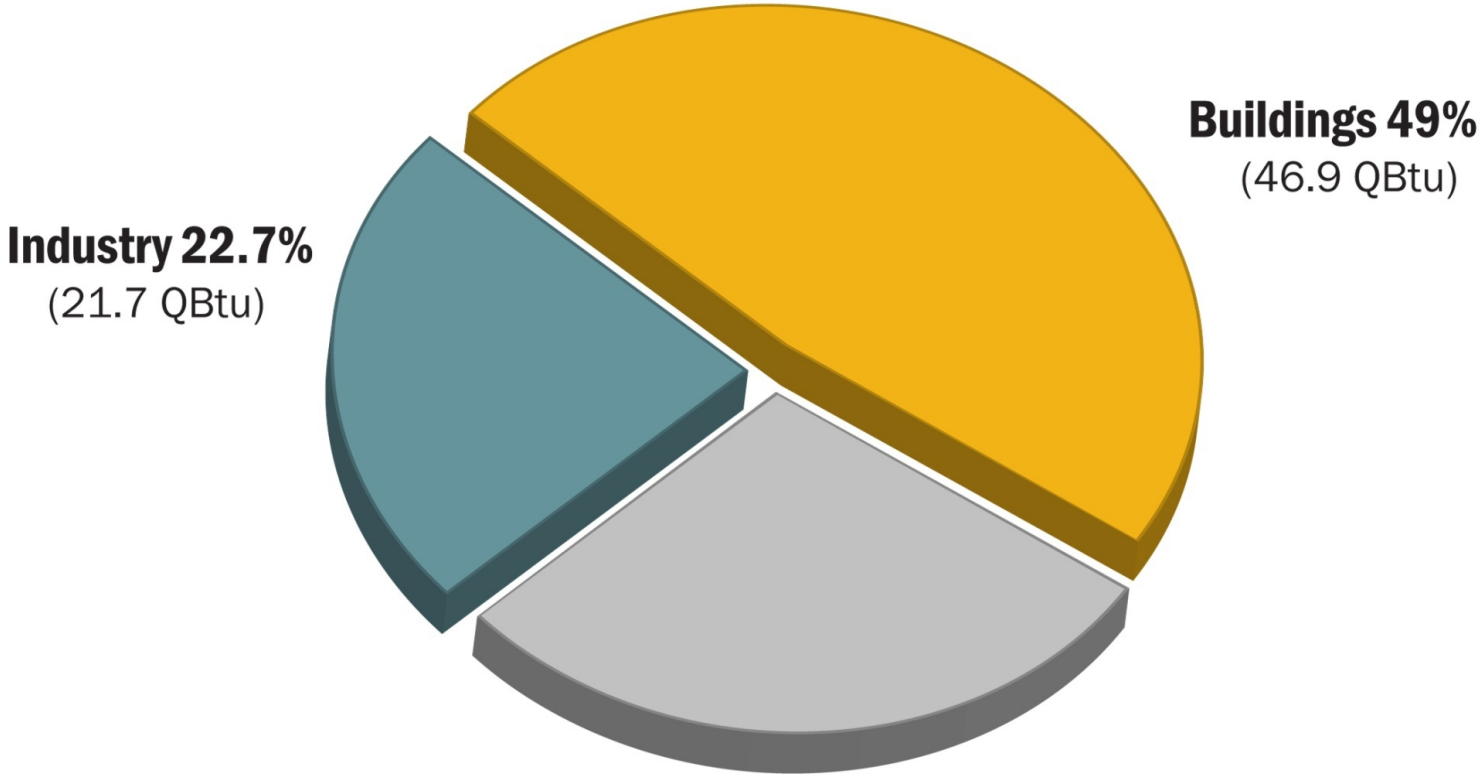
Seattle 2030 District

The Rise of a District

Matthew Combe
Program Director

SEATTLE 2030 DISTRICT

The National Context:

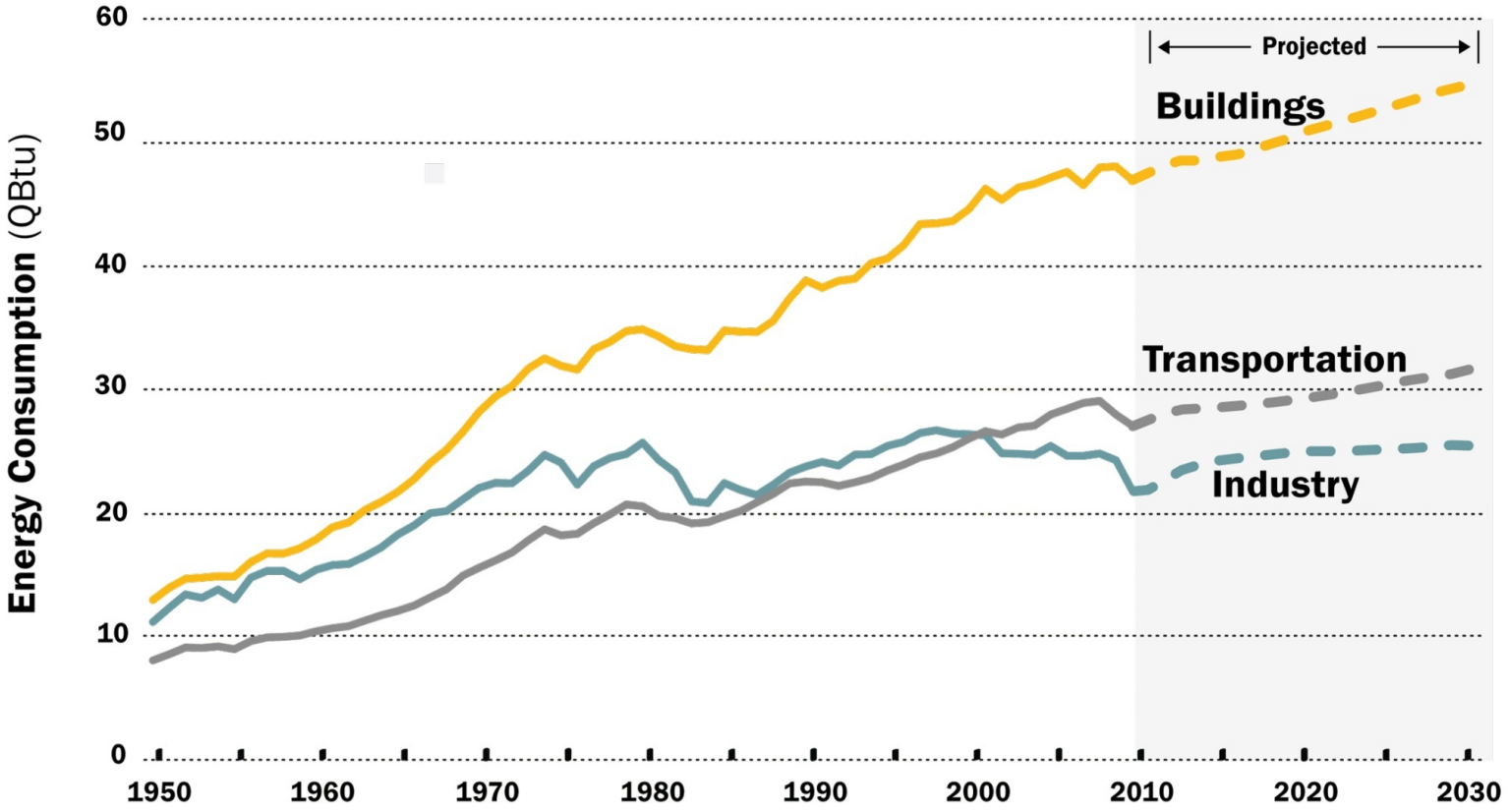


U.S. Energy Consumption by Sector

Data Source: U.S. Energy Information Administration (2009).

SEATTLE 2030 DISTRICT

The National Context:



U.S. Energy Consumption by Sector (Historic / Projected)

Data Source: U.S. Energy Information Administration.

