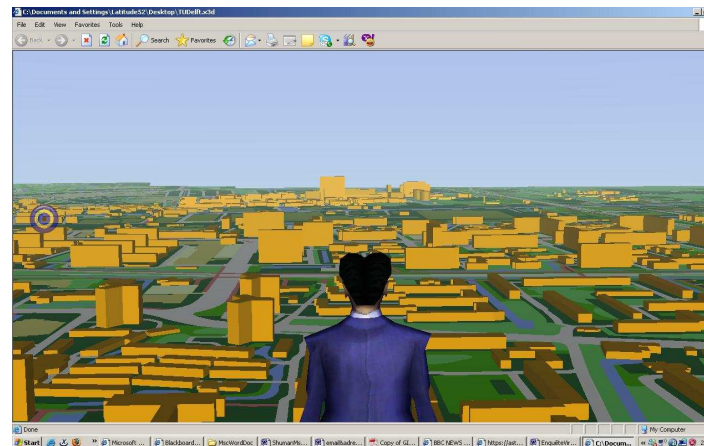


3D city modelling

Method for 3D polygonal modelling in ArcGIS Environment



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Basic Concept

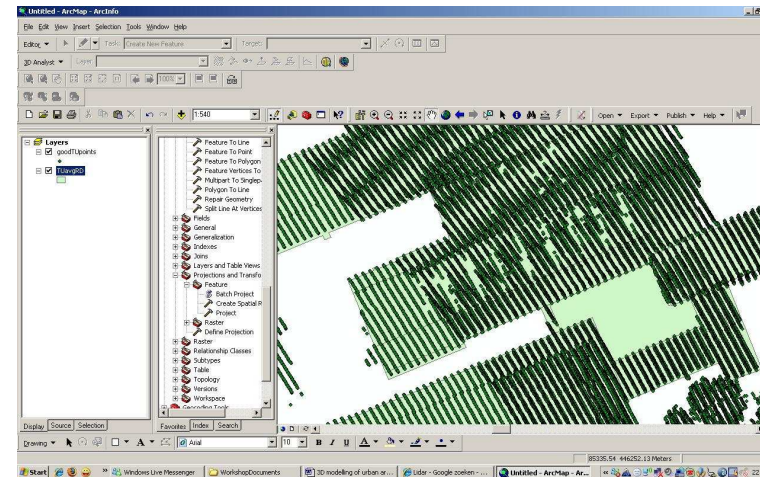
ArcGIS Environment:

ArcMap

ArcScene

3D Analyst Tool

Export Tool for Sketchup



Basic Concept:

