Landscape Modelling and Simulation Using Spatial Data

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Abstract

In this paper a procedure was performed for engendering spatial model of landscape acclimated to reality simulation. This procedure based on combining spatial data and field measurements with computer graphics reproduced using Blender software. Thereafter that we are possible to form a 3D simulation based on VIS ALL packages. The objective was to make a model utilising GIS, including inputs to the feature attribute data. The objective of these efforts concentrated on coordinating a tolerable spatial prototype, circumscribing facilitation scheme and outlining the intended framework. Thus; the eventual result was utilized in simulation form. The performed procedure contains not only data gathering, fieldwork and paradigm providing, but extended to supply a new method necessary to provide the respective 3D simulation mapping production, which authorises the decision makers as well as investors to achieve permanent acceptance an independent navigation system for Geoscience applications.

Keywords: Landscape Modelling, VIS ALL, GIS, Blender, GPS.

الخلاصة

في هذه الورقه تم اقتراح منهجية لانشاء موديل مكاني لمحاكاة الواقع . هذه المنهجية تقوم على عملية تكامل المعلومات المكانية و القياسات الحقلية بالاضافة الى استخدام برامج الرسم بالحاسوب بالتحديد Blender software حيث تم بناء موديل مكاني قادر على ربط كل هذه المعلومات. بعد الانتهاء من بناء الموديل المكاني تم بناء محاكاه للواقع ثلاثية الابعاد باستخدام VIS ALL package . الهدف من هذا العمل هو التركيز على تصميم موديل مكاني ، صياغة منهجة للتنفيذ و بناء نظام معلومات مكاني . و هكذا فان هذا النظام يمكن استعمالة كوسيلة تفاعل لدعم القرار. المنهجية المقترحة تتضمن ليس فقط جمع البيانت المكانية ، القياسات الحقلية و بناء الموديل، لكن توفر ايضا خارطة طريق ضرورية لتصميم نظام محاكاة وصفي ثلاثي الابعاد لانتاج الخرائط التي تخول صانعي القرار و كذلك المستثمريين للاستفادة من نظام ملاحي مستقل لاغراض التخطيط.

الكلمات المفتاحية : موديل مكاني ، نظام المعلومات الجغرافي ، نظام الموقع العالمي.

1 Introduction

"If I can visualise it, I can understand it." Elbert Einstein. Urban is a complicated framework, which makes up of divergent complementary subsystems and is controlled by an assortment of indicators. Modelling is a ruling means to perceive growth issues (Vanegas *et.al.*, 2009 a).Brilliant modelling of inhabited area is an excessively paramount part of urban studies and is also essential for recent urban planning. The manner of urban explosion could be monitored and treated based on GIS techniques, remote sensing, and statistical analysis (Tan *et.al.,* 2015).

Landscape perceptibility analysis applying automated methods usually searches for detecting areas that are recognized from a specific point (García & Rodríguez 2015). Another chronically applied dissimilar of scheme pays attention to complete aspects contemporaneously and allows choosing apparent sites which is needed (Tabak *et.al.*, 2013).

Urbanisation is not only a turnover in population and economic action, but also a significant spatial project. Whereas, this activity was of big value for comprehending city development and urban dilation (Jiao *et.al.*, 2015).

The motivation of this paper is to better link between landscape simulation and spatial modelling with the tools that can be used and to provide beneficial ideas of simulation with spatial data to support decision. The goal is to determine the prerequisites for applying these approaches in landscape simulation and to create a framework of opportunities for utilising design ideas that can support planning process. Urban renewal has turned into a main component of overall urban policy in numerous regions and nations seeking for welfare.(Couch,1990) showed two reasons for its rising consequence. Firstly, people steadily living in urban areas, particularly the old one, result in the need for revival of the urban framework. Secondly, urban revival pays attention to the apprehensiveness of urban expansion and large amount of forsaken urban areas. Currently, it is sincerely included in sustainable evolution (Wei Zheng *et.al.,* 2014).

This paper therefore presents a procedure for landscape simulation of urban in general which will be supported for multi-purpose tasks. The integration of spatial data with field measurements (DISTO and GPS) plus Satellite imagery linked to GIS and graphic programs (Blender software) led to get results which will be used as a support for decision. In addition, these results will be a basis for future planning process. Generally, this paper gives a good example for the evaluation of current situation in cities that search for development not only in planning process but also in making right decision.This,paper linking Survey Engineering with Geomatics Engineering in order to give a close picture for a reality.

To deal with visualization, we will require realizing how Blender works with files from CAD software such as AutoCAD, ArchiCAD, QCAD etc. The most familiar file extensions utilized to interchange CAD drawings is DXF. Hence, when your CAD software able to store the drawings in the DXF files extension, Blender will be capable of using it. For the reason that most CAD packages are able to do that, it makes Blender indeed convenient (Brito 2008) ArcGIS software can receive files from CAD software therefore there is a good connection between those three software to use them in importing files from each other to help in building very good visualization in an interactive manner.

1.2 Major contributions

The major contributions of this paper were as follows:

- Simulation model, which was built based on GIS and field measurements, was linked to graphic representations (Blender software was used) an integrative manner to provide accurate details not only for decision makers but also for designers in addition to architects.
- The gap between reality and simulation were diminished by the approach of building a model which covers the needs of the details in landscape in such way that give flexibility in bridging computer graphics with spatial data which are either GIS data or field measurements. .
- Finally, spatial model was established which can be extended to other studies or other data sets.

Urban design is a technique which simplifies accessibility. Nowadays, central business centres take their merits from new buildings. This emphasizes the distinction between the outer and inner also, among structures and landscapes that stand out beauty of a metropolis (Aydin,2014).

1.3 Study area

Mustansirya distrct (Hay) is located in Baghdad near to Falastin street (Fig. 1) as follows:

- Hay: Mustansirya/ Baghdad
- Mahalah: 502
- Spatial Coordinates

  Easting :448933.476966 m

  Northing:3692779.497839 m.

