EASTRAIL

Friday, January 31, 2020
10:00 AM- 12:00 PM
Sound Transit – First Floor Conference Room
705 5th Avenue South
Seattle, WA 98104

10:00 AM – 10:05 AM **Introductions and Agenda Review**
- RAC Chair/KC Councilmember Claudia Balducci

10:05 AM – 10:10 AM **Approval of Meeting Summary for October 17, 2019 RAC Meeting pp. 3-6**
- RAC Chair/KC Councilmember Claudia Balducci

10:10 AM – 10:40 AM **Fiber Optic Project Return on Investment Analysis Final Report and RAC Resolution (Information and Decision Item) pp. 7-41**
- Darryl E. Hunt, King County
- Joanne Hovis, CTC Technology and Energy

10:40 AM – 11:00 AM **RAC Work Plan for 2020/21/22 (Discussion and Decision Item) pp. 43-47**
- RAC Principals Staff Team

11:00 AM – 11:20 AM **Eastrail Partners Status (Information and Discussion Item)**
- Taldi Harrison, Eastrail Partners/REI
- Matt Cohen, Eastrail Partners/Stoel Rives
- Katherine Hollis, Eastrail Partners, Executive Dir.

11:20 AM – 11:30 AM **Capital Project Dashboard Update (Information Item) pp. 49-68**
- Joe Inslee, Communications Specialist, KC Parks Division

11:30 AM – 11:45 AM **Member Progress and Success Updates**

11:45 AM – 12:00 PM **Public Comment**

Adjourn

REGIONAL ADVISORY COUNCIL

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MEETING SUMMARY
October 17, 2019 – 10:00 AM
City of Redmond Council Chambers

Advisory Council Members Present: Jay Arnold, Deputy Mayor, City of Kirkland (Vice-chair); Angela Birney, Council President, City of Redmond; Susan Boundy-Sanders, Woodinville Councilmember; Vicky Clarke, Eastside Greenway Alliance; David Hoffman, Local Government Affairs and Public Policy Manager, Puget Sound Energy; Kathy Lambert, King County Councilmember; John Stokes, Bellevue Councilmember; Ariel Taylor, Government and Community Affairs Officer, Sound Transit; Tom Teigen, Parks Operations & Community Partnerships Manager, Snohomish County; and Christie True, Director, King County Department of Natural Resources and Parks.

Introductions and Agenda Review

Vice Chair Jay Arnold called the meeting to order at 10:10 a.m., welcomed all in attendance and asked the Regional Advisory Council (RAC) members to introduce themselves.

Approval of July 12, 2019, meeting summary

Councilmember Birney moved approval of the July 12, 2019, meeting summary. There being no objections, the summary was approved.

Trail Development Progress and Upcoming Implementation

Members of the Principal Staff Team provided a presentation on the status of capital projects on the trail, both current and upcoming. The intent is to keep the RAC informed as to the status of the various projects and support RAC consideration of how to address gaps in project funding and where there may be a need for RAC members to participate in coordination efforts supporting a project or projects.

Current projects include:

Project	*Phase*	Funding Status
Gene Coulon Connection	Early design	Partially funded
Lake Lanes I-405 Expansion	Final design	Fully funded
I-90 Steel Bridge	Early design	Unfunded
I-90 Trail/Mts. To Sound Connection	Early design	Unfunded
Wilburton Trestle	Final design	Partially funded
Eastrail – Main Street Greenway Connection	Early design	Partially funded
Grand Connection	Planning	Unfunded
Eastrail NE 8th St. Bridge	Final design	Fully funded
Spring Boulevard Connector	Early design	Unfunded
520 Trail/Northup Way Connector	Early design	Fully Funded
Totem Lake Connector	Final design	Fully funded

Willows/124th Connector	Final design	Fully funded
Kirkland to Woodinville Interim Trail	Planning	Fully funded
145th Crossing	Early design	Partially funded
Redmond Central Connector III	Early design	Partially funded
Centennial Trail South	Early design	Unfunded

Discussion ensued regarding covered overpasses, reclaiming any wood that is removed from the trestle to incorporate into art installations, the Northern Connections Package, the connection under 520 connecting the Redmond Central Connector with the East Lake Sammamish Trail, a correction to the estimated cost for the Redmond Central Connector, the inclusion of updates on capital funding in the work plan, and considering what the RAC's legislative agenda might be.

Eastrail Partners (EP) Formation and Coordination with the RAC

Taldi Harrison, REI and Eastrail Partners Director, reported that since their last report to the RAC the Eastrail Partners' nonprofit status has been secured, consultant staff have been hired on an interim basis and the fundraising target has been exceeded.

Formation of the EP board is underway, with 12 board members in place who were also previously on the ERC Funding Commission. Gene Duvernoy will serve as President, Greg Johnson as Vice President and Stacy Graven as Secretary. The ultimate goal is to have about 17 members on the board. They are currently seeking more geographic representation from Redmond, Renton and Woodinville. They are also looking for expertise in diversity, equity and inclusion; financial management; and fund raising. Two formal meetings have been held to date.

Matt Cohen, Eastrail Partners Board Member, reported that the primary focus right now is recruiting an Executive Director. They are interested in recommendations from RAC members and the broader audience. One of the EP's main focuses will be to work with the RAC to address funding gaps. A draft framework agreement with each of the RAC members to secure their cost shares was provided in the RAC meeting packet. One of the deliverables for the first year is to secure an exemplary corporate sponsorship and joint venture supporting the RAC vision for the Eastrail. In the long and short run, the EP's goal is to mobilize support for the project, public and private, and to support the RAC members in achieving those goals.

Development of 2020/21/22 RAC Work Plan

David St. John, Environmental Affairs Officer, Department of Natural Resources and Parks Director's Office, and Joe Inslee, Communications Specialist, Department of Natural Resources and Parks Director's Office, reviewed a proposed work plan for 2020-2022. Discussion ensued regarding the need to continually work on outreach so the project is not forgotten by those not directly involved; prioritize the items on the proposed work plan; tie the coming features to existing ones; assess corridor programming and the best way to go about it; connect with organizations like tourist bureaus, destination management organization, etc., regarding contributing towards data collection and wayfinding; look at ways to combine resources to achieve the same goal for multiple jurisdictions; consider adding the fiber component to the work plan; include updates on capital projects; and address what the RAC can do from a funding perspective with entities outside the respective jurisdictions.

Confirmation of RAC Chair and Vice Chair for 2019-2021

Motion: Councilmember Birney moved that the RAC continue on with Chair Claudia Balducci and Vice Chair Jay Arnold in their current roles through the next term. The motion passed by consensus.

Member Progress and Success Updates

Sound Transit – The downtown Redmond Link extension is moving from the planning phase into the construction phase. All are invited to the groundbreaking from 1:00 – 2:00 p.m. on October 23rd at 166th Ave. NE and NE 76th.

Eastside Greenway Alliance – Have been providing support for the King County Parks Levy and working on the No on I-976 campaign.

King County – Thanks to all for the Parks Levy support. Shout out to Sound Transit for $3 million for NE 8th from the Access fund. Also thanks to Sound Transit for their work on NE 8th and Wilburton, as well as the work involved in the groundbreaking next week. In regard to public testimony at the last meeting regarding rails to trails and the Surface Transportation Board matter – a page is included at the end of the packet that provides some background on this.

Bellevue – NE 8th is what we have had the most progress on. We've been working closely with King County and Sound Transit staff on the Japanese-American memorial. Biggest concern is the timing.

Snohomish County – Thanks to King County and Woodinville for outreach tied to the Surface Transportation Board matter.

Redmond – Downtown Link Station work is beginning. A sculpture called "The Erratic" will need to move so work on the station can start. Received an award from the American Planning Association for Cleveland Street, one of three great streets in its annual Great Places in America program. Very successful summer series utilizing both the Connector and the downtown park. Redmond Lights, which will also utilize the Connector, takes place December 7 and 8.

Kirkland – Crossing Kirkland was held in September to bring community onto the corridor. Kirkland Rotary is funding a shelter at the site of the original Depot on the rail line. Pieces of the ferry Kalakala will be on the corridor early next year. Cascadia Shakeout took place during this meeting, ask all to take a few moments to reflect on what you would do in the event of an earthquake.

Public comment
The following attendees offered public comment:

- Christopher Randels – Would be helpful to have a cohesive artistic vision or program. Prioritizing the art plan in the 2020 work plan would be a good step. Through a collaboration amongst the cities and agencies involved, create a central portal or mechanism through which community and individual projects can be submitted, reviewed and approved. Encouraged the RAC not to underestimate artistic contributions.

- Jeanne DeMund – Thanks to City of Renton staff and King County for their work in planning Eastrail/Coulon Park connection. Expressed concern regarding safety at the south end of the Eastrail and asked that the completion date not be delayed further.
- John Kerns – Commented regarding the Surface Transportation Board matter and expressed concerns over safety at the Centennial Trail Park due to train activity.

Next steps and adjournment

It was noted that the bad weather notification has been extended through next week – cautioned all to take precautions.

Dates for next year's meetings will be out shortly.

The meeting adjourned at 12:00 p.m.

ctc technology & energy

engineering & business consulting

Eastrail Return on Investment Analysis
Prepared for King County, Washington
January 2020

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Tables

1   Introduction and summary

This document presents an analysis for King County, Washington, as it develops a business strategy for developing, using, and leasing fiber optic assets on the Eastrail corridor. This report was prepared in late 2019 by CTC Technology & Energy.

The development of Eastrail in King County presents the opportunity to build future-proof fiber optic lines and communications conduit through a significant portion of this fast-growing metropolitan area.[1]

Once installed, new fiber and conduit infrastructure along the Eastrail **will enable decades of communications services** to meet County and other public sector needs. Meeting those needs, which were discussed in a report prepared by CTC Technology & Energy in July 2019,[2] represents a significant part of the potential return on investment in the event that the County and its other public partners choose to build fiber assets in the Eastrail.

Research and outreach to stakeholders in preparation of this report indicate that **the planned fiber holds value for private entities as well**. To prepare this report, County and CTC staff met with a range of private companies we had reason to believe might be interested in fiber in the Eastrail. The magnitude of the potential future leasing revenue is unknown, but if we use as a benchmark the existing pricing for fiber leasing established by a local jurisdiction in the King County area, a single lease arrangement of three strands of fiber along the 28 miles of the Eastrail from Renton to Woodinville would cover the network's projected $75,000 annual operating cost (a cost that applies regardless of the construction scenario).

At the fiber lease pricing used by that local jurisdiction ($83 per month per strand mile), a lease of three strands would produce $83,664 in revenue.[3] A hypothetical lease of 30 strands under this scenario would product $836,640 in revenue. This magnitude of revenue would cover operating costs and $761,640 toward capital costs, a figure that would cover all or most of the

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[1] Within the borders of King County, the Eastrail easement is owned by five entities—King County; the cities of Kirkland, Redmond, and Woodinville; and Sound Transit (collectively, "the Owners"). Depending on which entities choose to participate in the potential fiber project discussed here, these Owners may overlap with the entities that will be owners of the fiber infrastructure.

[2] *Eastrail Corridor Fiber and Conduit Feasibility Analysis,* prepared for Eastrail Stakeholders, July 2019. The July report was prepared by CTC Technology & Energy under a contract with the City of Kirkland, with the sponsorship of King County; the cities of Bellevue, Kirkland, Redmond, and Renton; the Renton School District, Bellevue School District 405, and Lake Washington School District; and Pacific Northwest Gigapop (PWNGP).

[3] Fiber strands are almost universally leased in pairs, not in odd numbers, so a lease of three fibers is unlikely. The number is used here not to suggest that any entity would lease this particular number of fibers, but to illustrate the leased fiber count necessary to cover annual operating expenses.

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potential annual debt service on capital costs under the various scenarios presented in the July 2019 report. (As described in Table 2 later in this report, these costs plus $16,000 in depreciation reserves range from $485,430 for the low estimate in Scenario C1 to $904,100 for the high estimate in Scenario A2.) We note that all of these construction scenarios include constructing a single 288-strand fiber cable.

Of course, it is not possible to know for sure who will lease fiber, or at what pricing and with what other terms. Pricing may need to be lower than the local jurisdiction's pricing, the desired fiber routes may be for shorter stretches, and volume discounts may need to be applied. But we do know that many of the private entities with whom we spoke demonstrated concrete interest in leasing conduit and potentially fiber, even though all declined to specify the pricing at which they would lease assets from the County. In addition, all stated a preference to build their own fiber or conduit in the Eastrail if this opportunity was made available to them. Several noted that the fiber and conduit would hold considerably more value to them if they had the opportunity to deploy small cell wireless facilities in the Eastrail, connected by the fiber.

Several also suggested a willingness to bid on a potential County procurement for the opportunity to work with the public entities to deploy and use the fiber or to share costs of deployment.

Given these private entities' unwillingness to share concrete data regarding lease pricing, likely revenues can only be reliably projected through a formal, binding procurement or over time, once fiber construction is complete and the asset can be marketed. That said, based on the data collected in stakeholder research and research of other fiber markets, this report offers the following:

Section 2 discusses the results of the market research into private sector interest in the fiber—as well as the value that would be realized by the public sector users of the fiber.

Section 3 offers an introduction to the dark fiber market, dark fiber leasing structures, and pricing considerations.

Section 4 summarizes analogous dark fiber market prices we have observed in other areas, then applies those prices to the revenue opportunity—and the likely avoided cost to the County and its municipal partners—that will arise from the planned Eastrail fiber. The section concludes that the fiber infrastructure owners' ongoing fiber and conduit operations and maintenance costs will almost certainly be covered by fiber lease revenues, though there is likelihood (but not certainty) that fiber revenues would be sufficient to cover any potential debt service. Potential avoided cost to the County and its other public sector partners, however, are so considerable that they cover significant parts of the capital expense.

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Conclusion and recommendation. In sum, while carrier reluctance to share proprietary data did not enable us to comprehensively quantify the potential revenues that could flow to the Eastrail fiber infrastructure owners from the conduit and fiber construction, we believe **the potential revenue opportunity is robust, as is the significant value and avoided cost over time** that will be derived by public sector users.

