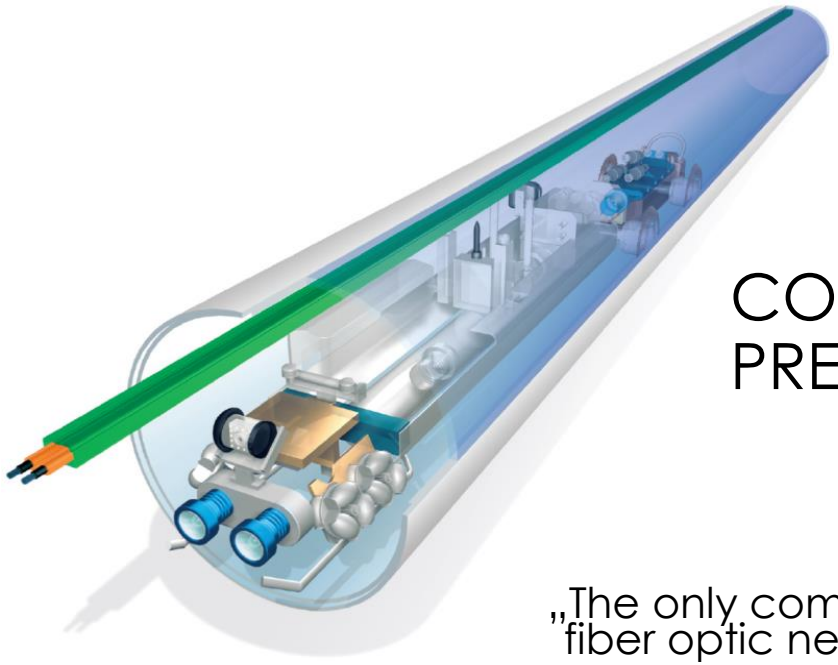
THE FIBER OPTIC INFRASTRUCTURE COMPANY

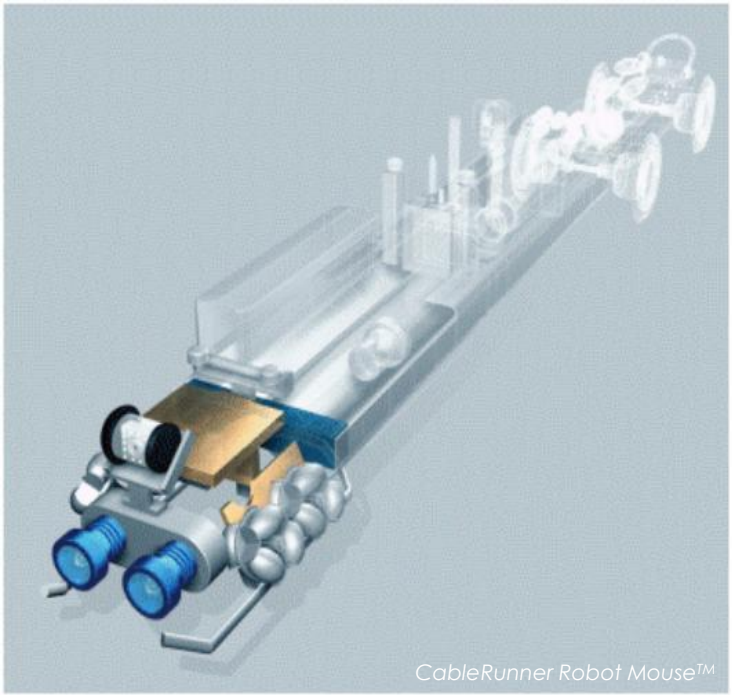


COMPANY PRESENTATION

„The only complete and flexible solution to build fiber optic networks in urban areas worldwide“

WHAT IS THE BUSINESS OF CABLERUNNER INTERNATIONAL?

