

**February 2012**

# TRAX Light Rail Pre-Test Study Guide

# Definitions

**Rule Book, Section 1**

**Revised June 26, 2011**

# UTA TRAX Pre-Test Study Guide

TRAX personnel must be able to communicate clearly in English and understand the specialized language of our business. Trainees must learn our terms and usage early in the training process. The TRAX Pre-Test will cover the ninety-seven definitions and a list of acronyms presented in the attached study guide.

The Pre-Test will contain fifty “Fill-in-the-Blank,” “True or False,” and “Multiple Choice” questions. In order to pass this test and be eligible to attend TRAX training you must achieve a score of 70%. Each question is worth 2 points. It is not necessary to memorize the rule number. Questions will be similar to the samples below:

A. A device affixed to the top of an LRV, used to conduct electric power from the overhead contact wire. The answer is PANTOGRAPH.

B. An Advisory must be acknowledged back to Control by all Train Operators in train number sequence and recorded on the clearance . The answer is TRUE.

C. Fouling Distance is the area within how many feet of the centerline of any track, high voltage conductor or appliance. a. 5 ft b. 10 ft. C 25 ft D. 50 ft The answer is b.10 ft.

D. TVM Ticket Vending Machine    ABS Automatic Block System    IJ Insulation Joint

# 1.01 Access Ramp

A ramp on each end of the platform used for boarding and alighting passengers with mobility impairments.





## 1.02 Accident

An unforeseen event or occurrence which results in injury or property damage.

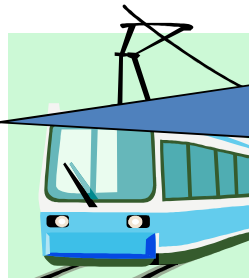
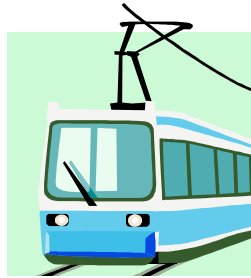
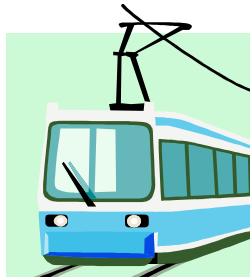


# 1.03 Advisory

Information communicated by radio to all trains which must be acknowledged back to Control by all Train Operators in train number sequence and recorded on their clearance.

Control to all Trains.  
Advisory Number  
One. Broken Gate  
at Haven Avenue.

Train 1 Copy.  
Train 2 Copy.  
Train 3 Copy.....



# 1.04 Auxiliary Track

A track other than a main track.



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# 1.05 Ballast

Selected material placed onto the roadbed for the purpose of holding the track in proper alignment and providing proper drainage.



# 1.06 Block

A section of track of defined limits, the use of which is controlled by signals or other means.

## 1.07 Block, Manual

A method of operation by which train movements are made without signal protection. The only Employee permitted to authorize use of the Manual Block system is the Controller.

# 1.08 Bulletin

Information issued in writing by the Rail Operations Manager which may be a temporary or permanent change in the rules or procedures. Bulletins must be signed for by all appropriate rail service personnel.



## 1.09 Bumping Post

A structure at the end of track placed to prevent rail vehicles from running off the track.





## 1.10 Cab

The compartment of an LRV from which manual control is achieved; the operator's compartment.



# 1.11 Catenary

A system of overhead wires in which the contact wire is supported from one or more longitudinal messengers either directly by hangers or by hangers in combination with auxiliary conductors or clamps.



# 1.12 Consist

The number and specific identity of the LRVs, engines and/or cars which make up a train.

Train 1 Consist:

1011

1009

1005

Train 2 Consist:

1022

1032

1018

## 1.13 Contact Wire

An overhead electrical conductor which provides power to the LRV through direct contact with the pantograph.





