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*Addendum to*  
**“Estimating the Costs Associated with a Change in Local Number Portability Administration”**

In March 2013, I estimated the impact for both carriers and consumers of changing the number-portability administrator based on the size of the Number Portability Administration Center (NPAC) telephone number database and the number of NPAC transactions processed during 2011.<sup>1</sup> Although other studies have sought to estimate transition-related costs to carriers, I am not aware of any other attempt to model the consumer impacts of a number portability change. Due to the length of time that has passed since the analysis was completed, I have been asked by Neustar to revise my estimates to reflect the significant increases that have occurred in the NPAC database and its level of usage by carriers since 2011. By December 2014, the number of relevant NPAC records and transactions increased by 28% and 79%, respectively. The revised model predicts that approximately 12 million customers could be adversely affected by the transition, an increase of 68% relative to my original estimate of slightly over 7 million customers based on 2011 data.

To understand how a change in the database affects my estimate, I briefly review how my model generates customer-impacting errors. The bulk of the transition-related effects in the

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1. Hal Singer, “Estimating the Costs Associated with a Change in Local Number Portability Administration,” March 2013, available at <http://www.ei.com/downloadables/SingerCarrierTransition.pdf>.

model are attributable to two factors: (1) the database transition itself, which is vulnerable to misinterpretation of database fields and structure; and (2) early-stage operations errors, due to inexperience with porting requests, particularly mass updates. My model conservatively assumes low error rates and that all early stage errors are resolved after the first year. Database transition errors were assumed to occur at a rate of 0.25%,<sup>2</sup> and only 19%<sup>3</sup> of those errors were assumed to impact a customer's service. Relative to an existing administrator, early-stage operations errors were assumed to occur at a rate of 0.81%<sup>4</sup> for transactions in the first year of the transition, and 63%<sup>5</sup> of those errors were assumed to impact a customer's service.

Relying on the size and characteristics of the 2011 NPAC database, these assumptions led to 7.14 million impacted customers. Most (72%) would experience problems with service features, and many (21%) would not receive phone calls. A smaller portion (7%) would experience difficulties in porting their numbers. These customer harms do not reflect any estimated increase in operating costs for the carriers attributable to the transition, some of which might be passed onto consumers in the form of higher prices.

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2. This estimate was based in part on studies for other database migration projects, including by University of Michigan (finding a 99.4% accuracy rate in the migration to Google email and calendar) and Borselaer.org (finding a 99.2% accuracy rate in the migration to a new version of a financial application). It was also vetted with systems experts inside and outside of Neustar, including Gerry Keith, a former operations expert at SBC. For a qualitative description of errors relating to telephony database migrations, see Alcatel-Lucent, Solving the NGN Data Migration Challenge (2007), available at [www.webtorials.com/main/resource/papers/lucent/paper82/NGNDataValidation.pdf](http://www.webtorials.com/main/resource/papers/lucent/paper82/NGNDataValidation.pdf).

3. Many fields in the NPAC are informational only (e.g., for carrier record keeping), and thus cannot adversely affect customers. Errors made during database migration will likely take more than one year to fully propagate to carriers because the records are not rebroadcast to carriers until a field needs to be changed; errors that are broadcast beyond the first year of the transition are not considered.

4. This estimate was developed in conjunction with systems experts inside of Neustar. It is a combined rate for the 4,000+ mass migration and change projects Neustar performs each year. The error rates vary by transaction type, from a low of 0.25% for SV disconnects to 1.5% for SV billable modifications. Despite the claims of Telcordia's expert to the contrary, I understand that execution of these operations *without error* is operationally infeasible for a new administrator.

5. Relative to the database transition, the percentage of transaction-related errors that impact a customer is much higher because the carriers are attempting to change fields that often affect a customer's routing or other service features; those changes are being immediately propagated to all the carriers. For the non-impacting errors, these changes are for internal carrier use (e.g., for inventory management).

Table 1 summarizes the consumer and carrier impacts using both the 2011 and 2014 NPAC data.

TABLE 1: ESTIMATE OF CONSUMER IMPACT

	2011 NPAC (millions)	2014 NPAC (millions)	Percent Increase
<b>Impacted customers</b>			
- Database transition	1.46	1.86	27%
- Early-stage operations and system unavailability	5.68	10.16	79%
<b>Total</b>	<b>7.14</b>	<b>12.02</b>	<b>68%</b>
<b>Carrier Transition Costs</b>			
- Database transition	\$182.8	\$233.8	28%
- Early-stage operations and system unavailability	\$465.1	\$831.3	79%
- Testing	\$71.0	\$71.0	No change
<b>Total</b>	<b>\$719.0</b>	<b>\$1,136.1</b>	<b>58%</b>

Assuming the *same* error rates as before, and assuming the *same* percentage of those errors adversely affect a customer, the updated model using 2014 data generates 12.02 million impacted customers, which represents a 68% increase relative to my original estimate of 7.14 million. Once again, these customer harms do not reflect any of the (updated) \$1.136 billion increase in operating costs for the carriers, some of which might be passed onto consumers in the form of higher prices.

Finally, my original estimate presumed that the new administrator would implement a copy of Neustar’s code. In the fall of 2014, Telcordia announced that it was committed to using its own version of the code, built entirely from scratch.<sup>6</sup> Whereas my original paper was concerned with estimating how modest error rates could affect customers and carriers in the face

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6. See, e.g. Telcordia Letter to Ms. Marlene Dortch, Oct. 27, 2014, at 4 (“Telcordia has never proposed to reuse code from foreign operations and has always planned to write its code from scratch.”).

of a fairly smooth transition, Telcordia's announcement substantially increases the much more serious risk of partial or complete project failure. The pronounced change in this risk would not only materially raise the expected costs to both customers and carriers, but it would do so in a way that is not easily calculable. Indeed, Telcordia's own expert acknowledged that new code leads to higher risk and error rates.<sup>7</sup> By not revising my estimate further in light of this new risk factor, my revision should be interpreted as a lower bound on the number of impacted customers based on a more favorable set of initial assumptions.

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7. Eric Burger, Issues and Analysis of a Provider Transition/or the NPAC, S2ERC TECHNICAL REPORT (July 22, 2014), at 14 ("In the case of the NPAC, the database schema and data model remains constant. That is, there are no conversion errors because there is no conversion.").