6712-01

FEDERAL COMMUNICATIONS COMMISSION

[GN Docket No. 12–268, MB Docket No. 16-306; DA 16-1095]

47 CFR Parts 1, 27, 73 and 76

Incentive auction Task Force and Media Bureau Seek Comment on Post-Incentive Auction Transition Scheduling Plan

AGENCY: Federal Communications Commission.

ACTION: Proposed rule, request for comment.

SUMMARY: This document seeks comment on the proposal set forth by the Media Bureau, in consultation with the Incentive Auction Task Force, the Wireless Telecommunications Bureau, and the Office of Engineering and Technology, for developing a post-incentive auction transition scheduling plan. In preparing their submissions commenters should be mindful of the Commission's prohibited communications rule, which prohibits broadcasters and forward auction applicants from communicating any incentive auction applicant's bids or bidding strategies to other parties covered by the relevant rules.

DATES: Comments due on or before October 31, 2016 and reply comments due on or before November 15, 2016.

FOR FURTHER INFORMATION CONTACT: Evan Morris, Video Division, Media Bureau, Federal Communications Commission, (202) 418-1656 or Erin Griffith, Incentive Auction Task Force, Federal Communications Commission, (202) 418-2957.

ADDRESSES: You may submit comments, identified by GN Docket No. 12–268 and MB Docket No. 16-306, by any of the following methods:

- Federal eRulemaking Portal: http://www.regulations.gov. Follow the instructions for submitting comments.

- Federal Communications Commission's Web site: https://www.fcc.gov/. Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: https://www.fcc.gov/ecfs/.
- Paper Filers: Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission. All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building. Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743. U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.
- People with Disabilities: Contact the FCC to request reasonable accommodations (accessible format documents, sign language interpreters, CART, etc.) by email: fcc504@fcc.gov or phone: 202–418–0530 or TTY: 202–418–0432.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's document, DA 16-1095, in GN Docket No. 12–268 and MB Docket No. 16-306; released on September 30, 2016. The full text of this document, as well as all omitted Illustrations, Figures and Tables are available on the Internet at the Commission's Web site at:http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db1003/DA-16-1095A1.pdf; https://www.fcc.gov/wireless/auction-1001 and selecting the "Documents" tab; or by using the

search function for GN Docket No. 12-268, MB Docket No. 16-306 on the Commission's Electronic Comment Filing System (ECFS) Web page at http://www.fcc.gov/cgb/ecfs/. The full text is also available for public inspection and copying from 8:00 a.m. to 4:30 p.m. Eastern Time (ET) Monday through Thursday or from 8:00 a.m. to 11:30 a.m. ET on Fridays in the FCC Reference Information Center, 445 12th Street SW., Room CY–A257, Washington, DC 20554 (telephone: 202-418-0270, TTY: 202-418-2555).

Synopsis

In the Incentive Auction Report and Order (IA R&O), 79 FR 48441, August 15, 2014, the Federal Communications Commission (Commission or FCC) delegated authority to the Media Bureau (the Bureau) to establish construction deadlines within the 39-month post-auction transition period for television stations that are assigned to new channels in the incentive auction repacking process. In delegating authority to the Bureau to establish construction deadlines within the transition period, the FCC directed the Bureau to tailor the deadlines to stations' individual circumstances. The Commission also determined that a phased construction schedule would facilitate efficient use of the resources necessary to complete the transition. In the IA R&O the FCC also directed the Bureau to account for "the needs of forward auction winners and their construction plans."

Based on the record to date and on staff analysis and computer modeling, the Bureau is developing a plan to create a phased transition schedule for broadcasters that are reassigned to a new channel in the repacking. Under this phased approach, stations will be assigned to one of 10 "transition phases" with sequential testing periods and deadlines, or "phase completion dates." The phase completion date will be the date listed in each station's construction permit as its construction deadline and will be the last day that a station may operate on its pre-auction channel. A station "must cease operating on [its] pre-auction channel once [that] station begins

operating on its post-auction channel or by the deadline specified in its construction permit for its post-auction channel, whichever occurs earlier." 47 CFR 73.3700(b)(4)(iii). We interpret "begin operating" to mean when the station begins providing a broadcast television service to the public on its post-auction channel, not simply testing equipment on that channel. We believe a phased approach will smooth the way for station coordination, promote efficient allocation of limited resources, limit the impact of the transition on consumers, and facilitate FCC monitoring to determine whether schedule adjustments are necessary during the course of the transition process. The proposed approach is also designed to provide information to stations, vendors, and other industry participants in a way that will allow them to plan for and respect the obligations and resource requirements of stations that are assigned to earlier phases. This approach will take into account our international obligations and the agreement to undertake in a joint repacking with Canada.

We seek comment on the proposed approach and the methodology described in Appendix A of the Public Notice for establishing a transition schedule, as well as the alternative constraints we present therein. Based on the development of the record and staff analysis, the Bureau will adopt a post-auction transition scheduling plan that will be used to create a phased transition and assign stations individual construction permit deadlines.

Post-Auction Transition Scheduling Process. The initial steps of the post-auction transition scheduling process will occur before the incentive auction closes. Once the final stage rule has been satisfied, no additional stages of the auction will be required. Therefore, as soon as the final stage rule is satisfied, the final television channel assignment plan will be determined. The Bureau will use the final channel assignments to establish a phased transition schedule for relocated stations and stations that voluntarily moved to a different band as part of the auction. We propose that the schedule be established using the methodology described in this Public

Notice and Appendix A. We anticipate that the Bureau will be able to determine the final channel assignment plan and the phase assignments prior to the conclusion of the forward auction. Therefore, because we recognize the importance of providing broadcasters with as much time as possible to prepare for the transition, we intend to send each eligible station that will remain on the air after the auction a confidential letter identifying the station's post-auction channel assignment, technical parameters, and assigned transition phase. If a station is not reassigned to a new post-auction channel, its confidential letter will list the station's pre-auction channel and technical parameters.

Once the forward auction concludes, we will release the Auction Closing and Channel Reassignment PN (Closing and Reassignment PN), which will announce that the reverse and forward auctions have ended and specify the effective date of the post-auction repacking. The information provided in the confidential letter will be subject to change in the Closing and Reassignment PN, we do not anticipate significant changes. Among other things, the Closing and Reassignment PN will announce the post-auction channel assignment and technical parameters of every station eligible for protection in the repacking process that will remain on the air after the incentive auction. The Closing and Reassignment PN will also announce the transition phase, phase completion date, and testing period for each reassigned station. Stations reassigned to new channels will have three months from the Closing and Reassignment PN release date to file construction permit applications proposing modified facilities to operate on their post-auction channel facility specified in the Closing and Reassignment PN. See 47 CFR 73.3700(b)(1)(i)-(iii), (vi), (iv)(A). The Bureau will then issue each station a construction permit. The construction permit deadline will be the phase completion date for that station. Stations will be required to abide by the deadlines and requirements of the transition scheduling plan. A station that does not comply with the requirements of the plan may be subject to

sanction or other action, as permitted under the Commission's rules. See, e.g., 47 CFR 1.80; 47 CFR 73.3598(e).

As illustrated below, the transition phases will all begin at the same time but will have sequential phase completion dates. Each phase will have a defined "testing period" that ends on the phase completion date. While stations may engage in planning and construction activities at any time prior to their phase completion date, equipment testing on post-auction channels will be confined to the specified testing periods in order to minimize interference and facilitate coordination. Other than for the first phase, the testing period will begin on the day after the phase completion date for the prior phase. The proposed plan is premised on the likelihood that winning go off-air bidders have ceased operations on their pre-auction channels prior to the first transition phase testing period, either because they have relinquished their license and gone off air, or because they have implemented a channel sharing arrangement and are now operating on the shared channel.

Whether a station needs to coordinate with other stations during the testing period will depend on whether it is part of a "linked-station set," that is, a set of two or more stations assigned to the same phase with interference relationships or "dependencies." Section II of Appendix A describes dependencies in detail. Stations that are not part of a linked-station set may operate on their pre-auction channels and test on their post-auction channels during the testing period without the need for coordination. Conversely, stations that are part of a linked-station set must coordinate testing with other stations in the set so as to avoid undue interference and must transition to their post-auction channels simultaneously. In order to facilitate coordination, linked-station sets will be identified in the Closing and Reassignment PN. The graph below illustrates a hypothetical phased transition schedule under the Bureau's proposed approach. The relatively longer test period for stations in phase 2 is a result of the fact that this is the first phase in which "complicated" stations can be assigned. Thus, it is likely that there will always be a longer test period for stations. [Illustration Omitted]

Phase Assignment and Scheduling Tools. The Bureau proposes to use two computer-based tools to establish a phased transition schedule. Consistent with the Commission's direction, we believe that these two tools will allow the Bureau to establish a transition schedule that takes into account the complexity of stations' individual circumstances, allocates resources fairly, and balances forward auction winners' needs with those of transitioning broadcasters. The first tool is the Phase Assignment Tool, which will assign television stations to transition phases. The Phase Assignment Tool is intended to group stations together in a way that will support an orderly, managed transition process based on a set of enumerated constraints and objectives. The second tool is the Phase Scheduling Tool, which will estimate the time required for stations in each phase to complete the tasks required to transition in light of resource availability. The Bureau will use the Phase Scheduling Tool to guide it in establishing phase completion dates for each phase. [Illustration Omitted].

