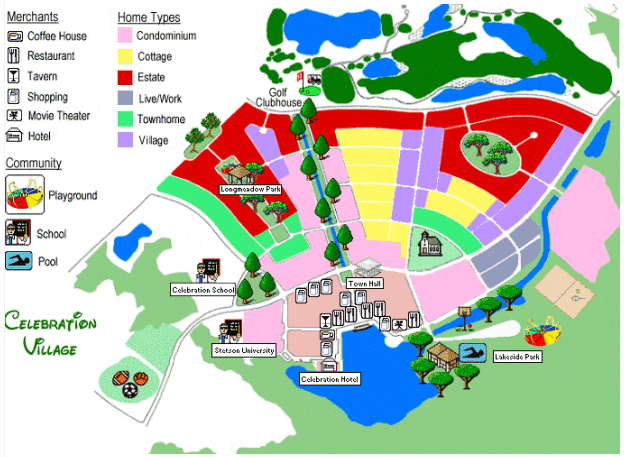
LOCATION: Celebration, FL

PROJECT SIZE: 11 Sq Mi

LESSONS LEARNED:

- A master-planned community with residential, retail, live/work, and civic component
- A direct Connection with Disney World Resort
- Naturalized /daylighted gulch act as a green infrastructure spine that links the golf course and the lake.
- A green space network comprises of parks, gulch, recreational space, etc.

DAYLIGHTING GULCH AS GREEN INFRASTRUCTURE SPINE



SUBURBAN PLANNED COMMUNITY

LOCATION: San Joaquin Valley, CA

PROJECT SIZE: 2000 +/- AC

LESSONS LEARNED:

- A compact, walkable environment for living and learning.
- Dynamic public spaces
- Adapted to changes in use and future expansion.
- Preserves the agricultural and environmental basis of its economy and ecosystem
- Sustainability: "triple net zero"—zero net energy, zero landfill waste, and zero net greenhouse gas emissions.
- The expansion is being delivered as a P3 structure

A MODEL FOR GROWTH

Exercise 1: Review Regional Plans

Infrastructure & Environmental Considerations

ROADWAYS

- Roadway networks master planned for most of East Kapolei in DHHL, Hoopili and UHWOC Roadways to be constructed in phases.
- Roadways will be constructed to support the developments.
- Need to improve Farrington Highway from the Kapolei Golf Course Driveway to Ft. Weaver Road
- DLNR properties are in the planning stage.

WATER AND SEWER

- Water and sewer are master planned for most of East Kapolei for DHHL, UHWOC and Hoopili.
  1. Underground Water and Sewer Infrastructure will be constructed with the Project Roadways.
  2. Water Reservoirs and Booster Pump Stations will be constructed as Development Progresses.
  3. Regional Water Allocations approved for these developments
  4. Water sources are adequate for more new development but the Ewa Shaft is the next water source required to meet the needs of the Ewa Development Plan
  5. Regional Sewer Allocations approved for these developments
  6. Regional Trunk Sewers do not have Excess Capacity
- DLNR Properties are in the Planning Stage.

DRAINAGE

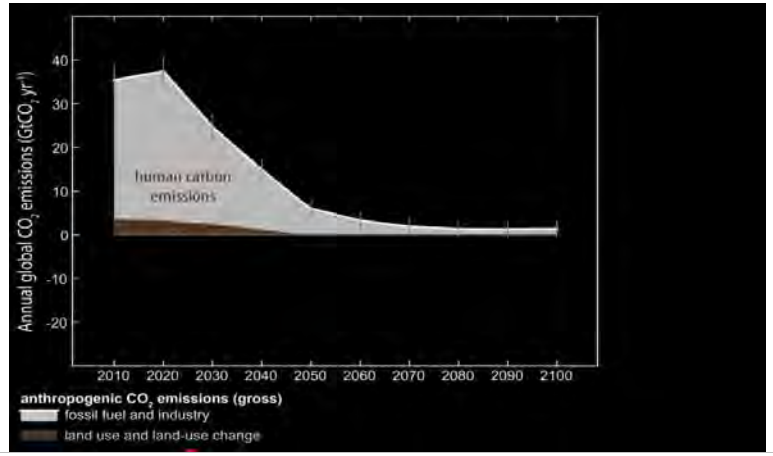
- Drainage is master planned for most of East Kapolei for DHHL, UHWOC and Hoopili.
  1. Most of the Drainage Existing and Planned Drainage Systems Connect to Kaloi Gulch
  2. Increase in Runoff will be Detained on-site
  3. Increase in Peak Flow to be Mitigated on-site with Detention Basins
- DLNR Properties are in the Planning Stage
  1. Kaloi Gulch is Unchannelized through the DLNR Lands
  2. Increase in Runoff and Peak Flow will have to be Mitigated on-site

