Improving technology decisions

Excipio Consulting is a business solutions provider that delivers analytical resources and a proven methodology to radically improve technology-related decisions.

Excipio Consulting

Has Prepared This Document for:

The Minnesota Technology Corridor

Data Center Facilities Model

Table of Contents

Overview

The purpose of this assessment is to help the Minnesota Technology Corridor (the Client) understand the requirements, costs, and other considerations to attract prospective data center developers to the Centerville market. The assessment includes the following sections:

- Location attributes
- An economic analysis
- A site risk assessment
- Appendixes containing detailed analysis elements

Assumptions and Disclaimers

While Excipio's consultants have a significant amount of knowledge, practical experience, and hands-on oversight of the construction/retrofit process, this assessment provides the following disclaimers:

- Excipio is not a licensed mechanical and electrical (M&E) engineering firm. Thus, the information provided in this document is for tactical and strategic planning purposes only. Should there be a decision to move forward with any of the recommendations, a licensed M&E firm is required. Excipio has access to some of the best M&E firms in the area from work on previous assessments.
- Excipio, nor any other organization, is not licensed or allowed by the Uptime Institute (UI) to certify any facility as meeting the UI's Tier criteria. While the UI accredits Excipio's consultants, the ratings provided in this document are Excipio's opinion and based on the UI rating standard. Only the UI can provide official certification, and this is an expensive and time-consuming process.
- The equipment load was derived using the current UPS, PDU, and rack power readings where available. Fluctuations in power consumption should not materially alter the analysis recommendations.

Objectives

The primary objectives for this assessment are as follows:

- Assess the viability of multiple sites for the suitability of a data center.
- Assess the utility and telecommunications infrastructure available, including the costs to bring the infrastructure to the proposed site.
- Estimate the physical size of a data center.
- Create a financial model for the construction and buildout of each site, incorporating net costs based upon current tax and other incentives.
- Provide documentation for use in marketing campaigns to entice prospective buyers.

Approach

- Excipio provided data collection requests to the Client's representatives.
- Input from subject matter experts from the City of Centerville, Connexus, and Comcast
- Excipio provided weekly status updates and progress reviews.
- Excipio has provided a draft deliverable reviewed with the team before any edits to produce the final deliverable.

Site Attributes

Incentives

Incentives are available at the State and City level that makes this property attractive to prospective buyers. A summary of the stimuli is listed below:

State Data Center Sales Tax

- Requirements: Available to companies or individuals who build data or telecommunications data centers with a minimum of 25,000 square feet and who invest at least $30M in less than 48 months
- Provides a sales tax exemption for 20 years on computer/server hardware, power equipment (distribution panels, UPS, PDUs, etc.), cooling equipment (chillers, air conditioners, et al.), software to operate the environment, and electric utility bills.
- All compute Personal Property assets qualify for the Sales Tax Incentives

MN Job Creation Fund

- Requirements: Minimum requirements are ten jobs and $500K in capital investment.
- The fund will provide up to $1M in grants once the position and capital investment objectives are achieved (YMMV based upon project parameters).

Third-Party Stimuli

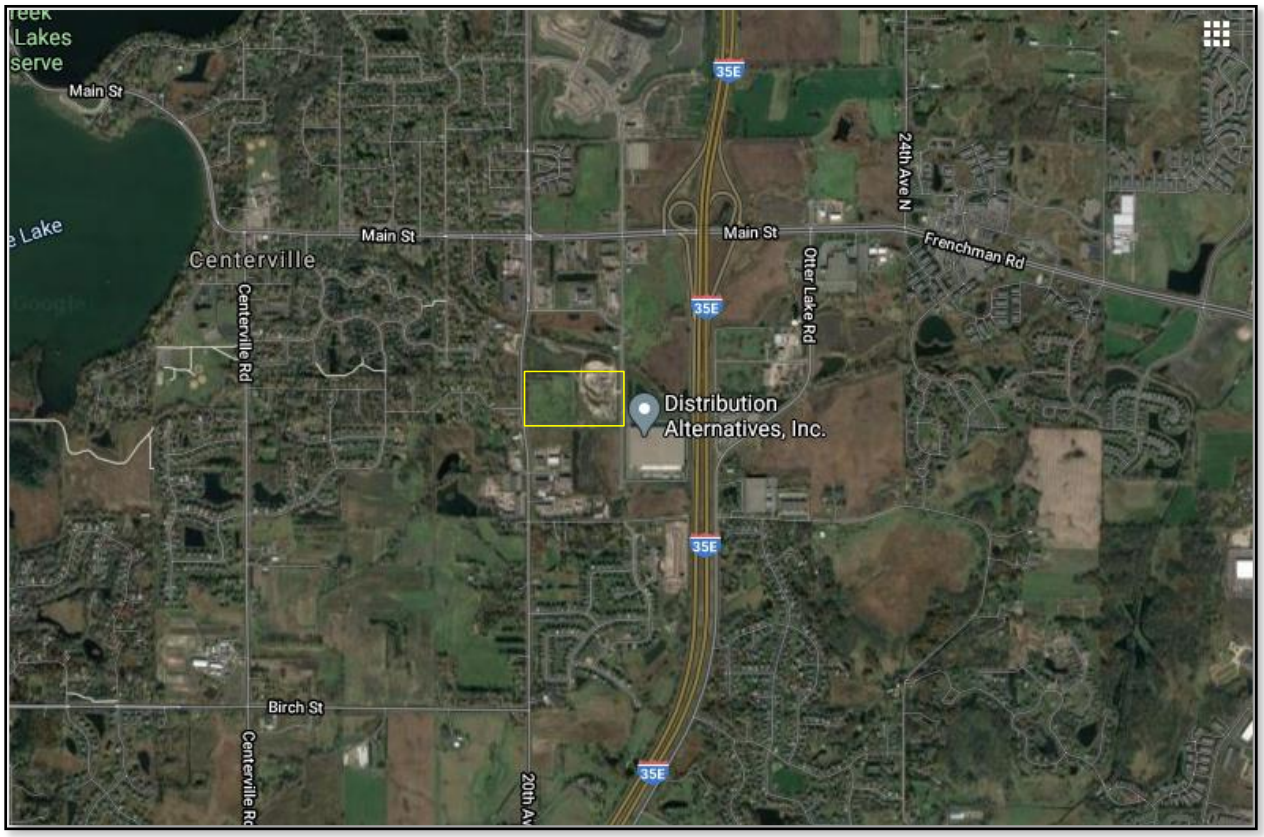
- Requirements:
    - Headquartered in Minnesota
    - Less than 25 employees
    - Focused on R&D of qualifying high-tech
- Potential to qualify for up to $1M in angel tax credits.

