



Cryptocurrency Zoning & Planning Discussion - UPDATE



Outreach Discussions on Cryptocurrency Zoning

Joint Agency Planning	PUD, Municipals, County, Port	June 20	
City of Wenatchee	City Planning Commission	Aug 15	
Port District	Chelan Port Planning	Aug 23	
Port District	Chelan Port Commission	Sept 4	
Chelan County	Chelan County Commission	Sept 25	
Chelan County	Chelan County Planning Com.	Sept 26	
City of Entiat	Entiat City Council/Planning	Sept 11	
City of Chelan	Chelan City Council /Planning	< Date Pending >	
City of Cashmere	Cashmere City Council	< Date Pending >	
City of Leavenworth	Leavenworth City Council	< Date Pending >	

What we are hearing through outreach

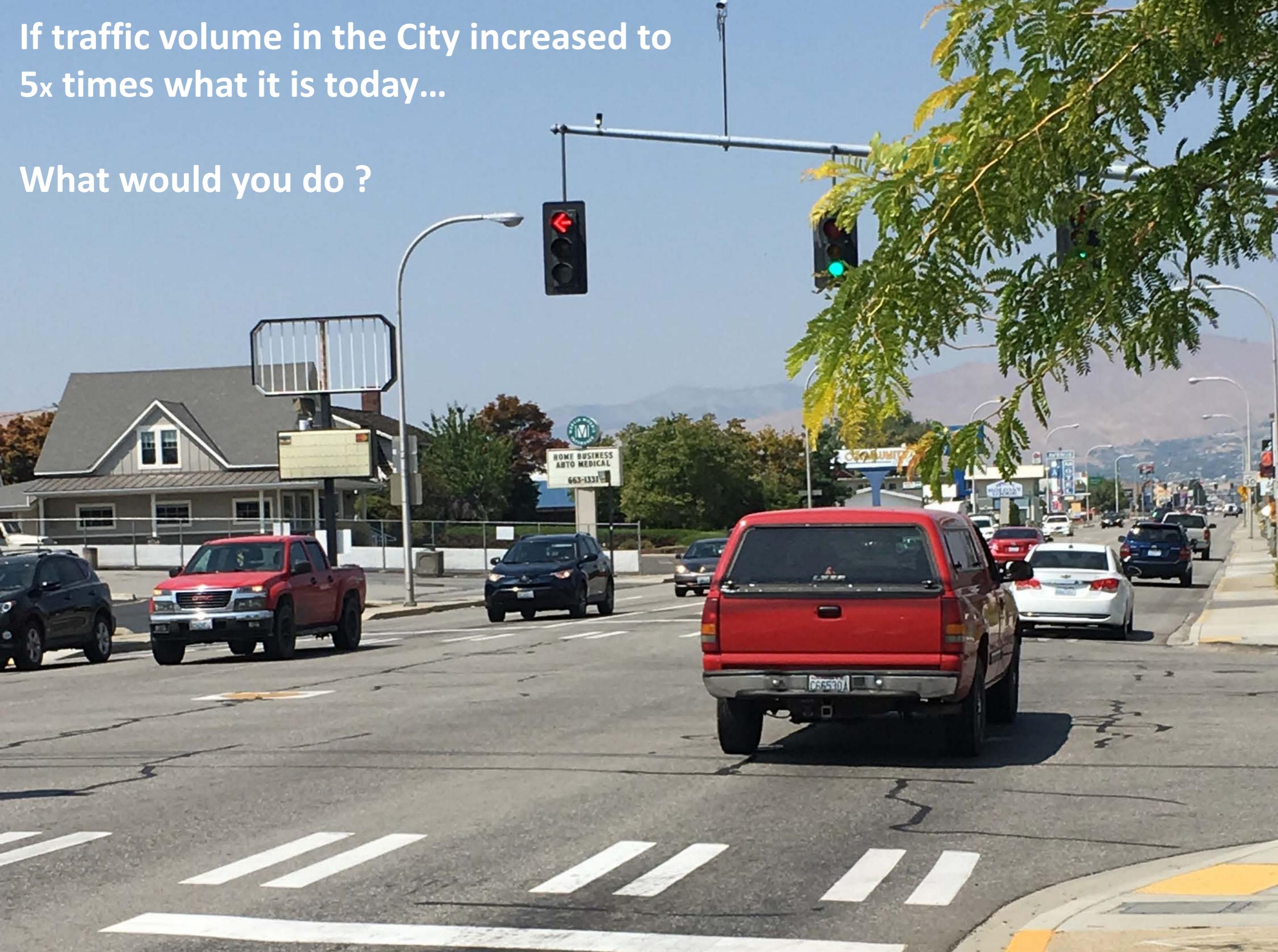
- Establishing proper zoning for cryptocurrency mining is a County and municipal responsibility
- Cryptocurrency mining in residential spaces introduces unique safety and reliability concerns in neighborhood electrical grids.
- Cryptocurrency mining is an Industrial / Commercial use of electricity
- Cryptocurrency mining is best served in Industrial / Commercial zones
- PUD should ensure electrical capacity for traditional non-crypto mining growth

