Portland Public Schools Security Camera Upgrades

A Case Study in Optimized Layout Design Using Parametric Tools

October 2025

A4LE LearningSCAPES 2025 PHOENIX

https://www.greaterportlandinc.com/news-and-events/news/p/item/48370/17-reasons-to-move-your-business-to-portland-oregon

Agenda

1 **The Challenge**

What the client was looking for

2 **The Team**

The unique blend of disciplines we brought together

3 **Our Solution**

How we collaborated to address the challenge successfully

4 **Outcomes**

How we exceeded expectations

The Challenge

About OPB | Public media funding | OPB and KMHD events | OPB en Español | Partnerships | Newsletters | Help center

EDUCATION

Portland Public Schools voters approve $1.2 billion borrowing plan

By Rob Manning (OPB) and Elizabeth Miller (OPB)
Nov. 3, 2020 8:23 p.m. **Updated:** Nov. 4, 2020 9:37 a.m.

The measure would continue district's work renovating school buildings.

Portland Public Schools voters have again approved a construction bond for the state's largest school district, according to unofficial election returns.

The district's 2020 bond, worth $1.2 billion, passed by a nearly three-to-one margin, according to the latest results published Wednesday morning.

The measure asked voters to back major investments in two high schools, as well as the establishment of a new Center for Black Student Excellence, and a range of other priorities from new laptops to expanded alarm systems and improved school heating.

Related: OPB's 2020 election coverage, ballot guide

The appearance of Measure 26-215 on the ballot marked the fourth time in a little less than a decade that Portland Public Schools had gone to voters for support of a construction bond with a big sticker price. Voters approved two of the previous three bonds — in 2012 and 2017 — but rejected a measure in 2011.

- Largest bond in District history (to date)
- Passed by a margin of 3 to 1
- Funds to support three major areas:

Educational Investments

(Textbooks, Laptops, SPED)

Health and Safety Investments

(Accessibility, Roofs, Seismic, Mechanical, Locks, Cameras)

School Modernizations & Rebuilds

(High Schools, Polytechnic HS)

https://www.greaterportlandinc.com/news-and-events/news/p/item/48370/17-reasons-to-move-your-business-to-portland-oregon

The Challenge

Notice of Measure Election
District 26-215 **SEL 803**

Notice			
Date of Notice	Name of District	Name of County or Counties	Date of Election
8/26/20	Portland Public Schools	Multnomah, Washington	11/3/20

Final Ballot Title The following is the final ballot title of the measure to be submitted to the district's voters. The ballot title notice has been published and the ballot title challenge process has been completed.

Caption 10 words which reasonably identifies the subject of the measure.

Bonds to Improve Health, Safety, Learning by Modernizing, Repairing Schools

Question 20 words which plainly phrases the chief purpose of the measure.

Shall Portland Public Schools repair, modernize schools; replace technology, curriculum; by issuing bonds estimated to maintain current tax rate? If the bonds are approved, they will be payable from taxes on property or property ownership that are not subject to the limits of sections 11 and 11b, Article XI of the Oregon Constitution.

Summary 175 words which concisely and impartially summarizes the measure and its major effect.

See attached

20 AUG 26 PM 3:24

Explanatory Statement 500 words that impartially explains the measure and its effect.

If the county is producing a voters' pamphlet an explanatory statement must be drafted and attached to this form for:
→ any measure referred by the district elections authority; or
→ any initiative or referendum, if required by local ordinance.

Explanatory Statement Attached? ■ Yes ☐ No

Authorized District Official Not required to be notarized.

Name	Title
Guadalupe Guerrero	Superintendent
Mailing Address	**Contact Phone**
501 N. Dixon St. Portland, OR 97227	503-916-3200

By signing this document:
→ I hereby state that I am authorized by the district elections authority to submit this Notice of Measure Election; and
→ I certify that notice of receipt of ballot title has been published and the ballot title challenge process for this measure completed.

Signature — 08/26/2020 Date Signed

In addition, the bond program has addressed infrastructure needs at every school throughout district:

- Replacing plumbing to remove lead, improve water quality;
- Removing or encapsulating exposed lead paint and asbestos;
- Upgrading fire alarm and sprinkler systems;
- Repairing or replacing leaking or deteriorating roofs, with improved seismically strengthened roofs;
- Seismic retrofitting;
- Improving accessibility for people with disabilities;
- Mitigating radon exposure;
- Strengthening school safety and security; and
- Upgrading science labs.

Health & Safety Investments

- Remove barriers to accessibility in schools across the district;
- Repair/replace leaking or deteriorating school roofs;
- Seismically retrofit up to three schools;
- Repair/replace high-priority mechanical systems (heating, cooling and ventilation); and
- Update classroom door locks, install security camera systems, and upgrade or replace intrusion alarm systems to strengthen security.

https://multco.us/file/ballot_measure_26-215/download

The Challenge

- Security Projects Budget = $25.9M
- Divided into three projects:

Classroom Door Locking Hardware

(Updating all doors to District Standards)

Intrusion Alarm Updates

(Integrate with systems)

Additional Security Cameras

(Increase coverage and align with District Standards)

Budget $17,669,572 (Construction Budget Only)

https://www.pps.net/Page/23324

The Challenge

Portland Public Schools
School District 1J
Multnomah County, Oregon

Request for Proposals
Architecture and Engineering: Security Consultant
RFP No. 2022-016

Key Components

- Project to be delivered in phases:

  Phase 1 = 15 Schools

  Phase 2A = 14 Schools

  Phase 2B = 13 Schools

  Phase 3A = 10 Schools

  Phase 3B = 18 Schools

  Phase 3C = 16 Schools

- Interior Cameras to be located based on District Standards

- Exterior Cameras to be located based on optimizing residual budget

- Exterior cameras to be prioritized relative to building perimeter and parking coverage

The Challenge

In responding to the RFP, we asked ourselves the following question:

“How do we deliver the scope of work in a budget compliant, optimized, and equitable way across all phases and eighty-six sites?”

The Team

Meeting the challenge required that we combine the capabilities of our teams to create a unique offering*:*

We took good old-fashioned know-how, and grizzled experience…

Combined it with computational wizardry…

And overlaid it with architectural knowledge and organization…

Security Consulting + Computational Design + Architecture

The Team

Bill Daniel – Security Consultant

bill.daniel@arcadis.com

“I help clients figure out where all their weaknesses and vulnerabilities are.”

Security System Design

Courthouses
Correctional Facilities
Hospitals
Education Facilities

Selected Projects

Vancouver Law Courts
Nanaimo Correctional Centre
Red Deer Justice Centre
Royal Inland Hospital Patient Care Tower
Kwantlen Polytechnic University – multi campus

The Team

Jason King – Principal, Computational Design Lead

jason.king@arcadis.com

“I’m the guy who teaches algorithms to think like planners and designers, and makes complex decisions feel simple.”

Selected Projects

Portland Community College Space Optimization

Knoxville College Restoration

UC San Diego Mixed Clinical Research Facility

Carleton University Campus Master Plan

University of Ottawa Health Sciences Building

Affordable Housing Plans for Redmond, Washington and San Diego County

Detroit and Cleveland Complete Walkable Community Plans

City of El Paso Master Plan

Los Angeles County Bus Rapid Transit Vision

Los Angeles Metro Vermont Avenue Transit-Oriented Communities Plan

Gateway Cities Parametric Station Area Scenario Planning

Untitled Residential Tower with Pharrell Williams, Toronto

The Team

Jonathan Steel – Architect, Principal-In-Charge

jonathan.steel@arcadis.com

“I curate value propositions and help everyone play nicely in the sandbox.”

Rebecca Grant – Principal, Project Manager

rebecca.grant2@arcadis.com

“I oversee the pit crew who ensure we have fresh rubber and full tanks as we speed toward the finish line.”

Jay Makar – Architect, Technical Coordination

jay.makar@arcadis.com

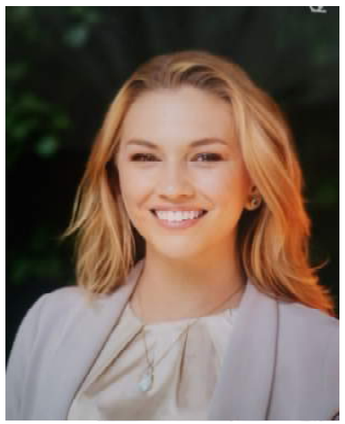
“I am a ‘process whisperer’. I harmonize project timelines with cross-functional teams.”

The Team

Eric Naes – Project Manager, Portland Public Schools

enaes2@pps.net

“I am the calm in the chaos – juggling deadlines, budgets, and contractors to make sure the building goes up, not everyone’s blood pressure!”

