Lawrenceville Allegheny Riverfront Responsible Growth District Plan Summary

Pittsburgh, PA

December 2015

Outline

- Overall Framework
- Transportation Opportunities
- Open Space Opportunities
- Funding & Implementation Opportunities
- District Energy Concepts

Project Scope

- Engage major property owners in Lawrenceville from 31st to 48th Streets to document an achievable strategy for Lawrenceville
- Establish areas for collaboration between the development proposals
- Prepare a Plan Update that integrates the current proposed development
- Consider how to improve perpendicular connections extending inboard from the River into the neighborhoods
- Incorporate infrastructure and mobility improvements that can potentially integrate into the Mayor's Complete Streets Plan
- Improve linkages to other neighborhoods
- Create a development typology for the District representing national and international best-practices for auto-free, live-work lifestyles

Project Goals

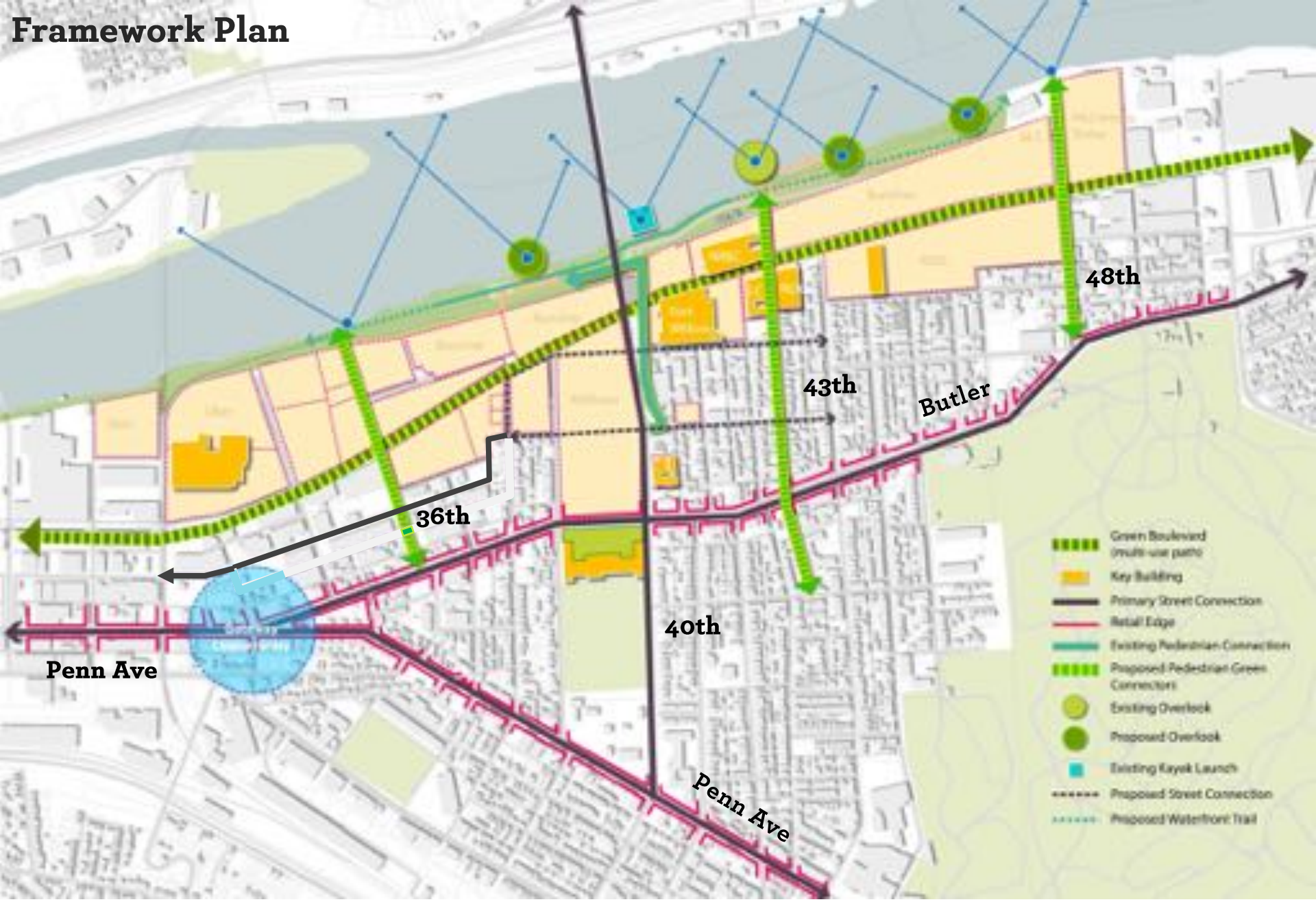
- Align private market interests with neighborhood and city objectives on large scale transformative development sites
- Advance high quality design and sustainability efforts in these developments
- Create strong transportation linkages, and improved public spaces between the Butler street Corridor and the Allegheny River and between Lawrenceville and surrounding neighborhoods
- Integrate best management practices in storm water control and facilitate the installation of green infrastructure where appropriate
- Create best practice models of development, including a suite of innovative financial tools and vision for shared district energy got for designated planning area

Existing Conditions:
Street network and rail corridors

Overall Framework

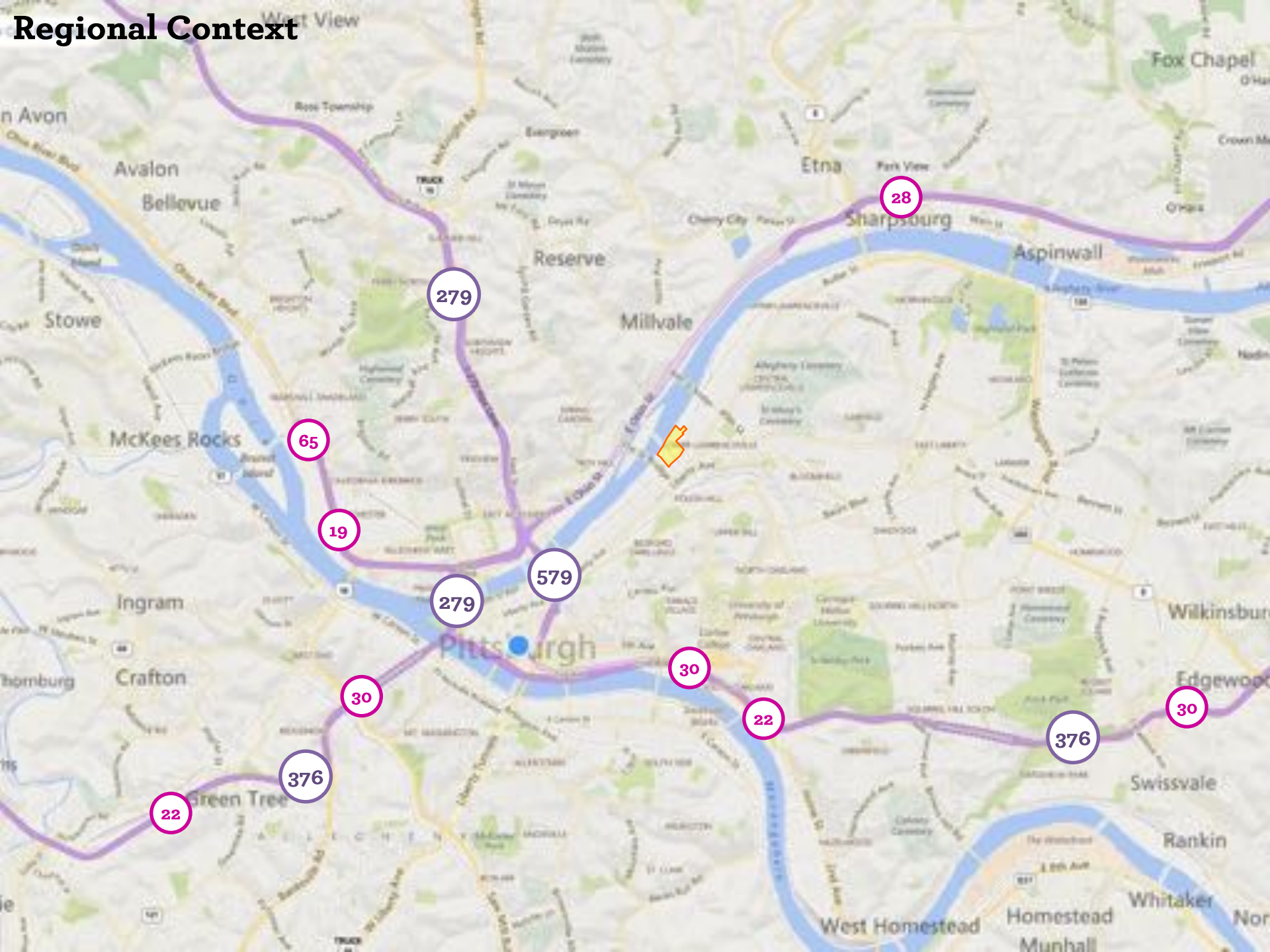
Potential Development Projects

Framework Plan



Transportation Opportunities

Regional Context



Average Annual Daily Traffic

Source: Google Earth/KSS Fuels

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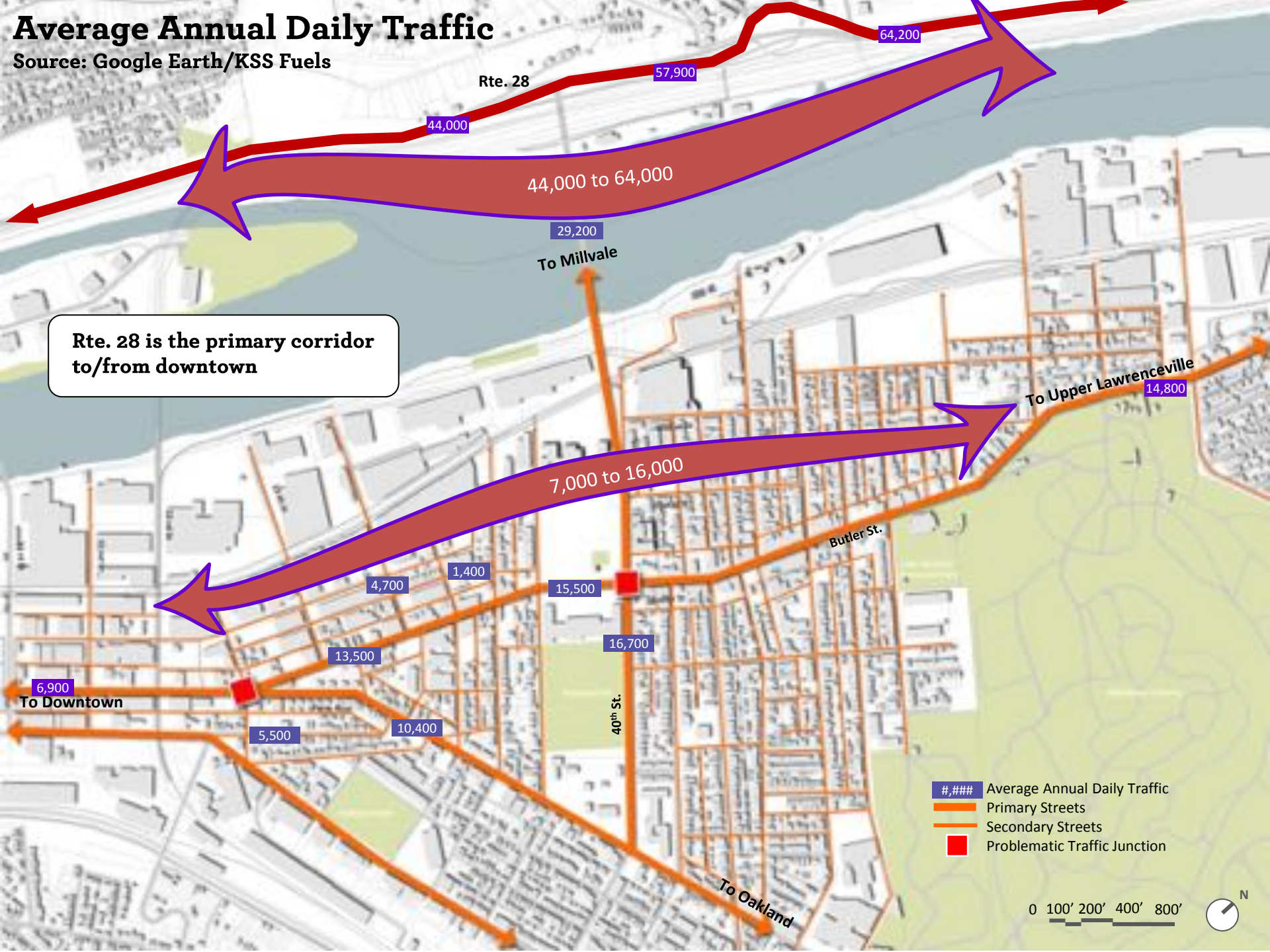


Average Annual Daily Traffic

Source: Google Earth/KSS Fuels

- **Butler St. carries more E-W traffic than Penn Ave.**
- **But Butler functions as a neighborhood street, not a regional arterial**

Rte. 28
57,900
44,000
Washington Crossing Br.
29,200
To Millvale
To Upper Lawrenceville
14,800
Butler St.
1,400
4,700
15,500
16,700
13,500
6,900
To Downtown
40th St.
10,400
5,500
Penn Ave.
To Oakland