Local Government

Local government is open to negotiation for prospective partnerships

Property Location

Figure SA-1: Site Overview



Key Attributes

- Location: 20 acres of shovel ready greenfield in Anoka County. Also, there is an additional 30 contiguous acres available for potential use.
- Zoned: I1 – Industrial park
- Utilities: Delivered to site and are already adjacent except telecom
- Power capacity: 3 MW immediately available, 6 MW in 2021; additional power available via an onsite substation.
- Electrical Costs: $.08 per kWh
- Proximity to multiple power providers.
- Fiber providers: Currently Comcast, Zayo, Arvig, but other Tier 1 providers are nearby
- The site can be subdivided
- Transportation: 30 miles to MSP airport, .6 miles to I-35E (2 min) via exit 123.

Figure SA-2: Parcel View

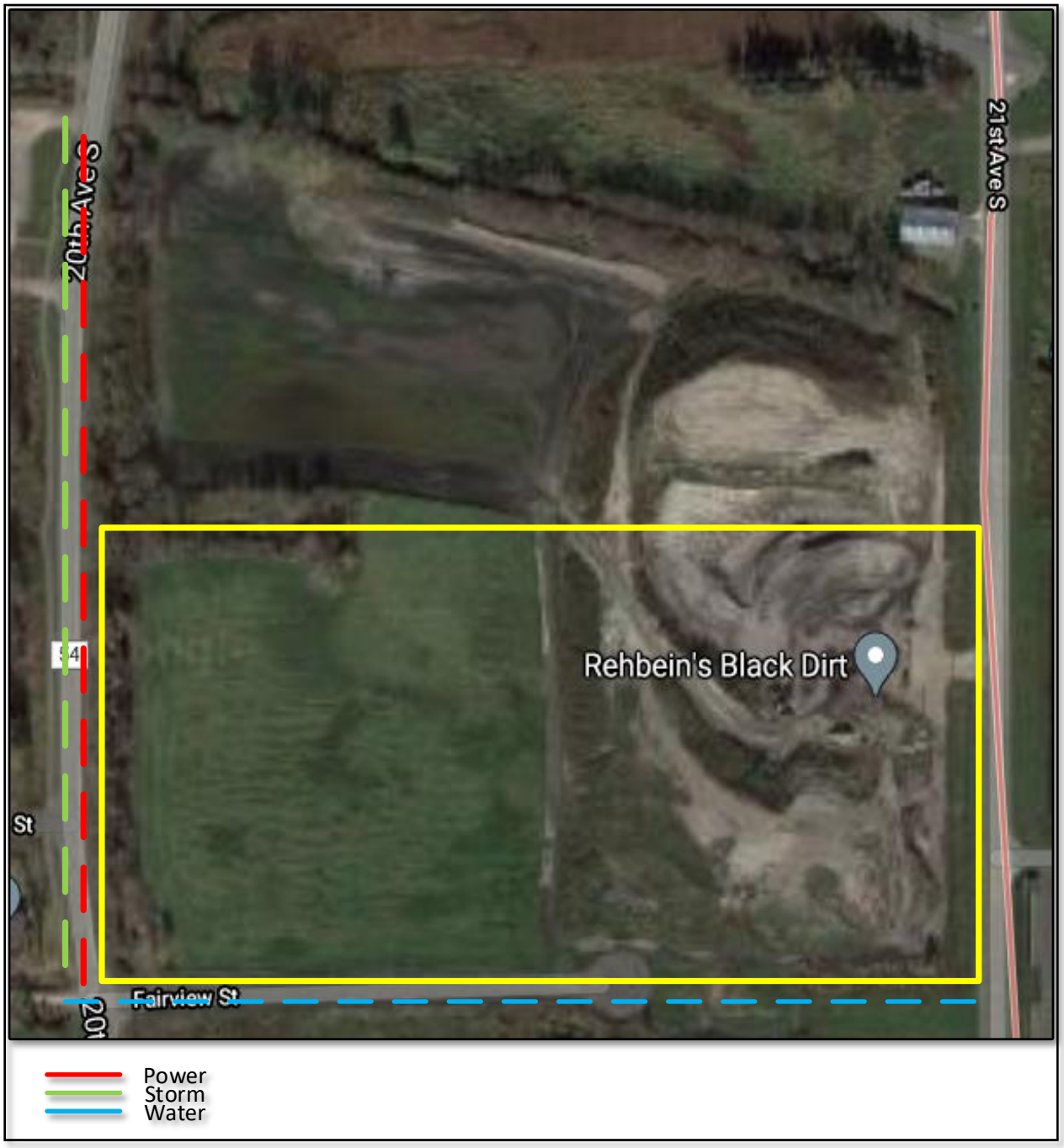
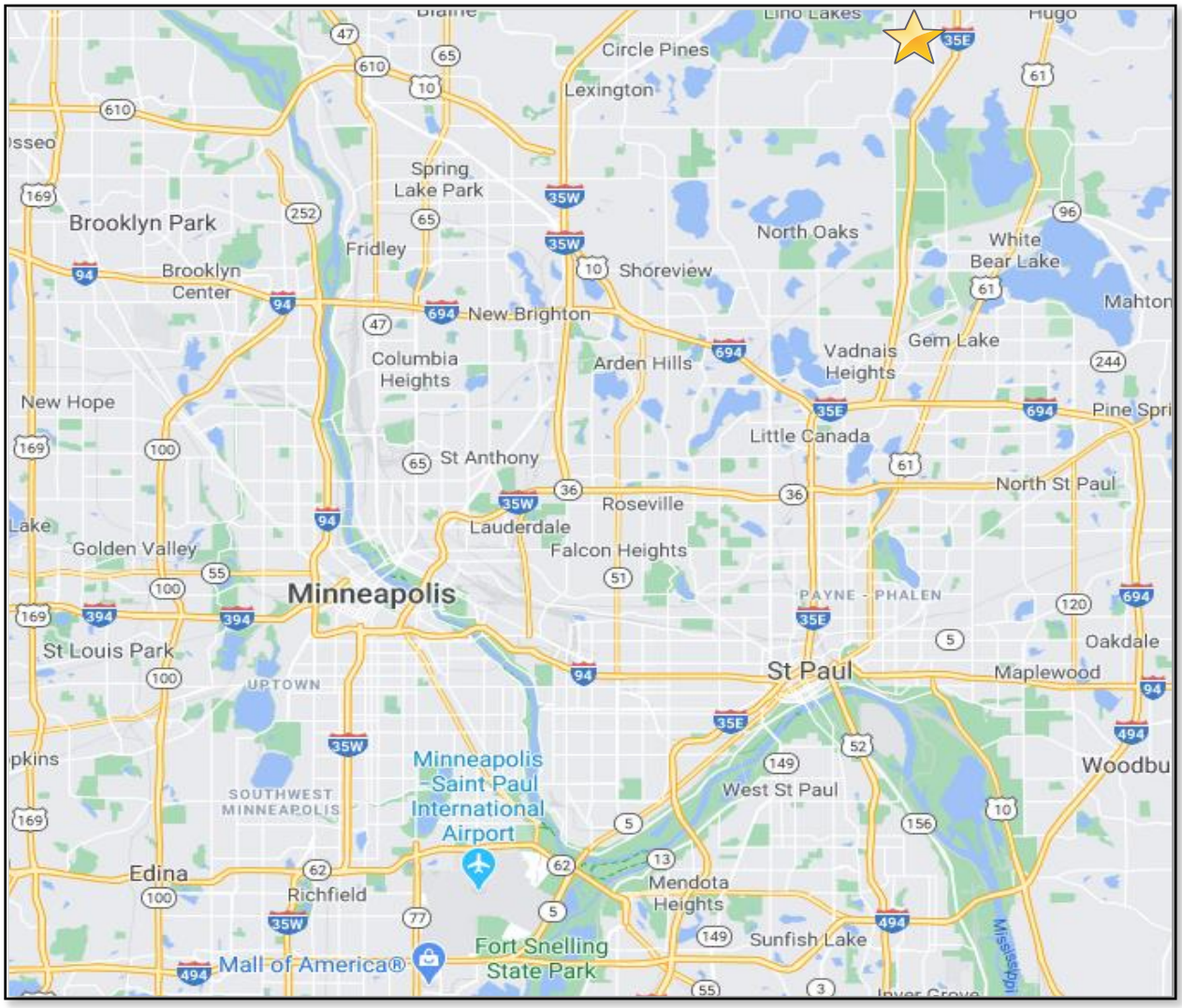