SEATTLE 2030 DISTRICT

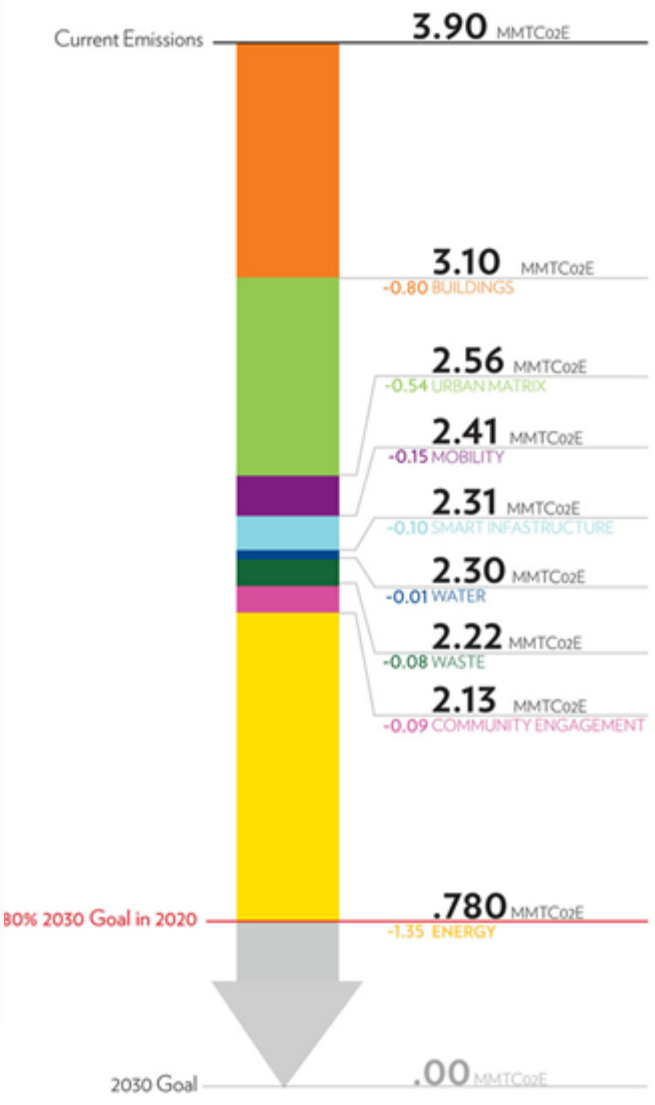
A Moment of Inspiration

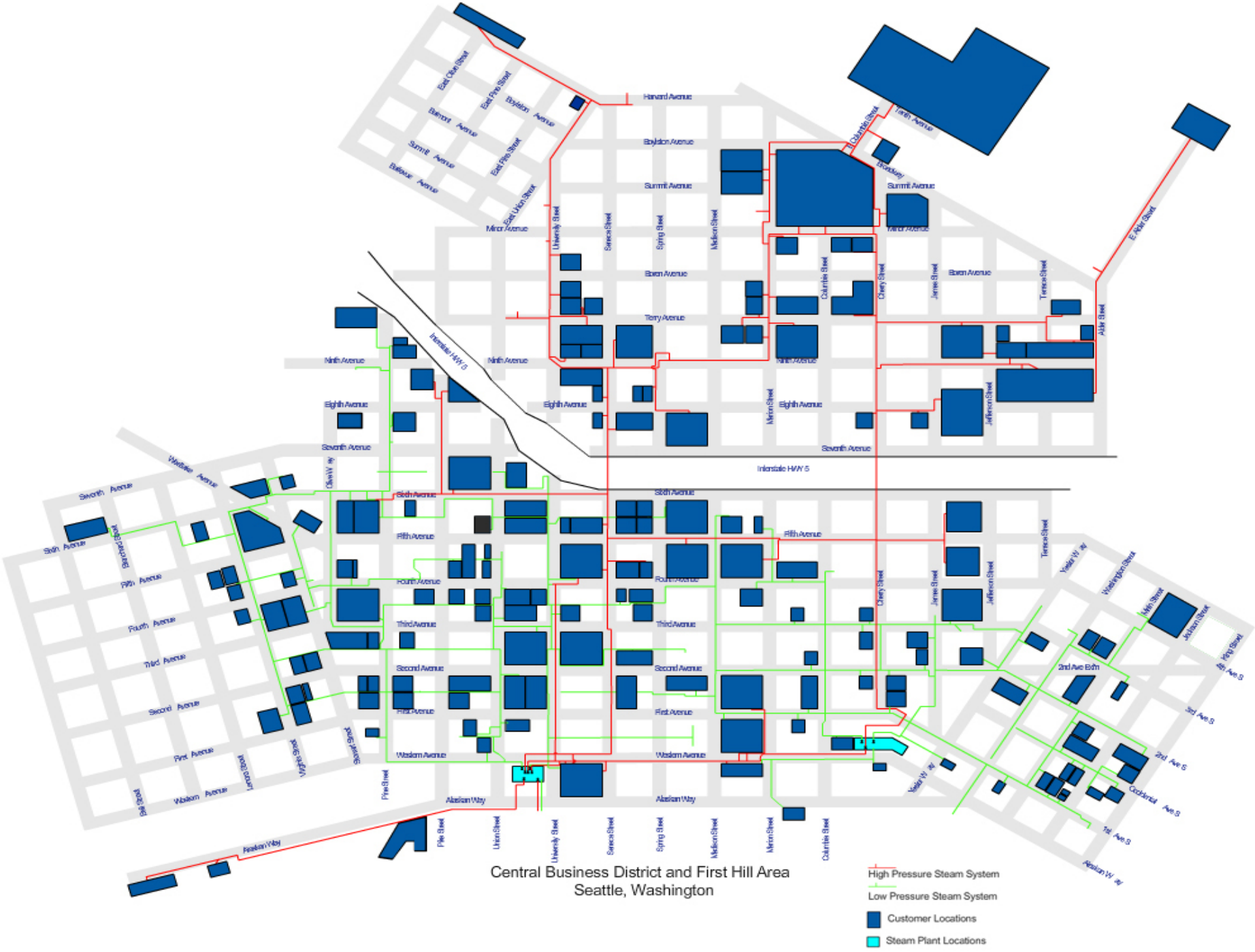
ARCHITECTURE

Adrian Smith + Gordon Gill Hatch Massive Plan to DeCarbonize Chicago

by Lea Bogdan, 02/22/10

filed under: Architecture, global development, Policy, Urban design




Central Business District and First Hill Area
Seattle, Washington
High Pressure Steam System
Low Pressure Steam System
Customer Locations
Steam Plant Locations
Harvard Avenue
Boylston Avenue
Summit Avenue
Minor Avenue
Aloha Street
Terry Avenue
Ninth Avenue
Eighth Avenue
Seventh Avenue
Sixth Avenue
Fifth Avenue
Fourth Avenue
Third Avenue
Second Avenue
First Avenue
Western Avenue
Alaskan Way
Interstate HWY 5
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Spring Street
Seneca Street
University Street
Union Street
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Columbia Street
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Jefferson Street
Terrace Street
Yesler Way
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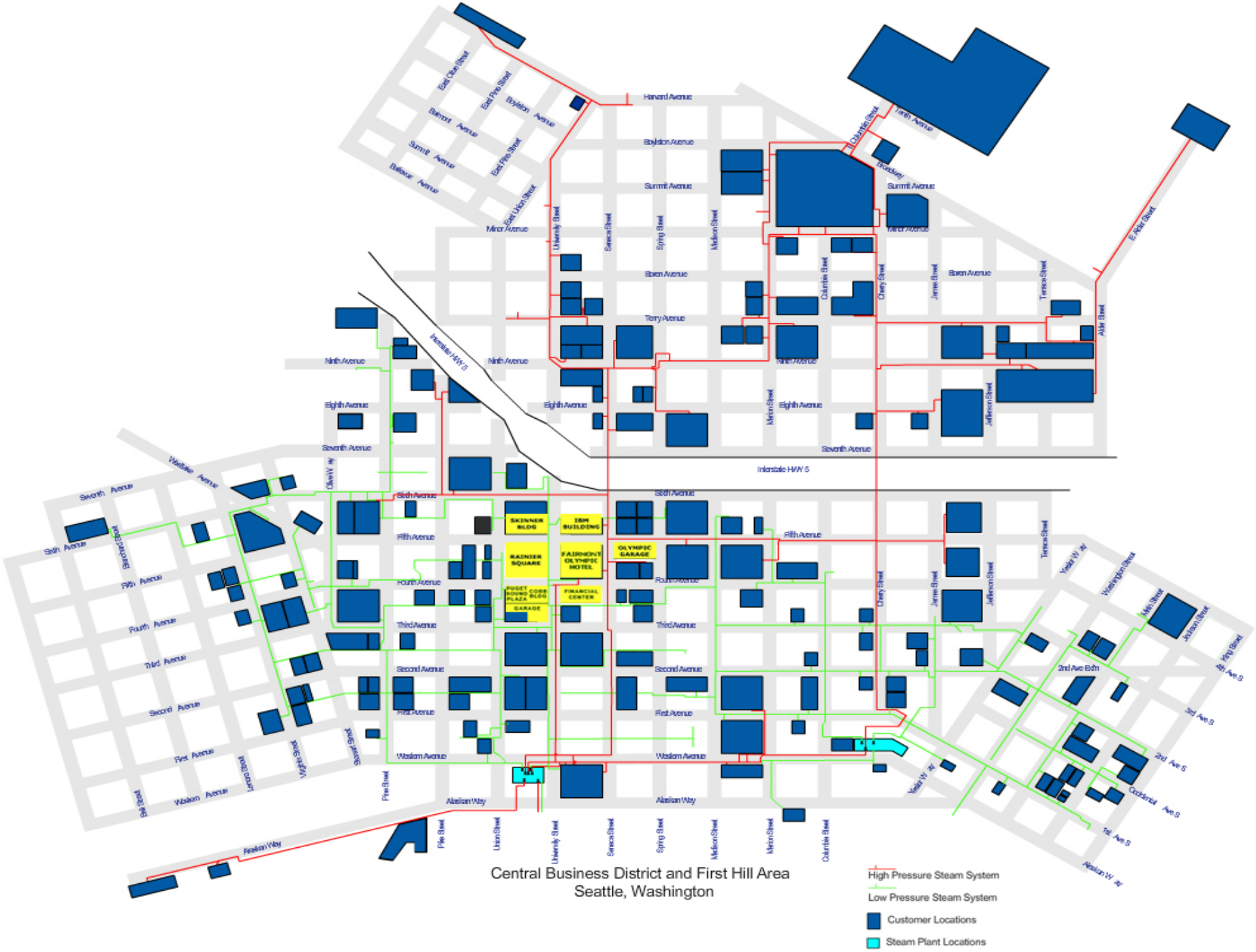
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PUGET SOUND PLAZA
COBB BLDG
FINANCIAL CENTER
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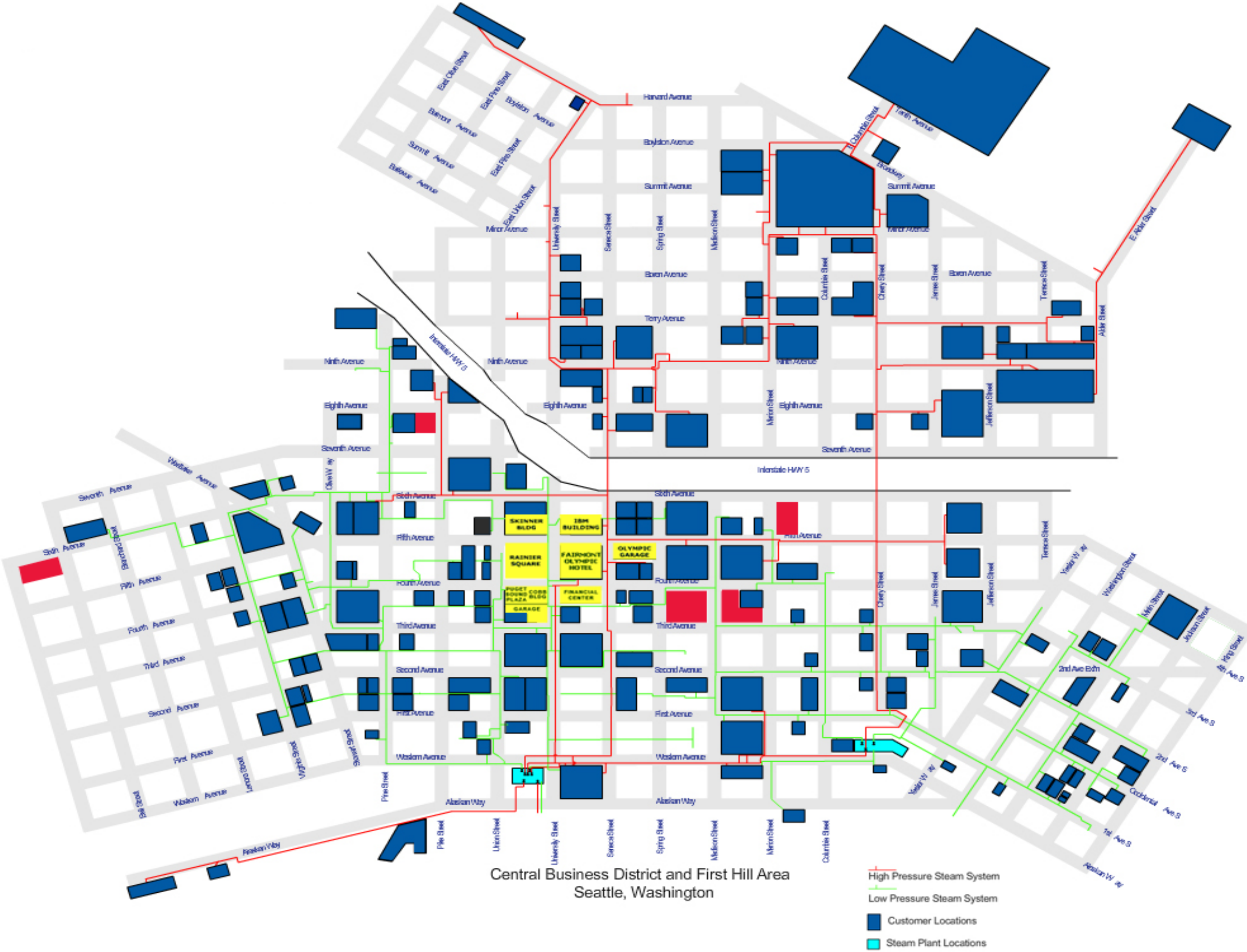
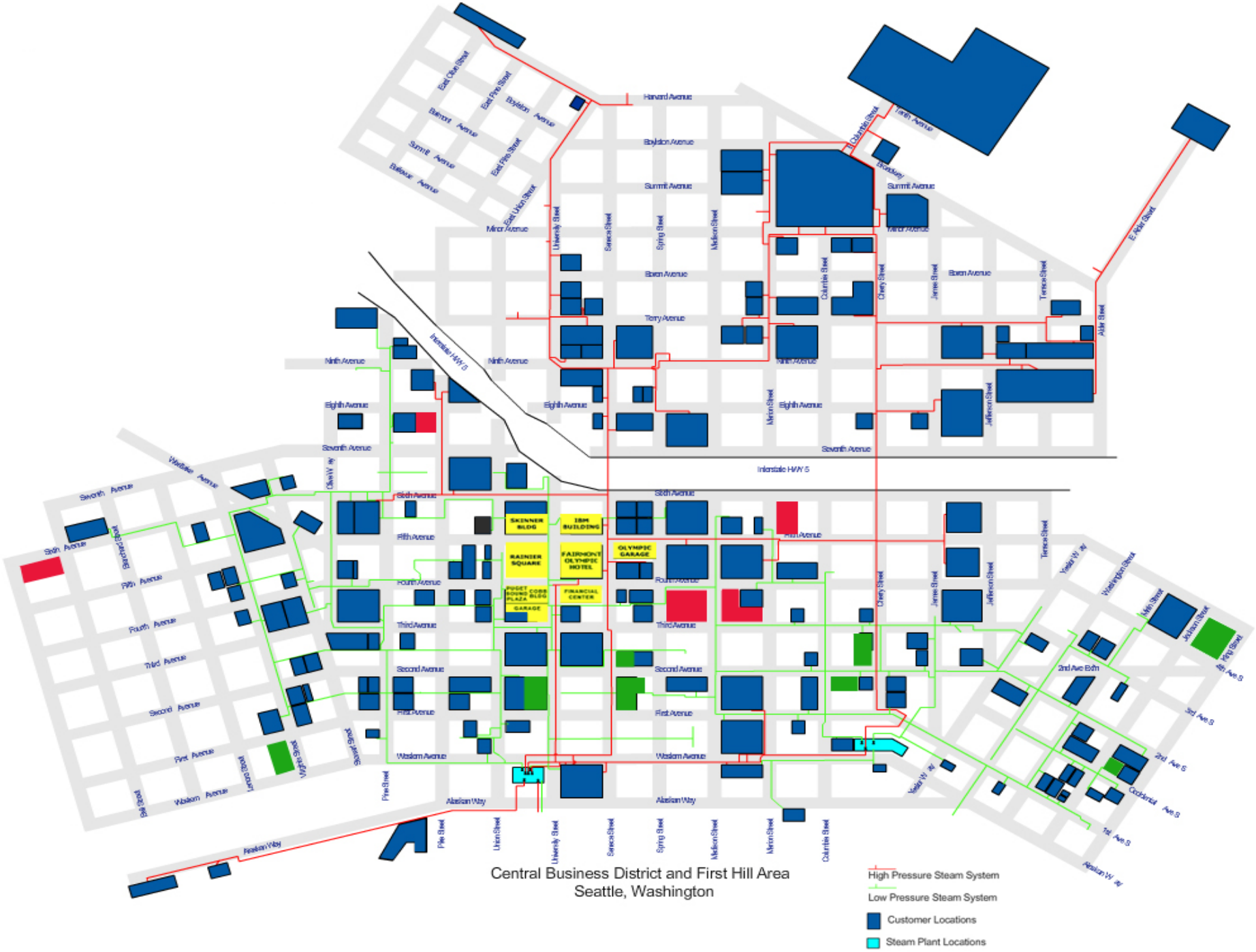


Central Business District and First Hill Area
Seattle, Washington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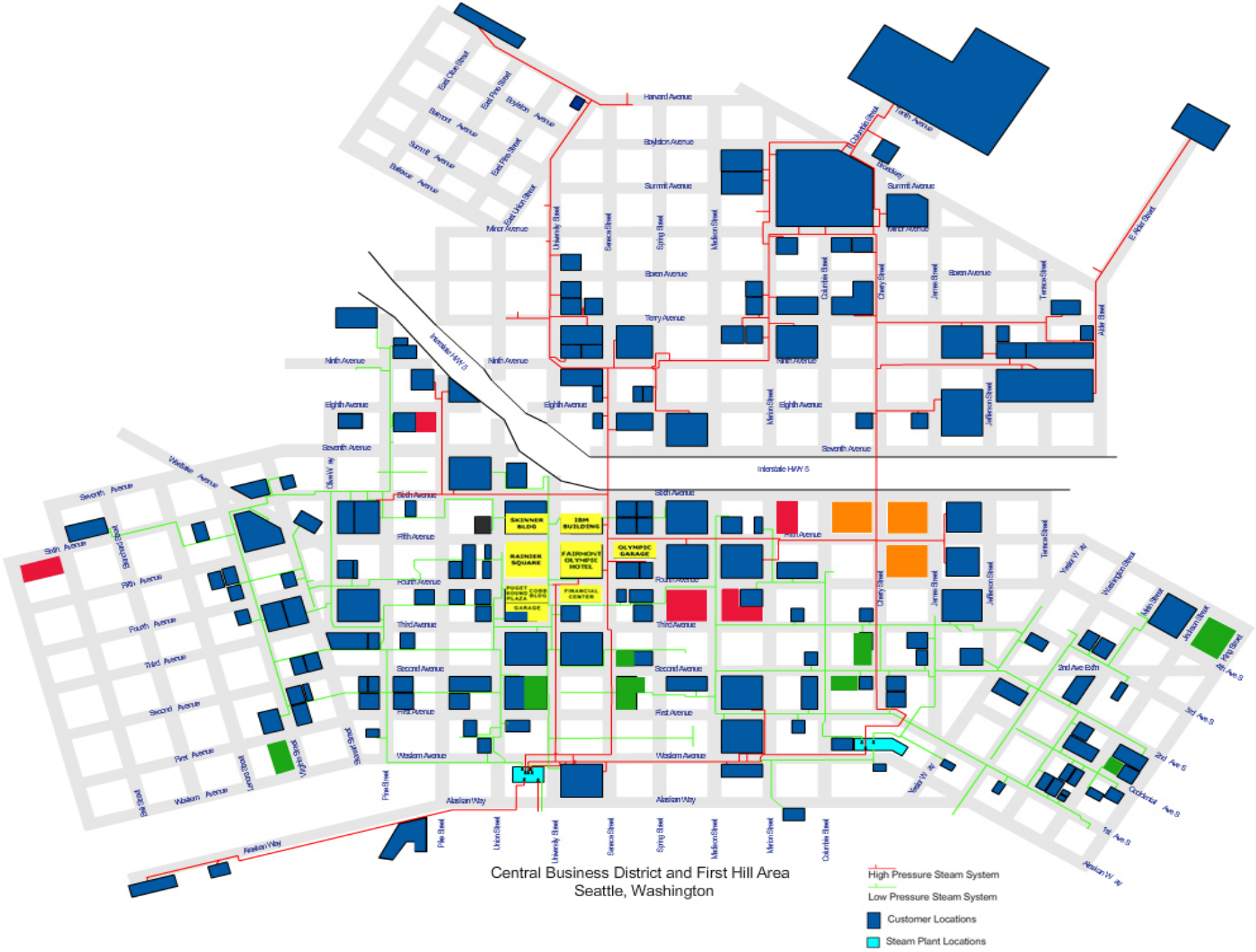
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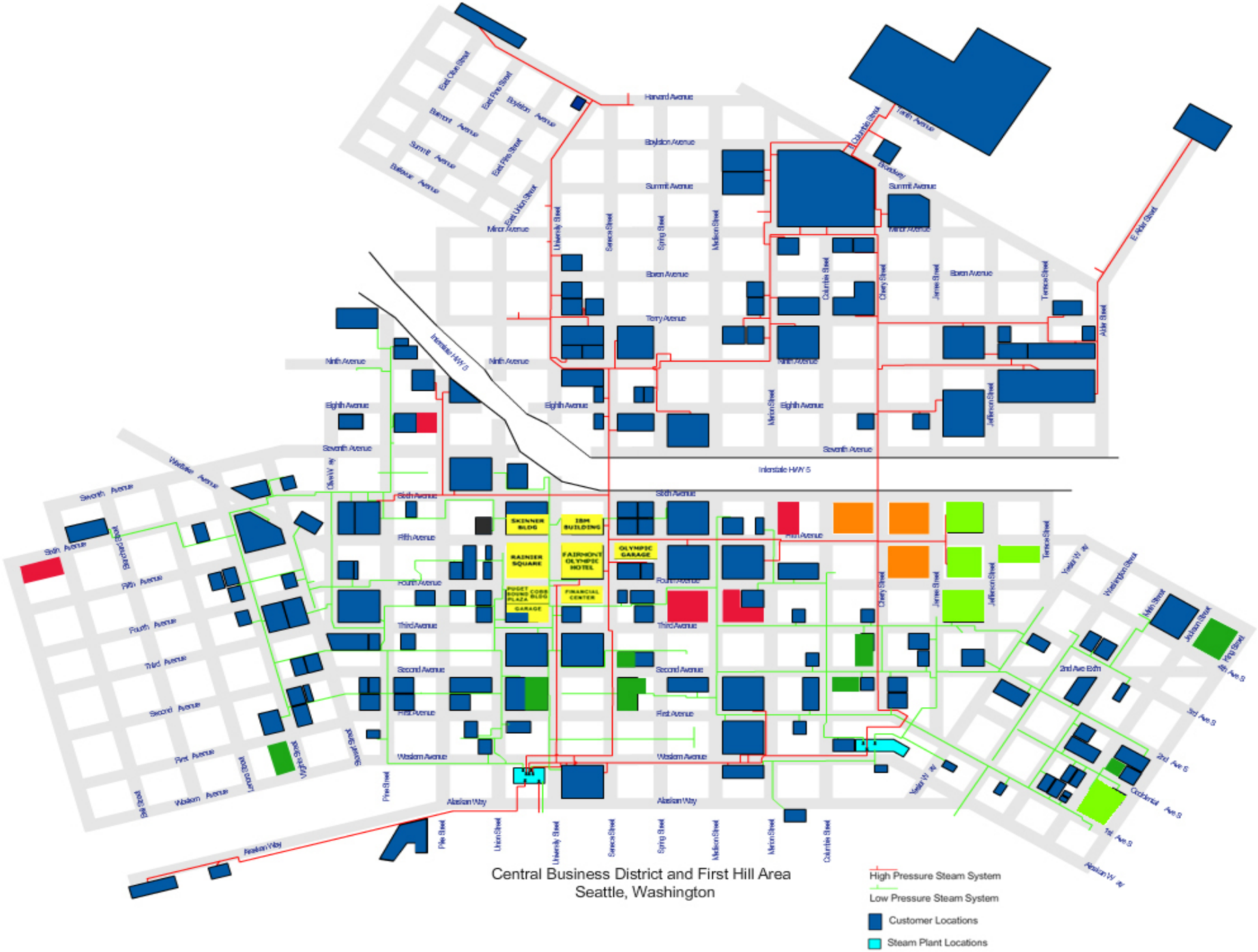
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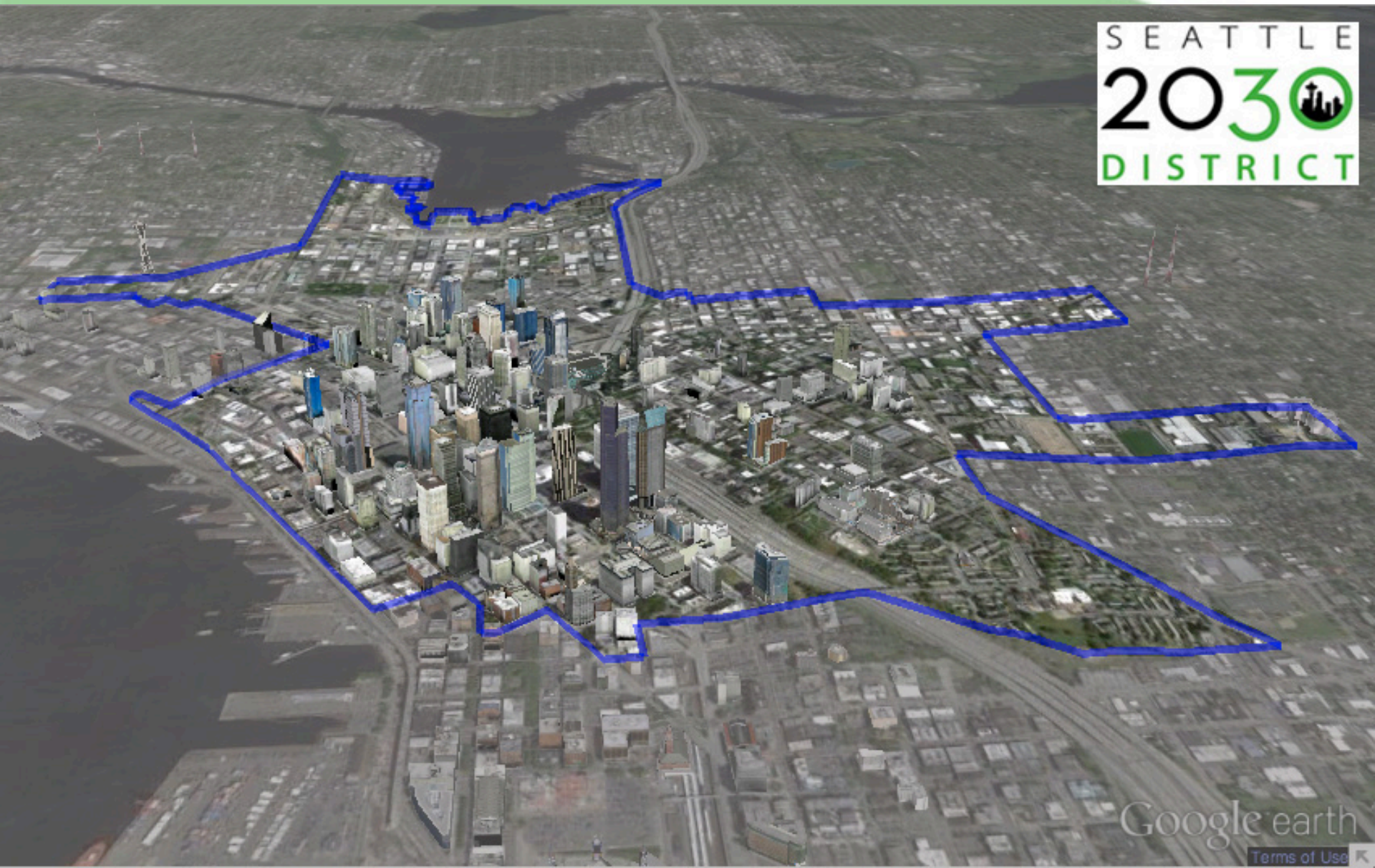
Central Business District and First Hill Area
Seattle, Washington

