

SPOKANE, PORTLAND & SEATTLE RAILWAY CO.

System Lines

TIME TABLE

No. 104

To be used in conjunction with
Current Special Instruction Book

Effective 12:01 A. M. Pacific Time

SUNDAY, SEPTEMBER 18, 1949

For the government of employes only. The Company reserves the right to vary therefrom at pleasure. Be positive that you have the Current Time Table and destroy all previous numbers. Read carefully the Special Instructions and always carry a copy for reference and a copy of OPERATING RULES.

Think! Is it Safe?

E. H. SHOWALTER, Superintendent

E. B. STANTON, Vice-Pres. & Genl. Mgr.

2 Westward

TERMINALS SUB-DIVISION—VANCOUVER TO PORTLAND

Westward

Water, Fuel, Wyes, Turn Tables, Scales, Standard Clocks & Bulletin Boards and Yard Limits, etc.	Station Numbers	Car Capacity		Distance from Spokane	TIME TABLE No. 104 SEPTEMBER 18, 1949		Distance from Vancouver	FIRST CLASS							
		Sidings	Other Tracks		STATIONS										
					701	3		1	703	5	705	707	709		
								U. P. 402	S. P. & S.	S. P. & S.	G. N. 460	S. P. & S.	N. P. 408	S. P. & S. 22	U. P. 458
								Passenger	Passenger	Passenger	Passenger	Passenger	Passenger	Passenger	Passenger
								Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
WTYOP RKXZBV	10		Yard	369.5	DN.....VANCOUVER.....MX 1.4	DOUBLE TRACK	0.0	L 6.15AM	L 6.20AM	L 7.08AM	L 1.20PM	L 4.00PM	L 4.10PM		L 8.47PM
	9			370.9	.....NORTH PORTLAND..... 0.5		1.4				f 1.25	f 4.05			
IJPV	8		Jct.	371.4	DN..NORTH PORTLAND Jct..KD 1.1		1.9	A 6.20AM	6.25	7.13	1.26	4.06	4.15		A 8.52PM
XPV	7	60	186	372.5	.....EAST ST. JOHNS..... 2.7		3.0		6.28	7.15	f 1.29	f 4.08	4.17		
IRXJP	4		Yard	375.2	DN.....WILLBRIDGE.....BE 2.3		5.7		6.33	7.19	1.34	4.12	4.21	L 6.36PM	
RKXPV	2		Yard	377.5	DN.....LAKE YARD.....C 2.0		8.0		6.38	7.22	1.39	4.16	4.25	6.40	
PRKXBV				379.5	DN..PORTLAND, Union Sta..VC		10.0	A 6.50AM	A 7.30AM	A 1.50PM	A 4.25PM	A 4.35PM	A 6.50PM		
WTOBP RKXZV	0		Yard	379.5	DN...PORTLAND, Hoyt St....OW		10.0								
								0.05 22.8	0.30 20.0	0.22 27.3	0.30 20.0	0.25 24.0	0.25 24.0	0.14 18.4	0.05 22.8
								Time Over District Average Speed Per Hour							

Eastward

TERMINALS SUB-DIVISION—PORTLAND TO VANCOUVER

Eastward

Water, Fuel, Wyes, Turn Tables, Scales, Standard Clocks & Bulletin Boards and Yard Limits, etc.	Station Numbers	Car Capacity		Distance from Spokane	TIME TABLE No. 104 SEPTEMBER 18, 1949		Distance from Portland	FIRST CLASS							
		Sidings	Other Tracks		STATIONS										
					700	6		702	704	2	706	4	708		
								S. P. & S. 21	S. P. & S.	U. P. 457	N. P. 407	S. P. & S.	G. N. 459	S. P. & S.	U. P. 401
								Passenger	Passenger	Passenger	Passenger	Passenger	Passenger	Passenger	Passenger
BWTYO PRKXZV	10		Yard	369.5	DN.....VANCOUVER.....MX 1.4	DOUBLE TRACK	10.0		A 9.21AM	A 9.26AM	A 12.22PM	A 3.20PM	A 4.51PM	A 9.21PM	A 11.55PM
	9			370.9	.....NORTH PORTLAND..... 0.5		8.6		9.17	f 9.22					
PIJV	8		Jct.	371.4	DN..NORTH PORTLAND Jct..KD 1.1		8.1		9.16	L 9.21AM	12.17	3.15	4.46	9.16	L 11.50PM
XPV	7	60	186	372.5	.....EAST ST. JOHNS..... 2.7		7.0		f 9.14		12.15	3.13	4.44	9.14	
IPRXJ	4		Yard	375.2	DN.....WILLBRIDGE.....BE 2.3		4.3	A 8.20AM	9.10		12.11	3.09	4.40	9.10	
RKXPV	2		Yard	377.5	DN.....LAKE YARD.....C 2.0		2.0	8.16	9.06		12.07	3.05	4.36	9.06	
PRKXBV				379.5	DN..PORTLAND, Union Sta..VC		0.0	L 8.10AM	L 9.00AM		L 12.01PM	L 3.00PM	L 4.30PM	L 9.00PM	
PBWTO RKXZV	0		Yard	379.5	DN...PORTLAND, Hoyt St....OW		0.0								
								0.10 25.8	0.21 28.6	0.05 22.8	0.21 28.6	0.20 30.0	0.21 28.6	0.21 28.6	0.05 22.8
								Time Over District Average Speed Per Hour							

When Single Track is used, Eastward Trains are Superior to trains of the same class in the opposite direction.

Rule (D97) is in effect on this Sub-Division.

At Lake Yard all first class trains will register by ticket per Rule 83(A), other trains will not be required to register.

At Willbridge, all westward trains, except first class, on Terminals Sub-Division, and all except first class trains from the Portland Division, will require a check of register in train order form.

At North Portland Jct., trains will not be required to comply with Rule D-83.

At Vancouver and Willbridge, trains will register by ticket per Rule 83(A).

At Vancouver, all westward trains, except first class on Terminals Sub-Division, will require a check of register in train order form.

Water, Fuel, Wyes, Turn Tables, Scales, Standard Clocks & Bulletin Boards and Yard Limits, etc.	Station Numbers	Car Capacity		FIRST CLASS			Distance from Spokane	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Portland	FIRST CLASS		
		Sidings	Other Tracks	5	1	3				6	2	4
				Passenger	Passenger	Passenger				Passenger	Passenger	Passenger
				Daily	Daily	Daily						
JBWOR YPKXZ	106		Yard	L 1.25PM	L 5.23AM	L 4.05AM	273.4	DN... WISHRAM... X 3.3	106.1	A 12.23PM	A 5.13PM	A 12.05AM
P	103	146	70W	f 1.30	5.27	4.10	276.7	..... AVERY..... 8.8	102.8	f 12.16	5.08	11.57PM
P	94	131	8	f 1.41	5.36	4.20	285.5	..... NORTH DALLES..... 8.7	94.0	f 12.03PM	4.58	11.45
B JWTOP	85	80	142	s 1.52	5.45	f 4.33	294.2	DN..... LYLE..... YA 9.7	85.3	s 11.50AM	4.48	s 11.33
P	76	131	132	s 2.07	5.55	f 4.47	303.9	DNBINGEN-WHITESALMON.WS 2.9	75.6	s 11.35	4.37	s 11.08
P	73		40	f 2.12			306.8	..... UNDERWOOD..... 1.8	72.7	f 11.20		
P	71	82	7	f 2.15	6.00	4.53	308.6	..... HOOD..... 5.1	70.9	f 11.15	4.32	10.55
	66		13W	f 2.21		4.59	313.7	..... COOKS..... 6.5	65.8	f 11.08		10.48
P	59	130		f 2.29	6.12	5.08	320.2	..... HOME VALLEY..... 1.6	59.3	f 11.00	4.20	10.40
W	58		6W	f 2.32		5.10	321.8	..... CARSON..... 3.9	57.7	f 10.57		10.38
P	54	79	34	s 2.38	6.18	5.15	325.7	DN... STEVENSON... NS 5.0	53.8	s 10.51	4.14	10.33
P	49	130	49	s 2.45	6.23	5.21	330.7	..... NORTH BONNEVILLE... 6.0	48.8	s 10.40	4.09	10.26
WP	43	84	17	f 2.53	6.29	5.28	336.7	N..... SKAMANIA..... SI 5.0	42.8	f 10.28	4.03	10.19
P	38		10E	f 3.00		5.34	341.7	..... PRINDLE..... 5.6	37.8	f 10.20		10.12
P	32	131		f 3.08	6.40	5.42	347.3	..... MT. PLEASANT..... 4.6	32.2	f 10.11	3.51	10.04
WP	28	107	14	f 3.15	6.45	5.48	351.9	..... WASHOUGAL..... 3.2	27.0	f 10.03	3.46	9.58
P	24	84	75	s 3.23	6.49	5.53	355.1	DN..... CAMAS..... MA 5.1	24.4	s 9.55	3.41	9.53
P	19	142	4	f 3.35	6.54	6.00	360.2	..... FISHER..... 4.8	19.3	f 9.45	3.35	9.46
P	15	84		3.42	6.59	6.06	365.0	..... McLOUGHLIN..... 2.3	14.5	9.39	3.30	9.40
		101		3.45	7.02	6.10	367.3	..... EAVAN..... 2.2	12.2	9.35	3.27	9.35
PWTY BOKXR VZ	10		Yard	A 3.55PM	A 7.05AM	A 6.15AM	369.5	DN... VANCOUVER... MX	10.0	L 9.30AM	L 3.23PM	L 9.30PM
										Daily	Daily	Daily
				2.30 38.4	1.42 56.5	2.10 44.4		Time Over District Average Speed Per Hour		2.53 33.3	1.50 52.4	2.35 37.2

EASTWARD TRAINS ARE SUPERIOR TO TRAINS OF THE SAME CLASS IN THE OPPOSITE DIRECTION

At Vancouver all westward trains to and eastward trains from Terminals Subdivision will register by ticket per Rule 83(A).

