

Before the
Federal Communications Commission
Washington, D.C.20554

In the Matter of
Connect America Fund
High-Cost Universal Service Support
WC Docket No. 10-90
WC Docket No. 05-337

REPORT AND ORDER

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By the Deputy Chief, Wireline Competition Bureau:

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## I. INTRODUCTION

1. In the *USF/ICC Transformation Order*, the Commission comprehensively reformed and modernized the universal service and intercarrier compensation systems to maintain voice service and extend broadband-capable infrastructure.<sup>1</sup> As part of the reform, the Commission adopted a framework for providing support to areas served by price cap carriers known as Phase II of the Connect America Fund. An estimated eighty-five percent of the approximately 6.3 million locations in the nation that lack access today to terrestrial fixed broadband at or above the Commission's broadband speed benchmark live in areas served by price cap carriers.<sup>2</sup> The Connect America Fund will maintain voice service and expand broadband availability to millions of unserved Americans living in these areas within the next five years, and aims to close this gap entirely within a decade. Through Phase II, the Commission introduced targeted, efficient support for broadband-capable networks in these unserved rural areas as part of its efforts to close the rural-rural divide and direct funding to parts of rural America where it is most needed. Specifically, the Commission will provide support through "a combination of competitive bidding and a new forward-looking model of the cost of constructing modern multi-purpose networks."<sup>3</sup> Using the cost model to "estimate the support necessary to serve areas where costs are above a specified benchmark, but below a second 'extremely high-cost' benchmark," the Commission will offer each price cap local exchange carrier (LEC) "a model-derived support amount [for a period of five years] in exchange for a commitment to serve all locations in its service territory in a state that, based on the model, fall within the high-cost range and are not served by an competing, unsubsidized provider."<sup>4</sup>

2. The Commission delegated to the Wireline Competition Bureau (Bureau) "the task of selecting a specific engineering cost model and associated inputs that meet the criteria specified" by the Commission.<sup>5</sup> Consistent with the approach taken by the Commission when it implemented a forward-looking model known as the High-Cost Proxy Model (HCPM) to determine support amounts for non-rural carriers in the wake of the implementation of the Telecommunications Act of 1996,<sup>6</sup> the Bureau's

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<sup>1</sup> See *Connect America Fund; A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing a Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform—Mobility Fund*; WC Docket Nos. 10-90, 07-135, 05-337, 03-109, CC Docket Nos. 01-92, 96-45, GN Docket No. 09-51, WT Docket No. 10-208, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC 17663 (2011) (*USF/ICC Transformation Order and/or FNPRM*); *pets. for review pending sub nom. In re: FCC 11-161*, No. 11-9900 (10th Cir. filed Dec. 8, 2011).

<sup>2</sup> This estimate is based on version 3.0 of the Connect America Cost Model (CAM or model), which incorporates June 2012 State Broadband Initiative (SBI) data reflected in the most recent National Broadband Map released by the National Telecommunications and Information Administration (NTIA). The 6.3 million is an estimate of the housing units and business locations in unserved census blocks, defined for purposes of this estimate as areas where no terrestrial fixed broadband provider offers a minimum speed of 3 Mbps downstream and 768 kbps upstream. This estimate of the number of unserved locations determined by CAM version 3.0 depends on a number of assumptions made in this version of the model (e.g., the treatment of partially served blocks and the speeds considered served); the Bureau has not determined which approaches will be used in the final implementation of Phase II. An explanation of the methodology and its underlying assumptions can be found on the model resources page at FAQ, p. 5 and systems update page at 3/20/2013, Version 3 Release Notes, <https://cacm.usac.org>.

<sup>3</sup> *USF/ICC Transformation Order*, 26 FCC Rcd at 17725, para. 156.

<sup>4</sup> *Id.* For all states for which price cap LECs decline to make the service commitment, the Commission will award ongoing support through a competitive bidding mechanism.

<sup>5</sup> *Id.* at 17725, para. 157; *see also id.* at 17737, para. 192.

<sup>6</sup> In the *Universal Service First Report and Order*, the Commission determined that high-cost universal service support should be based on forward-looking economic cost, but that rural carriers' high-cost support would not be based on forward-looking economic cost until further review. *See Federal-State Joint Board on Universal Service*,

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plan is to adopt a model to estimate forward-looking costs in two separate orders. In this first order, we primarily address the model platform, which is the basic framework for the model consisting of key assumptions about the design of the network and network engineering. We also address certain framework issues relating to inputs.

## II. BACKGROUND

3. In the *USF/ICC Transformation Order*, the Commission adopted reforms to “extend broadband to millions of unserved locations over a five-year period, including households, businesses, and community anchor institutions, while sustaining existing voice and broadband services.”<sup>7</sup> Recognizing that over eighty percent of the unserved locations in the nation were in price cap areas, the Commission provided for up to \$1.8 billion to be spent annually to make broadband available to as many unserved locations as possible within these areas, while sustaining voice and broadband in high-cost areas that would not be served absent support.<sup>8</sup>

4. The Commission concluded that a forward-looking cost model should be used to estimate the support necessary to serve areas where costs are above a specified benchmark, but below a second “extremely high-cost” benchmark.<sup>9</sup> Each price cap carrier will be offered a model-derived support amount in exchange for a commitment to serve all locations in its service territory in a state that, based on the model, fall within the high-cost range (above the specified cost benchmark but below the “extremely high-cost” benchmark) and are not served by a competing, unsubsidized provider.<sup>10</sup> In areas where the price cap carrier declines the state-level commitment, support will be determined through a competitive bidding mechanism.<sup>11</sup>

5. The Commission delegated to the Bureau the task of developing a specific engineering cost model and associated inputs, consistent with the parameters set forth in the *USF/ICC Transformation Order*.<sup>12</sup> Specifically, “the model should be of wireline technology and at a census block or smaller level.”<sup>13</sup> In addition, the Commission directed the Bureau to ensure that “the model design maximizes the number of locations that will receive robust, scalable broadband within the budgeted amounts.”<sup>14</sup>

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CC Docket No. 96-45, Report and Order, 12 FCC Rcd 8776, 8888-89, paras. 199, 203 (1997) (*Universal Service First Report and Order*) (history omitted). The Commission adopted the HCPM model platform, i.e., the model’s assumptions about the design of the network, network engineering, and fixed characteristics such as soil and terrain, in the *HCPM Platform Order*. See *Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, CC Docket Nos. 96-45, 97-160, Fifth Report and Order, 13 FCC Rcd 21323 (1998) (*HCPM Platform Order*). The Commission finalized the model platform and adopted model inputs used to estimate the forward-looking costs of a non-rural carrier’s operations in the *HCPM Inputs Order*. *Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs*, CC Docket Nos. 96-45, 97-160, Tenth Report and Order, 14 FCC Rcd 20156 (1999) (*HCPM Inputs Order*), *aff’d*, *Qwest Corp. v. FCC*, 258 F.3d 1191 (10th Cir. 2001).

<sup>7</sup> *USF/ICC Transformation Order*, 26 FCC Rcd at 17725, para. 156.

<sup>8</sup> See *id.* at 17725, para. 158.

<sup>9</sup> *Id.* at 17725, para. 156.

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> *Id.* at 17735, para. 187.

<sup>13</sup> *Id.*; see also *id.* at 17735-36, paras. 188-89.

<sup>14</sup> *Id.* at 17735, para. 187. Specifically, the model should direct funds to ensure availability of voice and 4 Mbps/1 Mbps broadband service to all supported locations, subject only to the waiver process for upstream speed, and should ensure that as many locations as possible receive a 6 Mbps/1.5 Mbps or faster service at the end of the five-year term, consistent with the Connect America Phase II budget. *Id.*

6. On December 15, 2011, the Bureau released a public notice inviting interested parties to submit proposed forward-looking cost models.<sup>15</sup> In response, in early February 2012, the ABC Coalition submitted a model that estimates the cost of providing service to the entire nation.<sup>16</sup> In February 2012, Alaska Communications Systems Group, Inc. (ACS) submitted a model with certain Alaska-specific cost variables.<sup>17</sup> Puerto Rico Telephone Company, Inc. (PRTC) subsequently submitted a standalone, Puerto Rico-specific cost model, in January 2013.<sup>18</sup>

7. On June 8, 2012, the Bureau released the *Model Design PN*, seeking comment generally on model design and data input issues and specifically on the models submitted in the record at that time.<sup>19</sup> The *Model Design PN* identified certain threshold model design decisions and sought comment on specific proposals for the design of the model and data inputs to be used. Subsequently, the Bureau convened an in-person workshop in September 2012 and commenced a “virtual workshop” in October 2012 to provide additional opportunities for all affected stakeholders and interested parties to provide input.<sup>20</sup> Over the course of more than six months, the virtual workshop has sought input on a variety of

<sup>15</sup> *Request for Connect America Fund Cost Models*, WC Docket Nos. 10-90, 05-337, Public Notice, 26 FCC Rcd 16836 (Wireline Comp. Bur. 2011). In addition to the parties that have made model submissions to date, Vitelco has stated that it plans to submit an alternative cost model for the Virgin Islands. See Letter from Russell M. Blau, Counsel for Virgin Islands Telephone Corp. (Vitelco), to Marlene H. Dortch, Secretary, FCC, at 2, Exh. A (filed Jan. 11, 2013) (providing preliminary description of proposed input requirements). This order does not prejudice the approach the model ultimately will take as to such areas outside the contiguous United States. See *infra* section III.A.5.

<sup>16</sup> Letter from Jonathan Banks, USTelecom, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, 05-337 (filed Feb. 13, 2012) (attaching, on behalf of the ABC Coalition, updated documentation of the CostQuest Associates Broadband Analysis Tool (CQBAT) model). This submission updated the ABC Coalition’s prior proposal for a forward-looking model, which had been submitted prior to the release of the *USF/ICC Transformation Order*. Letter from Robert W. Quinn, Jr., AT&T, Steve Davis, CenturyLink, Michael T. Skrivan, FairPoint, Kathleen Q. Abernathy, Frontier, Kathleen Grillo, Verizon, and Michael D. Rhoda, Windstream, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 10-90 et al. (filed July 29, 2011) (ABC Plan). The ABC Coalition model was submitted pursuant to a protective order adopted by the Bureau. See *Connect America Fund; High-Cost Universal Service Support*, WC Docket Nos. 10-90, 05-337, Second Supplemental Protective Order, 27 FCC Rcd 1503 (Wireline Comp. Bur. 2012).

<sup>17</sup> Letter from Karen Brinkmann, Counsel for ACS, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, 05-337 (filed Feb. 13, 2012) (ACS Feb. 13, 2012 ex parte) (submitting Alaska Communications Broadband Network Cost Study Model). This model was submitted pursuant to a protective order adopted by the Bureau. *Connect America Fund; High-Cost Universal Service Support*, WC Docket Nos. 10-90 and 05-337, Second Protective Order, 27 FCC Rcd 1494, 1494, para. 1 n.2 (Wireline Comp. Bur. 2012); see also Comments of Alaska Communications Systems Group, Inc., WC Docket Nos. 10-90, 05-337 (filed Feb. 1, 2012).

<sup>18</sup> See Letter from Thomas J. Navin, Counsel to PRTC, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, 05-337 (submitting “Broadband Cost Model: Puerto Rico (BCMPPR),” Attach. A (BCMPPR model documentation), Attach. B (CQBAT analysis comparing insular and non-insular results) (filed Jan. 18, 2013) (PRTC Jan. 18, 2013 ex parte); Letter from Thomas J. Navin, Counsel to PRTC, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, 05-337 (filed Jan. 18, 2013) (submitting PRTC model).

<sup>19</sup> *Wireline Competition Bureau Seeks Comment on Model Design and Data Inputs for Phase II of the Connect America Fund*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 6147 (Wireline Comp. Bur. 2012) (*Model Design PN*). After PRTC submitted its model, the Bureau sought comment on whether it should incorporate PRTC’s modifications into the working version of the model. See *Wireline Competition Bureau Seeks Comment on Connect America Phase II Support for Price Cap Areas Outside of the Contiguous United States*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 1030 (Wireline Comp. Bur. 2013) (*Phase II Non-Contiguous Areas PN*).

<sup>20</sup> *Wireline Competition Bureau Announces Connect America Phase II Cost Model Workshop*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 9882 (Wireline Comp. Bur. 2012); *Wireline Competition Bureau Announces Agenda for Connect America Phase II Cost Model Workshop*, WC Docket Nos. 10-90, 05-537, Public Notice, 27 FCC Rcd 10968 (Wireline Comp. Bur. 2012); *Wireline Competition Bureau Announces Connect America Phase II*

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topics related to the development and adoption of the model, including decisions that will ensure the model calculates forward-looking economic costs using reasonable economic and engineering assumptions.<sup>21</sup> Comments from the virtual workshop are part of the official public record of this proceeding.<sup>22</sup>

8. Over several months, the Bureau has released three working versions of a cost model that allows Commission staff and interested parties to calculate costs based on a series of inputs and assumptions for Connect America Phase II implementation, with each successive version containing refinements and improvements over the prior version. Each version of the CAM has two components: a cost-to-serve module and a support module. The cost-to-serve module contains the technical and engineering assumptions about network topology that, together with input data, produce an estimate of the monthly cost of providing voice and broadband. The cost-to-serve module considers both capital expenditures (in the capex sub-module) and operating expenses (in the opex sub-module). Each version of CAM contains several alternatives for network topology: a fiber to the premise (FTTP) architecture and a fiber to the digital subscriber line access multiplexer (DSLAM) architecture.<sup>23</sup> The support module takes the cost estimates of the cost-to-serve module and other information (such as the exclusion of certain areas because they are served by an unsubsidized competitor, and the upper and lower benchmarks that determine where support is provided) and calculates a support amount for each geography. Reports can be generated in a number of ways, including by company, by study area code, and by state.