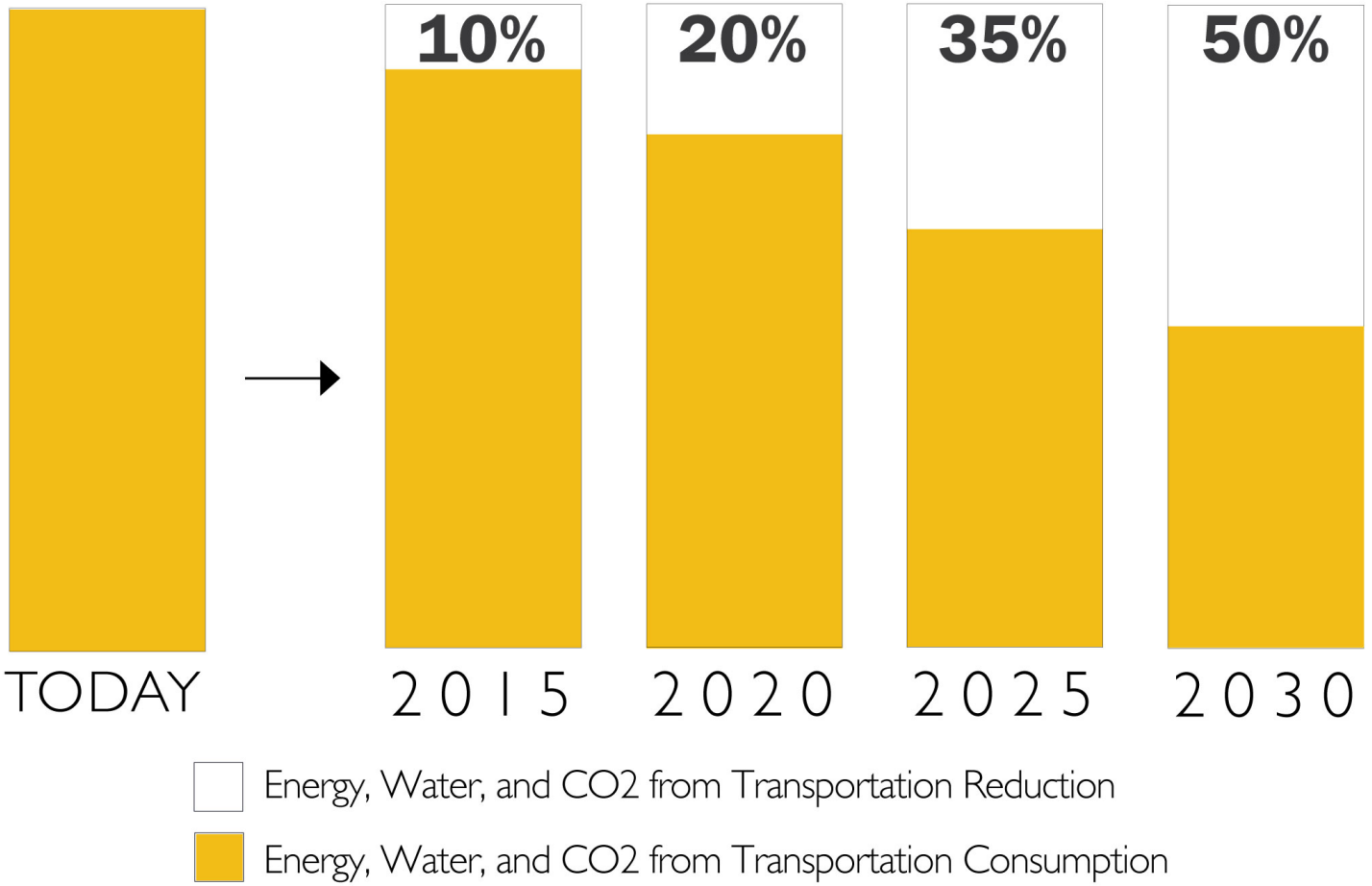
SEATTLE 2030 DISTRICT

Current Boundary



SEATTLE 2030 DISTRICT

Performance Targets – Existing Bldgs



The 2030 Challenge for Planning: Existing Buildings

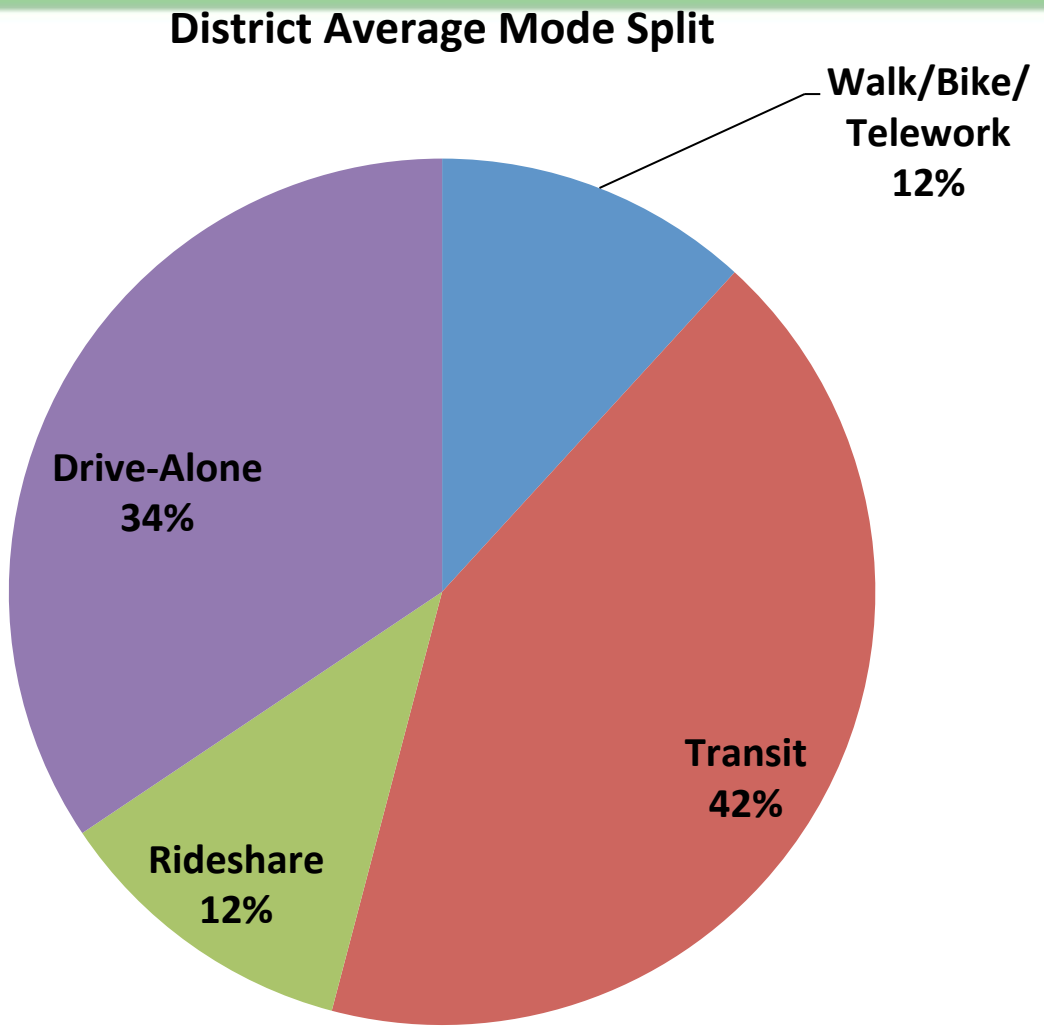
SEATTLE 2030 DISTRICT

Performance Targets - Energy

BUILDING TYPE DESCRIPTION	# OF BUILDINGS	FLOORSPACE (SF)	AVG ENERGY USE (kBtu/sf/yr)
Bank/Financial Institution	4	36,501	96
Convenience store (with or without gas station)	4	6,572	241
Courthouse	2	642,902	100
Entertainment/culture	13	1,808,711	95
Fast food	4	17,098	534
Hospital	6	2,956,960	314
Hotel	37	4,533,136	74
House of Worship	12	298,289	27
Industrial	13	308,062	200
K-12	15	837,411	73
Library	1	412,000	104
Medical Office	31	3,873,403	91
Multifamily Housing	196	8,134,107	40
Nursing/Assisted Living	5	615,388	124
Office	265	23,567,325	77
Other	7	268,661	104
Residence Hall/Dormitory	1	45,288	81
Restaurant/cafeteria	9	116,945	302
Retail (non-mall stores, vehicle dealerships)	8	178,096	82
Retail Store	84	2,480,167	70
Service (vehicle repair/service, postal service)	20	270,658	77
Social/meeting	7	213,540	52
Supermarket/Grocery Stores	2	12,338	287
Warehouse	40	806,604	23
Seattle 2030 District	786	52,440,162	

