

SIEMENS

The signal's always green



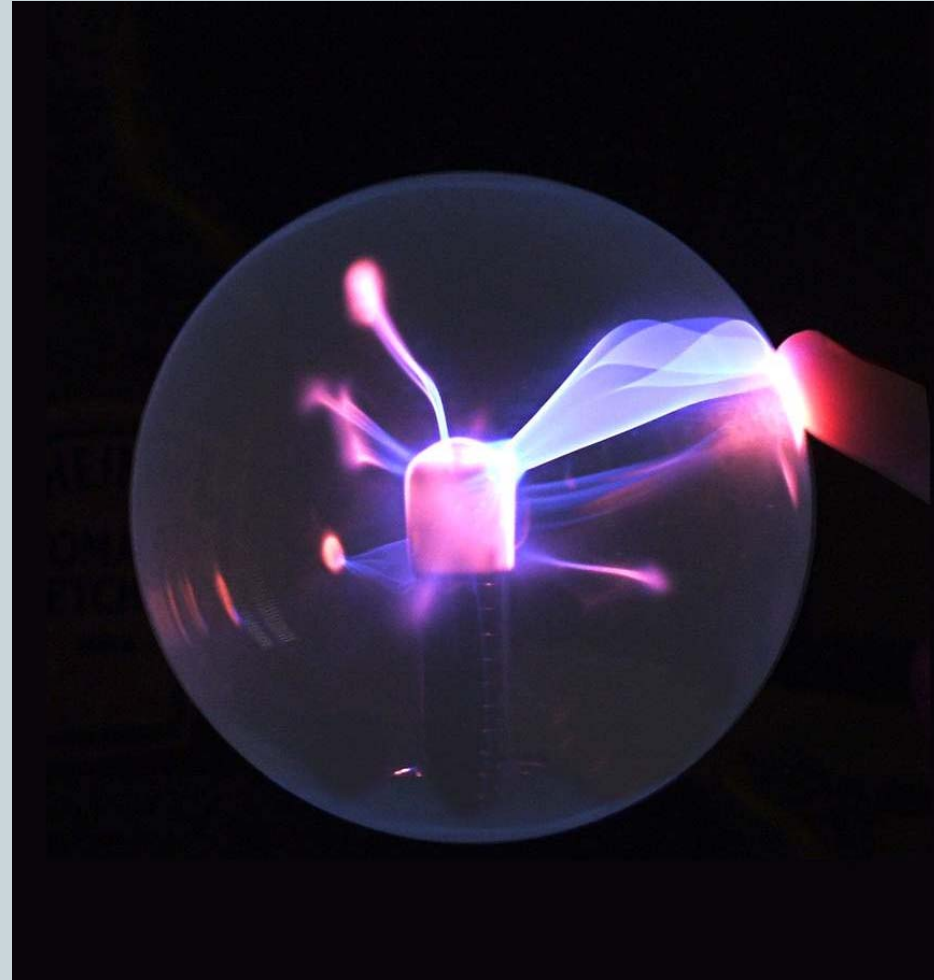
Background to ELV systems

The electrical hazards associated with traffic signals have been recognised for some time

