

**Oregon Telecommunications Coordinating Council**  
**Minutes**  
**February 22, 2007**

**Attendees:**

Council Members: John Irwin, Pam Berrian, Agnes Box, Cathy Britain, Faye Stewart, Rob Myers, Ed Parker, Jon Dolan representing Curt Pederson, Marlyn Shafer, Brant Wolf, Michael Weidman, Art Hill, Onno Husing, Doug Cooley and Kim Hoffman.

Staff: Chris Tamarin of the Oregon Economic and Community Development Department

Others: Ron Trullinger, Craig Kinsman, and Ray Simila of Qwest; Linda Kimberly, Felix Gutierrez and Keith Grunberg of Charter Communications; Al Grapoli and Mark Reyer of the Oregon State Data Center; David Crowe, Dave Barta and Dale Smith of the University of Oregon; Milo Mecham of Lane Council of Governments, Dale Seavey of the City of Eugene, John Blatt of Civic Affairs/One Economy, Matt Lampe of the City of Portland, Jeremy Rogers of the Oregon Business Plan, John Stadter of Leducor Group, Greg Palser of CoastCom, Steve Caldwell, Jere Retzer of NWAX, Joe Franell of the City of Ashland, Brad Holden of Blue Mountain Community College, Richard Ryan of Hunter Communications, Mike Prinslow of Southern Oregon ESD, Marian Hammond of the Oregon Economic and Community Development Department, Andrea Fogue of the League of Oregon Cities, and a representative of the Oregon Cable Telecommunications Association.

Videoconference sites included Klamath Falls, Medford, Eugene, and Pendleton.

**Old Business:**

**Action Item**

It was moved by Ed Parker that the January 18, 2007 minutes be approved as distributed. Doug Cooley seconded the motion. The Council approved the minutes.

**Internet Forest Roundtable:**

John Irwin welcomed everyone to the meeting and recognized the widespread interest in ongoing telecommunications issues and opportunities in the state. He noted that the Internet Forest Roundtable discussion is on the agenda for today and introduced Ed Parker to moderate the discussion.

Ed Parker welcomed everyone and asked Chris Tamarin to provide an introduction to the Internet Forest concept.

## Presentations:

### Chris Tamarin, Oregon Economic and Community Development Department

Chris observed that the Council serves as a forum where diverse groups of people and organizations can meet to share positions and ideas regarding telecommunications in Oregon. Over the past year, the Council has been working on and circulating a concept paper entitled “**From Silicon Forest to Internet Forest: A Vision for the Oregon Economy.**” The most recent version is posted on the Council website at [www.ortcc.org](http://www.ortcc.org). In the paper, the Council recognizes the significant improvements made over the past ten years in Oregon’s telecommunications infrastructure, thanks to the forward-looking actions of both its public and private sectors, with the construction of

- Fiber backbone networks
- Fiber distribution networks
- Fiber-coaxial cable networks
- Legacy copper telephone company distribution networks enhanced with new digital subscriber services
- Fixed wireless networks
- Mobile wireless networks
- WiFi and now emerging WiMAX networks
- And satellite networks

The Council recognizes and is directed by the finding of the Oregon Legislative Assembly that the improvement and expansion of the state’s telecommunications infrastructure, along with other types, provide the basic framework for continuing and expanding economic activity, providing jobs and economic opportunity. And that improving and expanding infrastructure is a continuous on-going process.

With much infrastructure now in place, there has been a growing focus on applications by communities, businesses, schools, governments, and individuals. Key “driver” applications continue to be:

- E-commerce; which holds unlimited opportunities for economic development
- E-Government
- On-line Education and Workforce Development
- Telework
- Telemedicine

All of these well-established applications continue to grow in use and they all have a new common denominator. These applications all seem to be moving to Internet Protocol (IP).

The concept paper poses and attempts to answer to the questions, “What’s next?” and “How can Oregon further leverage and improve the value of these new assets to position the state for future success?” And what is proposed is the concept of the Internet Forest.

Through an economic development strategy, Oregon successfully planted seeds for the “*Silicon Forest*” and benefited from the location and growth of businesses like Intel, Hewlett Packard and Tektronix. The Council believes that the next potential wave of

economic development and opportunity following high-tech will be Internet businesses like Google and Yahoo and open-source technology businesses like Mozilla, and the wide spread adoption of e-commerce and Internet based strategies by Oregon businesses at large. As Michael Porter instructed the Oregon Business Plan, “In the information age global economy, **all** industries are high-tech.”