Water, Fuel, Wyes, Turn Tables, Scales, Standard Clocks & Bulletin Boards and Yard Limits, etc.	Station Numbers	Car Capacity		FIRST CLASS			Distance from Spokane	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Portland	FIRST CLASS		
		Sidings	Other Tracks	3	15	1				4	16	2
				Passenger	N.P. 348 Passenger	Passenger				Passenger	N.P. 347 Passenger	Passenger
BCKO PRTW XYZ	381		Yard	Daily	Daily	Daily	3.2	DN.....YARDLEY.....YD 3.2	380.7			
BKP RXZ	378		Yard				0.0	DN SPOKANE (N.P. Depot) SF 8.7	377.5			
LJPV WXY							8.7	DN MARSHALL JCT.(N.P.) MR	368.8			

BETWEEN MARSHALL JUNCTION AND YARDLEY, TRAINS WILL BE GOVERNED BY N. P. RY., IDAHO DIV. TIME TABLE AND RULES

BIKO PRTW XYZ	384		Yard				4.8	DN.....HILLYARD (G.N.) HU 4.8	384.3			
BKPR WXZ	380		Yard	L 9.30PM		L 12.06AM	0.0	DN SPOKANE (G.N. Depot).PD 2.3	379.5	A 6.50AM		A 10.55PM

BETWEEN FT. WRIGHT AND HILLYARD, TRAINS WILL BE GOVERNED BY G. N. RY. SPOKANE DIVISION TIME TABLE AND RULES

Station	Station Numbers	Sidings	Other Tracks	FIRST CLASS			Distance from Spokane	STATIONS	Distance from Portland	FIRST CLASS		
				3	15	1				4	16	2
LJPVXY	377			L 9.35PM		L 12.11AM	2.3	DN...FORT WRIGHT..FW	377.2	A 6.43AM		A 10.48PM
P	371	129		9.44		12.17	8.2	.....OVERLOOK.....	371.3	6.35		10.40
JP	368	73		9.50		12.21	11.7	DN...SCRIBNER.....SC	367.8	6.30		10.36
WP	360	78	13	10.02		12.29	19.2	.....SOUTH CHENEY....	360.3	6.18		10.27
P	355	120		² 10.20		12.35	24.7	.....MOCK.....	354.8	6.10		³ 10.20
P	350		13W	^s 10.26			29.8	.....AMBER.....	349.7	^s 6.02		
P	344	78	23	10.33		12.46	35.6	.....RODNA.....	343.9	5.54		10.06
CWOP	335	EB 139 WB 96	120	^s 10.43		12.55	44.1	DN...LAMONT.....A	335.4	^s 5.44		9.57
P	329		37E	10.50			50.1	.....ROCKWELL.....	329.4	5.32		
P	323	129	16	10.57		1.07	56.1	.....MACALL.....	323.4	5.25		9.45
WP	311	131	31	^s 11.11		1.19	68.3	D.....BENGE.....BN	311.2	^s 5.12		9.33
P	300	130	13	11.24		1.31	79.7	.....HOOPER.....	299.8	4.58		9.19
CWP	291	EB 136 WB 74	30	^s 11.34		1.39	88.1	DN...WASHUCNA...WA	291.4	^s 4.48		9.09
P	285	80	19	11.41		1.45	94.4	.....SPERRY.....	285.1	4.38		9.02
P	278	130	85	^s 11.50PM		1.53	102.0	D.....KAHLOTUS.....K	277.5	^s 4.29		8.54
WP	269	87	5	12.03AM		2.06	110.4	.....FARRINGTON.....	269.1	4.15		8.40
P	263	64		12.12		2.15	116.9	.....BURR.....	262.6	4.06		8.30
JV							122.6	...SNAKE RIVER JCT....	256.9			
P	257	80	60	^s 12.21		2.24	122.8	DN...SNAKE RIVER...SR	256.7	^s 3.57		8.21
P	254	130		12.25		2.27	125.5	.....VOTAW.....	254.0	3.53		8.16
P	251	79	20	12.29		2.30	128.5	.....REDD.....	251.0	^s 3.49		8.12
P	245	130	9	12.36		2.36	134.9	.....LEVEY.....	244.6	3.40		8.05
P	238	69		12.43		2.43	141.4	.....MARTINDALE.....	238.1	3.32		7.58
JPV	234			12.48	L 11.20PM	2.48	146.0	...AINSWORTH JCT....	233.5	3.27	A 5.37AM	7.52
PZXTCY WRBOK V	231		Yard	A 1.00AM	A 11.35PM	A 3.00AM	148.2	DN.....PASCO.....PA	231.3	L 3.15AM	L 5.30AM	L 7.40PM
										Daily	Daily	Daily
				3.30 42.3	0.15 11.2	2.54 51.1		Time Over District Average Speed Per Hour		3.35 41.4	0.07 24.0	3.15 45.6

AUTOMATIC BLOCK

EASTWARD TRAINS ARE SUPERIOR TO TRAINS OF THE SAME CLASS IN THE OPPOSITE DIRECTION

Water, Fuel, Wyes, Turn Tables, Scales, Standard Clocks & Bulletin Boards and Yard Limits etc.	Station Numbers	Car Capacity		SECOND CLASS			Distance from Goldendale	TIME TABLE No. 104 SEPTEMBER 18, 1949	STATIONS	Distance from Lyle	SECOND CLASS	
		Sidings	Other Tracks	121		120						
				Mixed	Daily Ex. Sat.	Mixed					Daily Ex. Sat.	
BWYR P	G42		72	L 6.30PM	0.0	D.....GOLDENDALE.....GD	41.6	A 2.40AM				
P	G35		21	s 6.50	6.3	.....CENTERVILLE.....	35.3	s 2.15			
P	G30		18	f 7.06	11.4	.....WARWICK.....	30.2	f 1.55			
	G23		8W	7.29	18.9	.....SWALE.....	22.7	1.25			
	G17		15	f 7.47	24.7	.....WAHKIAKUS.....	16.9	f 1.00			
PW (1/2 Mi. E) X	G14	27		s 7.58	28.2	D.....KLUCKITAT.....KI	13.4	s 12.45				
	G10		8	f 8.08	31.3	.....PITT.....	10.3	f 12.35			
P	G 6			f 8.20	35.2	.....WRIGHTS.....	6.4	f 12.20AM			
BRWTO PJX	85	80	142	A 8.40PM	41.6	DN.....LYLE.....YA	0.0	L 1.55PM				
				2.10 19.2				Daily Ex. Sat. 2.45 15.1				
Time Over District Average Speed Per Hour												

EASTWARD TRAINS ARE SUPERIOR TO TRAINS OF THE SAME CLASS IN THE OPPOSITE DIRECTION
Except No. 121 is Superior to No. 120, Goldendale to Lyle

VANCOUVER DIVISION

Conditional Stops to Dispatch U. S. Mail; to Discharge Revenue Passengers upon Application to Conductor or to Pick Up Revenue Passengers upon Advance Arrangements through Agents

Train	At	Discharge Passengers From	Pick Up Passengers Destined To
3	Any Station	East of Spokane	
3	Any Station West of Pasco	Spokane	
3	Any Station East of Pasco		Vancouver and Portland
3	Hooper	Spokane	
3	Redd to Dispatch U. S. Mail		
3	Maryhill		Bingen-White Salmon, Vancouver and Portland
3	Stevenson		Vancouver and Portland
3	Camas	Pasco or Beyond	
4	Any Station		East of Spokane
4	Any Station West of Pasco		Spokane
4	Any Station East of Pasco	Portland and Vancouver	
4	Camas		Pasco or Beyond
4	Stevenson	Portland and Vancouver	
4	Maryhill	Portland, Vancouver and Bingen-White Salmon	
4	Hooper Daily Except Sunday	Any Station	Any Station where Scheduled to Stop

Conditional Stops to Discharge or Pick Up Passengers

Train	At	Discharge Passengers From	Pick Up Passengers Destined To
5	Moonax M. P. 152.6 on Flag	Any Station	Any Station
5	North McNary & Spearfish on Flag	Any Station	Any Station
6	Moonax M. P. 152.6 on Flag	Any Station	Any Station
6	Spearfish & North McNary on Flag	Any Station	Any Station

When No. 3 will not reach Vancouver by 8:45 A. M., back haul U. S. Mail for No. 6 will be dispatched at Stevenson.
When No. 3 will reach Portland later than 8:30 A. M., U. S. Mail for transfer to U. P. No. 457 will be dispatched at Vancouver, but when No. 3 arrives Vancouver after departure No. 457, this mail will be handled through to Portland.
When No. 1 will reach Portland later than 8:15 A. M., U. S. mail pouches for transfer to U. P. No. 457 will be dispatched at Vancouver.
When No. 1 will reach Portland prior to departure time of No. 6, U. S. Mail pouch from Williston and Seattle M. D. Train 1 should be handled through to Portland.

Water, Fuel, Wyes, Turn Tables, Scales, Standard Clocks & Bulletin Boards and Yard Limits, etc.	Station Numbers	Car Capacity		THIRD CLASS			SECOND CLASS		Distance from Bend	TIME TABLE No. 104 SEPTEMBER 18, 1949			Distance from Wishram	SECOND CLASS		THIRD CLASS		
		Sidings	Other Tracks				313	103		STATIONS				102	314			
							U. P. Mixed	Oregon Trunk Mixed						Oregon Trunk Mixed	U. P. Mixed			
BYOVZ PWRKX	T-151		Yard			L 5.00AM	L 8.00PM	0.0	DN...BEND.....D	151.5	A 6.30AM	A 2.30PM						
P	T-144	50	20			5.18	f 8.18	7.3	.....DESCHUTES.....	144.2	f 6.05	2.08					
WXP	T-135	101	227			¹⁰² 5.45	s 8.50	16.5	DN..REDMOND.....RD	135.0	³¹³ s 5.45	1.40						
JPV	T-132	87	45			6.15	f 8.58	19.2	D.PRINEVILLE JCT...XN	132.3	f 5.20	1.31						
P	T-129	49				6.24	f 9.05	22.0	.....TERREBONNE.....	129.5	f 5.15	1.22					
P	T-122	115	24			6.46	f 9.25	29.5	.....OPAL CITY.....	122.0	f 5.01	12.58					
P	T-115	52	41			7.07	s 9.43	36.6	.....CULVER.....	114.9	s 4.48	12.36					
OTWXP	T-110	100	179			7.22	s 9.55	41.3	DN..METOLIUS.....MS	110.2	s 4.40	12.22						
	T-108		4					43.9	.....AGENCY.....	107.6							
WP	T-105	51	60			7.37	s 10.10	46.3	D...MADRAS.....MD	105.2	s 4.30	12.05PM						
P	T-100	114	4			7.54	f 10.26	52.0	.....PAXTON.....	99.5	f 4.04	11.48AM					
P	T-94	34	23			8.10	s 10.41	57.5	D...GATEWAY.....GW	94.0	s 3.48	11.30						
PW ½ ML W	T-86	22	20			8.30	f 11.03	65.7	N...SOUTH JCT.....SJ	85.8	f 3.26	11.08						
YP	T-84					8.34	11.07	67.5	.....JERSEY WYE.....	84.0	3.22	11.03					
P	T-80	123				8.43	f 11.18	71.2	.....KASKELA.....	80.3	f 3.15	10.53					
P	T-75					8.56	f 11.31	76.1	D...DAVIDSON.....UN	76.4	f 3.05	10.40						
P	T-74		25E			9.01	f 11.36	77.9	.....DANT.....	73.6	f 3.01	10.35					
	T-68		20			9.15	f 11.51PM	84.0	.....FRIEDA.....	67.5	f 2.49	10.18					
WP	T-64	50				9.25	f 12.01AM	87.7	.....NENA.....	63.8	f 2.41	10.08					
P	T-55 A	93				³¹⁴ 9.45	12.25	96.1	.....CAMBRAI.....	55.4	2.25	³¹³ 9.45					
P	T-55		28			9.47	s 12.27	96.8	DN...MAUPIN.....AU	54.7	s 2.23	9.43						
WP	T-51		24			9.57	f 12.36	100.7	.....TUSKAN.....	50.8	f 2.15	9.34					
P	T-48		50W			10.05	f 12.44	108.8	.....SHERAR.....	47.7	f 2.09	9.26					
P	T-40	99				10.25	f 1.10	111.6	.....OAKBROOK.....	39.9	f 1.53	9.07					
P	T-31	50				10.48	f ¹⁰² 1.34	120.9	.....SINAMOX.....	30.6	f ¹⁰³ 1.34	8.44					
WP	T-26	48				10.59	f 1.50	125.2	N...DIKE.....DI	26.3	f 1.25	8.34						
P	T-18	113				11.20	f 2.09	133.5	.....LOCKIT.....	18.0	f 1.08	8.13					
P	T-12		27E			11.37	f 2.25	139.9	.....KLOAN.....	11.6	f 12.55	7.57					
P	T-6	90				11.52AM	f 2.40	145.8	.....MOODY.....	5.7	f 12.43	7.40					
	T-2A						2.46	149.2	.....CELILO.....	2.3	f 12.36						
VXJP	T-2					A 12.01PM	2.48	160.0	N...O. T. JCT.....VO	1.5	12.34	L 7.30AM						
JBWOP RXXZY	106		Yard				A 3.00AM	151.5	DN..WISHRAM.....X	0.0	L 12.30AM							
						7.01 21.6	7.00 21.6		Time Over District Average Speed Per Hour		Daily 6.00 25.3	Daily Ex. Sun. 7.00 21.6						

