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APPENDIX L
QUICK REFERENCE GLOSSARY OF JAPANESE LANGUAGE GENERIC RAILWAY TERMS

fundamental terms:
basu = bus
chokutsu unten = reciprocal running*
densha = electric car
deizeruka = diesel car
eki = station
hon-sen = main line
kisha = steam engine
rerubasu = railbus
-sen = line
shinkansen = new trunk line
sogo nori-ire = reciprocal running#
tetsudo = railway

* = literally, "direct communication" *or* "pass through running"
# = literally, "two people facing each other's territory," "to turn around, wheel, or revolve," *or* "combined into other place"

components of operating entity names:
bokujo = ranch (theme park)
bunka = cultural
chiho = district
daisan = Third Sector
denki = electric
dentetsu = electric railway
eidan = authority
-fu = [special] prefecture
hakubatsu = non-profit organization
jigyo = business, industrial
jokan = through-running
jutaku = housing
K.K. = Co.
kabushikigaisha = company
kaigan = seashore, coast
kaihatsu = development
kaisha = company
kamotsu = freight
kanjo = loop, belt line
kanko = sightseeing
keburu = cable
keikoku = gorge
kennai = within-prefecture
kenei = prefecture-operated
kensetsu = construction
kido = tramway
kodan = authority
koen = park
kogen = heights
kogyo = industrial
kokusai = international
kosoku = rapid
kosokudo = rapid
kotsu = transport, transit
kuko, -kuko = airport
kyokoku = gorge
kyoku = bureau
kyuko = express
monoreru = monorailway
nairiku = inland
renraku = connecting
rinkai = seaside
ryokaku = passenger
ryokan = hotel
seibi = agency, organization
sen, -sen = line
shi, -shi = city, municipal
shiei = city-operated
shin-, -shin = new
shintoshi = new town
-sho = bureau
tetsudo = railway
-to = [capital] prefecture
toshi = city development
tozan = mountain-climbing
unyu = transport

APPENDIX M

(Direct translation of a clear summary statement by German Regulators of Joint Use requirements for mixed service based largely on prior risk analysis)

"Special Conditions for the Operation of Light Rail Vehicles (LRV) in Mixed service with Standard Vehicles of the Railways of Public Transportation"

Source: Appendix to the Letter of the (German) Ministry of Transport (Bundes-ministerium für verkehr) of 24 April 1995 - E 15/32.31.00/19 Va 95

1. Vehicle Conditions:

1.1 The permissible speed for the LRVs is limited to 90 km/h, to 100 km/h with fulfillment of the condition 3.2 on page 2. (Note: the RegioSprinter has been given approval for speeds to 120 km/h by the German regulatory authority.)

1.2 The braking capability of the LRV must correspond to the limit values of Appendix 2, Table 2 of the Construction and Operation Regulations for Street Railways (BOStrab) and to the accompanying "Provisional Guidelines for the Calculation and Testing of Brakes" of 15 May 1988.

1.3 The LRV must be equipped with a train influencing [system] by which a train can be brought to a stop automatically, and with train radio equipment for the transmission of emergency stop instructions and emergency calling for all lines used.

2. Way Conditions:

2.1 The lines used by LRVs must be equipped with train radio equipment with which emergency stop instructions and emergency calls can be transmitted.

2.2 Secondary lines with permissible speeds of from 50 km/h to 80 km/h may be used by LRVs, if main signals, signal dependent switches, and a train influencing [system] which automatically guarantees the obeying of signals showing "stop" are available.

In addition, single track lines, which are operated in two-way service, must be safeguarded by means of technical dependency, that the section [of the line] will be free for travel in only one direction at any one time and the available direction can only be changed by unlocking the section.

The use of LRVs on secondary lines with permissible line speeds above 80 km/h will follow the conditions for main lines (com-pare No. 2.4).

2.3 Main lines with permissible line speeds up to 80 km/h may be used by LRVs if, in addition to the conditions specified in 2.2, the signal in a block is under the lock of the next block signal at all times.

This applies also for railway lines with permissible speeds of 80 km/h to 100 km/h if the percentage of trains made up of standard vehicles does not amount to more than 30% of the total number of trains.

2.4 The use of LRVs on single and double track main lines with a permissible line speed of from 80 km/h up to 160 km/h is permissible if main signals, signal dependent switches, section blocks, train influencing [systems] which automatically guarantee the obeying of signals showing "stop", and track free announcing systems in the stations are available. If tracks in stations are used exclusively for arrival, departure, and through travel by LRVs, track free announcing systems may be avoided for these tracks.