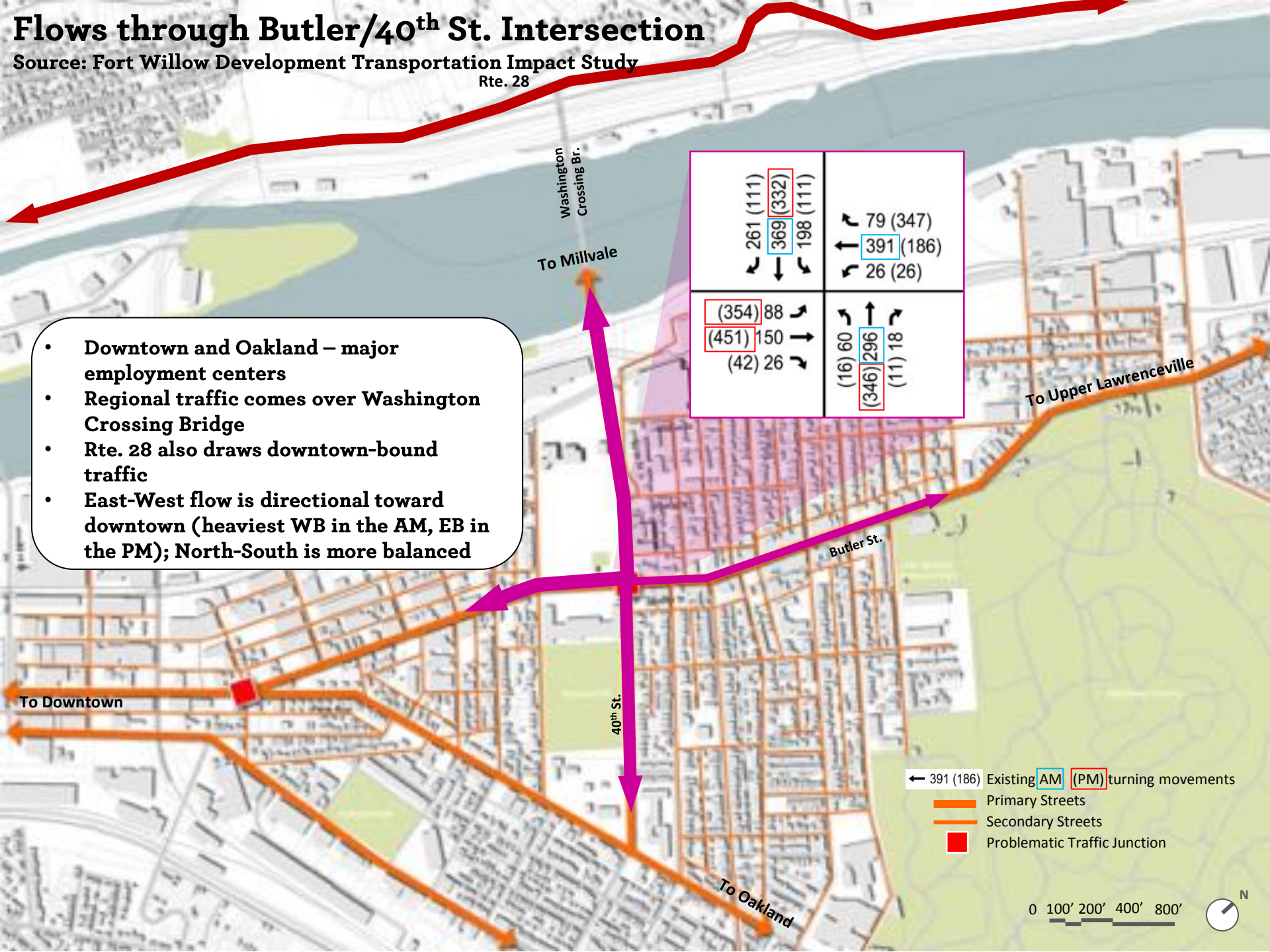
#,### Average Annual Daily Traffic
Primary Streets
Secondary Streets
Problematic Traffic Junction

0 100' 200' 400' 800'

N

Flows through Butler/40th St. Intersection

Source: Fort Willow Development Transportation Impact Study



- **Downtown and Oakland – major employment centers**
- **Regional traffic comes over Washington Crossing Bridge**
- **Rte. 28 also draws downtown-bound traffic**
- **East-West flow is directional toward downtown (heaviest WB in the AM, EB in the PM); North-South is more balanced**

Flows through Butler/40th St. Intersection

Source: Fort Willow Development Transportation Impact Study

- **Heavy Eastbound Left-turn volume in PM peak increases intersection capacity utilization**
- **Overall, intersection functions well: Level-of-Service D in PM**
- **Driveway turns, pedestrians etc. may increase friction**

Washington Crossing Br.

To Millvale

To Upper Lawrenceville

Butler St.

40th St.

To Downtown

To Oakland

Primary Streets

Secondary Streets

Problematic Traffic Junction

0 100' 200' 400' 800'

N

40th/Butler Projected Traffic Operations, 2019

- **LOS 'D' is ideal for urban peak periods**

HCM Signalized Intersection Capacity Analysis
1: 40th Street & Butler Street

9/7/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	375	460	43	31	196	354	16	382	11	113	340	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	9	9	9	9	9	9	9	9	9	10	10	10
Grade (%)		1%			-2%			-6%			2%	
Total Lost time (s)	5.0	5.0			5.0	5.0	5.0	6.0		5.0	5.0	6.0
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	0.98	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99			1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00			0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1567	1627			1625	1439	1671	1727		1634	1721	1492
Flt Permitted	0.43	1.00			0.87	1.00	0.29	1.00		0.16	1.00	1.00
Satd. Flow (perm)	717	1627			1418	1439	508	1727		268	1721	1492
Peak-hour factor, PHF	0.97	0.89	0.81	0.81	0.89	0.91	0.80	0.95	0.83	0.96	0.89	0.84
Adj. Flow (vph)	387	517	53	38	220	389	20	381	13	118	382	136
RTOR Reduction (vph)	0	0	0	0	0	209	0	0	0	0	0	75
Lane Group Flow (vph)	387	570	0	0	258	180	20	394	0	118	382	61
Confl. Peds. (#/hr)	46		22	22		46	6		12	12		6
Confl. Bikes (#/hr)			8			4			1			
Heavy Vehicles (%)	1%	2%	7%	12%	4%	2%	0%	1%	10%	2%	2%	0%
Turn Type	pm+pt	NA		Perm	NA	Prot	pm+pt	NA		pm+pt	NA	Prot
Protected Phases	5	2			6	6	3	8		7	4	4
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	72.0	72.0			44.6	44.6	33.8	31.0		42.2	35.2	35.2
Effective Green, g (s)	72.0	72.0			44.6	44.6	33.8	31.0		42.2	35.2	35.2
Actuated g/C Ratio	0.57	0.57			0.35	0.35	0.27	0.25		0.33	0.28	0.28
Clearance Time (s)	5.0	5.0			5.0	5.0	5.0	6.0		5.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	560	929			501	509	162	424		185	480	416
v/s Ratio Prot	c0.12	0.35				0.13	0.00	c0.23		c0.04	0.22	0.04
v/s Ratio Perm	c0.27				0.18		0.03			0.20		
v/c Ratio	0.69	0.61			0.51	0.35	0.12	0.93		0.72	0.80	0.15
Uniform Delay, d1	16.6	17.8			32.2	30.1	35.0	46.4		32.8	42.1	34.1
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	3.0			3.8	1.9	0.3	26.5		13.7	8.9	0.2
Delay (s)	20.2	20.8			35.9	32.0	35.3	73.0		46.6	50.9	34.3
Level of Service	C	C			D	C	D	E		D	D	C
Approach Delay (s)		20.6			33.6			71.1			46.6	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Millhaus Trip Generation & Distribution

Sources: Strada LLC, ITE Trip Generation Manual,
Fort Willow Development Transportation Impact Study (distribution)

- **Millhaus project would add about 80 trips to Butler St. in the AM peak hour; 110 in the PM**
- **Might tip Butler/40th St. intersection to LOS E in PM (undesirable)**

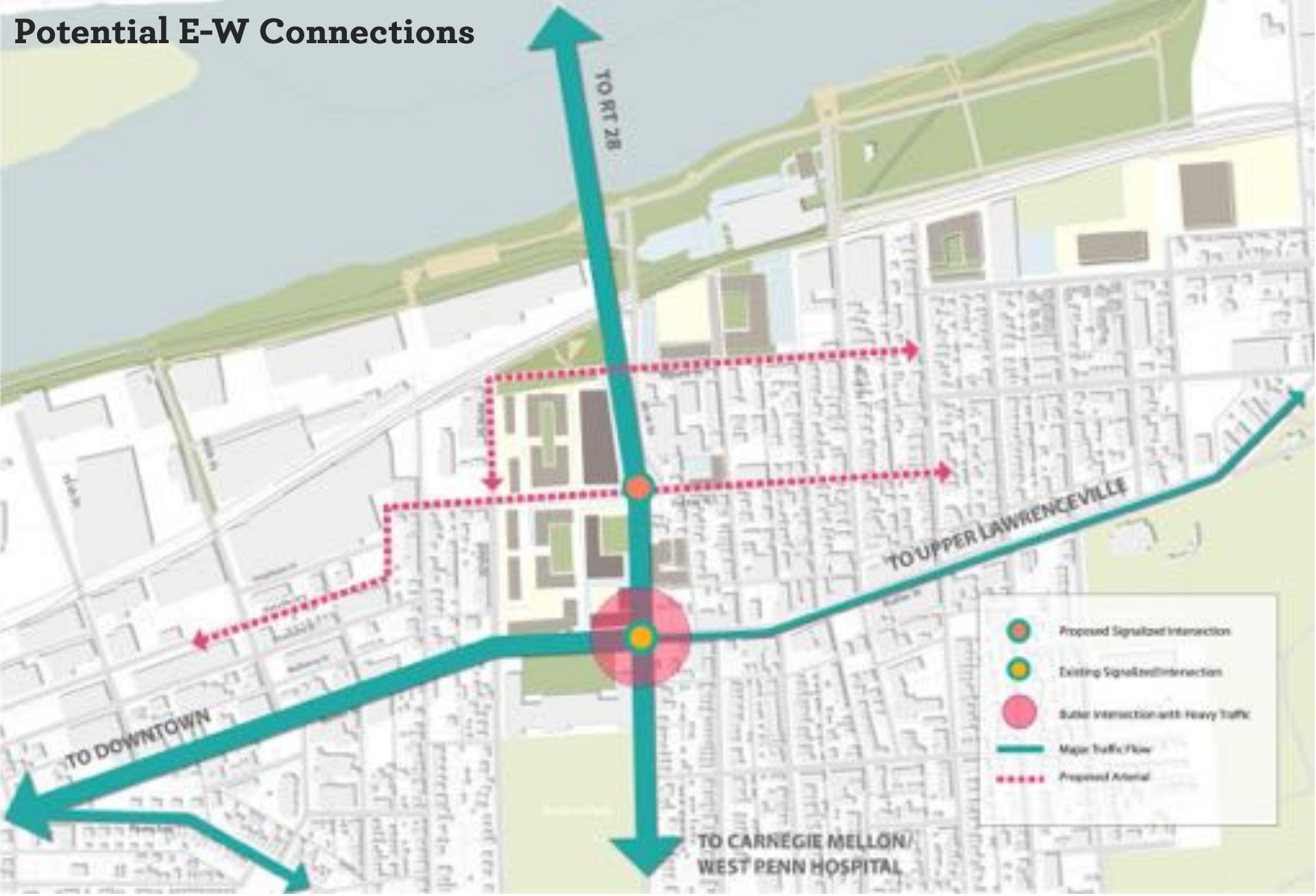
Millhaus Trip Generation, per ITE Manual 7th Edition

Land Uses	kgsf or du	LUC #	Trips/unit AM Peak	AM Trips	AM% out	AM in	AM out	Trips/unit PM Peak	PM Trips	PM% out	PM in	PM out	Trips/unit Weekday	Weekday Trips
townhome/condominium	650 du	230	0.44	286	83%	49	237	0.52	338	33%	226	112	5.86	3,809
neighborhood commercial	15 kgsf	814	2.71	41	56%	18	23	6.84	103	52%	49	53	44.32	665

Observations

- Primary employment centers – trip attractors – are Downtown and Oakland (U. Pittsburgh, hospitals, Carnegie Mellon)
- Connection of Foster St. across 40th St. would have a minor effect on Butler St. traffic, might divert some local traffic and relieve congestion in Butler corridor
- Foster/40th St./40th St. Bridge intersection would need to be redesigned to allow extension of Foster St.
- Millhaus development parking access should be located away from Butler to avoid driveways and conflicts near the Butler/40th St. intersection.

Potential E-W Connections

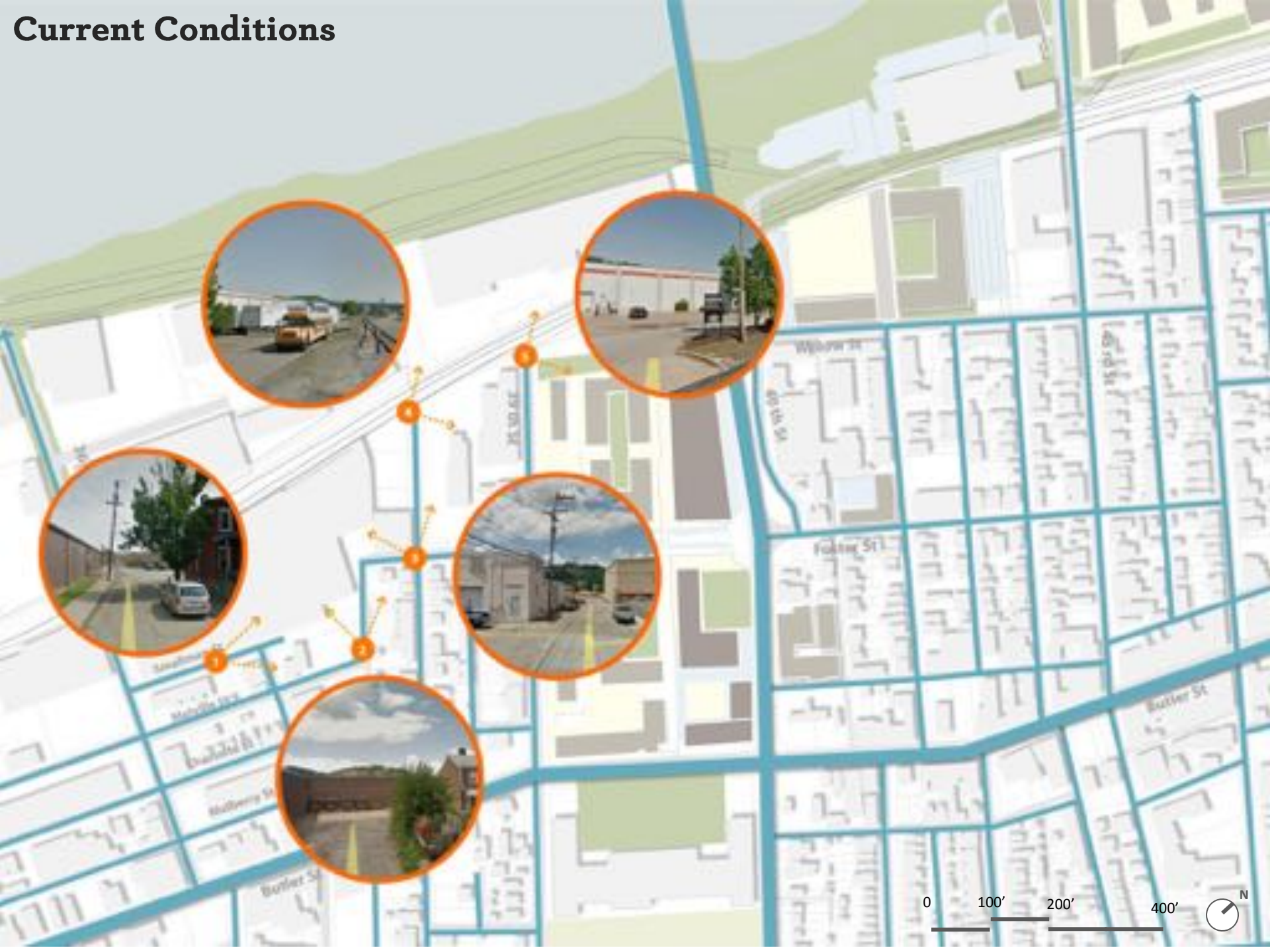


Proposed E-W Connection of Foster and Willow to provide for better street grid connectivity.
Foster Street will continue onto Smallman Street to better connect to Downtown, easing the traffic problems on Butler Street.

