IEEE P802.11  
Wireless LANs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PDT and Comment resolutions for Co-TDMA (Part 3) | | | | |
| Date: 2025-07-29 | | | | |
| Author(s): | | | | |
| Name | Affiliation | Address | Phone | email |
| Sanket Kalamkar | Qualcomm Technologies Inc | 5665 Morehouse Drive, San Diego, CA 92131 |  | sankal@qti.qualcomm.com |
| Abhishek Patil | Qualcomm Technologies Inc | 5665 Morehouse Drive, San Diego, CA 92131 |  | appatil@qti.qualcomm.com |
| Klaus Doppler | Nokia | 520 Almanor Ave, Sunnyvale CA 94085 |  | Klaus.doppler@nokia.com |
| GeonHwan Kim | LG Electronics | 19, Yangjae-daero 11gil, Seocho-gu, Seoul 137-130, Korea |  | geonhwan.kim@lge.com |
| Giovanni Chisci | Qualcomm Technologies Inc | 5665 Morehouse Drive, San Diego, CA 92131 |  | gchisci@qti.qualcomm.com |
| Gaurang Naik | Qualcomm Technologies Inc | 5665 Morehouse Drive, San Diego, CA 92131 |  | gnaik@qti.qualcomm.com |
| Sherief Helwa | Qualcomm Technologies Inc | 5665 Morehouse Drive, San Diego, CA 92131 |  | shelwa@qti.qualcomm.com |
| Alfred Asterjadhi | Qualcomm Technologies Inc | 5665 Morehouse Drive, San Diego, CA 92131 |  | aasterja@qti.qualcomm.com |

Abstract

This document proposes to amend the draft text on Co-TDMA based on CC50 comments. This document also proposes resolutions for following 116 CIDs as part of CC50 comments:

70, 93, 158, 201, 220, 417, 418, 438, 667, 673, 675, 677, 686, 689, 690, 693, 694, 695, 700, 715, 737, 764, 765, 779, 820, 821, 822, 823, 824, 825, 826, 827, 828, 867, 986, 987, 988, 989, 990, 1028, 1030, 1045, 1046, 1047, 1380, 1390, 1391, 1432, 1433, 1434, 1487, 1528, 1529, 1539, 1540, 1543, 1699, 1701, 1703, 1704, 1705, 1711, 1712, 1713, 1731, 1864, 1866, 1892, 1987, 1988, 2208, 2209, 2447, 2459, 2460, 2461, 2465, 2516, 2517, 2640, 2673, 2698, 2791, 2792, 2818, 2819, 3156, 3158, 3171, 3172, 3173, 3174, 3333, 3335, 3337, 3385, 3431, 3441, 3442, 3601, 3602, 3603, 3605, 3749, 3785, 3786, 3787, 3791, 3792, 3793, 3816, 3841, 3842, 3876, 3881, 3883.

TGbn editor: Baselines for this document are 11bn D0.3, 11-25/0599r16 (approved in Motion 453), 11be D7.0, and REVme D7.0.

**Revisions:**

* Rev 0: Initial version of the document.
* Rev 1: Update based on offline feedback
  + Editorial changes. Deleted redundant text for Co-TDMA negotiations that is already captured in the general MAPC negotiations (see 11-25/0599r16 (approved in Motion 435)). The changes are highlighted in green.
* Rev 2: Removed traffic profile discussions from the negotiation procedure. Some editorial changes. The changes are highlighted in turquoise.

### Relevant passed motions:

[Motion #46, [1]]

* TGbn shall define a Coordinated TDMA (Co-TDMA) procedure for an AP to share its time resources of an obtained TXOP with a set of APs.
  + Set of APs is TBD.
  + The set can consist of one AP.

[Motion #120, [1]]

* A UHR AP shall indicate to another AP its capability to respond in a TB PPDU or not.

[Motion #121, [1]]

* As part of the Co-TDMA procedure, a sharing AP may solicit a poll response in a TB PPDU from another AP only if the other AP has indicated support for responding via a TB PPDU.

[Motion #135, [1]]

* The sharing AP, that transmits a Trigger frame as part of a transmission sequence in a Multi-AP coordinated transmission scheme, identifies the shared AP via an AP ID carried in the AID12 field of the User Info field of the frame.
  + Note: the name of “sharing AP” and “shared AP” are TBD.
  + Note: Multi-AP coordinated transmission schemes are Co-SR, Co-BF and Co-TDMA.

[Motion #156, [1]]

* A TXOP owner AP announces its intention of sharing a portion of the time resource of its TXOP for Co-TDMA operation, in an Initial Control frame (exact ICF and name TBD) sent at the beginning of the TXOP. The frame polls AP(s) with whom it may share the TXOP to determine their interest
  + A TXOP owner AP that intends to share its TXOP is referred to as a sharing AP.
  + A candidate AP identified (polled) in the ICF is referred to as a polled AP.
  + The Duration field of the frame is set to the length of time required to transmit the solicited response frame plus one SIFS.
  + Whether or not the sharing AP is mandated to send the ICF that announces that intention is TBD.

[Motion #157, [1]]

* As part of the Co-TDMA procedure, a candidate AP that is polled by the sharing AP shall provide, via a response,
  + Its intention not to participate in TXOP sharing during the current TXOP.
    - Note: If the sharing AP doesn’t receive a response from a polled AP, it assumes that the polled AP is not interested in TXOP sharing during the current TXOP.
  + Its intention to participate in TXOP sharing during the current TXOP.
  + Signaling details (including traffic indication) are TBD.

[Motion #159, [1]]

* As part of the Co-TDMA procedure, to share a time portion of its TXOP, a sharing AP shall send a MU-RTS TXS Trigger frame to another non-collocated AP.
  + The Allocation Duration field of the frame indicates the duration of that time portion.
  + The Duration field of the frame is set to the time required to transmit the solicited response frame plus one SIFS.

[Motion #160, [1]]

* As part of the Co-TDMA procedure, TGbn defines a mechanism for an AP, that received a time portion of a TXOP from a sharing AP, to return the remainder of the allocated time (if any) back to the sharing AP.
  + Signaling details and the condition(s) for TXOP return are TBD.

[Motion #205, [2]] Move to incorporate the proposed text changes in 11-24/1961r4 to the latest TGbn draft (TGbn D0.1).

[Motion #268, [2]]

* Do you agree that a TXOP owner AP shall announce its intention of sharing a portion of the time resource of its TXOP for C-TDMA operation, in an Initial Control frame (exact ICF and name TBD) sent at the beginning of the TXOP and that the frame polls AP(s) with whom it may share the TXOP to determine their interest?
  + A TXOP owner AP that intends to share its TXOP is referred to as a sharing AP.
  + A candidate AP identified (polled) in the Initial Control frame is referred to as a polled AP.
  + The Duration field of the frame is set to the length of time required to transmit the solicited response frame plus one SIFS.
  + ~~Whether or not the sharing AP is mandated to send the Initial Control frame that announces that intention is TBD.~~

[Motion #269, [2]]

* The ICF (polling frame) sent as part of Co-TDMA operation shall be a BSRP Trigger frame.

[Motion #270, [2]]

* As part of Co-TDMA operation, a poll response from a polled AP solicited by the ICF shall be carried in an M-BA frame.

[Motion #274, [2]]

* Define a mechanism as part of the procedure of time sharing during a TXOP (e.g. C-TDMA, TXS, …) to support fairness to neighboring STAs (APs and non-APs)?
  + Exact mechanism is TBD

[Motion #277, [2]]

* As part of Co-TDMA operation, TGbn defines a mechanism for a Co-TDMA sharing AP to transmit to a Co-TDMA coordinated AP an indication of whether the Co-TDMA coordinated AP is to return the remainder of the allocated time (if any) back to the Co-TDMA sharing AP.
  + How to signal the indication is TBD
  + Note: This mechanism is to be enabled only if the Co-TDMA sharing AP is capable of receiving the TXOP return.

[Motion #329, [2]]

* The maximum time allocated by a sharing AP in a TXOP to all shared AP for CTDMA is not larger than the TXOP limit it advertised for the minimum between AC\_VI TXOP limit and the TXOP Limit of the AC it obtains the TXOP with to its associated STAs.
  + If TXOP limit for an AC is 0, there is no CTDMA in a TXOP obtained using that AC.
  + The sharing AP shall use at least a TBD portion of the obtained TXOP for data communication with its own associated STAs.
  + Note: similar consideration will apply for TXS mode 2

[Motion #363, [2]]

* The Co-TDMA sharing AP and the Co-TDMA coordinated AP shall have the same primary 20 MHz channel.

Interpretation of a Motion to Adopt

A motion to approve this submission means that the editing instructions and any changed or added material are actioned in the TGbn Draft. This introduction is not part of the adopted material.

***Editing instructions formatted like this are intended to be copied into the TGbn Draft (i.e., they are instructions to the 802.11 editor on how to merge the text with the baseline documents).***

***TGbn Editor: Editing instructions preceded by “TGbn Editor” are instructions to the TGbn editor to modify existing material in the TGbn draft. As a result of adopting the changes, the TGbn editor will execute the instructions rather than copy them to the TGbn Draft.***