In light of the combined potential revenue and savings opportunities, we recommend continuing with this project, determining a procurement and governance structure, and proceeding fast enough to take advantage of improvements that are currently underway in the Eastrail and that can make deployment more efficient. Moving quickly to take advantage of this opportunity will also enable the fiber infrastructure owners to more quickly capitalize on the benefits described here, to the extent feasible.

A procurement for public-private collaboration involving shared cost may offer the fastest means of deploying the fiber—as well as enabling the Eastrail fiber infrastructure owners to use the potential market value of the fiber as a tool to reduce their own construction costs. For example, shared construction with the private sector would reduce the Eastrail fiber infrastructure owners' cost of construction, simplify procurement, and simplify commercial operations and leasing by leaving them to the private entity that shares the costs. Collaboration with a private entity may also enable more efficient, more extensive use of the fiber assets if the private entity can respond faster than can the fiber owners to potential customer requests. In contrast, purely public deployment, operations, and leasing would increase the fiber owners' costs and risk but also maximize revenues and control, including over operations, leasing, and revenue in the long-term.

A purely public model would allow the Eastrail fiber infrastructure owners to adapt their strategy over time as the connectivity market changes and community internet and connectivity needs evolve. Private operations, in contrast, will likely necessitate private decision-making about the use of the fiber—though the fiber owners could attempt to modestly shape that decision-making through lease terms.

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2 The fiber investment offers revenue opportunity and operational value

CTC and County staff undertook the market analysis in order to determine the potential revenues and avoided costs to the County and other owners of the planned fiber. We approached this task by seeking data from potential private lessees of County fiber in order to understand the potential revenue opportunity. We also analyzed the potential savings to the County and other public users of fiber that have been partners to the County in this effort. The goals of the analysis were to determine whether the projected costs for deployment, maintenance, and operations would be covered by a combination of potential revenues and savings—and to understand the return on investment on a $12 million investment by the Eastrail fiber infrastructure owners.

2.1 Potential revenues: Summary of market research

In most markets, there exist only a dozen or two potential dark fiber lessees, given the sophistication and resources necessary for an entity to lease and light dark fiber itself, rather than simply lease lit communications services. In the King County area, these potential lessees include the incumbent and competitive communications carriers (such as Comcast, Wave, and CenturyLink); tower/infrastructure companies (such as Extenet, Crown Castle, and American Tower); and perhaps a handful of large enterprises that seek point-to-point fiber to connect their locations or to connect to other fiber assets they may hold (such as Microsoft, Boeing, Google, or Facebook).

In the course of this project, CTC and County staff-members engaged with 12 potential private lessees or collaborators for the planned conduit and fiber.

In brief, we learned that there exists market interest in the Eastrail opportunity for at least six of the companies with whom we met. Among those with a market interest, there exists particular demand for some segments, depending on the company and its existing service footprint.

While each of the companies has a different business model—serving a slightly different customer base or geography or offering a different set of services—all of the companies that demonstrated interest are primarily interested in leasing conduit, which would enable them to own and control their own fiber. Though stating this preference for conduit, the interested companies did note that they would consider leasing fiber if no conduit option were available.

The companies note that alternative, existing fiber paths do exist in the areas of King County traversed by the Eastrail, thus making the Eastrail fiber an attractive but not singular opportunity to secure connectivity in that part of the County. Some of the companies already have fiber on other routes in those areas and the Eastrail fiber would help add redundancy and resiliency in

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their operations, but not be an essential addition. For those that don't currently have fiber in that area, the Eastrail represents a good opportunity to secure fiber assets, but not an irreplaceable one, given that other leasing options exist.

We also learned from the market research that at least one of the companies leases existing, 25-year-old fiber in the Eastrail currently, but the age of that fiber would make the new fiber opportunity very attractive. In addition, the planned fiber is also attractive because of the design contemplated, which offers lessees greater operational flexibility than the existing fiber, which does not enable service to many customers along the Eastrail but rather serves as a long-haul route through King County.

At least three of the companies indicated interest in a turn-key design, build, operate, maintain, and leasing model, through which the County and its public partners would receive access to conduit and/or fiber assets and the private partner would have opportunity to monetize the assets dedicated for commercial use. In effect, this would result in a means of sharing the cost of construction and maintenance. The companies indicate less interest in a model in which they would share revenues with the County, though at least one is willing to consider this approach.

Most of the companies noted the value of an expedited rights-of-way permit that could be part of this initiative as an incentive to investment on their part. And most of the companies noted that the fiber assets would hold more leasing potential if there existed clarity about the potential to place small cell wireless infrastructure in the Eastrail, connected over the fiber.

None of the companies indicated strong interest in a collaboration that would involve sharing private revenues with the County. This is in part because of the challenge of determining which revenues would be recognized for purposes of sharing: dark fiber leases only or also downstream revenues associated with lit services running over the fiber. In a revenue sharing scenario, further complexity arises from the inevitability that leases of the fiber would include other cost elements associated with incremental construction or splicing, as well as leased services over interconnected assets not owned by the fiber owners; unpacking those revenues for purposes of determining the fiber owners' revenue share would be complex and resisted by companies that decline to make their pricing structures public.

2.2   Potential operational benefits and savings: Summary of value to the public stakeholders

The County and other members of C3 have successfully built dark fiber and leveraged fiber for government, public safety, research, education, and other public purposes over the course of two decades. They have avoided considerable cost relative to services they would have had to buy from private providers absent their fiber holdings. Similarly, the Eastrail fiber infrastructure

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owners will likely derive significant value (and likely avoid significant future cost) as a result of use of the planned fiber.[4]

2.2.1 Anticipated uses of planned Eastrail fiber

The current strategy of building new fiber assets reflects decades of experience indicating that controlling dark fiber offers both financial and operational benefits that grow over time. These include expanding public sector network access, developing smart community infrastructure, increasing resiliency and redundancy for public safety, and increasing internet access and applications for all citizens.

The County and its public partners anticipate using the planned Eastrail fiber in a range of ways that include service in the Eastrail itself, such as wireless internet access, smart lighting, smart parks, surveillance, safety, and wildlife video streaming. They also anticipate that the fiber will support information technology and communications needs at public facilities and will enhance the fiber owners' municipal operations by creating redundant capabilities for public networks such as King County's wide area network, the County I-Net, and C3. The fiber will also enable interconnection with other public sector municipal networks, including the state of Washington's network, the non-profit NoaNet, the Pacific Northwest Gigagpop, and state public safety facilities.

The fiber also has the potential to serve the region's digital equity and broadband universal service goals. Municipal-owned fiber eliminates the restrictions imposed by communications carriers on fiber, such as the I-Net, provided under franchise agreements; in this way, municipal-owned fiber offers the potential to provide services without restriction at locations on or near the Eastrail, including facilities that serve lower-income members of the community. For example, the Eastrail comes within blocks of a large number of the King County Housing Authority's facilities, offering the possibility that the Eastrail fiber could cost-effectively connect these facilities to enable provision of free or low-cost broadband access to members of the community that cannot afford costly high-speed commercial broadband services.[5]

2.2.2 Potential cost savings created by Eastrail fiber ownership

Government agencies lease circuits at rates that sometimes represent many hundreds if not thousands of percent profit for the lessor companies. And even as lease prices may come

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[4] As the County and its partners consider this fiber and conduit investment, we recommend particular consideration of developing an accounting mechanism that can recognize the savings, avoided cost, and value delivered to the County and other public sector users of the fiber. In our experience around the country, public entities seldom account for the true value derived from their fiber assets, leading to the systematic under-valuation of this critical infrastructure.

[5] This potential strategy is discussed in detail in the December 2019 King County Broadband Access Study.

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down over time, government needs grow, frequently requiring greater spending by the locality in aggregate. For this reason, we anticipate that the value to the County and the other public users of the Eastrail fiber will grow over time because, like the other publicly owned fiber in King County, public sector use will grow enormously without any corresponding increase in costs.

The Eastrail fiber thus offers a mechanism to mitigate the risk that future demands will exceed the capacity of affordable services and contain the associated exposure to unknown future costs.

2.2.3 Operational benefits of owning Eastrail fiber

In almost any community, the local government is the largest user of communications services, which are essential to government operations and public. In King County, the fiber owned and managed by the County and its C3 partners has delivered enormous operational benefits and savings. Fiber in the Eastrail would potentially secure similar benefits and savings by extending the public fiber assets and securing these routes for decades to come.

To understand these benefits, we first note that the alternative to municipal-owned fiber—a leased circuit—does have some advantages: For example, it does not require internal staff to operate and maintain the network; its upfront costs are lower than constructing municipal-owned fiber; and the time to activation can be shorter. Leasing, however, has critical disadvantages that make it much less desirable than municipal-owned and operated fiber, particularly with respect to public safety and emergency support services. Specifically, leased circuits mean a municipality does not have:

- Total control and management over its own network

- Ability to evaluate the reliability or availability of circuits because there is no transparency into the private provider's proprietary network and its physical infrastructure

- Independence of the networks used by the public, including the public internet, and would therefore be less secure and reliable

- Control over network security between the end points of leased circuits

Indeed, decades of experience demonstrate that owning or leasing dark fiber offers singular benefits to public entities—benefits that generally cannot be replicated with alternative services purchased from commercial carriers. These benefits include the following.

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2.2.3.1 Facilitates control and management

A network built on leased network services obtained from a service provider cannot provide the control and management that is available in a municipal-owned and operated network. Leased network services are in essence a black box in terms of control and management. A municipality is forced to rely on the provider (usually the phone company) to maintain and operate the core equipment of a leased service (these tasks include configuring the equipment, monitoring the hardware and physical infrastructure, fiber splicing, service restoration, and performing routine maintenance).

Municipalities' internal capacity requirements include video, voice, and data communications. Both voice and video services usually require dedicated bandwidth. Two-way voice and video services require dedicated bandwidth and very predictable transmission delay properties. In other words, linking two-way radio communications systems or supporting videoconferencing over IP or using TDM connections requires the ability to manage bandwidth across the entire network. This functionality can be provisioned on the edge device when using a managed service provider for connectivity—but because a municipality owns and operates its own fiber network, it has control and the capability to increase bandwidth based on the municipality's time frame (which in turn allows a municipality to properly plan for integration of new applications without an increase in cost for provisioning of new bandwidth). Further, it offers the ability to implement advanced Quality of Service mechanisms that can be enforced on a network-wide, end-to-end basis.

Under the leased service model, the Eastrail fiber infrastructure owners and their stakeholder partners would need to request (and pay for) the private company to make changes in the core of the network for a new application, increase bandwidth, or to implement new policies for enhanced Quality of Service. Under the leased model, the fiber owners would also not be able to control who manages and maintains the core of the network. The knowledge, skill set, and security background of those operating the network would likely be beyond the control of the fiber owners.

In contrast, the Eastrail fiber infrastructure owners would control and manage each piece of the communications network. The fiber owners can choose to operate the network on their own with their own staff or outsource the operations to a contractor. Either way, choices regarding the management of the network are in the hands of the fiber owners.

2.2.3.2 Secures availability and reliability

The availability of a communications link is derived from the probability of a failure within the network between two points. Because the Eastrail fiber infrastructure owners would own and operate the fiber, they would have greater control over availability and reliability—which means they would have the benefit of greater operational stability.

By contrast, in a leased circuit network, the end user is not aware of all of the potential risks to availability of the network. Several key factors that affect availability and cannot be determined by the lessee include:

- Physical redundancy in the plant

- Physical redundancy in the building entrances

- Physical redundancy in the networking equipment

- Ensuring network equipment is properly configured and regularly tested to take advantage of hardware and link redundancy

- Redundancy for power and HVAC

- How many facilities the circuit crosses between endpoints

- Whether the plant is located underground or aerial

- Who has access to the core networking equipment and plant

- The core equipment's age and maintenance

- How the system is monitored and maintained

- The single points of failure in the communications link

Many of the factors can be approximated or relative numbers may be obtained from the leased circuit provider; however, for critical government services such as public safety, the approximations and availability estimates from leased network services may not meet the availability requirements of a critical traffic network. In the case of physical architecture issues, such as the physical routes of cabling, approximations are not sufficient, and detailed maps are usually considered proprietary and confidential to a commercial provider.

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In addition, lessees are subject to the lessor's schedule for repair and maintenance of the circuit. Although it may be possible to include provisions in a service level agreement (SLA) for special priority service restoration, it is possible that SLAs will not be adhered to during major disaster events. Further, there may be no way to ensure that a leased circuit for public safety is the first link to be repaired during a major disaster.

A similar problem can arise in both scheduled and unscheduled maintenance of a leased circuit. The timing of these maintenance downtimes may not correspond to available downtimes in a public safety network. Because the County and its partners will own the fiber network, maintenance downtimes can be coordinated to minimize downtime and the fiber owners can prepare for an outage by adapting operational procedures.

SLAs often guarantee availability and repair time, but typically are not reliable in the event of a major disaster. In addition, service providers usually rely on cash rebates to compensate for network outages to the network—an unacceptable solution in the case of public safety, where cash cannot compensate for lost service.

2.2.3.3 Ensures independence from networks used by the public

A municipal communications network owned by government entities does not rely on physical infrastructure, equipment, or other resources that also carry public internet traffic for residents and businesses. In contrast, shared resources are used by a managed network service provider to reduce their cost by taking advantage of the statistical nature of communications traffic. In other words, commercial carriers intentionally oversubscribe their networks to minimize costs (maximize profits), because all of their customers are not likely (statistically speaking) to simultaneously use their services to full capacity all of the time. The advantage of an independent, municipal-owned network is that it is not affected by increases in public internet traffic or outages of networks used by the public.

Additionally, the only way to ensure that there is adequate bandwidth is to overbuild a network to support maximum capacity demand, not average utilization (while absorbing the cost even if the bandwidth is not used). Some leased managed services will charge only for the bandwidth that is used—but capacity is limited. Typically, these services are only cost-effective when institutions have a specific understanding of their applications' bandwidth requirements.

The Eastrail fiber infrastructure would provide a more reliable, higher-capacity, flexible network infrastructure because it would be designed to support a broad range of initiatives and to easily and seamlessly scale to meet new bandwidth requirements.