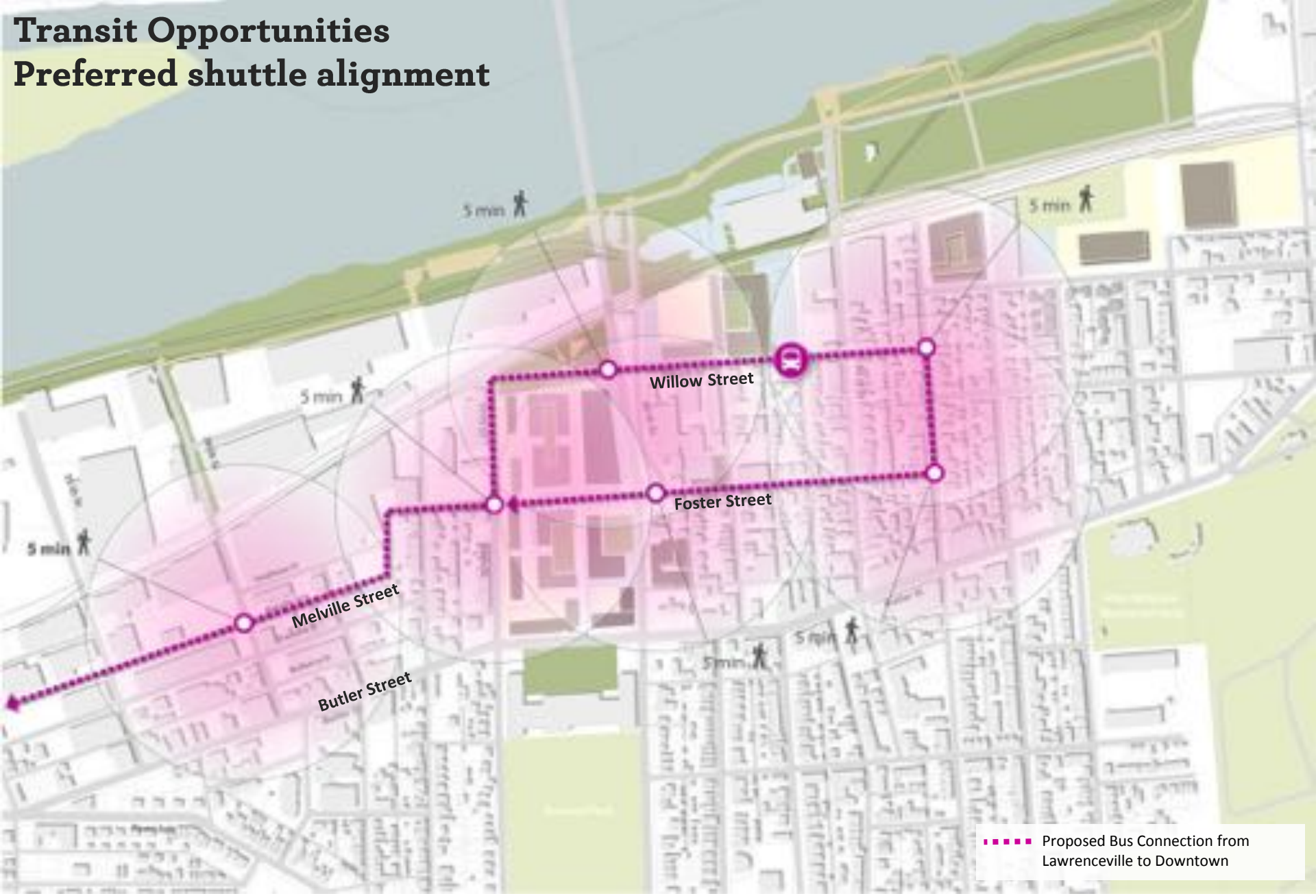
0 100' 200' 400'

N

Current Conditions



Transit Opportunities
Preferred shuttle alignment



Propose Bus Connection through Melville, Willow and Foster for better connectivity to Downtown and ease major traffic away from Butler Street

0 100’ 200’ 400’

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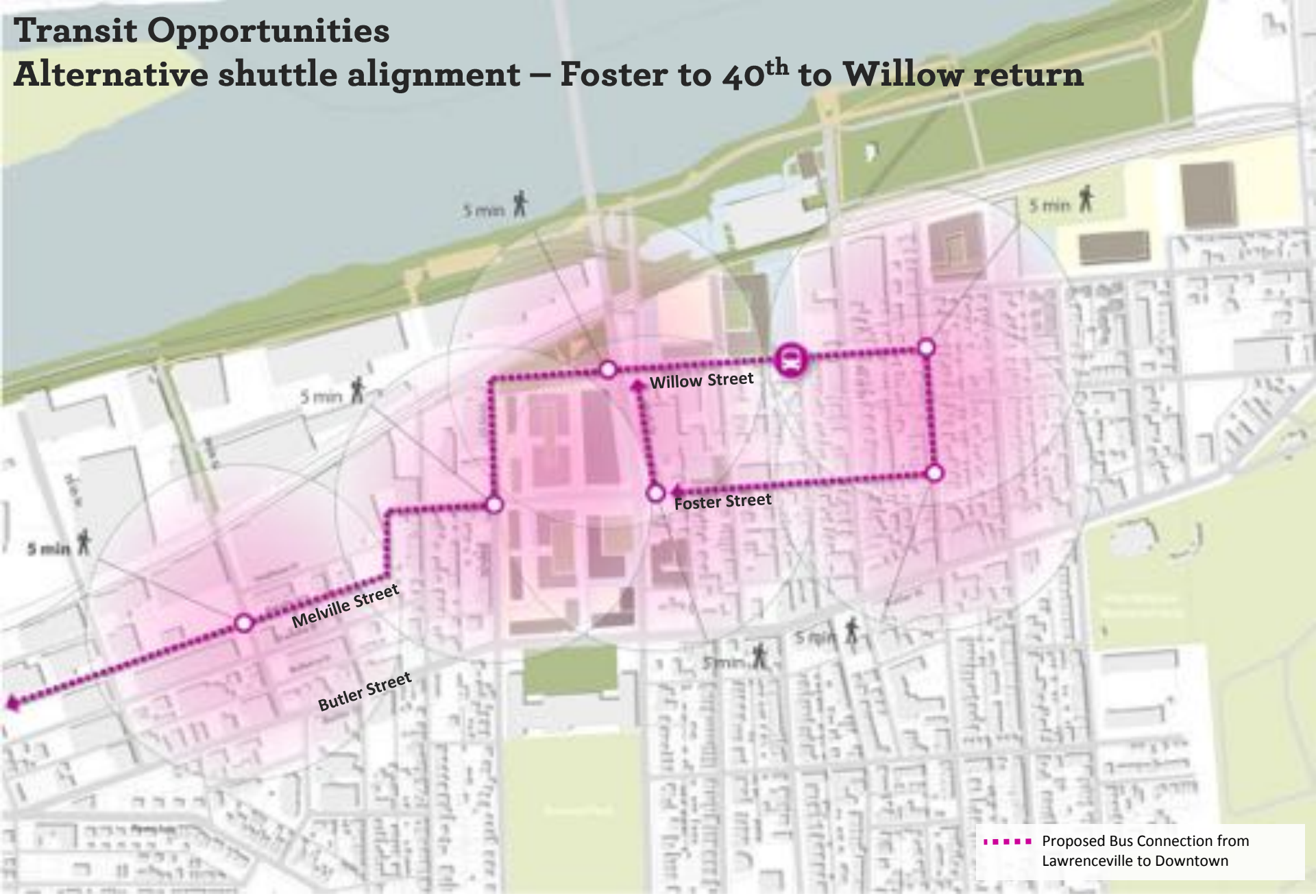
Transit Opportunities
Preferred shuttle alignment

Transit Opportunities
Alternative shuttle alignment – Foster to 40th to Willow return



Propose Bus Connection through Melville, Willow, Foster and back to Willow for better connectivity to Downtown and ease major traffic away from Butler Street

0 100' 200' 400'

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Parking Opportunities

Proposed Garage

@ Willow & 40th
41,000 sf / lvl
5 lvls
205,000 gsf

~624 space capacity

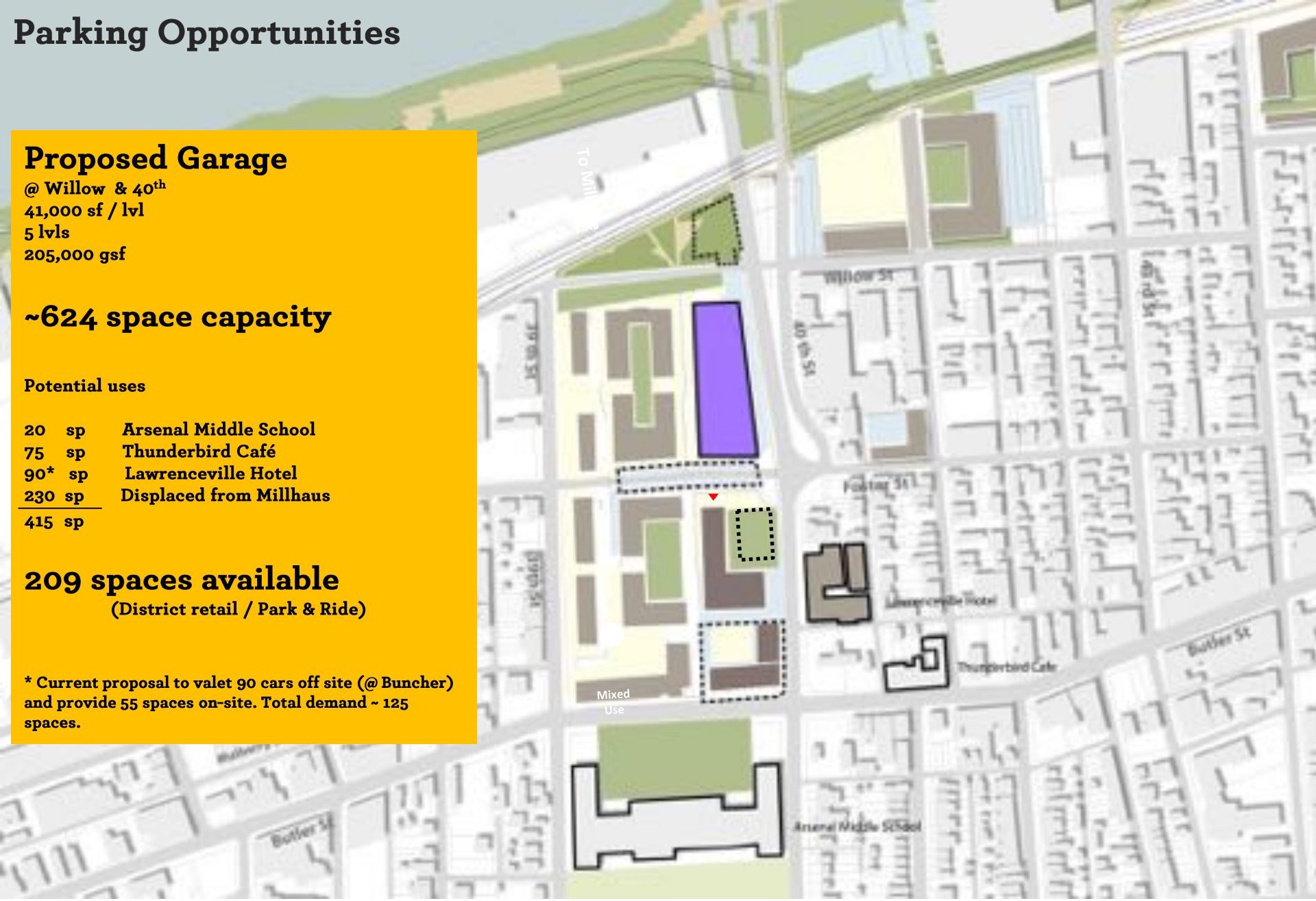
Potential uses

20	sp	Arsenal Middle School
75	sp	Thunderbird Café
90*	sp	Lawrenceville Hotel
230	sp	Displaced from Millhaus
415	sp	

209 spaces available

(District retail / Park & Ride)