**CC50 Comments:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CID** | **Commenter** | **Clause** | **Pg/Ln** | **Comment** | **Proposed Change** | **Resolution** | |
| 70 | Jialing Li | 37.8.2.3.3 | 74.01 | Update the subclause number of MU-RTS Trigger frame format to be 9.3.1.33.11. | Refer to the comment. | **Rejected**  The comment fails to locate the issue. The subclause 9.3.1.33.11 cited in the comment does not exist in either REVme D7.0 or 11be D7.0.  Additionally, the NOTE referenced in the comment for subclause renumbering was removed as part of the Co-TDMA PDT 11-25/0755r11. | |
| 93 | Xiangxin Gu | 37.8.2.3.1 | 72.46 | add “a Co-TDMA transmission consists of polling phase ...” to make the following sub clause easy to be addressed. | as the comment | **Rejected**  The comment fails to locate the issue. It is unclear where the text should be added in 72.46. | |
| 158 | Jay Yang | 37.8.2.3.3 | 73.57 | the co-located case is missing, that’s, a Co-TDMA sharing AP may share a time portion to it’s colocated AP without OTA signaling, we need add it. | as the comments | **Rejected**  In accordance with Motion #159, the Co-TDMA mechanism is between non-colocated APs, wherein a sharing AP allocates a TXOP to a non-colocated peer AP by sending an MU-RTS TXS Trigger frame over the air to the peer.  The scenario described in the comment—where two APs coordinate TXOP sharing without any over-the-air signaling—falls outside the scope of the defined Co-TDMA procedure. | |
| 201 | Chunyu Hu | 37.8.2.3 | 72.40 | The TXOP sharing incurs quite some overhead. The benefit of sharing TXOP should be evaluated to overcome the overhead and some constraints should be considered for initiating such a procedure. | Provide necessary analysis and define a mechanism to avoid excessive overhead. | **Rejected**  The comment fails to identify changes in sufficient detail so that the specific wording of the changes that will satisfy the commenter can be determined. Specifically, the reference to “necessary analysis” lacks sufficient detail to determine the intended scope or direction. | |
| 220 | Pei Zhou | 37.8.2.3.3 | 74.20 | Frequeny resource (e.g., channels, RUs) can also be allocated to a Co-TDMA coordinated AP. In addition, bandwith expansion should be allowed wthin the time allocated to a Co-TDMA coordinated AP under specifc conditions for better performance. | As in comment. | **Revised**  Allowing bandwidth expansion for a Co-TDMA coordinated AP within a shared TXOP introduces several complications.  For instance, the coordinated AP may include subchannels that the Co-TDMA sharing AP did not contend for when acquiring the TXOP. Expanding the bandwidth of the PPDU beyond that of the CTS frame transmitted in response to the MU-RTS TXS Trigger frame will make protocol complex.  To maintain protocol simplicity, during the time allocated by a Co-TDMA sharing AP, a coordinated AP addressed by the MU-RTS TXS Trigger frame must refrain from transmitting any PPDU that occupies subchannels beyond those used in the CTS frame response. A relevant text is added in this document.  **Note to editor**: Please apply the changes marked as #220. | |
| 693 | Geon Hwan Kim | 38.8.2.3.3 | 74.21 | We need to add several texts for bandwidth configuration in perspective of Co-TDMA shared AP (similar to line 40-50 on pp. 527 of 11be/D7.0). | During the time allocated by the Co-TDMA sharing AP using an MU-RTS TXS Trigger frame, an Co-TDMA coordinated AP shall not transmit PPDUs occupying subchannels that are not used when sending the CTS frame in response to the MU-RTS TXS Trigger frame. An Co-TDMA coordinated AP shall set the TXVECTOR paramter CH\_BANDWIDTH or CH\_BANDWIDTH\_IN\_NON\_HT of PPDUs that it transmits during the time allocated by the MU-RTS TXS Trigger frame to be the same or narrower than the TXVECTOR parameter CH\_BANDWIDTH\_IN\_NON\_HT of the CTS frame that it transmitted in response to the MU-RTS TXS Trigger frame. | **Revised**  The text is updated along the line of the proposed change.  The resolution of this comment is the same as that for CID 220.  **Note to editor:** Please apply the changes marked as #220. | |
| 417 | Shuang Fan | 37.8.2.3.2 | 73.49 | The polled AP which has intention to receive time allocation, may not respond to the Co-TDMA sharing AP's ICF trigger frame because of CS required field is set in the ICF, and the media status is busy for the polled AP. | Set the CS required field to 0 in ICF trigger frame for Co-TDMA if the ICF is not MU-RTS. | **Rejected**  If the medium around a polled AP is busy, it is not required to respond to the Co-TDMA ICF, in accordance with the existing rules defined for non-AP STAs. | |
| 418 | Shuang Fan | 37.8.2.3.3 | 73.62 | Currently, the value of TXS Mode subfield in MU-RTS TXS trigger frame is defined for non-AP STA’s uplink and P2P transmission, we should define a new mode with value 3 for a Co-TDMA coordinated AP transmit to its associated STAs | Define a new TXS mode with value 3 for a Co-TDMA coordinated AP transmit to its associated STAs | **Rejected** The existing TXS mode with value 2 can be reused, as the behavior of the MU-RTS TXS Trigger frame that allocates TXOP to another AP closely aligns with the TXOP allocation mechanism already defined for TXS mode 2. | |
| 438 | Shuang Fan | 37.8.2.3.3 | 74.04 | According to the text, “The Duration field of the MU-RTS TXS Trigger frame is set to one SIFS plus the time required to transmit the solicited CTS response frame.” If there exists a hidden node that can detect Co-TDMA sharing AP but cannot detect Co-TDMA coordinated AP. When Co-TDMA coordinated AP sends a TXOP return frame to Co-TDMA sharing AP, if the hidden node of Co-TDMA coordinated AP is transmitting a PPDU at this time, it may result in Co-TDMA sharing AP failing to receive the TXOP return frame. thereby this results in the failure of TXOP return phase. | Allow extending the value of the Duration field in the MU-RTS TXS Trigger frame to the entire TXOP when TXOP return is enabled. | **Rejected**  Setting a NAV for the entire TXOP may lead to overprotection.  Additionally, such a long NAV could prevent TXOP sharing—for example, non-AP STAs of a Co-TDMA coordinated AP might be blocked by the Basic NAV set by the MU-RTS TXS Trigger frame. | |
| 667 | Suhwook Kim | 37.8.2.3.2 | 73.48 | There may be cases where there is not a single response among the polled APs. The polling phase does not necessarily have to be single TXOP with allocation phase. | Modify the relevant part so that the polling phase can be transmitted to a separate TXOP. | **Rejected**  The comment and proposed change do not specify why the absence of a response during the polling phase necessitates placing the polling phase in a separate TXOP. The primary purpose of the polling phase is to allow the Co-TDMA sharing AP to identify neighboring APs interested in receiving TXOP allocation within the same TXOP. Placing the polling phase in a separate TXOP appears to diverge from this intended purpose. | |
| 673 | Jungjun Kim | 37.8.2.3.2 | 73.25 | Polling responses of APs that do not support TB PPDU transmission should be covered as well. | Add descriptions on polling phase when the polled AP does not support TB PPDU transmission in 37.8.2.3.2. | **Revised**  A Multi-STA BlockAck frame will carry a response from a polled AP that does not support TB PPDU transmission.   The resolution to this comment is the same as that of CID 1049, which is already resolved in the Co-TDMA PDT 11-25/0755r1.  **Note to editor**: No further changes are needed. | |
| 675 | Jungjun Kim | 37.8.2.3.2 | 73.40 | It is not determined whether only one User Info field is used per a polled AP. Also, “the polled AP’s User Info field” is confusing. | Change “AID12 subfield of the polled AP’s User Info field” to “AID12 subfield(s) of the User Info field(s)”. | **Revised**  In the Co-TDMA PDT 11-25/0755r11 (also part of D0.3), the text is updated to the following, which does not preclude the specified case: **“**The Co-TDMA sharing AP identifies a polled AP in the Co-TDMA TB ICF or the Co-TDMA NTB ICF by setting the AID12 field of a User Info field to the polled AP's AP ID, as assigned by the Co-TDMA sharing AP.**”**  **Note to editor:** No further changes are needed. | |
| 677 | Taeyoung Ha | 37.8.2.3.2 | 73.37 | As the duration field of ICF is set to the SIFS plus the time required to transmit the solicited response from the polled AP(s), the acquired TXOP of Co-TDMA Sharing AP is ended after the Polling phase. Additional descriptions for extending or acquiring TXOP of Co-TDMA Sharing AP is needed. | Add detailed descriptions for extending or acquiring TXOP of Co-TDMA Sharing AP in this subclause, or make another subclause between 37.8.2.3.2 and 37.8.2.3.3 to add these descriptions. | **Rejected**  The duration setting of the ICF falls under a single protection setting. Also, the Co-TDMA sharing AP is expected to begin its in-BSS transmissions at the SIFS boundary after ICF/ICR frame exchanges. | |
| 686 | Geon Hwan Kim | 37.8.2.3.2 | 73.41 | We need to have a way to include Co-TDMA information and a way to signal that this BSRP trigger frame is to be transmitted for Co-TDMA operation. | A Special User Info field can be defined to provide Co-TDMA info, which can include some info (e.g., TXOP duration to be shared, traffic priority per shared AP) and the Multi-AP coordination type field indicating that it is Co-TDMA. | **Revised**  In the Co-TDMA PDT 11-25/0755r11 (part of D0.3), a Feedback User Info field is added in the BSRP Trigger frame to convey Co-TDMA information to polled AP(s). The Feedback User Info field includes the primary AC of the Co-TDMA sharing AP, an indication whether TXOP return is solicited, and the Maximum TXOP Duration Under Consideration for Allocation to Coordinated AP(s).  The resolution to this comment is already captured in the Co-TDMA PDT 11-25/0755r11 and in the resolution to CID 1864.  **Note to editor**: No further changes are needed. | |
| 689 | Geon Hwan Kim | 37.8.2.3.3 | 73.61 | The terms “colocated” or “co-located” need to be unified into a single term, e.g., colocated. | As in the comment | **Revised**  The term “colocated” is now used in place of “co-located.”  The resolution is the same as that for CID 3326, which is already resolved in 11-25/0521r2.  **Note to editor**: No further changes are needed. | |
| 690 | Geon Hwan Kim | 37.8.2.3.3 | 74.01 | The notes can be replaced with specific sentences to list requirements or parameterize the MU-RTS TXS TF. We can modify it similarly to line 15 on pp. 524 of 11be/D7.0. | The MU-RTS TXS Trigger frame is defined in 9.3.1.22.9 (MU-RTS Trigger frame format) and is parameterized for the Co-TDMA procedure as follows: --The MU-RTS TXS Trigger frame shall have only one User Info field that is not a Special User Info field. --The User Info field shall be addressed to one of the AP(s) polled during the polling phase (i.e., AID12 field is set to an AP ID in the range 1 to 2006). --The MU-RTS TXS Trigger frame may contain a Special User Info field as defined in 9.3.1.22.9 (MU-RTS Trigger frame format) and 9.3.1.22.3 (Special User Info field).  (M#265) Note--The AP shall ensure that the AP ID value is not assigned by the AP or by its affiliated MLD to any other STA (e.g., STA is an associated non-AP STA, an unassociated non-AP STA that has been allocated a RSID, or any other coordinated AP), or a non-AP MLD that is associated with the AP MLD. | **Rejected**  We need not call out these sentences again if they are unchanged from the existing requirements.  The rules for AP ID are mentioned in subclause 37.13.1.3.2.2 (AP ID assignment). | |
| 694 | Geon Hwan Kim | 38.8.2.3.4 | 74.27 | Details regarding the TXOP return should be added based on motion #277 passed at the F2F meeting in Jan. 2025. | The Co-TDMA coordinated AP may use the time allocated by the Co-TDMA sharing AP in an MU-RTS TXS Trigger frame, which is addressed to the AP, for the transmission of one or more PPDUs that are addressed to the associated STA. The Co-TDMA coordinated AP that received an MU-RTS TXS Trigger frame (M#277)with an indication of whether the Co-TDMA coordinated AP is to return the remainder of the allocated time back to the Co-TDMA sharing AP may transmit, within an allocated time, a TXOP return frame (TBD) to the Co-TDMA sharing AP (M#277)only if the Co-TDMA sharing AP is capable of receiving the TXOP return frame (TBD). Otherwise, the Co-TDMA coordinated AP shall not transmit such TXOP return frame (TBD) to the Co-TDMA sharing AP within the allocated time. | **Revised**  A Co-TDMA sharing AP that has indicated support for TXOP return and that is soliciting a TXOP return from a Co-TDMA coordinated AP shall set the TXOP Return Solicited field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF to 1; otherwise, the Co-TDMA sharing AP shall set the TXOP Return Solicited field to 0.  The Co-TDMA coordinated AP shall return the TXOP after receiving a Co-TDMA TB ICF or a Co-TDMA NTB ICF that has set the TXOP Return Solicited field to 1.  This comment is already addressed in the Co-TDMA PDT document 11-25/0755r11—except  the addition of one word “return” as an editorial change.  **Note to editor**: Please apply the changes marked as #694. | |
| 695 | Geon Hwan Kim | 38.8.2.3.4 | 74.27 | We need to decide which frame to use to return the TXOP. | Multi-STA BA frame is transmitted by the polled AP as ICR during the polling phase. Therefore, Multi-STA BA frame can also be used to return TXOP. | **Revised**  As part of Co-TDMA operation, when the Co-TDMA coordinated AP returns the TXOP to the Co-TDMA sharing AP, the TXOP return shall be indicated via a Public Action frame, called MAPC TXOP Return frame, that includes only the Action field in the frame body.  This comment is already addressed in the Co-TDMA PDT document 11-25/0755r11.  **Note to editor**: No further changes are needed. | |
| 700 | Geon Hwan Kim | 38.8.2.3 | 72.40 | In Co-TDMA, when MU-RTS TXS TF is transmitted to only a single AP, the bandwidth signaling TA can be used to set DYN\_BANDWIDTH\_IN\_NON\_HT of MU-RTS TXS TF to dynamic. This allows the coordinated AP to respond with a CTS frame with the same or narrower than the bandwidth as indicated in the RU Allocation field. | As in the comment | **Revised**  To keep the protocol simple, it is better to retain the existing rule that the CTS frame must be transmitted using the same bandwidth as indicated in the RU Allocation field of the MU-RTS TXS Trigger frame.  The text is updated to clarify this requirement.  **Note to editor**: Please apply changes marked as #700. | |
| 715 | Chien-Fang Hsu | 37.8.2.3.3 | 74.20 | The duration field setup during the frame exchange of the shared AP and its non-AP STAs should be based on the Allocation Duration subfield in the MU-RTS TXS Trigger frame, but how to set up the duration is not defined. | Define the rules of how the duration field is set up based on the allocation duration in the MU-RTS TXS frame in frames of the frame exchange between the shared AP and its non-AP STAs. | **Revised**  A NAV (dictated by the value of a Duration field) set by the Co-TDMA coordinated AP during the allocated time shall end before this AP returns the TXOP to the Co-TDMA-sharing AP.  This resolution to the comment is already included in the Co-TDMA PDT document 11-25/0755r11.  **Note to editor**: No further changes are needed. | |
| 737 | Junbin Chen | 37.8.2.3.1 | 72.45 | In the motion the Co-TDMA allows a sharing AP to share a time portion with "a set of APs", which means it is possiable to share a time portion with more than one AP, but here in D0.1 it is restricted to only one AP. | modified as follows: "... ... Co-TDMA procedure enables an AP to share a time portion of an obtained TXOP with another AP (or more than one APs, TBD) that belongs to a set of APs ... ..." | **Revised**  The Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs.  The resolution to this comment is the same as that for CID 1700 addressed in the Co-TDMA PDT document 11-25/0755r11 (already part of D0.3).  **Note to editor**: No further changes are needed. | |
| 764 | Junbin Chen | 37.8.2.3.1 | 44.72 | The text "The coordinated time division multiple access (co-TDMA) procedure enables an AP to share a time portion of an obtained TXOP with another AP that belongs to a set of APs (the set is TBD and can consist of one AP) to transmit one or more PPDUs" seems to present a scenario where the sharing AP and shared AP transmit concurrently during a portion of the TXOP. However, concurrent transmission is not allowed in Co-TDMA. The amentiond ambiguity from the text should be avoided. | change the text to "The ...enables an AP to share a time portion of an obtained TXOP to another AP...PPDUs" or "The ...enables an AP to allocate a time portion of an obtained TXOP to another AP...PPDUs". | **Revised**  The text is already updated to clarify that a Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs.  The resolution to this comment is the same as that for CID 1700 addressed in Co-TDMA PDT document 11-25/0755r11 (already part of D0.3).  **Note to editor**: No further changes are needed. | |
| 765 | Junbin Chen | 37.8.2.3.2 | 29.73 | "A Co-TDMA sharing AP announces its intention of sharing a time portion of an obtained TXOP with another AP in an ICF sent at the beginning of the TXOP" . The ambiguity of concurrent transmisson from the " ...sharing a time portion... with... " should be avoided. | change the text " ...sharing a time portion... wtih... " to" ...sharing a time portion... to... " | **Rejected**  The Co-TDMA PDT document 11-25/0755r11 clarifies, at the start of 73.13.2.3.1, that the Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs.  Also, an MU-RTS TXS Trigger frame transmitted by a Co-TDMA sharing AP allocates TXOP to only one Co-TDMA coordinated AP. | |
| 779 | Seongho Byeon | 37.8.2.3.2 | 73.38 | The discussion is required on whether a sharing AP should guarantee the allocation of time portion within the TXOP for shared APs that successfully transmitted the ICR after receiving the ICF for Co-TDMA. | Suggest adding the following statement: "It is TBD whether the sharing AP shall allocate a time portion to all polled APs that have sent its intention to participate in time sharing through ICR successfully." at this moment. | **Rejected**  TXOP sharing in a Co-TDMA procedure operates on a best-effort basis. Due to inherent uncertainties—such as potential hidden node scenarios—it may not always be possible for the Co-TDMA sharing AP to allocate TXOPs to every polled AP. | |
| 820 | Oren Kedem | 37.8.2.3 | 73.03 | Should the UHR ICF advertise “Partial Duration” of Full Duration ? | Please clarify | **Rejected**  As per Motion 156, a Co-TDMA ICF shall set the Duration field shall be set to the length of time required to transmit the solicited response frame plus one SIFS. This is already clarified in the Co-TDMA PDT 11-25/0755r11. | |
