The Dynamics:

- Draped raster aerial photographs.
- Textures applied to coloured regions on a tin surface.
- Roadside furniture with extruded shapes (e.g. guide posts, guard rails, street lights, fences).
- Tree, shrubs, traffic signs using billboard images.
- Digital photos as building backdrops.
- The AVI Movie production.

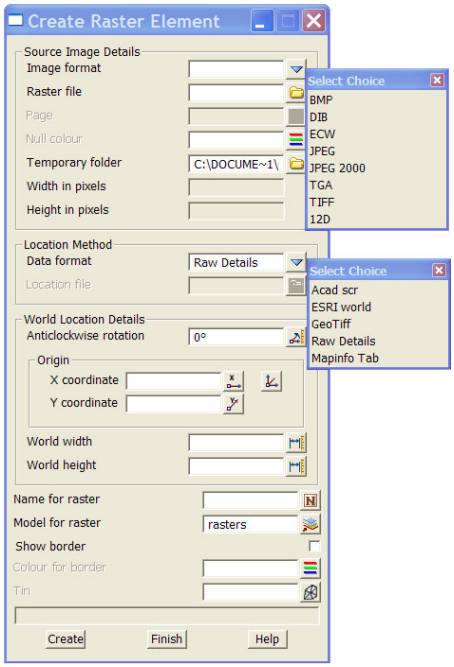
12D Visualisation:

Part 1

- Creation of raster aerial photograph.
- Creation of a composite tin of the existing and design.
- The "Tin Render" or drape of raster over tin surface.
- Viewing the composite tin.

Raster:

Strings->Create->Raster



Varied image formats refer 12D help (F1)

Name: *Ground Raster*

Tin for auto assignment of raster in visualisation

Composite Tin:

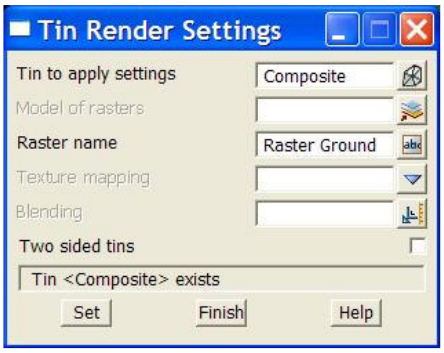
Using the ***Tin->Boundary*** option, create a boundary around your design tin for use in the fencing of the main survey data. Tick on the ***drape*** flag.

Add the survey data to a view and fence using the previous boundary….. ***Utilities->Fence***
Model for fence outside = ***DTM out***

Triangulate the **Design strings** and **DTM out** (***Tin Composite***)

Tin render Settings:

View->Visualisation->Tin render settings



Features:

- ***Model of rasters***, if more than one photo covers the tin.
- ***Texture mapping*** is used for applying textures to the coloured triangles of the tin (discussed later).
- ***Blending*** is a transparency factor that can be set to a tin (no raster or texture can be applied). The value of blending is between 0 and 1.
    - 0 means the tin is totally transparent
    - 1 means that the tin is opaque
- ***Two sided tins*** allows the tin to be solid when viewed from both above and below.

Viewing in Perspective (open GL):

While the draped raster can be viewed in a plan view at all times, it can only be viewed in an ***Open GL Perspective*** view, when the ***Shade*** is toggled on.
The raster does not show on **nulled** triangles, nor on any triangles that have been **coloured.**