Spatial Join of H (height) information to a building footprint

Extrude the building footprint using the H (height) information

Basic Concept

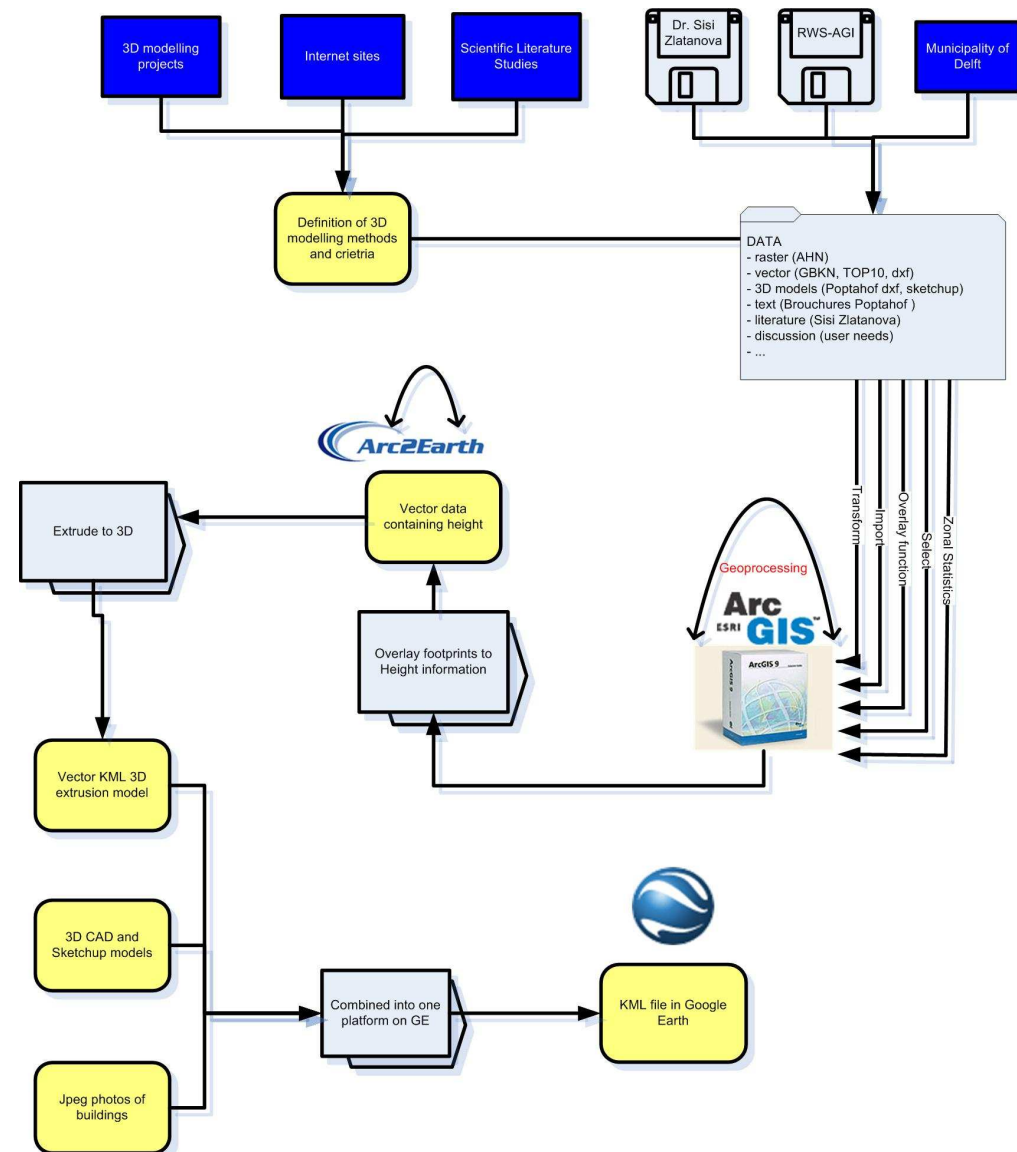
Data Used

Shape polygon geometry GBKN
(Grootschalige Basiskaart
Nederland),

Shape polygon geometry TOP10NL
(Topographical Map of the
Netherlands, Scale 1:10,000)

XYZ Point Height model
Raster Actual Height Model or AHN

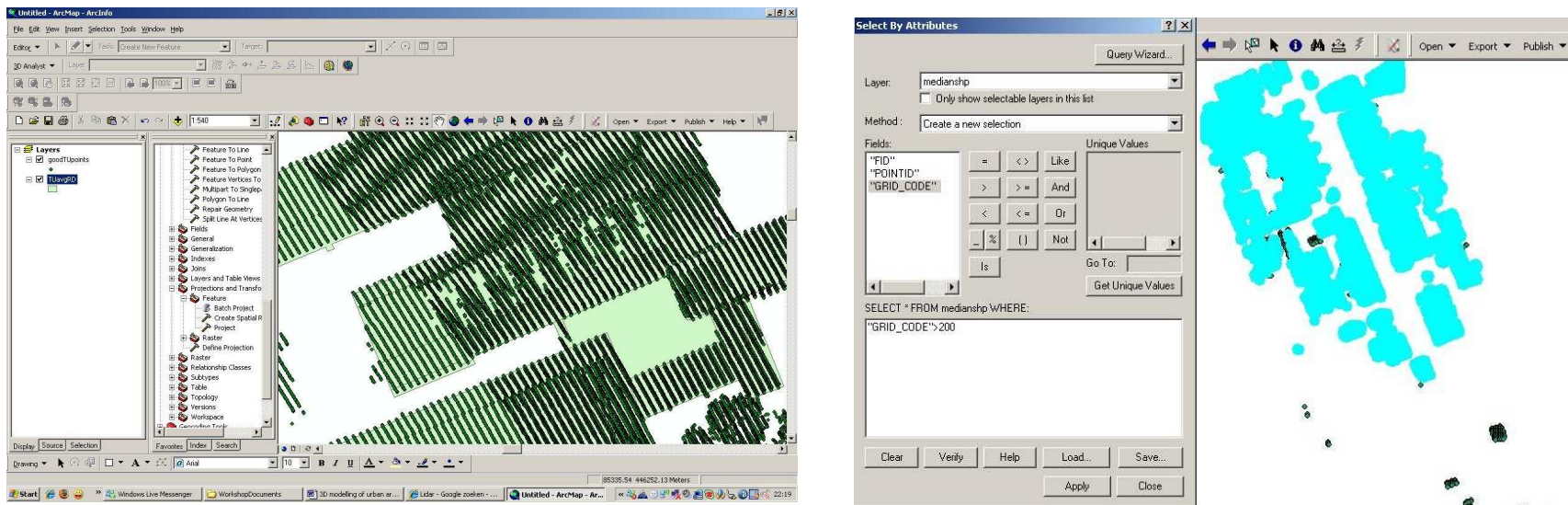
For overlay functions all data
needs to be converted to vector
shape geometry.