Examples of Questions from the City Planning Commission:

1. What is the PUD's opinion on cryptocurrency mining in residential areas/neighborhoods?
2. Is there a threshold or minimum amount of cryptocurrency mining that can safely occur in a residence without significant upgrades to service or power consumption?
3. Is there sufficient power reserved for residential and commercial/industrial growth?

If traffic volume in the City increased to 5x times what it is today...

What would you do ?





100 Watt

Turned on for (1 hour)

=

100 WattHour



100 Watt

100 Watt

100 Watt



100 Watt

100 Watt

100 Watt



100 Watt

100 Watt

100 Watt

100 Watt

1,000 Watts

Turned on for (1 hour)

=

1,000 WattHour

or

1 KiloWattHour

(1 Kwh)

JUNE 2018						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Free Printable Calendars From towncalendars.com

$$30 \text{ days} \times 24 \text{ hrs} = 720 \text{ hour / Month}$$



$$\text{Average Monthly Usage} = \sim 1,660 \text{ KiloWattHours}$$

or

$$(1,660 \text{ KWhs})$$

Wenatchee Residential Service

Cost: $(1,660 \text{ KWhs}) \times (\$0.032/\text{KWh}) = \$53.12 / \text{Month}$



100 Watt 100 Watt 100 Watt 100 Watt



100 Watt 100 Watt 100 Watt 100 Watt



100 Watt 100 Watt 100 Watt 100 Watt

1,200 Watts or 1.2 KW

Turned on for (1 hour)

=

1,200 WattHour

or

1.2 KiloWattHour

(1.2 Kwh)



(1) ASIC Miner

1,200 Watts or 1.2 KW

Turned on for (1 hour)

=

1,200 WattHour

or

1.2 KiloWattHour

(1.2 Kwh)



Average Monthly Usage
(720 Hours)

$$\begin{aligned} &= \sim 1,660 \text{ KiloWattHours} \\ &\text{or} \\ &= (1,660 \text{ KWhs}) \end{aligned}$$

Wenatchee Residential Service

Cost: $(1,660 \text{ KWhs}) \times (\$0.032/\text{KWh}) = \$53.12 / \text{Month}$

(2) ASIC Miner



(2) X (1,200 Watts) = 2,400 Watts

24 x7 Monthly Usage
(720 Hours)

$$\begin{aligned} &= 1,728 \text{ KiloWattHours} \\ &\text{or} \\ &= (1,728 \text{ KWhs}) \end{aligned}$$

Typical (residential) Cryptocurrency Operation



> (10) ASIC Miner
24 x7 Monthly Usage
(720 Hours)

