Final Model:

Architecture	Modified U-Net
Loss Function	Categorical Cross Entropy
Optimizer Function	Adam

Model Summary:

#	Layer (*)	Input Shape	Output Shape
0	InputLayer	(None, 512, 512, 1)	(None, 512, 512, 1)
1	Conv2D (3x3, same, ReLU)	(None, 512, 512, 1)	(None, 512, 512, 16)
2	Dropout (10%)	(None, 512, 512, 16)	(None, 512, 512, 16)
3	Conv2D (3x3, Same, ReLU)	(None, 512, 512, 16)	(None, 512, 512, 16)
4	MaxPooling2D (2x2)	(None, 512, 512, 16)	(None, 256, 256, 16)
5	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 16)	(None, 256, 256, 32)
6	Dropout (10%)	(None, 256, 256, 32)	(None, 256, 256, 32)
7	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 32)	(None, 256, 256, 32)
8	MaxPooling2D (2x2)	(None, 256, 256, 32)	(None, 128, 128, 32)
9	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 32)	(None, 128, 128, 64)
10	Dropout (20%)	(None, 256, 256, 64)	(None, 128, 128, 64)
11	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 64)	(None, 128, 128, 64)
12	MaxPooling2D (2x2)	(None, 256, 256, 64)	(None, 64, 64, 64)
13	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 64)	(None, 64, 64, 128)
14	Dropout (20%)	(None, 64, 64, 128)	(None, 64, 64, 128)
15	Conv2D (3x3, Same, ReLU)	(None, 64, 64, 128)	(None, 64, 64, 128)
16	MaxPooling2D (2x2)	(None, 64, 64, 128)	(None, 32, 32, 128)
17	Conv2D (3x3, Same, ReLU)	(None, 32, 32, 128)	(None, 32, 32, 256)
18	Dropout (30%)	(None, 32, 32, 256)	(None, 32, 32, 256)
19	Conv2D (3x3, Same, ReLU)	(None, 32, 32, 256)	(None, 32, 32, 256)
20	Conv2DTranspose (2x2, 2x2, Same)	(None, 32, 32, 256)	(None, 64, 64, 128)
21	Concatenate (15)	(None, 64, 64, 128), (None, 64, 64, 128)	(None, 64, 64, 256)
22	Conv2D (3x3, Same, ReLU)	(None, 64, 64, 256)	(None, 64, 64, 128)

23	Dropout (20%)	(None, 64, 64, 128)	(None, 64, 64, 128)
24	Conv2D (3x3, Same, ReLU)	(None, 64, 64, 128)	(None, 64, 64, 128)
25	Conv2DTranspose (2x2, 2x2, Same)	(None, 64, 64, 128)	(None, 128, 128, 64)
26	Concatenate (11)	(None, 128, 128, 64), (None, 128, 128, 64)	(None, 128, 128, 128)
27	Conv2D (3x3, Same, ReLU)	(None, 128, 128, 128)	(None, 128, 128, 64)
28	Dropout (20%)	(None, 128, 128, 64)	(None, 128, 128, 64)
29	Conv2D (3x3, Same, ReLU)	(None, 128, 128, 64)	(None, 128, 128, 64)
30	Conv2DTranspose (2x2, 2x2, Same)	(None, 128, 128, 64)	(None, 256, 256, 32)
31	Concatenate (7)	(None, 256, 256, 32), (None, 256, 256, 32)	(None, 256, 256, 64)
32	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 64)	(None, 256, 256, 32)
33	Dropout (10%)	(None, 256, 256, 32)	(None, 256, 256, 32)
34	Conv2D (3x3, Same, ReLU)	(None, 256, 256, 32)	(None, 256, 256, 32)
35	Conv2DTranspose (2x2, 2x2, Same)	(None, 256, 256, 32)	(None, 512, 512, 16)
36	Concatenate (3)	(None, 512, 512, 16), (None, 512, 512, 16)	(None, 512, 512, 32)
37	Conv2D (3x3, Same, ReLU)	(None, 512, 512, 32)	(None, 512, 512, 16)
38	Dropout (10%)	(None, 512, 512, 16)	(None, 512, 512, 16)
39	Conv2D (3x3, Same, ReLU)	(None, 512, 512, 16)	(None, 512, 512, 16)
40	Conv2D (1x1, Softmax)	(None, 512, 512, 16)	(None, 512, 512, 8)

* The information with the parentheses are specific for each layer type when implemented in Keras:

- **For Conv2D layers: (kernel size, padding option, activation function)**
- **For Dropout layers: (rate)**
- **For MaxPooling2D layers: (pool size)**
- **For Conv2DTranspose layers: (kernel size, strides, padding option)**
- **For Concatenate layers: (layer # to concatenate with)**

Model Size:

Total Parameters	Trainable Parameters	Non-Trainable Parameters
1,940,936 (7.40 MB)	1,940,936 (7.40 MB)	0 (0.00 Byte)

Training Datasets:

Class Definitions:

Class ID (Class)
0 (unlabeled)
1 (wall)
2 (roof)
3 (road)
4 (water)
5 (car)
6 (vegetation)
7 (person)

Model Performance:

Class	Intersection over Union Score (%)
0 (unlabeled)	16.64
1 (wall)	10.25
2 (roof)	0.13
3 (road)	31.48
4 (water)	47.88
5 (car)	4.65
6 (vegetation)	32.06
7 (person)	2.80
Mean	18.24