**NAVIGATOR   [The Short Blurb]**

We selected the DK from TatukGIS for its capabilities in handling shortest path analysis and the PixelStore image. We needed to present images of up to half a gigabyte, so this was critical to our project. An added bonus to all the brilliant features and functionality which comes with the DK, was the prompt and willing support we got from TatukGIS staff.

Effectively we had another friendly, supportive, and expert team on deck with the project, which is exactly what we needed. I would strongly commend TatukGIS to any developers working on GIS based applications.

NAVIGATOR   [A brief low Tech backgrounding]

Navigator and NavigatorPDA is an in-vehicle navigation system designed for use throughout Australia. It has a full set of roads data down to local street level. Both the Laptop and PDA versions have GPS support for accurate tracking, auto-rerouting, shortest path preference settings, and voice prompts for turn instructions.
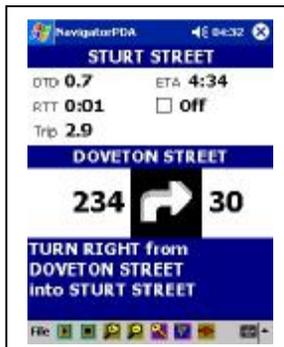

The Drivers Screen view with bold clear textual information

Osprey Computing, Ballarat, Australia developed the package using as the primary base the DK from TatukGIS. This has been enhanced with many other features for data querying by us, and modified to suit our particular needs in Australia. In general this could be done by anyone. The DK code is so good and well structured, that a programmer with Delphi knowledge would have no problem setting up their own project specifications around it. In its own right, it probably requires no change for most straightforward applications.

We also ported the code over to Windows CE for use on PDAs. This required a bit more of a challenge, because it meant conversion from Delphi to C/C++ to Windows CE. As you might appreciate there are a number of issues when doing this related to differences in acceptable classes, functions, and comms. But, it can be done. I know, because we did it.

The biggest problems to overcome with the current day range of PDAs are extent of RAM, the cost and programmatic accessibility of storage devices, and worst of all – user expectations that this little device can out-perform a PC. The size of the processors is very good now, and that is not a real problem, but with most having 64Mb RAM, and we are trying to run a memory hungry algorith for shortest pathing, then RAM size is a bigger problem than processor speed.

Another issue which comes into play with PDAs is the need to come to grips with ActiveSync. We automated the process for updates, registration checking from the desktop to the PDA Registry, and copying user selected map extents to user selected memory on the PDA. All of this is a new language and environment to come to terms with if you have not been involved with it before. One thing I would suggest is that you learn it yourself, it can be done, and do not
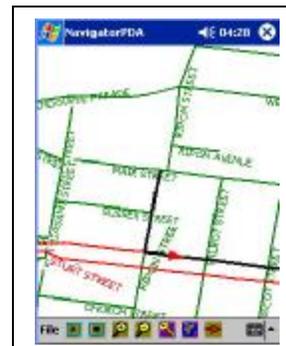
The Map View, shows the route and current position

buy/acquire components which purport to assist in this from VB programmers. They are useless and have no idea what C programming is about.

What is really amazing though is how many people [level of intelligence does not seem to be a factor] think a PDA can handle gigabyte images, process a shortest path, and plot vector data with labelling, all happening with a moving map display and GPS interaction. Also, why, when I have a 256Mb SD card, can't I upload a 100Mb+ map extent into 64Mb of RAM. I think Homer Simpson has the perfect answer to that one.

Apart from this we have got the PDA version running per second GPS polling; moving map display [vector data]; driver screen calculations for ETA,etc; voice prompts for turn instructions; and checking for being on-route and auto-recalculating if not. All of this takes place within the space of a one second interation of the GPS output. Being all in-memory calculations helps of course, but even so it is pretty slick.
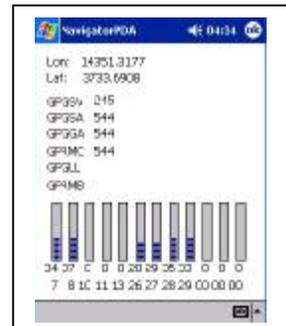

GPS signal strength

Setting a Destination

Having all of the key calculations and algorithms based on the TatukGIS DK gives us the speed we needed for GPS tracking and shortest pathing. It is centred on doing work in-memory in a way which gives it great speed. We use a number of different GIS packages and interface with most of the majors in this field. The DK gives us a huge lead in portability of data and functionality which is not possible with any other package around in the market place today.