The Council believes that Oregon has the opportunity to build upon the success of the Silicon Forest strategy, build upon the success of its greatly expanded and still expanding telecommunications infrastructure and strategically position itself for the Internet businesses and Internet applications that will be the engine for the next wave of economic growth.

The topic for the roundtable discussion today is Oregon’s potential to become the “*Internet Forest*” and ideas for how to make it happen.

Ed Parker, ORTCC Member

Ed shared the presentation that he made on February 14<sup>th</sup> before the Senate Business, Transportation and Economic Development Committee in support of Senate Bill 470.

He began with a look at the Oregon Economy noting that in the past it has been natural resource based, that the present relies increasingly on High Tech Manufacturing, and that he believes significant future opportunities are in Internet businesses. It is already clear that all businesses will need and rely on the Internet. Ed noted that the Internet is a network of networks that no one entity controls or regulates. The architecture of the Internet is shaped by the private sector decisions of individual users and service providers.

Ed reported that the major West Coast Internet connection or peering points are located in Seattle, the San Francisco Bay Area, and in Southern California. He also noted that Oregon has multiple trans-Pacific undersea cable that come ashore in Oregon, however, most pass through Oregon to out-of-state switching locations. This is because Oregon is not a big enough market with enough traffic to justify it. Ed believes that we can change that. He described how data is transported over fiber optic networks, how data traffic is directed through routers and the implications for network performance. Applications are impacted if they are time sensitive. Different levels of network performance don’t affect e-mail or web surfing, but they can significantly affect applications like voice and videoconferencing. Distance on the Internet is not effectively measured by miles, but by router hops.

Ed reflected that he used to say that if you had broadband Internet access that you could live and work anywhere, which is why he can live at Gleneden Beach on the Oregon coast. He has come to believe, though, that this will not be the case going forward for healthcare, gaming, entertainment and other time sensitive applications. Consequently, Oregon does not currently have a good location on the Internet as compared to Washington and California.

Ed noted that he has come to believe in a new paradigm, in which location does matter. Broadband access continues to be important and is of great value, however, as businesses increasingly use the Internet and IP network applications, their location relative to the Internet backbone will impact the service quality they provide to their customers. Carriers constantly make changes to their networks based on traffic and user demand. Oregon needs take steps to build the critical mass of traffic that will improve its position on the Internet.

Oregon currently has several advantages. It has an excellent statewide telecommunications infrastructure. It has eleven undersea fiber optic cable landings connecting it with points around the Pacific Rim. It has low power costs relative to other states. It has desirable, relatively low cost locations offering many amenities. It has Internet Exchanges in place in Portland and Eugene

Oregon also has some inherent disadvantages relative to the Internet. It is not on the Internet backbone. It is connected to the backbone and to Internet 2 via tail circuits from California and Washington. It has a relatively small population that will never generate the levels of end-user IP traffic needed to be competitive with California and Washington. Its market power is diffused. The web sites of many of the state's largest high profile organizations including the State of Oregon itself are hosted at out-of-state locations.

So, what do we want? ORTCC in its Internet Forest initiative wants to pursue several strategies to address these issues. We want to connect/switch Oregon IP traffic in Oregon keeping local traffic local. We want to improve network performance and service quality for real-time applications. We want to improve Oregon's connections to the rest of the Internet. We want to recruit and grow Internet businesses in Oregon. We want the benefits of these actions to be enjoyed statewide.

We want two simple things from the carriers. One, if you have facilities in the Pittock building, or in Eugene, then interconnect with NWAX and/or OIX to help build and support the Oregon Exchange. Two, adjust your routing tables to keep your local traffic local and use local peering. If you are a large carrier it will present an opportunity to sell Internet transit. If you are a small carrier, it will present an opportunity to buy Internet transit.

We want to maximize our Internet opportunities by taking steps to reduce Oregon Internet costs, improve Oregon Internet quality, create Oregon Internet Exchanges in Southern Oregon and East of the Cascades, interconnect Oregon's Internet exchanges, build on our emerging Open Source technology industry cluster, and develop Oregon's position as a Gateway to the Pacific Basin.

We need to strengthen Oregon's Internet exchanges, stimulate web hosting businesses, encourage widespread interconnection at Oregon Exchanges, leverage the demand that we do have including government, education, healthcare, and private sector users. ORTCC has developed proposed legislation and policy resolutions to support these

efforts. The Council prefers an approach of encouraging rather than mandating desired behavior. Progress on these initiatives should yield benefits to Internet service providers by reducing their costs, and improving quality. It should also improve web hosting opportunities, continue to improve our telecom infrastructure and help retain developing Open Source software businesses in Oregon.