We propose to use mathematical optimization techniques in the Phase Assignment Tool to assign stations to transition phases based on a defined set of constraints and objectives. We propose specific constraints and objectives, including the priority of the objectives, in Appendix A. We believe that the constraints and objectives proposed will result in a solution that minimizes dependencies created by interference issues, ensures that the 600 MHz Band is cleared as expeditiously as possible, clusters groups of stations into the same phase to help manage scarce transition resources, and minimizes the impact of the transition on consumers.

After stations are assigned to phases, the Bureau proposes to use the Phase Scheduling Tool to help determine the phase completion date for each phase. By modeling the tasks required to complete the transition, and accounting for limited resources, this Tool estimates the total time necessary for stations within a phase to complete the transition process.

The Phase Scheduling Tool accounts for limited resources by constraining the amount of such resources available to stations within a phase at any given time. If a required resource is unavailable, the stations will obtain access to the required resource according to their "simulation order," and the Tool will estimate the time required for all stations to complete the transition phase based on that order. The Bureau proposes to run the Phase Scheduling Tool with different simulation orders to produce a range of estimated times for each transition phase. By generating results for multiple simulation orders, the Tool produces a range of estimated completion times for each phase. The Bureau will use the resulting range of estimated times to guide its determination of a phase completion date for each transition phase.

Appendix A details the specific tasks or processes that we propose to model in the Phase Scheduling Tool for each stage of the transition process, as well as the estimated time and resource availability for each task. The proposed estimates are based on information from the Widelity Report, submissions from stakeholders, and informational discussions with tower crew companies, antenna and transmitter manufacturers, and broadcasters. We believe that the proposed estimates are conservative and reasonable.

Other Issues. Before transitioning to their post-auction channels, stations ideally should be able to test equipment on their new channels. During the transition, however, many stations would likely cause undue interference to one another if they test or operate on their post-auction channels without first coordinating with large numbers of other stations to avoid causing such interference. Appendix A sets forth in detail the results of the staff's analysis and modeling of transition-related interference relationships between stations.

The Commission has in the past allowed temporary increases in interference to broadcasters in order to facilitate transitions to new services. For example, the Commission permitted new wireless licensees in the 700 MHz Band to cause temporary increases of up to 1.5

percent interference to broadcasters. Qualcomm Order 21 FCC Rcd 11683 (2006). In doing so, the Commission balanced "the public interest benefits of an accelerated deployment in the 700 MHz Band against the importance of sustaining a minimally disruptive transition to DTV for consumers" and emphasized that it has a "forward-looking preference toward those services that are the end-points" of the transition. Qualcomm Order 21 FCC Rcd at 11697, para. 31. In addition, the Commission permitted three-way band clearing agreements that could result in up to two percent temporary interference to the population served of stations that were not parties to the agreement. See Upper 700 MHz Band 3rd R&O, 66 FR 10204, February 14, 2001; Upper 700 MHz Band Recon Order, 66 FR 51594, October 10, 2001. The Commission rejected broadcasters' arguments that the two percent standard was inappropriate because the interference permitted would be for the benefit of new wireless licensees and not broadcasters' efforts to transition to DTV, explaining that clearing the 700 MHz band was an integral part of the DTV transition.

The staff's analysis indicates that allowing temporary pairwise interference increases above the 0.5 percent authorized by the rules governing permanent interference, 47 CFR 73.616(e), is likely to significantly reduce inter-dependencies between stations, thereby reducing the amount of coordination needed to allow testing of a station's post-auction facility. During the post-auction transition the percentage of increased pairwise interference is relative to a station's pre-auction baseline interference-free population. We propose during the transition to allow temporary pairwise interference increases of up to two percent, which we believe will produce substantial benefits without undue disruption to television service during this limited period. Pairwise interference increases beyond the 0.5 percent permitted by the Commission's rules will not be permitted past conclusion of the post-auction transition period. Temporary pairwise interference increases of up to 2 percent could occur at any time during the transition on

either a station's pre-auction and post-auction channels. It could affect both reassigned stations and those that will remain on their pre-auction channels.

Another means of reducing the size or number of linked-station sets, and facilitating a station's ability to operate on its pre-auction channel while testing on its post-auction channel, would be to assign some stations to temporary channels during the transition. A station assigned to a temporary channel would have to transition twice: once to its temporary channel and then to its post-auction channel during a later transition phase. We do not propose to assign temporary channels as part of the phased transition scheduling plan. We tentatively conclude that the benefits of using temporary channels are not great enough to warrant their use in light of the potential burdens. For example, using temporary channels would require stations to move twice, which may confuse viewers. Stations would also need to acquire additional equipment, which would place additional demands on resources and increase overall transition costs. Nevertheless, we invite comment on using temporary channel assignments and on issues that would be raised if we were to do so. Whether we ultimately decide to use temporary channels as part of the phased transition scheduling plan depends on how the record develops and whether we adopt other, effective means of reducing the number and size of linked-station sets.

Should we decide to use temporary channel assignments, we tentatively conclude that temporary channels may be assigned to full power or Class A stations and may be located anywhere in the post-auction VHF or UHF television bands, as well as in the new 600 MHz wireless band. Temporary channel assignments would replicate pre-auction coverage area and population served and would be listed in the Closing and Reassignment PN along with ultimate post-auction channel assignments. A station would only be assigned a temporary channel within its post-auction band. We propose to limit such assignments to stations in complex "cycles" of inter-dependency, which are discussed in detail in Appendix A. We also propose to limit such

assignments to channels that are close to a stations' ultimate channel assignments, and to relatively low power stations (e.g., Class A stations or other stations similar in power), in order to limit the associated burdens and costs. Because we anticipate that stations would need to commence operations on temporary facilities early in the transition, we propose to require that stations assigned to temporary channels apply for special temporary authority (STA) within 90-days of the release of the Closing and Reassignment PN. A licensee that is assigned a temporary channel must comply with all filing and notification requirements, construction schedules, and all other post-auction deadlines that would apply to construction of the station's ultimate post-auction facility. We do not believe that requiring broadcasters to license their temporary channel facilities is appropriate in light of the temporary nature of the operations.

If we decide to use temporary channel assignments, we tentatively conclude that stations will have must-carry rights on their temporary channels. We believe the statute may reasonably be interpreted to extend such rights. Section 614 of the Communications Act of 1934, as amended, defines an eligible full-power television station entitled to must-carry as one that is "licensed and operating on a channel regularly assigned to its community by the Commission that, with respect to a particular cable system, is within the same television market as the cable system." Consistent with the broad definition of "license" in section 153 of the Act, we believe the term "licensed" in this context may be interpreted to include an STA. We also believe that the term "channel regularly assigned to [the station's] community by the Commission" in this context may be interpreted to encompass a temporary channel assignment. While this language could be read to refer to a channel allotted to a particular community in the DTV Table of Allotments (DTV Table), the FCC has explained that it "will not use a codified Table of Allotments or rulemaking procedures to implement post-auction channel changes." IA R&O 79 FR at 48491. During the post-auction transition period, therefore, temporary or permanent

channels will be "regularly assigned" to communities on a case-by-case basis in response to applications rather than by amending the DTV Table. Further, as a practical matter, channels assigned on a temporary basis would enable stations to serve the same coverage area and population as they did on their pre-auction channels, meaning that the stations will continue to serve the same communities of license set forth in the Table as they did before the auction.

We do not believe that MVPDs would be unduly burdened by extending must-carry rights to stations on temporary channels. MVPDs are eligible for reimbursement when they "reasonably incur costs in order to continue to carry broadcast stations that are reassigned as a result of the auction." IA R&O 79 FR at 48497. Such costs include the reasonable costs to set up delivery of a signal that the MVPD is required to carry under the Commission's must-carry rules or under retransmission consent contracts. Under this standard, MVPDs likewise would be eligible for reimbursement of all eligible costs in order to continue to carry a reassigned station operating on a temporary channel. Finally, we believe that extending must-carry rights to a station's temporary facility will further the important interests Congress sought to advance through the must-carry provisions, specifically "preserving the benefits of free, over-the-air local broadcast television and promoting the widespread dissemination of information from a multiplicity of sources." Carriage of Digital Television Broadcast Signals: Amendments to Part 76 of the Commission's Rules, 70 FR 14412, 14418, para. 35, March 22, 2005.