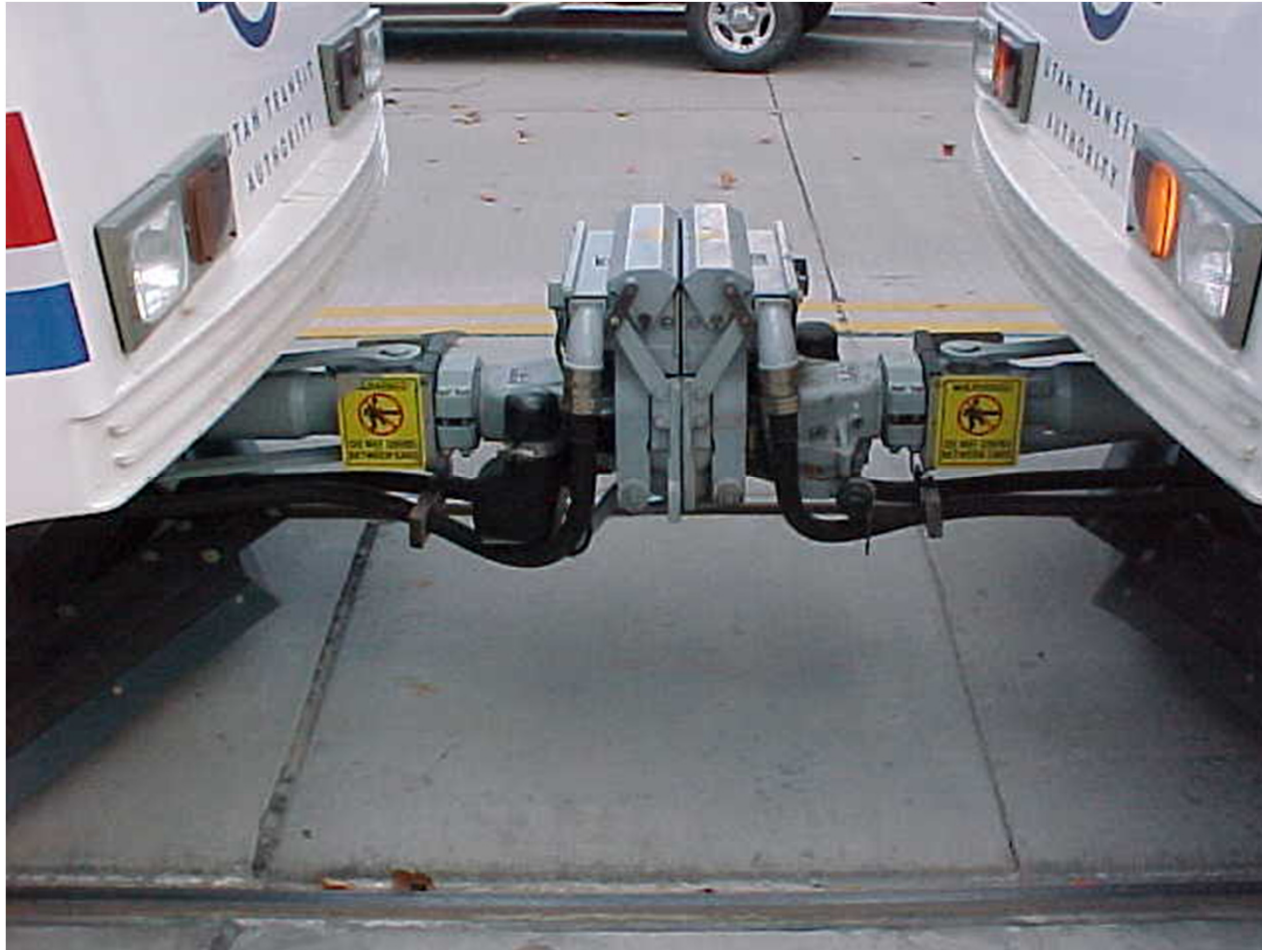
## 1.14 Controller

The designated Employee on duty in Control having authority over all movements on or affecting UTA tracks and property.



# 1.15 Couple

The  
connecting  
of two or  
more  
LRVs.



# 1.16 Coupler

A device for mechanically and electrically joining together LRVs.



## 1.17 Crossing Gates

Protective crossing guards located at a grade crossing inhibiting vehicular and pedestrian flows during unsafe conditions. Crossing gates also include an arrangement of warning bells and lights.





# 1.18 Crossover

Switches and tracks so arranged to provide a route from one track to another.



# 1.19 Deadman



A device used on LRVs which must be held in the operating position before movement can occur, and which will bring the LRV to a stop if released.



## 1.20 De-Energize

To turn off electrical power to the catenary, messenger wire, supporting catenary equipment, or other electrical appliances.





## 1.21 Derail

A fixed or portable device designed to cause rolling equipment to leave the rails to avoid fouling other tracks.