ELECTRICAL AND TELECOM

- Electrical and Telecommunications Systems are Master Planned for DHHL, UHWOC and Hoopili.
  1. New underground infrastructure will be constructed within the project roadways to support the development.
  2. New substations will be required to provide electrical distribution service to these areas.
- DLNR Lands are in the Planning Stage

A 66% chance *if we act effectively*

Science 2017, Stockholm Resilience Center, Johan Rockstrom



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Optimism at the 2018 Global Climate Summit

- The mayors of 19 cities presiding over 130 million city-dwellers including Copenhagen, Johannesburg and Tokyo, made a net-zero carbon pledge for all new buildings by 2030.
- 400 investor members, representing $32 trillion in assets, committed "to accelerate and scale up" climate action to support the Paris Agreement.
- The Under2 Coalition now represents 43% percent of the planet's economy and 1.3 billion people.
- The We Are Still In campaign now counts 3,540 corporate signatories pledging to uphold the Paris Agreement.

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Hawaii becomes first State to pass laws supporting Paris Climate Accord (June 2017)

*"climate change… is the **overriding challenge of the 21st century** [and] ...poses immediate and long-term threats to the State's economy, sustainability, security, and way of life.*

*…The State shall expand strategies… **among all agencies, departments,** industries, and sectors, including transportation."*

Gov. Ige signed SB 559 (Act 032), June 2017

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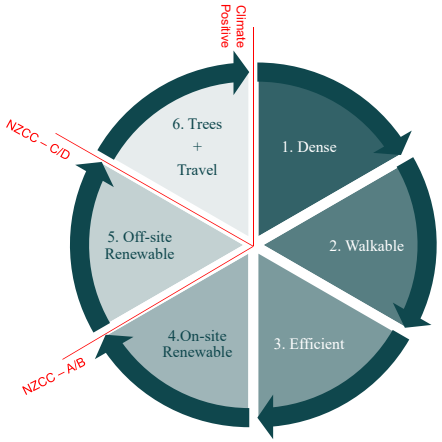
Affordable, Healthy, and Innovative

Climate Positive Communities

Effective Action – Climate Positive Community



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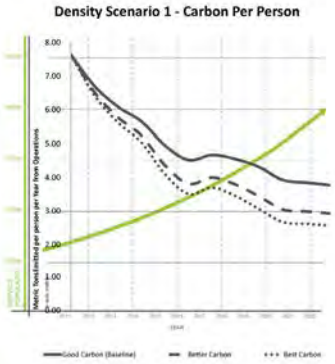
Density Enables Deep Improvements



Density
(FAR of 1x)

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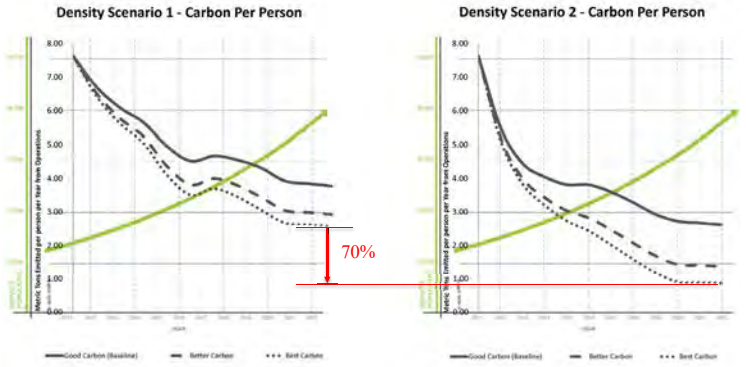
Density Enables Deep Improvements



Density
(FAR of 1x)

2x Density
(FAR of 2x)