EASTWARD TRAINS ARE SUPERIOR TO TRAINS OF THE SAME CLASS IN THE OPPOSITE DIRECTION

Water, Wyes, Turntables, Alca, Fuel, Saw, Standard, Coal, Blk, Bldg., Register, Yard Lumber.	Station Numbers	Car Capacity		SECOND CLASS		FIRST CLASS		Distance from Portland	TIME TABLE No. 104 SEPTEMBER 18, 1949		Distance from Seaside	FIRST CLASS		SECOND CLASS	
		Sidings	Other Tracks	231		21			STATIONS	22		230			
				Freight		Passenger				Passenger		Freight			
				Daily Ex. Saturday	Daily	Daily	Daily								
JRXP	4		Yard	l 7.30PM	L 8.20AM	4.3	DN.....WILLBRIDGE.....BE	113.7	A 6.36PM	A 4.45AM					
XP	A7	28	273	7.38	f 8.26	7.3	D.....LINNTON.....IN	110.7	f 6.30	4.37					
JX	A10			A 7.45PM	8.31	10.0	.....UNITED JCT.....	108.0	6.24	L 4.30AM				
PX	A11				8.33	10.5	DN.....RIVER JCT.....EJ	107.5	6.23						
	A13	29			8.36	12.6	.....HOLBROOK.....	105.4	6.19					
	A20	34	33		s 8.49	19.9	D.....SCAPPOOSE.....SQ	98.1	s 6.08						
	A24		19W		f 8.56	24.3	.....WARREN.....	93.7	f 6.00					
W	A28	52	17		s 9.04	27.6	DN.....ST. HELENS.....H	90.4	s 5.54						
	A30				f 9.09	30.0	.....COLUMBIA CITY.....	88.0	f 5.46					
	A31	43			9.11	31.3	.....WATERVIEW.....	86.7	5.44					
	A33		11W		f 9.14	33.2	.....DEER ISLAND.....	84.8	f 5.41					
XP	A39	20	60		f 9.25	39.4	.....GOBLE.....	78.6	f 5.31					
W1½ Ml. West	A42				f 9.30	41.9	.....PRESCOTT.....	76.1	f 5.26					
XP	A46		8		s 9.40	45.8	.....RAINIER.....	72.2	s 5.20					
X	A47	53	13W		9.42	46.8	.....AVON.....	71.2	5.16					
P	A56	50	13		s 10.02	55.8	.....MAYGER.....	62.2	f 4.59					
	A58				f 10.06	58.0	.....LOCODA.....	60.0	f 4.55					
	A59		15W		s 10.09	59.3	.....QUINCY.....	58.7	f 4.53					
P	A62	45	70		s 10.18	62.2	DN.....CLATSKANIE.....CN	55.8	s 4.47						
	A67		10W 23W		f 10.28	66.6	.....MARSHLAND.....	51.4	f 4.37					
WP	A71	29	41		s 10.39	71.2	.....WESTPORT.....	46.8	s 4.29					
P	A74		50		s 10.44	73.5	.....WAUNA.....	44.5	s 4.24					
P	A77		14		f 10.51	76.8	.....BRADWOOD.....	41.2	f 4.18					
P	A78	43			f 10.56	78.4	.....CLIFTON.....	39.6	f 4.14					
	A83		2E		f 11.05	83.3	.....BROWNSMEAD.....	34.7	f 4.05					
	A85				f 11.10	84.9	.....BLIND SLOUGH.....	33.1	f 4.01					
P	A87	20	5W		f 11.14	86.5	.....KNAPPA.....	31.5	f 3.58					
	A90	15	2W		f 11.22	90.2	.....SVENSEN.....	27.8	f 3.50					
WTOZP BKXR	A100		Yard		s 11.55AM	99.7	D.....ASTORIA.....BO	18.3	s 3.30						
JYX	A106		22		s 12.14PM	105.6	.....WARRENTON.....	12.4	s 3.00					
	A108		31		f 12.21	108.3	.....CAMP CLATSOP.....	9.7	f 2.51					
	A116				f 12.37	115.7	.....GEARHART.....	2.3	f 2.35					
BWY KXR	A118		73		A 12.45PM	118.0	D.....SEASIDE.....SD	0.0	L 2.30PM						
				0.15 22.8	4.25 25.7		Time Over District Average Speed per Hour		Daily 4.06 27.7	Daily Ex. Monday 0.15 22.8					

Eastward trains are superior to trains of the same class in the opposite direction Except No. 21 is superior to No. 22 Willbridge to Seaside.

Nos. 21 and 22 will stop on flag to receive or discharge passengers at Ivy, Woodson, Carnahan, and West.
No. 22 will stop at Warren on Mondays and Thursdays to dispatch U. S. Mail.

S. P. & S. Ry., PORTLAND DIVISION
Westward Second Sub-Division Eastward

Water, Wyes, Turntables, Fuel, Scales, Standard Clocks, Bul.-Bds., Register, Yard Limits	Station Numbers	Car Capacity		Distance from Warrenton	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Fort Stevens
		Sidings	Other Tracks			
	A106		22	0.0	..... WARRENTON	3.8
					1.8	
	FS2		25	1.8	..... FLAVEL	2.0
					2.0	
X	FS4			3.8	..... FORT STEVENS	0.0
Time Over District Average Speed per Hour						

Eastward trains are superior to trains of the same class in the opposite direction.

S. P. & S. Ry., PORTLAND DIVISION
Westward Third Sub-Division Eastward 9

Water, Wyes, Turntables, Fuel, Scales, Standard Clocks, Bul.-Bds., Register, Yard Limits	Station Numbers	Car Capacity		Distance from Wilkesboro	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Glenwood
		Sidings	Other Tracks			
	XPRJ	U26	12	0.0	..... WILKESBORO	12.9
					1.2	
	X	R1	24E	1.2	..... PENGRA	11.7
					7.7	
	WP	R9		8.9	..... WASHBURN	4.0
					4.0	
	XP	R13	Yard	12.9	..... GLENWOOD	0.0
Time Over District Average Speed per Hour						

Eastward trains are superior to trains of the same class in the opposite direction.

S. P. & S. Ry., PORTLAND DIVISION—Fourth Sub-Division
Westward Eastward

Water, Wyes, Turntables, Fuel, Scales, Standard Clocks, Bul.-Bds., Register, Yard Limits	Station Numbers	Car Capacity		SECOND CLASS	Distance from Portland	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Keasey	SECOND CLASS	
		Sidings	Other Tracks						
	XJ	A10		231	10.0	..... UNITED JCT.	47.0	A 4.30AM
				Freight		0.5			
	OWXP	NB10	Yard	Daily Ex. Saturday	10.0	..... RAFTON	47.0	
						0.5			
	JPX	U10		7.47	10.5	DN..... RIVER JCT..... EJ	46.5	4.27	
						0.5			
		U10A	31W	7.49	11.0	..... BAN SPUR	46.0	4.25
						0.7			
	P	U12	4 11W	7.52	11.7	..... BURLINGTON	45.3	4.22
						2.2			
	P	U14	6E	8.01	13.9	Auto. Bk. (..... TUNNEL SPUR	43.1	4.15	
						3.2			
	JXPR	U17	5E	A 8.15PM	17.1	DN..... BOWERS JCT..... BJ	39.9	L 4.00AM	
						4.8			
	PWX 2750' E.	U22	47 17E		21.9	D..... NORTH PLAINS... NP	35.1		
						1.4			
		U23	18		23.3	..... VADIS	33.7	
						2.2			
		U25	11E		25.5	..... CHRISTIE	31.5	
						0.9			
	JXPR	U26	12		26.4	..... WILKESBORO	30.6	
						1.1			
	XP	U28	32 22		27.5	..... BANKS	29.5	
						4.2			
	WP	U32	30 7		31.7	..... MANNING	25.3	
						7.1			
	P	U30	20		38.8	..... TOPHILL	18.2	
						4.3			
	WP	U43	29		43.1	..... BRAUN	13.9	
						5.4			
	BYK XPR	U40	Yard		48.5	D..... VERNONIA..... VN	8.5		
						8.5			
	VWX	U57	52		57.0	..... KEASEY	0.0	
0.30 14.2					Time Over District Average Speed per Hour			0.30 14.2	

EASTWARD TRAINS ARE SUPERIOR TO TRAINS OF THE SAME CLASS IN THE OPPOSITE DIRECTION

At Bowers Junction all westward trains to and eastward trains from O.E. Ry. First Sub-division will register by Ticket per Rule 83(A). Eastward trains from Fourth Sub-division will not register.

10 Westward

Oregon Electric Ry.—FIRST SUB-DIVISION

Eastward

Water, Wyes, Turn-tables, Fuel, Boats, Standard Crows, Bulletin Board, Register and Yard Limits	Station Numbers	Car Capacity		SECOND CLASS		Distance from Portland	TIME TABLE No. 104 SEPTEMBER 18, 1949		Distance from Eugene	SECOND CLASS	
		Sidings	Other Tracks	231	Freight		STATIONS	230		Freight	
											Daily Ex. Saturday
JRXP	U17		5E			8.15PM	17.1	DN..... BOWERS JCT.....BJ	125.7	A	4.00AM
	E21	46				8.27	20.9	..... MERLE.....	121.9		3.48
YPXJ	E22					8.29	21.5	..... FOREST GROVE JCT.....	121.3		3.46
X		77				8.45	26.7	..... BEAVERTON SIDING.....	116.1		3.30
XWP	E28		33			8.48	27.6	..... BEAVERTON.....	115.2		3.27
JVP	E28A					8.50PM	28.1	..... BEBURG.....	114.7		3.25AM

BETWEEN BEBURG AND GRETON TRAINS WILL BE GOVERNED BY SOUTHERN PACIFIC CO. TIME TABLE AND RULES

JVP	E31					9.10PM	31.2	..... GRETON.....	111.6		3.05AM
PX	E32	77	17			9.13	32.1	N..... TIGARD.....RD	110.7		3.02
P	E36		10			9.25	36.1	..... TUALATIN.....	108.7		2.50
P	E39	19				9.35	39.0	..... TONQUIN.....	103.8		2.40
P	E43	21	7			9.47	43.0	..... WILSONVILLE.....	99.8		2.28
P	E45	76				9.56	45.4	..... CURTIS.....	97.4		2.19
P	E49		20			10.08	49.1	..... DONALD.....	93.7		2.07
WP	E55	75	8E			10.25	54.5	..... WEST WOODBURN.....	88.3		1.50
	E57		9E			10.34	57.4	..... ST. LOUIS.....	85.4		1.41
	E63	9	6W			10.52	63.1	..... HOPMERE.....	79.7		1.23
P	E64		8			10.55	64.1	..... QUINABY.....	78.7		1.20
PX	E69	80	55			11.10	68.6	..... BUSH.....	74.2		1.05
WVBPXK	E71		303			11.25	71.2	DN..... SALEM.....SA	71.6		12.50
PX	E73	52				11.30	72.8	..... MINTO.....	70.0		12.44
P	E80		11E 5W			11.52PM	79.9	..... ORVILLE.....	62.9		12.22
P	E85	74				²³⁰ 12.07AM	84.8	..... SIDNEY.....	58.0	²³¹	12.07AM
	E88		17			12.17	87.9	..... TALBOT.....	54.9		11.57PM
	E91		15W			12.26	90.8	..... DEVER.....	52.0		11.48
ZXBRP TKWOJ	E97		Yard			1.01	96.5	DN..... ALBANY YARD.....YD.	46.3		11.30
VXP	E98		Yard			1.15	97.8	..... ALBANY.....	45.0		10.45
P	E111		14E			1.55	111.1	..... FAYETTEVILLE.....	31.7		10.05
	E114		5E			2.03	113.8	..... POTTER.....	29.0		9.58
	E116	6				2.10	116.1	..... TULSA.....	26.7		9.50
P	E124		12 24E			2.35	124.2	..... HARRISBURG.....	18.6		9.25
P	E129		65			2.50	128.7	D..... JUNCTION CITY.....JC	14.1		9.09
	E133		6E			3.05	133.4	..... MEADOW VIEW.....	9.4		8.53
	E135		9			3.10	135.0	..... AWBREY.....	7.8		8.48
	E136		8W 16E			3.13	136.1	..... ENID.....	6.7		8.45
BKXR YPV	E143		Yard			A 4.00AM	142.8	D..... EUGENE.....G	0.0	L	8.00PM
						7.45 16.2		Time Over District Average Speed per Hour			8.00 15.7