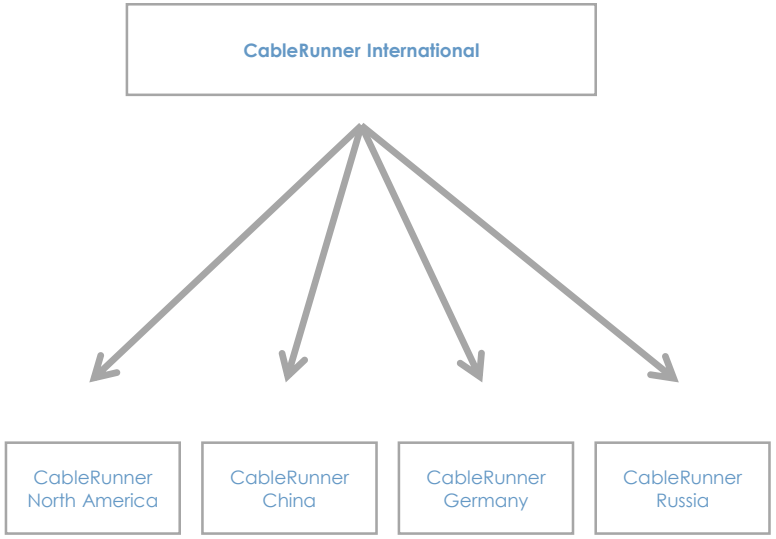
- Fiber optics is the only technology that will deliver enough bandwidth and reliably at a low enough cost to meet the consumer demands of the next decade.
- The traditional way to build fiber optic networks in urban areas is trenching, which means there always is a traffic and pollution problem in dense city areas. This old method is also slow and less cost efficient.
- CableRunner International is specialized in building fiber optic networks without digging or trenching. With our technology, we are using existing city infrastructure like sewer systems or storm water drains to install fiber networks.
- The technology, patented by CableRunner, consists of installation solutions for all pipe sizes; particularly for small pipes, robotic devices have been developed that perform the installation inside the pipes. This technology allows faster installation of fiber networks with significant and competitive cost advantages compared to conventional deployment.



CableRunner Robot Mouse™

WHO IS CABLERUNNER INTERNATIONAL?

- The CableRunner technology was invented by the Sewer Department of the city of Vienna in 1996 and was applied first to the city's own sewer and storm water systems.
- CableRunner Austria was founded in 1999, and started its international business activities by establishing subsidiaries in USA, Spain, China and Russia. Since then, the technology has been continuously improved and more than 2,000 km of in-sewer fiber optic networks in different countries worldwide have been successfully deployed.
- In 2009, a majority share of 76% of CableRunner Austria was acquired by Telekom Austria. Following their strategy, Telekom Austria decided to concentrate the activities of CableRunner in their primary markets Austria and Southeastern Europe. The international operations were assigned to CableRunner International.



WHAT ARE COMMON ISSUES FOR INFRASTRUCTURE IN URBAN AREAS?

Unprotected aerial installations

Extreme weather conditions

Permit complications and bureaucracy

Noise, air pollution and traffic jams due to construction sites

WHAT ARE THE ADVANTAGES OF OUR TECHNOLOGY?

By using existing city infrastructure, many of the difficulties usually encountered using conventional installation methods can be avoided.

- CableRunner fiber optic installations without trenching require minimal permitting and enable a fast installation time
- Flexible and easy to expand – individual products for different demands of the project – cable interchangeability
- Environmentally friendly – no pollution – no traffic problems
- Protection and security for the sewer environment and the installation
- Tested and proven for over 18 years
- Allows secure operation with no additional maintenance
- Long-term warranty – long lasting operation with easy add-on capacities in the future
- Cost effectiveness compared to other installation methods
- Minimal labor required
- Designed by sewer experts for the sewer environment


Sewer systems


Storm drains and aqueducts

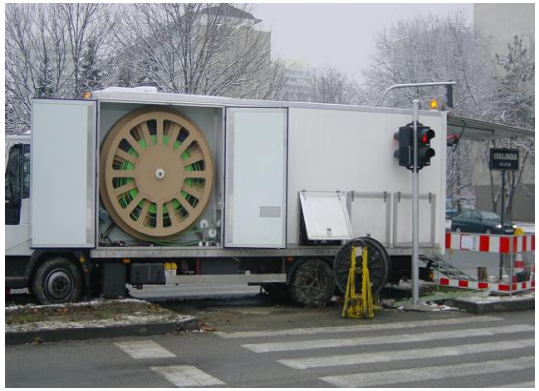

Subway systems


Tunnels and escape routes

HOW DOES THE CABLERUNNER INSTALLATION PROCESS WORK?