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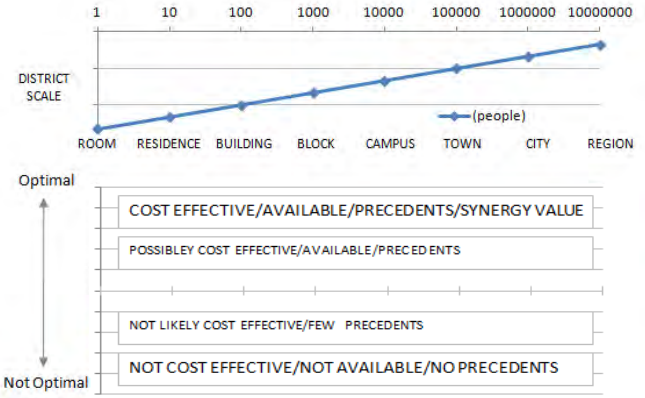
Optimal Scales



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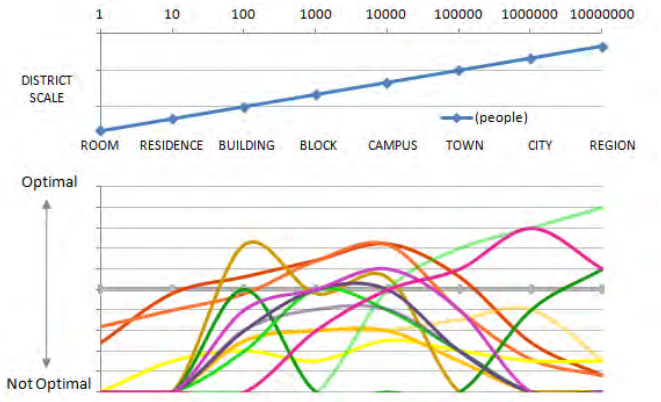
Optimal Scales



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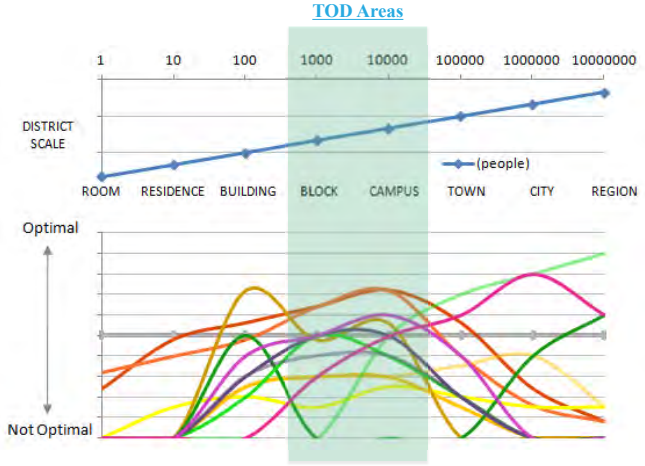
Optimal Scales

TOD Areas



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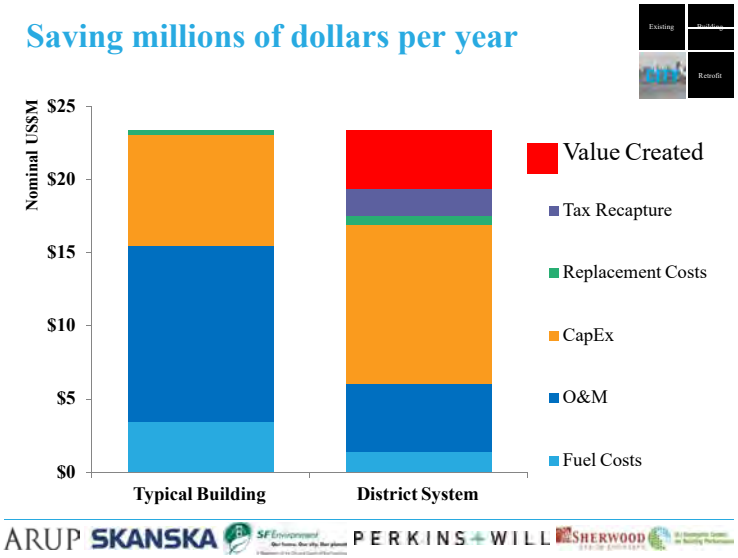
Saving millions of dollars per year



ARUP SKANSKA PERKINS+WILL SHERWOOD

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Establish, Expand, Optimize, Maximize