Figure SA-3: Metro Area Overview



Demographics

The city currently has an estimated 4,000 full-time residents, all within Anoka county. The following additional statistics were available from areavibes.com. Centerville has attracted more affluent households than average, which has resulted in a 26% higher cost for housing, which contributes to the lower Cost of Living score.

Talent

Being only thirty minutes from the heart of Minneapolis/St Paul, Centerville has access to a bountiful market of seasoned IT and engineering talent. From design, build, commissioning, and deployment, both local and regional talent is available. Recent trends allow more workers to operate remotely away from the corporate headquarters, allowing many workers to relocate from the City to suburban markets. This should increase the talent pool for the foreseeable future.

Telecommunications Network

The site already has three providers willing to come into the site (Comcast, Zayo, and Arvig). All have similar cost models of $1,600-$2,000 per month per 10GB MWave-enabled circuit. All providers can easily ramp up to 100GB and can expand beyond 100GB.

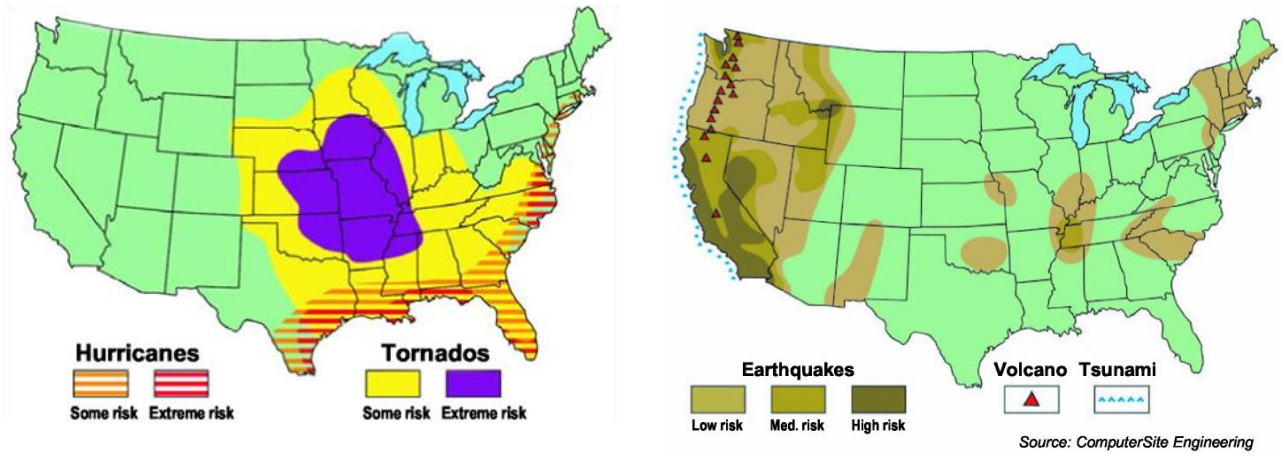
Renewable Energy

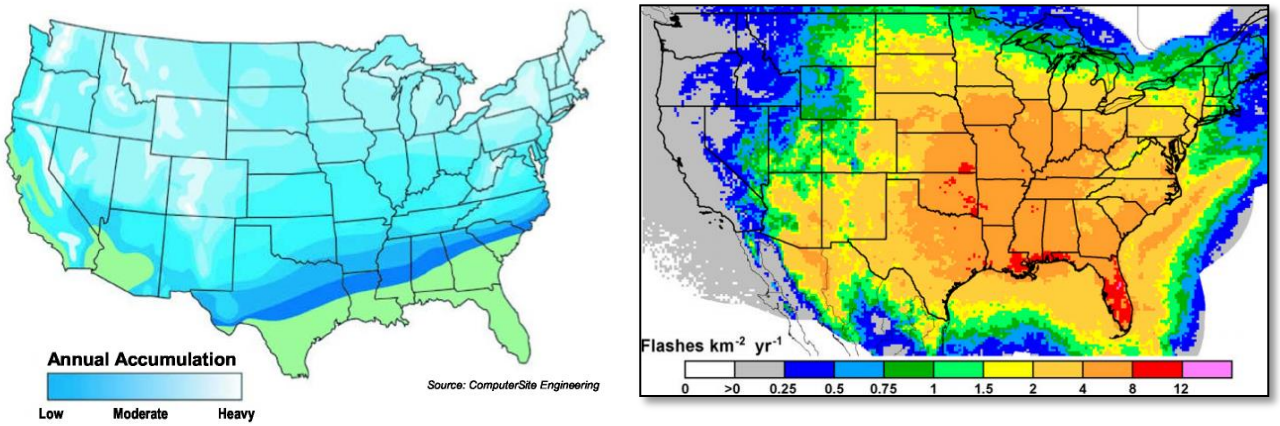
Centerville does not currently have a renewable energy plan, primarily due to the current size and scale of the community. However, city leaders would invite the opportunity to collaborate towards this goal. The City has every intention of creating and implementing a renewable energy strategy when the timing and economics are favorable. It can offer 100% renewable energy credits.