- The CableRunner truck arrives at the installation site, fully equipped with installation robots, power supply and installation material.
- The specially developed threaded bolt for securing the cable trays ensures safe installation. The construction prevents any stress in the sewer pipe. The complete installation can be removed easily if required.
- The system is robust and cannot be damaged by TV inspections, high pressure or manual cleaning work. All materials employed are resistant to corrosive substances contained in the sewage.

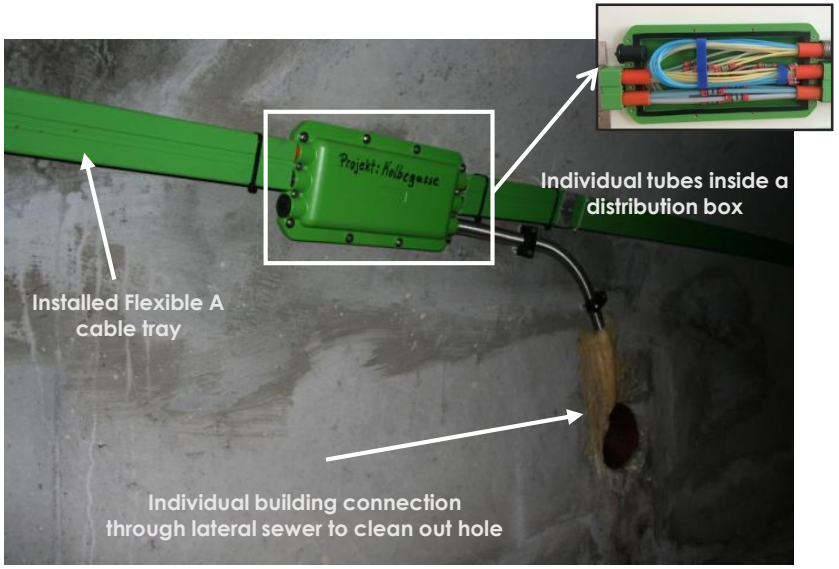
Storing and assembling of cable trays



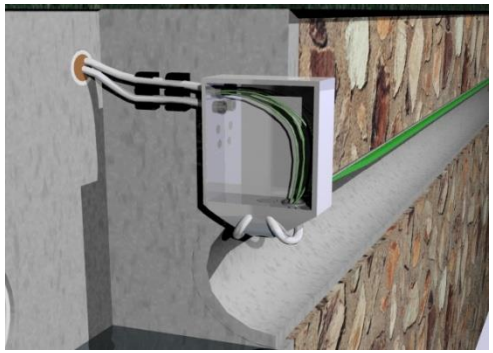
On site assembled cable tray inserted in sewer shaft

HOW DOES THE CABLERUNNER SYSTEM WORK?

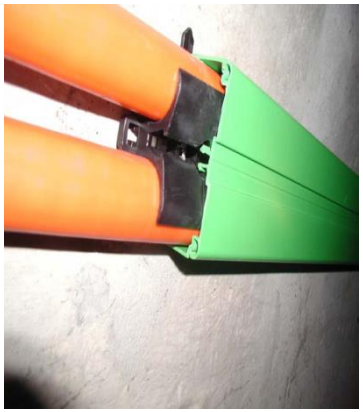
- CableRunner System works with the highly flexible modular cable system (MCS).
- The MCS cable comprises a bundle of thin micro air tubes into which the glass fibers are blown after successful installation – up to 1.5 km at a time. There is also the choice of inserting all the fibers or initially just a few. This is what makes it so quick, easy and cost effective to set up the network. As soon as greater capacity is required, it can be produced by inserting more fibers without the need for additional installation work.
- The system is open to a lot of types and manufactures of glass fibers. All fiber types can be inserted into the MCS mini pipes. So flexibility is increased even further because it is possible to use various types within one MCS cable.

