King County

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

KING COUNTY

Signature Report

June 1, 2016

Ordinance 18295

Proposed No. 2016-0239.2 **Sponsors** von Reichbauer

AN ORDINANCE authorizing the county executive to execute and enter into an agreement for the purpose of creating a high-speed optical network around Lake Washington and requesting that the executive undertake one or more pilot projects to use the created network to expand access to high-speed broadband service within the unincorporated areas of King County that have been underserved by high-speed digital technology.

STATEMENT OF FACTS:

1. Under membership of the Community Connectivity Consortium, King County, various municipalities and public agencies are joining together to create a high-speed optical network, known as The Ring around Lake Washington.

2. The Consortium will build a cost-effective fiber-optic network around Lake Washington, from Bothell in the North to City of Auburn in the South, providing connectivity and access to services for public, not-for-profit and governmental institutions who otherwise could not afford to build secure, resilient, high speed fiber-optic networks to support their essential operations.

3. Participating agencies in the project agreement are the cities of Auburn, Bellevue, Kent, Kirkland, Federal Way and Renton, King County, Valley Communications Center and the University of Washington. The University of Washington is acting as the lead agency/project manager.

4. In some communities within King County, especially in the unincorporated areas, lack of access to high-speed, fiber-optic networks limits the ability of public, not-for-profit and governmental institutions to provide educational and economic opportunities to their constituents. It is the expectation that the Ring around Lake Washington network will extend high-speed digital connectivity closer to some of those under-served communities, creating a potential for public, not-for-profit and governmental institutions in those communities to connect with the new network. This will help serve the goals of the county's digital equity initiative.

BE IT ORDAINED BY THE COUNCIL OF KING COUNTY

SECTION 1. The county executive is authorized to execute an agreement, substantially in the form of Attachment A to this ordinance, with the Community Connectivity Consortium and participating public agencies.

SECTION 2. As part of the Digital Equity Initiative of King County Information Technology, and in partnership with appropriate community partners, the county executive is requested to undertake one or more pilot projects to use the Ring around Lake Washington fiber optic network to expand access to high-speed broadband service within the unincorporated areas of King County that have been underserved by high-

speed digital technology. The executive should prioritize economically disadvantaged communities, or communities facing other social or educational challenges, when selecting the pilot project areas and partners. At least one pilot project should be identified not later than March 31, 2017, with a target date for operation not later than December 31, 2017. The executive is requested to prepare a summary report for the proposed pilot project or projects outlining the objectives and the anticipated costs and benefits. The report should be filed not later than March 31, 2017, in the form of a paper original and an electronic copy with the clerk of the council, who shall retain the original and provide an electronic copy to all councilmembers, the council chief of staff, the policy staff director and the lead staff for the transportation, economy and

environment committee, or its successor committee with jurisdiction over economic development issues.

Ordinance 18295 was introduced on 5/9/2016 and passed as amended by the Metropolitan King County Council on 5/31/2016, by the following vote:

Yes: 9 - Mr. von Reichbauer, Mr. Gossett, Ms. Lambert, Mr. Dunn, Mr. McDermott, Mr. Dembowski, Mr. Upthegrove, Ms. Kohl-Welles and Ms. Balducci
No: 0
Excused: 0

KING COUNTY COUNCIL
KING COUNTY, WASHINGTON

J. Joseph McDermott, Chair

ATTEST:

Anne Noris, Clerk of the Council

APPROVED this 9th day of June, 2016.

Dow Constantine, County Executive

RECEIVED
2016 JUN 10 PM 3:49
CLERK
KING COUNTY COUNCIL

Attachments: A. Consortium Project Agreement 70

Attachment A
18295

Consortium Project Agreement 70

Parties:

Provide for a high speed optical network ringing Lake Washington with optical nodes located at the Westin Building, UW-Bothell campus, Bellevue City Hall, King County Regional Communications and Emergency Coordination Center, Valley Communications Center and the King County Data Center at Sabey Campus.

An Addendum to the
Community Connectivity Consortium's
Project Agreement Template Policy

Table of Contents

I. *Project Summary*

A. Project Number

70

B. Project Name

C3 Optical Network System around Lake Washington

C. Project Description

This Consortium Project Agreement #70 ("**Agreement**"), consisting of this agreement, its appendices A-F, attached hereto and incorporated herein, and the Template Policy, is entered between the Community Connectivity Consortium ("C3"), the University of Washington ("**UW**"), and contributing project members as noted in Section E below for design, provisioning, and delivery of a high speed optical network around Lake Washington ("**the System**"). The System may only be used for the purpose of supporting public, not-for-profit, and governmental institutions unless explicitly agreed otherwise in writing by all parties. This project includes pathway, conduit, fiber and electronics to build and operate a high speed dense wave division multiplex ("**DWDM**") optical network around Lake Washington connecting The Westin, Seattle; UW-Bothell Campus; the City of Bellevue; the King County Regional Communications and Emergency Coordination Center ("**RCECC**"), Renton; Valley Communications Center, Kent; and King County Data Center ("**KCDC**") at Sabey Campus. Tukwila.

D. Lead Agency/Project Manager

University of Washington

E. Participating Agencies

City of Auburn
City of Bellevue
City of Federal Way
City of Kent
City of Kirkland
City of Renton
King County
Valley Communications Center

II. *Description of Project*

A. Fiber Segments

1. Route Segment Descriptions

- Fiber used in this project shall include existing fiber in 11 segments.

  - Segment 1 – The Westin, Seattle to UW-Bothell Campus, Bothell.
    Segment contributor: UW

- Segment 2 – UW-Bothell to City of Kirkland City Hall, Kirkland.
  Segment contributor: UW

- Segment 3 – Kirkland City Hall to Bellevue City Hall, Bellevue
  Segment contributor: City of Kirkland

- Segment 4 – Bellevue City Hall to King County RCECC, Renton.
  Segment contributor: City of Bellevue

- Segment 5 – King County RCECC to Benson Hill Elementary, Renton.
  Segment contributor: City of Renton

- Segment 6 – Benson Hill Elementary to Comcast Kent Vista Hub, Renton.
  Segment Contributor: King County

- Segment 7 – Comcast Kent Vista Hub to Valley Communications Center, Kent.
  Segment Contributor: City of Kent

- Segment 8 – Valley Communications Center to City of Auburn data center, Auburn.
  Segment contributor: City of Auburn

- Segment 9 – City of Auburn data center to City of Federal Way data center, Federal Way.
  Segment contributor: King County

- Segment 10 – City of Federal Way data center to KCDC at Sabey Campus, Tukwila.
  Segment Contributor: City of Federal Way

- Segment 11 – KCDC at Sabey Campus to the Westin Building, Seattle.
  Segment contributor: UW

- Specific fiber routing is shown on Appendix D to this Agreement. Some splicing of existing fiber will be required to complete the loop.

2. Points of Demarcation/Node Sites:

   - The Westin Building
     Node Site Host: UW
     Address: Suite 804, 2001 6th Ave, Seattle, WA

   - UW-Bothell Campus, Bothell
     Node Site Host: UW
     Address: Physical Plant Bldg., 18115 Campus Way NE, Bothell, WA

   - City of Bellevue City Hall

Node Site Host: City of Bellevue
Address: Room MEC01, 450 110th Ave NE, Bellevue, WA

- King County RCECC
  Node Site Host: King County
  Address: Room 142, 3511 NE 2nd St, Renton, WA

- Valley Communications Center
  Node Site Host: Valley Communications Center
  Address: Room 153, 27519 108 Avenue SE, Kent, WA

- KCDC at Sabey Campus
  Node Site Host: King County
  Address: KCDC, 3655 S 120th Place, Bldg. 5, Tukwila, WA

B. Active Electronics

1. Base System Description. The base system hardware includes chassis, system management hardware and software, amplifiers, and filters. The base system will provide the following capabilities:

- A DWDM system with 80 wave capacity.
- Each wave is capable of supporting Ethernet services ranging in speed from 1 to 100 Gigabit per second ("Gbps"), depending on the equipment purchased.
- 40 waves will be allocated to UW.
- 40 waves will be allocated to C3.

2. Ethernet Services Description. The initial C3 investment includes one Ethernet service switch at each Node site as follows:

- Sixteen 1 Gigabit Ethernet ("GE") services will be available to C3 members from any Node Site to any Node Site on the ring.
- Six of the C3 waves will be used for the 16x1GE services.
- Four of the C3 waves will be made available to King County in exchange for funding of a node site to be installed and operated at the Valley Communications Center as detailed in the Project Budget Table below, leaving 30 waves available for C3's future allocation.

All services on the network will be path protected at layer 1 to survive fiber breaks. This protection is provided by an Optical Path Protection Module, which protects services at the per-wave level. The services are demarked at the client port on the node. All base system and optional services will be provisioned with path protection as a standard. There will be no option to have unprotected services on the backbone.

C. Project Specifications and Scope of Work

This project shall meet all Node Site specifications, as outlined in Appendix A, and shall follow manufacturer recommendations for equipment installation and operations. Any

deviations from Node Site specifications are clearly documented in Appendix B and shall be remedied by the Node Site Host prior to the Acceptance Date unless deemed an acceptable risk by the Lead Agency.

III. Responsibilities

The following responsibilities of the organizations listed below shall exist for the term of this Agreement as specified in Section V below, and for any subsequent extensions as allowed by this Agreement:

A. University of Washington

1. Lead Agency. UW shall act as the project manager, system architect, equipment, operations and maintenance supplier for a high speed optical network ringing Lake Washington (see Appendix D, Ring Map).

2. Operations/Maintenance. Although jointly funded, all the C3 equipment will be procured, owned, operated, and maintained exclusively by UW except as described in the remainder of this Section III. C3 members, including future members, may use the fiber ring in accordance with the terms of this Agreement. All scheduled maintenance shall be performed during agreed upon maintenance windows. UW Network Operations Center ("NOC") will make reasonable efforts to ensure that optical network services are available and monitored 24 hours a day, 7 days a week, with the exception of upgrades, maintenance, and outages. In the event of a C3 equipment failure, the UW NOC will dispatch UW engineers to the applicable node site as required at the discretion of the UW NOC. UW NOC shall report, via web page and email distribution lists, all network outages and network incidents to C3 as they occur. C3 may report any known service outages to UW NOC by calling 206-221-6000 or sending an email to netops@uw.edu.

3. Maintenance Agreements. UW will maintain all C3 equipment vendor maintenance agreements, which will require a C3 maintenance commitment for the life of the equipment.

4. Spares. UW will also maintain spares for all of the base system hardware as identified in Appendix C.

5. Change Management. UW shall notify C3 of any system changes materially affecting the C3 service. UW shall use industry standard change management procedures for system changes as follows:

- **Routine** - The standard process: 7-10 business days
- **Urgent** - For change requests that address time-critical and significant network outages, security threats, or business risks
- **Recurring** - Lower-risk, lower-impact network changes that occur on a regular, scheduled basis.