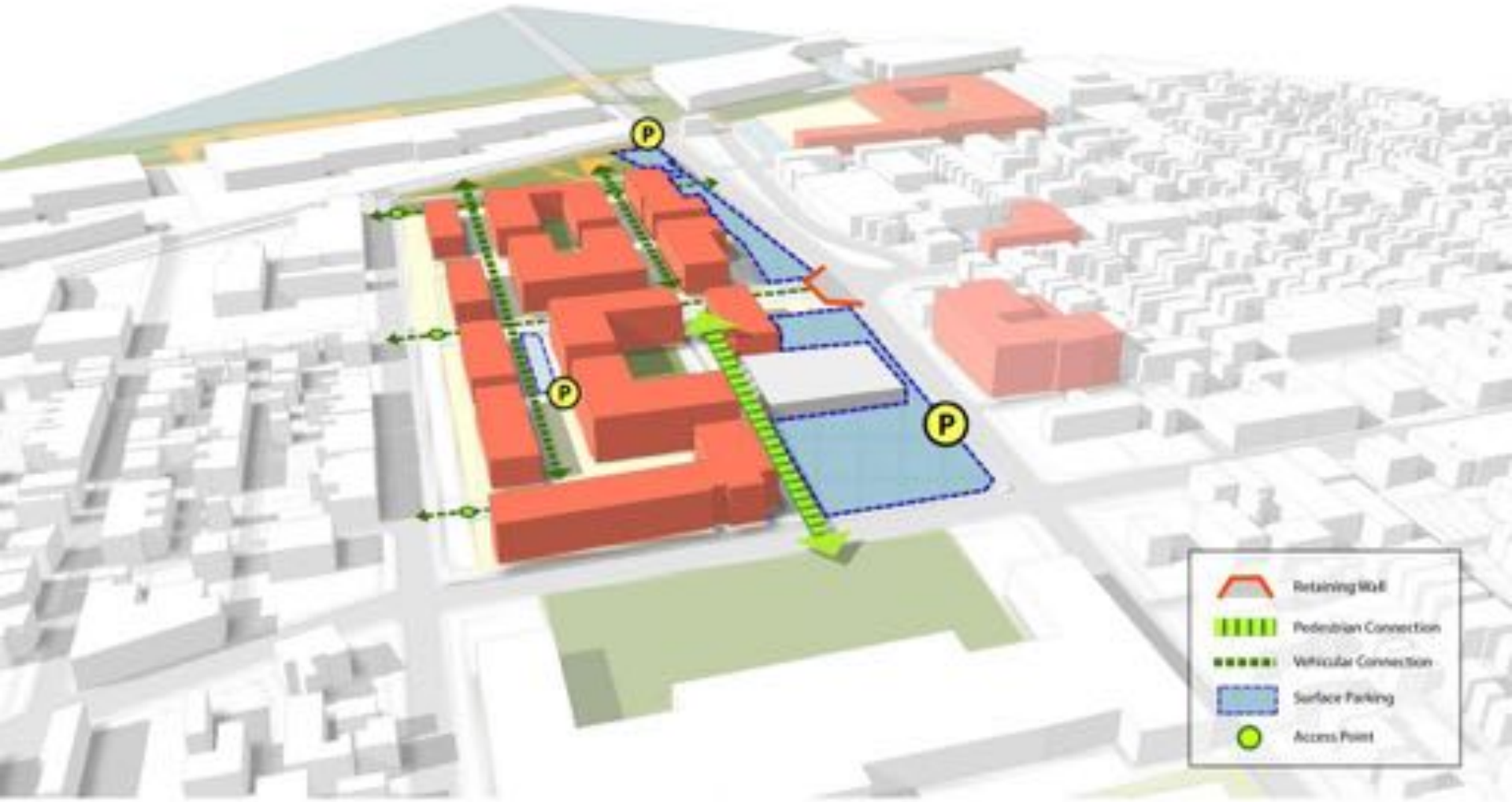
* Current proposal to valet 90 cars off site (@ Buncher) and provide 55 spaces on-site. Total demand ~ 125 spaces.



Propose Parking Garage at 40th and Willow to support parking demands from surrounding uses as well as from Millhaus Development. Ground level convenience retail possible to front the pedestrian core proposed within the Millhaus Development.

Millhaus Proposed Parking

Proposed Development on Millhaus Site



Recommendations on Proposed Development on Millhaus Site

Open Space Plan

Open Space Opportunities

Proposed Riverfront Green Space, extend the existing Three Rivers heritage Trail, and establish Perpendicular Green Connections from the Neighborhood onto the River. Willow St Park, 45th St park and Robot Testing Ground could add program and points of interest along the Green Boulevard. Propose Overlooks at the River at the termination of the Perpendicular Green Connections from the Neighborhood.

0 100' 200' 400'

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Site Design Opportunities

1
2
3
4
5
6
7

Site Design Concepts

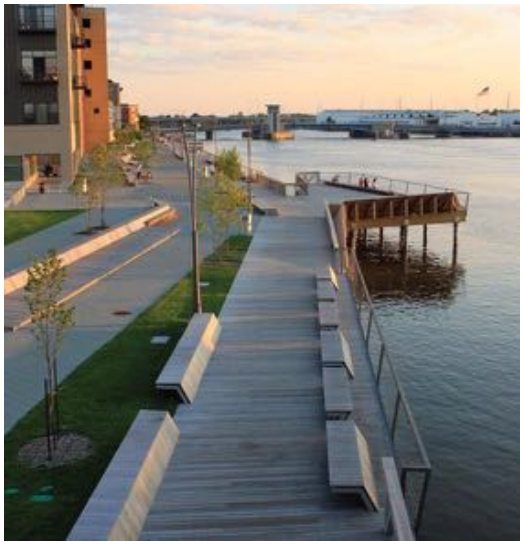


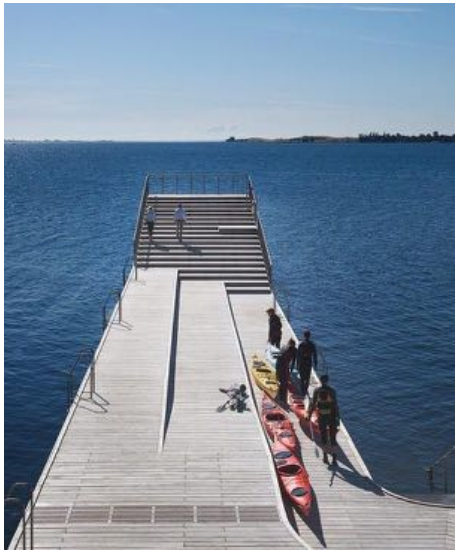





Materials- Contemporary Steel, Layered Concrete, Aztec Gold

Site Design Concepts



Riverfront Overlooks, Industrial Lighting

Open Space Plan

The plan focuses on 3 key areas. The Multi-Use Path, Riverwalk and Willow Street Park

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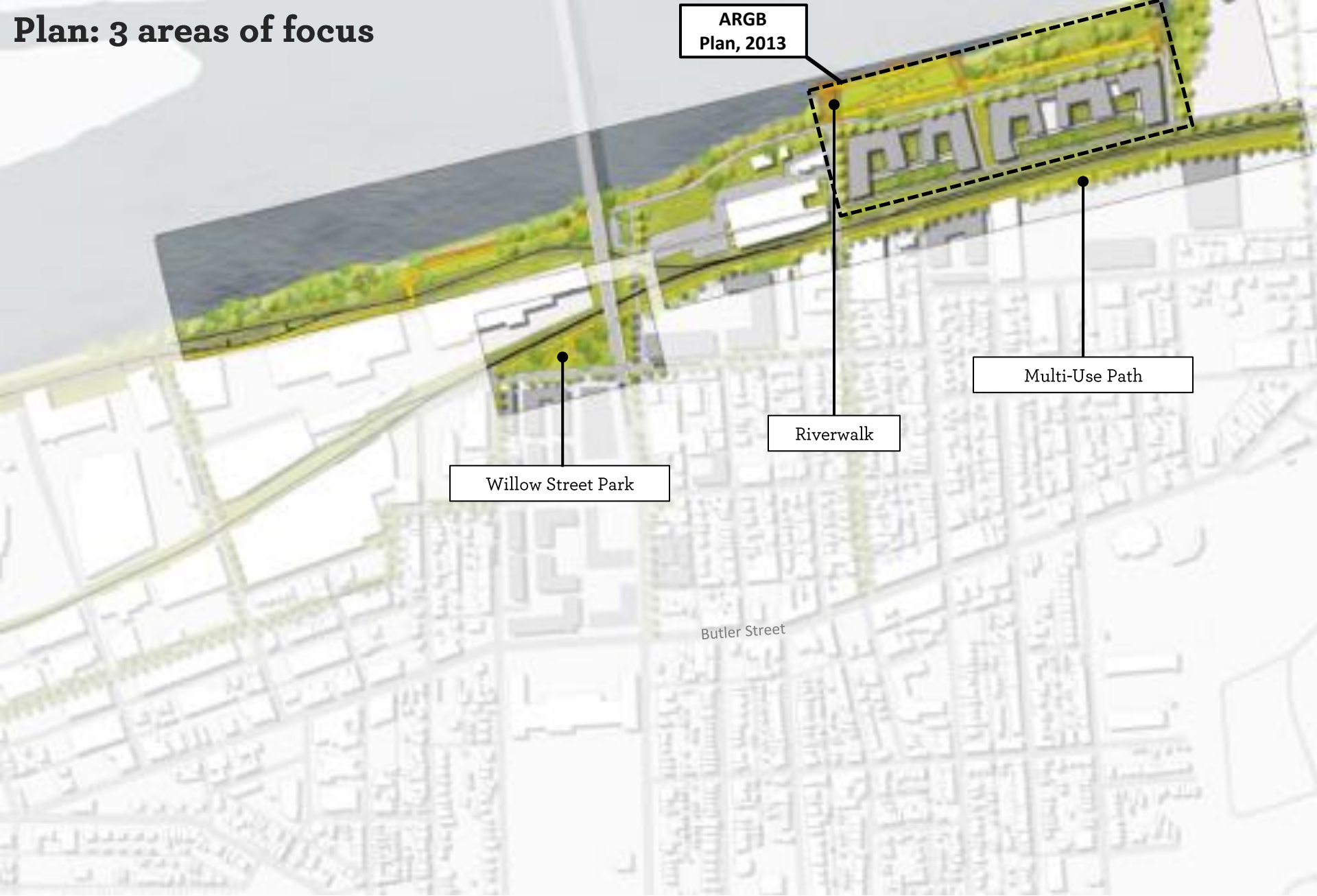
Plan: 3 areas of focus



The plan focuses on 3 key areas. The Multi-Use Path, Riverwalk and Willow Street Park

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Stormwater Infrastructure Opportunities

Stormwater improvements were evaluated based on replacing existing gray infrastructure on parcels with green infrastructure Best Management Practices (BMP's; parcels for following calculations.)

N

Green Infrastructure Opportunities

Porous paving

Bioswales

Green Roof

Stormwater Infrastructure Opportunities

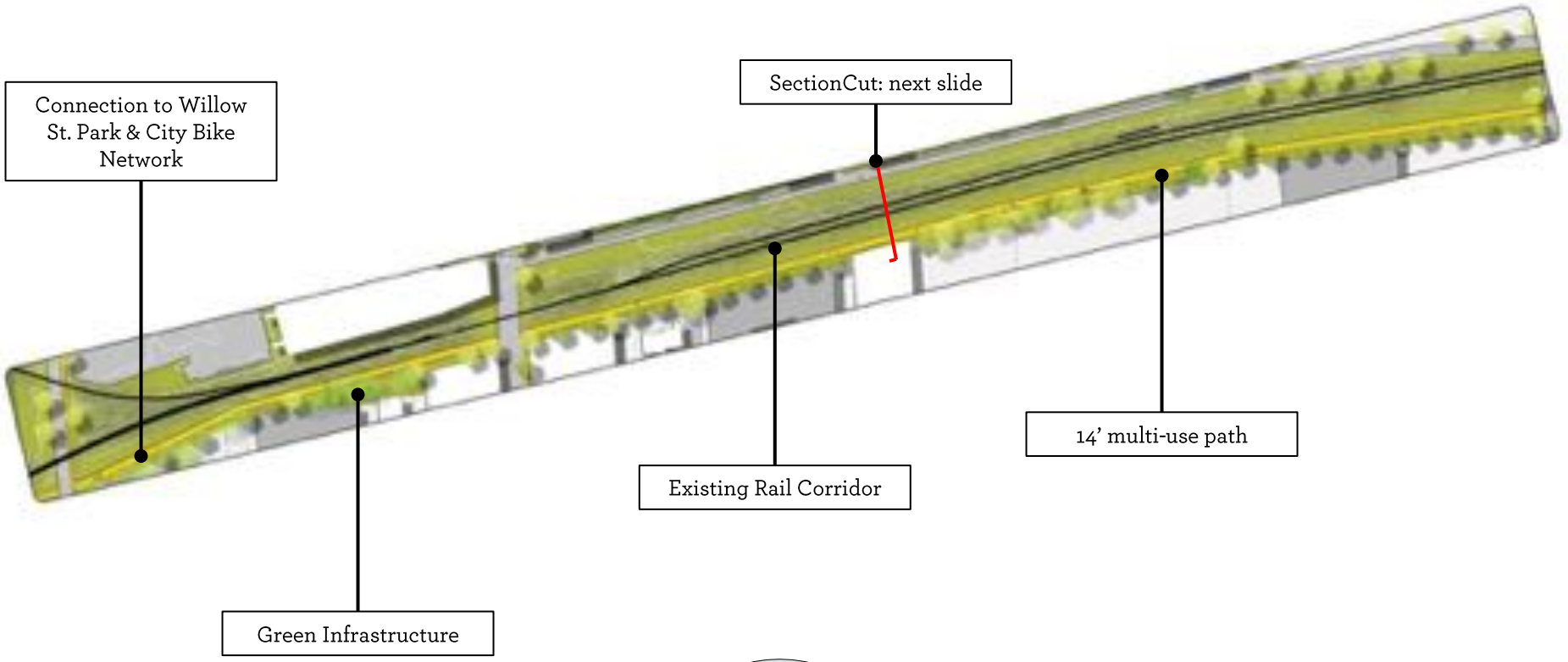
		Typical Development			Development With BMPs				
		98	79	98	84	98	80	98	79
			Landscape		Green Roof		Porous		Landscape
Parcel	Total Area (sf)	Roof (sf)	(sf)	Paving (sf)	(sf)	Roof (sf)	Paving (sf)	Paving (sf)	(sf)
1	609,164	258,892	42,538	307,734	194,169	64,723	153,867	153,867	42,538
2	208,185	84,431		123,754	63,323	21,108	61,877	61,877	
3	580,763	255,579		325,184	191,684	63,895	162,592	162,592	
4	35,557	23,696		11,861	17,772	5,924	5,931	5,931	
5	21,466	8,241		13,225	6,181	2,060	6,613	6,613	
6	37,574	27,209		10,365	20,407	6,802	5,183	5,183	
7	47,005	37,291		9,714	27,968	9,323	4,857	4,857	
8	363,770	77,900	157,960	127,910	58,425	19,475	63,955	63,955	157,960
9	536,492	157,503	106,923	272,066	118,128	39,376	136,033	136,033	106,923
10	256,834		256,834	-	-	-	-	-	256,834

2-YR Storm		Parcel	1	2	3	4	5	6	7	8	9	10	Total
	Runoff Volume (cf)	Typical Development	102,714	38,071	106,504	6,534	3,920	6,882	8,625	41,208	78,452	12,720	405,630
		Development with BMPs	65,427	23,566	65,776	4,008	2,439	4,269	5,314	29,664	54,624	12,720	267,807
	Peak Flow (cfs)	Typical Development	49.45	17.65	49.25	3.02	1.82	3.19	3.99	21.87	39.61	6.77	197
		Development with BMPs	34.95	12.5	34.91	2.14	1.29	2.26	2.83	16.13	29.33	6.77	143.11

10-YR Storm		Parcel	1	2	3	4	5	6	7	8	9	10	Total
	Runoff Volume (cf)	Typical Development	162,958	58,588	163,481	10,019	6,055	10,585	13,242	74,618	130,941	29,664	660,152
		Development with BMPs	120,400	42,689	119,093	7,275	4,400	7,710	9,627	1	102,192	29,664	443,050
	Peak Flow (cfs)	Typical Development	76.48	26.73	74.57	4.57	2.76	4.82	6.04	38.33	63.92	16.16	314
		Development with BMPs	62.36	21.93	61.19	3.75	2.26	3.96	4.95	31.66	53.29	16.16	261.51

Utilizing green infrastructure (assuming 75% green roof/25% standard roof and 50% of paving converted to porous paving), the 2-year storm results in a 36% stormwater reduction for the 2-year storm and a 35% stormwater reduction for the 10-year storm. Utilizing green infrastructure, the average decrease in peak flow for the 2-year storm is 28% and for the 10-year storm is 18%.