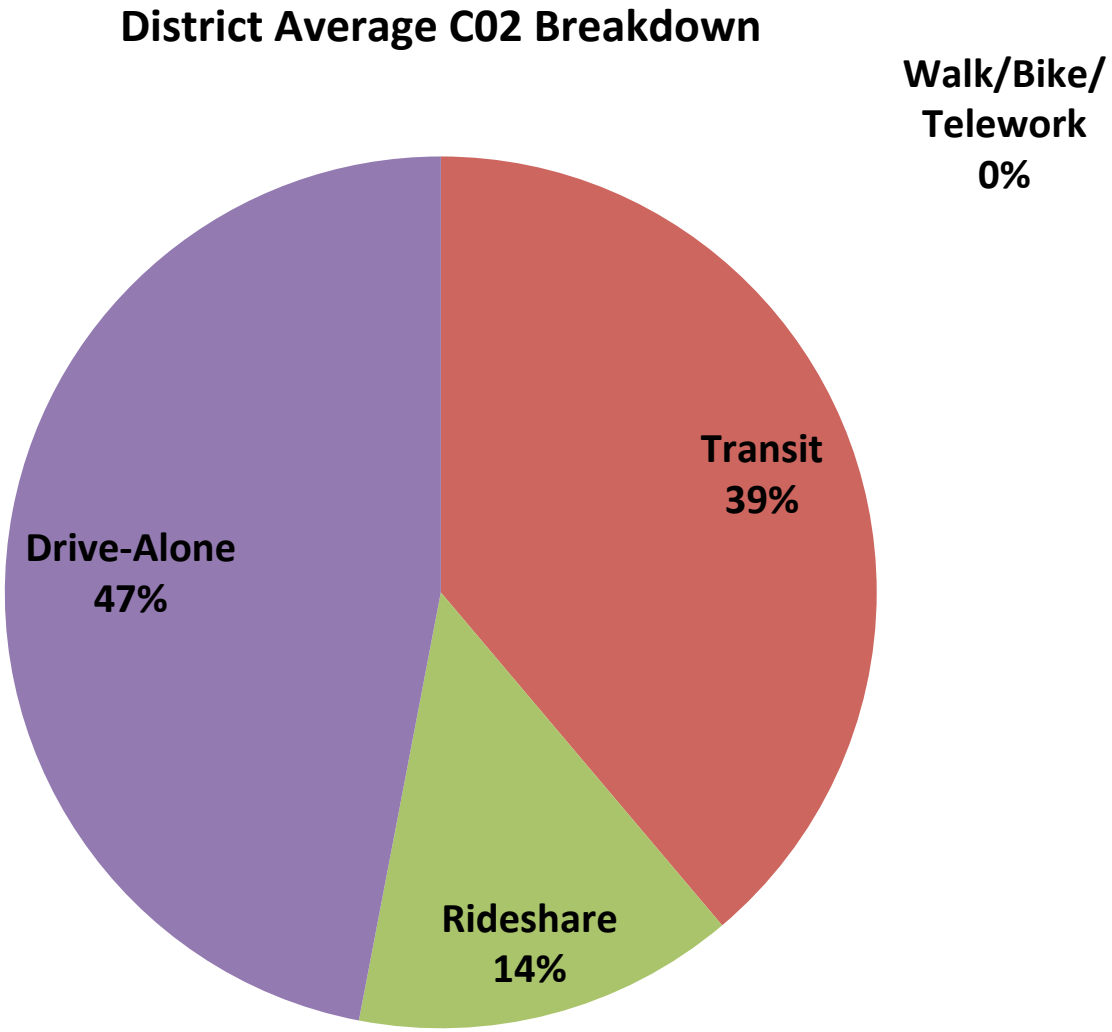
SEATTLE 2030 DISTRICT

Performance Targets – Transportation CO_2



SEATTLE 2030 DISTRICT

Performance Targets – Transportation CO_2

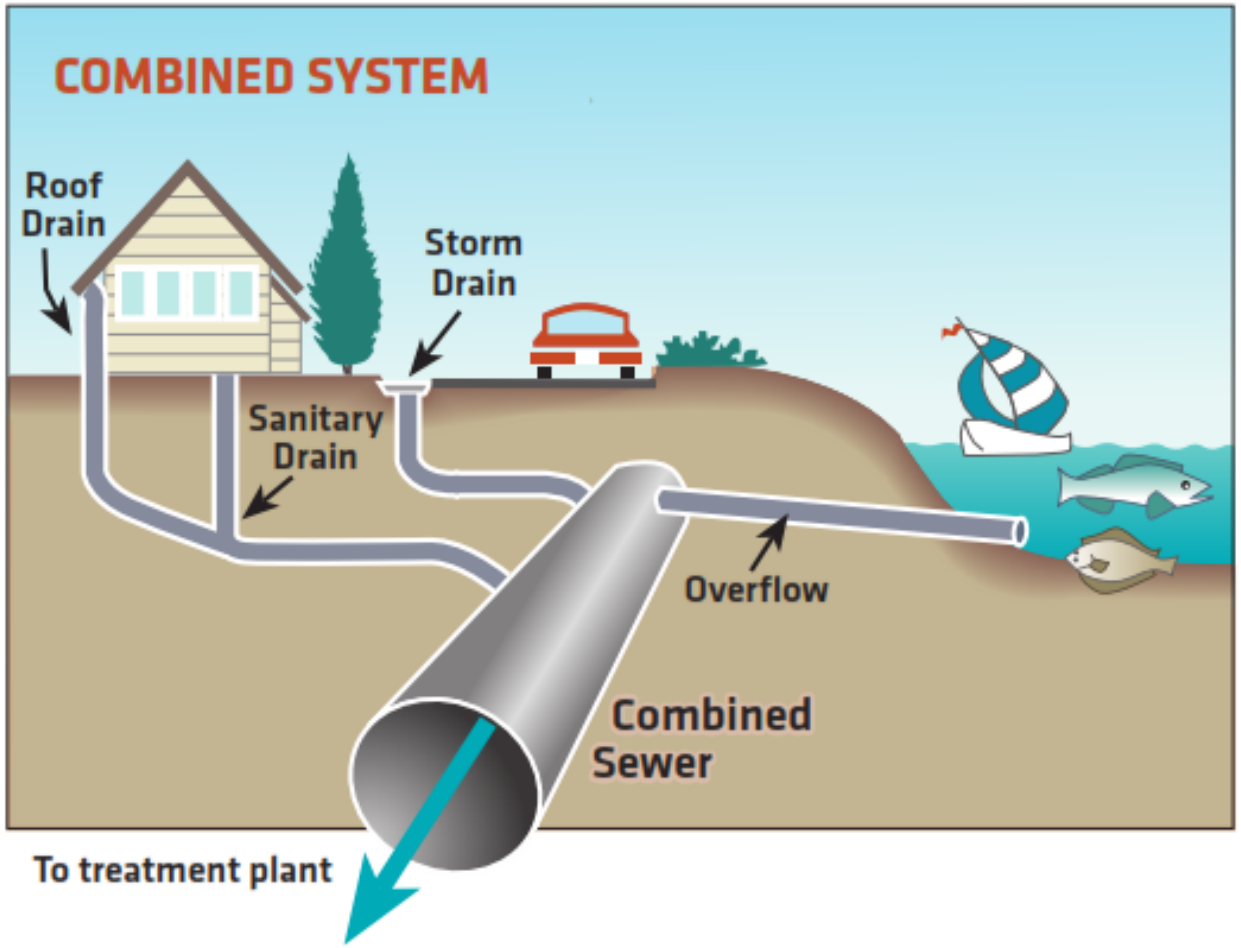


SEATTLE 2030 DISTRICT

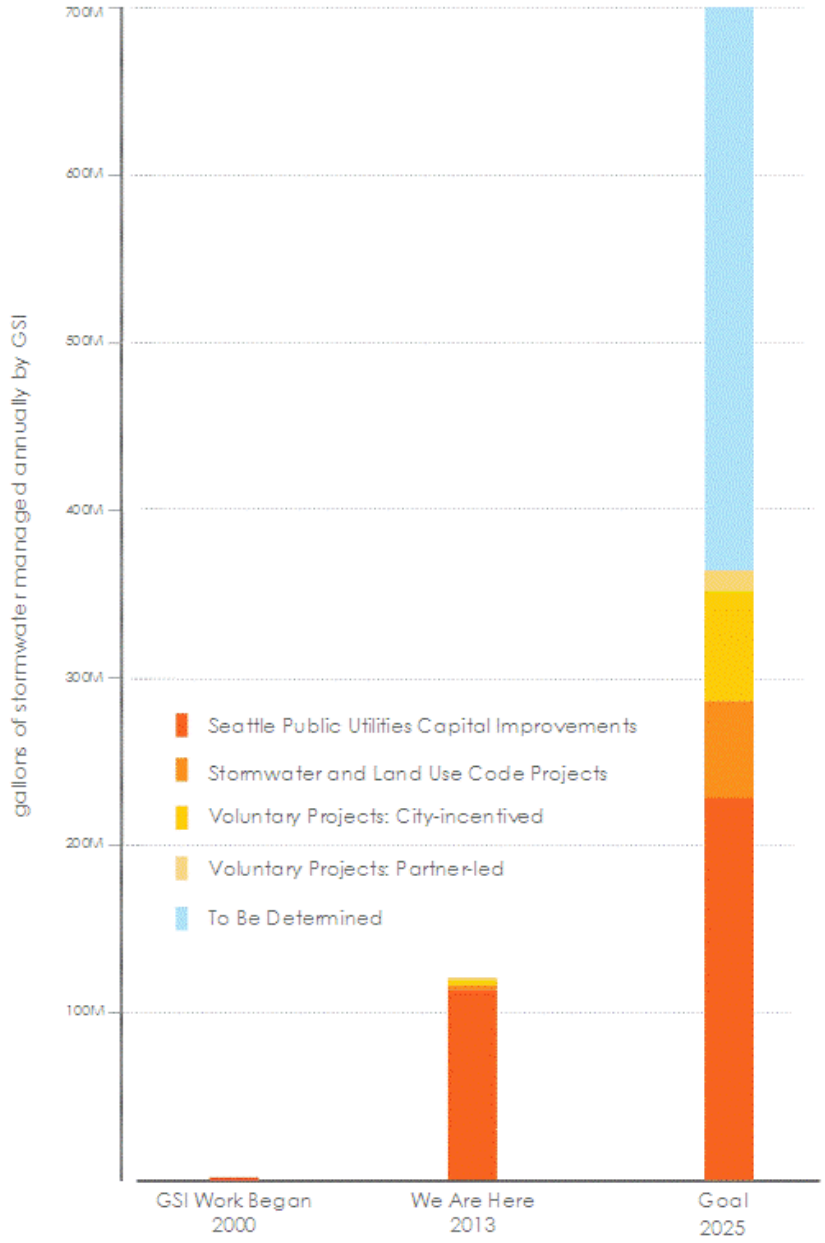
Performance Targets - Water

BUILDING TYPE	BASELINE GAL/SF/YR
Restaurant	125.99
Hotel	50.07
MultiFamily	41.14
Social/meeting	36.95
Industrial	32.53
Nursing/Assisted Living	30.11
SF Residential	27.63
Hospital	26.12
Retail	24.77
Medical Office	21.00
Office	14.21
Warehouse	13.00
Entertainment/culture	12.88
Service (vehicle repair/service, postal service)	11.74
House of Worship	11.31
K-12 School	11.09

Water: A Deeper Dive



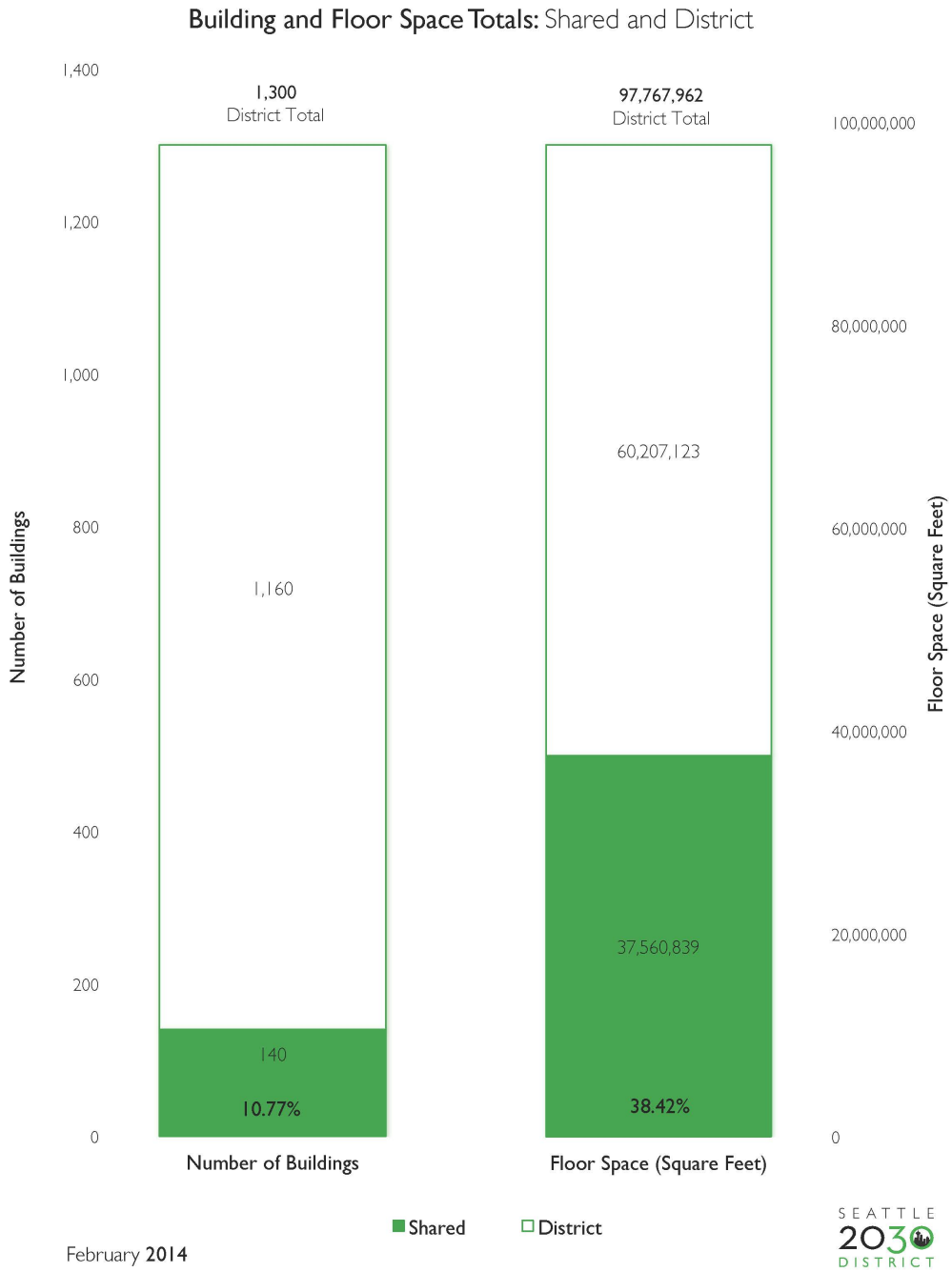
- Seattle, 2012:
  - 355 Events
  - 154 MG of sewage into our waterways



Aggressive GSI Goals

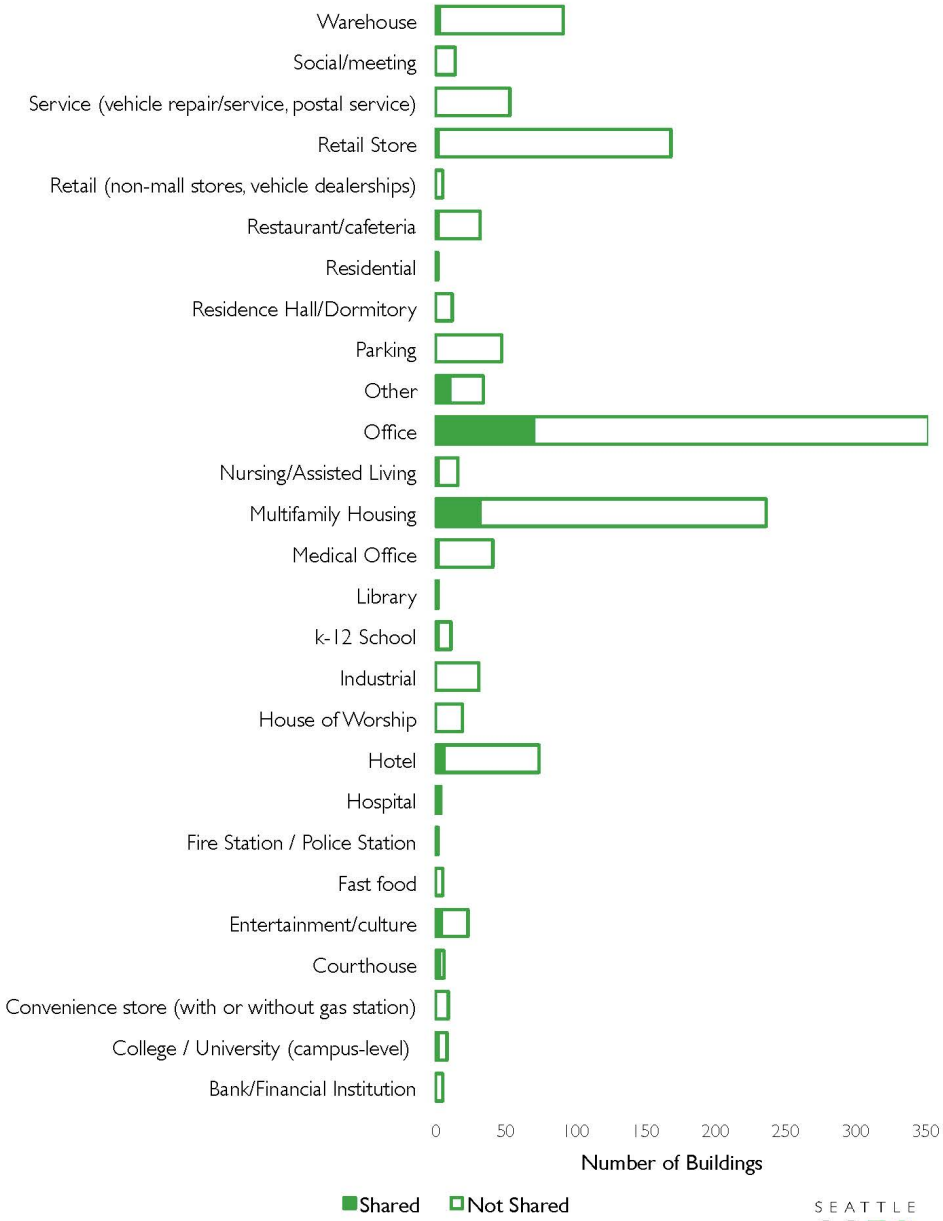
SEATTLE 2030 DISTRICT

Progress



SEATTLE 2030 DISTRICT

Shared Vs. Not Shared by Building Type: Number of Buildings



February 2014

SEATTLE 2030 DISTRICT

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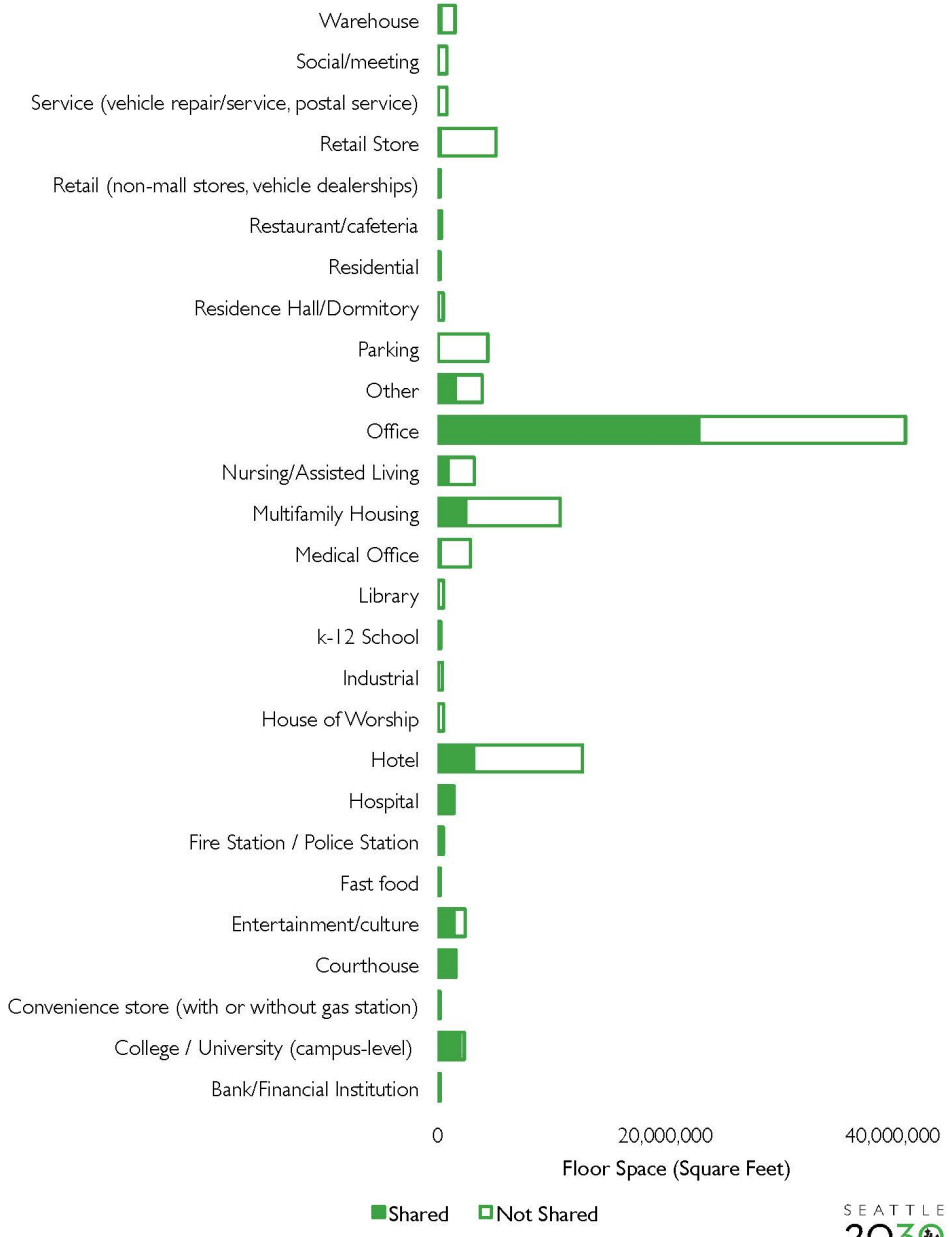
Shared Vs. Not Shared by Building Type: Floor Space