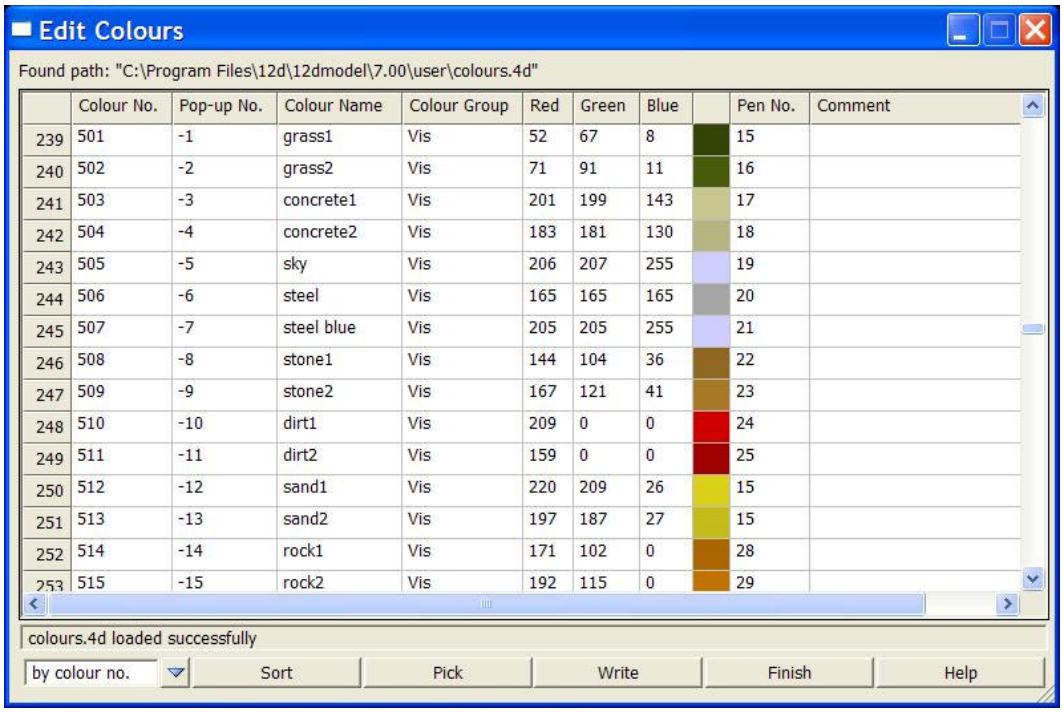
12D Visualisation:

Part 2

- Colours.4d edit and texture samples.
- Creation of polygons for colouration of tin.
- Texture and colour mapping.

Colours.4d / Textures:

The new **colours.4d** file allows a colour number range starting at 501 for the visualization colours. The negative pop-up number means these colours are read first along with the primary colours, and displayed in a list when choosing a colour.

