

Exhibit 1

Economic Benefits from Missoula Plan Reform of Inter-carrier Compensation

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1 February 2007

1 Overview

Since the presentation of our analysis on July 18, 2006 of the likely economic benefits to switched wireline and wireless customers from adoption of the “Missoula plan” for intercarrier compensation reform, more recent data have become available, several parameters of the plan have evolved and several criticisms of our analysis have been advanced.¹ In the following presentation, we adapt this earlier analysis to reflect these more recent data, plan parameters and our improved understanding of intercarrier minute usage. Further, we respond to criticisms advanced against our earlier analysis by intervening parties and explain why these criticisms are generally inapt.

As noted earlier, the Missoula plan reduces per-minute access and reciprocal compensation charges imposed on long distance or other intercarrier calls and replaces these revenues with a combination of increased caps on per-month subscriber line charges (“SLCs”) and revenues obtained from a new Restructure Mechanism (“RM”). More recently, the plan has been expanded to incorporate a Federal Benchmark Mechanism (“FBM”) whereby additional support is given to states that have already undertaken substantial reductions in their intrastate access charges.² In addition to these intercarrier compensation reforms, supporters of the Missoula plan call on the Federal Communications Commission to reform its current collections mechanism for its universal service fund (“USF”). As discussed below, the economy-wide benefits of these various reforms on the switched wireline and wireless industries may approach \$27 billion during the eight-year period after plan initiation.³

¹ Our July 18, 2006 analysis was attached as Exhibit 2 to a letter from Commissioners Tony Clark, Ray Baum, and Larry Landis, NARUC Task Force on Intercarrier Compensation, to Chairman Kevin Martin, Federal Communications Commission, CC Docket No. 01-92 (filed July 24, 2006).

² See *ex parte* filing by Missoula Plan Supporters and five state utility commissions in CC Docket No. 01-92, *Missoula Plan Amendment to Incorporate a Federal Benchmark Mechanism*, January 30, 2007 (available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518723934).

³ The analytic and expository structure of this analysis follows that presented in Richard N. Clarke, Thomas J. Makarewicz and Brian K. Staihr, “Economic Benefits from Intercarrier Compensation Reform,” attached to *Reply Comments of the Intercarrier Compensation Forum* in Federal Communications Commission CC Docket No. 01-92, July 20, 2005. Although certain of the wireline and wireless parameter values used in the present analysis match those that were first developed for this earlier analysis, others have been substantially revised.

2 Wireline

Under the analysis discussed below, switched wireline customers will realize an average monthly net welfare gain of \$0.52 per household once the plan has been fully phased in. Over the eight years following initial implementation of the plan, cumulative wireline consumer benefits will exceed \$4.02 billion, or \$37 per household.

2.1 Measuring welfare gains to wireline consumers

Efficiency and consumer welfare are improved when price structures are reformed to correspond more closely to the technological changes and increased customer choice that have altered telecommunications since the inception of the existing access charge structure. Here, because demand for telephone line rentals is less elastic than demand for toll minutes, the Missoula plan will increase wireline consumer welfare by reducing current levels of per-minute access charges and replacing associated revenue losses through increases in flat per-month charges.

In graphical format, the gross increase in consumer surplus (*i.e.*, the welfare gain consumers enjoy from reduced long distance prices enabled by lower access charges) is depicted by the area to the left of a product's demand curve lying between the relevant price horizontals. But to determine the net effective increase in consumer surplus, this gross increase must be reduced by any increases in flat per-month end user charges that under the Missoula plan will be borne by wireline customers.⁴ Figure 1 displays this consumer surplus measurement.

In Figure 1, Area A represents the gain to consumers from purchasing the same amount of wireline toll minutes as previously, but at a lower per-minute price brought about by implementation the Missoula plan's reforms. In addition to these lower toll payments, lower wireline toll prices will stimulate an increase in toll usage. Area B represents the value to consumers of this increased consumption of wireline toll minutes at the new lower per-minute price.

Known variables for the wireline consumer benefit analysis are:

⁴ This general approach to quantifying gains in consumer surplus has been used by T. Makarewicz in "Efficient Telecom Pricing: Who Stands to Benefit?" *Public Utilities Fortnightly*, March 15, 1996, pp. 26-28. A similar but simplified form of this welfare analysis has also been used in a Comment filed by the Regulatory Studies Program of the Mercatus Center at George Mason University in the Federal Communications Commission's CC Docket No. 01-92, May 23, 2005.

- Current average per incremental minute wireline toll price, $P_{current}$, is approximately \$0.0500.⁵
- Year 2005 wireline toll conversation minutes, $Q_{current}$, are approximately 428 billion nationwide. This figure is derived from year 2005 data reported to the FCC, NECA and CTIA. Its derivation is outlined in the Appendix to this paper.⁶
- Because the 200 billion wireless-attributable wireline access minutes removed from total wireline access minutes of 894 billion are always terminating access minutes, it is necessary to adjust downward the fraction of terminating access minutes in the balance of 694 billion wireline-attributable access minutes to determine the relevant access cost reduction in the per-minute cost of a wireline toll conversation minute (see the Appendix). These adjustments suggest that a post-Missoula plan per-minute wireline toll price, $P_{proposed}$, of \$0.03751 will be realized in the fourth year following the Missoula plan's implementation. The wireline toll reduction assumes that the plan's switched access reductions of \$0.01249 per conversation minute will be phased in evenly over four years and be flowed through to retail toll rates.
- The price elasticity of demand for wireline toll, β , is assumed to be -0.72. This measure applies to all wireline long distance – interstate and intrastate, business and residential. It falls in the middle of the range of historic interstate toll price elasticities and has not been superseded by more current estimates.⁷

⁵ This figure is an average of residence and business per-minute rates and is intended to represent the incremental retail price of a minute of toll calling. Note that is not intended to include the flat monthly charges (e.g., \$3.95) that an interexchange carrier may levy in addition to its per-minute charges and does not include universal service assessments. Thus, this figure should generally be significantly less than the gross average revenue per minute figures reported by the FCC in Table 9 of its report on *Telecommunications Industry Revenues* for calendar year 2004, released March 2006 (available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-264669A1.pdf) and in Table 13.4 of the FCC's *Trends in Telephone Service* report, June 21, 2005 (available at: http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend605.pdf).

⁶ This figure of 428 billion toll conversation minutes is substantially less than the figure of 582 billion used in our earlier paper. The newer figure reflects both the smaller number of such minutes in 2005 relative to 2004 and our improved understanding of the interplay between these wireline minutes and wireless long distance minutes. In our earlier work, we assumed that all wireline toll minutes were attributable to retail sales of wireline long distance services. But because certain of these wireline long distance minutes are actually wholesale minutes provided to wireless companies for retail sale to wireless end users, it is inappropriate to attribute the benefits of access charge reductions on these minutes to wireline customers. Rather, they are benefits properly attributable to wireless customers. Thus, the proper figure to use here are only wireline long distance minutes that originate on wireline networks. The development of these minute counts is explained at further length in the Appendix.

⁷ Consensus estimates of the elasticity for long distance service are in the neighborhood of -0.7; see M. H. Riordan, "Universal Residential Telephone Service," in Martin E. Cave, Sumit K. Majumdar, and Ingo Vogelsang (eds.), *Handbook of Telecommunications Economics, Volume 1* (Amsterdam: Elsevier, 2002), p. 436. See also Jerry Hausman and Howard Shelanski, "Economic Welfare and Telecommunications Regulation: The E-Rate Policy for Universal-Service Subsidies,"

- There are 170,495,498 switched telephone lines in 2005 and 383,856,440 switched telephone “numbers,” or 2.25 numbers per line.⁸ Each switched line will be assessed a SLC increase accumulating in four annual increments to \$1.70 per month. Each switched telephone “number” will be assessed USF, RM and FBM fee increases accumulating in four annual increments to \$0.38 per month as per recommendations from certain of the Missoula plan supporters.⁹

These known input values allow us to solve for the constant, A, and the post-Missoula plan toll minutes, $Q_{proposed}$.¹⁰ Using these parameter values, we can estimate welfare gains from the Missoula toll price reductions.

Clearly consumers are better off if they pay less for the same amount of long distance usage. Those lower unit toll charges constitute the bulk of the consumer surplus improvement the Missoula plan would achieve. Area A in Figure 1, calculated as $(P_{current} - P_{proposed})(Q_{current})$, represents the savings consumers would enjoy if they purchase an unchanged amount of toll usage at its new lower price per minute and generally constitutes the lion’s share of total consumer benefits. In addition, because consumers will find long distance service to be a better value at its new lower unit price, they will buy more minutes – according to their price elasticity of demand (β). Although a consumer’s total toll bill might increase if he chooses to purchase more lower-priced toll minutes than before, he still gains value from this more efficient consumption proposition. Area B mathematically captures the gain in value that consumers derive from their additional toll purchases.