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In addition, networks used by the public, such as the public switched telephone network (PSTN) and the internet, are often overloaded by traffic during major public safety incidents. This can lead to busy signals on the PSTN and a lack of connectivity on the internet. Municipal fiber networks typically do not experience the same traffic increases and can be designed to handle any expected traffic increase during a major incident.

A municipal fiber network like the Eastrail fiber infrastructure can also prioritize bandwidth both in the core and at the edge. This capability would allow the fiber owners to prioritize by location and to preempt all traffic other than public safety traffic, if necessary. More importantly, the Eastrail fiber infrastructure owners can allocate the infrastructure to ensure that sensitive traffic always has dedicated capacity, because capacity can be readily scaled as needed for other applications.

2.2.3.4 *Enables transparency to understand network routing and configuration*

Commercially obtained connectivity (whether dedicated leased options or simple internet access) traverses physical routes and electronics that are almost never disclosed to the lessees of those services. Some localities have learned the hard way that obtaining services from competing providers as redundant backup did them little good because it turned out both providers had leased physical lines in the same fiber optic bundle that was cut.

Similarly, how traffic is routed in a network matters. If it is all routed to the same central hub where there is a failure, even two government sites physically close to each other may be unable to communicate through such dedicated lines. The Eastrail fiber infrastructure owners would be able to mitigate such vulnerabilities with proper design and operations of the fiber, but that control would disappear if other providers were to design, light, and manage the network.

For proper risk assessment and risk mitigation—truly essential functions of any network manager—the transparency of such information is key.

Fiber owners can physically split the light on a fiber strand into multiple wavelengths to allow different electronics for each, essentially creating multiple physically separable and routable networks. This would be especially useful where fiber counts are scarce and in mixed network environments: some can be for open access commercial partner use, others for federal partners, and some for internal use.

Similarly, separation and capacity can be managed electronically with separate VPNs, each with its own rules and uses. Such flexibility is rarely possible for entities that do not own the network. In addition, the time it takes to turn up such services can be very long as the provider often needs to do its own internal management with multiple internal partners, and a long procurement

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process may be necessary. In contrast, the Eastrail fiber infrastructure owners would be able to turn up such services relatively quickly because they would control the infrastructure.

2.2.3.5   Ensures control over network security

Implementation of network security on a leased circuit typically occurs at the edge of the network. Many leased networks use end-to-end encryption to securely transmit data over networks that share a core network with public users. Frequently, the provider of a leased circuit may dictate what types of end-to-end security are allowed on a leased circuit (IP managed services, for example).

The Eastrail fiber infrastructure owners would be able to control end-to-end security throughout the network infrastructure—including elements of data security and physical security, such as:

- Access to facilities and networking rooms

- Passwords to edge equipment and firewalls

- Network access and authentication

- Monitoring of networking rooms, including security alarms, surveillance cameras, etc.

- Desktop security

- Equipment placement and provisioning

2.2.3.6   Enables segmentation

Good security with smart segmentation capabilities—from fiber and physical electronics, to virtual network segmentation—is critical to both internal government operations and working with partners and user groups. The Eastrail fiber infrastructure would offer its owners the ability to segment traffic—either by allocating strands of fiber or segmenting the light within a strand— which would maximize the potential uses and benefits of the fiber across its range of users.

Physical separation with different strands of fiber is appropriate and desirable when partnering with private sector or higher education partners who are able to light the fiber and provision their own networks with electronic equipment. Allocating different strands to different entities allows those entities to assume their own risk and liability for network operations.

For governmental uses of the network, segmentation of the light in a fiber strand into discrete frequencies (a technology called multiplexing) allows for further physical segmentation. This requires optical equipment at each end, which imposes a burden of responsibility to keep the

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signal going (including ensuring power and protection of the equipment), but the burden is rather small, and this method is often used as alternative to building costly additional strands. Multiplexing can maximize the cost-effective use of even a single pair of fiber.

For internal separation among public safety, financial, and regular internal traffic, segmentation is typically implemented with electronics. More robust equipment allows for segmentation that can allocate bandwidth and prioritization to specific classes so public safety can be prioritized. Other methods allow for encryption and simulation of separate virtual networks. Segmentation is critical to managing the different policies that attach to traffic (e.g., how sensitive is the data? What quality of service does it need?). More interconnection and more partnerships require more options in terms of fiber and electronics to facilitate communications.

The different types of segmentation are key to managing security. Sometimes such decisions are explicitly stated as requirements. For example, some sensitive federal data require total physical isolation of systems. But in most cases, segmentation is a matter of risk management. Segmenting traffic on the Eastrail fiber infrastructure would allow network and security managers to better isolate traffic, to quarantine threats without affecting other critical communications functions, and to more quickly restore services.

2.2.3.7 Supports last-mile broadband deployment

If fiber in the Eastrail is made available on a competitive basis to commercial and non-profit service providers, it may serve as a platform for new last-mile broadband. Access to middle-mile fiber can reduce the length of connections necessary for a service provider to reach neighborhoods where it may want to invest; provide higher quality, lower-cost internet connections for local providers; and provide more options for backhaul to wireless sites that can support local wireless ISPs (WISP) and enable mobile network operators' (MNO) expansion.

Open access long-haul and middle-mile fiber represents a proven model. For example, from 2009 to 2011, the federal Broadband Technology Opportunities Program (BTOP) awarded $3.5 billion in grants for fiber to anchor institutions like schools and libraries, with a requirement that excess fiber be available for use by ISPs. Generally, those projects that adhered to the open access rules were successful in modestly expanding rural broadband and improving service in metropolitan areas. In one notable case, the statewide Maryland middle-mile project facilitated expansion of wireless in some remote areas, reduced commodity internet costs for small ISPs throughout the state, and enabled connection of WISP facilities in suburban and rural areas to data centers in the Washington, D.C./Baltimore metropolitan area. In Washington, the NoaNet open access fiber network connected numerous anchor institutions and made available competitive capacity for ISPs seeking to reach new markets.

3   Background regarding dark fiber market, lease structures, and pricing

This section of the report summarizes relevant considerations regarding the dark fiber market generally, lease structures, and factors in dark fiber pricing.[6]

3.1   The dark fiber market

Generally, all dark fiber fits into three categories, with some sub-categories: (1) long-haul fiber, connecting towns, cities, or regions to each other; (2) metro-area fiber, connecting locations and facilities within a city or metropolitan area; and (3) distribution fiber, "passing" homes and businesses throughout a community as part of a fiber-to-the-premises initiative.[7]

The fiber in the Eastrail will have the potential to serve both long-haul needs (i.e., traversing a long swath of the County) and metro-area needs (connecting to fiber within the County that then extend to data centers and communications users).

For each of these categories, the dark fiber market is much like the real estate market, in that the value of fiber is location- and market-specific. Unfortunately, it is *not* like real estate in that there exists little publicly-available transaction data by which to understand individual markets or on which to base local pricing decisions. This remarkable national lack of reliable and comparable data makes it challenging to project lease revenues.

3.2   Factors in dark fiber lease pricing

Dark fiber is generally priced on a per strand per mile basis for a set term. Usually, the lease price is for fibers on an existing fiber network, and the lessee is charged the incremental cost to connect its facility to the closest access point on the existing fiber route. Additional fees are also assessed for colocation, splicing, make-ready, and rack space. Some entities also charge an upfront fee to cover administrative costs.

Dark fiber pricing varies greatly among markets and, even in the same market, among carriers. Pricing is route-specific, location-specific, and sometimes frankly arbitrary. Pricing and structures vary greatly based on region, population density, volume, availability of alternate communications services, cost structures, and other factors.

Reasonable pricing models are wide-ranging and influenced by numerous factors, including the location and urbanity of a region and the avoided construction costs. While cost recovery is a

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[6] In addition, Appendix A contains a summary of how cities and counties use their dark fiber pricing to incent and enable certain kinds of policy goals, including competition and last-mile broadband deployment.

[7] The Eastrail strategy does not contemplate distribution fiber and is therefore not discussed here. Unlike most long-haul and metro fiber, pricing for distribution fiber will be based on passings rather than on miles.

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fundamental objective of lease pricing, ultimately it is what the market is willing to pay that determines pricing. IRU and lease rates vary widely across the country. We have found that, nationwide, shorter-term dark fiber leases can range from $20 to $2,500 per strand per mile per month, based in part on whether a location is urban or rural and whether alternative options exist. This is a large range that reflects the importance of local factors in setting rates.

Metro-area prices are generally higher (on a per mile basis) than long-haul fiber. Within the metro-area category, more urban routes are generally more costly than routes in suburban and exurban areas, depending on existing and potential supply in the urban market. Occasionally, an urban market will prove to be surprisingly cost-effective, usually because a glut of fiber has had the competitive impact of pushing pricing down.

Pricing on major routes is generally more consistent than metro-area pricing, at least in the non-profit sector. Non-profit and public entities tend to publish their rates and offer them to all lessees (though sometimes with discounted pricing for specific types of lessees, such as schools or government), while for-profit entities usually will price dark fiber only on a custom basis and hold pricing data and factors very close to the vest.

Pricing will be higher for routes on which it is particularly difficult to build fiber because the asset represents a singular opportunity unless there exist accessible alternative routes. This is the case for particularly costly build areas, such as urban cores, across rivers or highways, and across mountain paths without roads.

3.3   Dark fiber lease structures

The communications industry in the United States has evolved a range of dark fiber lease structures over the decades of fiber deployment and operations. These structures are used by a full range of entities that own or use fiber, including public, private, and cooperative entities. The structures serve a range of goals, including those related to accounting and tax treatment, but for purposes of this analysis, the structures involve an interplay of two critical elements: first, length of fiber lease/lease and, second, cost. The longer the term, the lower the effective monthly payment, giving the user an effective discount in return for a long-term commitment and (usually) an upfront payment.

Upfront payment plus maintenance. Most commonly, dark fiber is leased or leased for up to 20 or more years through a specialized leasing vehicle known as an Indefeasible Right of Use (IRU). The customer pays a substantial upfront fee, generally calculated based on number of fiber strand miles leased, as well as a recurring annual maintenance charge. The maintenance charge is calculated on route miles, not strand miles.

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The upfront payment usually covers the entire term of the IRU, while the maintenance and colocation portions of the contract are variable or change based on predetermined measures, which allows for cost adjustments (modest in the case of maintenance) based on industry trends or inflation.

For the fiber owner, the benefit of this model is that it produces a substantial inflow of funds early in the IRU term. On the other hand, the model will not result in recurring annual revenues over the long term, beyond a portion of the cost of maintenance.

Per annum or per month pricing. This structure is used primarily for shorter-term commitments, which benefits a lessee that prefers a shorter-term financial obligation or that cannot pay a large upfront IRU fee. For the fiber owner, it also offers the flexibility of a shorter commitment and the chance to increase prices over time or lease to other lessees. In addition, it may increase the number of potential dark fiber lessees by making the initial costs more accessible.

Net pricing over the term of the lease is usually higher than in the upfront payment model over the same period.

4 Potential for market revenues and savings to cover fiber costs

To determine whether the potential combined avoided cost and revenues of the projects could meet or even exceed the projected costs of the project, we developed market data from around the country that shed light on potential lease costs and revenues on the Eastrail.

We applied the data to two different means of pricing fiber: first, long-term leases that require upfront payment for the entire term and more modest annual contributions toward maintenance, and second, shorter term leases that are priced on a per month basis with the lease fee and maintenance contribution built into the monthly price.

4.1 Potentially analogous dark fiber market prices in other areas

In light of the challenges securing dark fiber pricing data for King County itself, we researched other markets to understand potentially analogous pricing models. As is discussed above, there exists only limited public data regarding dark fiber pricing, and pricing is extremely location-specific, but with those caveats, we analyzed the Eastrail opportunity in light of the lease prices summarized in Table 1.

Table 1: Dark fiber lease rates in other areas

Location	Fiber lessor (owner)	Monthly rate per strand mile[8]	Term
Arizona urban	Commercial entity	$450	Monthly
King County area	Local jurisdiction in the King County area	$83	Monthly
Colorado urban	Commercial entity	$22, paid upfront, plus monthly maintenance fee	20-year IRU
Burbank, CA	Burbank Utilities	$200	Monthly
East coast urban	Commercial entity	$22, paid upfront, plus monthly maintenance fee	20-year IRU
Eugene, OR	Eugene Water & Electric Board	$57	Monthly, for 1 to 5 years
Palo Alto, CA	Palo Alto Utilities	$177	Monthly
Riverside, CA	Riverside Public Utilities	$125	Monthly

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[8] Generally, these are the per mile prices offered to commercial entities. In some cases, public and non-profit fiber owners offer lower pricing to public entities such as schools. In addition, the pricing offered by commercial entities is not standardized or based on a published rate sheet but is rather generated on a case-by-case basis.

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4.2   Application of analogous pricing to Eastrail costs

As is discussed in the July 2019 paper,[9] Eastrail conduit and fiber construction costs are estimated to range from $6.6 million to $12.6 million and operations and maintenance costs are estimated at $75,000 per year, exclusive of debt service.

The July report summarized the costs under the various construction scenarios as follows:

Table 2: Annual cost summary and revenue requirement for all construction scenarios

	Scenario							
	A1		**A2**		**B1**		**C1**	
	Conduit – Fiber and innerduct in one		Conduit – Fiber in one and innerduct in all		Conduit – Fiber and innerduct in one (one large handhole vs four handholes in "A" scenarios)		Single Conduit – Fiber and innerduct in one (one large handhole vs four handholes in "A" scenarios)	
	Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
P&I (20 years at 6%)	$642,290	$769,630	$741,000	$888,100	$606,960	$727,250	$469,430	$562,210
Operating expenses	59,100	59,100	59,100	59,100	59,100	59,100	59,100	59,100
Depreciation reserve	16,000	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Required revenues	$717,390	$844,730	$816,100	$963,200	$682,060	$802,350	$544,530	$637,310
Required revenues without P&I	$75,100	$75,100	$75,100	$75,100	$75,100	$75,100	$75,100	$75,100

As the July paper discusses in more detail, for the lowest-cost scenario (C1), revenues of $544,000 to $637,000 per year would be required to fully cover all costs, including debt service, over a 20-year debt term. For the highest cost scenario (A2), revenues of $816,000 to $963,000 would be required to fully cover all costs, including debt service.

