

CITY OF SAN DIEGO
ADMINISTRATIVE REGULATION

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CITYWIDE FIBER OPTIC INFRASTRUCTURE INSTALLATION, MAINTENANCE AND USE	Effective Date November 16, 2018		

1. PURPOSE

- 1.1. To establish the structure and procedures of a “Fiber Optic Working Committee” (also referred to from time to time in this Administrative Regulation as the “Committee”) which regularly meets to effectively and collaboratively share and manage citywide fiber optic resources, plans, and growth in order to maximize connectivity and to reduce redundancy and costs.
- 1.2. To ensure that all existing and future *Fiber Optic Infrastructure* throughout the City is accurately recorded in a Geographic Information System (*GIS*).
- 1.3. To standardize all future fiber optic build-out or installation in order to leverage minimal test equipment, repair parts and technological knowledge in the maintenance of the network.

2. SCOPE

- 2.1. This Administrative Regulation applies to all City departments.
- 2.2. This Administrative Regulation applies to all existing and future planned *Fiber Optic Infrastructure* owned by the City.

3. DEFINITIONS

- 3.1. *As-Builts* - Drawings of infrastructure construction that accurately reflect the infrastructure as it was actually built, including all changes made during construction, and which show the work completed under the contract.
- 3.2. *End Point Equipment* - Node equipment which is the interface to the end of the fiber optic cable or strand.
- 3.3. *Fiber Optic Infrastructure* - Any equipment, enclosure, cable, conduit or other device or item which is part of the fiber optic network.

(New Administrative Regulation 90.67, Issue 1, effective November 16, 2018)

Authorized

(Signature on File)

CHIEF OPERATING OFFICER

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- 3.4. Fiber Optic Tube - A bundle of fiber strands jacketed together in a fiber optic cable. A tube typically contains six or twelve individual fiber strands. A fiber optic cable may contain many separate tubes of fiber strands.
- 3.5. Fiber Optic Strand - A single fiber used as an optical waveguide to carry light which is modulated to provide high speed data connections between two points.
- 3.6. Flat Network - A flat fiber optic network that consumes one fiber transport pair (optical fibers) to connect only two devices together. It does not use routers and switches and does not permit automated redundancy.
- 3.7. GIS – Geographic Information System. A system that captures, stores, manipulates, analyzes, manages and presents geographic information and infrastructure.
- 3.8. Handhole - A shallow form of *manhole* used to contain fiber optic cable and equipment giving access for a hand and arm to access the enclosed parts.
- 3.9. IP Routing - The process of transporting data from source to destination based on pre-determined addresses and using routing equipment. Multiple sources and destinations can exist on the same network and use the same transport (optical fiber) thereby allowing one fiber pair to service many connections simultaneously.
- 3.10. Manhole - A covered underground chamber used to contain fiber optic cable and equipment.
- 3.11. Multi-Mode Fiber - A type of optical fiber mostly used for communication over short distances. Typical multi-mode links have data rates lower than that of single mode links and for shorter distances. *Multi-mode fiber* currently exists with two core sizes: either 50 micrometers or 62.5 micrometers.
- 3.12. Patch Panel - Used to separate out the fibers within a fiber-optic cable. By using one of these panels, the fibers can be connected to individual fibers on other cables, allowing the cables to be crossed and connected in a variety of ways.
- 3.13. Single Mode Fiber - A type of optical fiber which permits transmission of a single ray or mode of light as a carrier and permits communications over longer distances and at higher data rates than *multi-mode fiber*.
- 3.14. Vault - An underground rectangular structure providing housing and access to fiber optic equipment.

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4. POLICY

4.1. Fiber Optic Working Committee

4.1.1. The purpose of the Fiber Optic Working Committee will be to foster collaboration between City departments, jointly manage existing fiber optic resources, equitably distribute shared resources, seek opportunities to collocate conduit for future fiber runs with upgrades and build outs of other City services which drill, bore or trench, ensure that all existing and future *Fiber Optic Infrastructure* information is accurately recorded in *GIS*, and collaborate with departments to create and oversee a five-year consolidated City *Fiber Optic Infrastructure* plan.

4.1.2. The Fiber Optic Working Committee will determine the frequency and length of its meetings but, at a minimum, the Committee will meet on a quarterly basis until a majority of Committee members determine that a meeting is not necessary.

4.2. Ownership and Maintenance of Fiber and Equipment

4.2.1. Except as described in section 4.2.2., the department which requested the original installation will retain ownership and maintenance responsibility for *Fiber Optic Infrastructure* Equipment.

4.2.2. When one department uses another department's fiber, the department using the fiber will be responsible for programming, network engineering, operational configuration, and general operational maintenance of the equipment required for the activation and operation of fiber optic cable strands allocated to it.