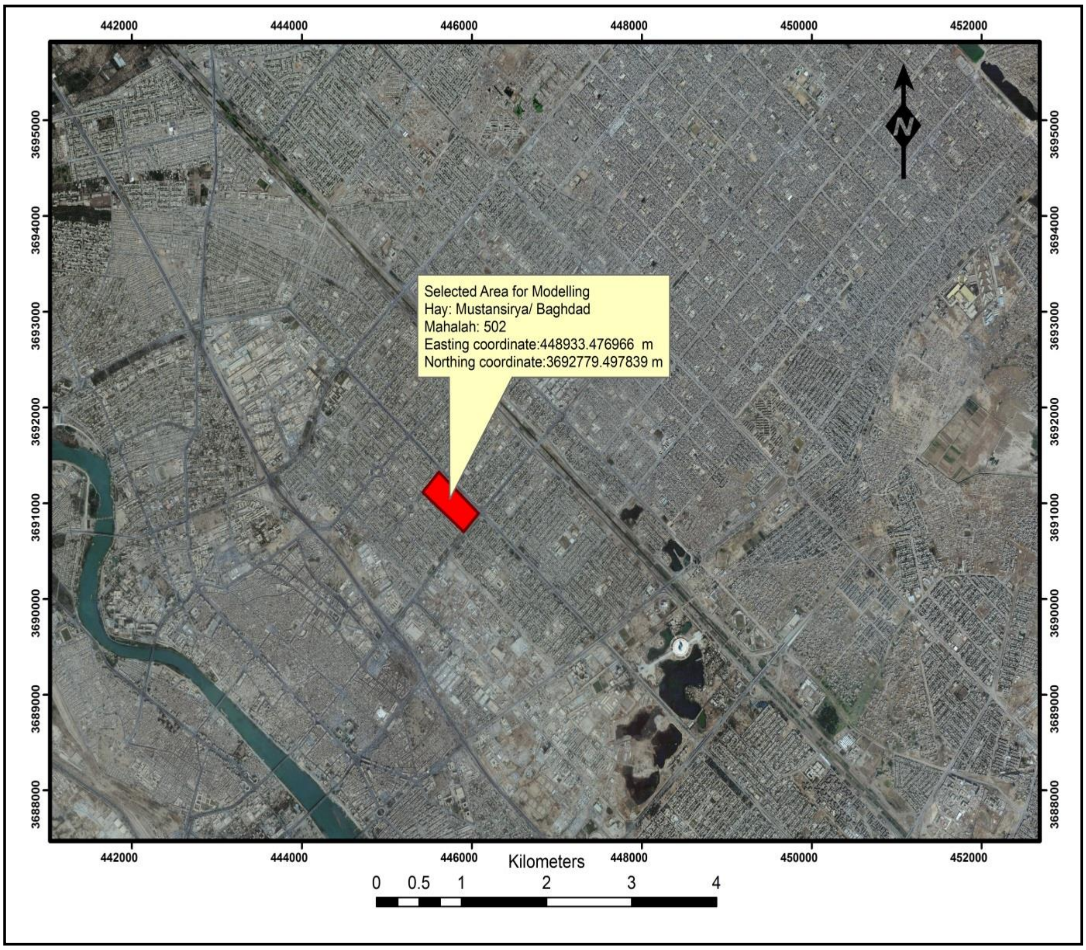


Figure 1. Selected area for modelling.

2-Fundamentals

Ruas *et.al.*, 2011 analyses the development of urbanization and simulated it on particular regions by concentrating on the development since 1950. This tool was utilised to inspect the densification by way of comparing temporal data generated from old data.

The design status could be the beginning for utilising design methods in planning more consistently. The foreseeable added value of combining design culture into planning may be improved communication and comprehending of the conceptual planning goals. Whether these prospects will be occurred must be studied in future research. Combining design methods could improve landscape planning ideas and its explicit activity (Von Haaren *et.al.*, 2014).

Recently, fresh locational tools progressively advanced on communal networks, few of them appear barely coupled with conventional understanding of the surroundings (Torres & Costa 2014).

Ample countries examined, integrated consequences due to stagnation, reorganization and objections to the renewal scheme. They are an extremely adaptable structure styles that is able to convert or change according to the need. Additionally, the plot size of each house is so tiny that it cannot permit destruction and reconstructing without affecting its neighbours, hereto, popular obtrusion is prerequisite to quicken urban renewal. In the internal urban districts of modern towns widespread construction style is the periphery square flats : separate constructions with an awesome boundary, encompassing isolated flats. Usually 6 levels overlooked to street are common. The flat bottom is predominantly extended to some purposes. Dilemmas guaranty the dimensions and comforts of flats (Couch *et.al.,* 2011).

Wang *et.al.,*2013 have demonstrated that urban renewal is a considerable influence in expanded urban regions, with a particular hardness for urban planners present in the redevelopment of land to meet needs whilst maintaining consistency with current land use.

Case & Hawthorne , 2013 worked with numerous society agencies in an urban district to analyse the spatial divergence of public service sponsors.They also determined rational new places for public service sponsors that can meet needs for such agencies,in addition to employing a public co-operation GIS framework to construct co-operated community sources and research contributions to the citizenry agents.This activity assists local sponsors, directors,and community residents to conceive gabs and coverage in public services across the urban scope(Al-Hameedawi, 2014).

Xiao *et.al.,*2006 exhibited a highly trained research of the sequential spatial features of urban expansion by using GIS and remote sensing. Batty *et.al.,*1999 illustrated a form of urban models whose dynamics are submissive to theories of growth linked to GIS-based cellular automata.Many tasks relating constructions and urban growth are essentially accomplished by local authorities and by government even though sponsors prepare resources and elevate the urban strategy. landscape simulation has viewed as a strategy that would assist dreams to come true via promising a good solution to such problem and provide tools for societies, local governments, and investors to use GIS and spatial data for decision making.

A 3-D GIS contingent on a photo-realistic city model should involve not only traditional GIS issues but also provide the nearest picture to a real landscape, which authorise investors or sponsors to survey the full city in 3-D virtual reality and discover the spatial relationships around location (Rau & Cheng , 2013). Utilising the third-dimensional prototype to place, the locational scheme has to test by applying option expectations, changing construction within the accepted range of use. The outcomes applied for supplying information to a modern notion (Yeo *et.al.,* 2013).

Second dimension and third Dimension prototype capable of combining systematically. They are linked with reference to information problems, information ordering, and detailed examination of the issues. Second Dimensionial details viewed with flexibility in third Dimensional simulation.2D-Dimensional experiment cases are complemented facilely in 3rd- Dimensional simulation (Wei & Yanmeia,2012)..

Yeo *et.al.,* 2013 proposed an approach for promoting a town service prototype, utilising the ambience and GIS, of the urban life period to minimize energy use for friendly urban planning. Problems

Widener *et.al.,* 2013 demonstrated a time-geographic method to comprehend how the urban spatial framework of daily commuting activity changes the spatiotemporally static picture of food deserts applying GIS.

The GIS maps are utilising value stream mapping symbols in order to promptly show who fulfil the process in the supply chain, in the like manner where and how a feature changes over time (Irizarry *et.al.,* 2013).

Coutu *et.al.,*2013 have proposed the implementation of combined 3D GIS with LiDAR data to bring back all the information substantial for applying norms for a big group of constructions. The proposed method was examined on an intensive urban area of lots buildings with a wide range of primary features.

Nowadays, at the regional standard, GI-technologies are utilised predominantly for geo-visualization for displaying dilemmas, perceive it, and to stand up to common differences.

Zhang and Pan, 2015 have developed rapid simulation method which is a kind of simplified distributed hydrologic model relying on DEM. Where an urban storm-inundation simulation method based on geographic information systems (GIS) were used.

Research Institute (http://www.esri.com), authorise users to combine 3D data into their work by tools to generate and modify surface models and simple three-dimensional vector geometry, in addition to integrative perspective viewing, and the capability to transform data to dissimilar extensions.

The necessity for 3D visualization is quickly rising. Nowadays, a lot of mankind activities, for instance cadastre, environmental monitoring, landscape planning, etc. progress steadily toward third dimension (Reindel *et.al.*,1999).