## 1.22 Dwell Time

The total time from the instant a train stops in a station to allow loading and unloading of passengers until the instant it resumes moving.





## 1.23 Electric Switch Lock

An electrically operated locking device, within signalized territory, affixed to a manually operated switch or derail to control its use.



## 1.24 Emergency

An unforeseen condition that can result in injury to passengers or Employees and/or damage to equipment and property.



## 1.25 Emergency Braking

The ultimate level of slide controlled braking achievable by the LRV/train, derived from a combination of independently controlled brakes, including emergency friction brakes, track brakes, and sanding. Emergency brake is recoverable.



# 1.26 Employee



Anyone  
employed by or  
under contract  
to, the Utah  
Transit Authority  
(UTA).

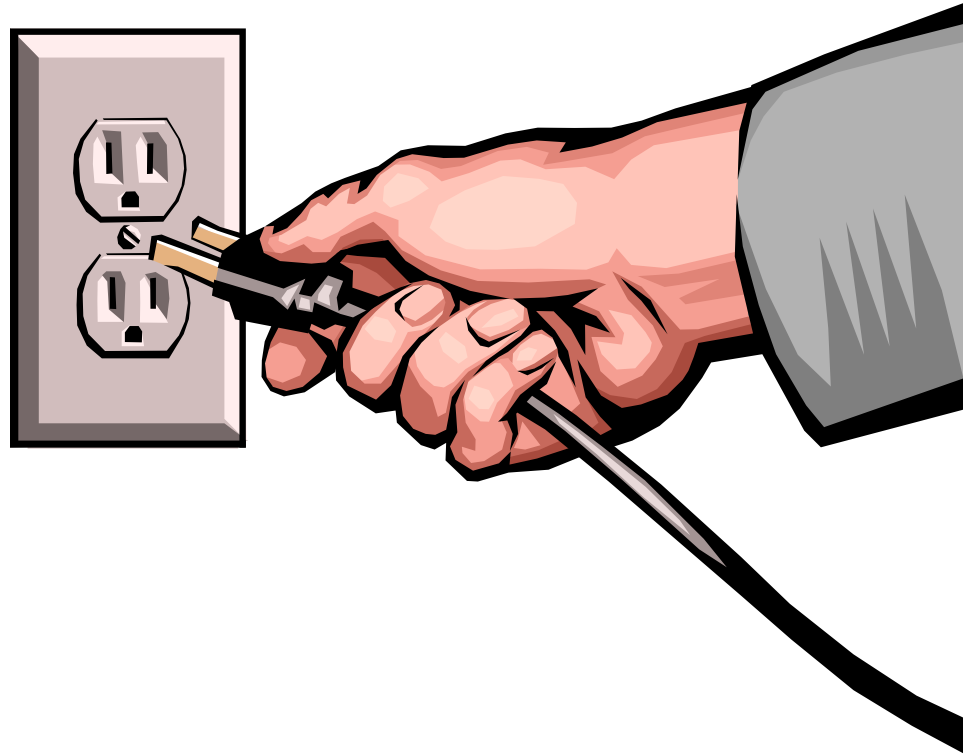


## 1.27 Employee in Charge

The Employee in Charge (EIC) is responsible for the safety of persons and equipment working on or near the tracks. The EIC communicates with trains to monitor movement through the affected area.

## 1.28 Energize

To turn on electrical power to the catenary, messenger wire, and supporting catenary equipment at which time all devices connected to it must be considered energized and live.



# 1.29 False Occupancy

Indication of track occupancy when no train or vehicle is present.



## 1.30 Flag

A device used for relaying hand signals or to indicate conditions on the right-of-way. Flags may be made of cloth, metal, lights, or other suitable material.

## 1.31 Flagger

An Employee using a flag assigned to protect persons and equipment working on or near the tracks to ensure the safe passage of trains.