9. On December 11, 2012, the Bureau announced the availability of version one of CAM.<sup>24</sup>

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*Cost Model Virtual Workshop*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 11056 (Wireline Comp. Bur. 2012).

<sup>21</sup> See *Wireline Competition Bureau Announces Commencement of Connect America Phase II Cost Model Virtual Workshop*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 11977 (Wireline Comp. Bur. 2012) (*Virtual Workshop Commencement PN*); *Wireline Competition Bureau Releases Additional Discussion Topics for Connect America Phase II Cost Model Virtual Workshop*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 13212 (Wireline Comp. Bur. 2012); *Wireline Competition Bureau Releases Further Discussion Topics for Connect America Cost Model Virtual Workshop*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 15795 (Wireline Comp. Bur. 2012); *Wireline Competition Bureau Seeks Additional Comment in Connect America Cost Model Virtual Workshop*, WC Docket Nos. 10-90, 05-337, Public Notice, 28 FCC Rcd 1007 (Wireline Comp. Bur. 2013); *Wireline Competition Bureau Seeks Updates and Corrections to Telcomaster Table for Connect America Cost Model*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 1151 (Wireline Comp. Bur. 2013); *Wireline Competition Bureau Releases Further Discussion Topics and Seeks Additional Comment in Connect America Cost Model Virtual Workshop*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 1447 (Wireline Comp. Bur. 2013); *Wireline Competition Bureau Adds New Discussion Topic to Connect America Cost Model Virtual Workshop*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 1961 (Wireline Comp. Bur. 2013).

<sup>22</sup> See Letter from Michael J. Jacobs, Legal Advisor to the Chief, Wireline Competition Bureau, to Marlene Dortch, Secretary, FCC (filed Feb. 6, 2013) (submitting into the record the attached “Connect America Cost Model Virtual Workshop Questions and Comments Posted as of February 1, 2013”) (WCB Feb. 6, 2013 Virtual Workshop Submission Letter); Letter from Jamie Susskind, Legal Advisor to the Chief, Wireline Competition Bureau, to Marlene Dortch, Secretary, FCC (filed Mar. 28, 2013) (submitting into the record comments posted by parties in the CAM virtual workshop from February 2, 2013 through March 25, 2013) (WCB Mar. 28, 2013 Virtual Workshop Submission Letter).

<sup>23</sup> For each network topology, the model takes into account actual central office location data (where available) and necessary plant, structure, and electronics to provide voice and broadband to all locations. The network is broken into two key components: loop and middle mile. The loop portion captures the routing of network facilities from the individual locations, both business and residential, up to a serving central office. The middle mile portion captures interoffice transport from the end office up to the point where traffic is passed to the Internet cloud.

<sup>24</sup> *Wireline Competition Bureau Announces Availability of Version One of the Connect America Fund Phase II Cost Model*, WC Docket Nos. 10-90, 05-337, Public Notice, 27 FCC Rcd 15356 (Wireline Comp. Bur. 2012). The Administrator of the Universal Service Fund, the Universal Service Administrative Company (USAC), procured the

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On January 17, 2013, the Bureau announced the availability of version two of CAM, which built upon version one in a number of key areas, specifically with regard to input data sets. For example, version two incorporated 2010 census boundaries, December 2011 National Broadband Map data, the latest available version of GeoResults wire center boundaries, and updated consumer location and business location counts compared to version one.<sup>25</sup> On March 11, 2013, the Bureau released version 3.0, which contained further updates to customer locations and existing broadband coverage.<sup>26</sup> Version 3.0 utilizes GeoResults third quarter 2012 data for residential and business locations, with adjustments to residential location counts to conform to 2011 Census data. Geocoded locations for both residences and businesses are used to the extent available, with locations lacking geocodes placed randomly along roads. Version 3.0 contains data as of June 2012 from the most recent National Broadband Map, enabling users to identify census blocks shown as unserved by wireline telecommunications, cable, and/or fixed wireless providers offering speed levels of 3 Mbps downstream and 768 kbps upstream.<sup>27</sup> As part of this ongoing, iterative public process, the Bureau expects to make additional adjustments prior to finalizing and adopting CAM for use in support calculations.

10. In this first order, we primarily address the model platform, which is the basic framework for the model consisting of key assumptions about the design of the network and network engineering. We also address certain framework issues relating to inputs. Subsequently, the Bureau expects to adopt a second order addressing input values for the model, for example, the monthly cost of network components such as fiber and electronics, plant mix, various capital cost parameters, and network operating expenses. Together, the two orders should resolve all of the technical and engineering assumptions necessary for the CAM to estimate the cost of providing service at the census block and state level. To determine the amount of support to be offered to specific price cap carriers, the Bureau will also need to address other issues, such as where to set the upper and lower benchmarks, the number of locations that will be required to offer broadband service at speeds of at least 6 Mbps downstream/1.5 Mbps upstream, and the treatment of carriers serving areas outside the contiguous United States. We may address these simultaneously with the second cost model order, or in one or more additional orders.

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services of a contractor to assist with the public availability, execution, and support of CAM, under policy direction from the Commission.

<sup>25</sup> *Wireline Competition Bureau Announces Availability of Version Two of the Connect America Fund Phase II Cost Model*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 280 (Wireline Comp. Bur. 2013). After the release of versions one and two, the Bureau sought comment in the virtual workshop on whether any modifications to functionalities, capabilities, or data sets should be addressed in or added to subsequent versions of the model. *See id.* at 281.

<sup>26</sup> *Wireline Competition Bureau Announces Availability of Version Three of the Connect America Fund Phase II Cost Model*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 2316 (Wireline Comp. Bur. 2013).

<sup>27</sup> This feature enables the user to designate areas that receive a speed of 3 Mbps downstream and 768 kbps upstream as a served census block, and areas that receive a speed less than 3 Mbps downstream and 768 kbps upstream as an unserved census block. The Bureau notes that this feature is intended only to allow parties to test the impact on support calculations of various assumptions about the existence of unsubsidized competitors meeting specified speeds, and does not signify a determination that these areas are or are not served by an unsubsidized competitor. The Bureau previously has sought public comment on various issues regarding how to determine which areas are served by an unsubsidized competitor, including specific metrics for latency, usage and price, which are not captured in the National Broadband Map. *See Wireline Competition Bureau Seeks Further Comment on Issues Regarding Service Obligations for Connect America Phase II and Determining Who is an Unsubsidized Competitor*, WC Docket No. 10-90, Public Notice, 28 FCC Rcd 1517 (Wireline Comp. Bur. 2013) (*Phase II Service Obligations PN*); *Wireline Competition Bureau Seeks Comment on Procedures Relating to Areas Eligible for Funding and Election to Make a Statewide Commitment in Phase II of the Connect America Fund*, WC Docket No. 10-90, Public Notice, 27 FCC Rcd 15970 (Wireline Comp. Bur. 2012) (*Phase II Challenge Process PN*).

### III. DISCUSSION

11. This order focuses on the platform components of the cost-to-serve module. As detailed below, and consistent with the approach previously taken by the Commission in adopting its prior forward-looking model for universal service support, we adopt a model platform that will allow the Bureau to estimate *the full average monthly cost of operating and maintaining an efficient, modern network*. Specifically, the model will begin by estimating all capital and operating expenses associated with a modern network. Those variously-timed expenditures will be converted to an average monthly cost, as described below. Because providers' support will be based on this average cost for five years, while many components of an actual network have much longer lives, using this average cost approach will not compensate providers for the full cost of a network within the five year Phase II timeframe. It will, however, estimate the cost of providing service in the way that best approximates the discipline of a competitive market.

12. The average costs will be based on an efficient modern network, rather than a less efficient legacy network supplemented with incremental upgrades over time. That is, consistent with the Commission's directive to adopt a "forward-looking" approach, we will model the costs as if all providers were able to claim the efficiency advantages of a modern green-field build, rather than attempt to model costs of upgrades and inefficiencies associated with maintaining and upgrading legacy networks piecemeal (a "brown-field" approach). Although some commenters have argued that a "brown-field" approach would result in lower modeled costs, we find that this is only because the various brown-field estimates in the record have each improperly excluded certain costs.

13. Following the assumption of a maximally efficient modern network, modeled costs will be based on an IP-based FTTP network of a wireline telecommunications provider, capable of providing both voice and broadband. Customer locations, both residential and business, will be placed in individual census blocks, and a network topology will be constructed to serve all of those locations. Consistent with the Commission's approach when it developed the HCPM in the 1990s, the model will calculate necessary interoffice transport (i.e., middle mile), which, in a modern network, would connect all central offices with internet gateways. The model will provide the capability to vary certain input values relating to the cost of construction based on physical geography within a given state. Costs will be calculated on a census block level.

14. Although a large number of important decisions regarding input values and other issues remain, preliminary estimates based on the current version of the CAM suggest that this better calibrated approach results in more reliable cost estimates of an efficient provider. Using the platform decisions adopted in this Report and Order, we estimate that per-location costs for the highest cost areas (those potentially available for Phase II funding) are roughly 20-25 percent lower in the current version of the CAM than in the cost model submitted by the ABC Coalition prior to the Commission's adoption of the *USF/ICC Transformation Order*.<sup>28</sup> The work done to date thus has modified aspects of the CQBAT model that led to an overstatement of the costs of providing broadband-capable infrastructure in Phase II areas.

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<sup>28</sup> We emphasize that this is an estimate only, and it is difficult to make a like-for-like comparison because a number of data sets and assumptions are different between the two models. Comparing costs by percentile for CAM version 3.0 and CQBAT, the costs for the 90<sup>th</sup> and 95<sup>th</sup> percentile are 23 percent and 26 percent lower, respectively, than they were in CQBAT. Comparing support levels between CQBAT and CAM is complicated by the disproportionate impact of the most expensive locations and the choice of benchmark and extremely high-cost threshold. To compare the two models, the Bureau held the same proportion of locations above the "extremely high-cost" benchmark in version 3.0 of CAM as in the ABC coalition's proposal, utilized the default input assumptions in version 3.0 of CAM, and utilized the same \$2.2 billion budget as in the ABC Coalition's proposal (recognizing that the Commission adopted a lower budget in the *USF/ICC Transformation Order*). Because the Bureau is still seeking comment on input values, final cost and support estimates will likely differ from the figures presented here.

## A. Threshold Model Design/Platform Issues

### 1. General Approach to Cost Estimation

15. Consistent with Commission precedent, the model platform that we adopt today will calculate a levelized cost that represents an estimate of the average monthly forward-looking cost of an efficient provider.<sup>29</sup> Those costs include both capital and operating expenses.<sup>30</sup> Recovery for each asset class, for example, poles, conduit, etc., will be spread out evenly over the useful life of the asset class according to empirical estimates of the rate at which elements of the asset class are retired. Costs will be levelized to produce a constant monthly cost throughout the life of each asset, which in many cases may exceed 20 years or more. Because a significant driver of network costs are assets with an accounting lifetime of 20 years or more, such as loop plant, the levelized cost calculated by the model will provide recovery for only a portion of the cost of the network over the five-year term of Phase II. In other words, as discussed more fully below,<sup>31</sup> the model platform will calculate costs assuming that the supported network will retain significant value at the end of the five-year term of Phase II support.

### 2. Network Design

16. In the *USF/ICC Transformation Order*, the Commission delegated to the Bureau the authority to select the specific engineering cost model, including the modeled network architecture.<sup>32</sup> The Commission indicated that the Bureau's "ultimate choice of a greenfield or brownfield model, the modeled architecture, and the costs and inputs of that model should ensure that the public interest obligations are achieved as cost-effectively as possible."<sup>33</sup>

17. In the *Model Design PN*, the Bureau sought comment on, among other things, the choice of a green-field or brown-field model; whether the model should estimate the costs of FTTP or Digital Subscriber Line (DSL) (including Fiber-to-the-Node (FTTN)) technology; and what terminal value to assign to the modeled network (e.g., book value or zero value).<sup>34</sup> The Bureau also sought comment on whether the model should estimate the total costs of serving the entire service area so that shared costs may be distributed between areas that are eligible and ineligible for support, or estimate only the standalone costs of areas eligible for support; how shared network costs should be distributed to the census-block (or smaller) area; and whether the model should calculate support for areas to which broadband has already been deployed or only for unserved areas.<sup>35</sup>

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<sup>29</sup> Cost models typically determine costs as a levelized figure, taking into account the costs of network investment and operations over time, starting from the present, and expressing them as a constant monthly amount. The resulting levelized cost can be thought of as the minimum monthly revenue stream necessary to ensure an efficient provider would enter the market and provide the specified services. See *Universal Service First Report and Order*, 12 FCC Rcd at 8899, para. 224.