If we decide to use temporary channel assignments, we propose that any temporary channel assignments in the 600 MHz Band would be subject to the inter-service interference (ISIX) protections adopted in the ISIX Third Report and Order, 80 FR 71731, 71736-37, November 17, 2015, as well as the other interference protections provided for in our rules and any temporary pairwise interference adopted for the post-auction transition. Although STA operations are not protected against interference under our normal rules, we believe that the

public interest would be served by extending the same protections to temporary channels that would apply to any licensed facility during the post-auction transition. In addition, a full power or Class A station operating on a temporary channel could displace a low power television (LPTV) station. Consistent with the Commission's previous interpretation, section 336(f)(7)(B) of the Act would not apply to temporary channel assignments for Class A stations for purposes of the post-auction transition because these temporary channels will be assigned by the Commission, not proposed by Class A licensees. See IA R&O 79 FR at 48463; 47 U.S.C. 336(f)(7)(B). We propose that an operating LPTV station displaced by a temporary channel assignment could file for a new channel during the post-auction LPTV displacement window. Alternatively, displaced LPTV stations could go silent or seek temporary authorization to operate its facility at variance from its authorized parameters in order to prevent interference. Depending on the station's proximity to Mexico or Canada, coordination approval may be required from that particular country.

The Commission anticipated the possibility of using temporary channels to facilitate the transition and stated that the reasonably incurred costs of equipment needed to move to temporary channels are eligible for reimbursement. IA R&O 79 FR at 48501. Thus, such costs would be eligible for reimbursement in the same manner as costs related to construction of permanent post-auction channel facilities. As discussed above, MVPDs likewise should be eligible for reimbursement of all eligible costs in order to continue to carry a reassigned station operating on a temporary channel.

As explained above, the Closing and Reassignment PN will announce the transition phase, phase completion date, and testing period for each reassigned station. We recognize that individual stations may wish to raise concerns regarding their particular phase assignments, phase completion dates, and/or testing periods once the Closing and Reassignment PN is

released. In considering any such concerns, we must be mindful of the potential impact of requests for changes or adjustments on other stations and on the overall phased transition schedule. While we tentatively conclude that we will rely on existing rules and procedures to address any such concerns, we also seek comment on whether to establish an alternative process. If we take the former approach and allow stations to challenge the PN as it impacts them, should we waive any rules or procedures in order to facilitate the transition?

We recognize that some stations may seek to construct an expanded facility or alternate channel that differs from the technical parameters assigned in the Closing and Reassignment PN. Further, during the transition period some stations may request extensions of their construction deadlines and may seek authority to continue operating on their pre-auction channel after their phase completion date. While a station may request an extension of its construction permit deadline as set forth in 47 CFR 73.3700(b)(5), grant of such a request only permits the station additional time to complete its construction on its final channel and does not permit a station to continue operating on its pre-auction channel. In order to do so a licensee must request special temporary authority (STA). In evaluating any such requests, we propose to examine the impact that grant of the request would have on the phased transition schedule; for example, by evaluating whether such modification may create new or affect existing dependencies (i.e., daisy chains or cycles). Any requests for expanded facilities or alternate channels by stations in the border regions with Mexico or Canada will require coordination approval from the country in question. The Bureau will view favorably requests that are otherwise compliant with our rules and have little or no impact on the phase assignments or transition schedule. If an application for an alternate channel or expanded facilities is granted, the initial deadline listed in the construction permit for the alternate channel or expanded facilities will be the same as the deadline in the station's initial construction permit. Thus, any station requesting an expanded

facility or alternate channel will be required to abide by the construction deadline and other transition schedule requirements applicable to the phase to which the station is assigned unless otherwise modified by the Bureau. Any request that the staff determines would be likely to delay or disrupt the transition, such as by causing pairwise interference above two percent to another station, creating additional linked-station sets, necessitating another station move to a different transition phase, or that is likely to cause a drain on limited transition resources required by other stations, will be viewed unfavorably. The Bureau will view requests that have such adverse effects on the transition schedule more favorably if the requesting station demonstrates that it has the approval of all the stations that would be affected if the request were granted, or it agrees to take steps during the transition period to mitigate the impact of the proposed request—such as by accepting additional levels of temporarily increased interference or operating at variance from its pre-auction licensed parameters (i.e., operating with reduced facilities). After evaluation, the Bureau may choose to modify transition phase assignments and construction deadlines to enable grant of a request. If the Bureau determines that granting a particular request would not cause adverse effects on the transition schedule, or that granting a request would be beneficial to the transition plan, the Bureau may adjust the phase assignment of the requesting station, or if necessary, other stations as well. However, we propose that no station will be assigned to an earlier transition phase than it was originally assigned to without its consent. To the extent that the Bureau denies a request for a station to continue operating on its pre-auction channel past its phase completion date, the Bureau will work with the impacted licensee to remain on-air while construction of its post-auction facility is completed. Each circumstance will be evaluated on a case-by case basis.

Commenters should be mindful that Commission rules prohibit broadcasters and forward auction applicants from communicating any incentive auction applicant's bids or bidding

strategies to other parties covered by the relevant rules. See 47 CFR 1.2205(b)(1), (c)(1), (c)(6)(ii). The relevant prohibitions will apply prior to, during, and after the period for comment. The prohibition covers related parties, as well as covered broadcast licensees and forward auction applicants. 47 CFR 1.2205(a)(1) and 1.2105(c)(5)(i).

We previously have cautioned that statements to the public may create a risk of prohibited communications when the public statement should be expected to result in a communication that violates the rule. Accordingly, comments submitted to the Commission may violate one of the prohibitions even though not made directly to another party covered by the rule. Moreover, a communication that does not explicitly state a bid or bidding strategy but conveys information that leaves little doubt about an incentive auction applicant's bids and bidding strategies may violate the rule regardless of the communicating party's intent.

A covered party may also violate the prohibition any time it conveys information that might communicate known past or future bids or bidding strategies of any other covered party. Information regarding past, as well as future, bids and bidding strategies is covered by the prohibitions. Furthermore, the prohibitions apply to more than a party's desired auction outcome and steps the party has taken or will take to achieve it. The fact that a party is not communicating its own bids or bidding strategies, or is communicating only the irrevocable results of another's bids or bidding strategies, will not preclude the statements from violating the prohibition. For example, a broadcaster that is not participating in the auction may not communicate that a prospective channel sharing partner no longer will need to share with it because it has exited the auction. Similarly, a forward auction applicant whose initial eligibility has decreased may not communicate that it has foregone prior plans to pursue particular markets due to reduced eligibility.

These prohibitions should not, however, preclude any party from addressing relevant issues regarding the post-auction transition. Until the final stage rule is met, all broadcasters reasonably might be expected to plan for a potential relocation to a new channel in their pre-auction band, regardless of participation in the reverse auction or current bidding status. Statements of general applicability, not related to a particular broadcaster's circumstances or a forward auction applicant's plans, generally should not disclose any incentive auction applicant's bids or bidding strategies. Furthermore, given that public statements regarding whether or not a broadcaster applied to participate in the incentive auction are not deemed to violate the rule, a broadcaster that has disclosed that it did not apply to participate will not disclose bids or bidding strategies by discussing the details of its own transition. For reasons already discussed, such a broadcaster that may share its post-auction channel with an auction participant must, however, exercise caution to avoid disclosing the bids or bidding strategies of its prospective channel partner. This is true with respect to statements regarding the technical interdependencies to be considered by the Phase Assignment Tool or the resource constraints relevant to the Phase Scheduling Tool, even if the statements might be applicable to the station's individual transition as well. A party's statements of general applicability will not violate the prohibition solely because they are consistent with its bids or bidding strategy. Rather, to be prohibited, statements must communicate bids or bidding strategies, either directly or by leaving little doubt regarding what they are, regardless of the lack of a direct statement.

Administrative Matters. The proceeding shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's ex parte rules. See 47 CFR 1.1200 et seq. Persons making ex parte presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral ex

parte presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the ex parte presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during ex parte meetings are deemed to be written ex parte presentations and must be filed consistent with section 1.1206(b) of the rules. In proceedings governed by section 1.49(f) of the rules or for which the Commission has made available a method of electronic filing, written ex parte presentations and memoranda summarizing oral ex parte presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable.pdf). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules.