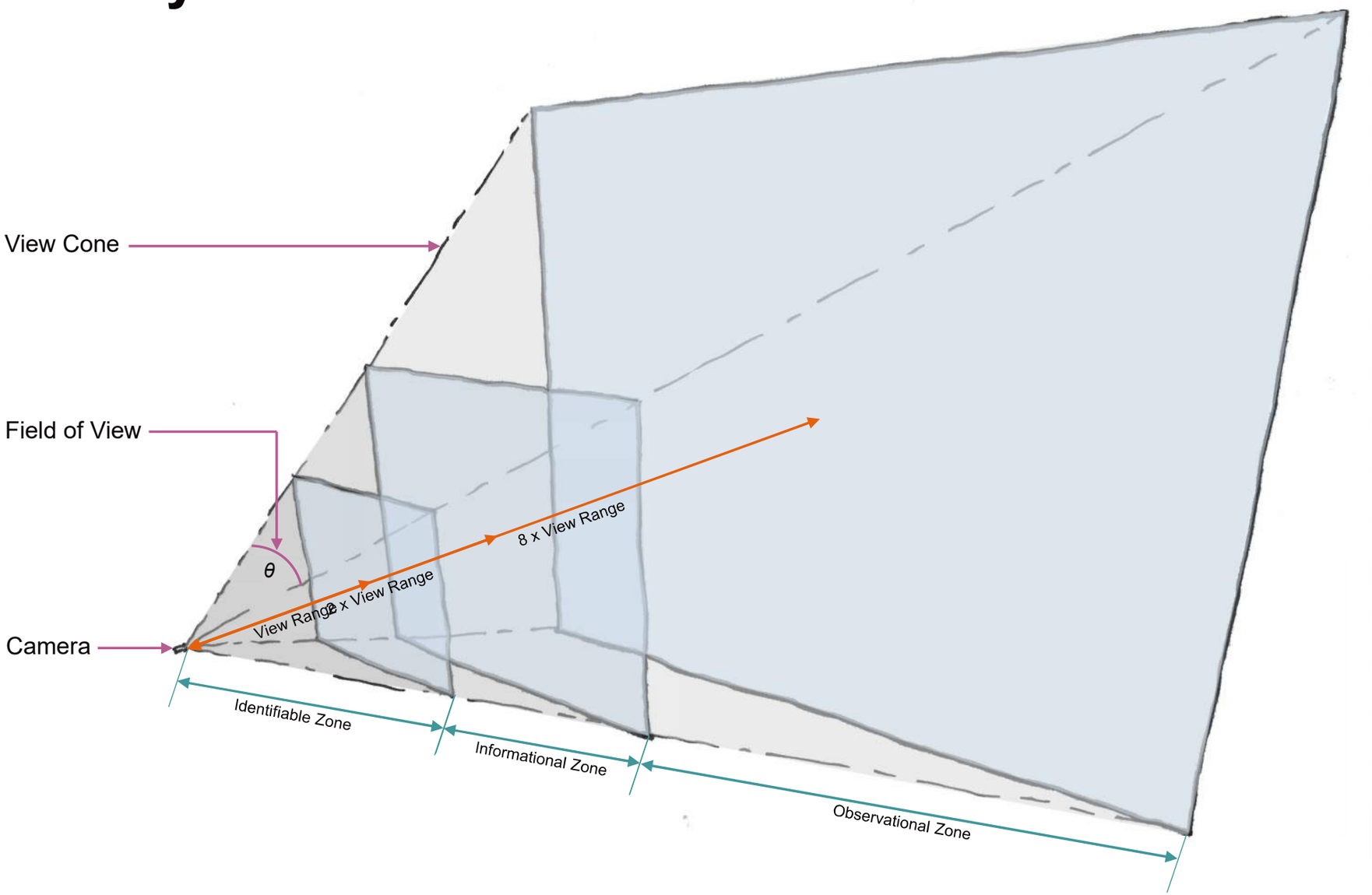


Kate Vaughan – Construction Manager, Portland Public Schools

kvaughan@pps.net

“I make sure the right people show up, the right materials are delivered and installed and nothing catches fire – all before lunch!”

Nerdy Interlude



Identifiable Zone

Unobstructed view of a person's face should enable identification of that person.

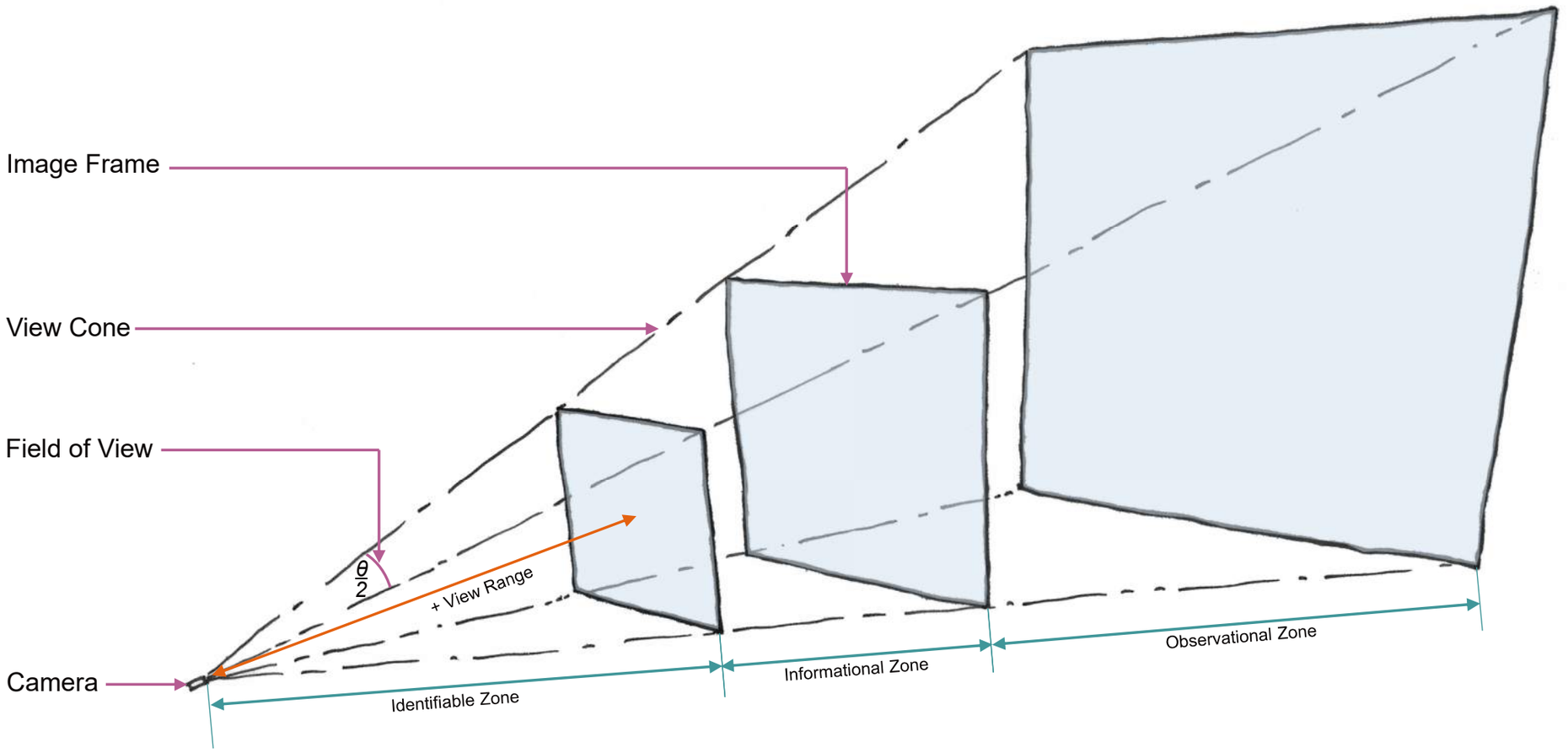
Informational Zone

Characteristics of an individual should be obtainable (height, weight, skin color, hair length, clothing, etc.) that could potentially lead to them being identified.

Observational Zone

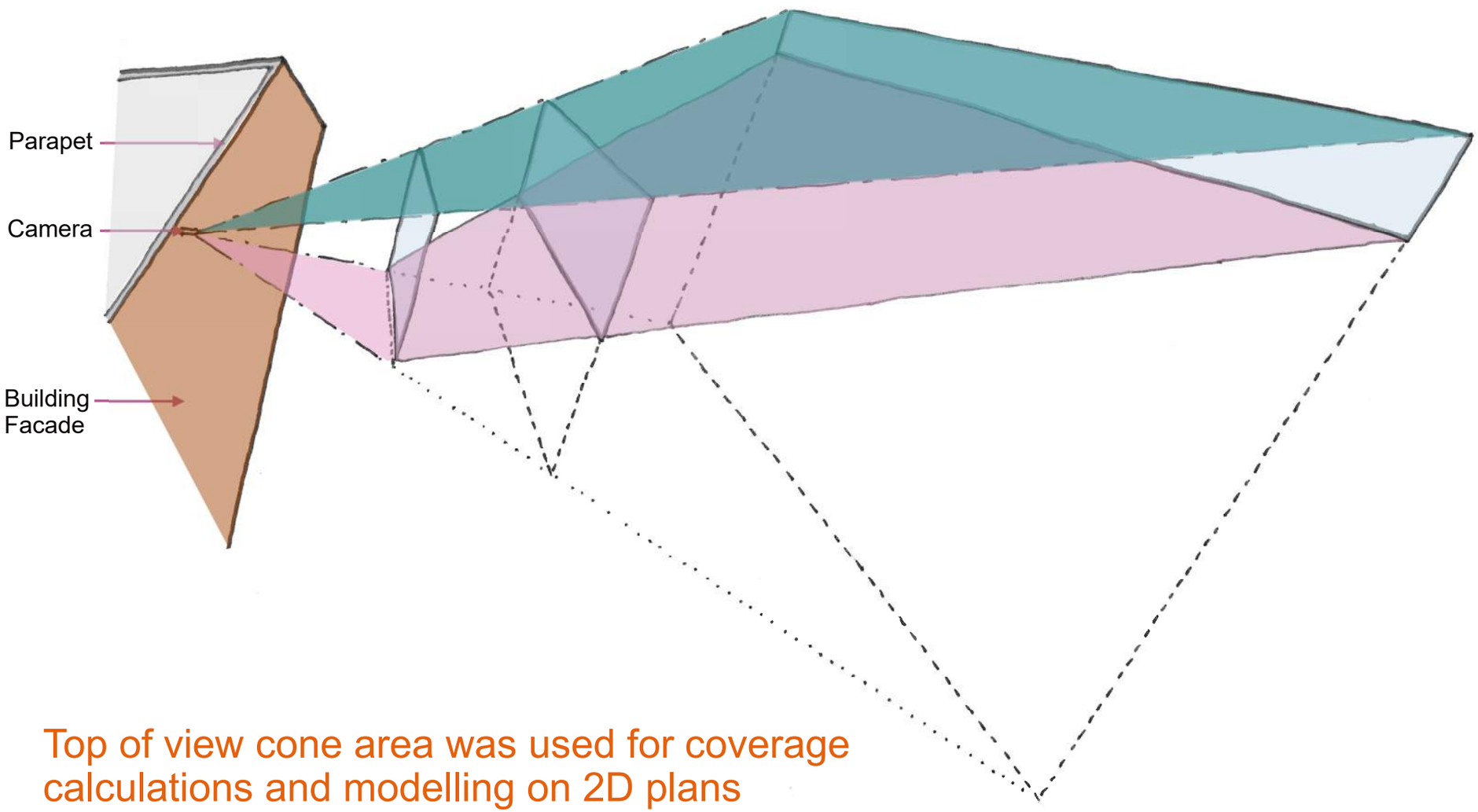
Possible to observe that an ‘event’ is occurring, but unlikely to retrieve usable information to aid identification.