<sup>30</sup> Capital costs include depreciation, the cost of money, and income taxes associated with various plant categories. Capital investment costs are converted into monthly costs through an Annual Charge Factor (ACF). Operating expenses include network operation expenses (both plant-specific, i.e., outside plant by cable type, poles, conduit, and circuit/transport, and non-plant-specific), general and administrative expenses, customer selling and marketing expenses, and bad debt expense.

<sup>31</sup> See *infra* paras. 34-36.

<sup>32</sup> See *USF/ICC Transformation Order*, 26 FCC Rcd at 17735, 17737, paras. 187, 192.

<sup>33</sup> *Id.* at 17735, para. 187.

<sup>34</sup> See *Model Design PN*, 27 FCC Rcd at 6150-59, paras. 12-39. The Bureau solicited public input on two alternative approaches: green-field FTTP paired with book value, or brown-field DSL paired with zero value; it also sought comment on the ABC Coalition's proposal to use a green-field DSL model.

<sup>35</sup> In the *USF/ICC Transformation Order*, the Commission limited support pursuant to Connect America Fund Phase II to areas not served by unsubsidized competitors. *USF/ICC Transformation Order*, 26 FCC Rcd at 17729, para.

(continued...)

18. As discussed below, we conclude that the Connect America Cost Model will be a green-field FTTP model with the terminal value of the network at the end of the five-year term determined by the book value of the assets. As explained in the *Model Design PN*, the issues of network technology (e.g., FTTP or DSL), design (green-field or brown-field) and terminal value (e.g., book value or zero value) are interrelated.<sup>36</sup> We conclude that using a green-field FTTP model paired with book value is the best choice for estimating the most efficient forward-looking cost of providing service over a voice and broadband-capable wireline network in price cap areas.

**a. Green-field vs. Brown-field**

19. We find that using a green-field model is more appropriate than using a brown-field model, for three principle reasons.<sup>37</sup> First, a green-field model is consistent with Commission precedent, including the *USF/ICC Transformation Order*. Second, a green-field model provides an estimate of costs that creates appropriate incentives to invest—that is, it best approximates the discipline provided by a competitive market. And finally, a green-field model can be implemented in a straightforward and timely manner. Contrary to some commenters’ assertions, we conclude that a green-field model does not over-compensate providers. Indeed, a levelized green-field approach is likely to result in no more support than a properly calculated levelized brown-field approach because it approximates the average long-run cost of an efficient modern network optimized for voice and broadband, rather than the average long-run cost of a less efficient legacy voice network plus broadband upgrades.<sup>38</sup>

20. First, a green-field approach is consistent with Commission’s determination in the *USF/ICC Transformation Order* in that it would use a *forward-looking* cost model to identify price cap  
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170. The model may calculate support for areas to which an incumbent carrier had deployed broadband because, for example, the carrier had received legacy forms of high-cost universal service.

<sup>36</sup> See *Model Design PN*, 27 FCC Rcd at 6150-51, para. 12.

<sup>37</sup> Using a green-field model is not inconsistent with the Commission’s rationale for offering price cap carriers a model-derived support amount in exchange for a commitment to serve all supported locations in a service territory in a state. See *USF/ICC Transformation Order*, 26 FCC Rcd at 17729-32, paras. 171-78. First, as noted in the following discussion, the average monthly costs derived from a green-field model over a five year period do not approach the full costs of constructing an all-new network; instead, it approximates the *average* cost of providing service over time, consistent with the costs of a provider that provides ongoing service. Second, as noted below, the model platform that the Bureau adopts herein assumes the existence of a network throughout the entire service territory, with costs allocated to both rural and urban areas. We do not believe that such an assumption would be reasonable for non-incumbent LECs given that those competitors lack ubiquitous footprints today. Finally, as noted below, this approach is consistent with Commission precedent in adopting a forward-looking, efficient green-field model, HCPM, to calculate the cost of a voice network even though a nearly ubiquitous legacy voice network, already existed when that model was put in place; forward-looking support recipients used that support to subsidize the cost of existing facilities, including those using less efficient, older technologies.

<sup>38</sup> We note some confusion over the meaning of the term “brown-field approach.” Some parties use brown-field to mean the cost of augmenting or upgrading a network, with a focus on the actual cash costs likely to be incurred over a specified period of time; this was the approach taken in the National Broadband Plan, which used a model to calculate the incremental cost of upgrading copper networks to offer DSL. The Commission recognized when it initiated this proceeding, shortly after publication of the National Broadband Plan, that this approach might be inappropriate for a model to determine universal support levels. See *Connect America Fund et al.*, WC Docket 10-90 et al., Notice of Inquiry and Notice of Proposed Rulemaking, 25 FCC Rcd 6657, 6671, para. 33 (2010) (*Connect America Fund NOI/NPRM*). When the Bureau sought comment on a brown-field DSL model in the *Model Design PN*, it stated that “the brown-field approach ignores sunk costs associated with existing plant (part of total cost of building, operating and maintaining in a given area), and so arguably will not provide sufficient funds to meet universal service goals over the long run.” *Model Design PN*, 27 FCC Rcd at 6158, para. 35. As discussed below, we now conclude that a properly conceived brown-field approach would not ignore the costs of existing plant. See *infra* paras. 30-31. In the remainder of this Report and Order, we instead use the term “brown-field” to mean a calculation that includes all the costs necessary to deliver service, not just those incurred as part of an upgrade.

areas eligible for Connect America Phase II support, as well as other Commission precedent.<sup>39</sup> A green-field approach is forward-looking because it estimates the cost of the ongoing provision of specific services by developing a hypothetical efficient, modern network to calculate the minimum cost of providing such services now and in the future, given current technology and input costs. It does not take into account historic costs or whether the carrier historically recovered its earlier investments in the existing network, other than what is provided through the monthly leveled cost stream going forward.

21. A green-field model is consistent with the approach taken by the Commission in developing and adopting its previous voice cost model, the HCPM. Even though legacy voice networks existed throughout the nation at that time, often including less-efficient older technologies or inefficient network routing, the Commission concluded that the appropriate way to determine support was to estimate the cost of an efficient modern network to provide voice service, assuming only the existence of incumbent central offices and current wire centers (referred to as the “scorched node” approach).<sup>40</sup> Consistent with this longstanding precedent, the green-field approach we adopt will calculate (1) the minimum, leveled cost of a voice and broadband-capable network today, using current, rather than historic, technologies and prices, and (2) the minimum costs of continued provision of voice and broadband services on that network, including the costs of maintaining the network’s capabilities in each year going forward.<sup>41</sup>

22. Second, consistent with longstanding Commission precedent, we adopt a green-field approach because it estimates costs in a manner that provides appropriate forward-looking incentives to invest.<sup>42</sup> A forward-looking approach to cost modeling does not ask whether or to what extent carriers’ have recovered their costs from past investments. Instead, a forward-looking model calculates costs at a level expected to recover all network costs over the long term, accounting for investment risk and anticipated demand, comparable to a market with sustainable competition. In such a regulatory environment, recipients of support should receive appropriate forward-looking compensation for risks that are intended to mimic the risks that competitive firms face in markets where subsidies are not provided.<sup>43</sup>

23. We are not persuaded by the argument that using a green-field model for Connect America Phase II will over-compensate the price cap carriers over a five-year period because the actual

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<sup>39</sup> The Commission concluded in the *Universal Service First Report and Order* that support in high-cost areas should be based on forward-looking economic costs, not embedded costs. See *Universal Service First Report and Order*, 12 FCC Rcd at 8899, para. 224 (explaining that “the proper measure of cost for determining the level of universal service support is the forward-looking economic cost of constructing and operating the network facilities and functions used to provide the supported services”). See also *id.* at 8901, para. 228; *NASUCA Model Design PN Comments* at 3 (“Since the Commission’s goal is for a model to be truly forward-looking, the model should assume a network design that follows a ‘green-field’ approach”).

<sup>40</sup> See *Universal Service First Report and Order*, 12 FCC Rcd at 8912-13, para. 250. When the Commission adopted criteria to guide the development of HCPM, it required that “[o]nly long-run forward-looking economic cost may be included. The long-run period used must be a period long enough that all costs may be treated as variable and avoidable.” *Id.*

<sup>41</sup> Because costs incurred at different points in time are discounted back to the present, costs incurred many years in the future have little impact on the cost estimate relative to the errors inherent in cost estimation. Consequently, in practice, cost models only look forward a limited number of years. The current version of CAM, version 3.0, stops estimating future costs after sixty years.

<sup>42</sup> *Universal Service First Report and Order*, 12 FCC Rcd at 8899, para. 224 (the use of forward-looking economic costs “will send the correct signals for entry, investment, and innovation”).

<sup>43</sup> The possibility that, for example, a price cap carrier may decide to deploy fiber only to the node does not mean it is being overpaid. The copper loop of such carriers will have to be replaced at some future date, and the green-field model provides a monthly cost stream consistent with what would lead them to replace that copper loop when that becomes necessary.

replacement costs incurred over the next five years may in some instances be less than the green-field levelized cost.<sup>44</sup> The Commission previously has concluded that forward-looking economic costs – not actual costs – are the proper framework for determining universal service support, and the Commission specifically directed the Bureau to use a forward-looking approach in the *USF/ICC Transformation Order*.<sup>45</sup> Moreover, whether an individual price cap carrier would actually spend more or less than model-determined support over the course of the five-year term will depend on where the individual price cap carriers that make a state-level commitment are in their respective investment cycles. Carriers have made and must continue to make investments that last substantially longer than five years, incurring costs that do not, year-by-year, match their revenues (even for the case of commercially-viable investments).<sup>46</sup> Those carriers that must undertake a relatively high level of asset replacement may therefore face higher costs than the modeled costs. Others will face lower costs. Allowing monthly recovery of the model's levelized cost means, on average, all carriers will earn an amount that would allow them to maintain the specified levels of service going forward over the longer term.

24. Indeed, a green-field model may calculate costs lower than actual costs because it may overstate the degree to which carriers are able, in practice, to optimize their network.<sup>47</sup> Carriers do not have the luxury of building their networks from the ground up to meet today's demand. Rather, they augment their networks piecemeal, with each upgrade subject to past investment decisions that may not always have been based on accurate forecasts of demand and technology developments. Consistent with Commission precedent in adopting a green-field model to estimate the forward-looking cost of voice service, we find that, on balance, the green-field approach should provide a reasonable overall approximation of costs for Phase II implementation.

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<sup>44</sup> See, e.g., Letter from Thomas Cohen, Counsel for ACA, to Marlene Dortch, Secretary, FCC (dated Oct. 23, 2012) (ACA Oct. 23, 2012 ex parte); Letter from Thomas Cohen, Counsel for ACA, to Marlene Dortch, Secretary, FCC (dated Oct. 26, 2012) (ACA Oct. 26, 2012 ex parte); Letter from Thomas Cohen, Counsel for ACA, to Marlene Dortch, Secretary, FCC at 1 (dated Apr. 9, 2013) (ACA Apr. 9, 2013 ex parte).

<sup>45</sup> *Universal Service First Report and Order*, 12 FCC Rcd at 8899, para. 224; *USF/ICC Transformation Order*, 26 FCC Rcd at 17734, para. 184.

<sup>46</sup> As is conventional in cost modeling, the model platform we adopt does not assume that the capital recovery for an investment (or asset class) takes place when the required capital is actually deployed, nor is such recovery assumed to take place all at once when the asset is retired and removed from the books. Instead, the model calculates capital recovery over the lifetime of the assets: 100% of recovery for assets that retire in the first year; 50% recovery each year for assets that retire in the second year; 33% recovery for each year for assets that retire in the third year, and so on. While, for a given initial investment, there will be more capital recovery in early years than in later years, even in the early years, recovery will be substantially lower than the initial investment. In particular, because the ACFs will be set to provide a return over the long term, the depreciation component of the ACFs will be significantly lower than the capital recovery in the years immediately following an investment.

We are not persuaded by ACA's argument that the model overstates the ACFs because it uses "accelerated depreciation." See Letter from Thomas Cohen, Counsel for ACA, to Marlene Dortch, Secretary, FCC, Attach. 1 at 3 (dated Mar. 7, 2013) (ACA Mar. 7, 2013 ex parte). The general approach that we adopt today is identical to that taken by the Commission in the HCPM. In particular, the model platform will take account of the accelerated depreciation schedules used for tax purposes to calculate the effective tax burden net of the benefit of deferring taxes for assets whose economic (functional) lives are longer than their tax lives, while using a straight-line, equal-life-group method for depreciation. See *HCPM Inputs Order*, 14 FCC Rcd at 20343, para. 424 & n.1329; *infra* paras. 34-35.