February 2014

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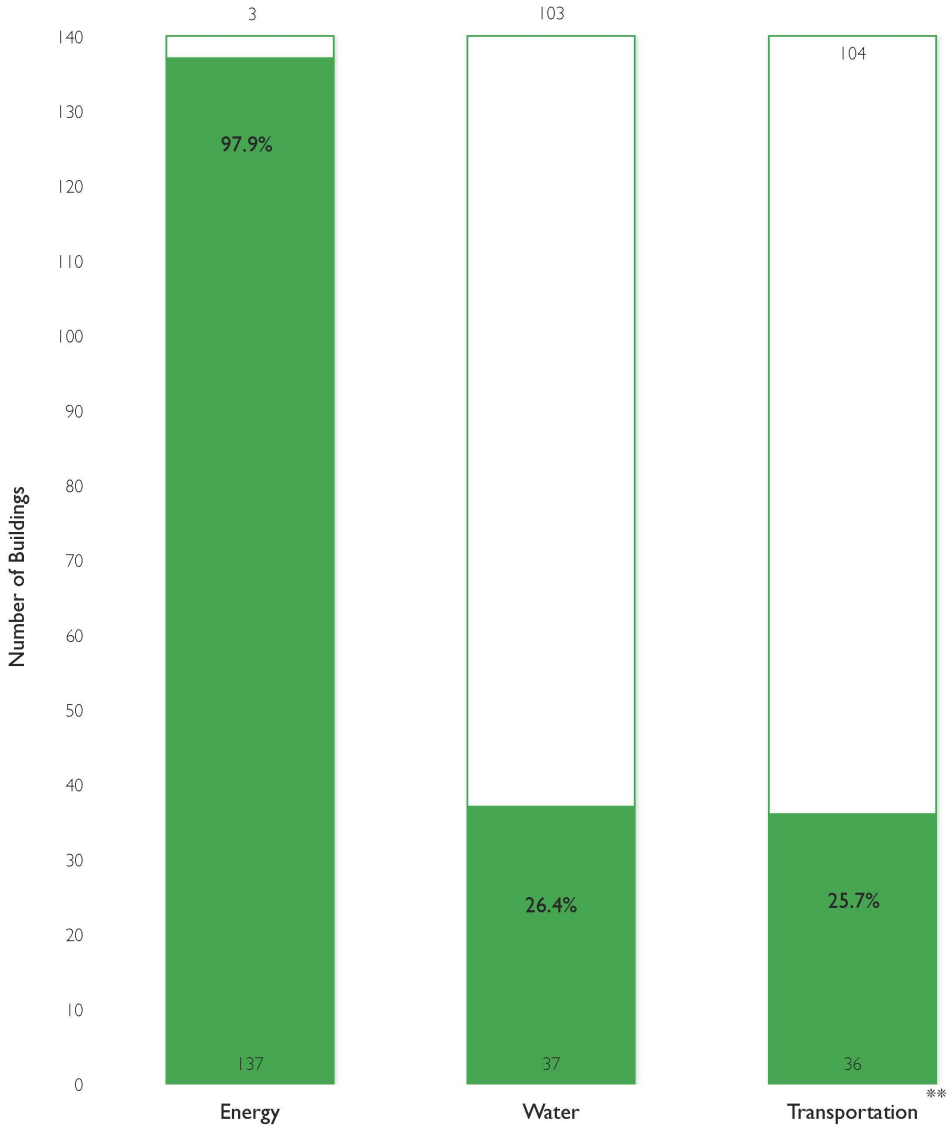
SEATTLE 2030 DISTRICT

Shared Buildings with 12+ Months of Data*: Number of Buildings



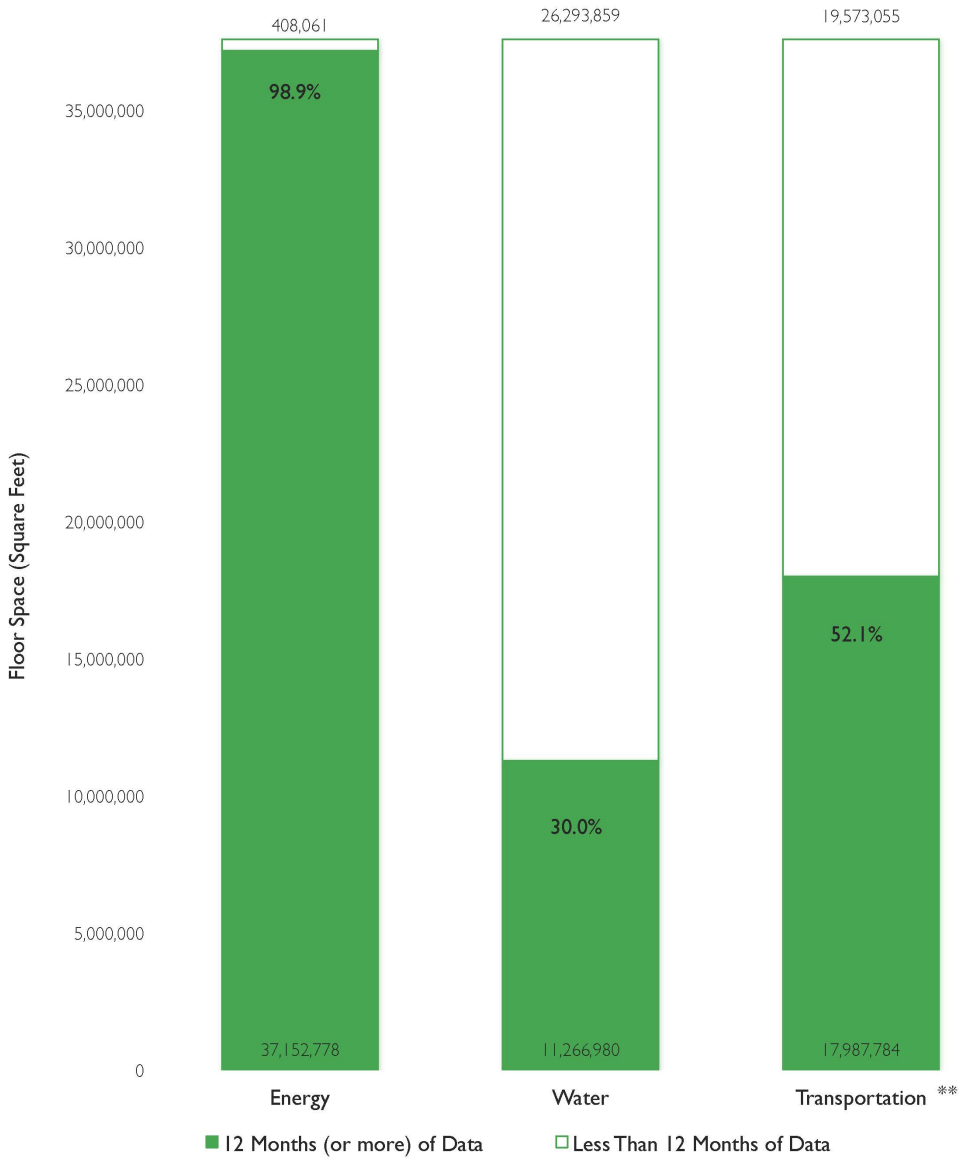
*Not necessarily current data **Annual interval

February **2014**

SEATTLE 2030 DISTRICT

SEATTLE 2030 DISTRICT

Shared Buildings with 12+ Months of Data*: Floor Space



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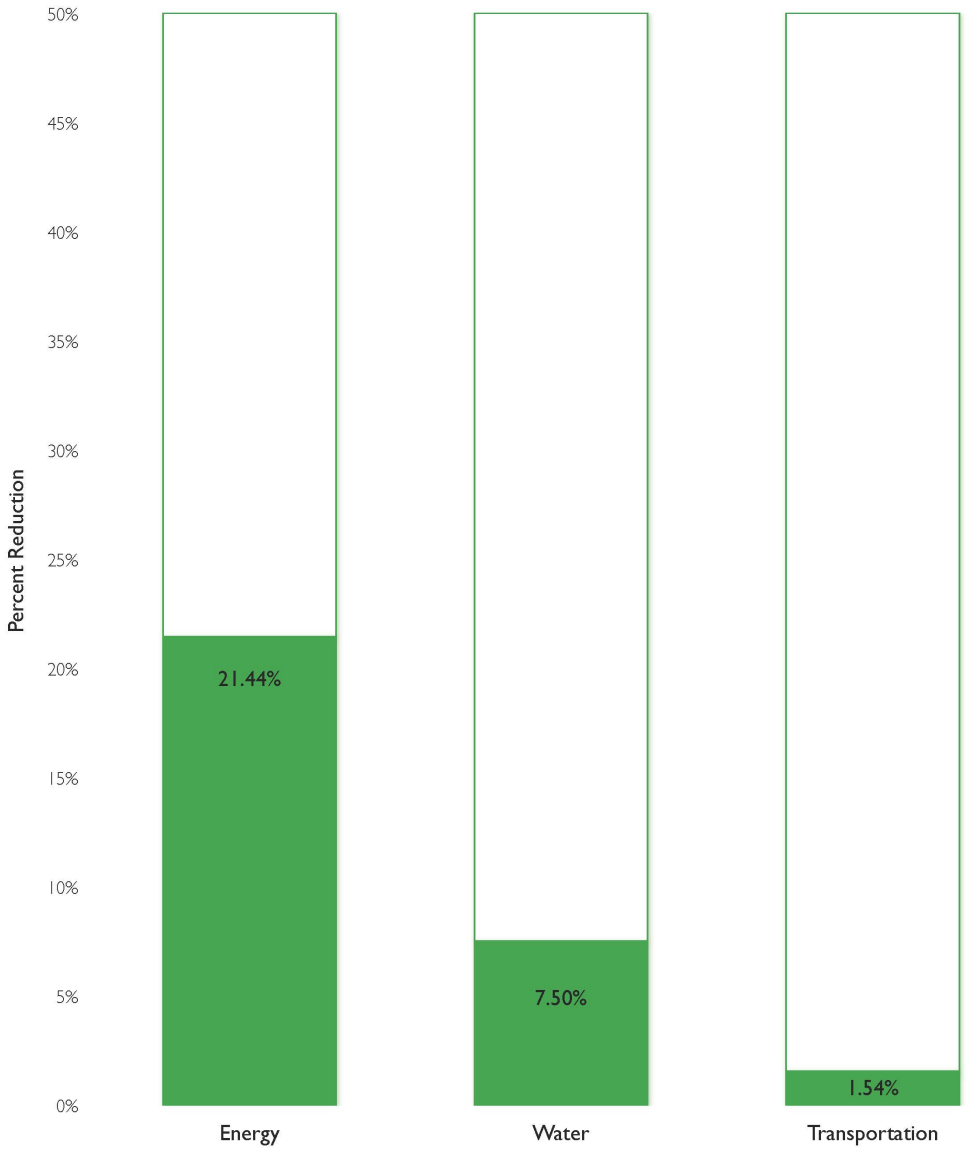
Aggregated Performace*: Shared Buildings



*Not necessarily current data; Buildings with no performance data assumed to operate at baseline

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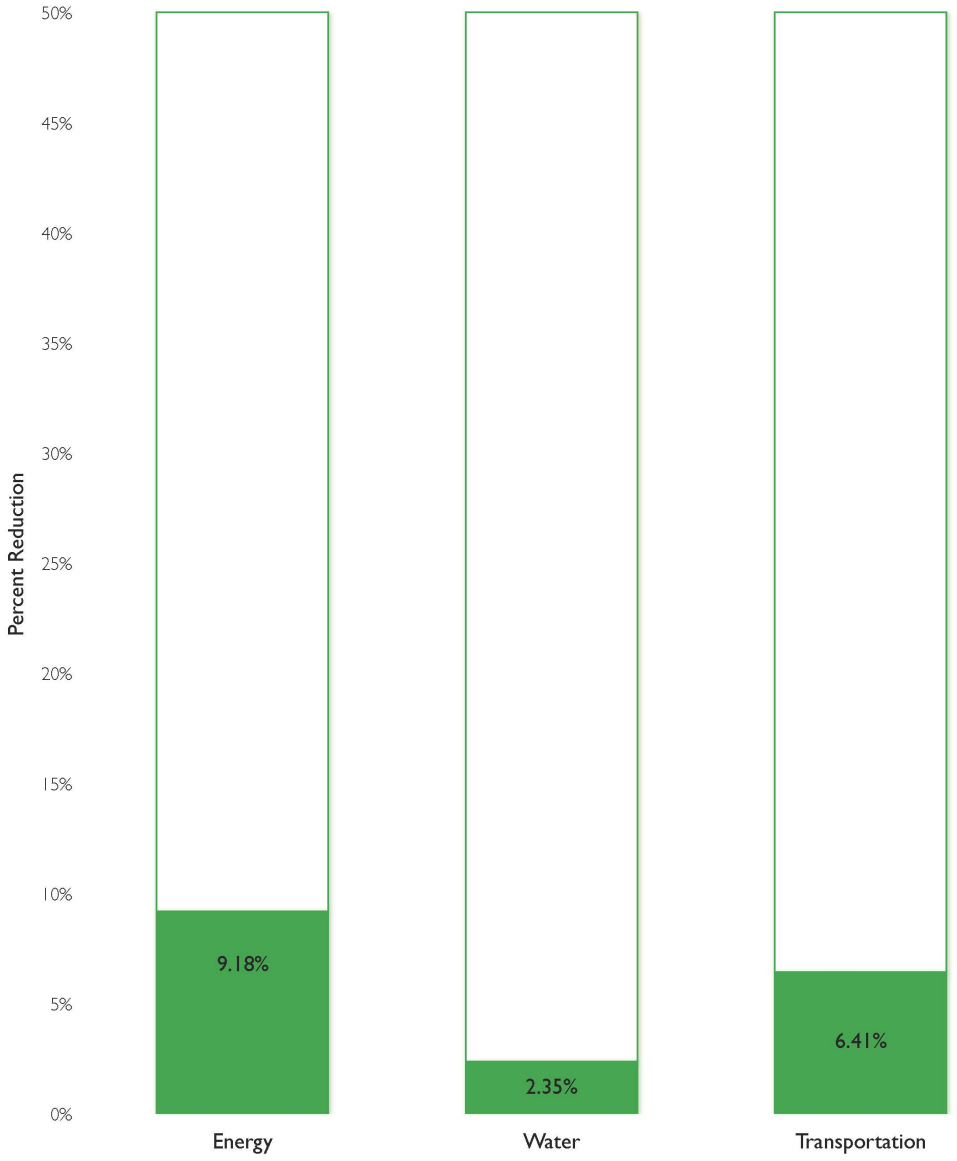
Aggregated Performance*: Total District



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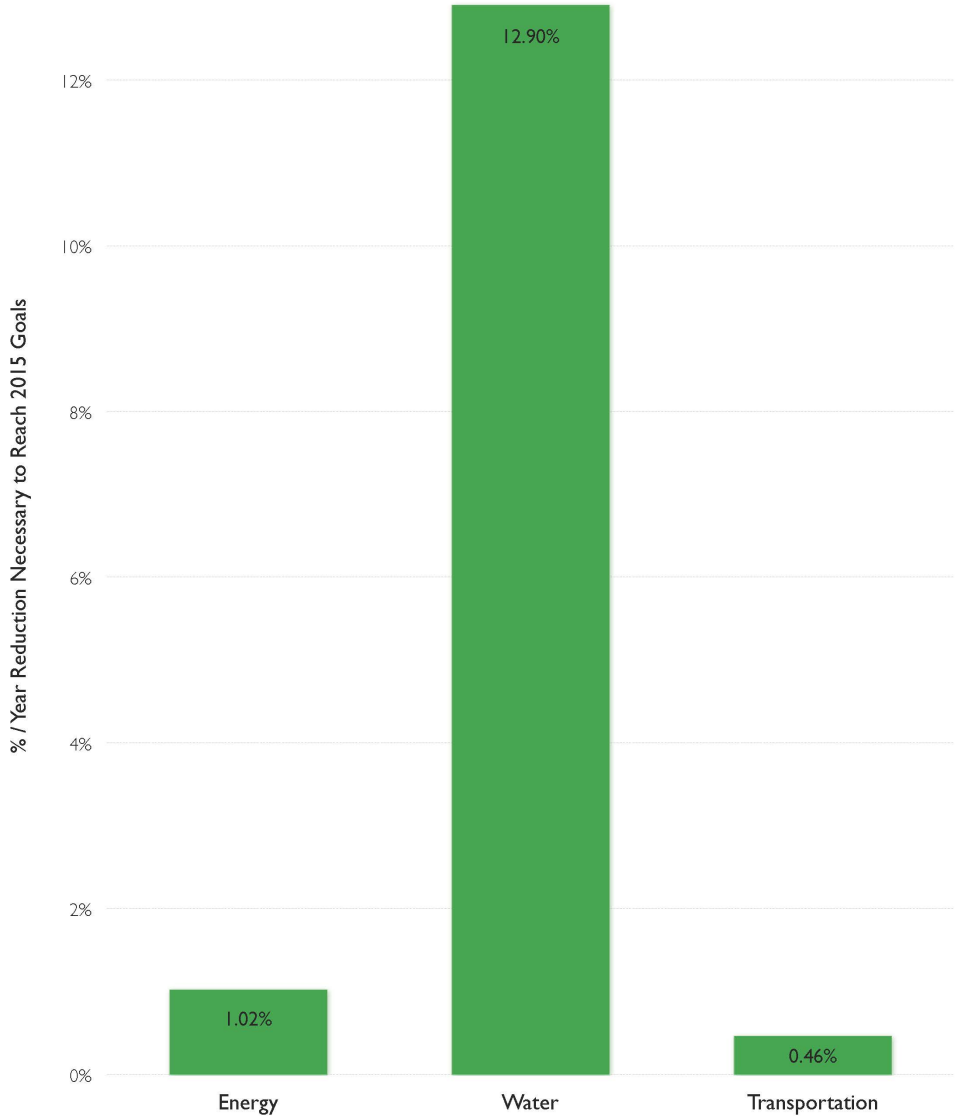
SEATTLE 2030 DISTRICT