Site Risk Assessment

Centerville has several weather-related attributes to make the sight attractive. Minnesota is no earthquake risk, is a low risk for moderate to severe tornados, and is a low/moderate risk for lightning. The cooler climate will also provide a minimum of 5,000 hours per year of free cooling. This means that when the outside temperature is under 60 degrees, the mechanical chillers will not be required to cool the data center. This configuration will provide a significant decrease in energy costs.

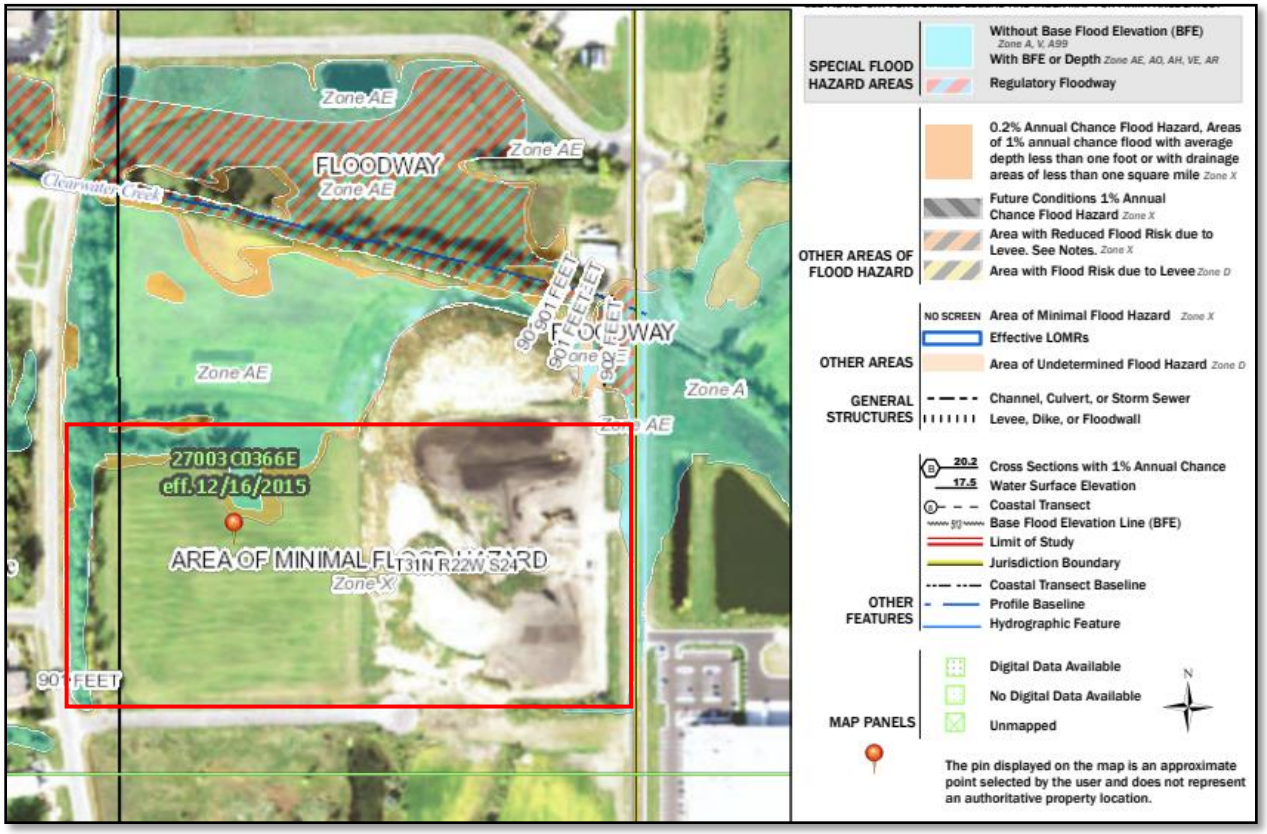
Figure SA-4: Natural Disaster Maps





The primary risk for the location is flooding. The proposed parcel has a small Zone AE in the northwest corner and is adjacent to a Zone AE parcel. However, the risk can be easily mitigated with minimal ground prep and/or a drainage ditch to separate the properties.

Figure SA-5: FEMA Flood Plain Map



Economic Analysis

This section contains an economic business case for a prospective provider to purchase and build on the proposed parcel.

Assumptions

The following assumptions were used in deriving a sample economic costs to acquire, develop, and operate a data center on the proposed parcel. The actual design will be up to the purchaser. The design intended to demonstrate the cost-effective economics of building in Centerville, MN.

- Data center design: Tier III, concurrently maintainable facility
- The buyer purchases the entire 20-acre parcel.
- Modular construction with pre-cast tilt-up panels allows the buyer to scale the facility as the business grows, thus reducing the initial construction investment risk.
- Two financial models: 5kW per rack and 10kW per rack
- MEP design: 2N electrical and mechanical.
- Utility construction costs: Excipio assumed a rate of $150 per kW. See Appendix, “Utility Construction Costs” for additional details
- Cost per kWh: $.08
- Cooling design: Air-cooled chiller with free cooling, conservatively producing a PUE of 1.4
- Telecommunications: The cost of the network connections is heavily dependent on the bandwidth and the technologies desired by the owner; thus, the telecom costs are not included in the cost estimates
- Initial Design: One of four potential buildings for the site
- City Fees: Fees are detailed out in the Appendix under “City Fees”, but all city fees are included as part of the General Contractor fees