6. Westin and UW Bothell sites. In addition to Node Site responsibilities listed in Section III.B below, UW will provide rack and cabinet space in the Westin and UW Bothell Node Sites, as described in Appendix B.

B. Node Site Hosts

1. "Node Site Hosts" means the parties listed in the following table:

Project Member	Contact	Email	Business Hour* Contact	After hours Contact
City of Bellevue	IS Help Desk		425.452.2886	425.452.2886
King County (RCECC and Sabey Campus)	KC NOC		206.263.7000	206.263.7000
Valley Communications Center	Help Desk		253.372.1575	253.372.1575
University of Washington	NOC		206.221.6000	206.221.6000

*Business hours shall be considered 7 a.m.–5 p.m. for purposes of this Agreement.

2. Node Site Operations. Each Node Site Host shall be responsible for the operation of the Node Site facility at the specific locations outlined above, in accordance with the C3 Node Site Specifications listed in Appendix A. Each Node Site Host shall operate the Node Site on a 24x7x365 basis. UW NOC is responsible for the 24x7x365 monitoring of the network. Should an interruption in service occur, UW NOC will initiate immediate restoration and notification procedures. As required, Node Site Hosts and Fiber Optic Segment Contributors shall:

a. Respond (Mean time to Respond) acknowledging the service disruption within 30 minutes of initial contact.

b. Arrive on site within 2 hours of initial contact. Reasonable efforts will be made to commence work immediately and work until complete.

c. Node Site Hosts shall make reasonable efforts to provide hourly updates to the UW NOC.

d. UW NOC will make reasonable efforts to provide subsequent updates via web page and email distribution lists to C3 members until the outage is resolved.

Members may use staff, support vendor or in the instance of a fiber break, C3 contracted firms to resolve the issue.

3. Node Site Maintenance. Each Node Site Host shall be responsible for the maintenance of its Node Site facility, and shall maintain, for the duration of this Agreement, a parts replacement and technical support contract as applicable in order to meet Node Site support requirements as identified in Appendix A. Said contract shall operate 24x7x365. Should a Node Site facility maintenance issue arise that is not specifically listed, those costs shall be the responsibility of the Node Site Host. Any Node Site facility maintenance shall be performed during agreed upon maintenance windows and low traffic periods for public safety. A schedule for Node Site maintenance activities will be established by the each Node Site Host, and notifications will be sent to C3 at least 72 hours prior to the scheduled maintenance.

4. Site/System Security. Node Site host will ensure that site and access security to the electronics meet the minimum Criminal Justice Information Services ("CJIS") Security Policy Ver. 5.3 or any subsequent revision thereof.

5. Change Management. Node Site hosts shall notify UW NOC and other C3 members of any system changes materially affecting the C3 service. Node Site hosts shall use industry standard change management procedures for Node Site changes as follows:

- **Routine** - The standard process: 7-10 business days
- **Urgent** - For change requests that address time-critical and significant network outages, security threats, or business risks
- **Recurring** - Lower-risk, lower-impact, network changes that occur on a regular, scheduled basis.

C. City of Bellevue

In addition to Node Site responsibilities listed in Section III.B above, The City of Bellevue will provide rack and cabinet space in its data center as described in Appendix B.

D. King County

1. King County Data Center at Sabey Campus. In addition to Node site responsibilities listed in Section III.B above, King County will provide rack and cabinet space in its data center located at the Sabey Data Center Campus as described in Appendix B, and provide a pair of fiber between the King County Data Center in Building 5 and the UW point of presence ("POP") in Building 2 of the Sabey Complex. King County will also provide transport fiber between the Building 5 Meet-Me-Room and the King County Data Center to extend the City of Federal Way segment to the data center.

2. King County Regional Communications and Emergency Coordination Center (RCECC). In addition to Node Site responsibilities listed in Section III.B above, King County will provide rack and cabinet space in its data center located at the RCECC as described in Appendix B.

E. Valley Communications Center

In addition to Node Site responsibilities listed in Section III.B above, Valley Communications Center will provide rack and cabinet space in its data center as described in Appendix B.

F. Fiber Optic Segment Contributors

Expected future maintenance of the fiber optic cable contributed to this project by the parties identified in Section II.A.1 is outlined below:

1. "Fiber Optic Segment Contributors" means the project members listed in Section II.A.1, and in the following table:

Project Member	Contact**	Email	Business	After hours

			Hour* Contact	Contact
City of Auburn	Melissa Medisch Colin Schmalz Brian Garbarino		253.804.5078	 253.261.1601 253.261.2476
City of Federal Way	Brian Pearson Thomas Fichtner		253.835.2552 253.835.2547 206.755.8548	253.835.2552 206.755.8548
City of Kent	Galen Hirschi James Endicott		253.856.4616 253.856.4620	253.266.2299 253.561.1998
City of Kirkland	IT Help Desk		425.587.4357	425.313.2132
City of Renton	IT Help Desk		425.430.6870	206.300.0571
UW	UW NOC			
City of Bellevue	IS Help Desk		425.452.2886	425.452.2886
King County	KC NOC		206.263.7000	206.263.7000

*Business hours shall be considered 7 a.m.–5 p.m. for purposes of this Agreement.
**Contact shall be made in the order listed in the table.

2. Route Preparation. All work shall be done during normal working hours. The fiber optic route utilizes existing City of Kirkland, City of Bellevue, City of Renton, City of Kent, Valley Communications Center, City of Auburn, King County, City of Federal Way, and UW fiber. If any construction, remediation, or relocation is required, it will be funded and completed by the Fiber Optic Segment Contributor in consultation with the Lead Agency.

3. Fiber Terminations, Splicing and Testing. All work shall be done during normal working hours. Segment contributors will confirm all splice details prior to undertaking any work under this section. The cost of any splicing required under this Agreement shall be borne by the applicable C3 member requesting the splice. Fiber pairs shall be tested prior to implementation of Active Electronics.

4. Locates/Fiber Relocation. Member fiber optic strands contributed to this project were constructed under other project agreements, including but, not limited to Consortium project agreements, that contain provisions for locates and relocation of fiber. Any fiber locate or fiber relocation shall be managed by the Fiber Optic Segment Contributor.

5. Repairs/Breaks. The C3 fiber segment contributor shall be responsible for immediate detection and coordination of timely repair of all breaks or outages of fiber in fiber segments identified in this Agreement. The underlying fiber optic agreements shall determine the cost allocation of the repair. C3 and/or the project participants shall contract with a competent and qualified vendor to provide 7x24x365, four-hour response to any fiber breaks/outages that happen on the fiber segments in the Agreement.

6. Notification and Response Process. In the event of a fiber optic disruption or cable break, notification and response procedures shall be those defined above in Section III.B.2 or as defined in any applicable subsequent operations document.

G. System Changes

The parties acknowledge that the optical network design, location of node sites, use of fiber optic cable provided by a Fiber Optic Segment Contributor through a franchise agreement or institutional network agreement, or other matters relating to the System may need to change during the term of this Agreement. Accordingly, the parties agree to cooperate in good faith to resolve any such need for changes, to jointly determine how the associated costs should be allocated between the parties, and, if necessary, to modify this Agreement in accordance with the requirements of Section XI.A herein.

IV. Project Budget/Payments

The base configuration includes 4 node sites funded jointly by UW and C3. Two additional node sites will be funded as follows:

- Valley Communications Center, Kent: funded by King County.
- Sabey Data Center Campus, Tukwila: funded by UW.

A. Budget

Project Budget Detail

Organization	Item Description	Non-Recurring Cost	UW Operations Recurring Cost	Vendor Maintenance Recurring Cost	Total Monthly Recurring Cost
UW					
	Core Optical System Equipment with Installation	$90,000	N/A	N/A	N/A
	Network Service Equipment with	$60,000	N/A	N/A	N/A
	Sabey Optical Node Equipment with Installation	$50,000	N/A	N/A	N/A
	UW Subtotal	**$200,000**	N/A	N/A	N/A
C3					
	Core Optical System Equipment with Installation	$90,000	$760	$880	$1,640
	Network Service Equipment with Installation	$40,000	$300	N/A	$300
	ValleyCom Locking	$2,400	N/A	N/A	N/A
	Miscellaneous Fiber	$1,500	N/A	N/A	N/A
	Sabey Optical Node	N/A	$190	$220	$410
	ValleyCom Optical Node	N/A	$190	$220	$410
	C3 Subtotal	**$133,900**	$1,440	$1,320	**$2,760**
King County					
	ValleyCom Optical Node Equipment with	$50,000	N/A	N/A	N/A
	King County Subtotal	**$50,000**	N/A	N/A	N/A
	COSTS	**$383,900**	$1,440	$1,320	**$2,760**

*Sales tax is included in the quoted equipment costs.

B. Optional Services Costs

Optional services will be made available by C3 to C3 members using a business model and pricing to be defined by the C3 Board. The cost, both one-time and recurring, of any additional slots or chassis required for any C3 services will be added to the cost of the proposed service, and invoiced by UW to C3.

C. In-Kind Asset Contributions

In-Kind Asset Contribution Table*

Contribution Type and Agency	Value (est.)
City of Auburn right of way/conduit system access, fiber optic cable (31,000 feet)	$1,550,000
City of Bellevue right of way/conduit system access, fiber optic cable (45,100 feet) and data center node location	$2,255,000
City of Federal Way right of way/conduit system access, fiber optic cable (90,500 feet)	$4,525,000
City of Kent right of way/conduit system access, fiber optic cable (59,300 feet)	$2,965,000
City of Kirkland right of way/conduit system access, fiber optic cable (29,300 feet)	$1,465,000
City of Renton right of way/conduit system access, fiber optic cable (42,000 feet)	$2,100,000
King County right of way/conduit system access, fiber optic cable (44,033 feet)	$2,201,660
King County RCECC Node location**	$215,760
King County Data Center Node location**	$215,760
City of Bellevue Data Center Node location**	$215,760
King County GIS Services	$7,000
King County Data Center to UW POP fiber interconnect (Sabey Bldg. 5 to Bldg. 2)	$120,000
University of Washington, fiber optic cable (total of 324,441 feet in the following segments): • UW Bothell to Kirkland City Hall (86,286 feet) • Westin to UW Bothell (128,116 feet) • Sabey to Westin (110,039 feet)	$16,222,050
Valley Communications Center data center node location**	$215,760
Total In-Kind Contributions	**$34,273,750**
Project Funding (see Section IV.A above)	$383,900
Estimated Total Project Valuation*	**$34,657,650**

*In-kind fiber optic strand contributions valued at approximately $33,283,710, have been accounted for in previous projects and will not be included in the total project valuation. Lengths of fiber segments are estimated and include service loops.
**Node location contribution based on King County's rate card.

