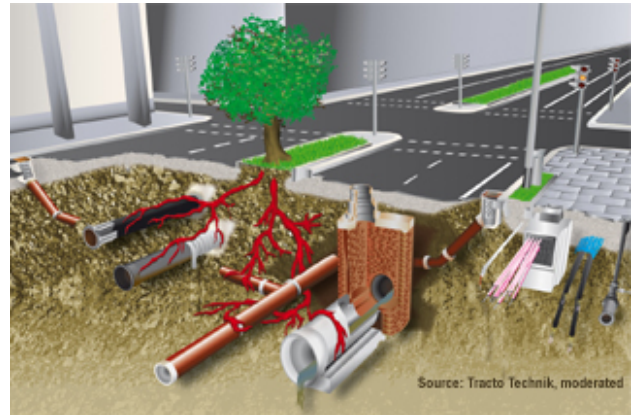


# Managing the Crowded Underground



Tolerated chaos in the underground

Who is responsible for our streets and roads? Who is entitled to lay pipelines, sewers and cables throughout our cities? Where in general do we find these pipes in the first place? After all, who is responsible for planning, construction and operation of our infrastructure?

## Claims for underground space

There are many players claiming space in the underground, all with viable needs (figure 1). In German cities, for example, the supply lines and cables are usually placed under the sidewalks, be it for gas, drinking water, electricity or data transmission. In the middle of the road, in greater depth, we find sanitary and storm water sewers or combined systems. Sometimes the larger supply mains and district heating lines are placed there also. As a consequence pipe trenches serve as foundations for roads and sidewalks. Hence, the soil has to meet many requirements; it's the bedding for the pipe as well as a base for the road. Moreover, the soil may also be used as a substrate for plants. Every tree has roots that need part of the underground space.

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