Figure EA-1: Site Master Plan

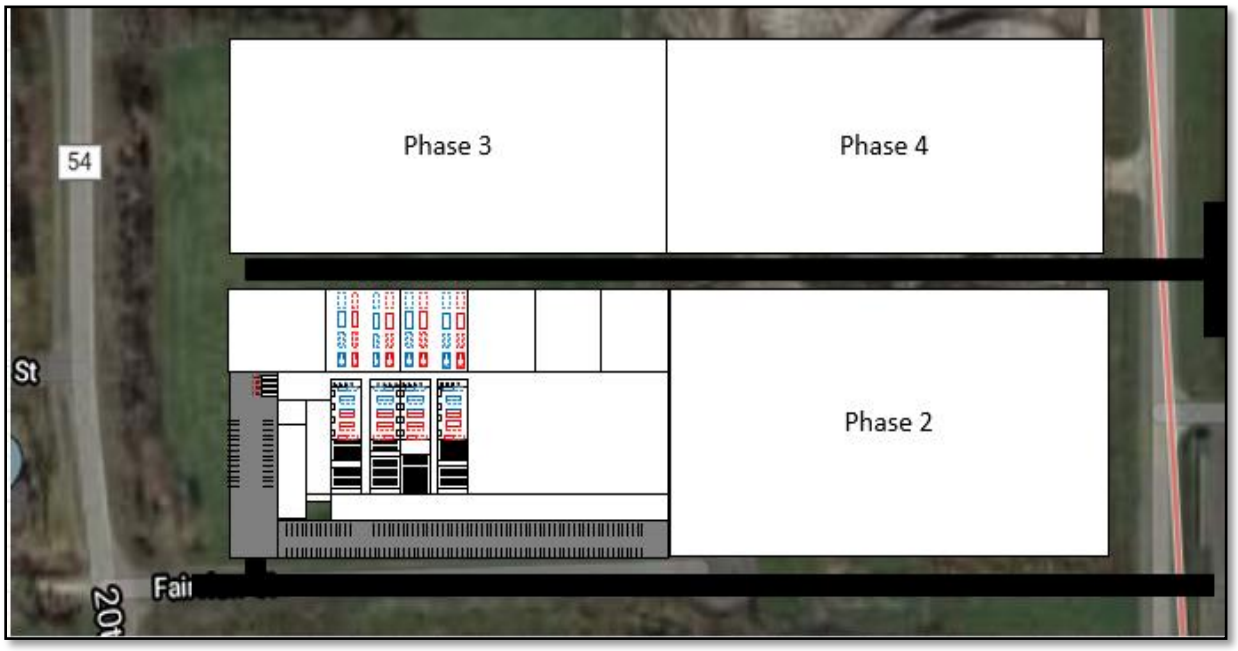
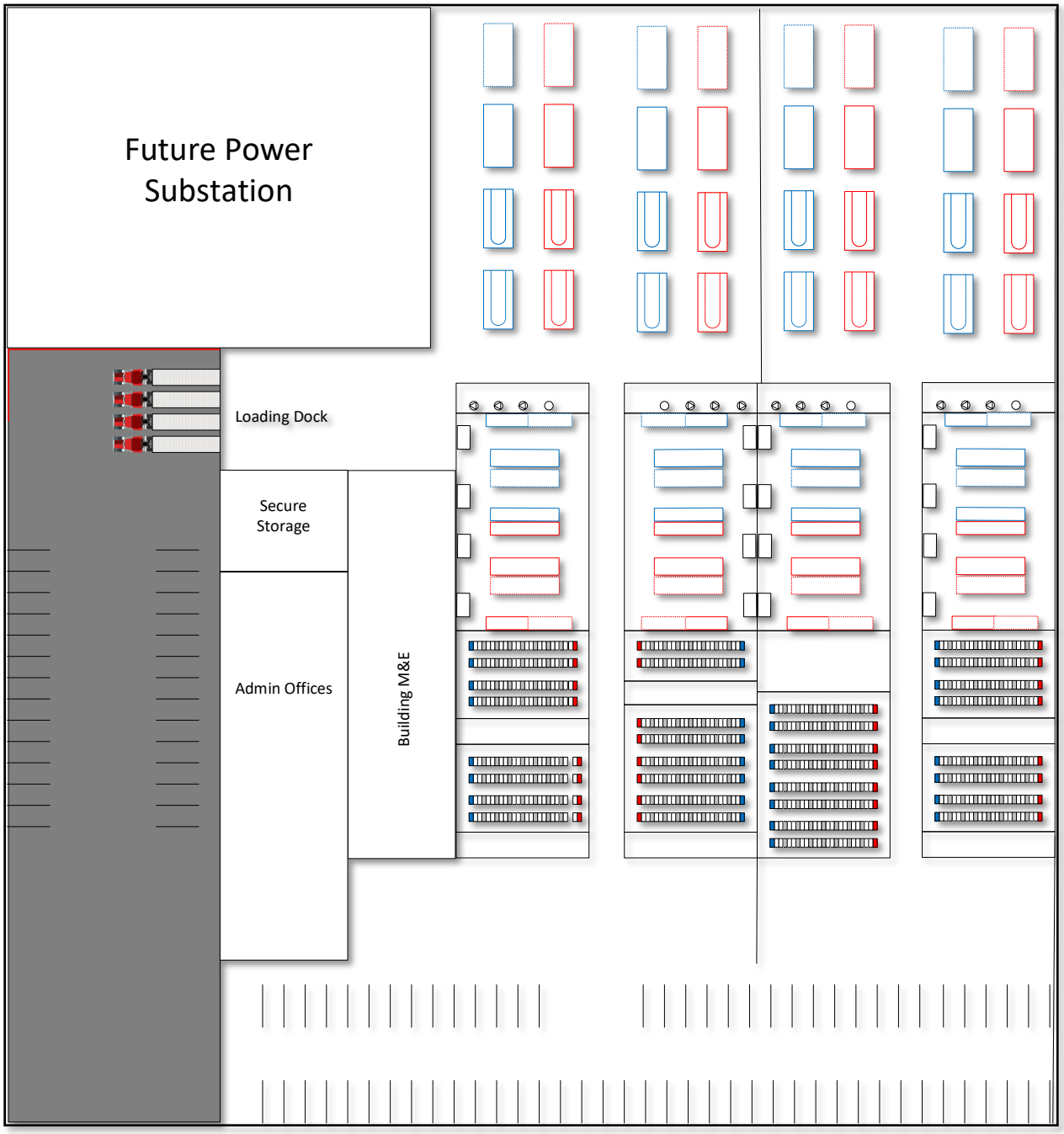


Figure EA-2: Data Center with Four Halls Constructed



Observations

- In the graphic above, the components with the bright colored borders represent the minimum equipment required for a 5kW per rack design.
- The components without the bright colored borders represent additional equipment that would be required for a 10kW per rack load.

Financial Estimates

5kW Model

This model uses an average designed kW per rack of 5kW but still maintains all of the attributes in the Assumptions section on the previous page. The detailed calculations for each of the summary charts below are included in the Appendix of this Document.