D. Payments

C3 and King County will provide funding to UW for project nonrecurring costs as outlined above in the Project Budget Detail table.

- C3 will pay to UW a one-time fee of $133,900 within 30 days of the Effective Date.
- King County will pay to UW a one-time fee of $50,000 within 30 days of the Effective Date.

Regarding recurring maintenance and operations fees to be paid by C3, payment shall be as follows. Subsequent to the Acceptance Date, and on the annual anniversary of the Acceptance Date thereafter, an annual recurring maintenance and operations fee of $29,520 ($2,460 x 12 months) as outlined above in the Project Budget Detail Table, plus any additional recurring fees as identified in Section IV.B, will be invoiced by UW to C3. Payment for the entire annual amount is due within 30 days of invoice. If C3 fails to make timely payment, UW may charge one percent (1%) per month on the amount due until paid in full. Should the payments of recurring fees to UW become more than 360 days past due, UW may choose to discontinue any services provided on the C3 Optical Network System without affecting any other rights or obligations of the parties to this Project.

E. Completion and Acceptance

UW will make reasonable efforts to provide all functionality contemplated in this agreement within 120 days of receipt of equipment from the manufacturer. Testing and acceptance will be considered complete as of the Acceptance Date, as defined in Appendix F.

V. Optical System Equipment Refreshes

The initial C3 optical system equipment (to include the optical system equipment at additional Node Sites) ~~[~~identified in Section II.B.~~2]~~ will have an expected life of 7 years. This expected life period will begin on the Acceptance Date and end 7 years after the Acceptance Date ("the Initial Optical System Equipment Term"). In conjunction with the completion of the Initial Optical System Equipment Term, and thereafter on each anniversary of that date, UW will evaluate the optical system equipment to determine if its useful life can be extended an additional year. Upon UW's determination that the useful life of the optical system equipment can no longer be extended, UW will consult with C3 to develop a new system design and quote for a technical refresh of the optical system equipment. Such costs for the technical refresh of the core equipment, and the available capacity of the resulting system, shall be apportioned 50% to UW, 50% to C3. As with this Agreement for the original system, any additional costs associated with network services provisioned on the resulting core system shall accrue to the party (UW, C3, or the Participating Agency) requesting the network services. These provisions shall also apply to any subsequent technical refreshes.

In the event C3 or UW decides not to fund its percentage of the core equipment, the remaining party (C3 or UW) may choose to fund the entire technical refresh, and as a result retain 100% of the available capacity of the resulting system. If C3 declines to fund its percentage of the core equipment refresh, UW will retain rights of use and access to all fiber segments and node site use in accordance with the overall terms and conditions of this Agreement. If UW declines to fund its

percentage of the core equipment refresh, C3 will retain rights of use and access to fiber segments under the control of UW, and all UW Lead Agency responsibilities as defined in Section III.A (1-5) will end.

VI. Agreement Term

A. Term. This Agreement shall be effective as of the date when it has been executed by all parties ("Effective Date") and continue in full force and effect for twenty years from the Effective Date ("Initial Agreement Term"), and will be automatically renewed in 5 year increments ("Renewal Periods") unless terminated in accordance with the provisions below.

B. Termination. This Agreement may be terminated at any time upon the unanimous written agreement of all of the parties to this Agreement. In addition, any party may terminate this Agreement at the end of the Initial Agreement Term or at the end of any 5-year Renewal Period. To terminate the Agreement as allowed by this paragraph, a party must provide a written notice of termination to all other parties at least 180 days in advance of the end of the Initial Agreement Term or applicable Renewal Period.

C. Disposition of Equipment. In the event this Agreement is terminated prior to the end of the Initial Agreement Term or any Renewal Period, UW shall redeliver the portion of optical equipment funded by C3 and King County and cancel all manufacturer's maintenance contracts. Whereas C3 funding supports a portion of the core equipment and may support a portion of the technical equipment refresh, UW will work in partnership with C3 to determine the most equitable redistribution of equipment. Costs for transporting or shipping will be paid by C3 and King County respectively. UW will incur no liability on account of any such termination.

VII. Apportionment of Liability

A. Liability

1. Except as otherwise provided in this Agreement, each party shall defend, indemnify, and hold harmless the other parties, including their officers, officials, employees, agents, and regents, from and against any claim alleging harm, damage, injury, or loss to any person or property to the extent such claim arises out of or results from its own, or its employees' or agents' negligent acts or omissions, whether during construction or after completion of the project.

2. If a party uses contractors or subcontractors for work pursuant to this Agreement, then either (a) the party agrees that its obligations in Section VII.A above will include responsibility for claims arising from the performance of such contractors and subcontractors, or (b) the party will include in its contract with any such contractor or subcontractor a provision requiring the contractor or subcontractor to defend, indemnify, and hold harmless the other parties, including their officers, officials, employees, agents, and regents from and against any claim arising from the contractor's or subcontractor's performance.

3. The indemnity in Section VII.A above is specifically and expressly intended to constitute a waiver of each party's immunity under the Washington Industrial Insurance Act, RCW Title 51, (a) only between and with regard to the parties, (b) only for work done by a party, and (c) only to the extent necessary to provide the indemnified party or parties with a full and complete indemnity

of claims made by the indemnitor's employees. The parties acknowledge that these provisions were specifically negotiated and agreed upon by them.

B. Worker Insurance

Each party to this Agreement shall ensure that it and all persons performing work on its behalf, including without limitation project suppliers and subcontractors, maintain in effect at all times during the Work, coverage or insurance in accordance with the applicable laws relating to worker's compensation and employer's liability insurance (including, but not limited to, the Washington Industrial Insurance Act and the laws of the state in which any such person was hired), regardless of whether such coverage or insurance is mandatory or merely elective under the law. Each party shall furnish such assurance and evidence of such coverage or insurance (such as copies of insurance policies and Certificates of Compliance issued by the Washington State Department of Labor and Industries) as Participating Agencies may request.

C. General Liability Insurance.

Each party to this Agreement shall maintain in full force and effect throughout the term of this Agreement, a minimum of Two Million Dollars ($2,000,000) liability insurance for property damage and bodily injury, and shall cause its agents, contractors, and subcontractors to maintain the same with regard to work under this Agreement. In satisfying the insurance requirements set forth in this section, a party may self-insure against such risks in such amounts as are reasonable for a municipality or agency of its size or shall obtain a coverage agreement through a Risk Pool authorized by Chapter 48.62 RCW which shall provide liability coverage to the party for the liabilities contractually assumed by the party in this Agreement. At the time of execution of this Agreement, and prior to commencement of performance of any of the Work, each party shall furnish, upon request, a Certificates of Insurance as evidence that policies providing insurance (or self-insurance) with such provisions, coverages and limits are in full force and effect.

VIII. Disclaimer, Third Party Components, and Exclusion of Damages

A. DISCLAIMER. ALL SERVICES AND ACTIVITIES PROVIDED BY A PARTY UNDER THIS AGREEMENT, INCLUDING SERVICES AND ACTIVITIES PERFORMED BY THE UW AND THE NODE SITE HOSTS, AND NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT, THE PARTIES ACCEPT SUCH ACTIVITIES, SERVICES AND THE SERVICE EQUIPMENT "AS IS," WITH NO REPRESENTATIONS OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OR ANY IMPLIED WARRANTY ARISING FROM STATUTE, COURSE OF DEALING, COURSE OF PERFORMANCE, OR USAGE OF TRADE. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, NO PARTY HAS ANY OBLIGATION TO INDEMNIFY OR DEFEND ANY OTHER PARTY AGAINST CLAIMS RELATED TO INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS.

B. Third Party Components. UW shall (a) pass through to the non-UW parties any warranty right UW receives from a third party provider of Third Party Components, and (b) reasonably cooperate with the non-UW party, at that party's expense, in enforcing such rights. UW PROVIDES NO WARRANTIES, EXPRESS OR IMPLIED, WITH REGARD TO THIRD PARTY COMPONENTS, AND UW WILL NOT BE LIABLE FOR ANY FAILURE OF ANY THIRD PARTY COMPONENT TO FUNCTION AS EXPECTED OR INTENDED.

C. EXCLUSION OF DAMAGES. TO THE EXTENT ALLOWED BY LAW, AND NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT, IN NO EVENT WILL ANY PARTY BE LIABLE TO ANY OTHER PARTY OR TO ANY THIRD PARTY FOR ANY LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR LOSS OF DATA, COVER, SUBSTITUTE GOODS OR SERVICES, OR FOR INCIDENTAL, CONSEQUENTIAL, PUNITIVE, SPECIAL, OR EXEMPLARY DAMAGES (INCLUDING DAMAGE TO BUSINESS, REPUTATION, OR GOODWILL), OR INDIRECT DAMAGES OF ANY TYPE HOWEVER CAUSED, WHETHER BY BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER LEGAL OR EQUITABLE CAUSE OF ACTION, EVEN IF THE PARTY HAS BEEN ADVISED OF SUCH DAMAGES IN ADVANCE OR IF SUCH DAMAGES WERE FORESEEABLE.

IX. Project Schedule

Task	Target Completion Date
Circulate and sign copies of the project PA	June 2016
Complete fiber optic splicing/testing	June 2016
Issue Purchase Orders	June 2016
Installation of rack/cabinet equipment	June 2016
Installation, configuration, testing of equipment	December 2016
Go-Live	January 2017

X. Changes or Addenda to Project Agreement Template Policy

This Agreement shall be interpreted in conjunction with the Project Agreement Template Policy document, which is incorporated into this Agreement by reference. This Agreement shall supersede the Project Agreement Template Policy document to the extent it contains terms and conditions which change, modify, delete, add to, supplement or otherwise amend the terms and conditions of the Project Agreement Template Policy document.

XI. Miscellaneous

A. Modifications or Amendments

No modification to or amendment of the provisions of this Agreement shall be effective unless in writing and signed by authorized representatives of the parties to this Agreement. The parties expressly reserve the right to modify this Agreement, from time to time, by mutual agreement as called for in the Project Agreement Template Policy.

B. Counterparts

This Agreement may be executed in counterparts, each of which so executed will be deemed to be an original and such counterparts together will constitute on and the same agreement.

C. Authority

Each party hereby represents and warrants to the other parties that it has the right, powers, and authority to enter into this Agreement and to fully perform all of its obligations hereunder.

XII. Approvals

IN WITNESS WHEREOF, the parties hereto have executed this Project Agreement on the respective dates indicated below.