<sup>47</sup> The model platform's "scorched node" approach, which assumes existing central office and tandem locations and wire center boundaries, does not completely optimize network design. The Commission required this approach when it originally set forth criteria for models used to calculate the forward-looking cost of providing universal service, and we see no reason to depart from that precedent today. See *Universal Service First Report and Order*, 12 FCC Rcd at 8913, para. 250. In the *HCPM Platform Order*, the Commission explained that this approach "imposed some uniformity in the models' network design." *HCPM Platform Order*, 13 FCC Rcd at 21333, para. 21.

25. Third, a forward-looking green-field approach can be implemented in a straightforward and timely manner, allowing the fastest possible deployment of new broadband in price cap territories. Each version of the CAM released to date contains the capability to estimate the costs of a green-field FTTP network. Moreover, the ABC Coalition previously submitted into the record of this proceeding more than a year ago a green-field model. As a result, the public and Bureau staff have had ample opportunity to analyze the attributes and the usefulness of a green-field model for implementing the Commission's universal service policies. These submissions build on a substantial history of use of green-field models in a variety of regulatory contexts.<sup>48</sup> In contrast, as discussed in more detail below, we are not satisfied that any version of the CAM has yet provided a reasonable way of estimating brown-field costs. We therefore conclude that adopting a green-field model platform now, so that parties can focus their attention on input values, will facilitate the timely conclusion of the Phase II cost model development process, and thereby accelerate the deployment of broadband-capable networks to unserved Americans.

26. In contrast to a green-field approach, there are significant drawbacks to a brown-field approach. First, notwithstanding arguments to the contrary,<sup>49</sup> a brown-field approach is not entirely forward-looking. It represents a hybrid approach that falls between a true forward-looking approach, which a green-field model approximates, and a historic cost approach. A brown-field approach assumes existing infrastructure as of a point in time and adds the ongoing costs of this infrastructure to the cost of additional network upgrades necessary to provide a desired set of services in the future.<sup>50</sup> As an example, existing fiber transport, and/or the last few thousand feet of copper terminating at an end-user location, could potentially be used to supply voice and broadband service. For these portions of the network, a brown-field approach would estimate costs based on the existing network facilities, rather than on a modern, efficient network.

27. Second, there would be serious practical hurdles to overcome before we could implement such an approach. The Bureau considered two possible ways to implement a brown-field approach: one that identifies those assets actually in place, and then considers the incremental cost of making that existing network broadband-capable, and another that produces a hypothetical model of a voice-only network, and then considers the incremental cost of adding broadband capability to that network. Both approaches raise significant practical difficulties.

28. The first approach to brown-field modeling has significant backward-looking elements not present in a green-field approach and is substantially more complicated than a green-field approach. In particular, this brown-field approach would require identification of the specific existing network assets that are assumed to be retained. Thus, we would need to develop a model that accurately represents the existing network infrastructure and determine what parts of the existing network can be used; we then would estimate the cost of any incremental upgrades required to meet the Commission's service obligations going forward, including the costs that would be necessary going forward to maintain the entire network's capabilities. In contrast to a green-field approach, this brown-field approach would require a substantial backward-looking exercise in which those components of the network that already exist must be identified and located, and characterized in terms of their age and capabilities going forward

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<sup>48</sup> See, e.g., ABC Coalition *Model Design PN* Comments at 22 ("In contrast to the myriad practical challenges to estimating an accurate brown-field model, the green-field methodology is tested and proven, having been used by the Commission and by state PUCs for many years. The HCPM model has been successfully used by the Commission for over a decade, and CostQuest models have been adopted in multiple carrier-to-carrier proceedings and negotiations and were used to support the National Broadband Plan.").

<sup>49</sup> ACA Oct. 23, 2012 ex parte at 2 (asserting that a brown-field methodology meets the Commission's "requirement that subsidies be based on a forward looking cost model").

<sup>50</sup> As discussed below, a brown-field model also must include the cost of replacing assets necessary to provide service. See *infra* para. 31.

(e.g., gauge of copper wire, etc.).<sup>51</sup> Additionally, this brown-field approach would model the forward-looking costs of augmenting the existing network to make it broadband-capable. In comparison to a green-field approach, such an exercise would likely require far more data, because existing network investments would need to be catalogued, and it would present a more complex cost optimization, because the optimal network would be designed to account for the elements of the existing network that would be efficient to keep. This would be particularly complex, requiring the Bureau to make decisions about what assets should be retained, and what should be replaced.<sup>52</sup>

29. The second approach to brown-field modeling would be to estimate the green-field cost of the existing network and then estimate the incremental cost of making that network fully broadband-capable.<sup>53</sup> This approach avoids the difficulties of cataloging existing network infrastructure, and of having to optimize taking historical investment decisions into account, but has the peculiarity of using a hypothetical optimized green-field cost model to estimate the cost of an existing network. While such an approach would limit the amount of data that would be required and would avoid some of the backward looking nature of the first approach, it only obliquely meets the ostensible objective of a brown-field approach, which is to assume that all existing infrastructure will be retained, with upgrades to make that network fully broadband-capable. In addition, taking this approach still would require the Bureau to make a substantial number of assumptions about the age and quality of existing assets and therefore significantly broaden the reasonable range of outcomes, compared to a green-field model. The Bureau first would have to determine which hypothetical assets are assumed to exist as the starting point, and then model the investments required to make that network capable of supplying broadband. In contrast, the green-field approach requires only modeling a current generation, modern network.

30. We are not persuaded by ACA's argument that a brown-field approach would result in cost estimates substantially lower than a green-field model, and therefore expand the number of unserved homes that could receive broadband given the fixed budget for Phase II.<sup>54</sup> ACA's attempts to estimate brown-field costs exclude some costs that should be included in a proper brown-field model. In response to the *Model Design PN*, ACA argues that "the CQBAT model [submitted by the ABC Coalition] includes functionality to allow for the modeling of a brownfield DSL build-out."<sup>55</sup> In fact, that function in CQBAT simply eliminated all capital expenditures for certain network elements, such as copper loops. ACA acknowledged that CQBAT did not adequately account for the operating expenses associated with the copper portion of the loop, copper replacement in cases where plant needs to be replaced, and loop conditioning costs on a granular level, but argued that adding these functionalities to the model should not

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<sup>51</sup> See ABC Coalition *Model Design PN* Comments at 19-21; Comments of the United States Telecom Association et al., WC Docket Nos. 10-90, 05-337, at 12-15 (filed Jan. 11, 2013) (ABC Coalition Jan. 11, 2013 Comments).

<sup>52</sup> For example, assume that a small group of households on the northeast side of a lake was efficiently served by one feeder line that runs north and east around the lake, and years later, a new development on the south and east of the lake was built, served by different feeder plant. If the network were to be built from scratch, the efficient means of reaching all these customers would be a single feeder that can serve both groups of homes. In this context, a brown-field model would have to determine whether it is more efficient, taking a long view, to extend fiber toward end-user premises on both lines, or abandon both lines in favor of constructing a new single line to serve both groups of homes. This is particularly difficult because the most efficient choice may not be the choice with the least one-time cost. Instead, the optimal upgrade path must take account of the option value of not committing to fiber all the way to the premise. A myriad of such judgment calls must be made in brown-field modeling of this type.

<sup>53</sup> This is the approach advocated by ACA. See ACA Oct. 23, 2012 ex parte.

<sup>54</sup> ACA Oct. 26, 2012 ex parte at 2.

<sup>55</sup> ACA *Model Design PN* Comments at 12.

be difficult.<sup>56</sup> Subsequently, in October 2012, ACA filed additional estimates of brown-field costs based on CQBAT runs under various scenarios, each of which excluded certain capital costs, such as copper loops, necessary for providing ongoing service from the calculations, and we find it would be appropriate to take these costs into account in a brown-field model.<sup>57</sup> Therefore, we are not persuaded that the calculations provided by ACA appropriately reflect the cost estimates of a brown-field approach, and conclude that ACA does not provide a reliable estimate of the number of homes that would become served by broadband in Phase II.

31. While CAM version 3.0 contains a feature that attempts to approximate brown-field costs, we still do not believe this approach fully corrects the issues associated with the CQBAT model's brown-field approach. This "brown-field adjustment" was intended to capture the replacement cost of existing plant as those assets are retired, but not to capture the cost of existing plant that is continued to be used to provide the existing services. That is, the calculation captures the cost of providing service when an asset is retired, but not of providing service until that point. We therefore conclude that additional costs would have to be added to this brown-field adjustment to properly take into account the existing assets necessary to provide and maintain voice and broadband services on an ongoing basis. In fact, we now are convinced that if all these costs are properly accounted for, brown-field modeling should provide cost estimates no lower than, or potentially higher than, a green-field approach.<sup>58</sup>

32. In sum, we find that a green-field cost approach is the preferable approach to calculate the cost of a forward-looking network. It is more consistent with the Commission's directive and prior precedent, and we conclude that there are no persuasive arguments that using a green-field approach would result in overpayments to the price cap carriers. In contrast, development of a suitable brown-field model would likely take a considerable amount of additional time and delay in implementation of Connect America Phase II, because it is a much more complex undertaking with little precedent to guide staff efforts.

#### **b. FTTP**

33. We also conclude the best approach to meet the Commission's directive that we adopt a forward-looking cost model is to estimate the costs of a FTTP network rather than a twisted copper pair DSL network.<sup>59</sup> As explained in the *Model Design PN*, a DSL network "is only forward looking from the

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<sup>56</sup> ACA *Model Design PN* Reply Comments at 14-15. A simple example demonstrates the problem with ACA's approach: paying only for home maintenance and repairs but not a mortgage would not capture the full cost of home ownership.

<sup>57</sup> ACA Oct. 23, 2012 ex parte. Specifically, for higher-cost housing units with no broadband service, ACA ran two scenarios; one excluded copper capital expenditures, but included maintenance costs, and the other excluded copper, pole and conduit capital expenditures, but included maintenance costs. For housing units with broadband provided by the existing incumbent LEC, ACA excluded all capital expenses and only provided support for maintenance. See *id.* at 11-12 nn.11-12. See also ACA Oct. 26, 2012 ex parte.

<sup>58</sup> We conclude that a brown-field approach that properly accounts for all costs should produce cost estimates no lower than a green-field approach. As noted above, the green-field cost represents the minimum monthly revenue stream necessary to make provision of required services economic. A brown-field approach similarly identifies the monthly revenue stream necessary to ensure that a company that owns the current network will augment and maintain that network to provide the specified services going forward. However, because the brown-field calculation relies on existing, non-optimized network costs, it is possible that a brown-field calculation will result in higher costs; for example, the cost of maintaining and upgrading a network that is routed inefficiently, would likely over the long term, exceed the cost of a newly deployed efficient network.

<sup>59</sup> See *USF/ICC Transformation Order*, 26 FCC Rcd at 17735, para. 187. The decision to model an IP-based network of a wireline telecommunications provider is consistent with the Commission's recognition that Phase II would be offering support to price cap carriers in areas where the incumbent is "likely to have the only wireline facilities" and is "likely to have at most the same, and sometimes lower, costs compared to a new entrant." *Id.* at 17730-31, para. 175. Although hybrid-fiber-coaxial cable (HFC) networks provide better performance than a

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perspective of decisions made a decade or more in the past,” and “has higher expected operating expenses and is more likely to require significant additional investment to make faster broadband offerings available.”<sup>60</sup> Although some price cap carriers may choose to extend broadband to unserved areas in the near term by shortening copper loops,<sup>61</sup> rather than deploying FTTP, the most efficient wireline technology being deployed today in new builds is FTTP.<sup>62</sup> Network construction costs are essentially the same whether a carrier is deploying copper or fiber, but fiber networks result in significant savings in outside plant operating costs over time.<sup>63</sup> If an efficient carrier were to design a new wireline network

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12,000-foot loop hybrid fiber-copper network, it would not be appropriate to model an HFC network for purposes of determining the support amounts to offer price cap carriers accepting the state-level commitment. The Commission determined that each price cap carrier would be offered a model-derived support amount in exchange for a commitment to serve all locations in its service territory in a state. *See id.* at 17725, para. 156. We are aware of only one price cap carrier, Vitelco, which serves only .037% of locations in price cap areas, that is deploying HFC technology, which typically is deployed by cable companies. In addition, because most of the cost is the cost of laying or hanging cable, whether it is fiber, twisted-pair copper or coaxial cable, we would not expect any substantial difference in cost between a green-field FTTP network and a green-field HFC network.

