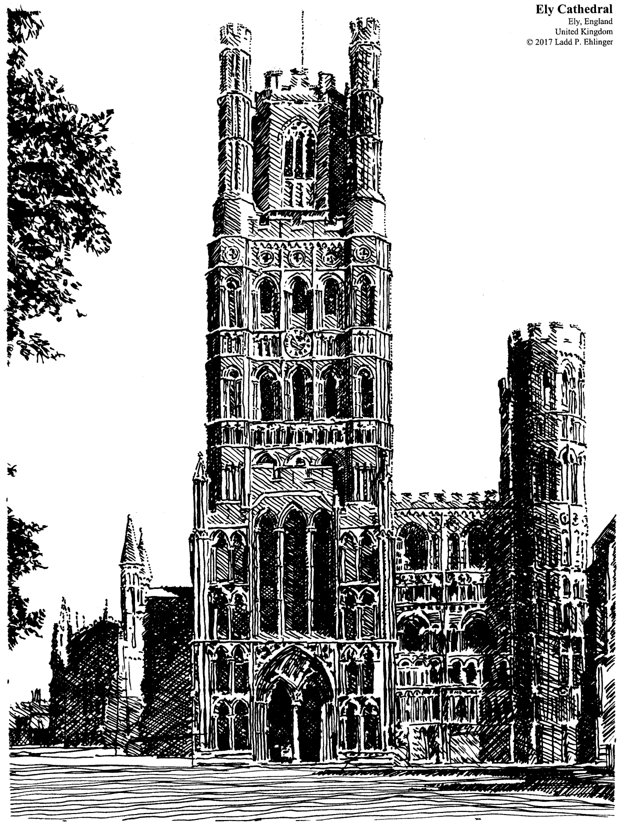
ARCHITECTURE

EHLINGER & ASSOCIATES **SECOND QUARTER 2017**

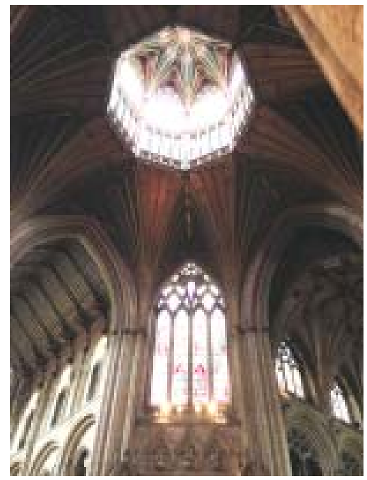


ELY CATHEDRAL

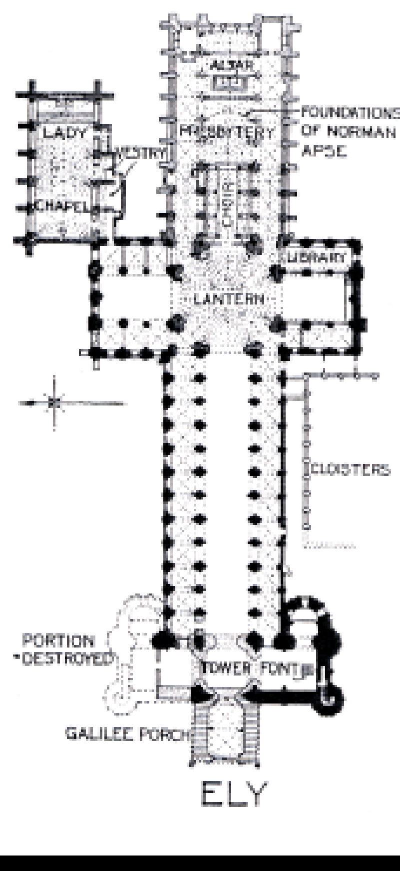
Ely Cathedral has a long and rich history, beginning in the 7th Century when it was initially founded as a double monastery for both monks and nuns, by St. Etheldreda, a Saxony princess. She married Prince Egfrid of Northumbria, and when he assumed the throne as king, she became queen. Apparently, she was extremely chaste and pious and never consummated the marriage (or admitted to having done so), and King Egfrid released her from her marriage vows in 672 to become a nun at a monastery in Berwick run by Egfrid's aunt. She later died of a throat tumor brought on by the bubonic plague in 679. Her body was exhumed and moved in 695 to the church, and when it was examined her body was found to be in remarkable condition and that the tumor had been healed or erased after death, or so the story goes. Later, her body was moved again into the Norman church built at the Ely site in 1106, and again into the Presbytery in 1253 built to honor her.

Ely has been sacked and pillaged by invaders from the Danes to the Normans, and ultimately it changed from a monastery to a cathedral in 1108. The architectural construction is as varied as the history, with the Norman rounded thick arches still retained on the lower levels and in some of the transept wings, to the pointed English arches, and ultimately to the fan vaults and the high Gothic vaults of the secondary chapels. In 1322, the central tower of Norman construction collapsed destroying the three bays that remained at that time of the Norman choir along with parts of the nave and transepts on either side. This disaster was solved brilliantly by removing one bay east, one bay west, one bay north, and one bay south of the crossing, thereby creating an octagon in plan that is quite spacious and supports fan vaults, that in turn support an octagonal lantern which brings a marvelous light to the very center of the cathedral. The octagon theme then became the dominant motif of this church.