_____	_____	_____
Nancy Backus Mayor City of Auburn	Date	City Attorney
_____	_____	_____
Toni Cramer Chief Information Officer City of Bellevue	Date	City Attorney
_____	_____	_____
Jim Ferrell Mayor City of Federal Way	Date	City Attorney
_____	_____	_____
Suzette Cooke Mayor City of Kent	Date	City Attorney

Brenda Cooper
Chief Information Officer
City of Kirkland

Date

City Attorney

Approved as to Legal Form:

Denis Law
Mayor
City of Renton

Date

City Attorney

Bill Kehoe
Chief Technology Officer
King County

Date

Dan Jordt
Associate Vice President
University of Washington Information Technology

Date

_____ _____

Lora Ueland Date
Executive Director
Valley Communications Center

_____ _____

Chelo Picardal Date
Chief Technology Officer
Community Connectivity Consortium

Appendix A
C3 Node Site Specifications

INFORMATION TECHNOLOGY
UNIVERSITY of WASHINGTON

C3 Ring Technical Requirements

Technical Requirements to support the C3 Lake Washington DWDM Ring

University of Washington Information Technology / C3

Document Control Information

Document Details	
Title	C3 Ring Technical Requirements
Purpose	Technical Requirements to support the C3 Lake Washington DWDM Ring
Prepared by	Dennis Cook dennisc@uw.edu

Version History

Version Number	Date Released	Reasons for Change/Comments
1.0	7/7/2015	Initial publication
1.1	7/9/2015	Additions made following initial feedback including a site checklist
1.2	4/25/2016	Amended AC power requirements

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Node Site Specifications

Each node site host must provide appropriate space, power, and environmentals to ensure the continuous uninterrupted operation of the network. Sites must follow TIA-942 and Telcordia SR-3580 level 3 (NEBS), ETSI EN 300 019-1-3 Class 3.1 specifications. The node site preparation must be completed and conditions approved prior to start of hardware installation. Table 1 is a site preparedness checklist which is provided to assist in completing the requirements.

Space

The optical transport node will require one cabinet with at least 40U's of space. This cabinet must be lockable with restricted access to UW support staff and designated personnel. In addition, 3U of space will be required to house a fiber distribution panel (FDP) in a separate cabinet/rack which will be the demarcation point for services transported on the ring. A fiber path between the two locations will be necessary to run jumpers from the Optical Transport node to the back of the FDP. This FDP should be located in proximity to the fiber tail circuits and/or the customer routers/switches that will connect to the services. Figure 1 illustrates a typical node site deployment.

The cabinet must be securely fastened in place and be seismically protected.

Power

Each FSP 3000R7 shelf can be either AC or DC powered. Each shelf is equipped with two power supply units (PSU). If DC power is provided, uninterrupted AC power must still be provided to support ancillary switching equipment within the cabinet.

General wiring requirements

Installation of the site wiring systems must follow national and local electrical codes. Comply with these requirements:

- Full power redundancy is required. Each node site shall provide two separate uninterrupted power sources. These power sources must be independent, and each must be controlled by a separate circuit breaker at the power distribution point. One power source is used for Power A (primary power supply), and the other for Power B (the backup power supply).
- Each node site power source must have backup generator power available with uninterrupted transfer to/from the generator to maintain service during extended outages.
- Each external power source must provide clean power to the installation site. If necessary, install a power conditioner.
- Proper earth grounding is mandatory at the site to prevent damage to the equipment or personal injury under dangerous fault conditions, such as lightning or over- voltages.

- The FSP 3000R7 relies on the building installation for overcurrent protection. Proper overcurrent protection of conductors and equipment should be available at the installation site.

Power circuits and associated circuit breakers must provide sufficient power.

AC Power Source Requirements

The AC-powered shelf operates either at nominal 110 V/60 Hz or 230 V/50 Hz. Each AC-powered shelf has two hot-swappable AC power supply units (PSUs) installed, thereby providing two redundant power feeds. The AC power supply unit is designed to work with power systems having a neutral conductor. Each PSU has autoranging capability.

The AC power supply should fulfill the following requirements:

- To achieve power redundancy, each PSU of the shelf must have its own AC receptacle. Note also that the reliability can be increased by connecting the receptacles to different power phases.
- Two power strips, one on each circuit, will be provided in the cabinet. Each power strip must have at least six outlets available and be dedicated to the optical transport node.
- The AC receptacles must be a three-conductor grounding type.
- Extension cords cannot be used to extend the power strips into the cabinet.
- A readily accessible fuse or circuit breaker with suitable electric ratings according to local safety standards incorporated in each circuit. 60 Amps is recommended however 30 Amps is acceptable.
- An on-off switch can be located between the AC receptacle and the PSU of the shelf. Instead of a dedicated on-off switch, the IEC 60320 appliance coupler may be considered the line power disconnect.
- Site wiring must include a ground connection to the AC power source.

DC Power Requirements

The DC-powered shelf operates at nominal -48 V DC (the positive conductor of the power source is connected to earth ground). The DC-powered shelf has two hot-swappable DC power supply units (PSUs) installed, thereby providing two redundant power feeds.

The DC power supply should fulfill the following requirements:

- For input power redundancy, two -48 V battery-based power supplies or AC/DC rectifiers, isolated from each other, are required.

- The node site will supply a power distribution unit (PDU) installed at the top of the cabinet. The PDU must provide power at nominal -48 V DC A/B feeds to each shelf in the rack.
- The equipment must be switched on or off via 35 Amp listed double-pole circuit breakers or single pole fuses, which have to be implemented in the building wiring between the shelf's PSU input terminals and the DC power source.
- Each PSU of the shelf must have its own circuit breaker that must be compliant to IEC/EN 60898.
- The rack and DC PDU must be connected reliably to protective earth ground.
- A readily accessible disconnecting device that is rated 35 Amp must be incorporated in the building's installation between the shelf's PSU input terminals and the DC power source.

System Earthing Conductor Requirements

Proper grounding must be supplied to the cabinet. To earth or ground a shelf (functional earth connection or protective earth connection), use an earthing conductor with a minimum 10 AWG solid or stranded copper

Environmentals

The installation location must meet Telcordia SR-3580 level 3 (NEBS), ETSI EN 300 019-1-3 Class 3.1 and must be:

- Clean and dry and allow enough space for future network connections (space for additional racks).
- Protected from water both from above and on the floor.
- Protected from excessive heat, direct sunlight, dust, or chemical exposure.
- The FSP 3000R7 must be installed in an air-conditioned equipment room with year-round humidity control and recirculated, filtered air.

Heat Dissipation

A significant amount of the electric energy consumed by an equipment shelf is converted into heat. Power draw and heat release from the shelves are dependent on the type of power supplies as well as the type and the number of modules installed. Each node can produce up to 10,000 BTU's of heat based on a max usage of 3000 Watts of power. To ensure the safety, performance, and reliability of the system excessive heat generated by the modules must be dissipated into the surrounding air. Dissipation is accelerated by ventilation.

An air conditioning system may be required to cool the equipment to acceptable operating temperatures. The capacity of the air conditioning system must be large enough to sufficiently

dissipate the heat generated by all of the equipment in the area. If the temperature of the intake air flow is too high, an overtemperature condition occurs. The temperature range within the cabinet must be between maintained between 41°F and 104°F with a target temperature of 75°F.

Fiber Path

Where possible, each C3 node site location shall have documented fiber path diversity which is defined as having two physically diverse fiber paths that are not sharing the same conduit or path. Each fiber segment leaving a C3 node site shall also be routed to separate C3 nodes to maintain the integrity of the ring. Where path compression exists, the UW will work with C3 to develop a risk assessment and obtain waiver approval if applicable.

Security and Access

The FSP 3000R7 must be installed in a "restricted access location" that meets the following criteria:

- Access to the equipment can only be gained by service personnel or by authorized personnel.
- Access is gained by means of a tool, lock and key, or other means of security. This is controlled by the person in charge of the location.
- Comply with applicable local and national safety regulations.
- 24/7 access must be made available to support staff.
- Must have a 24/7 contact to report site issues such as access, power and environmentals.