<sup>60</sup> *Model Design PN*, 27 FCC Rcd at 6159, para. 39. We disagree with the ABC Coalition’s claim that “there is nothing incongruous or conceptually incorrect about a green-field DSL model.” ABC Coalition *Model Design PN* Comments at 3. They argue that DSL is the appropriate technology choice to model, noting that price cap carriers currently providing broadband in rural areas have deployed DSL in the vast majority of cases. *Id.* at 7. They also point to the National Broadband Plan staff analysis finding that “the *incremental upfront* investment required to deploy FTTP would be significantly higher than the *incremental* cost of upgrading existing plant to FTTP.” *Id.* at 9. (emphasis added). In making this argument, the ABC Coalition thus focuses on the cash-cost savings of DSL deployments rather than the average cost over time. As discussed above, a modeling approach that considers the existing network and then estimates the incremental cost of upgrades is a brown-field modeling approach, not a green-field approach. *See supra* paras. 26-29.

<sup>61</sup> Adoption of a model platform that incorporates this network technology does not imply, and this Report and Order does not dictate, that carriers must necessarily extend fiber out to the premise. The requirements laid out in the *USF/ICC Transformation Order* focus on the services delivered, not the technology used. *See USF/ICC Transformation Order*, 26 FCC Rcd at 17696, para. 91. Similarly, when the Commission adopted the former forward-looking cost model in 1999, it did not expect non-rural carriers to build a new modern voice network.

<sup>62</sup> A number of price cap carriers deploy FTTP in green-field builds, particularly in new housing developments. *See, e.g.*, Letter from Jamie Susskind, Legal Advisor to the Chief, Wireline Competition Bureau, to Marlene Dortch, Secretary, FCC (filed Mar. 28, 2013) (submitting into the record Transcript from Technology Transitions Policy Task Force workshop on Mar. 18, 2013) (Technology Transitions Workshop Transcript), Attach. at 312-13 (comments of Michael Golob, Frontier Communications Corporation, stating that it is more cost-effective for Frontier to deploy fiber than copper to new areas). *See also* Press Release, AT&T Inc., The Preserve at Limestone Creek and AT&T Announce Complete FTTP Network (July 14, 2012), <http://www.att.com/gen/press-room?pid=23088&cdvn=news&newsarticleid=34895&mapcode=mk-connected-communities|U-verse>; Sean Buckley, *Consolidated Communications says it's not afraid of Google Fiber*, FIERCE TELECOM (Jan. 9, 2013), <http://www.fiercetelecom.com/story/consolidated-communications-says-its-not-afraid-google-fiber/2013-01-09>; Hawaiian Telcom Holdco, Inc., Annual Report (Form 10-K) at 10 (Mar. 14, 2013).

<sup>63</sup> For example, Verizon has been migrating certain customers experiencing repeated problems with their copper-based services to fiber, and estimates that the operational savings have more than offset the cost of migrating these customers (about 222,000 last year). *See* Technology Transitions Workshop Transcript at 290-92 (comments of Thomas Maguire, Verizon) (explaining Verizon’s initiatives to migrate customers experiencing repeated problems with its copper-based services to fiber); Letter from Maggie McCready, Verizon, to Marlene H. Dortch, FCC, GN Docket No. 13-5 (filed Feb. 22, 2013). *See also* Letter from Donna Epps, Verizon, to Marlene H. Dortch, FCC, GN Docket No. 09-51 at 2-3 (filed Feb. 12, 2010) (Verizon Feb. 12, 2010 ex parte) (“Fiber networks are faster, more efficient, and more reliable than the legacy copper network. For example, fiber lines require no mid-span equipment or electronics (e.g., repeaters, terminals, remotes, etc.), which means that they are cheaper to maintain and have fewer potential points of failure than copper lines. Fiber lines are also more durable and require fewer repairs. For example, as Verizon has previously explained, the rate of maintenance dispatches in 2007 was *eighty percent* lower

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today, it would be an all Internet protocol (IP) fiber network, not a circuit switched copper network, because such a network would be cheaper and more scalable over time.<sup>64</sup> Indeed, an IP fiber network would be the appropriate choice for a wireline network even if there were no service obligation to extend broadband.<sup>65</sup> Therefore, FTTP is more consistent with a forward-looking approach.

### c. Methodology for Determining Terminal Value

34. The model platform that we adopt today provides capital recovery through what is termed depreciation. We conclude that the model should determine the terminal value of the network based on “book value” calculated as the difference between investment and economic depreciation, which takes into account the economic life of the equipment and infrastructure.<sup>66</sup> Specifically, the model will calculate book depreciation expense based on equal-life-group methodologies, using Gompertz-Makeham survivor (mortality) curves and projected economic lives. The model will adjust the survivor curves, however, so that the average lifetime of the asset falls within the range of expected accounting lifetimes authorized by the Commission.<sup>67</sup> This approach is consistent with the methodology used in the Commission’s previous cost model used to determine support amounts for the non-rural LECs, HCPM, and supported in the current record.<sup>68</sup>

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for FiOS lines than for copper lines. When fiber is deployed, consumers gain faster speeds and more reliable service, and carriers gain a more efficient, greener network that is much easier to operate and maintain.”).

<sup>64</sup> As noted above, the Commission directed the Bureau to ensure that “the model design maximizes the number of locations that will receive robust, scalable broadband” and “ensure that the most locations possible receive a 6 Mbps/1.5 Mbps or faster service at the end of the five year term.” See *supra* para. 5 & note 14. In the *Model Design PN*, the Bureau stated that an “efficient provider” for purposes of modeling forward-looking costs “means one that deploys a network that provides speed and capacity that scale easily and which provides the greatest potential for end-user revenue, including data, voice and video over the long-run.” *Model Design PN*, 27 FCC Rcd at 6157, para. 31 n.36. An efficient provider replacing existing facilities would deploy FTTP because it offers much greater potential capacity and can be more easily upgraded to meet future speed requirements. See, e.g., Verizon Feb. 12, 2010 ex parte at 2-3 (“Regardless of any improvements in technology using legacy copper facilities, it remains the case that copper will never offer the capacity or robustness of fiber, both because of copper’s inherent limitations and because real-world copper facilities cannot duplicate speeds that are reached in laboratory experiments.”). See also NASUCA *Model Design PN* Comments at 3, 9.

<sup>65</sup> Nothing in this Report and Order prejudices any decisions that the Commission may make as it considers technology transitions, including the transition from time division multiplexing (TDM) to IP networks. See, e.g., AT&T Petition to Launch a Proceeding Concerning the TDM-to-IP Transition, GN Docket No. 12-353 (filed Nov. 7, 2012); Petition of the National Telecommunications Cooperative Association for a Rulemaking to Promote and Sustain the Ongoing TDM-to-IP Evolution, GN Docket No. 12-353 (filed Nov. 19, 2012); see also *Pleading Cycle Established on AT&T and NTCA Petitions*, GN Docket No. 12-353, Public Notice, 27 FCC Rcd 15766 (Wireline Comp. Bur. 2012); FCC Chairman Julius Genachowski Announces Formation of ‘Technology Transitions Policy Task Force,’ News Release (Dec. 10, 2012), available at [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2012/db1210/DOC-317837A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db1210/DOC-317837A1.pdf).

<sup>66</sup> The ABC Coalition notes that although the *Model Design PN* refers to “book value,” the model in the record at that time did not use a traditional accounting approach to depreciation, but estimates the depreciation due to physical deterioration of the assets. ABC Coalition *Model Design PN* Comments at 24.

<sup>67</sup> See *Simplification of the Depreciation Prescription Process*, CC Docket No. 92-296, Second Report and Order, 9 FCC Rcd 3206, 3211, App. B (1994); Further Order Inviting Comment (FOIC), 9 FCC Rcd 7651, 7657 App. (1994); Third Report and Order, 10 FCC Rcd 8442 (1995) (“adopt[ing] the ranges proposed in the FOIC”); *1998 Biennial Regulatory Review—Review of Depreciation Requirements for Incumbent Local Exchange Carriers et al.*, CC Docket No. 98-137, Report and Order in CC Docket No. 98-137, Memorandum Opinion and Order in ASD 98-91, 15 FCC Rcd 242, 247-48, 276, para. 13, App. B (1999) (adopting new range for digital switching).

<sup>68</sup> See *HCPM Inputs Order*, 14 FCC Rcd at 20342-47, paras. 422-31; NASUCA *Model Design PN* Comments at 10-13; ABC Coalition *Model Design PN* Comments 24-26. ACA claims that “there does not appear to be a documented basis for [using the Gompertz-Makeham curves], such as an accounting standard, academic study, or

(continued...)

35. In the virtual workshop, the Bureau sought comment on whether any of the projected lives used in HCPM are outdated and should be modified.<sup>69</sup> The ABC Coalition recommended that the Bureau uses the same economic lives for assets as HCPM, while ACS suggested the Commission's economic lives are too long and should be updated.<sup>70</sup> Based on our review of the record, we now conclude the model will utilize the same economic lives for assets as specified by the Commission previously when it adopted the HCPM, when determining the monthly cost of capital investments. As the ABC Coalition notes, for more than a decade, these economic lives for assets have been widely used in cost models in state regulatory proceedings.<sup>71</sup> We are persuaded that it would be administratively burdensome to establish new values, which would unnecessarily delay implementation of Connect America Phase II. We recognize that to the extent economic lives are overstated for particular assets that would result in a systematic understatement of costs, but no party has submitted any evidence in the record demonstrating that this effect would result in a material change in support levels thwarting achievement of the Commission's universal service objectives.

36. As the Bureau explained in the *Model Design PN*, the annual cost and support values are highly dependent on the terminal value, because the five-year support period is much shorter than the average lifetime of all of the asset classes in the model.<sup>72</sup> At the end of five years, a FTTP network would have significant commercial value. Because estimating commercial value at the end of the five-year term would require making a number of assumptions about the evolution of technology and the marketplace, we conclude that using book value is the best approach.<sup>73</sup> Using a terminal value of zero, as some parties advocate,<sup>74</sup> would permit carriers to recover the entire cost of the network over five years, and assume the network had no future commercial value.<sup>75</sup> We find that to be an unreasonable assumption and would over-compensate carriers, so we decline to use a zero terminal value in CAM.

### 3. Assigning Shared Network Costs

37. The Commission concluded in the *USF/ICC Transformation Order* that it would use a forward-looking model capable of determining “on a census block or smaller basis, areas that will be eligible for CAF Phase II support.”<sup>76</sup> As a threshold matter, we conclude that the model will calculate (Continued from previous page) \_\_\_\_\_ comparable precedent.” See ACA Mar. 7, 2013 ex parte, Attach. 1 at 4. This clearly is not the case, however, because the Commission was quite explicit about its use of the Gompertz-Makeham curves in HCPM, which “are recognizable to many knowledgeable parties concerned with depreciation methods and are normally more immediately meaningful to them than nonstandard curve shapes.” *HCPM Inputs Order*, 14 FCC Rcd at 20343, para. 424 & n.969.

<sup>69</sup> See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 25.

<sup>70</sup> See *id.* at 25-26 (Comments of Donald K. Stockdale, Jr., on behalf of the ABC Coalition, and Comments of Robin Tuttle, Counsel for ACS); ABC Coalition Jan. 11, 2013 Comments at 25-26.

<sup>71</sup> See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 25; ABC Coalition Jan. 11, 2013 Comments at 25-26.

<sup>72</sup> See *Model Design PN*, 27 FCC Rcd at 6157, para. 32.

<sup>73</sup> As noted above, the Bureau proposed using either book value paired with green-field FTTP or zero value paired with brown-field DSL. See *supra* note 34. Several commenters agreed that we should use book value, calculated as the difference between investment and economic depreciation, for a green-field model. See NASUCA *Model Design PN* Comments at 10-13; ABC Coalition *Model Design PN* Comments at 24-26.

<sup>74</sup> ACS and PRTC support a green-field approach, but argue that it should be paired with a zero value. See ACS *Model Design PN* Comments at 9-11; PRTC *Model Design PN* Comments at 10-12.

<sup>75</sup> See NASUCA *Model Design PN* Comments at 14 (arguing that “the zero terminal value approach is inappropriate because it assumes the service lives for all types of plant are five years” which “is unreasonable and would result in unreasonably high expenses”).

<sup>76</sup> *USF/ICC Transformation Order*, 26 FCC Rcd at 17728, para. 167.

costs at the census block level, except in those instances where a census block is split between two service providers.<sup>77</sup> The model will calculate costs at a significantly more granular level than the Commission's prior forward-looking model, HCPM, which calculated costs at the wire center level. There are approximately 11 million census blocks, compared to approximately 20,000 wire centers. We therefore conclude that calculating costs at the census block level will be sufficient to meet the Commission's objective of targeting support to high cost areas.

38. The Commission also concluded that "it would be appropriate to exclude any area served by an unsubsidized competitor" that meets the Commission's initial performance requirements.<sup>78</sup> Most costs in a network are shared costs.<sup>79</sup> As a result, the method used to attribute the costs of shared plant to eligible and ineligible areas and among census block or smaller areas will have a significant effect on the relative cost of serving different areas.