| 821 | Oren Kedem | 37.8.2.3 | 73.03 | How the Polling Phase protect AP3 stations from initiating TXOP with AP3 after its positive response to AP1 ?  Since RCF is TB PPDU, it provides no protection to BSS3 for legacy stations | Please clarify | **Revised**  We don’t need new rules. First, the polled AP (AP3) may not be able to respond to its associated non-AP STAs’ transmissions since the polled AP is blocked due to in-BSS transmissions of the Co-TDMA sharing AP.  In other cases, if deemed necessary, a polled AP (e.g., AP3) can use existing mechanisms—such as mandatory RTS/CTS exchange or MU-EDCA—to prevent its associated non-AP STAs from initiating transmissions to the polled AP.  However, to clarify, the following NOTE has been added:  When an AP participates in a Co-TDMA procedure, it might prevent its associated non-AP STAs from initiating UL transmissions. To do this, the AP can use existing mechanisms such as RTS enablement (see 26.2.1 (TXOP duration-based RTS/CTS)) or MU-EDCA (see 26.2.7(EDCA operation using MU EDCA parameters)). These mechanisms are helpful when the AP’s associated non-AP STAs are hidden from OBSS Co-TDMA-related transmissions—for example, when a polled AP’s associated non-AP STAs are hidden to in-BSS transmissions of a Co-TDMA sharing AP.  **Note to editor**: Please apply the changes marked as #821. | |
| 822 | Oren Kedem | 37.8.2.3 | 73.03 | Can the ICF in C-TDMA may be MU-RTS in case of one Shared AP ? | Please clarify | **Rejected**  Both the BSRP Trigger frame and the BSRP NTB Trigger frame support the case of a single shared AP. Introducing the MU-RTS Trigger frame as an additional ICF for the same purpose is not needed. | |
| 823 | Oren Kedem | 37.8.2.3 | 73.03 | Does AP must share in case it received positive response from AP3 ? TXOP was also may be given to AP2 in case of positive response, the result is that AP3 wait for AP1 TXOP sharing while it may not granted | Consider to allow only one STA in the polling state to avoide | **Rejected** TXOP sharing in a Co-TDMA procedure operates on a best-effort basis.  Always limiting the polling to a single AP may not be optimal, as the Co-TDMA sharing AP might be capable of sharing the TXOP with multiple APs. Therefore, the decision to poll one or more APs should be left to the discretion of the Co-TDMA sharing AP. | |
| 824 | Oren Kedem | 37.8.2.3 | 73.03 | What is the maximum number of AP may participate in polling phase ? | Please clarify | **Rejected**  There is no defined maximum number of polled APs. The decision regarding how many APs to poll should be left to the discretion of the Co-TDMA sharing AP. | |
| 825 | Oren Kedem | 37.8.2.3 | 73.03 | Does ICF Negotiate the TXOP Bandwidth ? | Please clarify | **Revised**  No. Instead, a UHR AP may convey its bandwidth configuration to another UHR AP—intended for Co-TDMA coordination—via the Multi-AP Coordination (MAPC) procedure. For example, it can include this information in a MAPC Negotiation Request frame, using a format similar to the EHT Operation Information field (see Figure 9-1074k of 11be D7.0, p.246). This allows the receiving AP to determine the overlapping BSS bandwidth. The allocated TXOP bandwidth must not exceed this overlapping portion between the Co-TDMA sharing and coordinated APs.  The text has been updated to clarify this requirement.  **Note to editor**: Please apply the changes marked as #825. | |
| 826 | Oren Kedem | 37.8.2.3 | 73.03 | How is the behavior in case AP1/AP3 does not have the same BW? | Please clarify | **Revised**  AP1 (a Co-TDMA sharing AP) must allocate TXOP to AP3 (a Co-TDMA coordinated AP) within the overlapping portion of their BSS bandwidths. For example, in a Co-TDMA TB ICF, the Co-TDMA sharing AP must not allocate an RU to a polled AP outside this overlapping bandwidth. Similarly, in an MU-RTS TXS Trigger frame that allocates a TXOP to a Co-TDMA coordinated AP, the sharing AP must not assign an RU beyond the overlapping portion of the BSS bandwidth between the two APs.  The resolution of this comment is the same as that for CID 825.  **Note to editor**: No further changes are needed. | |
| 2698 | Salvatore Talarico | 37.8.2.3 | 72.41 | A procedure on how to serve portions on the BW associated with the TxOP to multiple APs should be defined | The current procedure only allows a sharing AP to share the whole BW associated with a shared TxOP to a single AP, while the shared AP may only need to use part of it. | **Revised**  AP1 (a Co-TDMA sharing AP) must allocate TXOP to AP3 (a Co-TDMA coordinated AP) within the overlapping portion of their BSS bandwidths. For example, in a Co-TDMA TB ICF, the Co-TDMA sharing AP must not allocate an RU to a polled AP outside this overlapping bandwidth. Similarly, in an MU-RTS TXS Trigger frame that allocates a TXOP to a Co-TDMA coordinated AP, the sharing AP must not assign an RU beyond the overlapping portion of the BSS bandwidth between the two APs.  Additionally, an AP can use the MAPC negotiation procedure to convey its bandwidth configuration to another AP, enabling the receiving AP to determine the overlapping portion of their BSS bandwidth.  The text has been already updated to clarify this protocol as part of resolution to CID 825.  The resolution of this comment is the same as that for CID 825.  **Note to editor**: No further changes are needed. | |
| 3335 | Sanket Kalamkar | 37.8.2.3 | 72.40 | The current text on Co-TDMA does not specify the bandwidth considerations from the Co-TDMA coordinated AP's perspective when the AP receives the time allocation from a Co-TDMA sharing AP. | Specify the bandwidth considerations from the Co-TDMA coordinated AP's perspective when the AP receives the time allocation from a Co-TDMA sharing AP. Specifically, when a Co-TDMA coordinated AP receives a portion of time from the Co-TDMA sharing AP's TXOP, the Co-TDMA coordinated AP sets the BW for its in-BSS transmissions such that the BW of a PPDU transmitted during the shared time does not exceed beyond the overlapping BW between the Co-TDMA coordinated AP and the Co-TDMA sharing AP. Also, the Co-TDMA Sharing AP and the Co-TDMA Shared AP shall have the same primary 20 channel. Also, add a note that the PPDU BW used by the Co-TDMA coordinated AP during the shared portion of the TXOP might be less than the overlapping bandwidth between the Co-TDMA sharing AP and Co-TDMA coordinated AP due to considerations such as puncturing at the Co-TDMA coordinated AP. | **Revised**  AP1 (a Co-TDMA sharing AP) must allocate TXOP to AP3 (a Co-TDMA coordinated AP) within the overlapping portion of their BSS bandwidths. For example, in a Co-TDMA TB ICF, the Co-TDMA sharing AP must not allocate an RU to a polled AP outside this overlapping bandwidth. Similarly, in an MU-RTS TXS Trigger frame that allocates a TXOP to a Co-TDMA coordinated AP, the sharing AP must not assign an RU beyond the overlapping portion of the BSS bandwidth between the two APs.  Additionally, an AP can use the MAPC negotiation procedure to convey its bandwidth configuration to another AP, enabling the receiving AP to determine the overlapping portion of their BSS bandwidth.  The text has been already updated to clarify this protocol as part of resolution to CID 825.  The resolution of this comment is the same as that for CID 825.  **Note to editor**: No further changes are needed. | |
| 3602 | kaiying Lu | 37.8.2.3.3 | 73.57 | The rules of available bandwidth for the shared AP during Co-TDMA TXOP allocation phase needs to clarified. | As in comment. | **Revised**  AP1 (a Co-TDMA sharing AP) must allocate TXOP to AP3 (a Co-TDMA coordinated AP) within the overlapping portion of their BSS bandwidths. For example, in a Co-TDMA TB ICF, the Co-TDMA sharing AP must not allocate an RU to a polled AP outside this overlapping bandwidth. Similarly, in an MU-RTS TXS Trigger frame that allocates a TXOP to a Co-TDMA coordinated AP, the sharing AP must not assign an RU beyond the overlapping portion of the BSS bandwidth between the two APs.  Additionally, an AP can use the MAPC negotiation procedure to convey its bandwidth configuration to another AP, enabling the receiving AP to determine the overlapping portion of their BSS bandwidth.  Also, the text has already been already updated to clarify bandwidth rules for a CTS frame and the PPDUs transmitted in an allocated time.  The resolution of this comment is the same as those for CIDs 220 and 825.  **Note to editor**: No further changes are needed. | |
| 3792 | Yongho Seok | 37.8.2.3.3 | 74.16 | "The first PPDU of the exchange shall carry a CTS frame transmitted as per the rules defined in 26.2.6.3 (CTS frame sent in response to an MU-RTS Trigger frame)." The bandwidth of the TXOP during the allocated time can be smaller than the TXOP bandwidth of the sharing AP. Therefore, the CTS response should be allowed, even if the full bandwidth indicated in the MU-RTS TXS is not idle but a partial bandwidth is idle. | As in the comment | **Revised**  The TXOP sharing needs to happen on the overlapping portion of the BSS bandwidths of the Co-TDMA sharing and Co-TDMA coordinated APs. Thus, in an MU-RTS TXS Trigger frame that allocates a TXOP to a Co-TDMA coordinated AP, the Co-TDMA sharing AP shall not allocate an RU to the Co-TDMA coordinated AP outside the overlapping portion of the BSS bandwidth between the two APs.  To keep the protocol simple, the PPDU carrying the CTS frame from a Co-TDMA coordinated AP can be transmitted on the 20 MHz channel(s) indicated in the RU Allocation field of the User Info field of the MU-RTS TXS Trigger frame that allocated the time to the Co-TDMA coordinated AP.  The resolution to this comment is the same as that for CID 825.  **Note to editor**: No further changes are needed. | |
| 827 | Oren Kedem | 37.8.2.3 | 73.03 | Does the shared TXOP by AP3 is limited to the same AC gained it by AP1? | Please clarify | **Revised**  During the allocated time, any frame exchange between a Co-TDMA coordinated AP and its associated non-AP STA(s) shall be from the same or higher priority ACs as the primary AC of the obtained TXOP indicated in  the Primary AC field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF transmitted by the Co-TDMA  sharing AP during the polling phase of Co-TDMA.  The resolution to this comment is already included in the Co-TDMA PDT document 11-25/0755r11 (part of D0.3).  **Note to editor**: No further changes are needed. | |
| 828 | Oren Kedem | 37.8.2.3 | 73.03 | Does receiving Shared TXOP by impact the Backoff procedure of the shared AP in the same AC was used in the shared TXOP ? | Please clarify | **Rejected**  Since the backoff procedure of a shared AP remains unaffected, no further clarification is needed. | |
| 867 | Tomoko Adachi | 37.8.2.3.3 | 0.00 | How the STAs transmitting during the allocated time set their Duration field needs to be clarified. | As in comment. | **Revised**  The Co-TDMA PDT 11-25/0755r11 (part of D0.3) has already added the following text to indicate how a STA transmitting during the allocated time set their Duration field value, i.e., NAV: **“**A NAV set by the Co-TDMA coordinated AP during the allocated time shall end before this AP returns the TXOP to the Co-TDMA-sharing AP.**”**  **Note to editor:** No further changes are needed. | |
| 986 | Arik Klein | 37.8.2.3.1 | 73.01 | Figure 37-4 illustrates an example case for the polling phase where both AP2 and AP3 support transmission of ICR (poll response) in a TB PPDU. Please add another figure for the polling phase if neither of the polled APs support the transmission of ICR in a TB PPDU. | As in comment | **Rejected**  This comment fails to identity an issue.   The figures are intended for illustrative purposes, and it is unclear how adding a new figure to depict a polling phase where APs do not support transmission in a TB PPDU would help.  The subclause 37.13.2.3 on Co-TDMA has provided a normative text how polling works for an AP that does not support a TB PPDU transmission. | |
| 987 | Arik Klein | 37.8.2.3.2 | 73.25 | The ICF should be responded by ICR, (as defined in DPS, DOU etc.) not by poll response. | Please align the terminology for the frames naming. If the ICR corresponding to the polling phase of the Co-TDMA requires specific rules - please add them as well | **Revised**  The term “poll response” are replaced with the term “Co-TDMA ICR frame.”  **Note to editor**: Please apply the changes marked as #987. | |
| 988 | Arik Klein | 37.8.2.3.2 | 73.48 | Why does the polled AP need to include in the ICR (polled response) both Its intention not to receive time allocation from the Co-TDMA sharing AP during the current TXOP and Its intention to receive time allocation from the Co-TDMA sharing AP during the current TXOP?? should it be either of them? | Please clarify which of the "intentions" is required in the response, but not both. | **Revised**  The updated text now clarifies which intention is being carried in the response.  **Note to editor**: Please apply the changes marked as #988. | |
| 989 | Arik Klein | 37.8.2.3.3 | 74.05 | If the Duration field of the MU-RTS TXS Trigger frame is set to one SIFS plus the time required to transmit the solicited CTS response frame, please explain how should the AP avoids any response (as TXOP responder) to transmissions initiated by a "hidden-node" non-AP STA associated with AP1 (but hidden to AP3) during all the time used by AP3 for frame exchange with its associated non-AP STAs? | Please modify the sentence or add the relevant rules to avoid the scenario described in the comment. | **Revised**  We don’t need new rules. If deemed necessary, the Co-TDMA sharing AP (AP1) can use existing mechanisms—such as mandatory RTS/CTS exchange or MU-EDCA—to prevent its associated non-AP STAs from initiating transmissions to the AP.  However, to clarify, the following NOTE has been added:  “When an AP participates in a Co-TDMA procedure, it might prevent its associated non-AP STAs from initiating UL transmissions. Such a prevention can be helpful when associated non-AP STAs of the AP are hidden from other Co-TDMA-related transmissions—for example, when associated non-AP STAs of a polled AP are hidden to in-BSS transmissions of the Co-TDMA sharing AP. To do this, the AP can use existing mechanisms such as RTS enablement (see 26.2.1 (TXOP duration-based RTS/CTS)) or MU-EDCA (see 26.2.7(EDCA operation using MU EDCA parameters)).”  The resolution to this comment is the same as that for CID 821.  **Note to editor**: No further changes are needed. | |
| 990 | Arik Klein | 37.8.2.3.3 | 74.17 | Please elaborate to which "exchange" the sentence refers, as proposed | Please revise the sentence as follows: “The first PPDU of the exchange \*within the time allocation signaled in the MU-RTS TXS Trigger frame\* shall carry a CTS frame ...” | **Revised**  The text is updated which is slightly different from the proposed change.  Note to editor: Please apply the changes marked as #990. | |
| 1028 | Weiyi Li | 37.8.2.3.2 | 73.25 | Solicit seems to be too generic | Add a specific mean(s) of solicitation. | **Revised**  The text is updated to clarify that a Co-TDMA sharing AP may solicit a response from a polled AP in a Co-TDMA ICR frame.  The resolution to this comment is the same as that for CID 987.  **Note to editor**: No further changes are needed. | |
| 1030 | Weiyi Li | 37.8.2.3.2 | 73.29 | The current text does not permit a polled AP to decide whether it'll receive a sufficient minimum allocation. | Include minimum allocation information in the soliciting frame. | **Rejected**  TXOP sharing in a Co-TDMA procedure operates on a best-effort basis, e.g., due to uncertainties—such as the variable duration of in-BSS transmissions by the Co-TDMA sharing AP and potential hidden node issues. So, there is no need to include minimum allocation information. | |
| 1045 | Matthew Fischer | 37.8.2.3.1 | 72.45 | How can the Co-TDMA AP set have only one member? The language is confusing. The fact that there is or is not a set of APs that might participate in sharing is immaterial to the point being made. A lot of details are left out at this level of introduction. | Change "share a time portion of an obtained TXOP with another AP that belongs to a set of APs (the set is TBD and can consist of one AP) to transmit one or more PPDUs" to "share a time portion of an obtained TXOP with one other AP which may transmit one or more PPDUs but which shall not share the TXOP with a third AP" | **Revised**  The text is updated to clarify that the Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs. An AP that receives a time allocation from another AP as part of the Co-TDMA procedure exchanges one or more PPDUs during the allocated time.  The resolution to this comment is the same as that for CID 1700 addressed in Co-TDMA PDT document 11-25/0755r11 (part of D0.3).  **Note to editor**: No further changes are needed. | |
| 1046 | Matthew Fischer | 37.8.2.3.2 | 73.30 | Language is not accurate, not technically correct and not conformant to 802.11 standard style. | Change "to determine the intent of the polled AP(s) if receiving a time allocation from the Co-TDMA sharing AP within the TXOP." to "to solicit information from the polled AP(s) to use in determining to which AP(s) to grant a time allocation wtihin the TXOP." | **Revised**  The text is updated to clarify the procedure and purpose of the polling phase, specifically how a polled AP indicates its intent to receive a TXOP allocation from the Co-TDMA sharing AP.  **Note to editor**: Please apply the changes marked as #1046. | |
| 1047 | Matthew Fischer | 37.8.2.3.2 | 73.48 | Language is not precise. By providing accurate behavioral desriptions, each entity can determine correct actions to maximize desired system performance variables. A STA does not want intentions, but actual hard facts, quantifiable behavior, when possible. | Change "Its intention not to receive time allocation from the Co-TDMA sharing AP during the current TXOP." to "An indication that it will not accept a time allocation from the Co-TDMA sharing AP during the current TXOP." - also change "Its intention to receive time allocation from the Co-TDMA sharing AP during the current TXOP." to "A request to receive a time allocation from the Co-TDMA sharing AP during the current TXOP." | **Revised**  The text is updated to provide specific actions by a polled AP as a response to a Co-TDMA ICF.  The resolution to this comment is the same as that for CID 988.  **Note to editor**: No further action is needed. | |
| 1380 | Dibakar Das | 37.8.2.3.2 | 73.25 | During C-TDMA operation there could be several instances where a sharing AP sends Announcement frame only to other APs. In these cases, a non-AP STA associated to that AP would unnecessarily burn power trying parse all those Trigger frames to lookup its AID. It will be beneficial if the STA can determine early from such Trigger frames if they are going to be scheduled or not. | As in comment | **Rejected**  The Feedback User Info field in the BSRP Trigger frame (Co-TDMA TB ICF) and the User Info field in the BSRP NTB Trigger frame (Co-TDMA NTB ICF) indicate, via the Feedback Type field, that the ICF carries Co-TDMA information. A non-AP STA can use this indication to decide whether to further parse the ICF. | |
| 1390 | Dmitry Akhmetov | 37.8.2.3.1 | 73.01 | Update existing Figure 37-3 or provide additional one with examples on how NAV is set during Co-TDMA procedure | As in comment | **Rejected**  This comment fails to identity an issue.   The figure is intended for illustrative purposes. The details of NAV are provided in the normative text wherever needed, e.g., NAV setting for the polling phase and the TXOP allocation phase. Furthermore, it is clarified that the NAV set by the Co-TDMA coordinated AP during the allocated time shall end before this AP  returns the TXOP to the Co-TDMA-sharing AP. | |
| 1391 | Dmitry Akhmetov | 37.8.2.3.3 | 74.01 | Please provide rules to ensure fairness between Co-TDMA APs/BSSes and non-Co-TDMA APs/BSSes | as in comment | **Revised**  To ensure fairness to non-Co-TDMA STAs, the Co-TDMA sharing AP must perform at least some in-BSS transmissions before sharing its TXOP with another AP.  Additionally, as part of the resolution to CID 1378, D0.3 has already introduced rules to support fairness (see subclause 37.25).  **Note to editor:** Please apply the changes marked as #1391. | |