2.5 The use of a track on a double track line against the customary direction of travel for operation by LRVs is permissible only if the track is equipped with signal and technical block security in both directions of travel.

2.6 The use of LRVs on lines with a permissible line speed of more than 160 km/h is not permissible.

2.7 The use of LRVs on double track tunnel lines is only permissible up to a line speed of 120 km/h.

3. Operational Considerations:

3.1 Switching with vehicles other than LRVs on tracks occupied by LRVs with passengers is not permissible.

This may be departed from, if:

- the section of track occupied by LRVs is safeguarded by stop on demand signals, or
- during occasional switching movements in stations on lines with a maximum permissible speed of 90 km/h and an average scheduled loading of not more than four trains during each hour of operation.

Additional equipment will be used during shunting in switching areas in both cases, with which the operational employees in the peak of the switching operation can stop [the switching] by the immediate application of pneumatic brakes.

3.2 Operational instructions are to be drawn up for compliance with the above conditions for the regular use of LRVs in mixed service with conventional railway vehicles of public transportation on railway lines. If LRVs are expected to operate [at speeds] of more than 90 km/h to 100 km/h, a qualitative safety system (according to ISO 9000) is to be established for operational control of the lines concerned.

3.3 For casual trips by LRVs (trips with passengers which are not regularly [scheduled] and are [not] confirmed [extra trips]), conditions 1.1 through 3.1 will be in force without restriction.

3.4 During [dead head] trips by LRVs (trips without passengers which are not regularly [scheduled] and are [not] confirmed [extra trips]), conditions 2.2 to 2.4 may be disregarded. Operational instructions will be published in the documents for the operation of special trains (schedule regulation).

4. Exceptions:

If an individual condition cannot be complied with, or can only [be complied with] at a disproportionately high expense, the use of the accepted rules of engineering with regard to the supervisory authority of the railway infrastructure operations will govern the minimum proof of track safety.

A separate risk assessment in the area of permissible procedures can be required, particularly with weakly or massively loaded lines and with lines with a predominant percentage of LRVs in the total number of trains.

Note: the main body of the letter to which the above summary of special conditions is attached contains the following.

"The 'following' statements are found in a clear and simple format which will make it possible for the legislator and concurring offices, respectively, to make decisions in extensive individual cases."

APPENDIX N

GERMAN RY MINISTRY RISK ANALYSIS AND RISK ASSESSMENT TABLES (SELECTED)

These are presented for the purpose of illustrating the use of accident data and risk analysis translated into specific regulation of joint use under various operating scenarios and conditions. There is no implication that results can be applied to North America without use of a North American accident database.

Table N-1
Operating Program of the Selected Cases

			Number of Trains						Possible Headway for Local Pass. Trains - Each direction (Minutes)	
				MIXED SERVICE						
Operational Case	Characteristic of the Line	Permissible Line Speed (Km/h)	Pure Ry Service Total	Total	LRV	High Speed Local Pass.	High Speed Intercity Pass.	Freight	6-24	Peak
1	Secondary Line Train Service	≤ 50	40	40	30	10			60	60
2	Secondary Line accord. To FV	≤ 50	40	40	30	10			60	60
3	Secondary Line accord. To FV	> 50 ≤ 80	60	60	40	10		10	60	30
4	Secondary Line signaled Train SVC	≤ 80	60	60	40	10		10	60	30
5.1	Main Line Single Track	≤ 80	70	70	40	10		20	60	30
5.2	Main Line Double Track	≤ 80	160	160	160	20		80	30	30
6.1	Main Line Single Track	> 80 ≤ 120	80	80	40	10	10	20	60	30
6.2	Main Line Double Track	> 80 ≤ 120	160	160	60	20	20	60	30	30
7.1	Main Line Single Track	> 120 ≤ 160	90	90	40	10	20	20	60	30
7.2	Main Line Double Track	> 120 ≤ 160	200	200	40	20	50	90	60	30
8	Main Line Double Track	> 160	240	240	40		90	110	60	60

Source: German Ministry of Railways "Supplementary Report"/Risk Analysis

Table N-2
Probability of Accidents According to Types of Accidents and Causes of Accidents