Multi-Use Path



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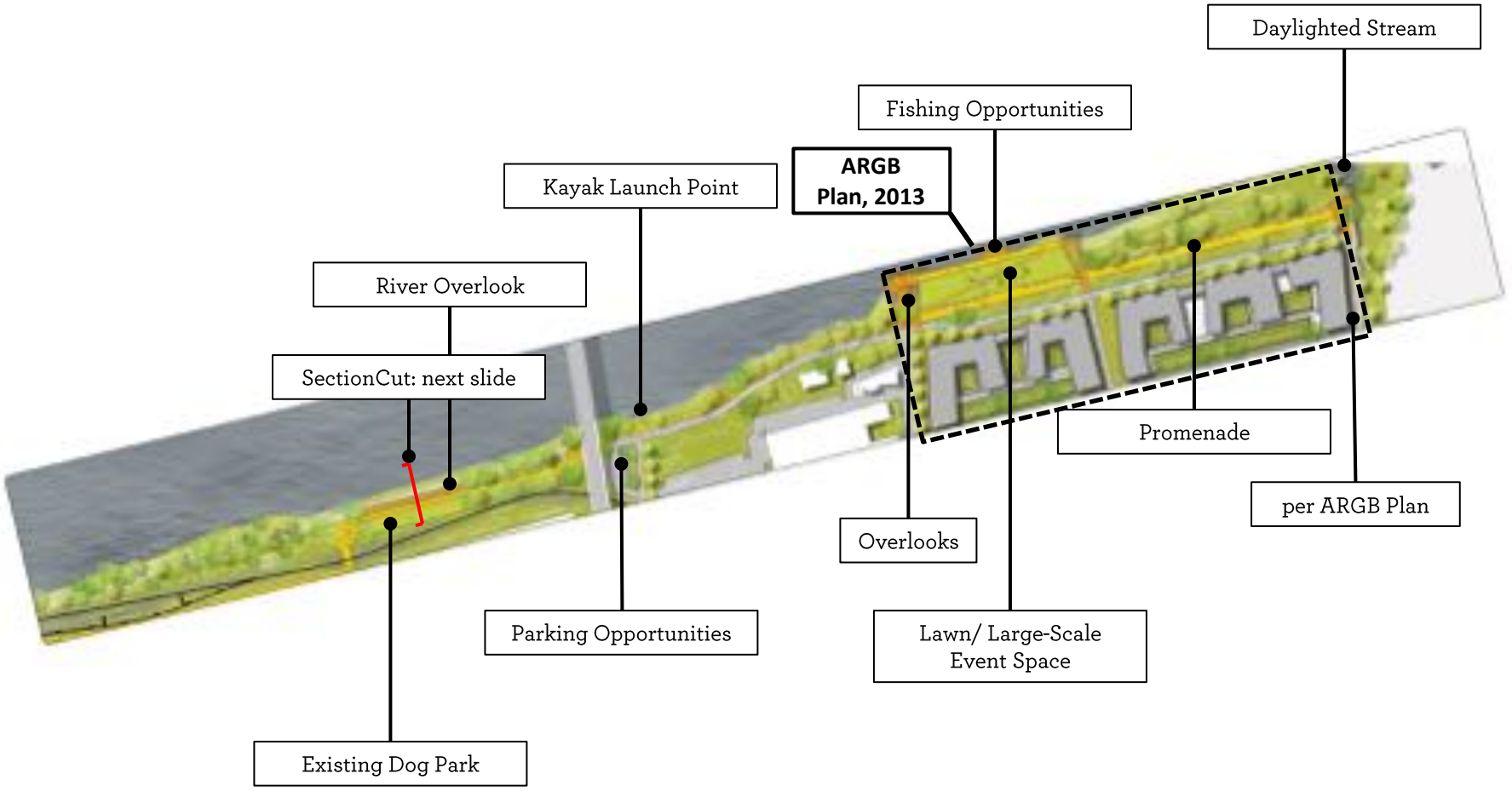
Multi-Use Path

Sited along the existing rail corridor, the path acts as a green unified urban corrodor for cyclists and pedestrians.

Riverwalk



0 100' 200' 400'

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Riverwalk

Focus on connection toward the rivers edge. Overlooks and programmed zones promote activity.

Riverwalk: Design Concepts

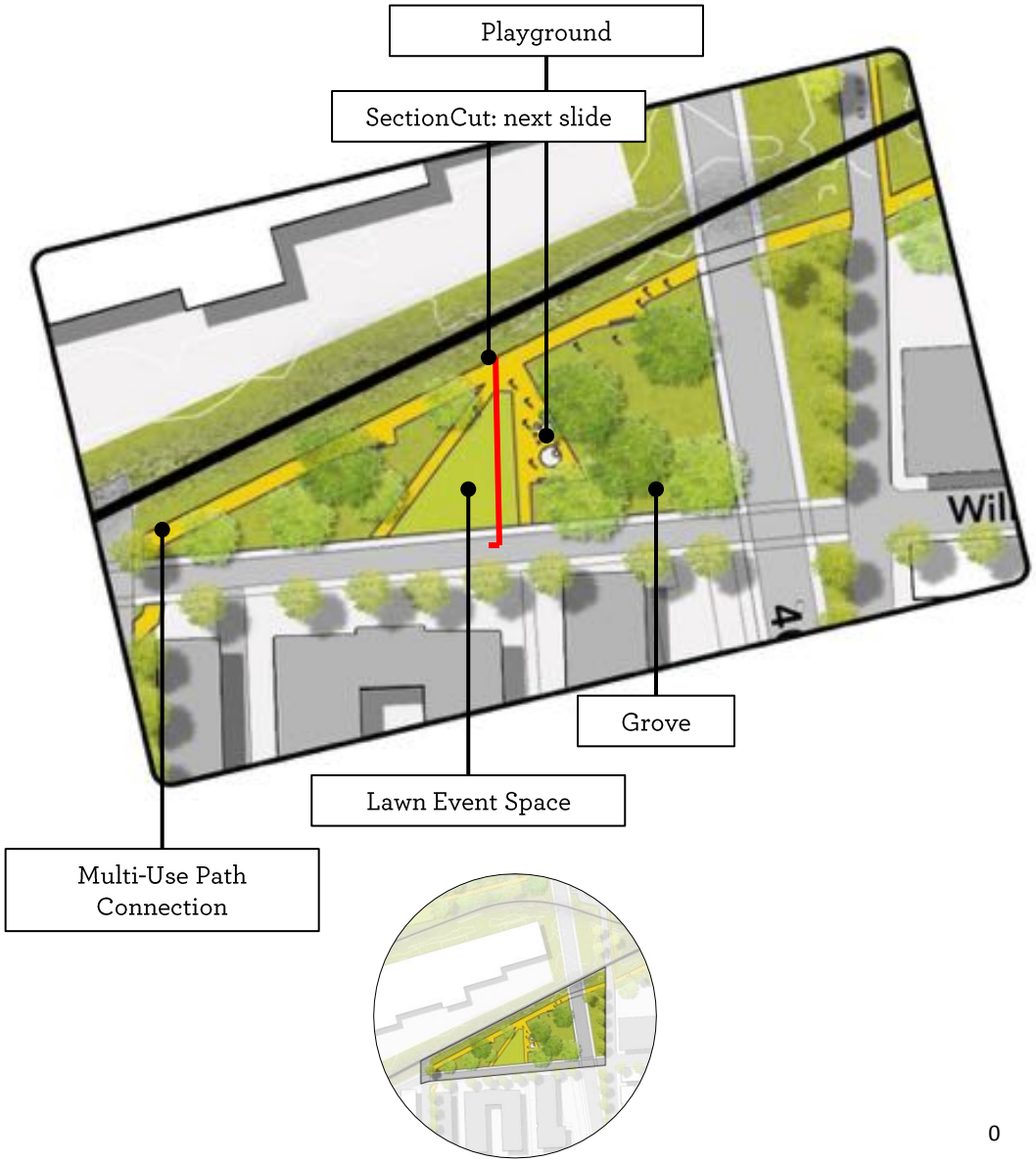







Focus on industrial character/ materiality as a continuous design/ path, while incorporating big bold graphics in Pittsburgh Aztec gold.

Willow Street park



Willow Street Park

Funding & Next Steps

Economic Benefits of Planned Development

Utilizing the methodology for the Three Rivers Park Economic Impact Analysis prepared by Sasaki for Riverlife in 2015, Sasaki prepared a similar analysis of the development in Lawrenceville to understand the fiscal benefits of planned developments, whether they generate enough value to justify public investments, and to guide development strategies for funding.

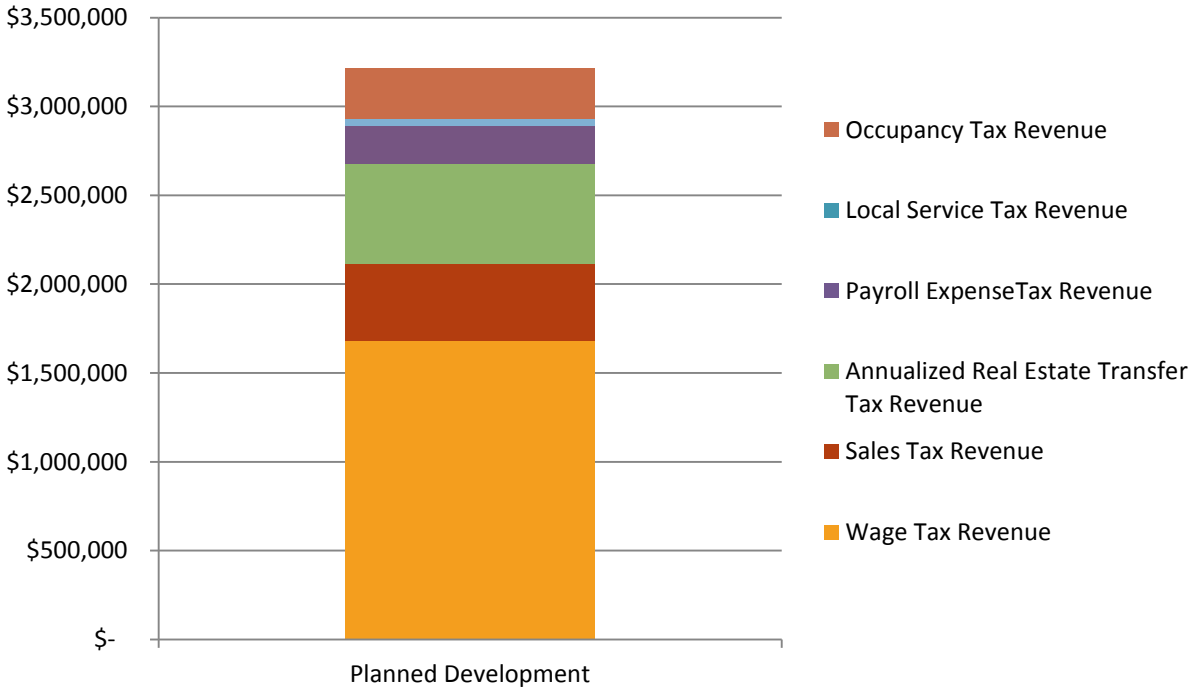
The Three Rivers Park study demonstrated an approximately 20:1 Return on Investment (ROI) for investments catalyzed by riverfront improvements in Three Rivers Park ($2.58 billion catalyzed by $129 million invested). The study also demonstrated property values along the riverfront appreciated nearly twice as much as property values citywide between 2001-2013 (60% to 32%).

The analysis looked at:

- Wage Tax Revenue
- Sales Tax Revenue
- Annualized Real Estate Transfer Tax Revenue
- Payroll Expense Tax Revenue
- Local Service Tax Revenue
- Occupancy Tax Revenue

Economic Benefits of Planned Development

Wage Tax Revenue	$	1,680,288
Sales Tax Revenue	$	436,800
Annualized Real Estate Transfer Tax Revenue	$	559,390
Payroll ExpenseTax Revenue	$	214,170
Local Service Tax Revenue	$	36,816
Occupancy Tax Revenue	$	285,266
TOTAL	$	3,212,729

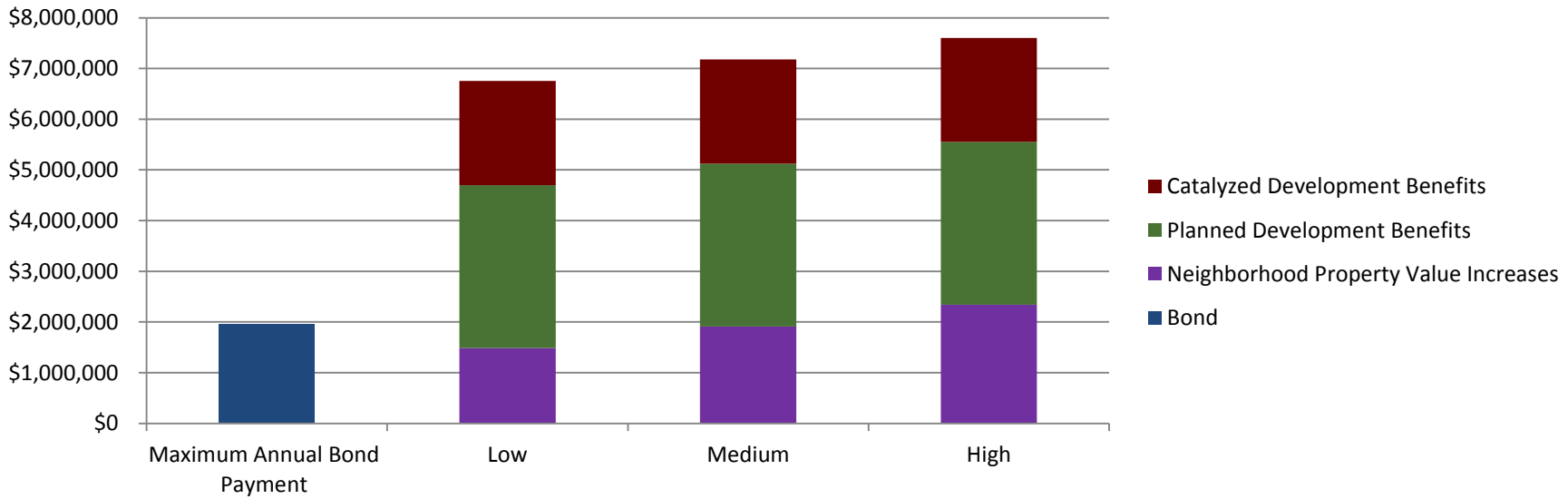


While the developments in Lawrenceville are already planned, the economic benefits of the proposed developments will generate approximately $3.2 million annually.