| 1432 | Akira Kishida | 37.8.2.3 | 73.01 | In the figure example, the shared AP obtained TXOP communicates with STAs belonging to the shared AP. However, it should also be permitted to communicate between shared APs joining the Co-TDMA procedures, for relay operations, for instance. | Please consider to specify. | **Rejected**  The direct sharing between shared APs goes against the consensus, such as, the TXOP return mechanism and only the Co-TDMA sharing AP allocating the TXOP.  Furthermore, direct  sharing between APs requires several considerations that may make protocol complicated, e.g., the shared AP allocating TXOP to other AP even though the former not being a TXOP owner, tight coordination required between shared APs and related signaling, etc. | |
| 1433 | Akira Kishida | 37.8.2.3.2 Polling phase | 73.25 | It is not clear how the sharing AP is decided. | Please consider to specify. | **Rejected**  The comment fails to identify an issue. The proposed change does not provide sufficient details to make a specific change that can satisfy the comment.  The decision whether an AP wishes to be a sharing AP is internal to the AP device. | |
| 1434 | Akira Kishida | 37.8.2.3.4 TXOP return phase | 74.25 | To properly return the remainder of a sharing AP's TXOP from a shared AP, the shared AP should know it is the last TXOP assigned to the AP by the sharing AP. | Specify an indication method(s) to notify it. | **Rejected**  There is no need for a shared AP to know whether it is the last portion of the TXOP allocated by the sharing AP. The shared AP may also need to return the TXOP even if it is not the last portion allocated by the sharing AP, e.g., in scenarios where a sharing AP wants to further share the TXOP with another AP and this requests a TXOP return from a shared AP. | |
| 1487 | Shinya Otsuki | 37.8.2.3.1 | 72.44 | A Co-TDMA sharing AP can share multiple time portions of an obtained TXOP with multiple APs. | The coordinated time division multiple access (co-TDMA) procedure enables an AP to share time portions of an obtained TXOP with other APs that belongs to a set of APs | **Revised**  The Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs.  The resolution to this comment is the same as that for CID 1700 addressed in Co-TDMA PDT document 11-25/0755r11.  **Note to editor**: No further changes are needed. | |
| 1528 | Xiandong Dong | 37.8.2.3.3 | 74.08 | rephrase the AP as either the polled AP or the Co-TDMA coordinated AP in the clause 37.8.2.3. | as in comment | **Rejected**  While an AP can be a polled AP in the polling phase, the same AP can be a Co-TDMA coordinated AP in the TXOP allocation phase. Please note that the polling phase and the TXOP allocation phase serve different purposes; therefore, both terminologies are necessary. | |
| 1529 | Xiandong Dong | 37.8.2.3.4 | 74.27 | clarify that the coordinating AP shall have the capability to support returning the remaining of the TXOP. | as in comment | **Revised**  In Co-TDMA PDT 11-25/0755r11 (part of D0.3), it is agreed that the sharing AP (coordinating AP) can provide an indication of its capability to receive a TXOP return via the Rx TXOP  Return Support field in the MAPC element.  **Note to editor**: No further changes are needed. | |
| 1539 | yajun CHENG | 37.8.2.3.2 | 73.31 | The sentence "if receiving a time allocation from the Co-TDMA sharing AP within the TXOP" sentence is redundant. The same issue in P73L38. | Please delete this sentence. | **Revised**  The resolution to this comment is the same as that for CID 1702 resolved in Co-TDMA PDT 11-25/0755r11 (part of D0.3).  **Note to editor**: No further changes are needed. | |
| 1540 | yajun CHENG | 37.8.2.3.2 | 73.41 | Do we define a polled AP's identifier field in a trigger frame? If not, this description should be avoided. | As in comment. | **Revised**  The resolution to this comment is the same as that for CID 3599 resolved in Co-TDMA PDT 11-25/0755r11 (part of D0.3).  **Note to editor**: No further changes are needed. | |
| 1543 | yajun CHENG | 37.8.2.3.3 | 73.50 | When the Sharing AP knows that multiple polled APs intend to receive time allocation from the sharing AP, to which AP will the Sharing AP allocate it's current TXOP first? | Adding the behaviors description of sharing AP when it determined that multiple polled AP intend to receive the current TXOP sharing, especially how to determine the order in which to share. | **Rejected**  Which polled APs receive TXOP allocation is implementation-specific to a Co-TDMA sharing AP. Although Co-TDMA sharing can consider its in-BSS traffic and the interest expressed by polled APs, the scheduling algorithms may vary significantly. | |
| 1699 | Gaius Wee | 37.8.2.3.1 | 72.48 | There should be a dot11 attribute and capabilities support indication for Co-TDMA | Add text for e.g., dot11CTDMAOptionImplemented and field in UHR capabilities element | **Revised**  The updated text now includes a reference to the dot11CoTDMAOptionImplemented MIB variable.  There is no need to define a capability field for Co-TDMA in the UHR Capabilities element, as support for Co-TDMA is implicitly indicated when an AP engages in MAPC negotiations, as described in 37.13.1 (Common procedures for all multi-AP coordination schemes).  **Note to editor**: Please apply changes marked as #1699. | |
| 1701 | Gaius Wee | 37.8.2.3.2 | 73.01 | It is not clear which Co-TDMA phases are optional or required | "example... that includes" suggests that there may be more or less phases. The relationship and requirement of the phases to Co-TDMA should be introduced in the General section. If all phases are included, replace "...that includes" with "..., which includes" | **Rejected**  There is no need to explicitly state whether the phases are optional. The normative text in the Co-TDMA subclause 37.13.2.3 (previously 37.8.2.3 in D0.1) specifies the conditions under which frame exchanges occur in each Co-TDMA phase. For example, the transmission of the Co-TDMA ICF by the sharing AP is mandatory, while the transmission of an MU-RTS TXS Trigger frame depends on the sharing AP’s decision to allocate a TXOP. | |
| 1703 | Gaius Wee | 37.8.2.3.2 | 73.38 | "intent if receiving" does not make sense in this sentence | Replace with "intent for receiving" | **Revised**  The text cited by the comment is revised as follows in the Co-TDMA PDT document 11-25/0755r11 (part of D0.3) as follows:  The ICF that polls the AP(s) as part of the Co-TDMA procedure and solicits a response from a polled AP in a TB PPDU is called a Co-TDMA TB ICF.  **Note to editor**: No further changes are needed. | |
| 1704 | Gaius Wee | 37.8.2.3.2 | 73.39 | Since the AID is in the polling frame, "to be polled" could be more correctly worded as "being polled" | Replace "to be polled" with "being polled" | **Revised**  The text pertaining to the comment is already changed to “The Co-TDMA sharing AP identifies a polled AP in the Co-TDMA TB ICF or the Co-TDMA NTB ICF by setting the AID12 field of a User Info field to the polled AP's AP ID, as assigned by the Co-TDMA sharing AP” in the Co-TDMA PDT 11-25/0755r11 (part of D0.3).  **Note to editor:** No further changes are needed. | |
| 1705 | Gaius Wee | 37.8.2.3.2 | 73.41 | "polled AP's User Info field" could be more correctly worded as "User Info field for the polled AP" | Replace "polled AP's User Info field" with "User Info field for the polled AP" | **Revised**  The text cited by the comment is revised as follows in the Co-TDMA PDT document 11-25/0755r11 (part of D0.3):  The Co-TDMA sharing AP identifies a polled AP in the Co-TDMA TB ICF or the Co-TDMA NTB ICF by setting the AID12 field of a User Info field to the polled AP’s AP ID, as assigned by the Co-TDMA sharing AP.  **Note to editor**: No further changes are needed. | |
| 1711 | Gaius Wee | 37.8.2.3.3 | 74.08 | "Co-TDMA coordinated AP" is used with introduction in this context. E.g., the relationship between other AP and Co-TDMA coordinated AP is not established | Insert in the first paragraph in 37.8.2.3.3 after the first sentence. "The other AP is referred to as a Co-TDMA coordinated AP". In the same paragraph, replace "other AP that is not co-located with the Co-TDMA sharing AP" with "Co-TDMA coordinated AP" | **Revised**  The text cited by the comment is revised as follows in the Co-TDMA PDT document 11-25/0755r11 (part of D0.3):  To allocate a portion of an obtained TXOP, the Co-TDMA sharing AP shall transmit an MU-RTS TXS Trigger frame with TXS Mode field equal to 2 to a coordinated AP that is not colocated with the Co-TDMA sharing AP.  Also, as a resolution to CID 3603, the relevant text is further updated to clarify that a polled AP that expressed interest in receiving TXOP allocation will be allocated TXOP.  **Note to editor**: No further changes are needed. | |
| 1712 | Gaius Wee | 37.8.2.3.3 | 74.14 | "the AP" may be ambiguous | Replace "the AP" with "it" | **Rejected**  The use of “it” creates ambiguity regarding which entity the sentence refers to, as two types of APs are mentioned in the same sentence. | |
| 1713 | Gaius Wee | 37.8.2.3.3 | 74.15 | It would be helpful for understanding this behaviour by including the time allocated in figure 37-3. E.g., similar to Figure 35-2 in 11be D7.0 | Modify the figure to include time allocated | **Rejected**  The Co-TDMA PDT document 11-25/0755r11 (part of D0.3) and the resolution of CID 990 have already provided sufficient detail on how time is allocated by the Co-TDMA sharing AP. Therefore, there is no need to update the figure cited in the comment to include the allocated time. | |
| 1731 | Gaius Wee | 3.2 | 22.08 | The definition of ICF is specific to Co-TDMA. It should be generalized since it is used elsewhere | Revise ICF definition to be general term applicable for expected uses | **Rejected**  The definition of the ICF is not specific to Co-TDMA. It is general enough to encompass the characteristics of other features, such as unavailability and the transition of a STA to a different mode of operation, which are not exclusive to Co-TDMA. | |
| 1864 | Sanghyun Kim | 37.8.2.3.2 | 73.23 | The participation intent of a Polled AP may change depending on the amount of resources the Sharing AP intends to allocate. For example, if the shared TXOP is short, the Polled AP may prefer to perform an alternative operation, such as NPCA, instead of using the shared TXOP. | Co-TDMA Sharing AP should provide details of the planned Co-TDMA procedure (i.e., allocation duration) so that the Polled AP can make a resonable decision. | **Revised**  The Co-TDMA PDT document 11-25/0755r11 (part of D0.3) includes the primary AC of the Co-TDMA sharing AP in a Co-TDMA ICF. Additionally, the shared TXOP must be used by a Co-TDMA coordinated AP to exchange frames from the primary AC or higher AC only. Therefore, a polled AP can use this primary AC information to determine whether it wants TXOP allocation based on its pending traffic.  Furthermore, a Co-TDMA sharing AP can provide information about the duration of the shared TXOP, which a polled AP can use to decide whether to request TXOP allocation—for example, the maximum TXOP duration being considered for allocation to coordinated AP(s).  **Note to editor**: Please apply the changes marked as #1864. | |
| 1866 | Sanghyun Kim | 37.8.2.3.4 | 74.23 | Missing details | Please define details of the TXOP return phase | **Revised**  The Co-TDMA PDT document 11-25/0755r11, which is incorporated in D0.3, includes additional details, such as the use of a Public Action frame as a TXOP return frame, and the conditions for TXOP return from both the Co-TDMA sharing AP and the Co-TDMA coordinated AP.  **Note to editor**: No further changes are needed. | |
| 1892 | Sanghyun Kim | 37.8.2.3.4 | 74.26 | While I agree that a coordinated AP must complete intra-BSS frame exchanges before the time allocated by the sharing AP expires, it may still be necessary to allow the coordinated AP to exceed the allocated time in unavoidable situations. Otherwise, interrupted frame exchanges would be delayed until the AP acquires a new TXOP or is assigned a new time duration. | Please consider allowing the coordinated AP to exceed its allocated time under conditions similar to those defined for TXOP limits (10.23.2.9). | **Rejected**  A Co-TDMA coordinated AP must adjust its in-BSS frame exchanges to ensure it does not exceed the allocated time. The coordinated AP determines the allocated time from the MU-RTS TXS Trigger frame addressed to it, which can be used to ensure that the AP completes its in-BSS frame exchanges within the allocated duration. | |
| 1987 | Liuming Lu | 37.8.2.3.2 Polling phase | 73.31 | the description of "if receiving a time allocation from the Co-TDMA sharing AP within the TXOP" is unclear. Suggest to modify it as "if receiving a frame that ..." | As in comment. | **Rejected**  The sentence indeed refers to receiving a time allocation, not to receiving a frame. | |
| 1988 | Liuming Lu | 37.8.2.3.3 TXOP allocation phase | 74.08 | "the Co-TDMA coordinated AP" or "the Co-TDMA shared AP"? Need to clarify | As in comment. | **Rejected**  The comment fails to identity an issue. The “Co-TDMA coordinated AP” is being used throughout the draft. | |
| 2208 | Brian Hart | 37.8.2.3.1 | 72.44 | For the Co-TDMA to operate between individual APs makes sense for non-colocated APs but is inefficent (and even weird) for the colocated APs typically used to support different SSIDs (such as for resident/employee vs guest and WPA2 vs WPA3 vs IOT). | MAPC interactions between "APs" should all operate at the Colocated BSSID Set level: such as capability negotiation, buffer status, flow requirements, medium resource sharing, TXOP grant, and TXOP return. | **Revised**  The text has already been updated in the Co-TDMA PDT document 11-25/0755r11 to clarify that the Co-TDMA procedure is between non-colocated APs.  **Note to editor**: No further changes are needed. |
| 2209 | Brian Hart | 37.8.2.3.1 | 73.06 | In Co-TDMA, APs in a colocated BSSID Set have no need to send a control frame over the air from one AP to another colocated AP - and indeed this would be weird since each transmission is unreceivable by the intended recipient | There should be no need for one AP to send control frames to another colocated AP for Co-TDMA - these should just be omitted. | **Revised**  The updated text in the Co-TDMA PDT document 11-25/0755r11 has already clarified that the Co-TDMA procedure is between non-colocated APs. Therefore, the control frames pertaining to Co-TDMA will be exchanged between two non-colocated APs.  **Note to editor**: No further changes are needed. | |
| 2447 | Klaus Doppler | 37.8.2.3.2 | 73.40 | Co-TDMA sharing AP sending an ICF frame to poll AP should include information that helps the polled AP to decide if it responds to the ICF with a positive response | Include signaling where the sharing AP includes information that help the responding AP to decide if it wants to get a share of the TXOP. | **Revised**  The Co-TDMA PDT document 11-25/0755r11 includes the primary AC of the Co-TDMA sharing AP in a Co-TDMA ICF. Additionally, the shared TXOP must be used by a Co-TDMA coordinated AP to exchange frames from the primary AC or higher AC only. Therefore, a polled AP can use this primary AC information to determine whether it wants TXOP allocation based on its pending traffic.  Furthermore, a Co-TDMA sharing AP can provide information about the duration of the shared TXOP, which a polled AP can use to decide whether to request TXOP allocation—for example, the maximum TXOP duration being considered for allocation to coordinated AP(s).  The resolution to this comment is the same as that for CID 1864.  **Note to editor**: No further changes are needed. | |
| 2459 | Yanjun Sun | 37.8.2.3.2 | 73.39 | Please clarify whether this be a frame other than BSRP? | as in comment | **Revised**  The Co-TDMA ICFs will be BSRP Trigger frame and BSRP NTB Trigger frame. This is already mentioned in the Co-TDMA PDT document 11-25/0755r11.  **Note to editor:** No further changes are needed. | |
| 2460 | Yanjun Sun | 37.8.2.3.2 | 73.44 | This TBD can be resolved based on latest motions | as in comment | **Revised**  All the TBDs are resolved in Co-TDMA PDT document 11-25/0755r11 (part of D0.3).  **Note to editor:** No further changes are needed. | |
| 2461 | Yanjun Sun | 37.8.2.3.2 | 73.46 | Suggest to add a condition around the "shall" such as "when physical/virtual CS indicates idle medium " | as in comment | **Revised**  The transmission of a Co-TDMA ICR frame by a polled AP shall be subject to the rules defined in 26.5.2.5 (UL MU CS mechanism) and 35.5.2.4 (UL MU CS mechanism for EHT STAs) for non-AP STAs.  **Note to editor**: Please apply the changes marked as #2461. | |
| 2465 | Yanjun Sun | 37.8.2.3.2 | 74.10 | As an AP may be allocated different AP IDs from different neighbors based on subclauses above and detailed allocation is still TBD, to avoid confusion, it's better to change "AP ID" to "the AP ID assigned by the sharing AP". | as in comment | **Revised**  The text is updated to clarify that the AP ID is assigned by the Co-TDMA sharing AP.  The resolution to this comment is the same as that for CID 3604.  **Note to editor**: No further changes are needed. | |
| 2516 | Inaki Val | 37.8.2.3.2 | 73.23 | Does the ICF include any traffic category indicator, to allow the polled APs to decide if they can accept the invitation? | In the ICF, consider to include parameters such as the gained traffic category (AC, TID, etc) and the gained TXOP length | **Revised**  The Co-TDMA PDT document 11-25/0755r11 has included the primary AC of the Co-TDMA sharing AP in a Co-TDMA ICF.  **Note to editor:** No further changes are needed. | |
| 2517 | Inaki Val | 37.8.2.3.4 | 74.23 | Is there any time threshold to decide if the shared AP may return the TXOP? | Consider to establish a minimum TXOP length limit to allow the shared AP to start the return TXOP procedure, if the remaining time is lower than this threshold, the shared AP will not initiate the procedure | **Revised**  There is no need to establish a minimum TXOP length. Whenever returning the TXOP, a shared AP must fit its PPDU transmission(s) and any expected responses with the allocated time. | |
| 2640 | Yue Qi | 37.8.2.3.1 | 73.04 | Figure 37-3, SIFS may be redundant, specific the duration if needed (PIFS or not), otherwise leave it blank for better visualization. This follows previous version of spec. | suggest to remove SIFS and corresponding lines. | **Accepted** | |
| 2673 | Xiaofei Wang | 37.8.2.3.1 | 73.04 | SIFS boundaries do not align correctly with the TXOP return to AP1 block | correct the figure | **Revised**  The ‘SIFS’ is removed from the figure as a resolution to CID 2640.  **Note to editor:** No further changes are needed. | |
| 2791 | Daniel Verenzuela | 37.8.2.3.2 | 73.31 | In the following sentence it is unclear what is the intent of the polled AP(s) "the intent of the polled AP(s) if receiving a time allocation from the Co-TDMA sharing AP within the TXOP." | change "the intent of the polled AP(s) if receiving a time allocation from the Co-TDMA sharing AP within the TXOP." to "the intent of the polled AP(s) to transmit and/or receive PPDUs if receiving a time allocation from the Co-TDMA sharing AP within the TXOP." | **Revised**  The text is updated to clarify the procedure and purpose of the polling phase, specifically how a polled AP indicates its intent to receive a TXOP allocation from the Co-TDMA sharing AP.  **Note to editor**: Please apply the changes marked as #1046. | |