Type of Accident	All Accidents [Accidents/Train km] Absolute Prob.	%	Accidents with Injured Passengers [Accidents/Train km] Absolute Prob.	%	Proportion of Accidents with Injured Passengers to Total Accidents	Cause of Accident	All Accidents [Accidents/Train km] Absolute Prob.	%
Collision Total of Which:	77.70 x 10 $^{-9}$	6.03	10.80 x 10 $^{-9}$	27.7	0.14	Safety of the Train Trip	43.70 x 10 $^{-9}$	3.44
Head-On	4 09 x 10 $^{-9}$	0.32	1.470 x 10 $^{-9}$	3.77	0.36	Running of the Train Trip	55.60 x 10 $^{-9}$	4.38
Rear-End	50.70 x 10 $^{-9}$	3.93	8.51 x 10 $^{-9}$	21.83	0.17	Switching Service	62.50 x 10 $^{-9}$	4.93
Flanking Trip	22.90 x 10 $^{-9}$	1 78	0.82 x 10 $^{-9}$	2.10	0.04	Railway Crossing	486.0 x 10 $^{-9}$	38.31
Under/Train Switching Unit	57.30 x 10 $^{-9}$	4.44	9 98 x 10 $^{-9}$	25 60	0.17	Safety Technology	2.45 x 10 $^{-9}$	0.19
Collision	557.0 x 10 $^{-9}$	43.21	13.30 x 10 $^{-9}$	34 11	0.02	Rail Vehicles	94.4 x 10 $^{-9}$	7.44
Derailment	65.5 x 10 $^{-9}$	5.08	1.39 x 10 $^{-9}$	3.57	0.02	Railway Installations	24.9 x 10 $^{-9}$	1.96
Impact	589.0 x 10 $^{-9}$	45.69	13 5 x 10 $^{-9}$	34.62	0.02	Environment	499.0 x 10 $^{-9}$	39.34
Total	1289 2 x 10 $^{-9}$	100.00	38.99 x 10 $^{-9}$	100.00	0.03	Total	1268 55 x 10 $^{-9}$	100.00

Source: German Ministry of Railways

Table N-3
Extent of Damage and Aversion Factors

Operating Case / Type of Train	Collision							Flanking Trip		Collision		Derailment		Impact	
	Head-On			Read-End[1]											
	Ry<->Ry	Ry<->LRV	LRV<->LRV	Ry<-Ry	Ry<-LRV	LRV<-Ry	LRV<-LRV	Ry	LRV	Ry	LRV	Ry	LRV	Ry	LRV
Extent of Damage [Injured Passengers per Accident (Total Number)]															
Statistical	26			2				0 2		0.1		0.1		0.1	
1	10	8	6	1	1	1	1	0.2	0.4	0.05	0.1	0 05	0.1	0.05	0.1
2	10	8	6	1	1	1	1	0 2	0.4	0 05	0.1	0.05	0.1	0.05	0.1
3	15	12	8	1	1	1	1	0.2	0.4	0.1	0.2	0.1	0.2	0.1	0.2
4	15	12	8	1	1	1	1	0.2	0.4	0.1	0.2	0.1	0.2	0.1	0 2
5.1	15	12	8	1	1	1	1	0.2	0.4	0.1	0.2	0.1	0.2	0.1	0.2
5.2	15	12	8	1	1	1	1	0.2	0.4	0.1	0 2	0.1	0.2	0.1	0.2
6.1	26	20	8	2	1	2	1	0.2	0.4	0.1	0 2	0.2	0.2	0.2	0.2
6.2	26	20	8	2	1	2	1	0 2	0.4	0.1	0.2	0.2	0.2	0.2	0.2
7.1	26	20	8	2	1	2	1	0 2	0.4	0.1	0 2	0 2	0.2	0.2	0.2
7.2	26	20	8	2	1	2	1	0.2	0.4	0 1	0.2	0.2	0.2	0.2	0.2
8	40	40	8	3	1	3	1	0.2	0.4			0.2	0.2	0.2	0.2
Factor of Averson [-]															
All Operating Cases	-	3	-	-	-	3	-	-	3	-	-	-	-	-	-

1) Train Series: 1st Train <- 2nd Train

Table N-4
Risk Values According to Basic Study

Operating Case	No. of Train Variations			a) Reference Risk	b) Risk in Mixed Service	Reduced Risk	
	Trains					c) With Consideration of the Increased Active Safety of LRVs	d) With Additional Flank Protection and Prohibition of Technically Unsafe Left-hand Operation
	Total	LRV	Railway				
1	40	30	10	1.0	1 7	0 94	
2	40	30	10	1 0	1.7	0.94	
3	60	40	20	1.0	1 7	0.88	
	60	30	30	1.0	1.5	0.91	
	60	50	10	1.0	1.8	0.84	
4	60	40	20	1.0	1 7	0.88	
	60	30	30	1 0	1.5	0.91	
	60	50	10	1.0	1.8	0.83	
5 1	70	40	30	1 0	1 6	0 90	
	70	50	20	1 0	1.7	0.87	
	60	30	30	1.0	1 3	0.91	
5.2	160	60	100	1 0	1 4	1.01	0.96
	160	70	90	1 0	1.5	1.00	0.94
	160	80	80	1.0	1.5	0.98	
	150	50	100	1.0	1.4	0.92	
	150	60	90	1 0	1 4	0.91	
6 1	80	40	40	1 0	1.2	0.70	
6 2	160	60	100	1.0	1.3	1.02	0.87
	160	40	120	1.0	1.2	1.06	0.91

