

DEPARTMENT OF PUBLIC SERVICE REGULATION
BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MONTANA

* * * * *

IN THE MATTER OF CenturyLink QC's) REGULATORY DIVISION
Service Quality and Its Response to Notice)
of Commission Action in Docket) DOCKET NO. D2014.11.91
N2014.3.38, Including Petition for Waiver of)
Admin. R. Mont. 38.5.337197)(b))

IN THE MATTER OF the Request of Staff) REGULATORY DIVISION
of the Montana Public Service Commission)
for CenturyLink Service Quality Information) DOCKET NO. N2014.4.38

Pre-Filed Direct Testimony

of

Dr. Robert Loube

on Behalf

of

The Montana Consumer Counsel

June 26, 2015

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1 **I. INTRODUCTION AND SUMMARY**

2 **Q. DR. LOUBE, PLEASE STATE YOUR NAME, OCCUPATION, AND**
3 **BUSINESS ADDRESS.**

4 A. My name is Robert Loube. My business address is 10601 Cavalier Drive,
5 Silver Spring, Maryland. I am the Vice President of Rolka Loube Associates,
6 headquartered in Harrisburg, Pennsylvania. I have a doctorate in Economics
7 from Michigan State University. I have previously worked in
8 telecommunications regulation at the Federal Communications Commission,
9 the District of Columbia Public Service Commission, and the Indiana Utility
10 Regulatory Commission. In my consulting work, I have provided services to
11 the Maine Office of the Public Advocate, the Pennsylvania Office of
12 Consumer Advocate, and the U.S. Department of Justice. My vita is attached
13 as MCC Exhibit No. 1.

14 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING?**

15 A. I am testifying on behalf of the Montana Consumer Counsel (“MCC”).

16 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

17 A. The purpose of my testimony is to evaluate CenturyLink QC’s plan to
18 comply with Admin. R. Mont. 38.5.3371(7) and its motion to remove the
19 issue of service quality from this docket. I will also evaluate CenturyLink’s
20 expressed concern that “compliance with the rule creates an unreasonable

1 burden, namely significant expenditures or the diversion of resources used to
2 deploy competitive services that customers demand.”¹ My analysis will show
3 that CenturyLink’s plan does not address the Commission’s main concern
4 that “some number of CenturyLink customers in rural areas who have little or
5 no choice other than CenturyLink for telephone service are experiencing
6 chronic service quality problems and outages due to the poor condition of the
7 CenturyLink infrastructure that serves them.”² Instead, the plan relies solely
8 on CenturyLink QC’s repair staff. Three technicians will be temporarily
9 reassigned from construction activities to repair activities. Repair technicians
10 will focus on fixing out-of-service troubles and the company may employ
11 more technicians.³ The company’s plan, however, does not provide a
12 coherent path toward providing reliable service. Other problems could
13 emerge while the company focuses energy on meeting one standard to avoid
14 the penalties associated with not meeting that standard. To give the
15 Commission an alternative consideration and approach to weigh alongside
16 the company’s plan, I will offer an alternative plan that focuses on each wire

¹ CenturyLink QC Withdrawal of Petition for Waiver and Motion to Remove Issue, paragraph 2, Filed April 13, 2015, Docket Nos. D2014.11.91 & N2014.4.38.

² Notice of Commission Action and Notice of Filing and Intervention Deadline, service date November 12, 2014, page 2, Docket Nos. D2014.11.91 & N2014.4.38.

³ Qwest Corporation d/b/a CenturyLink QC Plan to Comply with ADMIN.R.MONT.38.5.3371(7), Docket No. D2014.11.911, filed on April 13, 2015, page 2-3.

1 center and develops a strategy to solve that wire center's service quality
2 problems.

3 As part of my evaluation I will review the recent history of CenturyLink's
4 inability to meet the requirements of Admin. R. Mont. 38.5.3371(7) (b). I
5 will also focus on the types of infrastructure that are deployed in Montana
6 and how that infrastructure impacts the ability of CenturyLink QC to meet its
7 obligation. I will also review the investment patterns of CenturyLink QC.
8 In particular I will discuss CenturyLink QC's claims regarding the cost of
9 replacing its Analog Carrier systems. In addition, I will describe the Federal
10 Communication Commission's (FCC) Connect America Fund (CAF) Phase
11 II program and show how, if CenturyLink QC agrees to participate in that
12 program, CenturyLink QC will be provided with funds that would pay for
13 substantial enhancements to its network.

14 **II. CENTURYLINK QC'S CURRENT PERFORMANCE**

15 **Q. WHAT IS THE ADMINISTRATIVE RULE THAT IS THE FOCUS OF**
16 **THIS DOCKET?**

17 A. The administrative rule that is the focus of this docket is Admin. R.
18 38.5.3371(7)(b). The rule states that:

19 Ninety percent of out of service trouble reports shall be cleared
20 within 24 hours, excluding Sunday (except where access to the
21 customer's premises is required but not available, or where

1 interruptions are caused by unavoidable causalities and act of God
2 affecting large groups of customers).

3 **Q. PLEASE DESCRIBE CENTURYLINK'S PERFORMANCE.**

4 A. CENTURYLINK QC's performance has been substantially lower than the
5 90% standard. For the year 2014, the state-wide average out-of-service
6 ("OOS") greater than 24 hours was 49%.⁴ The best performance month was
7 February when the state-wide average was 62% and the worse performance
8 month was July when the state-wide average was 43%. The substandard
9 performance has continued into 2015. The state-wide average is 64% year-
10 to-date for the first four months of the year.⁵ As I discuss in my next question
11 and answer and as shown in the confidential exhibits MCC 2 and 3, the
12 substandard performance is not just a problem for the small rural wire
13 centers. It is also a problem for almost every wire center in Montana.
14 However, there was a turn-around in April, when the state-wide average
15 increased to 83%. April was the kick-off month for the company's
16 compliance plan that began on March 29, 2015.⁶

⁴ Out-of-Service data for the year 2014 is provided in confidential MCC Exhibit 2.

⁵ Out-of-Service Data for 2015 is provided in confidential MCC Exhibit 3.

⁶ Qwest Corporation d/b/a CenturyLink QC Plan to Comply with ADMIN.R.MONT.38.5.3371(7), Docket No. D2014.11.911, filed on April 13, 2015, page 2.

1 **Q. DOES CENTURYLINK QC'S PERFORMANCE VARY ACROSS THE**
2 **STATE?**

3 A. CenturyLink QC's performance is consistently substandard across the state.

4 To measure the variance across the state, I divided the state into two groups.

5 In the first group, I included the top 10 wire centers as measured by the

6 number of out-of-service tickets in 2014. These wire centers were Billings

7 Main, Billings West, Bozeman, Dillon, Great Falls Main, Hamilton, Havre,

8 Helena Main, Missoula Main, and Stevensville. The second group includes

9 all the other 59 wire centers reported referred to as the "all other group". For

10 the year 2014 the top 10 wire center OOS cleared in greater than 24 hours

11 average was 48%, while the all other group average was 51%. For the first

12 four months of 2015, the top 10 wire center OOS cleared in greater than 24

13 hours average was 64% and the all other group was 63%.

14 **Q. WILL ENFORCEMENT OF THE STATE-WIDE STANDARD**
15 **PROTECT CUSTOMERS IN RURAL AREAS?**

16 A. The enforcement of the state-wide standard will protect customers in rural

17 areas, because in order for the company to reach the 90% standard, even if the

18 company focuses most of its energy on improvements in the top ten wire

19 centers, it will still have to substantially improve service in the all other

20 group. To support this assertion I calculated two scenarios. In the first

21 scenario, I set the top ten wire center OOS cleared in 24 hours rate at 95%

1 and calculated what the rate would have to be for the all other group in order
2 to meet the 90% standard. In that case, in 2014, the all other group would
3 have had to meet an 85% clearance rate, and the range of clearance was
4 between 83 to 86% for each month during the year.⁷ For the year 2015, in
5 order for the state-wide average to be 90%, the all other group would have
6 had to meet an 85% clearance rate and range of clearance was between of 85
7 to 86% for each month during the year.⁸

8 In the second scenario, I set the top ten wire center OOS cleared in 24 hours
9 rate at 99% and calculated what the rate would have to be for the all other
10 group in order to meet the 90% standard. In that case, in 2014, the all other
11 group would have had to meet an 80% clearance rate, and the range of
12 clearance was between 78 to 82% for each month during the year.⁹ For the
13 year 2015, in order for the state-wide average to be 90%, the all other group
14 would have had to meet an 80% clearance rate and range of clearance was
15 between of 79 to 83% for each month during the year.¹⁰

⁷ Scenario calculations for the year 2014 are shown in confidential MCC Exhibit 2.

⁸ Scenario calculations for the year 2015 are shown in confidential MCC Exhibit 3.

⁹ Scenario calculations for the year 2014 are shown in confidential MCC Exhibit 2.

¹⁰ Scenario calculations for the year 2015 are shown in confidential MCC Exhibit 3.