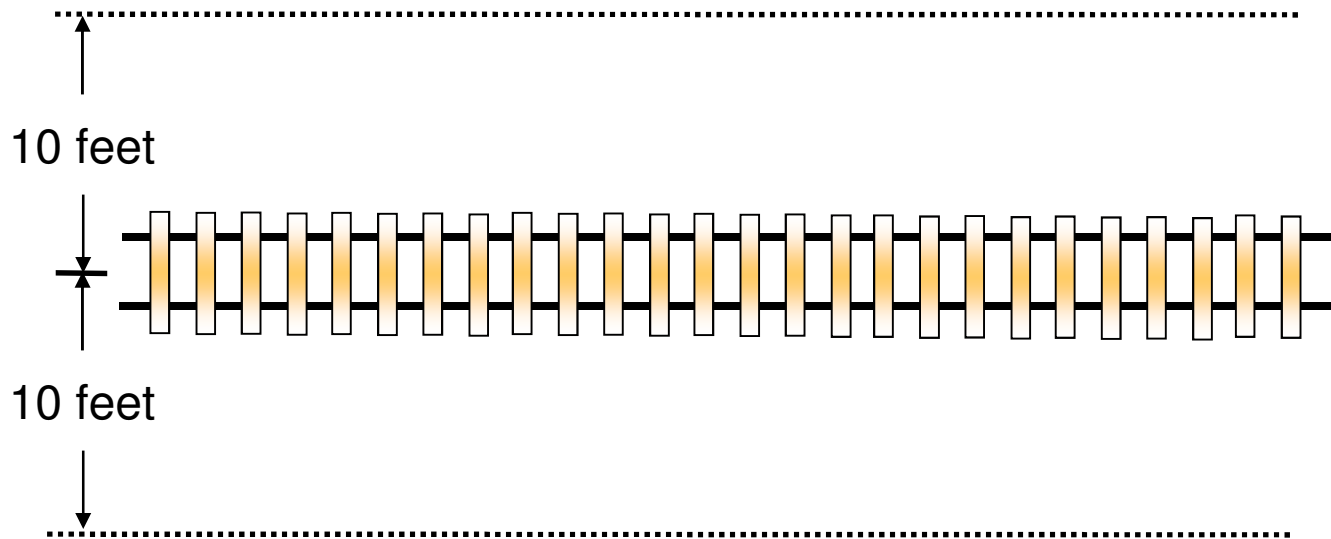


## 1.32 Flagging Protection

Used to protect persons and equipment from train and vehicular movements and any other obstructing activities.

# 1.33 Fouling Distance

The area within 10 feet of the centerline of any track or within 10 feet of any high voltage conductor or appliance.





## 1.34 Fouling Point

The location on a track beyond which movement or storage of rail cars, equipment, or materials will interfere with movements on another track.



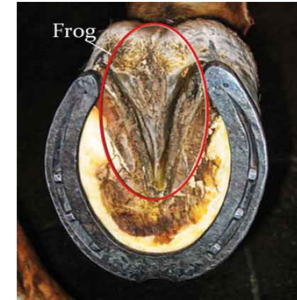
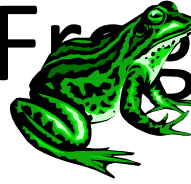
# 1.35 Fouling Point Mark

A yellow painted stripe or tie or other device or marker indicating the closest point to which a train may approach a switch of an intersecting track without encroaching on the clearance for equipment on adjacent track.





# 1.36 Frog



A track structure used at the intersection of two running rails to provide support for wheels and passageways for flanges, thus permitting wheels on either rail to cross the other.



## 1.37 Full Service Braking

The upper limit of the service braking effort normally required to stop the LRV/train, consisting of both dynamic and friction brakes as needed.

## 1.38 General Announcements

Information communicated by radio to all trains, which must be acknowledged back to Control by all Train Operators in train number sequence.

# 1.39 Grade Crossing

A street, road, or footpath crossing over track at the top-of-rail level in the exclusive right-of-way area excluding pedestrian crossings at stations.





## 1.40 Guard Rail

Rails mounted to the inside of the running rails to keep wheels in-line with the track in the event of a derailment.



# 1.41 Headway

The time separation between two trains, both traveling in the same direction.





## 1.42 Hi-Rail Vehicle

All rail vehicles, other than LRVs, which operate on the track for purposes of inspection and maintenance which may or may not shunt the track.



## 1.43 Incident

An unforeseen event or occurrence which does not result in injury or property damage.



# 1.44 Interlocking

An arrangement of signals, switches and signal appliances interconnected so that their movements must succeed each other in a prearranged sequence designed to prevent conflicting train movements.