Figure EA-3: 5kW Model

Computed Technical Values				
Power Computations	**Size/Metric**	**1.6MW**	**7MW**	**17MW**
IT Load	kW	600	2,560	6,400
Number of Racks		128	512	1280
kW per Rack		5	5	5
UPS Size	kW = IT Load / (1-20% SM)	750	3,200	8,000
Generator Size	kW=UPS kW*PUE/.9 SM/.8 SBR	1,500	6,300	15,600
Cooling Computations				
HVAC Cooling	Tons = UPS kW * 3.412 / 12	213	910	2275
Space Computations				
Raised Floor Space	# racks * 37.5 sq ft/rack	4,800	19,200	48,000
Total Facility Space	Raised Floor / 25%	19,200	76,800	192,000
Minimum Lot Size	1.5x Total Facility/43560 (acres)	0.66	2.64	6.61
Financials (Millions)				
CapEx (M)		$ 24.0	$ 96.0	$ 239.0
Annual OpEx		$ 0.6	$ 2.4	$ 6.0
25-Year TCO		$ 39.0	$155.0	$ 387.0
Monthly Cost per Rack (25 years)		$ 1,007	$1,008	$ 1,008
Assumed MRC per rack		$ 1,500	$1,500	$ 1,500
Annual Revenue		$ 2.4	$ 9.3	$ 23.1
Payback in years		16.79	16.79	16.79
Profit over 25 years		$ 19.0	$ 75.7	$ 189.3
Return on Investment		49%	49%	49%

Observations

- The chart lays out the CapEx and OpEx costs for constructing the facility at 1.6 MW (1 data hall), 7 MW (4 data halls), and 17 MW (10 data halls).
- The design includes space for server build rooms and shared collaboration and conference rooms for each data hall.
- The average build cost per rack is well under the market at $1,008 per rack, which allows the buyer to achieve an ROI of 49% on the initial investment, including all annual OpEx costs.
- The projected construction costs of this model are $14.91K per kW.

10kW Model

This model uses an average designed kW per rack of 10kW but still maintains all of the attributes in the Assumptions section on the previous page.

Figure EA-4: 10kW Model

Computed Technical Values				
Power Computations	**Size/Metric**	**3.4MW**	**13MW**	**33MW**
IT Load	kW	1,300	5,120	12,800
Number of Racks		128	512	1280
kW per Rack		10	10	10
UPS Size	kW = IT Load / (1-20% SM)	1,625	6,400	16,000
Generator Size	kW=UPS kW*PUE/.9 SM/.8 SBR	3,200	12,500	31,200
Cooling Computations				
HVAC Cooling	Tons = UPS kW * 3.412 / 12	462	1820	4549
Space Computations				
Raised Floor Space	# racks * 37.5 sq ft/rack	4,800	19,200	48,000
Total Facility Space	Raised Floor / 25%	19,200	76,800	192,000
Minimum Lot Size	3x Total Facility/43560 (acres)	1.32	5.29	13.22
Financials				
CapEx (M)		$ 44.0	$ 177.0	$ 442.0
Annual OpEx		$ 1.0	$ 4.2	$ 10.4
25-Year TCO		$ 70.0	$ 280.0	$ 700.0
Monthly Cost per Rack (25 years)		$ 1,822	$ 1,823	$ 1,823
Assumed MRC per rack		$ 2,700	$ 2,700	$ 2,700
Annual Revenue		$ 4.2	$ 16.6	$ 41.5
Payback in years		16.87	16.87	16.87
Profit over 25 years		$ 33.8	$ 134.9	$ 337.1
Return on Investment		48%	48%	48%

Observations

- The chart lays out the CapEx and OpEx costs for constructing the facility at 3.4 MW (1 data hall), 13 MW (4 data halls), and 33 MW (10 data halls).
- The design includes space for server build rooms and shared collaboration and conference rooms for each data hall.
- The average build cost per rack is well under the market at $1,822 per rack, which allows the buyer to achieve an ROI of 48% on the initial investment, including all annual OpEx costs.
- The projected construction costs of this model are $27.6K per kW; note the construction cost nearly doubles when increasing from 5kW to 10 kW per rack.

Alternative Construction

The data center economics were modeled after more common design methods. However, newer construction methods are being used to drive down the cost of these expensive facilities. One of the largest opportunities for savings leverages the use of external containers to house MEP equipment. Even if the code does not currently allow for MEP construction, the City is open to the idea of alternate construction methods. As not all equipment is ideal for this type of environment, the equipment most commonly suited for containers are:

- Uninterruptible Power Supplies (UPS) and batteries
- Main Distribution Panels (MDP)
- Automatic Transfer Switches (ATS)
- HVAC cooling systems

Systems typically not targeted for a container include generators. Most of the generators come in a sound-attenuated enclosure similar to or larger than the typical container.

Pros for Modular MEP Construction

The standardized construction typically reduces the construction cost of the facility by 10% for the following reasons:

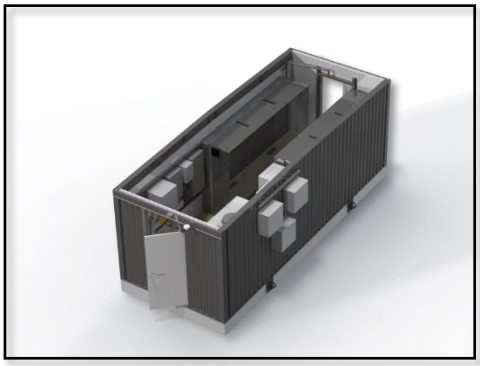
- The work is all completed in a factory, avoiding weather delays.
- The standardized construction eliminates the human error associated with onsite construction.
- The large factories typically get better pricing on components and raw materials than a regional construction firm.

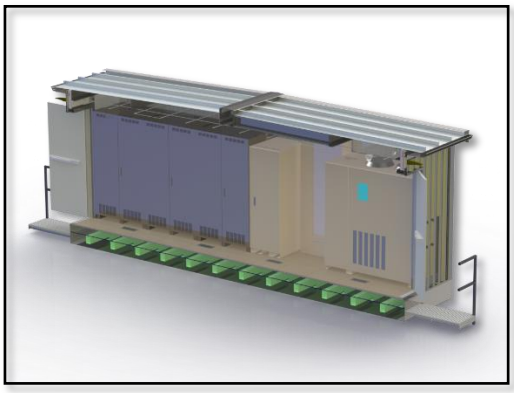
Cons for Modular MEP Construction

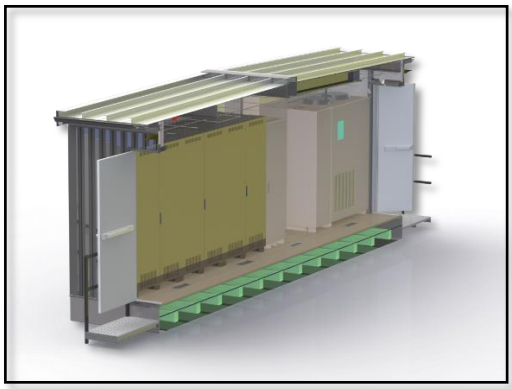
The following is a list of concerns that would need to be addressed with all parties and code officials:

- Reduces the build's footprint, as much of the MEP infrastructure is now located outside the building.
- Aesthetically, additional costs may be required to secure and hide the containers from surrounding properties.