This document does not contain proposed information collection(s) subject to the Paperwork Reduction Act of 1995, 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, see 44 U.S.C. 3506(c)(4).

The Regulatory Flexibility Act of 1980, as amended (RFA), requires that a regulatory flexibility analysis be prepared for notice and comment rule making proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a

substantial number of small entities." See 5 U.S.C. 603. The RFA, see 5 U.S.C. 601 through 612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996). The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act. 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). Written public comments are requested on the IFRA, and must be filed in accordance with the same filing deadlines as comments on the Public Notice, with a distinct heading designating them as responses to the IRFA. With respect to the Public Notice, an Initial Regulatory Flexibility Analysis (IRFA) under the Regulatory Flexibility Act is contained in Appendix B of the document.

Appendix A: Phase Assignment and Scheduling Tools

Appendix A sets forth a proposed methodology for assigning construction deadlines to stations based on the staff's analysis and the record developed to date. Potential "dependencies," or interference relationships, between certain television stations on pre-auction and post-auction channels will impact the transition process. As the Commission recognized, stations with dependencies must coordinate in order to test equipment or begin operating on their new channels without causing interference. Coordination may involve stations agreeing to operate at lower power or accept increased interference for short periods of time while the stations involved are performing tests. Dependencies can involve numerous and/or distant stations, however, making successful coordination extremely challenging. The FCC staff has analyzed these dependencies to develop a means of breaking them in order to reduce the need for coordination

and to make remaining coordination more manageable. These possible solutions that were considered include assigning stations to separate "transition phases," allowing temporary interference increases, and assigning stations to temporary channels.

Under this proposal, stations would be assigned to a limited number of transition phases. The phases will begin at the same time, but have sequential end dates. Equipment testing on post-auction channels will be confined to set "testing periods." With the exception of the first phase, the testing period for subsequent phases will begin on the day after the end of the preceding phase. Every station must cease operating on its pre-auction channel at the end of its assigned phase, also known as the "phase completion date."

The proposed methodology would utilize two computer-based tools to assign stations to phases and establish phase completion dates for each phase. First, stations would be assigned to phases using the Phase Assignment Tool, which applies optimization techniques to identify, among solutions that satisfy a set of defined rules or constraints, a solution that best meets a separate set of defined objectives. After stations are assigned to phases, the Phase Scheduling Tool would be used to help determine the phase completion date for each phase.

With the information provided in this Appendix, interested parties will have sufficient information to replicate the methodology proposed for determining the overall transition schedule. The Phase Assignment Tool implements the objectives and constraints described in this Appendix using commercially-available optimization software. The Phase Scheduling Tool leverages an open source discrete event simulation software package using inputs described in detail in this Appendix. The data presented in this Appendix is the output of applying this methodology to representative final television channel assignment plans for 114 MHz and 84 MHz spectrum clearing scenario and also making certain assumptions regarding Canada and Mexico based on ongoing coordination with those countries. As used herein, "representative"

means consistent with the plans generated by the Commission's Final Television Channel Assignment Plan determination procedure based on numerous auction simulations conducted by the staff. The clearing target for Stage 2 of the auction has now been set at 114 MHz. We therefore are using 84 MHz and 114 MHz as representative examples. We note that we do not anticipate publicly releasing these plans or the underlying simulations, consistent with our practice in this proceeding of releasing such information as appropriate in the interest of transparency and in consideration of the ongoing, internal deliberations regarding it, as well as broadcasters' confidentiality interests in reverse auction participation. Interested parties can create their own television channel assignment plans for any spectrum clearing scenario by applying the Assignment Plan determination procedure to auction simulations based on their own assumptions of likely outcomes.

Section II: Dependencies and Means of Breaking Them. Before transitioning to their post-auction channels, stations ideally should be able to test equipment on their new channels. During the transition, however, there is a potential for undue interference between stations that are still operating on their pre-auction channels and stations testing or operating on their post-auction channels. The Commission's rules governing interference between stations before and after the post-auction transition will prevent undue interference between stations operating on their pre-auction channels and between stations operating on their post-auction channels, respectively. In developing a proposed transition plan, the staff has sought to avoid undue interference while providing as much flexibility as possible for stations to test equipment prior to commencing operations on their new channels. The staff's "Precedence Daisy-Chain Graph" explicitly captures any interference that may occur between stations operating on their pre-auction and post-auction channels.

The Graph is constructed as follows: nodes are stations and a directed arc connects two nodes (say s and s') when station s cannot transition until station s' has transitioned to its post-auction channel because the current channel of station s' interferes with the future channel of station s. This relationship is called a dependency.

Example 1: Dependency. [Illustration Omitted]. Suppose Station A and Station B have co- and adjacent-channel interference restrictions on all channels. Station A is reassigned from channel 25 to channel 18. Station B is reassigned from channel 45 to channel 26. Station A must vacate channel 25 before Station B can move to channel 26 so that neither station will experience undue interference. Therefore, the graph includes a directed arc from Station A to Station B since Station A must transition before Station B (Station B is dependent on Station A in order to transition).

Example 2: Daisy-Chain. [Illustration Omitted]. Multiple dependencies can be connected, forming a daisy-chain. Example 2 illustrates a daisy chain of 4 stations. Station A must transition before Station B. Station B must transition before Station C. And Station C must transition before Station D. Thus, Stations A, B, and C all must transition before Station D can transition.

Daisy-chains can involve numerous stations and multiple transition dependencies. Figure 1 below illustrates a single daisy-chain involving 29 stations in the Northeast in a simulated outcome where the Commission repurposes 84 MHz of broadcast spectrum through the incentive auction. [Figure 1 Omitted]

Successful coordination to avoid undue interference among the stations illustrated in Figure 1 is likely to be extremely challenging, given the number of stations involved and their distance from one another. In order to reduce or eliminate the need for coordination, the chain could be broken by assigning stations to transition during different time periods or phases. At

least 29 separate transition phases would be needed to break the chain completely so that every station in the chain could transition without the need for coordination. A large number of transition phases may undercut other potential transition goals, however, such as transitioning stations within the same region at the same time and avoiding the need for multiple channel rescans by viewers. In order to balance these goals, a certain number of stations within a daisy chain may be assigned to the same transition phase, thereby "collapsing" the daisy chain into a more manageable size. For example, the first five or ten stations in the 29-station daisy chain illustrated above could be assigned to the first transition phase. Each station in this collapsed daisy chain would have to coordinate with one or more of the other stations in the chain in order to test their equipment without undue interference. Moreover, as illustrated by Example 3 below, the staff's analysis indicates that certain dependencies, known as "cycles," cannot be broken by assigning stations to different transition phases.

Example 3: Cycle. [Illustartion Omitted]. Example 3 shows a cycle consisting of three stations. Station A needs to transition from channel 20 to channel 17; while Station B needs to transition from channel 28 to channel 20; while Station C needs to transition from channel 17 to channel 28. Because all three stations cannot operate on either channel 17, channel 20, or channel 28 simultaneously, they must transition from their pre-auction to their post-auction channels simultaneously in order to commence operation on their post-auction channel. They must also coordinate in order to test equipment on their post-auction channels without causing increased interference to one another. In such circumstances, the dependencies between stations cannot be broken by assigning stations to different transition phases. On the other hand, assigning the stations to the same transition phase may facilitate their ability to coordinate with one another.

Cycles of much greater complexity than Example 3 are likely to occur during the post-auction transition process. Figure 2 below shows another simulated outcome in which the auction repurposes 84 MHz of broadcast spectrum. The cycle consists of 196 stations and reaches from the Southeast region of the United States through the Northeast and into Canada. [Figure 2 Omitted].

The problem becomes more complicated when all dependencies are considered. Daisy-chains can intersect and overlap, creating a larger and more complicated daisy-chain. A cycle can also be part of a daisy-chain. Thus, hundreds of stations may be inter-dependent and one station may require tens (or even hundreds) of stations to transition first in order to be able to begin operating on its post-auction channel. Figure 3 below shows another simulated 84 MHz outcome with a set of 796 inter-dependent stations. [Figure 3 Omitted].

As indicated above, transition phases are a potentially useful tool to address dependencies between stations. Stations may be assigned to different phases in order to break daisy chains, or to the same phase in order to facilitate coordination by stations involved in a cycle, or to achieve other goals. We refer to inter-dependent stations assigned to the same phase as a "linked-station set" and the individual stations in the linked-station set as "linked-stations."