From the demand equation, $Q = AP^\beta$, it follows that

$$P = (Q/A)^{1/\beta}. \tag{1}$$

Substituting for P, Area B is derived as follows:

$$Area\ B = [A^{-1/\beta} \int_{Q_{current}}^{Q_{proposed}} Q^{1/\beta} dQ] - [(Q_{proposed} - Q_{current})(P_{proposed})] \tag{2}$$

Completing the integration in the above expression renders:

Yale Journal on Regulation 16 (Winter 1999): 36-37; and L. Taylor, *Telecommunications Demand: A Survey and Critique*, Cambridge, MA: Ballinger Publishing, 1980, p. 99.

⁸ Many of these excess numbers are those associated with PBX extensions served by switched DID or DOD business trunks.

⁹ See, *Missoula Plan Amendment to Incorporate a Federal Benchmark Mechanism*, note 2, *supra*.

¹⁰ $A = Q/P^\beta$ and $Q_{proposed} = AP_{proposed}^\beta$.

$$AreaB = [A^{-1/\beta}] \left[\frac{(Q_{proposed}^{(1+1/\beta)}) - (Q_{current}^{(1+1/\beta)})}{(1+1/\beta)} \right] - [(Q_{proposed} - Q_{current})(P_{proposed})] \quad (3)$$

Thus, the gross gain in consumer surplus shown in Figure 1 measures the bill reduction from a static amount of toll minutes purchased at the lower price per unit (Area A), plus the increased value from expanded toll use prompted exclusively by the reduced unit price for toll (Area B).

For wireline subscribers, we subtract from these estimated gains in consumer welfare the phased-in increases in flat end user charges (SLC, RM and FBM charges) that wireline consumers could experience under this rate restructure. The resulting amount is the net gain in consumer welfare flowing from the combination of lower toll prices and increased end user charges.

2.2 Results for wireline customers

The analysis shows that the total nationwide incremental improvement in consumer surplus for wireline customers from the Missoula plan reaches \$677 million per year upon completion of the plan's switched access rebalancing. *That is, by the end of the plan's rebalancing phase-in, wireline customers will experience an annual net consumer welfare gain of \$677 million – which will continue for the remaining years of the plan.* This translates to an average monthly net welfare gain of \$0.52 per household. Of these gains, 20% are due to reform of interstate access charges and 80% are due to reform of intrastate access charges. Figure 2 shows annual, monthly, and cumulative impacts to wireline subscribers for each year following implementation of the Missoula plan. Eight years following implementation, cumulative consumer benefits will be \$4.02 billion, or \$37 per household. Also, to the extent that competition in retail markets inhibits carriers from raising SLCs all the way up to the levels justified based on associated access charge reductions, consumer welfare will be enhanced even further.¹¹

¹¹ Other than for rate-of-return carriers in Tracks 2 and 3, the Missoula plan provides no carrier with any guarantee of full cost recovery, because (among other considerations) competitive pressures may well preclude any given carrier from raising its end-user charges to account fully for decreases in its intercarrier compensation revenues. Our analysis is nonetheless conservative in that it assumes that, despite these competitive pressures, ILECs will raise their SLCs fully up to their access charge reduction-justified levels during the first four years of the Plan. We also assume that these competitive pressures will preclude possible out-year up-to-cap increases in SLCs beyond levels that are justified based on their associated access charge reductions. This is in contrast to suggestions that because such increases are theoretically permitted by the Missoula plan, they should be incorporated into this welfare analysis. While the Missoula plan may permit such up-to-cap increases to take place for non-rate-of-return carriers

2.3 Distribution of gains among wireline customers

Certain customers may benefit more than others from the Missoula plan. As discussed, a customer benefits when his gain from lower long distance prices more than offsets his end user charge increase. Thus, the more long distance minutes a customer uses, the greater that customer benefits. Notably, the potential benefit for higher wireline toll users has no ceiling, while any potential “loss” for light users of wireline toll service is bounded by the amount of the end user charge increase.

One customer segment of particular concern is low-income subscribers. A vital provision of the Missoula plan waives increases in end user charges for Lifeline subscribers. Under the Missoula plan, qualifying low-income subscribers will be protected from end user charge increases even as they receive the full benefit of lower wireline toll rates. Tariff data indicate that under current per-minute intercarrier compensation and USF charge structures, Lifeline subscribers currently pay about \$10.28 monthly for basic local service, with no associated charges for SLC or federal USF. Lifeline subscribers who use a “medium” amount of toll spend another \$5.00 per month, plus about \$0.36 for the associated federal USF charge. Hence, the total local and toll payment for Lifeline “medium” toll users is \$15.64. Under the Missoula plan, the local payments for these Lifeline subscribers will be unchanged due to their exemption from SLC, USF, RM and FBM charges. However, their \$5.00 monthly toll payment will fall to about \$3.80 and the corresponding \$0.36 federal USF charge will be waived, resulting in a post-plan total bill of about \$14.08. Thus, Lifeline subscribers who use a “medium” amount of toll will see a net monthly total bill reduction of approximately \$1.56 because they will be exempt from end user charge increases but will benefit from toll price reductions.

While specific consumer benefits will vary, most individual wireline consumers will likely enjoy substantial benefits from implementation of the Missoula plan, as suggested by experience with similar rate rebalancing in the past. In a consumer

beginning five years after its inception, it seems very doubtful that such increases would be competitively sustainable. Current projections for VoIP services suggest that these services will have obtained very significant market shares by that date (*Communications Daily* reported on January 26, 2007 that the Telecommunications Industry Association predicts that VoIP will comprise 34% of the U.S. landline market by 2010). In addition, Yankee Group forecasts residential broadband VoIP subscribers to reach 26.3 million by 2010 (*The VoIP Evolution Continues: Forecasting Broadband VoIP and Cable Telephony*, Yankee Group Report, August 2006). Increasing competition from wireless services is also expected. Over this period, wireless service may displace wireline telephone service in 15% or more of all households (see, *One in Seven US Households Say “No Thanks” to Wireline Phone Services in 2010*, Yankee Group Report, December 2006). Indeed, these projected competitive developments appear to make it likely that SLC levels in year 5 and beyond are more likely to fall short of full access loss recovery than to exceed full recovery.

expenditure survey, economist Frank Wolak's model showed that a similar type of price rebalancing proposal "appears to result in net consumer gains to the majority of households in our sample."¹² Similarly, a Southwestern Bell study that examined actual customer bill data indicated that about 45 percent of Southwestern Bell residential customers have experienced a net bill reduction under early implementation of the SLC program. Most of those who did not realize a net bill reduction saw only minor increases.¹³

3 Wireless

The Missoula plan will benefit wireless customers as well as wireline customers because they, too, will benefit from lower net per-minute rates for service. Wireless consumers should realize an average monthly benefit of \$0.48.¹⁴ By eight years after initial implementation of the plan, these benefits should amount to over \$9.07 billion, or \$37 per subscriber.

3.1 Measuring welfare gains to wireless customers

The prices that customers pay for wireless service will fall because of the reductions in access charges and reciprocal compensation rates offered by the Missoula plan. Accordingly, the estimated impact of the Missoula plan on wireless customers can be determined by replicating the process outlined above using wireless calling data, but with three major modifications.

First, in the wireline analysis presented above, the welfare gains from the reduction in access charges are netted against the offsetting welfare effects of the increase in SLC, USF, RM and FBM collections. But the Plan's increase in regulated SLC caps should not affect wireless subscribers. Wireless subscribers, however, will be assessed USF, RM and FBM charges, which will reduce their overall welfare gains. The following analysis assumes that wireless subscribers will pay these RM and FBM assessments through fixed monthly charges.

¹² Frank Wolak, "Can Universal Service Survive in a Competitive Telecommunications Environment?," *Information Economics and Policy*, at 36 (February 1996 draft).

¹³ A. Larson, T. Makarewicz and C. Monson, "The Effect of Subscriber Line Charges on Residential Telephone Bills," 13 *Telecommunications Policy* 337 (1989).

¹⁴ Indeed, because wireless minutes per subscriber per month are projected to rise independent and apart from Missoula plan price decreases, it is likely that wireless industry savings will exceed substantially this figure.

Second, unlike the above analysis of wireline effects, the analysis of wireless calling includes the net impact of reducing reciprocal compensation charges along with access charges.¹⁵ Although the impact of the reciprocal compensation reduction is significantly smaller than the impact of the access reduction (since reciprocal compensation rates generally are so much lower to begin with and constitute wireless company receipts as well as costs), this impact is realized across a larger quantity of wireless minutes than the access reduction impact.

Third, unlike the analyzed wireline data, which are specific to long distance toll usage, wireless usage data generally agglomerate all minutes. Hence wireless data include minutes for which there will be no reduction in either access charges or reciprocal compensation charges. This is because these minutes (such as on-network, wireless-to-wireless minutes) incur neither access charges nor reciprocal compensation charges.

This third effect could be incorporated into the analysis two different ways. One could measure the impact of the access charge reductions and reciprocal compensation reductions on the subsets of minutes to which each applies, or one could incorporate the combined reductions into an overall (but much smaller) impact that would be applied across all wireless minutes. For example, assume the monthly reduction in access charges and reciprocal compensation for an average wireless customer totaled \$1.00. If the average number of customer minutes was 100 per month (25 charge-bearing minutes and 75 non-charge-bearing minutes), the \$1.00 reduction could be modeled as a four-cent-per-minute reduction on each charge-bearing minute. Alternately, the \$1.00 reduction could be modeled as a one-cent-per-minute reduction on all 100 minutes.