8,640 KiloWattHours

=

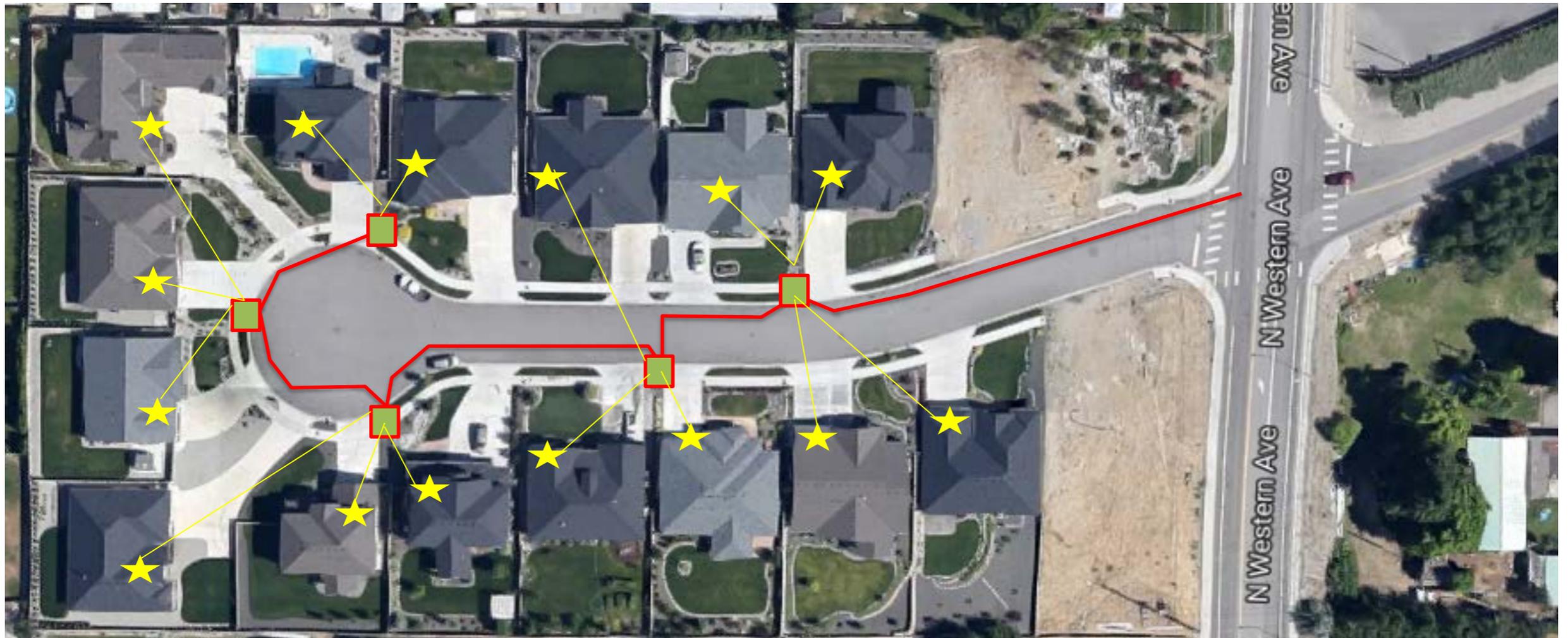
or

(8,640 KWhs)