Another means of breaking dependencies is to allow temporary, limited increases in station-to-station (pairwise) interference that exceed the 0.5 percent allowed under the Commission's rules governing pre-auction and post-transition interference relationships. As discussed in the Public Notice, the Commission has previously allowed such temporary increases in pairwise interference above the 0.5 percent threshold in order to facilitate spectrum transitions. As shown below, the staff's analysis indicates that allowing temporary, limited increases in pairwise interference would significantly reduce the number of dependencies between stations and in turn reduce the size, number, and complexity of daisy chains and cycles. Additionally, the

staff's analysis indicates that allowing temporary, limited increases in pairwise interference would not result in significant aggregate interference increases.

Another means of breaking dependencies would be to assign stations in complicated daisy chains or cycles to operate on temporary channels prior to transitioning to their post-auction channels. Stations assigned to temporary channels would have to "move" twice, first to their temporary channels and then to their ultimate post-auction channels. Below we illustrate how temporary channel assignments could be used to break large cycles.

Example 4: Temporary Channels. [Illustation Omitted]. In Example 4, nine stations are part of a complicated cycle and must coordinate their testing because no station can broadcast on its post-auction channel without causing undue interference with at least one other station in the set. However, if two of these stations are assigned to temporary channels (Station C and Station G), then the cycle is transformed into a collection of daisy chains in which stations at the same level of a daisy chain need not coordinate with one another in order to test equipment or operate on their post-auction channels. Since the longest chain in this example has five levels, stations could be assigned to five phases based on how far they are (in the dependence graph) from the stations placed on temporary channels.

Section III- The Phase Assignment Tool. Under the proposed methodology, stations would be assigned to a limited number of transition phases. Every station in a phase must cease operating on its pre-auction channel at the end of the phase, i.e., the phase completion date. Stations would be assigned to phases using the Phase Assignment Tool. This Section discusses the Phase Assignment Tool as well as the proposed constraints (i.e., rules by which all assignments generated by the proposed tool must abide) and objectives (i.e., goals when creating the assignments). We begin by proposing specific constraints and objectives, followed by a

discussion of the results of staff analysis illustrating the rationale underlying the proposal and the tradeoffs involved in choosing among different constraints and objectives.

Proposed Constraints and Objectives. Based on the staff's analysis and the record developed to date, we propose the following constraints and objectives in assigning stations to phases.

Constraints: (1) A station cannot cause more than two percent new interference to another station during the transition. As discussed above, we believe that it is important both to avoid undue interference during the transition and to provide stations with as much flexibility as possible to test equipment on their post-auction channels before transitioning. Although stations may be able to achieve these goals through coordination, coordination may not be feasible in situations involving large-scale and complex dependencies among stations. As discussed in more detail in the next section, the staff's analysis indicates that allowing temporary, limited increases in pairwise interference would reduce the number and complexity of dependencies without resulting in significant aggregate interference increases. Doing so is also likely to promote other potential goals, such as prioritizing the clearing of the 600 MHz Band and reducing the number of channel rescans. Although allowing higher levels of temporary interference—up to five percent—would further reduce dependencies, our proposal to allow no more than two percent represents a compromise between avoiding what the Bureau believes would cause undue interference and limiting dependencies. This proposal assumes that all winning bidders affecting the first phase of the transition who have agreed to go off-air completely, or that become a channel sharee of another station with a post-auction channel assignment, will have gone dark before the stations in the first transition phase begin testing of their equipment (e.g., two months before the end of the first transition phase). This assumption is reasonable given the expected timeline for paying winning stations and the estimated time for the first phase to complete.

(2) No stations in Canada will be assigned to transition before the third transition phase and no Canadian stations will be assigned to a temporary channel. Due to dependencies between domestic and Canadian stations, a joint transition plan with Canada is necessary and is being developed by FCC and ISED. In keeping with our informal discussions with ISED Canada to date, stations in Canada have generally been assigned to later transition phases for this proposal. This constraint will promote efficient use of cross-border resources and respect the minimum notification periods to Canadian TV stations established in ISED's 600 MHz decision.

(3) There will be no more than 10 transition phases. While increasing the number of phases could decrease the number of linked-station sets in each phase, a large number of phases may undercut other transition goals, such as transitioning stations within the same region at the same time and avoiding the need for multiple channel rescans by viewers. We also believe that limiting the number of phases will facilitate monitoring of the transition process. We believe that limiting the number of transition phases to 10 strikes a reasonable balance between these goals. Canadian stations not impeding the transition of U.S. stations may be permitted to continue to operate beyond the 10th phase based on rules to be established in Canada.

(4) No U.S. stations will be assigned to temporary channels. Although we do not propose to assign stations to temporary channels, the attached PN invites comment on whether we should use temporary channels. In the event that temporary channels are used to reduce dependencies we propose to potentially apply one or more of the following additional constraints: (a) Only assign temporary channels to stations in complex dependencies. (b) Only assign temporary channels to stations that are in close proximity to the stations' ultimate post-auction channel assignments. As stated above, temporary channel assignments would requires stations to move twice. Requiring that the temporary channel be "close" to the ultimate channel may reduce the burden and expense associated with double moves. If such an approach is considered, we seek

comment on what the definition of "close" should be. (c) Only assign temporary channels to stations with relatively low power (e.g., Class A stations). This constraint could limit the cost of the purchase of broadband antennas that would be necessary for stations that must move twice. If such an approach is considered, we seek comment on what the definition of a "relatively low power" should be with regard to a Class A or full power station.

(5) All stations within a DMA will be assigned to no more than two different transition phases. While some parties have suggested that the Bureau could divide the country into specific regions for the transition, it is not possible to create a wholly regionalized plan that will respect interference constraints because the interference constraints create dependencies that may overlap geographic areas. The proposed DMA constraint provides similar benefits to those that would come from a purely regional approach. For example, taking a station's DMA into account clusters stations in a particular geographic area into the same transition phase. Doing this will make resource allocation more efficient—for instance, tower crews would be able to focus on multiple stations in a specific area during a single phase. Additionally, the constraint will benefit consumers by limiting the number of rescans the consumer will have to complete because of the transition. While this constraint potentially increases the number and/or size of linked-station sets within a transition phase, on balance we believe that the benefits to consumers and stations outweighs the burden caused by this constraint. Limiting each DMA to a single transition phase results in approximately two-thirds of all stations having to transition in the same phase, removing the benefits of a phased transition approach.

(6) The difference in the number of stations in the largest transition phase and the smallest transition phase will be no more than 30 stations. If it is not feasible to assign stations in such a way that the difference in the number of stations in the largest transition phase and the smallest transition phase is less than or equal to 30 stations, then an optimization will be

performed minimizing the difference between the largest transition phase and smallest transition phase, and subsequent optimizations will be limited to no more than 1.1 times the number found in this optimization. This constraint will attempt to make the number of assigned stations in each of the phases somewhat equal, which in turn will help manage limited resources by ensuring that they can be spread more evenly across the transition phases.

(7) Every transitioning station will be assigned to one transition phase.

(8) No phase can have more than 125 linked-stations. The dependencies created by the interference constraints can affect a large number of stations across large geographic areas. This constraint will limit the effect of those dependencies and, to the extent that coordination is needed, facilitate a manageable transition process for broadcasters. Based on staff analysis, we believe the proposed 125-station limit strikes a balance between minimizing dependencies and other goals. If it is not possible to limit the number of linked-stations in a phase to 125, then we propose to apply an objective of minimizing the maximum number of linked-stations in any phase, and constrain all phases to no more than 1.2 times that maximum number.

(9) No station falling into the "complicated" category for purposes of the Phase Scheduling Tool can be assigned to Phase 1. The goal of this constraint is to allow adequate time to transition the most challenging stations and to prevent an early phase completion date to be delayed due to the most time consuming transitions.

Objectives: In order to identify a solution that best satisfies the Commission's transition goals, we propose to apply the following objectives to assignments or "solutions" identified by the Phase Assignment Tool that satisfy the constraints proposed above. The Phase Assignment Tool would prioritize the proposed objectives in the sequence listed below. Subsequent objectives would be constrained by prior objectives.

(1) Assign U.S. stations whose pre-auction channels are in the 600 MHz Band to earlier phases in order to clear the 600 MHz Band as quickly as possible, while simultaneously assigning all Canadian stations and U.S. stations whose pre-auction channel is in the remaining television bands (U.S. TV-band stations) to later phases, where possible. This objective would promote a number of goals. It would help to clear the 600 MHz Band first in order to open it up to wireless licensees to offer new innovative services. It would also prevent Canadian and U.S. stations from competing for limited resources and provide Canada with the time needed for its transition. The Phase Assignment Tool therefore gives weights to assignments where there are stations transitioning from the 600 MHz Band after transition Phase 8. Similarly, the Phase Assignment Tool gives weights to assignments where Canadian stations as well as U.S. TV-band stations are assigned to any transition phase earlier than Phase 9. The weights for stations not transitioning out of the 600 MHz Band before Phase 9 is significantly higher than the weights for U.S. TV-band stations or Canadian stations transitioning early. We propose the following weights to assignments: U.S. stations in the 600 MHz Band assigned to phase 9 would add a weight of 20; US stations in the 600 MHz Band assigned to phase 10 would add a weight of 200; US TV-band stations and Canadian stations assigned before phase 9 would add a weight of 1. The Phase Assignment Tool minimizes the sum of all weights incurred by the phase assignments.