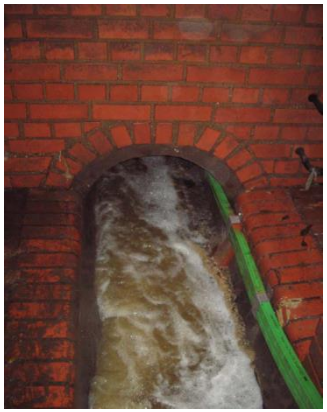


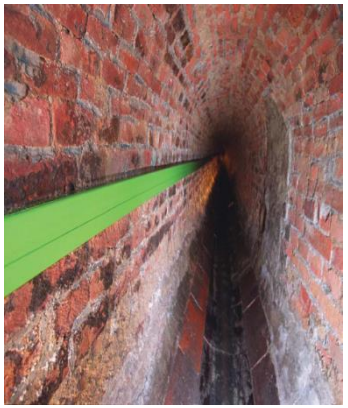
Connection to the household



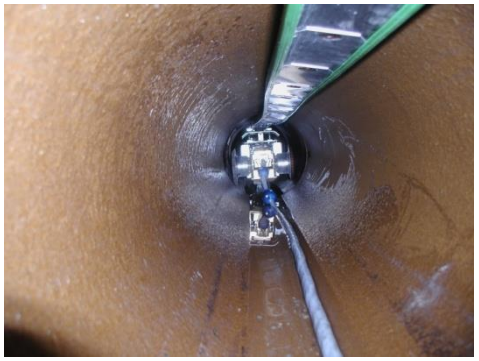
HOW DOES THE CABLERUNNER SYSTEM WORK?







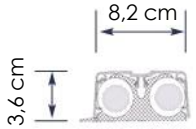
CableRunner's Technology – Level Access Net – accessible sewers



Installation robot in non-accessible sewer

HOW DOES THE CABLERUNNER SYSTEM WORK?

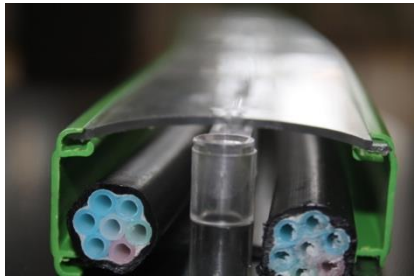
- The products of CableRunner are developed to perform under extreme conditions while preserving the integrity of both, the sewer structure and the installation itself. With CableRunner's fiber optic deployment system SewerLine™ cable trays have been installed in existing man-accessible and non-accessible sewer systems in major cities throughout the world.

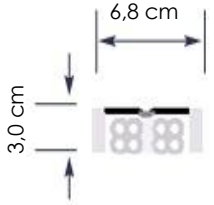


SewerLine FLEXIBLE "A"
for accessible sewers (>80cm)
Up to 2 x 864 = 1,728 fibres

SewerLine Flexible™ carries:

- Common FO cable and / or micro cable
- Modular cable system (micro air tubes)
- Any kind of fiber, not committed to manufacturer