Under all of the construction scenarios, revenues of only $75,000 would be required to cover operations and maintenance but not debt service.

At the pricing used by the local jurisdiction in the King County area ($83 per month per strand mile), ongoing lease of three strands throughout the 28-mile initial phase of the Eastrail project would produce $83,664 in revenue. more than covering the $75,000 annual operations and maintenance cost of any of the construction scenarios. A hypothetical lease of 30 strands under

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[9] *Eastrail Corridor Fiber and Conduit Feasibility Analysis,* prepared for Eastrail Stakeholders, July 2019.

this scenario would product $836,640 in revenue. This would cover the $75,000 in operating costs and $761,640 toward capital costs, covering all or most of the potential annual debt service on capital costs under the various scenarios presented in the July 2019 report. (As described in Table 2, the estimates of these costs, plus $16,000 in depreciation reserves, range from $485,430 for the low estimate in Scenario C1 to $904,100 for the high estimate in Scenario A2.) We note that all construction scenarios include constructing a single 288-strand fiber cable.

Given the interest shown by the providers with whom we met, we feel confident that the leasing requirement to cover operations and maintenance will be achievable given the local jurisdiction's pricing. The likelihood of covering debt service, however, is less certain. While not infeasible, we do not have enough market data to conclude that the revenues required are certain. We emphasize that pricing may need to be lower than the local jurisdiction's pricing, the desired fiber routes may be shorter stretches, and volume discounts may need to be applied.

If, however, we recognize the savings to the Eastrail fiber infrastructure owners and other public sector stakeholders associated with the new fiber capabilities, the financial picture is more robust. The savings to the fiber owners, relative to leasing dark fiber from a commercial carrier on the private market, can be measured based on the same pricing data points discussed above—and demonstrates that the savings alone will cover much of the cost to the fiber owners of even the more costly construction scenarios.

To be conservative, we applied to this analysis the lowest of the lease prices summarized in Table 1:

For a 20-year IRU, we applied the costs paid by a public entity in an urban East Coast area. The city leased dark fiber at $22 per strand mile per month for a 20-year term, paid in total upfront, plus an annual maintenance fee of $250 per route mile per year. Applying this model and assuming that the Eastrail fiber infrastructure owners collectively pay for a 24-count fiber IRU (a relatively low number of fibers compared to what they could access by building themselves) across 27 or so miles that approximate the routing of the Eastrail, the upfront cost to the public entities for the 20-year IRU would be $3.4 million and the annual maintenance cost would be $6,750. For a 48-count fiber IRU, the upfront cost would be $6.8 million. This avoided cost represents an amount equal to more than half of the capital cost of building the entire asset.

For a one-year lease, we applied the costs charged by the Eugene Water & Electric Board in Oregon, where the city's utility leases fiber to commercial entities at a cost of $57 per strand mile per month for a one- to five-year term, paid on an annual or monthly basis. Assuming that the County and its public partners collectively leased 24-count fiber (again, a relatively low number of fibers compared to what they could access by building themselves) across 27 or so miles that

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approximate the routing of the Eastrail, the annual cost for the fiber lease would be $443,000. For 48 strands of fiber, the annual cost would be $886,000. This avoided cost represents an amount equal to all or most of the cost of annual operations of the fiber, including debt service.

4.3   Summary of potential revenues and savings of Eastrail fiber project

This analysis is summarized in Table 3.

Table 3: Summary of potential revenues and savings of fiber and conduit project

20-year IRU cost analysis	Estimated costs and savings
Capital cost[10]	$6.6 to $12.6 million
Avoided cost to public stakeholders of 20-year IRU for **24-count** fiber, based on lowest analogous cost (East Coast city, $22 per fiber mile)	$3.4 million
Avoided cost to public stakeholders of 20-year IRU for **48-count** fiber (East Coast city, $22 per fiber mile)	$6.8 million
Annual cost analysis	
Annual operations and maintenance cost, per year, including debt service	$540,000 to $960,000
Avoided cost to public stakeholders of one-year lease of **24-count** fiber, based on lowest analogous cost (Eugene, OR, $57 per month)	$443,000
Avoided cost to public stakeholders of one-year lease of **48-count** fiber, based on lowest analogous cost (Eugene, OR, $57 per month)	$886,000

Thank you for the opportunity to develop the analysis, which will help inform the investment decision for building a communications use within the Eastrail. The development of Eastrail in King County presents the opportunity to build future-proof conduit and fiber optic lines through a significant portion of this fast-growing metropolitan area. Fiber and conduit infrastructure along the Eastrail will enable decades of communications services to meet the region's public sector needs. Meeting those needs represents a significant part of the potential return on investment in the event that the Owners and their other public partners choose to build fiber assets in the Eastrail.

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[10] For a detailed discussion of the capital and operating cost estimates, including debt service assumptions, please see the July 2019 report.

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Appendix A: Strategies for using dark fiber pricing to achieve goals

Pricing is one means by which a dark fiber owner can attempt to achieve goals based on policy priorities as well as financial goals. In our experience, both public and private entities have developed fiber and lit service pricing for the purpose of addressing policy goals such as competition in the last-mile market. The sections below offer examples of some of those goals and the pricing strategies that can help achieve them.

One complication, however, is that policy objectives can be in opposition. On one hand, for example, pricing must be high enough to meet revenue goals and discourage customers from leasing unnecessary capacity, whether simply by being wasteful or attempting to control the fiber to block access by competitors. On the other hand, policies and pricing must not discourage potential customers or involve so much cost that the first dark fiber customer is able to undercut the Eastrail fiber infrastructure owners' leasing opportunity by selling other entities lit services over the fiber it has itself leased.

Encourage development of a competitive ISP market

Through very attractive pricing, a fiber owner can seek to attract multiple competitive providers into the market of providing services over certain fiber routes. Pricing for particular routes can be set with consideration of how much competition the owner would like to enable: lower pricing, such that the fiber becomes a resource that is affordable to mid-size users, not only the most sophisticated users, is likely to mean more users.

A fiber owner can price different routes and segments at different amounts, for the purpose of encouraging use in particular areas, perhaps especially those that are less in demand—so long as the fiber owner is comfortable with the modestly greater administrative effort to manage the differently priced segments.

The goal of encouraging use and competition sometimes merits the fiber owner (or its agent) lighting the fiber and offering more accessible services to smaller users. While access to dark fiber on desirable routes greatly reduces the barrier to providing services over that route for those that can take advantage of it, dark fiber access does not lower barriers to competition as effectively as can lit services. This is because there is still considerable cost and complexity in lighting and operating an optical network over dark fiber. Only a sophisticated, well-funded company will have the scale and capacity to do so. Given the cost involved and the potential competition in the market created by the dark fiber itself, it's not likely that more than a small handful of entities would be interested in leasing dark fiber in the near term. Indeed, the market, depending on how the fiber is priced, may support only one or two lessees for the foreseeable

future. (Over the long term, however, market demand and structures may change and new opportunities for dark fiber competition may arise.)

In contrast, access to lit services over the fiber can provide low-cost transport to many service providers, including very small operations with modest resources, at low incremental cost. Lighting the network in the first place is costly, but the platform can then add additional competing providers quickly and cheaply.

At the same time, so long as dark fiber is licensable, the market frequently will provide alternative services for the smaller entities that can't afford to lease and light it themselves. Unless precluded by contract terms, a dark fiber lessee on a desirable route is likely to sell lit services to other entities, including smaller ISPs—thus partially filling the role of providing lit services that the fiber owner has declined. That said, an ISP lessee is less likely to be neutral or non-discriminatory in selling lit services to its competitors, so the prospect of a fiber lessee as wholesaler is not exactly equivalent to the outcome if the neutral fiber owner is the lit services wholesaler, and the result may be less competition than would otherwise emerge.

A fiber owner can also use lease pricing to incentivize last-mile construction investments, particularly in areas that the fiber owner seeks to prioritize for such deployment. In this scenario, the fiber owner would offer reduced pricing (dark or lit) in cases where the customer commits to building last-mile connections that capitalize on the access. That preferential pricing could even be improved further for investments in certain high-priority target areas.

Rather than giving reduced pricing upfront, some fiber owners provide rebates or credits for lessees once they meet their commitments to invest in last-mile construction—for example, based on a sliding percentage of lease fees.

In most circumstances, this strategy has only limited efficacy because the cost of the long-haul or middle-mile connectivity represents a relatively small percentage of the cost for an ISP of deploying and operating last-mile facilities. That said, in circumstances such as those in the County's current case, the credit could represent significant value for a lessee given that the value of the fiber routes under construction is high and the routing itself so singular.

One additional, important means of encouraging competition is to limit the amount of fiber that an individual customer can lease. This is a practice that has been adopted in cases where the fiber owner was concerned about a well-resourced entity leasing most or all of its available strands and then "squatting" on them—effectively reducing competition by tying up a large proportion of the available inventory. Given the abundance of planned Eastrail fiber, this may

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not serve to be a concern, but the County may wish to consider limiting any individual lessee to no more than 50 percent of the available asset.

In addition, **pricing can encourage local buildout by creating incentives for use of the dark fiber within the state.** This would entail some combination of limiting the amount of fiber that can be leased to entities that do not operate in King County (i.e., those that use the fiber only as part of a long-haul connection) and higher pricing for such entities.

Support local companies

In particular for public fiber owners, including localities and states, one policy priority is to enable companies within the jurisdiction or state to compete in the broadband market. In these cases, fiber owners offered preferred pricing for local companies.

Maximize revenue

Dark fiber owners frequently seek to maximize revenue by maximizing the number of lessees. But such an approach can backfire if increasing the number of customers lowers the market price of the fiber because of the increased competition and new lit services offered by lessees. Depending on the customers' intended uses for the dark fiber, too, the first lessee could have a business opportunity that is stronger than any other.

To reduce that risk, some dark fiber owners lease newly-available fiber all at once through a competitive process that establishes pricing levels and that mitigates the challenge of lack of information about comparable pricing (especially for singular dark fiber routes).

In another strategy that seeks to maximize revenues (and reduce administrative costs), some fiber owners charge a premium for exclusive leasing of a significant amount of fiber to a single entity whose business model is to wholesale service to other ISPs and offer services itself. Through individual negotiations, auction, or RFP process, the fiber owner awards the lease to the highest bidder that is also willing to commit to wholesaling services to other entities.

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Appendix B: Glossary of terms

Dark Fiber – Fiber optic strands that are installed in underground conduit or attached to utility poles, but are not "lit" by network electronics; these fibers are "dark" in that communications are not passing through them.

Dark Fiber Lease – A contract to lease dark fiber, typically for a shorter term than that in an IRU agreement, paid on a month-to-month or annual basis.

Fiber-to-the-Premises (FTTP) – A network architecture in which fiber optics are used to provide broadband services all the way to each subscriber's premises.

Internet Service Provider (ISP) – An organization that provides services over wired or wireless technology enabling customers to connect to the internet.

Indefeasible Right of Use (IRU) – A long-term agreement, typically covering up to 20 years, under which the customer purchases the right to use dark fiber strands on a network.

Last-Mile – The communications infrastructure that connects a network to end users' premises.

Lit Fiber – Fiber optic strands that are "lit" with network electronics and used to deliver broadband services to end users.

Middle-Mile – The communications infrastructure that connects from a network operator's core operational equipment to equipment near end users; this infrastructure does not connect to the users themselves, but brings connectivity close to them and connects to the last-mile.

Outside Plant (OSP) – The physical infrastructure portion of a network (also called "layer 1") that is constructed on utility poles (aerial) or in conduit (underground) and that is largely located in the public rights-of-way.

A resolution of the Eastrail Regional Advisory Council regarding the proposed fiber optic project in the Eastrail

WHEREAS, the vision of the Eastrail Regional Advisory Council (RAC) for the Eastrail corridor embraces its development for multiple uses including a regional trail, high capacity transit, and utilities; and

WHEREAS, the King County Department of Information Technology (KCIT) and the City of Kirkland, on behalf of a number of fiber infrastructure stakeholders located along the Eastrail corridor, in 2019 initiated a project to explore the potential to develop and implement new fiber optic infrastructure in the corridor; and

WHEREAS, at its July 12, 2019 meeting the RAC was briefed on the results of the fiber project feasibility analysis addressing, at a planning level of detail, project elements including infrastructure, costs, revenues, project management, and project governance; and

WHEREAS, at that meeting RAC members expressed support for the project at the planning level of detail and requested the completion of a more detailed Return on Investment (ROI) analysis to further inform considerations regarding the advancement of the project; and

WHEREAS, in response to this request KCIT, with consultant Columbia Telecommunications Corporation, has completed the ROI analysis, which addresses factors including fiber market characteristics, fiber leasing structures and pricing, and revenue opportunity; and

WHEREAS, the feasibility and ROI analyses conclude that at the planning level the proposed project holds potential for providing benefits to entities considering owning, constructing, and operating the project and to eventual users of the communications support the project would provide, and that these benefits warrant advancing the project to the next phase of development; and

WHEREAS, at its January 31, 2020 meeting the RAC was briefed on the conclusions and recommendations from the ROI analysis; and

WHEREAS, at that meeting the RAC affirmed that at the planning level the proposed project aligns with its vision for the development of the Eastrail corridor for multiple uses and expressed support for initiating the next phase of development of the project.

THEREFORE, in support of further development of the proposal to develop new fiber optic infrastructure in the Eastrail corridor, the RAC supports the following next steps for the project:

1. King County convenes in the next 60 days a meeting to identify the project lead entity and initiate development of a formal project implementation plan.

2. King County invites all RAC member entities to this meeting in addition to additional parties with an interest in the project.