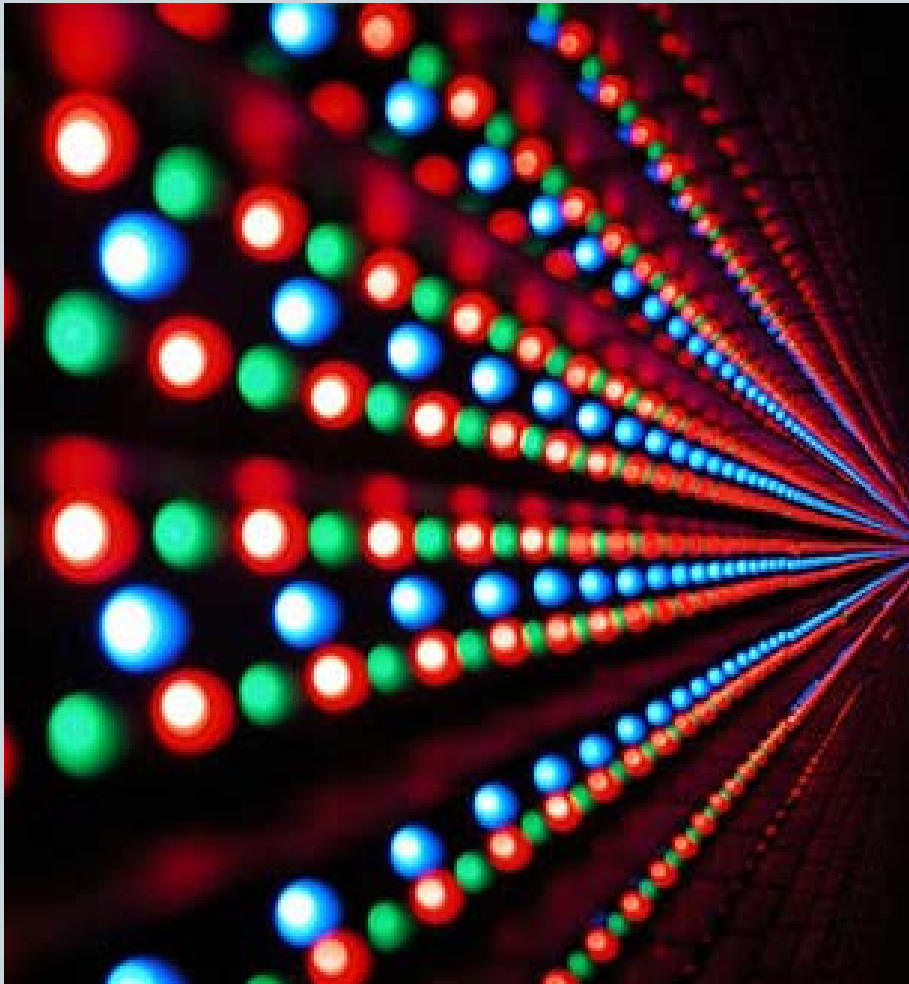
- Early attempts at solving these on complete intersections implemented by the Welsh Office over ten years ago
- Hampered by use of traditional incandescent signals

Greater success has been achieved with pedestrian signals

- All new pedestrian signals are now ELV



Background to ELV systems - What has changed?



Major advances in LED technology

- Very high light-output devices requiring little power

New lamp switching technology able to control signals with virtually no power loss

International standardisation

- CLC/TS 50509

Background to ELV systems



But.....

Will you see real benefits when using ELV traffic systems?

The benefits of implementing ELV traffic

Increased electrical safety

For members of the public in the event of damage to the signal installation

For personnel working on or around the intersection

Also has the potential to reduce the use of ladders

- Pole terminations are possible at the pole base with no associated electric shock risk



The benefits of implementing ELV traffic

Reduced energy consumption

Latest generation Helios ELV signals are very low power

- Offer up to 80% power saving over traditional signals
- Potential for considerable energy cost savings and reduction in carbon footprint



The benefits of implementing ELV traffic

Reduced installation costs

Can significantly reduce the number of street cables required

- No need to split LV and ELV into separate cables

ELV LED signals are lower cost than the equivalent LV LED versions



What is an ELV traffic system?



An ELV traffic solution requires more than just a controller

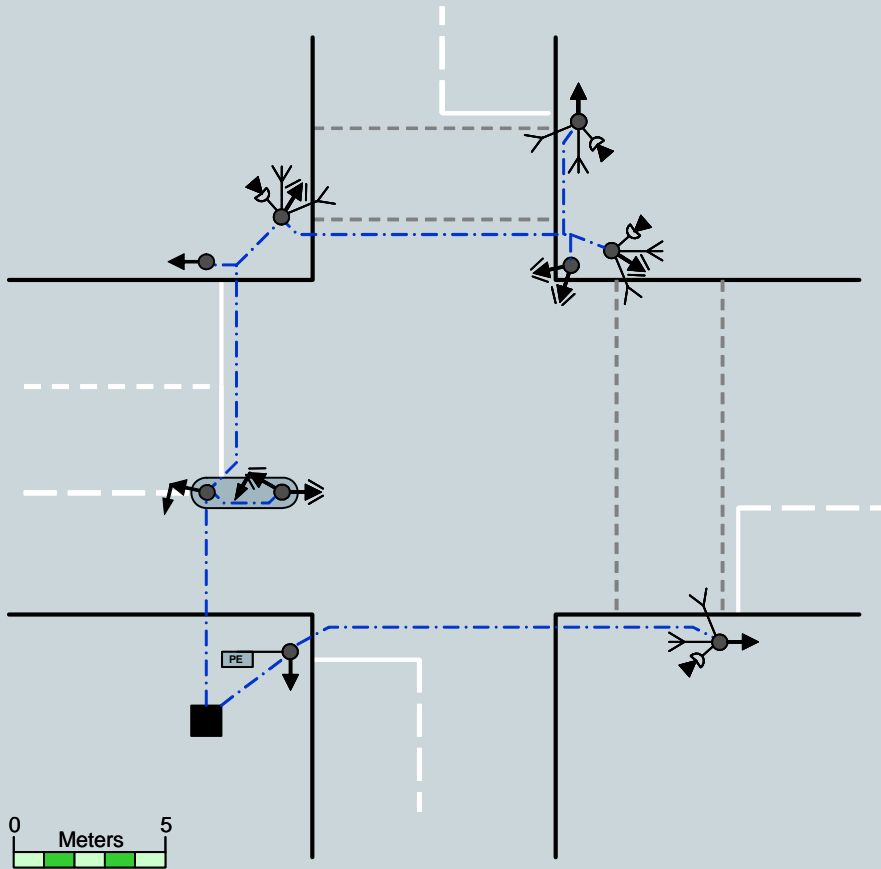
A full system approach is necessary!