(2) Minimize the sum, over all DMAs, of the number of times a DMA must rescan. This objective benefits consumers by minimizing the number of rescans necessary by viewers in a market and creates regionalized clusters that will make resource allocation more efficient. As in constraint #5 proposed above, the use of DMAs attempts to provide similar benefits to those that would flow from a purely regional approach.

(3) Minimize the total number of linked-stations. This proposed objective is different than constraint #8 proposed above, in that it would minimize the total number of linked-stations throughout all phases of the transition. This objective seeks to provide as many stations as possible with the ability to test their equipment on their post-auction channel while simultaneously broadcasting on their pre-auction channel without the need to coordinate.

(4) Minimizing the difference between the number of stations in the largest transition phase and the smallest transition phase. Like constraint #6 proposed above, by minimizing this maximum difference, this objective attempts to reduce below 30 the maximum difference between the number of stations in different phases. We believe that evening out the number of stations assigned to each transition phase will help manage limited resources by ensuring that they can be spread more evenly across the transition phases.

We seek comment on these proposed constraints and objectives. Although the Phase Assignment Tool can enforce any of these constraints and objectives, some conflict with others and cannot be imposed simultaneously and others will have no impact on the solution if placed after a preceding objective.

The Phase Assignment Tool could also be used during the transition to modify phase assignments. We recognize that unforeseen events may occur during the transition that may warrant adjustments in order to ensure that the transition proceeds in a timely fashion. If we decide to use the Phase Assignment Tool during the transition to modify phase assignments, we propose to restrict reassignments to later transition phases in order to provide certainty to stations that any adjustments will not require them to transition earlier than their originally scheduled phase completion date.

Preliminary Results of Staff Analysis- Baseline Results. This section presents results from running the Phase Assignment Tool using representative final channel assignment plans,

for both a 114 MHz and an 84 MHz spectrum clearing scenario. In each scenario, all of the constraints proposed above are satisfied and the proposed objectives were applied. We assumed that Canadian stations will be jointly transitioning with U.S. stations. All Canadian stations are included in the studies. Those stations that will remain on their channel but be required to convert to digital are not reflected at this time. However, the final joint transition plan and schedule will include all analog and digital Canadian stations. We also assumed that Mexican stations will have already completed their transition to their new channels below channel 37 prior to the end of the first phase.

Figures 4 and 5 below present histograms for the 114 MHz and 84 MHz cases, respectively, showing the total number of stations that transition in each phase and within each phase how many are (a) Canadian stations, (b) U.S. stations whose pre-auction channel is in the 600 MHz Band and (c) other U.S. stations. The figures show that the 600 MHz band is mostly clear of U.S.-based impairments by the end of Phase 8. Also, very few Canadian stations are assigned to early transition phases. Those Canadian stations that are assigned to early transition phases must transition earlier in order to allow U.S. stations or other Canadian stations to transition. Table 1 illustrates the number of stations that are part of linked-station sets in each of the two scenarios. [Figure 4, Figure 5, and Table 1 Omitted].

Preliminary Results with Modified Constraints. To illustrate the reasons underlying the constraints and objectives proposed above, this section presents comparable results under an 84 MHz clearing target scenario using alternative constraints. We chose to use the 84 MHz clearing target to illustrate these tradeoffs because the results are generally similar to those obtained using higher clearing targets. In this 84 MHz scenario the following constraints were applied instead of the proposed constraints above: (a) instead of not allowing any temporary channel assignments, a small number of temporary channel assignments were allowed; (b) instead of

allowing temporary pairwise interference increases of up to 2 percent, pairwise interference increases were limited to 0.5 percent and, conversely, allowed to go up to 5 percent; and (c) instead of requiring that all stations in a DMA be assigned to no more than two different transition phases, the restriction was tightened to assign all stations within a DMA to the same transition phase and, conversely, loosened to require that all stations in a DMA be assigned to no more than three different transition phases. The results of applying these alternative constraints are shown in the figures and tables below. We invite comment on whether any of these alternative constraints should be adopted.

Temporary Channel Assignments. Figure 6 below shows the impact of allowing 50 temporary channel assignments on the phase size distribution. Table 2 shows how allowing a small number of temporary channel moves can reduce the size of linked-station sets. The results in this table indicate that allowing up to 50 temporary channel assignments is likely to significantly reduce the size of the largest linked-station set, reduce the number of U.S. stations remaining in the 600 MHz Band in Phase 9, and reduce the number of DMAs requiring more than one rescan. [Figure 6 and Table 2 Omitted]

Pairwise Interference. Figures 7 and 8 and Table 3 below show the results if (a) only 0.5 pairwise interference increases are allowed on a temporary basis during the transition and (b) pairwise interference increases up to 5 percent are allowed. Figures 7 and 8 and Table 3 reflect that, as the amount of temporary pairwise interference allowed is increased, more U.S. TV-Band and Canadian stations transition in the final two phases, and fewer DMAs require more than one rescan. As compared to the 0.5 percent results, the higher interference levels substantially reduced the maximum number of linked-station sets. [Figure 7, Figure 8, and Table 3 Omitted]

Staff analysis also indicates that, when pairwise temporary interference is allowed to increase, aggregate interference levels (calculated consistent with the methodology presented in

the Aggregate Interference PN) do not exceed the pairwise limits except for a few cases. In those few cases, the aggregate interference for any one station is never more than double the pairwise limit. Table 4 shows the results of the staff's analysis. [Table 4 Omitted].

DMA Restrictions. Requiring that all stations within a DMA be assigned to the same transition phase resulted in approximately two thirds of all stations being assigned to the same phase. Figure 9 illustrates this result under an 84 MHz scenario. [Figure 9 Omitted]. On the other hand, as shown in Figure 10 and Table 5 below, when stations in the same DMA are allowed to transition in up to three different phases, the number of DMAs requiring more than one rescan actually decreases compared to the baseline run. This is because allowing a few DMAs to be subject to three rescans gives the optimization software more flexibility to improve the percentage of DMAs that only require one rescan. Loosening this constraint also results in more stations moving out of the 600 MHz Band sooner. [Figure 10 and Table 5 Omitted].

Section IV: The Phase Scheduling Tool. After stations are assigned to phases by applying the Phase Assignment Tool described above, we propose to use the Phase Scheduling Tool to help determine the phase completion date for each phase. The Phase Scheduling Tool estimates the total time necessary for stations within a phase to perform the tasks required to complete the transition process. In this section, we discuss the Phase Scheduling Tool and the proposed inputs which include the specific tasks required for stations to transition and the estimated time required to complete each task.

The Phase Scheduling Tool models the various processes involved in a station transitioning to its post-auction channel. It divides these processes into two sequential stages: the "Pre-Construction Stage" and the "Construction Stage." While separate processes within a stage may occur concurrently, such as equipment procurement and zoning applications, all processes within the Pre-Construction Stage must be complete before the station is ready to

move to the Construction Stage. For example, in the model, the process of installing a new primary antenna cannot occur until after the new antenna is manufactured and delivered. A transition phase cannot end until all stations in the model assigned to that phase have completed both stages and are ready to operate on their post-auction channels.

Some processes require specialized resources that may be in limited supply. The Phase Scheduling Tool models these limited resources by constraining the amount available at any given time. If a station needs a constrained resource to complete a process, and the resource is unavailable because other stations are using it, the station is placed in a queue until the required resource is available. As described in more detail below, the processes within each phase are not designed to be a comprehensive listing of every task; we have instead separated those processes which need resources that are most limited in supply and therefore likely will have the biggest impact on scheduling.

In each Stage, the Phase Scheduling Tool uses two inputs: (1) the time it would take for a station to complete the tasks of that stage if all resources are available when needed; and (2) the estimated availability of constrained resources. The Phase Scheduling Tool uses these inputs to calculate how long it will take each station within a transition phase to complete all work associated with both Stages. The output of the Tool is the estimated number of weeks from the start of the transition required for all stations assigned to a phase to complete all of the necessary transition tasks, test equipment on their post-auction channels, and be ready to operate on their post-auction channels.