Combined Benefit:
Planned Development Plus Public Realm Improvement

	Maximum Annual Bond Payment	Low	Medium	High
Bond	$1,951,543*			
Neighborhood Property Value Increases		$ 1,487,546	$ 1,912,560	$ 2,337,573
Planned Development Benefits		$ 3,212,729	$ 3,212,729	$ 3,212,729
Catalyzed Development Benefits		$ 2,054,433	$ 2,054,433	$ 2,054,433

*Assumes $30M bond for improvements



The developments planned in Lawrenceville generate enough economic benefits to offset the cost of annual bond payments for a $30 million public bond that could be used for District improvements, such as parking, utilities, open space, or other improvements. The spin-off benefits will also help increase neighborhood property values and catalyze other development that will generate enough economic benefits to offset the cost of an additional $3.5 to $4.4 million in annual bond payments

Economic Benefits of Planned Development

While the economic benefits of the proposed developments in Lawrenceville demonstrate they will create enough value to support public funding, Pittsburgh, like many cities in the US, is still recovering from the impacts of the 2008 Recession.

Similar to the Three Rivers Park Economic Impact Analysis, funding strategies were evaluated and recommendations were made to create a multi-pronged funding strategy that utilizes self-financing through private development value creation; federal, state, and local and tax dollars; and private contributions for Lawrenceville by engaging private developers, foundations, individuals and corporations in campaign fundraising activities.

Preferred Funding Strategy

RECOMMENDATION 1:

As demonstrated with the preliminary economic benefits in Lawrenceville, **pursue a TIF designation** focusing on the ability to capture redevelopment of industrial properties. Funds to be used for infrastructure upgrades including shuttle, parking structure, multi-purpose path, parks, and streetscape improvements.

TARGET $15-25 M

Preferred Funding Strategy

RECOMMENDATION 2:

Solicit private contributions for Lawrenceville. Develop case for support by highlighting mobility and open space improvements, and engage private developers, foundations, individuals and corporations in campaign fundraising activities. Explore opportunities and challenges with naming and donor recognition plans in public spaces.

TARGET $10-20M

Preferred Funding Strategy

RECOMMENDATION 3:

Pursue PennDOT ACT 89 Multimodal Program funds for the transportation focused elements of Lawrenceville. This would provide up to 70% funding, with a 30% local match. Given the other awards, $2.5 M is likely a good target, so would not likely contribute 70% toward the project, unless dedicated toward the Multi-purpose Path. In addition, partners should explore PA Infrastructure Bank as a complimentary opportunity

TARGET $2.5 M

Preferred Funding Strategy

RECOMMENDATION 4:

Pursue stormwater funds for improvements that can support the broader CSO consent decree investments

TARGET $5 M

Summary – Capital Funding

Rec 1	Targets: TIF (primary)	$15-25M
Rec 2	Private Match (primary) (developers, foundations, individuals, corporations)	$10-20M
Rec 3	ACT 89 (primary) and TIGER (secondary)	$2.5M
Rec 3	CSO (primary)	$5M

Preferred Funding Strategy

RECOMMENDATION 5 - MAINTENANCE:

In addition to existing sources of operating support, **Lawrenceville should advocate for the establishment of a Voluntary Assessment District,** whereby nearby property owners voluntarily pay into a fund to help support programming and maintenance, as well as other functions that promote a safe and clean environment. Given past challenges, this should be focused on creating a District where there is support.

TARGET: Revenue to offset approximately 25% of annual maintenance and stewardship costs.

Other Potential Funding Sources

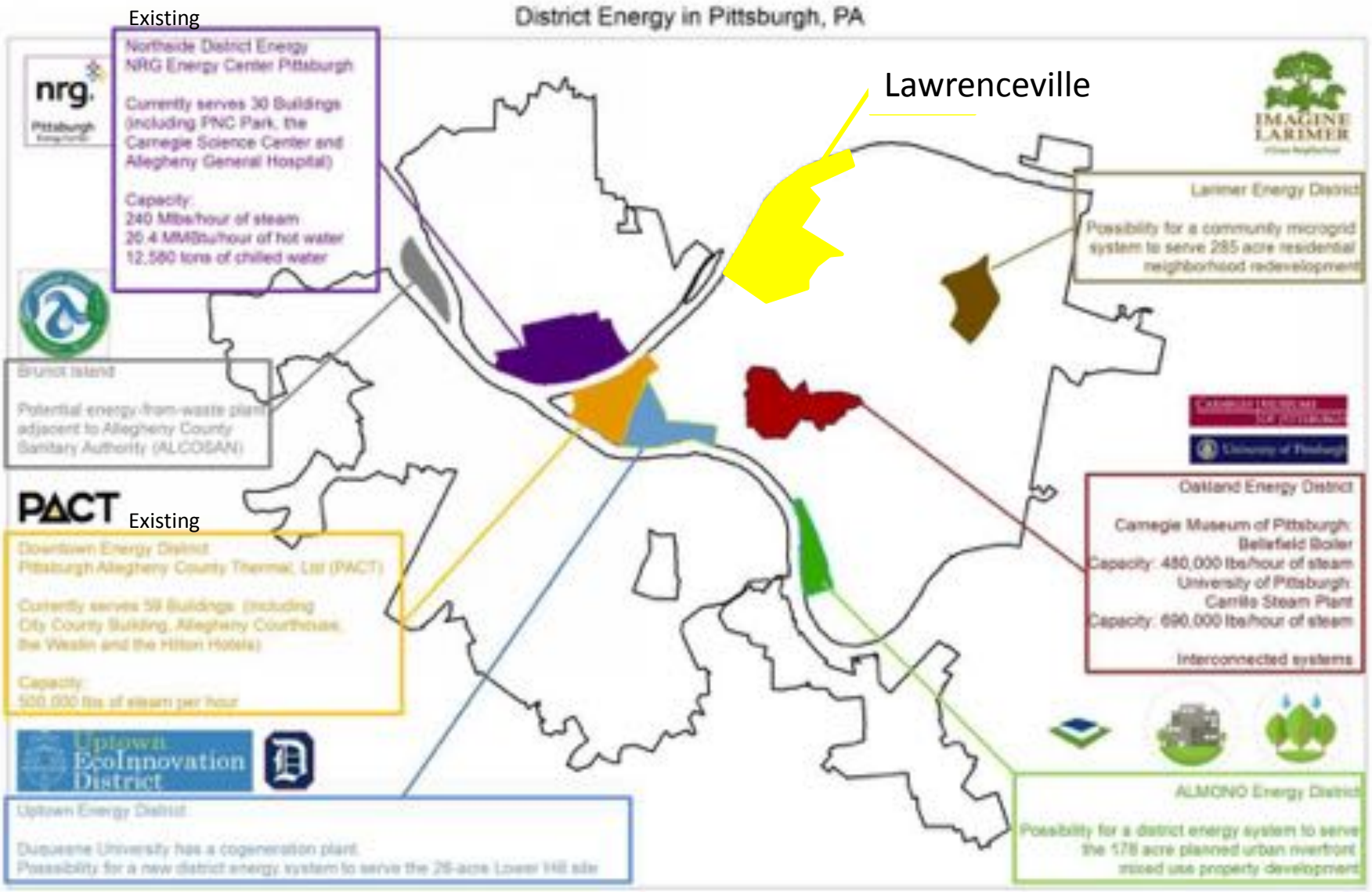
Allegheny Riverfront Green Boulevard Project Funding Sources, 2013

Table 3. Near-Term Funding Matrix				
	Near Term Projects (Uses)			
Funding Sources	Phase I Waterfront Park (43rd St. Landing)	Green Boulevard	Riverfront Drive (43rd to 45th St.)	43rd Street-Butler to Riverfront
Tax Increment Financing		★★★	★★★	★★★
Federal Land & Water Conservation Fund	★★			
Brownfields Economic Development Initiative	★★	★★		
Boating Infrastructure Grant	★★			
Coldwater Heritage Partnership	★	★★		
Heritage Park Grants	★			
Community Grants	★		★★	
River Conservation Grants	★★			
Rails to Trails Grants	★			
PA Recreational Trails Program Grants	★★			
Transportation Community &System Preservation		★★★	★★★	★★★
Corporate Sponsorships	★★			

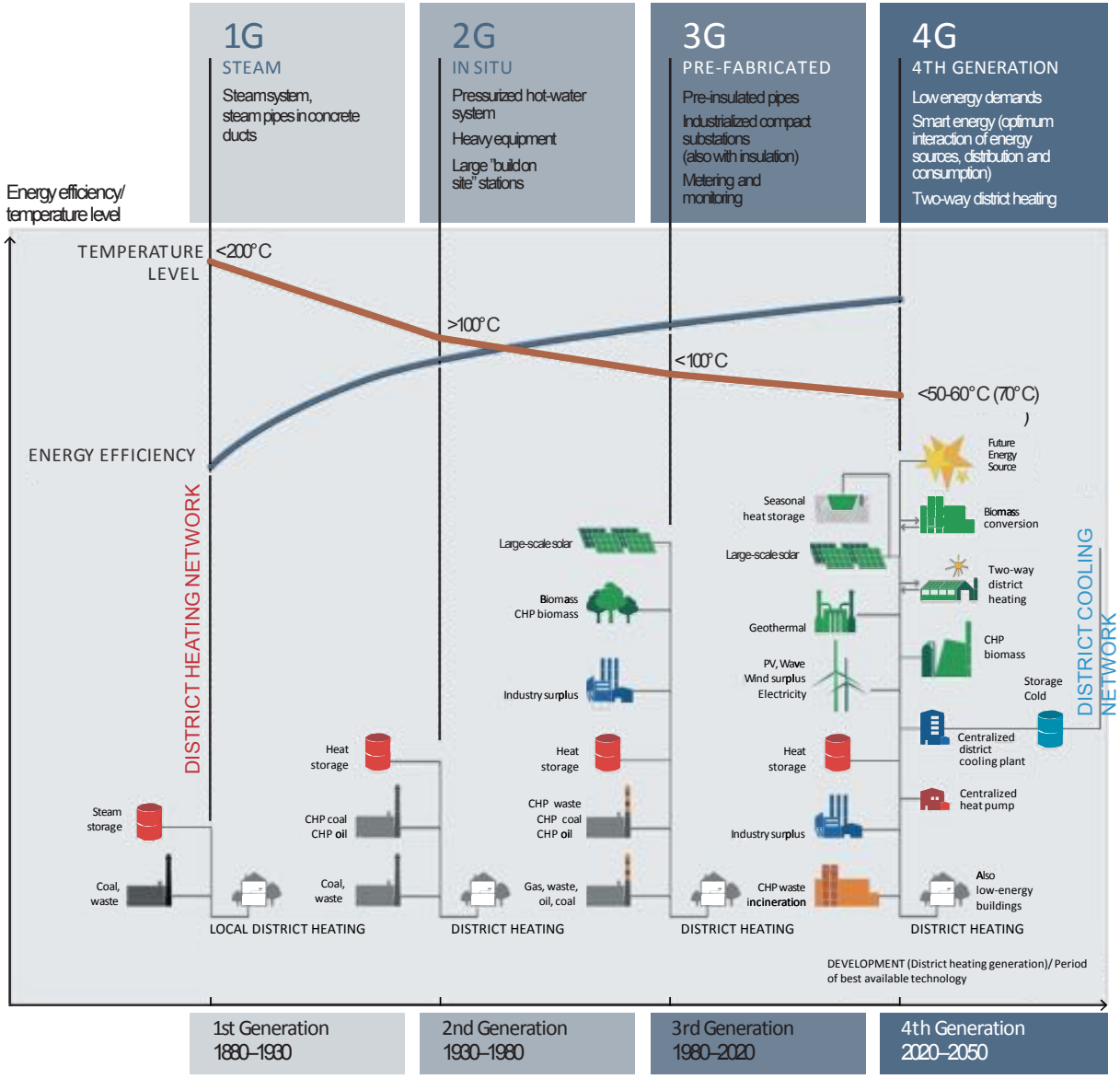
Note: Scale represents Easy= 3 stars, Moderate= 2 stars and Difficult= 1 star for access to funding by project type

Source: Partners for Economic Solutions, 2012.