| 2792 | Daniel Verenzuela | 37.8.2.3.2 | 73.53 | The intention of the polled AP should be clarified | change "Its intention to receive time allocation from the Co-TDMA sharing AP during the current TXOP" to "Its intention to to transmit and/or receive PPDUs upon receiving time allocation from the Co-TDMA sharing AP during the current TXOP" | **Revised**  The text is updated to clarify the intent of a polled AP and related signaling to receive a TXOP allocation from the Co-TDMA sharing AP as follows:  The TXOP Sharing Solicited field of the Feedback field in the Co-TDMA ICR frame transmitted by a polled AP shall be set to 1 if the polled AP intends to receive a time allocation from the Co-TDMA sharing AP during the current TXOP; otherwise, it shall be set to 0.  **Note to editor**: Please apply the changes marked as #988. | |
| 2818 | Serhat Erkucuk | 37.8.2.3.2 | 73.38 | Please correct the typo: ... determine their intent if receiving a time allocation ... | The word "if" should be replaced by "of". | **Revised**  The text is updated in a Co-TDMA PDT document 11-25/755r11 (part of D0.3) to improve the clarity as follows:The ICF that polls the AP(s) as part of the Co-TDMA procedure and solicits a response from a polled AP in a TB PPDU is called a Co-TDMA TB ICF.  **Note to editor**: No further changes are needed. | |
| 2819 | Serhat Erkucuk | 37.8.2.3.4 | 74.23 | The draft spec defines a TXOP return phase. During the TXOP return phase, there may be some STAs associated with the Co-TDMA sharing AP that may not receive the TXOP return frame from the Co-TDMA coordinated AP (due to being hidden from the Co-TDMA coordinated AP). Therefore a mechanism may be needed to inform STAs associated with Co-TDMA sharing AP of the TXOP return. | Define a mechanism to inform STAs associated with Co-TDMA sharing AP of the TXOP return (for the purpose of informing STAs hidden to the Co-TDMA coordinated AP of the TXOP return). | **Rejected**  The comment fails to identify an issue. It is unclear why an associated STA of the Co-TDMA sharing AP would need to know about TXOP return. | |
| 3156 | Yunbo Li | 3.2 | 22.06 | The TXOP is a time domain concept, so it is redundent to say a time potion of obtained TXOP. | "a time portion of" --> "a portion of" | **Accepted** | |
| 3158 | Yunbo Li | 3.2 | 22.05 | There are definitions of Co-TDMA and Sharing AP, based on that, it seems not so necessary to define Co-TDMA sharing AP anymore. | remove the definition of Co-TDMA sharing AP. | **Rejected**  Since the sharing procedure varies across different MAPC schemes, it is helpful to clearly define what is meant by a Co-TDMA sharing AP to enhance clarity. | |
| 3171 | Yunbo Li | 37.8.2.3.2 | 73.48 | It is not clear the relationship between first two subbullet, "AND" or "OR"? | modify the text to make it clear that a polled AP shall provide it intend or not to be a shared AP. | **Revised**  The text is updated to clarify the intent of a polled AP and related signaling to receive a TXOP allocation from the Co-TDMA sharing AP as follows:  The TXOP Sharing Solicited field of the Feedback field in the Co-TDMA ICR frame transmitted by a polled AP shall be set to 1 if the polled AP intends to receive a time allocation from the Co-TDMA sharing AP during the current TXOP; otherwise, it shall be set to 0.  The resolution to this comment is the same as that for CID 988.  **Note to editor**: Please apply the changes marked as #988. | |
| 3172 | Yunbo Li | 37.8.2.3.2 | 73.51 | When a polled AP doesn't provice response, the polled AP may failed to receive the ICF from sharing AP. So it is not reasonable to trate no response as not intend to be a shared AP. Furtherly, "shall" is not allowed in a NOTE | change "shall" to "might" | **Rejected**  If a polled AP fails to receive an ICF and cannot respond, the Co-TDMA sharing AP does not know whether that AP is available for TXOP allocation. Therefore, there is no need to allocate TXOP to that AP. | |
| 3173 | Yunbo Li | 37.8.2.3.2 | 73.55 | "Signaling details are TBD" should be a separate sentence. | as in comment | **Revised**  The sentence cited in the comment is removed as a resolution to remove TBDs in the Co-TDMA PDT document 11-25/0755r11 (part of D0.3).  **Note to editor:** No further action is needed. | |
| 3174 | Yunbo Li | 37.8.2.3.3 | 74.08 | about the naming, either use sharing AP/ shared AP, or coordinating AP/ coordiated AP? | change "coordinated AP" to "shared AP" to align better with the naming of sharing AP. | **Rejected**  Since there involved “coordination” between two APs, it is better to use the term “coordinated AP.” Also, the TGbn has a consensus on the term “coordinated AP.” | |
| 3333 | Sanket Kalamkar | 37.8.2.3.2 | 73.49 | In Co-TDMA, a polled AP is required to respond to the ICF, indicating whether it intends to receive time allocation from the Co-TDMA sharing AP. However, certain conditions, such as the OBSS NAV, may prevent the polled AP from responding to the ICF. Currently, the NOTE does not specify the conditions under which the polled AP(s) are unable to respond to the ICF. | Specify the conditions under which the polled AP(s) are unable to respond to the ICF in Co-TDMA. | **Revised**  The transmission of a Co-TDMA ICR frame by a polled AP shall be subject to the rules defined in 26.5.2.5 (UL MU CS mechanism) and 35.5.2.4 (UL MU CS mechanism for EHT STAs) for non-AP STAs.  The resolution to this comment is the same as that for CID 2461.  **Note to editor**: Please apply the changes marked as #2461. | |
| 3337 | Sanket Kalamkar | 37.8.2.3.4 | 74.27 | Currently, it is missing that how the Co-TDMA sharing AP indicates whether it wants TXOP return from a Co-TDMA coordinated AP or not. Motion #277 requires to provide a mechnism for a Co-TDMA sharing AP to transmit to a Co-TDMA coordinated AP an indication of whether the Co-TDMA coordinated AP is to return the remainder of the allocated time (if any) back to the Co-TDMA sharing AP. | Provide a mechanism for a Co-TDMA sharing AP to transmit to a Co-TDMA coordinated AP an indication of whether the Co-TDMA coordinated AP is to return the remainder of the allocated time (if any) back to the Co-TDMA sharing AP. | **Revised**  A Co-TDMA sharing AP that has indicated support for TXOP return and that is soliciting a TXOP return from a Co-TDMA coordinated AP shall set the TXOP Return Solicited field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF to 1; otherwise, the Co-TDMA sharing AP shall set the TXOP Return Solicited field to 0.  The Co-TDMA coordinated AP shall return the TXOP after receiving a Co-TDMA TB ICF or a Co-TDMA NTB ICF that has set the TXOP Return Solicited field to 1.  This comment is already addressed in the Co-TDMA PDT document 11-25/0755r11—except the addition of one word “return.”  **Note to editor**: Please apply the changes marked as #694. | |
| 3385 | Zhenpeng Shi | 37.8.2.3.3 | 74.08 | "Co-TDMA coordinated AP" has not been defined yet. | Define "Co-TDMA coordinated AP" in 37.8.2.3.1 | **Rejected**  The definition of “Co-TDMA coordinated AP” is defined in D0.3 (please see P26L05). | |
| 3431 | Yue Zhao | 37.8.2.3.5 | 75.24 | Even when shared AP uses up the allocated time, the explicit TXOP return procedure is needed to signal the current BW of the TXOP. | Introduce explicit TXOP return signaling for C-TDMA and make it mandatory unless the allocated time ends at the TXOP ending and shared AP indicates no TXOP return. | **Revised**  While it is agreed that signaling for TXOP return is necessary, it need not be mandatory unless indicated by a Co-TDMA sharing AP.  A Co-TDMA sharing AP that has indicated support for TXOP return and that is soliciting a TXOP return from a Co-TDMA coordinated AP shall set the TXOP Return Solicited field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF to 1; otherwise, the Co-TDMA sharing AP shall set the TXOP Return Solicited field to 0.  The Co-TDMA coordinated AP shall return the TXOP after receiving a Co-TDMA TB ICF or a Co-TDMA NTB ICF that has set the TXOP Return Solicited field to 1.  This comment is already addressed in the Co-TDMA PDT document 11-25/0755r11—except an editorial change where one word “return” is added.  **Note to editor**: Please apply the changes marked as #694. | |
| 3441 | Muhammad Kumail Haider | 37.8.2.3.1 | 72.44 | (the set is TBD and can consist of one AP) -> (the set is TBD and may consist of one or more APs) | As in comment | **Revised**  The Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs.  The resolution to this comment is the same as that for CID 1700 addressed in Co-TDMA PDT document 11-25/0755r11.  **Note to editor**: No further changes are needed. | |
| 3442 | Muhammad Kumail Haider | 37.8.2.3.2 | 73.31 | "if receiving a time allocation" -> "to receive a time allocation" | As in comment, multiple places in this subclause | **Revised**  In the Co-TDMA PDT document 11-25/0755r11 (part of D0.3), the text is updated to “…of receiving a time allocation…”  **Note to editor:** No further changes are needed. | |
| 3601 | kaiying Lu | 37.8.2.3.2 | 73.25 | A Co-TDMA sharing AP may poll one or more APs at the beginning of the TXOP.If the polled APs indicated not support for responding in a TB PPDU, the polling phase will be less efficient and more complicated, | Suggest that MAP coordination transmission capable AP shall support for responding in a TB PPDU. | **Rejected**  The proposed change goes against Motions 120 and 121 that allow a transmission of non-TB PPDUs based on AP’s capabilities. | |
| 3603 | kaiying Lu | 37.8.2.3.3 | 73.60 | Change "to another AP" to "a polled AP that confirmed the intention to receive time allocation." | As in comment. | **Revised**  The Co-TDMA sharing AP needs to allocate TXOP to a polled AP that has expressed interest in receiving time allocation during the polling phase.  **Note to editor:** Please apply the changes marked as #3603. | |
| 3605 | kaiying Lu | 37.8.2.3.3 | 74.20 | The time allocated to a Co-TDMA coordinated AP shall be limited for the fainess to other OBSSs. | Clarify the rule as the comment. | **Revised**  The PDT on fairness in 11-25/0479r10 has specified the rules for fairness that also apply to a Co-TDMA procedure.  **Note to editor:** No further changes are needed. | |
| 3749 | Leonardo Lanante | 37.8.2.3.1 | 73.06 | The sharing AP may not be able to regain the TXOP after return from the shared AP since the sharing AP side is not protected during the shared TXOP duration. | Define a mechanism to protect the allocated TXOP duration from the sharing AP side. | **Revised**  The proposed change does not provide sufficient information to make a specific change.  However, if deemed necessary, the Co-TDMA sharing AP can use existing mechanisms—such as mandatory RTS/CTS exchange or MU-EDCA—to prevent its associated non-AP STAs from initiating transmissions to the AP.  To clarify, the following NOTE has been added:  “When an AP participates in a Co-TDMA procedure, it might prevent its associated non-AP STAs from initiating UL transmissions. Such a prevention can be helpful when associated non-AP STAs of the AP are hidden from other Co-TDMA-related transmissions—for example, when associated non-AP STAs of a polled AP are hidden to in-BSS transmissions of the Co-TDMA sharing AP. To do this, the AP can use existing mechanisms such as RTS enablement (see 26.2.1 (TXOP duration-based RTS/CTS)) or MU-EDCA (see 26.2.7(EDCA operation using MU EDCA parameters)).”  The above part of the resolution to this comment is the same as that for CID 821.  Furthermore, if a shared AP sends a CF-End frame during the allocated time before returning the TXOP to the sharing AP, the NAV may be reset at neighboring devices, potentially causing the sharing AP to lose the TXOP. Therefore, a note is added to clarify that the coordinated AP does not send a CF-End frame if it is to return the TXOP..  **Note to editor**: Please apply the changes marked as #3749. | |
| 3785 | Yongho Seok | 37.8.2.3.1 | 72.46 | "...that belongs to a set of APs (the set is TBD and can consist of one AP) to transmit one or more PPDUs." A set of APs is not necessary. If the AP has negotiated, Co-TDMA can be applied with the negotiated AP." Remove the sentence. | As in the comment | **Revised**  The text has already been updated in the Co-TDMA PDT 11-25/0755r11 (part of D0.3) to remove the reference to “a set of APs.”  **Note to editor:** No further changes are needed. | |
| 3786 | Yongho Seok | 37.8.2.3.2 | 73.23 | Since other multi-AP schemes also require a polling phase, the polling phase should be moved to the common section. | As in the comment | **Rejected**  It is not yet clear from the TGbn discussions whether a polling phase will apply to MAPC schemes other than Co-TDMA. Furthermore, the polling phase may vary across different MAPC schemes. | |
| 3787 | Yongho Seok | 37.8.2.3.2 | 73.50 | "NOTE--If a Co-TDMA sharing AP does not receive a response from the polled AP, the Co-TDMA sharing AP shall consider that the polled AP does not intend to receive time allocation from the Co-TDMA sharing AP during the current TXOP." This is not a NOTE. The Co-TDMA sharing AP shall not send the MU-RTS TXS to the polled AP when the polled AP indicates no intention to receive time allocation. Move this NOTE to 37.8.2.3.3 and change to the normative text. | As in the comment | **Revised**  In the Co-TDMA PDT 11-25/0755r11, the note is removed, and the text of the note is made part of normative text.  As a resolution to CID 3603, it is now clarified that the Co-TDMA sharing AP shall not send an MU-RTS TXS to a polled AP when the polled AP indicates no intention to receive time allocation. The resolution to this comment is the same as that for CID 3603.  **Note to editor**: No further changes are needed. | |
| 3791 | Yongho Seok | 37.8.2.3.2 | 73.43 | "Whether or not the Co-TDMA sharing AP is mandated to send the ICF as part of the Co-TDMA procedure is TBD." The polling phase must be mandated; otherwise, the Co-TDMA sharing AP may waste resources by unnecessarily sharing the TXOP. Also, the polling phase much be applied to other multi-AP mechanisms. | As in the comment | **Revised**  As per Motion 268, the polling phase is mandated. The text is already updated in the Co-TDMA PDT 11-25/0755r11 (part of D0.3).  **Note to editor**: No further changes are needed. | |
| 3793 | Yongho Seok | 37.8.2.3.4 | 74.26 | “A Co-TDMA coordinated AP may return the remainder of the allocated time (if any) to the Co-TDMA sharing AP.” The Co-TDMA sharing AP should indicate whether the TXOP return is requested or not. | As in the comment | **Revised**  A Co-TDMA sharing AP that has indicated support for TXOP return and that is soliciting a TXOP return from a Co-TDMA coordinated AP shall set the TXOP Return Solicited field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF to 1; otherwise, the Co-TDMA sharing AP shall set the TXOP Return Solicited field to 0.  The Co-TDMA coordinated AP shall return the TXOP after receiving a Co-TDMA TB ICF or a Co-TDMA NTB ICF that has set the TXOP Return Solicited field to 1.  This comment is already addressed in the Co-TDMA PDT document 11-25/0755r11—except the editorial change of adding one word “return.”  **Note to editor**: Please apply the changes marked as #694. | |
| 3816 | Abhishek Patil | 3.2 | 22.02 | The TXOP can be shared with one or more APs. | For clarity, replace 'a set of APs' with "one or more APs". Same change on line 22. | **Revised**  The Co-TDMA procedure enables an AP to allocate a portion of an obtained TXOP sequentially to one or more non-colocated APs.  The resolution to this comment is the same as that for CID 1700 addressed in Co-TDMA PDT document 11-25/0755r11.  **Note to editor**: No further changes are needed. | |
| 3841 | Abhishek Patil | 9.3.1.22.11 | 54.55 | As part of the Co-TDMA procedure, a sharing AP shall use the MU-RTS TXS frame to share portion of its TXOP with another AP (see motion 159). Study the existing format of MU-RTS TXS frame and make the necessary updates to carry information needed to support Co-TDMA operation. | As in comment | **Revised**  There are no additional changes needed to the existing format of the MU-RTS TXS Trigger frame. The signaling in the MU-RTS TXS Trigger frame specific to Co-TDMA (e.g., AP ID signaling) is included in the Co-TDMA PDT 11-25/0755r11.  **Note to editor:** No further changes are needed. | |
| 3842 | Abhishek Patil | 9.3.1.22.12 | 54.62 | As part of the Co-TDMA procedure, a sharing AP shall use the BSRP Trigger frame as an ICF to initiate the Co-TDMA operation in a TXOP (see motion 156). Study the existing format of BSRP Trigger frame and make the necessary updates to carry information needed to support Co-TDMA operation. | As in comment | **Revised**  The Co-TDMA PDT 11-25/0755r11 has added the necessary updates to the existing format of the BSRP Trigger frame to support Co-TDMA operation, e.g., addition of a Feedback User Info field and related fields.  **Note to editor:** No further changes are needed. | |
| 3876 | Abhishek Patil | 37.8.2.3.2 | 73.25 | Clarify how an ICF indicates whether the response is to be a TB or non-TB PPDU. See motion #152. Harmonize the mechanism for all ICFs to use the same signaling (i.e., value 3 from Table 9-90b4) | As in comment | **Revised**  If the GI And HE/UHR-LTF Type field of a BSRP Trigger frame is set to 3, the BSRP Trigger frame—as a Co-TDMA ICF—solicits a response in a non-TB PPDU (the frame is called a BSRP NTB Trigger frame); otherwise, the BSRP Trigger frame solicits a response in a TB PPDU (the frame is called a BSRP TB Trigger frame).  The resolution of this comment is already included in the Co-TDMA PDT 11-25/0755r11.  **Note to editor:** No further changes are needed. | |
| 3881 | Abhishek Patil | 37.8.2.3.2 | 73.41 | In order for the shared AP(s) to better prepare (and respond), the ICF must also provide other information such as when the TXOP sharing is expected and perhaps the category of traffic for which the TXOP can be used. | Update the subclause on BSRP Trigger frame to identify / define fields to carry information needed to support Co-TDMA operation. Update this section with the corresponding normative behavior. | **Revised**  The Co-TDMA PDT document 11-25/0755r11 has included the primary AC of the Co-TDMA sharing AP in a Co-TDMA ICF. Also, the Co-TDMA ICF includes the indication whether the Co-TDMA sharing AP wants to have a TXOP return from a Co-TDMA coordinated AP.  **Note to editor:** No further changes are needed. | |
| 3883 | Abhishek Patil | 37.8.2.3.2 | 73.47 | Clarify that the response is an MBA (see motion #270) and harmonize the values of Ack Type and TID subfields with other feedback scheme that use MBA (see 9.3.1.8.6) | As in comment | **Revised**  As per the resolution to CID 988, the TXOP Sharing Solicited field of the Feedback field in the Co-TDMA ICR frame transmitted by a polled AP shall be set to 1 if the polled AP intends to receive a time allocation from the Co-TDMA sharing AP during the current TXOP; otherwise, it shall be set to 0.  The Co-TDMA PDT 11-25/0755r11 has already included that the Ack Type and TID fields shall be set to 0 and 13, respectively, and the Feedback Type field shall be set to 3.  **Note to editor**: No further changes are needed. | |