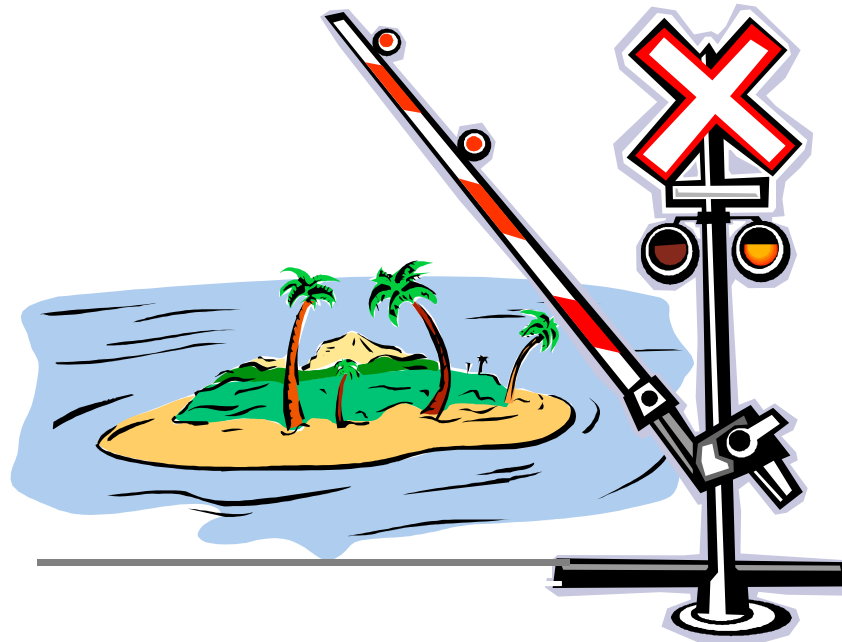


# 1.45 Interlocking Limits

The tracks between outer opposing signals that protect the interlocking.

# 1.46 Island Circuit

An electrical circuit located beneath tracks in close proximity to each grade crossing.



# 1.47 Light Rail Vehicle (LRV)

The passenger rail vehicle used to transport passengers on a light rail train.



# 1.48 Mainline

Track designated for passenger or freight service, extending through yards and between stations, which is governed by the authority of the Controller, signal indication, timetable, rules, or a combination thereof.



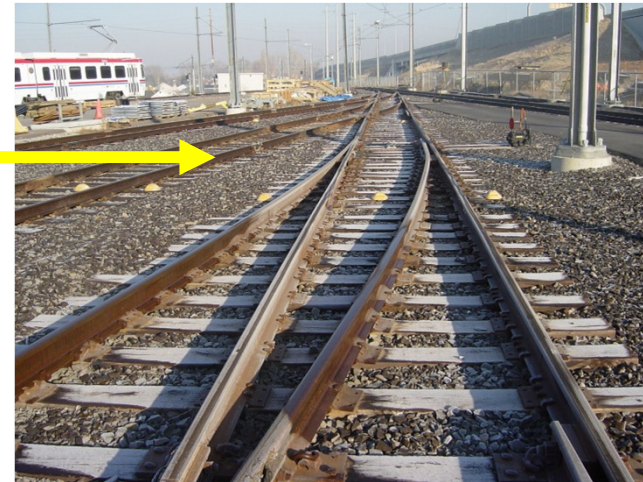


# 1.49 Movement Through Switches



Facing Movement: The movement of a train over a switch whose points face in the direction opposite to which the train is moving.

Trailing Movement: The movement of a train over a switch whose points face in the direction the train is moving.





# 1.50 Operate on Sight

Operate prepared to stop within the range of vision.

# 1.51 Operating Clearance

A document issued to Rail Service employees daily providing system status to operate on the alignment. Operating Clearances must be in the possession of each Train Operator on duty.

## 1.52 Opposing Move

A train, the movement of which is in a direction opposite to and toward another train on the same track.



## 1.53 Panic Brake

The ultimate level of non-slide controlled braking achievable by the LRV/train, derived from a combination of independently controlled brakes including emergency friction brakes, track brakes, and sanding. (Non-recoverable).



## 1.54 Pantograph

A device, affixed to the top of an LRV, used to conduct electric power from the overhead contact wire.