- SJR19 establishes state policy relating to Internet Protocol network infrastructure. <http://landru.leg.state.or.us/07reg/measpdf/sjr1.dir/sjr0019.intro.pdf>
- SJR20 established state policy to promote and facilitate activities by Oregon's health care and education communities and their telecommunications providers to develop network model that provides standards for interoperability. <http://landru.leg.state.or.us/07reg/measpdf/sjr1.dir/sjr0020.intro.pdf>
- SB470 establishes a grant program for purpose of improving the capacity and accessibility of Oregon's Internet exchanges and Internet web-hosting facilities for economic development. <http://landru.leg.state.or.us/07reg/measpdf/sb0400.dir/sb0470.intro.pdf>

Ed reported that some progress is being made. Embarq adjusted their routing tables for Oregon traffic and dramatically reduced the number of router hops that he experiences. This did not require a capital investment, but a change in network management. Ed mentioned that EasyStreet and LS Networks have also examined these issues and made adjustments to their networks accordingly. Google has interconnected its network with NWAX.

Ed concluded that we can make meaningful improvements in the state's Internet connectivity and quality, and in so doing help develop an Oregon Internet business cluster statewide. "Let's work together, and let's do it!"

#### Michael Weidman, LS Networks

Michael noted that LS Networks is a Tier 2 carrier that buys transit from Tier 1 carriers and is sensitive to Internet connection costs. He reported that LS Networks has established two core network switches in Oregon and has changed its routing tables to keep intrastate subscriber traffic intrastate. As a result, subscribers are enjoying nine millisecond connections as indicated by trace routes. Packets that route through Seattle or other out-of-state locations have about 26 millisecond trace routes. Michael believes that as a result of this change, his subscribers are seeing improved network performance and quality of service. He feels that this most directly affects the end-user's experience on voice and video over IP applications. He has visions for an intrastate "peering fabric" to be able to continue to aggregate and switch intrastate traffic. He thinks that to the extent that intrastate IP traffic can be switched intrastate, a benefit is realized for the greater good. Brant Wolf asked how SB470 would help LS Networks. Michael responded that extending the exchanges throughout the state would reduce the intrastate Layer 2 backhaul traffic he needs to carry, and he perceives that as a benefit.

Ron Trullinger, Qwest

Ron said that today he was representing Qwest, Century Tel, Verizon, and the Oregon Telecommunications Association. Ron began by noting that he believes that we are all in agreement that we want Oregon to actively recruit and create new business and realize economic growth. He wanted everyone to recognize that he does not consider himself to be a subject matter expert in the Internet backbone, but that he could make a technical expert available if needed. Ron indicated that he has spoken with subject matter experts within Qwest and that some of them have also worked for other Tier 1 providers and based on that, he would like to make some comments. Ron noted that the Internet Forest concept paper says that future changes in the Internet infrastructure in Oregon and elsewhere will result from the decisions of private sector businesses and will be driven by end-user demand. Ron said that this statement is very true and needs to be re-emphasized. The bottom line is that there currently is not enough demand from Oregon Internet traffic to the Internet backbone to warrant a Tier 1 peering point in Oregon and this is not unusual. There are many states that do not have Tier 1 peering points in fact Ron believes that there are only six states that do. Oregon is transiting megabytes of traffic while peering points in the California Bay area and Washington are transiting greater than ten terabytes of data. Even with aggregating Oregon traffic, it does not come close to meeting the amount of traffic needed to substantiate a Tier 1 peering point. Ron noted that there are multiple requirements to be a Tier 1 peering point that can be found on the Qwest website at [www.qwest.com](http://www.qwest.com).

Ron said that there is a claim in the Internet Forest concept paper that because IP traffic travels out of the state to Seattle, San Francisco and other peering points that this causes latency and delay due to multiple “hops” and that causes service issues. Ron pointed out that the Internet is designed for multiple hops and for the most part this does not cause service quality issues. Many variables can cause service quality issues including link congestion, distance, jitter, and the user application itself. It’s up to the network service providers to monitor network performance and make changes as needed such as adjusting router tables. IP traffic travels around the world without service quality issues. There are connections from the United States to China and other countries around the world with no service quality issues due to the number of hops. Ron observed that there has been a lot discussion around trace routes and the number of hops before reaching the end location. He is not sure that this affects the user’s overall experience. He noted that voice calls also are set-up through multiple switching points that are not visible to the public, and that as is true with the Internet, it is the network service provider’s responsibility to ensure quality service.