Operating Case	No. of Train Variations			a) Reference Risk	b) Risk in Mixed Service	Reduced Risk	
	Trains					c) With Consideration of the Increased Active Safety of LRVs	d) With Additional Flank Protection and Prohibition of Technically Unsafe Left-hand Operation
	Total	LRV	Railway				
7.1	90	40	50	1.0	1.2	0.86	
	90	30	60	1.0	1.2	0.93	
	90	50	40	1 0	1.2	0 76	
	80	40	40	1.0	1.1	0 78	
7.2	200	40	160	1.0	1.3	1.15	0.94
	200	60	140	1 0	1 3	1.17	0.95
8.0	240	40	200	1.0	1.3	1.27	1.1

Note: The number of cases where LRV active safety features reduce risk below mixed service risk and reference risk!
Source: German Ministry of Railway

Table N-5
Comparison of Total Accidents and Accidents with Passenger Trains

Types of Accidents	Total Accidents (German Ry 1989-1992)		Accidents with Passenger Trains (German Ry 1989-1992)		
	Total	Per Year	Total	Per Year	% of Total Accident Occurrences
■ Collision	187	46.75	59	14.75	36.6%
☐ Head-on	10	2.50	4	1.00	40.0%
☐ Rear-end	123	30.75	46	11.50	37.7%
☐ Flanking	54	13.50	9	2.25	16.7%
■ Impact	1434	358.5	1013	253.2	70.6%
■ Collision	1344	336.0	756	189.0	56.3%
■ Derailment	154	38.5	28	7.0	18.2%
⇨ Total	3122	780.5	1856	464.0	59.5%

Source: German Ministry of Railways

Table 6
Summary of the Results of the Assessment

Authorization Possible from Assessment								
	C		E		F		G	
Operating Case	Of the Improved Braking Capability of the LRV Calculation C		Additionally to C of the Lower Vu for Flanking Trips of the LRV Calculation E		Additionally to E of the Prohibition on Switching on Tracks Occupied by LRVs Calculation F		Additionally to F Prohibition on Travel on the Wrong Track [which] is not Technically Safeguarded Calculation G	
	LRV Max. Speed = 90 km/h	LRV Max. Speed = 100 km/h	LRV Max. Speed = 90 km/h	LRV Max. Speed = 100 km/h	LRV Max. Speed = 90 km/h	LRV Max. Speed = 100 km/h	LRV Max. Speed = 90 km/h	LRV Max. Speed = 100 km/h
Secondary Lines								
1	Yes	-	Yes	-	(Yes)	-	-	-
2	Yes	-	Yes	-	(Yes)	-	-	-
3	Yes	-	Yes	-	(Yes)	-	-	-
4	Yes	-	Yes	-	(Yes)	-	-	-
Main Lines								
5.1	Yes	-	Yes	-	(Yes)	-		
5.2	No	-	with LRV>35%	-	Yes	-		
6.1	Yes	with LRV>45%	Yes	with LRV>45%	(Yes)	with LRV>25%*		
6.2	with LRV>45%	with LRV>80%	with LRV>40%	with LRV>80%	Yes	with LRV>70%		
7.1	with LRV>15%	with LRV>65%	with LRV>10%	with LRV>80%	Yes	with LRV>50%*		
7.2	with LRV>60%	with LRV>80%	with LRV>55%	with LRV>80%	with LRV>20%	with LRV>70%		

* Authorization will be possible through additional improvement of the safety of grade crossings.

Source: German Ministry of Railways

GENERAL JOINT USE GLOSSARY OF TERMS AND ABBREVIATIONS

(Some terms, especially foreign equivalents, are defined in the text and here. The Risk Assessment Guide definitions also appear in Chapter 6 (the Guide) and in this Glossary. Appendix L provides a Quick Reference Glossary of Japanese Railway Terms. (J) Japan or (G) German denotes origin of foreign terms.)