The second approach is the most appropriate for two reasons. First, wireless demand elasticity measures do not differentiate between types of wireless minutes. Second, the retail pricing of wireless calls generally blends charges imposed for minutes that bear access or reciprocal compensation charges and minutes that do not. Thus, callers tend to be insensitive to distinctions between minute types.

As in the case of wireline calling, Figure 3 demonstrates the gain in consumer surplus that wireless customers receive as a result of the access charge reductions and reciprocal compensation charge reductions built into the Missoula plan.

¹⁵ As a general matter, there are likely no substantial consumer welfare benefits accruing to wireline callers from reform of reciprocal compensation rates because retail local wireline calling that may bear reciprocal compensation charges is normally priced on an unlimited usage regulated flat rate basis.

Known variables are:

- Base year 2005 average per minute price of wireless calling, $P_{current}$, is approximately \$0.04500 and usage is 623 wireless minutes per subscriber per month for 194,479,364 U.S. subscribers.¹⁶
- Post-Missoula plan per-minute wireless calling price, $P_{proposed}$, of \$0.04372 is reached during the fourth year of the plan's implementation and assumes that both terminating access charge reductions (approximately \$0.00935 per access minute) and net reciprocal compensation charge reductions (approximately \$0.00020 per reciprocal compensation minute) are flowed through to consumer retail prices.¹⁷ As discussed above, the total impact of these reductions in charges for access minutes and for reciprocal compensation minutes is divided across all wireless minutes, resulting in a much smaller per-minute impact when spread across this larger denominator. The numerical development of this average per-minute reduction of \$0.00128 (= \$0.04500 - \$0.04372) is displayed in the Appendix.
- The price elasticity of demand for per-minute wireless calling, β , is assumed to be -1.29. This measure applies to all wireless minutes.¹⁸

Figure 3 displays the various components of the total welfare gain to wireless customers. As with the wireline analysis, one portion of the total gain is the net reduction in the per-minute price of wireless calling multiplied by the previous purchase volume of minutes (Area A), while the second portion is the increased value gained by wireless customers from their increased demand stimulated by the lower price (Area B). Incremental monthly USF, RM and FBM charges are then subtracted to compute net welfare gains. These gains are calculated on a monthly per-subscriber basis using average minutes, and then multiplied by the total number of wireless subscribers. However, unlike the wireline analysis above, the wireless estimate must also incorporate the substantial growth in wireless subscribers that we have witnessed and expect will continue over the life of the Missoula plan.

¹⁶ The Cellular Telecommunications & Internet Association's *Semi-Annual Wireless Industry Survey* (available at: <http://files.ctia.org/pdf/CTIAMidYear2006Survey.pdf>) and the FCC Wireless Telecommunications Bureau's *2006 Annual Report* (available at: <http://www.fcc.gov/realaudio/presentations/2007/011707/wtb.ppt>) provide wireless average revenue per-unit ("ARPU") – \$49.52 in June 2005. The same data sources also provide minutes per subscriber per month – 623 at midyear 2005. The resulting ARPU per minute is adjusted to remove non-minute related revenue. Using regression analysis and inspection of surcharges, we estimate that, on average, \$21.50 of ARPU is non-minute related. This results in a minute-related ARPU of \$28.02 being divided by 623 minutes to obtain \$0.04500 as the incremental per-minute price.

¹⁷ Note that this reduction in per-minute access charges for wireless carriers differs from that for wireline carriers. This is because wireless carriers purchase only terminating access, while wireline carriers purchase a mix of originating and terminating access.

¹⁸ Taken from A. Ingraham and J. G. Sidak, "Do States Tax Wireless Service Inefficiently? Evidence on the Price Elasticity of Demand," *Virginia Law Review*, Fall 2004.

3.2 Results for wireless customers

Figure 4 demonstrates that after full phase-in of the Missoula plan, *wireless customers will experience an annual net consumer welfare gain of approximately \$1.44 billion that will continue for the remaining years of the plan.* This translates to a monthly benefit of \$0.48 for the average wireless subscriber as compared to the results under the regulatory status quo. On an annual basis, this amounts to \$5.76 per subscriber once rebalancing is complete. Of these benefits to wireless customers, roughly 60% are due to reform of interstate access charges and reciprocal compensation while 40% are due to reform of intrastate access charges. Over the eight years following initial implementation of the plan, these wireless benefits will amount to over \$9.07 billion, or \$37 per subscriber.

4 Combined results – including USF collections reform

As discussed above, the impact of the intercarrier-compensation reform provisions of the Missoula plan on switched wireline customers produces, upon completion of the rebalancing, a net increase in consumer welfare of \$677 million annually. The analogous impact on wireless customers produces, upon completion of the rebalancing, a net increase in consumer welfare of approximately \$1.44 billion annually. Thus the wireline plus wireless total benefit equals \$2.12 billion per year after the plan is fully phased in.¹⁹

In addition to the Missoula plan's reforms of the existing framework of intercarrier compensation, reform of the method used to collect current Universal Service Fund contributions may also occur. Currently, these funds are collected through percentage assessments on interstate and international telecommunications revenues. This inflates effective per-minute interstate retail toll prices and wireless per-minute prices by the amount of this assessment, which is currently in the neighborhood of 10%. Missoula plan supporters are in agreement that this mechanism must be broadened and improved.

An improvement advocated by certain Missoula plan supporters is to convert current USF contributions (on a revenue-neutral basis) from percentage additives on

¹⁹ In addition to affecting the welfare of switched wireline and wireless customers, compensation reform also may affect the welfare of customers of paging and special access services by imposing USF, RM and FBM collections liability on these services. These services comprise, roughly, 5% of all assessed telephone "numbers." While per-number assessments against these services may possibly impair the benefits received by customers of these services, it is also possible that per-number assessments may improve the welfare of these customers if these assessments result in smaller fee collections than the current ad valorem assessment mechanism.

high-elasticity per-minute rates to low-elasticity flat per-connection charges. This should produce a welfare benefit for switched wireline and wireless customers.²⁰

Figure 5 calculates the welfare gains from converting embedded USF collections contributed by switched wireline customers to flat monthly charges per line or per connection.²¹ It demonstrates that this conversion will return wireline customers an additional \$33 million in consumer surplus per year. Over an eight-year horizon, these benefits amount to \$268 million. Figure 6 calculates the analogous welfare gains to wireless customers. It demonstrates that this conversion will return wireless customers an additional \$41 million in consumer surplus per year.²² Over an eight year horizon, these benefits amount to \$332 million.

Thus, combined compensation and USF collections reform may produce an annual net increase in consumer welfare of \$2.20 billion, which will be realized for every year of the plan after phase-in. Over eight years (four years of phase-in, four years of full effect), the cumulative plan benefits amount to about \$13.69 billion.

Finally, the benefits the plan would bring to the entire economy may exceed the telecommunications sector benefits discussed above. Any economic activity in a specific sector that introduces additional dollars into the system has a multiplier effect as those dollars flow through the greater economy. These impacts on output and employment can be measured by using the Department of Commerce RIMS II multipliers.²³ For the telecommunications sector, the RIMS II multiplier is 2.56. Simply stated, this means that a \$1 expansion of economic activity in the telecommunications sector ultimately translates to a \$2.56 expansion in the overall economy. Because Missoula plan compensation reforms will increase net overall expenditures on telecommunications by \$5.10 billion over its phase-in, these increased expenditures may stimulate greater output and employment in the overall economy. Using the RIMS II multiplier, the multiplied economic impacts could equal \$13.05 billion over the eight years following

²⁰ If a wireless carrier has already chosen to collect its USF assessments through flat per-customer charges, then the welfare benefits to its customers from this shift to flat per-connection charges will be less than the figures calculated here.

²¹ Because current USF collections rules assess only interstate revenues, the calculated welfare gains are based only on reductions in the effective retail price of interstate toll minutes.

²² Because current USF collections rules assess only interstate revenues, wireless benefit calculations assume that average wireless retail prices will fall by only 30% of the amount that interstate minute prices would drop from this collections reform.

²³ Bureau of Economic Analysis, U.S. Department of Commerce RIMS II Multipliers (1997/2002), Table 1.4.

adoption of the plan.²⁴ This figure is separate and apart from the \$13.69 billion of increased consumer surplus – translating to a combined economic benefit of up to \$26.74 billion. Applying the RIMS II multiplier for employment of 15.75 new jobs per additional million dollars of demand indicates that overall national employment also could rise by close to 20,000 jobs after full implementation of the plan. Fully 53% of these benefits derive from reform of intrastate mechanisms and 47% from reform of interstate mechanisms.

5 Response to criticisms of the analysis

Several parties have offered criticisms of the validity of our original consumer benefit analysis.²⁵ These criticisms divide into several categories.