39. In the *Model Design PN*, the Bureau asked how shared network costs should be assigned between eligible and ineligible areas.<sup>80</sup> Specifically, the Bureau asked whether costs should be modeled for the entire service areas and then allocated between eligible and ineligible areas or costs should be estimated only for the eligible areas on a standalone basis.<sup>81</sup>

40. We conclude that the Connect America Cost Model will model the total cost of serving an entire service territory within a state, rather than calculating the standalone costs of serving only eligible census blocks, and then, as more fully discussed below, allocate the shared costs between eligible and ineligible census blocks.<sup>82</sup> Modeling the costs associated with a complete network (i.e., including both eligible and ineligible census blocks) and then assigning shared costs between the eligible and ineligible census blocks has significant benefits. First, it more accurately depicts an economically efficient network and provider. An economically efficient network would cover all or most locations in a given service territory, rather than only serving a small subset of locations that lack broadband. Indeed, building a network to only serve those locations that lack broadband would likely result in higher cost estimates for those areas than otherwise would be the case, because the service provider would have to deploy less than optimal routing to reach those pockets of customers that are in eligible census blocks. Moreover, an economically efficient provider would not generally cede a large fraction of customers within its service territory to unsubsidized competitors; rather, it would seek to compete in those areas where a positive business case exists. Modeling the entire network and then making adjustments to determine support for particular census blocks where there is no unsubsidized competitor is a reasonable

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<sup>77</sup> The only instance in which the model will calculate costs at the sub-census block level is where a census block is located in more than one carrier's service territory. In those cases, the census block will be split and the portions assigned to the appropriate service territory. When we refer to "census blocks" in this order, we also include these split census blocks.

<sup>78</sup> *Id.* at 17729, para. 170. The Bureau previously sought comment on various issues regarding how to determine the presence of unsubsidized competitors, including what specific metrics should be used to determine whether an unsubsidized competitor meets the service obligations established by the Commission (speed, usage, price and latency). See *Phase II Challenge Process PN*; *Phase II Service Obligations PN*.

<sup>79</sup> For example, feeder cabling is shared among all end-users served by that feeder; even cabling in the distribution plant is often shared among multiple end-user locations.

<sup>80</sup> *Model Design PN*, 27 FCC Rcd at 6159-62, paras. 40-48.

<sup>81</sup> *Id.*

<sup>82</sup> As described in more detail in the *Model Design PN*, shared network facilities, such as feeder plant, may pass through and serve both central and outlying areas of a wire center. *Id.* at 6160-61, para. 43. The area central to the wire center may have an unsubsidized competitor and therefore be ineligible for support, even though the outlying areas, served by the same feeder plant, are eligible.

way to proceed. Finally, the Bureau notes that this approach has broad support in the record.<sup>83</sup> For these reasons, the Bureau finds that it is appropriate for the Connect America Cost Model to model the total cost of serving the entire state, not the standalone costs of only serving eligible census blocks, and then allocate shared costs between eligible and ineligible census blocks.

41. In the *Model Design PN*, the Bureau also asked how to allocate shared costs consistent with the requirement in the *USF/ICC Transformation Order* that the model be capable of determining “on a census block or smaller basis, areas that will be eligible for CAF Phase II support.”<sup>84</sup> Shared costs need to be allocated not only between eligible and ineligible areas, but among census blocks in eligible areas so that the costs of serving each individual census block can be estimated. The Bureau sought comment on two potential options: (1) a subtractive method, in which the model would estimate only those costs to serve eligible areas that are over and above the costs of serving the ineligible areas, and (2) a pro rata method, in which costs would be assigned to eligible and ineligible areas on some pro rata basis or using some other formula. The Bureau indicated a general preference for the subtractive method, but acknowledged that the computational complexity of the subtractive method might make it difficult or impossible to implement in practice.<sup>85</sup> Subsequently, as part of the virtual workshop, the Bureau sought comment on a possible approach to the subtractive method.<sup>86</sup>

42. Based on our review of the record and our development of CAM to date, we now conclude that the model will use a pro rata method for assigning shared costs. The Bureau gave significant consideration to a subtractive approach for assigning costs, and there was support in the record for such an approach.<sup>87</sup> Ultimately, however, we find that the computational complexity and the novelty of the subtractive approach renders it too difficult to implement.<sup>88</sup> The cost-causation approach contained in the current version of CAM (CAM version 3.0) provides a practical method of assigning shared costs in a reasonable manner. Specifically, the model will use a “cost causation” method that assigns a fraction of the costs associated with a shared network facility according to the relative number of customers in each area using the facility.<sup>89</sup> Using cost causation to allocate costs is consistent with the current High-Cost Proxy Model, the model submitted by the ABC Coalition and the National Broadband Plan modeling.<sup>90</sup> For that reason, the Bureau concludes that the cost-causation approach for sharing costs between eligible and ineligible census blocks is appropriate for use in the Connect America Cost Model.

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<sup>83</sup> ACS *Model Design PN* Comments at 10; ABC Coalition *Model Design PN* Comments at 29-31; ACA *Model Design PN* Comments at 15-16; PRTC *Model Design PN* Comments at 11; NRIC *Model Design PN* Comments at 14-15.

<sup>84</sup> *Model Design PN*, 27 FCC Rcd at 6162, para. 49 (citing *USF/ICC Transformation Order*, 26 FCC Rcd at 17728, para. 167).

<sup>85</sup> *Model Design PN*, 27 FCC Rcd at 6166, paras. 57-59.

<sup>86</sup> WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 44.

<sup>87</sup> ACS *Model Design PN* Comments at 13; PRTC *Model Design PN* Comments at 11. *But see* WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 46-47 (Comments of Robin Tuttle, Counsel for ACS).

<sup>88</sup> ABC Coalition *Model Design PN* Comments at 3, 33-34; WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 45-46 (Comments of Donald K. Stockdale, Jr., on behalf of the ABC Coalition).

<sup>89</sup> For example, if 100 customer locations are served by a particular section of feeder plant, the cost of the feeder plant will be divided equally between each customer location and assigned to census blocks based on the relative number of customer locations in each census block.

<sup>90</sup> See ABC Plan, Attach. 3 (Model Description); National Broadband Plan, Broadband Assessment Model at 9, 11, Attach. 6 at 11, Attach. 7 at 2, [http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-\(obi\)-working-reports-series-technical-paper-broadband-assessment-model.pdf](http://download.broadband.gov/plan/fcc-omnibus-broadband-initiative-(obi)-working-reports-series-technical-paper-broadband-assessment-model.pdf).

#### 4. Calculation of Costs for Price Cap Carriers' Currently Served Locations

43. We conclude the model platform will estimate the costs of serving locations irrespective of whether they are currently provided broadband by the ILEC.<sup>91</sup> We find that this approach is consistent with the Commission's goals and directives in the *USF/ICC Transformation Order*. While the Commission sought to "extend[] broadband to millions of unserved locations," it also recognized the importance of "sustaining existing voice and broadband services."<sup>92</sup> We therefore reject the Joint Michigan Competitors' claim that the model should exclude broadband-served areas because the Commission's focus is on deploying broadband to unserved areas,<sup>93</sup> and ACA's claim that broadband-served areas should only receive ongoing support for maintenance and operational expenses—not for capital expenses.<sup>94</sup>

44. We will presume, consistent with the Commission's direction and predictive judgment,<sup>95</sup> that locations that exceed a specified cost benchmark, which will be determined in a future order, will require support on an ongoing basis based on the total leveled cost of sustaining existing voice and broadband services at reasonable end-user rates. As we noted in the *Model Design PN*, carriers may have deployed broadband in certain areas based on past universal service support and intercarrier compensation revenues.<sup>96</sup> Even where carriers may have deployed broadband to fulfill merger commitments, because they received another source of funding, or for other reasons, such carriers still may require funding to sustain the previous broadband deployment. And as we explained above, providing support for only maintenance and operational expenses would not cover the entire cost of sustaining service.<sup>97</sup>

45. Moreover, treating locations currently served by the incumbent differently from completely unserved locations is inconsistent with using a green-field approach to estimate the costs of an efficient modern network optimized for voice and broadband. Treating served and unserved locations differently would require modeling actual historical network deployment, rather than an efficient forward-

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<sup>91</sup> The Bureau sought comment in the *Model Design PN* as to whether the model should include or exclude locations that are already served with broadband. *Model Design PN*, 27 FCC Rcd at 6166-67, paras. 60-62.

<sup>92</sup> *USF/ICC Transformation Order and FNPRM*, 26 FCC Rcd at 17725, para. 156. See also *Connect America Fund NOI/NPRM*, 25 FCC Rcd at 6671, para. 33 (because the National Broadband Plan economic cost model "does not estimate forward-looking economic costs in areas with existing broadband networks," it "provides no means of objectively evaluating whether current high-cost support levels are efficient, or how much support would be necessary to maintain broadband and voice services in areas currently receiving high-cost support").

<sup>93</sup> Joint Michigan Competitors *Model Design PN* Comments at 10-11. The Joint Michigan Competitors do not provide any evidence to justify their blanket assertion that support is not required in such instances.

<sup>94</sup> ACA March 7, 2013 ex parte, Attach. at 4 ("[L]ocations with existing broadband from a price cap LEC that meets the speed requirements should be treated differently from locations that do not have broadband"); ACA *Model Design PN* Comments at 18-20; ACA Oct. 23, 2012 ex parte at 9 (claiming only support for "maintenance and operating expenses would be required since [high-cost broadband-served] locations already have existing operational broadband that meets the Commission's broadband speed benchmark").

<sup>95</sup> The Commission stated that the forward-looking cost model will "target support to areas that exceed a specified cost benchmark . . ." as those areas are the areas where the cost of providing service is "likely to be higher than can be supported through reasonable end-user rates alone . . ." *USF/ICC Transformation Order*, 26 FCC Rcd at 17728, paras. 167-68.

<sup>96</sup> *Model Design PN*, 27 FCC Rcd at 6166-67, para. 60. For instance, price cap carriers in some areas may have deployed broadband in high-cost areas because they were formerly subject to other forms of regulation (such as rate-of-return regulation) and received legacy high-cost support based on their embedded costs. See also ABC Coalition *Model Design PN* Reply Comments at 30.

<sup>97</sup> See *supra* para. 30 & note 56.

looking network.<sup>98</sup> This is functionally similar to the first approach to brown-field modeling, which would require an extensive data collection, while unnecessarily delaying implementation of Phase II.

46. Accordingly, we reject commenters' claims that areas already served by broadband do not require ongoing support, (or only require limited ongoing support),<sup>99</sup> and we conclude that the model will include and calculate ongoing support for high-cost locations above the cost benchmark that are both served and unserved by broadband. We note that this is consistent with the Commission's approach when it adopted HCPM; it calculated the cost of an efficient provider to provide voice service throughout the territory of a non-rural LEC, even though those LECs already provided voice.<sup>100</sup>

## 5. Treatment of Non-Contiguous United States

47. The Commission has "direct[ed] the [Bureau] to consider the unique circumstances of [Alaska, Hawaii, Puerto Rico, the U.S. Virgin Islands and Northern Marianas Islands] when adopting a cost model."<sup>101</sup> The Commission further directed the Bureau to determine whether the cost model provides sufficient support to these areas, and if, in the Bureau's determination, the model does not provide these areas with sufficient support, the Commission granted the Bureau the discretion to "maintain existing support levels, as modified in this Order, to any affected price cap carrier, without exceeding the overall budget of \$1.8 billion per year for price cap areas."<sup>102</sup> The Bureau has sought comment to further develop the record on these two options for areas outside the contiguous United States, and the associated service obligations.<sup>103</sup>

48. The decisions we make herein do not prejudice whether modifications to the model platform or input values should be made with respect to the non-contiguous United States, or support levels for those areas should be frozen. We will address those arguments at a future date.<sup>104</sup>

### B. Customer Locations and Outside Plant Design

49. As the Commission recognized when it adopted the model platform for HCPM, outside plant – namely, the loop facilities between switches and the customer premises – constitutes the largest portion of total network investment, and the design of outside plant facilities depends heavily on the

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<sup>98</sup> See *supra* para. 26. The alternative of using the efficient network design while treating served and unserved locations differently is internally inconsistent, with some locations appearing able to get service from network facilities (i.e., assuming the facilities exist) and others unable to get service from those same facilities (i.e., as if the facilities do not exist). Another option would be to use existing routing as part of the green-field model; however, after identifying the location of existing plant to estimate the costs of the unserved areas, the resulting costs would be based on a sub-optimal network design.

<sup>99</sup> See Joint Michigan Competitors *Model Design PN* Comments at 10-11; ACA *Model Design PN* Comments at 18-20; ACA Oct. 23, 2012 ex parte at 9; ACA April 9, 2013 ex parte at 1.

<sup>100</sup> See *Universal Service First Report and Order*, 12 FCC Rcd at 8912-13, para. 250 (criterion 6) ("The cost study or model must estimate the cost of providing service for all businesses and households within a geographic region").

<sup>101</sup> *USF/ICC Transformation Order*, 26 FCC Rcd at 17737, para. 193.

<sup>102</sup> *Id.* at 17737-38, para. 193. Disbursements in 2011 to price cap carriers in these areas totaled approximately \$76 million. See USAC, Frozen High Cost Support Price Caps-Rate of Return Affiliates and CETCs, [http://www.usac.org/\\_res/documents/hc/pdf/fcc/Frozen-High-Cost%20Support-021512.pdf](http://www.usac.org/_res/documents/hc/pdf/fcc/Frozen-High-Cost%20Support-021512.pdf) (USAC Frozen High-Cost Support Data).