AAR	Association of American Railroads
ADA	Americans with Disabilities Act - Associated with level boarding, dimensions, and other standards requiring full access to rail transit systems by persons having a range of disabilities
ANSI	American National Standards Institute
APTA	American Public Transit Association
AVG	(Albtalbahn Verkehrsgesellschaft) A subsidiary of VBK, associated with the operation of the former Albtalbahn Interurban Railway and Hardtbahn freight railway that is corporately separate, but operationally integrated. These interurbans were the first stages of integrated joint use of tracks in Karlsruhe
AREA	American Railway Engineering Association (see AREMA)
AREMA	American Railway Engineering and Maintenance-of-Way Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
Articulated	In the context of this report, articulation is a semi-permanent, weather-protected coupling between units of a transit vehicle to permit long vehicles to negotiate tight track curvatures and allow passengers to pass between units
BARTD	Bay Area Rapid Transit District (San Francisco and East Bay rail transit carrier)
BTB 2002	(Bus Tram Bunn 2002) Bus Tram and Train-Year 2002 Project in Luxembourg city and region employing joint use of tram on railroad tracks
Bahn (G)	Railway. Usually combined with other titles or descriptors as a suffix or compound word, as in "Stadtbahn" or city/metropolitan railway and as in "Regionalbahn"

BOStrab (G)	(Bau und Betriebesordung fur Strassenbahnen.) German federal uniform regulations governing operation and physical standards of tramways/street railways
Buffing Strength	Regulated longitudinal compression limits exerted on car end buffing plates or anti-climbers, measured in pounds or kilo newtons, prescribed for various classes and modes of rail cars
Bund (G)	Federal Government of Germany, used as a prefix in compound words, such as "Bundesbahn" or "Federal Railroad"
CBD	Central Business District, or downtown commercial area
CFR	Code of Federal Regulations
C&S	Communications and Signaling
CSA	Canadian Standards Association
CSI	Construction Specifications Institute
Canton	A Swiss unit of Government comparable to a state or province
Carrier	An operating entity that conveys people or goods
Chokutsu unten (J)	Reciprocal running (literally, "direct communication" or "pass through running")
Clearance Plate	A sectional diagram of a rail car used by FRA in classifying and regulating standards for car dimensions and wayside clearance, usually expressed in an alpha code in ascending order of size, e.g., Plate B being smaller than Plate C
ConDOT	Connecticut Department of Transportation
DBAG (G)	(Deutsche Bahn, AG) German (Federal) Railways Inc., formed by merging the East German (Deutsche Reichsbahn [DR]) and West German (Deutsche Bundesbahn [DB]) on January 1, 1994. DBAG is wholly federally owned, but with the intention of being divided and privatized into separate *Infrastructure* (Fahrweg), *Passenger* (Personenverkehr) and *Freight* (Gutertransport) enterprises. The first step was to form these separate companies still held by DBAG as a holding company, then make offerings on the three affiliates
DBOM	"Design, Build, Operate, and Maintain" a turnkey procurement technique
DLRV	A Category 3 DMU derived from Light Rail Vehicle origin or type - characteristically dual power diesel and electric capable of

	operating on light rail track geometry and independently, off wire
DMU	Category 1 or 2 Diesel (mechanical or electric transmission) Multiple-Unit self-propelled rail car. Used generically to describe any internal combustion (including alternate fuel) propelled rail cars
Denki (J)	Electric
Densha (J)	Electric car
Dentetsu (J)	Electric railway
Dieselka (J)	Diesel car
Dual power	Rail vehicles which are capable of operating from on-board, internal combustion and wayside electrical (third rail or overhead catenary) power sources. Tri-power traditional refers to locomotives which. In addition to the above power sources, can operate off on-board battery power
Dual voltage	Rail vehicles, including locomotives which can operate of multiple wayside power voltages; third rail, catenary or both
Dynamic Envelope	Maximum exterior dimensional limits of a rail car (in section) accounting for bounce and sway of the car in motion used in quantifying clearances, the antonym being "static clearance"
EBO (G)	"Eisenbahn -Bau-und Betriebsordung" uniform federal railway operating and physical standards applying to interurbans and certain regional stadtbahns
Eidan (J)	Authority
EMU	Electric Multiple-Unit rail car - designed a motor, trailer, cab car sub-types which form various train consists for various purposes
EU	(European Union) In the context of this research, particularly as it relates, to economic and financial reforms required to join the Union and participate in the joint currency. EU measures (EU Directive 91-440 and EU Regulation 19893/91 ...) also apply to reform of railways
FOX	Florida Overland eXpress - high speed rail initiative
FRA	Federal Railroad Administration of USDOT
FTA	Federal Transit Administration of USDOT (formerly UMTA)