Step 1

Vector Overlay

Show me which points fall inside the building footprint polygons



Clip

Make a clip of the vector points that fall inside building footprint polygon.

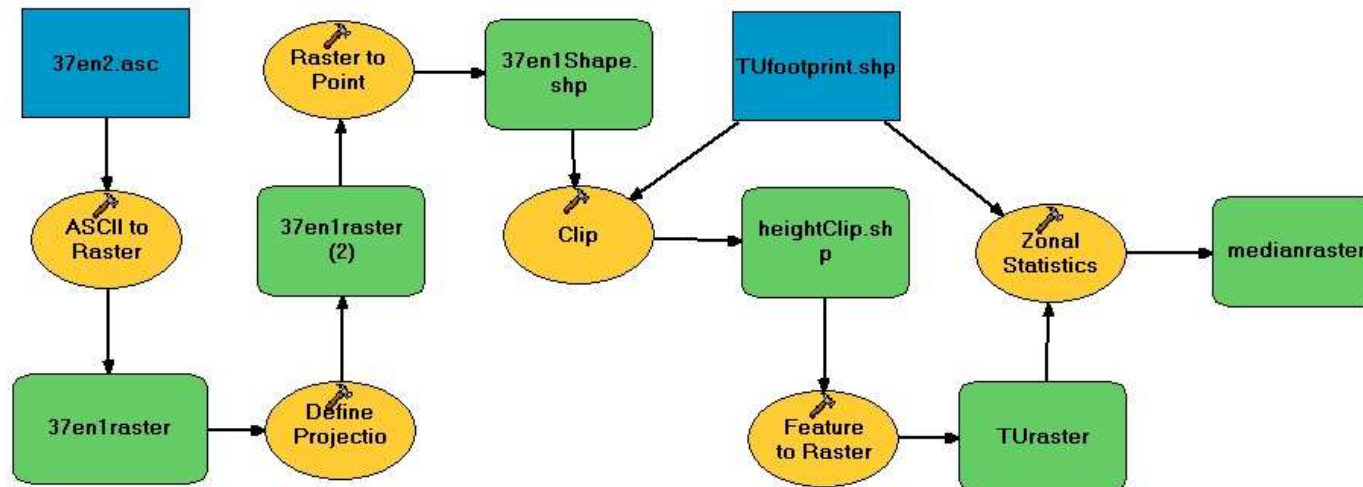
Step 2

Zonal Statistics

Calculate the median value of these points that fall inside Polygon ID 001 using zonal statistics.

Give all the points that fall inside the polygon footprint the same value (median value)

All the points inside a certain polygon receives the median value therefore the average of this values will represent the median height of the polygon which contains these points.



Step 3

Spatial Join

Add this height information to the polygon as an attribute.

Height Information as Attribute of the Polygon Footprint

The screenshot displays the ArcGIS interface during a spatial join operation. On the left, the 'Join Data' dialog box is open, showing the 'medianshp' layer selected for joining to the 'vlak' layer. The 'Each polygon will be given a summary of the numeric attributes of the points that fall inside it' option is selected. The 'Attributes of TUVaGRD' table is visible in the background, showing the results of the join. A callout box points to the 'Count' column in the table.

FID	Shape*	FID_1	FID_1_1	Count	Value
0	Polygon	0	0	18	8.09
1	Polygon	1	1	11	4.579081
2	Polygon	2	2	11	3.853636
3	Polygon	3	3	366	8.468895
4	Polygon	6	6	263	8.925983
5	Polygon	9	9	564	2.976844
6	Polygon	11	11	564	2.976844
7	Polygon	12	12	9175	5.086007
8	Polygon	13	13	23	3.071304
9	Polygon	14	14	1583	2.858147
10	Polygon	15	15	260	2.976844
11	Polygon	16	16	1727	2.957238
12	Polygon	19	19	21041	6.503561
13	Polygon	20	20	500	2.4484
14	Polygon	23	23	445	3.978629
15	Polygon	26	26	474	3.542489
16	Polygon	28	28	377	4.290212
17	Polygon	29	29	25213	11.241713
18	Polygon	31	31	529	2.954707
19	Polygon	32	32	202	9.860248
20	Polygon	33	33	7733	4.554198
21	Polygon	34	34	17055	3.070004
22	Polygon	35	35	1196	2.874891
23	Polygon	36	36	1193	2.664183
24	Polygon	37	37	118	8.319746
25	Polygon	38	38	127	13.060630
26	Polygon	40	40	1409	2.484166
27	Polygon	41	41	10	3.014
28	Polygon	42	42	2818	5.039517
29	Polygon	43	43	3	2.05
30	Polygon	45	45	639	5.746886

