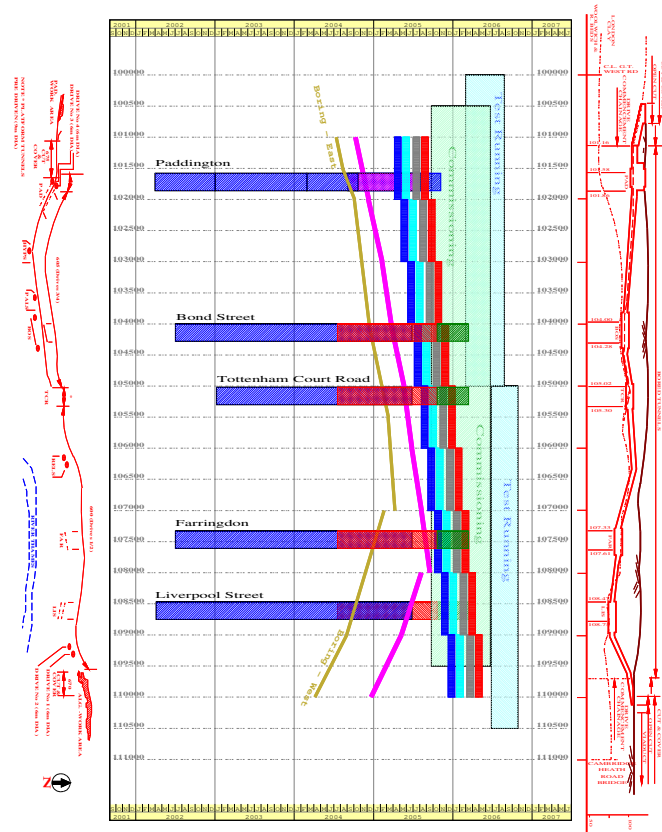


Example



The diagram on the left shows what LinearPlus is capable of producing. This example is a high level chart created for a proposed underground line in London and illustrates many of the key features of the product.

Activities at stations such as shaft sinking appear as horizontal bands, with their vertical position based on the distance of the station from the datum.

The diagonal brown lines show tunnel boring, and the chart shows that there are two boring machines being used, one from each end of the line. The diagonal pink lines represent track laying – again taking place from each end of the site, but meeting up at a different location.

The staggered sequences of blocks show the installation of power, signalling and services through the tunnel, with all of these operations starting at the west end (top of chart). The large pale green and pale blue blocks show final commissioning works and test running of trains, both spanning the entire length of the tunnel.

Also included alongside the chart are imported CAD drawings with the plan and elevation of the line, scaled to match up with the chart itself.

Summary of Features

| | | | |
|-------------------|---|-------------------|---|
| Activities | Supports baseline and schedule dates; durations can be entered directly or computed from progress rates; early and late constraints. Support for 5 types of activity (linear, block, single location, zone access, complex area) and milestones. | Graphics | Create or import graphics and store in shareable symbol libraries. Annotate charts with text or graphics. |
| Relations | All standard relation types supported; relations may also have leads/lags and working calendars associated with them. | Interfaces | Import and export data between LinearPlus and other systems, with wizards for both Primavera and Microsoft Project. |
| Resources | Supports resource definitions and assignments, with total or rate based values. Related resources can be grouped together, and resource definitions can be stored as a shareable library. Resource usage curves can be displayed below the schedule data. | System | PC running Windows NT, 2000 or XP with at least 256Mb RAM and 30Mb free disk space. |
| Calendar | Up to 256 working calendars can be defined and applied to activities, relations and resources, or used as a backdrop for charts. | Output | Any output device supported by Windows. Charts can also be published as web pages for use on an intranet or the Internet. |
| | | Licensing | LinearPlus is sold as a single user system to be installed on one specified PC. Discounts are available for Government institutions, educational establishments and registered charities. |

To request your free trial of LinearPlus, please visit www.linearplus.com or contact PCF for details of your local representative.