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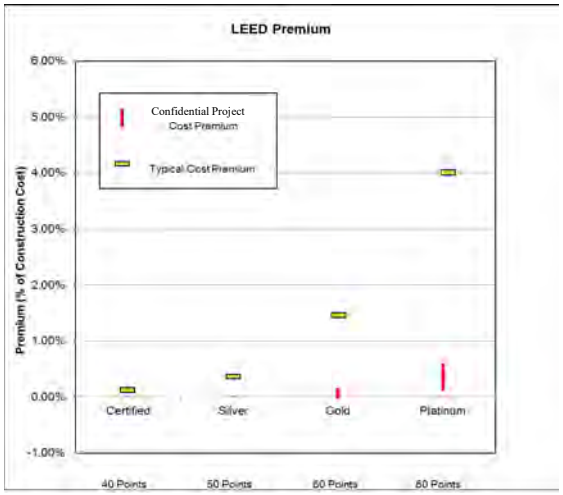
Zero Net Carbon Performance Standards



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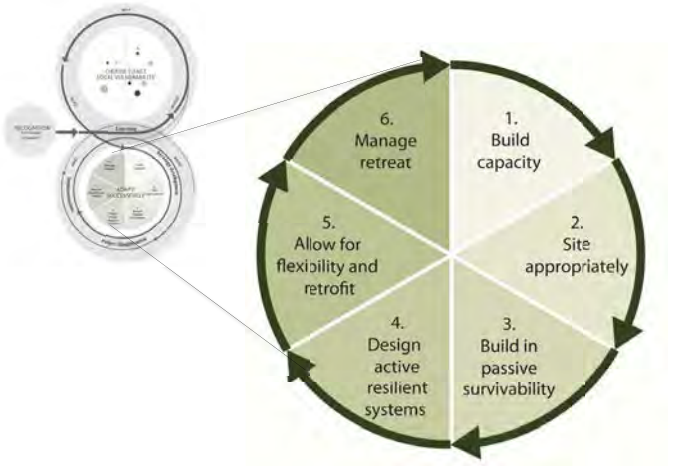
Adaptation

Resistance & Resilience

Act Successfully: Comprehensive + Time Based



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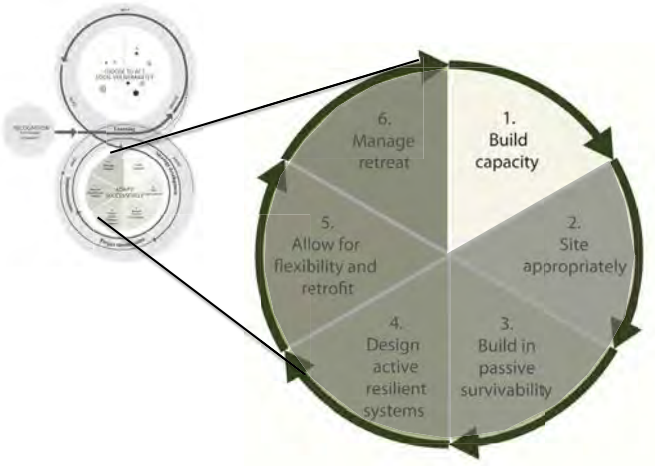

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Building Community + Innovation

MARILY OPPEZZO

Want to be more creative? Go for a walk

When trying to come up with a new idea, we all have times when we get stuck. But according to research by behavioral and learning scientist Marily Oppezzo, getting up and going for a walk might be all it takes to get your creative juices flowing. In this fun, fast talk, she explains how walking could help you get the most out of your next brainstorm.

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Climate Resilience Design Guidance

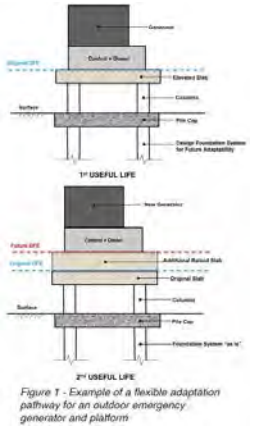
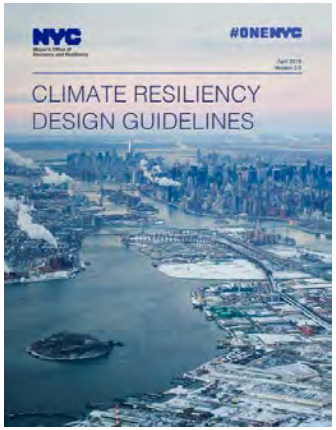


Figure 1 - Example of a flexible adaptation pathway for an outdoor emergency generator and platform