EASTWARD TRAINS ARE SUPERIOR TO TRAINS OF THE SAME CLASS IN THE OPPOSITE DIRECTION

Westward

Oregon Electric Ry.—SECOND SUB-DIVISION

Eastward 11

Water, Wyes, Turntables, Fuel, Seales, Standard Clocks, Bulletin Boards, Register and Yard Limits	Station Numbers		Car Capacity		Distance from Forest Grove Junction	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Forest Grove
	Sidings	Other Tracks	Sidings	Other Tracks			
JYPX	E22				0.0	.....FOREST GROVE JCT..... 0.8	10.6
X	F1	11	3E		0.8	.....ORENCO..... 2.1	9.8
	F3		7E		2.0	.....SEWELL..... 1.6	7.7
P	F5	5	32		4.5	D.....HILLSBORO.....BO 3.4	6.1
	F8		6E		7.9	.....CORNELIUS..... 2.7	2.7
P	F11		51		10.6	D.....FOREST GROVE.....	0.0
						Time Over District Average Speed per Hour	

Eastward trains are superior to trains of the same class in the opposite direction.

Westward

Oregon Electric Ry.—THIRD SUB-DIVISION

Eastward

Water, Wyes, Turntables, Fuel, Seales, Standard Clocks, Bulletin Boards, Register and Yard Limits	Station Numbers		Car Capacity		Distance from Albany Yard	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Foster
	Sidings	Other Tracks	Sidings	Other Tracks			
ZKBXP TWOR	E97		Yard		0.0	DN.....ALBANY YARD.....YD 0.9	31.0
JV					0.9	.....S. P. CONN. ALBANY..... 13.6	31.0
						Time Over District Average Speed per Hour	

Between S. P. Conn. Albany and Lebanon Conn. with O. E. Third Sub-Division Trains Will Be Governed by S. P. Co. Portland Division Time Tables and Rules

WPJV	S14		20		14.5	DN.....LEBANON.....BA O. E. Conn. 0.3	17.4
	S15	10			14.8	.....LEBANON..... (O. E. Siding) 1.1	17.1
PX	S16	70	154		15.9	D.....WELDWOOD.....V 4.3	16.0
	P	S20		2E	20.2	.....WATERLOO..... 1.9	11.7
		S22		8E	22.1	.....NYE..... 2.2	9.8
	S24		11E		24.3	.....NARROWS..... 4.5	7.6
PWYO RBXJ	S29		Yard		28.8	DN.....SWEET HOME.....SW 3.1	3.1
	S32				31.9	.....FOSTER.....	0.0
						Time Over District Average Speed per Hour	

Eastward trains are superior to trains of the same class in the opposite direction.

Westward

Oregon Electric Ry.—FOURTH SUB-DIVISION

Eastward

Water, Wyes, Turntables, Fuel, Seales, Standard Clocks, Bulletin Boards, Register and Yard Limits	Station Numbers		Car Capacity		Distance from Sweet Home	TIME TABLE No. 104 SEPTEMBER 18, 1949	Distance from Dollar
	Sidings	Other Tracks	Sidings	Other Tracks			
PWYRB XOJ	S29		Yard		0.0	DN.....SWEET HOME.....SW 6.4	15.5
	H6		20W		6.4	.....HOLLEY..... 1.7	9.1
	H8		10		8.1	.....CALAPOOYA..... 3.7	7.4
	H12		9E		11.8	.....MITCHELL..... 2.1	3.7
	H14		49		13.9	.....WOODRAFFE SIDING..... 1.6	1.6
W 0.0 M1.E	H16		Yard		15.5	.....DOLLAR.....	0.0
						Time Over District Average Speed per Hour	

Eastward trains are superior to trains of the same class in the opposite direction.

SPEED RESTRICTIONS

All Subdivisions—

Designation "Str."—Train with diesel-electric locomotive and all light-weight roller bearing passenger train equipment.

Designation "Psgr."—Train with diesel-electric or steam locomotive and all passenger train equipment, any car of which is not light-weight roller bearing.

Designation "Frt."—Train with freight cars; train with caboose only; locomotive without cars.

Maximum speed of Streamliner trains must not exceed by more than ten miles per hour the permissible passenger train speed indicated on slow boards.

When Streamliner train is operated against the current of traffic in double track territory the Streamliner train must not exceed the maximum speed for other passenger trains.

	M.P.H.
Through crossovers, gantlets and turnouts.....	15
Through No. 15 and No. 16 turnouts located at Willbridge, S.P.& S. Jct., Ainsworth Jct., Scribner and Ft. Wright.....	25
Over spring switches not equipped with facing point lock, when moving in facing point direction and not using turnouts.....	30
Over spring switches when moving in trailing point direction actuating switch points and not using turnouts.....	30
Over spring switches when using turnouts.....	15
Freight engines used in passenger service must not exceed authorized speed for freight trains in the territory where operated.	
Handling steam wrecking cranes, pile drivers or locomotive cranes	30
Handling scale test car.....	30
When freight cars, except those equipped with passenger trucks and steel wheels, are handled in passenger trains, the train will not exceed authorized speed for freight trains in the territory where operated.	
Over switches in paved streets.....	10
When picking up train orders (except where hoop stands are located).....	25
To avoid damage to rail and bridges by moving locomotives having main or side rods down, over the road at too high a speed, the following speeds will be maximum permitted:	
With main and side rods removed:	
All classes.....	20
With main rods removed and side rods in place:	
All classes.....	25
Over bridges.....	20

Engines with either or both main and side rods removed shall not be moved over any bridge at a speed in excess of 20 MPH, and the speed shall be further reduced over bridges which carry speed restrictions against the class of power being so moved. In the latter case, the speed of an engine with rods removed shall be reduced over the bridge to one-half the restricted speed for that engine in working order, as shown under "Bridge and Engine restrictions."

Dead engines with all rods up or in place, the piston rod being parted from the crosshead and removed and the valve motion disconnected and blocked, may be moved in trains at not to exceed the permissible speed of freight trains operating in the territory over which such engines are moved.

Dead engines with all rods up or in place and piston rod not disconnected from the crosshead may be moved in trains at a speed not to exceed 12 M. P. H.

Bridge or other restrictions applicable to these engines when in operating condition to be observed.

For engines coming from the shop, to prevent running hot authorized maximum speed is..... 25 M.P.H.

SPEED RESTRICTIONS

Terminals Subdivision—

	M. P. H.		
	Str.	Psgr.	Frt.
Maximum speed.....	75	70	45
Between 17th Avenue and end of double track.....	10	10	10
Between end of double track and Union Station.....	6	6	6
Through In terlocking and on all depot tracks, Union Station	6	6	6
Over Bridges between Vancouver and Willbridge.....	30	30	30

Vancouver Division—First Subdivision—

Maximum speed.....	75	70	45
At Camas to exchange U.S. Mail, Trains 3 and 4.....	20		
At Washougal to dispatch U. S. Mail, Train 3.....	20		
At Bingen-White Salmon to exchange U. S. Mail, Train 3	20		
At Lyle to dispatch U. S. Mail, Train 3.....	20		

Vancouver Division—Second Subdivision—

Maximum speed.....	75	70	45
At Maryhill to dispatch U. S. Mail, Train 3.....	20		

Vancouver Division—Third Subdivision—

Maximum speed.....	75	70	45
Between Kahlotus and Snake River Jct.....	50	40	25

Vancouver Division—Fourth Subdivision—

Maximum speed.....	25		
On curves 5 degrees and over.....	15		

Oregon Trunk Railway—

	Frt. and	
	Psgr.	Mixed
Between Wishram and MP 87.....	40	35
Between MP 87 and MP 98.....	30	25
Between MP 98 and Metolius.....	40	35
Between Metolius and Bend.....	45	45

Portland Division—First and Second Subdivisions—

	Psgr. Frt.	
Maximum speed (Steam Power).....	45	35
Maximum speed (Diesel-electric Power).....	50	40
Through Linnton.....	20	20
Hageman Moorage crossing, located 462 feet west of Bridge A-9.3.....	15	15
Through Scappoose.....	20	20
Through Rainier (City Ordinance).....	8	8
Between Astoria and Seaside.....	30	20
Over Youngs Bay draw span, Bridge 102.6, west of Astoria.	12	12
On Pacific Avenue, Hammond.....	8	8
Between Warrenton and Fort Stevens.....	15	15

SPEED RESTRICTIONS

<u>Portland Division—Third and Fourth Subdivisions—</u>	M.P.H.
Over Bridge B-07 between River Junction and Rafton.....	12
Between United Junction and Wilkesboro.....	25
Between Wilkesboro and Keasey.....	20
Between Wilkesboro and Glenwood.....	15
Eastward trains will use not less than 25 minutes between Tophill and Manning.	
Trains handling logs, disconnected trucks.....	15
Trains handling empty disconnected trucks.....	25
<u>Oregon Electric Railway— First, Second, Third and Fourth Subdivisions—</u>	M.P.H.
Over Bridge 43.4, Wilsonville, 20 MPH, except over steel span, 10 MPH. Brakes must be released before moving on any portion of the structure and the application of brakes while moving on the bridge must be avoided as much as possible.	
Between Forest Grove Junction and Forest Grove.....	25
Through Hillsboro.....	10
Through Forest Grove.....	15
Between Bowers Junction and Beburg.....	35
Between Beburg and Greton on S. P. tracks.....	20
Between Greton and Eugene.....	35
Through Salem.....	10
Passing paper mill, Salem.....	5
Through Albany.....	12
Between second crossing east of depot at Harrisburg and county road crossing, 1800 feet west.....	8
Through Junction City.....	20
Between Lebanon and Sweet Home.....	25
Between Sweet Home and Calapooya.....	25
Between Calapooya and Dollar.....	12
Trains handling logs.....	30
Trains handling logs over Willamette River Bridge 126-1, Cal- lapooya River Bridge 99-9 and Santiam River Bridge 89-0....	10
Trains handling logs under S. P. Co. bridge at Tualatin.....	15

SPRING SWITCHES WITH FACING POINT LOCK

<u>Vancouver Division—Second Subdivision—</u>	
Wishram.....	East yard lead switch.

<u>Vancouver Division—Third Subdivision—</u>	
Pasco.....	East switch of siding.
Votaw.....	East switch of siding.
Hooper.....	East switch of siding.
Benge.....	East switch of siding.
Mock.....	West switch of siding.
Overlook.....	East switch of siding.

SPRING SWITCHES WITHOUT FACING POINT LOCK

<u>Vancouver Division—First Subdivision—</u>	
Vancouver.....	{ East yard lead switch. End of double track.