Figure 1 - Typical Rack Configuration

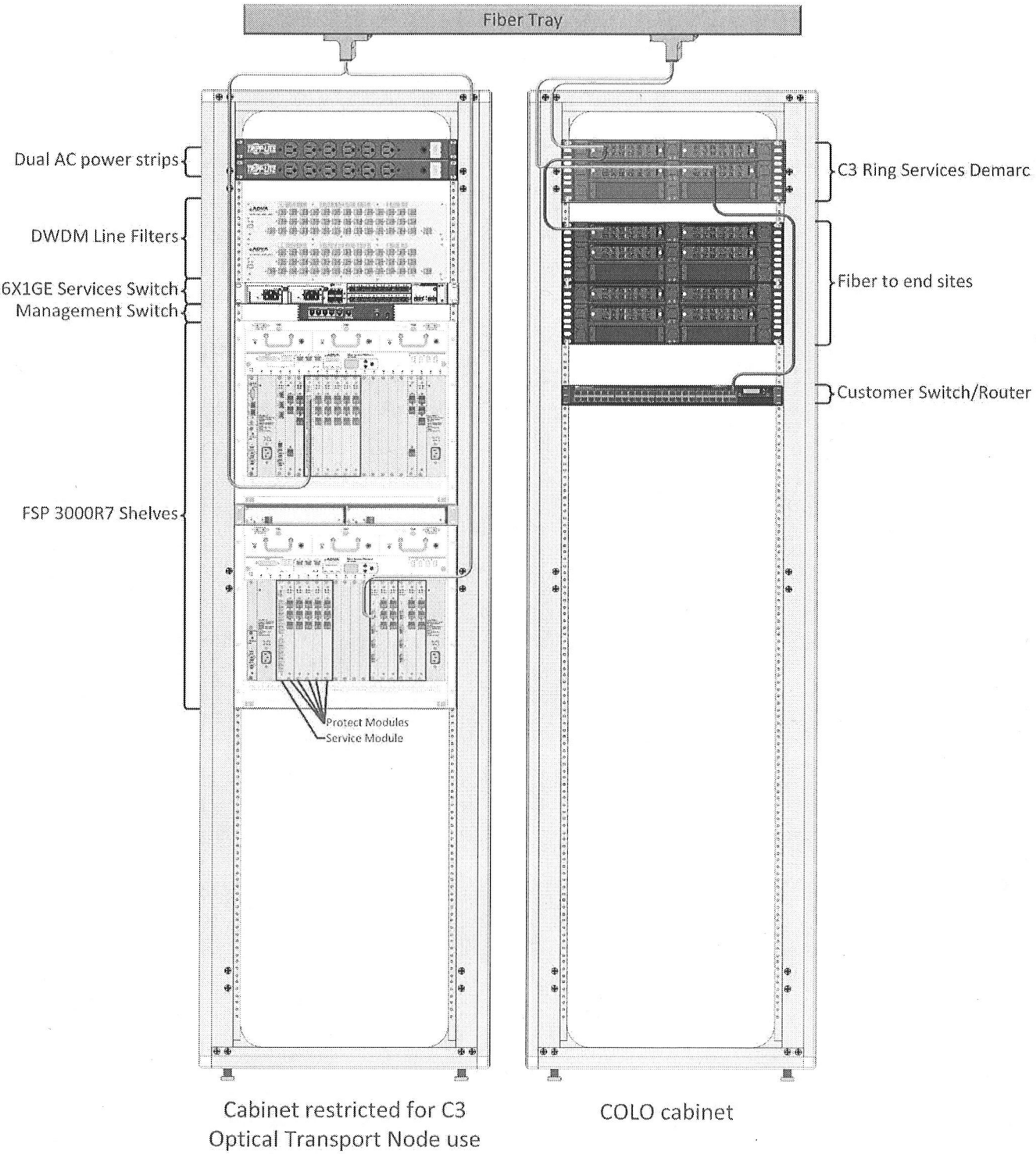

Table 1 - Site Preparedness Checklist

	Reqt #	C3 Node Site Requirements
		Space
☐	1	40U cabinet
☐	2	Cabinet seismically protected
☐	3	Cabinet properly grounded
☐	4	Access to cabinet secured
☐	5	3U located in COLO space
☐	6	Fiber pathway between cabinet and COLO space
		AC Power (if applicable)
☐	7	Two separate UPS feeds
☐	8	Dedicated 30 amp breakers
☐	9	Generator backup
☐	10	110 V/60 Hz or 230 V/50 Hz power
☐	11	Two power strips (one on each feed) installed at the top of the cabinet
☐	12	Three-conductor grounding type AC receptacles
☐	13	Proper ground connection
		DC Power (if applicable)
☐	14	Two separate feeds (A/B) from the DC power plant to the cabinet
☐	15	Fuse/circuit breaker panel located at the top of the cabinet
☐	16	35 amp fuses/breakers in the fuse panel
☐	17	Battery backup on the DC power plant
☐	18	Generator **backup**
☐	19	-48VDC Power
☐	20	Proper ground connection
		Environmentals
☐	21	Protection from water
☐	22	Humidity control
☐	23	Adequate HVAC
☐	24	Cabinet air flow
		Security and access
☐	25	Access to space restricted
☐	26	Access to line fibers restricted
☐	27	24/7 access for support personnel
☐	28	24/7 contact for site issues
		Fiber Path
☐	29	Documented fiber path diversity

Appendix B
C3 Site Preparedness

INFORMATION TECHNOLOGY
UNIVERSITY of WASHINGTON

C3 Node Site Preparedness

A summary of the preparedness of C3 node sites to support the optical transport ring around Lake Washington.

University of Washington Information Technology / C3

Document Control Information

Document Details	
Title	C3 Node Site Preparedness
Purpose	Provides a summary of the preparedness of C3 node sites to support the optical transport ring around Lake Washington.
Prepared by	Dennis Cook dennisc@uw.edu

Version History

Version Number	Date Released	Reasons for Change/Comments
1.0	11/24/2015	Initial publication
1.1	12/2/2015	Included additional site information
1.2	12/11/2015	Added diagrams and tables
1.3	4/25/2015	Amended AC power requirements

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C3 Node Site Summary

This document summarizes the proposed C3 node sites that will support the optical transport nodes. The information provided is based on site visits that were conducted in August 2015. Space and facilities to support partner services that will utilize the C3 ring is beyond the scope of this assessment.

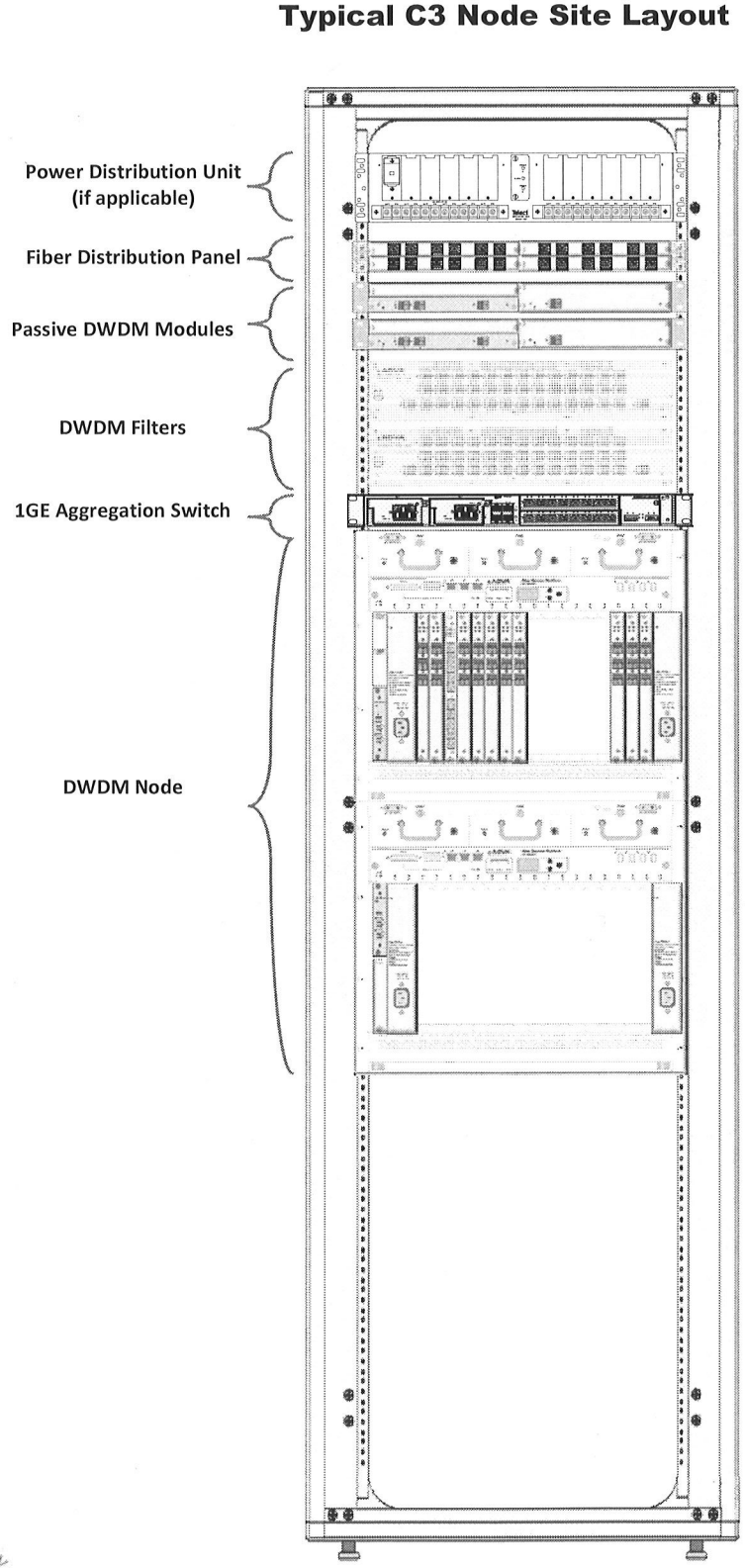
Node sites were reviewed to identify that they meet requirements for the following areas:

- Space
- Power
- Environmentals
- Fiber
- Security and Access

Throughout the document, items highlighted in yellow are outstanding and need to be addressed.

Figure 1 is an elevation drawing of a typical node site layout contained within the C3 cabinet.

Figure 1 - Typical Node Site Rack Layout



Seattle

Location
Westin Building
2001 6th Ave
Suite #804
Seattle, WA 98121

Space
40U cabinet
The cabinet is already in place. It is designated cabinet 804.03.03.

Cabinet seismically protected
Yes

Cabinet properly grounded
Yes

3U located in COLO space
Yes. UW has FDP's already located in the Westin Fiber Meet Me Room terminating the fiber riser from Suite 804.

AC Power
Westin is a DC powered site and does not require AC power.

DC Power
Two separate feeds (A/B) from the DC power plant to the cabinet
Two 80 ADC drops are currently in place

35 amp fuses/breakers in the fuse panel
PDU is currently in place

Generator backup
Yes

-48VDC Power
Yes

Fuse/circuit breaker panel located at the top of the cabinet
Yes

Battery backup on the DC power plant
Yes

Proper ground connection
Yes

Environmentals

Protection from water
Yes

Humidity control
Yes

Adequate HVAC
Yes

Cabinet air flow
Yes

Fiber

Fiber pathway between cabinet and COLO space
Yes. A fiber tray is available.

Fiber tie between Node equipment and demarc FDP
Yes. Individual service jumpers will be run directly from the ADVA to the FDP in 804

Fiber tie between Node demarc FDP and C3 fiber
Yes, both are located in the Fiber Meet Me Room

Documented fiber path diversity
To be completed

Security and Access

Access to space restricted
Yes

Access to line fibers restricted
Yes

Access to cabinet secured
The cabinet is not secured but the entire space is restricted to authorized personnel.

24/7 access for support personnel
Yes, unescorted access is already in place.

24/7 contact for site issues

Yes, Westin Building provides support.

Bothell

Location
UW Bothell
Physical Plant Building
11125 NE 180th St
Bothell, WA 98011

Space
40U cabinet
The cabinet is already in place. There is currently no cabinet designation assigned.

Cabinet seismically protected
Yes

Cabinet properly grounded
Yes

3U located in COLO space
Yes.

AC Power
Bothell is a DC powered site and does not require AC power.