GVFG (G)	(Gemeinderverkehsfinanzierungsgesetz) German federal law (1971) which governs how federal funds will be passed through the Länder to municipal jurisdictions for public transit and road projects. Länder must rank projects by cost effectiveness and provide matching funds, much in the manner which MPOs and TIPs function in the U.S.). Typical matching ratios are; federal - 50%, Land - 35%, City - 15%, though these have changed over time
Gun (J)	A Japanese unit of government roughly equivalent to a county in North America
Hakubatsu (J)	Non-profit organization
Hazard	Source of potential harm or a situation with a potential for harm
ICC	Interstate Commerce Commission (dissolved in December 1996 by the ICC Termination Act of 1995 (Pub.L. No. 104-88, 109 Stat. 803, ICCTA) with most of its remaining regulatory powers going to the new STB within USDOT)
ICCTA	Interstate Commerce Commission Termination Act of 1995. Under the ICCTA..."the (Surface Transportation) Board does not have jurisdiction...over mass transportation provided by a local governmental authority" 49 USC
IEEE	Institute of Electrical and Electronics Engineers, Inc.
Interline	Reciprocal exchange of rolling stock, passengers, fare medium or other rights or objects governed by tariff or operating agreements
Interurban Railway	A predominantly passenger railway, usually electrically propelled which functions to connect separate urban areas or villages. Standards vary from railroad to light rail and tram. North American interurbans are usually street railway compatible, overseas interurbans are characteristically of light rail or rapid transit standard
Joint Running	(For purposes of this research) Co-mingled *railroad* and *rail transit* train operation using equipment that is significantly different in terms of buff strength, floor height and other physical and performance characteristics that may impact the consequences of accidents
Joint Use	Use of a facility by two or more transport modes, carriers, or sectors as in public/private also "joint operations" or "reciprocal running"
Jokan (J)	Through-running

Kabushikigaisha (J)	Company
Kaihatsu (J)	Development
Kaisha (J)	Company
Kamotsu (J)	Freight
Ken (J)	A Japanese unit of government called a prefecture which is generally smaller than a state or province, but has many of the same functions
Kido (J)	Tramway
kips	Thousand pounds of effort
Kodan (J)	Authority
Kreise (G)	A German unit of government comparable to a county in the United States
LIRR	MTA - Long Island Railroad
LRT	Light Rail Transit - A broad spectrum of rail transit capable of operating in mixed (street traffic, pedestrian, subway, elevated) environments. Typically, LRT is overhead electrically powered and functions flexibly in urban/suburban locations
LRV	Light Rail Vehicle - A term used by contemporary practitioners to differentiate higher performance versions of the traditional electric streetcar or tram to be used on varied exclusive and mixed traffic rail lines
Lande (G)	A German unit of government comparable to a state or province in North America
Länder (G)	Plural of Lande
Liability	A legal concept used to measure financial value of potential damage
Light Railway	A term stemming from English law and related to local railways, other than those under control of the Crown. "Light" usually, but not exclusively, refers to the type of construction and duty which dictates a light duty and usually light weight vehicle. Freight, passengers, steam and diesel "Light" railways exist. In contemporary use, "light rail" describes the difference between tram/streetcar of modest performance, operating most typically in street trackage, and newer, heavier LRVs operating predominantly on private right-of-way

MARC	(Maryland) Mass Transit Administration (Maryland Rail Commuter)
MARTA	Metropolitan Atlanta Rapid Transit Authority
MBTA	Massachusetts Bay Transportation Authority (Boston)
MIS	Major Investment Study - a federal process for evaluating and selecting surface transportation alternatives
MNRR	MTA Metro North Railroad
MOE	Maintenance of equipment
MOW	Maintenance of way
MOW&S	Maintenance of way and structures
MTDB	Metropolitan Transit Development Board (San Diego)
Mitigation	Also known as risk controls - action including regulation, supervision, redundant systems, equipment modifications, etc. that are designed to reduce either the *frequency component* of risk or the *consequences (severity) component* of risk
Mode	A particular form of travel as in bus, walk, railroad
NJDOT	New Jersey Department of Transportation
NJT	NJ TRANSIT
NTSB	National Transportation Safety Board
NWP	Northwestern Pacific RR Co.
Open Access	An operating concept rooted in the earliest railroad experience when a railroad owner permitted any qualified carrier to enter and run upon its tracks in exchange for an agreed-to fee or toll. Implicit in this "open access" arrangement is joint use by several carriers of common trackage. In contemporary form, "open access" applies to prioritizing by splitting of national railroads into infrastructure (host) and multiple operating (tenant) companies. The operators then bid to provide services on the infrastructure company's tracks. It does not mean free access
PAT	Port Authority of Allegheny County (Pittsburgh rail, bus and incline operator)
PATCO	Port Authority Transit Corporation (Philadelphia-Lindenwold rail rapid transit)