SEATTLE 2030 DISTRICT

Percent / Year Member **Reductions** Necessary to **Reach 2015** District Goal of a **10% Reduction** from Baseline



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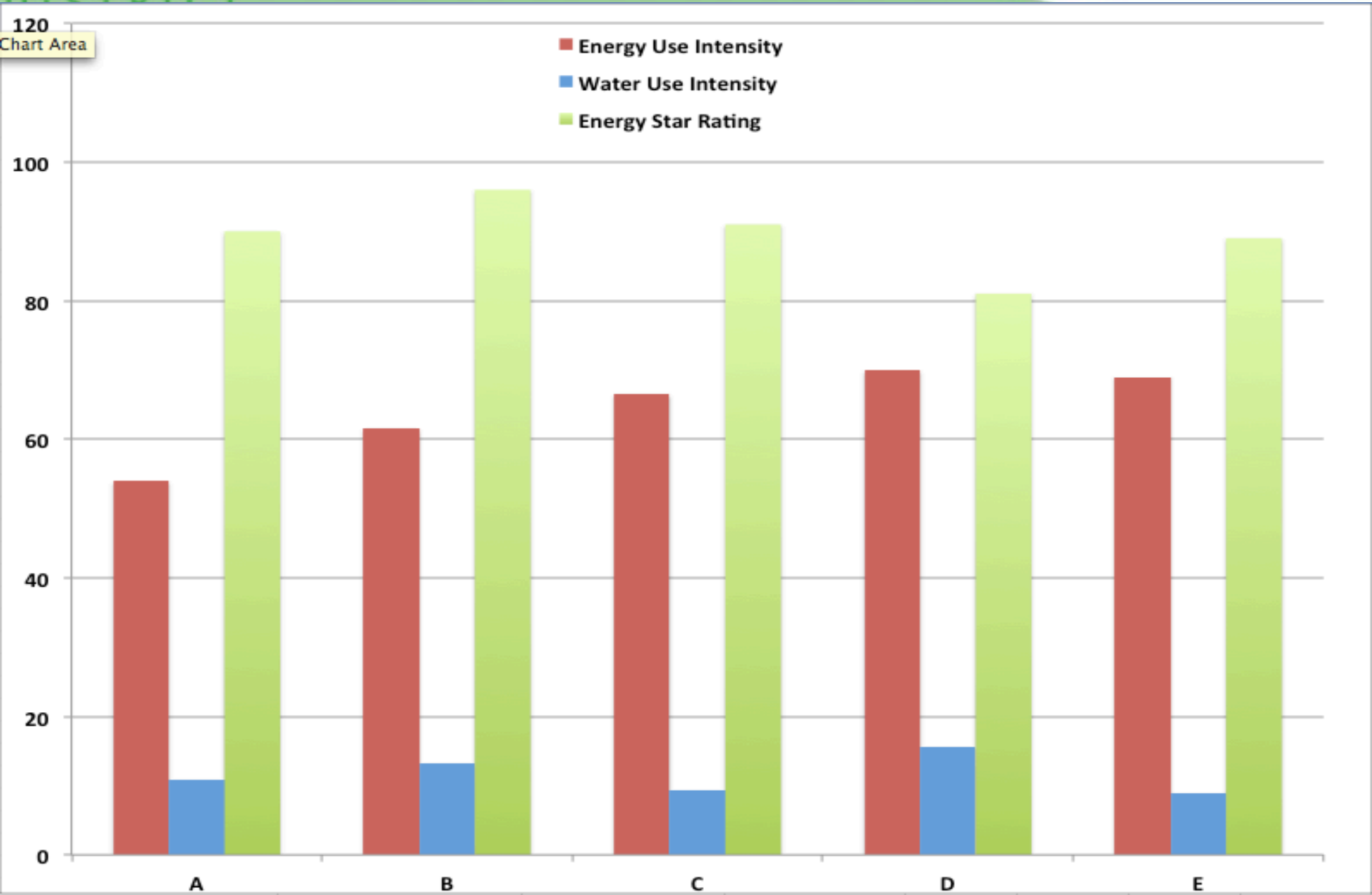
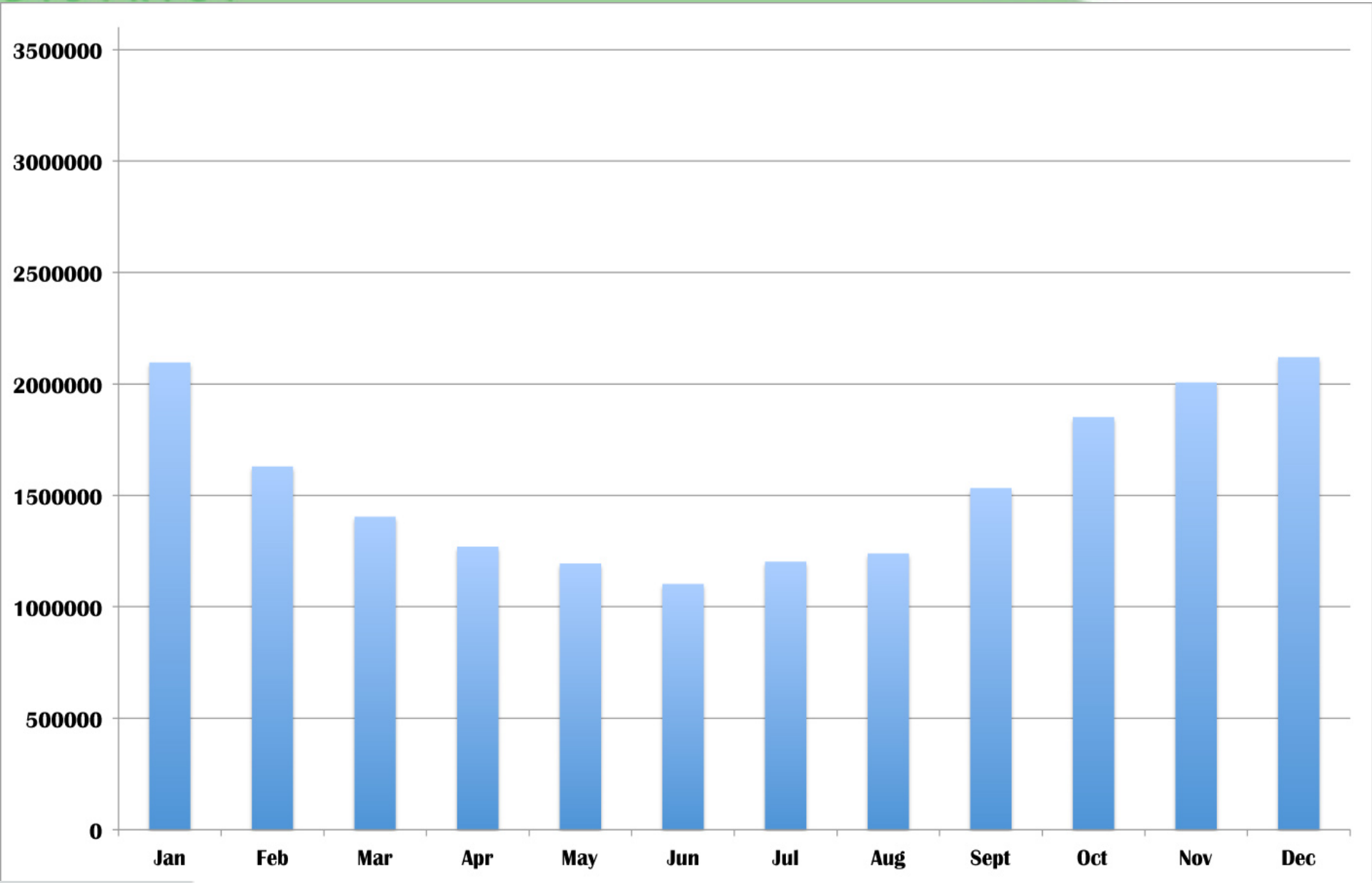
Assess



SEATTLE 2030 DISTRICT

Target



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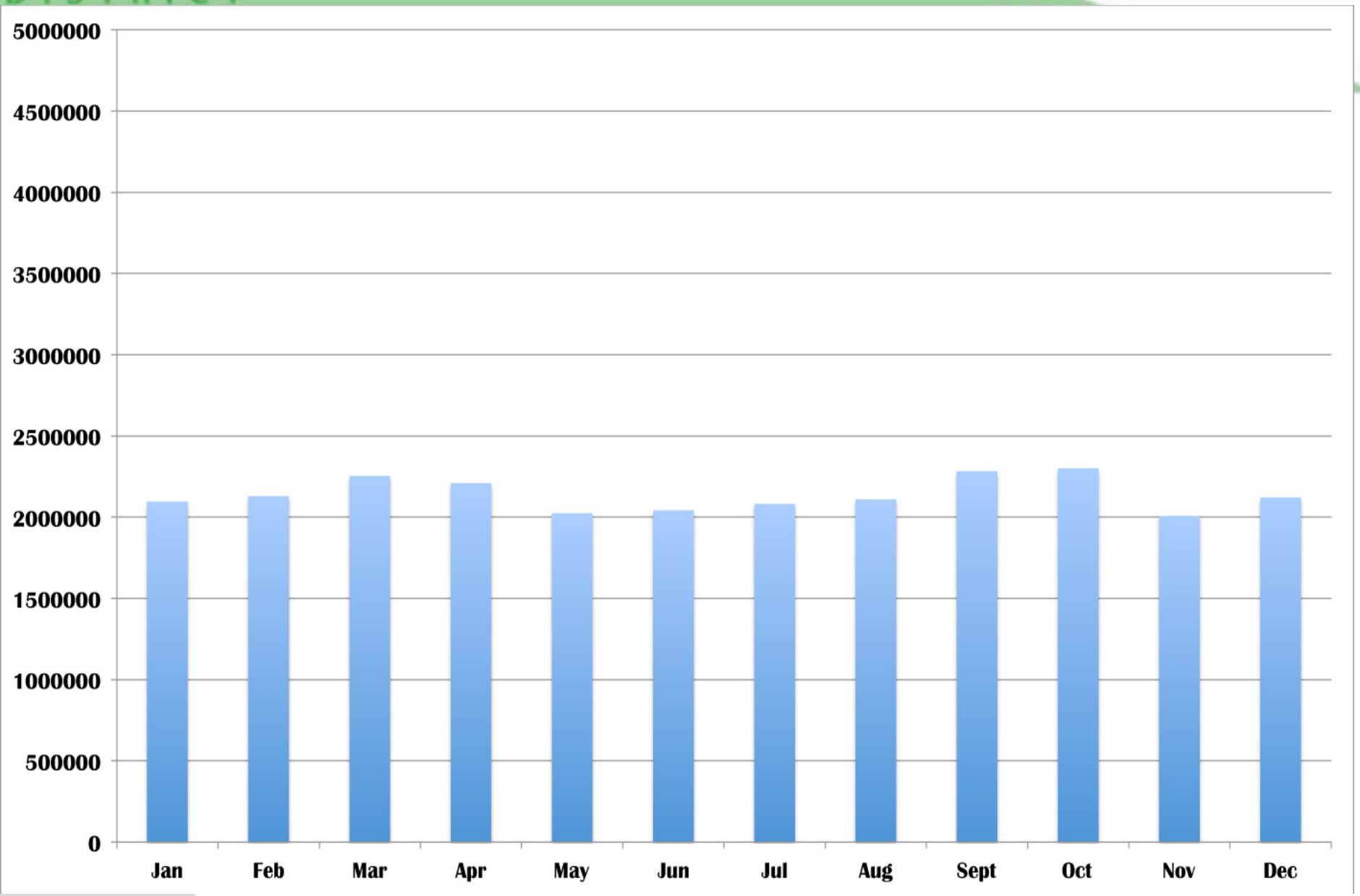

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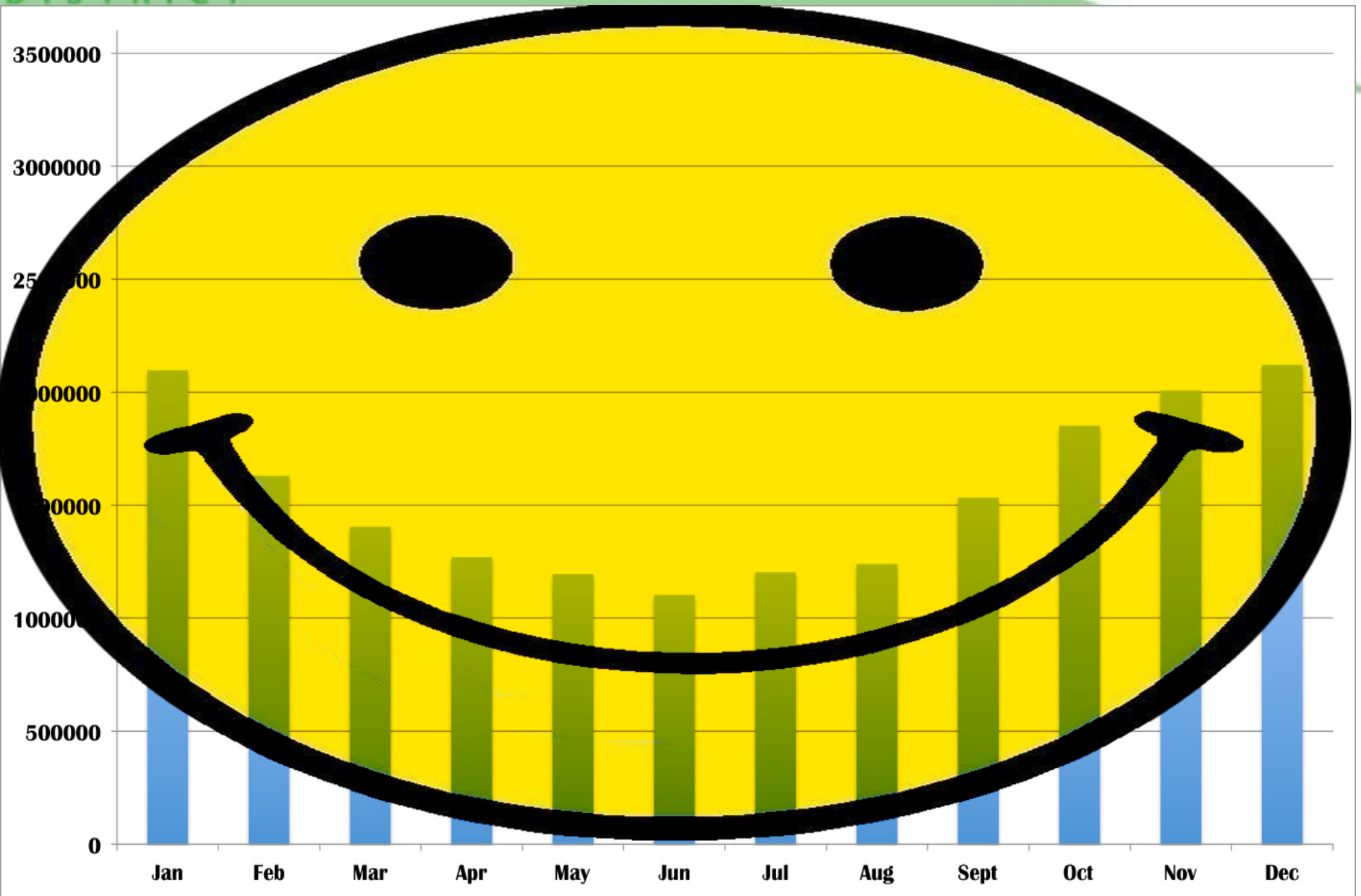