<sup>103</sup> See *Phase II Non-Contiguous Areas PN* (seeking comment on various options for providing Connect America Phase II support to price cap carriers serving non-contiguous areas and the associated obligations).

<sup>104</sup> In the discussion that follows, we therefore do not address the arguments that have been raised to date by price cap carriers serving non-contiguous areas regarding specific aspects of the model platform or input values.

location of customers.<sup>105</sup> Business customer information is important not only for locating business customers, but also for scaling the network infrastructure to ensure that the costs of shared resources are appropriately shared among all users. The placement of customer locations thus is an important element of the CAM platform.

### 1. Customer Locations

50. In the *Model Design PN*, the Bureau proposed to use a commercial data set for residential customer location data, but also sought comment on two alternatives: using official government census data, which would provide the number of housing units in a census block but no geocodes, and collecting actual customer location data from providers.<sup>106</sup> For business locations, the Bureau proposed using government data from the U.S. Bureau of Labor Statistics (BLS) Economic Census, but also sought comment on using commercial data sources.<sup>107</sup> The Bureau sought further comment via the CAM virtual workshop on methods for determining customer locations.<sup>108</sup>

51. Few commenters offered any comments about customer locations data.<sup>109</sup> In the absence of actual geocode information, the ABC Coalition supports using a methodology that uses a combination of data sources to estimate the number of customer locations by zip code and then distribute those locations randomly along roads in the census block.<sup>110</sup> The only commenter suggesting an alternative source for customer location data is the National Association of State Utility Consumer Advocates (NASUCA), which proposed the Commission obtain E911 databases and translate the addresses into geocodes that can be used in the cost model.<sup>111</sup> If the Commission uses census data, NASUCA argues that these data should be augmented by geocoded data provided by the carriers in census blocks above a certain size.<sup>112</sup>

52. We adopt a model platform that will use a combination of commercial data set (GeoResults Q3 2012) and census data to determine residential and business locations. Specifically, the model will use GeoResults Q3 2012, which provides an address-based residential data set of households. To the extent there are discrepancies between the location counts from GeoResults and 2011 census housing unit estimates, the GeoResults count will be adjusted upward or downward to conform to the census, with the records for the requisite number of locations to be added or subtracted selected in a random manner. We conclude the model also should use GeoResults for business location data, because those data are more current and include more businesses than the BLS economic census data.<sup>113</sup> GeoResults also provides a national building file, which is used to identify buildings that have both

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<sup>105</sup> *HCPM Platform Order*, 13 FCC Rcd at 21335-36, para. 27.

<sup>106</sup> *See Model Design PN*, 27 FCC Rcd at 6173, paras. 89-92.

<sup>107</sup> *See id.* at 6172-73, paras. 85-88.

<sup>108</sup> *See Virtual Workshop Commencement PN*.

<sup>109</sup> WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 5 (Comments of Robin Tuttle, Counsel for ACS). ACS argues that the customer location data is unlikely to be accurate for Alaska. As discussed above, we defer issues related to areas outside the contiguous United States to a future date. *See supra* para. 48 & note 104.

<sup>110</sup> *See ABC Coalition Jan. 11, 2013 Comments at 15-16; see also WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 1-5, 7-8, 10-13, 16, 18, 20-21, 23-25, 28-29, 33, 35-36, 40, 44-46.* As discussed below, however, we now have geocode data and will use it where it is available.

<sup>111</sup> *See NASUCA Model Design PN Comments at 20-22.*

<sup>112</sup> *Id.* at 21 (“These additional data are required in large census blocks because in those blocks a random allocation of locations along the road network could bias the outcome of the cost model”).

<sup>113</sup> The most recent BLS economic census data is from 2007, and only captures larger businesses.

residential and business customers. The model will use additional data sources to identify the locations of community anchor institutions and cell towers.<sup>114</sup>

53. The CAM will use geocoded locations wherever possible, and place locations that cannot be geocoded randomly along the roads within the census block.<sup>115</sup> This is an improvement upon the approach previously taken by the Commission when it implemented HCPM. By using geocoded data where available, the model will estimate with greater precision the amount of feeder plant necessary to reach all locations, which should result in more accurate cost estimates than the prior forward-looking cost model utilized by the Commission, which assigned all locations randomly along roads using Topologically Integrated Geographic Encoding and Referencing (TIGER) data.<sup>116</sup>

54. We find that using these data is preferable to using E911 data, supplemented by carrier-provided data, as suggested by NASUCA. First, NASUCA does not specifically identify the E911 database(s) that it contends should be used. Moreover, an approach based on E911 databases would potentially introduce inconsistencies in the model across states, because each state and, in many instances depending on state and local regulations, individual Public Safety Answering Points (PSAPs), are responsible for their E911 databases, and these databases differ in methodology, completeness and accuracy. Using a consistent methodology throughout the nation will lessen the likelihood of inconsistencies in cost estimates among states, which could skew the relative distribution of support in unknown ways among the states.

55. We conclude that it is not feasible to develop a model platform that incorporates actual customer locations for all locations. There is no publicly available source of nationwide geocoded location data, and commercial data sources do not provide geocodes for all locations. Even if the price cap carriers provided the Commission with their geo-coded customer database, or address list if they do not have geo-coded customer locations, these data bases would only include the incumbent local exchange carriers' customers and not all the housing units in the census block. Doing a mandatory data collection that collected customer location information from cable operators and other non-incumbent providers would be a significant Commission undertaking, and it would impose burdens on those providers. Nothing in the record before us suggests that the incremental improvement in precision of locations that would result from such a mandatory data collection would be worth the costs in terms of burden on both the Commission and outside parties. Accordingly, we conclude that GeoResults, trued-up with Census data for residential locations, is the best source of customer locations because of the number of locations that are geocoded. The final model will use the methodology in CAM version 3.0 for assigning included locations that cannot be geocoded along road segments.

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<sup>114</sup> Version 3.0 of CAM uses June 2012 SBI data from the National Broadband Map for community anchor institution location data, and a CostQuest-developed data set for tower locations, which is necessary to determine enterprise demand from wireless providers to provide fiber to towers.

<sup>115</sup> For residential locations without an address or that cannot be geocoded, a random placement algorithm is used to place the locations along the roads of the census block. Roads that are restricted, e.g., interstate highways, are not used. With the use of geocoded locations, a rectification step is included, which spreads points out along a segment if they are unrealistically bunched/clustered on the road. Because 96% of residential locations and 94% of business locations are geocoded, we expect that any effect on average cost in a census block, because of random placement of some locations, would be small.

<sup>116</sup> When the Commission adopted this approach for customers whose actual location is unknown, it acknowledged that using actual geocoded data would be preferable and that the model should use actual geocode data to the extent available. See *HCPM Platform Order*, 13 FCC Rcd at 21337-38, 21340-41, paras. 34, 40. In the *HCPM Inputs Order*, the Commission concluded it would use road surrogate customer location data in HCPM until it could select an accurate and verifiable source of actual geocode data. See *HCPM Inputs Order*, 14 FCC Rcd at 20173-74, para. 36.

## 2. Clustering

56. We adopt a clustering approach that uses road-based routing to determine the maximum size of the clusters. Once customer locations have been identified, the model must determine how to group and serve those customers in an efficient and technologically reasonable manner. Consistent with past Commission precedent for forward-looking cost models, the objective is to group customers into serving areas in an efficient manner to minimize costs, while maintaining a specified level of network performance equality.<sup>117</sup> Like HCPM, our model platform will design clusters consistent with engineering constraints, grouping customers so that they are no further away than allowed by network design to deliver services meeting the Commission's performance requirements. CAM will improve the approach previously used by the Commission in HCPM, however, as it will use road-based routing to determine the maximum size of the clusters. Thus, clusters defined by CAM are likely smaller, but more realistic estimates of cluster size, resulting in more accurate cost estimates. By using road segments in clustering, the CAM model avoids the problem of having the length of some loops modeled along roads exceed the maximum loop length necessary to provide service meeting specified standards. The ABC Coalition supported this approach, and no party objects to using this clustering methodology for modeling costs in the contiguous United States.<sup>118</sup> We conclude that the model will include the clustering methodology currently incorporated into CAM version 3.0.

## 3. Routing

57. We adopt the routing methodology used in CAM, which builds plant along roads and uses a minimum spanning tree algorithm. Although HCPM allowed for minimum spanning-tree optimization of routes, it did not use the road network. CAM, on the other hand, represents an enhancement to the approach taken by the Commission in developing a forward-looking model in the 1990's, as it lays loop plant along actual road segments and utilizes a spanning tree algorithm to find the lowest cost route to serve all customer locations along road paths. The ABC Coalition supported this approach, and no party objects to using this routing methodology for modeling costs in the contiguous United States.<sup>119</sup> We conclude that the model platform will include the CAM version 3.0 algorithm for routing loop plant and feeder network.

## 4. Sizing Network Facilities

58. We adopt a model platform that will size network facilities such that there is sufficient capacity at the time of peak usage. The model platform accomplishes this by ensuring that the size of each link in the network is sufficient to support peak usage busy hour offered load, taking into account

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<sup>117</sup> See *HCPM Platform Order*, 13 FCC Rcd at 21341-45, paras. 42-53.

<sup>118</sup> The Bureau sought comment in the virtual workshop on whether an approach to clustering that uses road-based routing to group customers into efficient serving areas was reasonable. See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 7. Only two parties commented on clustering. The ABC Coalition supports this road-based routing approach to clustering and notes that this clustering approach has been examined in numerous state regulatory proceedings. See *id.*; ABC Coalition Jan. 11, 2013 Comments at 16. ACS suggests road-based routing omits unserved customers who are not on the road system in Alaska. See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 7 (Comments of Robin Tuttle, Counsel for ACS). As discussed above, however, we defer issues related to areas outside the contiguous United States to a future date. See *supra* para. 48 & note 104.

<sup>119</sup> The Bureau sought comment in the virtual workshop on using a routing methodology that builds plant along roads and uses a minimum spanning tree algorithm to estimate the plant necessary to serve customer locations. See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 8. The ABC Coalition supports this approach to routing. See *id.* (Comments of Donald K. Stockdale, Jr. on behalf of the ABC Coalition); ABC Coalition Jan. 11, 2013 Comments at 17. ACS argues that the routing approach used by CQBAT does not produce reasonable cost estimates for Alaska, but as noted above, we defer issues related to areas outside the contiguous United States to a future date. See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 9 (Comments of Robin Tuttle, Counsel for ACS).

subscriber usage capacity (GB/month/subscriber) as well as throughput (Mbps) and take-rate.<sup>120</sup> This method is basically the same approach that was taken in the National Broadband Plan modeling.<sup>121</sup> Because voice is the supported service, the model also takes into account peak demands associated with voice service in the sizing calculations. No party objects to this general approach to network sizing.<sup>122</sup> The ABC Coalition agrees that sizing broadband facilities based on throughput required at the time of peak usage is reasonable, while noting that the peak demands associated with voice service should be included in the sizing calculations if voice capability is to be added to the model.<sup>123</sup> We will address the specific input values the model will use for busy hour under load in a future order.

### C. Switching and Interoffice Facilities

#### 1. Voice Capability

59. In the *USF/ICC Transformation Order*, the Commission determined that “voice telephony service” is the service supported by federal high-cost universal support.<sup>124</sup> All recipients must offer voice telephony service.<sup>125</sup> In addition, as a condition of receiving support, all recipients must offer broadband service.<sup>126</sup>

60. We adopt a model platform that estimates the cost of an IP-enabled network capable of providing voice service. The cost is modeled on a per-subscriber basis and takes into account the cost of hardware, software, services, and customer premises equipment to provide carrier-grade Voice over Internet Protocol (VoIP) service.<sup>127</sup> No party objects to this general methodology for including voice capability to serve the contiguous United States, and the ABC Coalition supports this approach.<sup>128</sup> We

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<sup>120</sup> HCPM modeled a narrow-band, voice network and sized the network to ensure a sufficient capacity to handle voice calls and provide appropriate levels of call blocking. See *HCPM Platform Order*, 13 FCC Rcd at 21356-57, 21379, para. 79, App. A para. 46.

<sup>121</sup> For further discussion regarding “busy hour offered load,” see Omnibus Broadband Initiative, *The Broadband Availability Gap: OBI Technical Paper No. 1*, at 109-14 (April 2010) (OBI, Broadband Availability Gap), available at <http://www.broadband.gov/plan/broadband-working-reports-technical-papers.html>.

<sup>122</sup> The Bureau sought comment in the virtual workshop on the general approach of sizing network facilities based on throughput required at the time of peak usage and based on a busy hour offered load. See WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 20. The ABC Coalition supports this approach to sizing network facilities. See *id.*; ABC Coalition Jan. 11, 2013 Comments at 22.