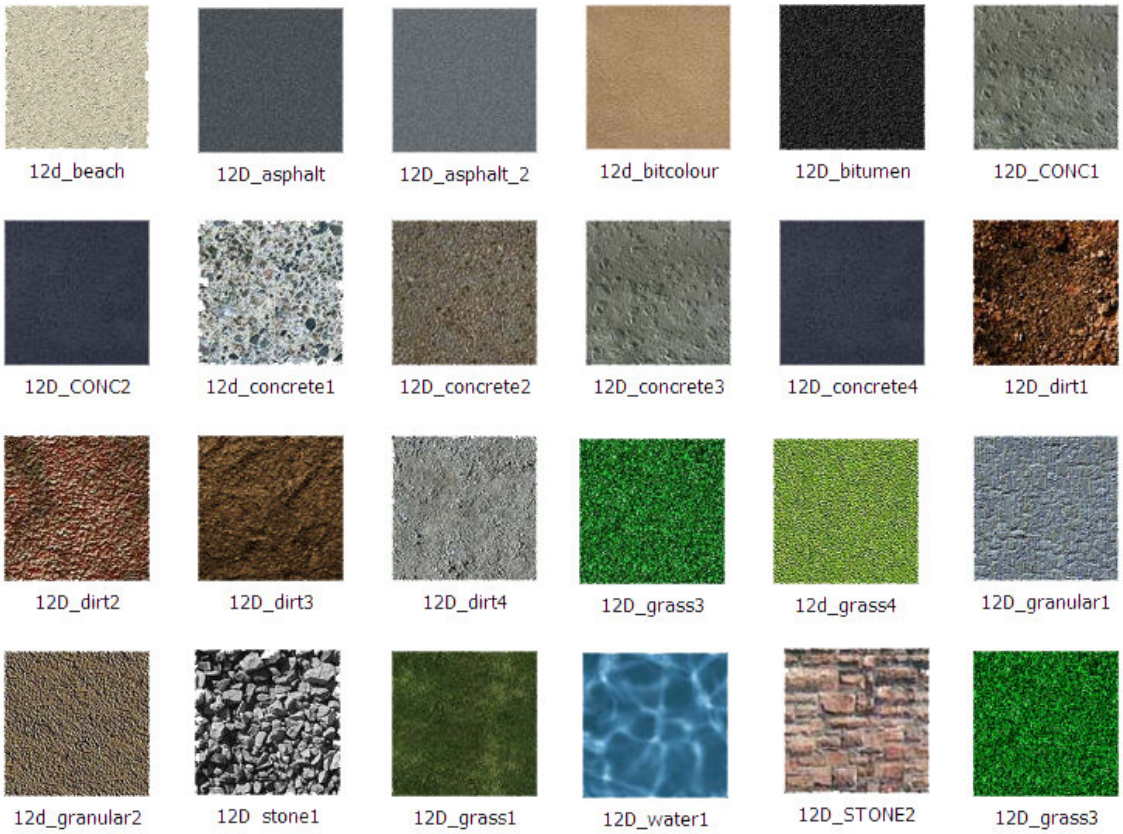


	Colour No.	Pop-up No.	Colour Name	Colour Group	Red	Green	Blue		Pen No.	Comment
239	501	-1	grass1	Vis	52	67	8		15	
240	502	-2	grass2	Vis	71	91	11		16	
241	503	-3	concrete1	Vis	201	199	143		17	
242	504	-4	concrete2	Vis	183	181	130		18	
243	505	-5	sky	Vis	206	207	255		19	
244	506	-6	steel	Vis	165	165	165		20	
245	507	-7	steel blue	Vis	205	205	255		21	
246	508	-8	stone1	Vis	144	104	36		22	
247	509	-9	stone2	Vis	167	121	41		23	
248	510	-10	dirt1	Vis	209	0	0		24	
249	511	-11	dirt2	Vis	159	0	0		25	
250	512	-12	sand1	Vis	220	209	26		15	
251	513	-13	sand2	Vis	197	187	27		15	
252	514	-14	rock1	Vis	171	102	0		28	
253	515	-15	rock2	Vis	192	115	0		29	

The *edit* option on any colour button will open the above panel**.**

The textures supplied are in the ***images*** directory under ***Set_ups.***

Some examples:



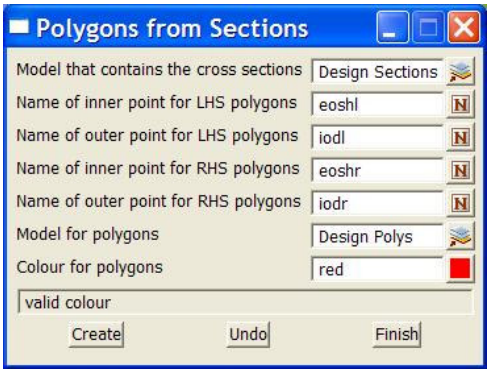
The textures are *square and a multiple of 256 pixels*.
The texture library can be extended by the user, but the shape and size parameters must be adhered to.
Image types shown are ***jpeg*** format.

The idea is to match the colours and textures by name.

Creation of Polygons:

- When creating the polygon, assign it a colour corresponding to the texture you wish to apply.
- Use ***join many strings (Strings->Strings edit)*** to create the simple polygons from the design strings e.g. edge of bitumen, shoulder, lip of kerb.
- For the more complicated regions (e.g berms, batters and table drains), try the option under

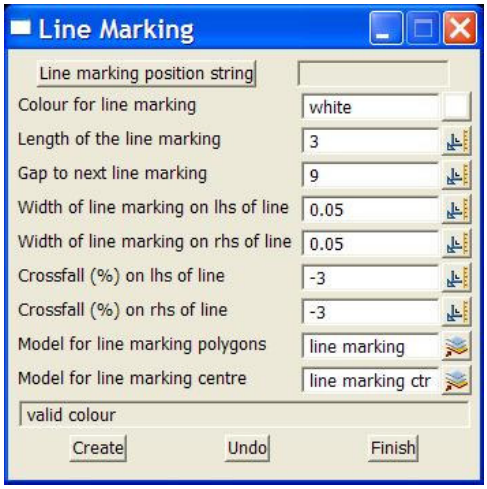
  Design->Roads->More->Road polygons



Change the colour of polygon to match texture

Line Marking Polygons:

View->Visualisation->Line marking



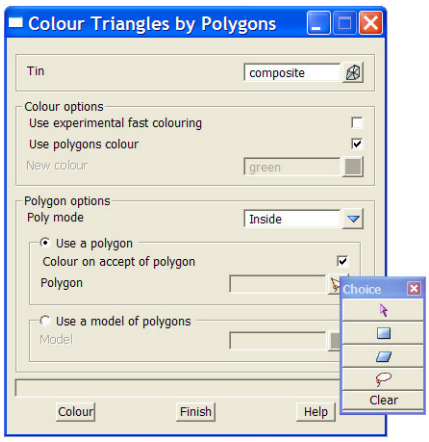
Create line marking by paralleling the road centreline and then joining them to form solid edge lines or double lines.

This line making panel can be used to create broken lines, as it creates the polygons.

Drape the polygons onto the composite tin using ***Tins->Drape->Heights for boundary***, As this option only drapes the vertices
Colour is white.
Add the draped model to the composite tin and retriangulate.

Colouring composite tin:

View->Visualisation->Colour within polygon



Select each polygon or use the model of polygons.

The options under the polygon select are useful for when the triangles are very close together and some may be missed by the normal polygon method.

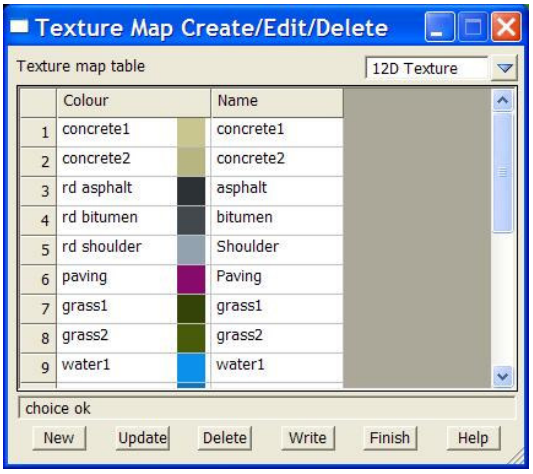
- Rectangle
- Parallelogram
- Lasso

When colouring triangles turn on ***tin solid*** in a plan view, as it will easily show any problem areas on the tin.

Texture and Colour Mapping:

Texture_map.4d:

View->Visualisation->Texture map edit



Colour corresponding to the texture name.

Textures.4d:

File for setup of textures-

- Name of texture
- File reference (default is images directory)
- Size of texture

```
textures {
    group {
        name "Texture Grass"
        texture {
                name    "Grass1"
                image   "12D_grass1.jpg"
                width   10.0
                height  10.0
                origin_x 0.0
                origin_y 0.0
        }
 }
}
```

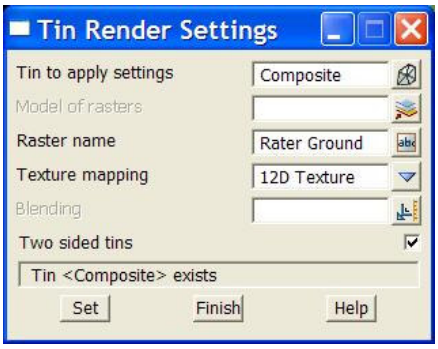
Note: image only has to be a filename.
12d will look in the following order

- $USER_4D/images (env.4d file specified)
- $USER
- $SET_UPS_4D/images
- SET_UPS_4D
- current directory

If the file “12d_grass1.jpg” is in any of the standard locations above, all that is needed for the image is: *"12D_grass.jpg"*

Tin render Settings:

View->Visualisation->Tin render settings



The setting of the texture mapping is all that is needed to apply the texture to the coloured triangles.

Composite Tin (before and after):

Composite tin - Shaded only

Composite tin - Texture Applied

(View background colour has been set to “sky”)

12D Visualisation:

Part 3

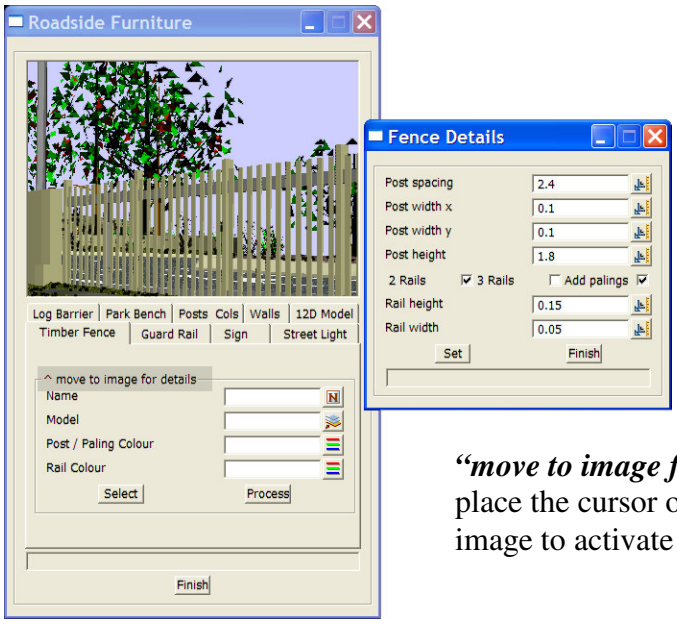
- Roadside furniture with extruded shapes (e.g. guide posts, guard rails, street lights, fences).
- User defined extruded shapes.

Roadside Furniture:

View->Visualisation->Roadside furniture

The selections above utilize the extrusion capability of a super string. A particular super string shape (guard rail, fence paling, and single circular post) is applied along a selected string.
Because the process is done internally and the super string (e.g. fence) is also created internally, the actual string selected to extrude the fence shape along, can be any string type.

General Features:

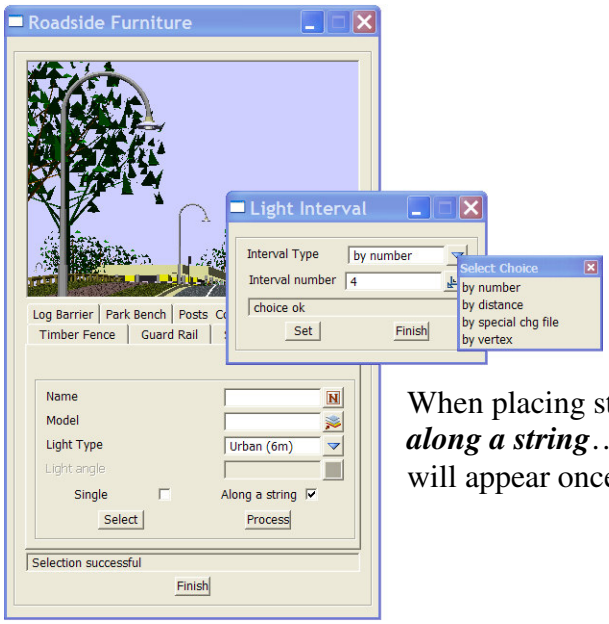


"move to image for details" place the cursor over the image to activate the panel above.

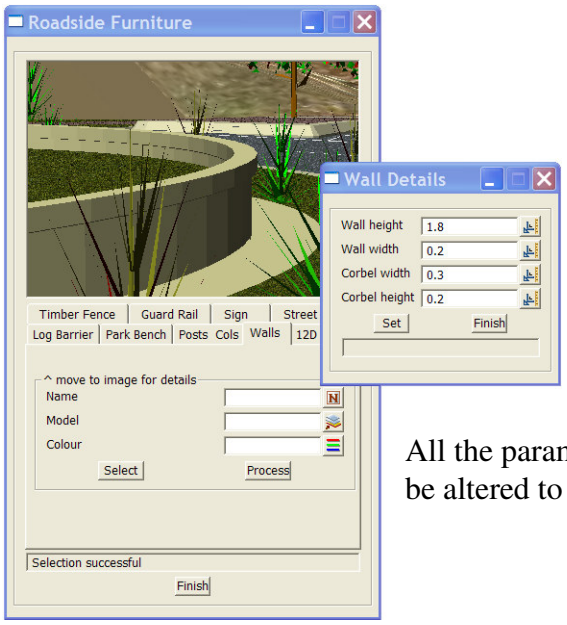
Note:

When selecting the string to extrude the fence along, a "***pick with direction"*** will position any palings on the right hand side.
This selection process will also apply to Street Lights and Guard Rail.