Nerdy Interlude



↑ View Range = ↓ Field of View

Nerdy Interlude



Camera Angle typically results from top of view cone being aligned horizontally.

Image Frame is reduced due to intersection of ground plane and view cone.

Ground Plane Coverage Area results from camera angle, field of view, and ground plane

Angled Plane Coverage Area results from view cone and camera angle

Top of view cone area was used for coverage calculations and modelling on 2D plans

Nerdy Interlude

Camera Characteristics

TYPE	VIEW RANGE (ft)		FIELD OF VIEW (º) Hor / Ver				IDENTIFIABLE (x1)	INFORMATIONAL (x2)	OBSERVATIONAL (x8)
Wide Angle	30		102		73		30	60	240
Varifocal	30	75	104	40	74	29	30-75	60-150	240-600
Multisensor	25	35	103	72	103	72	25-35	50-70	200-280
Wide Angle	12		105		73		12	24	96
Varifocal	24.5	31	98	73	73	73	24.5-31	49-62	196-248

Budget Estimates - Camera Supply and Install

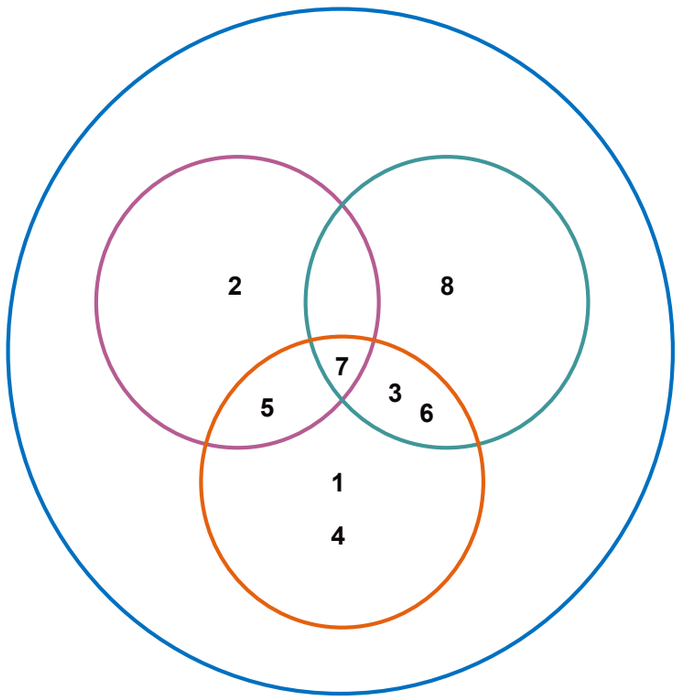
TYPE	COST
Wide Angle	$4,000
Varifocal	$5,000
Multisensor	$7,500

Nerdy Interlude

What is Computational Design?

Arcadis' computational design practice develops customizable algorithmic processes—built from parametric modeling, custom coding, GIS, machine learning, and AI—to efficiently and effectively process complex information. Using multiple parameters and datasets as design drivers for evidence-based decision-making, this flexible framework optimizes outcomes across disciplines and empowers project teams with data-informed tools and insights.

Our Solution

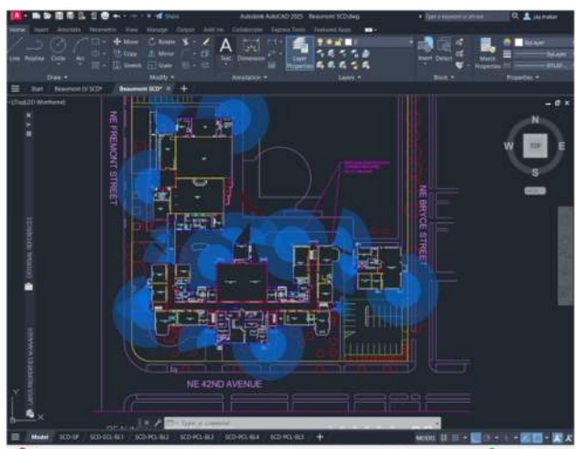


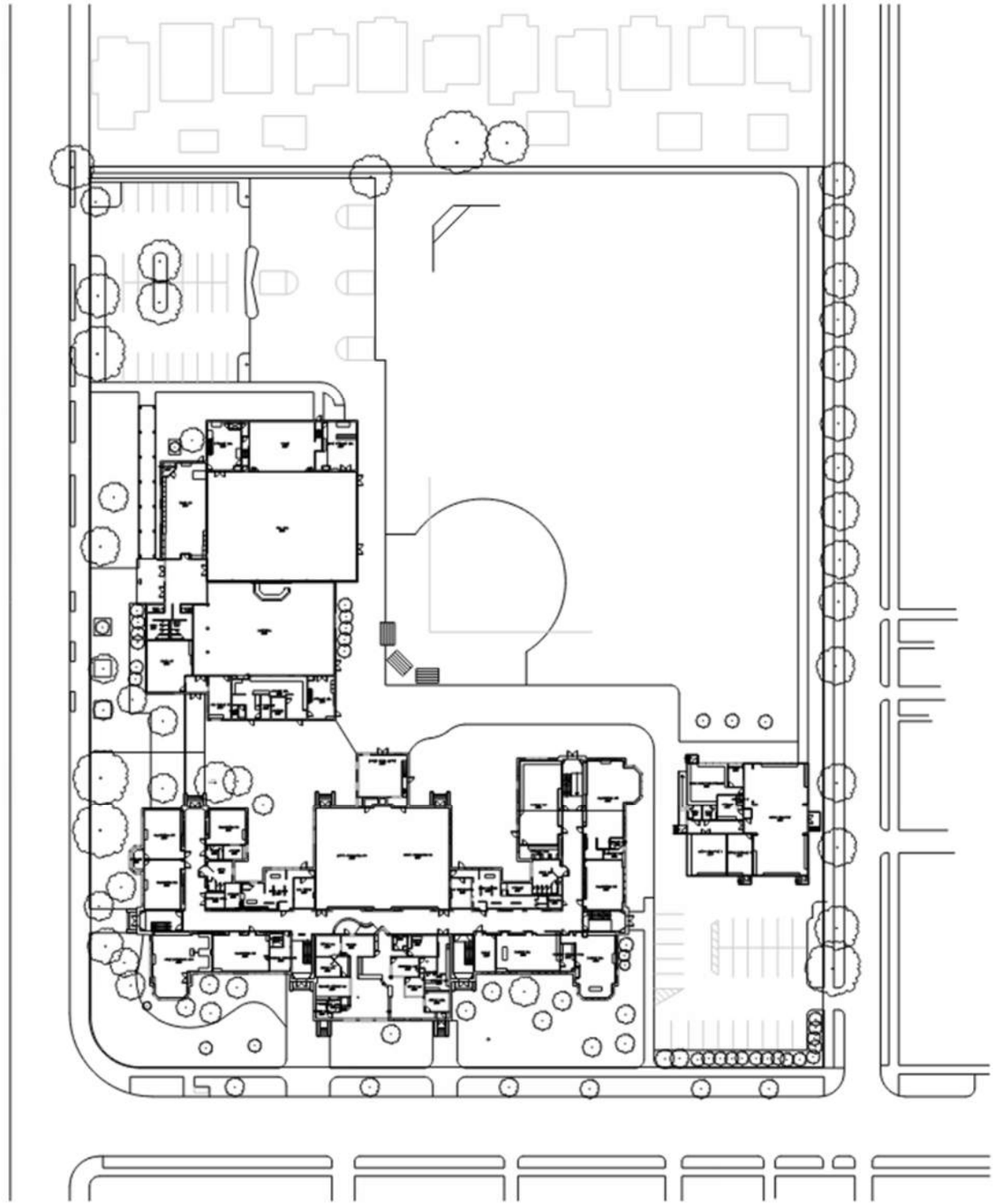
Architecture
Security Consulting
Computational Design
Portland Public Schools