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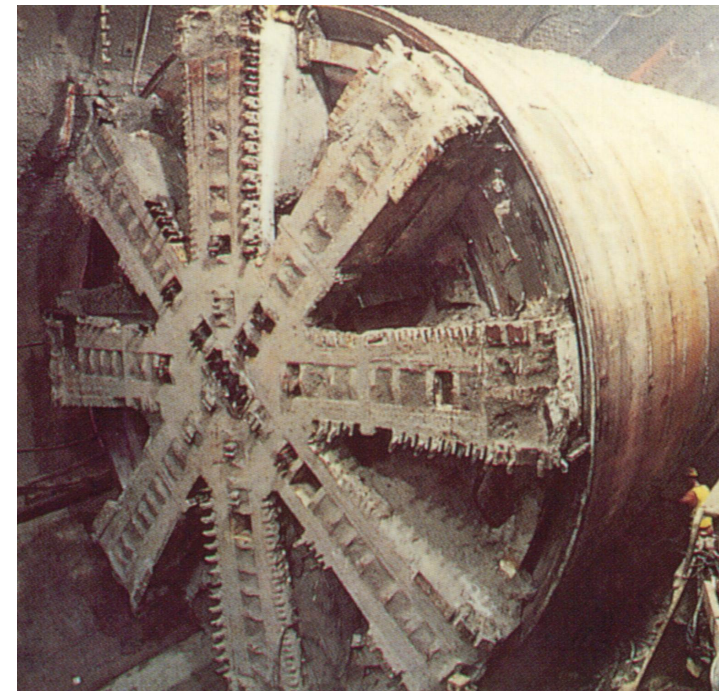
Registered in England 05504589

LinearPlus

Interactive time chainage charts for linear projects

pcf

The Challenge of Linear Projects



Many civil engineering projects take place in worksites with restricted access along an overall line of route. Such projects include:

- Roads
- Power Lines
- Railways
- Sea Defences
- Tunnels
- Waterways
- Pipelines

In this type of environment, planners must pay particular attention to the physical restrictions associated with the worksites in addition to the normal constraints imposed by activity sequencing and resource availabilities. Unfortunately, traditional planning tools based on Gantt charts cannot display where activities are taking place, nor do they take account of any location-related constraints when performing a time analysis. Time Chainage charts (also known as Time Distance or Time Location charts) were developed to resolve this problem.

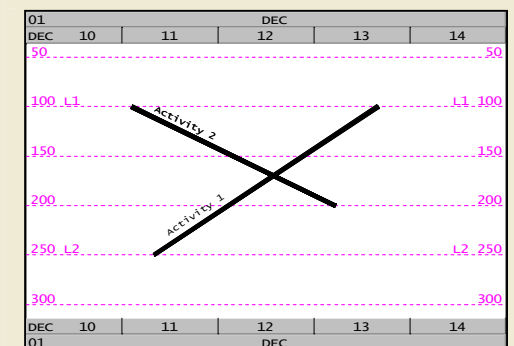
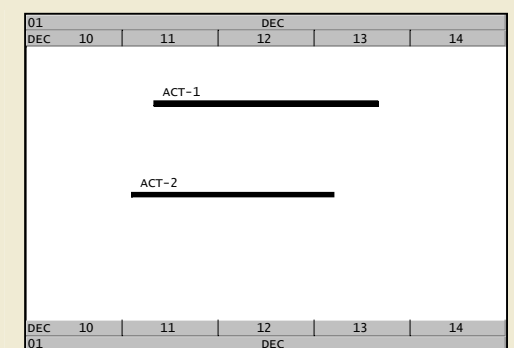
Time Chainage Principles

A Time Chainage chart displays time on the horizontal axis like a Gantt chart and position – expressed as distance from some datum - on the vertical axis. This implies that overlapping activities are occurring at the same place as well as at the same time, providing instant visual warning of a potential scheduling problem. Activities that take place at one location are displayed as a horizontal bar, while activities which occur between two points are shown either as a diagonal line or a rectangle.

To illustrate the concept, consider the Gantt chart at upper right. All we can deduce from it that the two activities are taking place at roughly the same time. In contrast, the Time Chainage chart below shows much more information.