Ron reported that the initial cost of a Tier 1 peering point is about \$2 million with routers, cable racks, labor and that this does not include the costs of transport facilities. Total start-up costs and the first year of operation would be over \$3 million, and then there would be ongoing recurring operating costs.

Ron said that the concept paper mentions new time sensitive applications such as telemedicine. He observed that Internet traffic is carried by fiber optic networks at the speed of light, so this should not be an issue. It is also important to understand that, over

the years, Internet backbone providers have introduced new technologies to improve network performance. He also noted that most Oregon IP traffic will not terminate in Oregon anyway, since most content is hosted out of state.

Ron said that the concept paper also paints a picture that Oregon is being “left out” or is “living under a freeway” because undersea cables that land in Oregon do not have a point of presence (PoP) in Oregon and that because there is no PoP in Oregon that somehow we don’t have good access. Ron said that transiting to another state to access these cables does not mean that Oregon has been left out. This should not cause any service quality issues. Even if we were to look at this as an employment opportunity, a PoP would not have many employees. Even if a PoP for an undersea cable were to be established this would still not justify a Tier 1 peering point. An illustration of this is a fiber landing in Florida from Latin America, and that traffic goes to New York. The perception that service problems are caused because traffic travels through other states is not correct.

Ron noted that Oregon has an advanced fiber based statewide network in place and a large percentage of residents have access to high speed Internet services. The providers are not aware of any latency problems in Oregon and are not aware of any time sensitive applications that cannot be supported. If there are issues, they need to be brought to the service providers so that they can be addressed.

Ron said that the “build it and they will come” strategy has proven many times not to work when dealing with broadband services. There are many examples of where a broadband build-out has not resulted in the anticipated economic development. Ashland FiberNet is a good example. Qwest has built fiber to business parks around the state and several are sitting there years later without a need for fiber.

Ron stated that the service providers do not believe that Lottery funds should be used for this initiative and do not believe that this initiative would stimulate the next wave of economic development in Oregon. Funds would be better used to recruit a Fortune 500 business to Oregon. Hopefully, a Fortune 500 company headquartered in Oregon would stimulate the increase in Internet traffic that’s proposed. Ron offered that if more information is needed, he would arrange for a subject matter technical expert for a future meeting.

#### Milo Mecham, Lane Council of Governments

Milo observed that this appears to be the classic economic development “chicken or egg” dilemma. If you don’t have the infrastructure, you can’t support the traffic, but you can’t build a business model for getting the traffic until you have the infrastructure in place. In the past, governments have sometimes taken the bold step of putting infrastructure in place. Somebody needs to start the ball rolling, and that is what economic development does. In Eugene, there is an initiative working with the City of Eugene and the University of Oregon to develop a business case and a model for what needs to be done to build the Oregon Internet Exchange located in Eugene. If funds are made available

under SB470, Eugene wants to be ready with a clear business model to support an application. This work will begin in the next fiscal year in July.

Ed Parker commented that he would like to make a distinction between an exchange and a Tier One peering point. Ed agrees with Ron Trullinger's point that Oregon does not have enough traffic to justify building a Tier One Peering point in Oregon today. That was an early idea that we learned is not realistic or practical. We can, however, work to improve Internet connectivity and network performance in Oregon without having a Tier One peering point. Peering means exchanging traffic as equals. Internet traffic is also exchanged between carriers as buyers and sellers.

#### Dale Smith, University of Oregon and Oregon Internet Exchange

The Oregon Internet Exchange (OIX) has been operating for almost a decade. Dale explained that peering is all about critical mass. The more peers you have the more valuable an exchange becomes. The more people we can attract to an exchange, the more valuable it becomes to all the parties that meet there. It is important that anyone with the ability to peer in Oregon should peer in Oregon. We are not talking about a Tier One Exchange and large capital investments. Improvements in the exchange of traffic can often be made with cross-connects at costs that approach zero.

Today, the University of Oregon continues to invest in this technology in its educational process. He estimated that three quarters of UO classes now use web-based materials and streaming media. UO continues work to improve Internet access including a WiFi network that now covers every academic space on campus, but importantly most all students and faculty use high speed Internet access at home. Students access a very rich set of education materials. They use Qwest DSL, Comcast Cable Modem, Clearwire wireless and other Internet services. All of that traffic leaves Eugene, goes to Seattle, or depending upon the provider goes to California and then comes back to Eugene. Dale said that he pays for that traffic to come back. If all these providers were peering locally, none of us would be paying to haul that traffic out of state. Qwest has high capacity circuits that go out of state and they have a presence in the Pittock Building. He believes that traffic could easily be exchanged there and noted that these exchanges do not need to have the same level of reliability and robustness of a Tier One peering point. If they were to fail traffic will alternatively get routed out of state as it is today, and we would be no worse off than we are today. It is also important that these be bilateral exchanges where carriers peer with other carriers at the exchange for local traffic. It is a simple proposition.