- Street Light (along a string)…90deg to and on RHS
- Guard Rail... "W beam" will be on RHS



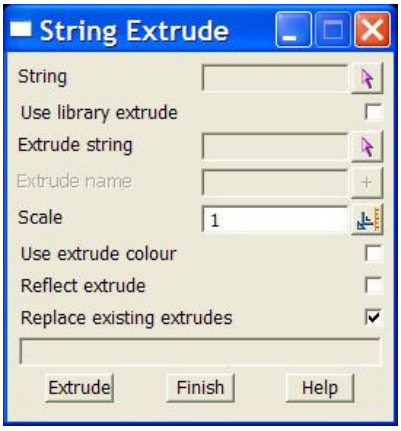
When placing street lights and posts and columns ***along a string***…the above interval selection panel will appear once you accept the string.



All the parameters in the ***"T Shape"*** wall can be altered to form different shapes.

User defined extruded shapes:

View->Visualisation->Extrude string



The ***String*** you select must be a super string and normally in the real world project.
The ***Extrude string*** must be a super string as well, and depicts the actual shape of the extrusion (square, rectangle, concrete barrier). This shape is drawn with its origin at 0,0 and in metres (scale of 1:1). Similar to blocks in AutoCad.
There are some library extrudes available.

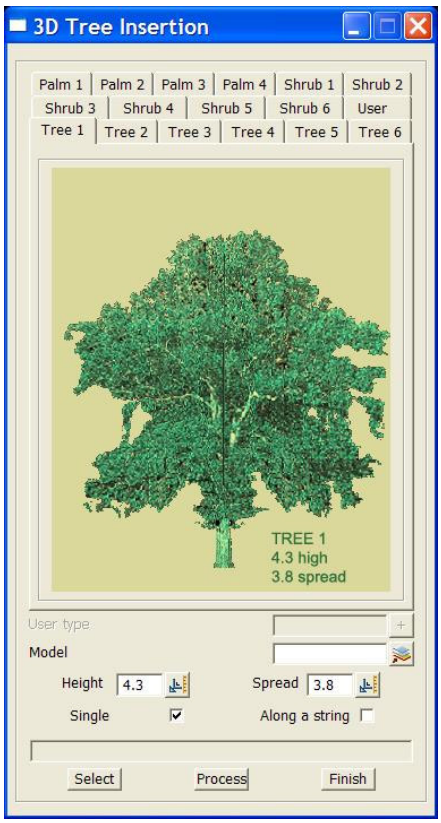
12D Visualisation:

Part 4

- Tree and shrubs using billboard images.
- Traffic Signs using billboard images.

Tree and shrubs:

View->Visualisation->Trees/shrubs



The billboard images are in ***TGA format*** (allows transparency).
The billboard image is defined in ***Billboards.4d***

```
billboard {
        name   "12d Tree 1"
        image  "12D_tree 1.tga"
        colour green
        width  3.8
        height 4.3
        fan    4
}
```

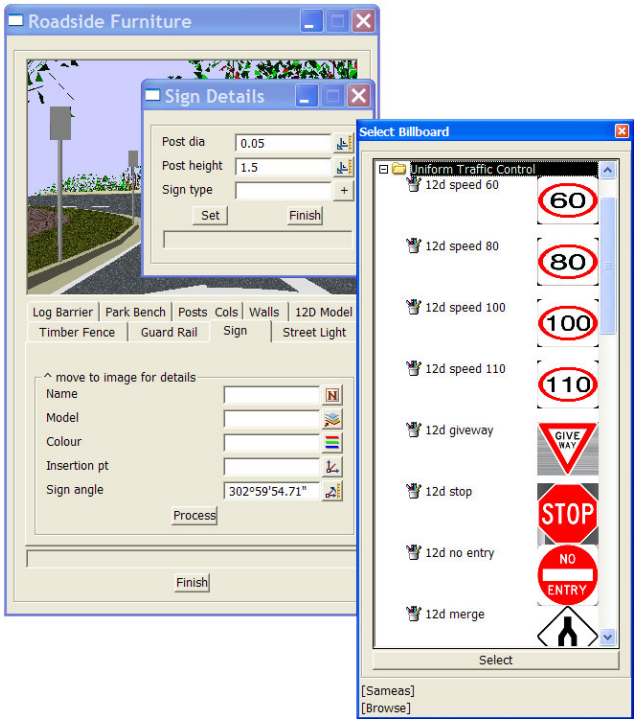
The fan is the number of rotational copies to create the 3d look.