We can now see that Activity 1 starts at location L2, 250m from the datum, and progresses until it reaches location L1, 100m from the datum. Activity 2 starts at L1 a short while before Activity 1 starts, and ends 200m from the datum shortly before Activity 1 ends. Most importantly, we can now see that at approximately midday on 12th December both activities are occurring simultaneously, at about 170m from the datum.

If these two operations both involve heavy machinery in a tunnel or on the same railway track, then there is obviously a potential problem, but the planner can now see this and can if necessary adjust the schedule.



Introducing LinearPlus

LinearPlus gives planners working on linear projects all the features they need when working with time chainage charts, and completely eliminates the three principal historical problems associated with their creation:

- Speed** Once set up for your project, LinearPlus can create a chart automatically in a matter of seconds, instead of the hours or even days associated with manual or semi-manual processes.
- Accuracy** LinearPlus can import data directly from a wide variety of sources, ensuring that schedule and resource information is up to date.
- Ease of Use** LinearPlus has been designed specifically for the creation and manipulation of time chainage charts, with over 15 years of customer feedback incorporated into its design.

Plan

Within LinearPlus, you can do everything that you would do in a normal planning system – create and edit activities and logic, assign resources and perform time analysis. The system uses an intuitive CAD-like metaphor to construct plans, with activities and relations created using simple mouse based “point and click”. Once you have created the plan, you can change activity dates by dragging them on screen or using the internal critical path scheduler.

Unlike a normal planning system, LinearPlus also knows where your work is taking place. By defining start and end locations for activities as you plan, the system can display the progress of work along the worksite, and if required can calculate activity durations between two points automatically based on a work rate. The system supports five different types of activity, each of which has a different on screen representation.

Visualise

Once you have created your plan, the next step is to decide how it is to be presented. LinearPlus allows you to generate any number of views from the same plan using a wide variety of techniques. You can for example elect to create a high level chart based on WBS elements rather than activities, break down a long worksite into a series of short sections to be presented individually, or filter the activities to produce a chart based on one specific type of work. Standard rules for colouring activities can be defined and combined together to produce a “look and feel” for a particular view or set of views.

For all views, you can elect to display resource loads and availabilities. LinearPlus provides sophisticated resource display functions, including the ability to generate incremental or cumulative curves, to stack curves together, or even create curves based on spreadsheet-like operations on other curves.

You can import or create symbols for use as annotation on the plan or associated with locations; these can be stored in a library for reuse. CAD drawings of the worksite can be imported and incorporated alongside the plan to enhance the presentation.



Communicate

LinearPlus can produce output in a variety of formats, depending on your requirements. It supports paper sizes up to A0 or greater, and can print out to any device supported by Microsoft Windows, including PDF generators. You can group views together for printing in a single operation.

As an alternative, LinearPlus also provides facilities for publishing plans to the Internet or a company intranet as web pages, including the option of using SVG vector graphics for unsurpassed image quality.

Synchronise

Rather than create and maintain your plan in LinearPlus, you may prefer to import it from an existing planning system and then periodically update LinearPlus with changes. This is not a problem – the product has been designed to integrate with external sources such as Microsoft Project or Primavera, and can import and export data in a wide variety of formats. When transferring a project for the first time, the system will import all relevant data (including resources and working calendars) to ensure that both versions remain completely synchronised. Changes made within LinearPlus can then be exported back to the source system, providing a complete “round trip” facility.

Customers

PCF created the world’s first time chainage based planning system in 1989 for Transmanche Link, the constructors of the Channel Tunnel. Our time chainage software is currently used around the world by a wide variety of organisations, including:

- Network Rail
- Laing O’Rourke Construction
- Crossrail
- RZD (Russian Railways)
- Channel Tunnel Rail Link
- Mott MacDonald
- Leighton Kumagai JV
- East London Line

Custom Solutions

The full functionality of LinearPlus is also available as an add-on module for PCF’s graphical planning system OEI Exec. When the software is deployed in this fashion, users can switch seamlessly between Time Chainage based views and traditional Gantt, PERT and WBS charts. This environment provides several additional time chainage features and access to OEI Exec’s sophisticated baselining and earned value calculations.

For the most demanding requirements, OEI Exec’s built in application programming language permits the rapid development of bespoke solutions specifically tailored to your own systems and procedures.