4.2.3. Departments are encouraged to share test equipment and technical knowledge.

4.2.4. Replacement of any equipment or fiber will be with "comparable or better" equipment or fiber.

4.3. Fiber Sharing

Fiber optic strands shall be shared with City departments based on needs of both the department providing the fiber and the recipient department as well as the quantity of available unassigned strands. Additional *fiber optic strands* shall, upon request of a department to the Fiber Optic Working Committee, be allocated between departments whenever practical and necessary. *Fiber optic strands* allocated to a department cannot be deallocated without the Fiber Optic Working Committee first providing reasonable, advanced, written notice to the department

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which is losing the use of its allocated fiber. The Fiber Optic Working Committee will make the final decision regarding allocation of fiber.

4.4. Information Control

- 4.4.1. Information sharing and accurate documentation is imperative for achieving independent fiber networks. By moving existing usage of commercial services onto City-owned infrastructure, cost savings will be realized.
- 4.4.2. Departments will strive to accurately document *As-Builts* and modifications to the existing and all future *Fiber Optic Infrastructure* using City *GIS* resources. At a minimum, the information recorded in *GIS* will contain fiber routes, splices, type of fiber, owner/maintainer, tube assignments, *End Point Equipment*, and other information deemed relevant to the accurate description of the infrastructure.
- 4.4.3. *GIS* documentation conversion and on-going *GIS* maintenance is the responsibility of the department which caused the installation or modification. In addition to the documentation of fiber optic runs, departments will equally document in *GIS* all existing and future conduit runs, *vaults*, *manholes*, *handholes*, and junction boxes which could be used for fiber optic expansion.

4.5. Emergency Reporting Procedures

- 4.5.1. Any City employee who discovers that any of the communications equipment is damaged or that fiber systems require emergency repair or maintenance, shall immediately notify Public Works Dispatch Center (Station 38) at (619) 527-7500.

4.6. Standards

- 4.6.1. All future fiber optic build-outs must be standardized in order to require minimal test equipment, repair parts and technological knowledge in the maintenance of the network. Exclusive use of Corning equipment and products (or equivalent) is encouraged. With the exception of repairs being made to legacy *multi-mode fiber* optic cables, all fiber optic cables shall contain *single mode fibers*.
- 4.6.2. Fiber Optic Networks shall be IP routed, allowing distributed intelligence and optimal use of fiber optic resources. Un-routed, "*flat networks*" are to be avoided.
- 4.6.3. The Department of Information Technology (IT) with input from the Fiber Optic Working Committee, will develop, approve, and maintain standards which reflect citywide standardization of infrastructure growth and which should be used for

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procurements related to *Fiber Optic Infrastructure*.

RESPONSIBILITY

- 4.7. Department Directors
 - 4.7.1. Department Directors from each member department shall appoint a designated member or members to the Committee.
 - 4.7.2. Department Directors are responsible for ensuring that the policies of this Administrative Regulation are appropriately implemented with regard to *Fiber Optic Infrastructure* managed by their department.
 - 4.7.3. Departments will collaborate with the Fiber Optic Working Committee to create and maintain their five-year consolidated City *Fiber Optic Infrastructure* plan.
- 4.8. Department of Information Technology
 - 4.8.1. The Fiber Optic Working Committee shall be chaired by the Department of IT. The Chief Information Officer (CIO) shall select which additional departments will participate on the Committee.
 - 4.8.2. The Department of IT is responsible for providing on-going direction, training and expertise regarding the standardization of Fiber Optic resources and related industry advancements, and for providing standards as described in Section 4.6.3.
- 4.9. Public Works Dispatch Center (Station 38)
 - 4.9.1. Public Works Dispatch Center (Station 38) is responsible for receiving trouble calls relating to Fiber Optic issues and calling the Department of IT's Wireless Technology Services Duty Supervisor who will determine what action is appropriate for the issue reported.
- 4.10. Fiber Optic Working Committee
 - 4.10.1. The Fiber Optic Working Committee is responsible for meeting regularly to share information regarding existence and status of all *Fiber Optic Infrastructure* throughout the City.
 - 4.10.2. The Committee will collaboratively manage the infrastructure, share resources and jointly guide the City through future fiber optic expansion in a manner that promotes the efficient use of financial resources for the City.

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- 4.10.3. The Committee will assist departments with compiling information to use if they believe a contractor has failed to satisfy its responsibility to repair, replace or reimburse the City for any damages the contractor caused to the City's *Fiber Optic Infrastructure*.
- 4.10.4. The Committee will collaborate with the departments to create and oversee a five-year consolidated City *Fiber Optic Infrastructure* plan.

APPENDIX

Legal References

None

Forms

None

Subject Index

Fiber Optics
Fiber Optic Infrastructure
Fiber Optic Working Committee
Data Transport

Administering Department

Department of Information Technology