Currently, the 3D maps have become very common and essential element of cartography. It is important to mention that, the cyber 3D worlds have turned into more authentic, more comprehensive, more obvious to people, who accomplish them for many missions.3D maps definitely present very beneficial ways for active visualisation of geographical data. Yet, it should be recognized whether or not this data is rigorous enough (Bandrova & Bonchev,2013).

3-Methods

3.1 Height measurements

Height measurements of buildings were obtained from firstly fieldwork and secondly extracted from DEM. The measurements of fieldwork were used to validate the extracted heights from DEM. It is known that field measurements are time-consuming process. Therefore DEM was used to accelerate it.

This type of study is yearning for field work and spatial data. Therefore, the following activities are covered during the field work:

- Surveying of the study location to get valid spatial data for the research place using the GPS instrument. This phase is predominatingly to be imputed as the ground truth. Therefore, one can be capable to clarify the details which are noticeable in the image.
- Potential measurements of buildings are carried out using DISTO instrument.

3.1.1 Height measurements in field work

Height measurements in field work were used to make verification of the obtained results.3D attributes for the buildings. Seeking For realistic visualization, the building dimensions are recorded with some precision. 2D floor plans were obtained from the satellite image. To supplement the third dimension, the following activities were covered:

- Heights from field measurements using DISTO device
- Heights from field recordings
- Estimating the amount of number of full floors.

Simplification: Complicated roof geometry to be simplified. Dormers, bay windows, turrets and other small architectural decorative elements can be neglected.

3D attributes for the edges of buildings existing data model: The building dates have already attributed fields, which enable a simple 3D reconstruction. In order to start the model building, it is required to perform the essential steps as follows:

- F: floor number
- S: (Medium) storey height

- Z3: Parametric building base point height (highest point on section line road surface - outside building wall
- R2: relative height from the base point to the eaves
- Z2: Para height of the eaves
- R1: relative height of the eaves of the roof ridge
- Z1: Para height of the roof ridge

It is needed to identify only two sizes: R1 and R2, others result from the digital terrain model and the relative heights as below Figure 2.

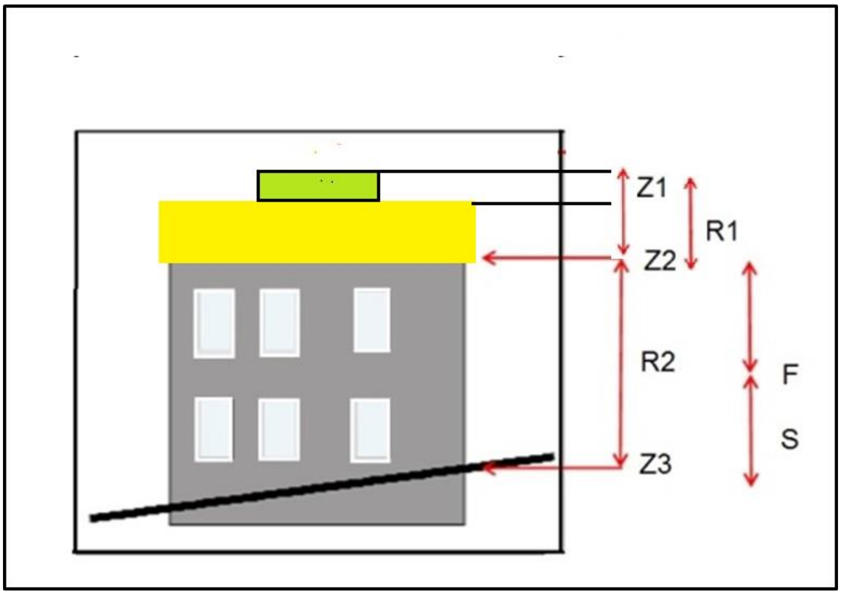


Figure 2. Building height measurements.

3.1.2 Buildings height measurements using digital surface model and GPS Visualizer website

Digital elevation model (DEM) is comprehensive expression, including digital topographic data in all its multiple patterns which include the following (Maune *et.al.*, 2001):

- Digital terrain model (DTM) is an equivalent to bare-earth DEM
- Digital surface model (DSM) is elevations of the top of surfaces, such as buildings and vegetation.

Let me illustrate this with an example to make sense:

DSM-DTM= Height of the objects existing on the surface of the earth that are either natural like tree canopy or man-made like buildings, towers etc.

By using Arc GIS 10.5 all the buildings of selected area for modelling were extracted based on satellite image as a polygons, then these polygons converted to points using "features to point order" in ArcGIS.

Then we extracted the pixel values that represent elevations of DEM (Fig.3) using

"Extract multi values to points spatial analyst order".

Finally, we used "spatial join" for the purpose of converting elevations extracted from the points to the polygons, which represents the buildings height above sea level (A.S.L). In order to obtain building heights above natural ground level simple formula was used in attribute data where the elevations of buildings above sea level were subtracted from elevation of natural ground above sea level for the same building, so we get a net rise of buildings

(Height = DSM-DTM).