DC Power
Two separate feeds (A/B) from the DC power plant to the cabinet
Two power feeds need to be installed from the DC power plant to the cabinet

35 amp fuses/breakers in the fuse panel
To be installed

Generator backup
Yes

-48VDC Power
Yes

Fuse/circuit breaker panel located at the top of the cabinet
PDU needs to be installed

Battery backup on the DC power plant

Yes

Proper ground connection
To be installed

Environmentals

Protection from water
Yes

Humidity control
Yes

Adequate HVAC
Yes

Cabinet air flow
Yes

Fiber

Fiber pathway between cabinet and COLO space
Fiber tray is available

Fiber tie between Node equipment and demarc FDP
To be installed

Fiber tie between Node demarc FDP and C3 fiber
Both are located in the same rack

Documented fiber path diversity
To be completed

Security and Access

Access to space restricted
Yes

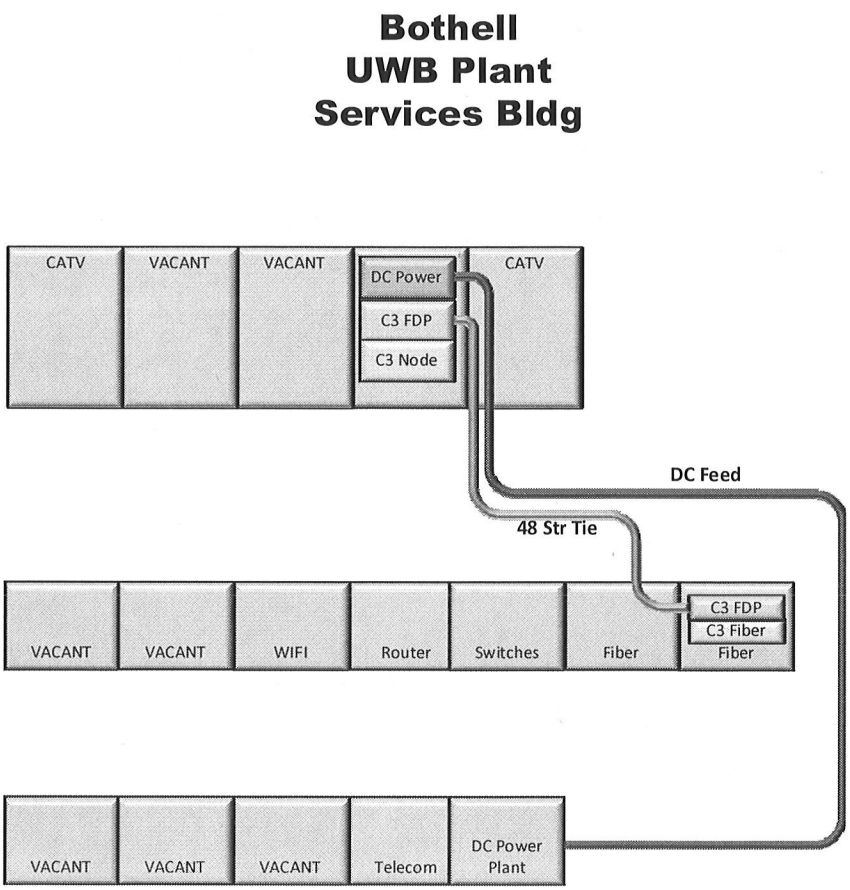
Access to line fibers restricted
Yes

Access to cabinet secured
The cabinet is not secured but the entire space is restricted to authorized personnel.

24/7 access for support personnel
Yes, unescorted access is already in place.

24/7 contact for site issues
UW Bothell Plant Services provides support for issues.

Figure 2 - Bothell Node Diagram



Bellevue

Location

Bellevue City Hall
450 110th Ave NE
Bellevue, WA 98004

Space

40U cabinet
The cabinet is already in place. It is designated cabinet MEC1-R2-R16

Cabinet seismically protected
Yes

Cabinet properly grounded
Yes

Access to cabinet secured
Yes

3U located in COLO space
Yes. Located in rack MEC1-R1-R01

AC Power

Two separate UPS feeds
Yes

Dedicated 30 amp breakers
Yes

Generator backup
Yes

110V/60HZ or 230V/50Hz power
Yes

Two power strips (one on each feed) installed at the top of the cabinet
Yes

Three-conductor grounding type AC receptacles
Yes

Proper ground connection
Yes

DC Power

Bellevue is an AC powered site and does not require DC power

Environmentals

Protection from water
Yes

Humidity control
Yes

Adequate HVAC
Yes

Cabinet air flow
Yes

Fiber

Fiber pathway between cabinet and COLO space
Yes

Fiber tie between Node equipment and demarc FDP
To be installed

Fiber tie between Node demarc FDP and C3 fiber
To be installed

Documented fiber path diversity
To be completed

Security and Access

Access to space restricted
Yes

Access to line fibers restricted
Yes

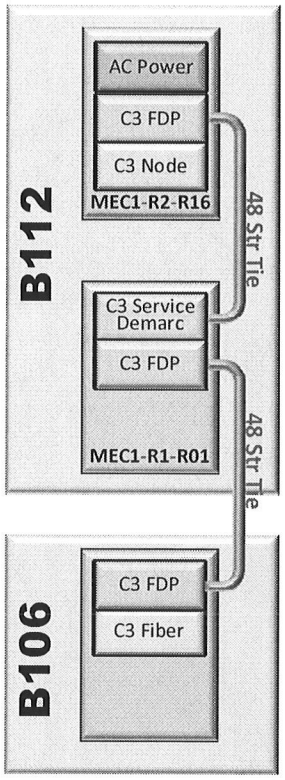
Access to cabinet secured
Yes

24/7 access for support personnel
Yes. Need to complete background check

24/7 contact for site issues
Yes

Figure 3 - Bellevue Node Diagram

Bellevue City Hall



Renton

Location

Regional Communications and Emergency Coordination Center (RCECC)
3511 NE 2nd Street
Renton, WA 98506

Space

40U cabinet
Cabinet needs to be purchased and installed

Cabinet seismically protected
To be installed. Seismic bracing is available.

Cabinet properly grounded
To be installed

3U located in COLO space
Yes, located in rack South R1/Rack 2

AC Power

Two separate UPS feeds
Yes

Dedicated 30 amp breakers
To be installed

Generator backup
Yes

110V/60HZ or 230V/50Hz power
Yes

Two power strips (one on each feed) installed at the top of the cabinet
Power outlets are located above rack

Three-conductor grounding type AC receptacles
Yes

Proper ground connection
Yes

DC Power

Renton is an AC powered site and does not require DC power

Environmentals

Protection from water
Yes

Humidity control
Yes

Adequate HVAC
Yes

Cabinet air flow
To be installed

Fiber

Fiber pathway between cabinet and COLO space
Yes

Fiber tie between Node equipment and demarc FDP
To be installed

Fiber tie between Node demarc FDP and C3 fiber
Fibers are located in same lineup.

Documented fiber path diversity
To be completed

Security and Access

Access to space restricted
Yes

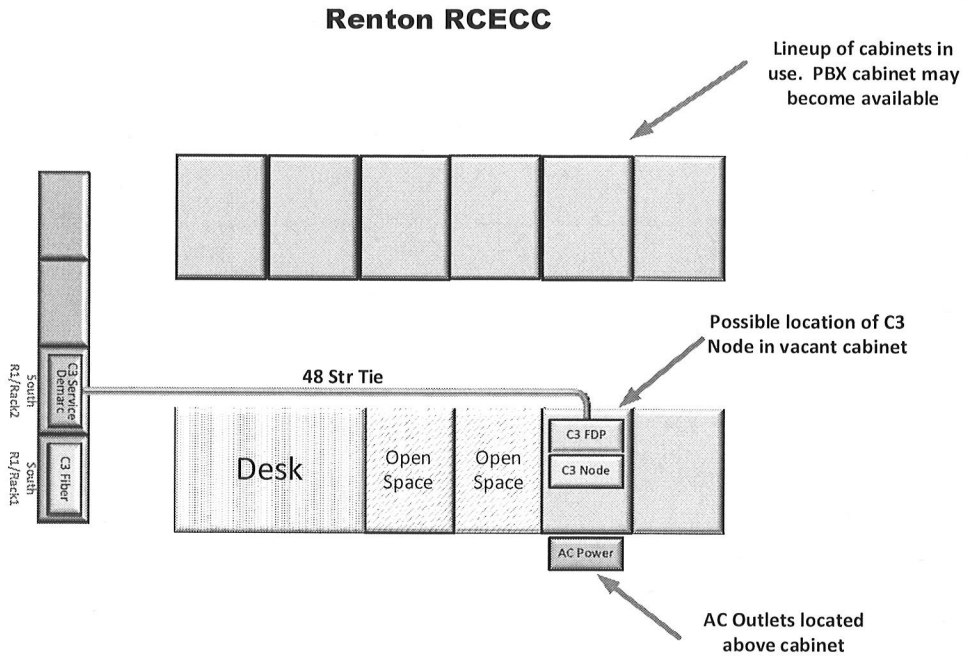
Access to line fibers restricted
Yes

Access to cabinet secured
Cabinet to be installed

24/7 access for support personnel
Yes. Need to complete background check

24/7 contact for site issues
Yes

Figure 4 - Renton Node Diagram



Kent

Location

Valley Communications
27519 108 Avenue SE
Kent, WA 98030

Space

40U cabinet
Cabinet needs to be purchased and installed

Cabinet seismically protected
To be installed

Cabinet properly grounded
To be installed

3U located in COLO space
Yes, located in rack Row R4 R9

AC Power

Two separate UPS feeds

Feeds are available but drops need to be installed

Dedicated 30 amp breakers
To be installed

Generator backup
Yes

110V/60HZ or 230V/50Hz power
Yes

Two power strips (one on each feed) installed at the top of the cabinet
To be installed

Three-conductor grounding type AC receptacles
To be installed

Proper ground connection
To be installed

DC Power

Kent is an AC powered site and does not require DC power

Environmentals

Protection from water
Yes

Humidity control
Yes

Adequate HVAC
Yes. Additional HVAC will be added in a 2017 project.

Cabinet air flow
To be installed

Fiber

Fiber pathway between cabinet and COLO space
Yes

Fiber tie between Node equipment and demarc FDP
To be installed

Fiber tie between Node demarc FDP and C3 fiber

Fibers are located in same lineup.

Documented fiber path diversity
To be completed

Security and Access

Access to space restricted
Yes

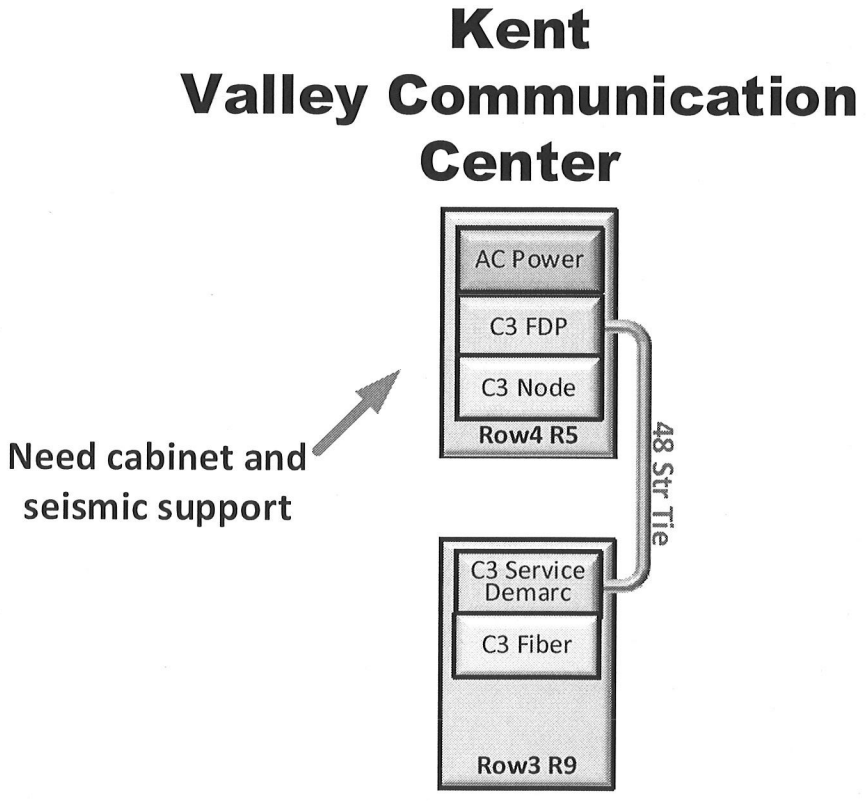
Access to line fibers restricted
Yes

Access to cabinet secured
Yes

24/7 access for support personnel
Yes. Need to complete background check

24/7 contact for site issues
Yes

Figure 5 - Kent Node Diagram



Tukwilla

Location
Sabey Data Center
3355 S. 120th Place
STE 5201A
Tukwilla, WA 98168

Space
40U cabinet
Yes

Cabinet seismically protected
Yes

Cabinet properly grounded
Yes

3U located in COLO space
Yes

AC Power
Sabey is a DC powered site and does not require AC power

DC Power
Two separate feeds (A/B) from the DC power plant to the cabinet
Yes

35 amp fuses/breakers in the fuse panel
Probably but needs to be verified

Generator backup
Yes

-48VDC Power
Yes

Fuse/circuit breaker panel located at the top of the cabinet
Probably but needs to be verified