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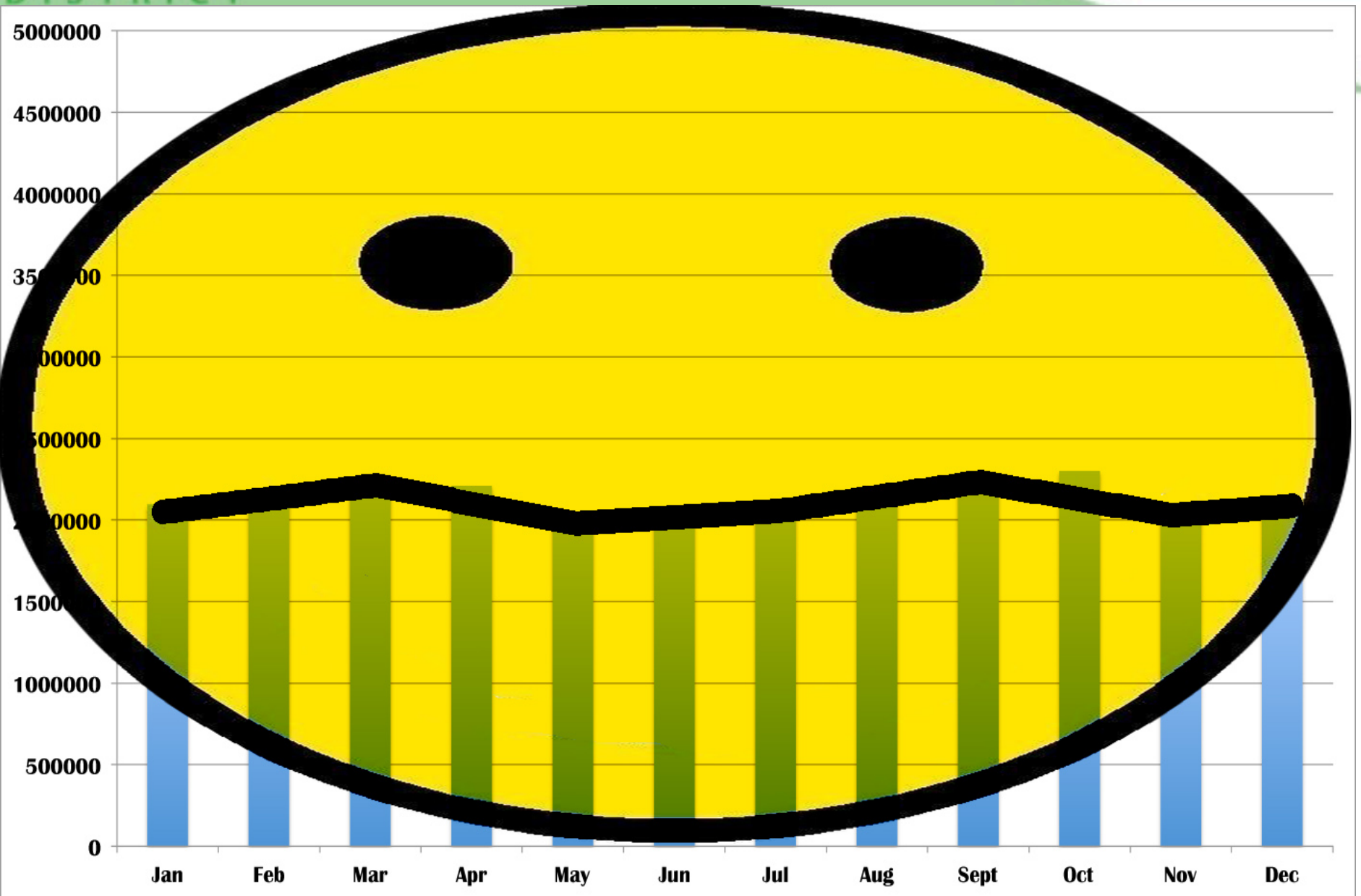


The High Performance Building Team Structure

Accenture develops business cases, documents scopes of work, integrates solutions package (including **Microsoft**) and delivers projects for each pilot

2030 District manages contracts with Accenture, Microsoft, OED and pilot participants and oversees progress and performance at each site

Pilot participants work with Accenture to execute project plan, committing resources to connect the solution and monitor and implement energy saving recommendations

2030 works with **SCL** to develop measurement and verification process to monitor pilot performance

Seattle OED contracts with **2030 District** to drive and manage project; utilize DOE funds to support onboarding

Representatives from each organization form a **steering committee**, which drives project vision, objectives, roles and responsibilities

SEATTLE 2030 DISTRICT

Accenture Smart Building and Energy Solutions

Continuous execution of advanced analytics on Microsoft's cloud

End Users
- Portal views
- MRO integration,
- Trouble ticket generation


MRO personnel


Executives

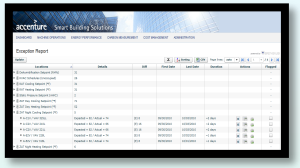
Operations Center

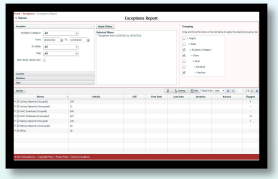

Energy Manager


Facility Mgmt VP


Engineer

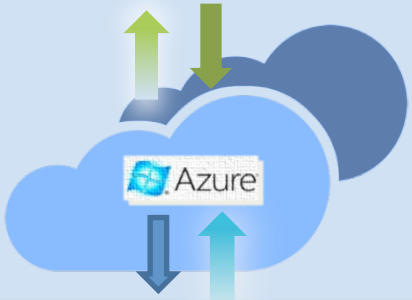
Accenture Smart Building Portal
- Continuous analytics
- Predictive algorithms
- Operational exceptions





Automated Fault Detection, Operational Guidelines, Cloud-Based Control Services, M&V validation, ECM identification

Microsoft Cloud (Azure)
- 100,000+ set points, I/O points, lighting controls, and meter data managed 24x7
- 10,000+ algorithms run every minute



Analytics Engine

Data Normalization

Data Storage

Research Buildings
- Buildings of all types and usage

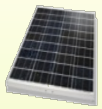
Building Equipment
- Connect to BMS systems, meters, equipment, control systems, etc.
- Monitors data 24x7x365


Building Automation System


Meters / Sub-meters


HVAC


Environmental Sensor

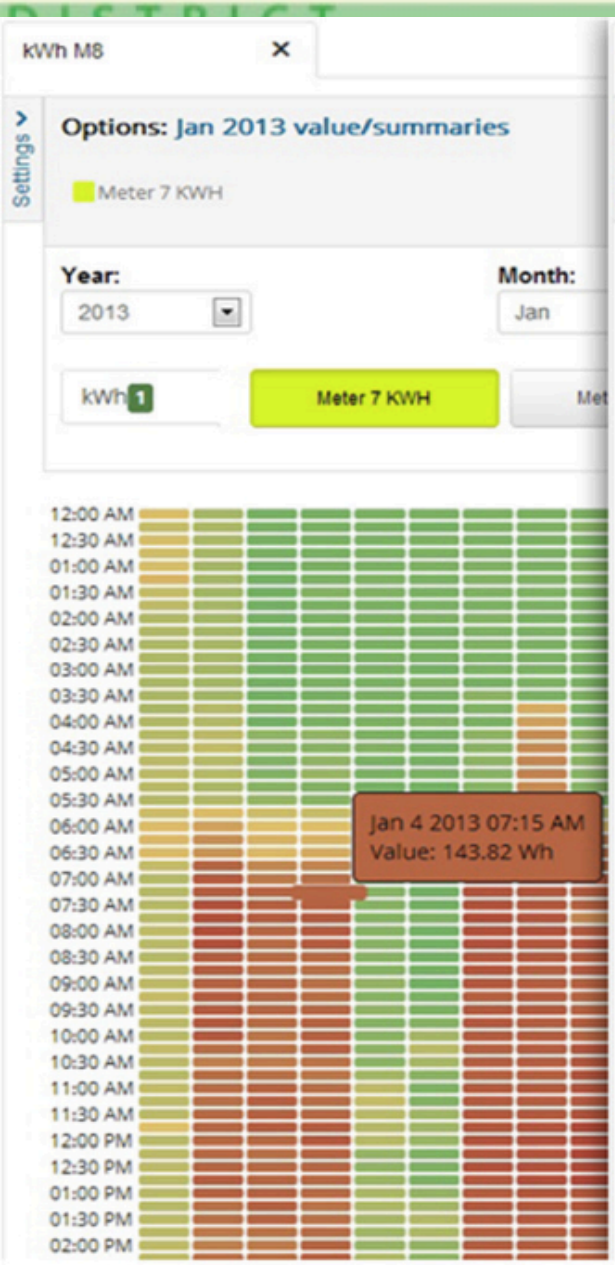

Renewable Technologies

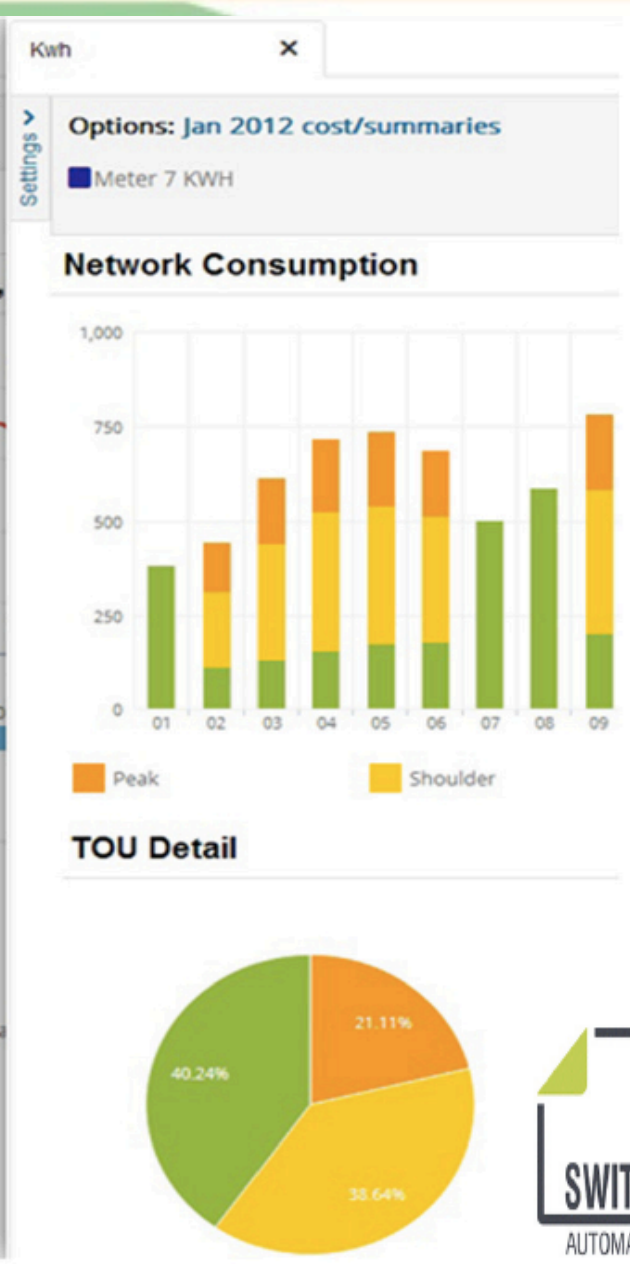

Lighting Systems


Weather Station

SEATTLE 2030 DISTRICT

Interval Data Analysis

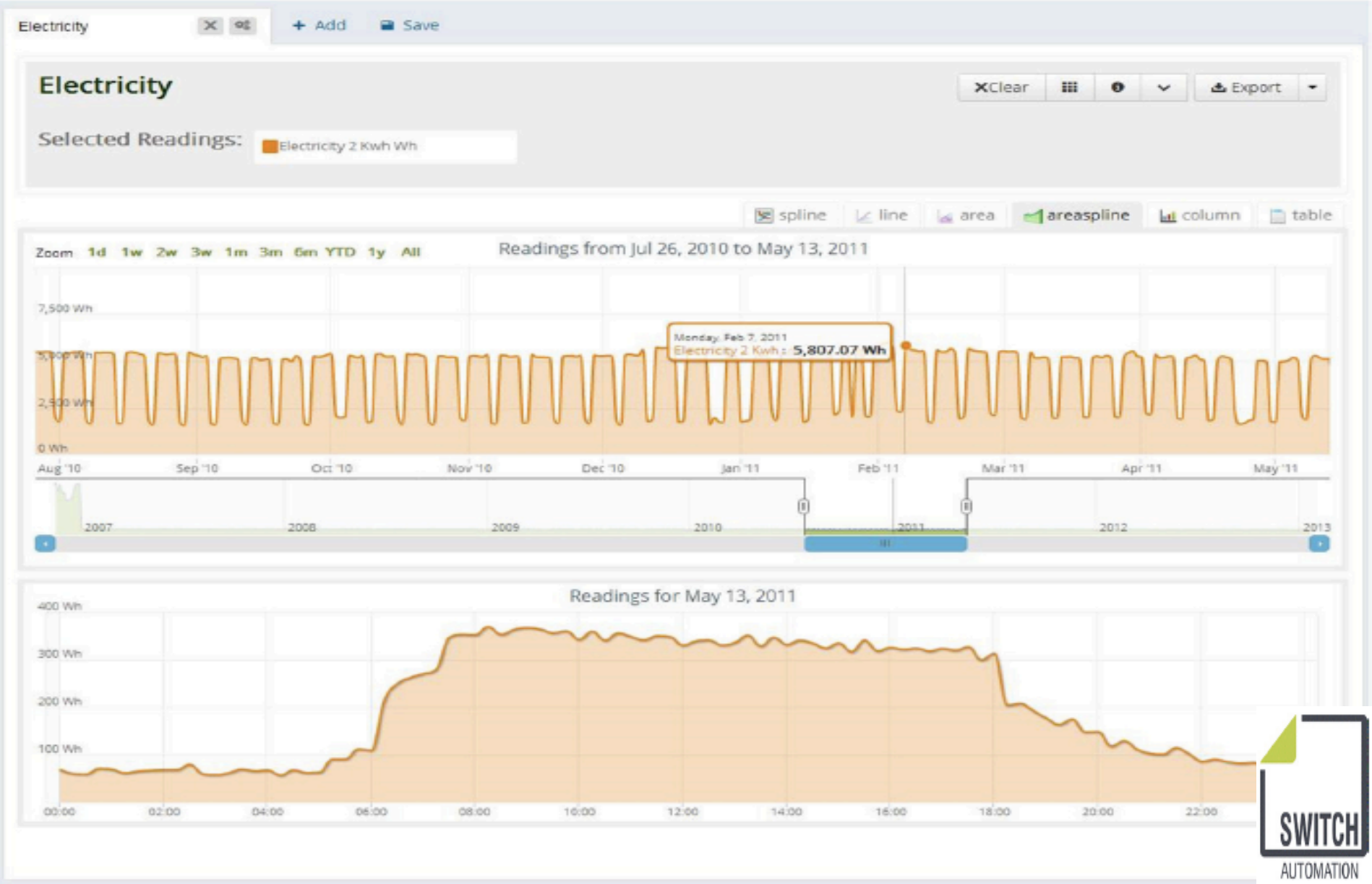




SWITCH AUTOMATION

SEATTLE 2030 DISTRICT

Interval Data Analysis



SWITCH AUTOMATION

SEATTLE 2030 DISTRICT

Small Commercial Program

SEATTLE 2030 DISTRICT

Small Commercial Toolkit

Web Resource

Tracking Tool: Energy Efficiency Strategies

Operations | *Auditing* | *Whole Building* | *Components*

- **Open Energy Information System**
- **Energy Management Package**
- **Whole Building Retrofit Tool**
- **Lighting: Retrofit Calculator**
- **Plug Loads: Energy Star Equip**
- **HVAC: Rooftop Units**
- **HVAC: Heat Pumps**
- **HVAC: Boilers**
- **HVAC: Air Cooled Elec. Chillers**

Existing Tool. Transforming to an on-line format

Tool to be/being developed

Case Study Library

SEATTLE 2030 DISTRICT

- ***2030 Districts Small Commercial Program and Toolkit***
- **Whole Building Retrofit EvaluaPon Tool**
- **HVAC Tools**
- **Energy Data VisualizaPon and AudiPng Tools**
- **LighPng Retrofit Calculator**
- **Plug Load Equipment Tools**
- **Case Study Library & Templates**
- **Low Cost AudiPng TransacPon Cost Tools**
- **2030 District Web Resource**

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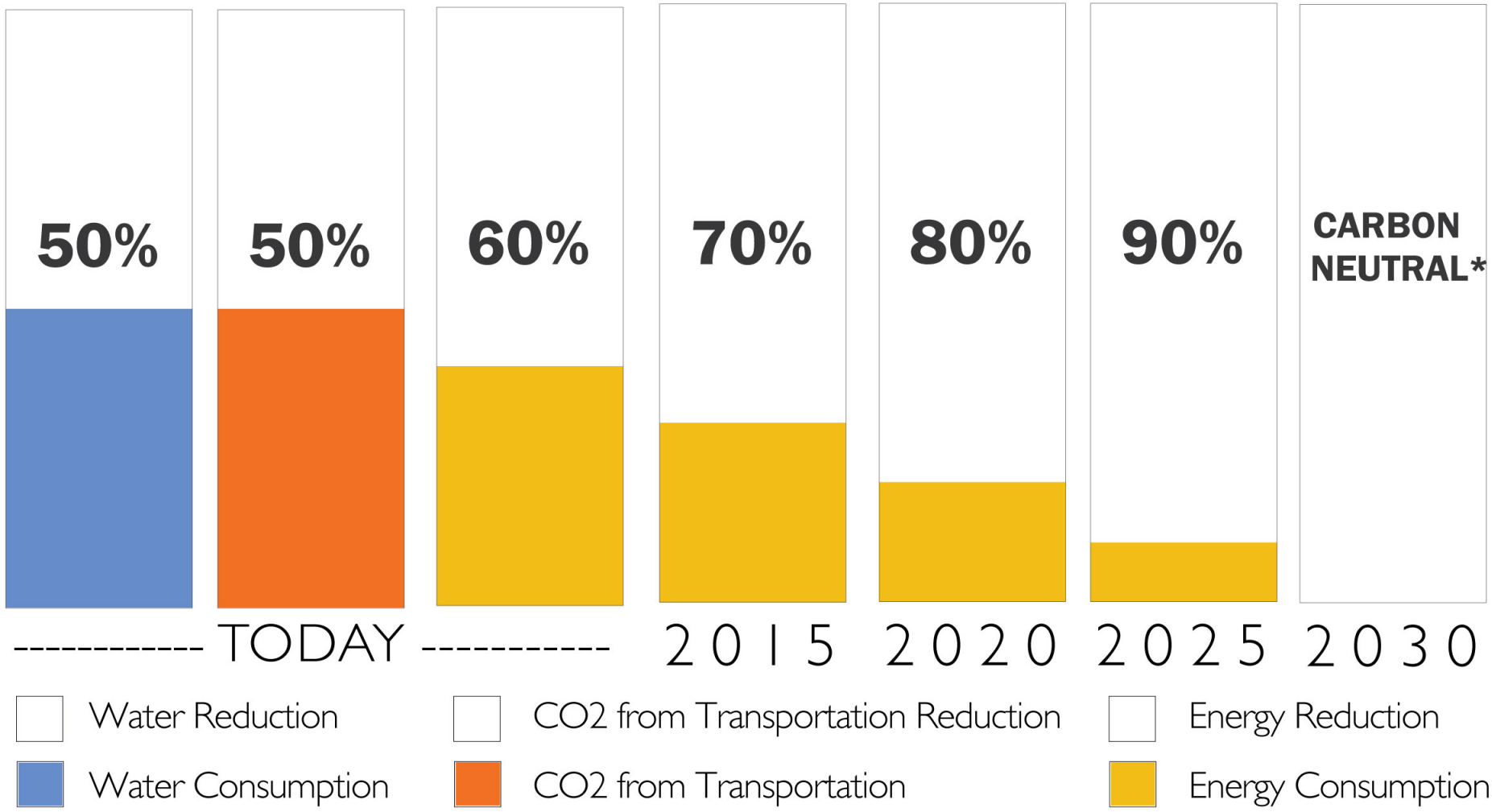
Seattle 2030 & Nissan Partnership