5 X (Typical residential home usage)

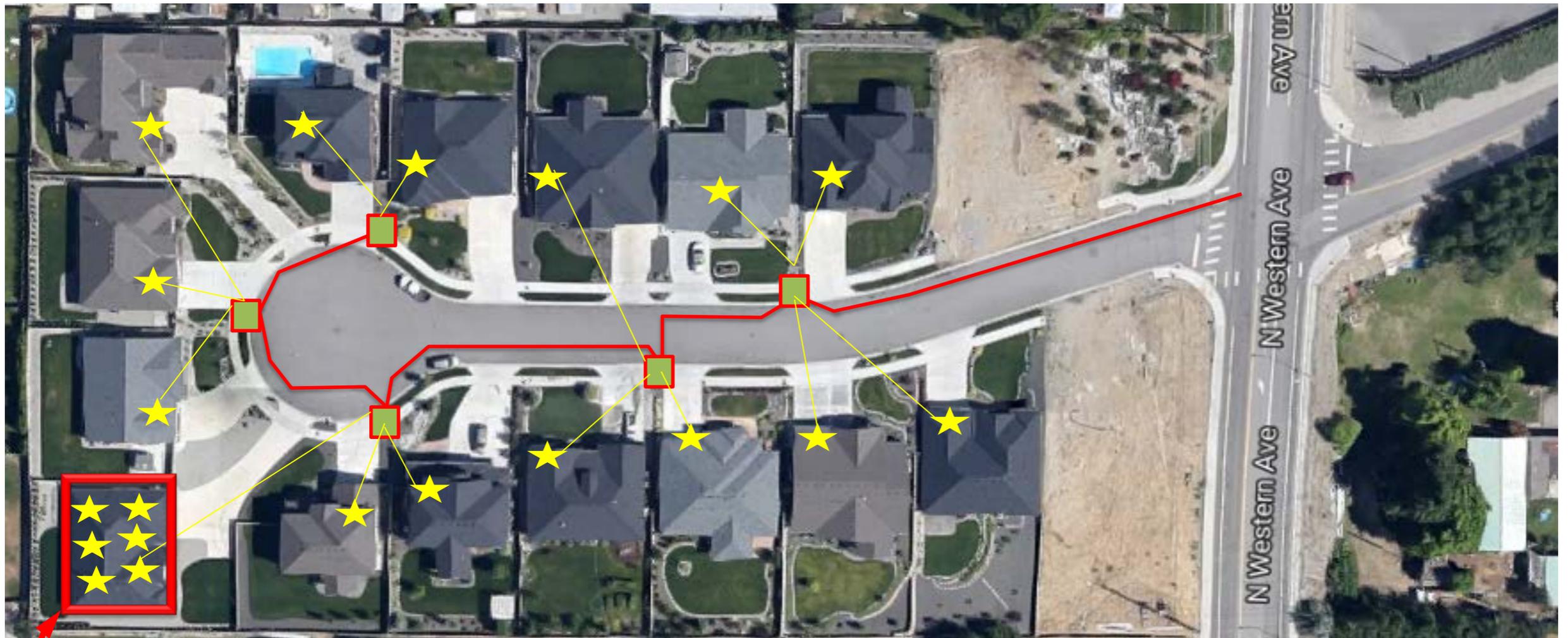
(10) X (1,200 Watts) = 12,000 Watts

Typical Street Development



- 15 Residential Homes
- (5) Shared Transformers,
- Typical Urban underground distribution system