#### Jere Retzer, Northwest Access Exchange (NWAX)

Jere reported that NWAX was founded by Portland State University, Oregon Health and Science University and the Oregon Graduate Institute to interconnect public and private networks in order to improve regional access and service quality, and to accelerate regional deployment of "Next Generation" capabilities. NWAX became operational in December 2001 using Foundry Networks equipment located in the Pittock Block

Building in Portland. Jere said that NWAX supports the Internet Forest proposals and views them as valuable for the State of Oregon. He noted that NWAX has enjoyed near perfect availability since beginning operations.

NWAX has as its goals to help the region attain critical mass on the Internet, foster metropolitan, regional and global collaboration; leverage advanced technology to extend the benefits of leading-edge research, education and health care statewide; promote interconnection with state, regional and commercial networks to ensure seamless access and delivery of services wherever needed; support state and community development goals; and become self-supporting in the process. Jere noted that NWAX provides peering and a private virtual Local Area Network (VLAN) via 10/100/1000 MBPS Ethernet connections. NWAX is a “transit exchange” where networks buy and sell transit, as well as peer. NWAX currently has twenty-two members (see [www.nwax.org](http://www.nwax.org)) Its daily traffic peaks at over 500 MB per second. About 300 MB is from the Universities and about 200 MB is other “customer traffic.” NWAX has also expanded its fiber network to connect to EasyStreet in Beaverton and Viawest (formerly Fortix) in Hillsboro using Gigabit Ethernet.

Jere considered the “Critical Mass” issue. You’d think Oregon would be an Internet leader. It is often described as part of the most connected region of the country with the greatest concentration of teleworkers. We have a high concentration of technology companies and employees here. We have large Universities with growing demands, Jere sees University demand for bandwidth doubling each year. We straddle major fiber cable routes though we have few local “onramps.” Jere is concerned that potential business opportunities may migrate elsewhere such as research opportunities developed by Intel, Tektronics and other high-tech companies. He is concerned that e-business operations will locate to be close to the Internet backbone. He is concerned that any problems with the local quality of service will dampen demand. He noted that we are hampered by our lack of market concentration and close proximity to Seattle and the San Francisco Bay area. Oregon is currently on the edge of the network.

#### Rich Bader, EasyStreet Online Services

Rich was pleased to see the turnout and level of interest in this topic. Rich indicated that he is also in agreement with Ron Trullinger that we are in no position to support a Tier One Peering Point in Oregon, and that’s the problem. The question is, “What can we do about it?” Nobody is proposing an “if you build it they will come” approach. The insight that ORTCC had is looking for strategies to stimulate demand and grow and accelerate the growth of Oregon’s Internet economy. That is where the notion of web hosting came from. The next question is what can we host? We are back to the chicken and egg dilemma. There is a kernel of a solution that resides in Corvallis at the Oregon State University Open Source Lab (OSL). Somehow, OSL has become an epicenter for hosting one of the world’s most popular open source software applications. They can consume tremendous amounts of bandwidth for downloads of the Mozilla Firefox browser, Apache and other open source software. The thought is that if we can develop a coordinated strategy among data centers, large and small, around the state and grow

hosting activity, we can use that as a core to stimulate economic development in software companies. The Software Association of Oregon recently reported that the software industry contributes \$1.4 Billion in payroll for high-paying jobs in Oregon. It is a growth industry. Rich noted that we have a lot of assets associated with the software industry and Open Source and it is the hosting of those applications can help stimulate Internet traffic and demand. We may not have a Tier One Peering Point, but maybe we can begin to build the critical mass needed to improve our position.