The tree can be scaled (height & spread) and positioned singularly or along a string.
The same string interval options apply as per the road furniture street lights.

The ***User*** selection tab allows for the insertion of a user defined and created tree (in the TGA format).
The details of the tree must be added to the billboars.4d file to enable selection (under the ***User type***).

Traffic Signs:

View->Visualisation-> Roadside furniture



The addition of trees and signs

12D Visualisation:

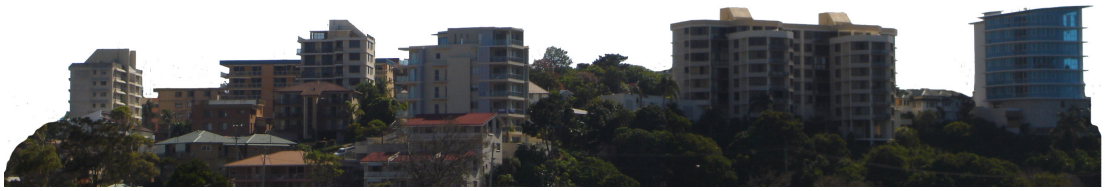
Part 5

- Digital photos as building backdrops.

The buildings and the clouds are billboard backdrops. The buildings comprise a ***one point super string*** which is located at the ***centroid*** of the billboard. Attached to that vertex is the billboard attribute name, that is referenced in billboards.4d e.g.

```
billboard {
        name   "backdrop"
        image  "C:\Program Files\12d\12dmodel\7.00\user_lib\backdrop.tga"
        colour black
        width  190
        height 33
}
```

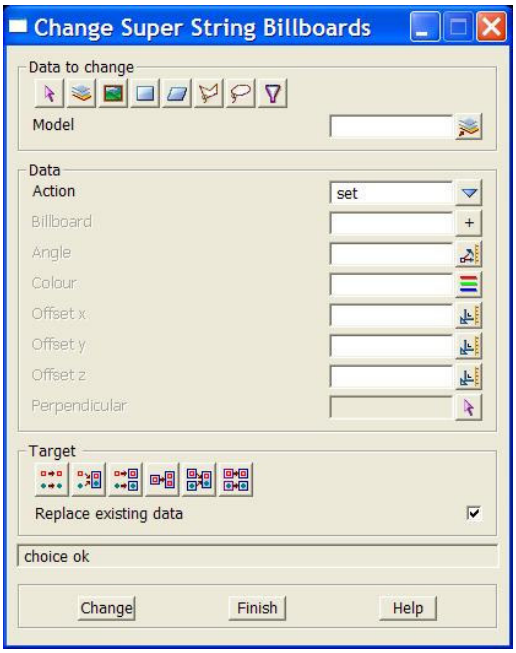
The width and height are in metres, while the position and orientation are defined upon placement in the project.



Example billboard image used. (transparent background)

Placement:

View->Visualisation-> Billboards->Global add



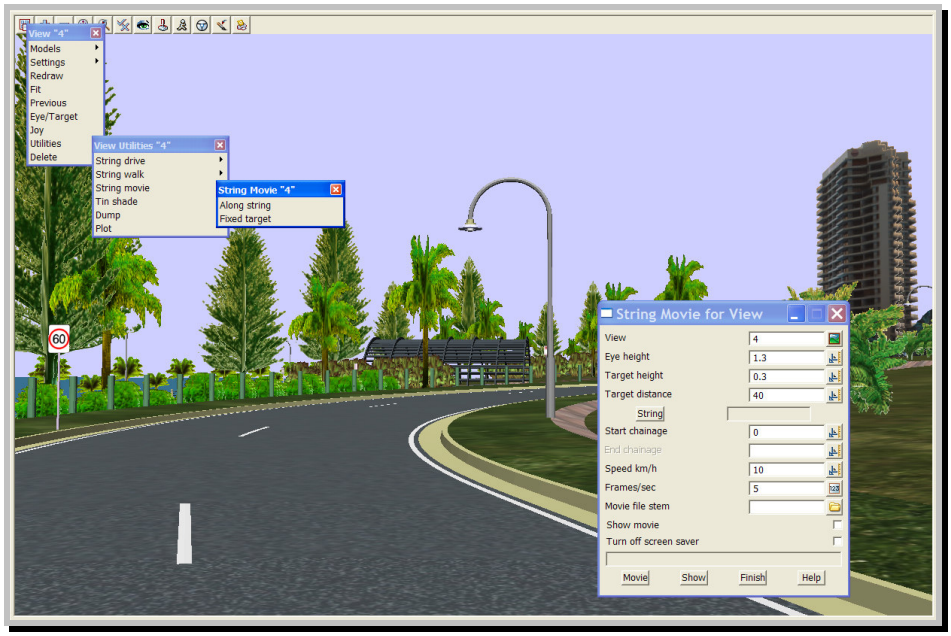
Options:

- Data to change needs to be a super string.
- Select billboard type (billboards.4d).
- The angle is the orientation in plan of billboard.
- The offsets are from the vertex on super string.
- As the vertex (x,y,z) relates to the centroid of the image, the ***Offset z*** would enable you to elevate the billboard rather than change the z value of the vertex.
- Perpendicular allows for a second string selection, to which the billboard can be orientated.

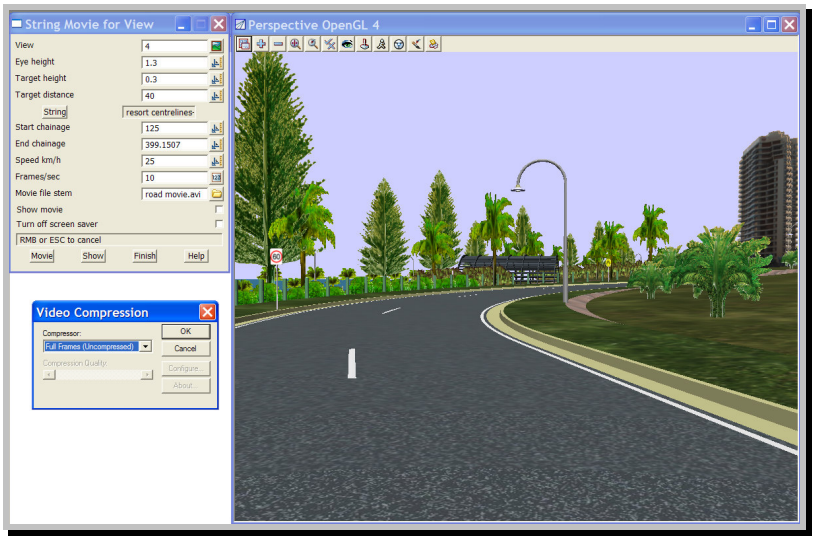
12D Visualisation:

Part 6

- The AVI Movie production.



- Along a string (same as the traditional string drive)
- Fixed target (drives along a selected string while always looking at a fixed point off the string)



Hint: When running the movie, manually size the perspective view so as to clear the movie panel. On selection of ***Movie***, the **Video Compression** options are displayed.

The ***Full frames (uncompressed)*** option will give the best quality but the file size is very large.

Microsoft Video 1 gives a poorer quality but the file size is considerable smaller.

TechSmith Screen Capture gives good quality at a middle of the range file size. 12D does install the TechSmith Codec on installation, which allows the playing of the avi.
A software product called **Camtasia** can be then used for the movie production.

Camtasia Features:

- Storyboard / Timeline allowing drag and drop video (avi's) and screen captures (jpeg etc).
- Video transition fades
- Add text to the video at start, middle or end.
- Video clipping
- Audio
- and much more…..

Microsoft ***Movie Maker*** also has the above features and is very user friendly. (Supplied with Microsoft Office)

Hints on movie production:

- Create several movies along a road drive (100 to 200m each), rather than one for the entire road. The features in the packages mentioned above will transition the shorter movies, resulting in a more interesting video.

- Integrate screen capture stills with the video, along with company or client logos.

- Add audio (voice over or music) or a 5 minute video may seem like an eternity.

- The ***fixed target*** video is a very good tool to highlight a particular feature e.g. an aerial view around a roundabout intersection or a panoramic view of a park complex.

Refer to CD or 12D.com for example movies and screen cams