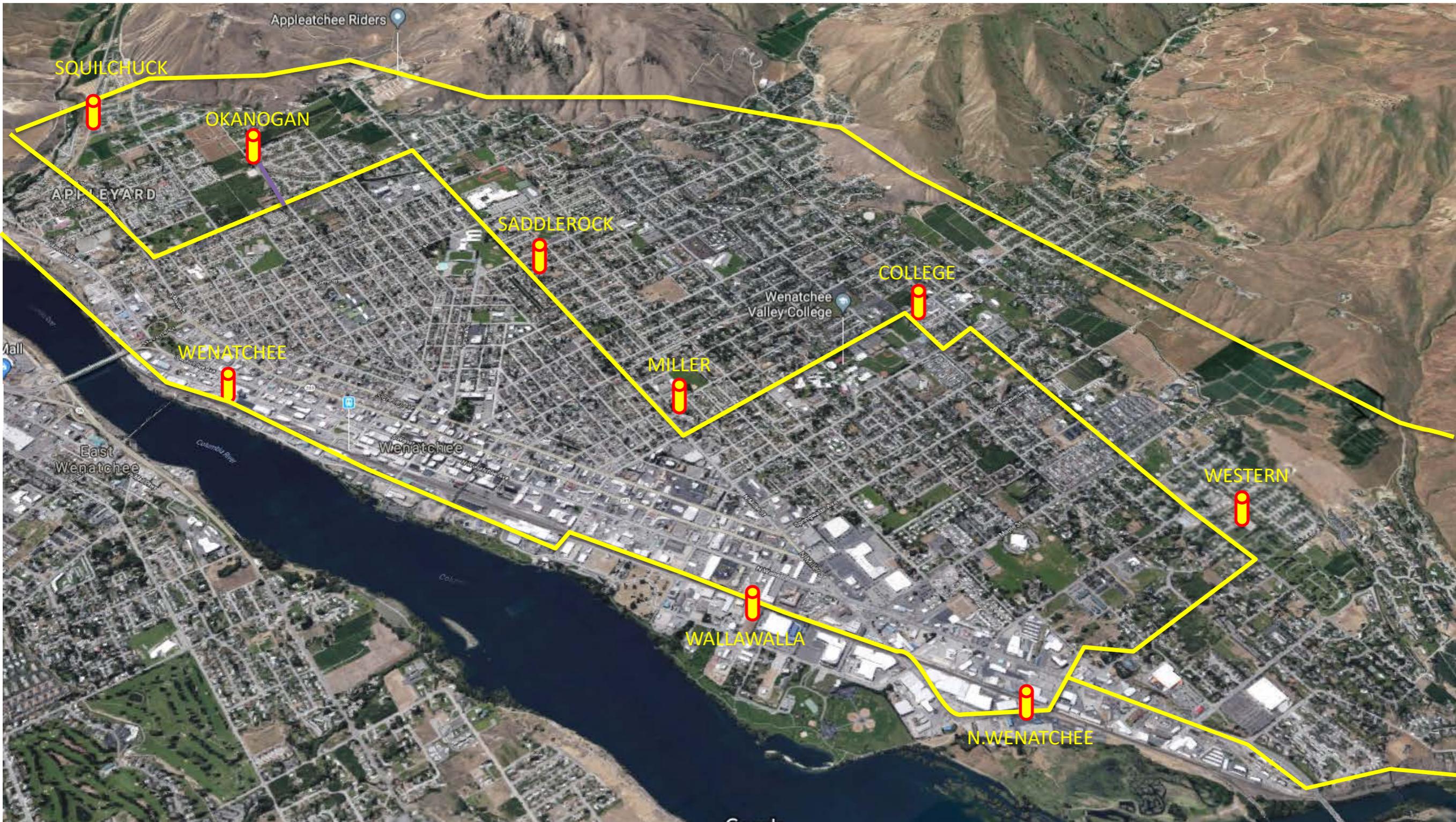
Typical Street Development With (1) Typical Mining Operation



**Equivalent to adding
5 additional homes**

- Equivalent of ~~15~~ **20** Residential Homes
- Requires at least (2 New Transformers)
- New Secondary Supply Cables
- Replacement & Upgrading of the primary cable