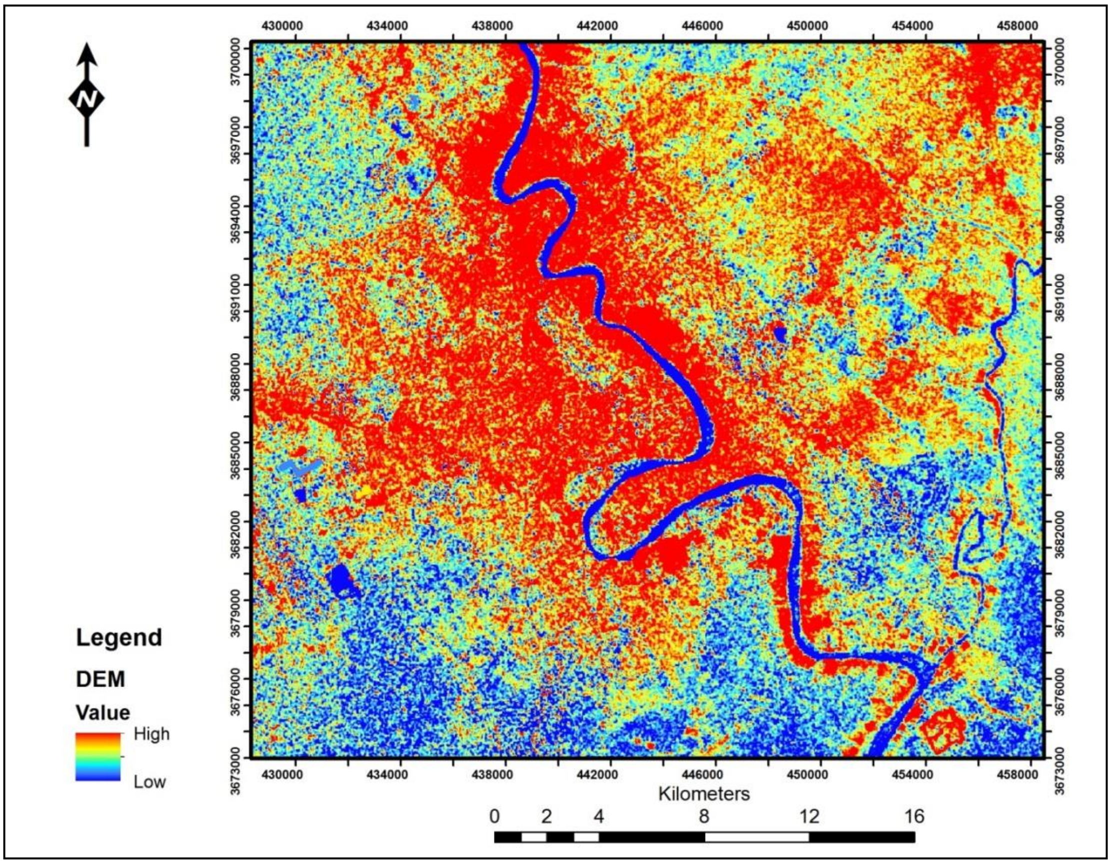


Figure 3. DEM of Baghdad City.

In order to get accurate results relating to elevation, GPS Visualizer website (http://www.gpsvisualizer.com/elevation) were used to calculate heights to all features in study area. All you have to do is to upload coordinates information on this website and you will get elevations. See Table 1 which represents detailed elevations of buildings and their surroundings.

3.2 3D-modelling of selected objects of an urban landscape using "Blender"

Practical 3D object generation via the sub-steps

- Shape Modelling
- Surface material
- Easy lighting and Rendering
- Export to other programs.

The objective is creating 3D complex object geometry by using Blinder software, primary object geometry through clever construction of sections; complex, soft shapes are created from small original bases. This way we can effortlessly model an object. Make use of this mode only if you want to modify and model an object (for more information see Brito 2008).

3.3 Conversion of the GIS-Model to a 3D-Model and visualization using "VIS-All"

3D visualization of Contents Software used for 3D visualization (3D VIS ALL software: 3D visualization) means an approach to a true perception by creating rendered 2D perspectives from models of spatial features. VIS ALL 3D is a software system for composing 3D scenes (landscapes to individual objects) from external databases. In the produced scenes, the user can navigate interactively. 3D objects can even have dynamic properties. We have to mention also that still images from a definite perspective on the Definition of camera paths and animations can be created. In a similar way, the lighting of the scene, involving the leaves Shadows interactively direct as periodically Shadows animate as diurnal variation.

The objective is to create 3D visualisation by making use of VIS ALL 3D package for study case. In order to achieve this goal the following steps must be fulfilled.

The essential steps to build the model are as follows:

1) Data import into ArcGIS using the Vis-All-package Principles of data transfers:

- Acquiring of geometry from feature classes
- Display properties from attribute tables

2) In the "configuration", the original 3D GIS features must be assigned

- Points to be full 3D objects
- Lines are linear to 3D objects (pipe, wall, fence, etc.)
- Areas to be surface types or extruded 3D building objects (block model)

3) The assignment (type and display parameters).

4-Results and Discussions

4.1 Data Preparation and Analysis

The digital representations of spatial data have to take into account that simulation approach usually is linked to authorities and other parties. Data applied to the landscape simulation consists of a shape-files, raster data and attribute data, recorded as databases (Fig. 4). Dissimilar layers were generated for each of the planning sorts. The framework of the attribute for all layers is the same. The map production, relying on, the nature of the landscape. Opposite to the regional plan, landscape plans do not have a pledge directive on cartographic symbology (Thomas, 2001). These support the visualization of the maps extremely. In order to exploit the spatial manipulation significantly, we in need of a tool where the user can interpret features through multiple layers examinations by using full knowledge of the phenomena.

Figure 4. Area of interest.

4.2 Starting 3D Visualisation and Adding Data

In order to visualise spatial data in three dimensional model, the Arc Scene was used which is a 3rd Dimension scene despite inspecting details in Arccatalog. Arcscene (Fig5) authorizing creating complicated views with multi-function. The need for 3D information is rapidly increasing. The advantages of applying computer-aided visualization for architecture led them to rapidly becoming a standard for these categories of presentations. Today, almost every project for buildings or anything creation has a 3D-visualization for project progress or to illustrate the principle to someone who wouldn't comprehend an idea based on technical drawings. The employing of 3D-models provide more alternatives, even in the project phase, since it is contingent to fast visualize all the environments to make changes to improve the organization and overlook every area of interest (Brito 2008). Measurement: is carried out by a laser distance meter (DISTO) and protractor (2 min / building).

• Measure 1: horizontal distance from the building wall (d)

• Measure 2: Angle to the eaves (α)

• Then, the relative height of the observer's eye level of the targeted wall upper edge (eave): $h1 = d * \tan \alpha$ • Addition of the observer's eye height (h2)

• Relative height of the eaves: $R2 = h1 + h2$.

Complicated roof geometry can be simplified. Dormers, bay windows, turrets and other small architectural decorative elements can be neglected. 3D attributes for the edges of buildings existing data model: The building dates have already attributed fields, which enable a simple 3D reconstruction.

Figure 5. Snapshot of thematic layers in 3D scene subset showing sample for buildings. Note . The building heights were exaggerated for better visualising.

4.3 3D modelling of selected objects of an urban landscape using "Blender"

Modelling in Blender was used for generating views, which requires the following means: Prototype, Textures and Illumination. This section illustrated the most important of those aspects: modelling. Modelling represents generating a surface which is appropriate for user's imaginations (Fig.6).

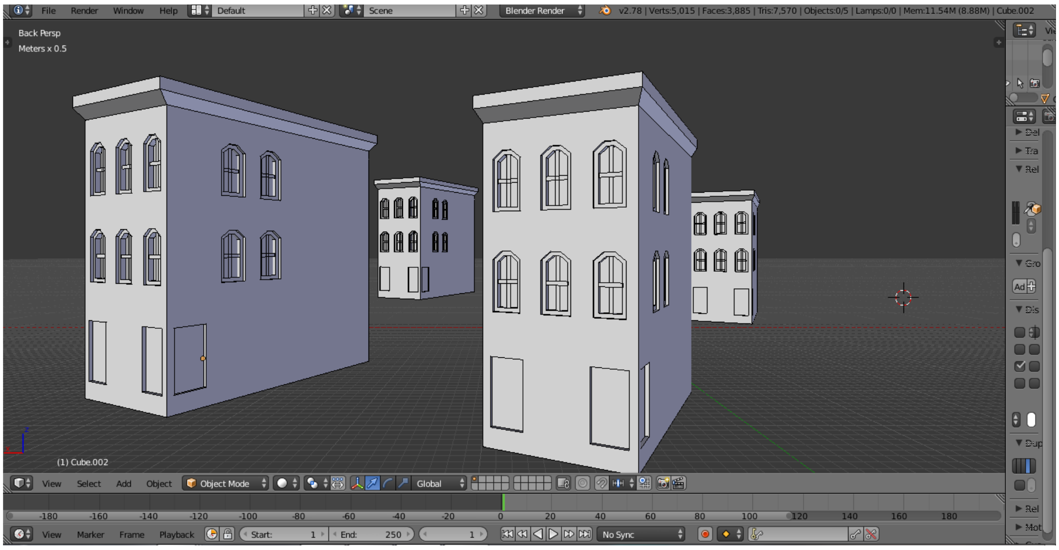


Figure 6. 3D-Blender model (Buildings).