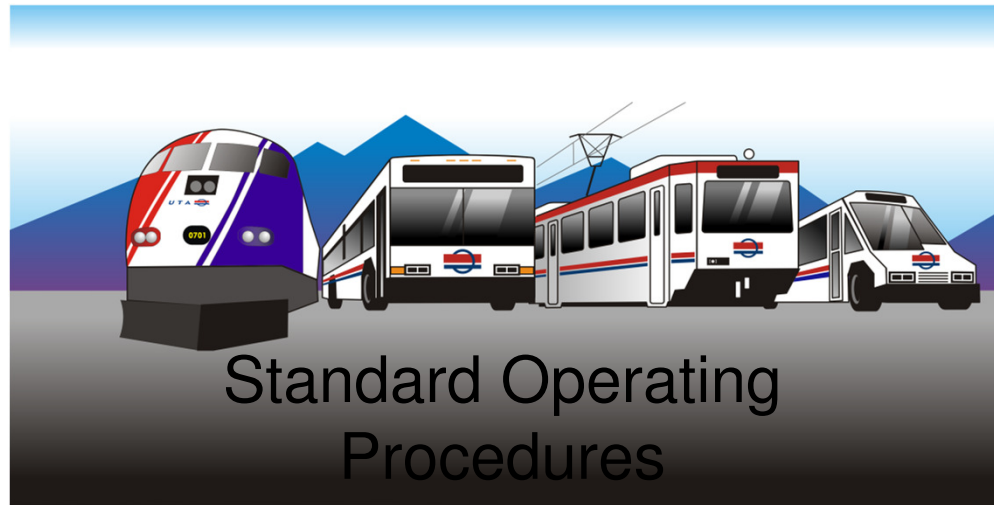
## 1.55 Pilot



A qualified Employee assigned to a train or other on-track equipment where single track train protection is provided by an individual riding through the single track area.

# 1.56 Procedures

Established methods to perform a series of tasks.



## 1.57 Qualified Employee

An Employee who is properly trained and certified, and possesses the necessary licenses or certificates on his/her person required for his/her duties.



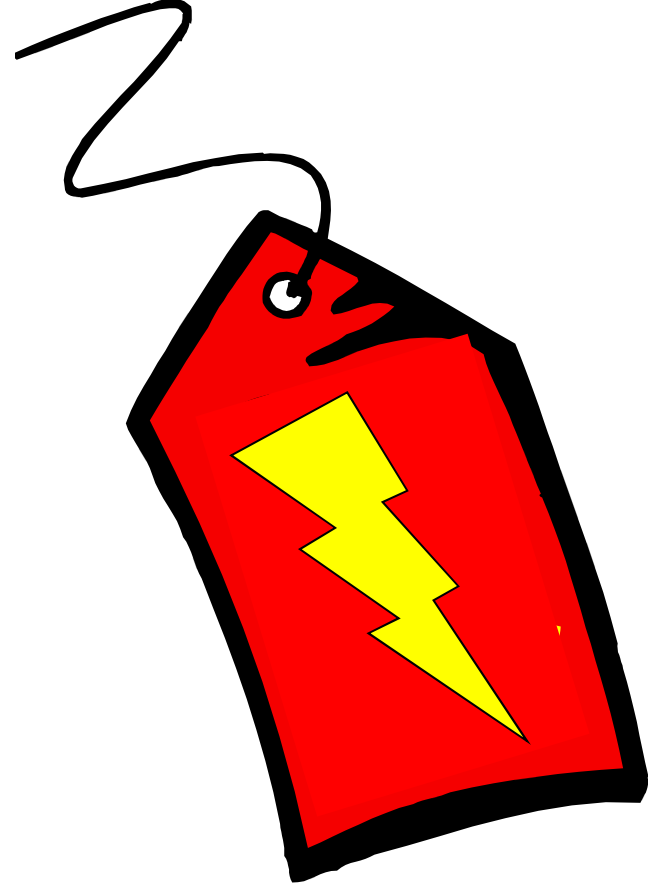
# 1.58 Rear View Camera

A system of cameras and monitors attached to an LRV that enables Train Operators to observe the area next to the train to ensure safe movement.



## 1.59 Red Tag

A safety warning method used to indicate that traction power substations or other equipment have been de-energized for maintenance, repair or other reasons. Equipment marked with a red tag must not be energized.





## 1.60 Right-of-Way

The limits of UTA owned property including and adjacent to any track.

## 1.61 Rigid Switch

A track switch which must be aligned for both facing and trailing point movements.



## 1.62 Route

A pre-determined course of travel  
between interlockings or crossovers.

## 1.63 Route Selector

Push buttons contained in a box located adjacent to a signal used to request or cancel a route.