1) Develop accurate and detailed site and building plans, verified through site visits to each location
2) Investigate recording capacity and methodology at each location
3) Plot existing camera positions and view cones on building plans
4) Determine an appropriate budget for each school
5) Develop interior camera layouts based on District Standards
6) Develop exterior camera budget by subtracting interior camera costs for each school
7) Create baseline exterior camera layout options
8) Create optimized, budget compliant, final layout for exterior cameras balancing multiple variables

Our Solution

1) Develop accurate and detailed site and building plans, verified through site visits to each location



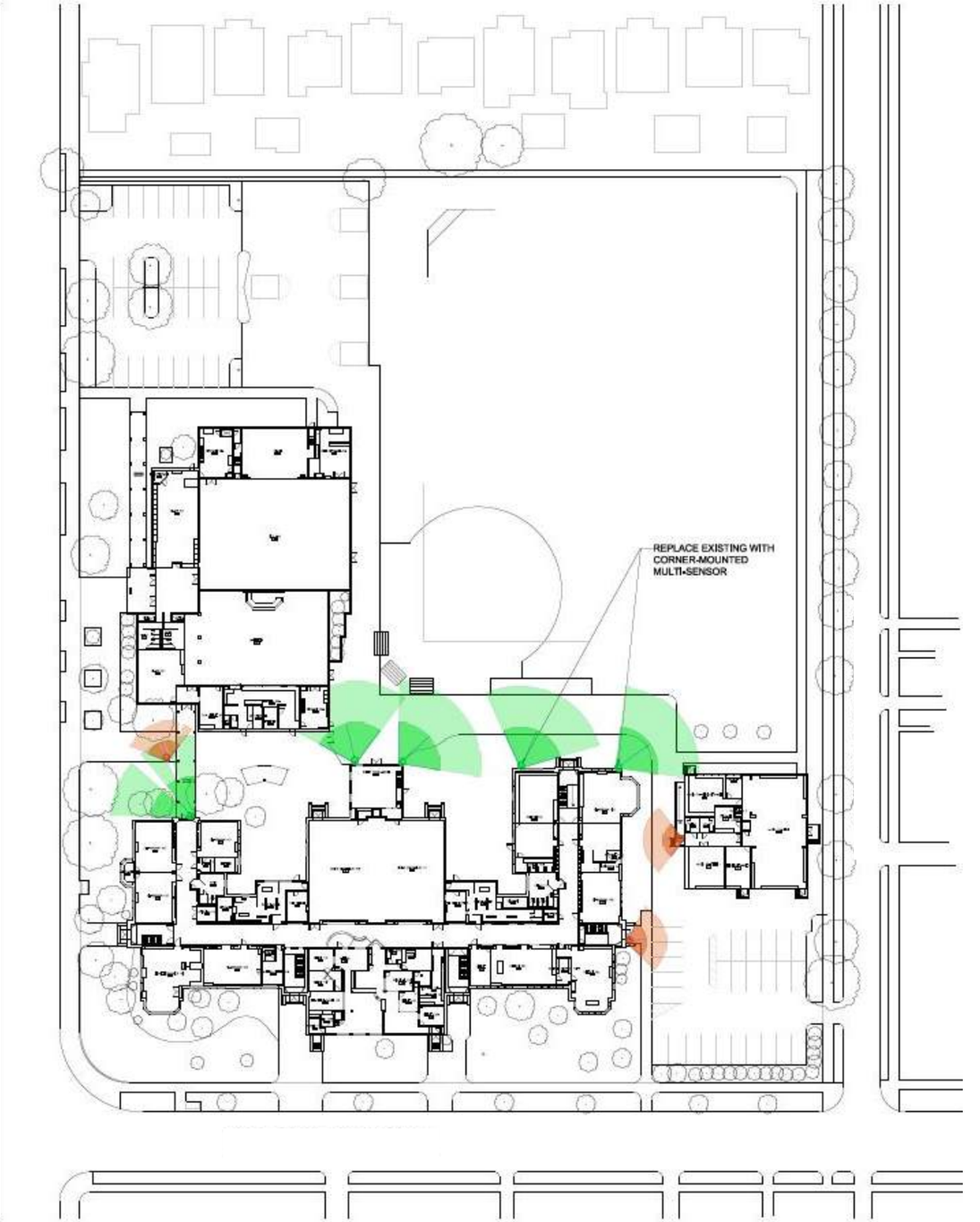


Our Solution

2) Investigate recording capacity and methodology in each location

Our Solution

3) Plot existing camera positions and view cones on building



Our Solution

4) Determine an appropriate budget for each school

Based on the spreadsheet you provided to us on 02/08/23, we are proposing to develop a preliminary budget number for each school, which is aligned with our scope for this project. We notice that the $1.56/sq.ft. number includes an allowance for additional Exacq controllers, which is not part of our work, and we therefore want to make sure that we do not use an inflated number which will cause challenges downstream. We will therefore use a figure of $1.44/sq.ft. to develop a budget for us to work to at each school, which includes the cameras, port switches, and a 15% contingency. As such the budget numbers for schools in Phase 1A will be as follows:

Beaumont MS	$133,290
Roseway Heights	$149,197
Martin Luther King ES	$231,536
Lane MS	$137,091
Ockley Green	$106,585
George MS	$109,644
Jefferson HS	$463,935
Kelly K-5	$119,890
Woodmere K-5	$74,735
Harriet Tubman MS	$126,158
TOTAL Phase 1A	$1,652,061

Our Solution

5) Develop interior camera layouts based on District Standards

Interior Camera Placement Principles

- Gathering Areas

  Lobbies, Gymnasium Stands, Cafeterias

- Bathroom Entries
- Building Entries / Exits
- Currency Exchange Areas

  Ticket Booths, Cafeterias Kiosks

- Areas of Concern

  Identified through consultation with staff

Our Solution

6) Develop exterior camera budget by subtracting interior camera costs for each school

SCHOOL	OVERALL BUDGET	INTERIOR BUDGET	EXTERIOR BUDGET
Beaumont MS	$133,290	$103,500	$29,790
Roseway Heights	$149,197	$83,500	$65,697
Martin Luther King ES	$231,536	$76,000	$155,536
Lane MS	$137,091	$76,500	$60,591
Ockley Green	$106,585	$52,000	$54,585
George MS	$109,644	$83,000	$26,644
Jefferson HS	$463,935	$201,500	$262,435
Kelly K-5	$119,890	$30,000	$89,890
Woodmere K-5	$74,735	$40,000	$34,735
Harriet Tubman MS	$126,158	$59,000	$67,158

