

System 500 - RoadPlus Editor

The family of Leica road applications has a new member: the **RoadPlus Editor** for GPS System 500, which was released in the middle of the year. With the new RoadPlus Editor it is now possible to **create new or edit existing alignments onboard**.

As RoadPlus Editor uses the same GSI data-structure as other Leica road products you have an efficient and flexible means to reach your goals. Other Leica products using the same data structure are: RoadPlus and RoadX for staking out with TPS and GPS, the PC based entry tool RoadEd, RoadPlus Editor for TPS and the existing converters from different road design packages to GSI.

The RoadPlus Editor supports the following **five types of alignment files**:

- Horizontal alignment
- Vertical alignments
- Cross sections (X-Sections)
- Cross section assignments
- Station equations.

Flexible Entry

Information on plans can vary from department to department and customer to customer. For a circular curve in a horizontal alignment you will find different combinations of radius, end station, segment length and delta angle. With RoadPlus Editor you **select the "Method"** in which the data appears on the plans. All other parameters will be computed and shown to give you the opportunity to check your entry and the design.

```

ELEMENT\ Curve
Method      : Radius&Length
Start Stn   : 7.6200 m
TAN (start) : 399.9998 g
Curve Direct: RIGHT
Radius      : 9.0800 m
Curve Length: 12.6781 m
End E.      : 312.5033 m
    
```

Design Changes Onboard

One of the main features of RoadPlus Editor is that it not only offers a way to enter a new design but also to edit existing data.

An example: during a stakeout on a construction site you notice a tree is not on the plans, and it is in the middle of the street. The decision is to leave the tree and change the design.

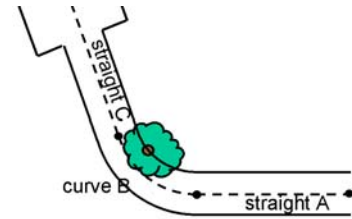


Fig.: Original design

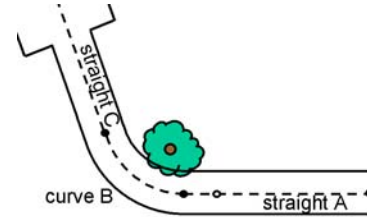


Fig.: Shifted design

This is no problem with the RoadPlus Editor, focus on the element you want to change and press EDIT.

HORIZ ALN\ ALNHZ.GSI			
Nr.	Station	Element	
0	0.0000	Start Pt	
1	7.6200	Straight	
2	20.2981	Curve	
3	27.9175	Straight	

```

CONT NEW EDIT DEL CHECK
    
```

You can now change the length of the straight so that the design is no longer affected by the tree. All other elements of the alignment will be **shifted as well in respect to the last change**. What will not be affected is the internal geometry of all the elements, e.g. the radius and length of the circular curve will stay the same.

Depending on the work you have to do it is also possible to shift only the following element. The system prompts you as soon as you have changed an element.

```

INSERT ELEMENT\ Confirmation
Confirmation
You have moved a coordinate
in the alignment. Do you want
to shift the rest of the
alignment (YES) or the next
element only (NO)
    
```

```

ABORT NO YES
    
```

It is possible to change or insert a new element or shift the whole design for the horizontal and vertical alignment.

The Design Elements

For staking out, the RoadPlus Editor supports the same types of elements as RoadPlus:

- Horizontal alignment: straights, circular curves, spirals/clothoids (transition curves between straights and curves or two curves with different radius)
- Vertical alignment: straights, circular curves and parabolas.

Cross (X)-Sections

Like the different “Methods” for horizontal and vertical alignments, RoadPlus Editor can also handle different entry methods for X-Sections.

For every X-Section template, it is possible to define the left and right end slope.

```

TEMPLATE\
Temp1 Name : TUTOR
CUT/FILL : FILL▼

L.End S1p(%) : 50.0000%
R.End S1p(%) : 50.0000%

CONT
    
```

To define the vertices of the X-Section you can choose between the two methods:

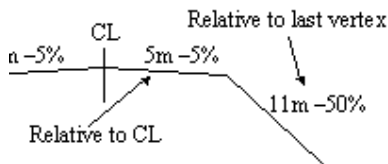
- Delta Dist To CL (for horizontal and vertical offset from the centre line)
- Cross Slope % (for cross slope in percentage and distance).

```

SEGMENT\ TMP07
Method : Delta Dist CL▼
DIST CL : 4.2500 m
Lft/Rght C : Right▼
Delta Hgt : 0.1500 m
Up/Down CL : Down▼

CONT
    
```

If you are adding a vertex with method “Cross Slope %”, the vertex will be placed relative to the vertex the focus is on. This offers you the possibility of creating vertices in a sequence.