## 1.64 Rule Book

A book of Rules, Instructions and Definitions issued to all Rail Service Employees and used for instruction and discipline. The Rule Book may be supplemented by Bulletins and other written directives.



# 1.65 Running Rails

The tracks  
upon which a  
train moves.



# 1.66 Shop

The building  
used for  
vehicle  
maintenance.





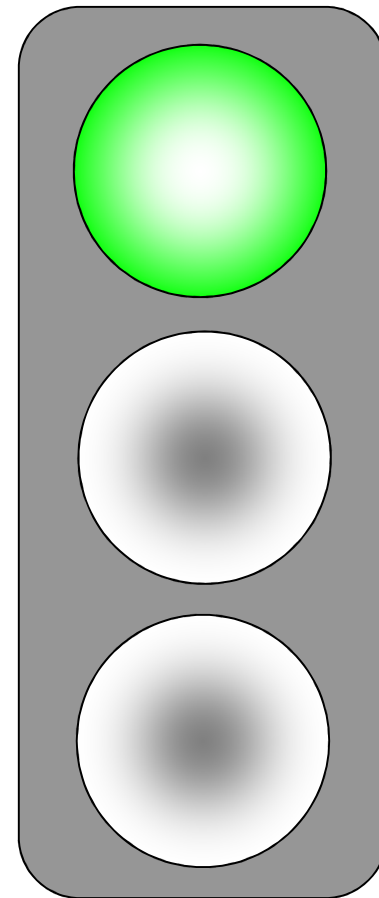
# 1.67 Signal

A method or device conveying visual and/or audible information affecting movement of a train, rail car, or other on-track equipment.



# 1.68 Signal Aspect

The appearance of any signal as viewed by the Operator of a rail vehicle.



# 1.69 Signal, Block

A fixed signal at the entrance of a block that governs trains entering and using that block.

NOTE: Block signals are also called “intermediate” signals.





# 1.70 Signal, Dwarf



A low interlocking  
or block signal.

# 1.71 Signal, Fixed

A signal of fixed location along the track. It may be a switch indication, speed limit sign, interlocking signal, or any other designated fixed signal.



## 1.72 Signal, Hand

A signal given by the motion or position of a person's hand, arm, flag or light.





## 1.73 Signal Indication

The operating information conveyed by the aspect of a signal.

Proceed,  
approaching next  
signal prepared  
to stop.



# 1.74 Signal, Interlocking

The fixed signals that protect the limits of an interlocking.

**NOTE:**  
Interlocking signals are also called “home” signals.





# 1.75 Single Track Operation

The operation of trains in both directions on a single track.



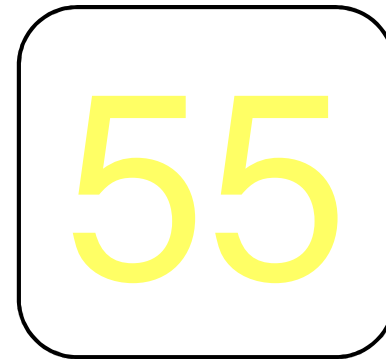
## 1.76 Slow Zone

A section of track of defined limits through which trains must operate at a reduced speed.



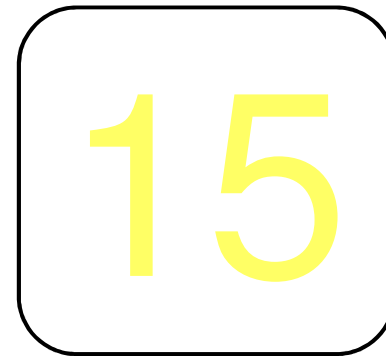
## 1.77 Speed, Authorized

The maximum allowable speed designated by signal indication, wayside signs, hand signals, bulletins, Operating Clearance, and Controller's instructions.



## 1.78 Speed, Restricted

A speed, not exceeding 15 MPH, that will permit stopping within one-half the range of vision, and short of any train, obstructions, improperly aligned switches, and broken rails.