- Complaints that the presented analysis and data are inconsistent with other analyses and data presented by the Missoula plan sponsors.
- Claims that reductions in intercarrier compensation charges will not be flowed through to customers.
- Claims that demand elasticity parameters are misspecified and that current structures of wireline and wireless retail pricing plans attenuate severely consumers' usage level reactions to changes in compensation costs.

Each of these criticisms is inapt. In the following sections, we discuss each of these complaints and explain why they present no compelling basis for suggesting that Missoula plan reform of intercarrier compensation is without customer benefit.

²⁴ While increases in economic activity in one sector may have multiplied effects on other sectors of the economy, these calculations must be considered speculative and are strongly influenced by the input-output relationships assumed within the economy.

²⁵ See comments filed in CC Docket No. 01-92 on October 25, 2006 by the following entities: National Cable & Telecommunications Association “NCTA” (available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518537887); Comments of Cavalier *et al.* at 56-58 (available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518538105); Comments of National Association of State Utility Consumer Advocates “NASUCA” at 28-37 (available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518537968); Comments of the Missouri Public Service Commission at 37-38 (available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518537952). See, also, Briefing Paper from the National Regulatory Research Institute “NRRI” dated October, 2006 (available at: <http://www.nrri.ohio-state.edu/dspace/bitstream/2068/1039/1/06-14+Intercarrier+Compensation+and+the+Missoula+Plan.pdf>) and paper by Economics and Technology, Inc. “ETI”, “The True Economic Impact of the “Missoula Plan’ for Intercarrier Compensation: An Assessment Based on Reality,” (available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518539976).

5.1 Data and analysis inconsistent with other Missoula analyses

ETI claims that the data used in this consumer benefit analysis are inconsistent with data and other analyses proffered by the Missoula plan sponsors. ETI claims further that this analysis fails to reflect the revenue-neutral nature that it claims was intended for the Missoula plan. In particular, ETI argues that the total compensation charge reduction figure of roughly \$12.5 billion (annual, after phase-in) from our July 18, 2006 paper (hereafter, “CM1”) exceeds the “AT&T model’s” figure for total ILEC switched access revenues of \$8.9 billion.²⁶ Because of this claimed excess in compensation charge reductions, ETI suggests that CM1 does not model faithfully a revenue-neutral rate rebalancing that ETI states to be an explicit requirement within the Missoula plan. Because of this alleged error, ETI avers that our forecast of substantial consumer benefits from rebalancing is faulty and unfairly biased in favor of concluding that the Missoula plan results in a welfare gain to consumers. ETI’s complaints are unfounded.

First, the comparison that ETI offers between CM1 figures for compensation charge reductions and those contained in the “AT&T model” analysis is “apples to oranges.” The July 18, 2006 “AT&T model” computed only the inter- and intrastate interLATA switched access reductions that the Missoula plan would impose on the ILECs. Our analysis, because it attempts to calculate economy-wide impacts, incorporated the reductions in both inter- and intraLATA switched access revenues and reciprocal compensation revenues that Missoula would impose on the ILECs, CLECs, and wireless carriers. Because of the broader nature of our modeling, it is unsurprising that our figure for these compensation charge reductions would be far larger than the figure reported in the “AT&T model.”

Second, ETI uses incorrect calculations in its criticism of wireless minute and charge issues. In computing its figure for CM1’s wireless compensation reductions to compare against the “AT&T model’s” figures (which were calculated using base period 2004 demand), ETI takes CM1’s overall wireless per-minute reduction and multiplies it by base year minutes/subscriber/month (791) times Step 4 demand (249.5 million subscribers). Due to autonomous growth in wireless lines (which CM1 assumes to be

²⁶ The “AT&T Model” that ETI refers to was included as Attachment A to a letter from Commissioners Tony Clark, Ray Baum, and Larry Landis, NARUC Task Force on Intercarrier Compensation, to Chairman Kevin Martin, Federal Communications Commission, CC Docket No. 01-92 (filed July 24, 2006). Because of its different purpose, it incorporated different modeling assumptions than those used in CM1. In particular, the submission stated that this model “does not include other LECs such as CLECs and wireless providers, nor does it include revenue effects resulting from changes in reciprocal compensation, EAS arrangements, transiting arrangements, and the billing of phantom traffic.”

10% annually), this will, of course, yield an excessive figure. An apples-to-apples comparison would require multiplying the overall compensation charge reduction only by base year subscribers (170.4 million). Because of this error, ETI overestimates the relevant wireless compensation reductions by over 46%.

ETI also questions CM1's overall figure for the reduction in average compensation cost per wireless minute. This overall figure was developed from applying the \$0.00926 reduction in access charges (same as was assumed in the CM1 wireline analysis) to originating wireless minutes requiring the payment of access charges. CM1's figure of \$0.00020 for the reduction in reciprocal compensation charges (applied to reciprocal compensation minutes) comes from the Missoula plan's specification that Tier 1 carriers reduce their reciprocal compensation rates from \$0.00070 to \$0.00050.²⁷

Instead of these figures, ETI appears to believe that Missoula plan wireless reduction figures should match those from an Intercarrier Compensation Forum ("ICF") *ex parte* document filed several years earlier.²⁸ But the ICF plan was different from the Missoula plan and the estimation time frame is different, so there is no real "conflict." The earlier ICF figure estimated the switched access cost of wireless carriers terminating traffic to the large ILECs, only. The CM1 access cost figure assumes that wireless carriers will terminate traffic to both large and small ILECs and CLECs. Since the average termination rates charged by CLECs and by small ILECs exceed those charged by the large ILECs, it is unsurprising that the CM1 access reduction figure should exceed the earlier ICF figure.

Thus, the only remaining basis for ETI's complaint about CM1's wireless compensation cost reduction figure is its suggestion that CM1 may overestimate the number of wireless access-bearing and reciprocal compensation-bearing minutes. In this, we agree that there may have been a minor error. CM1 assumed 30% of originating wireless minutes to be access-bearing and 45% to be reciprocal-compensation bearing. Based on improved data, we now believe that access-bearing minutes are closer to 25% of originating minutes and reciprocal compensation minutes are closer to 50%.²⁹

²⁷ Because the Missoula plan's directed reduction in Tier 2 and Tier 3 carriers' reciprocal compensation rates is likely greater than this figure of \$0.00020 for Tier 1 carriers, our calculation of wireless reciprocal compensation reductions is almost certainly an underestimate.

²⁸ ETI paper at p. 6 and note 13.

²⁹ Note that because wireless revenues associated with interstate services may be higher than for local services, these figures remain consistent with the FCC's interstate "safe harbor" threshold for wireless carriers which it has recently raised from 28.5% to 37.1% (see *FCC Updates Approach for Assessing Contributions to the Federal Universal Service Fund*, available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-266030A1.pdf).

Perhaps more significant is the issue of the total number of minutes. CM1 placed this figure at 791 per subscriber per month. Improved data now shows a more accurate year 2004 figure to be 540 and year 2005 figure to be 623.³⁰ The above consumer impact analysis incorporates these revised figures, and continues to forecast a vast net benefit to consumers.

But this discussion over CM1 calculations is beside the point. The important issues are whether (a) the Missoula plan is intended to result in carrier revenue-neutrality; and (b) whether the current welfare analysis models accurately the degree of revenue-neutrality implicit in the Missoula plan.

First, despite suggestions by ETI, the Missoula plan provides no specific carrier nor class of carriers (except the small rate-of-return ILECs in Tracks 2 and 3) with a revenue-neutral exchange of flat end user charge revenue for per-minute access revenue. It provides ILECs only an on-average rebalance of per-minute compensation charges into flat monthly charges (SLCs, USF, RM and FBM). Indeed, the plan may be revenue-negative for most Track 1 and 2 carriers because of prescribed increases in several universal service programs. Similarly, depending on the actual amount of compensation revenues lost by CLECs under the plan, the increased SLCs calculated under the plan may or may not be enough to balance their access revenue loss. To the extent that CLECs serve disproportionately high-value customers with greater than average long distance use (*e.g.*, business customers) or have access charge rates that are higher than the ILEC average, the Missoula plan could be revenue negative to these entities. Further, if the recommendations of certain Missoula plan supporters are adopted, USF, RM and FBM charge increases will be borne by carriers in proportion to the telephone numbers that they hold. To the extent that some assessed telephone “numbers” are held outside the switched wireline and wireless industries (about 5%), these assessments will not be recognized explicitly and calculations within this benefit analysis may not reflect revenue-neutrality.³¹

As noted above, this analysis is intended to model the welfare effects on switched wireline and wireless customers. For wireline customers, it models only the benefits that these customers receive from access charge reductions by ILECs and CLECs for interLATA and intraLATA services. It does not incorporate net reciprocal compensation reductions – which are likely to be small. For wireless customers, it models both the

³⁰ See, FCC Wireless Bureau 2005 Annual Report, Tenth Report, WT Docket No. 05-71, at para. 168.

³¹ See note 19, *supra*.

benefits of access charge reductions and any reductions in net reciprocal compensation costs.