<u>Portland—First and Fourth Subdivisions—</u>	
United Junction.....	Junction of First and Fourth Subdivisions.
River Junction.....	Junction of Fourth Subdivision and route to Rafton.
Bowers Junction.....	Junction of Fourth Subdivision and O. E. Ry.

<u>Oregon Trunk Railway—</u>	
Oregon Trunk Junction.....	Junction of O. T. Ry. and U. P. R. R. Co.

DRAW BRIDGES

<u>Terminals Subdivision—</u>	
Willamette River, MP 5.3 center of draw, Interlocked.	
Oregon Slough, MP 8.7 center of draw, Interlocked.	
Columbia River, MP 9.8 center of draw, Interlocked.	

<u>Portland Division—First Subdivision—</u>	
Clatskanie River, MP 62.7 center of draw.	
Blind Slough, MP 84.8 center of draw.	
John Day River MP 94.8 center of draw.	
Youngs Bay, MP 102.6 center of draw.	
Skipanon Creek, MP 105.5 center of draw.	

<u>Oregon Trunk Railway—</u>	
Columbia River, MP T-1.3 center of draw.	

Celilo Draw Bridge is closed as a draw span except when actually in use to permit passage of navigation. Advance notice covering time a vessel will pass through draw will be given to the Chief Dispatcher. He will then instruct section foreman at Wishram to be on hand at Celilo draw at proper time, and after flagmen have been placed and vessel is ready to pass through, will remove angle bars which will allow draw span to be opened. After vessel has passed through draw and angle bars have been replaced, flagmen will be recalled and section foreman and flagmen released.

OVERHEAD RAILROAD CROSSINGS

<u>Vancouver Division—Second Subdivision—</u>	Miles from Portland
Union Pacific R. R.....	228.4

<u>Vancouver Division—Third Subdivision—</u>	
Union Pacific R. R.....	362.5
Northern Pacific Ry.....	364.1

<u>Portland Division—First Subdivision—</u>	
Rafton trackage.....	10.5

<u>Oregon Electric Railway—First Subdivision—</u>	
Southern Pacific Co.....	35.8
Southern Pacific Co.....	97.6

RAILROAD CROSSINGS

<u>Oregon Electric Railway—First Subdivision—</u>	Miles from Portland
Southern Pacific Co.....	70.9
Southern Pacific Co.....	71.0
Southern Pacific Co.....	71.2
Southern Pacific Co.....	71.5
Southern Pacific Co.....	97.7
Southern Pacific Co.....	97.8
Southern Pacific Co.....	97.9
Southern Pacific Co.....	140.7

<u>Oregon Electric Railway—Second Subdivision—</u>	
Southern Pacific Co.....	26.3

COMMERCIAL AND STORAGE TRACKS

Vancouver Division—First Subdivision—

	Miles from Portland	Car Capacity	Switch at
Hegewald and Stevenson Plywood Co. Spurs.....	52.7	76	East end
Weber Lumber Co. Spur.....	74.4	5	East end

Vancouver Division—Second Subdivision—

	Miles from Portland	Car Capacity	Switch at
Ballast loading tracks.....	174.0	45	Both ends
North McNary.....	195.3	27	Both ends

Vancouver Division—Third Subdivision—

	Miles from Portland	Car Capacity	Switch at
Burr Canyon Spur.....	265.9	5	West end
Harder.....	280.7	18	East end
Washtucna Industry.....	292.4	156	East end
Ankeny.....	305.9	14	West end
Nemour's Powder Spur.....	368.6	48	West end
Brick Yard Spur.....	374.6	9	East end

Vancouver Division—Fourth Subdivision—

	Miles from Lyle	Car Capacity	Switch at
Doubling Spur.....	1.6	8	East end
Klickitat Springs.....	15.8	10	East end

Oregon Trunk Railway—

	Miles from Wishram	Car Capacity	Switch at
Central Oregon Fir Supply Spur...	136.3	8	West End

Portland Division—First Subdivision—

	Miles from Portland	Car Capacity	Switch at
Gasco.....	5.6	28	West end
Gasco.....	5.6	24	West end
Gasco.....	5.6	16	East end
Harbor Track.....	9.8	57	East end
Trojan.....	40.7	12	East end
Reeds.....	45.2	5	East end
Mill Creek Naval Spur.....	96.2	21	East end
Tongue Point.....	96.8	19	East end

Portland Division—Second Subdivision—

	Miles from Portland	Car Capacity	Switch at
Warrenton Clay Spur.....	106.3	54	West end
Bioproducts Spur.....	108.1	5	West end
Point Adams Spur.....	108.3	5	East end

Portland Division—Third Subdivision—

	Miles from Wilkesboro	Car Capacity	Switch at
Atlas Logging Co. tracks.....	12.1	72	Both ends

Portland Division—Fourth Subdivision—

	Miles from Portland	Car Capacity	Switch at
Outfit Spur 39.3.....	39.3	8	West end

COMMERCIAL AND STORAGE TRACKS

Oregon Electric Railway—First Subdivision—

	Miles from Portland	Car Capacity	Switch at
Bendemeer.....	18.9	2	East end
Durham.....	34.4	6	East end
Mulloy.....	40.2	7	East end
Waconda.....	61.3	8	East end
Roberts.....	75.4	23	East end
Linn County Lbr. Prod. Co.....	101.7	8	East end
Miller Seed Co.....	118.3	4	West end
Timber, Inc., Spur.....	122.1	4	East end
J & W Lumber.....	129.2	6	East end
Crown-Zellerbach.....	129.9	25	Both ends
Johnson & Powell Bros.....	130.0	10	East end
North End Lumber Co. Spur.....	136.6	2	East end

Oregon Electric Railway—Third Subdivision—

	Miles from Albany	Car Capacity	Switch at
Crowfoot Lbr. Co.....	17.9	4	East end
Kelley Timber Products.....	18.3	3	East end
C. & M. Lbr.—Brady Bros.....	20.7	7	East end
Douglas Fir Products.....	20.8	15	East end
B. F. Johnson Lbr. Co.....	21.3	9	East end
W. O. W. Lbr. Co.....	21.9	2	West end
McGlothern Spur.....	23.7	3	East end
In-Kell Lbr. Co.....	23.9	5	East end
Benjo Milling Co.....	24.5	6	East end
Puget Timber Company.....	24.7	7	East end
Daugherty Piling Co.....	26.0	10	Both ends

Oregon Electric Railway—Fourth Subdivision—

	Miles from Sweet Home	Car Capacity	Switch at
Ingraham Spur.....	9.7	4	East end

SPEED TABLE

Time Per Mile		Miles Per Hour	Time Per Mile		Miles Per Hour
Minutes	Seconds	Hour	Minutes	Seconds	Hour
0	45	80	1	12	50
0	46	78.3	1	15	48
0	47	76.6	1	20	45
0	48	75	1	25	42.3
0	49	73.5	1	30	40
0	50	72	1	40	36
0	51	70.6	1	45	34.3
0	52	69.2	1	50	32.7
0	53	67.9	2	..	30
0	54	66.6	2	10	27.6
0	55	65.4	2	15	26.6
0	56	64.2	2	20	25.7
0	57	63.1	2	30	24
0	58	62.0	2	40	22.5
0	59	61.0	2	45	21.8
1	..	60	2	50	21.2
1	1	59	3	..	20
1	2	58	3	9	19
1	3	57.1	3	20	18
1	4	56.2	3	31	17
1	5	55.3	3	45	16
1	6	54.5	4	..	15
1	7	53.7	5	..	12
1	8	52.9	6	..	10
1	9	52.1	7	30	8
1	10	51.4	10	..	6

INTERLOCKINGS

Terminals Subdivision—

	Miles from Portland
Portland (Union Station) south end.....	0.0
Willbridge.....	4.3
Willamette River Draw Bridge.....	5.3
North Portland Junction.....	8.1
Oregon Slough Draw Bridge.....	8.7
Columbia River Draw Bridge.....	9.8

At Portland—Interlocking at south end of freight and passenger yards governs movement of all trains and engines entering or leaving N.P.T. Co. Yards.

When the Home Signal is at "Stop" the following signals will be used to call for desired route:

For Albina	— •
For Troutdale	— —
For S.P. Main Track	• —
For S.P. Yard	• — •
For E. 2nd St.	• • —
For S.P.S. to E. Side	• • —

When the Home Signal is at "Proceed" the whistle must not be sounded. When conditions are favorable use hand or lantern signals for route desired, omitting whistle signals.

At Willbridge—Whistle signal — • — will be sounded for route to Astoria. Upper unit of eastward home interlocking signal governs movements on eastward main track. Lower unit governs movements to Astoria Line.

At North Portland Jct.—Calling for diverging route through interlocking, the following whistle signals will be sounded:

From and to U. P. R. R.	• —
Stock Yards: From S.P. & S. Ry.	• — •
From U. P. R. R.	• • • •

At Oregon Slough Bridge—Assigned hours of draw bridge tender are 8 A. M. to 4 P. M., but is subject to call (Tel. UNiversity 5458) while off duty to operate draw for river traffic. Should it become necessary to flag through this interlocking plant, it must be ascertained if the draw tender is not on duty, and then flagmen must precede train and be sure that derails and rail locks are in proper position.

At Columbia River Bridge—The following engine whistle signals will be sounded in calling for route:

Eastward: For N.P. Ry.	—
For S.P. & S. Ry.	• • —
Westward: From S.P. & S. Ry.	• — •
From N.P. Ry.	• • • •

Upper units of eastward home interlocking signal governs movement from Terminals Subdivision to N. P. Ry. The lower unit governs movements to S. P. & S. Ry.

Vancouver Division—Third Subdivision—

	Miles from Portland
Marshall Junction, N. P. Ry.....	368.8
Fort Wright, G. N. Ry.....	377.2

Telephone located at Signal 375.6 to enable crews to contact operator at Ft. Wright when signal indicates "APPROACH" or "STOP".

COMPANY SURGEONS

Dr. Merl L. Margason, Chief Surgeon	} 1216 S. W. Yamhill, Portland. Telephone ATwater 4152.
The Portland Clinic	} 1216 S. W. Yamhill, Portland. Telephone ATwater 4152.

LOCAL SURGEONS

DRS. CONE & WALZ, Vancouver
 DR. F. L. DUNNAVAN, Vancouver.
 DR. W. S. SHEPHERD, Camas.
 DR. H. L. ELDRIDGE, Washougal.
 DR. J. E. STRAIN, North Bonneville.
 DR. J. R. REHAL, Stevenson
 DR. T. G. LATHROP, Bingen-White Salmon.
 DR. WAYNE M. HENKLE, Bingen-White Salmon.
 DR. D. G. MOODY, Bingen-White Salmon
 DR. J. N. REID, Goldendale.
 THE DALLES CLINIC, The Dalles, Oregon
 DR. G. J. VOTAVA, Pasco.
 DR. JOSEPH L. GREENWELL, Pasco.
 DR. A. L. VICTOR, Washtuena.
 DR. E. R. NORTHRUP, Spokane.
 THE ROBERT HEMINGWAY
 MEMORIAL CLINIC, Bend.
 DR. R. F. JONES, Redmond.
 DR. JOHN BARTON, St. Helens.
 DR. O. L. ZESCHIN, St Helens.
 DR. M. A. KENNEY, Rainier.
 DR. PAUL H. STARR, Clatskanie.
 DR. J. L. WOODIN, Clatskanie.
 DR. FRANK E. FOWLER, Astoria.
 DR. R. W. PARCHER, Seaside.
 DR. ROLAND D. EBY, Vernonia.
 DR. A. O. PITMAN, Hillsboro.
 DR. GERALD B. SMITH, Woodburn.
 DR. R. E. PURVINE, Salem.
 DR. L. M. BAIN, Albany.
 DR. JOEL C. BOOTH, Lebanon.
 DR. ROBT. LANGMACK, Sweet Home.
 DR. W. H. CHAPMAN, Eugene.

