CLAIMS:

1. A method of video decoding for a decoder, the method comprising:

acquiring transform block signaling information from a coded video bitstream;

determining whether (i) the transform block signaling information indicates an implicit transform scheme, and (ii) a low-frequency non-separable transform (LFNST) and a matrix-based intra predication mode (MIP) are both invalid; and

when the transform block signaling information indicates the implicit transform scheme, and the LFNST and MIP are both signaled as invalid,

(i) determining a primary transform type based on a size of a coding unit (CU), and

(ii) performing a primary transform for a transform block that is partitioned from the CU in accordance with the determined primary transform type.

2. The method of claim 1, wherein determining the primary transform type comprises:

determining whether a transform skip mode is enabled; and

when the transform skip mode is not enabled,

(i) determining a transform type DST-7 for a horizontal transform for the transform block, responsive to a width of the CU being equal to or greater than T1 and equal to or less than T2;

(ii) determining a transform type DCT-2 for the horizontal transform for the transform block, responsive to the width of the CU being less than T1 or greater than T2;

(iii) determining a transform type DST-7 for a vertical transform for the transform block responsive to a height of the CU being equal to or greater than T1 and equal to or less than T2; and

(iv) determining a transform type DCT-2 for the vertical transform for the transform block responsive to the height of the CU being less than T1 or greater than T2.

3. The method of claim 2, wherein the T1 is equal to one of 2 pixels, 4 pixels, or 8 pixels, and T2 is equal to one of 4 pixels, 8 pixels, 16 pixels, or 32 pixels.

4. The method of claim 1, wherein when t the transform block signaling information indicates the implicit transform scheme, and the at least one of the LFNST or MIP is signaled as true, the method comprises at least one of:

(i) determining a first transform type DCT-2 for the transform block; and

(ii) determining a second transform type that is not DCT-7 for the transform block, the second transform type including at least one of DST-1, DCT-5, compound orthonormal transform (COT), or karhunen-loève transform.

5. The method of claim 1, wherein when the transform block signaling information indicates the implicit transform scheme, and the MIP is signaled as false which indicates the MIP is not applied for the transform block, the method comprises at least one of:

(i) determining a transform type DST-7 for a horizontal transform for the transform block responsive to a width of the CU being equal to or greater than T1 and equal to or less than T2;

(ii) determining a transform type DCT-2 for the horizontal transform for the transform block responsive to the width of the CU being less than T1 or greater than T2;

(iii) determining a transform type DST-7 for a vertical transform for the transform block responsive to a height of the CU being equal to or greater than T1 and equal to or less than T2; and

(iv) determining a transform type DCT-2 for the vertical transform for the transform block responsive to the height of the CU being less than T1 or greater than T2.

6. The method of claim 5, wherein the T1 and T2 indicate at least one of:

T1 is equal to 2 pixels, and T2 is equal to one of 4 pixels or 8 pixels;

T1 is equal to 4 pixels, and T2 is equal to one of 4 pixels or 8 pixels;

T1 is equal to 8 pixels, and T2 is equal to one of 8 pixels, 16 pixels, or 32 pixels; and

T1 is equal to 16 pixels, and T2 is equal to one of 16 pixels or 32 pixels.

7. The method of claim 1, wherein the method comprises at least one of:

(i) determining a transform type DST-7 for a horizontal transform for the transform block responsive to a width of the CU being equal to or greater than T1 and equal to or less than T2;

(ii) determining a transform type DCT-2 for the horizontal transform for the transform block responsive to the width of the CU being less than T1 or greater than T2;

(iii) determining a transform type DST-7 for a vertical transform for the transform block responsive to a height of the CU being equal to or greater than T1 and equal to or less than T2; and

(iv) determining a transform type DCT-2 for the vertical transform of the transform block responsive to the height of the CU being less than T1 or greater than T2.

8. An apparatus for video decoding, comprising:
processing circuitry configured to:

acquire transform block signaling information from a coded video bitstream;

determine whether (i) the transform block signaling information indicates an implicit transform scheme, and (ii) a low-frequency non-separable transform (LFNST) and a matrix-based intra predication mode (MIP) are both invalid; and

when the transform block signaling information indicates the implicit transform scheme, and the LFNST and MIP are both signaled as invalid,

(i) determine a primary transform type based on a size of a coding unit (CU), and

(ii) perform a primary transform for a transform block that is partitioned from the CU in accordance with the determined primary transform type.

9. The apparatus of claim 8, wherein the processing circuitry is configured to:

determine whether a transform skip mode is enabled; and

when the transform skip mode is not enabled,

(i) determine a transform type DST-7 for a horizontal transform for the transform block responsive to a width of the CU being equal to or greater than T1 and equal to or less than T2;

(ii) determine a transform type DCT-2 for the horizontal transform for the transform block responsive to the width of the CU being less than T1 or greater than T2;

(iii) determine a transform type DST-7 for a vertical transform for the transform block responsive to a height of the CU being equal to or greater than T1 and equal to or less than T2; and

(iv) determine a transform type DCT-2 for the vertical transform for the transform block responsive to the height of the CU being less than T1 or greater than T2.

10. The apparatus of claim 8, wherein when the transform block signaling information indicates the implicit transform scheme, and the at least one of the LFNST or MIP is signaled as true, the processing circuitry is configured to operate at least one of:

(i) determining a first transform type DCT-2 for the transform block; and

(ii) determining a second transform type that is not DCT-7 for the transform block, the second transform type including at least one of DST-1, DCT-5, compound orthonormal transform (COT), or karhunen-loève transform.

11. The apparatus of claim 8, wherein when the transform block signaling information indicates the implicit transform scheme, and the MIP is signaled as false which indicates the MIP is not applied for the transform block, the processing circuitry is configured to operate at least one of:

(i) determining a transform type DST-7 for a horizontal transform for the transform block responsive to a width of the CU being equal to or greater than T1 and equal to or less than T2;

(ii) determining a transform type DCT-2 for the horizontal transform for the transform block responsive to the width of the CU being less than T1 or greater than T2;

(iii) determining a transform type DST-7 for a vertical transform for the transform block responsive to a height of the CU being equal to or greater than T1 and equal to or less than T2; and

(iv) determining a transform type DCT-2 for the vertical transform for the transform block responsive to the height of the CU being less than T1 or greater than T2.

12. The apparatus of claim 11, wherein the T1 and T2 indicate at least one of:

T1 is equal to 2 pixels, and T2 is equal to one of 4 pixels or 8 pixels;

T1 is equal to 4 pixels, and T2 is equal to one of 4 pixels or 8 pixels;

T1 is equal to 8 pixels, and T2 is equal to one of 8 pixels, 16 pixels, or 32 pixels; and

T1 is equal to 16 pixels, and T2 is equal to one of 16 pixels or 32 pixels.

13. The apparatus of claim 8, wherein the processing circuitry is configured to operate at least one of:

(i) determining a transform type DST-7 for a horizontal transform for the transform block responsive to a width of the CU being equal to or greater than T1 and equal to or less than T2;

(ii) determining a transform type DCT-2 for the horizontal transform for the transform block responsive to the width of the CU being less than T1 or greater than T2;

(iii) determining a transform type DST-7 for a vertical transform for the transform block responsive to a height of the CU being equal to or greater than T1 and equal to or less than T2; and

(iv) determining a transform type DCT-2 for the vertical transform of the transform block responsive to the height of the CU being less than T1 or greater than T2.