

## Boston 3D Model Components

# Tile Grid and Coordinate System

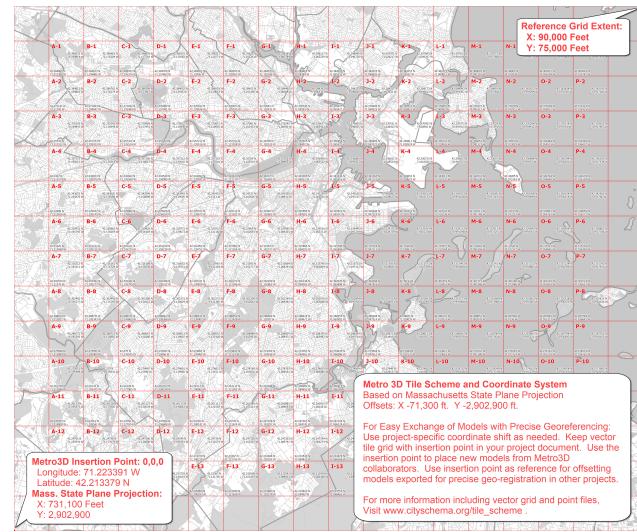
**File Name:** BOS3D Tile Grid

**Updated:** November 2023

**Formats:** Autodesk DXF, Trimble Sketchup, ESRI Shapefile, GeoJSON

## Tiling Strategy

The tiling scheme for the BPDA's 3D model serves as a framework for sharing a detailed model of metropolitan extent with design tools that are limited in terms of spatial extent and file-size. By dividing the city-wide model components into snap-together modules, the tile grid provides a framework for registering model collections and terrain meshes that can be precisely snapped together and draped with a variety tiled groundplan images.



Click image to view full-size reference image.

## Download City-Wide Tile Grid Resources

- Tile Polygons and Points (including insertion-point and bounding rectangle)
    - [SketchUp format](#).
    - [.OBJ format](#)
  - [DXF format Metro Boston 3D coordinate system](#) or [Un-shifted State Plane Feet](#) -- useful for registering data layers from unshifted State-Plane data-sets.
  - [Shapefile format](#). useful for clipping ground plan images or vector data to precisely register with tiled models.
  - [GeoJSON format](#). Helpful for automating processes that involve coordinate transformation of tiled models (see Data Dictionary, below).
- [ArcGIS Projection file for Metro 3D Boston coordinate system](#).

## Data Dictionary for Tile Grid Attribute Table

This attribute table is a reference for tile identifiers and tile-center coordinates.

Since the tiles are 5000 feet and square with the State Plane grid, eht state-plane coordinates fom the corners can be calculated by adding or subtracting 2500 feet frm the center coordinate.

Field Name	Type	Description
Town_Code	Text	A three letter abbreviation of the town name.
Tile_Label	Text	a hyphenated label consisting of the letter designating the tile column and the number reflecting the tile row.
Tile_ID	Text	A concatenation of the Town_Code, underscore, and the Tile_Label string. This identifier is used for naming tiled models and folders eliminates tile name conflicts for modeling

		projects that span multiple towns.
Center_Lat	Text	The latitude of the center of the tile. Assuming the WGS84 earth model.
Center_Lon	Text	The longitude of the center of the tile. Assuming the WGS84 earth model.
BosShift_X	Text	The X coordinate of the tile center. Metro Boston 3D coordinate system
BosShift_Y	Text	The Y coordinate of the tile center. Metro Boston 3D coordinate system
MASP_X	Text	The X coordinate of the tile center. Massachusetts State Plane (Mainland, Feet) coordinate system
MASP_Y	Text	The Y coordinate of the tile center. Massachusetts State Plane (Mainland, Feet) coordinate system

## Context

The Boston Planning and Development Agency (BPDA) maintains a 3D model of the city as a visualization and analytical tool for understanding ideas related to the future of neighborhoods. The BPDA city model is constructed of several components: Terrain, Groundplan, and 3D models of buildings. Each of these components is shared in formats intended to facilitate collaboration between diverse communities who have an interest in understanding places in the city as they have changed or as they may be changed.

[BPDA 3D Download Page](#) [About the CitySchema project](#)

## Metro Boston 3D Coordinate System

**Projected Coordinate System:** State Plane Massachusetts Mainland (Feet), North American Datum of 1983.

**Vertical Datum:** North American Vertical Datum, 1988 (NAVD 88) Feet (Height)

**Offset** To enable exchange precisely located models with diverse applications, State Plane coordinates are offset to keep all coordinates within limits inherent in most 3D design tools.

### Coordinate System Origin

- X: 731,100 U.S. MA State Plane Feet
- Y: 2,902,900 U.S. MA State Plane Feet
- Longitude: 71.223391 W (WGS84)
- Latitude: 42.213379 N (WGS84)
- Elevation: 0
- Rotation to align with True North: Clockwise 0.34 Degrees.

**OBJ Orientation:** Many modeling tools treat the Y axis as vertical. Geographical coordinate systems use a Z-Up, Y-Forward orientation. If you experience mis-orientation when importing OBJ format models into your design projects, check the orientation options in your importer. The Z-Up orientation is sometimes obtained by rotating the model -90 degrees around the X axis.

For more information and resources the Metro3d coordinate system and tile grid, visit [The Coordinate System and Tile Grid page at cityschema.org](#)

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