STRETCHERS ARE LOCATED AT FOLLOWING POINTS

Portland.....	Baggage Room
Portland.....	Steam Derrick Outfit
Vancouver.....	Baggage Room
Vancouver.....	Steam Derrick Outfit
Stevenson.....	Station
Lyle.....	Station
Wishram.....	Station
Wishram.....	Steam Derrick Outfit
Pasco.....	Baggage Room
Snake River.....	Station
Washtuena.....	Station
Lamont.....	Station
Maupin.....	Station
Metolius.....	Station
Bend.....	Station
Astoria.....	Station
Vernonia.....	Station
Salem.....	Station
Albany.....	Station

J. L. MONAHAN, Asst. Supt.	M. L. BUNTIN, Chief Dispatcher
C. F. CROFFUT, Trainmaster	F. C. WAGER, Mechanical Supt.
R. G. HASKELL, Trainmaster	C. E. BARNES, Master Mechanic
F. S. BARLOW, Jr., Trainmaster	W. C. ABBOTT, Traveling Engr.
H. J. TIERNEY, Trainmaster	J. M. WASSENAR, Traveling Engr.
A. BERGH, Trainmaster	J. T. CRAINE, Traveling Engr.
A. W. GEORGE, Trainmaster	

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY

TABLE OF CONTENTS

- 1. INTRODUCTION
- 2. EXPERIMENTAL
- 3. RESULTS AND DISCUSSION
- 4. CONCLUSIONS
- 5. REFERENCES
- 6. APPENDIX
- 7. SUMMARY
- 8. ACKNOWLEDGMENTS
- 9. AUTHOR'S ADDRESS
- 10. RECEIVED
- 11. REVISION RECEIVED
- 12. PUBLISHED
- 13. COPYRIGHT
- 14. PERMISSION TO REPRODUCE
- 15. DISTRIBUTION STATEMENTS
- 16. ABSTRACT
- 17. KEYWORDS
- 18. SUBJECT TERMS
- 19. CLASSIFICATION
- 20. INDEXING
- 21. CITATION
- 22. SUMMARY
- 23. CONCLUSIONS
- 24. REFERENCES
- 25. APPENDIX
- 26. SUMMARY
- 27. ACKNOWLEDGMENTS
- 28. AUTHOR'S ADDRESS
- 29. RECEIVED
- 30. REVISION RECEIVED
- 31. PUBLISHED
- 32. COPYRIGHT
- 33. PERMISSION TO REPRODUCE
- 34. DISTRIBUTION STATEMENTS
- 35. ABSTRACT
- 36. KEYWORDS
- 37. SUBJECT TERMS
- 38. CLASSIFICATION
- 39. INDEXING
- 40. CITATION
- 41. SUMMARY
- 42. CONCLUSIONS
- 43. REFERENCES
- 44. APPENDIX
- 45. SUMMARY
- 46. ACKNOWLEDGMENTS
- 47. AUTHOR'S ADDRESS
- 48. RECEIVED
- 49. REVISION RECEIVED
- 50. PUBLISHED
- 51. COPYRIGHT
- 52. PERMISSION TO REPRODUCE
- 53. DISTRIBUTION STATEMENTS
- 54. ABSTRACT
- 55. KEYWORDS
- 56. SUBJECT TERMS
- 57. CLASSIFICATION
- 58. INDEXING
- 59. CITATION
- 60. SUMMARY
- 61. CONCLUSIONS
- 62. REFERENCES
- 63. APPENDIX
- 64. SUMMARY
- 65. ACKNOWLEDGMENTS
- 66. AUTHOR'S ADDRESS
- 67. RECEIVED
- 68. REVISION RECEIVED
- 69. PUBLISHED
- 70. COPYRIGHT
- 71. PERMISSION TO REPRODUCE
- 72. DISTRIBUTION STATEMENTS
- 73. ABSTRACT
- 74. KEYWORDS
- 75. SUBJECT TERMS
- 76. CLASSIFICATION
- 77. INDEXING
- 78. CITATION
- 79. SUMMARY
- 80. CONCLUSIONS
- 81. REFERENCES
- 82. APPENDIX
- 83. SUMMARY
- 84. ACKNOWLEDGMENTS
- 85. AUTHOR'S ADDRESS
- 86. RECEIVED
- 87. REVISION RECEIVED
- 88. PUBLISHED
- 89. COPYRIGHT
- 90. PERMISSION TO REPRODUCE
- 91. DISTRIBUTION STATEMENTS
- 92. ABSTRACT
- 93. KEYWORDS
- 94. SUBJECT TERMS
- 95. CLASSIFICATION
- 96. INDEXING
- 97. CITATION
- 98. SUMMARY
- 99. CONCLUSIONS
- 100. REFERENCES
- 101. APPENDIX
- 102. SUMMARY
- 103. ACKNOWLEDGMENTS
- 104. AUTHOR'S ADDRESS
- 105. RECEIVED
- 106. REVISION RECEIVED
- 107. PUBLISHED
- 108. COPYRIGHT
- 109. PERMISSION TO REPRODUCE
- 110. DISTRIBUTION STATEMENTS
- 111. ABSTRACT
- 112. KEYWORDS
- 113. SUBJECT TERMS
- 114. CLASSIFICATION
- 115. INDEXING
- 116. CITATION
- 117. SUMMARY
- 118. CONCLUSIONS
- 119. REFERENCES
- 120. APPENDIX
- 121. SUMMARY
- 122. ACKNOWLEDGMENTS
- 123. AUTHOR'S ADDRESS
- 124. RECEIVED
- 125. REVISION RECEIVED
- 126. PUBLISHED
- 127. COPYRIGHT
- 128. PERMISSION TO REPRODUCE
- 129. DISTRIBUTION STATEMENTS
- 130. ABSTRACT
- 131. KEYWORDS
- 132. SUBJECT TERMS
- 133. CLASSIFICATION
- 134. INDEXING
- 135. CITATION
- 136. SUMMARY
- 137. CONCLUSIONS
- 138. REFERENCES
- 139. APPENDIX
- 140. SUMMARY
- 141. ACKNOWLEDGMENTS
- 142. AUTHOR'S ADDRESS
- 143. RECEIVED
- 144. REVISION RECEIVED
- 145. PUBLISHED
- 146. COPYRIGHT
- 147. PERMISSION TO REPRODUCE
- 148. DISTRIBUTION STATEMENTS
- 149. ABSTRACT
- 150. KEYWORDS
- 151. SUBJECT TERMS
- 152. CLASSIFICATION
- 153. INDEXING
- 154. CITATION
- 155. SUMMARY
- 156. CONCLUSIONS
- 157. REFERENCES
- 158. APPENDIX
- 159. SUMMARY
- 160. ACKNOWLEDGMENTS
- 161. AUTHOR'S ADDRESS
- 162. RECEIVED
- 163. REVISION RECEIVED
- 164. PUBLISHED
- 165. COPYRIGHT
- 166. PERMISSION TO REPRODUCE
- 167. DISTRIBUTION STATEMENTS
- 168. ABSTRACT
- 169. KEYWORDS
- 170. SUBJECT TERMS
- 171. CLASSIFICATION
- 172. INDEXING
- 173. CITATION
- 174. SUMMARY
- 175. CONCLUSIONS
- 176. REFERENCES
- 177. APPENDIX
- 178. SUMMARY
- 179. ACKNOWLEDGMENTS
- 180. AUTHOR'S ADDRESS
- 181. RECEIVED
- 182. REVISION RECEIVED
- 183. PUBLISHED
- 184. COPYRIGHT
- 185. PERMISSION TO REPRODUCE
- 186. DISTRIBUTION STATEMENTS
- 187. ABSTRACT
- 188. KEYWORDS
- 189. SUBJECT TERMS
- 190. CLASSIFICATION
- 191. INDEXING
- 192. CITATION
- 193. SUMMARY
- 194. CONCLUSIONS
- 195. REFERENCES
- 196. APPENDIX
- 197. SUMMARY
- 198. ACKNOWLEDGMENTS
- 199. AUTHOR'S ADDRESS
- 200. RECEIVED
- 201. REVISION RECEIVED
- 202. PUBLISHED
- 203. COPYRIGHT
- 204. PERMISSION TO REPRODUCE
- 205. DISTRIBUTION STATEMENTS
- 206. ABSTRACT
- 207. KEYWORDS
- 208. SUBJECT TERMS
- 209. CLASSIFICATION
- 210. INDEXING
- 211. CITATION
- 212. SUMMARY
- 213. CONCLUSIONS
- 214. REFERENCES
- 215. APPENDIX
- 216. SUMMARY
- 217. ACKNOWLEDGMENTS
- 218. AUTHOR'S ADDRESS
- 219. RECEIVED
- 220. REVISION RECEIVED
- 221. PUBLISHED
- 222. COPYRIGHT
- 223. PERMISSION TO REPRODUCE
- 224. DISTRIBUTION STATEMENTS
- 225. ABSTRACT
- 226. KEYWORDS
- 227. SUBJECT TERMS
- 228. CLASSIFICATION
- 229. INDEXING
- 230. CITATION
- 231. SUMMARY
- 232. CONCLUSIONS
- 233. REFERENCES
- 234. APPENDIX
- 235. SUMMARY
- 236. ACKNOWLEDGMENTS
- 237. AUTHOR'S ADDRESS
- 238. RECEIVED
- 239. REVISION RECEIVED
- 240. PUBLISHED
- 241. COPYRIGHT
- 242. PERMISSION TO REPRODUCE
- 243. DISTRIBUTION STATEMENTS
- 244. ABSTRACT
- 245. KEYWORDS
- 246. SUBJECT TERMS
- 247. CLASSIFICATION
- 248. INDEXING
- 249. CITATION
- 250. SUMMARY
- 251. CONCLUSIONS
- 252. REFERENCES
- 253. APPENDIX
- 254. SUMMARY
- 255. ACKNOWLEDGMENTS
- 256. AUTHOR'S ADDRESS
- 257. RECEIVED
- 258. REVISION RECEIVED
- 259. PUBLISHED
- 260. COPYRIGHT
- 261. PERMISSION TO REPRODUCE
- 262. DISTRIBUTION STATEMENTS
- 263. ABSTRACT
- 264. KEYWORDS
- 265. SUBJECT TERMS
- 266. CLASSIFICATION
- 267. INDEXING
- 268. CITATION
- 269. SUMMARY
- 270. CONCLUSIONS
- 271. REFERENCES
- 272. APPENDIX
- 273. SUMMARY
- 274. ACKNOWLEDGMENTS
- 275. AUTHOR'S ADDRESS
- 276. RECEIVED
- 277. REVISION RECEIVED
- 278. PUBLISHED
- 279. COPYRIGHT
- 280. PERMISSION TO REPRODUCE
- 281. DISTRIBUTION STATEMENTS
- 282. ABSTRACT
- 283. KEYWORDS
- 284. SUBJECT TERMS
- 285. CLASSIFICATION
- 286. INDEXING
- 287. CITATION
- 288. SUMMARY
- 289. CONCLUSIONS
- 290. REFERENCES
- 291. APPENDIX
- 292. SUMMARY
- 293. ACKNOWLEDGMENTS
- 294. AUTHOR'S ADDRESS
- 295. RECEIVED
- 296. REVISION RECEIVED
- 297. PUBLISHED
- 298. COPYRIGHT
- 299. PERMISSION TO REPRODUCE
- 300. DISTRIBUTION STATEMENTS