3. The project lead entity includes in the project implementation plan regular and timely updates to the RAC to ensure that development and implementation of the project aligns well with the RAC's vision for the Eastrail and other activities intended to realize that vision, with the first such update being scheduled for the 2Q2020 RAC meeting.
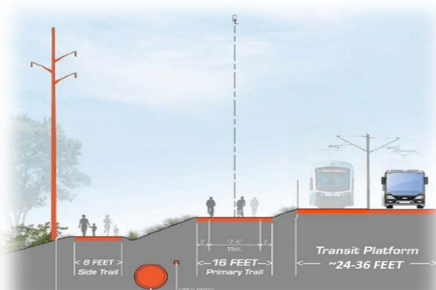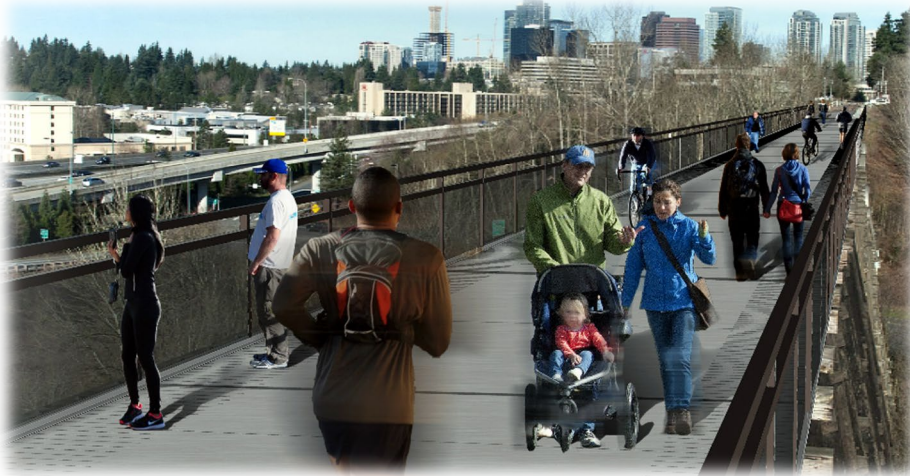
Eastrail Fiber Return on Investment Analysis Findings

Regional Advisory Council Presentation
January 31, 2020

Presenters:
Darryl E. Hunt, KCIT
Joanne Hovis, President,
Columbia Telecommunications
Corporation

Purpose of Today's Briefing

▶ Brief RAC member on findings from the Eastrail Fiber Return on Investment Analysis

▶ Share immediate next steps and anticipated major milestones

▶ Receive RAC project affirmation

The 2019 Feasibility Study Determined:

▶ Confirmed municipalities along the Eastrail are interested in new fiber in the corridor

▶ Validated that construction is possible given the on-the-ground conditions in the corridor

▶ Preliminary, planning-level cost estimate $6-12M

▶ Provided options for business and governance models

▶ Recommended integrating fiber specifications into Eastrail projects currently in design

The 2020 Fiber Return on Investment Analysis Findings

- Purpose of this study & scope of work
  - Interviewed 12 private companies regarding their interests
  - Researched market pricing for fiber leases
  - Developed range of ROI scenarios based on various pricing models

- Finding: Reasonable revenue opportunity
  - Many companies interested in leasing conduit or fiber, either in entire Eastrail or specific areas of the Eastrail
  - Fiber represents long-term asset, with growing demand
  - Fiber lease revenues will cover opex, with additional ROI potential
  - Private sector interest in range of partnerships including design, build, operate, maintain, & sales
  - Low risk procurement can flesh out opportunity

- Finding: Value to county & city users
  - Significant operational value to public entities & avoided cost of $3,600,000/yr
  - Legacy project: Long term use and value to public entities over time

Immediate Next Steps

1. RAC affirmation of support for the project concept

2. Schedule a project organization planning meeting
   - within the next 60 days and include Eastrail owners and stakeholders

Anticipated Major Milestones

▶ Integrate with active trail/HCT/utility project designs

▶ Define interests and appropriate roles of stakeholders

▶ Develop a formal project management framework and form the core project team

▶ Secure resources needed to finalize project planning, design, permitting

▶ Finalize a detailed scope and schedule

▶ (Periodically) Affirm commitments supporting resource investments for various project phases

▶ Build the project

▶ Operate and maintain the project

Q & A

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1) Workplan reflects tremendous work ahead

From 2020-2022, there is a potential for up to $119 million of Eastrail trail projects that will begin construction. The earliest any of these projects would be open would be 2023. In addition to these trail projects, several large non-trail Eastrail projects will be occurring (ie: Downtown Redmond Link Extension, East Link Extension)

The goal of the proposed workplan is to ensure we have the appropriate resources available to communicate in the scale required to match such an intense level of project development. As such we are recommending this RAC workplan have a strong set of communications/engagement tasks. We do not want to be caught short and not have appropriate funding to host events, and engage new audiences when these projects begin and/or open.

(Please note the workplan includes numerous non-cost share items that are based off general PST support.)

Trail Project Development (2020-2022) Snapshot	
Project	$ in millions
WSDOT - 2.5 miles of trail - I-405 overpass	$27
Wilburton Trestle	$29.5
NE 8th Crossing	$27
Totem Lake Connector	$18
Willows 124th Connector	$2.8
Willows to Woodinville	$2.9
145th Crossing	$3
RCC III	$9
Total	$119
	(the construction start and costs of the projects above are subject to change, this indicates a scenario of early start dates in a 2020-2022 timeframe)

Non-trail Eastrail Capital Projects
East Link Extension
Downtown Redmond Link Extension
Fiber prospect

2) Workplan Priorities

Today we would like to hear from RAC members about 1) what they feel are the key priorities for funding in the workplan 2) their entities ability to participate in cost sharing items.

The more we know about who is participating in cost-sharing, the more accurate we can prepare budgets and scopes.

Summary of RAC Cost Sharing Items

Wayfinding Plan ($150k) – Year: 2021
Need and cost Justification • Essential for branding implementation • Products (signs, maps) will reflect elements to increase broader trail usership. Products will reflect consistent messaging heard in branding engagement with diversity focus. • Scope is based off discussions with several wayfinding firms   o This estimate allows for increased constituency engagement

Event and community engagement ($30K a year) Year: 2021, 2022
Need and cost Justification • Reflects large opportunities presented by capital projects • Enables capacity to deliver events and products beyond what has been done the last few years.

Underserved communities engagement ($15k a year) Year: 2021, 2022
Need and cost Justification • Reflects large opportunities to engage non-traditional trail users • Goals: Increase awareness, seek feedback regarding steps to increase usership. • Reflects numerous ESJ plans and objectives throughout RAC member entities   o This level of scope will allow for contractual support to engage nontraditional trail user community. King County recently had similar project for the Green River Trail extension project.

3) Questions for RAC –
- Of these cost-sharing items, which seem most important? Lower priority?
- What is your entities current outlook on cost share participation? (ie: willingness to add to your budget process submittals)
- Are their items not listed that you would be interested in cost sharing?

Eastrail Regional Advisory Council: Proposed 2020 – 2022 Workplan

Category of Funding	2020	2021	2022
Base Staff (no cost share)	• RAC support • Capital Project Dashboard • Grant coordination • Congressional and Governor/State Legislature Engagement • User counts data collaboration • Arts plan collaboration meeting		
RAC Subset Cost Share	• Any individually/group funding activities?	n/a	n/a
RAC Cost Share	n/a	• Wayfinding Plan ($150k) • Event and community engagement ($30K) • Underserved communities engagement ($15k)	• Event and community engagement ($30K) • Underserved communities engagement ($15k)
Contingency (?)			
Total Annual Cost:		$195k	$45k
Possible break down by RAC member (under a scenario of ST/Sno. County/EGA not participating)		• Renton $7,662 • Bellevue $22,662 • KC $84,940 • Kirkland $30,926 • Redmond $20,976 • Woodinville $7,968	• Renton $1,768 • Bellevue $5,304 • KC $19,610 • Kirkland $7,136 • Redmond $4,840 • Woodinville $1,838

RAC January 31, 2020

• PSE $19,500	• PSE $4,500

Deliverables	
(items with no costs indicate that the items are supported by base staff)	

Wayfinding Plan ($150k in 2021)	• Directly implementable multi jurisdiction wayfinding plan (including possible digital wayfinding). Goals of this plan would be to improve the public's experiences, increase their awareness through distinct designs, engage a wide range of potential trail users.
	    o Individual trail owners will need to pay for actual signs and implementation.
	• Wayfinding development has two main components 1) Design 2) Stakeholder engagement
	    o As we will most likely need strong stakeholder engagement this component may be the larger finical component of the consultant costs.

Underserved communities engagement ($15K in 2021 and 2022)	• Coordinated outreach to diverse and underserved communities. To be implemented in partnerships with contractual support;
	    o Non-profit would facilitate Eastrail information distribution at community events and other venues with the goal to expand Eastrail awareness (and solicit feedback) to diverse communities.
	    o Translation services for key outreach products.

Event and community engagement ($30K in 2021 and 2022)	• Several large events which result in engagement with traditional and non-traditional Eastrail user community (consultant support) o Events could vary from private sector stakeholder summit, to outdoor arts/music festivals (recall the 'Enliven Wilburton trailside café") • Brand materials

RAC January 31, 2020

Grant Coordination	• Develop ongoing plan to coordinate key funding issues such as grant requests (e.g., BUILD, PSRC, etc.). Work will improve awareness of funding status and priorities among each RAC member • Matrix of all RAC member state and federal grant requests, including listing of grant opportunities.
Congressional and Governor/State Legislature Engagement	• Identification of 1-3 RAC priorities • Conduct several field trips with congressional/governor/ legislators and/or their staff, especially to show the effective use of federal/state funding and where it could be especially helpful • Development of engagement materials

Coordinated outreach and communications	• Strategic communication plan with brand activation/capital project engagement opportunities and priorities. Plan will also include priorities for:
	   ○ Websites
	   ○ Social media
	   ○ Development of key messaging

Arts plan collaboration meeting	• Hold an arts plan workshop to identify how a new Eastrail wide arts plan can build off existing arts plans and other existing/developing land use guidance.
User Data Collection	• Determine what statistics would align best for reports and grant opportunities. • Task 1- Gather existing user data from various existing trail counters into one database to generate a summary of segment user rates Task 2 – develop protocol and implement trail user intercepts to learn about user origin points and collection of selective qualitative data
Capital Project Dashboard	• Provide an up to date dashboard of capital projects at RAC meetings

RAC January 31, 2020

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Upcoming Eastrail Construction
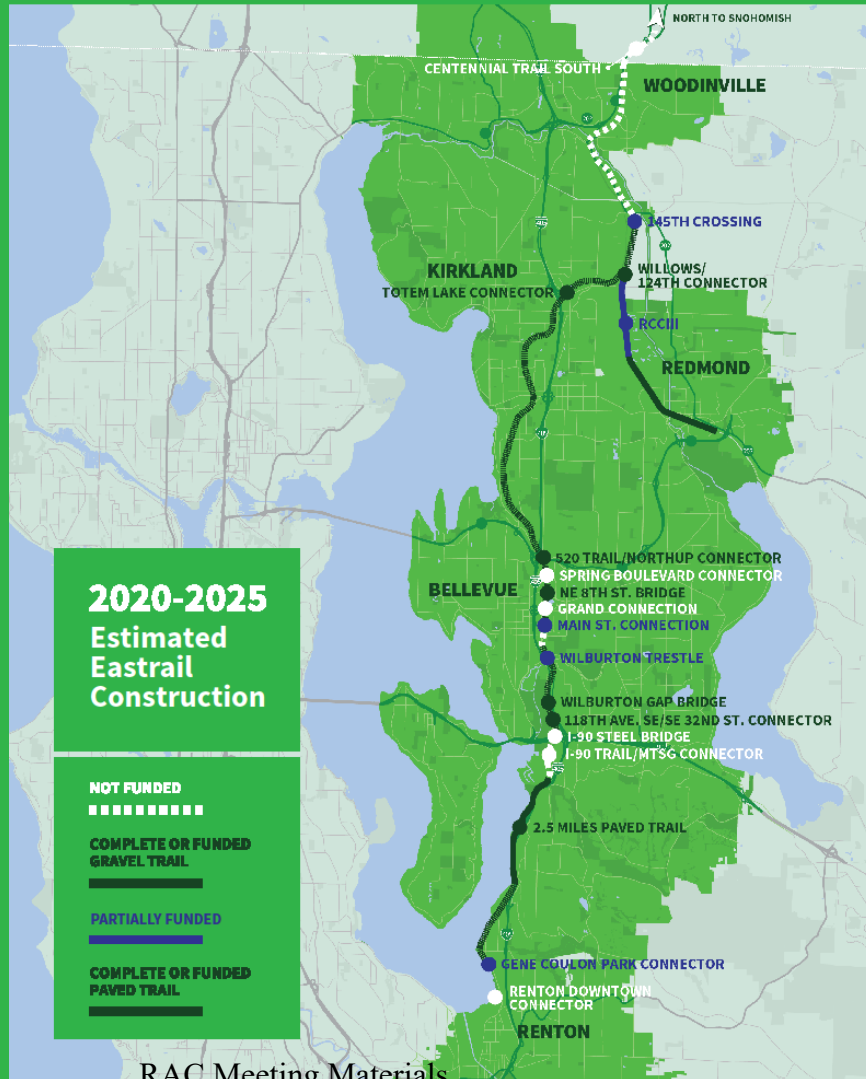
Eastrail Regional Advisory Council
January 31, 2019

An Estimated Construction Outlook

Timeline and cost information is current as of January 2020 and is based on the best available information at this time.

Estimating standards vary between agencies and based on the extent of design work completed for each project. Contact Joe Inslee, King County Parks for questions or clarification, jinslee@kingcounty.gov

Project Categories

The Eastrail Funding Commission recommended a three-part strategy for completing the trail:
- Connect
- Construct
- Complete

COMPLETING THE EASTRAIL

CONNECT, CONSTRUCT, COMPLETE

A fully connected, paved trail will demonstrate the Eastrail's benefits to the private sector and set the stage for engaging potential partners. This three-part strategy for completing the trail will help grow support for the Eastrail and encourage public-private partnerships and contributions:

Build a safe, soft-surface interim trail along the entire corridor and open it for use as soon as possible.

Make continuous progress towards widening and paving the entire trail so that people of all ages and abilities can use it.

Develop public gathering places, art, and amenities along the trail to enhance the trail experience and knit the Eastrail into surrounding communities.