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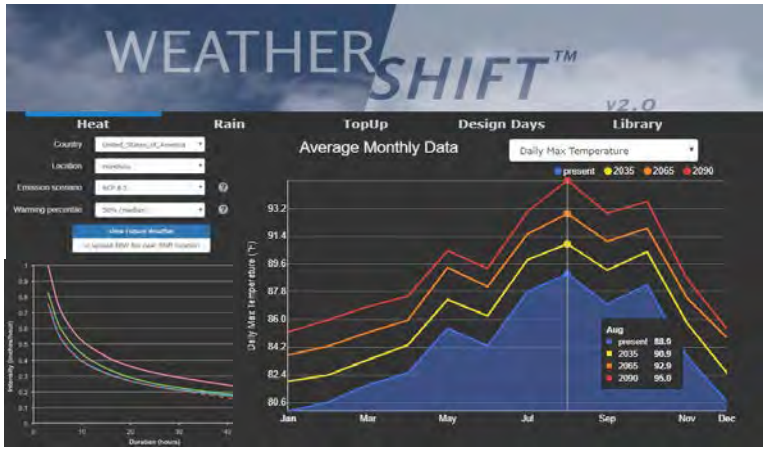
Climate Resilience Design Data



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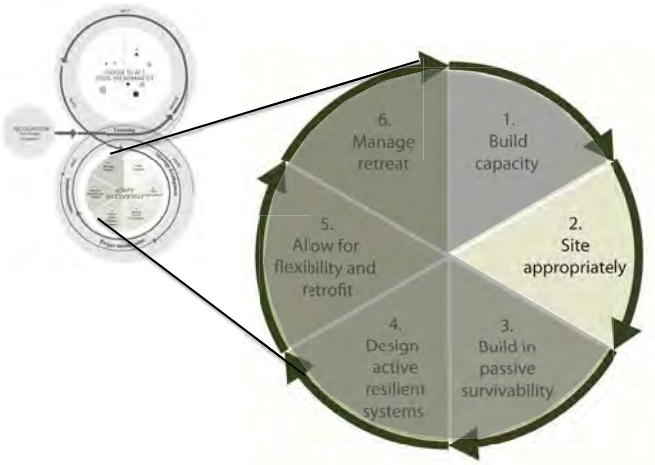

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De-site – Cheonggyecheon Stream

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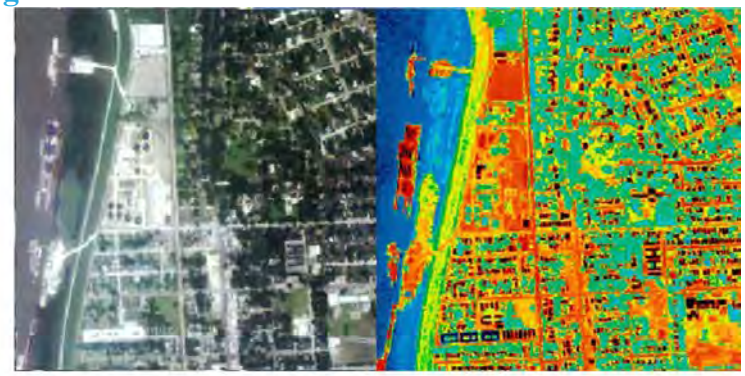
Synergies – Heat Island Reduction



Baton Rouge Urban heat Island
" The bright red areas in this image are about 65 deg. C (149 deg. F); dark green and blue areas are around 25 deg. C (77 deg. F). The solid blue swatch of color flowing down the left side is the Mississippi River.
http://science.nasa.gov/science-news/science-at-nasa/1998/essd20nov98_1/

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Masonic Boulevard

Masonic Avenue: typical existing roadway section

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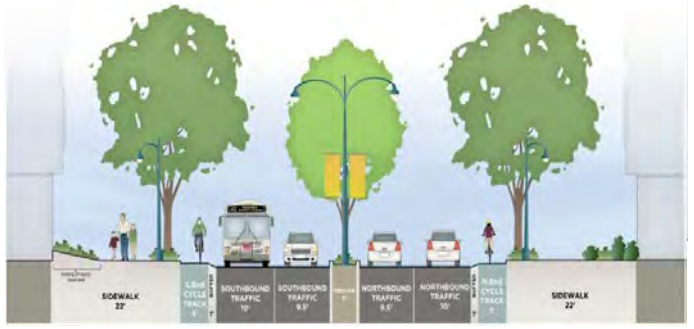
Masonic Boulevard