- 301. ABSTRACT
- 302. KEYWORDS
- 303. SUBJECT TERMS
- 304. CLASSIFICATION
- 305. INDEXING
- 306. CITATION
- 307. SUMMARY
- 308. CONCLUSIONS
- 309. REFERENCES
- 310. APPENDIX
- 311. SUMMARY
- 312. ACKNOWLEDGMENTS
- 313. AUTHOR'S ADDRESS
- 314. RECEIVED
- 315. REVISION RECEIVED
- 316. PUBLISHED
- 317. COPYRIGHT
- 318. PERMISSION TO REPRODUCE
- 319. DISTRIBUTION STATEMENTS
- 320. ABSTRACT
- 321. KEYWORDS
- 322. SUBJECT TERMS
- 323. CLASSIFICATION
- 324. INDEXING
- 325. CITATION
- 326. SUMMARY
- 327. CONCLUSIONS
- 328. REFERENCES
- 329. APPENDIX
- 330. SUMMARY
- 331. ACKNOWLEDGMENTS
- 332. AUTHOR'S ADDRESS
- 333. RECEIVED
- 334. REVISION RECEIVED
- 335. PUBLISHED
- 336. COPYRIGHT
- 337. PERMISSION TO REPRODUCE
- 338. DISTRIBUTION STATEMENTS
- 339. ABSTRACT
- 340. KEYWORDS
- 341. SUBJECT TERMS
- 342. CLASSIFICATION
- 343. INDEXING
- 344. CITATION
- 345. SUMMARY
- 346. CONCLUSIONS
- 347. REFERENCES
- 348. APPENDIX
- 349. SUMMARY
- 350. ACKNOWLEDGMENTS
- 351. AUTHOR'S ADDRESS
- 352. RECEIVED
- 353. REVISION RECEIVED
- 354. PUBLISHED
- 355. COPYRIGHT
- 356. PERMISSION TO REPRODUCE
- 357. DISTRIBUTION STATEMENTS
- 358. ABSTRACT
- 359. KEYWORDS
- 360. SUBJECT TERMS
- 361. CLASSIFICATION
- 362. INDEXING
- 363. CITATION
- 364. SUMMARY
- 365. CONCLUSIONS
- 366. REFERENCES
- 367. APPENDIX
- 368. SUMMARY
- 369. ACKNOWLEDGMENTS
- 370. AUTHOR'S ADDRESS
- 371. RECEIVED
- 372. REVISION RECEIVED
- 373. PUBLISHED
- 374. COPYRIGHT
- 375. PERMISSION TO REPRODUCE
- 376. DISTRIBUTION STATEMENTS
- 377. ABSTRACT
- 378. KEYWORDS
- 379. SUBJECT TERMS
- 380. CLASSIFICATION
- 381. INDEXING
- 382. CITATION
- 383. SUMMARY
- 384. CONCLUSIONS
- 385. REFERENCES
- 386. APPENDIX
- 387. SUMMARY
- 388. ACKNOWLEDGMENTS
- 389. AUTHOR'S ADDRESS
- 390. RECEIVED
- 391. REVISION RECEIVED
- 392. PUBLISHED
- 393. COPYRIGHT
- 394. PERMISSION TO REPRODUCE
- 395. DISTRIBUTION STATEMENTS
- 396. ABSTRACT
- 397. KEYWORDS
- 398. SUBJECT TERMS
- 399. CLASSIFICATION
- 400. INDEXING
- 401. CITATION
- 402. SUMMARY
- 403. CONCLUSIONS
- 404. REFERENCES
- 405. APPENDIX
- 406. SUMMARY
- 407. ACKNOWLEDGMENTS
- 408. AUTHOR'S ADDRESS
- 409. RECEIVED
- 410. REVISION RECEIVED
- 411. PUBLISHED
- 412. COPYRIGHT
- 413. PERMISSION TO REPRODUCE
- 414. DISTRIBUTION STATEMENTS
- 415. ABSTRACT
- 416. KEYWORDS
- 417. SUBJECT TERMS
- 418. CLASSIFICATION
- 419. INDEXING
- 420. CITATION
- 421. SUMMARY
- 422. CONCLUSIONS
- 423. REFERENCES
- 424. APPENDIX
- 425. SUMMARY
- 426. ACKNOWLEDGMENTS
- 427. AUTHOR'S ADDRESS
- 428. RECEIVED
- 429. REVISION RECEIVED
- 430. PUBLISHED
- 431. COPYRIGHT
- 432. PERMISSION TO REPRODUCE
- 433. DISTRIBUTION STATEMENTS
- 434. ABSTRACT
- 435. KEYWORDS
- 436. SUBJECT TERMS
- 437. CLASSIFICATION
- 438. INDEXING
- 439. CITATION
- 440. SUMMARY
- 441. CONCLUSIONS
- 442. REFERENCES
- 443. APPENDIX
- 444. SUMMARY
- 445. ACKNOWLEDGMENTS
- 446. AUTHOR'S ADDRESS
- 447. RECEIVED
- 448. REVISION RECEIVED
- 449. PUBLISHED
- 450. COPYRIGHT
- 451. PERMISSION TO REPRODUCE
- 452. DISTRIBUTION STATEMENTS
- 453. ABSTRACT
- 454. KEYWORDS
- 455. SUBJECT TERMS
- 456. CLASSIFICATION
- 457. INDEXING
- 458. CITATION
- 459. SUMMARY
- 460. CONCLUSIONS
- 461. REFERENCES
- 462. APPENDIX
- 463. SUMMARY
- 464. ACKNOWLEDGMENTS
- 465. AUTHOR'S ADDRESS
- 466. RECEIVED
- 467. REVISION RECEIVED
- 468. PUBLISHED
- 469. COPYRIGHT
- 470. PERMISSION TO REPRODUCE
- 471. DISTRIBUTION STATEMENTS
- 472. ABSTRACT
- 473. KEYWORDS
- 474. SUBJECT TERMS
- 475. CLASSIFICATION
- 476. INDEXING
- 477. CITATION
- 478. SUMMARY
- 479. CONCLUSIONS
- 480. REFERENCES
- 481. APPENDIX
- 482. SUMMARY
- 483. ACKNOWLEDGMENTS
- 484. AUTHOR'S ADDRESS
- 485. RECEIVED
- 486. REVISION RECEIVED
- 487. PUBLISHED
- 488. COPYRIGHT
- 489. PERMISSION TO REPRODUCE
- 490. DISTRIBUTION STATEMENTS
- 491. ABSTRACT
- 492. KEYWORDS
- 493. SUBJECT TERMS
- 494. CLASSIFICATION
- 495. INDEXING
- 496. CITATION
- 497. SUMMARY
- 498. CONCLUSIONS
- 499. REFERENCES
- 500. APPENDIX
- 501. SUMMARY
- 502. ACKNOWLEDGMENTS
- 503. AUTHOR'S ADDRESS
- 504. RECEIVED
- 505. REVISION RECEIVED
- 506. PUBLISHED
- 507. COPYRIGHT
- 508. PERMISSION TO REPRODUCE
- 509. DISTRIBUTION STATEMENTS
- 510. ABSTRACT
- 511. KEYWORDS
- 512. SUBJECT TERMS
- 513. CLASSIFICATION
- 514. INDEXING
- 515. CITATION
- 516. SUMMARY
- 517. CONCLUSIONS
- 518. REFERENCES
- 519. APPENDIX
- 520. SUMMARY
- 521. ACKNOWLEDGMENTS
- 522. AUTHOR'S ADDRESS
- 523. RECEIVED
- 524. REVISION RECEIVED
- 525. PUBLISHED
- 526. COPYRIGHT
- 527. PERMISSION TO REPRODUCE
- 528. DISTRIBUTION STATEMENTS
- 529. ABSTRACT
- 530. KEYWORDS
- 531. SUBJECT TERMS
- 532. CLASSIFICATION
- 533. INDEXING
- 534. CITATION
- 535. SUMMARY
- 536. CONCLUSIONS
- 537. REFERENCES
- 538. APPENDIX
- 539. SUMMARY
- 540. ACKNOWLEDGMENTS
- 541. AUTHOR'S ADDRESS
- 542. RECEIVED
- 543. REVISION RECEIVED
- 544. PUBLISHED
- 545. COPYRIGHT
- 546. PERMISSION TO REPRODUCE
- 547. DISTRIBUTION STATEMENTS
- 548. ABSTRACT
- 549. KEYWORDS
- 550. SUBJECT TERMS
- 551. CLASSIFICATION
- 552. INDEXING
- 553. CITATION
- 554. SUMMARY
- 555. CONCLUSIONS
- 556. REFERENCES
- 557. APPENDIX
- 558. SUMMARY
- 559. ACKNOWLEDGMENTS
- 560. AUTHOR'S ADDRESS
- 561. RECEIVED
- 562. REVISION RECEIVED
- 563. PUBLISHED
- 564. COPYRIGHT
- 565. PERMISSION TO REPRODUCE
- 566. DISTRIBUTION STATEMENTS
- 567. ABSTRACT
- 568. KEYWORDS
- 569. SUBJECT TERMS
- 570. CLASSIFICATION
- 571. INDEXING
- 572. CITATION
- 573. SUMMARY
- 574. CONCLUSIONS
- 575. REFERENCES
- 576. APPENDIX
- 577. SUMMARY
- 578. ACKNOWLEDGMENTS
- 579. AUTHOR'S ADDRESS
- 580. RECEIVED
- 581. REVISION RECEIVED
- 582. PUBLISHED
- 583. COPYRIGHT
- 584. PERMISSION TO REPRODUCE
- 585. DISTRIBUTION STATEMENTS
- 586. ABSTRACT
- 587. KEYWORDS
- 588. SUBJECT TERMS
- 589. CLASSIFICATION
- 590. INDEXING
- 591. CITATION
- 592. SUMMARY
- 593. CONCLUSIONS
- 594. REFERENCES
- 595. APPENDIX
- 596. SUMMARY
- 597. ACKNOWLEDGMENTS
- 598. AUTHOR'S ADDRESS
- 599. RECEIVED
- 600. REVISION RECEIVED
- 601. PUBLISHED
- 602. COPYRIGHT
- 603. PERMISSION TO REPRODUCE
- 604. DISTRIBUTION STATEMENTS
- 605. ABSTRACT
- 606. KEYWORDS
- 607. SUBJECT TERMS
- 608. CLASSIFICATION
- 609. INDEXING
- 610. CITATION
- 611. SUMMARY
- 612. CONCLUSIONS
- 613. REFERENCES
- 614. APPENDIX
- 615. SUMMARY
- 616. ACKNOWLEDGMENTS
- 617. AUTHOR'S ADDRESS
- 618. RECEIVED
- 619. REVISION RECEIVED
- 620. PUBLISHED
- 621. COPYRIGHT
- 622. PERMISSION TO REPRODUCE
- 623. DISTRIBUTION STATEMENTS
- 624. ABSTRACT
- 625. KEYWORDS
- 626. SUBJECT TERMS
- 627. CLASSIFICATION
- 628. INDEXING
- 629. CITATION
- 630. SUMMARY
- 631. CONCLUSIONS
- 632. REFERENCES
- 633. APPENDIX
- 634. SUMMARY
- 635. ACKNOWLEDGMENTS
- 636. AUTHOR'S ADDRESS
- 637. RECEIVED
- 638. REVISION RECEIVED
- 639. PUBLISHED
- 640. COPYRIGHT
- 641. PERMISSION TO REPRODUCE
- 642. DISTRIBUTION STATEMENTS
- 643. ABSTRACT
- 644. KEYWORDS