SewerLine FLEXIBLE "N"
for non-accessible sewers
Up to 8 x 96 = 768 fibres

CABLERUNNER INTERNATIONAL: EXPERTS IN TECHNOLOGY TRANSFER

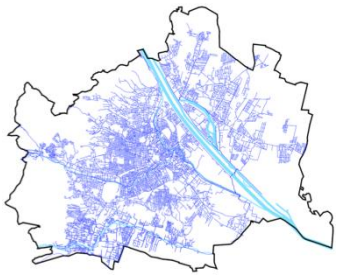
CABLERUNNER INTERNATIONAL: EXPERTS IN TECHNOLOGY TRANSFER

Case Study Vienna, Austria

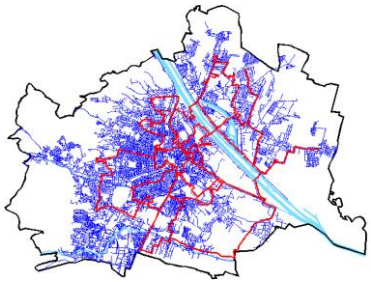
In 2004, CableRunner was asked to upgrade Vienna's fiber optic backbone with the CableRunner technology. During the course of the project, more than 250 km of fiber optic cables were installed inside Vienna's sewer system.

Since 2009, the City of Vienna, together with incumbent Telekom Austria, initiated a FTTH project covering one low to mid and one mid to high income area. Both districts together comprise some 70.000 apartments. CableRunner was assigned to carry out the construction. The first step of the project, comprising some 7.000 households, was finished in 2011. The long-term goal is to connect 140.000 buildings with a potential subscriber base of 980.000 households and 70.000 businesses.

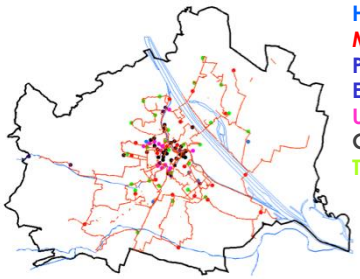
Vienna's backbone, installed with CableRunner technology



Sewer Network



Fiber optic backbone



Key customers

Hospitals
Municipal Departments
Public Broadcast & Entertainment
Universities & Education
Governmental Entities
Telephone Switches

CABLERUNNER INTERNATIONAL: EXPERTS IN TECHNOLOGY TRANSFER

Case Study Russian Federation

CableRunner International is present in Russia via CableRunnerRus CJSC, a company founded to develop the CableRunner technology in the Russian market together with local investors. While CableRunner International supplies the CableRunner technology including training, know-how and material supply, the partners provide local know-how and access to local customers.

Pilot projects in Moscow and St. Petersburg have been conducted to gain a local footprint and to prove that the technology is applicable in the local sewer system just like it is in other countries – due to the similar structures that can be found worldwide. Based on the positive evaluation from Russian governmental and municipal bodies, the roll-out of the CableRunner technology is now prepared.

Pilot project St. Petersburg

The first pilot project in Russia has been constructed in St. Petersburg and comprises a length of approximately 1.5 km. By using the sewers of Vodokanal St. Petersburg (St. Petersburg's sewer department) in a rural area, fiber connectivity for two separate educational facilities has been established.

Project map St. Petersburg

Pilot project Moscow

In 2014, CableRunner cable trays have been installed for the first time in Moscow. The 4 km of fiber optic lines that were installed during the project connect the headquarters of Mosvodokanal with one of its subsidiaries. The route passes the main train station, one of the most crowded areas in Moscow and has been installed in pipes from Mosvodokanal as well as Mosvodostok, the local waste water and storm water departments.