CONNECT   CONSTRUCT   COMPLETE

EASTRAIL

Eastrail South Lake Washington Waterfront
RENTON/KING COUNTY

Extending the Eastrail from Renton businesses to Milepost 5 next to Gene Coulon Park will provide an alternative transportation corridor for thousands of employees and access to the Cedar River Trail and Lake to Sound Trail. Renton is a hub for dozens of trail miles!

PHASE
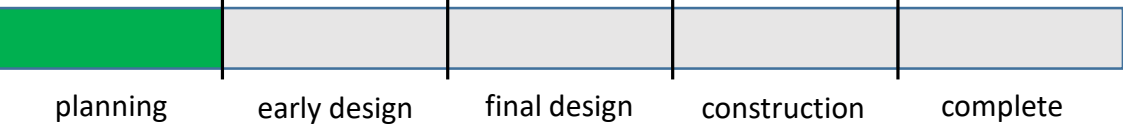
planning   early design   final design   construction   complete
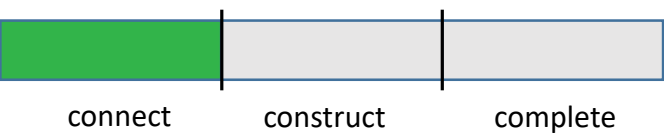
PROJECT CATEGORY

connect   construct   complete

FUNDING STATUS

unfunded   partial funded   full funding

ESTIMATED COST: TBD

ESTIMATED START OF CONSTRUCTION: Not Scheduled

FUNDING SOURCES: Not funded

Gene Coulon Connection
RENTON/KING COUNTY

Design and construct an interim, pedestrian and ADA trail that directly connects the Eastrail near Milepost 5 and a paved pathway at Gene Coulon Park, replacing an existing link along a residential street.

PHASE
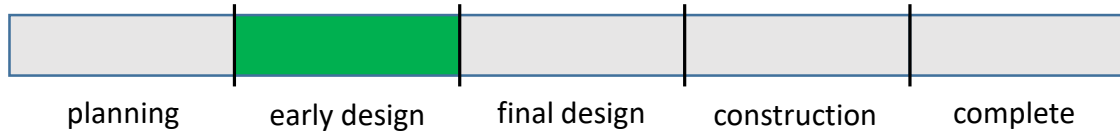
planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding
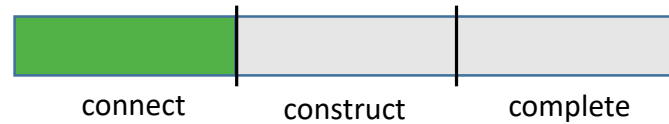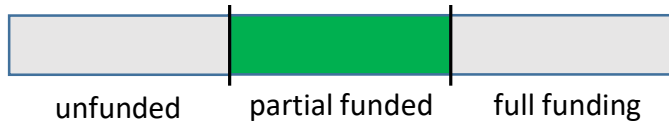
ESTIMATED COST: TBD

ESTIMATED START OF CONSTRUCTION: Q3 2020

FUNDING SOURCES: City of Renton, King County Parks Levy

Gene Coulon Park (left) – Eastrail (right)

EASTRAIL

Lake Lanes I-405 Expansion
WSDOT/KING COUNTY

During the upcoming Renton to Bellevue Express Toll Lanes (R2B) project, WSDOT will construct a bicycle and pedestrian bridge over I-405. Also as part of the R2B project, WSDOT will construct 2.5 miles of paved trail in the Eastrail south of I-90 between Coal Creek Parkway and Ripley Lane.

2.5 MILES PAVED TRAIL

PHASE

planning | early design | final design | construction | complete

PROJECT CATEGORY

connect | construct | complete

FUNDING STATUS

unfunded | partial funded | full funding
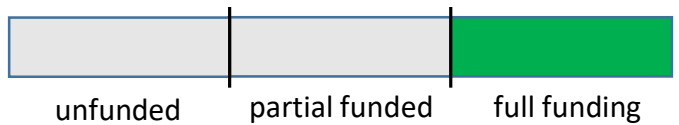
ESTIMATED COST: $26,500,000

ESTIMATED START OF CONSTRUCTION: Q1 2020

FUNDING SOURCES: King County Parks Levy, WSDOT

I-405 crossing visualization

Trail cross section visualization

EASTRAIL

I-90 Steel Bridge
KING COUNTY

Renovation of an existing steel railroad bridge and gravel trail construction to close the gap over I-90 between Coal Creek Parkway and SE 32nd.

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding
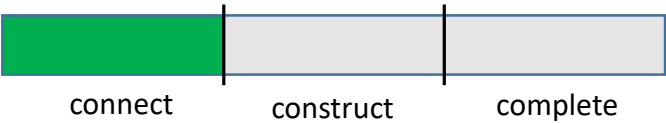
ESTIMATED COST: $10,000,000

ESTIMATED START OF CONSTRUCTION: Not Scheduled

FUNDING SOURCES: Unfunded

I-90 Bridge – looking east

EASTRAIL

Connection to I-90 Trail/Mountains to Sound Greenway
BELLEVUE

A raised multi-use path with planted buffer on the west side of 118th Ave. SE will connect the Mountains to Sound Greenway with the Eastrail via SE 32nd St. Includes ADA walkway along south shoulder of SE 32nd St.

PHASE

planning | early design | final design | construction | complete

PROJECT CATEGORY

connect | construct | complete

FUNDING STATUS

unfunded | partial funded | full funding
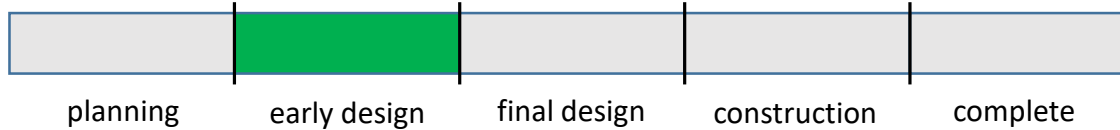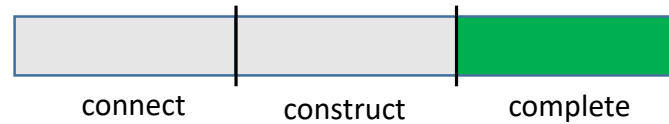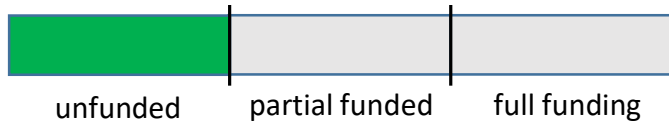
ESTIMATED COST: $1,000,000

ESTIMATED START OF CONSTRUCTION: 2021

FUNDING SOURCES: TBD
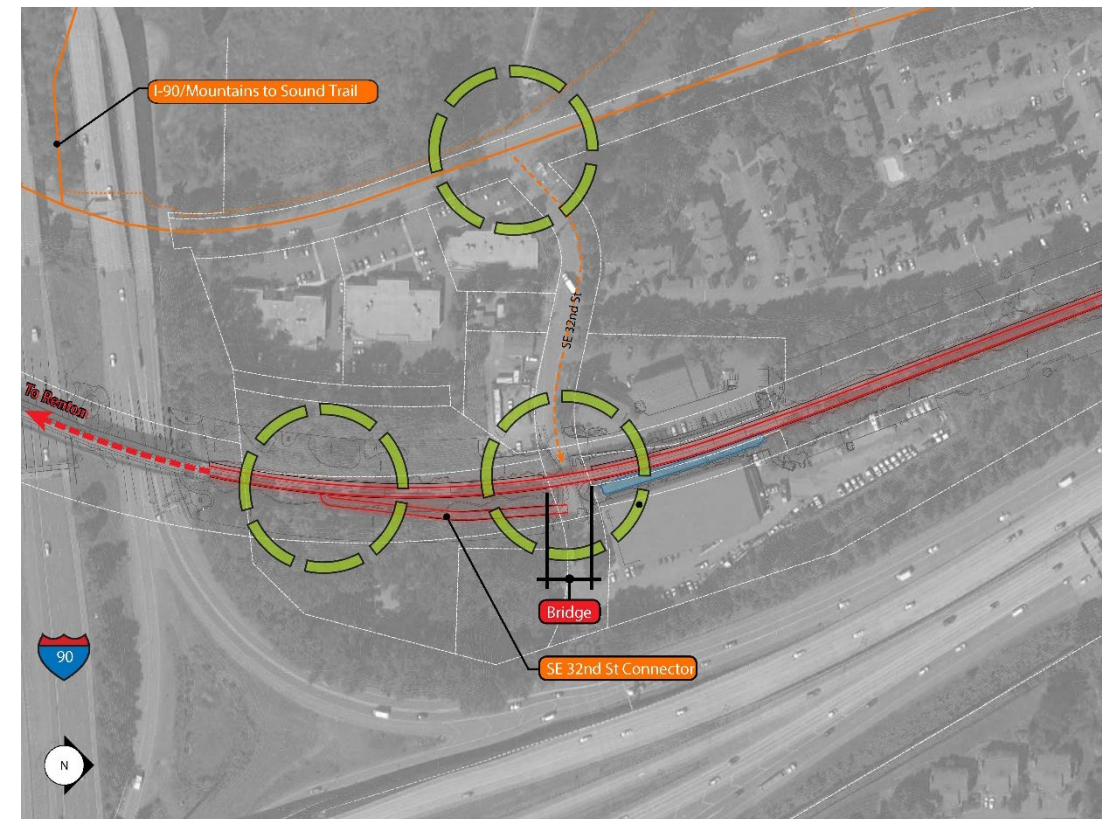
EASTRAIL

Wilburton Trestle
KING COUNTY PARKS

The Wilburton Trestle will be a defining landmark for the Eastrail, offering a signature experience for trail users. The full project includes a trailhead and entry space at the north end of the trestle, renovation of the trestle for trail use, and a trail segment west of I-405 to create a continuous route from 118th St. to SE 5th St.

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding
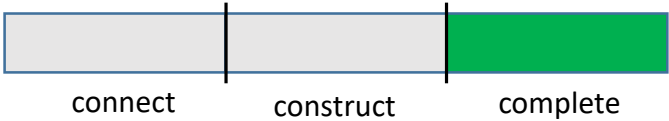
ESTIMATED COST: $29,500,000

ESTIMATED START OF CONSTRUCTION: Q3 2021- Q1 2023

FUNDING SOURCES: King County Parks Levy, Kaiser Permanente, City of Bellevue, FHWA Non-Motorized grant

Eastrail—Main Street Greenway Connection
BELLEVUE

The Eastrail—Main Street Greenway nonmotorized connection will link the future East Main light rail station with the Eastrail and the Main Street Greenway/Bellevue Botanical Garden.

PHASE

planning | early design | final design | construction | complete

PROJECT CATEGORY

connect | construct | complete

FUNDING STATUS

unfunded | partial funded | full funding
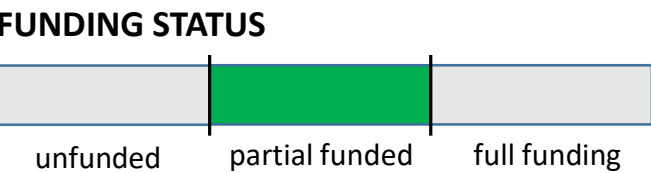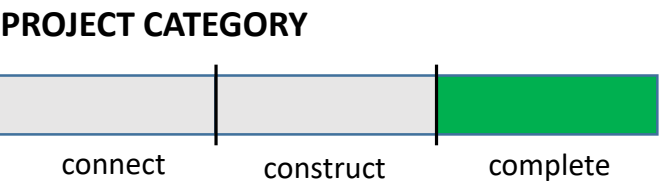
ESTIMATED COST: TBD

ESTIMATED START OF CONSTRUCTION: Not Scheduled

FUNDING SOURCES: TBD

Grand Connection
BELLEVUE

The Grand Connection begins at Meydenbauer Bay Park on Lake Washington, skirts Bellevue's signature Downtown Park, spans the bustling central business district, crosses I-405 with a lid park, and ultimately connects to the Eastrail in Wilburton.