- 645. SUBJECT TERMS
- 646. CLASSIFICATION
- 647. INDEXING
- 648. CITATION
- 649. SUMMARY
- 650. CONCLUSIONS
- 651. REFERENCES
- 652. APPENDIX
- 653. SUMMARY
- 654. ACKNOWLEDGMENTS
- 655. AUTHOR'S ADDRESS
- 656. RECEIVED
- 657. REVISION RECEIVED
- 658. PUBLISHED
- 659. COPYRIGHT
- 660. PERMISSION TO REPRODUCE
- 661. DISTRIBUTION STATEMENTS
- 662. ABSTRACT
- 663. KEYWORDS
- 664. SUBJECT TERMS
- 665. CLASSIFICATION
- 666. INDEXING
- 667. CITATION
- 668. SUMMARY
- 669. CONCLUSIONS
- 670. REFERENCES
- 671. APPENDIX
- 672. SUMMARY
- 673. ACKNOWLEDGMENTS
- 674. AUTHOR'S ADDRESS
- 675. RECEIVED
- 676. REVISION RECEIVED
- 677. PUBLISHED
- 678. COPYRIGHT
- 679. PERMISSION TO REPRODUCE
- 680. DISTRIBUTION STATEMENTS
- 681. ABSTRACT
- 682. KEYWORDS
- 683. SUBJECT TERMS
- 684. CLASSIFICATION
- 685. INDEXING
- 686. CITATION
- 687. SUMMARY
- 688. CONCLUSIONS
- 689. REFERENCES
- 690. APPENDIX
- 691. SUMMARY
- 692. ACKNOWLEDGMENTS
- 693. AUTHOR'S ADDRESS
- 694. RECEIVED
- 695. REVISION RECEIVED
- 696. PUBLISHED
- 697. COPYRIGHT
- 698. PERMISSION TO REPRODUCE
- 699. DISTRIBUTION STATEMENTS
- 700. ABSTRACT
- 701. KEYWORDS
- 702. SUBJECT TERMS
- 703. CLASSIFICATION
- 704. INDEXING
- 705. CITATION
- 706. SUMMARY
- 707. CONCLUSIONS
- 708. REFERENCES
- 709. APPENDIX
- 710. SUMMARY
- 711. ACKNOWLEDGMENTS
- 712. AUTHOR'S ADDRESS
- 713. RECEIVED
- 714. REVISION RECEIVED
- 715. PUBLISHED
- 716. COPYRIGHT
- 717. PERMISSION TO REPRODUCE
- 718. DISTRIBUTION STATEMENTS
- 719. ABSTRACT
- 720. KEYWORDS
- 721. SUBJECT TERMS
- 722. CLASSIFICATION
- 723. INDEXING
- 724. CITATION
- 725. SUMMARY
- 726. CONCLUSIONS
- 727. REFERENCES
- 728. APPENDIX
- 729. SUMMARY
- 730. ACKNOWLEDGMENTS
- 731. AUTHOR'S ADDRESS
- 732. RECEIVED
- 733. REVISION RECEIVED
- 734. PUBLISHED
- 735. COPYRIGHT
- 736. PERMISSION TO REPRODUCE
- 737. DISTRIBUTION STATEMENTS
- 738. ABSTRACT
- 739. KEYWORDS
- 740. SUBJECT TERMS
- 741. CLASSIFICATION
- 742. INDEXING
- 743. CITATION
- 744. SUMMARY
- 745. CONCLUSIONS
- 746. REFERENCES
- 747. APPENDIX
- 748. SUMMARY
- 749. ACKNOWLEDGMENTS
- 750. AUTHOR'S ADDRESS
- 751. RECEIVED
- 752. REVISION RECEIVED
- 753. PUBLISHED
- 754. COPYRIGHT
- 755. PERMISSION TO REPRODUCE
- 756. DISTRIBUTION STATEMENTS
- 757. ABSTRACT
- 758. KEYWORDS
- 759. SUBJECT TERMS
- 760. CLASSIFICATION
- 761. INDEXING
- 762. CITATION
- 763. SUMMARY
- 764. CONCLUSIONS
- 765. REFERENCES
- 766. APPENDIX
- 767. SUMMARY
- 768. ACKNOWLEDGMENTS
- 769. AUTHOR'S ADDRESS
- 770. RECEIVED
- 771. REVISION RECEIVED
- 772. PUBLISHED
- 773. COPYRIGHT
- 774. PERMISSION TO REPRODUCE
- 775. DISTRIBUTION STATEMENTS
- 776. ABSTRACT
- 777. KEYWORDS
- 778. SUBJECT TERMS
- 779. CLASSIFICATION
- 780. INDEXING
- 781. CITATION
- 782. SUMMARY
- 783. CONCLUSIONS
- 784. REFERENCES
- 785. APPENDIX
- 786. SUMMARY
- 787. ACKNOWLEDGMENTS
- 788. AUTHOR'S ADDRESS
- 789. RECEIVED
- 790. REVISION RECEIVED
- 791. PUBLISHED
- 792. COPYRIGHT
- 793. PERMISSION TO REPRODUCE
- 794. DISTRIBUTION STATEMENTS
- 795. ABSTRACT
- 796. KEYWORDS
- 797. SUBJECT TERMS
- 798. CLASSIFICATION
- 799. INDEXING
- 800. CITATION
- 801. SUMMARY
- 802. CONCLUSIONS
- 803. REFERENCES
- 804. APPENDIX
- 805. SUMMARY
- 806. ACKNOWLEDGMENTS
- 807. AUTHOR'S ADDRESS
- 808. RECEIVED
- 809. REVISION RECEIVED
- 810. PUBLISHED
- 811. COPYRIGHT
- 812. PERMISSION TO REPRODUCE
- 813. DISTRIBUTION STATEMENTS
- 814. ABSTRACT
- 815. KEYWORDS
- 816. SUBJECT TERMS
- 817. CLASSIFICATION
- 818. INDEXING
- 819. CITATION
- 820. SUMMARY
- 821. CONCLUSIONS
- 822. REFERENCES
- 823. APPENDIX
- 824. SUMMARY
- 825. ACKNOWLEDGMENTS
- 826. AUTHOR'S ADDRESS
- 827. RECEIVED
- 828. REVISION RECEIVED
- 829. PUBLISHED
- 830. COPYRIGHT
- 831. PERMISSION TO REPRODUCE
- 832. DISTRIBUTION STATEMENTS
- 833. ABSTRACT
- 834. KEYWORDS
- 835. SUBJECT TERMS
- 836. CLASSIFICATION
- 837. INDEXING
- 838. CITATION
- 839. SUMMARY
- 840. CONCLUSIONS
- 841. REFERENCES
- 842. APPENDIX
- 843. SUMMARY
- 844. ACKNOWLEDGMENTS
- 845. AUTHOR'S ADDRESS
- 846. RECEIVED
- 847. REVISION RECEIVED
- 848. PUBLISHED
- 849. COPYRIGHT
- 850. PERMISSION TO REPRODUCE
- 851. DISTRIBUTION STATEMENTS
- 852. ABSTRACT
- 853. KEYWORDS
- 854. SUBJECT TERMS
- 855. CLASSIFICATION
- 856. INDEXING
- 857. CITATION
- 858. SUMMARY
- 859. CONCLUSIONS
- 860. REFERENCES
- 861. APPENDIX
- 862. SUMMARY
- 863. ACKNOWLEDGMENTS
- 864. AUTHOR'S ADDRESS
- 865. RECEIVED
- 866. REVISION RECEIVED
- 867. PUBLISHED
- 868. COPYRIGHT
- 869. PERMISSION TO REPRODUCE
- 870. DISTRIBUTION STATEMENTS
- 871. ABSTRACT
- 872. KEYWORDS
- 873. SUBJECT TERMS
- 874. CLASSIFICATION
- 875. INDEXING
- 876. CITATION
- 877. SUMMARY
- 878. CONCLUSIONS
- 879. REFERENCES
- 880. APPENDIX
- 881. SUMMARY
- 882. ACKNOWLEDGMENTS
- 883. AUTHOR'S ADDRESS
- 884. RECEIVED
- 885. REVISION RECEIVED
- 886. PUBLISHED
- 887. COPYRIGHT
- 888. PERMISSION TO REPRODUCE
- 889. DISTRIBUTION STATEMENTS
- 890. ABSTRACT
- 891. KEYWORDS
- 892. SUBJECT TERMS
- 893. CLASSIFICATION
- 894. INDEXING
- 895. CITATION
- 896. SUMMARY
- 897. CONCLUSIONS
- 898. REFERENCES
- 899. APPENDIX
- 900. SUMMARY
- 901. ACKNOWLEDGMENTS
- 902. AUTHOR'S ADDRESS
- 903. RECEIVED
- 904. REVISION RECEIVED
- 905. PUBLISHED
- 906. COPYRIGHT
- 907. PERMISSION TO REPRODUCE
- 908. DISTRIBUTION STATEMENTS
- 909. ABSTRACT
- 910. KEYWORDS
- 911. SUBJECT TERMS
- 912. CLASSIFICATION
- 913. INDEXING
- 914. CITATION
- 915. SUMMARY
- 916. CONCLUSIONS
- 917. REFERENCES
- 918. APPENDIX
- 919. SUMMARY
- 920. ACKNOWLEDGMENTS
- 921. AUTHOR'S ADDRESS
- 922. RECEIVED
- 923. REVISION RECEIVED
- 924. PUBLISHED
- 925. COPYRIGHT
- 926. PERMISSION TO REPRODUCE
- 927. DISTRIBUTION STATEMENTS
- 928. ABSTRACT
- 929. KEYWORDS
- 930. SUBJECT TERMS
- 931. CLASSIFICATION
- 932. INDEXING
- 933. CITATION
- 934. SUMMARY
- 935. CONCLUSIONS
- 936. REFERENCES
- 937. APPENDIX
- 938. SUMMARY
- 939. ACKNOWLEDGMENTS
- 940. AUTHOR'S ADDRESS
- 941. RECEIVED
- 942. REVISION RECEIVED
- 943. PUBLISHED
- 944. COPYRIGHT
- 945. PERMISSION TO REPRODUCE
- 946. DISTRIBUTION STATEMENTS
- 947. ABSTRACT
- 948. KEYWORDS
- 949. SUBJECT TERMS
- 950. CLASSIFICATION
- 951. INDEXING
- 952. CITATION
- 953. SUMMARY
- 954. CONCLUSIONS
- 955. REFERENCES
- 956. APPENDIX
- 957. SUMMARY
- 958. ACKNOWLEDGMENTS
- 959. AUTHOR'S ADDRESS
- 960. RECEIVED
- 961. REVISION RECEIVED
- 962. PUBLISHED
- 963. COPYRIGHT
- 964. PERMISSION TO REPRODUCE
- 965. DISTRIBUTION STATEMENTS
- 966. ABSTRACT
- 967. KEYWORDS
- 968. SUBJECT TERMS
- 969. CLASSIFICATION
- 970. INDEXING
- 971. CITATION
- 972. SUMMARY
- 973. CONCLUSIONS
- 974. REFERENCES
- 975. APPENDIX
- 976. SUMMARY
- 977. ACKNOWLEDGMENTS
- 978. AUTHOR'S ADDRESS
- 979. RECEIVED
- 980. REVISION RECEIVED
- 981. PUBLISHED
- 982. COPYRIGHT
- 983. PERMISSION TO REPRODUCE
- 984. DISTRIBUTION STATEMENTS
- 985. ABSTRACT
- 986. KEYWORDS
- 987. SUBJECT TERMS
- 988. CLASSIFICATION