For linear phenomena, exploit "curve modelling" that forms the boundry. Either method is completely approved in Blender exploiting its modelling tools. Each .blend file involves a database. This database includes all scenes, objects, meshes, textures, etc. that are in the file. A file can contain diverse scenes and each scene can contain different objects. Objects can contain a lot of materials which can contain many textures. It is also possible to create bridge between different objects. Please see Figures 7 and 8 respectively.

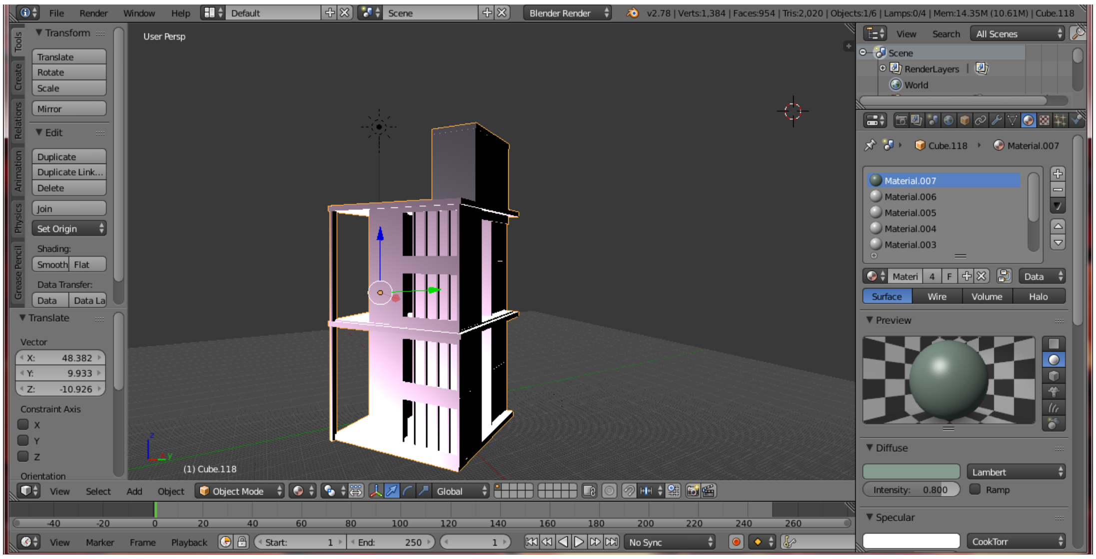


Figure 7. 3D-Blender model (Detailed building).

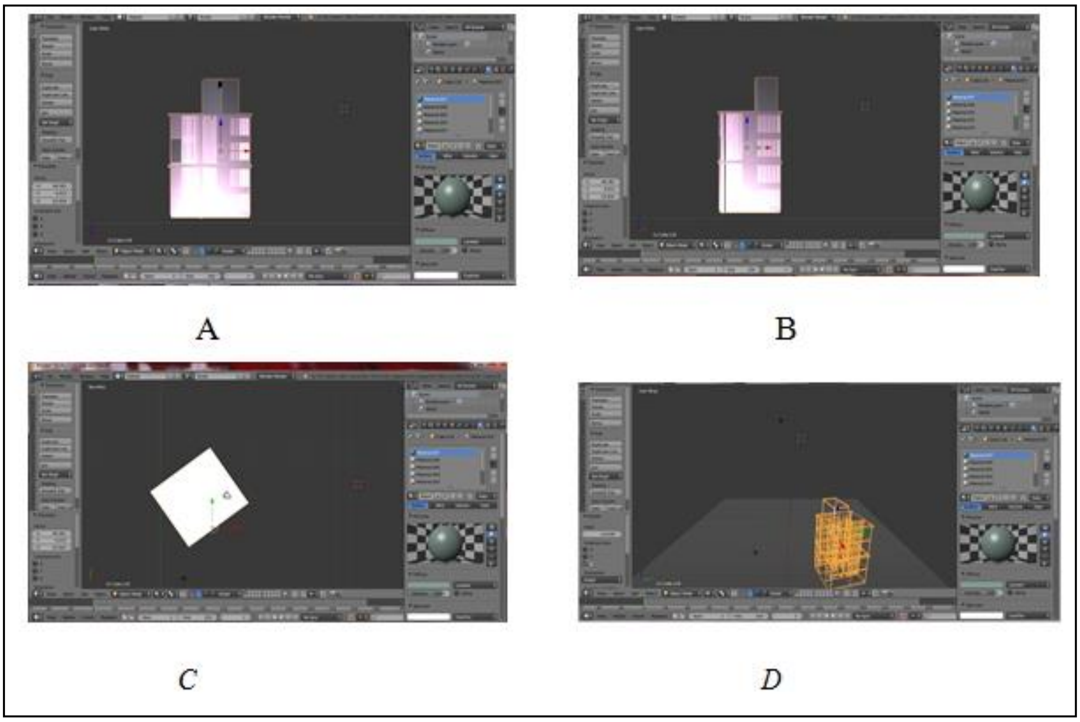


Figure 8. 3D-Blender model projections. A: Right view, D: Left view, C: Top view, D: Wireframe view.

4.4 Conversion of the GIS-Model to a 3D-Model and visualization using "VIS-All"

It can be concluded that getting a fresh perspective by visualizing the details in 3D help understanding of reality and trace each step in any project. Use 3D GIS to accomplish tasks that simply cannot be addressed in a 2D context. We live in a 3D world and many spatial tasks can only be accomplished in 3D environment. Data import into ArcGIS utilising the Vis-All-Extension Start of data transfer: The relating configurations listed in menu, so the first attribute of spatial data of the classes is expanded. The relevant details are saved in an access database. At the same time

Vis-All started and shut down ArcGIS. All related levels, is initiated by pressing the button "3D" the real transfer.

GPS Visualizer website (http://www.gpsvisualizer.com/elevation) was used to calculate heights to all features in study area. Table 1 which represents detailed elevations of buildings and their surroundings. Rapidly create 3D visualizations, and share the 3D scenes with the public led to represent work effectively. Hence, ideas can be communicated highly in 3D (Fig.9 a and b).