Over the years we have been Developer Partners with MapInfo, and used the Blue Marble OCX. Both of these had good and bad features like any package. Being American based these companies have most interest in the bottom line rather than product support, and little interest in Developer support.

It has been refreshing to move our applications across to the TatukGIS DK platform, and we have no regrets, even though it has cost us the better part of a year of code rewriting. We now have full control over all elements of our final code, no ActiveX mystery bags to deal with, and no expensive ongoing licence fees to pay out for little to no return value.

NAVIGATOR   What does it do ?

Navigator is a vehicle routing and guidance system, but it can also be used simply as a desktop aid to finding locations, Points of Interest, streets, the best route from/to a destination, and to print out the route turn instructions.

The main display is a map view down to local street level, with a raster map backdrop for the major cities in Australia. On this view you can display a wide range of Points of Interest covering Hotels, Wineries, Places of Interest, Car Parks, and so on. You can also create and your own WayPoints and save them to be used as destinations. This allows you to put in clients, friends, favourite places, etc.
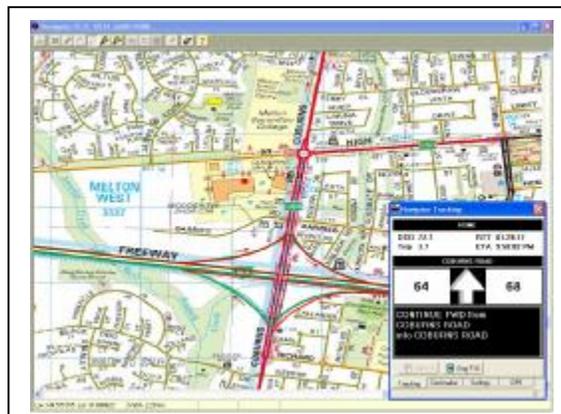
You are able to search and locate any street, locality, or Point of Interest. The search can be across combinations of these, for example you could search for all categories which have Melbourne in the name, make a selection, then show where they are on the map.

At the desktop you can create a Trip Plan, then save it for future use or store it as a destination Trip to be used on the laptop or PDA. When mobile, the start point of the Trip becomes the current GPS position, and the trip is plotted accordingly.

In keeping with our basic philosophy we have made the interface very simple. There is no menu bar, and the minimum number of buttons required to perform the key tasks needed for a guidance system. We believe too many programmers these days go over the top with buttons, menus, etc which confuse and often obscure the main aim of the application from the point of view of the user. The interface must be intuitive and clear to a novice user. GIS principles are not well understood even by seasoned computer gurus, so users get lost if it not kept simple. This principle has worked well for us in the marketplace.

To create a Trip you can set the Start point anywhere on the map view with a simple right mouse click, or use a street, POI, or one of your WayPoints. The Destination is set the same way. Preferences based on the road hierarchy can be set to suit. We include Tollways, for example, so it is feasible to plot a course bypassing any Tollways. Then the Trip can be calculated, which will return a visual route indicated on the map, turn-by-turn instructions [with distances to each turn], and the distance of the Trip.

Navigator really comes into its own on the road. With a GPS connected to a laptop or a PDA, you can drive around without really looking at the screen at all, simply follow the voice prompts. If you miss a turn Navigator will detect this and automatically calculate a new route. This only takes seconds, so that generally by the time you are at the next intersection you will know which way to turn, or go straight ahead.

The voice of Navigator has been named as Virginia. It seemed odd referring to something which talks to you as Navigator, or the in-car nav system. Virginia is much more personal, and suits the pleasant and patient personality she is.

More information about Navigator can be found at www.ospreycomputing.com.au