Based on the analysis performed in section 3, the following table presents the compensation cost reductions and end user charge increases experienced by these coarse industry segments.

Revenue/cost item (\$ billions)	Wireline	Wireless	Total
Access	-\$5.34	-\$1.87	-\$7.21
Reciprocal compensation	--	<u>\$0.01</u>	<u>\$0.01</u>
Total	-\$5.34	-\$1.86	-\$7.20
Subscriber line charge	\$3.48		\$3.48
USF+RM+FBM charges	<u>\$1.75</u>	<u>\$0.89</u>	<u>\$2.64</u>
Total	\$5.23	\$0.89	\$6.12
Net change	-\$0.11	-\$0.97	-\$1.09

While this table of results suggests \$1.09 billion of revenue negativity, this is to be expected. Roughly \$146 million in annual USF, RM and FBM contributions by the 5% of all telephone numbers outside of our switched wireline and wireless analysis are omitted. And there may be many sources for the remaining \$939 million in excess compensation reductions over end user charge increases. These sources may include: CLEC lines handling more toll traffic per line than ILEC averages; small but significant differences in the access and reciprocal minute counts used in this analysis relative to the counts used in developing the specific figures for access and reciprocal compensation rate reductions or SLC increases; mismatches between base year minute volumes and current rate levels, *etc.* But in any event, because there is no guarantee that the Missoula plan is overall revenue-neutral, it is not implausible that it could be slightly revenue-negative – and to the extent that the Missoula plan is effectively revenue-negative, customer welfare is genuinely improved.

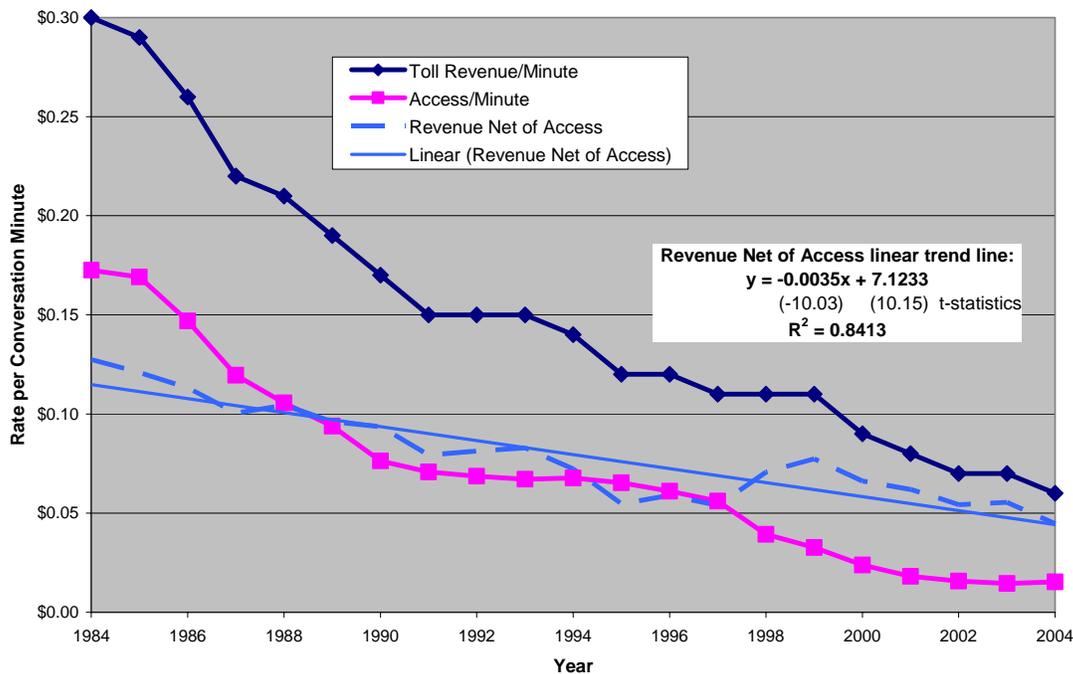
5.2 Flow-through of compensation charge reductions

The centerpiece of the complaints lodged against the CM1 analysis is the claim that we should not have assumed full flow-through of compensation charge reductions to

customers.³² Rather, it is alleged, we should have assumed that some significant fraction of these reductions would remain in the pockets of wireline or wireless carriers. These assertions are without merit.

First, the empirical history of access charge reductions demonstrates that long distance carriers have flowed these reductions fully to end users. Indeed, reductions in retail long distance rates have exceeded the reductions experienced in the access component of these rates. From a statistical perspective, there could hardly be a closer correlation between historical access reductions and attendant retail toll charge reductions. This is demonstrated in the following chart based on data from the FCC’s *Trends in Telephone Service* report, April 2005, Tables 1.2 and 13.4 and the FCC’s *Telecommunications Industry Revenues* report, March 2006, Table 9.

History of Interstate Access Flow-Through: 1984-2004



The time span depicted in this chart includes both the period in which SLCs were first introduced, along with periods when SLC caps were progressively raised. During the early portion of the data period (1984-95), flow-through of access reductions to lower toll rates was required by FCC regulation of AT&T. But during the latter portion of the data period (1996-2004), such flow-throughs were not required by regulation – but took

³² See, for example, ETI paper at 8-10, 14 and NASUCA at 34-35.

place anyway (as reflected in the data) because of the competitive nature of the long distance business. In any competitive market, reductions in the principal cost of production, which for long distance is carrier access, are flowed-through to retain customers. This is exactly what happened historically in the long distance market.

Certain commenters acknowledge that while full flow-through of access charge reductions has been the historical rule, they suggest that this phenomenon should no longer be expected to prevail in current telecommunications markets.³³ Rather, they argue that competition for long distance service is lessening – with half or more of all customers choosing to receive long distance services from their local service incumbent carrier. Given the large long distance market share of the ILECs, they argue that it is less likely that future access charge reductions will be passed on to customers.

This prediction of future non-flow-through seems unlikely. First, high market share does not imply a lack of flow-through incentives. AT&T's market share of residential direct-dial interLATA long distance minutes was 69.5% when it was declared nondominant in late 1995, and its share did not drop below 50% until the year 2000.³⁴ But regardless of this share and the fact that AT&T was no longer regulated to require flow-through, these flow-throughs continued. Because today's long distance market is as competitive as it ever has been, it is very reasonable to expect that all further decreases in carrier access charges will flow through to lower toll rates – without need for any explicit regulatory mandate.

Further, even though more than half of all customers may now choose to take their long distance service from their local carrier, this does not mean that the long distance market has become uncompetitive. Over 40% of all customers continue to take their long distance service from an independent provider – and switching vendors from one's local carrier to an independent long distance carrier remains exceedingly cheap and easy. It requires but a PIC change, the charge for which is nearly always waived for the end user and paid for by the receiving long distance provider. Thus, if local carriers fail to pass compensation cost savings on to their customers, it remains very easy for customers to defect to independent carriers that pass these savings on in the form of lower retail toll prices. In the end, price governs consumer behavior. For long distance service, vertically integrated carriers that attempt to retain the financial gain of access

³³ See, for example, ETI paper at 8-9.

³⁴ FCC *Trends in Telephone Service*, Table 9.7.

reductions by not lowering long distance rates will most surely lose their toll customers to a host of waiting competitors.³⁵

Finally, ETI goes on to suggest that Missoula plan rebalancing will provide a massive revenue windfall for the ILECs and/or their affiliated long distance carriers.³⁶ ETI argues that all incremental revenues arising from any demand stimulation induced by access charge reductions will be pocketed by these carriers as pure windfall profit. But for this to occur, there need to be two antecedents – neither of which ETI establishes. The first is that the cost structure of these carriers is completely non-traffic-sensitive; and the second is that these markets are devoid of any competitive rivalry for customers. Without the implicit assumption that costs are insensitive to demand, ETI cannot conclude that extra revenues resulting from demand stimulation are pure profit to the receiving carrier. And without a subsequent implicit assumption that there is no competitive rivalry among the various carriers, it is impossible for ETI to conclude that extra revenues from demand stimulation will not be competed away through necessary price reductions to customers.

5.3 Specification of demand elasticity parameters and influence of retail pricing plan structures

ETI and NASUCA have claimed that the demand elasticity structure that we have assumed is no longer apposite to the toll services market.³⁷ They suggest that the -0.72 elasticity level for wireline toll demand applies only to interstate services and is dated. Further, they argue that it is inappropriate to use an elasticity of zero for access line rental and a -1.29 elasticity for wireless minute use. Although these commenters propose no documented alternative figures of any vintage for these elasticities, ETI does argue that because of industry movement toward all-you-can-eat wireline service plans and bucket-of-minute wireless plans, consumer demand responsiveness to changes in compensation charges may be nil.

These arguments should receive little credit. First, we have not found, nor have intervening parties advanced or documented more recent or accurate estimates of long distance price elasticity. The most recent accepted measure of wireline toll elasticity dates to 1995 (M. Ward, “Measurements of Market Power in Long Distance

³⁵ In any event, even if the degree of local competition were relevant to access flow-though, this competition is already substantial – and growing dramatically from both VoIP and wireless. See note 11, *supra*.