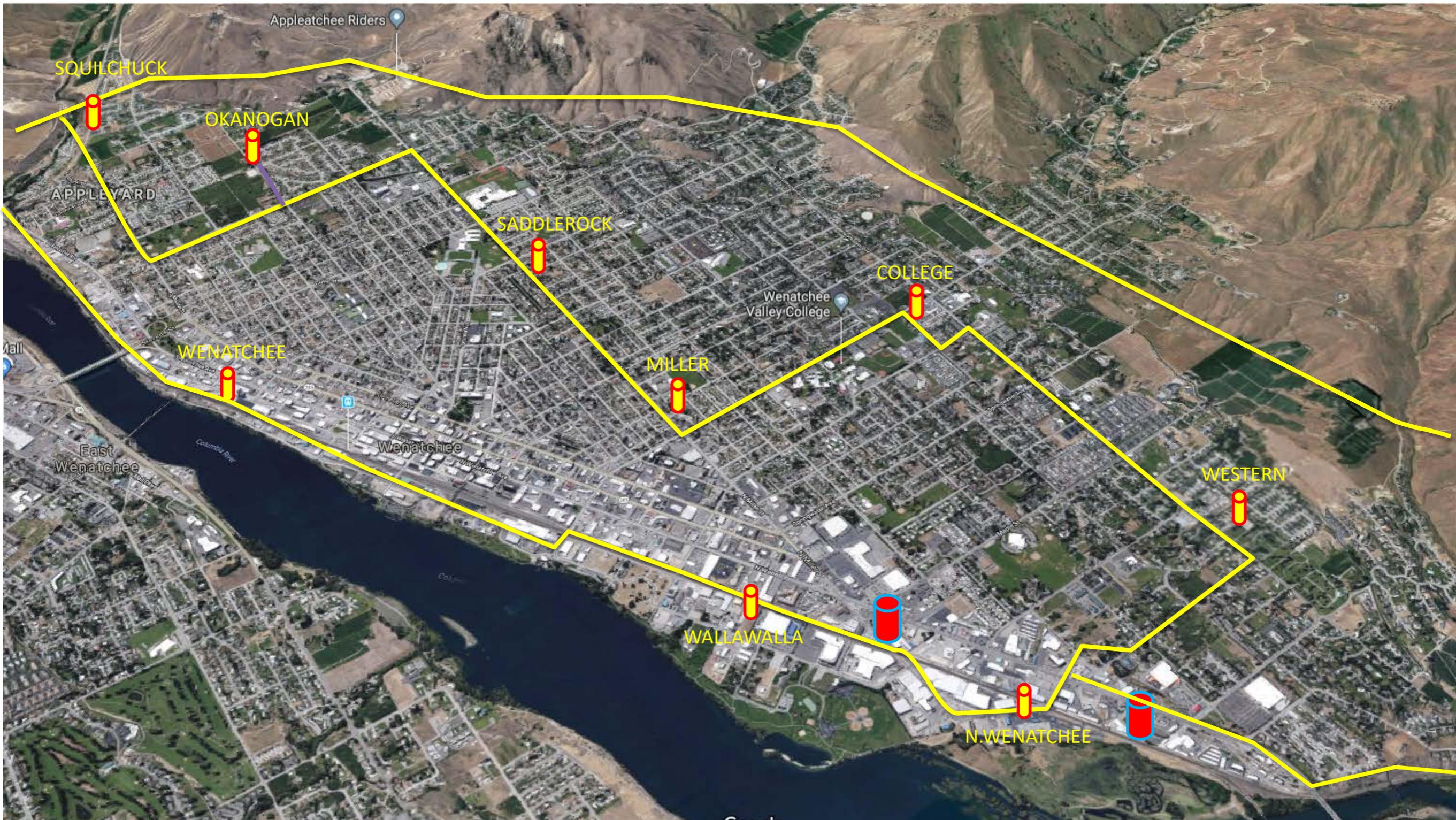
City of Wenatchee (Existing Transmission & Substations)



(10) Substations
(15 Miles of Transmission)
(205 Miles of Distribution Cable)
(3,700 Transformers)