Battery backup on the DC power plant
Yes

Proper ground connection
Yes

Environmentals

Protection from water
Yes

Humidity control
Yes

Adequate HVAC
Yes

Cabinet air flow
Probably but needs to be verified once the C3 ring cabinet is designated

Fiber

Fiber pathway between cabinet and COLO space
Probably but needs to be verified once the C3 ring cabinet is designated

Fiber tie between Node equipment and demarc FDP
Probably but needs to be verified once the C3 ring cabinet is designated

Fiber tie between Node demarc FDP and C3 fiber
Probably but needs to be verified once the C3 ring cabinet is designated

Documented fiber path diversity
To be completed

Security and Access

Access to space restricted
Yes

Access to line fibers restricted
Yes

Access to cabinet secured
Probably but needs to be verified once the C3 ring cabinet is designated

24/7 access for support personnel
Yes. Need to complete background check

24/7 contact for site issues

Yes

Summary

Table 1 summarizes the estimated cost required for each site. Note that this estimate can vary significantly from the actual costs for each site depending on the contractor performing the work and the type of cabinet selected. The 48 strand tie with panels price is accurate and is based on a vendor quote which does not include tax and shipping. Due to the variances, each node site should identify their true costs to bring the sites into compliance.

Table 1 - Estimated Node Site Costs

	Est Cost	Westin	Bothell	Bellevue	Renton	Kent	Tukwila
Cabinet	$2,400	$0	$0	$0	$2,400	$2,400	$0
Installation	$1,000	$0	$0	$0	$1,000	$1,000	$0
Power strips/misc	$600	$0	$600	$600	$600	$600	$0
48st tie with panels	$5,300	$0	$5,300	$10,600	$5,300	$5,300	$5,300
Fiber installation	$600	$0	$600	$600	$600	$600	$600
Install Power Drop	$2,000	$0	$2,000	$2,000	$0	$2,000	$0
Total for Site		**$0**	**$8,500**	**$8,500**	**$9,900**	**$11,900**	**$5,900**

Table 2 is an excel spreadsheet dashboard of the site readiness and summarizes the information contained within this document.

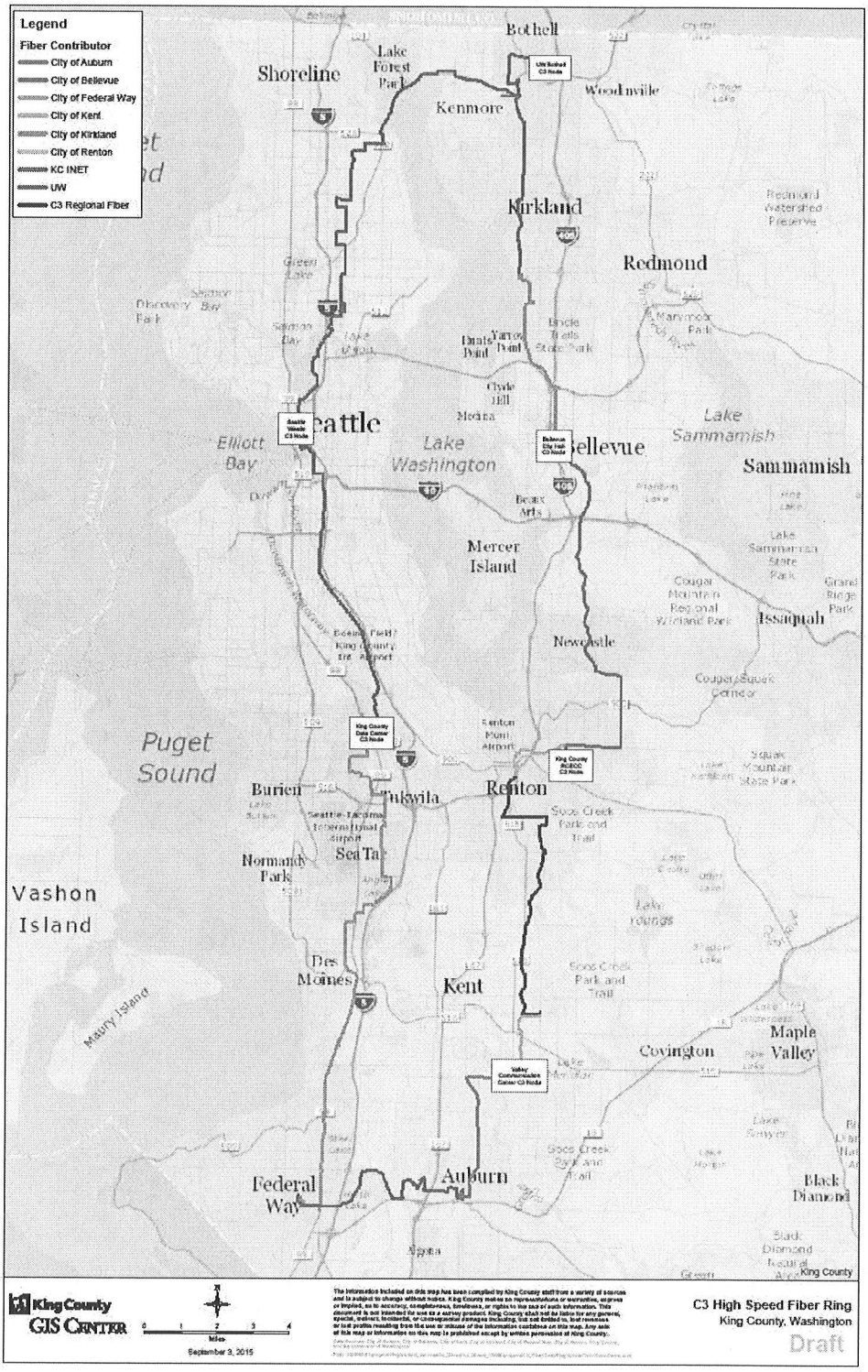
Table 2 - Site Survey Dashboard

Worksheet

Appendix C
Spares List

Part Number	Description
1040700041	Power Supply Module DC for 9HU Shelf, 1000W, PSU/9HU-DC, HW Rel 2.00
1040700042-01	Power Supply Module AC for 9HU Shelf, 1000W, PSU/9HU-AC, HW Rel 1.02
1063708416	Common Equipment Module for 9HU Shelf, CEM/9HU, HW Rel 2.00
1042700011	Fan Module for 9HU Shelf, FAN/9HU, HW Rel 2.00
1063708423-01	Shelf Control Unit II with High-Availability Functionality, 2.5 HU high for small slots, SCU-II, HW Rel 1.01
0061705844-03	SFP IF, 850nm, Intra-Office Reach, for 1G FC, 2G FC, and GigE, SFP/2G1/850I/MM/LC, HW Rel 3.01
1063708412	Network Element Control Unit with high performance processor, 2.5 HU high, 2 RJ45 Ethernet ports and 1 serial port, NCU-II, HW Rel 2.01
1063708463-03	Optical Supervisory Channel Module with 2 pluggable network ports, OSCM-PN, HW Rel 3.01
1061706193	SFP IF, 1510nm, Very Long Reach, 125Mbit/s only, for use with OSCM-PN and OSFM+#1510, SFP/FE/C1510V/SM/LC, HW Rel 2.00
1063701000-01	Dual Terminal 10G Core XPDR with 2x XFP client IFs and 2x XFP network IFs, 2WCC-PCN-10G, HW Rel 1.01
1063703210-01	5-Terminal Access XPDR with 5x SFP+ client IFs and 5x SFP+ network IFs, 5WCA-PCN-16GU, HW Rel 1.01
1063703200	Dual Terminal 10G Access XPDR with 2x XFP client IFs and 2x XFP network IFs, 2WCA-PCN-10G, HW Rel 2.00
1078974400-01	SH1PCS, 1HU Packet Connectivity Shelf for Packet Optical Carrier Ethernet with Full 11G OTN Line Interface, EFEC, & GCC Communication, Includes 2x Slots for Client Cards (Kit, including Fan Module, 1x PSU filler, and 1x Client Interface filler), SH1PCS&FAN
1040974039	SH1PCS, 200W AC Power Supply Module, S/PSU/AC-200, HW Rel 1.01
1078974424-01	SH1PCS, 8-Port GigE Client Interface Module with SFP Pluggable Ports, PCS/PM/GE/8/SFP, HW Rel 1.01
0061701811-03	11G XFP IF, 1310nm, Standard Reach, 9.953 Gbit/s-11.400 Gbit/s, XFP/11G/1310S/SM/LC, HW Rel 3.01
1061701850-02	10G/11G SFP+ IF, 1310 nm, Short Reach, SFP+/11GU/1310S/SM/LC, HW Rel 2.01
1061705850-02	SFP IF, 1310 nm, Standard Reach, Gigabit Ethernet (FSP 3000/FSP150) and Fast Ethernet (FSP 150 only), with Industrial Temperature Range, SFP/GBE/1310S/SM/LC/TIN, HW Rel 2.01
1061701400-01	Up to 11G XFP DWDM IF, Very Long Reach, C-Band Tunable, 81 Wavelengths, XFP/11G/DCTV/SM/LC, HW Rel 1.01
1061702000-01	Up to 11G SFP+ DWDM IF, Very Long Reach, C-Band Tunable, 96 Wavelengths, SFP+/11GU/DCTV/SM/LC, HW Rel 1.01
1063708449-01	Optical Path Protection Module, OPPM, HW Rel 1.01
1063708320	ROADM Module, 8-Degree, WSS-Based, 40 C-Band Wavelengths, 100 GHz, with WSS, 1x8 Power Splitter, and Integrated OPM, 8ROADM-C40/0/OPM, HW Rel 2.02
1063709052	Optical Amplifier, Double Stage, 20 dBm maximum output power, variable gain for low-gain applications, gain controlled (C-Band), Dual Monitoring Ports, EDFA-C-D20-VLGC-DM, HW Rel 2.01