Figure EA-5: Container Site Overview and Examples







Appendix

5kW Model Details

Analysis Calculations

			1.6MW					
Capital Components	Redundancy	Metric	Unit Cost	Unit Size	Calc Unit Qty	Override Size	Override Qty	Cost
Land	N/A	Acre	$ 175,000		0.66		20.00	$ 3,500,000
Site Work	N/A	SF	$ 10		19,200		19,200	$ 192,000
Substructure - Foundations	N/A	SF	$ 9		19,200		19,200	$ 172,800
Shell - Superstructure	N/A	SF	$ 21		19,200		19,200	$ 403,200
Shell - Exterior Skin	N/A	SF	$ 22		19,200		19,200	$ 422,400
Shell - Roofing	N/A	SF	$ 17		19,200		19,200	$ 326,400
Interior Buildout	N/A	SF	$ 100		19,200		19,200	$ 1,920,000
Raised Floor	N/A	SF	$ 25		4,800		4800	$ 120,000
Utility Power Construction	NA	kW	$ 150		1,600		1600	$ 240,000
Racks & Power Strips	N/A	Rack	$ 8,400		128		0	$ -
Distribution Switchgear	2N	kW	$ 1,000	2300A	2	2,500	2	$ 5,000,000
Generators & ATS	N+1	kW	$ 800	1,500	2	1,500	2	$ 2,400,000
UPS and batteries	N+1	kW	$ 800	750	2	750	2	$ 1,200,000
PDUs and Whips	2N	kW	$ 500	150	10	150	16	$ 1,200,000
Lightning protection		SF	$ 5	19,200	1	19,200	1	$ 86,400
HVAC Infrastructure	N+1	T	$ 2,000	250	2	250	2	$ 1,000,000
HVAC Air Handlers	2N	T	$ 3,000	6	37	6	48	$ 864,000
Heat and Smoke Detection	N/A	SF	$ 5	19,200	1	19,200	1	$ 96,000
VESDA	N/A	SF	$ 30	4,800	1	4,800	1	$ 144,000
Fire Suppression - Wet Pipe	N/A	SF	$ 5	14,400	1	14,400	1	$ 72,000
Fire Suppression - Pre-Action	N/A	SF	$ 10	4,800	1	4,800	1	$ 48,000
Fire Suppression - Gas	N/A	SF	$ 35	4,800	0	4,800	0	$ -
Environmental Monitoring	N/A	SF	$ 20	19,200	1	19,200	1	$ 384,000
Security Cameras / Access	N/A	SF	$ 10	19,200	1	19,200	1	$ 192,000
Engineering and Design	N/A	% of project	7.5%					$ 1,498,740
General Contractor	N/A	% of project	9.0%					$ 1,798,488
Commissioning	N/A	% of project	2.0%					$ 399,664
Project Management	N/A	Monthly Rate	$ 15,000				12	$ 180,000
Total Capital Cost								$ 23,860,092

			Startup					
Operating Costs	Redundancy	Metric	Unit Cost	Unit Size	Calc Unit Qty	Override Size	Override Qty	Cost
Distribution Switchgear	2N	ea	$ 10,000		2		2	$ 20,000
Generators	N+1	per kW	$ 7	1,500	2		2	$ 21,000
UPS	N+1	per kW	$ 20	750	2		2	$ 30,000
PDUs	2N	ea	$ 500	150	10		16	$ 8,000
HVAC Infrastructure	N+1	per Ton	$ 50	250	2		2	$ 25,000
HVAC Air Handlers	2N	per Unit	$ 1,600		37	6	48	$ 76,800
Heat and Smoke Detection	1	per sq ft	$ 0.50	19,200	1	19,200	1	$ 9,600
VESDA	1	ea	$ 0.50	4,800	1	4,800	1	$ 2,400
Fire Suppression - Wet Pipe	1	ea	$ 0.50	14,400	1	14,400	1	$ 7,200
Fire Suppression - Dry Pipe	1	ea	$ 0.50	4,800	1	4,800	1	$ 2,400
Fire Suppression - Gas	1	ea	$ 0.50	4,800	0	4,800	0	$ -
Environmental Monitoring	1	per sq ft	$ 5.00	19,200	1	19,200	1	$ 96,000
Utilities		per kWh	$0.08		3,679,200			$ 294,336
Annual Operating Cost								$ 592,736

Financial Metrics	
15-Year TCO	$ 28,275,132
25-Year TCO	$ 38,678,492
Monthly Cost per Rack (15 years)	$ 1,421
Monthly Cost per Rack (25 years)	$ 1,007