1 **Q. IS IT POSSIBLE TO COMPARE THE OOS CLEARANCE RATE BY**
2 **THE TYPE OF INFRASTRUCTURE DEPLOYED?**

3 A. It is possible to compare the OOS clearance rate by type of infrastructure. I
4 was able to compare the clearance by whether the customer is served by
5 analog carrier systems, fiber to the node (FTTN) design, fiber to the home
6 (FTTH) design, bonded copper pair and all other network designs.

7 **Q. WHAT TYPE OF INFRASTRUCTURE IS INCLUDED IN YOUR ALL**
8 **OTHER CATEGORY?**

9 A. The all other network contains all of the network designs that are not
10 specifically mentioned. It would include customers connected directly to the
11 wire center via copper cable or open wire. It would also include customers
12 served by a combination of fiber feeder cable, a remote and copper
13 distribution wire.

14 **Q. WHAT METRIC DO YOU USE TO COMPARE SERVICE BY**
15 **INFRASTRUCTURE TYPE?**

16 A. The metric I use to compare service by infrastructure type is the number of
17 OOS greater than 24 hours per 1000 living units passed.

1 **Q. HOW DID YOU CALCULATE THAT METRIC?**

2 A. I used a multi-step process to calculate the metric. First, census blocks were
3 assigned to CenturyLink QC on the basis of whether the centroid¹¹ of the
4 census block lies within the boundary of one of Century Link QC's wire
5 centers. Second, the number of living units in each census block was
6 obtained from the Bureau of the Census data bases. Third, the addresses as of
7 December 31, 2014 associated with bonded pairs, analog circuit, FTTN and
8 FTTH locations were geocoded.¹² Geocoding a location provides the latitude
9 and longitude of the location. With those measurements, the location can be
10 assigned to a census block. It was not possible to geo-code all of the
11 addresses. For example, 1,089 of 1,207 (90.2%) analog carrier addresses
12 were geo-coded. Next the addresses associated with OOS greater than 24
13 hours for the months of August 2014 to February 2015 were geo-coded and
14 assigned to census blocks.¹³ The numerator of the metric was determined by
15 summing the number of OOS greater than 24 hours across all census blocks
16 where the particular infrastructure was available, and the denominator was
17 determined by summing the number of living units across all census blocks

¹¹ The **centroid** or geometric center of a two-dimensional region is the arithmetic mean ("average") position of all the points in the shape. The definition extends to any object in n-dimensional space: its **centroid** is the mean position of all the points in all of the coordinate directions.

¹² CenturyLink QC Responses to Data Request No. MCC-002, Confidential Attachments A, C, and D.

¹³ Selected CenturyLink QC Montana OOS Miss Detail Reports.

1 where the particular infrastructure was available and dividing that sum by
2 1,000.

3 **Q. WHAT WAS THE RESULT OF YOUR ANALYSIS?**

4 A. The results of my analysis are shown in the table below. Analog circuit
5 stands out as having the poorest results and FTTH as having the best results.
6 The FTTH results should be given limited weight because the number of
7 locations passed by FTTH was very small and one of the FTTH
8 neighborhoods appeared on a Google Map search of June 4, 2015 as an open
9 field with dirt tracks.¹⁴ This analysis supports a recommendation that the
10 analog circuit equipment should be replaced as soon as possible.

11 Table 1: OOS>24/ 1000 Living Units by Network Design

Structure Type	Analog Circuit	FTTN	FTTH	Bonded Pair	All other
OOS>24/1000 Living Units	6.95	2.83	0.0	2.98	2.62

12

¹⁴ Begin Confidential [REDACTED] End Confidential.

1 **III. CENTURLINK QC'S COMPLIANCE PLAN**

2 **Q. PLEASE DESCRIBE CENTURLINK QC'S CURRENT REPAIR**
3 **OPERATIONS.**

4 A. For repair purposes CenturyLink QC divides the state into six work areas.
5 Each work area contains a group of wire centers. The work areas are: Great
6 Falls (13 wire centers), Missoula (10 wire centers), Butte (9 wire centers),
7 Billings (20 wire centers), Helena (7 wire centers), Bozeman (13 wire
8 centers).¹⁵ The wire centers in the Helena work area are: Helena Main, East
9 Helena, Helena North, Clancy, Canyon Ferry, Townsend, and Wolf Creek.
10 The total number of technicians employed were 59, 64, and 63 measured as
11 full-time equivalent (FTE) employees as of December 31, 2012, 2013, and
12 2014 respectively.¹⁶ In addition, CenturyLink QC hires incidental
13 employees, where an incidental employee is allowed to work only 1160 hours
14 per year. There were eight, five, and one incidental employees as of
15 December 31, 2012, 2013 and 2014 respectively.¹⁷ As of December 31, 2014,
16 there were [Begin
17 Confidential] [REDACTED]

¹⁵ CenturyLink QC's Response to MCC Data Request No. 18.

¹⁶ CenturyLink QC's Response to MCC Data Request No. 15.

¹⁷ *Id.*

1 [REDACTED]
2 [REDACTED]
3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED] [End

12 Confidential.]

13 **Q. HOW DOES CENTURYLINK QC HANDLE TROUBLE REPORTS?**

14 A. When a customer reports a trouble event, it is routed through a call center.
15 There are no call centers in Montana. Such calls would most likely be
16 processed in the Denver call center but other call centers may also handle the
17 call.¹⁸ The responsibility to assign the trouble ticket to a technician “is a
18 coordinated effort between a load specialist located in Denver, Colorado and

¹⁸ CenturyLink QC’s Response to MCC Data Request No. 30.

1 the technician's local supervisor who is an Area Plant Supervisor (APS)."¹⁹
2 Upon completion of the repair, the technician files a report through an
3 automated wireless system.²⁰ There may be instances where a comprehensive
4 solution to the trouble would require the construction of new facilities. If so,
5 then the Area Operations Manager and/or the Area Plant supervisor would
6 make a request for that work. CenturyLink QC, however, does not track such
7 requests, and therefore, it is not known how often those requests have been
8 made.²¹

9 **Q. PLEASE DESCRIBE CENTURYLINK QC'S COMPLIANCE PLAN?**

10 A. CenturyLink QC's compliance plan supplements its current repair program
11 by first temporarily transferring three technicians from construction activities
12 to repair activities. The transfer of three technicians is approximately a 5%
13 increase in the number of technicians assigned to repair duties. This transfer
14 was scheduled to occur on March 29, 2015.²² The plan does not provide a
15 schedule for when this temporary transfer might end. CenturyLink QC did
16 not rely on any studies, memoranda or other documents to support the
17 reasonableness of this decision.²³ CenturyLink QC may also transfer some

¹⁹ *Id.*

²⁰ *Id.*

²¹ CenturyLink QC's Response to MCC Data Request No. 31.

²² Qwest Corporation d/b/a CenturyLink QC Plan to Comply with ADMIN.R.MONT.38.5.3371(7), Docket No. D2014.11.911, filed on April 13, 2015, page 2.

²³ CenturyLink QC's Response to MCC Data Request No. 26.

1 unspecified number of additional employees if it deems such a transfer is
2 necessary. Second, when scheduling work assignments, managers will ensure
3 that out of service conditions will take top priority over other activities.²⁴
4 Third, some technician will be scheduled to work on Saturdays and
5 overtime.²⁵ Fourth, CenturyLink QC will begin the process of hiring
6 additional technicians.²⁶ The plan, however, does not specify when these
7 technicians will be hired nor does it specify how many technicians will be
8 hired.

9 **Q. WHAT IS WRONG WITH THE CENTURYLINK QC PLAN?**

10 A. The CenturyLink QC Compliance Plan contains three significant problems.
11 First, there is no systematic analysis of the out-of-service incidents. Because
12 this analysis is missing, any strategy proposed by CenturyLink QC won't
13 realistically be directed toward preventing future out-of-service incidents.
14 Without an evidence-based strategy for preventing future incidents,
15 CenturyLink QC will risk continually addressing immediate problems
16 without implementing a long term resolution. It will continue to spend
17 money on quick fixes. Instead, the solution should be a reliable network
18 across the entire state of Montana that experiences fewer outages in every

²⁴ Qwest Corporation d/b/a CenturyLink QC Plan to Comply with ADMIN.R.MONT.38.5.3371(7), Docket No. D2014.11.911, filed on April 13, 2015, page 3.

²⁵ *Id.*

²⁶ *Id.*

1 area in which the outages that do occur can be fixed within 24 hours,
2 regardless of where they occur.

3 Second, the plan relies exclusively on refocusing and hiring technicians. The
4 plan states four times that there will be no effect on its capitalized
5 expenditures.²⁷ These statements imply that CenturyLink QC has no intention
6 of upgrading its network to prevent out-of-service incidents from occurring.
7 While CenturyLink QC has shown that it is upgrading its network²⁸ and that
8 those upgrades may improve its network reliability, those upgrades are not
9 linked to its compliance plan. Therefore, CenturyLink QC is not addressing
10 the Commission's observation that chronic rural service quality problems are
11 due to the poor condition of the CenturyLink QC network.²⁹ Moreover,
12 because it does not involve capital expenditures, the plan cannot be a long
13 term plan. Because it does not involve capital expenditures, the plan cannot
14 take CAF II funding into account because to receive CAF II funding the
15 carrier would have to upgrade its network to meet the CAF II public service
16 obligations. Yet, CenturyLink QC argued that a plan to solve its service
17 quality issues must be long term and must take into account CAF II

²⁷ Qwest Corporation d/b/a CenturyLink QC Plan to Comply with ADMIN.R.MONT.38.5.3371(7), Docket No. D2014.11.911, filed on April 13, 2015, page 2-3.