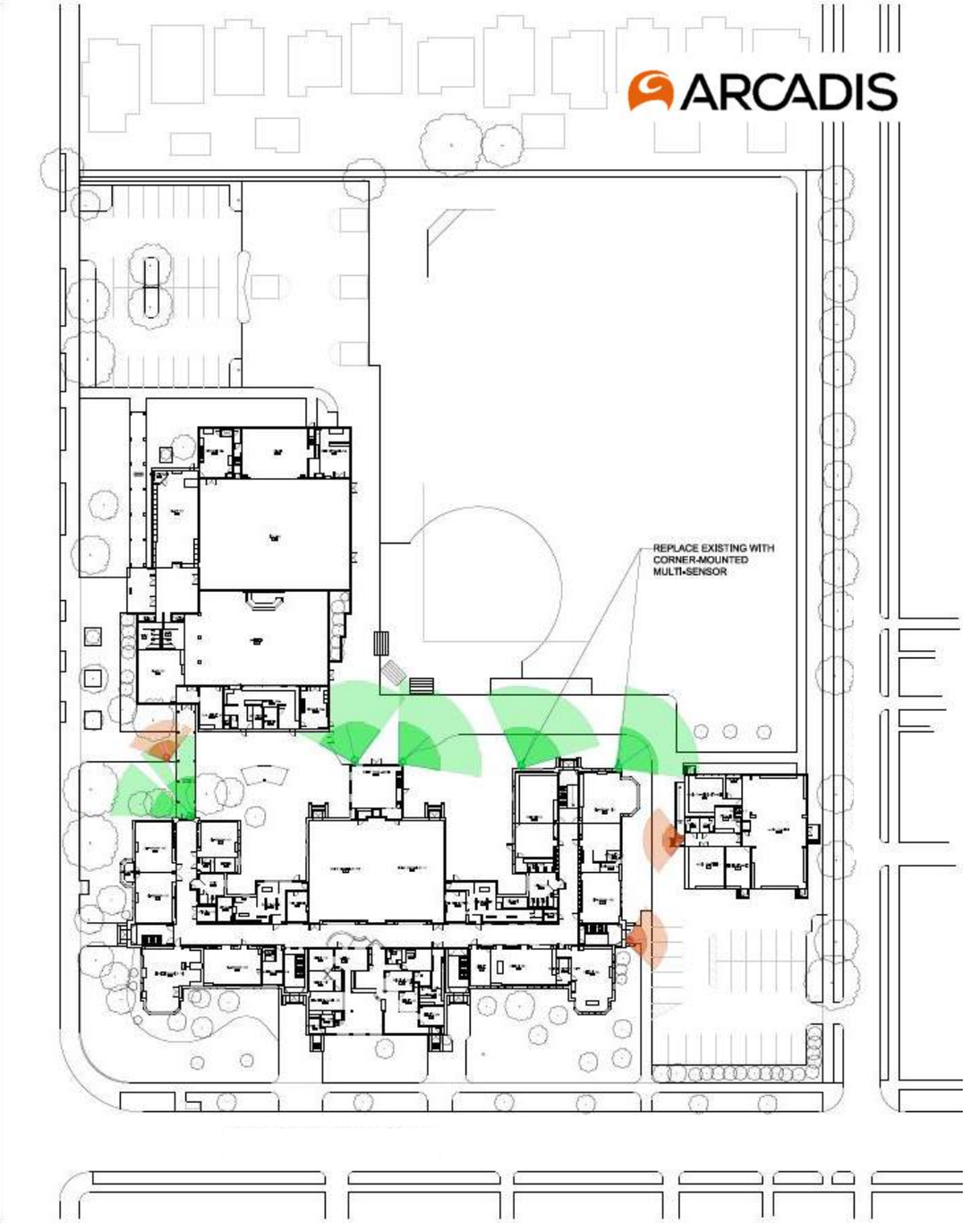
Our Solution

7) Create baseline exterior camera layout options

Baseline 1

Utilize the parametric tool to determine existing % coverage of external façade and external parking areas at each school.

SCHOOL	WALL PERIMETER LENGTH (ft)	WALL COVERAGE			PARKING COVERAGE		
		x1	x2	x8	x1	x2	x8
Beaumont MS	4,392	1.17%	3.88%	27.50%	0.00%	1.20%	24.97%
Roseway Heights	1,589	1.25%	4.38%	5.26%	0.00%	0.00%	0.00%
Martin Luther King ES	1,897	2.00%	5.68%	15.88%	9.36%	33.74%	99.90%
Lane MS	1,976	1.15%	2.13%	5.32%	0.00%	0.00%	0.00%
Ockley Green	2,188	0.18%	3.26%	7.96%	0.00%	0.00%	0.00%
George MS	2,561	0.24%	1.34%	1.81%	0.00%	0.00%	0.00%
Jefferson HS	3,758	2.20%	3.93%	7.91%	0.00%	0.00%	95.75%
Kelly K-5	3,212	1.82%	3.81%	17.86%	0.41%	5.71%	12.40%
Woodmere K-5	1,973	0.60%	1.00%	10.71%	0.00%	0.00%	0.00%
Harriet Tubman MS	1,358	2.03%	6.10%	19.77%	0.00%	0.00%	1.59%



Our Solution

7) Create baseline exterior camera layout options

Baseline 2

Utilize human expertise to develop a proposed layout of external cameras and use the parametric tool to determine the % of coverage it achieves.

SCHOOL	WALL COVERAGE			PARKING COVERAGE			EXTERIOR CAMERA COST	EXTERIOR CAMERA BUDGET	BUDGET DELTA
	x1	x2	x8	x1	x2	x8			
Beaumont MS	26.69%	47.43%	80.52%	5.04%	38.22%	100.00%	$79,000	$29,790	($49,210)
Roseway Heights	31.54%	60.83%	81.98%	0.00%	4.23%	100.00%	$60,000	$65,697	$5,697
Martin Luther King ES	29.65%	53.84%	79.39%	29.70%	87.52%	93.34%	$63,000	$155,536	$92,536
Lane MS	11.54%	32.49%	46.32%	8.36%	21.79%	59.69%	$49,000	$60,591	$11,591
Ockley Green	19.37%	50.50%	79.10%	29.67%	95.72%	100.00%	$56,500	$54,585	($1,915)
George MS	21.86%	37.97%	55.50%	9.25%	31.82%	99.78%	$64,500	$26,644	($37,856)
Jefferson HS	15.29%	32.25%	58.53%	0.00%	0.00%	100.00%	$68,500	$262,435	$193,935
Kelly K-5	11.99%	26.21%	75.48%	7.39%	37.50%	76.69%	$56,500	$89,890	$33,390
Woodmere K-5	18.52%	35.04%	70.07%	12.76%	41.71%	100.00%	$43,000	$34,735	($8,265)
Harriet Tubman MS	32.27%	53.49%	83.43%	12.91%	62.05%	96.09%	$46,500	$67,158	$20,658

$260,561 under budget, 28.97% off coverage target

Our Solution

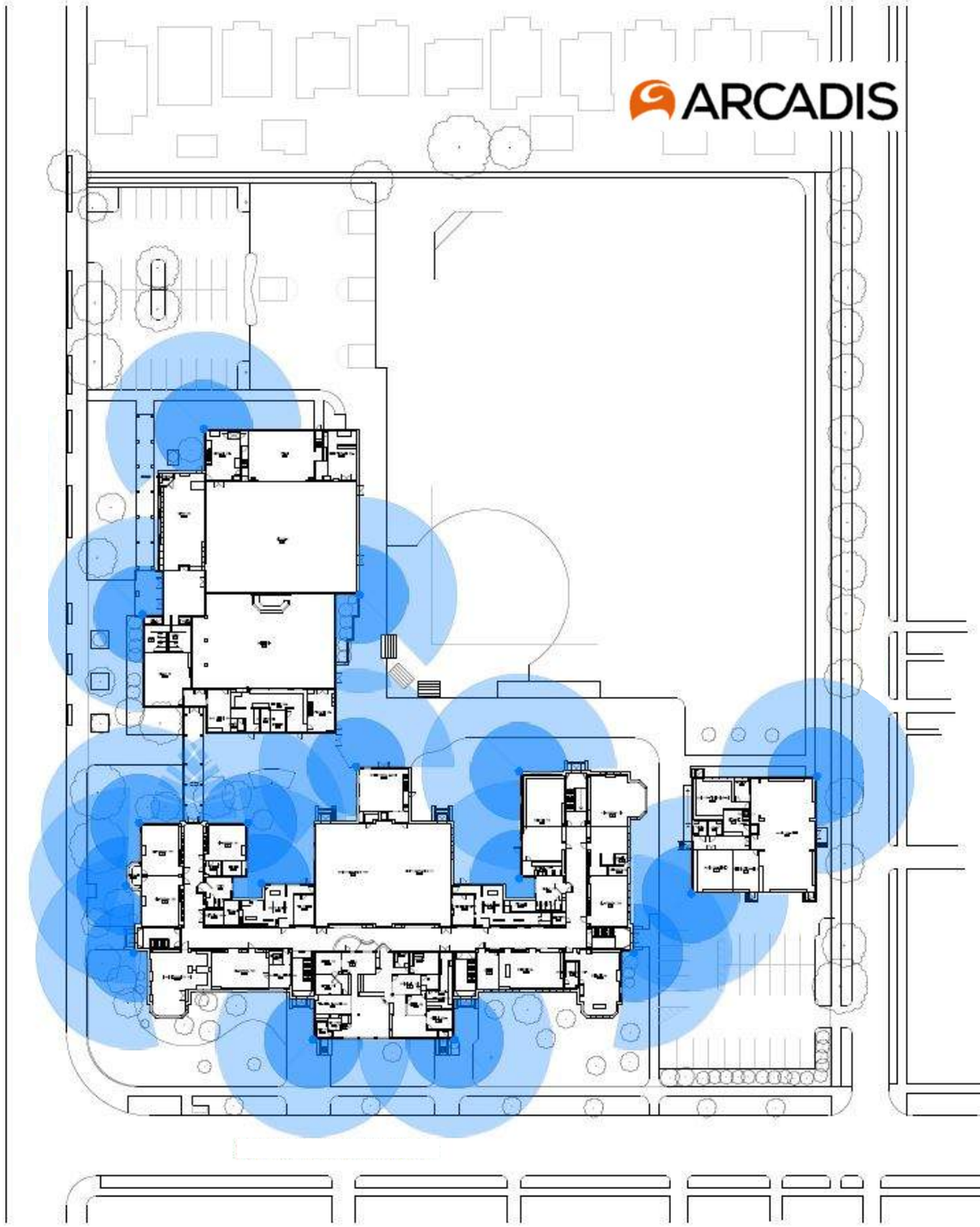
7) Create baseline exterior camera layout options

Baseline 3

Ignore budget and use the parametric tool to develop a 100% coverage layout.