There are huge economies of scale in the Internet. The cost per Megabit for Internet transit goes down dramatically the more you buy. We do not buy enough to have competitive costs in this state for large users that will be building their businesses on the Internet. The Open Source development community is based on sharing, collaboration, and everything is free in the “dot org” phase. The investment community has realized that there are “dot com” opportunities associated with these “dot org” projects and that is where the money is going. We should continue to raise the visibility of Oregon Open Source and promote it with large companies already in the state like IBM, Intel, and HP. Open Source is not the only answer or savior, but it can get us started. If demand can be stimulated, and data centers route traffic into local exchanges and concentrate transit requirements, it makes it more cost effective for the carriers to deliver bandwidth there. That means lower costs and that enables us to attract more large volume users and start a cycle that will help us keep up with what is already happening in places like the San Francisco Bay area and Seattle. Rich said that he has been doing economic development related to high technology for fifteen years and this is the best opportunity that he has seen to actually do something to make a difference. SB470 can help get web hosting to help reach the critical mass needed by the carriers. We need collaboration in the state to help make it happen. Data centers like EasyStreet, users like HP and Intel, and carriers working together. That is what Rich hopes SB470 will help get started. It will require some unnatural acts – some cooperation among competitors for the common good. It is what the Internet is all about. Rich hopes that there will be interest in participating.

Jon Dolan added that the kernel in Corvallis that Rich was referring to is the LINUX kernel that is hosted at Oregon State University. This Open Source operating system has been the seed for many open source projects.

Ed Parker asked Al Grapoli of the State Data Center if he had any comments. Al responded that the Data Center is currently engaged in network planning that includes increasing bandwidth in the southern and eastern areas of the state. This was confirmed by Mark Reyer, State Data Center Director, who added that Oregon has a tremendous asset in the Data Center. Mark indicated that he is open to proposals for additional uses of the Data Center for the betterment of Oregon.

### Internet Forest Discussion

Ed Parker asked for comments, concerns, and questions.

John Irwin echoed that ORTCC is not looking for a Tier One peering point, but that ORTCC is looking for continued improvement in Oregon's Internet telecommunications infrastructure.

Ron Trullinger again expressed that Qwest routes IP traffic all over the world and that the number of router hops does not equal service quality issues. Ron said that he is confused about what is being asked for. He understands the web-hosting idea and its economic development potential, but doesn't see why we need Lottery dollars to do that versus marshalling members of the private sector, presenting the idea and asking how do we as a team make it happen. He said that you don't need to incent companies like HP or Qwest to do things that make business sense.

Dale Smith responded that, as he described before, one of the principles of peering is critical mass. The more peers you have the more value is created. One of the objectives identified is to connect the two existing exchanges in Oregon. Another is to expand exchanges to southern and eastern Oregon. There are costs associated with doing these things. These funds can help make the business case to move forward on these initiatives.

Rich Bader noted that he spent time last year working with some local consultants and people from higher education on an Open Source proposal to the Oregon Innovation Council for funds to support Open Source industry cluster development. The large corporations did not directly participate in the proposal, but chose to watch the process. The proposal ended up not making the cut, and not being included in the Oregon Innovation Council's legislative package to the detriment of the Open Source cluster. Rich believed that the effort was not successful because "the big boys" did not participate. They did not participate because they were waiting for government to make a commitment to this issue and make something happen, and he believes that they would then have participated. Rich observed that this is seed money, and he believes that it will be leverage five or ten times over from the private sector. \$100,000 could be a significant help to the OSL to get additional servers into the data center. \$50,000 could be a significant help to exchanges pay for additional circuits until we reach critical mass. It could create some seed projects to develop that otherwise would not occur and it is an important symbolic gesture and a public policy statement.

Ron Trullinger said that he does not disagree, but he doesn't believe that the concept paper or the legislation lays that out. He hears peering points and router hops and is not getting the higher-level message, and he still has an issue with using Lottery dollars to build infrastructure that should be built with private investment.

Rich said that it is through sessions like this that these ideas need to be communicated and promoted.

Agnes Box asked for input on the language in the proposed legislation. She thinks that there is value in providing leadership and developing strategies for attracting business to Oregon in the areas of web hosting and e-commerce. She sees positive starting points from everything that has been said today.

Ed Parker commented we looking for continuing incremental improvements. When videoconferencing was introduced, we were happy that it worked at all. We are now beyond that point and want it to work reliably and with better quality. It is his experience that for applications like video conferencing, the number of router hops does create a service issue and that there are things that we can do to improve it at very little cost to improve network performance, reduce latency and jitter, and better serve user needs. We are not asking the state to pay for things the private sector should pay for. We are asking for the state to make a symbolic gesture as described by Rich and establish a public policy in this area. This is not intended to be used in any way to compete with the private sector but rather to facilitate interconnection and improve Oregon's Internet infrastructure.