²⁸ See CenturyLink QC's October 17, 2014 oral presentation. CenturyLink QC provided the Commission with paper copies of the non-confidential information presented on January 9, 2015 and paper copies of the confidential information presented on March 9, 2015.

²⁹ Notice of Commission Action and Notice of Filing and Intervention Deadline, Docket Nos. D2014.11.91 & N2014.4.38, service date November 12, 2014, page 2.

1 funding.³⁰ These previous CenturyLink QC arguments suggest that its current
2 plan is inadequate.

3 Third, by focusing solely on reducing the number of out-of-service trouble
4 tickets that have not been repaired within 24 hours, it is possible that other
5 problems will not be addressed. For example, if customers have troubles that
6 do not generate an out-of-service, such as static on the line, it is likely that
7 those customers will have a harder time gaining the company's attention and
8 having the trouble repaired. Rather than focusing solely on out-of-service
9 troubles, a plan that upgrades the network would simultaneous solve the out-
10 of-service troubles, reduce other network troubles and allow the company to
11 provide enhanced services to more customers.

12 **Q. DID CENTURYLINK QC PROPOSE AN EARLIER PLAN?**

13 A. On October 17, 2014 CenturyLink QC presented a response³¹ to the
14 requirement for the company to submit a service improvement plan.

15 **Q. HOW DOES THAT RESPONSE DIFFER FROM THE CURRENT**
16 **PLAN?**

17 A. The Company, in its presentation to the Commission about what was needed
18 to address the out of service problems, documented that 38 technicians

³⁰ CenturyLink Response to Notice of Commission Action, Request for Continuance and Petition for Waiver, Docket No. N2014.4.38, October 24, 2014, Paragraphs 4 and 6.

³¹ See CenturyLink QC's October 17, 2014 oral presentation. CenturyLink QC provided the Commission with paper copies of the non-confidential information presented on January 9, 2015 and paper copies of the confidential information presented on March 9, 2015.

1 would be required to improve the OOS repair rate in 24 hours to greater than
2 90% in every wire center and the cost of those additional technicians.³² The
3 current proposed compliance plan addresses the repair rate on a state-wide
4 basis. The OOS repair rate in 24 hours may be higher or lower than 90% in
5 individual wire centers.

6 **IV. AN ALTERNATIVE COMPLIANCE PLAN**

7 **Q. PLEASE DESCRIBE THE PLAN YOU ARE RECOMMENDING.**

8 A. My alternative plan will incorporate the need to assign additional technicians
9 to the task of repairing out-of-service troubles. However, that assignment
10 should be short-run. The goal of the alternative plan is to fix and upgrade the
11 network so that out-of-service troubles are reduced and repairing those out-
12 of-service troubles would occur in less than 24 hours. The additional tasks
13 included in the alternative plan are to focus on the underperforming wire
14 centers over the six years of the CAF II program. For each selected wire
15 center, the additional tasks would include:
16

³² *Id.*

- 1 1. Determine the current condition of the network by having
2 technicians inspect all access points such as pedestals and terminals
3 and the cable facilities.

- 4 2. Upon request, make a log book available for one month to
5 residential customers. The log book should allow those customers to
6 enter the date, time and nature of the problem of any problem that
7 they are having with their voice telephone or Internet service.

- 8 3. Review all information obtained in steps 1 and 2.

- 9 4. Require the technicians that are inspecting the network facilities to
10 repair any problems that do not require major engineering work or
11 capital improvements.

- 12 5. Integrate capital improvements required for service improvements
13 with any other capital improvements scheduled by the company for
14 other reasons. If there are no other capital improvements scheduled,
15 initiate new capital improvement programs to solve the problems.

16 In addition I highly recommend that CenturyLink QC accept the FCC's CAF
17 II offer which will facilitate the above recommendations. Accepting the offer
18 will provide revenue that would support capital improvement programs. For
19 example, there are an estimated 422 of the 1,207 CenturyLink QC analog
20 carrier locations in the census blocks that the FCC is willing to support.
21 The plan would also require CenturyLink QC to continue the current reports
22 on OOS, OOS miss detail, repeat troubles, and the monthly incident log. In
23 addition, CenturyLink QC should file with the Commission its FCC 471 and
24 481 reports and any reports related to compliance with CAF Phase I support
25 on the day it files those reports with the FCC. Further, CenturyLink QC
26 should file a five-year service quality improvement plan as if it were required

1 to file such a plan according to 47 C.F.R 54.202(a) and a progress report on
2 its service quality improvement plan as if it were required to file such a report
3 according to 47 C.F.R. 54.313(a).

4 **Q. WHY DOES YOUR PLAN INCLUDE PROVIDING CUSTOMERS**
5 **WITH A LOG BOOK TO RECORD THEIR PROBLEMS WITH**
6 **THEIR SERVICE?**

7 A. During the public hearing on May 21, 2015, customers discussed several
8 problems with the manner in which CenturyLink QC reports its troubles. For
9 example, one customer was told she could not report a trouble that affected
10 another customer's service.³³ She said that she attempted to call her friends.
11 The called party telephone rang and rang and no one answered. Later, when
12 she asked her friends about the call, she was told that they had not heard the
13 telephone ringing. In that case, the other customer did not even know that the
14 trouble was occurring. If the testifying customer had had a log book, that
15 customer could have recorded those troubles and the company would have a
16 more complete record of the problems that its customers are facing.

³³ Public witness Anderson speaking during the last ten minutes of the hearing.
<http://psc.mt.gov/Docs/WorkSessions/WorkSessionAudio/?year=2015>.

1 **Q. HAS ANOTHER COMMISSION ADOPTED A PLAN SIMILAR TO**
2 **THE ONE YOU ARE RECOMMENDING?**

3 A. The Wyoming Commission has adopted a plan similar to the plan I am
4 recommending.³⁴

5 **V. THE FCC'S CAF II PROGRAM**

6 **Q. WHY DID YOU RECOMMEND THAT CENTURYLINK**
7 **PARTICIPATE IN THE FCC'S CAF II PROGRAM?**

8 A. I recommended that CenturyLink participate in the CAF II program because
9 that program will provide the funds that will support an upgrade in
10 CenturyLink's network. While the goal of the upgrade is to connect every
11 American household to a broadband network, voice service will be an
12 application on that network. The upgraded network should provide more
13 reliable voice service than the existing deteriorating network and therefore
14 the upgrade is part of the solution to CenturyLink's quality of service
15 problems.

³⁴ *In the Matter of the Commission's Investigation on its own motion into the Quality and Reliability of the Telecommunications Service provided by Qwest Corporation (Now D/B/A CenturyLink QC) in its Certified Territories in Wyoming*, Docket No. 9000-113-XI-10, Order, entered on March 18, 2014 and Attachment A to the Order.

1 **Q. PLEASE DESCRIBE THE FCC'S CAF II PROGRAM**

2 A. The FCC's CAF II program provides carriers with universal service support
3 funding in certain designated census blocks. The support level is the
4 difference between the monthly cost of service and a benchmark times the
5 number of locations in the census block times 12 (months). The carrier's
6 support would be the sum of the census block support for all supported
7 census blocks in its service territory. To receive support the carrier is
8 required to fulfill certain public service obligations.

9 **Q. HOW DOES THE FCC DECIDE TO SUPPORT A PARTICULAR**
10 **CENSUS BLOCK?**

11 A. The FCC uses several criteria to determine if a census block should be
12 supported. First, the census block cannot be served by another wireline or
13 fixed wireless provider that provides voice telecommunications and
14 broadband Internet service. Second, the cost per month per location must be
15 between a lower and an upper benchmark. The monthly cost is determined
16 by a forward-looking economic model. The model investments are based on
17 a FTTH network design. The lower benchmark is \$52.50, the upper
18 benchmark is \$198.60.³⁵ Census blocks with cost below the lower

³⁵ *Wireline Competition Bureau Announces Connect America Phase II Support Amounts Offered to Price Cap Carriers To Expand Rural Broadband*, WC Docket No. 10-90, DA 15-509, released April 29, 2015, footnote one.

1 benchmark will never be supported. Census blocks with costs above the
2 upper benchmark may be eligible for support from the FCC's remote areas
3 support program. However, the remote areas support program has not been
4 established at this time.

