

Referat ESRI UC 2016

Folie	Text
1/2	Dear ESRI-Users, I'm glad to present you today the infrastructure management solution INVERS – and how GEONIS gear helped us to get it smarter. ewp is one of the leading engineering and planning enterprises in Switzerland. Part of our ambition is to maintain and renew the infrastructure of our clients in a efficient and sustainable way. Among specific projects, this contains the portfolio management, in order to get the renewal investitions done at the right time.
3-7	First of all let's have a look at the topic. Infrastructures are an elementary part of modern urban live. Since centuries, cities have grown – and also did the needs of its population. Housing, roads, public transport, lightning, water supply, and so on, have been built in order to make life more comfortable.
8	But all these infrastructures have to be maintained. Road pavements are renewed around every 20 years, the underground about every 40-50 years. Perhaps against expectation, it matters, that you do the renewal at the right point of time.
9-13	<p>For illustration, let's have a look at two different strategies, here on both sides of the slide. Damages in road pavement will happen both in Sunnyside and Rain City. The infrastructure manager in Sunnyside – apparently consulted by ewp – will repair it soon, getting a almost new pavement back for a good price. The other one in Rain City economizes the renewal expenses – at least at the moment.</p> <p>A few years later, there's a little damage again in the road of Sunnyside – and the infrastructure manager will have it fixed again for little money. His fellow in Rain City sees the damage having grown – and since the saved money a few years ago has already been spent for luxury, there's no other way out than a side-step – or perhaps a little jump.</p> <p>At last, after a few years more, the damage in Rain-city has become a hole – a black hole even, which swallows up everything in its gravitation, the big fortune to have it fixed as well. The infrastructure manager in Sunnyside on the other side still spends a regular, calculable price every 10 or 20 years, to get his road as new as at the first day after construction.</p> <p>In which city do you want to live? And where do you want to pay taxes? Obviously, there is a best-practice strategy to maintain road infrastructures. As well, there are such strategies for all other infrastructures like bridges, water supply, wastewater, and so on.</p>
14	The difference again in a chart: Undertaking renewal at the end off he life cycle will result in a very expensive operation in order to repair the road to an acceptable condition. Investing in road renewal periodically will result in an optimized investition und saves money. The trick is: when should repairs/renewals take place. When is the optimum?
15-16	A continuous inventory of the infrastructure condition provides the data needed to decide about this. The engineering method for this analysis exists since a long time and is well know to all infrastructure managers. It contains various parameters such as the actual degree of damage, the traffic load and other relevant conditions. Meanwhile, the way to collect data has evolved incredibly.
17	Decades ago, the infrastructure manager recorded his observations on paper by filling checklists.
18	Obviously, an amount of paper grew within only a few years. A proper management wasn't possible, though all the needed data has been gathered. If anyone else had to work with the data, he had to fetch the folders in the office of the manager or in the archiving room – or even several folders.

19	GIS provided new possibilities. Now we were able to transfer the paperwork in an electronic system, which can be updated and allows much more analysis with existing data, such as forecasts of the infrastructure condition, statistics over a whole network, graphics and so on. Everyone connected with internet can now look at the data and work with it. The GIS System has replaced the archiving room. Still, the inventory covered two steps: One in the field on paper, one – a boring one – back in the office for the transfer in GIS.
20	With GEONIS gear, the inventory work has become much easier. gear stands for GEONIS Enriched Application on Runtime and is an applications based on the ArcGIS Runtime SDK for .NET . Together with Geocom we developed a custom-made mobile inventory shell for different types of infrastructure. The specific tools allow the use of existing desktop configurations so that the well established workflows can be carried out efficiently. With the help of GEONIS gear, the data collected in the field can now be directly stored in the main GIS database.
21	The different ways in comparison: The paperwork allowed the planning of infrastructure renewal – but it was very inefficient and not available for everyone.
22	With GIS everyone got access to the data from nearly everywhere, but the inventory work was still not very efficient, since the monitoring could not be integrated directly from the field.
23	With GEONIS gear, all requirements are covered.
24-27	In short the advantages of what GEONIS gear contributed to our daily work: [bullet points on slide]
28	Let's have a look at the operation:
29	With GEONIS gear, the field engineer can define road sections directly on site. This allows to capture different sections, according to the different states of infrastructure condition. One state of conditions = one section. Renewal investments can be planned much more precisely than before.
30	The field engineer judges the various indicators of state by his experience and the standards embedded in the GIS inventory shell. The indicators are defined through the “best practice” manual and cannot be changed. This guarantees an impartial evaluation of the road condition
31	By taking pictures, the damages can be documented directly. The pictures complete the technical assessment and help to understand the evaluation. This helps as well through the auditing process, where a second engineer can check the evaluation of the field engineer.
32	The whole analysis data including pictures is saved in GIS. Furthermore, when the repair of the road is completed, the execution plans can also be saved in the database. This will help in planning next renewal works.
33	The mobile solution allows different new and more efficient ways to execute the field work.
34	In a flat city, our field staff can move around with inline-skates, in a more hilly town we can use a quad bike. Anyway, with an internet connection the inventory can be made directly in the GIS database...
35-36	... or offline in a local database on the tablet, synchronizing the results back in office.
37	As mentioned before, our solution can not only be used for road infrastructure, but also for several other grids. Overlapping the different analysis makes infrastructure management even smarter and easier.

38	Based on the inventory, we can define for our clients proper renewal periods for the road, calculate and forecast the evolution of infrastructure state with our in-house developed product INVERS (Infrastructure Management System).
39	This methodology is as well applied to other infrastructures such as Bridges,
40	... waste water...
41	... water supply ...
42	... and power supply.
43	The renewal periods for this different types of infrastructure can be very different but a common point of renewal can be found so that the local authorities can undertake a maximum of renewals at the same time. This has many positive effects: first of all it reduces costs but it also reduce negative impacts of the works on to the population and road users (less disruption and road closure, less noise and better use of environmental resources). With INVERS, we can identify a proper way to combine the different renewal works.
44	Finally a quick overview of what we can provide with INVERS to our clients: With INVERS we can <u>forecast</u> the state of their infrastructure. The results of the modelling can be made easily available to anyone with GIS.
45	The renewal planning based upon the forecasts allows to plan the infrastructure maintenance budgets for the next 20 years.
46	By overlapping different infrastructure grids, renewal projects can be coordinated in advance and the needed investment can be integrated into the overall budget of the local authority. This makes renewal cheaper and reduces disturbances.
47	With the three points above, public spendings can be reduced, optimized and planned for now and the future. Politicians and Tax payers will love it.
48	Public authorities can give account of their activities to the politicians and to the public. The transparency of the decisions is throughout the whole process guaranteed
49	By doing renewal works for different grids together, natural resources are preserved...
50	... and the number of road works will be reduced. Finally, everyone benefits from the results of our Infrastructure Management System INVERS: Public, Politicians, the economy and the environment
51	I'd like to thank you for your attention. If you want more information, we await you during the Conference at Geocom booth 2024.