- ST900 ELV controller
- Helios ELV LED signal heads
- Helios ELV LED box signs
- ELV nearside signals
- ELV LED wait indicators
- ELV solar cell

Are the cost and 'green' benefits real?



Real benefits for a simple junction



Estimated costs (incl installation)	HI	CLS LED	ELV LED
Equipment (£K)	17.5	21.9	20.7
Cable (£K)	1.6	1.6	1.0
Total cost (£K)	19.1	23.5	21.7

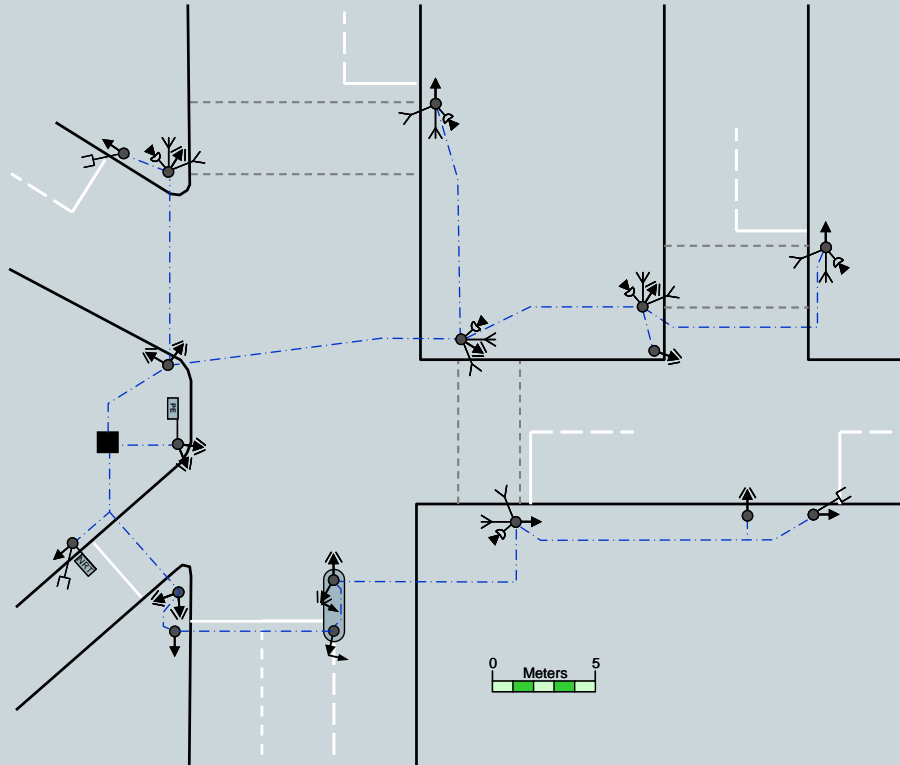
Annual power (KWH)	5041	2632	1770
Annual CO2 (Metric Tons)	2.17	1.13	0.76

- Reduces power consumption and CO₂ emissions by **65%** compared with standard HI signals

Estimated life costs (£K)	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
HI	20.1	21.1	22.2	23.2	24.2	25.2
CLS LED	23.9	24.4	24.8	25.3	25.7	26.1
ELV LED	22.0	22.4	22.7	23.1	23.4	23.8

Assumes bulk lamp change is eliminated and routine cleaning reduced to once a year

Real benefits for a complex junction



Estimated costs (incl installation)	HI	CLS LED	ELV LED
Equipment (£K)	27.6	36.8	32.8
Cable (£K)	3.6	3.6	2.5
Total cost (£K)	31.2	40.4	35.2

Annual power (KWH)	9667	5068	2865
Annual CO2 (Metric Tons)	4.16	2.18	1.23

- Reduces power consumption and CO₂ emissions by **70%** compared with standard HI signals