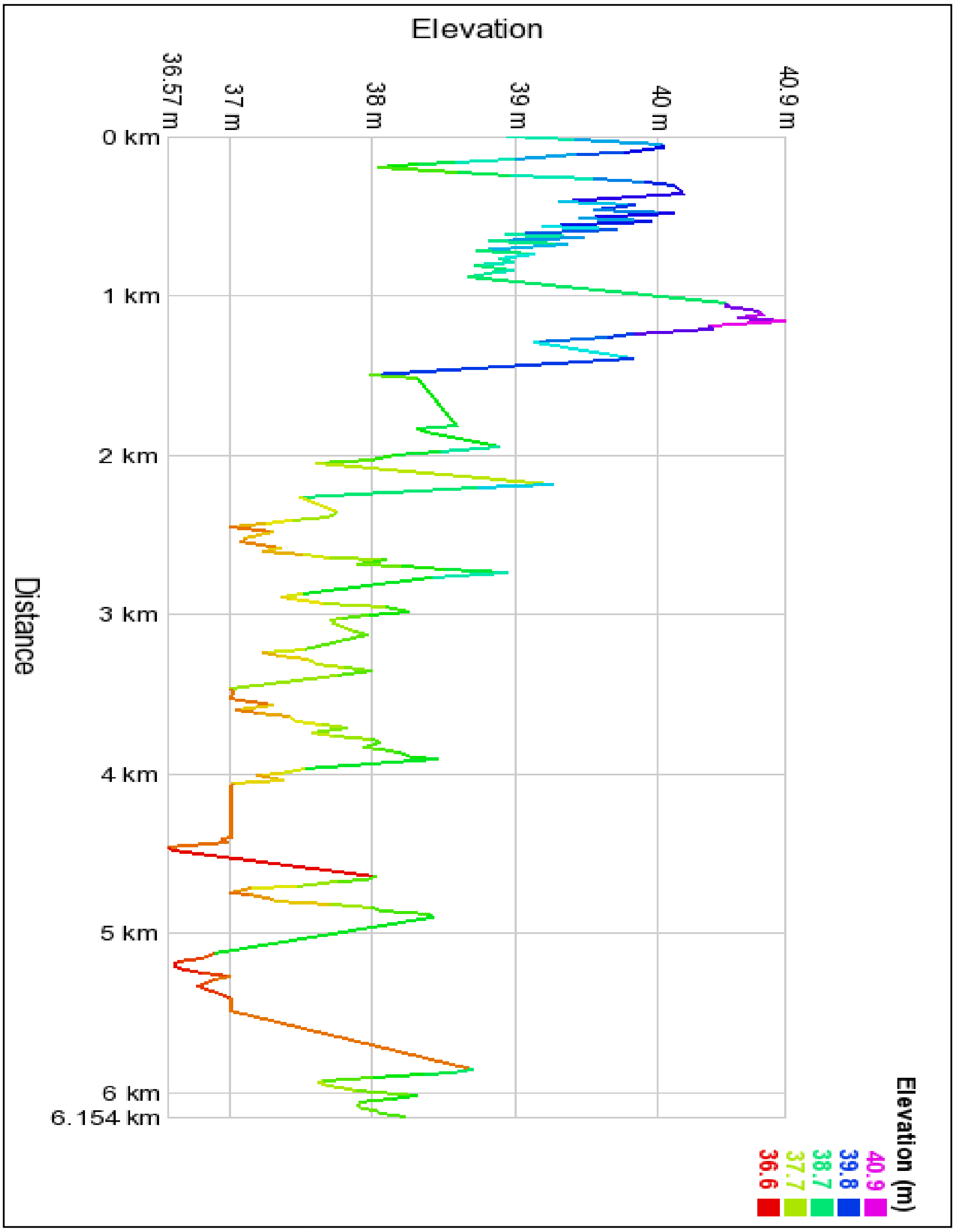


Figure 9a. Elevation profile of Buildings and its sourroundings A.S.L calculated by GPS Visualizer.

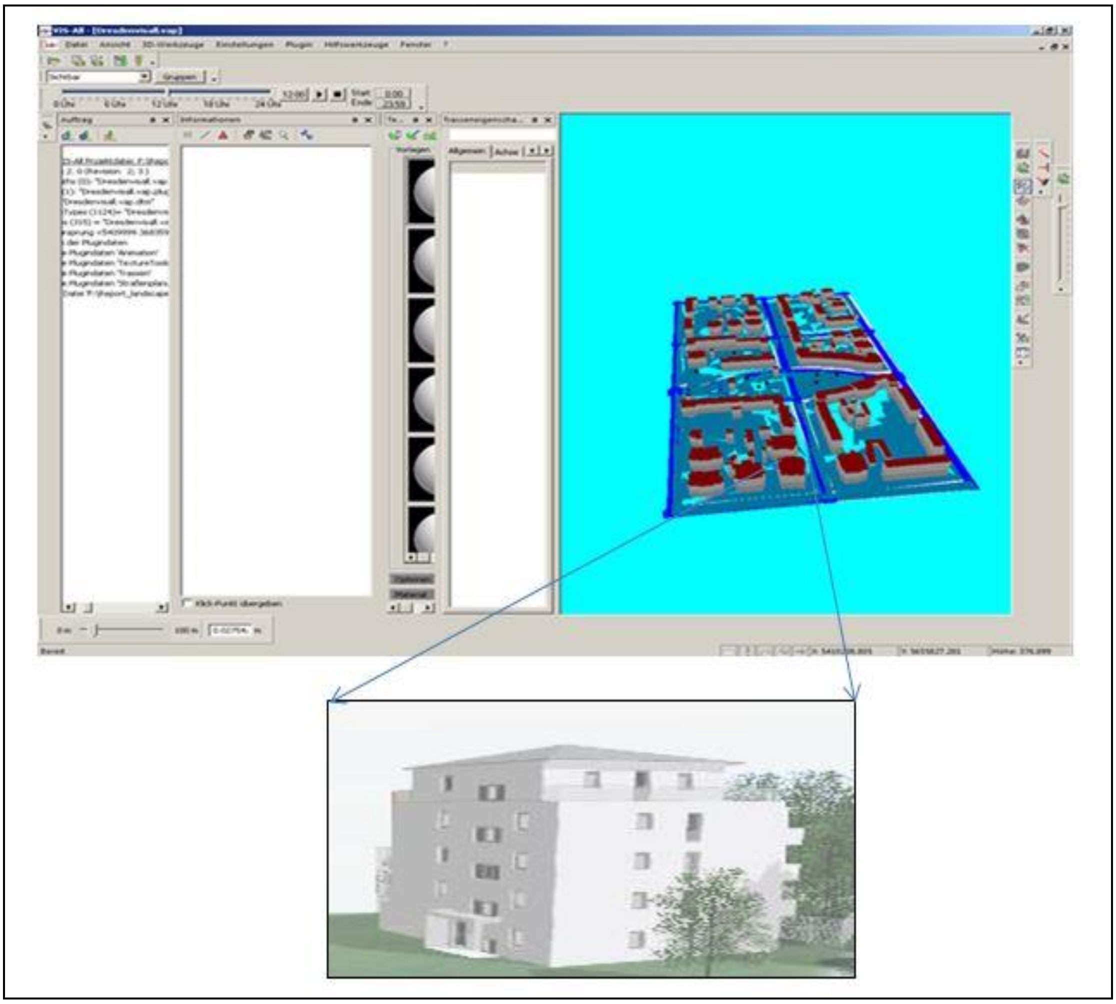
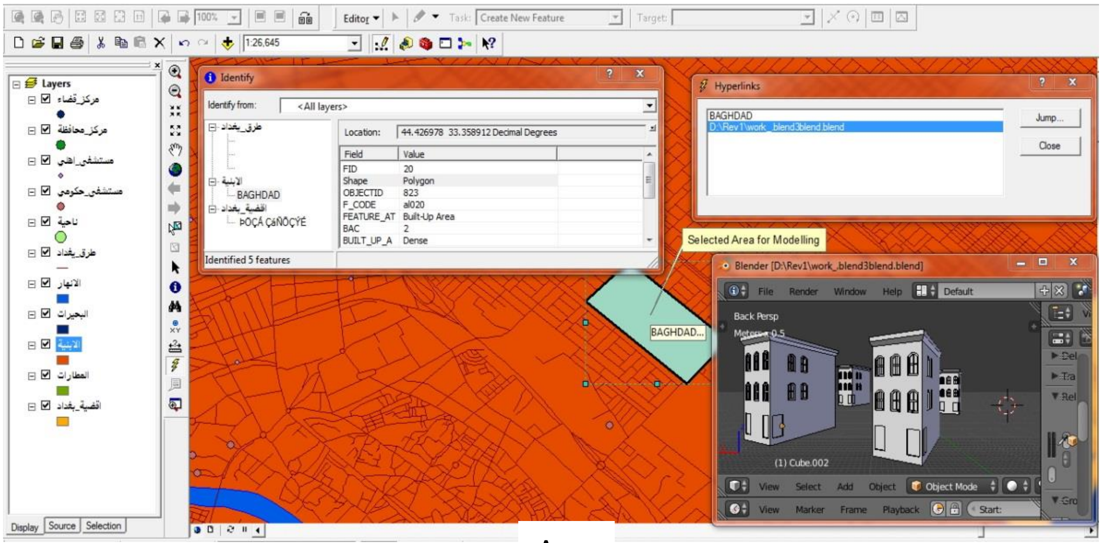