PHASE
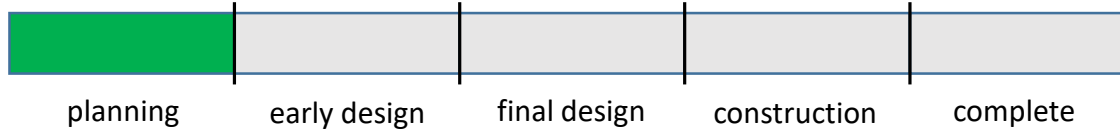
planning	early design	final design	construction	complete
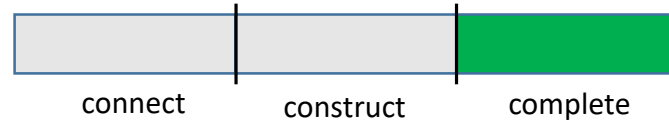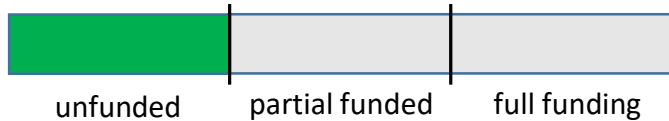
PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding

ESTIMATED COST: TBD

ESTIMATED START OF CONSTRUCTION: Not Scheduled

FUNDING SOURCES: TBD
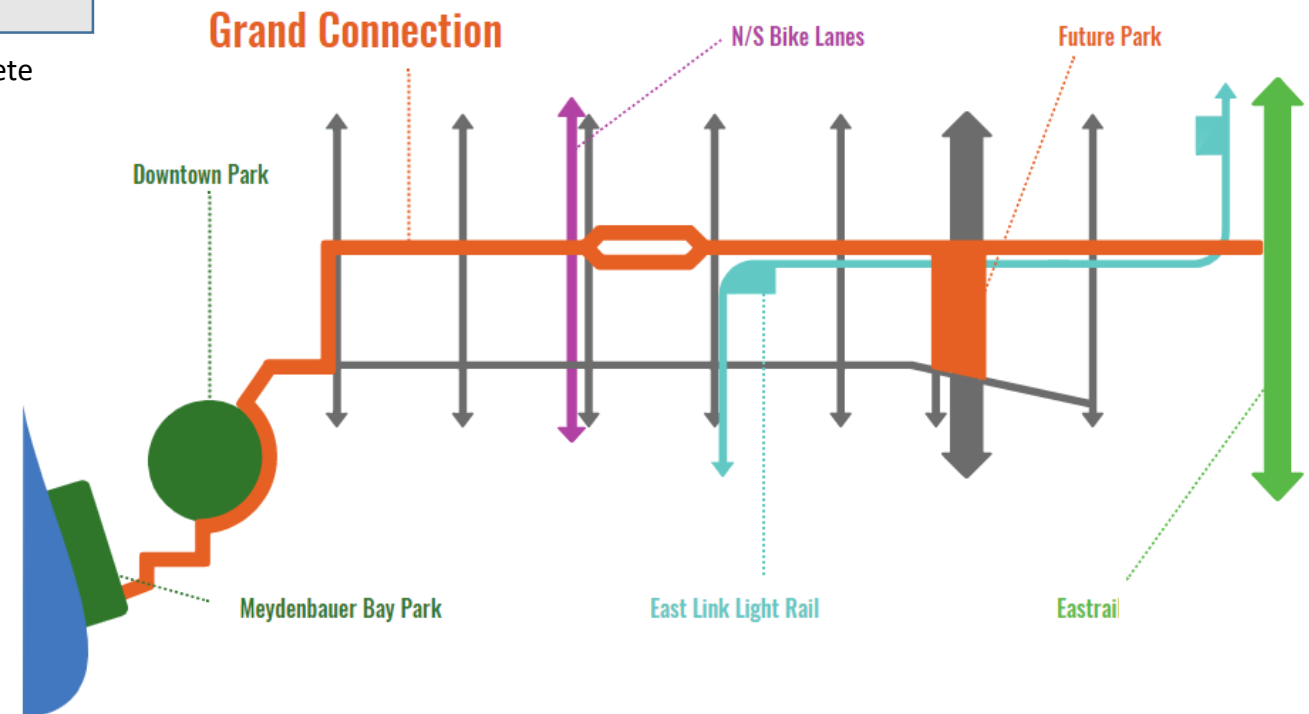
Eastrail NE 8th St. Bridge
KING COUNTY

The NE 8th St. Bridge in Bellevue is a proposed trail bridge crossing one of the busiest roadways along the Eastrail. Along with providing a safe crossing of the road, the bridge connects to the Wilburton Sound Transit Station, providing seamless connection between pedestrians and cyclists and high capacity light rail.

PHASE

| planning | early design | final design | construction | complete |

PROJECT CATEGORY

| connect | construct | complete |

FUNDING STATUS

| unfunded | partial funded | full funding |
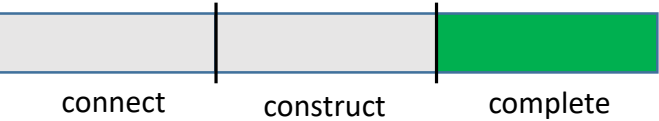
NE 8th St. Bridge concept
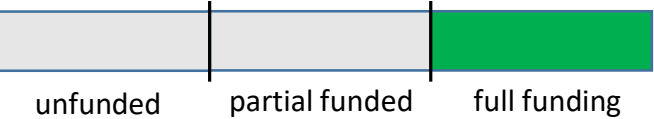
ESTIMATED COST: $27,000,000

ESTIMATED START OF CONSTRUCTION: Q3 2021- Q1 2022

FUNDING SOURCES: King County Parks Levy, Sound Transit System Access Fund, FHWA Non-Motorized grant

Spring Blvd. Connector
BELLEVUE
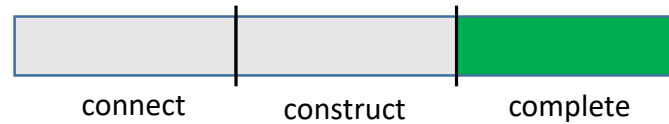
NE Spring Boulevard is a multi-modal road and ped-bike facility running east-west through the BelRed area. A connector trail will be located on the west side of the Eastrail allowing for a key connection to Downtown and the Spring District.

PHASE

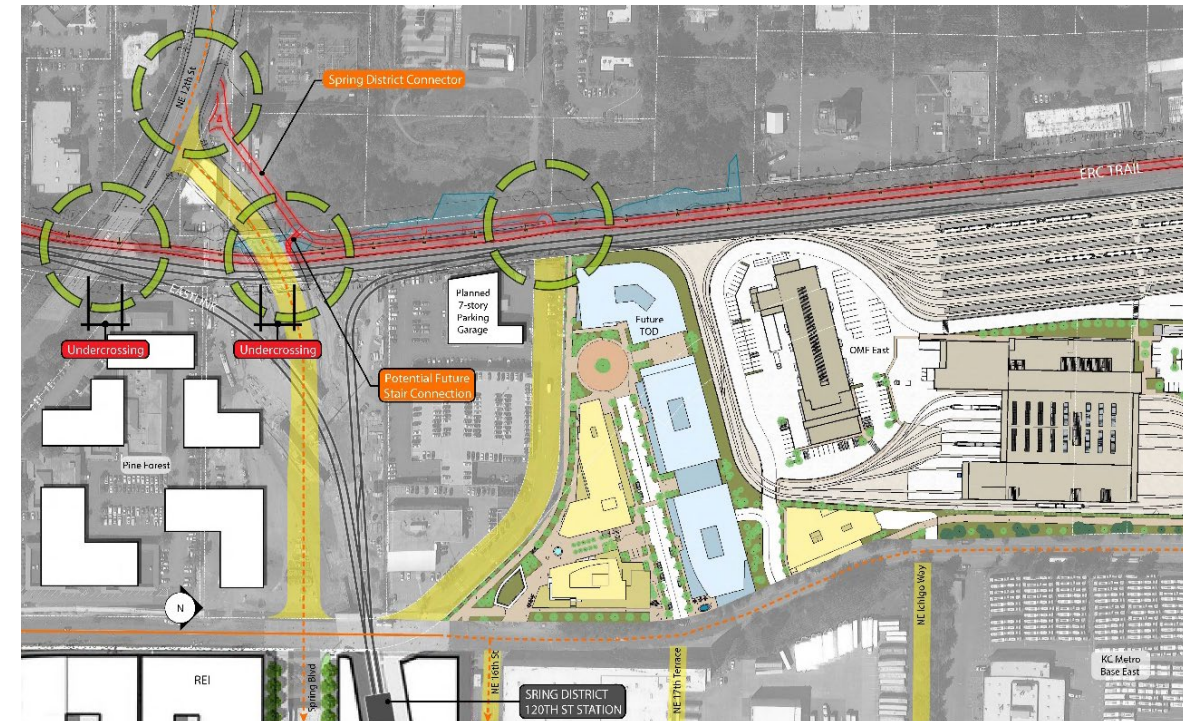| planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding
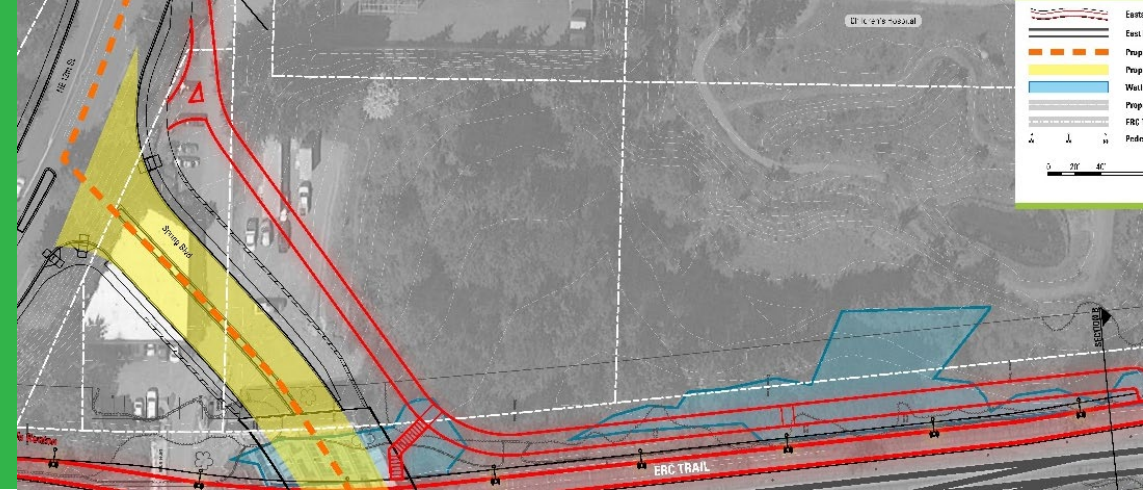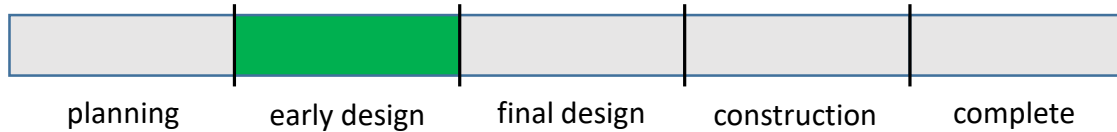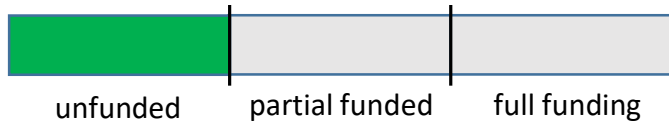
ESTIMATED COST: $7,000,000

ESTIMATED START OF CONSTRUCTION: TBD

FUNDING SOURCES: TBD

520 trail/Northup Way Connector
KING COUNTY PARKS

Construction of a trail ramp to connect the Eastrail to the SR 520 Trail at Northup Way.

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding
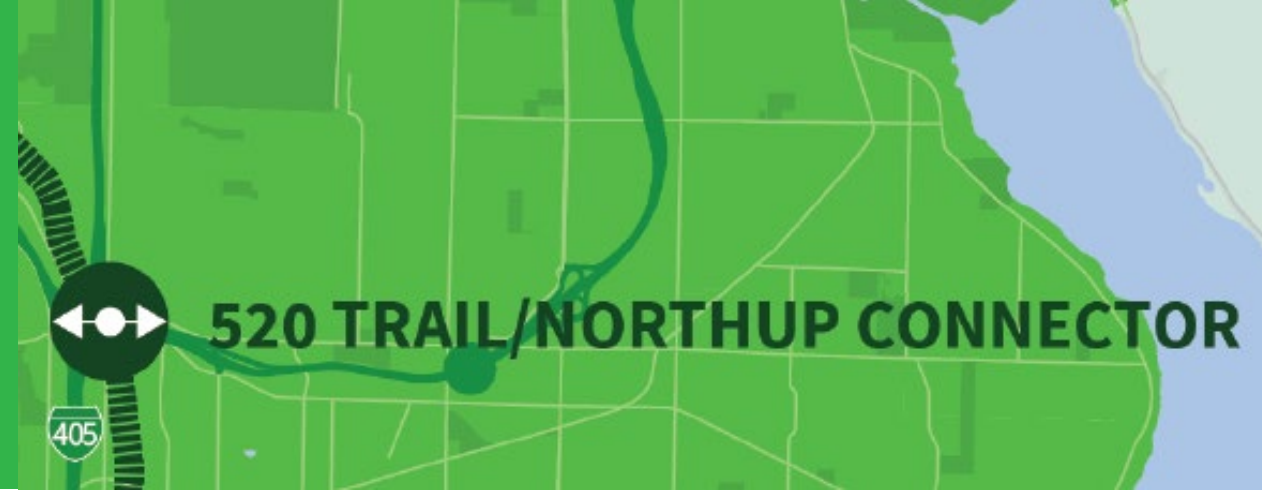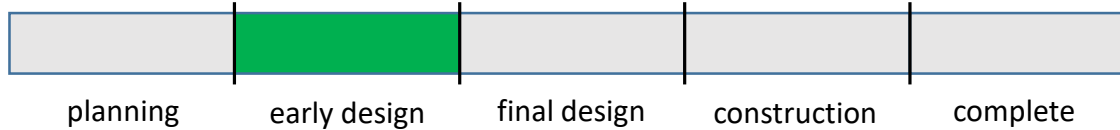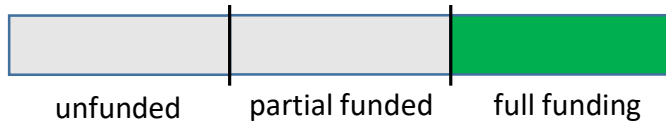
ESTIMATED COST: $2,250,000

ESTIMATED START OF CONSTRUCTION: Not Scheduled

FUNDING SOURCES: King County Parks Levy

Totem Lake Connector
KIRKLAND

The Totem Lake Connector will be a bicycle and pedestrian bridge, that will connect the two ends of the 5.75-mile Cross Kirkland Corridor currently severed by one of Kirkland's most complicated intersections: Totem Lake Boulevard and Northeast 124th Street.
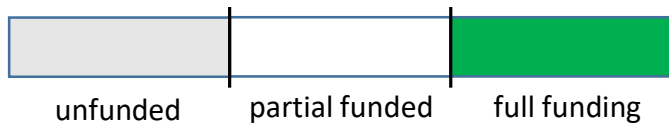

TOTEM LAKE CONNECTOR

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding

ESTIMATED COST: $18,400,000

ESTIMATED START OF CONSTRUCTION: 2020

FUNDING SOURCES: City of Kirkland

EASTRAIL

Willows/124th Connector
KIRKLAND

This connection will follow the east side of Willows Road between Northeast 124th Street and the Eastrail (at 139th). This will allow for increased connections to the future RCC (phase III) and the Sammamish River Trail.
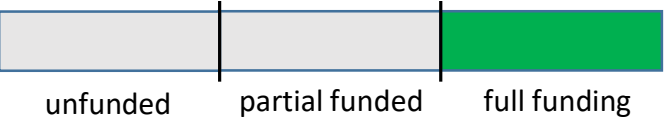