Masonic Avenue: typical proposed roadway section



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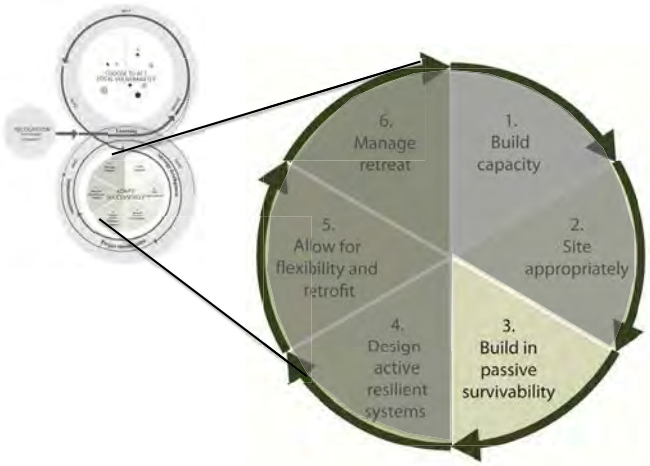

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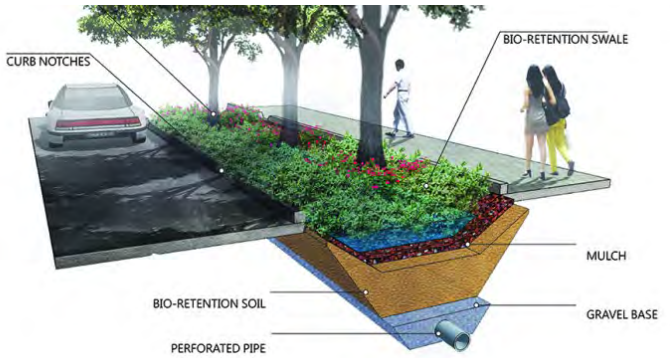
Green Infrastructure - Bioswales



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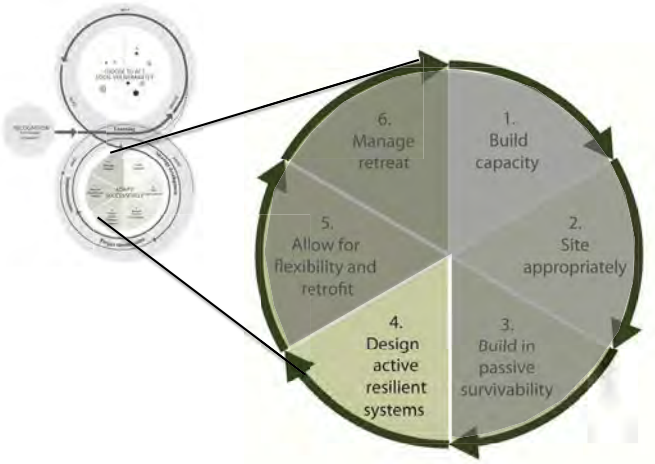

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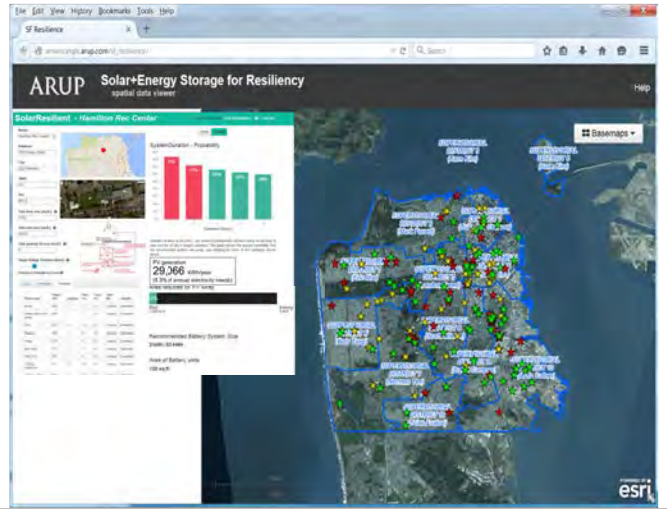
SolarResilientTM



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Exercise 2: Enhance Design Concepts

Report Back

What about Finance?

NEXT STEPS / SCHEDULE

- "Homework"
- Compilation of alternatives
- We'll keep in touch!