**Discussions:**

### MAPC element with a Co-TDMA example (11-25/1082r1)

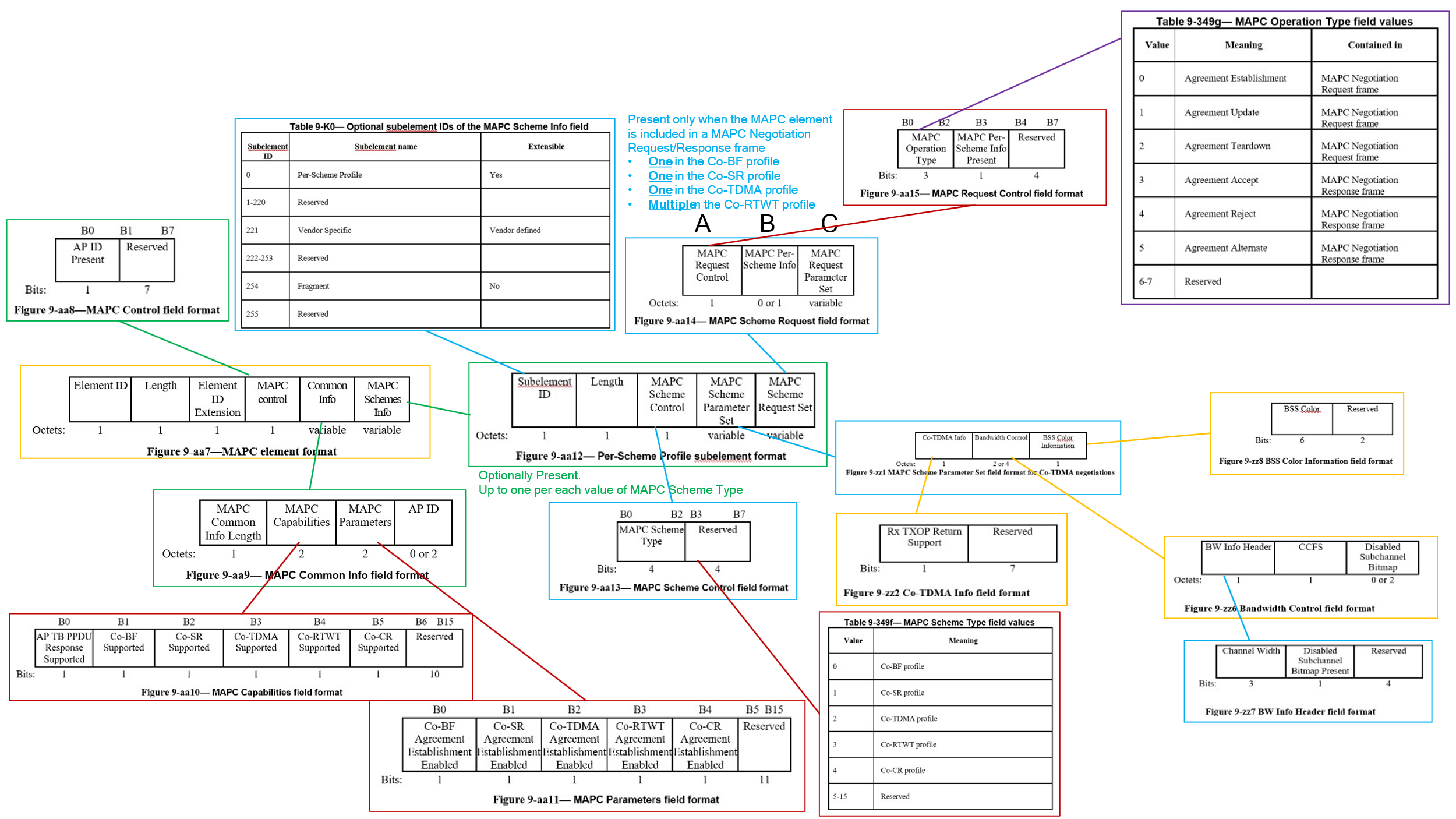
The structure of the MAPC element defined in subclause 9.4.2.aa3 (MAPC element) is summarized in the figure below for an example of Co-TDMA.

***A group of forms with text and numbers

AI-generated content may be incorrect.***

### MAPC element with a Co-TDMA example (11-25/1082r2)

The structure of the MAPC element defined in subclause 9.4.2.aa3 (MAPC element) is summarized in the figure below for an example of Co-TDMA.



**The text to be adopted begins here.**

**TGbn Editor: Please apply changes marked as tracked changes and strikethrough changes to 9.3.1.22.7 (Feedback User Info field) as follows.**

9.3.1.22.7 Feedback User Info field

The Feedback User Info field is identified by setting the AID12 field to 2008 and is present in a BSRP Trigger frame transmitted as a Co-TDMA TB ICF by a Co-TDMA coordinating AP (see 37.8.2.3.3 (Polling phase)).

(#3256)If the Feedback Type field is set to 3, then the format of the Feedback Information field is defined in Figure 9-xxx (Feedback Information field if the Feedback Type field is set to 3).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | B0   B1 | B2 | B3 B10 | B11 B23 |
|  | Primary AC | TXOP Return Solicited | (#1864)Max TXOP Allocation Under Consideration | Reserved |
| Bits: | 2 | 1 | 8 | 13 |

**Figure 9-xxx— Feedback Information field format if the Feedback Type field is set to 3**

(#3790)The Primary AC field indicates the primary AC of the obtained TXOP by a Co-TDMA coordinating AP. The Primary AC field is encoded as the AC index (ACI) defined in Table 9-193 (ACI-to-AC coding).

The TXOP Return Solicited field indicates whether the Co-TDMA coordinating AP is soliciting a TXOP return from a Co-TDMA coordinated AP, as described in 37.13.2.3.5 (TXOP return phase). The TXOP Return Solicited field is set to 1 if the Co-TDMA coordinating AP is soliciting a TXOP return from a Co-TDMA coordinated AP; otherwise, it is set to 0.

(#1864)The Max TXOP Allocation Under Consideration field indicates the maximum TXOP duration that the Co-TDMA coordinating AP considers for allocation to Co-TDMA coordinated AP(s), in units of 16~~64~~ μs.

NOTE – A polled AP can take into account the value carried in the Max TXOP Allocation Under Consideration field to determine its response to a Co-TDMA ICF.