Joe Franell said that he is hearing a desire to move the state forward in the use of the Internet. He disagrees with the opposition to initiatives to be aggressive in building infrastructure. Joe said that he is responsible for managing Ashland FiberNet that was mentioned earlier. He said that today, Ashland FiberNet is cash flow positive, and the City of Ashland has recently received global recognition for its use of broadband in economic development. Today, thirty to forty percent of the homes in Ashland have a home-based business. Joe suspects that many of those businesses use the Internet. As the technology director for the city, he is concerned with how do we move to the next level for economic growth. The challenges he faces include interconnection and how governments can work together. He thinks that a funding program that can improve interconnection, peering and improved efficiencies is a good thing. He thinks the funds will help exponentially what we are trying to do.

Rich Bader observed that some ideas have emerged from this discussion. We are trying to stimulate demand and concentrate the use of the Internet around the state. Rich suggested that perhaps the grant program should require at least two entities apply together with at least one of them coming from the private sector. This could help build community of interest and collaboration. Ed added that we are trying to do two things through SB470: one, facilitate interconnection and two, stimulate web hosting.

Milo Mecham noted that he has been involved in telecommunications for ten years and observed that, in his experience, the leading telecommunications service providers, and they are mostly based out of state, have always sung the same song. That is that when we say we want something, the response is that you don't need that. You don't need fiber. You don't need redundant rings. You don't need better Internet service. These proposals are doing what the State of Oregon and telecom advocates have done in the past, and that is to push the state forward despite the resistance of the industry that is the main provider of these services. They are perfectly satisfied with what they are doing now, and don't see a reason to advance. The state has played a role in advancing them in the past. This

legislation represents another step in pushing Oregon forward against the inertia of service providers.

Onno Husing said that he would appreciate some more discussion of the quality of service issue. He has observed dramatic differences in the user experience with videoconferencing given the quality of the network connection.

Jere Retzer responded with several examples. He has seen instances of physicians working with patients through telemedicine in rural Oregon using their standard Internet Service Provider and found it to be unusable, but when we had them use an ISP that was connected to NWAX, there was a dramatic quality improvement and the application worked. To comment on Ed Parker's Sprint – Embarq routing example, before routing tables were changed, traffic used to go by way of Ft. Worth, Texas and there were quality of service problems. When packets were redirected to Tacoma, it significantly improved the quality of service, though he added that they could be further improved by using an exchange in Oregon. More direct routing improves the quality of service.

Ray Simila said that he has been working with videoconference applications and listening to discussions about routing for years. He said that routing video over the Internet is a tough task. The Internet was not intended for that purpose. Peering at the exchanges is a great way of improving network performance for video, but again that is not an Internet function. There are other things coming in the Internet backbone such as Multi-Protocol Label Switching (MPLS) and other Quality of Service technologies that will improve network performance for video. Related to that issue are the Internet Service Providers (ISPs) and where user Internet addresses come from. When you buy Qwest DSL, you are not necessarily getting Qwest ISP service. Qwest provides the DSL, but your Internet connection may be through MSN or another ISP of your choosing and it may be their routing that's the problem. Ron added that fifty ISPs are used by Qwest DSL subscribers.

Matt Lampe shared two of his experiences. Before coming to the City of Portland he worked for the City of Seattle, one of the first cities to get cable-modem Internet services, and early in the deployment trials there were problems with network performance with users from the University trying to run applications from home. The diagnostics found that the local network was working fine. The problem was that that packets were being routed down to California and back up to Seattle and that was killing the applications. A local peering agreement addressed the issue. The point is that the real experience out there is that this does make a difference. Matt said his second experience was his participation in the founding Council of the Washington Technology Alliance that worked these kinds of issues with the Washington State Legislature. One of the reasons that there is an Internet2 Point of Presence (PoP) in the Pacific Northwest at all, is because there was a joint effort with the Legislature to invest money to bring it here. If you were to go back ten years and take that Internet 2 PoP away, you would see a significant negative effect on the Universities in Washington and Oregon. That was a government investment, and it took that investment to make the Internet2 PoP happen. Matt does not care if it is Lottery funds or something else, but there are times and places

when that government investment makes a huge difference out ten years impacting education and the economy. That needs to be recognized and to just say that government should not be involved is not an effective way of moving this region forward.

Agnes Box indicated that she greatly appreciates the private sector investment in Oregon's telecommunications. She loves her Qwest DSL and the continuing performance and price improvements. Their investments are based on business cases and she said that it is understandable that the incumbent service providers do not want to see prospective competitors financed with state funds. Agnes asked that we look for a way to partner for mutual benefit so that we can improve the switching fabric in Oregon and generate more business for the carriers.