District Energy/Sustainability Concepts

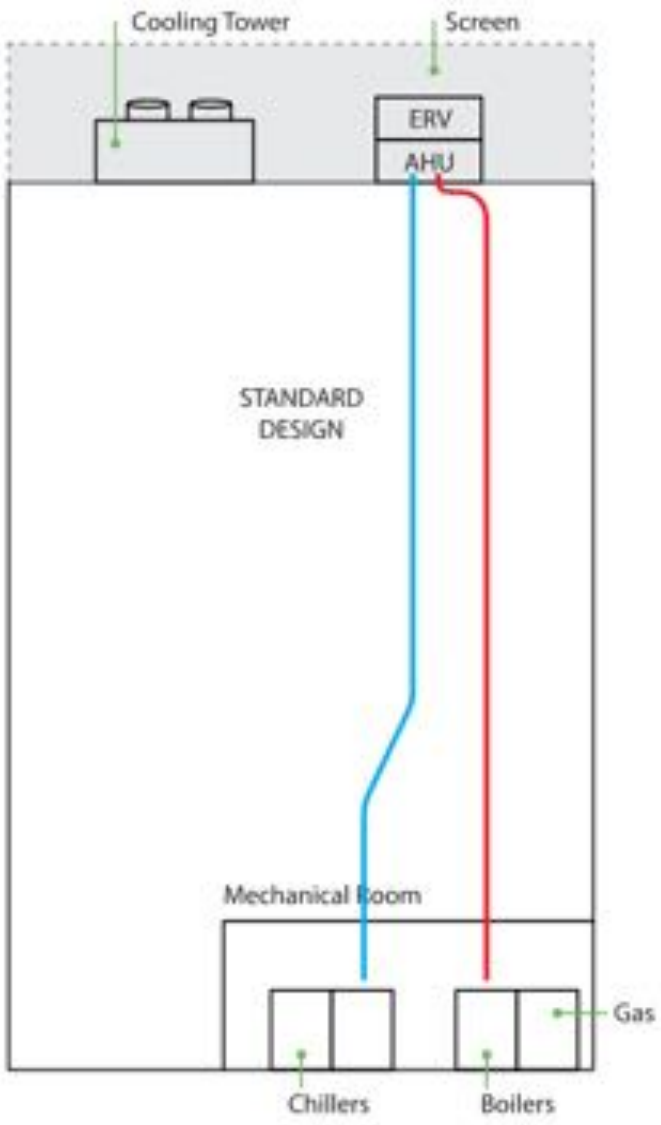

District Energy in Pittsburgh, PA
Existing
Northside District Energy
NRG Energy Center Pittsburgh
Currently serves 30 Buildings (including PNC Park, the Carnegie Science Center and Allegheny General Hospital)
Capacity:
240 Mlbs/hour of steam
20.4 MMBtu/hour of hot water
12,580 tons of chilled water
Lawrenceville
Larimer Energy District
Possibility for a community microgrid system to serve 285 acre residential neighborhood redevelopment
Brunot Island
Potential energy-from-waste plant adjacent to Allegheny County Sanitary Authority (ALCOSAN)
Existing
Downtown Energy District
Pittsburgh Allegheny County Thermal, Ltd (PACT)
Currently serves 59 Buildings (including City County Building, Allegheny Courthouse, the Westin and the Hilton Hotels)
Capacity:
500,000 lbs of steam per hour
Oakland Energy District
Carnegie Museum of Pittsburgh:
Bellefield Boiler
Capacity: 450,000 lbs/hour of steam
University of Pittsburgh:
Carrillo Steam Plant
Capacity: 690,000 lbs/hour of steam
Interconnected systems
Uptown EcoInnovation District
Uptown Energy District
Duquesne University has a cogeneration plant.
Possibility for a new district energy system to serve the 26-acre Lower Hill site
ALMONO Energy District
Possibility for a district energy system to serve the 178 acre planned urban riverfront mixed use property development

Historical Development of District Energy



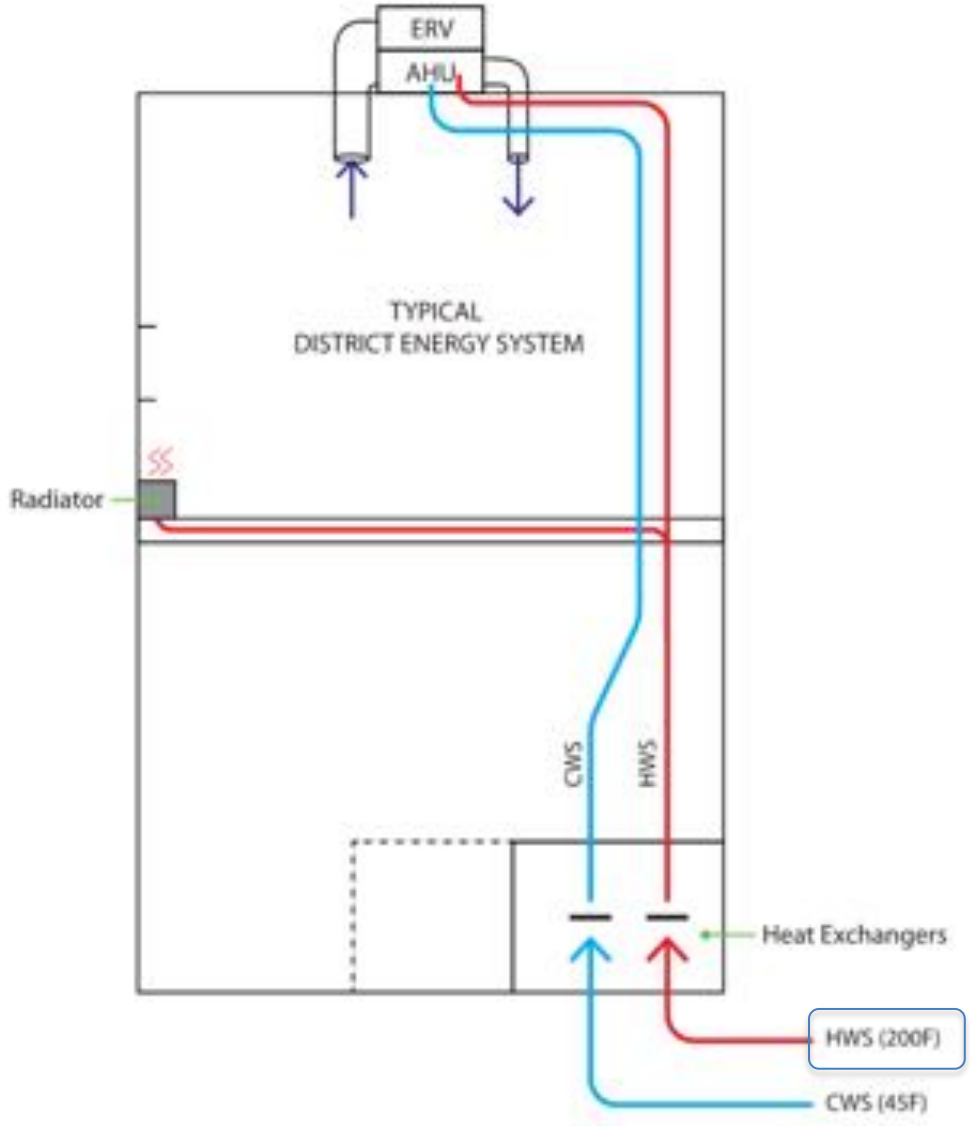
Source: Aalborg University and Danfoss District Energy, 2014

Typical Building Design



- Gas Boilers for Hot Water
- Electric Chillers and Cooling Towers for Chilled water
- Each building has stand alone equipment sized for peak condition
- Buildings are connected only by electric grid
- Little opportunity for waste heat recovery

Typical District Energy System



Environmental Benefits

- Improved energy efficiency
- Waste heat recovery options (high temp)
- Increased Reliability
- Decreased life-cycle costs
- Lower Emissions
- Better use of capital

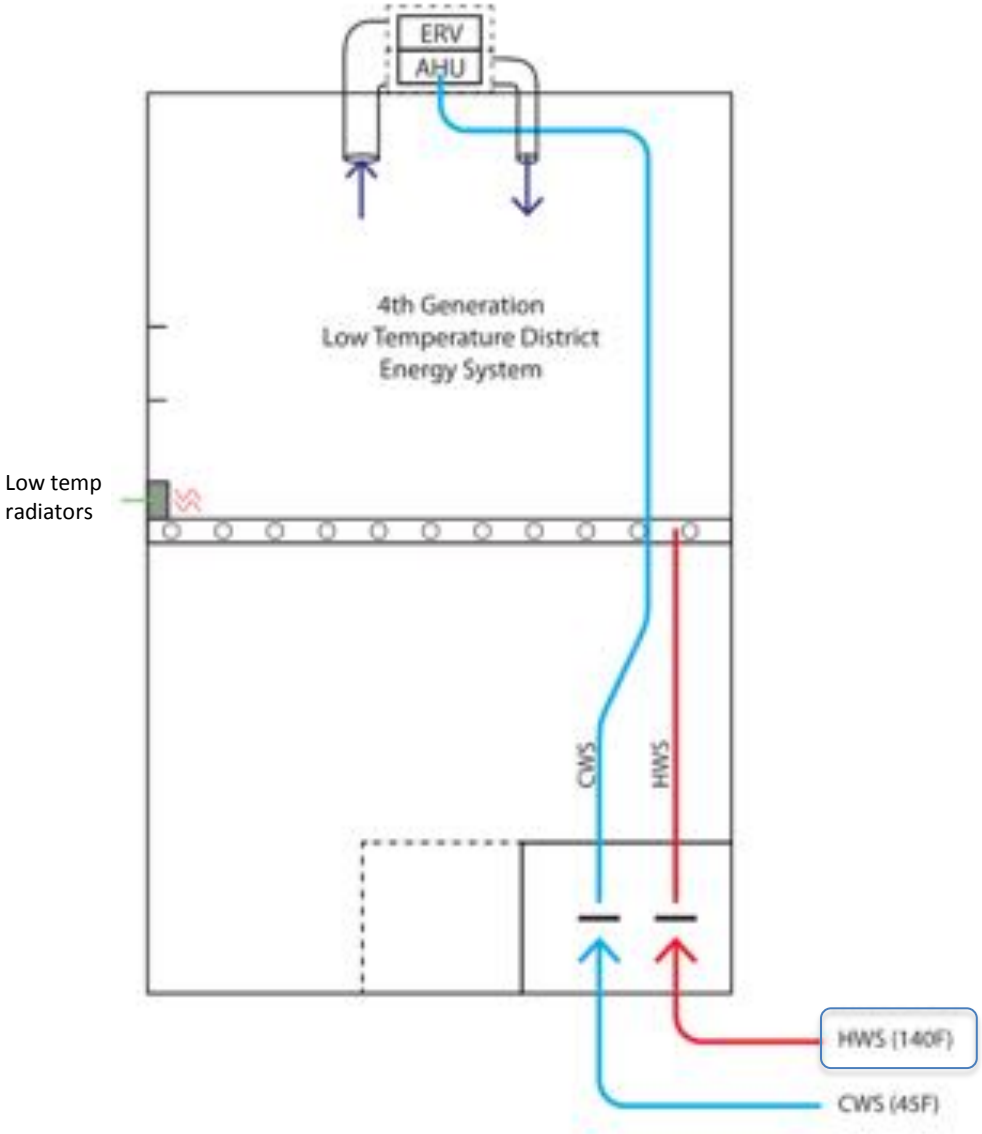
Building Considerations

- More usable SF
- Lower development cost
- Lower energy and maintenance cost

Potential Sources:

- CHP – gas
- Biomass
- Waste Incineration
- Industry waste heat (high temp)

4th Generation Low-Temp District Energy System



Environmental Benefits

- Even higher energy efficiency
- Ability to capture waste heat (low-temp)
- Multiple renewable energy sources
- Low distribution loses
- Smart Energy System

Building Consideration

- Low Temp hot water supply
- Peak sizing
- Envelope Improvements
- Peak booster boiler
- Low Temp Radiant systems

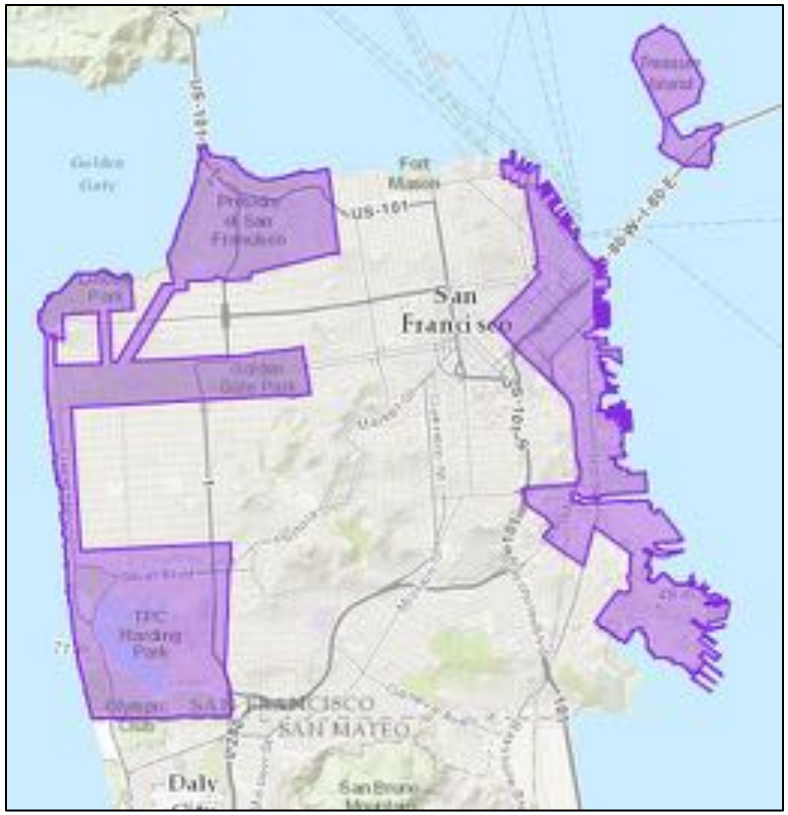
Potential Sources:

- Geothermal
- River Heating/Cooling
- Solar hot water
- Recycled waste heat (low temp)
- Heat pumps