³⁶ ETI paper at 6-7.

³⁷ See, for example, ETI paper at 15-17 and NASUCA at 33-34.

Telecommunications,” FTC whitepaper, April 1995 – finding an own price elasticity for toll of -0.89.) Second, even if the price elasticity for wireline or wireless long distance has fallen in recent years, this fall would have only a small impact on the wireline consumer welfare calculation presented in CM1 and updated here. The vast majority of wireline or wireless consumer gain measured in our analysis – more than 95% – is due to reductions in producer surplus, *i.e.*, consuming the same amount of long distance or reciprocal compensation minutes at a lower unit price. Thus, even if the price elasticity for wireline toll or wireless services had dropped to zero, nearly all of our quantified consumer welfare gain would remain. And to the extent that price decreases stimulate any growth in long distance or other intercarrier usage, consumer surplus will be enhanced further.

NASUCA criticizes our original analysis for equating economic gain with a reduction to producer surplus.³⁸ But in this instance, reduced producer surplus shifts directly to consumers via lower toll rates – even at the same level of demand. Consumers may get the same amount of toll service as previously, but at a lower price. Therefore, the reduction in producer surplus (Area A in our analysis) represents a direct economic gain to consumers.

ETI and NASUCA criticize the premise we used that the elasticity for access line rentals is essentially zero, despite the fact that our original analysis cited historical empirical backing for this premise. Assuming zero elasticity for access line rentals only simplifies our analysis. The overall consumer benefit quantifications would change very little if a -0.10 or below elasticity measure (which is certainly an upper bound for line rental elasticity) were substituted.

These commenters also suggest that the availability of bundled or bucket-of-service plans for wireline long distance and wireless service invalidate the demand curve structure that underlies our consumer welfare study.³⁹ Rather, they argue, that the advent of bundles and buckets eliminates customer exposure to per-incremental minute pricing. This concern is overblown. Just because toll usage may be bundled with local service or sold in 100-minute chunks doesn’t mean that the overall pricing doesn’t reflect the quantities of minutes consumed. Bundle or bucket prices do rise as the usage levels they permit rise. Four hundred minute long distance bundles are generally priced higher than two hundred minute bundles. Similarly for wireless bucket plans. Larger buckets are priced higher than smaller buckets. Thus, the basic difference between bundle/bucket plan pricing and pure per-minute pricing is that their cost rises in stair-

³⁸ NASUCA at 28-37

³⁹ See, for example, ETI paper at 18-19.

step fashion rather than linearly as additional minutes are consumed.⁴⁰ Further, given the competitive status of long distance or wireless markets, reductions in their principal cost of production (i.e, access or reciprocal compensation minutes) would be reflected in bundle/bucket prices.

6 Conclusions

Current rate structures for intercarrier compensation and universal service fund collections are inefficient. These structures rely on per-minute charges for compensation and percent-of-interstate-revenue assessments for universal service. The Missoula plan reforms intercarrier compensation away from per-minute charge structures and towards flat-rate collections. Supporters of the Missoula plan agree that universal service collection structures should be broadened. Certain of these supporters promote replacing percent-of-revenue assessments for universal service with flat assessments based on telephone “numbers.”

In the foregoing paper we have examined the welfare effects of these proposed reforms using a generally-accepted model of consumer demand and our best estimates of market parameters. Based on this empirical analysis, we project switched wireline consumer benefits from the Missoula plan’s intercarrier compensation reforms at over \$4 billion over the eight-year period after implementation of the plan. Projected wireless consumer benefits exceed \$9 billion. Additional benefits from reform of universal service collections to a “numbers” basis amount to roughly \$600 million. Altogether, these benefits exceed \$13 billion over the eight-year period after plan implementation – and economy-wide benefits may be even double this amount.

Complaints registered by other parties against this benefit analysis are generally inapposite. They rely on mischaracterizations of the Missoula plan and a fundamental belief – advanced without evidence – that local, long distance and wireless telephone service are both now and in the future completely noncompetitive services. It is only based on this unfounded belief that these critics are able to bootstrap conclusions that these long-needed reforms are without customer benefit.

⁴⁰ The only plans for which there may be arguable concern are unlimited usage plans – but these are not very prevalent – and even though their usage is theoretically unlimited, carrier experience is that customers’ actual usage under these plans is only modestly higher than under a high limit plan. Similarly beside the point are suggestions that because many high-end wireless plans offer unlimited mobile-to-mobile or off-peak calling, their consumers are insensitive to per-minute pricing. Carriers offer such plans because they know that typical use levels for mobile-to-mobile or off-peak minutes follow closely these customers’ usage patterns for charged “anytime” minutes.

Appendix

Wireline minute development

Wireline conversation minute counts are developed by the following process.

1. Compute 2005 interstate access minutes following the process used in Table 9 of the FCC's 2004 report on *Telecommunications Industry Revenues*.
2. Adjust downwards the resulting count of terminating interstate access minutes by the number of originating wireless interMTA minutes calculated in the second half of this Appendix.⁴¹
3. Compute intrastate interLATA and intraLATA access minutes.
4. Convert sum of wireline interstate, intrastate and intraLATA access minutes into conversation minutes.

These steps are displayed numerically in the table, below.

⁴¹ While this analysis presumes that wireless interMTA minutes are all interstate terminating access minutes, this assumption has no effect on the resulting count of total conversation minutes. A portion of interMTA wireless minutes could have just as well been assumed to be intrastate interLATA or intraLATA terminating access minutes.

	<u>(in millions)</u>
1. Development of total interstate access minutes	
U.S. billed international minutes	84,360 est
- Country-direct/beyond minutes	1,472 est
- <u>Reoriginating minutes</u>	<u>8,433 est</u>
= U.S. billed international minutes excluding country-direct/beyond and reoriginating	74,455
ILEC originating interstate access minutes	130,277
+ Estimated CLEC originating minutes	44,636
- <u>U.S. billed international minutes excluding country-direct/beyond and reoriginating</u>	<u>74,455</u>
= Domestic originating access minutes	100,457
ILEC terminating interstate access minutes	256,354
+ Estimated CLEC terminating minutes	87,833
- Country-direct/beyond international settlement minutes	1,472 est
- <u>Foreign billed international settlement minutes</u>	<u>23,518 est</u>
= Domestic terminating access minutes	319,197
2. Adjustment to remove wireless-originated access minutes	
Domestic terminating access minutes	319,197
- <u>Wireless-originated terminating access minutes</u>	<u>199,915</u>
Wireline-originated terminating access minutes	119,281
3. Development of intrastate interLATA and intraLATA access minutes	
ILEC originating intrastate access minutes	73,939
+ <u>Estimated CLEC originating minutes</u>	<u>25,333</u>
= Originating intrastate access minutes	99,273
ILEC terminating intrastate access minutes	123,232
+ <u>Estimated CLEC terminating minutes</u>	<u>42,222</u>
= Terminating intrastate access minutes	165,455
ILEC originating intraLATA access minutes	30,693
+ <u>Estimated CLEC originating minutes</u>	<u>10,516</u>
= Originating intraLATA access minutes	41,209
ILEC terminating intraLATA access minutes	51,155
+ <u>Estimated CLEC terminating minutes</u>	<u>17,527</u>
= Terminating intraLATA access minutes	68,682
4. Development of wireline-originated access and conversation minutes	
Interstate access minutes	319,185
+ Intrastate access minutes	264,727
+ <u>IntraLATA access minutes</u>	<u>109,892</u>
= Total wireline-originated access minutes	693,804
Interstate conversation minutes	193,737
+ Intrastate conversation minutes	165,455
+ <u>IntraLATA conversation minutes</u>	<u>68,682</u>
= Total toll conversation minutes	427,874
Wireline CMOU/AMOU ratio	61.67%

Wireless minute and cost reduction development

Our process for calculating the average reduction in wireless costs is as follows. First, for an average wireless purchaser, determine total monthly minutes and the percent of these minutes originating versus terminating. For the originating minutes, determine the percent that (a) terminate to another carrier and incur access charges; (b) the percent that terminate to other carriers and incur reciprocal compensation charges; and (c) the percent that terminate on-network to other wireless subscribers. In addition, for the wireless customer's terminating minutes, we determine the percent of these minutes that originate on other networks versus the percent that originate on the wireless carrier's own network.

For an average consumer utilizing 623 total minutes per month, we estimate 55% of these total minutes are originating (343/623) and 45% (280/623) are terminating. Of the 343 originating minutes, we estimate that on average 25% (86/343) incur access charges, 50% (171/343) incur reciprocal compensation charges and the remaining 25% (86/343) are on-network mobile-to-mobile minutes. Of the 280 terminating minutes, 195 minutes come from other networks and the wireless carrier receives reciprocal compensation for terminating these minutes – while the remaining 86 minutes are on-network mobile-to-mobile.

Thus, per-minute access charge reductions are applied to 86 originating minutes and per-minute reciprocal compensation charge reductions are applied to 171 originating minutes. However, these cost reductions are netted against the reduction in reciprocal compensation revenue that the wireless carrier receives on the 195 minutes that it terminates from other carriers. The combined dollar value \$0.80 per month from these two cost reduction elements and the one revenue reduction element is divided across all 623 minutes. The resulting per-minute cost reduction is \$0.00128.