PATH	Port Authority Trans-Hudson Corporation (Newark and New York City "railroad," operated as rail rapid transit but regulated as a railroad)
PRESS	Passenger Rail Equipment Safety Standards, an APTA committee formed to provide advice on rail equipment standards. Members include passenger RR, Rail Labor, suppliers, and nonvoting FRA, FTA, and NTSB
PTS, PTC	Positive Train Separation, Positive Train Control - two systems - Communications based train location and control systems using global positioning and other technologies to reduce risk of train collisions. Tests and demonstrations underway
PUC	Public Utilities Commission (state regulatory body known by different names, such as "Public Services Commission")
PennDOT	Pennsylvania Department of Transportation
"Private"	In Japan, "private" sector railway does not necessarily denote non-public ownership. In the context of three sectors of railways, there is the *First Sector*, consisting of national or federal (JR) railroads which are destined for private ownership through issuance of stock, *Second Sector* "private" either municipal, prefecture or privately owned railways and *Third Sector*, a combination of public and private ownership. These sectors are explained in greater detail in Chapter 8
RA	Risk Assessment; a mathematical process by which hazards can be measured and mitigation techniques quantified to compare a proposed risk condition with an existing one for the purpose of driving management decisions
Rail Bus	A passenger rail vehicle, (typically non-articulated or rigid frame) derived from bus propulsion and construction technology, but which may evolve into larger dimensions, performance and characteristics similar in appearance to a small Category 1 DMU. (See chapter 8 for a full description of this type rail vehicle in its several forms.) Rail buses are characteristically non-FRA
Rail Car Transmissions: *Electrical*	Electric traction motors transmitting energy as the final drive in rail car propulsion. In a typical electric-drive DMU application, motor leads/wires convey electrical energy between the car body mounted diesel/alternator set and the swiveling truck where traction motors are mounted. Some motors are car body-mounted

Mechanical	Hydraulic fluid coupling, or geared mechanical transmission provide the final drive, usually through angle drive (cardan or drive shaft and universal joints) couplings. In a typical mechanical drive DMU, shaft and universals convey mechanical energy between car body-mounted diesel prime mover and truck-mounted gear case. This relatively inflexible arrangement reduces minimum radius track curvature capability of the car
Rapid Transit	As used in the report; heavy rail, subway or elevated urban rail transit mode
RDC	A Budd stainless steel DMU built in the 1940s-50s. RDC has become for some a generic term to describe an FRA-compliant DMU
Reciprocal Running	Joint use by one or more owners of track in which each entity yields operating rights to the other(s) in exchange for gaining similar rights
Rerubasu (J)	Railbus
Reservation	An exclusive or semi-exclusive alignment dedicated for rail transit, usually in a roadway median or along the shoulder. May be a transit dedicated traffic lane
Risk	The chance of injury or loss as defined as a measure of the probability and severity of adverse effect to health, property, the environment, or something else of value.(Canadian Standards Association - CSA, 1977)
Risk	Combination of frequency, or probability, of occurrence and the consequence of a hazardous event (International Electrotechnical Commission (IEC), 1995)
Risk	Vulnerability to hazards or damage that may be expressed as a mathematical likelihood (Webster)
Risk Analysis	Systematic use of available information to identify hazards and to estimate the risk to individuals or population, property or the environment (IEC, 1995)
Risk Assessment	Overall process of risk analysis and risk evaluation (IEC, 1995)
Risk Evaluation	Process in which judgements are made on the tolerability of the risk on the basis of risk analysis and taking into account factors such as socio-economic and environmental aspects. (IEC, 1995)
Risk Management	An element of safety management function that evaluates effects of potential hazards...by considering acceptance, control or