Appendix D
Ring Map



Appendix E
Fiber Segment Detail Spreadsheet

APPENDIX E

FIBER SEGMENT DETAILS

iber Connection Options for C3 High Speed Ring and C3 South Loop

C3 High Speed Ring

Date: 02/19/16

SIX C3 High Speed Ring Nodes at Westin, UW Bothell, Bellevue City Hall, KC RCECC, VCOM, and Sabey Tukwila

For data Compilation - King County GIS Contact: Cheryl Wilder (206) 477-4421, Cheryl.Wilder@kingcounty.gov

					Point A				Point Z						GIS Contacts			Technical Contacts			
Fiber Link No.	Description	UWDLR	Fiber Contributor	Fiber Owner	Bldg	Strands	Panel	Ports	Building	Strands	Panel	Ports	Tested Length	Fiber Line Status	Name	Email	Phone	Name	Email	Phone	Fiber Route Details for GIS Mapping (Digital Spatial data set; ESRI, AC, text descriptor, or hardcopy)
Segment #1	**Westin To UW Bothell**	DLR003175																			
1.1	Westin To UW Bothell		UW	UW	Westin		804.01.DB P1	9/10	UW Bothell		B1-2	11/12		Assigned by UW	Brenda Jones	brendaj@uw.edu	206-221-4523	Brenda Jones	brendaj@uw.edu	206-221-4523	
Segment #2	**UW Bothell To Bellevue City Hall**																				
2.1	UW Bothell To Kirkland City Hall		UW	UW	UW Bothell		B1-2	23/24	Kirkland City Hall		A1-2	9/10		Assigned by UW	Xiaoning Jiang, CoK	XJiang@kirklandwa.gov	425.587.3070	Donna Gaw	dgaw@kirklandwa.gov	(425) 587-3080	
2.2	Kirkland City Hall To Bellevue City Hall		CoK	CoK/CoB	Kirkland City Hall	93/94			Bellevue City Hall	93/94				Complete	Xiaoning Jiang, CoK	XJiang@kirklandwa.gov	425.587.3070	Donna Gaw	dgaw@kirklandwa.gov	(425) 587-3080	
Segment #3	**Bellevue City Hall To RCECC**																				
3.1	Bellevue City Hall To NE 4th Street & Monroe Ave. in Renton (via Factoria Blvd. & Coal Creek PKWY)		CoBV	CoB	Bellevue City Hall	71/72			NE 4th St & Monroe Ave	71/72				Splice needed	Smitha Vijayan, CoB	svijayan@bellevuewa.gov	425.452.6053	Jim Rawley	JRawley@bellevuewa.gov	425.452.7197	
3.2	NE 4th Street & Monroe Ave. in Renton To RCECC		CoBV	CoB	NE 4th St & Monroe Ave	71/72			RCECC	127/128				Splice needed	Smitha Vijayan, CoB	svijayan@bellevuewa.gov	425.452.6053	Jim Rawley	JRawley@bellevuewa.gov	425.452.7197	
Segment #4	**RCECC To ValleyCom**																				
4.1	RCECC To NE 4th and Monroe, Renton		CoRenton	CoR	RCECC	71/72			NE 4th & Monroe, Renton	71/72				Splice needed	Tim Moore	TMoore@Rentonwa.gov	425.430.6881	Ron Hansen	rhansen@rentonwa.gov	(425) 430-6873	
4.2	NE 4th Street & Monroe Ave. to Grady and Wells, Renton		CoRenton	CoR	NE 4th & Monroe, Renton	71/72			Grady & Wells, Renton	77/78				Splice needed							
4.3	Grady and Wells To Renton City Hall		CoRenton	CoR	Grady & Wells, Renton	77/78								Splice needed							
4.4	Renton City Hall To 116th		CoRenton	CoR	Renton City Hall	273/274			116th	32/33				Splice needed							
4.5	116th To Benson Hill Elementary		CoRenton	CoR	116th	32/33			Benson Hill Elementary	32/33				Splice needed							
4.6	Benson Hill Elementary to Kent Vista Hub (Comcast Hub)		CoRenton		Benson Hill Elementary	32/33			Kent Vista Hub	32/33				Splice needed	Galen Hirschi	ghirschi@ci.kent.wa.us	253-856-4614	Galen Hirschi	ghirschi@ci.kent.wa.us	253-856-4614	
4.7	Kent Vista Hub to Kent City Hall		CoK	Comcast	Kent Vista Hub	3/4			Kent City Hall	3/4					Galen Hirschi	ghirschi@ci.kent.wa.us	253-856-4614	Galen Hirschi	ghirschi@ci.kent.wa.us	253-856-4614	
4.8	Kent City Hall to Kent EOC		CoK	Comcast	Kent City Hall	47/48			Kent EOC	47/48											
4.9	Kent EOC to Valley Com		CoK	Comcast	Kent EOC	5/6			ValleyCom	5/6											
Segment #5	**Valley Com to Sabey**																				
5.1	VCOM To Auburn City Hall		CoAuburn	CoA	VCOM	11/12			Auburn City Hall	11/12				To Be Assigned by CoAuburn	Ashley Riggs, CoA	ariggs@auburnwa.gov	(253) 288-3149				
5.2	Auburn City Hall To KC-Inet Federal Way Hub		KC INET	Comcast	Auburn City Hall				KC-Inet Federal Way Hub					To Be Assigned by KC	Cheryl Wilder	Cheryl.Wilder@kingcounty.gov	206.477.4421	Hanker Su	Hanker.Su@kingcounty.gov	(206) 263-7986	
5.3	KC-Inet Federal Wayt Hub To Federal Way City Hall		KC INET	Comcast	KC-inet Federal Way Hub				Federal Way City Hall			Ports 53/54		To Be Assigned by KC							
5.4	Federal Way City Hall To Sabey Tukwila Building 5, Room 133A		CoFW	Zayo	Federal Way City Hall			Ports 1/2	Sabey Bldg 5 Rm 133A			Ports 37/38		To Be Assigned by CoFW	Erik Earle	Erik.Earle@cityoffederalway.com					
5.5	Sabey Tukwila Building 5, Room 133A to King County Data Center		KC-INET	KC-INET	Sabey Bldg 5 Rm 133A				Sabey KCDC					To Be Assigned by KC							
5.6	King County Data Center to Building 2, Sabey Data Center		KC-INET	KC-INET										To Be Assigned by KC							
Segment 6	**Sabey Tukwila To Westin**	DLR003044																			
6.1	King County Data Center to Building 2, Sabey Data Center		KC-INET	KC-INET	Sabey KCDC				Sabey Bldg 5 Rm 133A					To Be Assigned by KC							
6.2	Sabey Tukwila Building 5, Room 133A to King County Data Center		KC INET	KC-INET										To Be Assigned by KC							
6.3	Sabey Tukwila Building 2 To Westin		UW	UW	Sabey Bldg 2/or 5-133A		SDC P3	135/136	Westin		WT-10.1	75/76		Assigned by UW	Brenda Jones	brendaj@uw.edu	206-221-4523	Brenda Jones	brendaj@uw.edu	206-221-4523	

C3 South Loop

For data Compilation - King County GIS Contact: Cheryl Wilder (206) 477-4421, Cheryl.Wilder@kingcounty.gov

Fiber Link No.	Description	Fiber Contributor	Point A	Point Z	Fiber Line Status	Contacts (name, phone & email)	Fiber Route Details for GIS Mapping (Digital Spatial data set; ESRI, AC, text descriptor, or hardcopy)
Fiber Link 1:	**Renton City Hall to Kent EOC**		**Renton City Hall**	**Kent EOC**			
Fiber Link Segment 1-1	Renton City Hall To Kent EOC	C3 (South End Members)			To be designed by C3 South End Members		
Fiber Link 2:	**Kent EOC To VCOM**		**Kent EOC**	**VCOM**			
Fiber Link Segment 2-1	Kent EOC To VCOM	CoKent			To Be Assigned by CoKent		
Fiber Link 3:	**VCOM To Auburn City Hall**		**VCOM**	**Auburn City Hall**			
Fiber Link Segment 3-1	VCOM To Auburn City Hall	CoAuburn			To Be Assigned by CoAuburn		
Fiber Link 4:	**Auburn City Hall To Federal City Hall**		**VCOM**	**Federal City Hall**			
Fiber Link Segment 4-1	Auburn City Hall to Federal City Hall	C3 (South End Members)			To be designed by C3 South End Members		
Fiber Link 5:			**Federal City Hall**	**Sabey Tukwila**			
Fiber Link Segment 5-1	Federal Way City Hall To Sabey Tukwila Building 5	CoFW via Zayo			To Be Assigned by CoFW		
Fiber Link 6:	**Sabey Tukwila To Tukwila City Hall**		**Sabey Tukwila**	**Tukwila City Hall**			
Fiber Link Segment 6-1	Sabey Tukwila Building 5 To Tukwila City Hall	C3 (South End Members)			To be designed by C3 South End Members		
Fiber Link 7:	**Tukwila City Hall To Renton City Hall**		**Tukwila City Hall**	**Renton City Hall**			
Fiber Link Segment 7-1	Tukwila City Hall To Renton City Hall	C3 (South End Members)			To be designed by C3 South End Members		

Appendix F

Definitions

Acceptance Date	The date after 72 continuous hours of network operation within acceptable parameters agreed to by the C3 and UW jointly.
Active Electronics	Switches, routers, hubs that move data across a network.
Dense Wavelength Division Multiplexing	Dense wavelength division multiplexing (DWDM) is a technology that puts data from different sources together on an optical fiber, with each signal carried at the same time on its own separate light wavelength.*
Fiber Segment	A length of fiber optic cable between known points.
Lead Agency	Lead agency is the project member responsible for the successful completion of the project.
NOC	Network operations center.
Node Site	Facility location, usually a data center, of the optical network gear.
Optical Path Protection Module	Provides protection to the network so that a service disruption to the network, reverses traffic in the opposite direction around the disruption (No loss of service.).
Response Time	Acknowledgement of receipt of an incident call.
Wave	A band of colored light used to transmit data.
24x7x365	Denotes industry standard language where service is provided 24 hours a day, 7 days a week, 365 days per year.

*Source: http://searchtelecom.techtarget.com/definition/dense-wavelength-division-multiplexing