SCHOOL	WALL COVERAGE			PARKING COVERAGE			EXTERIOR CAMERA COST	EXTERIOR CAMERA BUDGET	BUDGET DELTA
	x1	x2	x8	x1	x2	x8			
Beaumont MS	48.56%	81.37%	99.78%	5.04%	29.38%	100.00%	$120,000	$29,790	($90,210)
Roseway Heights	42.37%	78.19%	100.00%	0.00%	5.45%	100.00%	$75,000	$65,697	($9,303)
Martin Luther King ES	45.50%	78.57%	100.00%	29.78%	91.02%	99.99%	$90,000	$155,536	$65,536
Lane MS	37.19%	64.82%	99.25%	2.79%	44.39%	99.87%	$82,500	$60,591	($21,909)
Ockley Green	38.17%	74.78%	97.77%	29.68%	95.70%	100.00%	$90,000	$54,585	($35,415)
George MS	39.56%	70.78%	96.82%	13.58%	43.37%	99.97%	$105,000	$26,644	($78,356)
Jefferson HS	28.04%	52.11%	96.16%	0.00%	0.00%	100.00%	$127,000	$262,435	$135,435
Kelly K-5	27.58%	56.46%	96.52%	5.30%	27.29%	100.00%	$112,500	$89,890	($22,610)
Woodmere K-5	25.86%	47.04%	99.26%	0.00%	10.78%	100.00%	$67,500	$34,735	($32,765)
Harriet Tubman MS	41.07%	68.93%	99.64%	35.39%	84.21%	99.65%	$67,500	$67,158	($342)

$89,939 over budget, 1.48% off coverage target



Our Solution

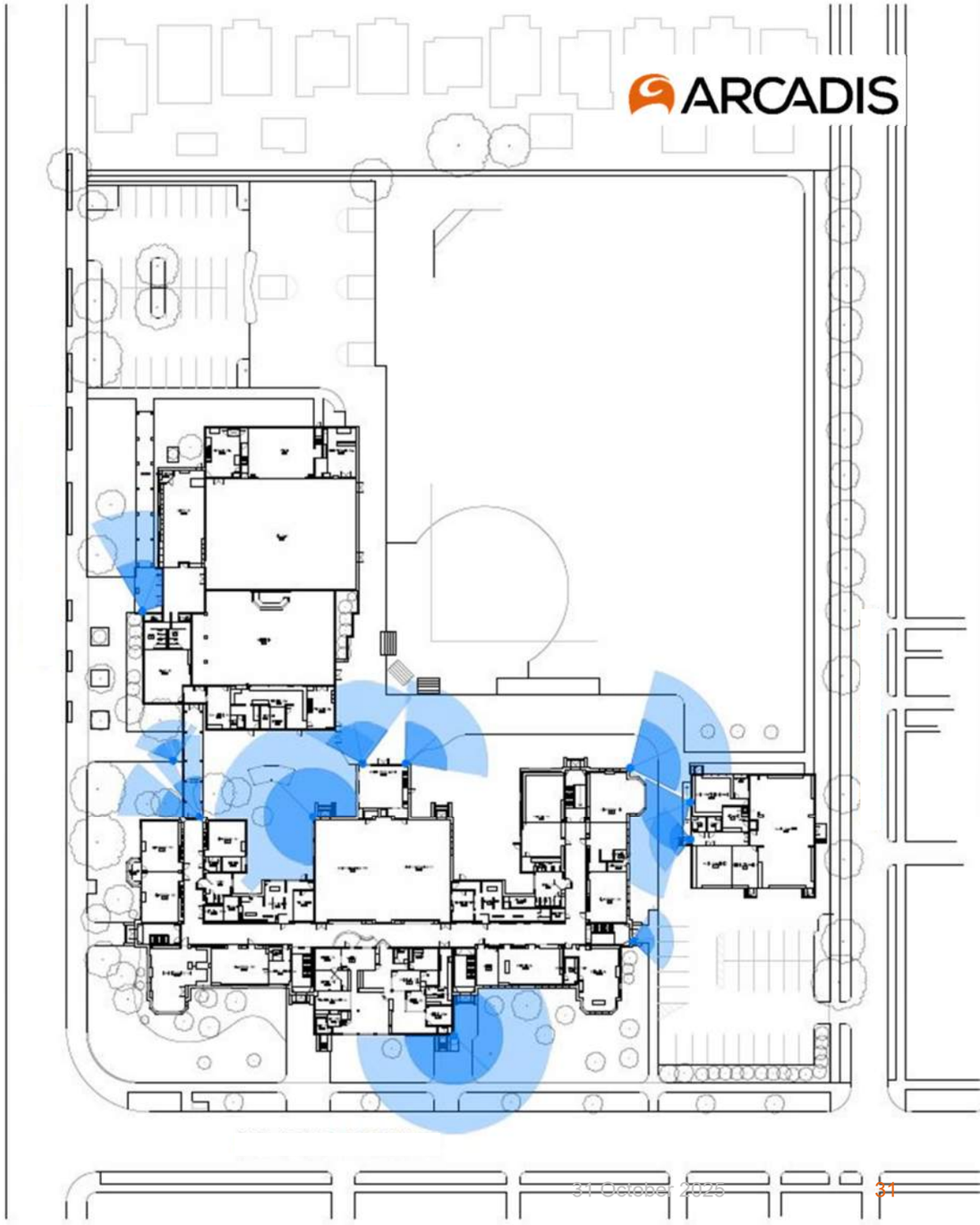
7) Create baseline exterior camera layout options

Baseline 4

Take the district budget per school and use the parametric tool to create an optimized layout within budget.

SCHOOL	WALL COVERAGE			PARKING COVERAGE			EXTERIOR CAMERA COST	EXTERIOR CAMERA BUDGET	BUDGET DELTA
	x1	x2	x8	x1	x2	x8			
Beaumont MS	34.37%	47.67%	60.75%	0.00%	1.20%	65.54%	$27,000	$29,790	$2,790
Roseway Heights	36.14%	68.22%	98.13%	0.00%	7.39%	100.00%	$53,000	$65,697	$12,697
Martin Luther King ES	43.34%	72.06%	98.69%	13.73%	49.17%	99.94%	$77,500	$155,536	$78,036
Lane MS	31.16%	51.76%	96.48%	5.24%	28.98%	99.56%	$57,500	$60,591	$3,091
Ockley Green	29.46%	54.69%	83.93%	22.68%	74.07%	99.93%	$53,000	$54,585	$1,585
George MS	12.13%	20.68%	48.11%	9.23%	23.95%	53.47%	$26,500	$26,644	$144
Jefferson HS	32.52%	53.91%	94.88%	0.00%	0.00%	100.00%	$105,000	$262,435	$157,435
Kelly K-5	38.75%	59.94%	96.66%	3.30%	23.58%	100.00%	$87,000	$89,890	$2,890
Woodmere K-5	16.75%	28.82%	87.19%	0.00%	3.71%	100.00%	$34,000	$34,735	$735
Harriet Tubman MS	45.00%	62.86%	100.00%	25.68%	84.14%	99.55%	$45,000	$67,158	$22,158

$281,561 under budget, 13.52% off coverage target



Our Solution

7) Create baseline exterior camera layout options

Baseline 5

Identify surplus budget from Baseline 4 layouts and reallocate proportionally, based on amount of uncovered perimeter at each school.

SCHOOL	WALL PERIMETER LENGTH (ft)	WALL COVERAGE			UNCOVERED PERIMETER LENGTH (ft)	PARKING COVERAGE			BL4 SURPLUS BUDGET	OVERALL BUDGET	INTERIOR CAMERA BUDGET	ORIGINAL EXTERIOR CAMERA BUDGET	REALLOCATED EXTERIOR CAMERA BUDGET	REVISED EXTERIOR CAMERA BUDGET
		x1	x2	x8		x1	x2	x8						
Beaumont MS	4,392	34.37%	47.67%	60.75%	1,724	0.00%	1.20%	65.54%	$2,790	$133,290	$103,500	$29,790	$118,937	$145,937
Roseway Heights	1,589	36.14%	68.22%	98.13%	30	0.00%	7.39%	100.00%	$12,697	$149,197	$83,500	$65,697	$2,050	$55,050
Martin Luther King ES	1,897	43.34%	72.06%	98.69%	25	13.73%	49.17%	99.94%	$78,036	$231,536	$76,000	$155,536	$1,715	$79,215
Lane MS	1,976	31.16%	51.76%	96.48%	70	5.24%	28.98%	99.56%	$3,091	$137,091	$76,500	$60,591	$4,799	$62,299
Ockley Green	2,188	29.46%	54.69%	83.93%	352	22.68%	74.07%	99.93%	$1,585	$106,585	$52,000	$54,585	$24,259	$77,259
George MS	2,561	12.13%	20.68%	48.11%	1,329	9.23%	23.95%	53.47%	$144	$109,644	$83,000	$26,644	$91,687	$118,187
Jefferson HS	3,758	32.52%	53.91%	94.88%	192	0.00%	0.00%	100.00%	$157,435	$463,935	$201,500	$262,435	$13,275	$118,275
Kelly K-5	3,212	38.75%	59.94%	96.66%	107	3.30%	23.58%	100.00%	$2,890	$119,890	$30,000	$89,890	$7,402	$94,402
Woodmere K-5	1,973	16.75%	28.82%	87.19%	253	0.00%	3.71%	100.00%	$735	$74,735	$40,000	$34,735	$17,438	$51,438
Harriet Tubman MS	1,358	45.00%	62.86%	100.00%	0	25.68%	84.14%	99.55%	$22,158	$126,158	$59,000	$67,158	$0	$45,000
				TOTALS	**4081**				**$281,561**	**$1,652,061**		**$847,061**	**$281,561**	**$847,061**