	elimination of such hazards with respect to expenditure of resources
RLA	Railway Labor Act
Ryokaku (J)	Passenger
SBS	Stadtbahn Saar or "Saarbahn" for short, Saarbrucken "City" or Metropolitan Railway Transit System
SCADA	Supervisory Control and Data Acquisition, a computerized system for monitoring and managing transit electronic traction power and operations
SDTI	San Diego Trolley, Inc. (LRT operator)
Shi (J)	A Japanese form of municipal government equivalent to a city. Smaller units of municipal government include *machi* (towns) and *mura* (villages)
SIRT	Staten Island Rapid Transit now operated as MTA - Staten Island Rapid Transit (formerly known as "SIRTOA" with "Operating Authority" part of its title
SNCF	Sociètè Nationale des Chemins de Fer Francais (French National Railways)
STB	Surface Transportation Board, which assumed some regulatory responsibilities of the ICC
Sen, -sen (J)	Line
Shiei (J)	City-operated
Shinkansen (J)	New trunk line
Shunt	In joint use context, closing a track circuit to indicate the presence of a train and to activate control systems or grade-crossing protection devices. Also applies to traction motor controls
Sogo nori-ire (J)	Reciprocal running (literally, "two people facing each other's territory," "to turn around, wheel, or revolve," or "combined into other place"
Stadtbahn (G)	Literally "city railway" "S bahn" or metropolitan rail system which can be based on light rail, pre-metro, heavy rail or some combination with railroad. In Karlsruhe, Stadtbahn is LRT-based running on railroad. In Berlin, the S bahn is heavy rail in

	character and is referred to as the "Schneubahn" or rapid railway
TSC	Volpe National Transportation Systems Center, a research arm of USDOT
(T)SSPP	(Transit) System Safety Program Plan - Statewide developed plans required of each of the 19 states where rail transit exists
TRB	Transportation Research Board, a unit of the National Research Council that is the principal operating arm of the National Academy of Sciences, National Academy of Engineering and Institute of Medicine
TCRP	Transit Cooperative Research Program, a program of TRB to advance research into issues within the transit industry
Temporal Separation	"Temporal separation" has been explained earlier in the text. This report uses the term to describe a time separation into lengthy blocks of time when the tracks are dedicated to one of the joint users exclusively. In effect, the railroad is shut down during the transition between periods of exclusive use, while it is verified that the previous user is off the tracks. Baltimore and current San Diego operations are examples of temporal separation. As we have pointed out earlier, temporal separation is exclusive, not joint use. Temporal separation has been described commonly as a form of joint use, but the term may be misapplied (for purposes of this research) since the track cannot be occupied concurrently This research is directed at the feasibility of simultaneous shared track or co-mingled operation by a mixture of railroad and rail transit users. A-17 also differentiates between temporal separation and blocks of *exclusive* track use or time windows when one of the joint users may be permitted to *share* the tracks in mixed traffic, or schedule gaps when trains can be fit into a joint schedule. These degrees of track sharing using time as a separation control and enforcement device are described as scheduling strategies in Chapter 1
Tetsudo (J)	Railway
Third Sector (J)	A Japanese institution for railway ownership and operation, but found elsewhere under different names. A public private partnership formed typically to prevent the discontinuance of former JNR branch line railroads by purchase, reorganizing, modernizing and executing operating reforms. Third Sector railway partners jointly finance and manage a railway for a common economic or special purpose. Third sector railways are common practitioners of joint freight and passenger use

Tram	An overseas term for streetcar or trolley which operates almost exclusively in mixed traffic environment. Trams are differentiated from light rail vehicles in having lighter type construction, reduced top, speed and configured for high-density short trips and high passenger turnover
Truck	In rail transportation, a rail car supporting wheel assembly consisting of frame, journal bearings, usually two axles and four wheels, and brake rigging, all of which pivots from a pin in the car body bolster that allows the assembly to swivel while negotiating curve track. May have axle or truck frame-mounted traction motors. In Europe, the term "bogie" applies
UIC	International Union (Association) of Railways or Union Internationale des Chemins de Fer. An international equivalent of Association of American Railroads (AAR)
UITP	International Union (Association) of Public Transport or Union Internationale des Transports Publics. An international equivalent of American Public Transit Association (APTA)
VBK	(Verkehrsbetriebe Karlsruhe) Karlsruhe Transit System part of city administration
VDV (G)	Association of German Transport Undertakings (Verband Deutscher Verkehrsunternehmen) roughly a German equivalent to APTA in North America
VRE	Virginia Railway Express
WMATA	Washington (DC) Metropolitan Area Transit Authority
Wayside	An operations support facility or auxiliary located along the right-of-way of a rail property such as wayside signals or wayside power distribution

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Abbreviations used without definitions in TRB publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ITE	Institute of Transportation Engineers
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
SAE	Society of Automotive Engineers
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
U.S.DOT	United States Department of Transportation