5 **Q. PLEASE DESCRIBE THE PUBLIC SERVICE OBLIGATIONS?**

6 A. The public service obligation includes the obligation to provide voice
7 telephone service in high cost and extremely high cost areas.³⁶ With regard
8 to broadband service in supported areas there is a speed requirement that the
9 service should at least provide service at a speed of 10Mbps downstream and
10 1 Mbps upstream direction.³⁷ There are also latency and capacity
11 requirements.³⁸

12 **Q. DOES CENTURYLINK HAVE TO ACCEPT THE FCC'S OFFER?**

13 A. CenturyLink does not have to accept the FCC offer.

14 **Q. WHAT ARE THE CONSEQUENCES OF NOT ACCEPTING THE**
15 **OFFER?**

16 A. If CenturyLink turns down the offer, then CenturyLink will continue to
17 receive its frozen support until such time as the FCC picks a carrier to receive

³⁶ *In the Matter of Connect America Fund*, WC Docket No. 10-90 et al., Report and Order, FCC 14-190, released on December 18, 2014, ¶ 51-52.

³⁷ *Id.*, ¶15.

³⁸ *In the Matter of Connect America Fund*, WC Docket No. 10-90 et al., Report and Order and Further Notice of Proposed Rulemaking, FCC 11-161, released on November 18, 2011, ¶ 96-97.

1 universal service support through a competitive bid process in the designated
2 census blocks. Once the FCC picks the winner of the bid process,
3 CenturyLink loses its frozen support. However, CenturyLink can participate
4 in the bid process. For CenturyLink the benefit for participating in the
5 competitive bid process is that it can pick and choose the areas of the state
6 where it wants to meet the public service obligations rather than meet the
7 public service obligations in all parts of the state. The risk to CenturyLink is
8 that it may lose support in areas that it wishes to serve.

9 **Q. IF CENTURYLINK ACCEPTS THE FCC'S OFFER WHAT ARE THE**
10 **BENEFITS TO THE CENTURYLINK QC SERVICE TERRITORY?**

11 A. The benefits include support for 27,730 locations³⁹ of which approximately
12 422 are locations that are currently served by analog carrier systems. The
13 amount of support will be \$15,195,626 per year⁴⁰ or \$91,173,768 for six
14 years with an option to extend it to seven years.⁴¹ For every location,
15 broadband service must be upgraded to at least 10mbps service in the
16 downstream direction and 1mbps in the upstream direction. The maps in

³⁹ CAM4.3 supported locations, <https://www.fcc.gov/encyclopedia/price-cap-resources>.

⁴⁰ This amount includes support for both CenturyLink QC and Century Tel dba CenturyLink. Connect America Cost Model Final Results Report: Offer by Carrier and by State, <https://www.fcc.gov/encyclopedia/connecting-america>.

⁴¹ *In the Matter of Connect America Fund*, WC Docket No. 10-90 et al., Report and Order, FCC 14-190, released on December 18, 2014, ¶ 31.

1 confidential MCC Exhibit 4 show the extent of CAF II proposed support in
2 Helena, Billings and the Cascade and Wolf Creek wire centers.

3 **VI. CENTURYLINK QC'S CONCERNS REGARDING ADMIN. R.**

4 **MONT. 38.5.3371(7)**

5 **Q. WHAT IS CENTURYLINK QC'S POSITION REGARDING THE**
6 **ENFORCEMENT OF ADMIN.R.MONT.38.5.3371(7)(B)?**

7 A. CenturyLink QC originally requested that the Commission waive the rule. It
8 has now withdrawn that request.⁴² Instead, it is asking the Commission to
9 remove from this docket the issue of service quality in rural areas.⁴³

10 **Q. WHY IS CENTURYLINK QC CONCERNED ABOUT THIS RULE?**

11 A. CenturyLink QC has asserted that the rule is a legacy rule that is outdated.⁴⁴
12 CenturyLink claims that the industry environment has changed and it must
13 address issues associated with those changes rather than focusing on its rural
14 customers' service quality.⁴⁵ CenturyLink asserted that it is very expensive
15 to fix the problems associated with its rural areas in terms of investment and
16 labor costs. In particular, it noted that it is very expensive to replace its

⁴² CenturyLink Response to Notice of Commission Action, Request for Continuance and Petition for Waiver, Docket No. N2014.4.38, October 24, 2014, Paragraphs 13.

⁴³ CenturyLink QC Withdrawal of Petition for Waiver and Motion to Remove Issue, Filed April 13, 2015, Docket Nos. D2014.11.91 & N2014.4.38, paragraph 3.

⁴⁴ CenturyLink Response to Notice of Commission Action, Request for Continuance and Petition for Waiver, Docket No. N2014.4.38, October 24, 2014, Paragraphs 4 & 8.

⁴⁵ *Id.*, paragraph 4.

1 analog carrier systems and that customer service related to those systems is
2 affected by their geographic location and the difficulty of obtaining spare
3 parts.⁴⁶

4 **Q. DO YOU AGREE WITH THE ASSERTION THAT THE RULE IS**
5 **OUTDATED?**

6 A. I disagree. Providing reasonable service quality is a primary task of any
7 telephone service provider. I agree with the FCC that in the transition to a
8 new network it is essential to protect the enduring core values of the
9 telecommunications network. The FCC listed four major core values of
10 telecommunications networks. These are: (1) public safety and national
11 security; (2) universal service; (3) competition; and (4) consumer
12 protection.⁴⁷ Repairing out-of-service troubles in less than 24 hours is an
13 essential part of the public safety obligation of telephone carriers. When
14 telephone service does not work, it may not possible to connect to 911.⁴⁸ The
15 FCC also recognized that universal service requires carriers to maintain or
16 enhance service quality.⁴⁹

⁴⁶ *Id.*, paragraph 3.

⁴⁷ *In the Matter of Technology Transitions*, GN Docket No. 13-5, et al., Order, Report and Order and Further Notice of Proposed Rulemaking, Report and Order, Order and Further Notice Proposed Rulemaking, Proposal For Ongoing Data Initiative, FCC 14-5, released January 31, 2014, ¶37.

⁴⁸ *Id.*, ¶39.

⁴⁹ *Id.*, ¶57.

1 **Q. DO YOU AGREE THAT THE INDUSTRY ENVIRONMENT HAS**
2 **CHANGED?**

3 A. I agree that the industry environment changes over time. I, however, do not
4 agree that the industry environment has changed since April 1, 2011 when
5 CenturyLink purchased QWEST. QWEST's switched access line counts had
6 been declining from a peak of 393,904 in 2000 to 202,156 access lines in
7 2010, the year before the purchase.⁵⁰ CenturyLink either knew or should
8 have known about this change in environment. It was generally known by
9 2010 that many consumers were switching to cable providers for telephone
10 service and that many consumers were "cutting the cord" and depending on
11 wireless providers for telephone service. CenturyLink either knew or should
12 have known about ADMIN.R.MONT.38.5.3371(7)(B). The rule should not
13 be considered a surprise to CenturyLink. If CenturyLink did not have the
14 resources to meet the standards in the rule, it could have either refused to
15 purchase the service territory or offered a lower price for the service territory
16 so that it would be able to meet the standard. CenturyLink QC has the
17 responsibility to maintain service quality such that it meets the standard in the
18 rule. Its customers should not suffer because CenturyLink QC has not
19 complied with the rule.

⁵⁰ Qwest 2000 and 2010 Annual Reports to the Commission.

1 **Q. HAS CENTURYLINK QC INVESTED IN ITS SERVICE**
2 **TERRITORY?**

3 A. Whether CenturyLink QC has invested in its service territory depends on how
4 you measure and consider investment. Gross investment has increased by
5 \$67 million from \$938 million in 2010, the last year prior to the CenturyLink
6 purchase of Qwest, to \$1,005 million in 2014.⁵¹ Rate base, net investment,
7 however, has decreased by \$26 million from \$128 million in 2010 to \$102
8 million in 2014.⁵² This implies that depreciation charges recovered from
9 customers were more than sufficient to pay for CenturyLink QC's investment
10 program. In addition, CenturyLink QC received \$42,190,318 in high cost
11 support from the FCC over the period from April 2011 through April 2015.⁵³

12 **Q. IS IT EXPENSIVE TO REPLACE CENTURY LINK QC'S ANALOG**
13 **CARRIER SYSTEMS?**

14 A. CenturyLink QC has estimated that it would cost \$157,037,000 to replace its
15 analog carrier systems. Of that amount, \$98,572,000 would be needed for
16 remotes and local fiber that connect customers to wire centers.⁵⁴

⁵¹ Qwest 2010 annual report to the Commission and CenturyLink QC 2014 annual report to the Commission.

⁵² *Id.*

⁵³ The disbursement value can be obtained from Universal Service Administrative Company (USAC). <http://www.usac.org/hc/tools/disbursements/default.aspx>.

⁵⁴ CenturyLink QC's response to Data Request No. MCC-014.