Our Solution

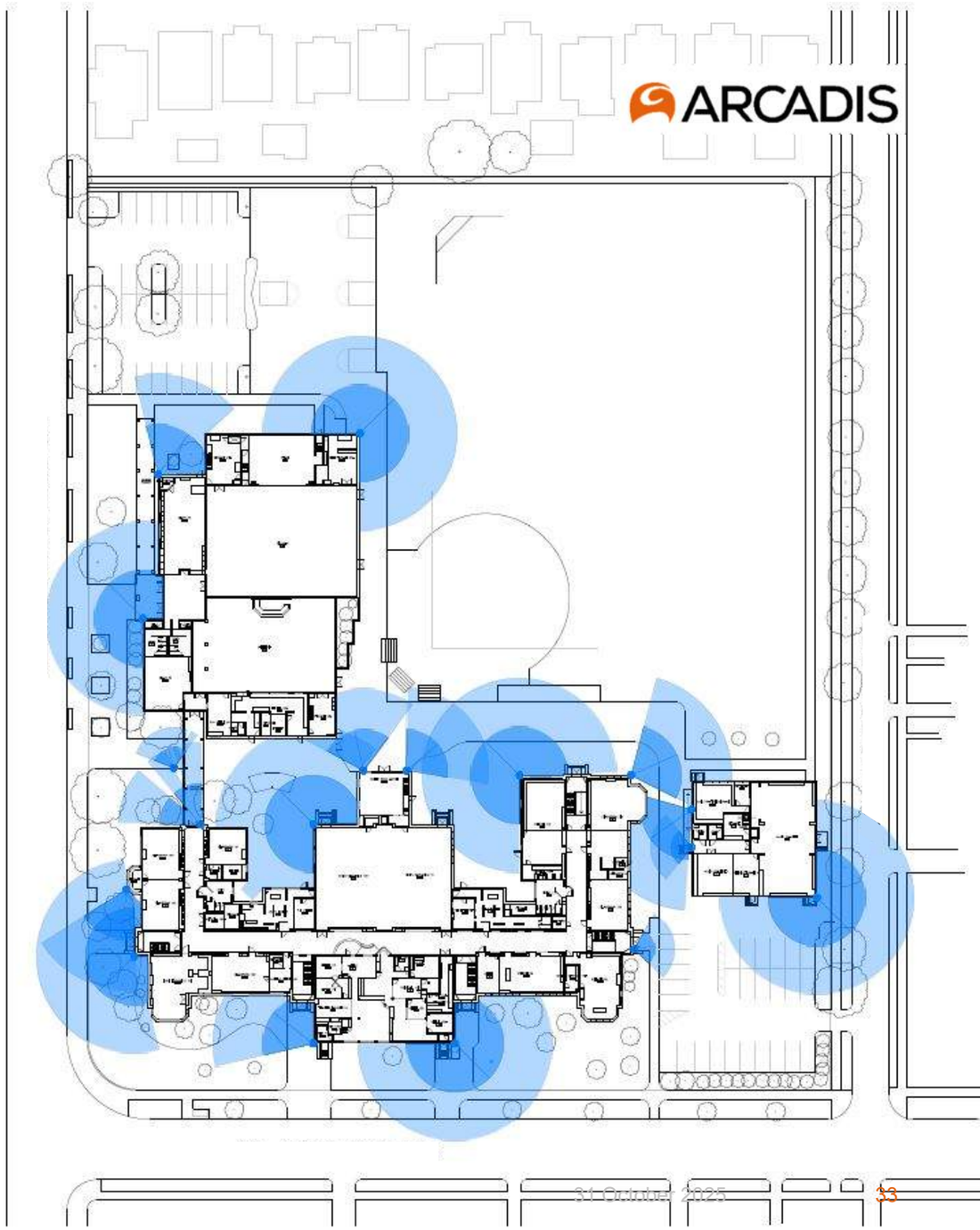
7) Create baseline exterior camera layout options

Baseline 5

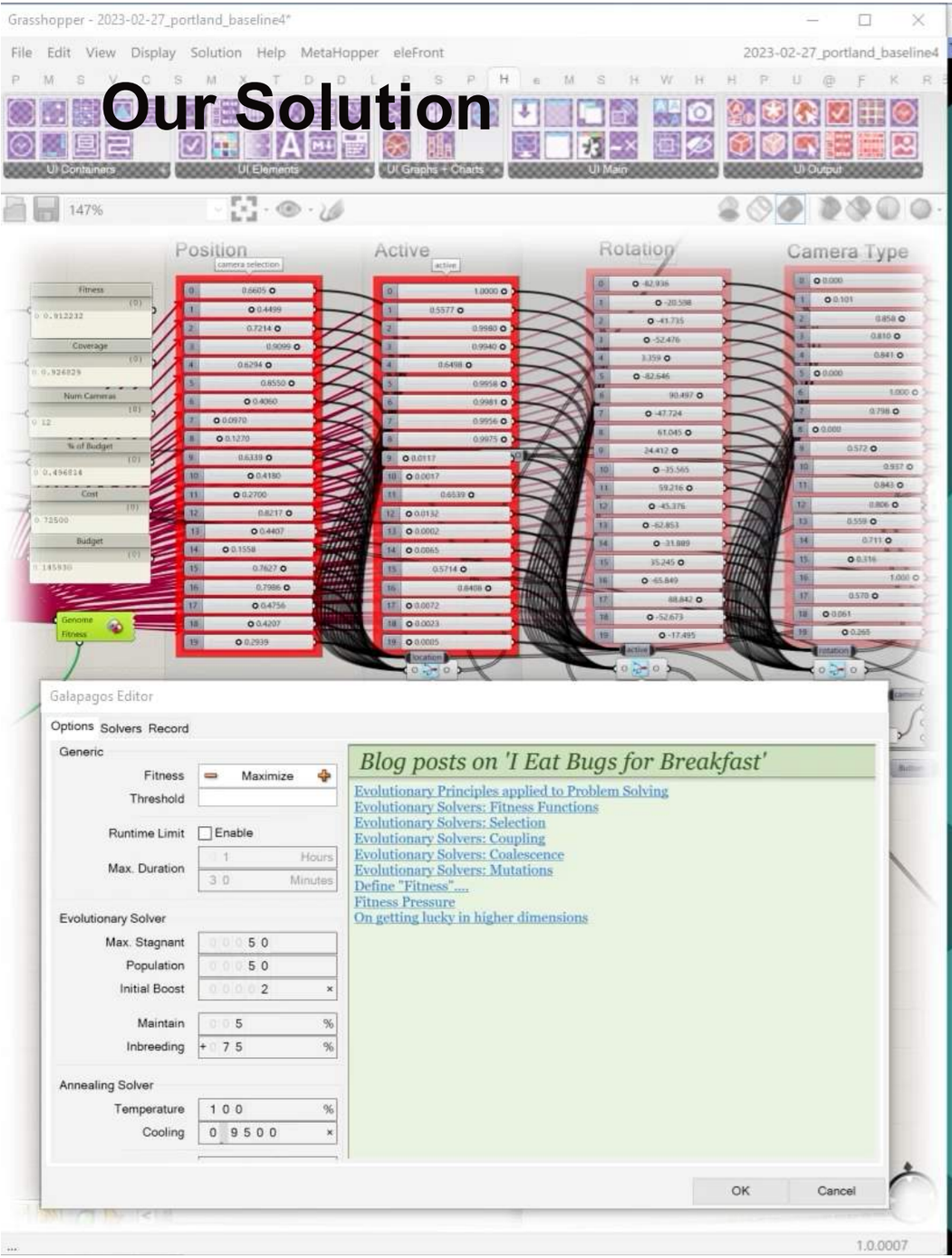
Use the parametric tool to generate layouts within revised budgets for schools receiving additional funds.