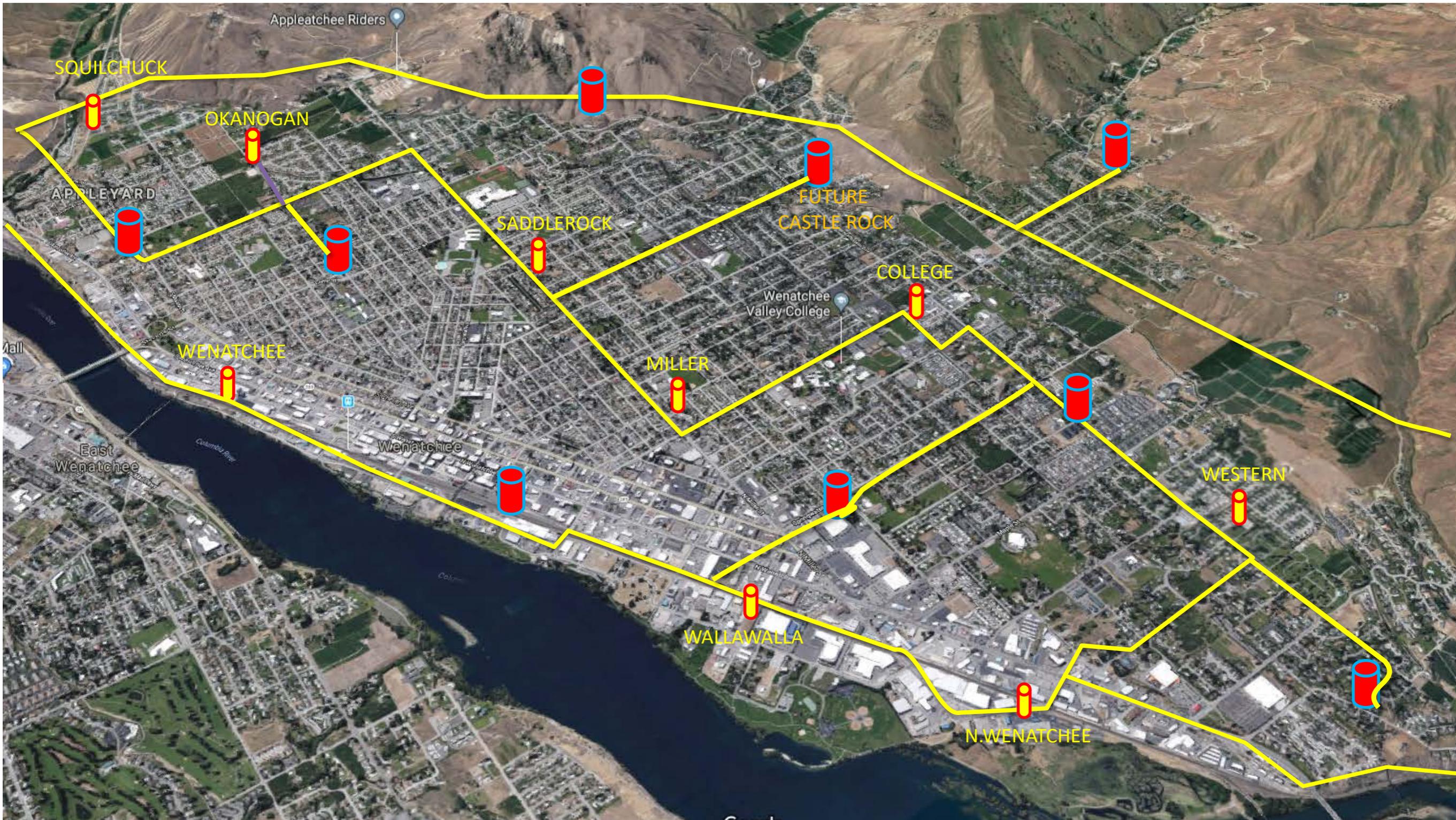
Provide Electrical Service to ~ 15,865 Meter Endpoints
> \$650 Million in assets

If Cryptocurrency load is centralized & zoned similar as Industrial



Electrical infrastructure impacts are limited to the specific Industrial/Crypto zoned areas

If Cryptocurrency load is De-Centralized & allowed in residential zoned areas



Electrical infrastructure impacts would be far more extensive & costly

If Cryptocurrency load is De-Centralized & allowed in residential zoned areas:



Adding neighborhood Substations



Upgrading existing transformers

Material
Change to
Current Cost
Models



Adding High voltage Transmission



Upgrading existing neighborhood
Distribution lines



Questions?

General Questions from the City Planning Commission:

1. What is the PUD's opinion on cryptocurrency mining in residential areas/neighborhoods?
2. Is there a threshold or minimum amount of cryptocurrency mining that can safely occur in a residence without significant upgrades to service or power consumption?
3. What is the PUD's legal obligation to provide power?
4. Can the PUD simply deny service to cryptocurrency miners?
5. What are the fees/rates applied to cryptocurrency mining?
6. What is the public benefit vs the power consumed?
7. Is there sufficient power reserved for residential and commercial/industrial growth?

General Questions from the City Planning Commission:

Q1: What is the PUD's opinion on cryptocurrency mining in residential areas/neighborhoods?

A: CCPUD has significant concerns with safety, reliability and the overall costs associated with the potential change in how we plan, build and maintain residential electrical systems that support cryptocurrency mining . We are basing these concerns on facts, findings, and reoccurring patterns relating to cryptocurrency mining in residences. We know that local area residential electrical systems in Wenatchee are not designed for sustained high density, high load factor electrical consumption like cryptocurrency mining. Allowing cryptocurrency mining in residential zoned areas will materially change costs in addition to the way the PUD plans, constructs, and maintains the residential electrical services.



Residential supply cable to a home failed due to a Cryptocurrency operation, resulting in a fire.