Since it is not possible to know the exact order stations will begin each process, the Phase Scheduling Tool uses discrete event simulation to model this uncertainty. The Phase Scheduling Tool does assume, however, that a station assigned to an earlier phase will begin its Pre-Construction Stage processes requiring a constrained resource (e.g., ordering an antenna) before

a station assigned to a later phase. By assigning the station order within a transition phase randomly, called the "simulation order," and simulating the transition processes, the Phase Scheduling Tool provides a single estimate of the time to complete each transition phase. By repeating this simulation multiple times with stations in the same phase entering the system in a new random simulation order, the Phase Scheduling Tool produces a range of completion times for each phase. The Bureau intends to use this range in determining appropriate phase deadlines given the composition of the individual stations in each phase.

The Phase Scheduling Tool also enables the staff to analyze the sensitivity of transition phase time estimates based on changes in input data. During the transition, as new information becomes available, the Tool can be rerun to assess the potential impact of unforeseen developments on the overall schedule.

The following subsections detail the specific processes or tasks that we propose to model for each stage, as well as the estimated time and resource availability for each process. The proposed estimates are based on data contained in the Widelity Report, submissions from stakeholders, and informational discussions with tower crew companies, other antenna and transmitter manufacturers, and broadcasters. We believe that the proposed estimates are conservative and that they reasonably capture each aspect of the transition. We invite comment on these proposed inputs. The final subsection shows sample outputs of the Phase Scheduling Tool for the two baseline Phase Assignment Tool runs set forth in the prior section.

Modeling the Transition Stages. As stated earlier, the individual tasks required for a station to complete its transition have been grouped into two stages: the Pre-Construction Stage and the Construction Stage. In the Pre-Construction Stage, a station completes two tasks: ordering and delivery of the main and auxiliary antennas; and administration and planning work, which includes zoning, administration, legal, possible structural tower improvements, equipment

modifications, and other activities. In the Construction Stage, a station completes two additional tasks: construction-related work and tower crew work. This process is shown in Figure 11 below. [Figure 11 Omitted].

The Phase Scheduling Tool groups together all tasks within a stage that can be done regardless of how many other stations are performing similar tasks. However, since there are two constrained resources that are dependent on the actions of others (antenna deliveries and tower crew availability), these tasks are separated out and the model considers how resource availability impacts the total completion time for any station in either stage. We note that there are many other resources that are not specifically identified but are essential to completion of the transition process. Based on the staff's analysis and the record developed to date, resources such as auxiliary antenna manufacturing, transmitter manufacturing, transmission line manufacturing and RF component installers will not affect the time required for a station to complete its transition. The availability and manufacturing capacity of these resources have been identified as being sufficient to fulfill the expected demand during the transition (i.e., these resources have been designated as being "unconstrained") and therefore are not broken out separately in the Phase Scheduling Tool. Instead, as illustrated in Figure 11, the tasks related to these unconstrained resources have been grouped into the general tasks of Administration/Planning, which is within the Pre-Construction Stage, and Construction-related Work, which is within the Construction Stage. The Phase Scheduling Tool uses conservative estimates for the time requirements in order to safely over-estimate the individual needs of each station.

Pre-Construction Stage Inputs. There are two components to the Pre-Construction Stage: (1) the time required for antenna equipment to be ordered, manufactured and delivered (a significant constraint); and (2) the time required for all other planning and administration activities necessary to prepare for construction (called "Administration/Planning"). The

Administration/Planning component includes zoning, administration, legal work, and pre-construction alterations to tower and transmitter equipment. Since administration and planning activities take place in parallel and the activities of one station are unlikely to impact the ability of others to perform the same activities, the model simply estimates the total time needed to complete all of these activities.

The proposed Phase Scheduling Tool categorizes stations based on the difficulty of completing these activities. The Commission used a similar "bucketing" approach for categorizing stations as was used when determining the Final Channel Assignment. Proposed time estimates were derived by taking estimates from Widelity and, where appropriate, adding "slack" time so that the overall estimate of the time required would be a conservative one. The proposed time estimates are shown in Table 6 below. [Table 6 Omitted].

The Administration/Planning time estimate sets the minimum amount of time required for a station to complete the Pre-Construction Stage. While Administration/Planning work is occurring, stations likely will place orders for their main antennas. The proposed time estimates for this component of the Pre-Construction Stage include manufacturing time once the antenna manufacturers receives orders from stations, as well as delivery time. If no station had to wait for its main antenna to be manufactured and delivered, then the maximum amount of time it would take any station to complete the Pre-Construction Stage would be the 72 weeks allotted for the complicated stations to complete their planning activities. However, the ability of manufactures to produce enough antennas may impact the overall schedule. Therefore, the Phase Scheduling Tool includes antenna manufacturing and delivery as a specific resource constraint. Each station within a Transition Phase must receive its antenna delivery in order for it to complete the Pre-Construction Stage.

Stations are divided into two categories, based on the assumption that manufacture and delivery of directional antennas for full power stations will require more time than for non-directional and Class A antennas (of either type). The time estimates shown in Table 7 are based on the assumption that the antenna manufacturers will begin manufacturing antennas as soon as the orders are received unless they are manufacturing at their current capacity. [Table 7 Omitted].

We also propose to include in the Phase Scheduling Tool a specific number of antennas that can be manufactured and delivered at any given time. Based on those numbers, some stations may be able to receive their antenna without waiting for any additional time, but other stations may have to wait for their antennas to be delivered. The Phase Scheduling Tool will place such stations in a queue until the antenna can be delivered, based on the station's assigned number in a simulation order. In addition, the Phase Scheduling Tool will assume that manufacturers have an inventory of 20 antennas at the start of the 39-month transition period, and that capacity will increase over the course of the transition period. These proposed assumptions are listed in Table 8 below. [Table 8 Omitted].

The completion of the Pre-Construction Stage for a given station is the maximum completion time for these two activities – either the time required for Administration/Planning activities or the time required for the manufacture and delivery of the antennas. For stations in early phases, the Pre-Construction Stage is usually the time required for Administration/Planning. For a station assigned to a later phase, the station will likely have completed the Administration/Planning activities before the delivery of its antenna, and therefore, its Pre-construction Stage will be completed when the antenna is delivered.

Construction Stage Inputs. The approach to modeling the Construction Stage is similar to that of the Pre-Construction Phase and consists of two activities: (1) the time to complete all

general facets of construction (called "Construction-Related Work"); and (2) the time required by tower crews to complete installation of equipment on the tower. As with Pre-Construction Stage activities, these activities can occur in parallel but the estimated completion time for the Stage is the time required to complete both these activities. In addition, like the Administration/Planning category in the Pre-Construction Stage, the Construction-Related Work category is a catch-all category of work for the Construction Stage. The estimated time for this activity includes estimates of the time to complete all construction work and associated management and coordination activities. More specifically, Construction-Related Work includes estimates for the time associated with installing the transmitter components, combiners, RF mask filters and the transmission line to the tower base. Construction-Related Work also allows time for any possible installation of liquid cooling systems, AC power, and connection to remote control equipment and input signal connections if required. Finally, Construction-Related Work includes time required for performing any tower modifications and any final testing of the system. Table 9 proposes estimates of the time to complete all work included in the "Construction-Related Work" category. [Table 9 Omitted]

The Construction-Related Work estimates the minimum amount of time required for a station to complete the Construction Stage. The other process in the Construction Stage work is tower work. The time required for tower work is both tower and antenna specific. Table 10 lists the different characteristics that determine the amount of time required to perform tower work. [Table 10 Omitted]. If a station did not need to wait for an antenna crew to become available in order to complete its tower work, then the amount of time the station would take to complete the Construction Stage would be the larger of the time estimated for construction-related work and the time estimated for the station to complete work on its tower. However, not every station will be able to have a tower crew as soon as needed. The Phase Scheduling Tool will place any

station that is waiting for a tower crew to become available in a queue until a crew becomes available, based on the station's assigned number in a simulation order. Stations will be removed from the queue according to their simulation order.

We propose to include in the Phase Scheduling Tool specific estimates regarding the number of available tower crews. The record developed to date reflects different estimates as to the number and types of tower crews that will be available. In light of the variance in these estimates, we propose to place tower crews into three buckets: one for U.S. crews capable of servicing towers that are particularly difficult to work on due to height or location; one for U.S. crews that are capable of servicing easier towers; and one for Canadian crews. U.S. stations on towers that are above 300 feet in height and that are top-mounted or located on a candelabra can only draw from the pool of U.S. crews that can handle such difficult sites. Other U.S. stations can only draw from the other pool of U.S. crews, on the assumption that these difficult site crews will be fully occupied. Canadian stations can only draw from the pool of Canadian crews. It is likely that crews will travel between countries, but separating the crews in this way provides a more conservative estimate of the number of crews available in each country. We expect that the number of crews will increase as the transition proceeds. The specific estimates we propose are set forth below in Table 11. We assume a conservative growth rate in U.S. tower crews of 5%, but no growth in Canadian crews (which is very conservative). [Table 11 Omitted].