1 **Q. WERE CENTURYLINK QC ESTIMATES OF THE COST OF**
2 **REPLACING ANALOG CARRIER SYSTEMS BASED ON ITS**
3 **ACTUAL RECENT EXPERIENCE IN REPLACING THESE**
4 **SYSTEMS?**

5 A. CenturyLink QC estimates were not based on its recent experience in
6 replacing analog carrier systems because it did not replace any systems in
7 2012, 2013 or 2014.⁵⁵

8 **Q. ARE YOU CONCERNED THAT CENTURYLINK QC ESTIMATES**
9 **MAY BE UNREASONABLY HIGH?**

10 A. Yes, I am concerned that CenturyLink QC estimates may be unreasonably
11 high. I developed alternative estimates of the cost of upgrading the
12 connections between the customers to the wire centers. My estimates range
13 between \$34 million and \$54 million, or between \$44 million and \$64 million
14 less than CenturyLink QC's estimates.

15 **Q. HOW DID YOU CONSTRUCT YOUR ESTIMATES?**

16 A. I used data from the capital input file of the FCC's Connect America Model
17 (CAM) and data from CenturyLink QC's confidential Attachment A to its
18 response to MCC 14. My calculations are attached in MCC confidential
19 exhibit 5.

⁵⁵ CenturyLink QC's response to Data Request No. MCC-033.

1 **Q. PLEASE DESCRIBE YOUR CALCULATIONS.**

2 A. I based my estimate on the cost of FTTH network. I included the cost of an
3 Optical Network Terminal (ONT), a fiber drop, the fiber distribution terminal
4 (FDT) trenching costs for buried fiber cable, cable and splicing costs, splitter
5 and cabinet costs and remote costs. The ONT is the box that is located at the
6 customer's home. I included one ONT per customer. The fiber drop
7 connects the home to the distribution cable. Because many of the customers
8 live in rural areas, I estimated the drop length to be 500 feet. The FDT
9 connects the fiber drop to the distribution cable. Because the customers are in
10 a rural area, I estimated one FDT per customer. For trenching costs, I began
11 with the CAM basic trenching cost for rural and urban trenching in hard-rock
12 conditions. The model contains three types of trenching costs - normal,
13 medium and hard-rock - where the hard-rock estimates are the most
14 expensive. I multiplied the basic trenching cost times an overhead factor. I
15 did not multiply the trenching cost by a sharing factor. The sharing factor
16 allows for the trenching costs to be shared among various utilities. Because I
17 did not use the sharing factor, my trenching cost estimates are higher than the
18 trenching costs used in the CAM. I placed one splitter that serves 16
19 customers in every cabinet. My estimates of the number of cabinets required
20 starts with the number of remotes that were listed in the CenturyLink
21 estimate. I increased that number because splitters are engineered to be

1 within 5,000 feet of the customers while remotes are generally engineered to
2 be within 12,000 feet of the customers. I added Optical Line terminals (OLT)
3 in remotes where the cable runs were greater than 60,000 feet. OLTs are
4 usually located in wire centers. However, in long loop situations, additional
5 OLTs are placed in the field.

6 **Q. WHAT WERE THE RESULTS OF YOUR CALCULATIONS?**

7 A. I made three estimates of the investment cost of connecting customers to the
8 wire center. The low estimate, \$34 million, relied solely on the rural cost of
9 trenching. The middle estimate, \$39 million, was based on 30% urban
10 trenching cost and 70% rural trenching cost. The high estimate, \$52 million,
11 relied solely on the urban trenching cost. These lower estimates indicate that
12 replacing analog carrier systems is not as expensive as CenturyLink QC
13 asserts.

14 **Q. WHAT ARE YOUR RECOMMENDATIONS REGARDING THE**
15 **REPLACEMENT OF ANALOG CARRIER SYSTEMS?**

16 A. I recommend that CenturyLink QC should replace its analog carrier systems
17 in census blocks where the FCC is offering CAF II. Replacing analog carrier
18 systems in these census blocks would improve service to an estimated 422
19 customers. These areas are in high cost areas but not in the extremely high
20 cost remote areas. In addition, I recommend that CenturyLink QC replace its
21 analog carrier systems in low cost census blocks. Low cost census blocks are

1 census blocks where CAM has estimated the monthly cost of service to be
2 below \$52.00. Replacing analog carrier systems in these census blocks
3 would improve service to an estimated 193 customers. Replacing analog
4 carrier systems in the combination of supported census blocks and low cost
5 census blocks would improve service to 615 of 1,207 customers or 51% of
6 customers currently served by analog carrier systems. The analog carrier
7 system that will be removed will supply the company with an inventory of
8 spare parts. The company has indicated that the lack of spare pairs is one of
9 the reasons that customers on analog carrier systems have problems.⁵⁶ With
10 the additional spare parts the company should be able to improve the service
11 quality provided to those customers that are served by the remaining analog
12 carrier systems.

⁵⁶ CenturyLink Response to Notice of Commission Action, Request for Continuance and Petition for Waiver, Docket No. N2014.4.38, October 24, 2014, Paragraph 3.

1 **VII. RECOMMENDED ACTIONS**

2 **Q. WHAT ARE YOUR RECOMMENDATIONS?**

3 A. My recommendations include:

- 4 • The Commission should not adopt CenturyLink QC's proposed compliance
5 plan;
- 6 • The Commission should require CenturyLink QC to adopt my proposed
7 compliance plan; and
- 8 • The Commission should not remove the issue of service quality from this
9 docket.

10 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

11 A. Yes.

MCC Exhibit No. 1

Vita of Dr. Robert Loube

D2014.11.91 and N2014.4.38

CenturyLink

Pre-Filed Direct Testimony of

Dr. Robert Loube

on behalf of the Montana Consumer Counsel

June 26, 2015

Vita of Dr. Robert Loube

Personal Data

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Education

Ph.D., Economics, Michigan State University, 1983

M.A., Economics, University of Massachusetts-Amherst, 1971

B.S., Economics, University of Maryland-College Park, 1969

Professional Experience

Utility Regulation

Vice President, Rolka Loube and Saltzer Associates, April 2007 to Present. Responsibilities include:

- Testified on behalf of the Office of the People's Counsel for the District of Columbia, In the Matter of Investigation into the Continued Use of Verizon Washington, DC, Inc.'s Copper Infrastructure to Provide Telecommunications Service, Formal Case No. 1102, with Messrs. Peter Bluhm and David Malfara, January 22, 2015.
- Testified on behalf of the Pennsylvania Office of Consumer Advocate, Joint Petition of Verizon Pennsylvania LLC and Verizon North LLC for Competition Classification of all Retail Services in Certain Geographic Areas, and for Waiver of Regulation for Competitive Services, PA PUC Docket Nos. P-2014-2446303 and P-2014-2446304, December 17, 2014.
- Testified on behalf of the Maine Office of the Public Advocate In the Matter of Request for Increase in Rates and for Maine Universal Service Fund Support for Provider of Last Resort Service, MPSC Docket No. 2013-00340, June 11, 2014.
- Filed the Joint Affidavit of Dr. Robert Loube and Peter Bluhm on behalf of the District Columbia Office of the People's Counsel, In the Matter of Investigation into the Continued Use of Verizon Washington, DC, Inc.'s Copper Infrastructure to Provide Telecommunications Service, Formal Case No. 1102, February 10, 2014

- Vermont Universal Service Goals and Policy Options, Volume 3 of a Report to the Vermont Department of Public Service, with Peter Bluhm and Mark Kennet, February 6, 2014.
- Cost and Profitability of Vermont's Incumbent Telecommunications Carriers, Part 2 of 3 of a Report to the Vermont Department of Public Service, with Peter Bluhm and Mark Kennet, January 8, 2014.
- Filed the Joint Affidavit of Dr. Robert Loube and Peter Bluhm on behalf of the District Columbia Office of the People's Counsel, In the Matter of Investigation into the Continued Use of Verizon Washington, DC, Inc.'s Copper Infrastructure to Provide Telecommunications Service, Formal Case No. 1102, July 19, 2013.
- Revenue Effects of FCC Reforms to Intercarrier Compensation and Federal Universal Mechanisms, Part 1 of 3 of a Report to the Vermont Department of Public Service, with Peter Bluhm and Mark Kennet, February 14, 2013.
- Filed direct testimony on behalf of Citizens Against Rate Excess, In the matter of the application of Wisconsin Electric Power Company d/b/a We Energies for approval of a power supply cost recovery plan and authorization of monthly power supply cost recovery factors for calendar year 2013, MPSC Case No. U-17094, filed on February 4, 2013.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of the application of Indiana Michigan Power Company For Approval of a Power Supply Cost Recovery Plan (2013), MPSC Case No. U-17096, filed on February 22, 2013.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of the application of Wisconsin Electric Power Company's Power Supply costs recovery reconciliation proceeding for the 12-month period ended December 31, 2011, MPSC Case No. U-16424-R, filed on October 25, 2012.
- Testified on behalf of the Maine Office of Public Advocate In the Petition for Suspension or Modification of Application of Requirements of 47 U.S.C. § 251 (b) and (c), pursuant to 47 U.S.C. § 251(f)(2) regarding Time Warner Cable Information Services (Maine) LLC's Request, Maine PUC Docket Nos. 2012-198, 218, 219, 220 and 221, October 23, 2012.
- Provided expert advice to NASUCA and helped prepare comments on model design and data inputs for Phase II of the Connect America Fund, In the Matter of Connect America Fund, WC Docket No. 10-90, filed July 9, 2012.
- Presentation on behalf of the Pennsylvania Office of Consumer Advocate at the Pennsylvania Public Utility Commission's Collaborative Workshop Session Regarding the Implementation of the FCC's November 18, 2011 Order, April 20, 2012.
- Affidavit filed on behalf of the Pennsylvania Office of Consumer Advocate, Investigation Regarding Intrastate Access Charges and IntraLata Toll Rates of Rural Carriers, and the Pennsylvania Universal Service Fund, PAPUC Docket No. I-00040105, April 19, 2012.
- Filed direct testimony on behalf of Citizens Against Rate Excess, In the matter of the application of Wisconsin Electric Power Company d/b/a We Energies for approval of a

power supply cost recovery plan and authorization of monthly power supply cost recovery factors for calendar year 2012, MPSC Case No. U-16884, filed on February 9, 2012.

