IEEE P802.11  
 Wireless LANs

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| **Proposed TGbd draft specification**  **PHY transmit procedure** |
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Abstract

This document contains a proposal for the TGbd draft amendment. It captures the feature requirements outlined in the TGbd specification framework document (11-19/0497) in detailed draft text.

# Next Generation V2X (NGV) PHY specification

## Intorduction

## NGV PPDU format

## Transmitter block diagram

## Overview of the PPDU encoding process

## NGV modulatin and coding schemes

## Timing related parameters

## Mathematical description of signals

## NGV Preamble

## Data field

## Transmit specification

## Receiver specification

## NGV transmit procedure

There are two paths for the transmit PHY procedure:

* The first path, for which typical transmit procedures are shown in Figure 33-x1 (PHY transmit procedure for NGV transmission), is selected if the FORMAT parameter of the PHY-TXSTART.request(TXVECTOR) primitive is NGV. These transmit procedures do not describe the operation of optional features, such as TBD.
* The second path is to follow the transmit procedure in Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) if the FORMAT parameter of the PHY-TXSTART.request(TXVECTOR) primitive is NON\_NGV except that the signal referred to in Clause 17 (Orthogonal frequency division multiplexing (OFDM) PHY specification) is instead generated with the Duration/ID field to report transmitter is an NGV capable STA as defined in 33.xx.



**Figure 33-x1—PHY transmit procedure for NGV transmission**

In both paths, in order to transmit data, the MAC generates a PHY-TXSTART.request primitive, which causes the PHY entity to enter the transmit state. Further, the PHY is set to operate at the appropriate frequency through station management via TBD, as specified in 33.xx. Other transmit parameters, such as NGV-MCS Coding types and transmit power, are set via the PHY SAP using the PHY-TXSTART.request(TXVECTOR) primitive, as described in 33.x (TXVECTOR and RXVECTOR parameters). The remainder of the clause applies to the first path.

Transmission of the PPDU shall be initiated by the PHY after receiving the PHY-TXSTART.request(TXVECTOR) primitive. The TXVECTOR elements for the PHY-TXSTART.request primitive are specified in Table 33-1 (TXVECTOR and RXVECTOR parameters).

Transmission of the PHY preamble may start if TIME\_OF\_DEPARTURE\_REQUESTED is false, and shall start immediately if TIME\_OF\_DEPARTURE\_REQUESTED is true, based on the parameters passed in the PHY-TXSTART.request primitive.

After the PHY preamble transmission is started, the PHY entity immediately initiates data scrambling and data encoding. The encoding method for the Data field is based on the FEC\_CODING, CH\_BANDWIDTH,

NUM\_STS, and MCS parameter of the TXVECTOR, as described in 33.2 (NGV PPDU format).

The SERVICE field and PSDU are encoded as described in 33.3 (Transmitter block diagram). The data shall be exchanged between the MAC and the PHY through a series of PHY-DATA.request(DATA) primitives issued by the MAC, and PHY-DATA.confirm primitives issued by the PHY. PHY padding bits are appended to the PSDU to make the number of bits in the coded PSDU an integer multiple of the number of coded bits per OFDM symbol. Midambles are inserted every *M* OFDM symbols if present, where *M* is indicated by the Midamble Periodicity field in TBD.

Transmission can be prematurely terminated by the MAC through the PHY-TXEND.request primitive. PSDU transmission is terminated by receiving a PHY-TXEND.request primitive. Each PHY-TXEND.request primitive is acknowledged with a PHY-TXEND.confirm primitive from the PHY. Normal termination occurs after the transmission of the final bit of the last PSDU octet, according to the number of OFDM symbols indicated by *Nsym* (see 33.xx).

In the PHY, the GI is inserted in every data OFDM symbol as a countermeasure against delay spread.

When the PPDU transmission is completed the PHY entity enters the receive state.

A typical state machine implementation of the transmit PHY is provided in Figure 33-x2 (PHY transmit state machine). Request (.request) and confirmation (.confirm) primitives are issued once per state as shown. This state machine does not describe the operation of optional features, such as TBD.



**Figure 33-x2—PHY transmit state machine (TBD)**

## NGV receive proceduee

## Regulatory requirements