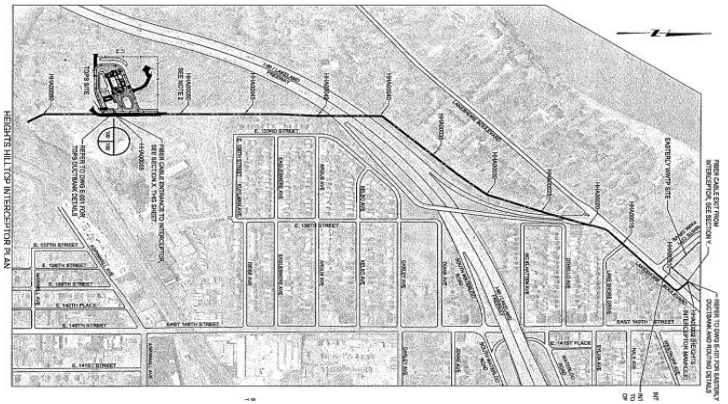
Project map Moscow

CABLERUNNER INTERNATIONAL: EXPERTS IN TECHNOLOGY TRANSFER

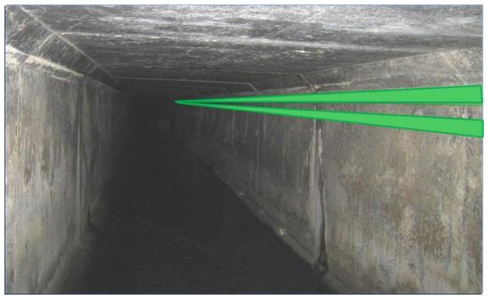
Case Study Cleveland

North East Ohio Regional Sewer District asked CableRunner to connect one of their facilities through the sewers because traditional methods like digging could not be utilized due to local conditions.

The project was supported by a regional construction company that performed the actual installation on site after having received a technical and safety training conducted by CableRunner.



Project plan Cleveland



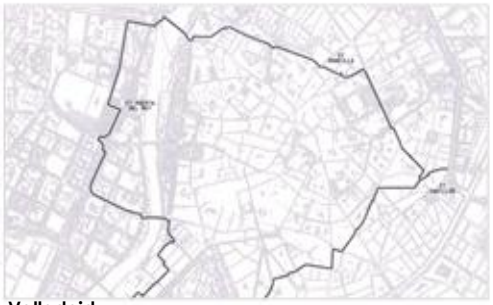
Selected pictures of installed cable trays in Cleveland

WHERE IS THE TECHNOLOGY IN USE?

- The CableRunner technology is proven and internationally certified. With the CableRunner technology, more than 2.000 km of fiber optic networks have been built in urban areas worldwide up to now.
- CableRunner is dedicated to product innovation and offers unique solutions for deploying fiber optic cable in accessible and non-accessible sewers in congested metropolitan areas. The company has partnerships with leading international telecom companies to develop customized solutions. CableRunner products and services have been used safely and successfully worldwide.

Vienna

Seville



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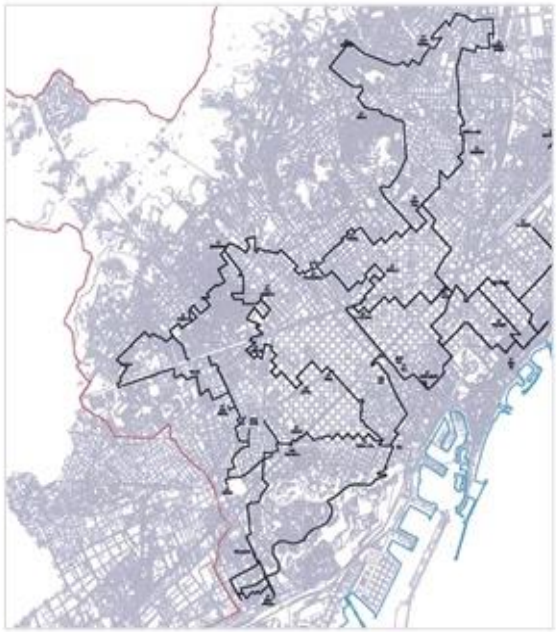

Barcelona

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Offices

CableRunner USA

CableRunner RUS

CableRunner GERMANY

CableRunner CHINA

CableRunner also contributes to setting industry standards through ASTM International, one of the largest voluntary standards development organizations in the world.

ASTM Standards for In-Sewer Fiber Development
ASTM Committee F36 on Technology and Underground Utilities developed Standards on Installation and Operation of Fiber Optic Cables in Existing Sewers.
F 2233: Standard Guide for Safety, Access Rights, Construction, Liability, and Risk Management for Optical Fiber Networks in Existing Sewers.
F 2303: Standard Practise for Selection of Gravity Sewers Suitable for Installation of Optical Fiber Cable and Conduits.
F 2462: Standard Practise for Operation and Maintenance of Sewers with Optical Fiber Systems