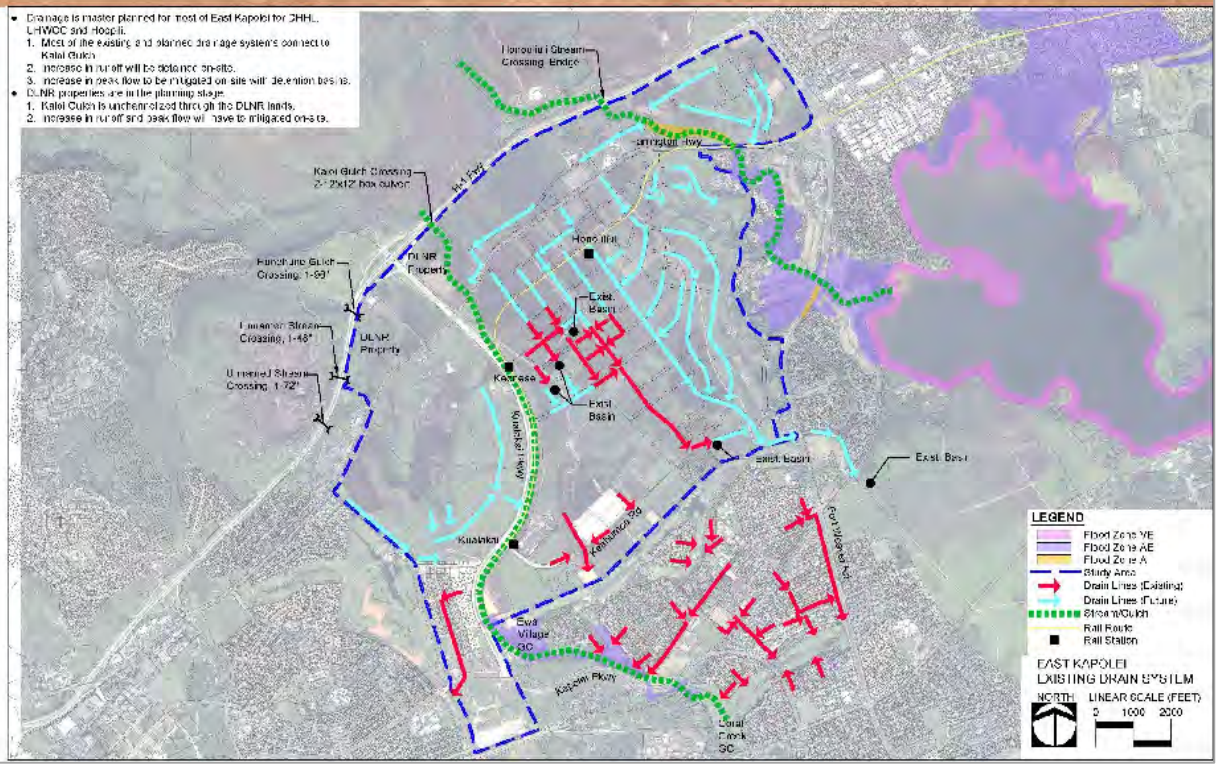
Attachment E.
Key Infrastructure Conditions in East Kapolei TOD Priority Area

Infrastructure: Sewer

- Master Planned for most of East Kapolei
  - Underground sewer infrastructure will be constructed with the project roadways
  - Regional sewer allocation approved for DHHL, UHWO, and Hoopili
  - Regional trunk sewers do not have excess capacity
- DLNR properties are in the planning stage

Infrastructure: Drainage

- Master Planned for most of East Kapolei
  - Most of the existing and planned drainage systems connect to Kaloi Gulch
  - Increase in runoff will be detained on-site
  - Increase in peak flow to be mitigated on site with detention basins
- DLNR properties are in the planning stage
  - Kaloi Gulch unchannelized through the DLNR lands
  - Increase in runoff and peak flow will have to be mitigated on-site



Infrastructure: Water

- Master Planned for most of East Kapolei
  - Underground water infrastructure will be constructed with the project roadways
  - Water reservoirs and booster pump stations will be constructed as development progresses
  - Regional sewer allocation approved for DHHL, UHWO, and Hoopili
  - Water sources are adequate for more new developments but the Ewa Shaft is the next water source required to meet the needs of the Ewa Development Plan
- DLNR properties are in the planning stage