Figure 9b. Conversion of the GIS-Model to a 3D-Model and visualization using "VIS-All".

4.5 Interactive GIS-Model

We used hyperlink tool in ArcGIS in order to connect all the spatial data for Hay Mustansiriya , with these data represent detailed buildings produced using Blender software for the same area in addition to data the representing selected area for modelling on Google maps where all they were linked to GIS for highly interactive modelling as shown in Figure 10. So all you need to click on study area by the hyperlink tool in ArcGIS to get all needed information.



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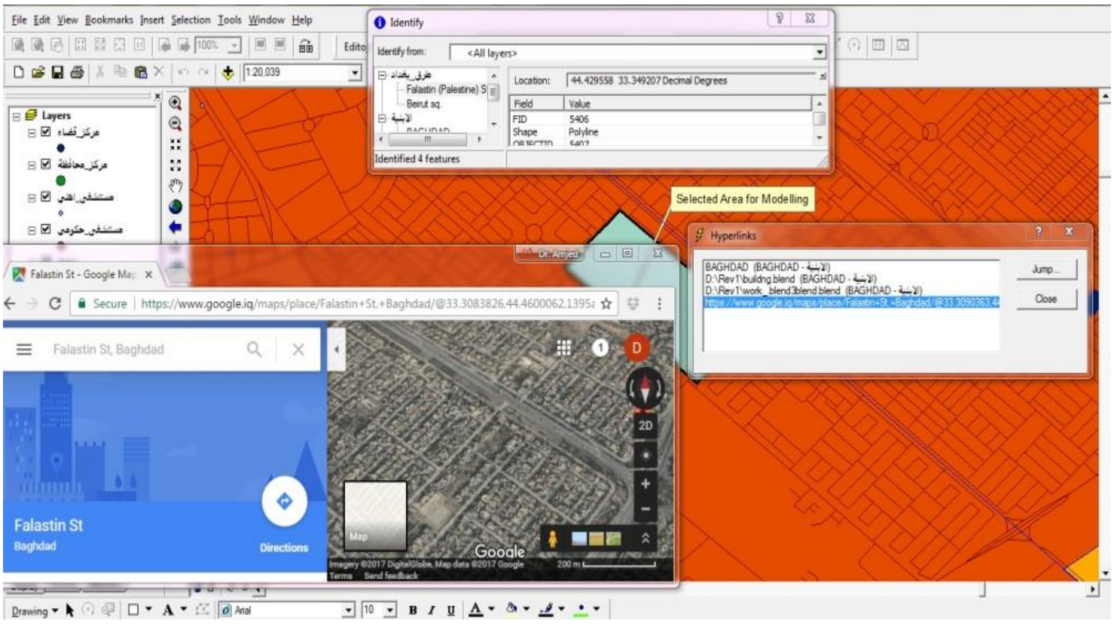

B

Figure 10. Snapshot of interactive modelling using GIS. A: Building produced using Blender. B: Google map for selected area for modelling.

5- Conclusions

This paper has been paving the way for making the simulation more realistic for landscape by linking computer graphics with an accurate spatial model which has been built using GIS techniques. A lot of efforts have been done to minimise uncertainties in the spatial model based on accurate measurements utilising GPS and Disto measurements during the field work stage. It is too early to fill the gap between spatial data and reality because of huge details in our world. However, this space can be minimised by subjecting it to rigorous spatial data and fieldwork. Architects can take advantage of this paper in the design of some areas inside cities or design a whole city in addition, Ministry of Municipalities may utilise this paper in meeting needs of users and promise new techniques for future plans of public services. Landscape simulation is a fantastic tool which enables decision makers to throw light on investment process in an interactive style.

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Table 1. Heights of Buildings and its surroundings

Points ID	Latitude	Longitude	DSM (height above A.S.L)	AVG.Buildings Height above N.G.L. (m)
ID0	33.35949	44.41562	38	3
ID1	33.35936	44.41545	38	3
ID2	33.3591	44.41529	43	8
ID3	33.35897	44.41508	42	7
ID4	33.3588	44.4149	42	7
ID5	33.35869	44.41476	41	6
ID6	33.35854	44.41458	40	5
ID7	33.35838	44.41441	37	-
ID8	33.35827	44.41431	37	-