NISSAN

Performance Targets – New Buildings



The 2030 Challenge for Planning: New Buildings & Major Renovations

**Using no fossil fuel GHG-emitting energy to operate.*

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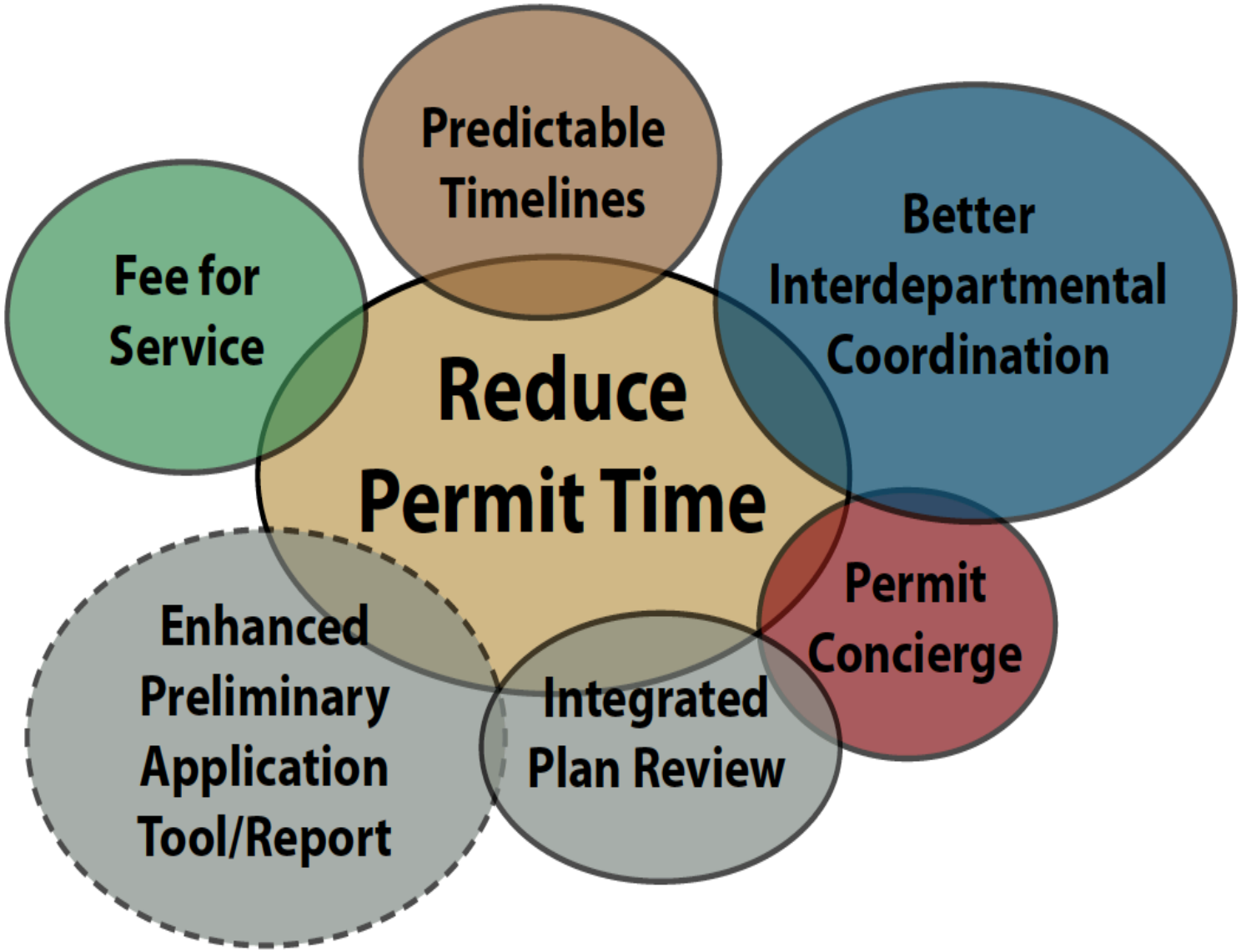
Streamlined Permitting



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Streamlined Permitting

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Streamlined Permitting

2-4 Weeks?

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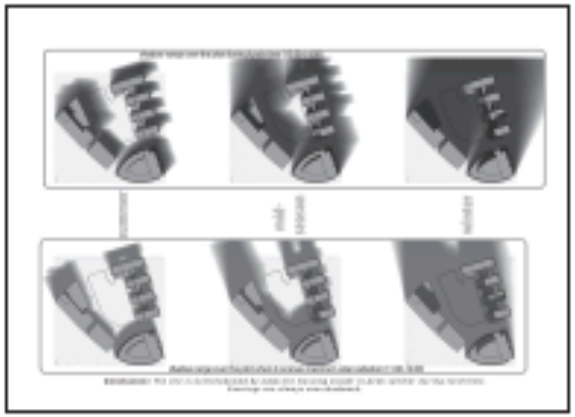
Streamlined Permitting

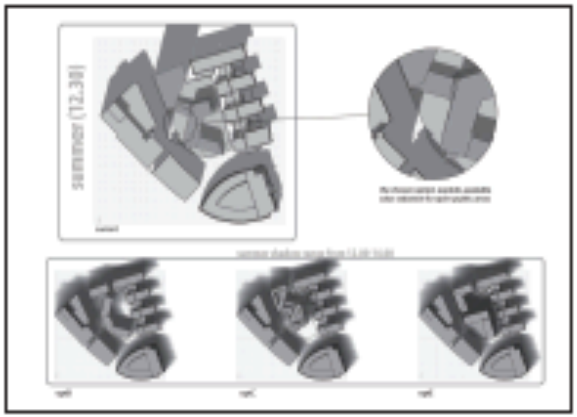
…Up to 3 Months!

Early Energy Modeling Assistance

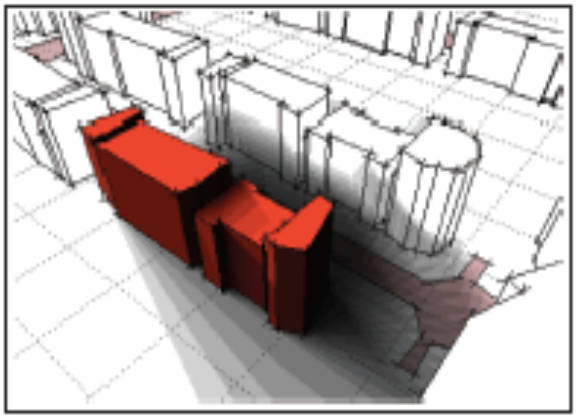
Shadow Analysis



Site Shadow Analysis

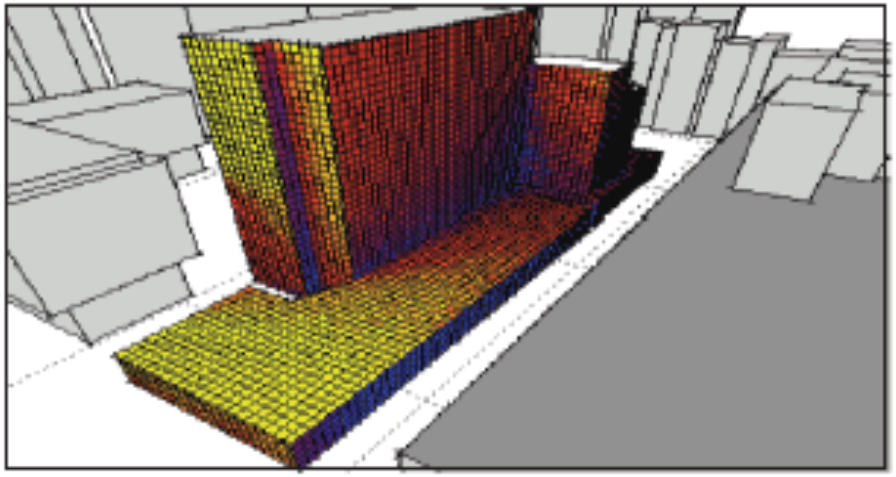


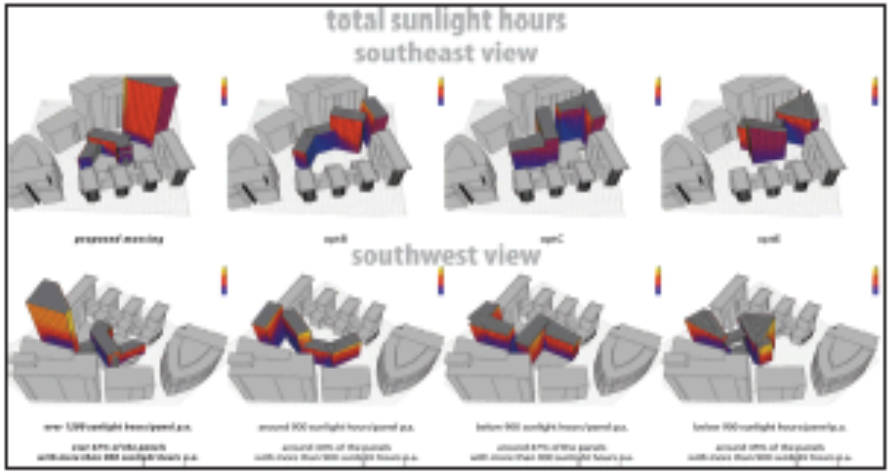
Shadow Analysis for Options



Shadow Range

Solar Radiation





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Relationships with other Programs

- Architecture 2030
- Better Buildings Challenge
- Northwest Energy Efficiency Alliance
- EcoDistricts

Better Buildings Challenge:
Place-Based Ally Agreement

The **Better Buildings Challenge** is a Presidential leadership initiative which calls on chief executive officers, university presidents, and state and local leaders to create American jobs through building energy efficiency. Challenge partners will make 'public commitments to action' and implement their plans to achieve lasting energy savings, improve our environment, and reduce our dependency on foreign oil. They will receive technical and implementation support from the Department of Energy in collaboration with other federal agencies and the William J. Clinton Foundation's Clinton Climate Initiative. BBC Place-Based Allies are asked to support the BBC by advocating for energy efficiency and transparently demonstrating their approaches and accomplishments.

Place-Based Ally Agrees to:

✔ **Commit**

The Department of Energy (DOE) Agrees to:

✔ **Assist**

Current List of Allies

Financial Allies

Abundant Power
$100 million committed

Blue Hill Partners LLC
$50 million committed

Clean Fund LLC
$50 million committed

GE Capital
$50 million committed

Greenwood Energy
$50 million committed

Metrus Energy
$75 million committed

Samas Capital
$150 million committed

Ygrene Energy Fund
$100 million committed

AFL-CIO
$150 million committed

Citi
$500 million committed

Energi Inc.
$50 million committed

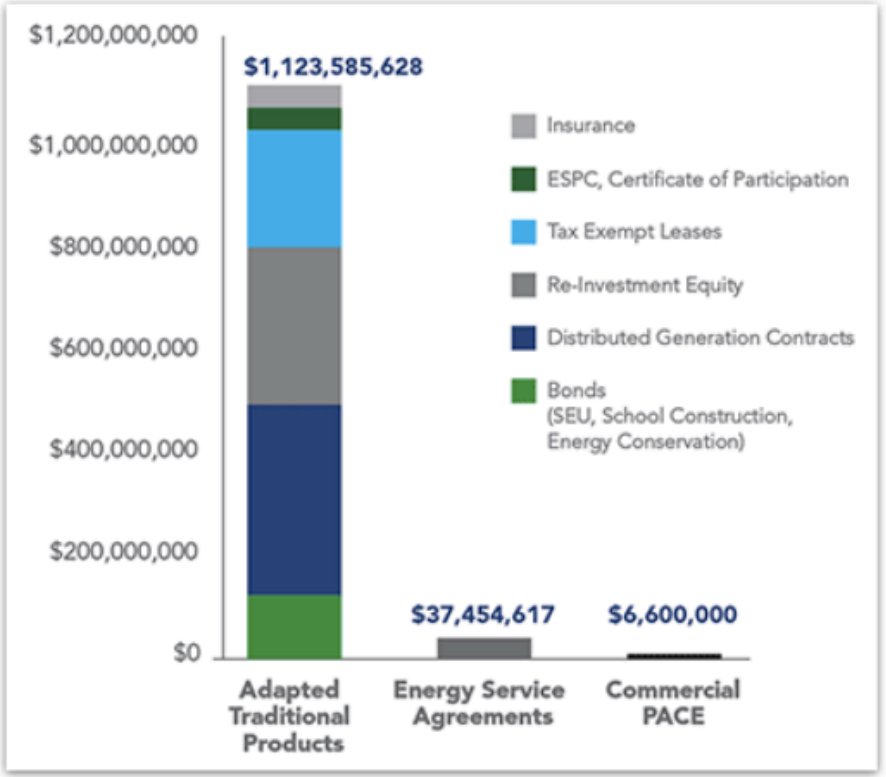
Green Campus Partners
$200 million committed

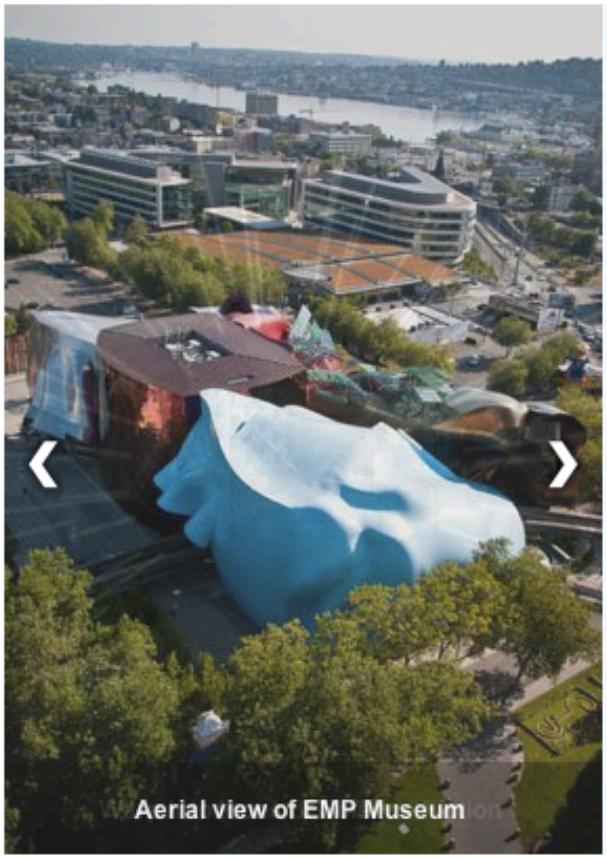
Hannon Armstrong
$250 Million

Renewable Funding
$150 million committed

SClenergy
$100 million committed

Financial Allies Close Deals on $1.1 Billion in Program's First Year





EMP MUSEUM

Showcase Project: City of Seattle

LOCATION
Seattle, WA

PROJECT SIZE
140,000 Square Feet

FINANCIAL OVERVIEW
Project Cost $1.54 Million

Annual Energy Use (Source EUI)

Baseline (2011)	504 kBtu/sq. ft.
Expected (2012)	399 kBtu/sq. ft.
Actual	COMING SOON

Expected Energy Savings: 21%

Annual Utility Cost

Baseline (2011)	$425,000
Expected (2012)	$319,000
Actual	COMING SOON

Expected Savings: $106,000

BACKGROUND

The City of Seattle retained McKinstry's Energy Services group to conduct a Directed Engineering Study of the EMP Museum, an iconic museum in downtown Seattle. Working closely with the facilities staff

SOLUTIONS

EMP's Directed Engineering Study produced eight recommended Facility Improvement Measures, which are expected to deliver $106,000 in annual utility savings (gas, electric,

OTHER BENEFITS

Seattle's EMP Museum showcase project will provide documentation for several LEED® Existing Buildings (EB) certification credits and will be key to achieving the goal of

SEATTLE 2030 DISTRICT

Interested in starting a District?

If you are interested in starting a District in Washington please contact Vincent Martinez, Interim Executive Director of the 2030 Districts Network at martinez@architecture2030.org

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More information

- For more information please visit our website at:

  2030districts.org/Seattle

- Follow us on Twitter @SEA2030

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Thank you!