General Questions from the City Planning Commission:

Q2: Is there a threshold or minimum amount of cryptocurrency mining that can safely occur in a residence without significant upgrades to service or power consumption?

A: Electrical capacity is unique to each individual home. Safety of the electrical equipment goes beyond the utility's meter. Residential building codes and electrical codes should be considered as the primary standard for safe use of electricity in a residential home. The job of the utility is to ensure the supply transformer, supply cable and meters are properly sized and used for the approved electrical service. All non-residential load such as cryptocurrency should be reviewed and approved by the Department of Labor and Industries Electrical Division prior to use.

General Questions from the City Planning Commission:

Q3: What is the PUD's legal obligation to provide power?

A: The PUD, as the electric utility in the county, meets reasonable requests for power. The obligation to provide power is not absolute or unconditional. The PUD and state and local law place conditions and restrictions on service. Examples include appropriate rates and conditions of service, making necessary improvements so that service is safe, proper permitting, inspection and other similar requirements. For example, the PUD requires applicants to pay the cost of necessary line extension construction before it will provide power. The PUD's policies and regulations are established and directed by the Board of Commissioners through PUD rates, policies, and regulations and are designed in part to protect the PUD and its customers and to maintain safe, reliable, and cost-effective service in the long-term.

General Questions from the City Planning Commission:

Q4: Can the PUD simply deny service to cryptocurrency miners?

A: We assume the question intends to inquire about a blanket prohibition against serving under any circumstances. As a general matter the PUD denies service only for reasons related to non-compliance with its procedures, requirements or other applicable laws, such as failing to complete the application process or failing to pay a fee. In and of itself, what the consumer intends to do with the electrical power is generally not something the PUD considers in determining whether to deny service, with the potential exception of an intended unlawful service. Instead, what a consumer intends to do is important to conditions of service such as determining the right rate, impacts on the utility infrastructure and the safe and reliable provision of service. For example, the PUD would deny (or at least suspend) service to an electrically unsafe structure (e.g., with visibly dangerous wiring) or without L&I inspection. When a service request presents new and unique challenges, such as with cryptocurrency, the PUD seeks to develop reasonable terms and conditions of service, consistent with the policy of the Board of Commissioners, that protect the District and the District's other customers rather than deny service outright.

Q5: What are the fees/rates applied to cryptocurrency mining?

A: Below are clips from the July 23rd, 2018 CCPUD Board of Commission update. These are draft and not approved at this time:

Cryptocurrency Upfront Capital Charge

Transmission Costs

- » \$55/kW (first 100 MW) in Wenatchee corridor (Monitor, Olds Station, Wenatchee, Malaga)
- » No connections allowed north of Leavenworth (Anderson Canyon-Summit Line)
- » \$400/kW - \$500/kW in all other areas, or cost based on Transmission Study

Distribution Costs

- » \$270-388/kW depending on substation capacity
- » Where substation capacity not available customer may be required to build necessary infrastructure

Willingness to pay does not guarantee service availability

Draft Cryptocurrency Rate Considerations

For use over 1 MW, at market monthly average index energy price over the last 24 months, averages 5.5 ¢/kWh*

For use over 1 MW, at 5-yr future market energy, approx. 6 ¢/kWh* for commercial or industrial services

For residential services, recommend adjusting delivery charge, resulting in 7-10 ¢/kWh*

Excess use charges apply for incidental use over authorized levels

*Includes customer charge, delivery and energy, does not include upfront charges

Q5: What is the public benefit vs the power consumed?

A: There have been many debates as to the “*benefits*” and “*risks*” of cryptocurrency and blockchain technology. What we do know is that cryptocurrency mining places new stresses on the electrical utility systems and is accelerating the need to build more infrastructure and make costly upgrades to existing infrastructure.

In terms of cryptocurrency mining, the PUD is looking for solutions that result in a positive or neutral impact to our existing customers.

Q6: Is there sufficient power reserved for residential and commercial/industrial growth?

A: The PUD continuously updates a five year look forward and plans to be able to serve local organic (non-crypto) load growth over that horizon. And our current rates and policy development are designed to assure we do not inhibit future organic load growth at currently planned levels.