With method “Delta Dist To CL” all vertices will be relative to the centre line. Independent of the

used entry method, you can always switch between displaying horizontal and vertical offset or X-Slope.

```

Template\ TEST03
Segment Length Slope(%)
- 11.000 - 50.000
- 5.000 - 5.000
--- zero ---
+ 5.000 - 5.000
+ 11.000 - 50.000

CONT SL/DH
    
```

This makes it easy for you to check what you have typed in with your design.

X-Section Assignment

Relate your X-Sections to the right station simply by creating a X-Section assignment file. It is possible to use the same X-Section template more than once within a design.

Dummy Points in X-Sections

RoadPlus can automatically interpolate between X-Sections only if they have all the same number of vertices. The comparison always works separated in a left and right part of the X-Section. As the number or vertices on the left/right side from the center-line is not the same for both X-Sections, interpolation would not work for the example below.

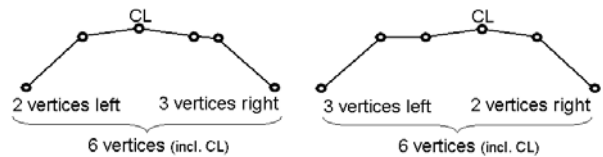


Fig.: In this case an interpolation between X-Sections is not possible

The question is how to deal with designs where the number of vertices defining the X-Sections changes (e.g. a bus stop appears on one side of the street)?

An example: What we are looking for are X-Sections and X-Section assignment file for the street with a bus stop shown below.

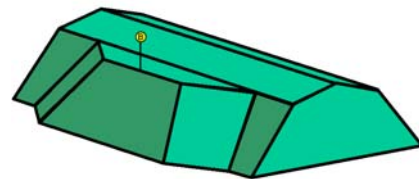
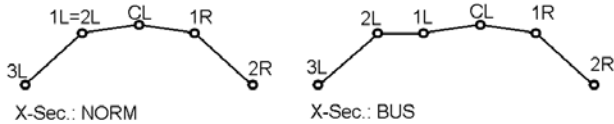
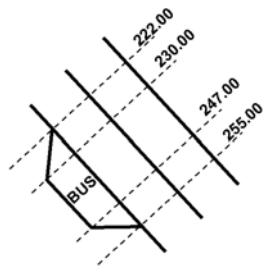


Fig.: Street with bus stop

There are two X-Sections with a different number of vertices needed to define the design. By **creating a dummy vertex**, this problem can be solved. In this example we introduce the dummy vertex 2L with the same offset and elevation as vertex 1L in X-Section NORM.



In the X-Section BUS, vertex 2L is now used to define the outer edge of the bus stop.



Assuming the widening for the bus stop starts at station 222, reaches its full width at station 230, goes on with that width until station 247 and ends at station 255, the X-Section assignment file will look like this:

```
X-SEC ASSGN STABUS.GSI
Template      Station
NORM         0.000
NORM         222.000
BUS          230.000
BUS          247.000
NORM         255.000
↑
CONT NEW EDIT DEL
```

Interpolation between the two X-Sections now works without any problems (widening from station 222 to 230 and narrowing from station 247 to 255).

When dealing with X-Sections it is important that you **examine all the X-Sections** that appear in your design and then set up a concept for the dummy points you have to introduce. If you run into a complicated job where X-Sections change every few meters and vertices come and go it makes sense to split them into different X-Section- and X-Section assignment files. This keeps your job under control and helps you to avoid errors.

Design Versus Entry and Editing

RoadPlus Editor is not intended to replace the tools you are using for road design. We believe that you need a big screen and a good cup of coffee to design your street, something that is not easy to get in the field! The intention of RoadPlus Editor is to offer you a **fast and easy way to** either **enter new designs**, e.g. from a paper plan, or **to edit existing designs**.

Remember

- RoadPlus Editor is the new onboard entry and editing tool for System 500. You can use it in combination with RoadPlus and your existing PC-based entry tool (RoadEd).
- As you can choose the entry "Method" to suit the way the data appears, it is no longer necessary for you to manually compute all the values in the right formats.
- When editing, inserting or deleting a design element, RoadPlus Editor offers you the possibility to also shift the other elements.
- Interpolation between X-Sections with different amount of vertices can be reached by introducing "dummy vertices".
- Find out more about the RoadPlus Editor in the manual "General Guide to RoadPlus Editor".