WILLOWS/ 124TH CONNECTOR
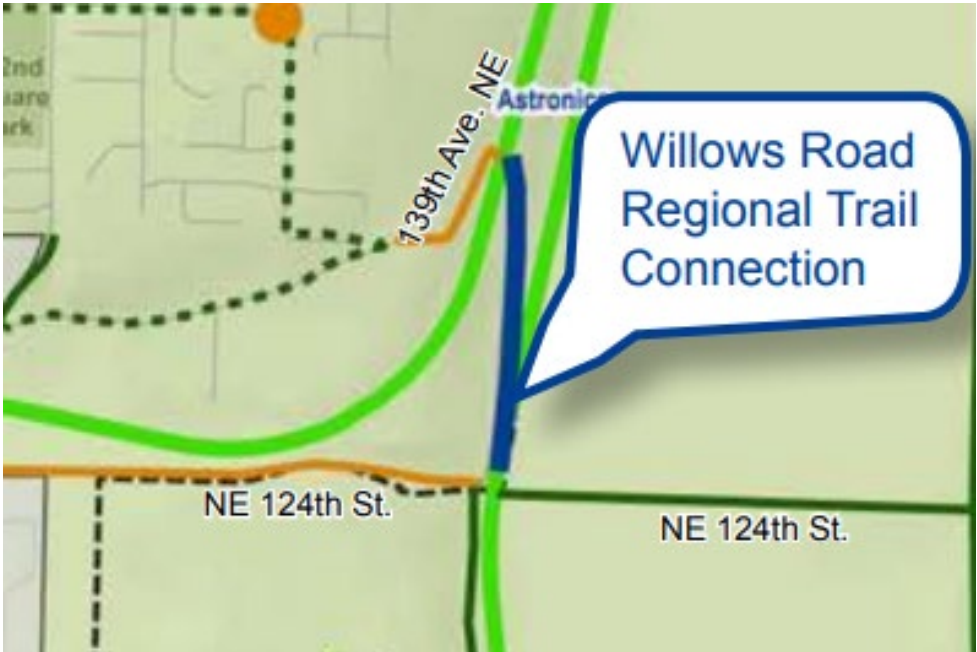
PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding
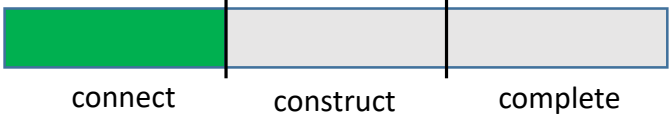
ESTIMATED COST: $2,800,000

ESTIMATED START OF CONSTRUCTION: 2020

FUNDING SOURCES: City of Kirkland, State of WA

Willows Road Regional Trail Connection

139th Ave. NE
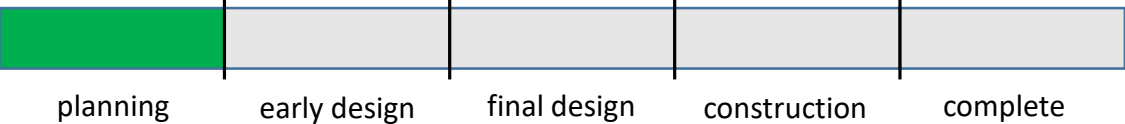
NE 124th St.   NE 124th St.

Kirkland to Woodinville Interim Trail
KING COUNTY
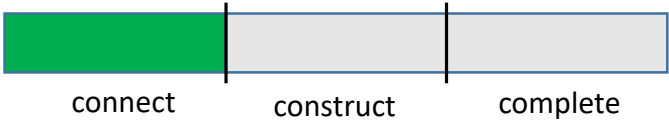
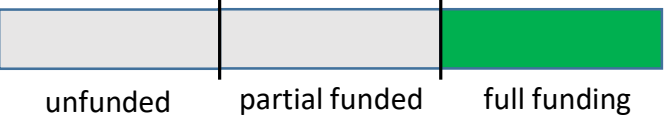Construction of an interim (gravel) trail from the north end of the Cross Kirkland Corridor to NE 145th in Woodinville

PHASE

| planning | early design | final design | construction | complete |

PROJECT CATEGORY

| connect | construct | complete |

FUNDING STATUS

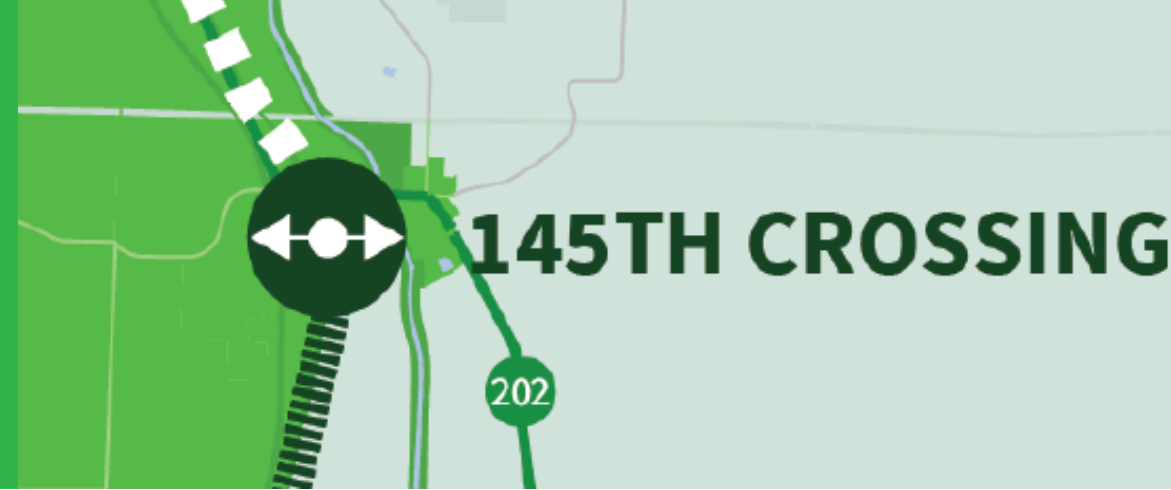| unfunded | partial funded | full funding |
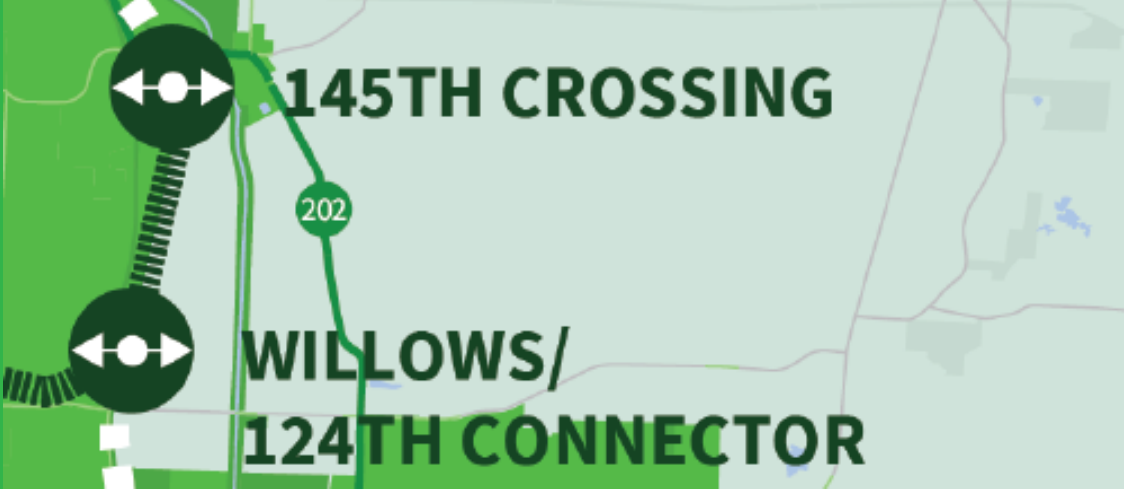
ESTIMATED COST: $2,900,000

ESTIMATED START OF CONSTRUCTION: Not Scheduled

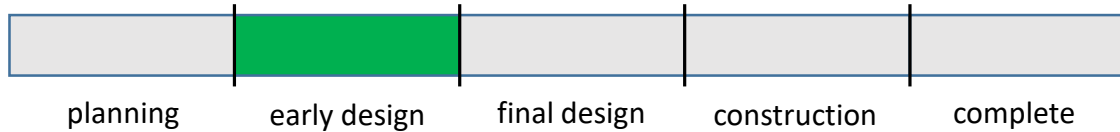**FUNDING SOURCES:** King County Parks Levy
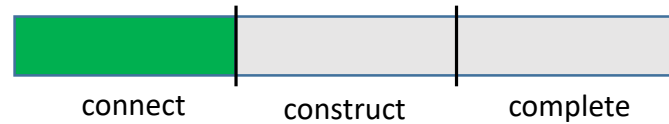
145th Crossing
WOODINVILLE/KING COUNTY

A signalized pedestrian crossing and improvements to non-motorized facilities along NE 145th (Eastrail Spur) will improve safety for pedestrians in Woodinville's tourism district and connect from the Eastrail to the Sammamish River Trail.
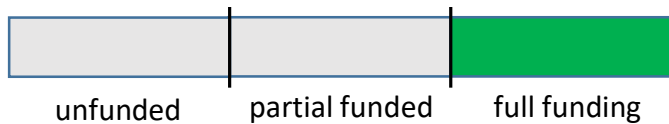

145TH CROSSING
202

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

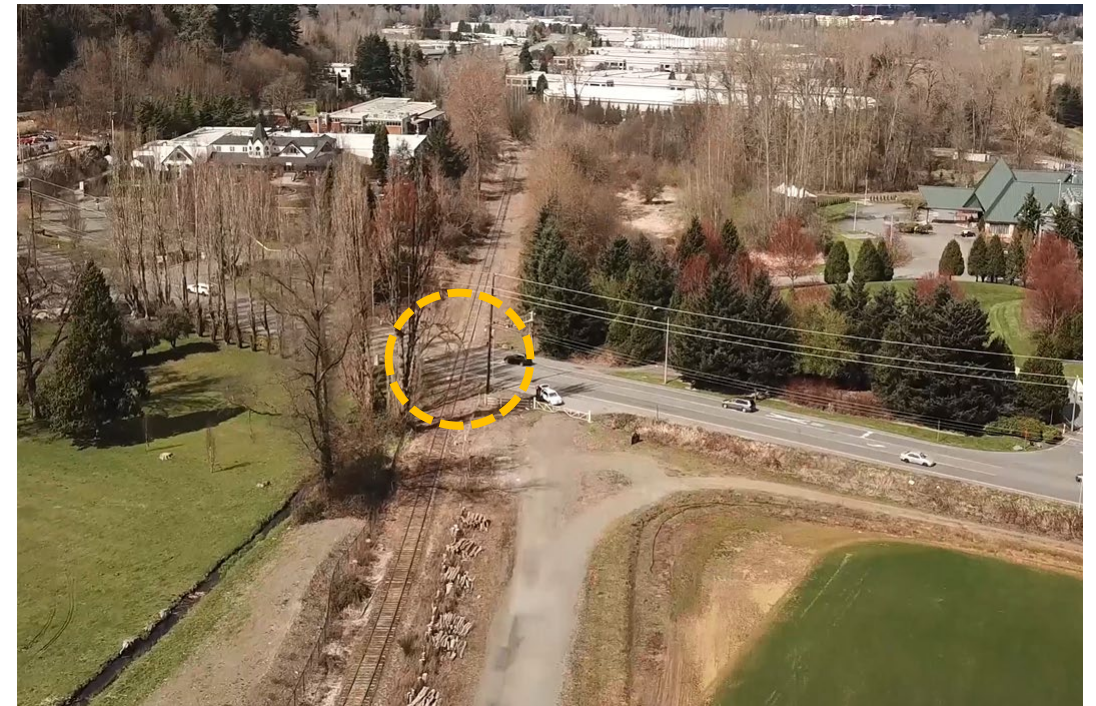| unfunded	partial funded	full funding

ESTIMATED COST: $3,000,000

ESTIMATED START OF CONSTRUCTION: Q2 2021 (may be phased)

FUNDING SOURCES: City of Woodinville, King County Parks Levy

145th crossing – looking north

EASTRAIL

Redmond Central Connector – Phase III
REDMOND

This 1.6 mile segment will extend the RCC north to NE 124th street at the Kirkland boarder.

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding

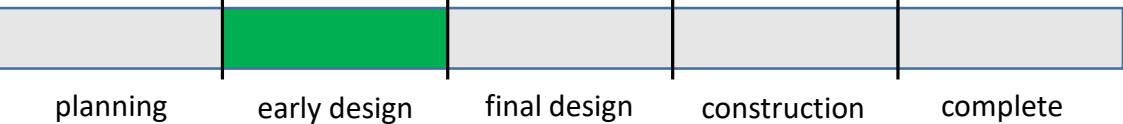**ESTIMATED COST:** $9,100,000

ESTIMATED START OF CONSTRUCTION: 2022

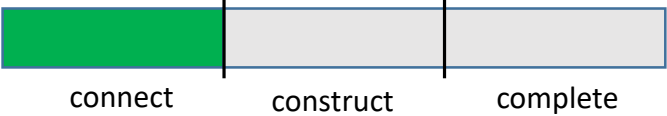**FUNDING SOURCES:** City of Redmond, State of WA

EASTRAIL

Centennial Trail South
SNOHOMISH COUNTY

This 12 mile rail-with-trail corridor will complete the regional trail through Snohomish County, from the Skagit County line to the King County line. The trail construction is anticipated to take place in phases.
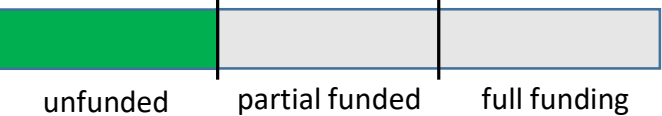
NORTH TO SNOHOMISH

PHASE

planning	early design	final design	construction	complete

PROJECT CATEGORY

connect	construct	complete

FUNDING STATUS

unfunded	partial funded	full funding

ESTIMATED COST:　　TBD

ESTIMATED START OF CONSTRUCTION:　　2024

Project Location

EASTRAIL