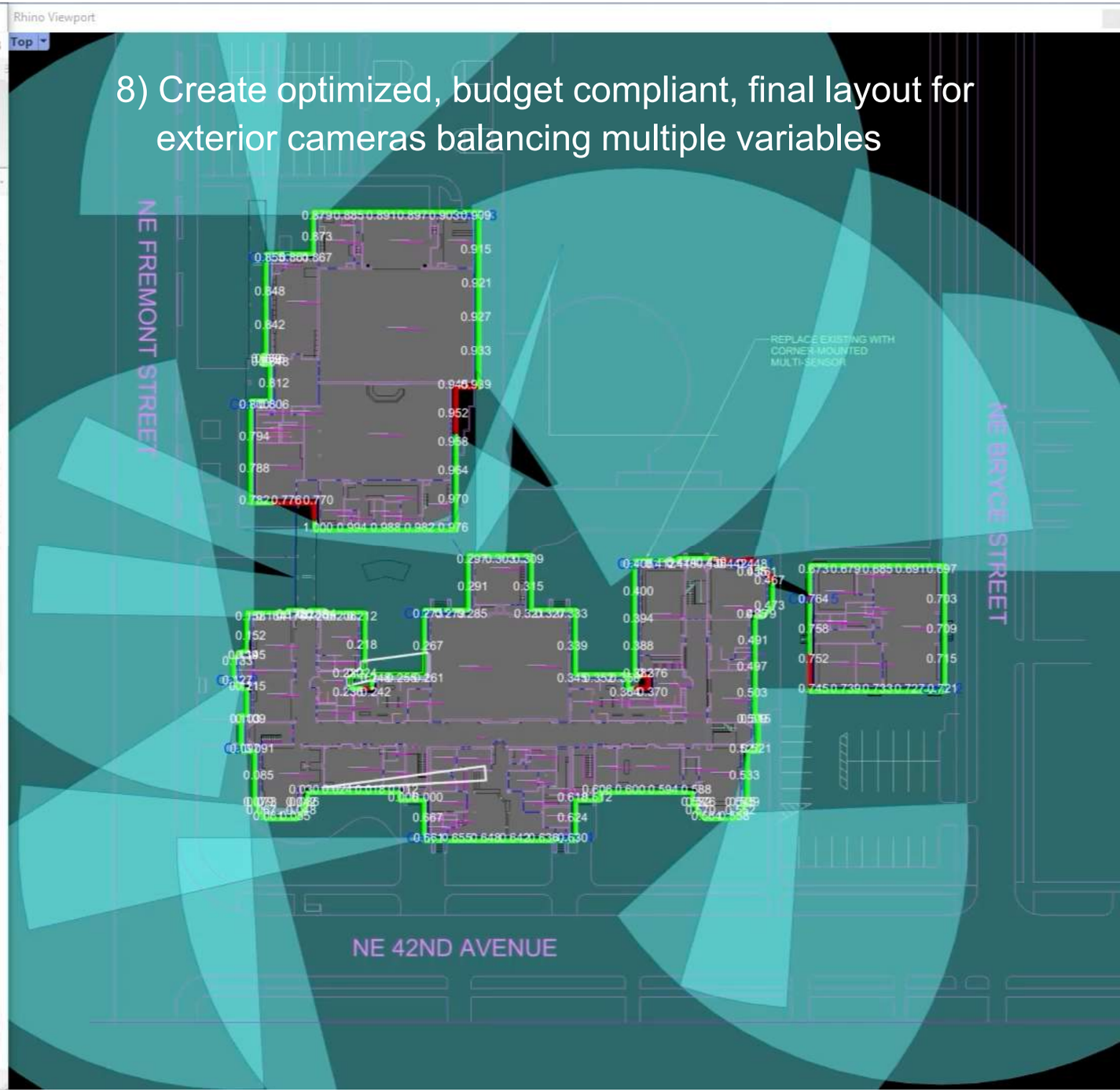
SCHOOL	WALL COVERAGE			PARKING COVERAGE			EXTERIOR CAMERA COST	EXTERIOR CAMERA BUDGET	BUDGET DELTA
	x1	x2	x8	x1	x2	x8			
Beaumont MS	48.78%	71.62%	97.34%	1.18%	11.57%	100.00%	$72,500	$145,937	$73,437
Roseway Heights	36.14%	68.22%	98.13%	0.00%	7.39%	100.00%	$53,000	$55,050	$2,050
Martin Luther King ES	43.34%	72.06%	98.69%	13.73%	49.17%	99.94%	$77,500	$79,215	$1,715
Lane MS	31.16%	51.76%	96.48%	5.24%	28.98%	99.56%	$57,500	$62,299	$4,799
Ockley Green	39.29%	72.99%	94.42%	25.64%	91.70%	99.94%	$76,000	$77,259	$1,259
George MS	33.60%	63.02%	97.22%	9.23%	25.66%	99.73%	$73,500	$118,187	$44,687
Jefferson HS	35.34%	58.26%	97.31%	0.00%	0.00%	100.00%	$117,500	$118,275	$775
Kelly K-5	38.90%	59.94%	97.39%	2.88%	17.87%	98.28%	$91,000	$94,402	$3,402
Woodmere K-5	24.14%	41.63%	100.00%	0.00%	3.71%	100.00%	$45,500	$51,438	$5,938
Harriet Tubman MS	45.00%	62.86%	100.00%	25.68%	84.14%	99.55%	$45,000	$45,000	$0

$138,061 under budget, 2.3% off coverage target



Our Solution





Outcomes

- Phase 1(A) was used as our experimental test bed
- It served to provide confidence in the effectiveness of the parametric tool
- In subsequent phases we were able to reduce the number of baselines (1, 4, 5)
- Our methodology enabled us to develop a budget based on perimeter length, rather than sq.ft.
- Perimeter length is a better indicator of budgetary need for exterior cameras
- The surplus budget has been reinvested into other security upgrades to various campuses
- The approach developed on this project has been used successfully on numerous other projects now
- The Security Consulting team have gone from being early skeptics to keen advocates
- Most at the district (outside the immediate PM team) have no idea how we achieved these outcomes
- The process adapted to a new contractor and camera supplier between phases without missing a beat

Outcomes

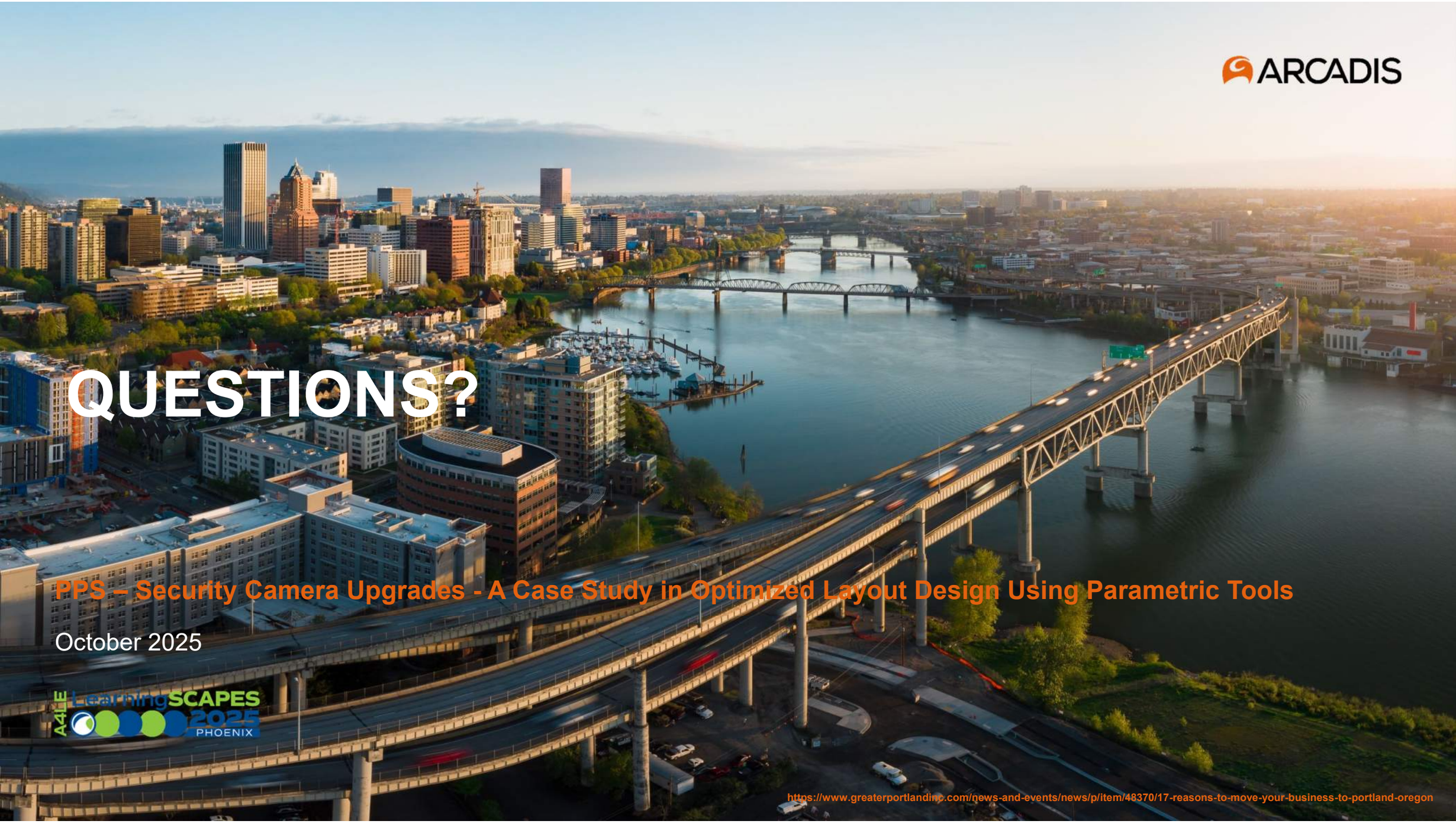
	PROJECT BUDGET	COMMITMENTS	ESTIMATE AT COMPLETION
Phase 1 (6245)	$5,049,473	$2,508,745	$2,508,745
Phase 2A (6317)	$2,817,500	$1,522,255	$1,522,255
Phase 2B (6340)	$2,817,500	$1,586,545	$1,586,545
Phase 3A (6381)	$1,659,989	$1,140,654	$1,140,654
Phase 3B (6422)	$2,523,805	$2,246,027	$2,246,027
Phase 3C (6437)	$2,801,305	$1,471,966	$1,552,332
TOTALS	**$17,669,572**	**$10,476,192**	**$10,556,558**

With 5 of 6 phases complete, the project is on schedule and 40% under budget

"Working with Arcadis as our project Architect on the 2020 Security Bond project has been a truly positive experience. From the start, their team demonstrated exceptional professionalism, creativity, and a deep understanding of our district's security needs. The "Parametric" process was efficient, collaborative, and well-managed — keeping the project on schedule and within budget."

"The final result exceeded our expectations. They were able to take the needs of our Security Services team, our design standards as well as each individual schools needs to create a functional and safe environment for the students and staff. We're proud of what was accomplished and grateful for the role Arcadis played in making it a success."

Eric Naes, Project Manager, Office of School Modernizations – Portland Public Schools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QUESTIONS?
PPS – Security Camera Upgrades - A Case Study in Optimized Layout Design Using Parametric Tools
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