Heat Sources for Community Energy

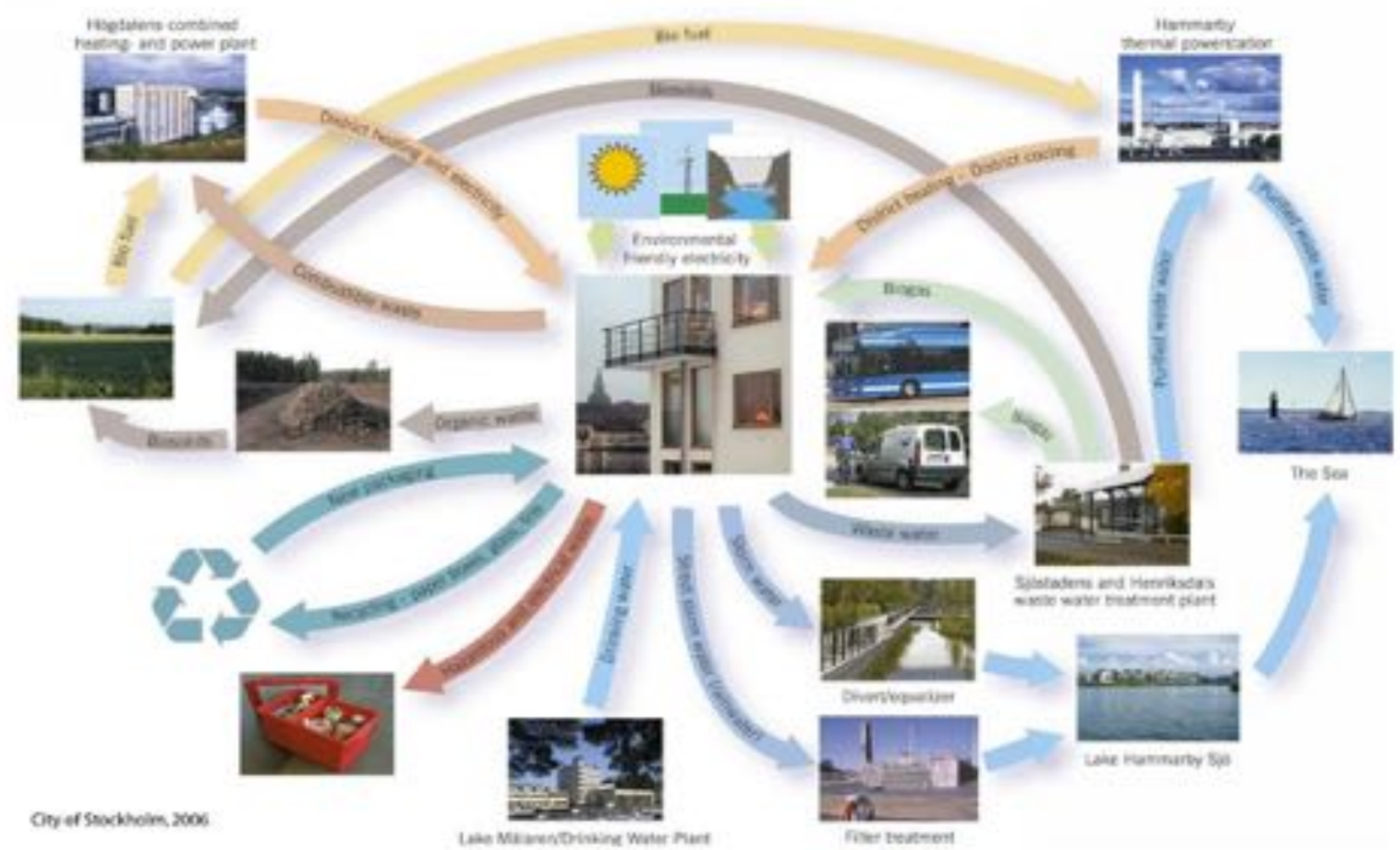
District Greywater Example

- San Francisco



- Purple Pipe zones
- Greywater supply district
- Capture Rainwater/ Stormwater
- Stormwater tax?
- Water savings = energy savings
- Centralized water storage and filtration
- Reduce demand on city stormwater system
- Aim to keep 100% of rainwater onsite
- Stormwater reuse for cooling towers

Sustainable District Elements



Hammarby Model

District Wide Environmental Programs

Living Community Challenge

Living community challenge projects have their own 'utility,' generating their own energy and processing their own waste.

LEED for Neighborhood Development

Focuses on high levels of walkability, a sense of place, and social cohesion. It encourages strategies that conserve resources, protecting natural areas, and facilitate connections to the surrounding community.

Sustainable SITES Initiative

Foster a transformation in land design and development practices to bring the essential importance of ecosystem services to the forefront of decision-making and implementation.

EcoDistricts

A new model of public-private partnership that emphasizes innovation and deployment of district-scale best practices to create the neighborhoods of the future - resilient, vibrant, resource efficient and just.

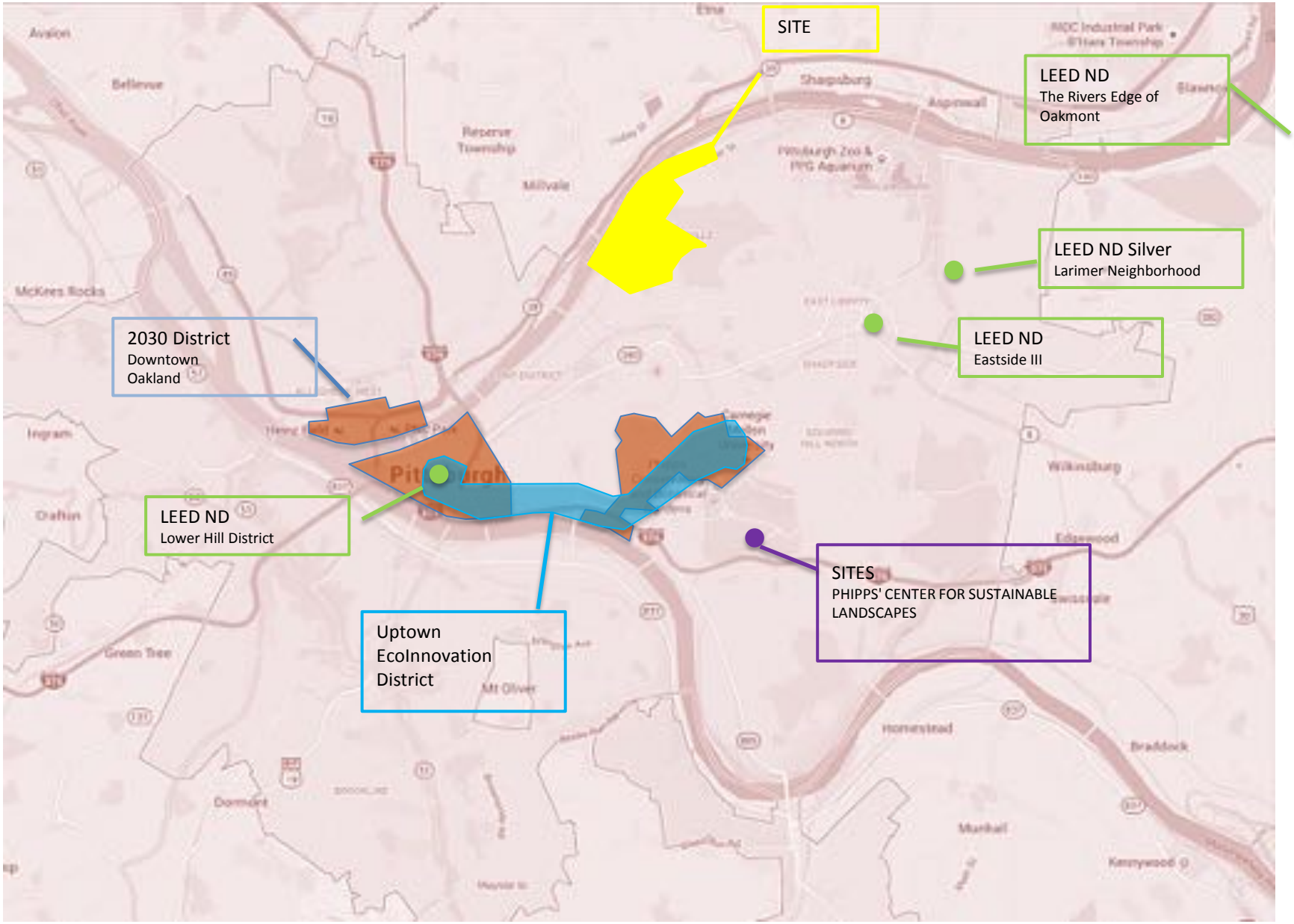
2030 Districts

Designated urban areas committed to meeting the energy, water, and transportation emissions reduction targets of the 2030 Challenge for Planning.

Uptown EcoInnovation District

A Plan that is environmentally and economically innovative and enhance equitable land use, mobility, energy, and infrastructure that will embody sustainability in all aspects of development; both people and place.

Pittsburgh Area District Environmental Programs

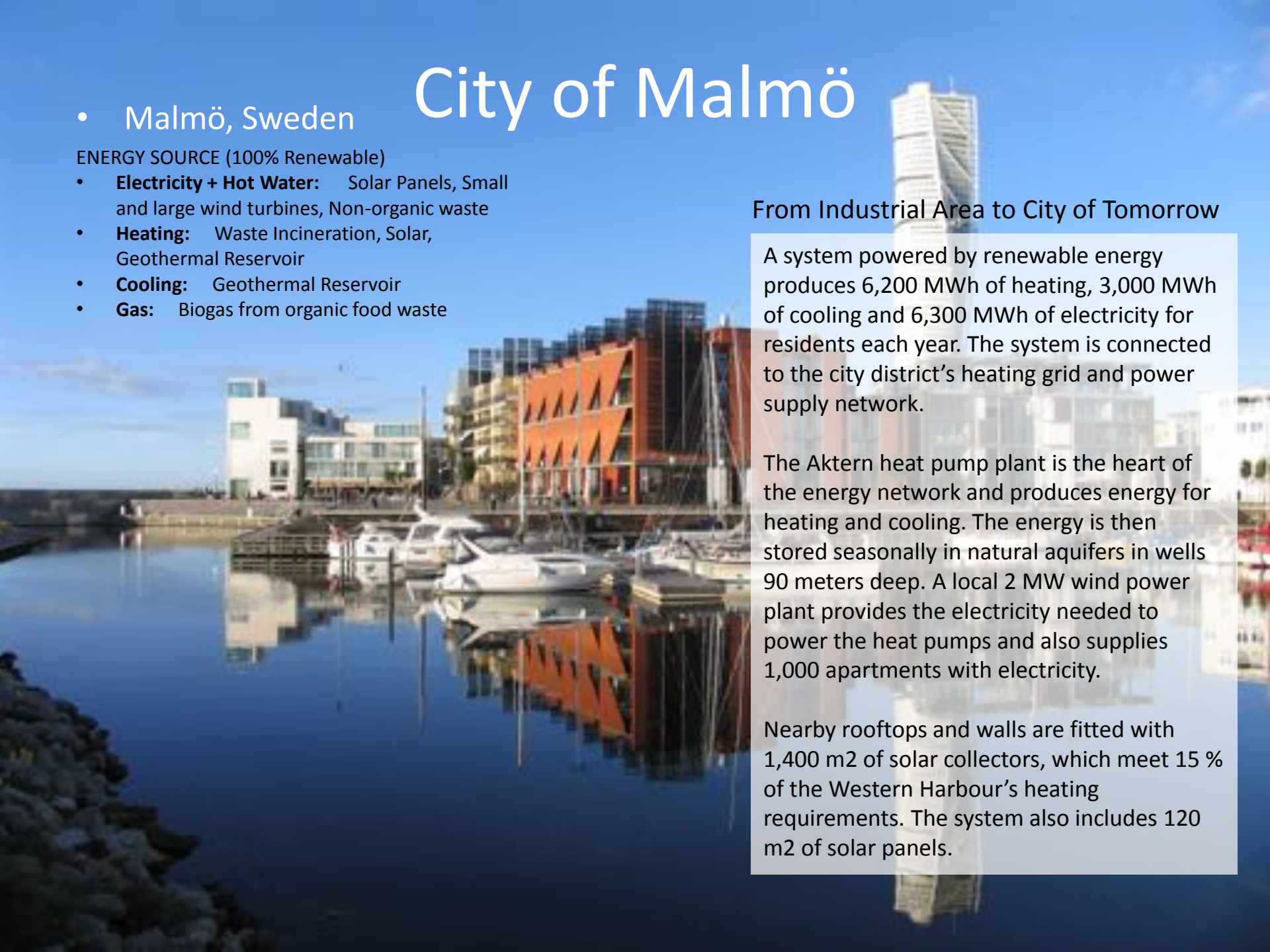


City of Malmö

- Malmö, Sweden

ENERGY SOURCE (100% Renewable)

- **Electricity + Hot Water:** Solar Panels, Small and large wind turbines, Non-organic waste
- **Heating:** Waste Incineration, Solar, Geothermal Reservoir
- **Cooling:** Geothermal Reservoir
- **Gas:** Biogas from organic food waste



From Industrial Area to City of Tomorrow

A system powered by renewable energy produces 6,200 MWh of heating, 3,000 MWh of cooling and 6,300 MWh of electricity for residents each year. The system is connected to the city district's heating grid and power supply network.

The Aktern heat pump plant is the heart of the energy network and produces energy for heating and cooling. The energy is then stored seasonally in natural aquifers in wells 90 meters deep. A local 2 MW wind power plant provides the electricity needed to power the heat pumps and also supplies 1,000 apartments with electricity.

Nearby rooftops and walls are fitted with 1,400 m2 of solar collectors, which meet 15 % of the Western Harbour's heating requirements. The system also includes 120 m2 of solar panels.

Dockside Green

- Victoria, British Columbia, Canada

ENERGY SOURCE

- **Heat + Hot Water:** Biomass (waste wood), Heat recovery from wastewater treatment
- **Electricity:** Hydropower
- **Cooling:** Cold water from municipal supply

THE GREENEST NEIGHBORHOOD

The Dockside Green District Energy Plant, operated by Corix Utilities, is intended to generate high efficient heat and hot water for every Dockside Green resident and tenant.

This is achieved through either the burning of locally sourced, low-cost biomass fuel sources (sawmill and wood waste), or natural gas. The plant was built with the capacity to supply the entire Dockside Green development (1.3 million sq.ft.).

The plant recovers heat from sewage, bathwater, and dishwater.

Findings & Next Steps

Initial Findings

Initial research determined that there appears to be significant potential for implementing a high performance district wide energy distribution system in Lawrenceville. There appears to be sufficient and diverse energy loads in close proximity to support such a system. Concerns and questions about timing are noted, but we believe a phased implementation approach is possible to develop.

Recommended Next Steps

1. Conduct a pre-feasibility study. The pre-feasibility study will analyze all the available possible sources and uses of energy in the district, map the area to determine efficient distribution systems, determine critical stakeholders required to initiate the project, review the timing of the developments and determine if phased implementation is feasible.

2. Determine ownership/ funding/ management options.

3. Conduct a full feasibility study to evaluate all associated costs, sources and funding structures.

4. Contract with a design/ build entity to initiate the project.

5. In addition or concurrent with these steps we would recommend evaluating the feasibility of LEED Neighborhood Development. The direction to pursue LEED ND may have some design implications for the existing development projects.