Ron Trullinger asked another question. Regarding telemedicine, Ron thinks we are a long way away from a Doctor delivering clinical services to him in his home over a broadband connection. Isn't telemedicine going to involve hospitals and clinics with their own networks versus using the Internet? Kim Hoffman, Telehealth Coordinator for the Oregon Health and Science University (OHSU), responded that OHSU is currently working several projects that rely on the Internet. One is a project with Sacred Heart Hospital in Eugene where OHSU pediatric medical staff is evaluating patients at Sacred Heart using a video link on a virtual private network over the public Internet. Ron noted that we have hospitals in Oregon today that use radiologists in Australia during off-hours. A picture is being painted of the Internet here that it can't support these kinds of applications and that the Internet Forest concepts will somehow enable us to leap to the next level and he is not seeing it. Dale Smith replied that he doesn't see all healthcare providers in the state using a private network and that the difference in costs between private networks and the Internet will impact the viability of telehealth applications for small and rural clinics. Dale added that two key factors affect voice and video quality – latency and jitter. Basically what we are trying to do here is reduce latency and jitter.

Joe Franell said that he has to believe that Qwest, as one of the largest service providers in the state, wants Oregon to be better economically and to become a leading edge user of technology. How do we partner to take the next step in making Oregon's network more robust? How do we take the next step to improve network performance and reduce latency and jitter? Collectively, how do we take the network in Oregon to the next level?

Rich Ryan made the observation that improving and expanding exchanges in Oregon is as much about improving the flow of traffic within the state as it is connecting to the Internet. Why wouldn't the incumbent providers want to have some funding available to improve services within the state? Everyone would have an opportunity to access these funds.

Dale Smith said that he sees this as an opportunity to unify a lot of individual efforts localized around the state. Oregon State University has developed an Open Source Lab. OHSU, PSU and others created NWAX. UO built the OIX a decade ago. All of these efforts have produced positive results and economic growth. What is missing is the glue to tie these and other efforts together and help build the critical mass. As an alternative

we would be happy to have industry to step up and offer a grant program to address these opportunities. It could be a public-private partnership. We need equipment, rack space, circuits and people.

Chris Tamarin offered that the Internet Forest concept is concerned with defining the next public policy strategy for the state. Oregon through a proactive telecommunications public policy, specifically broadband telecommunications, has had a positive influence on the infrastructure that is in the state today, and has enjoyed some tremendous successes in building a robust network backbone and made tremendous progress in the deployment of broadband access throughout the state. The Internet Forest initiative seeks to define, “What’s next?” What can and should we do next to positively influence our network infrastructure? Our assessment is that the world is going to Internet Protocol (IP) and that IP network infrastructure is going to be important for the future. So let’s determine where we stand and determine what we need to improve. SB470 is one legislative concept and one proposed strategy. It may or may not be the best strategy. If not, what are some other ways we make improvements? We can be passive, and wait and see what happens next, or we can be proactive and define what we want to have happen next, and take steps to positively influence progress toward that end, facilitate it and accelerate it, so that it happens next year instead of in five years, or never. Let’s try not to get hung-up on one Bill or one program. Instead, we should consider whether this general approach is sound, and this focus on IP network development is valuable, and whether having a public policy that we can take direction from as government agencies, private sector service providers and end users in this area is useful.

Steve Caldwell suggested that ORTCC continue to work on the concept paper and pursue these goals. He suggested that work be done to clarify the wording, e.g., peering, exchange, Tier 1 and other terms. Craft a description in one page. Keep it simple. Use that as the vision statement. He said that there have been many good ideas expressed here today, but there is also confusion. Even with great people that have good working relationships, we are not going to get anywhere with this much confusion.

Ed Parker noted that we are after a public-private partnership that is a win-win proposition for the purpose of improving the Oregon economy. If we are successful in doing that, we all win.

Ed thanked everyone for participating today.

### **New Business:**

John Irwin asked for suggestions for the next meeting. He noted that the Oregon Wireless Interoperability Network recommendations and strategies for public safety networks and interoperability remain as active issues.

**Meeting Schedule:**

The next Council meeting will be on Thursday, March 22, 2007. ORTCC meeting dates for the rest of 2007 are April 26, May 24, June 28, July 26, August 23, September 27, October 24, and November 29. Meetings will be held in the Teleconference Room (Basement) of the Public Service Building, 255 Capitol Street NE, in Salem with the exception of the October meeting, which will be held in Newport. Meeting information will be updated and posted on the Council website at [www.ortcc.org](http://www.ortcc.org). John Irwin adjourned the meeting.

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