- Provided expert advice to NASUCA on universal service and helped prepare comments for NASUCA in the Matter of Connect America Fund, WC Docket No. 10-90, A National Broadband Plan for Our Future, GN Docket No. 09-51, Establishing Just and Reasonable Rates for Local Exchange Carriers, WC Docket No. 07-135, High-Cost Universal Service Support, WC Docket No. 05-337, and Developing a Unified Intercarrier Compensation Regime, CC Docket No. 01-92, Federal-State Joint Board on Universal Service, CC Docket No. 96-45, filed January 18, 2012.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of the application of Northern States Power Corporation A Wisconsin corporation and wholly Owned subsidiary of Xcel Energy Inc. For authority to implement a power supply cost recovery plan in its electric tariffs and establish power supply cost recovery factors for the twelve-month period ending December 2012, MPSC Case No. U-16883, filed January 12, 2012.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of the application of Wisconsin Electric Power Company's Power Supply costs recovery reconciliation proceeding for the 12-month period ended December 31, 2010, MPSC Case No. U-16034-R, filed on September 28, 2011.
- Testified on behalf of the Pennsylvania Office of Consumer Advocate in AT&T of Pennsylvania, LLC v. Verizon North LLC and Verizon Pennsylvania, Inc., PA PUC Docket No. C-20027195, June 7-8, 2011.
- Provided expert advice to the state members of the Federal-State joint board on universal service and helped prepare comments for the state members in the Matter of Connect America Fund, WC Docket No. 10-90, A National Broadband Plan for Our Future, GN Docket No. 09-51, Establishing Just and Reasonable Rates for Local Exchange Carriers, WC Docket No. 07-135, High-Cost Universal Service Support, WC Docket No. 05-337, Developing a Unified Intercarrier Compensation Regime, CC Docket No. 01-92, Federal-State Joint Board on Universal Service, CC Docket No. 96-45, and Lifeline and Link-up WC Docket No. 03-09, filed May 2, 2011.
- Filed direct testimony on behalf of the Wisconsin Citizens Utility Board, Investigation of Voice over Internet Protocol(VoIP) in Wisconsin, Wisconsin PSC Case No. 5-TI-2071, February 15, 2011.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of the Application of Upper Peninsula Power Company for approval of a power supply cost recovery plan and authorization fo monthly power supply factors for the calendar year 2011, approval of capacity charges and other related approvals, Michigan PSC Case No. U-16421, January 28, 2011.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of the Application of Northern States Power Corporation A Wisconsin corporation and wholly owned subsidiary of Xcel Energy Inc. For authority to implement a power supply cost

recovery plan in its electric tariffs and establish power supply cost recovery factors for the twelve-month period ending December 2011, Michigan PSC Case No. U-16423, January 12, 2011.

- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of Wisconsin Electric Power Company's power supply cost recovery plan and authorization of monthly power supply cost reconciliation proceeding for the 12-month period Ended December 31, 2009. Michigan PSC Case No. U-15664-R, October 28, 2010.
- Prepared comments on behalf of Michigan Citizens Against Rate Excess, Midwest Operator, Inc. and the Midwest ISO Transmission Owners, FERC Docket No. ER10-1791-000, September 10, 2010 (with Dr. Ken Rose and John Liskey)
- Filed an expert report on behalf of the U.S. Department of Justice, the United States District Court of Kansas, Sprint Nextel Corporation and Subsidiaries and Embraq Corporation, Plaintiff, v. United States of America, Defendant, Case No. 2:09-cv-2325, July 30, 2010.
- Testified on behalf of the Pennsylvania Office of Consumer Advocate in the Investigation Regarding Intrastate Access Charges and IntraLata Toll Rates of Rural Carriers, and the Pennsylvania Universal Service Fund, PA PUC Docket No. I-00040105, April 15, 2010.
- Testified on behalf of the Maine Office of the Public Advocate, in the Investigation Pursuant to 47 U.S.C § 251(f)1), Maine PUC Docket Nos. 2009-40-4, April 6, 2010.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter Indiana and Michigan Power Company for approval of a Power Supply Cost Recovery Plan (2010), Michigan PSC Case No. U-16046, February 24, 2010.
- Filed direct testimony on behalf of the Citizens Against Rate Excess, In the matter of Wisconsin Public Service Corporation for approval of power supply cost recovery plan and authorization of monthly power supply cost recovery factors for the calendar year 2010, Michigan PSC Case No. U-16032, February 1, 2010.
- Filed direct testimony on behalf of the Residential Ratepayer Consortium, In the Matter of the Application of The Detroit Edison Company for Reconciliation of its Power Supply Cost Recovery Plan for the 12-month period ending December 31, 2008, Michigan Public Service Commission Case No. U-15417-R, October 20, 2009
- Filed direct testimony on behalf of the Residential Ratepayer Consortium, In the Matter of the Application of Consumers Energy Company for Reconciliation of its Power Supply Costs and Revenues for the calendar year 2000 and for other relief relating to pension and OPEB costs, Michigan Public Service Commission Case No. U-15415-R, October 5, 2009
- Filed the Report of Consultants to the Delaware Public Service Commission Staff on the Adequacy of Verizon's Service, Delaware Public Service Commission Docket No. 08-194, with Roland Curry, September 9, 2009.
- Filed answer testimony on behalf of the Colorado Office of Consumer Counsel, In the matter of the application of NNTC Wireless, LLC, for designation as an eligible

telecommunications carrier and eligible provider in the state of Colorado, Colorado Public Utilities Commission Docket No. 08A-508T, June 12, 2009.

- Testified on behalf of the Pennsylvania Office of Consumer Advocate in the Investigation Regarding Intrastate Access Charges and IntraLata Toll Rates of Rural Carriers, and the Pennsylvania Universal Service Fund, PA PUC Docket No. I-00040105, February 17, 2009.
- Filed an expert report on behalf of the U.S. Department of Justice, the United States District Court for the Western District of Texas, San Antonio Division, AT&T Inc, Plaintiff, v. United States of America, Defendant, Civil No. SA-07-CA-0197-OG, October 14, 2008.
- Filed reply testimony on behalf of the Maryland Office of the People's Counsel, In the Matter of Appropriate Forms of Regulating Telephone Companies, Maryland Public Service Commission, Case No. 9133, August 28, 2008.
- Filed initial and reply testimony on behalf of TelNet Worldwide, Inc., ACD Telecom, Inc., TC3 Telecom, Inc., Michigan Access, Inc., JAS Networks, Inc., DayStarr, LLC, Clear Rate Communications, Inc., and Arialink Telecom. (the "CLECs"), In the matter on the Commission's own motion, to review the total element long run incremental costs and the total service long run incremental costs for Verizon North Inc. and Contel of the South, Inc. d/b/a Verizon North Systems, to provide telecommunications services, Michigan PSC Case No. U-15210, April 7 and June 26, 2008.
- Testified on behalf of the City of Kitchener, the Consumers Council of Canada, and the Vulnerable Energy Consumers Coalition in the Union/Enbridge 2008 Rates Cases, Ontario Energy Board, EB 2007-0606 and EB2007-0615, April 1, 2008.
- Testified on behalf of the New Hampshire Office of Consumer Advocate in Kearsarge Telephone Company, Wilton Telephone Company, Hollis Telephone Company and Merrimack County Telephone Company Petition for an Alternative Form of Regulation, New Hampshire Public Utilities Commission, Case No. DT 07-027, December 5, 2007.
- Filed testimony on behalf of the City of Kitchener, the Consumers Council of Canada, and the Vulnerable Energy Consumers Coalition in the Union/Enbridge 2008 Rates Cases, Ontario Energy Board, EB 2007-0606 and EB2007-0615, October 22, 2007.
- Testified on behalf of the Maine Office of the Public Advocate in the Joint Application for Approvals Related to Verizon's Transfer of Property and Customer Relations to Company to be Merged with and into Fairpoint Communications, Inc. Maine Public Utilities Commission Docket No. 2007-67 on October 2, 2007.
- Prepared comments on behalf of the Washington Public Counsel and The Washington Electronic Business and Telecommunications Coalition, In the Matter of the Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Denver, Minneapolis-St. Paul, Phoenix and Seattle Metropolitan Statistical Areas, WC Docket No. 07-97, August 31, 2007.