10kW Model Details

Analysis Calculations

			Startup					
Capital Components	Redundancy	Metric	Unit Cost	Unit Size	Calc Unit Qty	Override Size	Override Qty	Cost
Land	N/A	Acre	$ 175,000		1.32		20.00	$ 3,500,000
Site Work	N/A	SF	$ 10		19,200		19,200	$ 192,000
Substructure - Foundations	N/A	SF	$ 9		19,200		19,200	$ 172,800
Shell - Superstructure	N/A	SF	$ 21		19,200		19,200	$ 403,200
Shell - Exterior Skin	N/A	SF	$ 22		19,200		19,200	$ 422,400
Shell - Roofing	N/A	SF	$ 17		19,200		19,200	$ 326,400
Interior Buildout	N/A	SF	$ 300		19,200		19,200	$ 5,760,000
Raised Floor	N/A	SF	$ 25		4,800		4800	$ 120,000
Utility Power Construction	NA	kW	$ 150		3,400		3400	$ 510,000
Racks & Power Strips	N/A	Rack	$ 8,400		128		128	$ 1,075,200
Distribution Switchgear	2N	kW	$ 1,000	5000A	4	2,500	4	$ 10,000,000
Generators & ATS	N+1	kW	$ 800	1,600	3	1,750	3	$ 4,200,000
UPS and batteries	N+1	kW	$ 800	233	8	500	8	$ 3,200,000
PDUs and Whips	2N	kW	$ 500	150	27	150	32	$ 2,400,000
Lightning protection		SF	$ 5	19,200	1	19,200	1	$ 86,400
HVAC Infrastructure	N+1	T	$ 2,000	400	3	400	3	$ 2,400,000
HVAC Air Handlers	2N	T	$ 3,000	8.5	56	8.5	56	$ 1,428,000
Heat and Smoke Detection	N/A	SF	$ 5	19,200	1	19,200	1	$ 96,000
VESDA	N/A	SF	$ 30	4,800	1	4,800	1	$ 144,000
Fire Suppression - Wet Pipe	N/A	SF	$ 5	14,400	1	14,400	1	$ 72,000
Fire Suppression - Pre-Action	N/A	SF	$ 10	4,800	1	4,800	1	$ 48,000
Fire Suppression - Gas	N/A	SF	$ 35	4,800	0	4,800	0	$ -
Environmental Monitoring	N/A	SF	$ 20	19,200	1	19,200	1	$ 384,000
Security Cameras / Access	N/A	SF	$ 10	19,200	1	19,200	1	$ 192,000
Engineering and Design	N/A	% of project	7.5%					$ 2,784,930
General Contractor	N/A	% of project	9.0%					$ 3,341,916
Commissioning	N/A	% of project	2.0%					$ 742,648
Project Management	N/A	Monthly Rate	$ 15,000				12	$ 180,000
Total Capital Cost								$ 44,181,894

			Startup					
Operating Costs	Redundancy	Metric	Unit Cost	Unit Size	Calc Unit Qty	Override Size	Override Qty	Cost
Distribution Switchgear	2N	ea	$ 10,000		4		4	$ 40,000
Generators	N+1	per kW	$ 7	1,600	3		3	$ 33,600
UPS	N+1	per kW	$ 20	233	8		8	$ 37,280
PDUs	2N	ea	$ 500	150	27		32	$ 16,000
HVAC Infrastructure	N+1	per Ton	$ 50	400	3		3	$ 60,000
HVAC Air Handlers	2N	per Unit	$ 1,600		56	9	56	$ 89,600
Heat and Smoke Detection	1	per sq ft	$ 0.50	19,200	1	19,200	1	$ 9,600
VESDA	1	ea	$ 0.50	4,800	1	4,800	1	$ 2,400
Fire Suppression - Wet Pipe	1	ea	$ 0.50	14,400	1	14,400	1	$ 7,200
Fire Suppression - Dry Pipe	1	ea	$ 0.50	4,800	1	4,800	1	$ 2,400
Fire Suppression - Gas	1	ea	$ 0.50	4,800	0	4,800	0	$ -
Environmental Monitoring	1	per sq ft	$ 5.00	19,200	1	19,200	1	$ 96,000
Utilities		per kWh	$0.08		7,971,600			$ 637,728
Annual Operating Cost								$ 1,031,808

Financial Metrics	
15-Year TCO	$ 53,747,814
25-Year TCO	$ 69,977,094
Monthly Cost per Rack (15 years)	$ 2,589
Monthly Cost per Rack (25 years)	$ 1,822

City Fees

The following is a list of fees that should be expected as part of the construction costs listed in the 5kW and 10kW models provided. The fees are incorporated in the 2% Commissioning cost for each model.

The fees' details are listed in detail below since they are very attractive and competitive to similar cities for data center locations.

Fee Type	Fee	Additional
Encroachment Agreement	$ 100.00	
Annual Insurance Monitoring and Inspection	$ 25.00	
Fence Permit	$ 60.00	
Fence Permit in Easement	$ 100.00	Recording Fees
PUD Application	$ 500.00	
Variance Application	$ 250.00	$500.00 Deposit
Conditional or Interim Use Permit Application	$ 250.00	$1,000.00 Deposit
Rezoning Requests	$ 250.00	$1,000.00 Deposit
Site Plan Review	$ 250.00	$5,000.00 Deposit
Comprehensive Plan Amendment	$ 250.00	$1,000.00 Deposit
Site Maintenance Deposit/Erosion Control/Landscape/Sod/Driveway Escrow	$ 5,000.00	
Land Development Minimum	$ 5,000.00	

Utility Construction Costs

Any greenfield construction project has multiple options for utility power. The local utility company can provide dedicated power to the site or construct an onsite substation. However, the cost models are very different between the two options. While many variations exist, a standard set of variables was assumed in both cases to make the illustration clear.

Assumptions

- The utility voltage provided is all 480V
- The size of the transformer is 1,500kVA, at the cost of $37.5K each
- Due to the range in outcomes of the two models below, an average cost of $150/kW was used in the project economics

Utility Provided Power

Using this model, the utility company will provide all the necessary equipment and services to construct, trench the lines, and land power at the site. This option has a lower cost of entry but does not scale as efficiently as an onsite substation. As shown in the chart below, the cost climbs quickly

Capacity (MW)	3	7	13	17	27	33
Capital (M)	$ 75,000	$ 915,000	$ 1,700,000	$ 2,745,000	$ 3,660,000	$ 4,575,000
Distance (mi)	0.0	2.7	2.7	2.7	2.7	2.7
# Xfmrs	2	5	9	12	18	22
Xfrmr Volts (V)	480	480	480	480	480	480
Xfrmr Size (A)	1500	1500	1500	1500	1500	1500
Cost per Xfrmr	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500
Total Buildout	$ 150,000	$ 1,102,500	$ 2,037,500	$ 3,195,000	$ 4,335,000	$ 5,400,000
Cost per Unit (kW)	$ 50	$ 158	$ 157	$ 188	$ 161	$ 164

Onsite Substation

Under this model, approximately half an acre would need to be set aside to construct the substation. This model has a much higher upfront cost due to the substation's initial $1.5M construction. However, this model is much more cost-effective over the long term.

Capacity (MW)	3	7	13	17	27	33
Capital (M)	$1,500,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	$ 1,700,000
# Xfmrs	2	5	9	12	18	22
Xfrmr Volts (V)	480	480	480	480	480	480
Xfrmr Size (A)	1500	1500	1500	1500	1500	1500
Cost per Xfrmr	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500
Total Buildout	$1,575,000	$ 1,687,500	$ 1,837,500	$ 1,950,000	$ 2,175,000	$ 2,525,000
Cost per Unit (kW)	$ 525	$ 241	$ 141	$ 115	$ 81	$ 77