Other assumptions incorporated into the proposed Phase Scheduling Tool are: (1) The estimated time required to complete work on a tower is reduced or discounted if more than one station on the tower is transitioning in the same phase. The Phase Scheduling Tool assumes that antenna installations will be performed by a single tower crew at the same time for all stations located on a given tower that are assigned to the same phase. The total estimated time for work on the tower will be the time required for the most difficult station plus 10 percent for the second

station and five percent for each additional station up to an additional 30 percent. Based on informal discussions with industry and the record developed to date, we believe that these proposed discounts are appropriately conservative; (2) The Phase Scheduling Tool assumes that 75 percent of all stations (including those with a licensed auxiliary antenna) will need to install an auxiliary antenna. For each station requiring an auxiliary antenna, one additional week of tower crew time is added to the tower crew time, which is the maximum time required for an auxiliary in Table 10; and (3) Where the estimated time required to complete an entire transition phase is less than four weeks because much of the work (other than transmission testing on the new channel) has already occurred prior to the start date for the testing period of that transition phase, the testing period window is scaled up to allow four weeks for testing.

Sample Output. This section provides sample results of the Phase Scheduling Tool using the baseline Phase Assignment Tool results and the proposed constraints and objectives, as presented in section III above, for simulated auction outcomes involving 114 MHz and 84 MHz clearing scenarios. Although Tables 12 and 13 below show the average number of weeks from the start of the phase to phase completion date, each phase completion date will be listed as a specific date when the final transition plan is released. This outputs of each clearing scenario are represented graphically below in Figures 12 and 13, respectively. As both Figures show, stations within each phase cannot start testing until the prior phase is complete, and all stations within a phase must cease operating on their pre-auction channels by the phase completion date. [Table 12, Figure 12, Table 13, and Figure 13 Omitted].

Appendix B: Initial Regulatory Flexibility Act Analysis

The RFA directs agencies to provide a description of, and where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted. The following small entities, as well as an estimate of the number of such small entities, are discussed

in the IRFA: full power television stations; (2) Class A TV and LPTV stations; (3) wireless telecommunications carriers (except satellite); (4) wired telecommunications carriers; (5) cable television distribution services; (6) cable companies and systems; (7) cable system operators (Telecom Act standard); and (8) direct broadcast satellite (DBS) service

Need for, and Objectives of, the Proposed Rule Changes. The Federal Communications Commission (Commission) delegated authority to the Media Bureau (Bureau) to establish construction deadlines within the 39-month post-incentive auction transition period for television stations that are assigned to new channels in the incentive auction repacking process. Pursuant to the Commission's direction, the Bureau, in consultation with the Wireless Telecommunications Bureau, the Office of Engineering and Technology and the Incentive Auction Task Force, is developing a plan for a "phased transition schedule." The purpose of the Public Notice is to invite comment on the plan.

The Bureau proposes to use a Phase Assignment Tool that will use mathematical optimization techniques to assign stations to one of 10 "transition phases." The phases will have sequential testing periods and deadlines or "phase completion dates." The phase completion date is the last day that a station in its assigned phase may operate on its pre-auction channel. The specific constraints and objectives the Bureau proposed are set forth in Appendix A to the Public Notice.

The Bureau proposes to use a Phase Scheduling Tool to estimate the time required for stations in each phase to complete the tasks required to transition to their pre-auction channels in light of resource availability. The Bureau will use the Phase Scheduling Tool to guide it in establishing phase completion dates for each phase. This is the date by which stations within that phase must cease operations on their pre-auction channels. Appendix A details the specific tasks or processes that the Bureau proposes to model in the Phase Scheduling Tool for each stage

of the transition process, as well as the estimated time and resource availability for each task.

Under the proposed plan, the transition phases will begin at the same time, but will have sequential phase completion dates. Each phase will have a defined "testing period," ending with the phase completion date. For each phase after the first one, the testing period will begin on the day after the phase completion date for the prior phase. The need for a station to coordinate with other stations during the testing period will depend on whether it is part of a "linked-station set," that is, a set of two or more stations assigned to the same phase with interference relationships or "dependencies." Stations that are not part of a linked-station set may test on their post-auction channels during the testing period without the need for coordination. Stations that are part of a linked-station set must coordinate testing with stations in the set so as not avoid undue interference. Such stations must transition to their post-auction channels simultaneously.

As part of the proposed plan, the Bureau is seeking comment on whether to allow increased temporary interference between stations that are still operating on their pre-auction channels and stations testing or operating on their post-auction channels in order to facilitate the transition. The staff's analysis indicates that allowing temporary pairwise (station-to-station) interference above the 0.5 percent authorized by the rules governing increased permanent interference is likely to significantly reduce inter-dependencies between stations and facilitate coordination. The Bureau proposes to allow temporary pairwise interference increases of up to two percent, which it believes will produce substantial benefits without undue disruption to television service during the transition.

The Bureau is also considering whether to assign some stations to temporary channels during the transition as another means of reducing the size or number of linked-station sets and facilitate the transition. The Bureau proposes to limit such assignments, however, to stations in complex "cycles" of inter-dependency. The Bureau also proposes to limit such assignments to

channels that are close to stations' ultimate channel assignments, and to relatively low power stations, in order to limit the associated burdens and costs. Temporary channel assignments would replicate pre-auction coverage area and population served. Because the Bureau anticipates that stations would need to commence operations on temporary facilities early in the transition, it proposes to require that stations assigned to temporary channels apply for special temporary authority (STA) within ninety days of the Closing and Reassignment PN's release.

If the Bureau decides to use temporary channel assignments, it tentatively concludes that stations will have must-carry rights on their temporary channels. It also proposes that any temporary channel assignments in the 600 MHz Band would be subject to the inter-service interference (ISIX) protections adopted in the ISIX Third Report and Order. In addition, a full power or Class A station operating on a temporary channel could displace a low power television (LPTV) station. An operating LPTV station displaced by a temporary channel assignment could file for a new channel during the post-auction LPTV displacement window. Alternatively, the displaced LPTV station could go silent or seek temporary authorization to operate its facility at variance from its authorized parameters in order to prevent interference.

Because the Commission anticipated the possibility of using temporary channels to facilitate the transition and stated that the reasonably incurred costs of equipment needed to move to temporary channels are eligible for reimbursement, the Bureau notes that such costs would be eligible for reimbursement in the same manner as costs related to construction of permanent post-auction channel facilities. Multichannel Video Programming Distributors (MVPDs) likewise should be eligible for reimbursement of all eligible costs in order to continue to carry a reassigned station operating on a temporary channel.

Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements. If the Bureau decides to use temporary channels, it proposes to require that

stations assigned to temporary channels apply for special temporary authority (STA) within ninety days of the Closing and Reassignment PN's release. It also proposes that any temporary channel assignments in the 600 MHz Band would be subject to the inter-service interference (ISIX) protections adopted in the ISIX Third Report and Order, which requires, among other things, that wireless carriers prepare and retain a study demonstrating that no interference will be caused to full-power or Class A broadcast television stations. We believe the proposals will not have a significant effect on the reporting, recordkeeping, or other compliance requirements of regulatees. To the extent that commenters believe that any of the proposals would impose any additional reporting, recordkeeping, or compliance requirement on small entities, we ask that they describe the nature of that burden.

Steps Taken to Minimize Significant Impact on Small Entities and Significant Alternatives Considered. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standard; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.

In general, alternatives to proposed rules or policies are discussed only when those rules pose a significant adverse economic impact on small entities. In this context, however, the proposed transition plan set forth in the Public Notice generally confers benefits. In particular, the intent of the plan is to ensure that all stations are able to complete a timely transition to their final post-auction channel facilities without delay and without incurring unnecessary costs. Although certain proposals, such as the use of temporary channels and increased interference,

may impose additional burdens on stations and MVPDs, the benefits of such proposals (such as further facilitating the successful post-incentive auction transition) outweigh any burdens associated with compliance. Further, eligible stations and MVPDs that incur additional costs associated with these proposals may seek reimbursement. In addition, if a full power or Class A station operating on a temporary channel displaces an operating LPTV station, such LPTV station could file for a new channel during the post-auction LPTV displacement window. Alternatively, the displaced LPTV station could go silent or seek temporary authorization to operate its facility at variance from its authorized parameters in order to prevent interference.

FEDERAL COMMUNICATIONS COMMISSION.

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