These calculations are displayed in the table, below.

<u>Minutes per sub per month</u>	Originating	Terminating	Total
Total	343	280	623
InterMTA	86	58	144
IntraMTA	171	136	308
Intra-network	86	86	171
<u>Compensation rates</u>	Initial	Final	Delta
Terminating access	\$0.01277	\$0.00342	(\$0.00935)
Reciprocal compensation	\$0.00070	\$0.00050	(\$0.00020)
<u>Expense per subscriber</u>	Initial	Final	Delta
Access	\$1.09	\$0.29	(\$0.80)
Reciprocal compensation	(\$0.02)	(\$0.01)	\$0.00
Total	\$1.08	\$0.28	(\$0.80)
Subscribers:	194,479,364		
<u>Total minutes (millions/yr)</u>	Originating	Terminating	Total
Total	799,660	654,267	1,453,928
InterMTA	199,915	136,306	336,221
IntraMTA	399,830	318,047	717,877
Intra-network	199,915	199,915	399,830

Figure 1: Wireline Surplus Derivation

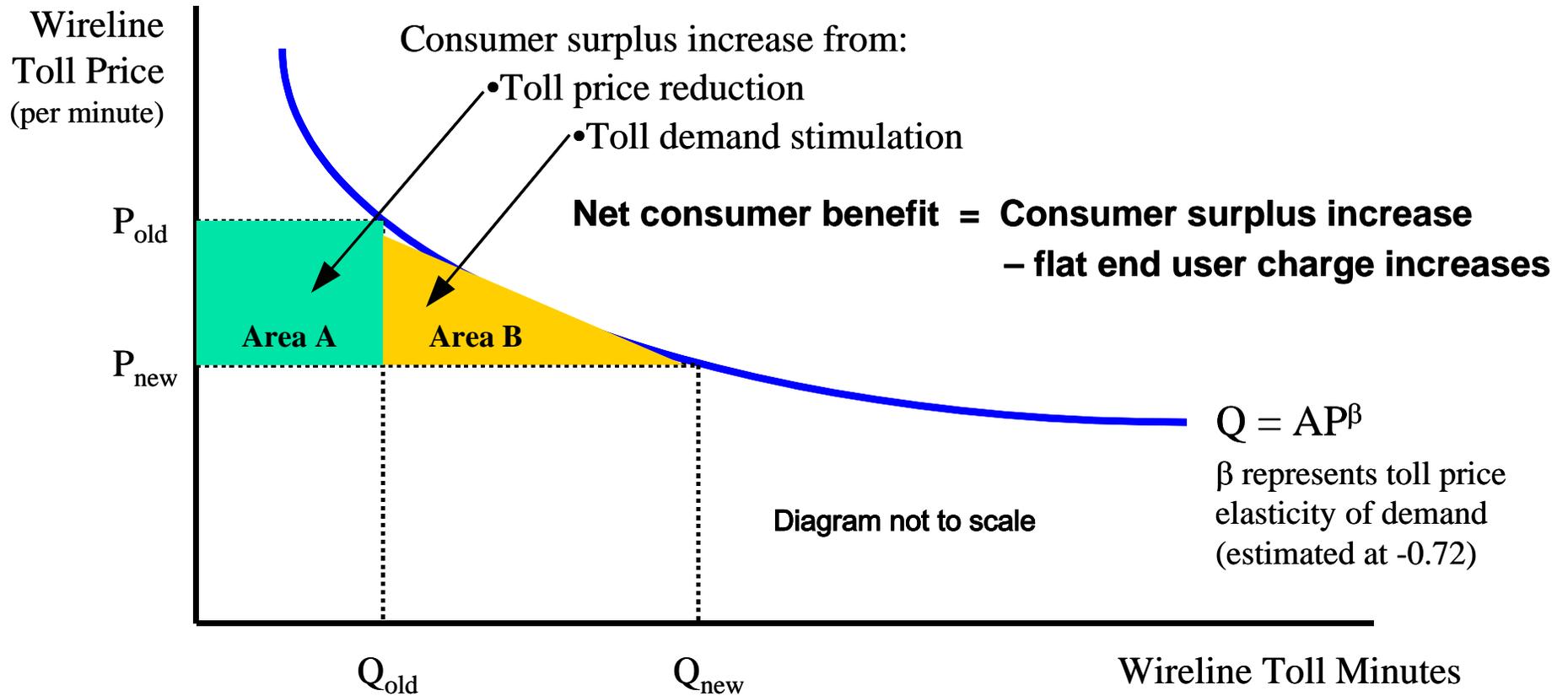


Figure 2

Missoula Plan for Compensation Reform: WIRELINE CONSUMER WELFARE ANALYSIS

	Base Year	Step 1	Step 2	Step 3	Steps 4&5	
Wireline toll minutes	427,873,806,604	448,200,640,348	470,997,574,886	496,775,443,814	526,201,478,117	
% Change		4.8%	5.1%	5.5%	5.9%	
<i>Composite Switched Access rate per convers min</i>	\$0.02071	\$0.01759	\$0.01446	\$0.01134	\$0.00822	
Estimated Toll Price per minute (w/o USF)	\$0.05000	\$0.04688	\$0.04376	\$0.04064	\$0.03751	
% Change		-6.2%	-6.7%	-7.1%	-7.7%	
Interstate toll price elasticity (β)	-0.72	-0.72	-0.72	-0.72	-0.72	
Constant (A) in demand equation $Q = A(P^\beta)$	49,496,455,986	49,496,455,986	49,496,455,986	49,496,455,986	49,496,455,986	
Wireline Toll Revenues	\$21,393,690,330	\$21,011,011,505	\$20,609,520,302	\$20,186,844,194	\$19,740,099,702	
Area A (\$ transfer from producers to consumers)		\$1,335,572,014	\$1,399,020,512	\$1,470,179,221	\$1,550,642,666	
Area B (amount added to consumer surplus)		\$31,138,074	\$34,876,643	\$39,378,309	\$44,873,375	
Incremental End User Increases (SLC + USF charges)		\$1,307,123,381	\$1,307,123,381	\$1,307,123,381	\$1,307,123,381	
						<u>Cumulative Gain</u> <u>Over Eight Year Plan</u>
Incremental Annual Net Benefit (Area A + Area B - End User incr)		\$59,586,707	\$126,773,774	\$202,434,149	\$288,392,660	
Run-rate relative to base		\$59,586,707	\$186,360,481	\$388,794,630	\$677,187,289	\$4,020,678,263
Incremental Monthly Net Benefit		\$4,965,559	\$10,564,481	\$16,869,512	\$24,032,722	or \$37
Run-rate relative to base		\$4,965,559	\$15,530,040	\$32,399,552	\$56,432,274	per household
Monthly Net Gain per subscribing household (run-rate)		\$0.05	\$0.14	\$0.30	\$0.52	
Households	107,500,000					
Intrastate fraction of access reductions	80%					
Interstate fraction of access reductions	20%					
Intrastate benefits (run-rate)		\$47,669,366	\$149,088,385	\$311,035,704	\$541,749,831	\$3,216,542,610
per household per month		\$0.04	\$0.12	\$0.24	\$0.42	\$30 per household
Interstate benefits (run-rate)		\$11,917,341	\$37,272,096	\$77,758,926	\$135,437,458	\$804,135,653
per household per month		\$0.01	\$0.03	\$0.06	\$0.10	\$7 per household

