HOW BIG IS A HORSE'S BACKSIDE?

and why does it matter?

When you see the Space Shuttle sitting on its launch pad there are two big booster rockets attached to the sides of the main fuel tank. These solid rocket boosters, or SRBs are made by Thiokol at their factory in Utah. The engineers who designed the SRBs would have preferred to make them a bit fatter but they have to be shipped by train from the factory to the launch site. The railroad line from the factory happens to run through a long tunnel in the mountains so the SRBs have to fit through that tunnel. The tunnel is slightly wider than the railroad track, and the railroad track is built to the US standard railroad gauge which is 4 feet 8½ inches. (That's the distance between the rails for those who've never played with toy trains!) It's a strange number to pick.

Why was that gauge used for American railroads? Because that's the way they built them in Britain, and British expatriates designed the US railroads.

Why did the British build them that strange size?

Because the first railway lines were built by the same people who built the pre-railroad tramways, and that's the gauge they used.

Why were tramways built to that gauge then? Because the people who built the tramways used the same jigs and tools that they had used for building road wagons, which used that wheel spacing.

Why did the wagons have that particular odd wheel spacing? Well, if they tried to use any other spacing, the wagon wheels would break on some of the old, long distance roads in England, because that's the spacing of the wheel ruts which had built up over centuries.

So who built those old rutted roads? Imperial Rome built the first long distance roads in Europe (including Britain) for their legions and those roads have been used ever since.

And the ruts in the roads? Roman war chariots formed the initial ruts, which everyone else had to match for fear of destroying their wagon wheels. Since the chariots were made for Imperial Rome, they were all alike in the matter of wheel spacing.

Therefore the United States standard railroad gauge of 4 feet 8½ inches is derived from the original specifications for an Imperial Roman war chariot. Bureaucracies live forever!

And so for the final question: why did the Romans build their chariots and wagons that size? Because that is the best size to accommodate the rear ends of two horses.

So, a major design feature of the Space Shuttle, which is arguably the world's most advanced transportation system, was determined over two thousand years ago by the width of a horse's backside!