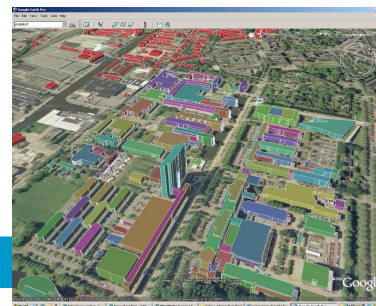
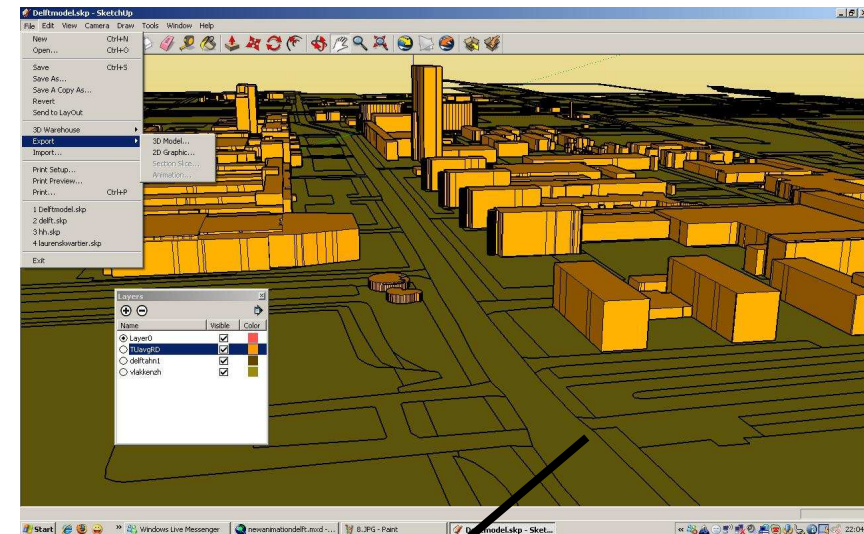
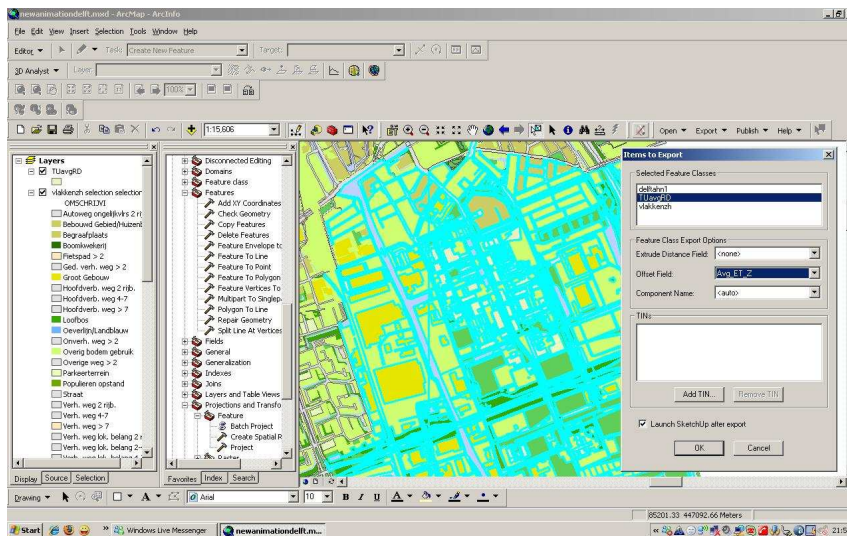
Step 4