## 1.79 Spot

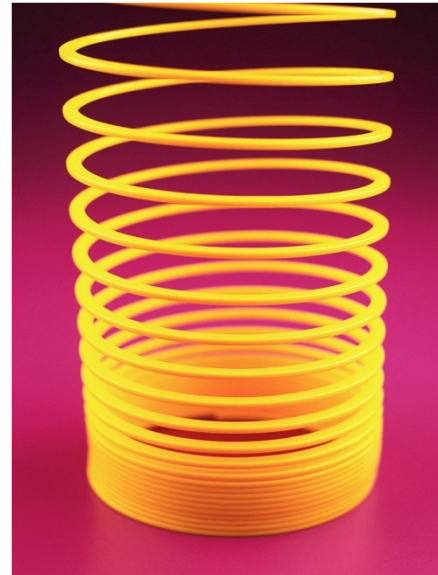
Placing a rail vehicle or track equipment in a designated position or specific location.





# 1.80 Spring Switch

A switch equipped with a spring mechanism arranged to restore the switch points to their original position after having been trailed through.



## 1.81 Spur Track

An auxiliary track connected to the Mainline which ends at an industry or other destination off the Mainline.



# 1.82 Station

A location  
where  
passengers  
board/alight  
Light Rail  
Vehicles.





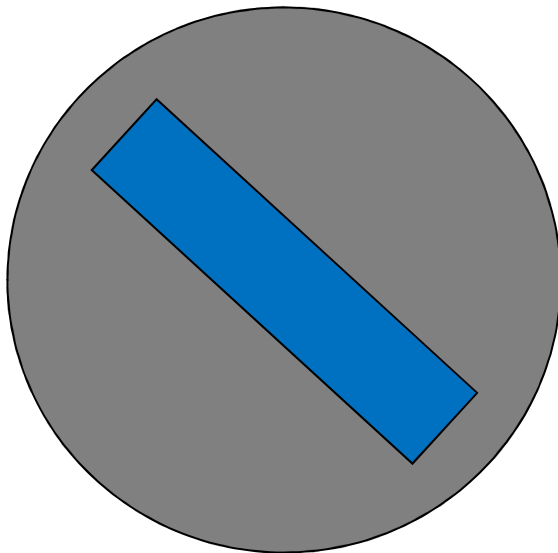
## 1.83 Switch

A device used for establishing a route from one track to another.



# 1.84 Switch Point Signal

A wayside device located in advance of a switch or on the switch stand itself indicating alignment of the switch.



Switch lined for a left diverging move.



# 1.85 Switch Position

The switch point alignment allowing for straight or diverging moves.



Straight



Diverging



## 1.86 Switch Stand

A device by which a switch is thrown, locked, and its position indicated. It consists of a base, spindle, lever and connecting rod.



## 1.87 Tail Track

A Mainline track designated for train storage outside of signal territory, usually located at a terminal.



# 1.88 Timetable

The schedule for the movement of revenue trains  
subject to the rules and instructions of the Controller.



# 1.89 Track Shunt

Occurs when a conducting device is placed between the running rails on signalized track.

# 1.90 Traction Power System

The substations, feeder cable, contact wires, switch gear, and other equipment interfacing with public utilities or other power sources to provide power for the movement of LRVs and their auxiliary systems.



# 1.91 Traffic, Normal Direction of

On double track, the normal direction is to the right unless otherwise directed by Rules, Bulletins, Procedures or as instructed by the Controller.

## 1.92 Traffic, Reverse Direction of

The operation of trains against the normal direction of traffic. Maximum speed when reverse running is 35 MPH, unless otherwise authorized.



## 1.93 Train

One or more LRVs, Engines and/or cars, coupled together, operating on the mainline and displaying headlights to the front and red light(s) to the rear.



# 1.94 Train Monitoring System

A device used on LRVs which monitors the activity level of a Train Operator. Failure of the Train Operator to make a control input in a designated amount of time will bring the train to a stop.





# 1.95 Train Operator

A qualified Employee who controls the movements of a train.



# 1.96 TRAX Control Center

The designated location from which all TRAX operations are authorized and directed.





## 1.97 Yard Limits

Yard Limits are defined as all Yard and shop tracks outside of signaled territory.



## 1.98 Yard Track

All tracks within the Yard used for car storage, repair, and testing.





# 1.99 Yard Lead

A track connecting Main Line track to Yard track.



Pictures of the Yard Lead at Lovendahl Rail Service Center.

# Common TRAX Acronyms

- ABS Automatic Block System
- ATMS Automatic Traffic Management System
- TVM Ticket Vending Machine
- TCU Traction Control Unit
- BCU Brake Control Unit
- SOP Standard Operating Procedure
- IJ Insulated Joint
- TCCTRAX Control Center