Director, Economic Research, Rhoads & Sinon, LLC, April 2001 to March 2007.

Responsibilities included:

- Testified on behalf of the Washington Public Counsel in the Matter of the Petition of Qwest Corporation to be Regulated Under An Alternative Form of Regulation, WUTC Docket No. UT-061625, March 14, 2007.
- Filed rebuttal testimony on behalf of the Pennsylvania Office of Consumer Advocate in the 2006 Annual Price Stability Index/Service Price Index of Buffalo Valley Telephone Company, Conestoga Telephone & Telegraph Company, and Denver & Ephrata Telephone & Telegraph Company, PA PUC Docket No. P-0098142F1000, filed January 5, 2007.
- Testified on behalf of the Attorney General Michael A. Cox, In the Matter of the Notice by AT&T Michigan Pursuant to sections 304(d) and 310a of the Michigan Telecommunications Act of an increase to the rate for primary basic local exchange service in the amount not to exceed AT&T Michigan's intrastate end user line charge in effect on July 1, 2005, MPSC Case No. 15036, filed January 30, 2007.
- Prepared comments on behalf of the Pennsylvania Office of the Consumer Advocate, FCC Intercarrier Compensation Workshop and Solicitation of Comments on the Missoula Plan, Pennsylvania Public Utility Commission Docket No. M-000061972.
- Prepared an affidavit on behalf of the National Association of Utility Consumer Advocates (NASUCA) and the Maine Office of the Public Advocate, In the Matter of Jurisdictional Separations and Referral to the Federal-State Joint Board, CC Docket No. 80-286, filed August 22, 2006.
- Advisor to the Maryland office of the People's Counsel, In the Matter of Cavalier Telephone Midwest Atlantic for Breach of Interconnection Terms by Verizon Maryland, Inc., Case No. 9046.
- Testified on behalf of the Maine Office of Public Advocate in the Investigation Into Verizon Maine's Alternative Form of Regulation, Phase I, Docket No. 2005-155, October 17 and October 18, 2006.
- Prepared comments on behalf of the National Association of State Utility Consumer Advocates (NASUCA) In the Matter of the Federal-State Joint Board on Universal Service, CC Docket No. 96-45, filed March 27, 2006 (with David Gabel and the NASUCA Telecommunications Committee).
- Advisor to the Washington State Public Counsel in the Investigation of the Sprint-Nextel Merger, Washington Utilities and Transportation Docket No. UT-051291.
- Filed direct testimony on behalf of the Maine Office of Public Advocate in the Investigation into Verizon Maine's Alternative Form of Regulation, Phase II, Docket No. 2005-155, January 13, 2006.
- Testified on behalf of the Maine Office of Public Advocate in the Investigation into Line Sharing, Maine Docket No. 2004-809, November 18, 2005.

- Testified on behalf of the Maine Office of Public Advocate in Verizon Communications, Inc. and MCI, Inc., Review of Joint Application for Approval of Merger, Maine Docket No. 2005-154, September 29, 2005.
- Filed direct, rebuttal and surrebuttal testimony on behalf of the Office of Consumer Advocate in Pennsylvania Docket No. C-20027195, June 8, June 29, and July 11 2005.
- Filed a rebuttal declaration regarding price floor issues on behalf of The Utility Reform Network in re: Investigation on the Commission's Own Motion into Open Access and Network Architecture Development of Dominant Carrier Networks, Verizon UNE Phase, Investigation 93-04-002, filed April 1, 2005.
- Filed a price floor declaration on behalf of The Utility Reform Network in re: Investigation on the Commission's Own Motion into Open Access and Network Architecture Development of Dominant Carrier Networks, Verizon UNE Phase, Investigation 93-04-002, filed January 28, 2005.
- Filed direct testimony on behalf of Public Counsel and AARP in re: WUTC v. Verizon, Docket No. UT-040788, before the Washington Utilities and Transportation Commission, December 17, 2004.
- Filed a rebuttal declaration on behalf of The Utility Reform Network in re: Investigation on the Commission's Own Motion into Open Access and Network Architecture Development of Dominant Carrier Networks, Verizon UNE Phase, Investigation 93-04-002, filed November 9, 2004
- Prepared a report on the State of Telecommunications Services in Nevada for the subcommittee to study telecommunications service in Nevada, August 2004,
- Filed a declaration on behalf of The Utility Reform Network in re: Investigation on the Commission's Own Motion into Open Access and Network Architecture Development of Dominant Carrier Networks, Verizon UNE Phase, Investigation 93-04-002, filed August 6, 2004
- Filed expert rebuttal testimony on behalf of the Staff of the South Carolina Commission in re: Implementation of requirements Arising from Federal Communications Commission Triennial UNE review: Local Circuit Switching for mass market customers, SC PSC Docket No. 2003-326-c.
- Testified on behalf of the Pennsylvania Office of Consumer Advocate in re: Investigation into the Obligations of Incumbent Local Exchange Carriers to Unbundle Network Elements, PA PUC Docket No. I-0030099.
- Prepared an Affidavit for the National Association of State Utility Consumer Advocates in the Matter of the Review of Commission's Rules Regarding The Pricing of Unbundled Network Elements And the Resale of Service by Incumbent Local Exchange Carriers, WC Docket No. 03-173 (with David Gabel), December 16, 2003.
- Provided expert advice to the Cities of Austin, Dallas, Fort Worth, and Hereford in Southwestern Bell Telephone Company's Filing To Establishing Surcharges Resulting From District Court Remand Of PUC Final Order In Docket No. 18509, SOAH Docket No. 473-03-1620, Texas PUC Docket No. 26719.

- Filed expert testimony on behalf of the Staff of the Nevada Public Utilities in The Petition of Nevada Bell for an Order commencing a proceeding to determine the costs and rates for unbundled network elements, Docket No. 00-7012, April 8, 2003.
- Prepared comments for the National Association of State Utility Consumer Advocates in the Matter of Cost Review Proceeding for Residential and Single-Line Business Subscriber Line Charge Cap, FCC CC Docket No. 96-262 (with David Gabel), January 24, 2002.
- Technical Adviser to the Alabama Public Service Commission in the Generic Proceeding to Establish Prices for Interconnection Services and Unbundled Network Elements – Docket No. 27821
- Prepared reply comments for the Office of the People’s Counsel of the District of Columbia In the Matter of Developing a Unified Inter-carrier Compensation Regime, FCC CC Docket No. 01-92.
- Assisted the Universal Service Administrative Company in managing the interstate common line and model support programs.

Industry Economist, Federal Communications Commission, GS 301-15, May 1996 to April 2001. Responsibilities included:

- Established the criteria for choosing the universal service economic cost model;
- Determined the input values used in telephone cost models;
- Served on the FCC staff of the Federal State universal service joint board;
- Developed and evaluated alternative universal service funding proposals;
- Developed and compared alternative jurisdiction separations allocators with regard to the impact of the allocators on state and federal jurisdictional responsibilities;
- Conducted special studies for use by the Chairman, Commissioners, Bureau Chief or Division Chief

Director, Office of Economics, Public Service Commission of the District of Columbia, July 1993 to May 1996. Responsibilities included:

- Supervised the preparation of staff testimony in telephone, electric and gas utility cases.
- Represented the Commission on the Staff of Federal State Separations Joint Board.
- Prepared and presented testimony on the strategic approach to electricity demand side management and least cost planning principles.
- Represented the Commission on the National Association of Regulatory Utility Commissioners Communications Committee’s universal service and access reform working groups.

Acting Director, Office of Economics, Public Service Commission of the District of Columbia, February 1993 to July 1993. Responsibilities included:

- Prepared comments on FERC Notices of Proposed Rulemaking.
- Represented the Commission on the telephone quality of service and low-income program working groups.

Senior Telecommunications Economist, Public Service Commission of the District of Columbia, May 1989 to the February 1993. Responsibilities included:

- Prepared and presented testimony regarding telephone rate structure, competition in telephone markets, embedded cost studies, and long run incremental cost studies.
- Represented the Commission on digital deployment and generic cost manual working groups.
- Represented the Commission on the staff of the 410B Joint Federal/State Conference on Open Network Architecture.
- Prepared comments on FCC Notices of Proposed Rulemaking.

Econometrician, Indiana Utility Regulatory Commission, March 1988 to May 1989. Responsibilities included:

- Developed electric energy and demand forecasts.
- Supervised consultants developing economic and demographic models for utility service territories.
- Represented the Commission on the Executive Committee on Intrastate Access Charges.

Principal Utility Analyst, Indiana Utility Regulatory Commission, January 1986 to March 1988. Responsibilities included:

- Prepared and presented testimony regarding demand forecasting for telephone and electric services, cost of equity and long run marginal cost.
- Contributed to staff reports on energy and demand forecasts.
- Developed financial forecasts for electric utilities.

International Consulting

Telephone Organization of Thailand. Conducted a Tariff and Cost Workshop for Senior Management and Staff, Bangkok, February 5-7, 2001. Contractor: Booz, Allen & Hamilton, Inc.