Estimated life costs (£K)	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
HI	32.7	34.3	35.8	37.3	38.9	40.4
CLS LED	41.1	41.8	42.5	43.2	43.9	44.6
ELV LED	35.7	36.1	36.6	37.1	37.5	38.0

Assumes bulk lamp change is eliminated and routine cleaning reduced to once a year

Summary of realised benefits



ELV sites typically

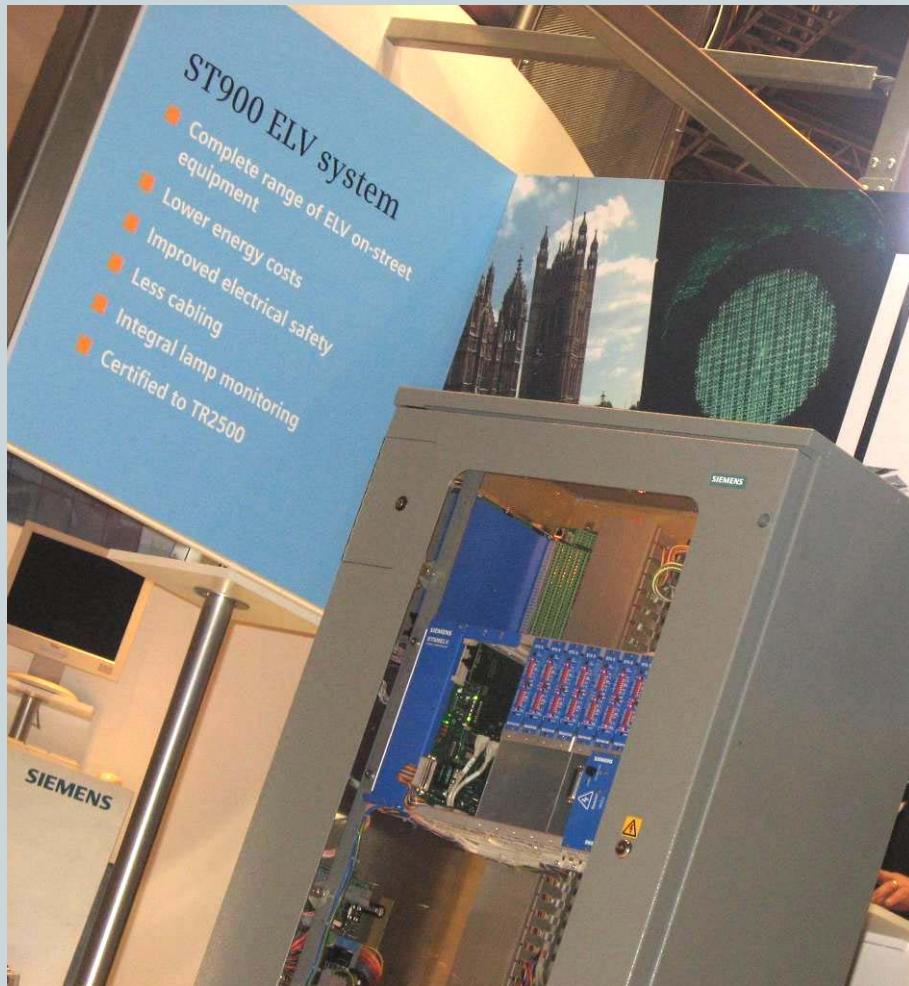
- Reduce annual power consumption by 65% to 70%
- Save over two tonnes of CO₂ per year
- Reduce precious raw materials, used for cables, by typically 30%

Are cheaper to install than traditional LED based solutions

Offer realistic overall payback times even compared to initially lower cost HI solutions

Are electrically much safer than non ELV installations

How does the ST900 'set the standard' for ELV systems?



Approved to TR2500

Compliant with the latest EC signal head specification CLC/TS 50509

Designed 'from the ground up' to meet the particular demands of very low power ELV traffic systems

- Is not based on an LV controller
- Provides unique benefits not found in any other ELV system

Unique benefits of the ST900 ELV

Direct lamp monitoring of LED signals, including nearside and LED wait indicators

Reduces downtime in the event of cable faults by offering electronic short circuit protection on all outputs

Eliminates spurious fault reporting when using very low power LED signals by implementing electronic load suppression

Maximises the length of supportable street cables by exploiting a 48V fully rectified lamp supply and new lamp switching techniques



Conclusion



The ST900 ELV system is the most advanced and comprehensive ELV solution available today

It significantly increases the electrical safety of on-street traffic equipment

It offers real, quantifiable environmental and cost benefits

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