<sup>123</sup> See ABC Coalition Jan. 11, 2013 Comments at 22. The ABC Coalition noted that it did not expect that this incremental demand for voice service should have a significant impact, however.

<sup>124</sup> *USF/ICC Transformation Order*, 26 FCC Rcd at 17692-95, paras. 77-83.

<sup>125</sup> *Id.*

<sup>126</sup> *Id.* at 17695, para. 86.

<sup>127</sup> Similar to our discussion above regarding the decision to model a FTTP network, adoption of a model platform that assumes voice service is provided via an all-IP network does not imply, and this Report and Order does not dictate, that carriers in fact will provide VoIP. The requirements laid out in the *USF/ICC Transformation Order* focus on the services delivered, not the technology used. See *USF/ICC Transformation Order*, 26 FCC Rcd at 17696, para. 91. The Commission expressly recognized that carriers may offer VoIP on a Title II basis. *IP-Enabled Services*, WC Docket No. 04-36, First Report and Order and Notice of Proposed Rulemaking, 20 FCC Rcd 10245, 10268, para. 38 n.128 (2005); see also *USF/ICC Transformation FNPRM*, 26 FCC Rcd at 18143, para. 1389 (“some providers of facilities-based retail VoIP services state[d] that they are providing those services on a common carrier basis”).

<sup>128</sup> In the virtual workshop, the Bureau asked interested parties for comments regarding how the model should calculate the cost of a network that can provide voice service in addition to broadband. WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 15. The ABC Coalition and ACS filed comments in response to this question. *Id.* at 15-17 (Comments of Donald K. Stockdale, Jr. on behalf of the ABC Coalition, and Robin Tuttle,

(continued...)

conclude that the appropriate forward-looking way to model a network today that provides voice service is to design an all-IP network.<sup>129</sup> The specific inputs used to calculate the per-subscriber cost will be addressed in a future order.

## 2. Interoffice Facilities

61. We adopt a model platform that ties central offices to the nearest tandem location, ties tandems together, and uses efficient routing paths for all connections, using information from the Local Exchange Routing Guide database. The model platform assumes Ethernet-based fiber connections among wire centers and between wire centers and tandem switches, including the use of wave division multiplexing gateways. Additionally, the model platform connects each hierarchy to the nearest (lowest cost) Internet access point regardless of ownership. The model platform also uses routing along roads to determine the cost of deploying fiber to make connections, and includes Broadband Remote Access Services and/or gateway costs. No party objects to this general approach for the contiguous United States, and the ABC Coalition supports this approach.<sup>130</sup> This is consistent with the HCPM, which also included the middle mile costs of providing service.<sup>131</sup> We will address cost inputs related to interoffice transport in a future order.

### D. Framework for Capturing Variations in Cost

62. As discussed more fully below, the CAM will utilize differing assumptions for certain input values based on three geographic density zones, and will adjust certain input values for labor and materials based on the three-digit zip code.

#### 1. Plant Mix Based on Density Zone

63. The cost of a modern broadband network varies significantly based on the type of infrastructure used to deploy the wires – specifically whether the wires are underground, buried or aerial.<sup>132</sup> Most networks rely on all three types of plant in varying degrees, with the precise mix of plant dependent on many factors. A model used to estimate the costs of deploying a network must therefore make assumptions regarding the mix of plant used in the network.

64. We adopt a model that assumes that each state is made up of three density zones – urban, suburban, and rural. For each density zone, the model will assume a specific plant mix for each of three different parts of the network – distribution, feeder, and inter-office transport. As a result, each state will have a matrix of nine different density zone/network component combinations, each of which has its own mix of underground, buried, and aerial plant. In addition, the model will include a nationwide set of plant

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Counsel for ACS); WCB Mar. 28, 2013 Virtual Workshop Submission Letter, Attach. at 1-2 (Comments of Robert Mayer, on behalf of ABC Coalition).

<sup>129</sup> ACS provided comments with respect to modeling the cost of voice service in Alaska, but, as noted above, the model decisions described in this Report and Order do not necessarily apply to the non-contiguous United States, including Alaska, and the Bureau does not address ACS's comments here. *See supra* para 48 & note 104.

<sup>130</sup> The Bureau sought comment in the virtual workshop on this methodology for estimating interoffice transport. WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 12. Only two parties commented. *See id.* at 12-13. ACS provided comments with respect to interoffice transport in Alaska, but, as noted above, the model decisions described in this Report and Order do not necessarily apply to the non-contiguous United States, including Alaska. The Bureau therefore does not address ACS's comments here. *See supra* para. 48 & note 104.

<sup>131</sup> *Universal Service First Report and Order*, 12 FCC Rcd at 8913, para. 250 (“Any network function or element, such as . . . transport . . . must have an associated cost”); *HCPM Platform Order*, 13 FCC Rcd at 21354-57, paras. 75-80.

<sup>132</sup> Underground wires are passed through conduits, while buried wires are put in trenches and covered. Aerial wires are attached to poles.

mixes for each density zone and network component, which may be used in any state for which specific inputs may not be available.

65. The Bureau concludes that this methodology will provide sufficiently granular variation in the mix of plant in the entire network. We recognize that the HCPM varied cost by nine density zones, but no party in the current proceeding objects to using three geographic zones.<sup>133</sup> The ABC Coalition notes there was no variation in the plant mix between the least dense zones in HCPM, which together correspond to the rural zone in the model we are evaluating.<sup>134</sup>

66. No commenter objected to the general principle that plant mix should vary according to density zones, with different plant mix values in different areas. Rather, the parties that addressed this issue argued there should be a process to document the development of the specific input values to be used.<sup>135</sup> The source and specific percentages of plant mix to be used in the matrix will be determined in a future order addressing inputs.

## 2. Material and Labor Cost Adjustments Based on Location

67. We adopt an approach that utilizes uniform input values for various capital costs, with adjustments for regional variations in labor and material costs. We conclude that this approach to development of a forward-looking model is consistent with past precedent. In the *HCPM Inputs Order*, the Commission determined nationwide default values are generally more appropriate than company-specific input values for a forward-looking model.<sup>136</sup> It noted that the universal service support mechanism is “based on the estimated costs that an efficient carrier would incur to provide the supported services, rather than on the specific carrier’s book costs.”<sup>137</sup> It concluded that “it would be administratively unworkable to use company-specific values in the federal nationwide model.”<sup>138</sup> At the same time, however, the Commission recognized the desirability of having data that accurately and objectively reflect “variations in forward-looking costs based on objective criteria,” and it stated that it was open to additional modifications of inputs in the future.<sup>139</sup> Thus, although the Commission did not adjust costs for regional variation in adopting HCPM, it expressly recognized that a forward-looking model could appropriately recognize variations in cost.

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<sup>133</sup> In the *Model Design PN*, the Bureau sought comment on using provider-submitted plant mix data. See *Model Design PN*, 27 FCC Rcd at 6173-74, paras. 94-97. ACA argued that providers should be required to document their plant mix, while NASUCA suggested that state regulators could verify a sample of the data. *ACA Model Design PN Comments* at 24-26; *NASUCA Model Design PN Comments* at 22. In the virtual workshop, the Bureau sought comment on capturing variation by geography and additional issues relating to plant mix. WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 10, 30-33. The ABC Coalition and ACS filed comments in response to these virtual workshop questions. *Id.* at 10-11, 33-34. We will address plant mix input values and related issues in a future order.

<sup>134</sup> WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 10.

<sup>135</sup> ACA agreed that using carrier-provided data to develop plant mix inputs was reasonable, but urged greater transparency in the process of developing the input values, while NASUCA suggested that state regulators could verify a sample of the data. WCB Mar. 28, 2013 Virtual Workshop Submission Letter, Attach. at 11 (Comments of Thomas Cohen, Counsel for ACA) (“[T]he data inputs as well as the calculation methodology (i.e., the process of using the data inputs to determine state-wide averages for each plant type in each density zone) should be clearly documented”); *NASUCA Model Design PN Comments* at 22.

<sup>136</sup> See *HCPM Inputs Order*, 14 FCC Rcd at 20172, 20305, paras. 31, 348.

<sup>137</sup> *Id.* at 20172, para. 31.

<sup>138</sup> *Id.*

<sup>139</sup> *Id.* at 20171-72, para. 30.

68. Our forward-looking model will use regional cost adjustment factors to capture variation in labor and materials costs by three-digit ZIP codes. Those regional adjustments are based on data obtained from a national survey of the costs of construction in various areas of the United States by R.S. Means.<sup>140</sup> The ABC Coalition supports this approach of using nationwide average values with regional adjustments, noting that the R.S. Means data is widely recognized and used in numerous contexts.<sup>141</sup> No party objected to the use of this methodology for areas in the contiguous United States.<sup>142</sup>

#### IV. PROCEDURAL MATTERS

##### A. Paperwork Reduction Act

69. This document does not contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, it does not contain any new or modified information collection burden for small business concerns with fewer than 25 employees, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198.<sup>143</sup>

##### B. Final Regulatory Flexibility Act Certification

70. The Regulatory Flexibility Act of 1980, as amended (RFA),<sup>144</sup> requires that a regulatory flexibility analysis be prepared for rulemaking proceedings, unless the agency certifies that “the rule will not have a significant economic impact on a substantial number of small entities.”<sup>145</sup> The RFA generally defines “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.”<sup>146</sup> In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.<sup>147</sup> A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).<sup>148</sup>

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<sup>140</sup> See R.S. Means, *Building Construction Cost Data* (69th Annual Ed. 2010).

<sup>141</sup> In the virtual workshop, the Bureau sought comment on the use of company-specific values as well as labor-cost adjustments based on location. WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 21, 35. See also *id.* (Comments of Donald K. Stockdale, Jr., on behalf of the ABC Coalition); ABC Coalition Jan. 11, 2013 Comments at 22-24, 29-30.

<sup>142</sup> We do not address at this time comments provided by ACS regarding the use of this methodology for Alaska, as we defer resolution of issues relating to the non-contiguous United States to a future order. See *supra* para 48 & note 104; WCB Feb. 6, 2013 Virtual Workshop Submission Letter, Attach. at 22 (Comments of Robin Tuttle, Counsel for ACS).

<sup>143</sup> See 44 U.S.C. § 3506(c)(4).

<sup>144</sup> The RFA, see 5 U.S.C. § 601 *et seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

<sup>145</sup> 5 U.S.C. § 605(b).

<sup>146</sup> 5 U.S.C. § 601(6).

<sup>147</sup> 5 U.S.C. § 601(3) (incorporating by reference the definition of “small business concern” in Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies “unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register.”

<sup>148</sup> Small Business Act, 15 U.S.C. § 632.

71. In this Report and Order, we adopt a model platform for the Connect America Phase II cost model that will calculate a levelized cost that represents an estimate of the average monthly forward-looking cost of an efficient provider. A model platform is the basic framework for the model consisting of key assumptions about the design of the network and network engineering. We also address certain framework issues relating to inputs for the model. These decisions are not anticipated to have a significant economic impact on small entities, insofar as the model produces high-cost support amounts for price cap carriers and their affiliates that accept the right of first refusal pursuant to Connect America Phase II. This is primarily because most (and perhaps all) of the affected carriers are not small entities. Moreover, the decisions made about the model platform in this Report and Order are not anticipated to systematically increase or decrease support for any particular group of entities as compared to possible alternatives discussed in the record. Therefore, we certify that the decisions made in this Report and Order will not have a significant economic impact on a substantial number of small entities. The Commission will send a copy of the Report and Order, including a copy of this final certification, in a report to Congress pursuant to the SBREFA.<sup>149</sup> In addition, the Report and Order and this certification will be sent to the Chief Counsel for Advocacy of the SBA, and will be published in the Federal Register.<sup>150</sup>

### C. Congressional Review Act

72. The Commission will send a copy of this Report and Order to Congress and the Government Accountability Office pursuant to the Congressional Review Act.<sup>151</sup>

## V. ORDERING CLAUSES

73. Accordingly, IT IS ORDERED, pursuant to the authority contained in sections 1, 2, 4(i), 5, 214, 254, 303(r), and 403 of the Communications Act of 1934, as amended, and section 706 of the Telecommunications Act of 1996, 47 U.S.C. §§ 151, 152, 154(i), 155, 214, 254, 303(r), 403, and 1302, sections 0.91, 0.201(d), 1.1, and 1.427 of the Commission's rules, 47 C.F.R. §§ 0.91, 0.201(d), 1.1, 1.427, and the delegations of authority in paragraphs 157, 184, 186, 187, and 192 of the *USF/ICC Transformation Order*, FCC 11-161, that this Report and Order IS ADOPTED, effective thirty (30) days after publication of the text or summary thereof in the Federal Register.

FEDERAL COMMUNICATIONS COMMISSION

Carol E. Matthey  
Deputy Chief  
Wireline Competition Bureau

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<sup>149</sup> See 5 U.S.C. § 801(a)(1)(A).

<sup>150</sup> See 5 U.S.C. § 605(b).

<sup>151</sup> See 5 U.S.C. § 801(a)(1)(A).