**TGbn Editor: Please apply the changes marked as tracked changes and strikethrough changes to 9.3.1.8.6 (Multi-STA BlockAck variant) as follows.**

If a Per AID TID Info field has the Ack Type subfield equal to 0 and the TID subfield equal to 13 then:

* If the Multi-STA BlockAck frame is individually addressed to the UHR non-AP STA, the AID11 subfield of the Per AID TID Info subfield is set to the 11 LSBs of the AID of a UHR non-AP STA. If the Multi-STA BlockAck frame is individually addressed to an AP, the AID11 subfield is set to 0. (#3829)
* ~~(#3883)If a Multi-STA BlockAck frame is transmitted by a UHR AP to another UHR AP with which it has a MAPC agreement (see 37.13.1.3 (MAPC agreement negotiation)), and the frame is individually addressed, the AID11 field in the AID TID Info field is set to the 11 LSBs of the receiving AP’s AP ID, as assigned by the transmitting AP.~~
* If the Multi-STA BlockAck frame frame is transmitted by an AP and is group addressed, the AID11 subfield of the AID TID Info subfield is set to the AID of a UHR STA that is the intended receiver of the feedback information or to 2008 if the feedback information is intended for all addressed UHR STAs.(#3829)
* The Block Ack Starting Sequence Control subfield in the Per AID TID Info subfield has the format shown in Figure 9-48 Block Ack Starting Sequence Control subfield format.(#3829)
* The Feedback Type subfield indicates the type of feedback that is contained in the Feedback field and the encoding of the Feedback Type field is shown in Table 9-40 (Feedback Type subfield encoding(#1035)).(#3829)
* (#2871)The feedback subfield length is defined in Table9-40 (Fragment Number subfield encoding for the Multi-STA BlockAck variant) and a UHR STA indicates a feedback length for unavailability feedback or low latency feedback equal to 4.(#3829)

NOTE—While a UHR STA uses length 4, it is possible to in future amendments, other feedback length might be used and as such UHR STAs are expected to parse them correctly.

(#684)The Feedback Type field is set to 3 to carry Co-TDMA information as described in 37.8.2.3 (Coordinated time division multiple access (Co-TDMA)).

If the Feedback Type field is set to 3, the Feedback field has the format defined in Figure 9-60c (Feedback field format if the Feedback Type field is set to 3 for Co-TDMA information).

|  |  |  |
| --- | --- | --- |
|  | B0 | B1    B31 |
|  | TXOP Sharing Solicited | Reserved |
| Bits: | 1 | 31 |

**Figure 9-60c Feedback field format if the Feedback Type field is set to 3 for Co-TDMA information**

The TXOP Sharing Solicited field of the Feedback field is set to 1 if the polled AP intends to receive a time allocation from the Co-TDMA coordinating AP during the current TXOP to exchange frames of the same or higher priority ACs compared to the AC indicated in the Primary AC field in the Co-TDMA TB ICF or the Co-TDMA NTB ICF with its associated non-AP STAs, otherwise it is set to 0.

**TGbn Editor: Please add the text marked as tracked changes and strikethrough changes in 9.4.2.aa3.2.4 (Co-TDMA profile) as follows.**

**9.4.2.aa3.2.4 Co-TDMA profile**

The MAPC Scheme Type field is set to the value corresponding to the Co-TDMA profile, as indicated in Table 9-349f (MAPC Scheme Type field values).

The MAPC Scheme Parameter Set field is always present in a Co-TDMA profile and carries parameters specific to the AP for the Co-TDMA procedure. The MAPC Scheme Parameter Set field format for Co-TDMA negotiations is defined in Figure 9-zz1 (MAPC Scheme Parameter Set field format for Co-TDMA negotiations).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Co-TDMA Info | ~~Traffic Control~~ | Bandwidth Control | BSS Color Information |
| Octets: | 1 | ~~variable~~ | 2 or 4 | 1 |

Figure 9-zz1 MAPC Scheme Parameter Set field format for Co-TDMA negotiations

The Co-TDMA Info field carries the capabilities of an AP related to the Co-TDMA procedure and is defined in Figure 9-zz2 (Co-TDMA Info field format).

|  |  |  |
| --- | --- | --- |
|  | Rx TXOP Return Support | Reserved |
| Bits: | 1 | 7 |

**Figure 9-zz2 Co-TDMA Info field format**

The Rx TXOP Return Support field is set to 1 if the AP, when operating as a Co-TDMA coordinating AP, supports receiving a TXOP return from a Co-TDMA coordinated AP to which it has allocated a portion of its TXOP; otherwise, it is set to 0.

~~The Traffic Control field of the MAPC Scheme Parameter Set field consists of four Per-AC Traffic Info fields, one for each AC. The format of the Per-AC Traffic Info field is defined in Figure 9-zz3 (Per-AC Traffic Info field format).~~

|  |  |  |
| --- | --- | --- |
|  | ~~Traffic Info Header~~ | ~~Traffic Profile Set~~ |
| ~~Octets:~~ | ~~1~~ | ~~variable~~ |

~~Figure 9-zz3 Per-AC Traffic Info field format~~

~~The Traffic Info Header field specifies information related to the traffic profile(s) for which the AP, when operating as a Co-TDMA coordinated AP, is requesting TXOP allocation. The format of the Traffic Info Header field is defined in Figure 9-zz4 (Traffic Info Header format).~~

|  |  |  |  |
| --- | --- | --- | --- |
|  | ~~Traffic AC~~ | ~~Traffic Profile Count~~ | ~~Reserved~~ |
| ~~Bits:~~ | ~~2~~ | ~~2~~ | ~~4~~ |

~~Figure 9-zz4 Traffic Info Header format~~

~~The Traffic AC field indicates the AC associated with the traffic profile(s) provided in the Traffic Profile Set field. The Traffic AC field is encoded as the AC index (ACI) defined in Table 9-193 (ACI-to-AC coding).~~

~~The Traffic Profile Count field specifies the number of Traffic Profile fields present in the Traffic Profile Set field.~~

~~The Traffic Profile Set field provides a set of traffic profiles for the AC indicated in the Traffic AC field, for which the AP is requesting TXOP allocation from a Co-TDMA coordinating AP with which it has established a Co-TDMA agreement. If the Traffic Profile Count field is set to 0, the Traffic Profile Set field is absent, and the AP is requesting to be polled, for the AC indicated in the Traffic AC field, by a Co-TDMA coordinating AP with which it has established a Co-TDMA agreement. If the Traffic Profile Set field includes at least one Traffic Profile field (see Figure 9-zz5 (Traffic Profile field format)), the AP is requesting TXOP allocation for the traffic profile specified by the Traffic Profile field from a Co-TDMA coordinating AP with which it has established a Co-TDMA agreement.~~

~~The format of the Traffic Profile field is defined in in Figure 9-zz5 (Traffic Profile field format).~~

~~Repeated as per the   
Traffic Profile Count field~~

|  |  |  |  |
| --- | --- | --- | --- |
|  | ~~Profile ID~~ | ~~Allocated TXOP Duration~~ | ~~Allocation Interval~~ |
| ~~Octets:~~ | ~~1~~ | ~~1~~ | ~~2~~ |

~~Figure 9-zz5 Traffic Profile field format~~

~~The Profile ID field is set to a nonzero value in the range of 1 to 15, selected by the AP to identify a traffic profile specified in the Traffic Profile field. The values outside this range are reserved.~~

~~The Allocated TXOP Duration field specifies the expected TXOP allocation duration for each TXOP allocation event for the traffic profile identified by the Profile ID field, in units of 32 μs.~~

~~The Allocation Interval field indicates the expected periodicity of the TXOP allocation for the traffic profile identified by the Profile ID field, in units of 256 μs.~~

(#825)The format of the Bandwidth Control field of the MAPC Scheme Parameter Set field is defined in Figure 9-zz6 (Bandwidth Control field format), which specifies the bandwidth configuration of the AP.

|  |  |  |  |
| --- | --- | --- | --- |
|  | BW Info Header | CCFS | Disabled Subchannel Bitmap |
| Octets: | 1 | 1 | 0 or 2 |

Figure 9-zz6 Bandwidth Control field format

The BW Info Header field is defined in Figure 9-zz7 (BW Info Header field format).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Channel Width | Disabled Subchannel Bitmap Present | Reserved |
| Bits: | 3 | 1 | 4 |

Figure 9-zz7 BW Info Header field format

The Channel Width and CCFS fields are defined in Table 9-zz1 (Channel Width and CCFS fields).

Table 9-zz1 Channel Width and CCFS fields

|  |  |  |
| --- | --- | --- |
| **Field** | **Definition** | **Encoding** |
| Channel Width | The field defines the UHR BSS bandwidth. | Set to 0 for 20 MHz UHR BSS bandwidth.  Set to 1 for 40 MHz UHR BSS bandwidth.  Set to 2 for 80 MHz UHR BSS bandwidth.  Set to 3 for 160 MHz UHR BSS bandwidth.  Set to 4 for 320 MHz UHR BSS bandwidth.  Values in the ranges 5 to 7 are reserved. |
| CCFS | The field defines the channel center frequency for a 20, 40, 80, 160, or 320 MHz UHR BSS bandwidth. | For 20, 40, 80, 160 or 320, indicates the channel center frequency index for 20, 40, 80, 160, or 320 MHz channel on which the UHR BSS operates. |

The Disabled Subchannel Bitmap field in the Bandwidth Control field is present if the Disabled Subchannel Bitmap Present field in the BW Info Header field is set to 1 and provides a list of subchannels that are punctured within the BSS bandwidth. Otherwise, the Disabled Subchannel Bitmap field is not present.

The encoding of the Disabled Subchannel Bitmap field in the Bandwidth Control field is the same as that of the Disabled Subchannel Bitmap field defined in the Figure 9-1074k (EHT Operation Information field format).

NOTE—An AP that receives a MAPC Negotiation Request frame can determine the overlapping BSS bandwidth based on the bandwidth configuration information included in the Bandwidth Control field.

The BSS Color Information field in the MAPC Scheme Parameter Set field indicates the BSS color of the transmitting AP, and is defined as in Figure 9-zz8 (BSS Color Information field format).

|  |  |  |
| --- | --- | --- |
|  | BSS Color | Reserved |
| Bits: | 6 | 2 |

Figure 9-zz8 BSS Color Information field format

The BSS Color field is an unsigned integer whose value is the BSS Color of the BSS corresponding to the transmitting AP.

The MAPC Per-Scheme Info Present field is set to 0.

The MAPC Request Parameter Set field is not included.

**TGbn Editor: Please make the following changes (marked as tracked changes) and strickethrough changes to 37.13.2.3 (Coordinated time division multiple access (Co-TDMA)) as follows.**

* **Coordinated time division multiple access (Co-TDMA)**
* **General**

The coordinated time division multiple access (Co-TDMA)(#111) procedure enables an AP (#1699)with dot11CoTDMAOptionImplemented equal to true to allocate a portion of an obtained TXOP(#1430, #1700, #3322) sequentially to one or more non-colocated APs (#1699)with dot11CoTDMAOptionImplemented equal to true. (#1700)An AP that receives a time allocation from another AP as part of the Co-TDMA procedure (#217)exchanges one or more PPDUs during the allocated time.

(#3874)An AP shall not initiate a Co-TDMA procedure with another AP if any of the following conditions are true:

* No MAPC agreement on Co-TDMA exists between the APs.
* The primary 20 MHz channels of the two APs’ BSS differ.
* Both APs are part of the same colocated AP set.

A Co-TDMA negotiation to establish, update, and tear down a Co-TDMA agreement is performed by following the rules defined in 37.13.1.3 (MAPC agreement negotiation) and 37.13.2.3.2 (Co-TDMA negotiation procedure).

NOTE—An AP can establish a MAPC agreement for Co-TDMA with another AP by following the procedures defined in 37.13.1.3 (MAPC agreement negotiation) and 37.13.2.3.2 (Co-TDMA negotiations), or via other means out of the scope of the standard. An AP with dot11CoTDMAOptionImplemented equal to 1 can participate in a Co-TDMA procedure by means that do not follow the protocol defined in 37.13.1.3 (MAPC agreement negotiation) and are out of the scope of this standard. Figure37-5 (An Example of the Co-TDMA(#623) procedure between three APs(#3328)) shows an example of Co-TDMA(#622) procedure that includes a polling phase, a TXOP allocation phase, and a TXOP return phase.



37.3—An Example of the Co-TDMA(#623) procedure between three APs(#3328)

* **Co-TDMA negotiations**

A MAPC requesting AP that follows the rules defined in 37.13.1.3 (MAPC agreement negotiation) for a Co-TDMA negotiation procedure, and also follows the rules in this subclause, is referred to as a Co-TDMA requesting AP.

~~A MAPC responding AP that follows the rules defined in 37.13.1.3 (MAPC agreement negotiation) for a Co-TDMA negotiation procedure, and also follows the rules in this subclause, is referred to as a Co-TDMA responding AP.~~

~~A Co-TDMA requesting AP may initiate a Co-TDMA negotiation procedure by transmitting an individually addressed MAPC Negotiation Request frame (see 9.6.7.66 (MAPC Negotiation Request frame format)) to the AP with which the Co-TDMA requesting AP intends to establish, update, or tear down a Co-TDMA agreement.~~

A Co-TDMA requesting AP shall include a Co-TDMA profile (see 9.4.2.aa3.2.4 (Co-TDMA profile)) in the MAPC element carried in ~~of~~ a MAPC Negotiation Request frame. The Co-TDMA profile shall include one MAPC Scheme Request field.

The MAPC operation Type field of a MAPC Negotiation Request frame transmitted by a Co-TDMA requesting AP shall be set to one of the following values:

* 0 to request establishment of a Co-TDMA agreement;
* 1 to request an update to an existing Co-TDMA agreement;
* 2 to request teardown of an existing Co-TDMA agreement.

A Co-TDMA requesting AP shall not set the MAPC Operation Type field to 0 if a Co-TDMA agreement is already established between the Co-TDMA requesting AP and the Co-TDMA responding AP.

A Co-TDMA requesting AP shall not set the MAPC Operation Type field to ~~0 or~~ 1 or 2 if there is no ~~existing~~ established Co-TDMA agreement between the Co-TDMA requesting AP and the Co-TDMA responding AP.

~~Upon receiving a MAPC Negotiation Request frame with the MAPC Scheme Type field set to 2, the Co-TDMA responding AP shall transmit a MAPC Negotiation Response frame (see 9.6.7.67 (MAPC Negotiation Response frame format)) to the Co-TDMA requesting AP, including its Co-TDMA profile (as defined in 9.4.2.aa3.2.4) in the MAPC element. The MAPC Operation Type field in the MAPC Negotiation Response frame shall be set to one of the following values:~~

* ~~3 to indicate acceptance of the Co-TDMA agreement request, or~~
* ~~4 to indicate rejection of the Co-TDMA agreement request.~~

An AP that responds to a Co-TDMA requesting AP during a Co-TDMA negotiation is also a MAPC responding AP. In this subclause, it is referred to as a Co-TDMA responding AP and follows the procedures defined in 37.13.1.3 when responding to the Co-TDMA requesting AP. Also, the Co-TDMA responding AP shall not set the MAPC Operation Type field, carried in the MAPC Scheme Request field of the Co-TDMA profile included in the MAPC Negotiation Response frame, to 5 ~~in a MAPC Negotiation Response frame~~.