A similar disaster on the west front was not dealt with as skillfully. This church has a central octagonal tower, with a "porch" each side terminated originally on the north and south by smaller octagonal towers. Sometime in the late middle ages (the exact date curiously unrecorded as is the cause), the north porch and its tower collapsed. It was replaced with a rather crude triangular buttress at the line of the nave's beginning, which can be seen to the left of the tower in the sketch by Ladd P. Ehlinger in this issue's print of it. The net result is an asymmetrical west front, which is unique among all English Gothic cathedrals, and adds to the charm and delight of the building.



The Lady Chapel on the northeast was a late addition, and is of high English Gothic style. It has beautiful fan vaults in a simple plan with very large windows that flood the space with light. This addition rivals the King's College Chapel at Cambridge which is nearby.



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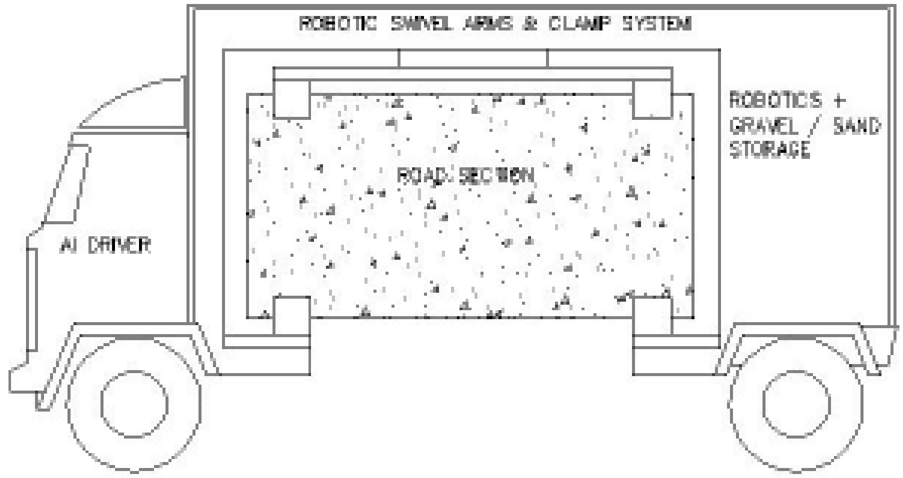
The End of Potholes



Recently, I wrote about how self-driving cars would radically alter the architecture and urban planning of the U.S., but what about a city like New Orleans? Even the best maintained roads deteriorate rapidly, and the poorly maintained roads would be impossible for an A.I. to navigate (and are nearly impossible for a human).

Currently, roads are mostly made of asphalt - it's an inexpensive material, lasts a reasonable amount of time, in temperate weather and use conditions. It is also suited for large scale construction equipment. This makes it the perfect material for large scale road projects - it also makes it a poor material for smaller scale projects, particularly ones that will need frequent maintenance when the environmental and use conditions vary from the typical design.

While asphalt roads can be readily patched, the patches generally don't last long, nor are they attractive. Re-paving a road in city conditions isn't an easy task, either - creating traffic issues, along with the difficulty of getting in the large equipment and construction materials.

With the advance of robotics and A.I. construction, what if roads were completely re-thought? What if roads were built as readily maintained component systems instead of as monolith structures? It could be the perfect remedy for the pothole/maintenance issues that plague modern cities.

If roads were prebuilt in smaller, portable sections that interlock, then they could be both transported and installed by automated machines. More importantly, they could be maintained automatically.

Built to the width of a lane (8'-12' long) and a stretch that's as high as a vehicle can transport it (6'-8'), each road section would be loaded onto a vehicle, transported, and then lowered into place. Curbs and gutters could either be integrated, or placed separately. Interlocking would be achieved with retractable steel dowels, so that any road section could be lifted at a later date - either for access to water, sewer, and storm drains underneath, or for re-leveling, if the soil has subsided or heaved, or for replacement, if the section is damaged.

Automated maintenance surveyors could roam the streets in off hours, looking for out-of-level sections that need attention, cracked areas, and it could even look for sinkholes forming beneath the roads using x-ray sensors.

The panels themselves would be prestressed reinforced concrete, formulated for longevity in the local environment, and capable of handling heavy traffic that would rapidly wear down asphalt roads.

Why most roads aren't currently made of concrete is a question of cost - they're considerably more expensive. Mass produced off site with automated transport and installation, the cost of a sectional road would be comparable, and maintenance costs would be a fraction of current costs.

Just to give an idea, new asphalt roads are currently about $4 million/mile, and they cost $1.25 million/mile to resurface. If sectional roads cost $6 million/mile, but maintenance is only $100,000/mile, then we have a winner that's worth the investment.

In addition, with road sections that can be easily lifted, it provides an additional advantage of being able to 'bury' utilities that currently run overhead. Along with sewer, storm drainage, and water supply, it would also be possible to bury telephone, cable, fiberoptics, and even power.

Naturally, in a city that floods regularly, additional precautions and safety measures against water damage and live currents in flood water would need to be (and could be) provided. Doing so would again be a question of cost - is it less expensive to maintain utility poles and the cost of repairs from wind damage, or to provide automated short circuit interrupts at all junctions and have a robot lift the street section where the damage actually occurred?

If so, can we imagine streets without wires strung up all over the place from pole to pole?

Convenient technologies could also be embedded into the road sections as well - wireless hubs for hotspot internet connections, beacons for automatic cars, solar powered LED striping, instead of paint that fades and can't be seen anyway in heavy rain.

Unfortunately, there's no expected date for any of this miraculous technology to arrive, but we can expect a big push for the development of it as A.I. cars become more commonplace, and no one living in cities can readily take advantage of the A.I. because they won't work on lousy streets. *R. Perrin Ehlinger*