Figure 3: Wireless Surplus Derivation

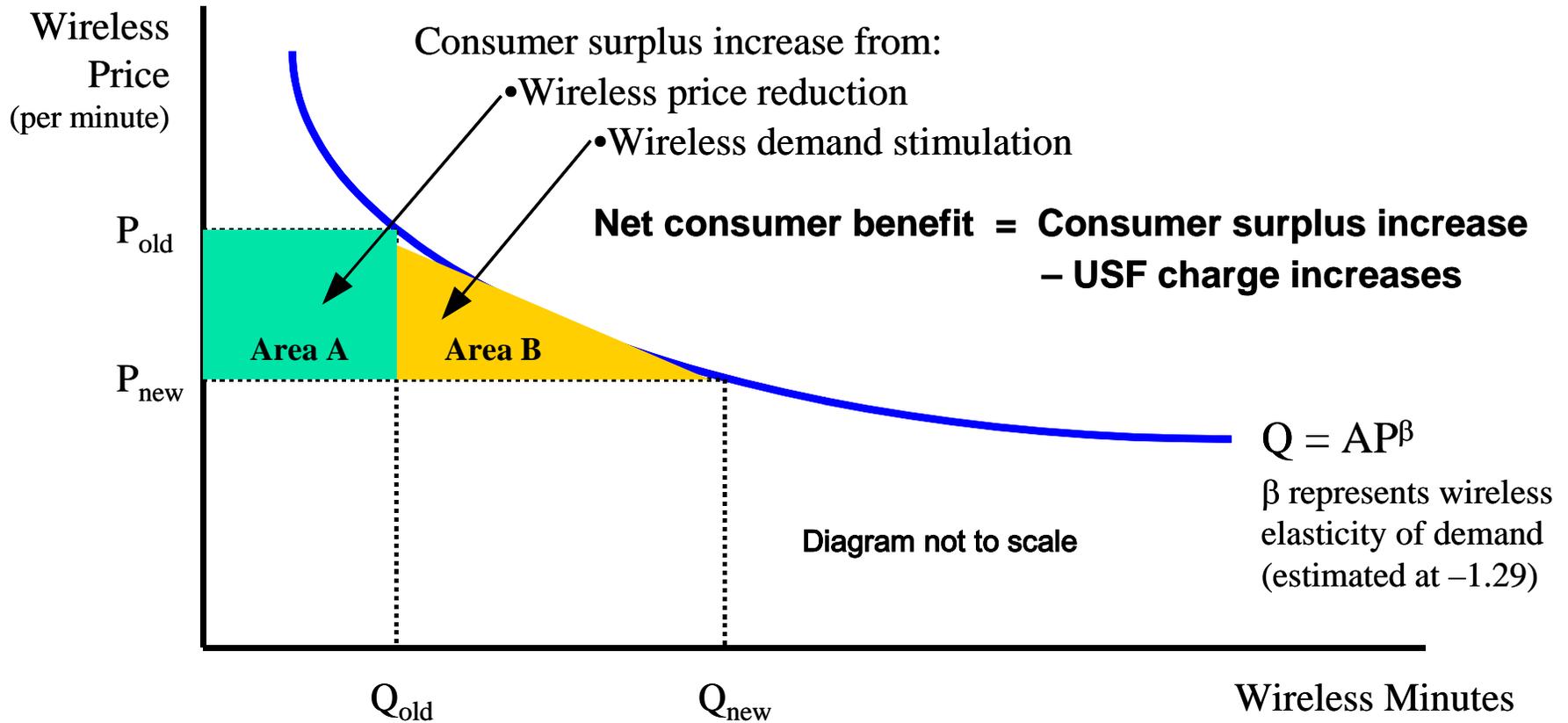


Figure 4

Missoula Plan for Compensation Reform: WIRELESS CONSUMER WELFARE ANALYSIS

	Base Year	Step 1	Step 2	Step 3	Steps 4&5	
Wireless minutes per subscriber per month	623	629	635	641	647	
% Change		0.9%	0.9%	0.9%	0.9%	
Estimated Price per wireless minute (w/o USF) *	\$0.04500	\$0.04468	\$0.04436	\$0.04404	\$0.04372	
% Change		-0.7%	-0.7%	-0.7%	-0.7%	
Wireless price elasticity (β)	-1.29	-1.29	-1.29	-1.29	-1.29	
Constant (A) in demand equation $Q = A(P^\beta)$	11.4060	11.4060	11.4060	11.4060	11.4060	
Minute-driven wireless revenues	\$28.04	\$28.09	\$28.15	\$28.21	\$28.27	
Subscribers @ 10% growth:	194,479,364	213,927,300	235,320,030	258,852,033	284,737,237	
Area A (\$ transfer from producers to consumers)		\$0.1991	\$0.2009	\$0.2028	\$0.2047	
Area B (amount added to consumer surplus)		\$0.0009	\$0.0009	\$0.0009	\$0.0010	
Incremental USF increase		\$0.0950	\$0.0864	\$0.0785	\$0.0714	
Net monthly benefit per subscriber (Area A + Area B - USF incr)		\$0.1050	\$0.1155	\$0.1252	\$0.1343	
						Cumulative Gain Over Eight Year Plan
Incremental Annual Net Benefit		\$269,509,020	\$326,081,626	\$388,930,304	\$458,756,600	
Run-rate relative to base		\$269,509,020	\$595,590,646	\$984,520,951	\$1,443,277,551	\$9,066,008,371
Incremental Monthly Net Benefit		\$22,459,085	\$27,173,469	\$32,410,859	\$38,229,717	or \$37
Run-rate relative to base		\$22,459,085	\$49,632,554	\$82,043,413	\$120,273,129	per subscriber
Monthly Net Gain per subscriber (run-rate)		\$0.10	\$0.22	\$0.35	\$0.48	
Intrastate fraction of net access/comp reductions	60%					
Interstate fraction of net access/comp reductions	40%					
Intrastate benefits (run-rate) per subscriber per month		\$161,705,412 \$0.06	\$357,354,388 \$0.13	\$590,712,570 \$0.21	\$865,966,530 \$0.29	\$5,439,605,022 \$22 per subscriber
Interstate benefits (run-rate) per subscriber per month		\$107,803,608 \$0.04	\$238,236,259 \$0.09	\$393,808,380 \$0.14	\$577,311,020 \$0.19	\$3,626,403,348 \$15 per subscriber

* Figure excludes wireless revenues that are not related to minutes of use

Figure 5

Missoula Plan for USF Collections Reform: WIRELINE CONSUMER WELFARE ANALYSIS

	Base Year	Step 1	Step 2	Step 3	Steps 4&5	
Wireline toll minutes (interstate)	193,736,858,167	207,498,511,588	207,498,511,588	207,498,511,588	207,498,511,588	
% Change		7.1%	0.0%	0.0%	0.0%	
Estimated Toll Price per minute w/ USF	\$0.0550	\$0.0500	\$0.0500	\$0.0500	\$0.0500	
% Change		-9.1%	0.0%	0.0%	0.0%	
Interstate toll price elasticity (β)	-0.72	-0.72	-0.72	-0.72	-0.72	
Constant (A) in demand equation $Q = A(P^\beta)$	24,003,434,628	24,003,434,628	24,003,434,628	24,003,434,628	24,003,434,628	
Wireline Toll Revenues	\$10,655,527,199	\$10,374,925,579	\$10,374,925,579	\$10,374,925,579	\$10,374,925,579	
Area A (\$ transfer from producers to consumers)		\$968,684,291	\$0	\$0	\$0	
Area B (amount added to consumer surplus)		\$33,464,351	\$0	\$0	\$0	
Incremental End User Increases (SLC + USF charges)		\$968,684,291	\$0	\$0	\$0	
						<i>Cumulative Gain Over Eight Year Plan</i>
Incremental Annual Net Benefit (Area A + Area B - End User incr)		\$33,464,351	\$0	\$0	\$0	
Run-rate relative to base		\$33,464,351	\$33,464,351	\$33,464,351	\$33,464,351	\$267,714,810
Incremental Monthly Net Benefit		\$2,788,696	\$0	\$0	\$0	
Run-rate relative to base		\$2,788,696	\$2,788,696	\$2,788,696	\$2,788,696	or \$2 per household
Monthly Net Gain per subscribing household (run-rate)		\$0.03	\$0.03	\$0.03	\$0.03	
Households	107,500,000					
USF assessment rate	10%					

Figure 6

Missoula Plan for USF Collections Reform: **WIRELESS CONSUMER WELFARE ANALYSIS**

	Base Year	Step 1	Step 2	Step 3	Steps 4&5	
Wireless minutes per subscriber per month	623	647	647	647	647	
% Change		3.9%	0.0%	0.0%	0.0%	
Estimated Price per wireless minute (w/ USF) *	\$0.04635	\$0.04500	\$0.04500	\$0.04500	\$0.04500	
% Change		-2.9%	0.0%	0.0%	0.0%	
Wireless price elasticity (β)	-1.29	-1.29	-1.29	-1.29	-1.29	
Constant (A) in demand equation $Q = A(P^\beta)$	11.8493	11.8493	11.8493	11.8493	11.8493	
Minute-driven wireless revenues	\$28.88	\$29.12	\$29.12	\$29.12	\$29.12	
Subscribers @ 10% growth:	194,479,364	213,927,300	235,320,030	258,852,033	284,737,237	
Area A (\$ transfer from producers to consumers)		\$0.8411	\$0.0000	\$0.0000	\$0.0000	
Area B (amount added to consumer surplus)		\$0.0162	\$0.0000	\$0.0000	\$0.0000	
Incremental end user charge increases		\$0.8411	\$0.0000	\$0.0000	\$0.0000	
Net monthly benefit per subscriber		\$0.0162	\$0.0000	\$0.0000	\$0.0000	
						<i>Cumulative Gain Over Eight Year Plan</i>
Incremental Annual Net Benefit		\$41,485,368	\$0	\$0	\$0	
Run-rate relative to base		\$41,485,368	\$41,485,368	\$41,485,368	\$41,485,368	\$331,882,941
Incremental Monthly Net Benefit		\$3,457,114	\$0	\$0	\$0	or \$1
Run-rate relative to base		\$3,457,114	\$3,457,114	\$3,457,114	\$3,457,114	per subscriber
Monthly Net Gain per subscriber (run-rate)		\$0.02	\$0.02	\$0.02	\$0.02	
Interstate percentage of wireless revenue	30%					
USF assessment rate	10%					

* Figure excludes wireless revenues that are not related to minutes of use