An AP that has established a Co-TDMA agreement with a peer AP may operate as both a Co-TDMA coordinating AP and a Co-TDMA coordinated AP.

**37.13.2.3.3 Polling phase**

A Co-TDMA coordinating AP shall announce its intention of (#3170)allocating a portion of an obtained TXOP to another AP in an ICF sent at the beginning of the TXOP. The ICF polls one or more APs (#94)that have established MAPC agreements for Co-TDMA with the Co-TDMA coordinating AP (see 37.13.1.3 (MAPC agreement negotiation)), to solicit (#1046)response(s) from polled AP(s) and determine their intent (#1702)of receiving a time allocation from the Co-TDMA coordinating AP within the TXOP.

A Co-TDMA coordinating AP may solicit a (#987)Co-TDMA ICR in a TB PPDU from another AP (#94)with which it has a MAPC agreement for Co-TDMA, only if the AP to be polled has indicated support for (#1049)transmitting a (#987)Co-TDMA ICR in a TB PPDU (#3877)by setting the AP TB PPDU Response Supported field in the MAPC element to 1.

The ICF that polls the(#3879) AP(s) as part of the Co-TDMA procedure(#3878) and solicits a (#987)Co-TDMA ICR from a polled AP in a TB PPDU is called a Co-TDMA TB ICF.

The Co-TDMA TB ICF shall be a BSRP Trigger frame.

(#3336)The ICF, as part of the Co-TDMA procedure, that solicits a (#987)Co-TDMA ICR from a polled AP in a non-HT PPDU or a non-HT duplicate PPDU is called a Co-TDMA NTB ICF.

The Co-TDMA NTB ICF shall be a BSRP NTB Trigger frame (see 9.3.1.22.13 (BSRP Trigger frame format)), which has the GI And HE/UHR-LTF Type field set to 3.

The Co-TDMA coordinating AP identifies a polled AP in the Co-TDMA TB ICF or the Co-TDMA NTB ICF by setting the AID12 field of a User Info field to the polled AP’s AP ID, as assigned by the Co-TDMA coordinating AP(#3599).

The Duration field of the Co-TDMA TB ICF and the Co-TDMA NTB ICF shall be(#676) set to one SIFS plus the time required to transmit the solicited (#987)Co-TDMA ICR(s) from the polled AP(s).

(#3256)When a Co-TDMA coordinating AP transmits a Co-TDMA TB ICF, the AP shall set the Feedback Type field of the Feedback User Info field (see 9.3.1.22.7 (Feedback User Info field)) of the Co-TDMA TB ICF to 3.

(#3256)When a Co-TDMA coordinating AP transmits a Co-TDMA NTB ICF, the AP shall set the Feedback Type field of a User Info field addressed to the polled AP to 3.A polled AP shall transmit(#1706) (#987)a Co-TDMA ICR, in response to a received Co-TDMA TB ICF or the Co-TDMA NTB ICF that includes a User Info field with an AID12 field set to the AP ID of the polled AP as assigned by the Co-TDMA coordinating AP, (#2461)subject to the rules defined in 26.5.2.5 (UL MU CS mechanism) and 35.5.2.4 (UL MU CS mechanism for EHT STAs) for non-AP STAs.

The Co-TDMA ICR shall be a Multi-STA BlockAck frame (#684) with the following parameterization in a Per AID TID Info field:

* The Feedback Type field shall be set to 3.
* The AID11 field shall be set to 0.~~the 11 LSBs of the AP ID of the Co-TDMA coordinating AP, as assigned by the polled AP transmitting the Co-TDMA ICR.~~
* The Ack Type field and TID field shall be set to 0 and 13, respectively.
* (#988)The TXOP Sharing Solicited field of the Feedback field in the Co-TDMA ICR transmitted by a polled AP shall be set to 1 if the polled AP intends to receive a time allocation from the Co-TDMA coordinating AP during the current TXOP; otherwise, it shall be set to 0.

(#713)If a Co-TDMA coordinating AP does not receive a (#987)Co-TDMA ICR from a polled AP, the Co-TDMA coordinating AP shall consider that the polled AP does not wish to receive a time allocation from the Co-TDMA coordinating AP during the current TXOP.

~~In a Co-TDMA TB ICF, a Co-TDMA coordinating AP shall not allocate an RU to a polled AP outside of the overlapping portion of the BSS bandwidths of the two APs.~~

~~The bandwidth of the PPDU carrying a Co-TDMA NTB ICF shall not exceed the overlapping portion of the BSS bandwidths of the two APs.~~

(#825)A PPDU carrying a Co-TDMA ICF shall not occupy any 20 MHz subchannel that lies outside the overlapping portion of the BSS bandwidths between the Co-TDMA coordinating AP and each AP polled by the ICF.

NOTE—When performing a Co-TDMA agreement, an AP that receives a MAPC Negotiation Request frame can determine the overlapping BSS bandwidth based on the bandwidth configuration information included in the Bandwidth Control field (see Figure 9-zz6 (Bandwidth Control field format)).

**37.13.2.3.4 TXOP allocation phase**

(#3444)To(#3170) allocate a portion of (#1710)an obtained TXOP, the Co-TDMA coordinating AP shall transmit an MU-RTS TXS Trigger frame, (#687)with TXS Mode field equal to 2, (#3603)only to a polled AP that is not colocated(#3326) with the Co-TDMA coordinating AP and from which the Co-TDMA coordinating AP has received a Co-TDMA ICR with the TXOP Sharing Solicited field set to 1.

(#691)The time allocation to the Co-TDMA coordinated AP shall start at the end of the PPDU that contains the MU-RTS TXS Trigger frame.

The Duration field of the MU-RTS TXS Trigger frame shall be(#676) set to one SIFS plus the time required to transmit the solicited CTS response frame.

A Co-TDMA coordinating AP identifies the Co-TDMA coordinated AP (#3170)to which a portion of the obtained TXOP is to be allocated by setting the AID12 field of the User Info field of the MU-RTS TXS Trigger frame to the Co-TDMA coordinated AP's AP ID, (#3604)as assigned by the Co-TDMA coordinating AP.

After a Co-TDMA coordinated AP receives an MU-RTS TXS Trigger frame from the Co-TDMA coordinating AP that contains a User Info field (#3327)and the AID12 field of the User Info field contains the AP ID of the Co-TDMA coordinated AP, the (#1544)Co-TDMA coordinated AP may exchange one or more PPDUs within the time allocation signaled in the MU-RTS TXS Trigger frame. The first PPDU of this exchange (#990), within the time allocation signaled in the MU-RTS TXS Trigger frame, shall carry a CTS frame, which is transmitted as per the rules defined in 26.2.6.3 (CTS frame sent in response to an MU-RTS Trigger frame) (#991)with the exceptions stated in 37.13.2.3 (Coordinated time division multiple access (Co-TDMA)).

(#821)NOTE—When an AP participates in a Co-TDMA procedure, it can manage UL transmissions from its associated non-AP STAs using existing mechanisms such as RTS enablement (see 26.2.1 (TXOP duration-based RTS/CTS)) or MU-EDCA (see 26.2.7(EDCA operation using MU EDCA parameters)). Such coordination of UL transmissions can facilitate the reception of Co-TDMA-related transmissions, including the reception of an MU-RTS TXS Trigger frame at a polled AP or the reception of a MAPC TXOP Return frame at the Co-TDMA coordinating AP.

The time allocated to a Co-TDMA coordinated AP identified in the MU-RTS TXS Trigger frame is specified in the Allocation Duration field in the MU-RTS TXS Trigger frame.

The Co-TDMA coordinating AP shall follow 37.25 (Fairness considerations for TXOP sharing(#1378)) when determining the time allocated to Co-TDMA coordinated AP(s) within an obtained TXOP.

During the allocated time, any frame exchange between a Co-TDMA coordinated AP and its associated non-AP(s) shall be from the same or higher priority ACs as the primary AC of the obtained TXOP indicated in the Primary AC field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF transmitted by the Co-TDMA coordinating AP during the polling phase of Co-TDMA.

(#825)In an MU-RTS TXS Trigger frame that allocates a TXOP to a Co-TDMA coordinated AP, the Co-TDMA coordinating AP shall not allocate an RU to the Co-TDMA coordinated AP outside the overlapping portion of the BSS bandwidths of the two APs.

The PPDU carrying the CTS frame from a Co-TDMA coordinated AP shall be transmitted on the 20 MHz channel(s) indicated in the RU Allocation field of the User Info field of the MU-RTS TXS Trigger frame that allocated the time to the Co-TDMA coordinated AP.

(#220)During the time allocated by a Co-TDMA coordinating AP, a Co-TDMA coordinated AP that is addressed by the MU-RTS TXS Trigger frame shall not transmit any PPDU that occupies subchannels other than those used when transmitting the CTS frame in response to the MU-RTS TXS Trigger frame.

**37.13.2.3.5 TXOP return phase**

A Co-TDMA coordinated AP may return the remainder of the allocated time (if any) to the Co-TDMA coordinating AP if the Co-TDMA coordinating AP has indicated support for TXOP return by setting the Rx TXOP Return Support field to 1 in the MAPC element, otherwise the Co-TDMA coordinated AP shall not return the TXOP. A NAV set by the Co-TDMA coordinated AP during the allocated time shall end before this AP returns the TXOP to the Co-TDMA-sharing AP.

(#3749)~~NOTE—~~A Co-TDMA coordinated AP shall~~does~~ not transmit a CF-End frame in the allocated time to truncate the TXOP if the AP is to return the TXOP.

As part of Co-TDMA operation, when the Co-TDMA coordinated AP returns the TXOP to the Co-TDMA coordinating AP, the TXOP return shall be indicated, within the allocated time, via a CAS Control field with the RDG/More PPDU field equal to 0. This CAS Control field is carried in an HE variant HT Control field in the MAC header of a MAPC TXOP Return frame (see 9.6.7.68 (MAPC TXOP Return frame format(#3256))) that includes only the Action field in the frame body.

The Co-TDMA coordinating AP shall respond with an Ack frame when it receives the TXOP return indication from a Co-TDMA coordinated AP.

No other MAPC Public Action frame shall carry a CAS Control field in the HT Control field of the frame's MAC header.

A Co-TDMA coordinating AP that has indicated support for TXOP (#694) return by setting the Rx TXOP Return Support field to 1 in the MAPC element and that is soliciting a TXOP return from a Co-TDMA coordinated AP shall set the TXOP Return Solicited field of the Co-TDMA TB ICF or the Co-TDMA NTB ICF to 1; otherwise, the Co-TDMA coordinating AP shall set the TXOP Return Solicited field to 0.

The Co-TDMA coordinated AP shall return the TXOP after receiving a Co-TDMA TB ICF or a Co-TDMA NTB ICF that has set the TXOP Return Solicited field to 1.

**TGbn Editor: Please make the following changes (marked as tracked changes) to 37.25 (Coordinated time division multiple access (Co-TDMA)) as follows.**

* **Fairness considerations for TXOP sharing(#1378)**

This subclause defines a mechanism as part of TXOP sharing to support fairness to neighboring STAs (APs and non-APs).

When a UHR AP that is a TXOP owner allocates a portion of its obtained TXOP to at least one of

* Co-TDMA coordinated AP(s) during a Co-TDMA procedure (see 37.13.2.3 (Coordinated time division multiple access (Co-TDMA))) and
* Associated non-AP STA(s) during a TXS mode 2 procedure (i.e., the one in which the MU-RTS TXS Trigger frame has the TXS Mode subfield value set to 2),

then the total allocated duration shall not exceed the minimum of:

* The TXOP limit the AP advertises to its associated non-AP STAs for AC\_VI.
* The TXOP limit the AP advertises to its associated non-AP STAs for the primary AC of that TXOP.

The UHR AP that is a TXOP owner shall not share an obtained TXOP if either of the TXOP limits for the primary AC or for AC\_VI that the AP advertises to its associated non-AP STAs is 0.

Within a TXOP in which a UHR AP that is a TXOP owner performs either Co-TDMA or the TXS mode 2 procedure, the AP shall (#1391)meet all of the following requirements:

* Use the obtained TXOP to exchange at least one Data or Management frame with its associated STA(s) before allocating the TXOP to:
  + Another AP as part of a Co-TDMA procedure; or
  + Associated non-AP STA(s) during a TXS mode 2 procedure.
* Use at least 33% of the duration of the obtained TXOP for frame exchanges with its associated STAs that include at least one Data or Management frame, except if the AP is performing Co-TDMA in that TXOP and the AP has a Co-TDMA agreement with every other AP whose Beacon frame is received by the AP on the primary 20 MHz channel at an RSSI no lower than -72 dBm, in which case there is no such constraint.

**TGbn Editor: In subclause 9.3.1.22.13, please make existing highlighted text in D0.3 as a fourth sub-bullet of the main text above starting with “In a BSRP NTB Trigger frame(#3756, #2953, #1271):”**

(#24, #3756, #2935, #1271, #2936, #2937, #3726, #25)A UHR variant BSRP Trigger frame that is individually addressed and that has the GI And UHR-LTF Type field equal to 3 is called a BSRP non-trigger based (NTB) Trigger frame . In a BSRP NTB Trigger frame(#3756, #2953, #1271):

* The Number Of UHR-LTF Symbols field, the LDPC Extra Symbol Segment field, the AP Tx Power field, the Pre-FEC Padding Factor field, the PE Disambiguity field, the UL Spatial Reuse field, the UHR P160 field, and DRU/RRU Indication field of the Common Info field are reserved.(#2936, #3756, #2935, #1271)
* The Special User Info Flag field of the UHR variant Common Info field is set to 0, indicating that a Special User Info field is present in the Trigger frame that contains the UHR variant Common Info field.(#3756, #2935, #1271)
* The PHY Version Identifier field of the Special User Info field is equal to 1, and the UL Bandwidth Extension field and NPCA Primary Channel Indication field are set as defined in 9.3.1.22.3 (Special User Info field). (#3756, #2935, #1271)
* The UHR Spatial Reuse 1 field, the UHR Spatial Reuse 2 field and the U-SIG Disregard And Validate field of the Special User Info field are reserved.(#2936)
* In the User Info field with the AID12 field set to the STA's AID (see 9.3.1.22.1 (General))(#3726), (#2937)all the other fields of this User Info field are reserved.

In a User Info field where the AID12 field is set to the AP ID of an AP participating in a Co-TDMA procedure (see 37.13.2.3.2 (Polling phase)), the User Info field has the format shown in Figure9-90j5 (User Info field format with AID12 field set to an AP ID of an AP participating in a Co-TDMA procedure).

|  |  |  |  |
| --- | --- | --- | --- |
|  | B0 B11 | B12 B15 | B16 B39 |
|  | AID12 | Feedback Type | Feedback Information |
| Bits: | 12 | 4 | 24 |
| * **User Info field format with AID12 field set to an AP ID of an AP participating in a Co-TDMA procedure** | | | |

The Feedback Type field indicates the type of feedback carried in the Feedback Information field. The Feedback Type field is set to 3 for a Co-TDMA procedure. Other values are reserved.

The Feedback Information field contains feedback corresponding to the type specified in the Feedback Type field. When the Feedback Type is set to 3, the Feedback Information field has the format defined in Figure Figure9-90j4 (Feedback Information field if the Feedback Type field is set to 3).

**The text to be adopted ends here.**