Extrusion

Free toolbox on Internet for Export to sketchup

Geo-referencing of original data from shape and TIN can be exported

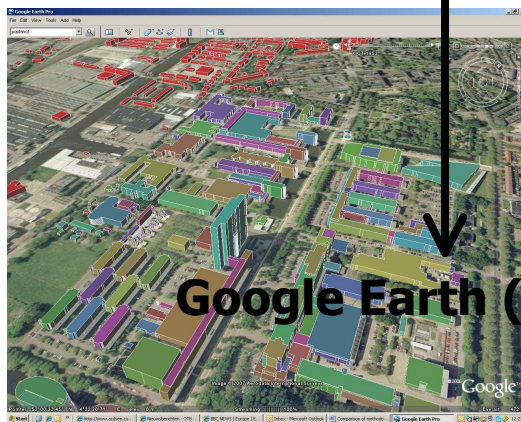
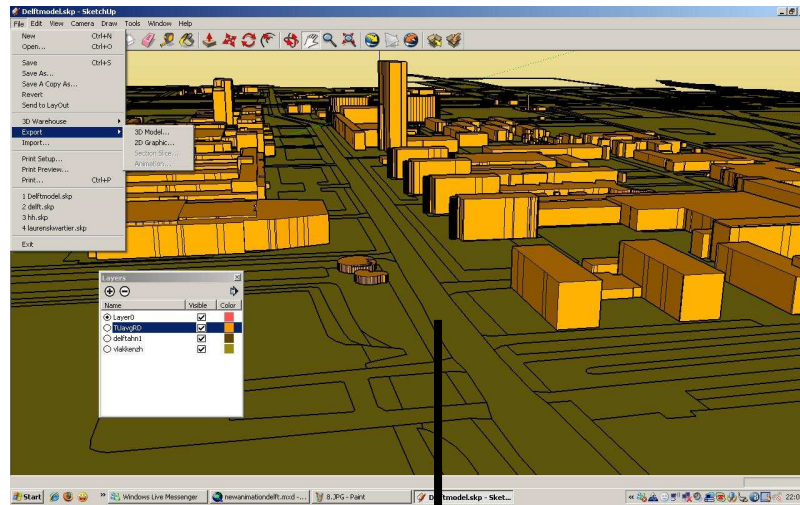
3D data format (multipatch) can be exported and imported in ArcGIS Environment



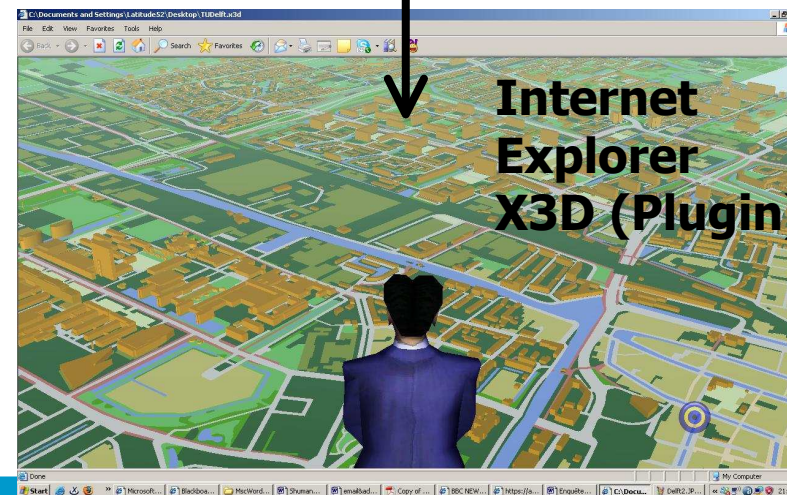
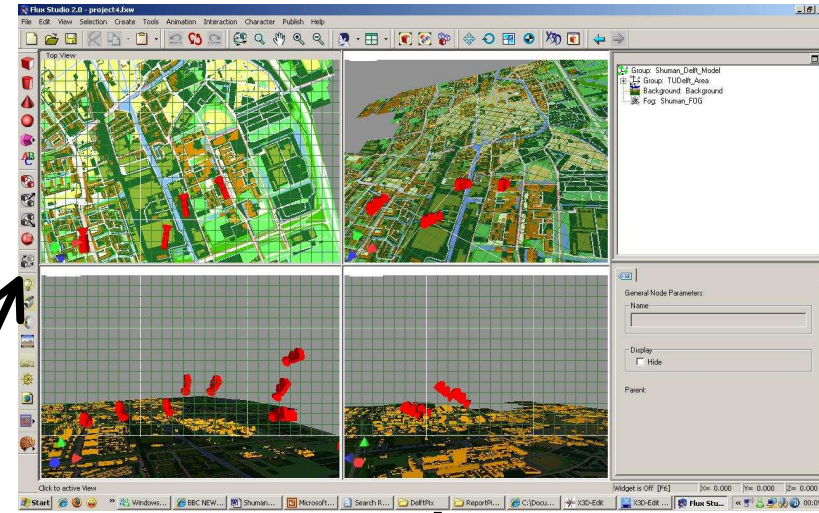
Georeferenced
Export to Google Earth

Creating a 3D Scene of Delft City

Export to KML/X3D LoD1 Tools Sketchup & FluxStudio



Freeware Data Fusion Environment: Flux Studio



8 januari 2008

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