Ministry of Communications, Indonesia. Drafted a report on best practices guidelines for Universal Service Obligations, and conducted round-table with the Ministry of Communications staff and with the U. S. telecommunications community, Jakarta, August 20-September 9, 2000. Contractor: Nathan Associates, Inc.

Teaching

Assistant Professor, James Madison University, September 1983 to December 1985.

Instructor, James Madison University, September 1979 to June 1983. Courses Taught:

- Industrial Regulation, Industrial Organization (undergraduate and MBA), Intermediate Macroeconomic Theory, Economic Analysis (MBA), Principles (Macro and Micro)

Other

Economist, Office of Director, Bureau of Economic Analysis, Department of Commerce, Washington D.C., November 1972 to September 1975.

Selected Publications

- “Competitive Issues in Special Access Markets,” National Regulatory Research Institute, January, 2009 (with Peter Bluhm).
- “The Telecommunications Act of 1996: Residential Rates and Competition,” *Utilities Policy*, September 2004.
- “Public Interest Regulation, Common Costs and Universal Service,” eds. Edythe S. Miller and Warren J. Samuels, *An Institutional Approach to Public Utilities Regulation*, Michigan State University Press, 2002.
- "Price Cap Regulation: Problems and Solutions," *Land Economics*, Vol. 71, Number 3, August 1995.

Testimony

Before the Public Service Commission of the District of Columbia:

- Formal Case No. 929, Application of Potomac Electric Power Company for an Increase in its Retail Rates for the Sale of Electric Energy. Principal Issues: Class Revenue Responsibility, Rate Structure and Low Income Rates.
- Formal Case No. 926, Application of The Chesapeake and Potomac Telephone Company for Authority to Establish a Revenue Requirement and to Increase and Restructure its Schedule of Rates and Charges. Principal Issues: Centrex burden and the Centrex embedded cost study.
- Formal Case No. 917. Phase II, Application of Potomac Electric Power Company For Approval of its Third Least Cost Plan. Principal Issues: The Strategic Approach to DSM Develop and Implementation, Level of DSM Spending, Appropriate Standards by Which DSM Expenses Should Be Judged Prudent, and Rate Design and Least-Cost Planning Principles.
- Formal Case No. 891, Application of Chesapeake and Potomac Telephone Company to Offer Return Call and Caller ID Within the District of Columbia. Principal Issues: Tying

Arrangements Between Sales of Equipment and Services, and Public Policy Issues Associated With the Offering of Caller ID.

- Formal Case No. 850 Investigation into the Reasonableness of the Authorized Return on Equity, Rate of Return, and Current Charges and Rates for Telecommunications Services Offered by the Chesapeake and Potomac Telephone Company. Principal Issues: Rate Design, Incremental Cost and Embedded Cost Studies
- Formal Case No. 814. Phase III Investigation into the Impact of AT&T Divestiture and Decisions of the Federal Communications Commission on the Chesapeake and Potomac Telephone Company's Jurisdictional Rates. Principal Issues: Flexible pricing, incremental cost studies, tests for the existence of competition, criteria for measuring alternative regulatory plans.
- Formal Case No. 814. Investigation into the Impact of AT&T Divestiture and Decisions of the Federal Communications Commission on the Chesapeake and Potomac Telephone Company's Jurisdictional Rates. Principal Issues: The Use of Cross Elasticity Studies and Market Surveys to Define Markets for Telecommunications Services
- Telephone Tariff 91-3. Investigation of the Chesapeake and Potomac Telephone Company's General Regulations Tariff No. 201, Section 1. Principal Issues: Regulatory safeguards and costs of pre-approval of special assemblies

Before the Indiana Utility Regulatory Commission:

- Cause No. 38665, Joint Petition of Century Telephone Enterprises, Inc., Odon Telephone Co., Inc. and Colonial Telephone Company, Inc. Principal Issue: Approval of the Purchase of Odon by Century.
- Cause No. 38560. Petition of Northern Indiana Public Service Company. Principal Issues: Economic Development Rates and Long Run Marginal Cost
- Cause No. 38426. Petition of GTE-Indiana. Principal Issues: Revenue Adjustment, Cross-Subsidization, Cost Methodology and Demand Repression.
- Cause No. 38415. Petition of Public Service Company of Indiana. Principal Issue: Financing Authority.
- Cause No. 38302. Joint Petition of Indiana Gas Company, Inc. and Westport Natural Gas Company, Inc. Principal Issue: Acquisition Adjustment.
- Cause No. 38158-S1. Investigation to Determine the Extent of Regulation of Pay Telephone Equipment. Principal Issue: Regulation of IXC-Owned Pay Phones.
- Cause No. 38158. Investigation to Determine the Extent of Regulation of Pay Telephone Equipment. Principal Issues: Deregulation and Rate Structure.
- Cause No. 38061. Petition of Midwest Natural Gas Corporation. Principal Issue: Cost of Equity.
- Cause No. 38059. Petition of Indiana Bell Telephone Company, Inc. Principal Issues: Local Measured Service and Long Run Marginal Cost.

- Cause No. 38045. Petition of Northern Indiana Public Service Company. Principal Issues: Demand Forecasting, Financial Viability and Regulatory Policy with Regard to Excess Capacity.
- Cause No. 38034. Petition of Odon Telephone Company, Inc. Principal Issues: Acquisition Adjustment, Cost of Equity, Financing Authority, and Service Improvement Program
- Cause No. 37938. Petition of Northern Indiana Public Service Company. Principal Issues: Economic Development Rates.
- Cause No. 37927. Petition of United Telephone of Indiana. Principal Issues: Cost of Equity.
- Cause No. 37866. Petition of Hoosier Energy Rural Electric Cooperative, Inc., et al. Principal Issues: Economic Development Rates and Long Run Marginal Cost.
- Cause No. 37814. Petition of United Telespectrum of Indiana, Inc. Principal Issue: Certificate of Territorial Authority.
- Cause No. 37735. Petition of Westport Natural Gas Company, Inc. Principal Issue: Cost of Equity.
- Cause No. 37706. Petition of Midwest Natural Gas Corporation. Principal Issue: Cost of Equity.
- Cause No. 37686. Petition of Indiana Bell Telephone Company, Inc. Principal Issue: Demand Repression.
- Cause No. 37414. Petition of Public Service Company of Indiana. Principal Issues: Forecasting Methodology and Capacity Planning.

Selected Lectures

- “Universal Service Funding and Implementation” and “Telecom Service Quality,” NARUC Annual Regulatory Studies Program, August 2014.
- "Network Neutrality and Service Quality," and "Telecommunications Pricing," NARUC Advanced Regulatory Studies Program, June 2006.
- “Public Utility Pricing,” “Retail Pricing in Telecommunications,” and “Cost Models in Telecommunications,” NARUC Annual Regulatory Studies Program, August 2004.
- "Cost Modeling in Telecommunications," NARUC Annual Regulatory Studies Program, August 2000.
- Public Policies Toward Competition in the Electric Power Industry, Wisconsin Public Utility Institute, October 1994.
- "Pricing Concepts and the Control of Price Discrimination in Advanced Telecommunications Networks: Issues and Methods," NARUC Advanced Regulatory Studies Program, January 1994.

- "Cost Allocation in Advanced Telecommunications Networks: Issues and Methods," NARUC Annual Regulatory Studies Program, August 1993.
- "Who Determines the Costs and Prices for Access to the Infrastructure," Telecommunications Policy: Agenda for the 21st Century Conference, The Michigan Divestiture Research Fund, March 1992.

Industry Committees

- Federal Staff of the Federal-State Joint Board of CC Docket No. 80-286 (June 1999 to April 2001).
- Federal Staff of the Federal-State Joint Board of CC Docket No.96-45 (May 1996 to April 2001).
- NARUC Staff Subcommittee on Communications (1994-1996).
- State Staff of the Federal-State Joint Board of CC Docket No.80-286 (1991-1996).

Professional Associations

- Member: American Economic Association
- Association for Evolutionary Economics

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CenturyLink

Pre-Filed Direct Testimony of

Dr. Robert Loube

on behalf of the Montana Consumer Counsel

June 26, 2015

Information is redacted

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Pre-Filed Direct Testimony of

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June 26, 2015

Information is redacted

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Billings

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Pre-Filed Direct Testimony of

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on behalf of the Montana Consumer Counsel

June 26, 2015

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Cascade

D2014.11.91 and N2014.4.38

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Dr. Robert Loubé

on behalf of the Montana Consumer Counsel

June 26, 2015

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Helena

D2014.11.91 and N2014.4.38

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Pre-Filed Direct Testimony of

Dr. Robert Loube

on behalf of the Montana Consumer Counsel

June 26, 2015

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Wolf Creek

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Pre-Filed Direct Testimony of

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on behalf of the Montana Consumer Counsel

June 26, 2015

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Pre-Filed Direct Testimony of

Dr. Robert Loube

on behalf of the Montana Consumer Counsel

June 26, 2015

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