ID9	33.35819	44.41418	37	-
ID10	33.35809	44.41452	35	-
ID11	33.35819	44.41466	35	-
ID12	33.35835	44.41481	36	-
ID13	33.35851	44.41496	41	6
ID14	33.35861	44.41514	43	8
ID15	33.35879	44.41528	43	8
ID16	33.35892	44.41549	42	7
ID17	33.35936	44.41576	39	4
ID18	33.35921	44.41563	41	6
ID19	33.35923	44.41594	41	6
ID20	33.35907	44.41579	40	5
ID21	33.35908	44.41611	39	4
ID22	33.35895	44.41596	40	5
ID23	33.35894	44.41628	39	4
ID24	33.3588	44.41614	39	4
ID25	33.35882	44.41645	38	3
ID26	33.35869	44.41629	39	4
ID27	33.35872	44.41655	38	3
ID28	33.35858	44.41639	38	3
ID29	33.35858	44.41675	38	3
ID30	33.35846	44.41655	39	4
ID31	33.35847	44.41692	39	4
ID32	33.35835	44.41673	39	4
ID33	33.3582	44.41691	40	5
ID34	33.35835	44.41706	39	4
ID35	33.35825	44.41722	40	5
ID36	33.3581	44.41736	41	6
ID37	33.35867	44.41567	43	8
ID38	33.35853	44.41552	43	8
ID39	33.35856	44.41581	41	6
ID40	33.35842	44.41568	43	8
ID41	33.35847	44.41595	42	7
ID42	33.35832	44.41582	42	7
ID43	33.35837	44.41608	39	4
ID44	33.35823	44.41591	41	6
ID45	33.35826	44.41622	39	4
ID46	33.35813	44.41606	40	5
ID47	33.35816	44.41638	39	4
ID48	33.35818	44.41523	41	6
ID49	33.358	44.41414	37	-
ID50	33.35801	44.41438	37	-
ID51	33.35801	44.41751	41	6
ID52	33.35783	44.41738	39	4

ID53	33.35795	44.4172	40	5
ID54	33.35802	44.41624	40	5
ID55	33.35803	44.41654	39	4
ID56	33.35786	44.4164	39	4
ID57	33.35789	44.41676	40	5
ID58	33.35773	44.41659	38	3
ID59	33.358	44.41526	41	6
ID60	33.35783	44.41531	41	6
ID61	33.35761	44.41601	36	-
ID62	33.3577	44.41697	39	4
ID63	33.35754	44.41719	36	-
ID64	33.35737	44.41703	37	-
ID65	33.3575	44.41687	37	-
ID66	33.3574	44.41666	37	-
ID67	33.35721	44.41691	37	-
ID68	33.35726	44.41652	37	-
ID69	33.35712	44.41672	36	-
ID70	33.3571	44.41636	36	-
ID71	33.35693	44.41653	36	-
ID72	33.35682	44.4164	36	-
ID73	33.35694	44.41623	37	-
ID74	33.35684	44.41609	37	-
ID75	33.3567	44.41628	38	3
ID76	33.3566	44.41617	38	3
ID77	33.35674	44.41598	39	4
ID78	33.35665	44.41585	39	4
ID79	33.35647	44.41606	41	6
ID80	33.35683	44.41708	37	-
ID81	33.35669	44.41696	38	3
ID82	33.35656	44.41685	37	-
ID83	33.3564	44.41665	39	4
ID84	33.35624	44.41654	39	4
ID85	33.35612	44.41681	38	3
ID86	33.35627	44.41692	38	3
ID87	33.35643	44.41705	39	4
ID88	33.35655	44.41716	38	3
ID89	33.35669	44.41727	38	3
ID90	33.35713	44.4174	37	-
ID91	33.35695	44.41752	38	3
ID92	33.35767	44.41797	38	3
ID93	33.35753	44.41814	37	-
ID94	33.35741	44.41804	37	-
ID95	33.35727	44.41788	38	3
ID96	33.35754	44.41785	37	-

ID97	33.35738	44.41767	37	-
ID98	33.35725	44.41749	37	-
ID99	33.35707	44.41771	37	-
ID100	33.35731	44.41847	38	3
ID101	33.35711	44.41832	38	3
ID102	33.35713	44.41861	38	3
ID103	33.35701	44.4185	38	3
ID104	33.35691	44.41808	37	-
ID105	33.35671	44.4183	37	-
ID106	33.35658	44.41817	36	-
ID107	33.3567	44.41799	36	-
ID108	33.35641	44.41795	36	-
ID109	33.35656	44.4178	38	3
ID110	33.35642	44.41765	37	-
ID111	33.3563	44.41786	37	-
ID112	33.35613	44.41773	37	-
ID113	33.35623	44.41751	38	3
ID114	33.35613	44.41737	38	3
ID115	33.35593	44.41756	38	3
ID116	33.35584	44.41746	38	3
ID117	33.35597	44.41727	38	3
ID118	33.35576	44.41733	38	3
ID119	33.35566	44.41724	39	4
ID120	33.3558	44.41792	38	3
ID121	33.35598	44.41803	37	-
ID122	33.35588	44.41818	37	-
ID123	33.35566	44.41808	37	-
ID124	33.35559	44.41833	36	-
ID125	33.35573	44.4184	37	-
ID126	33.35647	44.4186	39	4
ID127	33.35632	44.41839	38	3
ID128	33.35633	44.41868	39	4
ID129	33.35617	44.41854	39	4
ID130	33.35617	44.4189	39	4
ID131	33.35603	44.41868	39	4
ID132	33.35603	44.41903	39	4
ID133	33.35591	44.41889	37	-
ID134	33.35578	44.41892	37	-
ID135	33.35591	44.41923	37	-
ID136	33.35578	44.41928	37	-
ID137	33.35567	44.41918	36	-
ID138	33.35569	44.41951	37	-
ID139	33.35553	44.41932	36	-
ID140	33.35564	44.41764	38	3

ID141	33.35549	44.41777	38	3
ID142	33.35539	44.41793	37	-
ID143	33.35526	44.41811	37	-
ID144	33.35516	44.41827	37	-
ID145	33.355	44.41846	37	-
ID146	33.35489	44.41856	38	3
ID147	33.35475	44.41838	36	-
ID148	33.35483	44.41825	36	-
ID149	33.35496	44.41803	37	-
ID150	33.35505	44.4179	37	-
ID151	33.35518	44.41784	40	5
ID152	33.35536	44.4176	40	5
ID153	33.3555	44.41748	38	3
ID154	33.35595	44.41982	38	3
ID155	33.35604	44.42008	40	5
ID156	33.35617	44.41993	38	3
ID157	33.35628	44.41978	38	3
ID158	33.35641	44.41964	35	-
ID159	33.35653	44.41948	35	-
ID160	33.35664	44.41934	37	-
ID161	33.35654	44.41917	37	-
ID162	33.35643	44.41931	37	-
ID163	33.35628	44.41944	37	-
ID164	33.35618	44.41964	37	-
ID165	33.35664	44.41901	38	3
ID166	33.35675	44.41913	37	-
ID167	33.35711	44.41873	38	3
ID168	33.35703	44.41863	38	3
ID169	33.35786	44.41483	38	3
ID170	33.35774	44.41496	37	-
ID171	33.35768	44.41512	37	-
ID172	33.35759	44.41524	37	-
ID173	33.35742	44.41536	37	-
ID174	33.35735	44.41549	37	-
ID175	33.35724	44.41568	37	-
ID176	33.3571	44.41589	37	-
ID177	33.35692	44.41569	38	3
ID178	33.357	44.4155	38	3
ID179	33.35719	44.41531	39	4
ID180	33.35732	44.41517	39	4
ID181	33.35744	44.41507	38	3
ID182	33.35751	44.41493	38	3
ID183	33.35753	44.41474	38	3
ID184	33.35766	44.41466	37	-